Superior Clamping and Gripping

SCHUNK®

Robot Accessories

Perfection in End-of-Arm Competence

Robot Accessories

Perfection in End-of-Arm Competence

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www.facebook.com/SCHUNK.HQ

Superior Clamping and Gripping

Jens Lehmann stands for precise gripping, and safe holding. As a brand ambassador of the SCHUNK team, the No. 1 goalkeeper represents our global competence leadership for clamping technology and gripping systems. The top performance of SCHUNK and Jens Lehmann are characterized by dynamics, precision, and reliability.

For more information visit our website:
www.gb.schunk.com/Lehmann

Jens Lehmann

Henrik A. Schunk, Kristina I. Schunk, brand ambassador Jens Lehmann, and Heinz-Dieter Schunk

Top Performance in the Team

SCHUNK is the world's No. 1 for clamping technology and gripping systems – from the smallest parallel gripper to the largest chuck jaw program.

In order to boost efficiency, SCHUNK customers have bought more than 2,000,000 precision toolholders, 1,000,000 SCHUNK grippers, and 100,000 lathe chucks and stationary workholding systems so far.

This makes us proud and motivates us to attain new top performances.

As a competence leader, we recognize and develop standards with a large potential for the future, which will drive the rapid progress in many industries.

Our customers profit from the expert knowledge, the experience, and the team spirit of more than 2,500 employees in our innovative family-owned company.

The Schunk family wishes you improved end results with our quality products.

Heinz-Dieter Schunk Henrik A. Schunk Kristina I. Schunk

Superior Clamping and Gripping

It's time to use your machine's

With superior components, find potentials in your machine where you would least expect to find them.

Make full use of your machine's potential – with the extensive product portfolio from SCHUNK.

SCHUNK, the competence leader for clamping technology and gripping systems, can now open up the full potential of your processing machines and production processes. Reduce costs by combining accurate, flexible workpiece machining with dynamic production automation.

SCHUNK Synergy – when everything fits together.

With SCHUNK Synergy, you benefit from superior components from our innovative family-owned company and the result of a perfectly harmonized interplay of clamping technology and gripping systems. The more SCHUNK, the more efficient it is.

SCHUNK®

full potential!

"Clamping technology and gripping systems – the perfectly adjusted interplay makes you a champion in terms of productivity. We call it SCHUNK Synergy.

Let's have a look where the potentials in your machines are hidden."

Jens Lehmann

SCHUNK No. 1 Products for higher Productivity ...

Discover new potential now:

www.gb.schunk.com/machine-potential

And order the SCHUNK Synergy poster by telephone +49-7133-103-2256

... in your Automated Handling System

up to 20 tons load handling

MAGNOS **magnetic lifting technology**

... in your Lathe

... in your Lathe

60 seconds jaw change

Lathe chucks ROTA-S plus 2.0 and ROTA THW plus

300% better surface quality

TENDO turn – innovative **hydraulic expansion toolholders,** for lathes and turning/milling centers

1,200 standard chuck jaws

The world's largest **chuck jaw program** for every chuck type

… in your Automated Handling System

No. 1 unique
PGN-plus-P, Generation Permanent, the only gripper with multi-tooth guidance and permanent lubrication

more than 500 standard combinations
for **line and room gantries** from the modular system

100% cycle increase
Universal rotary module SRU-plus 20-S, the new benchmark in top performance

90% faster gripper change
SWS quick-change system – fully automatic gripper change within seconds

… for your Automated Machine Loading

… for your Automated Machine Loading

300 kg load capacity
NSR robot coupling
for pallet handling – space-saving and extremely flexible

100% control
TANDEM **KSP plus clamping force block** with jaw monitoring

30% more productivity
Automated machine loading with **PGN-plus-P, Generation Permanent** SCHUNK gripper with **GSW spindle interface**

… in your Machining Center

90% less set-up costs
with **VERO-S**, due to set-up during processing time

20 mm height
VERO-S NSE *mini* – the pneumatic **quick-change pallet system** in a very flat design

... in your Automated Handling System

... in your Machining Center

... in your Automated Asse

75,000 customized solutions
Hydraulic expansion technology for tool or workpiece clamping

0.3 mm shank diameter
TRIBOS **mini** sets a benchmark in micro machining

100% encapsulated
KONTEC **KSK centric clamping vise** fully functional in harsh environments

less than **3** µ run-out accuracy
TRIBOS**-SVL super-slim tool extension** optimized interfering contours

5 -sided workpiece machining
in one set-up – MAGNOS **magnetic clamping technology**

up to **85,000** rpm
TRIBOS**-S** predestined for high-speed cutting

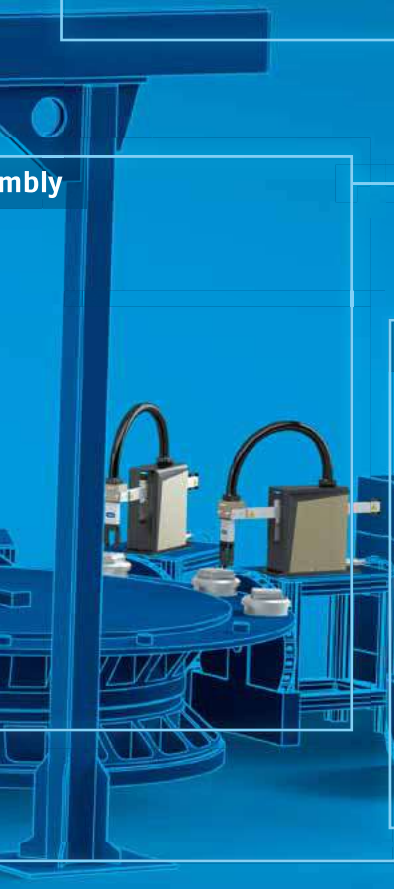
... in your Automated Assembly

∞ combination options
SCHUNK modular assembly system

180% better gripping force – mass ratio
EGP – The powerful electronic **gripper for small components** with integrated electronics

25% greater gripping force
MPG-plus – The most powerful pneumatic **miniature gripper** in the market

110 picks per minute
PPU-E – The fastest pick & place unit in the market, **PPU-P** with 90 picks/min



... in your Service Robotics Application

Future handling

6 degrees of freedom
Powerball lightweight arm LWA 4P
The lightweight arm with the world's most compact performance. Used on mobile platforms

less than 3 µ run-out accuracy
TRIBOS-R with unique patented **polygonal clamping technology**

100% suitable for all SCHUNK toolholders
TENDO-SVL tool extension – optimized interfering contours and super-slim

up to 80 bar coolant-proof or peripheral coolant
Versatile clamping range with **GZB-S intermediate sleeves**

more than 35 years of experience in **TENDO hydraulic expansion technology.** **TENDO**, the original. With 29 interfaces, versatile, with 3 µ run-out accuracy

2,000 Nm torque with Ø 32 mm
TENDO E compact for large volume cutting, boring, reaming, and threads

0 µ permanent run-out accuracy
TENDO zero, perfect vibration damping, resulting in up to 50% longer service life

SCHUNK

SCHUNK Gripping Systems

From the standard Component to the customized Gripping System

More than 30 years of gripping expertise is the basis for the world's largest standardized gripping technology product range, with more than 4,000 components and an average of 2,000 standard and customized gripping systems per year.

Components

Standard Components

SCHUNK Grippers

Rotary Modules

Linear Modules

Robot Accessories

Pick & Place Units

Gripping Hands

Lightweight Arms

Customized Components

From standard components further developed in accordance with customer requirements to exclusive customized new developments.

Examples:

Wafer Grippers

made of laser-forming material with SCHUNK LGP gripper

Compact Vises

for sheet metal machining, pneumatically actuated

Packaging Grippers

High-speed grippers according to legal, hygienic, and production specifications

Gripping Systems

Standard Gripping Systems

Modular Assembly Automation

Line and Room Gantries

Solution composed of several SCHUNK standard components for robots and gantries

Customized Gripping Systems

Solution composed of several SCHUNK components, of which at least one is further developed or newly developed specifically for the customer.

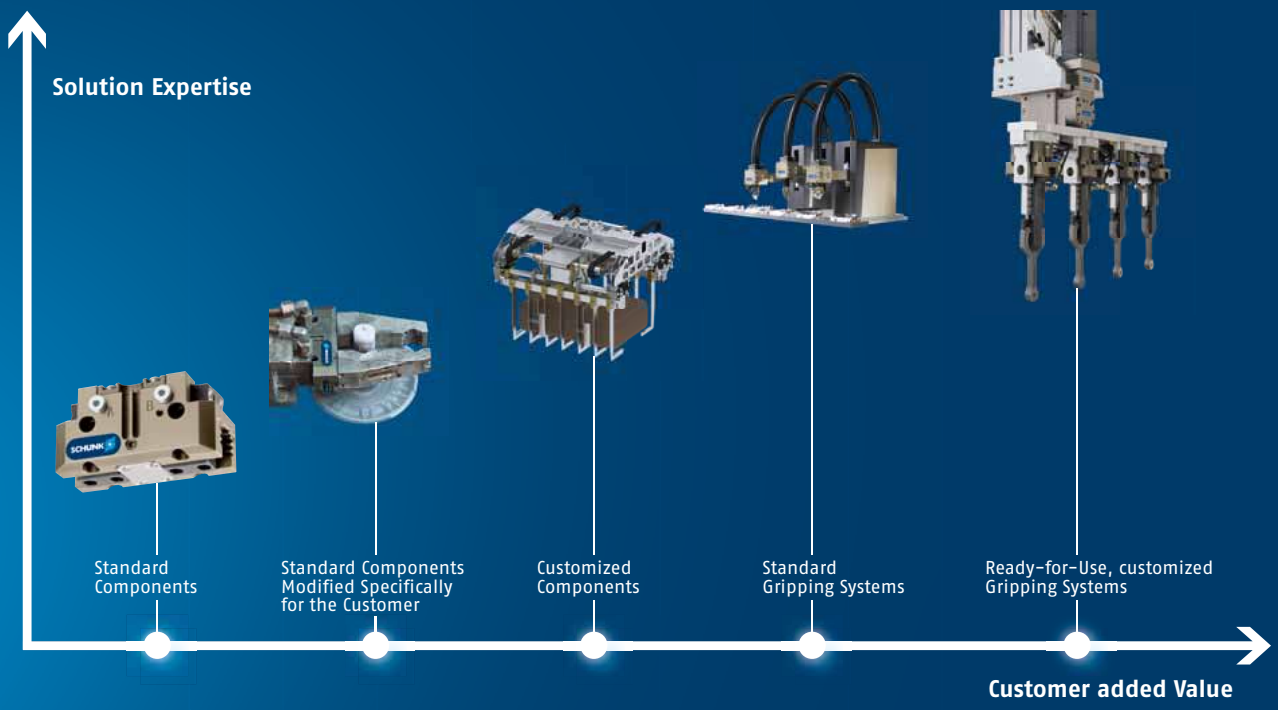
Examples:

Connecting Rod Handling

Aluminum Foil Handling

Modular and Mobile Gripping Systems

From the standard Component to the customized Gripping System



Just 1 Expert Contact Person for a Solution from one Source

For smooth communications, a personal contact person is available to you from the start of the project until completion. Your contact person is the interface between you and the individuals involved in the project and ensures that information is exchanged smoothly.

From planning to continued support after the conclusion of the project, SCHUNK guarantees that your project will be handled cooperatively and efficiently.

Your Advantage

- Over 30 years of experience in gripping technology
- Over 12,000 implemented gripping systems for a wide range of industries
- Modular design with perfectly coordinated standard components
- Complete accuracy of fit due to standardized interfaces
- Shorter project lead times due to standardized systems
- Reliable implementation processes and planning security without extra project costs
- Functional assemblies fitted on request or ready for use
- Time savings due to the perfect solution from a single source

All inclusive!

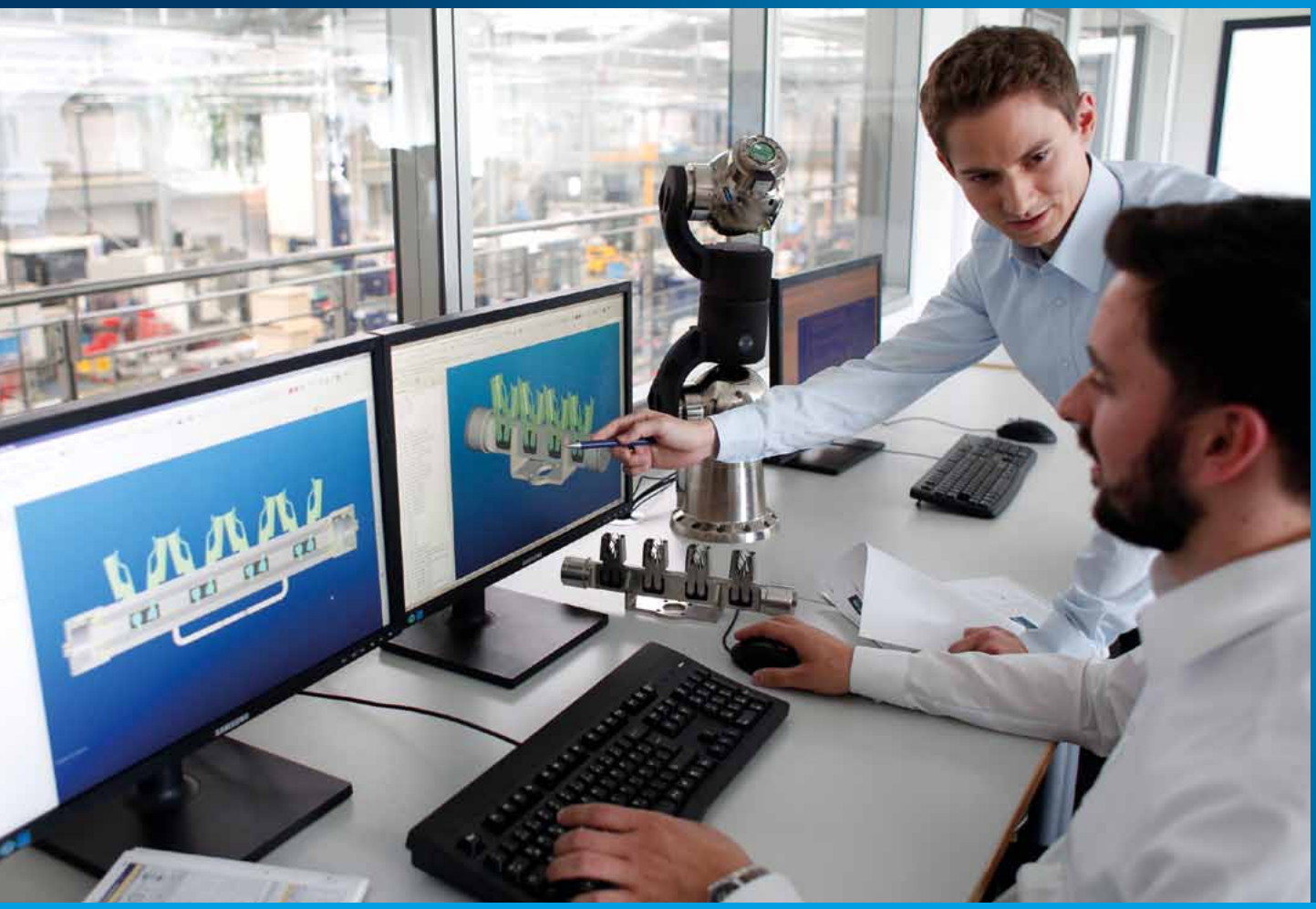
SCHUNK customized Gripping Systems. Take Advantage of our Experience.

More than 12,000 implemented solutions speak for themselves.

Consistent and comprehensive project management is an important part of the SCHUNK philosophy. Our approach is systematic and individually adapted to your project; each step is traceable and documented.

The analysis of complex processes and the comprehensive analysis of parts and products of our customers leads SCHUNK to develop effective and customized gripping systems. The visualization of automated processes requires maximum precision – we use state-of-the art technology for 2D and 3D visualizations and 3D simulations. Our components and configurations contain decisive performance potential for the cost effectiveness of your process chain. We exhaust this potential. Entirely for your benefit.

Consulting → **Project planning** → **Engineering** → **Imple-mentation** → **Service**



Automated removal and loading process.

Task
Automated loading and removal of raw material from a rack by a robot.

SCHUNK solution
The robot removes raw material from an externally accessible rack with a PZN-plus pneumatic centric gripper. After processing in the machine the workpiece is set down by a second PZN-plus centric gripper that was exchanged by means of a SCHUNK SWS quick-change system.

SCHUNK products

SWS
Quick-change system

PZN-plus 380
3-finger centric grippers

Sorting of pistons

Task
Removal of unsorted pistons from a crate for checking the dimensions on a test bench.

SCHUNK solution
A SCHUNK PGN-plus universal gripper was mounted on the robot arm in combination with an OPR anti-collision sensor. Imaging software is used to determine possible gripping points and the PGN-plus removes the pistons.

SCHUNK products

PGN-plus
Universal grippers

OPR
Collision and overload sensor

SCHUNK Adapter plate
Accessories

Gripping Meets Robotics

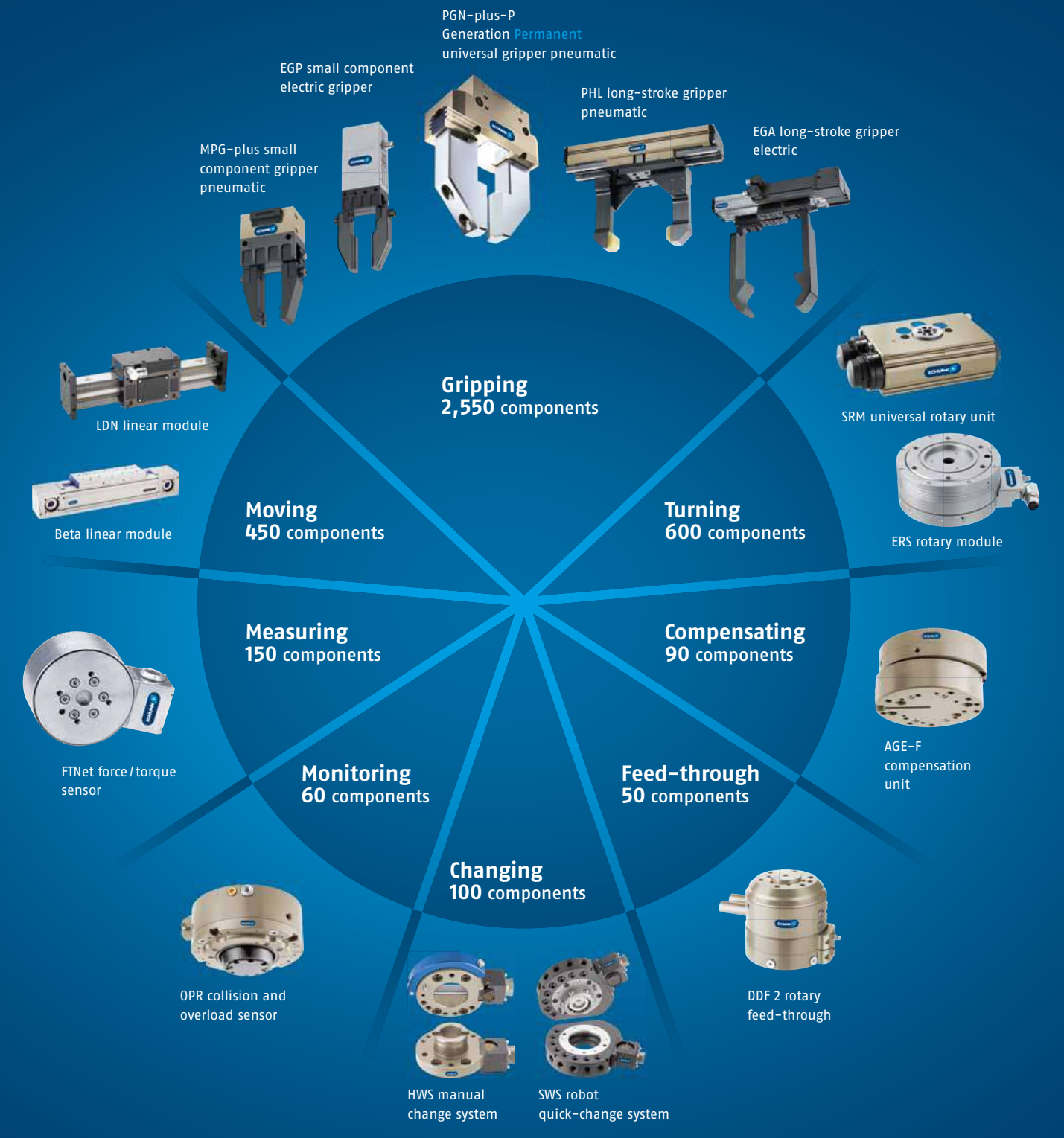
Discover SCHUNK End-of-Arm Competence! For every Robot, every Industry, every Handling Task.

With its components and gripping systems SCHUNK sets standards worldwide in automation for every sector.

Our robot accessories include a uniquely extensive standard range of modules for the mechanical, sensoric and power connection of handling devices and robots. The comprehensive range of robust and durable grippers for small components and universal grippers features high product quality, precision, and numerous sensing options.

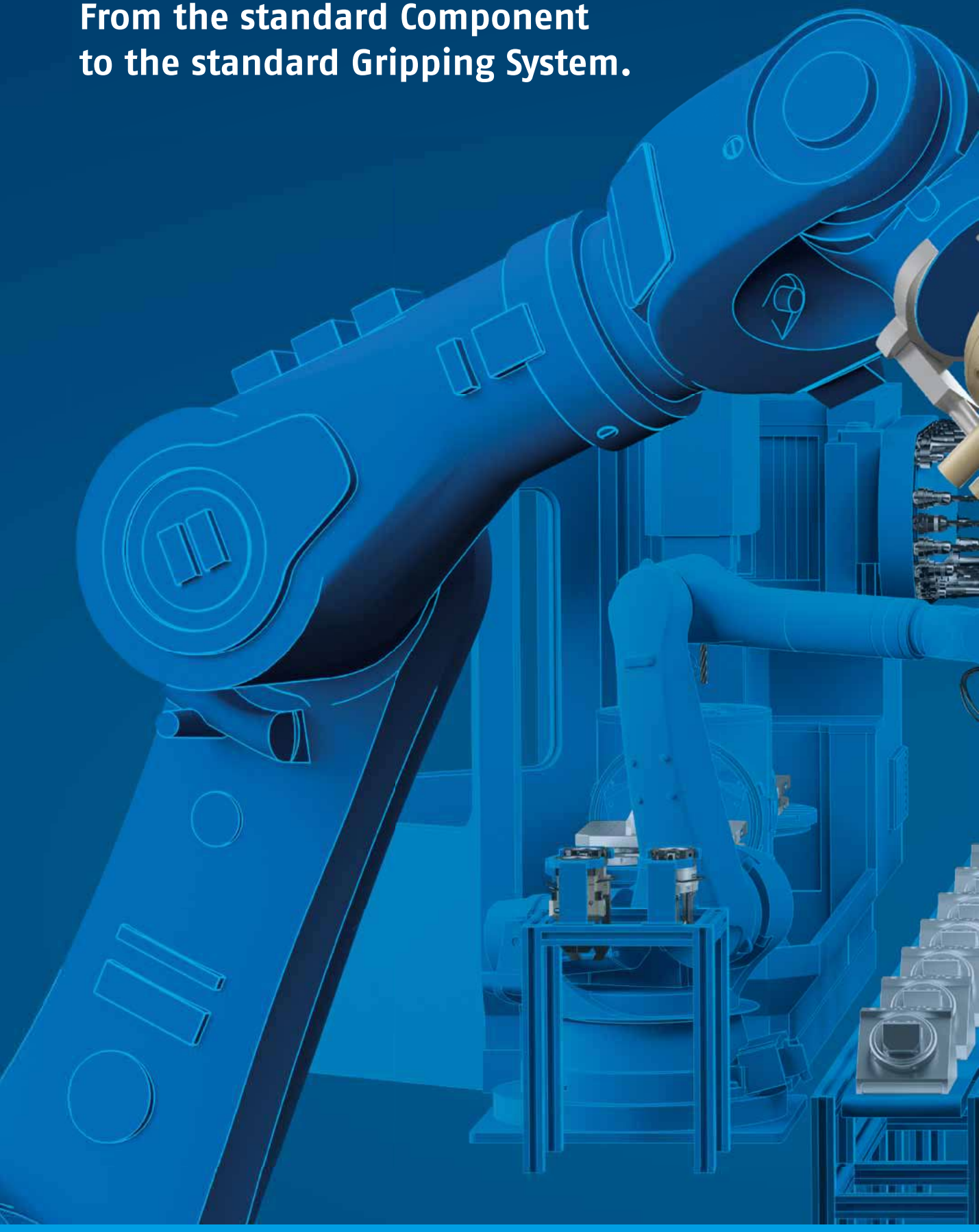
With axis system handling solutions SCHUNK also opens up new perspectives for optimally priced and value-added automation solutions from a single source.

Take Advantage of the SCHUNK Modular System with more than 4,000 standard Components.



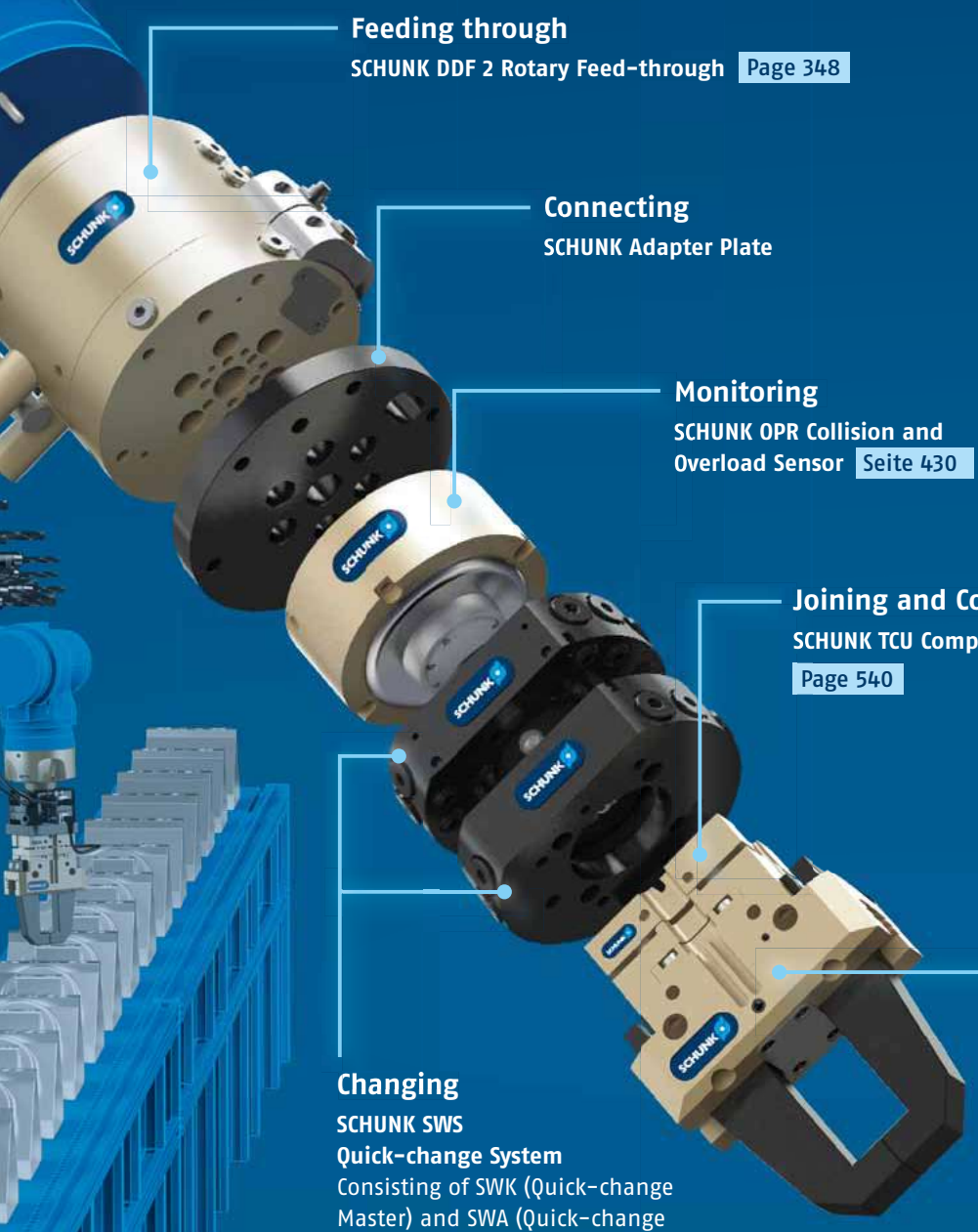
The SCHUNK End-of-Arm

From the standard Component to the standard Gripping System.



n Competence ...

... for your articulated arm robot



Feeding through
SCHUNK DDF 2 Rotary Feed-through Page 348

Connecting
SCHUNK Adapter Plate

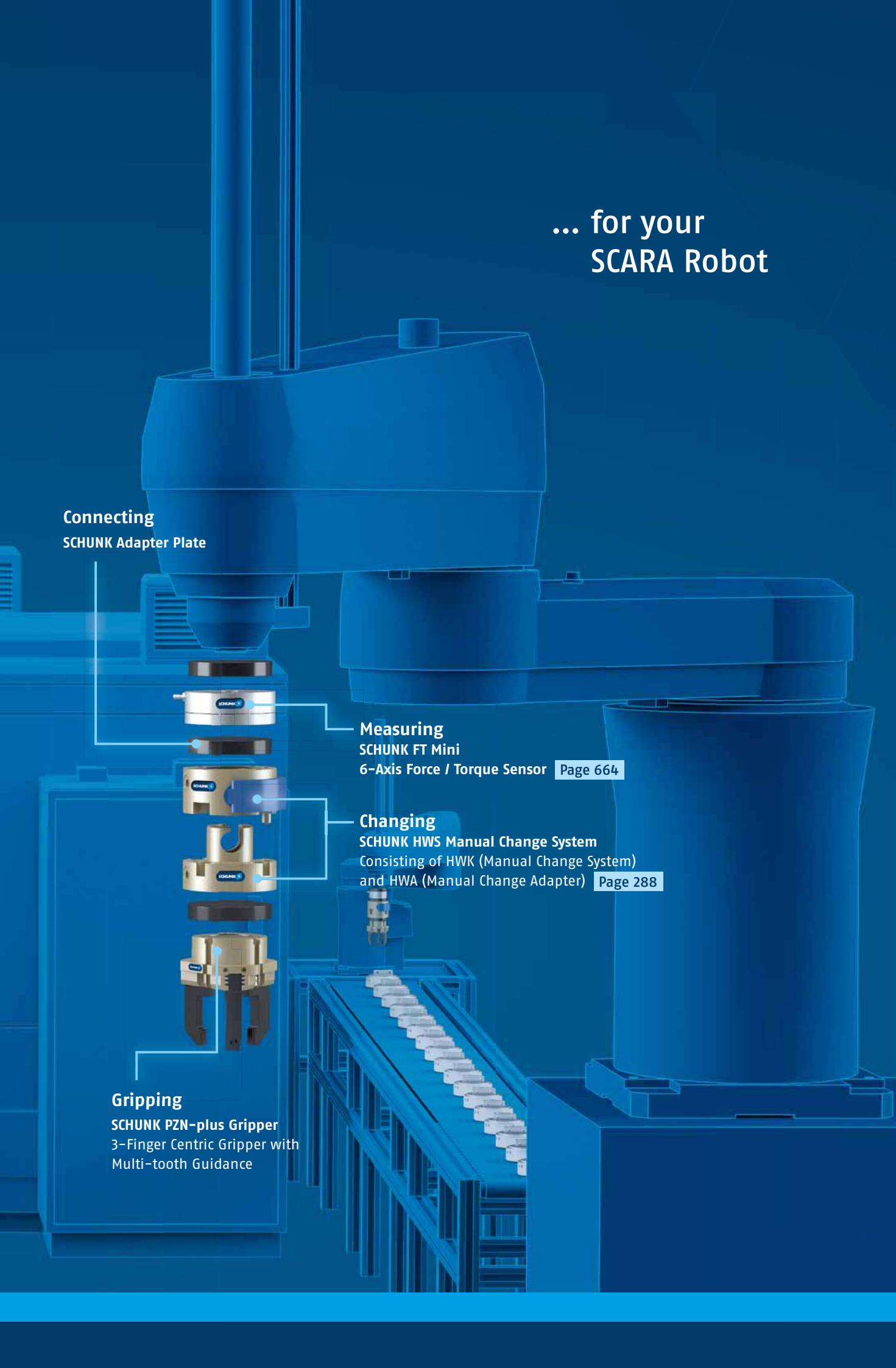
Monitoring
SCHUNK OPR Collision and Overload Sensor Seite 430

Joining and Compensating
SCHUNK TCU Compensation Unit
Page 540

Changing
SCHUNK SWS
Quick-change System
Consisting of SWK (Quick-change Master) and SWA (Quick-change Adapter) Page 42

Gripping
SCHUNK PGN-plus-P, Gripper Generation Permanent
2-Finger Universal Gripper with Multi-tooth Guidance

... for your SCARA Robot



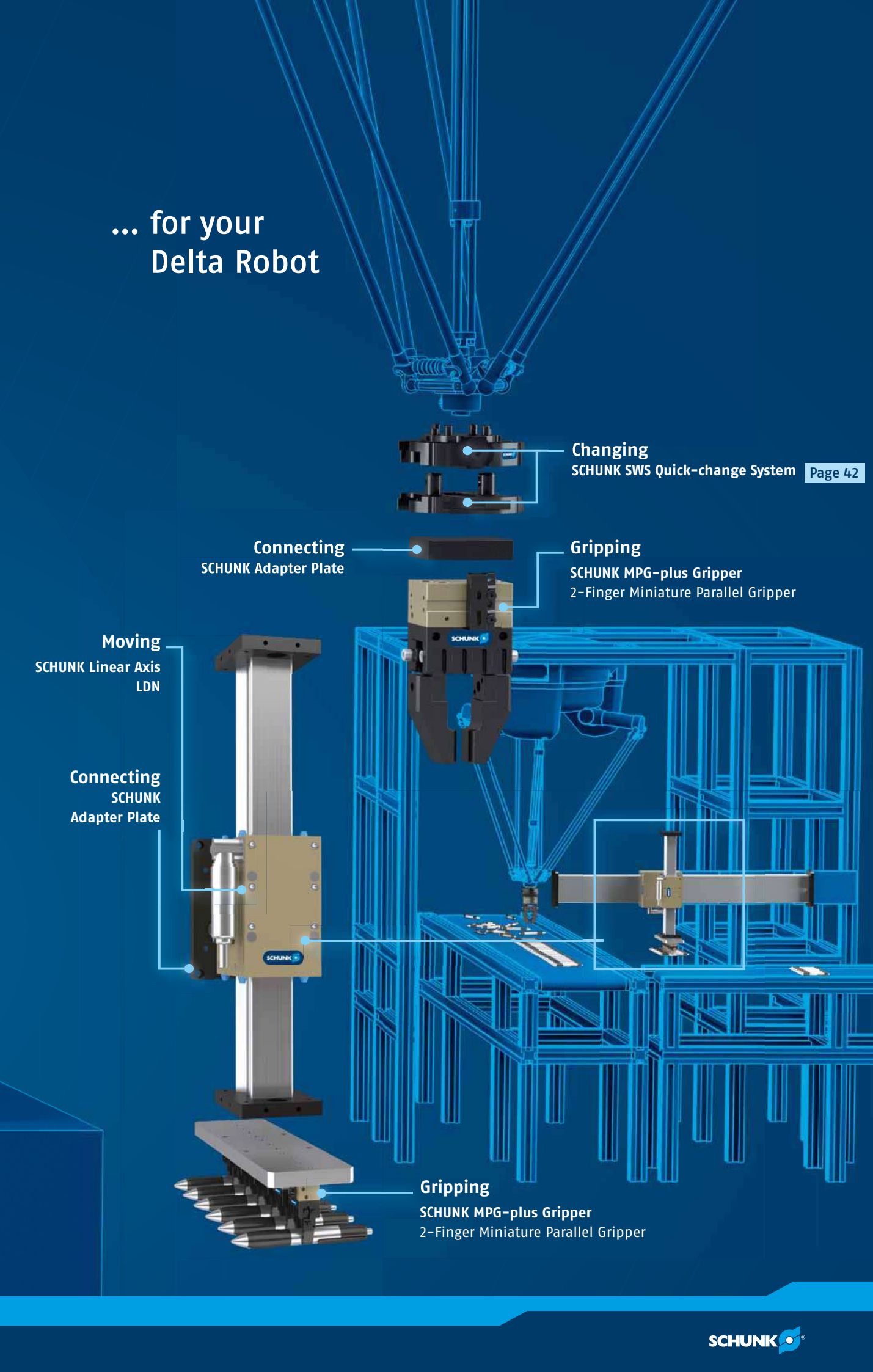
Connecting
SCHUNK Adapter Plate

Measuring
SCHUNK FT Mini
6-Axis Force / Torque Sensor Page 664

Changing
SCHUNK HWS Manual Change System
Consisting of HWK (Manual Change System)
and HWA (Manual Change Adapter) Page 288

Gripping
SCHUNK PZN-plus Gripper
3-Finger Centric Gripper with
Multi-tooth Guidance

... for your Delta Robot



Changing
SCHUNK SWS Quick-change System
Page 42

Connecting
SCHUNK Adapter Plate

Gripping
SCHUNK MPG-plus Gripper
2-Finger Miniature Parallel Gripper

Moving
SCHUNK Linear Axis
LDN

Connecting
SCHUNK
Adapter Plate

Gripping
SCHUNK MPG-plus Gripper
2-Finger Miniature Parallel Gripper

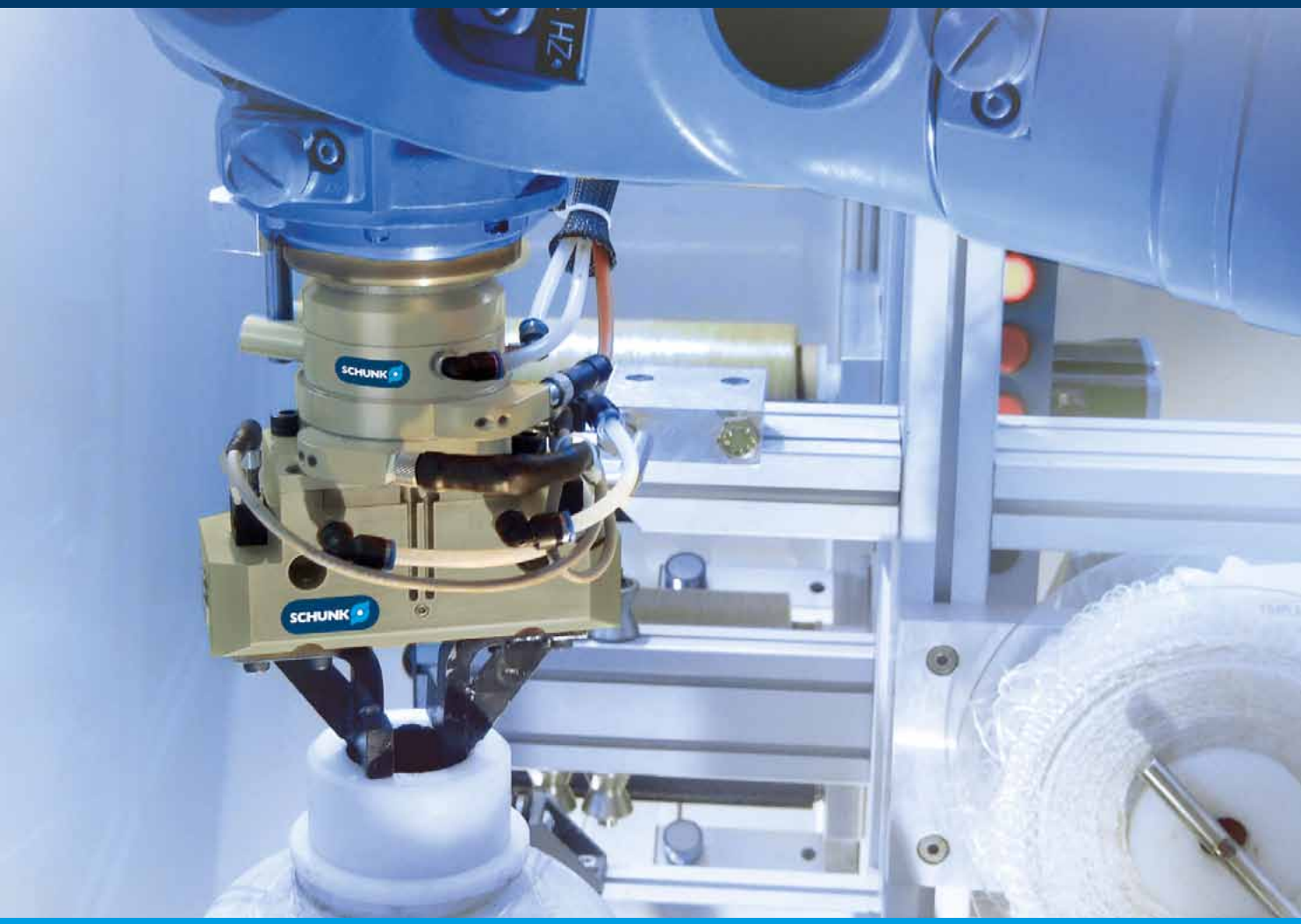
Robot Accessories

Perfection in End-of-Arm Competence

Robot accessories from SCHUNK include an extensive line of modules for the mechanical, sensor, and power connections of handling modules and robots. Quick-change systems, rotary feed-throughs, collision and overload modules, force sensors, compensation units, and insertion units ensure optimal interplay between the robot arm and gripper. This cutting edge technology "Made in Germany" requires our continuous innovative drive.

Strong arguments for robot accessories from SCHUNK:

- Extensive product line from one source
- Suitable for nearly all robot types
- Easy integration
- Compact design
- Series with perfectly matching sizes



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Changing | Page 30

MWS Change System | Page 34

MWS Miniature Change System

- Handling weight up to 0.5 kg
- Extremely thin design
- Transmission of electric signals and pneumatics is possible

SWS Change System | Page 42

SWS Quick-change System

- Handling weight up to 450 kg
- Piston stroke monitoring possible
- Diverse electrical and fluidic energy transmission capabilities

SWS Change System Accessories | Page 146

SWO-E, Electric Options

- Diverse electrical energy transmission capabilities
- Suitable modules from sensor signals all the way to welding current
- Suitable standard cable connectors

SWS Change System Accessories | Page 240

SWO-P, Pneumatic Options

- Diverse fluidic energy transmission capabilities
- Large diameter for higher flow rate
- Self-sealing modules possible

SWM Stacking Magazines | Page 246

SWM-S / SWM-M Storage Racks

- Modular storage racks for SWS change systems
- Corrosion-free, hardened pins
- Sensor monitoring optional

SWS-L Change System | Page 258

SWS-L Quick-change System

- Handling weight up to 4,080 kg
- Piston stroke monitoring possible
- Diverse electrical and fluidic energy transmission capabilities

NSR-A Change System | Page 280

NSR-A Pallet Change System

- Handling weight up to 300 kg
- Compact lightweight design
- Diverse electrical energy transmission capabilities

HWS Change System | Page 288

HWS Manual Change System

- Handling weight up to 54 kg
- Easy mounting due to ISO flange pattern
- Integrated air feed-through

CWS Change System | Page 316

CWS Compact Change System

- Handling weight up to 28 kg
- Direct mounting to PGN-plus and gripper with the same screw connection pattern
- Integrated pneumatic feed-through for reliable supply of power to the gripping modules

FWS Change System | Page 340

FWS Flat Change System

- Handling weight up to 6 kg
- Extremely thin design
- Integrated pneumatic and electric feed-through

Feeding through | Page 346

DDF 2 Rotary Feed-through
Page 348

DDF 2 Rotary Feed-through

- 14 sizes, 31 to 160
- Easy mounting due to ISO flange pattern
- Up to 4x pneumatic feed-through and 10x electrical signal feed-through

DDF-SE Stationary Rotary Feed-through | Page 400

DDF-SE Stationary Rotary Feed-through

- Rotary feed-through for air and electrical signal transmission
- Standardized shaft end for easy assembly of gears
- Rotational speed up to 500 rpm

Protecting | Page 408

OPS Collision and Overload Sensor | Page 410

OPS Collision and Overload Sensor

- Mechanical compliance in case of a collision
- Integrated sensing for collision monitoring
- Breakaway force and moment adjustable via air pressure

OPR Collision and Overload Sensor | Page 430

OPR Collision and Overload Sensor

- Mechanical compliance in case of a collision
- Automatic reset
- Breakaway force and moment adjustable via air pressure

Compensating | Page 462

AGE-Z 2 Tolerance Compensation Unit | Page 464

AGE-Z 2 Compensation Unit

- Z compensation path up to 10 mm
- Easy mounting due to ISO flange pattern
- Can be combined with AGE-XY without adapter plates

AGE-XY Tolerance Compensation Unit | Page 480

AGE-XY Compensation Unit

- XZ compensation path up to +/- 4 mm
- Easy mounting due to ISO flange pattern
- Optional: position memory for eccentric locking

AGE-F Compensation Unit with Spring Return | Page 498

AGE-F Compensation Unit with Spring Return

- XZ compensation path up to +/- 4 mm
- Easy mounting due to ISO flange pattern
- Optional position memory

AGE-S-XYZ Compensation Unit | Page 518

AGE-S-XYZ Compensation Unit

- XY compensation path up to +/- 14 mm and Z up to 12 mm
- Easy mounting due to ISO flange pattern
- With centric locking and position memory

TCU-P Tolerance Compensation Unit | Page 540

TCU-P Tolerance Compensation Unit

- Deflection in X and Y up to 2° and in Z up to 1.5°
- Direct mounting to PGN-plus and gripper with the same screw connection pattern
- Optional: pneumatic locking for a rigid unit during movement

TCU-Z Tolerance Compensation Unit | Page 572

TCU-Z Tolerance Compensation Unit

- Deflection in X, Y and Z up to 1°
- Direct mounting to PGN-plus and gripper with the same screw connection pattern
- Optional: pneumatic locking for a rigid unit during movement

FUS Insertion Unit | Page 602

FUS Insertion Unit

- XZ compensation up to +/- 2.2 mm
- Rotation compensation up to 5°
- Pneumatic centric locking

Measuring | Page 622

6-Axis Force / Moment Sensors Page 624

6-Axis Force / Moment Sensors

- 16 sizes
- Measurement range for moments up to +/- 60,000 Nm and forces up to +/- 40,000 N
- Communication via Ethernet, Ethernet IP, ProfiNet, CAN, DAQ or RS232

Machining | Page 688

FDB Machining System | Page 690

FDB Deburring Spindle

- No-load speed up to 65,000 rpm
- XY compensation path up to 9 mm
- Collet diameter from 3 to 8 mm

FDB-AC Machining System | Page 710

FDB-AC Deburring Spindle

- No-load speed up to 30,000 rpm
- Z compensation path up to 4 mm
- Up to 250 W power

MFT Machining System | Page 722

MFT Polishing Spindle

- No-load speed up to 5,600 rpm
- Z compensation path up to 15 mm
- Up to 390 W power

Accessories | Page 728

Accessories | Page 732

Sensors

- Flexible, position sensors
- Inductive, magnetic, reed sensors
- Programmable

Accessories | Page 772

Sensor Accessories

- Sensor testing
- Connectors
- Sensor adjustment

Accessories | Page 780

Cables, Connectors and Distributors

- Numerous options
- Several connectors
- Pre-assembled

Accessories | Page 814

Attachment Elements

- Absolute precision
- Suitable for all SCHUNK products
- Easy attachment

Accessories | Page 818

Valves and Fittings

- Angular, swivel, and flow control fittings
- Safety valves
- Suitable for all pneumatic SCHUNK components

Robot Accessories

Product-Quickfinder

Changing

	Quick-change Systems		
	SWS page 42	**SWS-L** page 266	**NSR-A** page 280
Product features			
Pneumatic actuation	●	●	●
Piston stroke monitoring possible	●	●	●
Tool presence check possible	●	●	●
Pneumatic feed-throughs	●	●	●
Electrical feed-throughs	●	●	●
Technical data			
Sizes	001 to 300	210 to 1210	100
Recommended workpiece weight [kg]	1 to 450	300 to 1350	75
Moment load M_{xy} [Nm]	3 to 9870	8100 to 13500	75
Moment load M_z [Nm]	3.45 to 8460	6900 to 16200	200
Repeatability [mm]	0.01	0.01	0.02
Mass [kg]	0.25 to 19.1	7.7 to 28	0.4
Mounting flange on robot	Adapter plates / direct mounting ISO-9409	Adapter plates / direct mounting ISO-9409	Adapter plates
Ambient conditions			
Clean	●	●	●
Slightly contaminated	●	●	●
High-temperature and stainless steel version available on request	●	●	

Changing

	Manual Change Systems			
	HWS page 288	**CWS** page 316	**MWS** page 34	**FWS** page 340
Product features				
Manual actuation	●	●	●	●
Tool presence check				
Pneumatic feed-throughs	●	●	●	●
Electrical feed-throughs	●		●	●
Technical data				
Sizes	040 to 125	050 to 125	20 to 30	50
Recommended workpiece weight [kg]	8 to 54	10 to 28	0.5 to 0.8	6
Moment load M_{xy} [Nm]	150 to 960	75 to 480	1.5 to 2.7	90
Moment load M_z [Nm]	120 to 750	30 to 600	0.5 to 2.7	90
Repeatability [mm]	0.01	0.01	0.01	
Mass [kg]	0.22 to 3.92	0.07 to 0.445	0.016 to 0.03	0.045 to 0.098
Mounting flange on robot	Adapter plates / direct mounting ISO-9409	Adapter plates	Adapter plates	Adapter plates
Ambient conditions				
Clean	●	●	●	●
Slightly contaminated	●			
High-temperature and stainless steel version available on request	●			

Feeding through

	Rotary Feed-throughs	Stationary Rotary Feed-through
	DDF 2 page 348	**DDF-SE** page 400
Product features		
Endless rotary motion	●	●
Mounting flange acc. to ISO-9409 standard	●	
Pneumatic feed-throughs	●	●
Vacuum energy transmission		
Electrical energy transmission	●	●
Bus transmission		
Technical data		
Sizes [fulfills ISO-9409]	031 to 160	80 to 120
Recommended workpiece weight [kg]	8 to 250	
Max. rotational speed [rpm]	70 to 120	300 to 500
Initial torque [Nm]	0.8 to 22	4 to 13
Starting torque [after shutdown] [Nm]	1.3 to 25	5 to 20
Forces F_z [N]	1000 to 9000	2000 to 4000
Moments M_x, M_y [Nm]	15 to 600	60 to 250
Moments M_z [Nm]	10 to 400	60 to 250
Pneumatic feed-throughs	2 to 4	4 to 6
Electric feed-throughs	4 to 10	6 to 8
Mass [kg]	0.5 to 14.2	3.3 to 9
Ambient conditions		
Clean	●	●
Slightly contaminated	●	●

Protecting

	Collision and Overload Sensors	
	OPS page 410	**OPR** page 430
Product features		
Pneumatic actuation	●	●
Integrated spring optional		●
Technical data		
Sizes	080 to 200	048 to 221
Moments M_x, M_y [Nm]	7.5 to 430	6 to 2000
Forces F_z [N]	500 to 7000	440 to 14000
Axial deflection [mm]	9.5 to 12	5.1 to 16
Max. deflection angle [°]	±4 to ±12	±8 to 13
Max. rotation angle [°]	45 to endless	20
Repeatability [mm]	±0.02 to ±0.05	±0,025
Operating pressure range [bar]	0.5 to 6.0	1.4 to 6.2
Mass [kg]	0.4 to 7.0	0.24 to 11.4
Mounting flange on robot	Adapter plate	Adapter plate
Ambient conditions		
Clean	●	●
Slightly contaminated		●
Moist		●

Robot Accessories

Product-Quickfinder

Compensating

	Compensation Units			
	AGE-XY page 480	**AGE-Z 2** page 464	**AGE-S-XYZ** page 518	**AGE-F** page 498
Product features				
Pneumatic locking	●	●	●	
Position memory	●		●	
Mounting flange acc. to ISO-9409 standard	●	●	●	
Monitoring via proximity switches	●	●	●	●
Technical data				
Sizes	050 to 080	050 to 080	100 to 200	031 to 080
Compensation stroke XY [mm]	±2.5 to ±4		±4 to ±12	±1.5 to ±5
Compensation stroke Z		8 to 10	10 to 14	
Rotational compensation [°]	12			
Spring force [N]		20 to 120	240 to 1500	
Piston force Z, extension at 6 bar [N]		500 to 1500	800 to 3000	
Piston force Z, retraction at 6 bar [N]		280 to 1450		
Mass [kg]	0.46 to 1.5	0.55 to 1.7	2.6 to 29.5	0.1 to 3.1
Locking force at 6 bar [N]	235 to 580		800 to 2700	
Horizontal payload [kg]	4 to 10		5.5 to 100	1.5 to 32.3
Vertical payload [kg]	6 to 15		9 to 160	
Repeatability [mm]	0.01	0.02	0.01	0.03 to 0.08
Axial force F_z [N]	1700 to 3200	200 to 500	110 to 2000	100 to 2800
Moment load capacity M_x, M_y [Nm]	16 to 30	10 to 30	30 to 500	3.5 to 50
Ambient conditions				
Clean	●	●	●	●
Slightly contaminated			●	
High-temperature version available on request	●	●	●	

Compensating

	Tolerance Compensation Unit		Insertion Unit
	TCU-P page 540	**TCU-Z** page 572	**FUS** page 602
Product features			
Pneumatic locking	●	●	●
Monitoring via proximity switches	●	●	●
Technical data			
Sizes	050 to 200	050 to 200	001 to 400
Rotational compensation [°]	1	1	±2.5 to ±4.5
Mass [kg]	0.08 to 2.45	0.09 to 2.75	0.18 to 1.6
Horizontal payload [kg]	0.5 to 0.8	3 to 60	
Repeatability [mm]	0.02 to 0.1	0.02 to 0.1	0.01
Moment load capacity M_z [Nm]	3 to 55	15 to 140	1.1 to 45.2
Torsional moment M_z	1.0 to 32		1 to 66
Deflection x [°]	1 to 2	1	±2.2
Deflection y [°]	1	1	±2.2
Deflection z [°]	1 to 1.5	1 to 1.5	1.1
Ambient conditions			
Clean	●	●	●
Slightly contaminated	●	●	●

Measuring

	6-Axis Force / Moment Sensors		
	FTN page 624	**FTD** page 624	**FTS** page 624
Product features			
Without IP protection	●	●	●
Protection class IP60	●	●	●
Protection class IP65	●	●	●
Protection class IP68	●	●	●
Technical data			
Sizes	NANO-17 to OMEGA-331	NANO-17 to OMEGA-331	NANO-17 to OMEGA-331
Calibration	SI-12-0.12 to SI-40000-6000	SI-12-0.12 to SI-40000-6000	SI-12-0.12 to SI-40000-6000
Evaluation electronics	Net box	DAQ card	Stand-alone controller
Sensor weight [kg]	0.09 to 47	0.09 to 47	0.09 to 47
Measuring range F_x, F_y [N]	±12 to ±40000	±12 to ±40000	±12 to ±40000
Measuring range F_z [N]	±17 to ±88000	±17 to ±88000	±17 to ±88000
Measuring range M_x, M_y [Nm]	±0.12 to ±6000	±0.12 to ±6000	±0.12 to ±6000
Measuring range M_z [Nm]	±0.12 to ±6000	±0.12 to ±6000	±0.12 to ±6000
Resolution F_x, F_y [N]	1/120 to 1/320	1/120 to 1/320	1/160
Resolution F_z [N]	1/60 to 1/320	1/60 to 1/320	1/130 to 1/160
Resolution M_x, M_y [Nm]	1/64 to 3/2000	1/64 to 3/2000	1/32 to 3/1000
Resolution M_z [Nm]	1/64 to 3/4000	1/64 to 3/4000	1/32 to 3/2000

Machining

	Deburring Spindle		Polishing Spindle
	FDB page 690	**FDB-AC** page 710	**MFT** page 722
Product features			
Pneumatic actuation	●	●	●
Technical data			
Compensation	Radial	Axial	Axial
Sizes	150 – 660	90 – 180	390
Power [W]	150 – 660	250	390
Compensation path [mm]	5.1 to 9.0	4	7.5 to 15
Recommended compensation path [mm]	2.5 – 5.5	2	7.5
Compensation force [N]	3.1 – 45.4	1 – 25	14 to 74
Deflection moment [Nm]	0.09 – 0.16		1.4
Compensation pressure [bar]	1 – 4.1	1 – 3	0.34 to 4.1
Rotational speed without load [1/min]	30000 – 65000	30000	5600
Air consumption without load [l/s]	1.4 – 5.4	6.6	9
Air consumption blocked [l/s]	3.8 – 17.9		
Collet diameter [mm]	3 – 8		10
Mass [kg]	1.1 – 2.2	0.51	3.3
Drive noise [dB]	70	75 – 87	70
Ambient conditions			
Clean	●	●	●
Heavily contaminated	●	●	●

Up to 90% faster, fully automatic component change with the SCHUNK SWS Quick-change System.

Changing

MWS Miniature Change System

Series	Size	Page
MWS		34
MWS	020	38
MWS	030	40

SWS Quick-change System

Series	Size	Page
SWS		42
SWS	001	50
SWS	005	54
SWS	011	58
SWS	020	64
SWS	021	72
SWS	027	80
SWS	040	84

Series	Size	Page
SWS	041	92
SWS	060	100
SWS	071	108
SWS	076	116
SWS	110	124
SWS	160	132
SWS	300	138

SWO-E Electric Options

Series	Size	Page
SWO-E		146
SWO-E	E04	150
SWO-E	A15	152
SWO-E	B15	154
SWO-E	E10-005	156
SWO-E	E10-010	158
SWO-E	E20	160
SWO-E	E2A	162
SWO-E	E3A	164
SWO-E	G19	166
SWO-E	GF19	170
SWO-E	G26	174
SWO-E	K19	178
SWO-E	KF19	182
SWO-E	K26	186
SWO-E	KG19	190

Series	Size	Page
SWO-E	KM14	194
SWO-E	MT8	196
SWO-E	MT9	200
SWO-E	MT14	202
SWO-E	PG0	204
SWO-E	R19	206
SWO-E	RF19	210
SWO-E	R26	214
SWO-E	R32	218
SWO-E	S19	222
SWO-E	S26	226
SWO-E	SF19	230
SWO-E	T19	234
SWO-E	X7D	236
SWO-E	X7G	238

SWO-P Pneumatic Options

Series	Page
SWO-P	240

Robot Accessories

Changing

SWM-S / SWS-M Storage Racks

Series	Size	Page
SWM-S		246
SWM-S	005	249
SWM-S	011	250
SWM-S	020	251
SWM-S	021	252

Series	Size	Page
SWM-M	040	255
SWM-M	041	255
SWM-M	060	256
SWM-M	071	256
SWM-M	076	257
SWM-M	110	257

SWS-L Quick-change System

Series	Size	Page
SWS-L		258
SWS-L	210	264
SWS-L	310	266

Series	Size	Page
SWS-L	510	268
SWS-L	1210	270

NSR-A Pallet Change System

Series	Size	Page
NSR-A		280
NSR-A	100	284

HWS Manual Change System

Series	Size	Page
HWS		288
HWS	040	292
HWS	050	296
HWS	063	300

Series	Size	Page
HWS	080	304
HWS	100	308
HWS	125	312

CWS Compact Change System

Series	Size	Page
CWS		316
CWS	050	320
CWS	064	324

Series	Size	Page
CWS	080	328
CWS	100	332
CWS	125	336

FWS Flat Change System

Series	Size	Page
FWS		340
FWS	50	344

Modular. Compact. Flexible.

MWS Miniature Change System

Manual tool change system with integrated air feed-through and optional electric feed-through.

Field of Application

Ideal for use in micro-systems technology and particularly for handling tiny components.

Advantages – Your benefit

Extremely thin design for less interfering contours

Easy handling without additional tools, quick and easy to remove at any time

Center bore for feed-through of parts, camera, laser beams, etc.

Integrated feed-through for six pneumatic or four electrical signals

Suitable storage rack to ensure the optimal adaption to each application

ISO flange pattern for simple assembly; in compliance with DIN 32565 level 4

Sizes	Handling weight	Moment load M_x	Moment load M_z
Quantity: 2	0.5 .. 1 kg	0.5 .. 1 Nm	0.2 .. 0.75 Nm

Functional Description

The MWS miniature change system consists of a MWK miniature change master and a MWA miniature change adapter. A form-fit connection is established between the MWK miniature change master and the MWA miniature change adapter by actuating the locking ring. An integrated pneumatic feed-through safely provides the tool with electricity.

① **Screw surface**
compliant with DIN 32565 level 4

② **Locking mechanism**
for safe locking and unlocking

③ **Anti-twist protection**
for exact coupling and maximum precision

④ **Locking mechanism**
fail-safe locking mechanism

⑤ **Pneumatic feed-through**
integration into housing means no interfering contours

⑥ **Electrical feed-through**
for electrical energy and signal transmission

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Actuation: manual

Operating principle: The master and adapter are locked and unlocked by turning the manual lever.

Energy feed-through: integrated pneumatic and electric energy feed-through

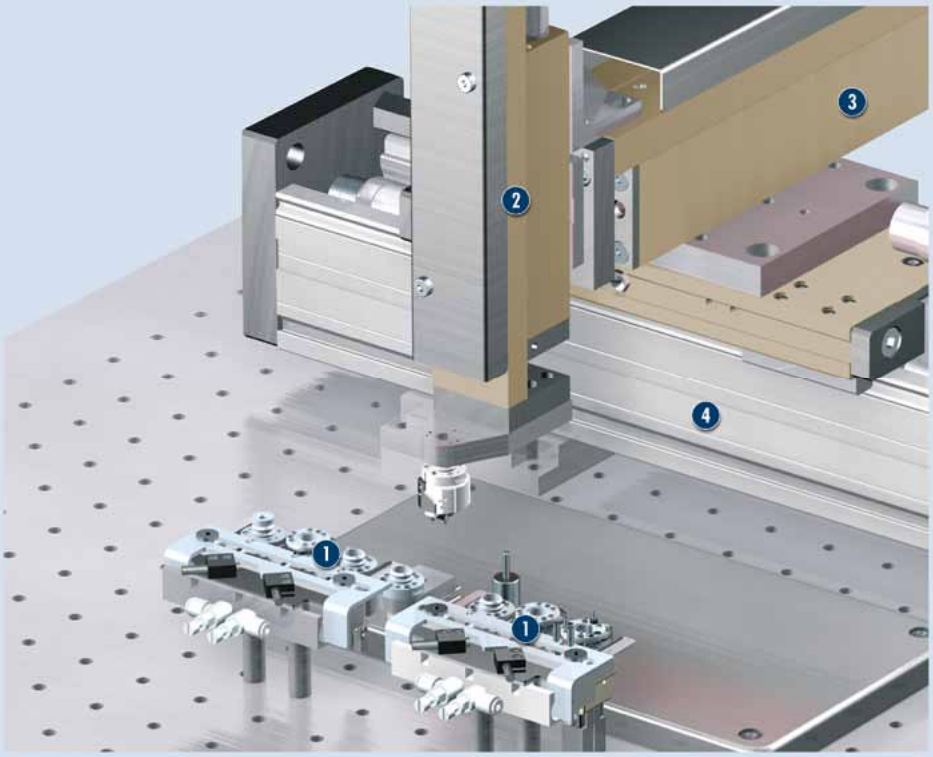
Housing: stainless steel

Scope of delivery: Electrical feed-throughs, O-rings for pneumatic feed-throughs and small components for mounting

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and may void the warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.



Application example

Automated assembly of writing utensils: Lead refills are inserted into mechanical pencils. The MWS ensures fast changing of the gripper and tools.

1. MWS Miniature Change System
2. ELM 23-H70 Linear Module with direct drive
3. ELM 37-H260 Linear Module with direct drive
4. EPM 48-0300 Gantry Module with direct drive

SCHUNK offers more ...

The following components make the MWS even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

MPG-plus 2-Finger Small Parts Gripper

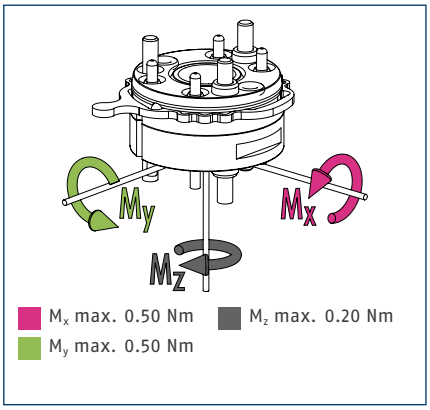
MWPG Miniature Change Parallel Gripper

MPZ 3-Finger Centric Gripper

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

MWS 020

Forces and moments

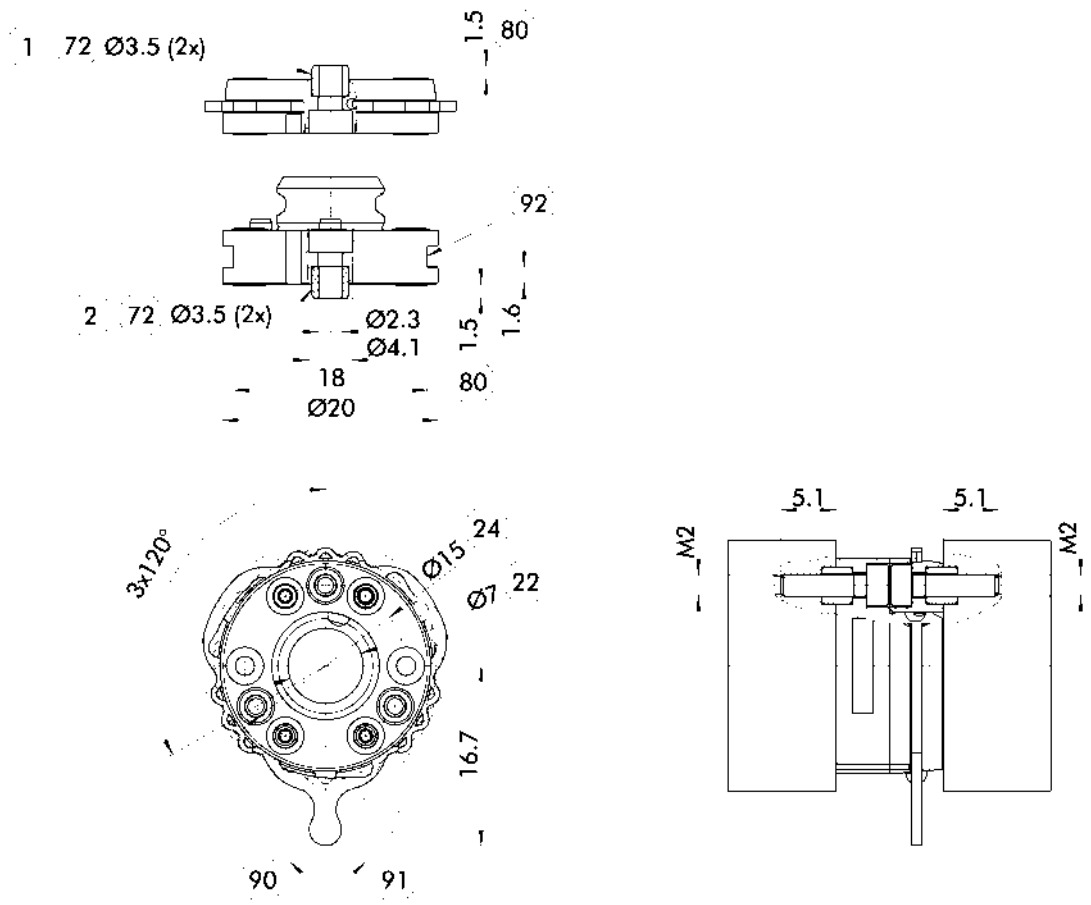


ⓘ This is the max. sum of all torques (acceleration torques, process forces, acceleration forces etc.) that are permitted to act on the change system to ensure error-free functioning.

Technical data

Description		MWK-020-2P-0E	MWA-020-2P-0E	MWK-020-2P-4E	MWA-020-2P-4E
		Miniature change master	Miniature change adapter	Miniature change master	Miniature change adapter
ID		0305623	0305624	0305611	0305612
max. payload	[kg]	0.5	0.5	0.5	0.5
Repeat accuracy	[mm]	0.1	0.1	0.1	0.1
Mass	[g]	7	9	7	9
min. / max. locking distance	[mm]	0.25	0.25	0.25	0.25
Number of fluid feed-throughs		2	2	2	2
Number of electrical feed-throughs				4	4
Voltage	[V]			24	24
Current strength	[A]			1	1
max. permissible XY offset	[mm]	±0.3	±0.3	±0.3	±0.3
max. permissible angular offset	[°]	±0.8	±0.8	±0.8	±0.8

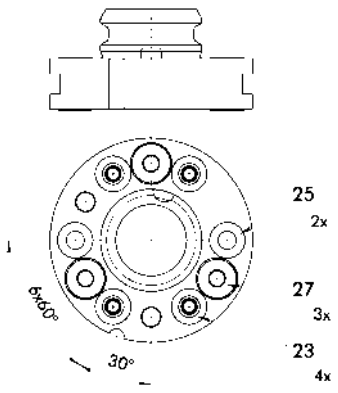
Main view



The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(22) Center bore
(24) Bolt circle
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part
(90) Unit unlocked
(91) Unit locked
(92) Channel for quick-change rack

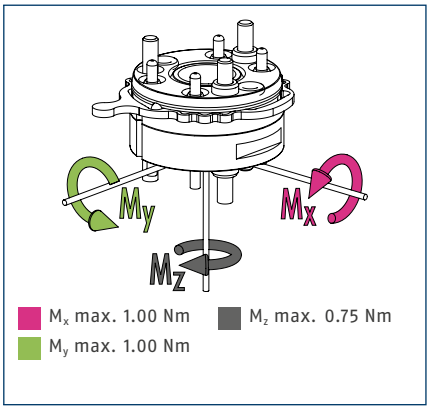
Mounting and feed-throughs



(23) Electrical signal feed-through
(25) Pneumatic feed-through
(27) Through-holes for screw connections

MWS 030

Forces and moments

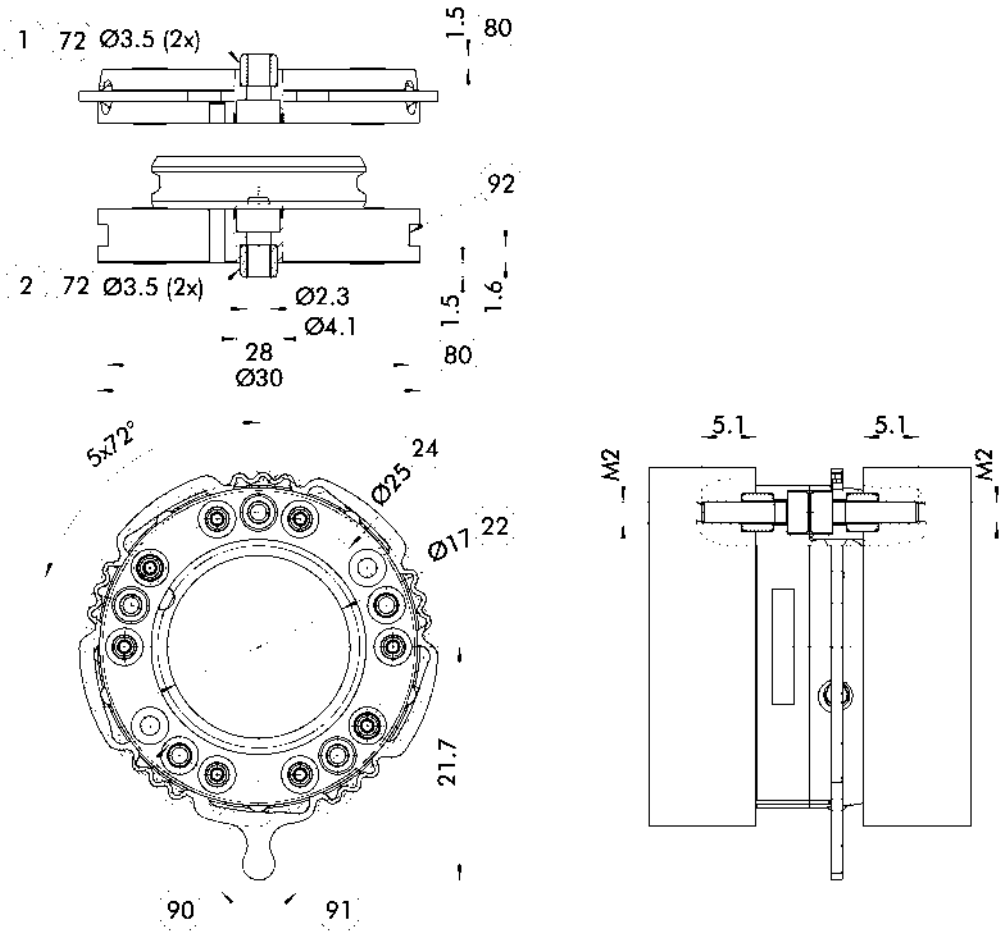


ⓘ This is the max. sum of all torques (acceleration torques, process forces, acceleration forces etc.) that are permitted to act on the change system to ensure error-free functioning.

Technical data

Description	Unit	MWK-030-2P-0E	MWA-030-2P-0E	MWK-030-2P-4E	MWA-030-2P-4E	MWK-030-2P-6E	MWA-030-2P-6E
		Miniature change master	Miniature change adapter	Miniature change master	Miniature change adapter	Miniature change master	Miniature change adapter
ID		0305633	0305634	0305641	0305642	0305643	0305644
max. payload	[kg]	1	1	1	1	1	1
Repeat accuracy	[mm]	0.1	0.1	0.1	0.1	0.1	0.1
Mass	[g]	12	16	12	16	12	16
min. / max. locking distance	[mm]	0.25	0.25	0.25	0.25	0.25	0.25
Number of fluid feed-throughs		2	2	2	2	2	2
Number of electrical feed-throughs				4	4	6	6
Voltage	[V]			24	24	24	24
Current strength	[A]			1	1	1	1
max. permissible XY offset	[mm]	±0.3	±0.3	±0.3	±0.3	±0.3	±0.3
max. permissible angular offset	[°]	±0.8	±0.8	±0.8	±0.8	±0.8	±0.8

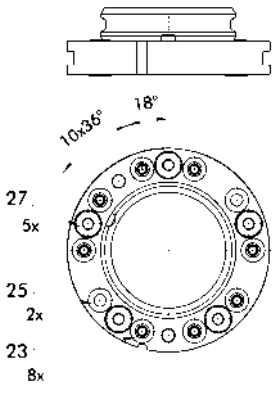
Main view



The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(22) Center bore
(24) Bolt circle
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part
(90) Unit unlocked
(91) Unit locked
(92) Channel for quick-change rack

Mounting and feed-throughs



(23) Electrical signal feed-through
(25) Pneumatic feed-through
(27) Through-holes for screw connections

Modular. Robust. Flexible.

SWS Quick-change system

Pneumatic tool changing system with patented locking system.

Field of Application

Can be used wherever short changeover times between a handling device and a tool (pallets, gripper) are required

Advantages – Your benefit

Many sizes for almost every robot size: there is always the matching unit for your application

Patented fail-safe locking mechanism for safe connection between quick-change master and quick-change adapter

Manual emergency unlocking possible no counter-forces from springs

All functional components made from hardened steel for a greater change system load bearing capacity

Wide range of electric, pneumatic, and fluid modules for manifold energy transmission possibilities

Integrated pneumatic feed-through for safe energy supply of the handling modules and tools

Possibility of transmission of fluid systems with self-sealing couplings possible

Adapter coding via electric module possible

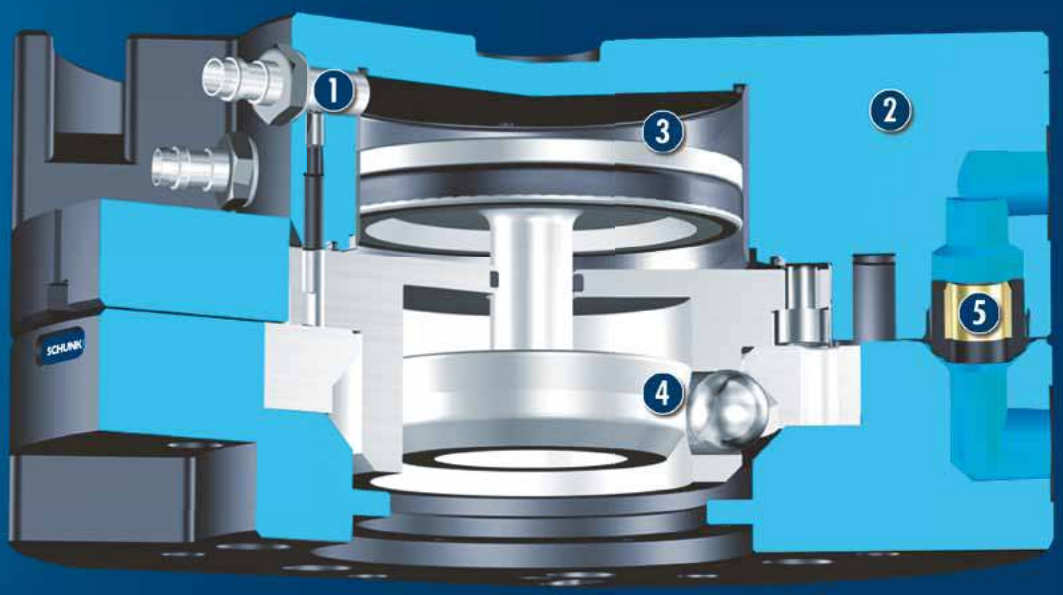
Suitable storage racks for all sizes of standardized storage modules

ISO flange pattern for easy assembly with most types of robots without needing additional adapter plates

Sizes	Handling weight	Moment load M_x	Moment load M_z
Quantity: 15	1.4 .. 450 kg	2.8 .. 9870 Nm	3.45 .. 8460 Nm

Functional Description

Due to the automatic change of the robot tool (e.g. gripper, pallets, suction cups, pneumatic or electrically driven tools, welding guns ...) the flexibility of your robot increases. The SWS quick-change system consists of a SWK quick-change master and a SWA quick-change adapter. The SWK, mounted onto the robot, couples with the SWA mounted onto the tool. A pneumatically driven locking piston, with its patented design, ensures that the connection is secure. After coupling, pneumatic and electric feed-throughs automatically supply your robot tool.



① **Sensor monitoring of the locking device**
Optional, for process reliable monitoring of the locking condition

② **Housing**
Weight-optimized through application of high-strength aluminum alloy

③ **Drive**
Pneumatic, efficient, and easy to handle

④ **Locking mechanism**
Force-free locking and unlocking, self-locking in locked position

⑤ **Air feed-through**
No interfering contours due to the integration into the housing. Also suitable for vacuum.

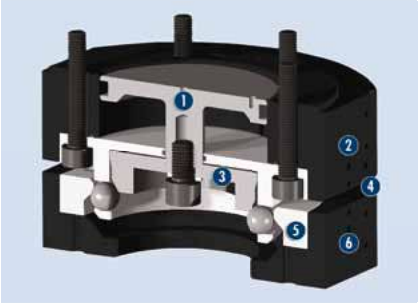
CAD data, operating manuals and other current product documents are available at **www.schunk.com**

Detailed Functional Description

Quick-change system in unlocked position

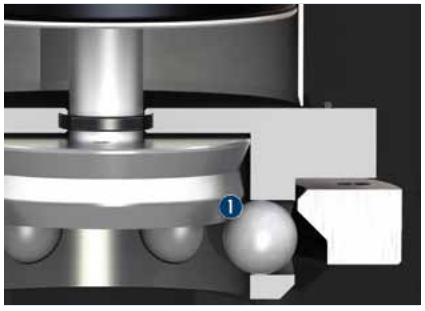
1. Adapter plate
2. Quick-change master SWK
3. Electrical module, robot-side
4. Locking mechanism
5. Locking ring
6. SWA quick-change adapter
7. Electrical module, tool-side

Section view in Ready-to-Lock position



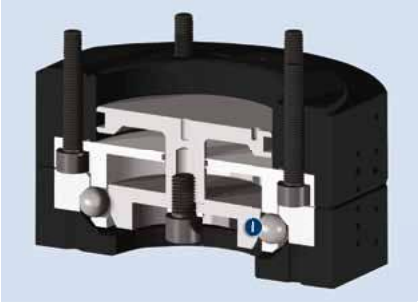
1. Piston
2. Quick-change master SWK
3. Locking piston
4. No-Touch-Locking™
5. Locking ring
6. SWA quick-change adapter

Detailed view of the locking ball position in Ready-to-Lock position



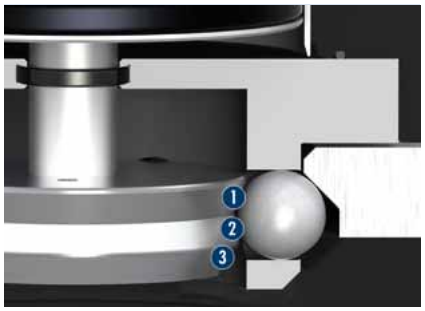
1. Locking balls are on the 1st taper of the cam. The master and adapter do not need to be touching to lock.

Section view of the quick-change system in locked position



1. Actuation of the piston forces the balls out and into the hardened steel ring, pulling the adapter to the master.

Close-up of locking ball in locked position

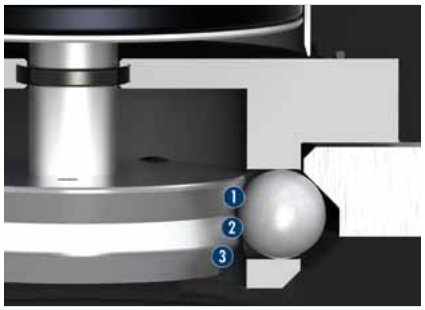


1. Locking balls on the 2nd taper of the cam create extremely high locking forces.
2. Fail-Safe reverse taper
3. 1st taper

Section view of the quick-change system in fail-safe position

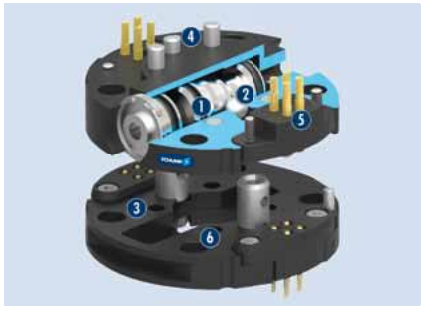
1. The tool plate will not release from the master plate unless unlock air pressure is applied.
Separation of master and adapter in fail-safe position is only possible by pneumatic actuation of the piston.

Close-up of locking ball while in fail-safe position



1. In the case of pressure loss the locking balls are held in place via the cylindrical part of the locking piston. The piston seal friction prevents the piston from moving due to its own weight or vibrations. The master and adapter can only be separated by pneumatic actuation of the piston.
2. Fail-Safe reverse taper
3. 1st taper

Sectional diagram SWS-001



1. Drive
Pneumatic, efficient, and easy to handle
2. Locking mechanism
Force-free locking and unlocking, self-locking in locked position
3. Housing
Weight-optimized through application of high-strength aluminum alloy
4. Centering and mounting possibilities by using a standardized ISO 9409 interface for robots
5. Electric feed-throughs
No interfering contours, due to the integration into the housing.
6. Air feed-through
No interfering contours due to the integration into the housing. Also suitable for vacuum.

General Notes to the Series

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Operating principle: Locking balls actuated by pistons

Energy feed-through: Variable via attachment modules, depending on the type

Housing: The housing is made of high-tensile, hard-coated aluminum alloy. The functional parts are made of hardened steel.

Scope of delivery: Operating and maintenance instructions, manufacturer's declaration

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and may void the warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: the weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Insertion tool for assembly of small to medium-sized workpieces. The tool can be used in both, clean and dirty environments. Due to its quick-change system, many tools can alternatively be fixed to the robot flange.

1. SWS quick-change system
2. Electric feed-through
3. TCU-Z tolerance compensation unit
4. PZN-plus 3-finger centric gripper

SCHUNK offers more ...

The following components make the SWS even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Optional Electrical Module

Cable Connector

Pneumatic Optional Modules

SWM Storage Rack

Extension Cable

Adapter Plates

Inductive Proximity Switches

Dust Cover

PGN-plus Universal Gripper

OPR Collision and Overload Sensor

FDB-AC Deburring Spindles

AGE Compensation Unit

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

Options and special Information

No-Touch-Locking™: Locking without touching. Ensures that the SWS is securely locked even when the SWK and SWA do not contact.

Patented fail-safe locking mechanism: Large piston diameter and outward ball travel increase moment load. All locking parts are made of Rc 58 stainless steel.

Selection of a SWS Quick-change System

1. Determining the Size

Quick Method:

When low or medium forces and moments act upon the SCHUNK quick-change system, you should choose a quick-change system with a payload that is comparable to that of your robot.

If high moments and forces act upon the SCHUNK quick-change system, please use the following method, which is more precise.

More Precise Method:

The forces and moments are a critical factor in choosing a suitable quick-change system. Proceed as follows to estimate the most unfavorable moment:

- Calculate for the approximate center of gravity (COG) of the heaviest end effector that will be used. Calculate the distance (D) from the COG to the bottom of the tool plate.
- Calculate the mass (m) of the heaviest end effector.
- Multiply m, D and gravity (9,81 m/s²) to determine the approximate static moment (M) (or a moment based on 1 g acceleration).
- Choose a quick-change system with a moment load that is equal to or greater than M.

Due to their potentially high accelerations, robots can generate moments that are two to three times higher than M. The quick-change systems are designed for absorbing dynamic moments that are three times higher than their static moments.

2. Pneumatic and electrical System

Determine the number of required pneumatic connections and electrical contacts. Larger quick-change systems feature a higher number of pneumatic connections and electrical contacts.

3. Temperature and Chemicals

SCHUNK quick-change systems use nitrile seals for the pneumatic supply to the tool plate. O-rings seal the pneumatic locking mechanism. These O-rings are resistant to most chemical influences and also withstand temperatures ranging from -25 to 65 °C. Please contact your SCHUNK representative if you need information on temperatures or chemical influences in particular environments.

4. Precision Applications

Always comply with the specifications if you work with applications that require high repeat accuracy.

SWS Sizes

Designation	Recommended handling weight [kg]	Dynamic moment [Nm]		Static moment [Nm]		Pneumatic feed-throughs	Air connections locked and unlocked
		M_x and M_y	M_z	M_x and M_y	M_z		
SWS-001	1.4	2.8	3.45	0.983	1.15	4 x M5	M5
SWS-005	8	37.2	50.7	12.4	16.9	6 x M5	M5
SWS-011	16	74.7	101.7	24.9	33.9	6 x M5	M5
SWS-020	25	169.5	234	56.5	78	12 x M5	M5
SWS-021	25	169.5	234	56.5	78	8 x G1/8"	M5
SWS-027	38	254.1	298.2	84.7	99.4	8 x G1/8"	G1/8"
SWS-040Q	50	678	678	226	226	8 x G1/8"	G1/8"
SWS-041	50	471	648	157	216	6 x G3/8"; 4 x G1/8"	G1/8"
SWS-060	75	591	882	197	294	8 x G1/8"	G1/8"
SWS-071	79	1185	1185	395	395	8 x G1/4"	G1/8"
SWS-076	100	1626	2103	542	701	5 x G3/8"	G1/8"
SWS-110	150	2352	2352	784	784	8 x G3/8"	G1/8"
SWS-160	300	7170	3800	2390	1267	5 x G3/8"; 4 x G1/2"	G1/8"
SWS-210	300	8130	6780	2710	2260		
SWS-300	450	9870	8460	3290	2820	10 x G3/8"w	G1/4"
SWS-310	510	9870	9480	3290	3160		
SWS-510	700	14580	10500	4860	3500		
SWS-1210	1350	16260	16260	5420	5420		

Sample Order SWS 001 / 005 / 011 / 020 / ... / 300

SW K - 040 - R19 - G19

Designation
SW

Page
K = Master (robot side)
A = Adapter (tool side)

Size
001 / 005 / 011 / 020 / ... / 300

Optional modules
Rxx, Sxx, Gxx, Kxx = Electro modules
Pxx = Pneumatic module (anodized aluminum housing, not suitable for liquids)
Vxx = Vacuum module
Fxx = Fluid modules (stainless steel, self-sealing)
000 = Option not used

Sample Order SWS 011H / 020H / 021H / 040Q / 076 / 110 / 160

SW K - 110 - R19 - G19 - SM

Designation
SW

Page
K = Master (robot side)
A = Adapter (tool side)

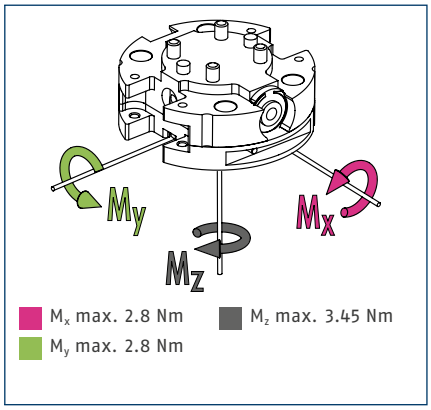
Size
011H / 020H / 021H / 040Q / 110 / 160

Optional modules
Rxx, Sxx, Gxx, Kxx = Electro modules
Pxx = Pneumatic module (anodized aluminum housing, not suitable for liquids)
Vxx = Vacuum module
Fxx = Fluid modules (stainless steel, self-sealing)
000 = Option not used

Proximity switch monitoring
SM = Inductive proximity switch PNP (SWK-110, SWK-160)
SG = Inductive proximity switch PNP (for SWK-040Q, SWK-076)
SQ = Inductive proximity switch PNP (for SWK-011H, SWK-020H, SWK-021H)
0 = No proximity switch
Additional variants available on request

SWS 001

Forces and moments

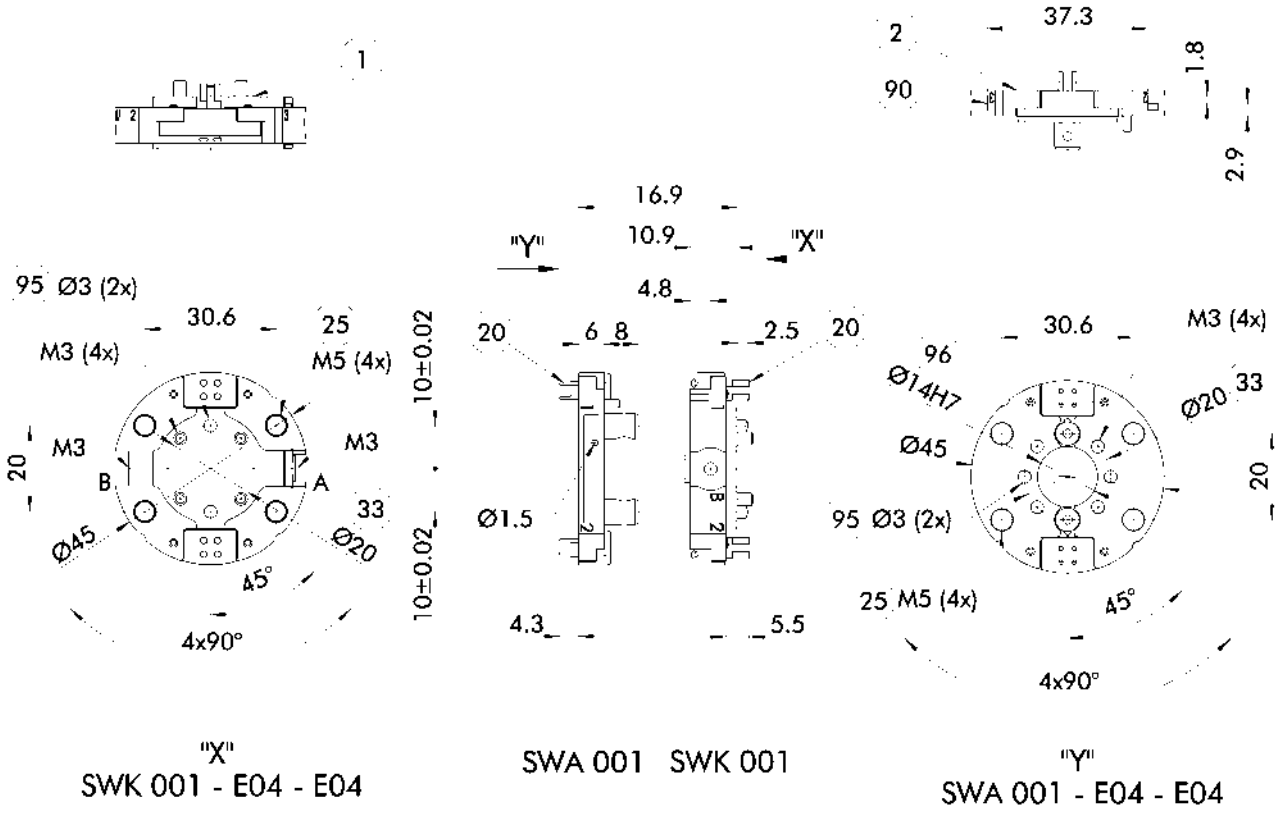


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-001-000-000	SWA-001-000-000	SWK-001-E04-E04	SWA-001-E04-E04
		Quick-change master	Quick-change adapter	Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	1.4	1.4	1.4	1.4
Locking force	[N]	170	170	170	170
Repeat accuracy	[mm]	0.01	0.01	0.01	0.01
Mass	[g]	30	20	80	40
max. locking distance	[mm]	1	1	1	1
Air connection thread Pneumatic feed-through		4x M5	4x M5	4x M5	4x M5
Main connection lock / unlock		M3		M3	
Number of electrical feed-throughs				8	8
Voltage	[V]			50	50
Current strength	[A]			3	3
max. permissible XY offset	[mm]	±0.3	±0.3	±0.3	±0.3
max. permissible angular offset	[°]	±0.8	±0.8	±0.8	±0.8
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9	4.5/6.9	4.5/6.9

Main view



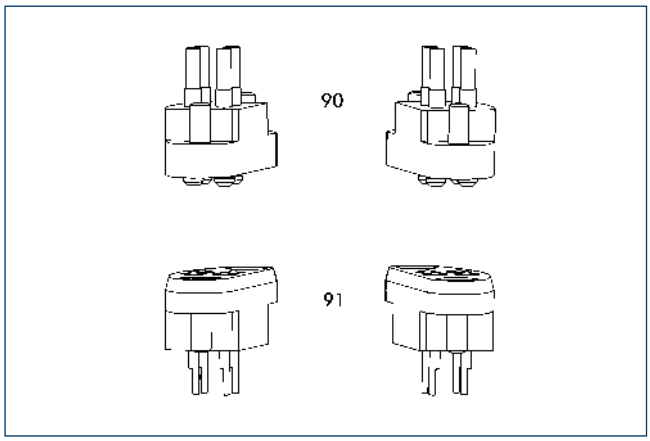
The drawing shows the basic design of the quick-change system with an electrical optional module.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(20) Connection for electric feed-through
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(90) Channel for quick-change rack
(95) Fit for a centering pin
(96) Fitting for centering

Optional electrical modules



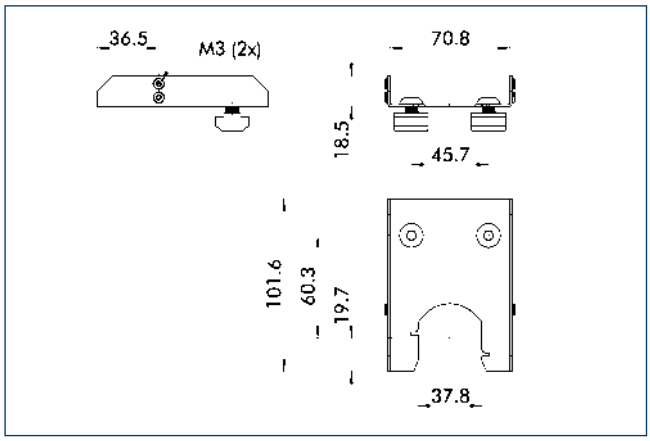
(90) Robot-side (91) Tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-E04-K	9960359	4	50 V AC/3 A
Tool-side			
SWO-E04-A	9960360	4	50 V AC/3 A

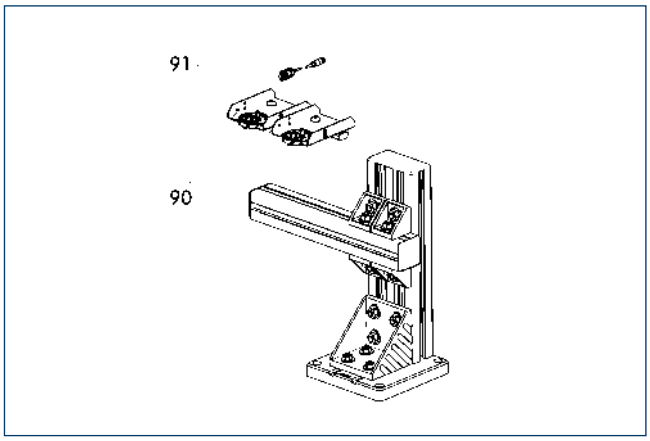
ⓘ For other modules and technical data, see chapter “Options” or visit www.schunk.com

SWS 001 Storage Plate



ⓘ Fastening nuts are included in the scope of delivery.

SWM-S-001 Modular Quick-change Magazine



(90) Storage plate (91) Sensor

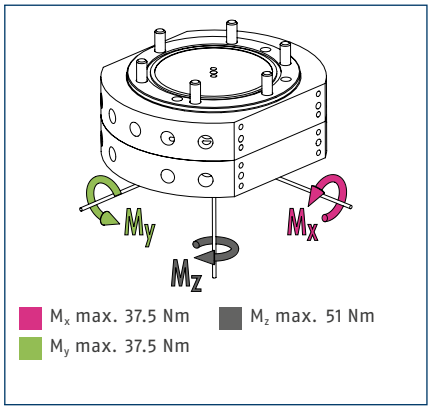
The modular storage rack is designed for the specific size. The system's modular design allows you to design your individual storage rack providing a storage rack that meets your individual requirements, taking into account the number of tools, storage positions and tool size.

Description	ID	
Storage plate		
SWM-TSS-MM-7869	0303276	
Sensor		
SWM-SMA-7869	0303277	

SWS 005

Robot Accessories | Changing | Quick-change System

Forces and moments



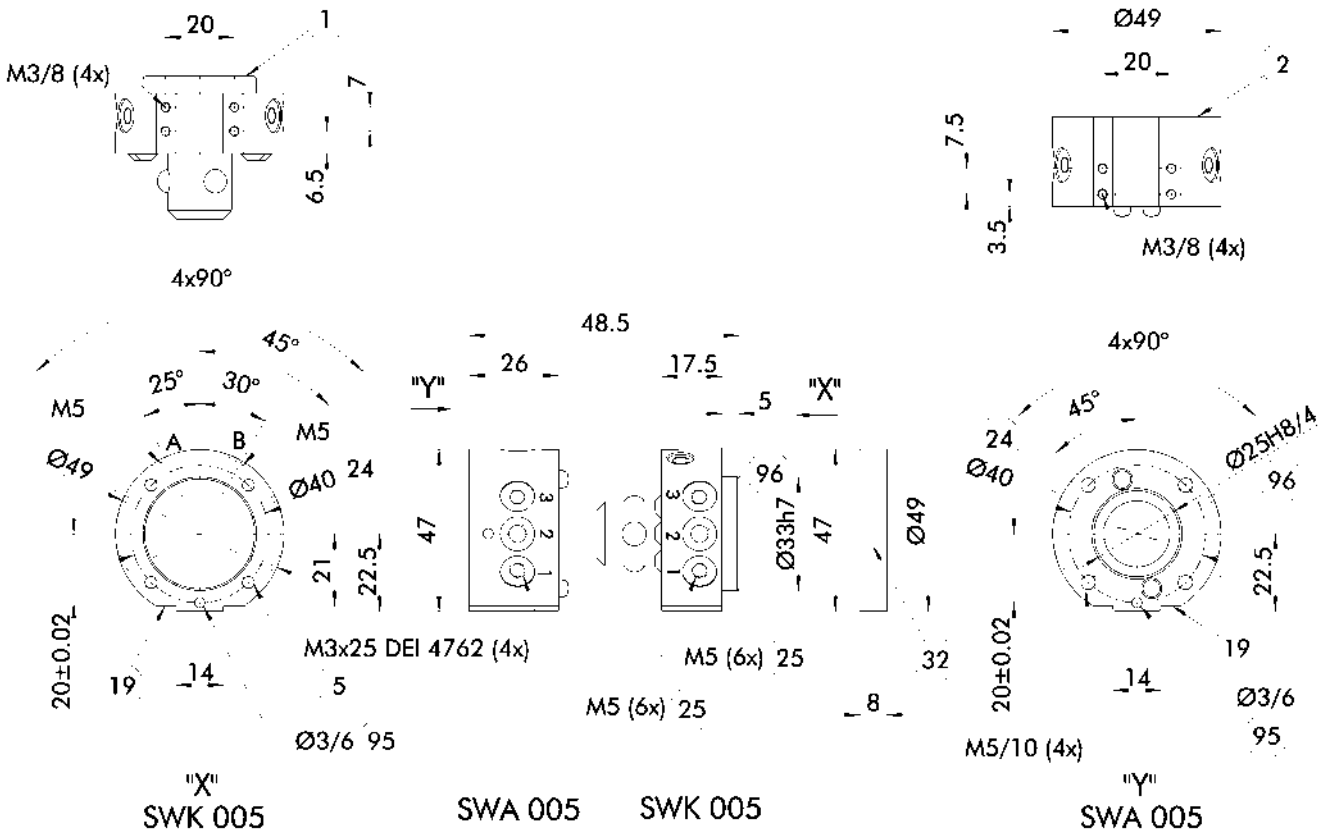
ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-005-000-000	SWA-005-000-000
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	8	8
Locking force	[N]	690	690
Repeat accuracy	[mm]	0.015	0.015
Mass	[kg]	0.27	0.09
min. / max. locking distance	[mm]	1.5/3	1.5/3
Air connection thread Pneumatic feed-through		6x M5	6x M5
Main connection lock / unlock		M5	
max. permissible XY offset	[mm]	±1	±1
max. permissible angular offset	[°]	±2	±2
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9

ⓘ Please maintain the min. and max. locking distances when coupling.

Main view



The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

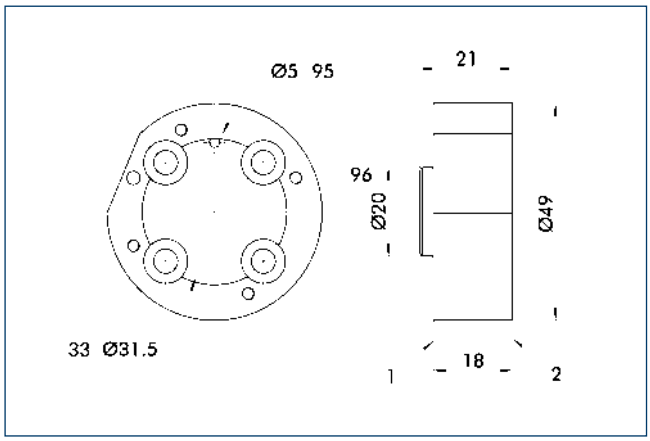
ⓘ The robot-side plate mounted on the SWK is a cover for the piston chamber. It is essential that it is supported by the adapter plate. See the further product information for a note on how to design this adapter plate.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(24) Bolt circle
(25) Pneumatic feed-through
(32) Cover
(95) Fit for a centering pin
(96) Fitting for centering

Adapter plate ISO-A31.5-R

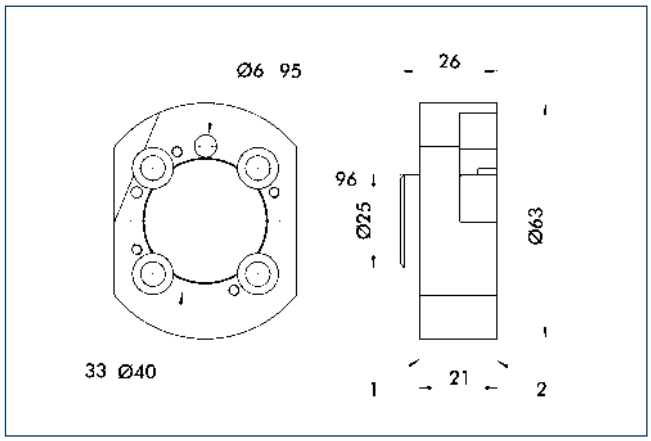


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-005-ISO-A31.5	0302218	

Adapter plate ISO-A40-R

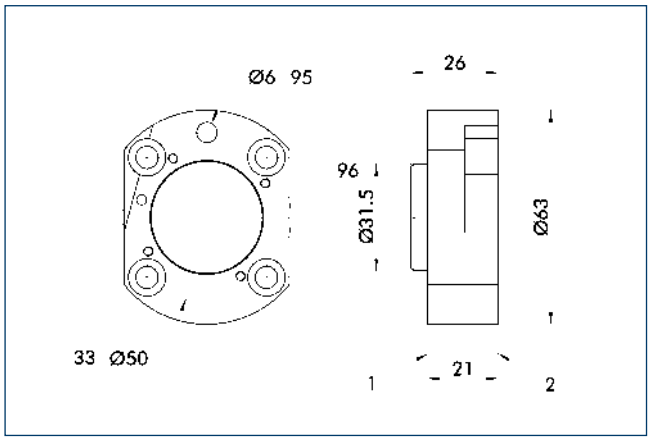


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-005-ISO-A40	0302219	

Adapter plate ISO-A50-R

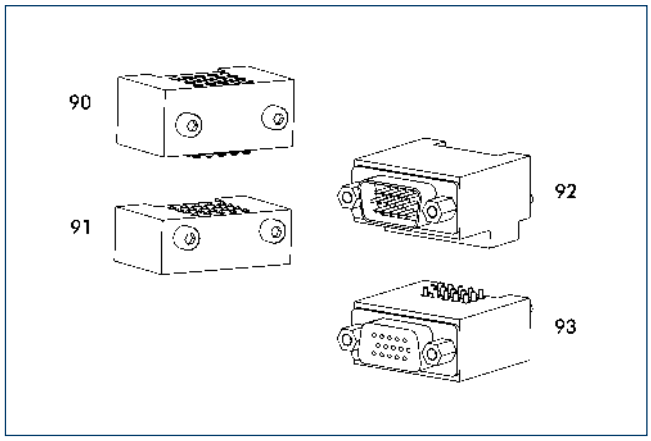


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-005-ISO-A50	0302220	

Optional electrical modules



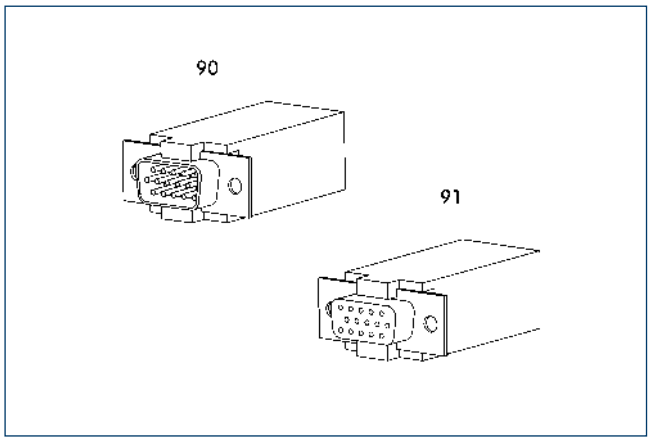
(90) E..., robot-side
(91) E..., tool-side
(92) A.../B... robot-side
(93) A.../B... tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-B15-K	9937326	15	50 V AC/3 A
SWO-E10-005-K	9935799	10	50 V AC/3 A
SWO-E2A-K	9941289	20	50 V AC/3 A
SWO-E3A-K	9941631	30	50 V AC/3 A
Tool-side			
SWO-B15-A	9937327	15	50 V AC/3 A
SWO-E10-005-A	9935800	10	50 V AC/3 A
SWO-E2A-A	9941290	20	50 V AC/3 A
SWO-E3A-A	9941632	30	50 V AC/3 A

ⓘ For other modules and technical data, see chapter “Options” or visit www.schunk.com

Cable connector

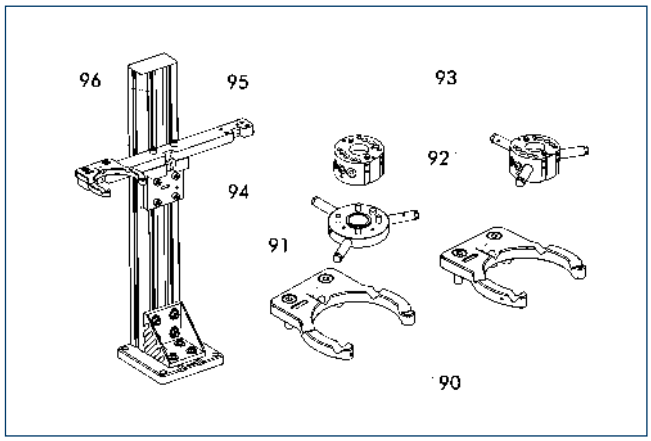


90 D-sub connecting plug
91 D-sub connector

Description	ID
Straight cable connector, robot-side	
KAS-A15-K-0	0301264
Straight cable connector, tool-side	
KAS-A15-A-0	0301265

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter “SWO-E Electrical Option” or contact us at any time.

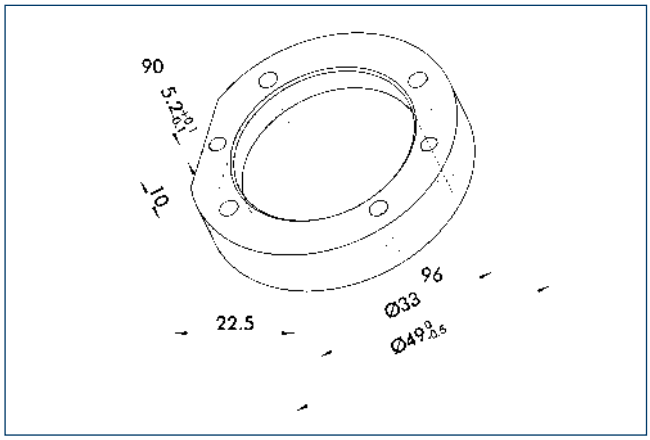
SWM-S modular storage rack



90 Storage plate
91 Intermediate plate blank
92 Workpiece stop
93 SWA quick-change adapter
94 Fixing block
95 3-position adapter
96 Vertical profile

The modular storage rack is designed for the specific size quick change module. The modular design of the storage rack allows for a standard solution customized to your application. Depending on the number of tools, the storage positions and the size of the tools a customized storage rack can be created for your application. For more information please see chapter “SWM Storage Rack”.

Adapter plate design



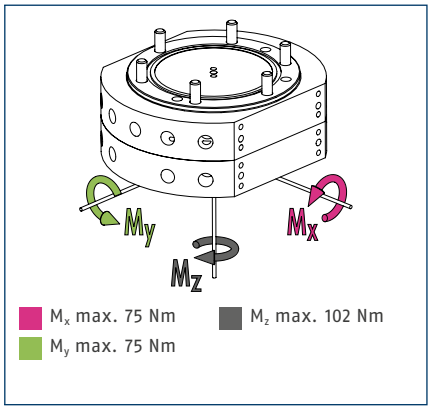
90 Recommended adapter plate depth
96 Fitting for centering

Recommended adapter design. An adapter is necessary in order to seal the piston chamber.

SWS 011

Robot Accessories | Changing | Quick-change System

Forces and moments

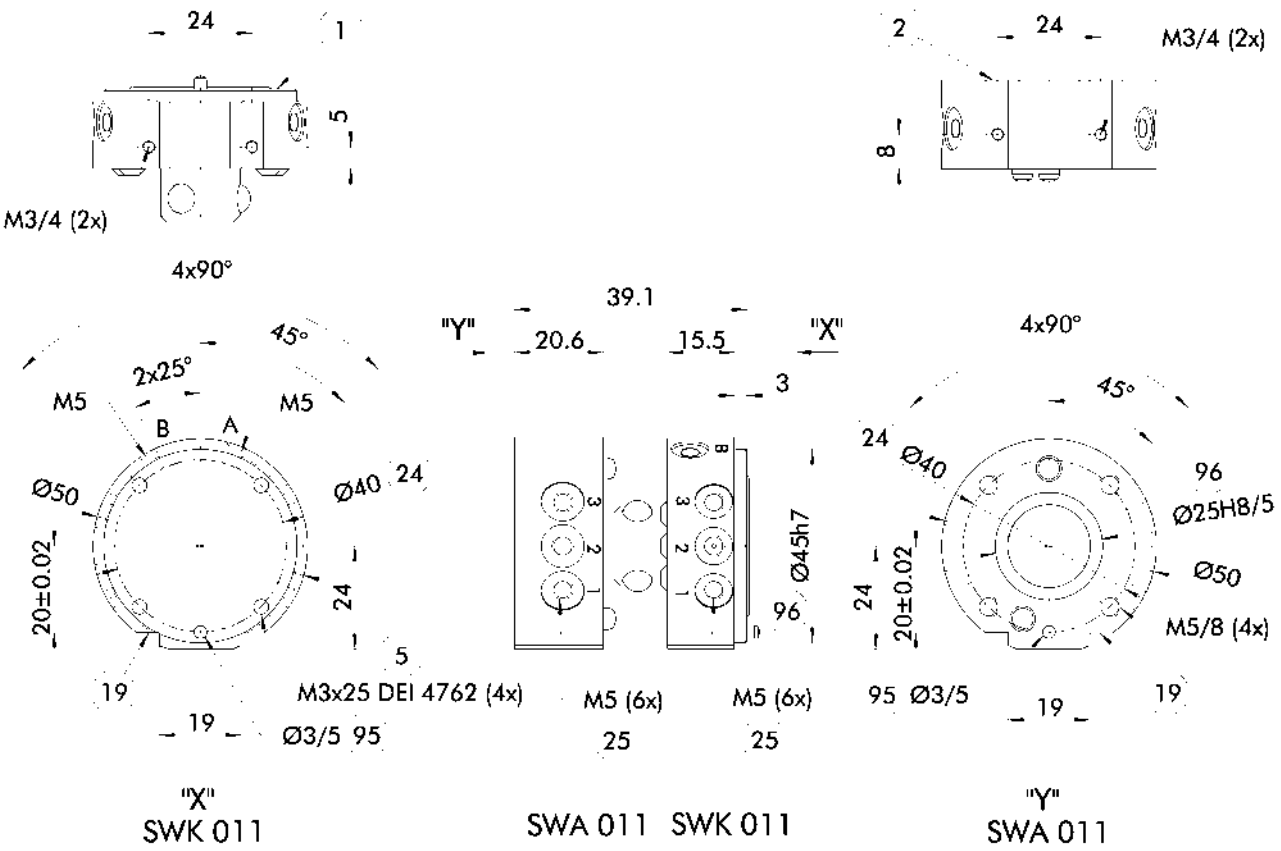


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description	Unit	SWK-011-000-000	SWK-011-H-000-000-SQ	SWA-011-000-000
		Quick-change master	Quick-change master for hollow wrist robot	Quick-change adapter
Recommended handling weight	[kg]	16	16	16
Piston stroke monitoring		optional	integrated	
Locking force	[N]	1100	1100	1100
Repeat accuracy	[mm]	0.015	0.015	0.015
Mass	[kg]	0.13	0.29	0.09
max. locking distance	[mm]	3	3	3
Air connection thread Pneumatic feed-through		6x M5	6x M5	6x M5
Main connection lock / unlock		M5	M5	
max. permissible XY offset	[mm]	±1	±1	±1
max. permissible angular offset	[°]	±2	±2	±2
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9	4.5/6.9

Main view



The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

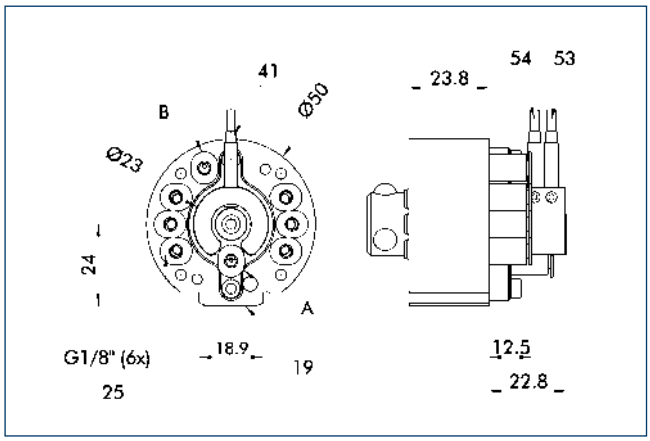
ⓘ The robot-side plate mounted on the SWK is a cover for the piston chamber. It is essential that it is supported by the adapter plate. See the further product information for a note on how to design this adapter plate.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(24) Bolt circle
(25) Pneumatic feed-through
(95) Fit for a centering pin
(96) Fitting for centering

Main view SWK-011-H



A, a Air connection locked

B, b Air connection unlocked

(19) Mounting surface for options

(25) Pneumatic feed-through

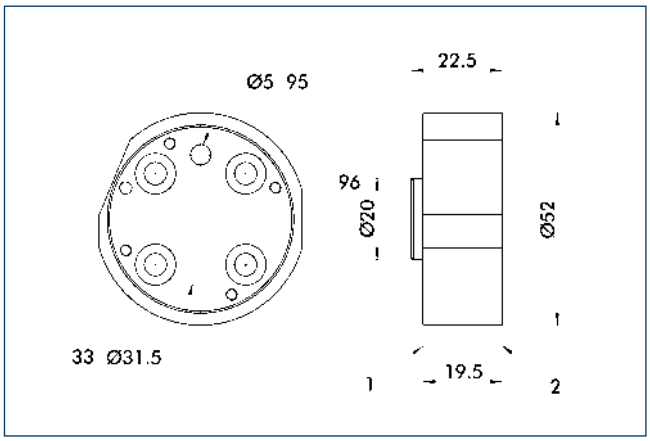
(41) Optional proximity switch

(53) Monitoring position unlocked

(54) Monitoring position locked

Via axial air connections it is ideal for hollow wrist robots.

Adapter plate ISO-A31.5-R



(1) Robot side connection

(2) Tool side connection

(33) DIN ISO-9409 bolt-hole circle diameter

(95) Fit for a centering pin

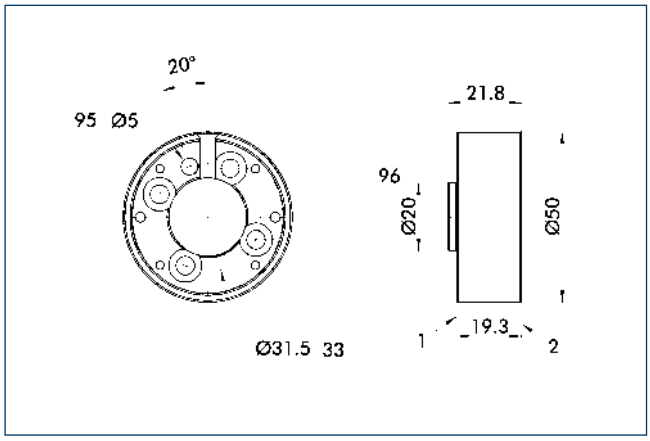
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-011-ISO-A31.5	0302221	

ⓘ Adapter plate for quick-change master without piston stroke control
Does not work with SWK-011-H

Adapter plate ISO-A31.5-SIP-R



(1) Robot side connection

(2) Tool side connection

(33) DIN ISO-9409 bolt-hole circle diameter

(95) Fit for a centering pin

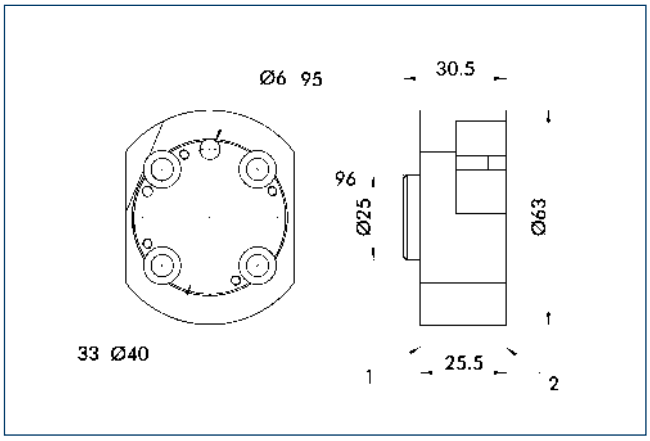
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-011-ISO-A31.5-SIP	0302226	

ⓘ Adapter plate for quick-change master with piston stroke control
Does not work with SWK-011-H

Adapter plate ISO-A40-R



(1) Robot side connection

(2) Tool side connection

(33) DIN ISO-9409 bolt-hole circle diameter

(95) Fit for a centering pin

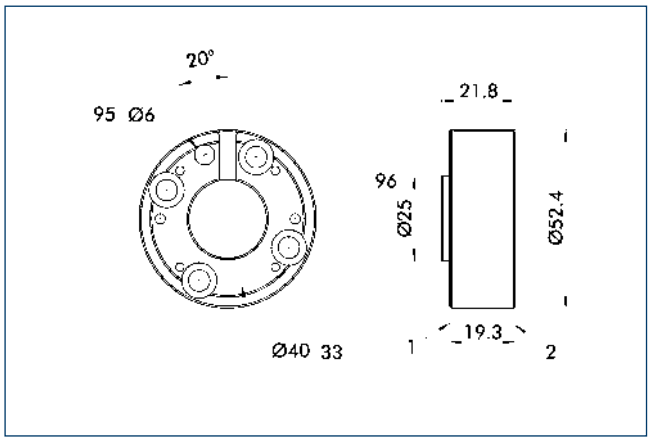
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-011-ISO-A40	0302222	

ⓘ Adapter plate for quick-change master without piston stroke control
Does not work with SWK-011-H

Adapter plate ISO-A40-SIP-R



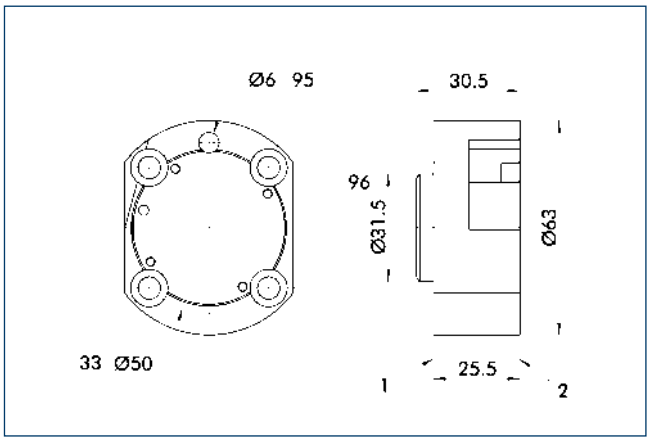
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-011-ISO-A40-SIP	0302227	

ⓘ Adapter plate for quick-change master with piston stroke control
Does not work with SWK-011-H

Adapter plate ISO-A50-R



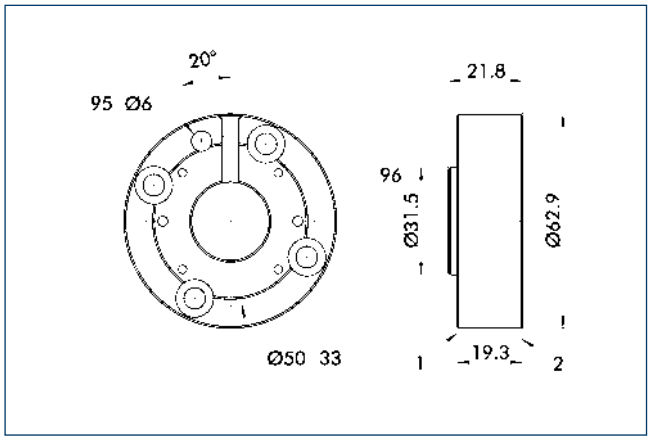
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-011-ISO-A50	0302223	

ⓘ Adapter plate for quick-change master without piston stroke control
Does not work with SWK-011-H

Adapter plate ISO-A50-SIP-R



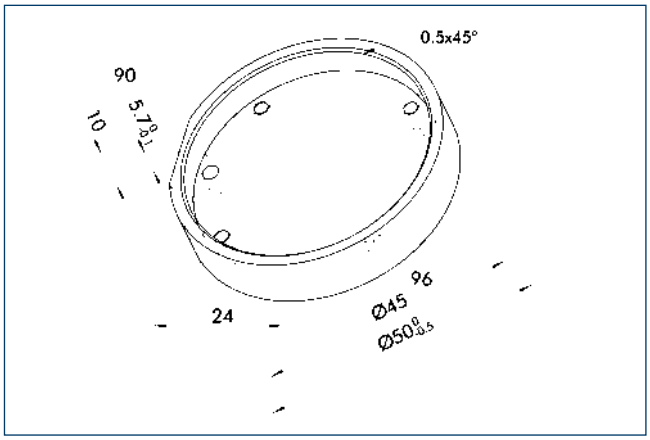
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-011-ISO-A50-SIP	0302228	

ⓘ Adapter plate for quick-change master with piston stroke control
Does not work with SWK-011-H

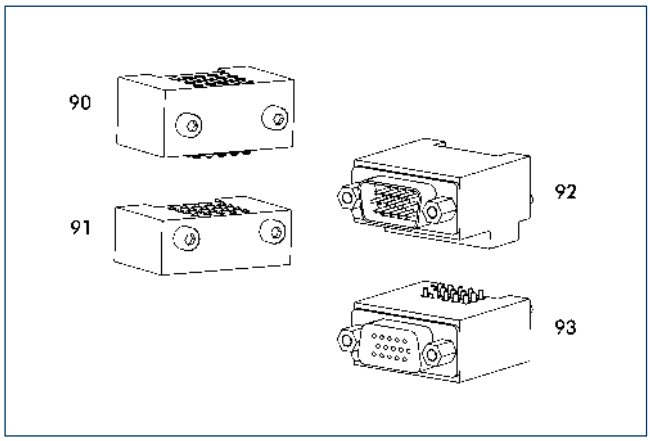
Adapter plate design



(90) Recommended adapter plate depth
(96) Fitting for centering

Recommended adapter design. An adapter is necessary in order to seal the piston chamber.

Optional electrical modules



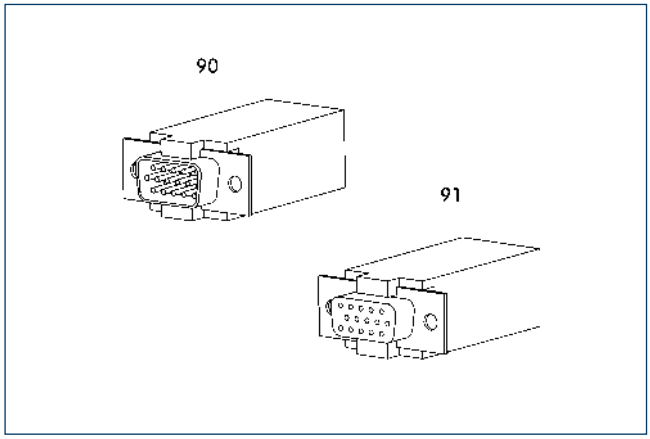
(90) E..., robot-side
(91) E..., tool-side
(92) A.../B... robot-side
(93) A.../B... tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-A15-K	9936357	15	50 V AC/3 A
SWO-E10-010-K	9935801	10	50 V AC/3 A
SWO-E20-K	9936525	20	50 V AC/3 A
Tool-side			
SWO-A15-A	9936356	15	50 V AC/3 A
SWO-E10-010-A	9935802	10	50 V AC/3 A
SWO-E20-A	9936526	20	50 V AC/3 A

ⓘ For other modules and technical data, see chapter “Options” or visit www.schunk.com

Cable connector

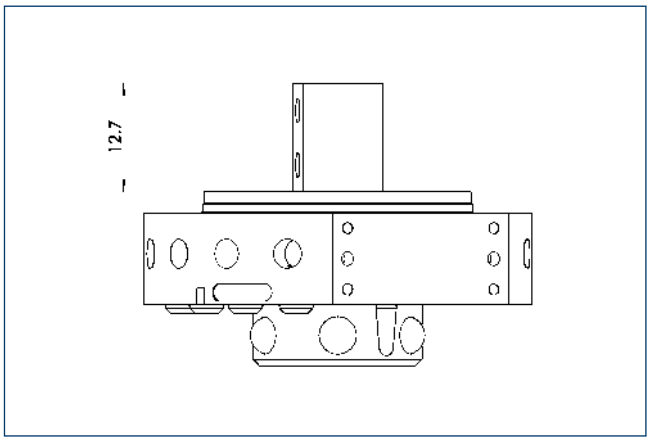


(90) D-sub connecting plug
(91) D-sub connector

Description	ID	
Straight cable connector, robot-side		
KAS-A15-K-0	0301264	
Straight cable connector, tool-side		
KAS-A15-A-0	0301265	

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter “SWO-E Electrical Option” or contact us at any time.

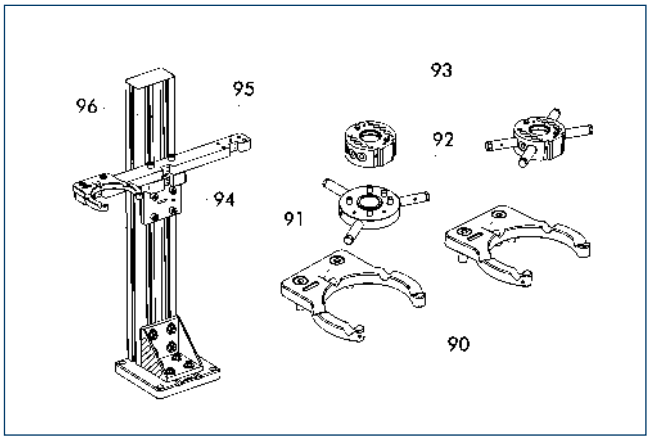
Piston stroke control



The drawing shows the minimum height of the adapter plate that is required when installing a piston stroke control.

Description	ID	
Piston stroke control		
SWK-011-SIP	0302318	

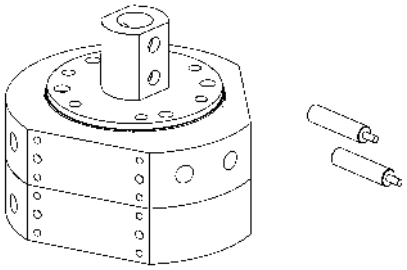
SWM-S modular storage rack



(90) Storage plate
(91) Intermediate plate blank
(92) Workpiece stop
(93) SWA quick-change adapter
(94) Fixing block
(95) 3-position adapter
(96) Vertical profile

The modular storage rack is designed for the specific size quick change module. The modular design of the storage rack allows for a standard solution customized to your application. Depending on the number of tools, the storage positions and the size of the tools a customized storage rack can be created for your application. For more information please see chapter “SWM Storage Rack”.

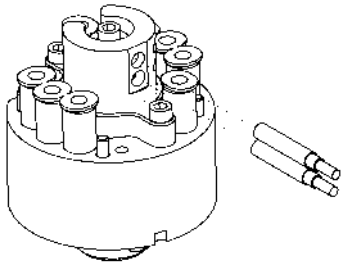
Piston stroke control



Description	ID	Often combined
Inductive proximity switches		
IN 41-S-M8	9941216	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Piston stroke control for SWK-011-H



Description	ID	Often combined
Inductive proximity switches		
IN 41-S-M8	9941216	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

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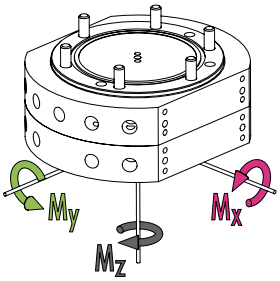
Robot Accessories | Changing | Quick-change System

Forces and moments



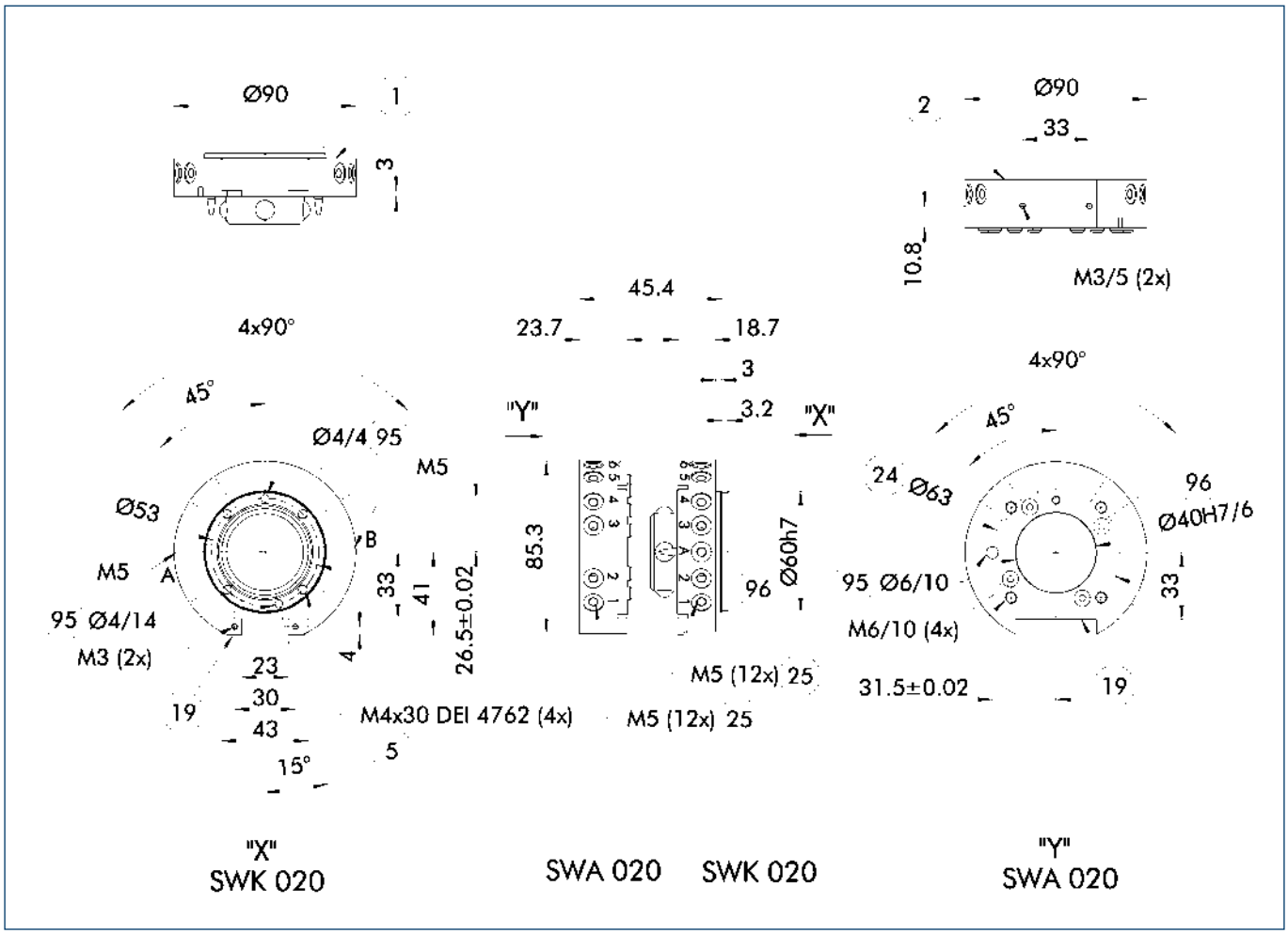
M_x max. 169.5 Nm
M_z max. 220 Nm
M_y max. 169.5 Nm

ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description	Unit	SWK-020-000-000	SWK-020-H-000-000-SQ	SWA-020-000-000
		Quick-change master	Quick-change master for hollow wrist robot	Quick-change adapter
Recommended handling weight	[kg]	25	25	25
Piston stroke monitoring		optional	integrated	
Locking force	[N]	2300	2300	
Repeat accuracy	[mm]	0.015	0.015	0.015
Mass	[kg]	0.68	0.68	0.31
max. locking distance	[mm]	3	3	3
Air connection thread Pneumatic feed-through		12x M5	12x M5	12x M5
Main connection lock / unlock		M5	M5	
max. permissible XY offset	[mm]	±1	±1	±1
max. permissible angular offset	[°]	±2	±2	±2
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9	4.5/6.9

Main view



The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

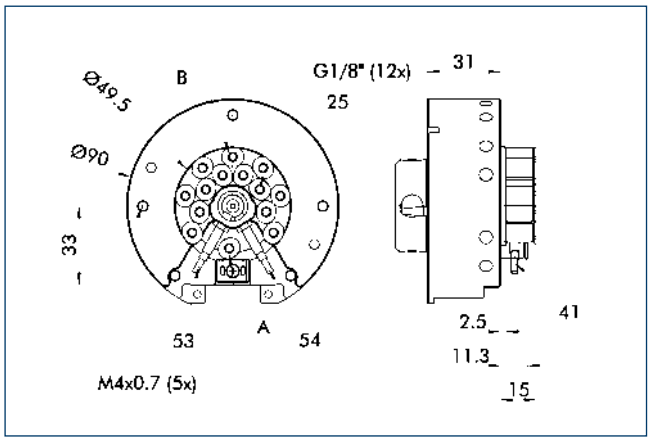
ⓘ The robot-side plate mounted on the SWK is a cover for the piston chamber. It is essential that it is supported by the adapter plate. See the further product information for a note on how to design this adapter plate.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(24) Bolt circle
(25) Pneumatic feed-through
(95) Fit for a centering pin
(96) Fitting for centering

Main view SWK-020-H



A, a Air connection locked

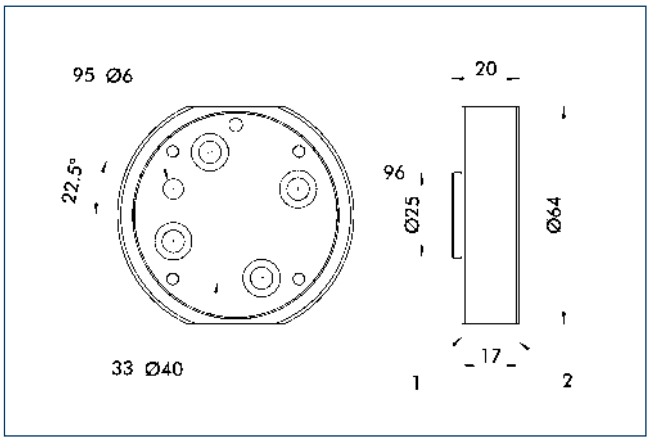
B, b Air connection unlocked

(25) Pneumatic feed-through

Via axial air connections it is ideal for hollow wrist robots.

(41) Optional proximity switch
(53) Monitoring position unlocked
(54) Monitoring position locked

Adapter plate ISO-A40-R



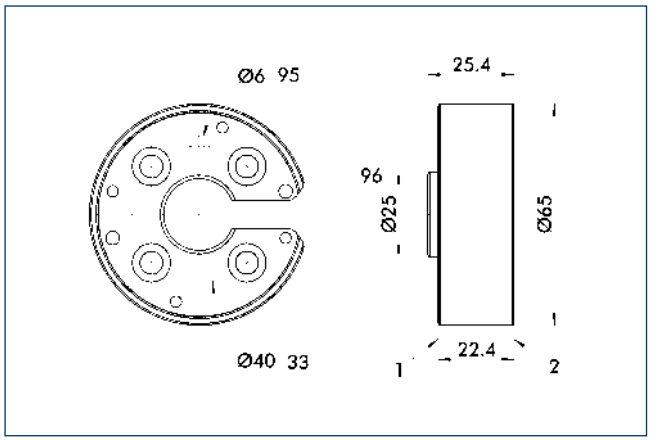
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021-ISO-A40	0302200	

ⓘ Adapter plate for quick-change master without piston stroke control
Does not work with SWK-020-H

Adapter plate ISO-A40-SIP-R



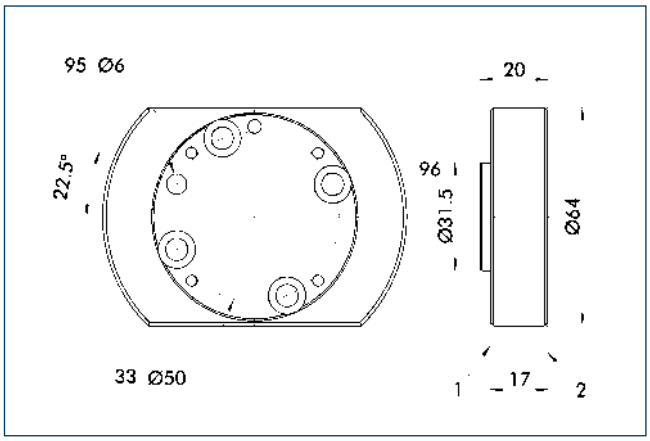
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021-ISO-A40-SIP	0302229	

ⓘ Adapter plate for quick-change master with piston stroke control
Does not work with SWK-020-H

Adapter plate ISO-A50-R



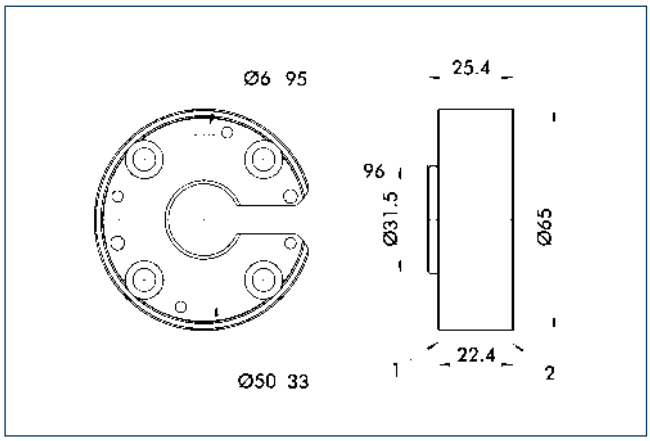
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021-ISO-A50	0302201	

ⓘ Adapter plate for quick-change master without piston stroke control
Does not work with SWK-020-H

Adapter plate ISO-A50-SIP-R



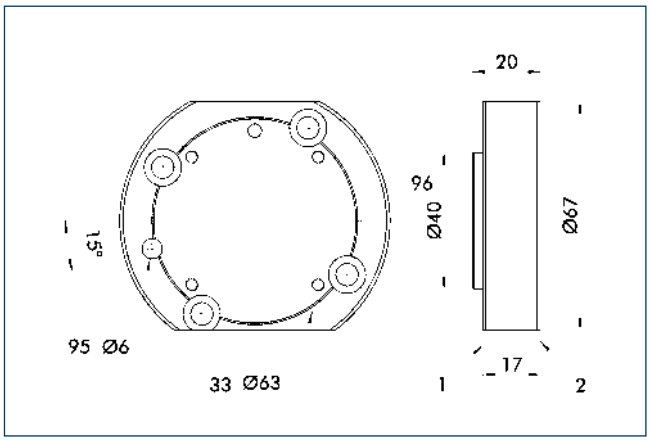
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021-ISO-A50-SIP	0302230	

ⓘ Adapter plate for quick-change master with piston stroke control
Does not work with SWK-020-H

Adapter plate ISO-A63-R



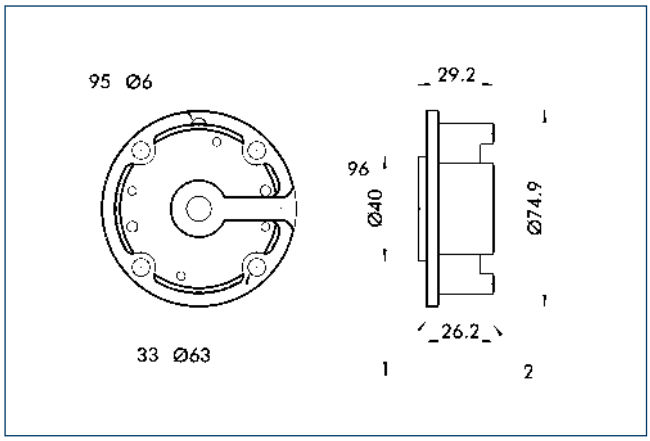
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021-ISO-A63	0302202	

ⓘ Adapter plate for quick-change master without piston stroke control
Does not work with SWK-020-H

Adapter plate ISO-A63-SIP-R



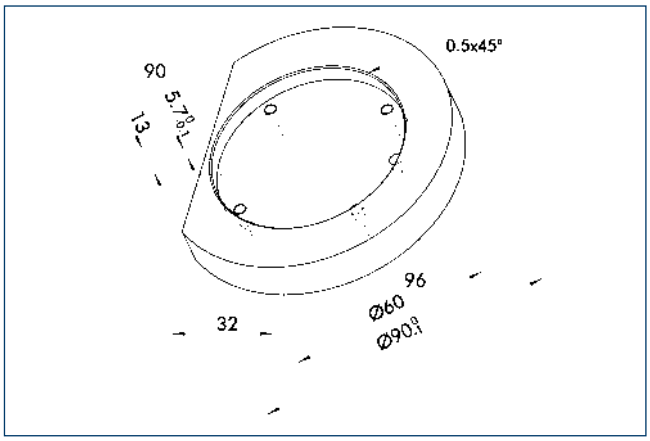
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021-ISO-A63-SIP	0302231	

ⓘ Adapter plate for quick-change master with piston stroke control
Does not work with SWK-020-H

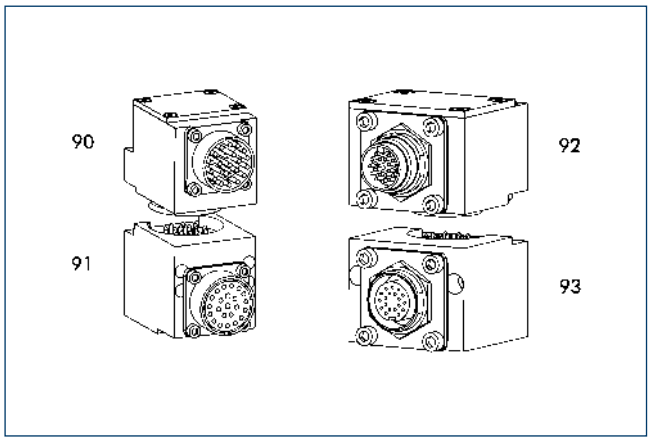
Adapter plate design



(90) Recommended adapter plate depth
(96) Fitting for centering

Recommended adapter design. An adapter is necessary in order to seal the piston chamber.

Optional electrical modules



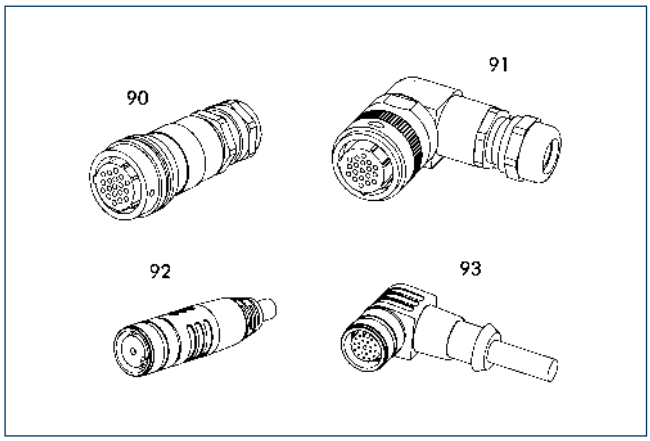
(90) E-module with bayonet fitting, robot-side
(91) E-module with bayonet fitting, tool-side
(92) E-module with metric threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-KF19-K	9959886	19	50 V DC/3 A
Tool-side			
SWO-KF10-A	9961308	10	50 V DC/3 A
SWO-KF14-A	9961307	14	50 V DC/3 A
SWO-KF19-A	9959887	19	50 V DC/3 A

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter "SWO-E Electrical Option" or contact us at any time.

Cable connector / cable extension



(90) Connection plug / socket straight
(91) Connection plug / socket at an angle
(92) Connection plug / socket straight with extension cable
(93) Connection plug / socket at an angle with extension cable

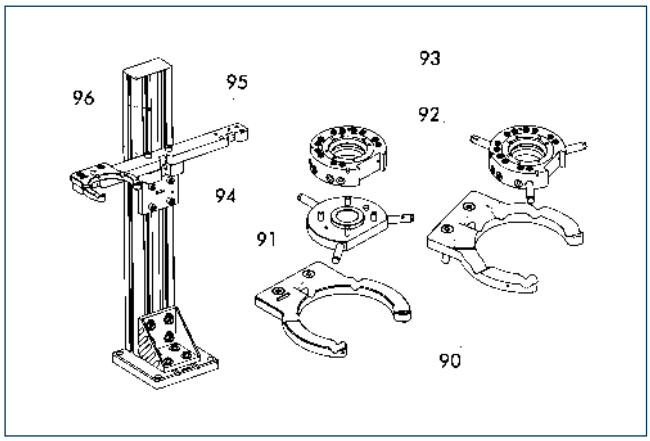
Other cable lengths on request.

Cable connector for SWO-RF19 / GF19 / SF19 / KF19 / RF14 / GF14 / KF14 / RF10 / KF10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector with cable			
KV-5-SWK-19F-0	0302170	0°	5 m
KV-10-SWK-19F-0	0302171	0°	10 m
KV-5-SWK-19F-90	0302172	90°	5 m
KV-10-SWK-19F-90	0302173	90°	10 m
Tool-side			
Cable connector with cable			
KV-3-SWA-19F-0	0302174	0°	3 m
KV-3-SWA-19F-90	0302175	90°	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

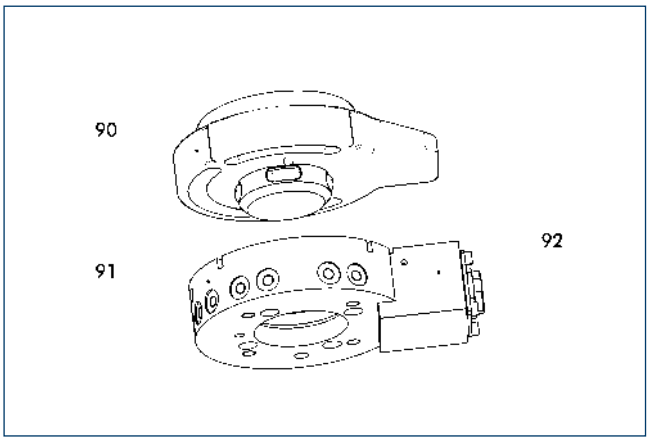
SWM-S modular storage rack



90 Storage plate
91 Intermediate plate blank
92 Workpiece stop
93 SWA quick-change adapter
94 Fixing block
95 3-position adapter
96 Vertical profile

The modular storage rack is designed for the specific size quick change module. The modular design of the storage rack allows for a standard solution customized to your application. Depending on the number of tools, the storage positions and the size of the tools a customized storage rack can be created for your application. For more information please see chapter “SWM Storage Rack”.

SWD-020 dust cover

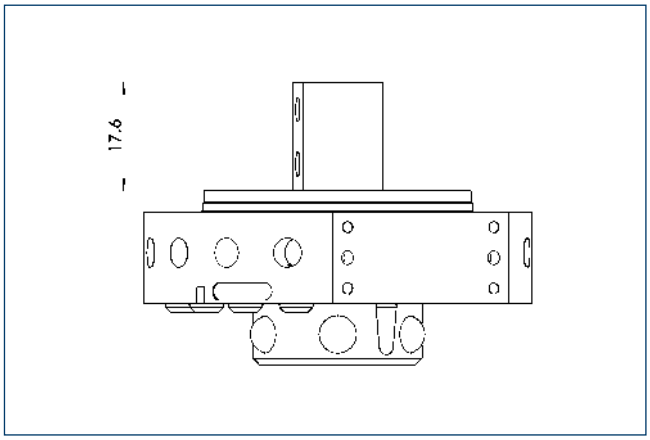


(90) SWD protection cover
(91) SWA quick-change adapter
(92) Optional electrical module

The protection cover protects the quick-change adapter in the storage rack against dust and chips. The cover has an integrated clip mechanism which is actuated by locking / unlocking the changing master, allowing the robot to remove the cover from one adapter and place it on another adapter.

Description	ID	
Dust cover		
SWD-020-K00-000	0302252	

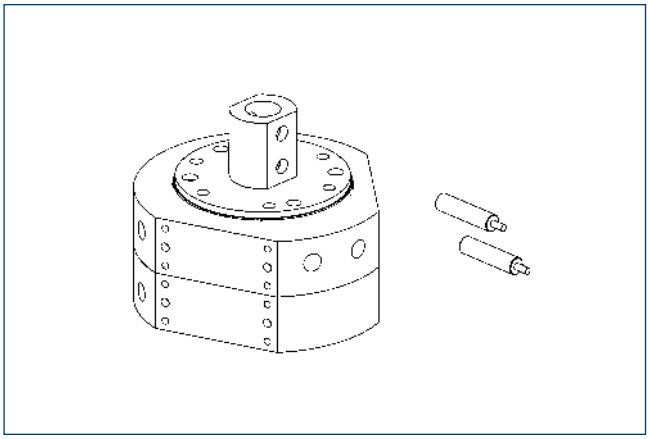
Piston stroke control



The drawing shows the minimum height of the adapter plate that is necessary when installing a piston stroke control.

Description	ID	
Piston stroke control		
SWK-020-SIP	0302325	

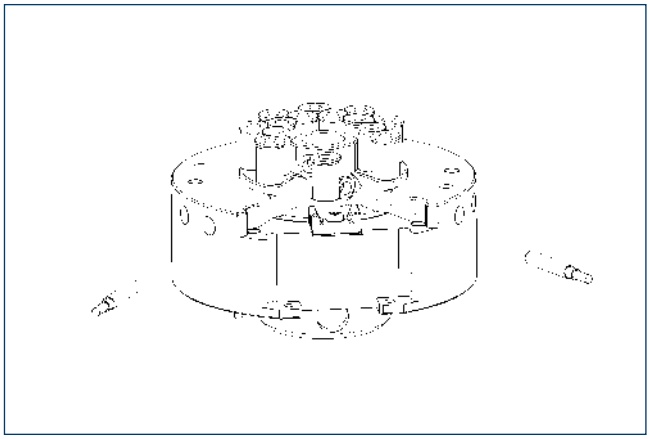
Piston stroke control



Description	ID	Often combined
Inductive proximity switches		
IN 41-S-M8	9941216	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Piston stroke control for SWK-020-H



Description	ID	Often combined
Inductive proximity switches		
IN 41-S-M8	9941216	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

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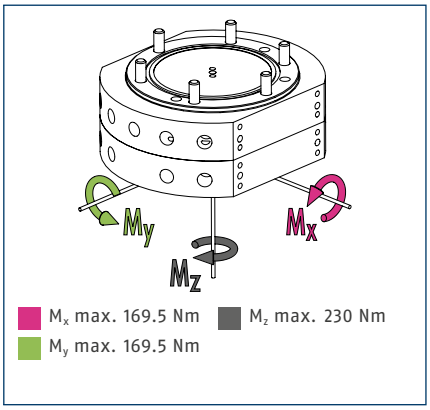
Forces and moments

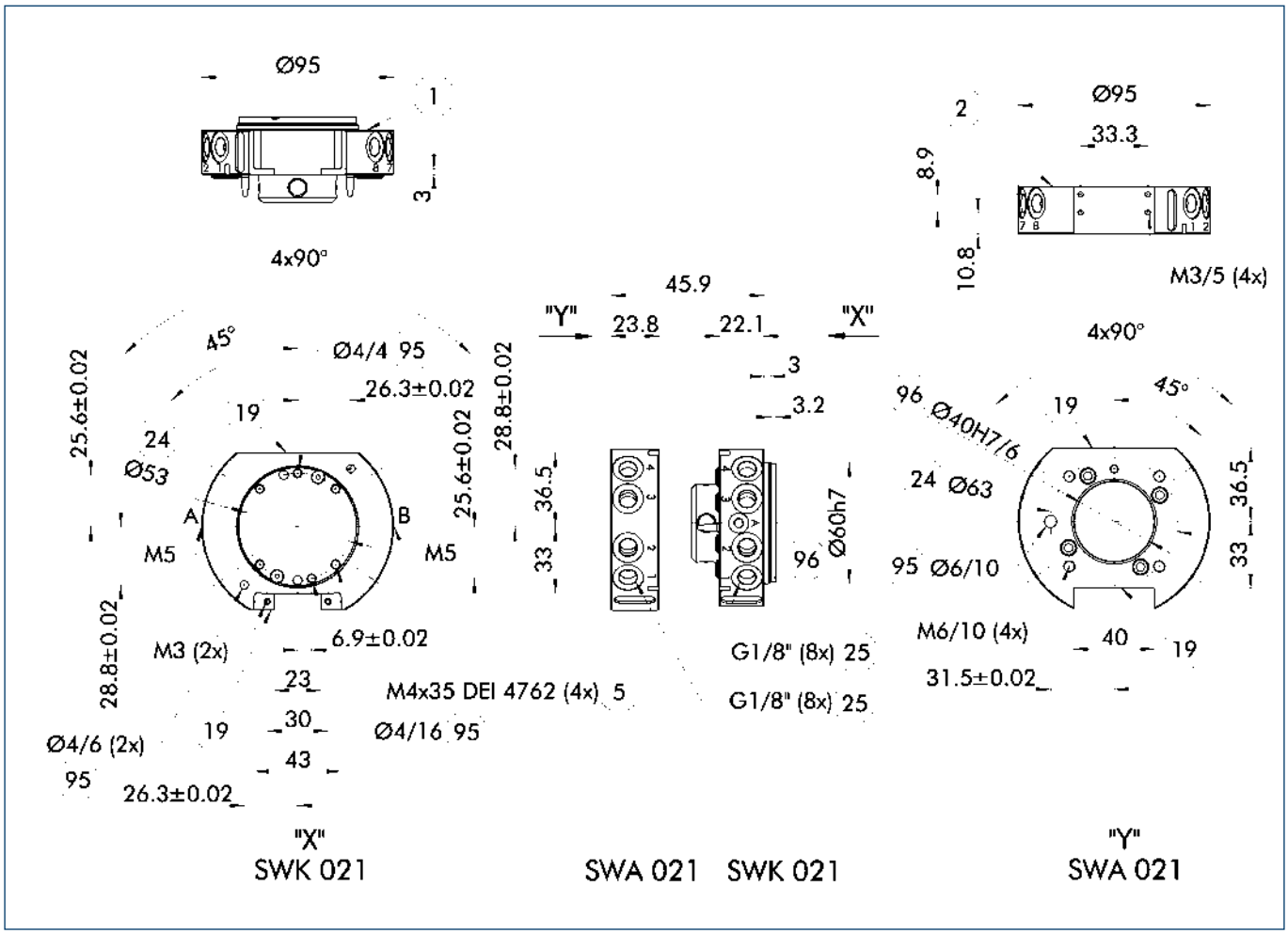


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-021-000-000	SWK-021-H-000-000-SQ	SWA-021-000-000
		Quick-change master	Quick-change master for hollow wrist robots	Quick-change adapter
Recommended handling weight	[kg]	25	25	25
Piston stroke monitoring		optional	integrated	
Locking force	[N]	2300	2300	
Repeat accuracy	[mm]	0.015	0.015	0.015
Mass	[kg]	0.5	0.7	0.3
max. locking distance	[mm]	3	3	3
Air connection thread Pneumatic feed-through		8x G1/8“	8x G1/8“	8x G1/8“
Main connection lock / unlock		M5	M5	
max. permissible XY offset	[mm]	±1	±1	±1
max. permissible angular offset	[°]	±1	±1	±1
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9	4.5/6.9

Main view



The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

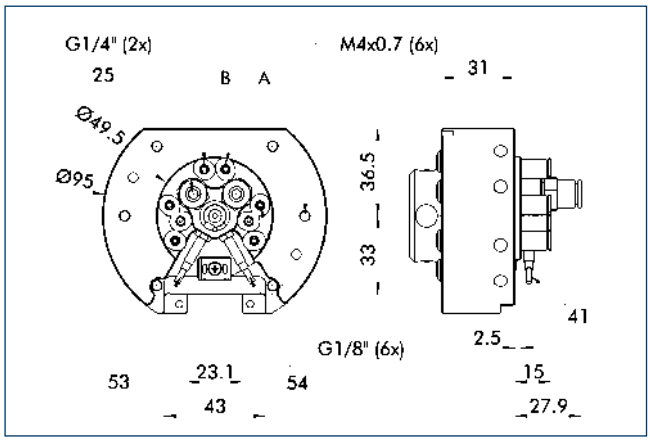
ⓘ The robot-side plate mounted on the SWK is a cover for the piston chamber. It is essential that it is supported by the adapter plate. See the further product information for a note on how to design this adapter plate.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(24) Bolt circle
(25) Pneumatic feed-through
(95) Fit for a centering pin
(96) Fitting for centering

Main view SWK-021-H



A, a Air connection locked

B, b Air connection unlocked

(25) Pneumatic feed-through

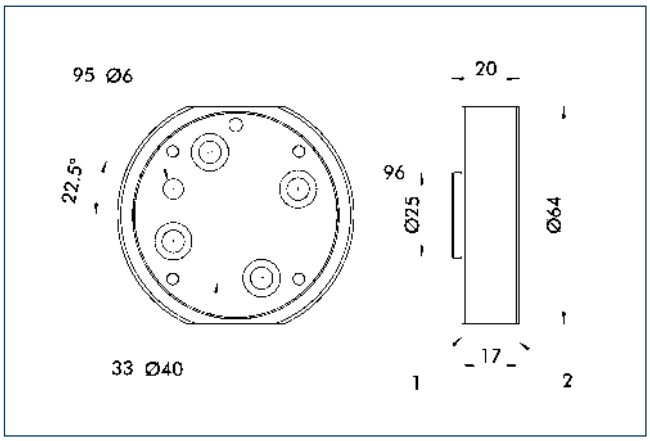
(41) Optional proximity switch

(53) Monitoring position unlocked

(54) Monitoring position locked

Via axial air connections it is ideal for hollow wrist robots.

Adapter plate ISO-A40-R



(1) Robot side connection

(2) Tool side connection

(33) DIN ISO-9409 bolt-hole circle diameter

(95) Fit for a centering pin

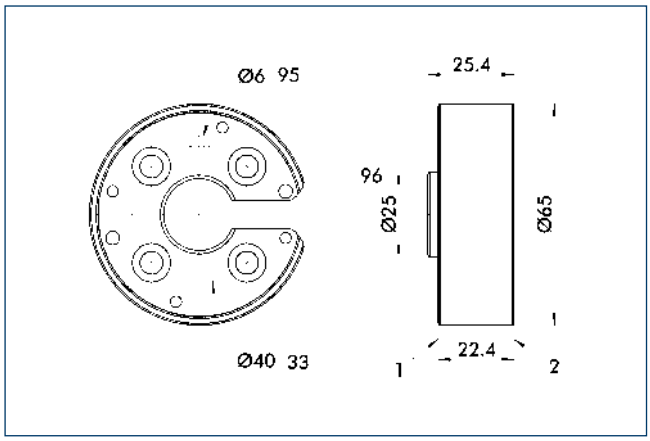
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021-ISO-A40	0302200	

ⓘ Adapter plate for quick-change master without piston stroke control
Does not work with SWK-021-H

Adapter plate ISO-A40-SIP-R



(1) Robot side connection

(2) Tool side connection

(33) DIN ISO-9409 bolt-hole circle diameter

(95) Fit for a centering pin

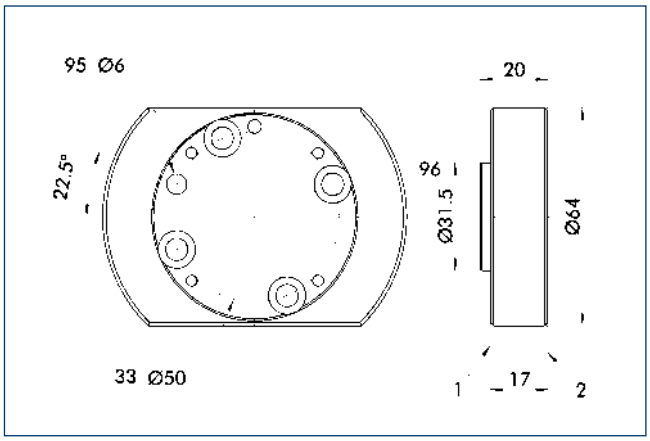
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021-ISO-A40-SIP	0302229	

ⓘ Adapter plate for quick-change master with piston stroke control
Does not work with SWK-021-H

Adapter plate ISO-A50-R



(1) Robot side connection

(2) Tool side connection

(33) DIN ISO-9409 bolt-hole circle diameter

(95) Fit for a centering pin

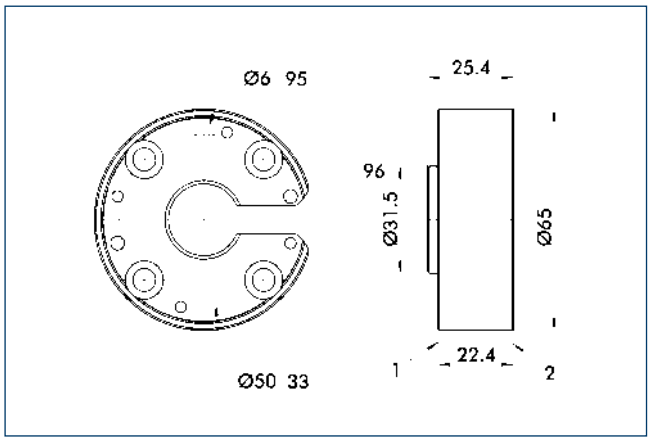
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021-ISO-A50	0302201	

ⓘ Adapter plate for quick-change master without piston stroke control
Does not work with SWK-021-H

Adapter plate ISO-A50-SIP-R



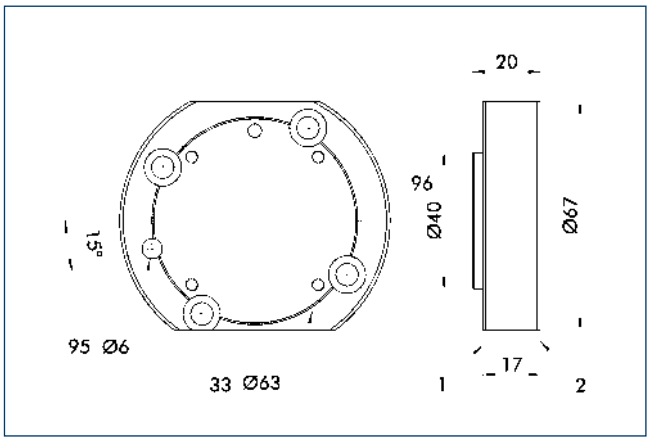
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021-ISO-A50-SIP	0302230	

ⓘ Adapter plate for quick-change master with piston stroke control
Does not work with SWK-021-H

Adapter plate ISO-A63-R



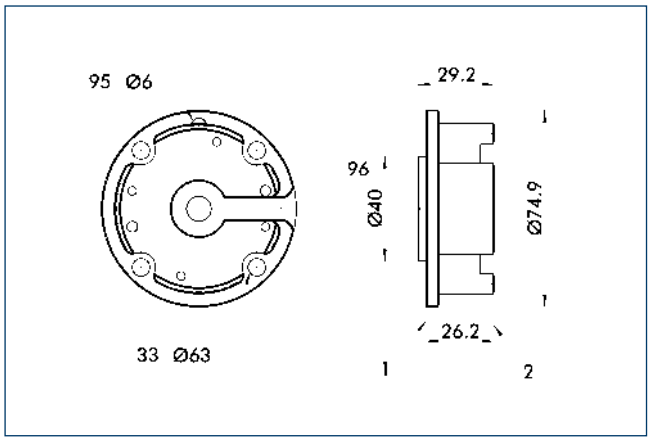
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021/025-ISO-A63	0302202	

ⓘ Adapter plate for quick-change master without piston stroke control
Does not work with SWK-021-H

Adapter plate ISO-A63-SIP-R



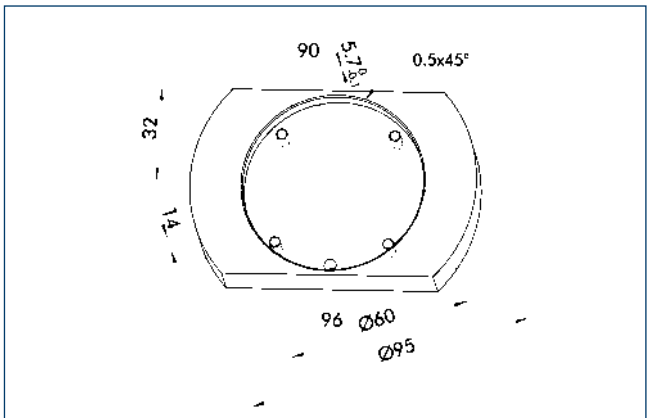
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-020/021-ISO-A63-SIP	0302231	

ⓘ Adapter plate for quick-change master with piston stroke control
Does not work with SWK-021-H

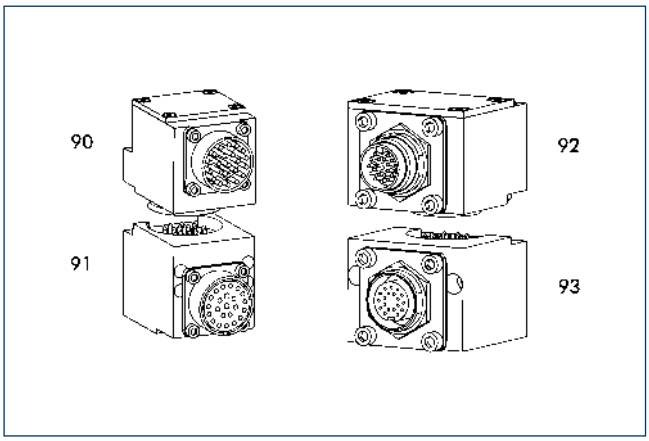
Adapter plate design



(90) Recommended adapter plate depth
(96) Fitting for centering

Recommended adapter design. An adapter is necessary in order to seal the piston chamber.

Optional electrical modules



(90) E-module with bayonet fitting, robot-side

(91) E-module with bayonet fitting, tool-side

(92) E-module with metric threads, robot-side

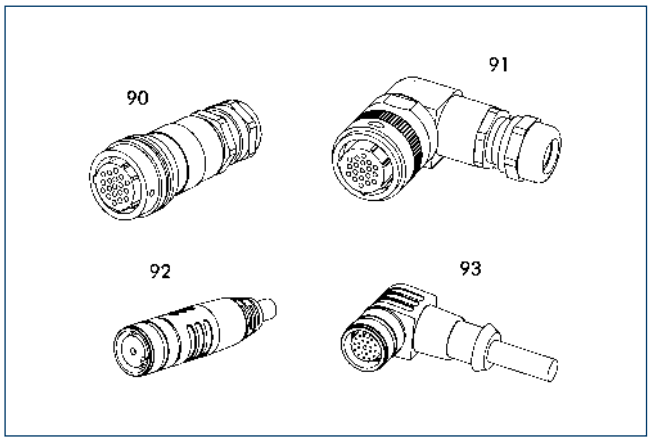
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-KF19-K	9959886	19	50 V DC/3 A
Tool-side			
SWO-KF10-A	9961308	10	50 V DC/3 A
SWO-KF14-A	9961307	14	50 V DC/3 A
SWO-KF19-A	9959887	19	50 V DC/3 A

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter "SWO-E Electrical Option" or contact us at any time.

Cable connector / cable extension



(90) Connection plug / socket straight
(91) Connection plug / socket at an angle
(92) Connection plug / socket straight with extension cable
(93) Connection plug / socket at an angle with extension cable

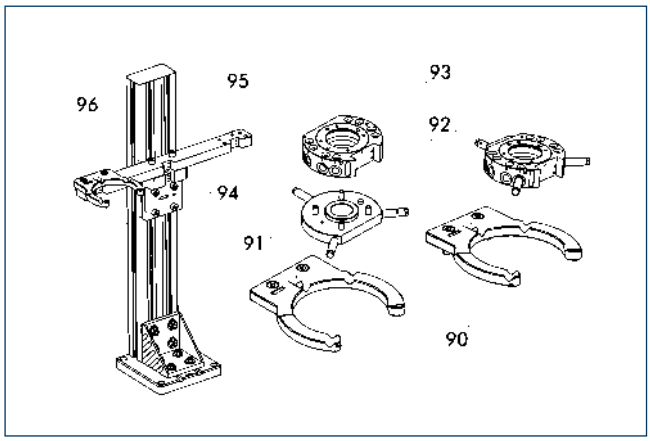
Other cable lengths on request.

Cable connector for SWO-RF19 / GF19 / SF19 / KF19 / RF14 / GF14 / KF14 / RF10 / KF10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector with cable			
KV-5-SWK-19F-0	0302170	0°	5 m
KV-10-SWK-19F-0	0302171	0°	10 m
KV-5-SWK-19F-90	0302172	90°	5 m
KV-10-SWK-19F-90	0302173	90°	10 m
Tool-side			
Cable connector with cable			
KV-3-SWA-19F-0	0302174	0°	3 m
KV-3-SWA-19F-90	0302175	90°	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

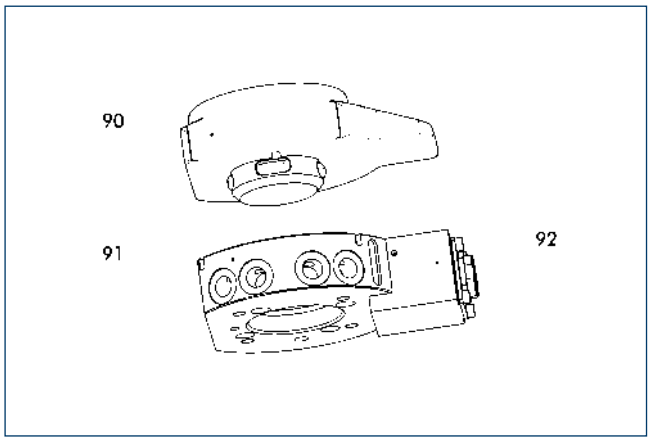
SWM-S modular storage rack



(90) Storage plate
(91) Intermediate plate blank
(92) Workpiece stop
(93) SWA quick-change adapter
(94) Fixing block
(95) 3-position adapter
(96) Vertical profile

The modular storage rack is designed for the specific size quick change module. The modular design of the storage rack allows for a standard solution customized to your application. Depending on the number of tools, the storage positions and the size of the tools a customized storage rack can be created for your application. For more information please see chapter “SWM Storage Rack”.

SWD-021 dust cover

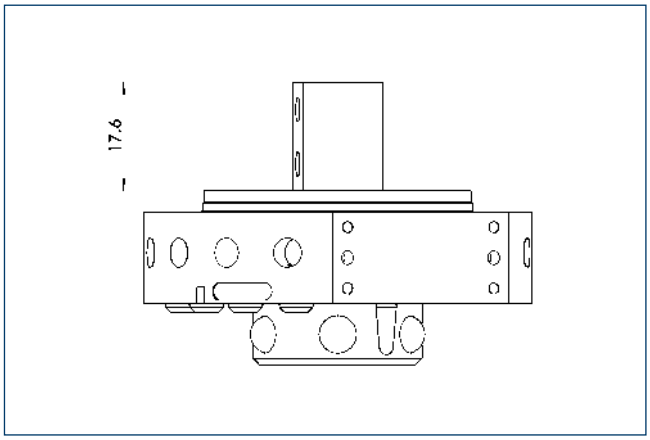


(90) SWD protection cover
(91) SWA quick-change adapter
(92) Optional electrical module

The protection cover protects the quick-change adapter in the storage rack against dust and chips. The cover has an integrated clip mechanism which is actuated by locking / unlocking the changing master, allowing the robot to remove the cover from one adapter and place it on another adapter.

Description	ID	
Dust cover		
SWD-021-K00-000	0302253	

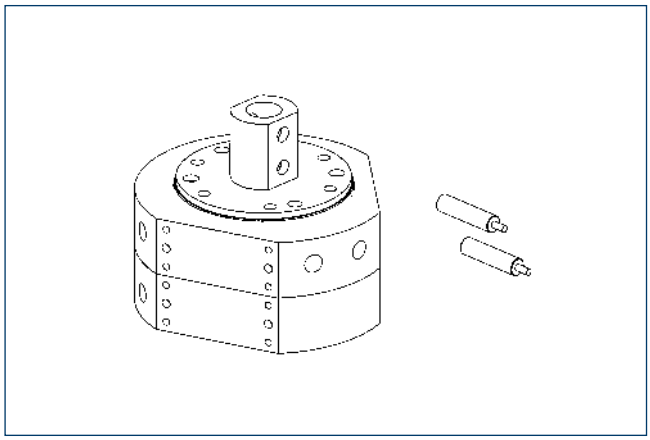
Piston stroke control



The drawing shows the minimum height of the adapter plate that is necessary when installing a piston stroke control.

Description	ID	
Piston stroke control		
SWK-021-SIP	0302328	

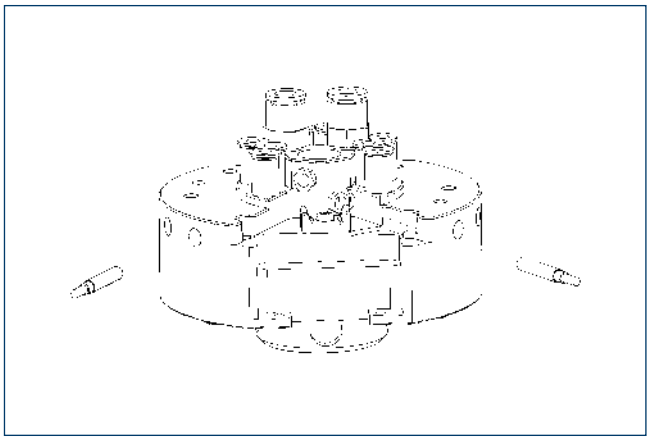
Piston stroke control



Description	ID	Often combined
Inductive proximity switches		
IN 41-S-M8	9941216	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Piston stroke control for SWK-021-H

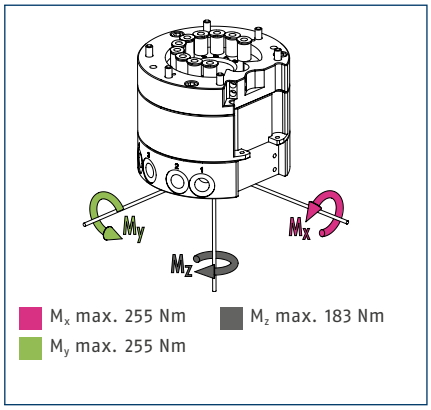


Description	ID	Often combined
Inductive proximity switches		
IN 41-S-M8	9941216	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

SWS 027

Forces and moments

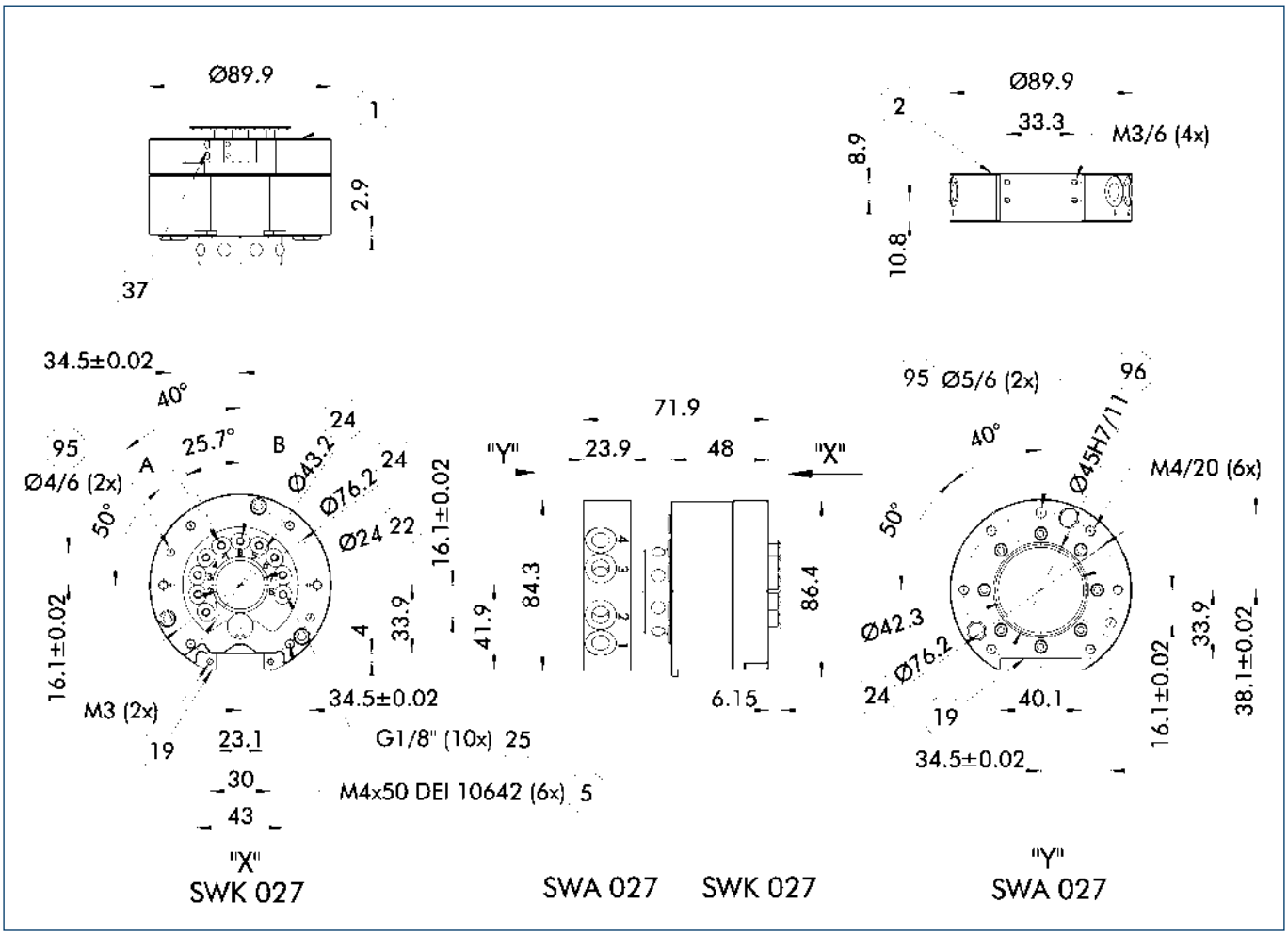


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-027-000-000-SIP	SWA-027-000-000
		Quick-change master for hollow wrist robots	Quick-change adapter
Recommended handling weight	[kg]	38	38
Piston stroke monitoring		integrated	
Locking force	[N]	3500	
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	1.1	0.29
max. locking distance	[mm]	2	2
Air connection thread Pneumatic feed-through		8x G1/8“	8x G1/8“
Main connection lock / unlock		M5	
max. permissible XY offset	[mm]	±1	±1
max. permissible angular offset	[°]	±2	±2
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9

Main view



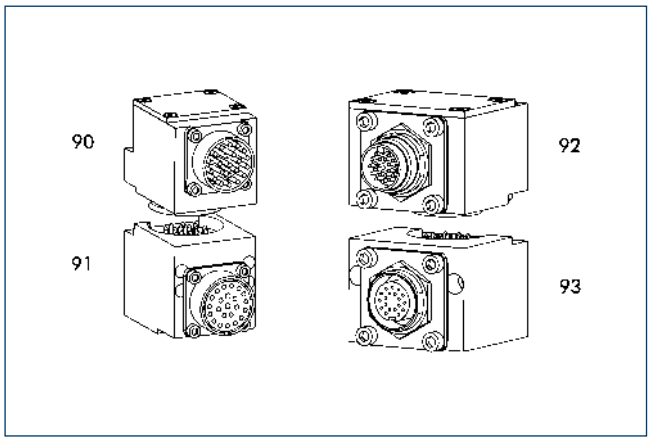
The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(22) Center bore
(24) Bolt circle
(25) Pneumatic feed-through
(37) Sensor connection
(95) Fit for a centering pin
(96) Fitting for centering

Optional electrical modules



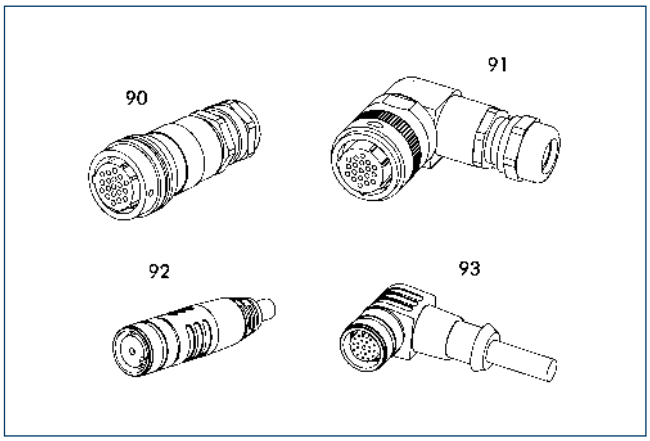
(90) E-module with bayonet fitting, robot-side
(91) E-module with bayonet fitting, tool-side
(92) E-module with metric threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-KF19-K	9959886	19	50 V DC/3 A
Tool-side			
SWO-KF10-A	9961308	10	50 V DC/3 A
SWO-KF14-A	9961307	14	50 V DC/3 A
SWO-KF19-A	9959887	19	50 V DC/3 A

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter "SWO-E Electrical Option" or contact us at any time.

Cable connector / cable extension



(90) Connection plug / socket straight
(91) Connection plug / socket at an angle
(92) Connection plug / socket straight with extension cable
(93) Connection plug / socket at an angle with extension cable

Other cable lengths on request.

Cable connector for SWO-R19 / G19 / S19 / K19 / KG19 / R14 / G14 / S14 / R10 / G10 / S10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector without cable			
KAS-19B-K-0-C	0301283	0°	-
KAS-19B-K-90-C	0301294	90°	
Cable connector with cable			
KV-3-SWK-19B-0	0302176	0°	3 m
KV-5-SWK-19B-0	0302177	0°	5 m
KV-3-SWK-19B-90	0302179	90°	3 m
KV-5-SWK-19B-90	0302190	90°	5 m
Tool-side			
Cable connector without cable			
KAS-19B-A-0-C	0301284	0°	-
KAS-19B-A-90-C	0301295	90°	-
Cable connector with cable			
KV-3-SWA-19B-0	0302178	0°	3 m
KV-3-SWA-19B-90	0302191	90°	3 m

Cable connector for SWO-R26 / G26 / S26 / K26 / R17 / R21 / S21 / K21

Description	ID	Cable outlet	Length
Robot-side			
Cable connector without cable			
KAS-26B-K-0-C	0301290	0°	-
KAS-26B-K-90-C	0301296	90°	-
Cable connector with cable			
KV-3-SWK-26B-0	0302192	0°	3 m
KV-5-SWK-26B-0	0302193	0°	5 m
KV-3-SWK-26B-90	0302185	90°	3 m
KV-5-SWK-26B-90	0302186	90°	5 m
Tool-side			
Cable connector without cable			
KAS-26B-A-0-C	0301291	0°	-
KAS-26B-A-90-C	0301297	90°	-
Cable connector with cable			
KV-3-SWA-26B-0	0302184	0°	3 m
KV-3-SWA-26B-90	0302187	90°	3 m

Cable connector for SWO-KM14

Description	ID	Cable outlet	Length
Robot-side			
Cable connector without cable			
KAS-14B-K-0	0301276	0°	-
KAS-14B-K-90	0301278	90°	-
Tool-side			
Cable connector without cable			
KAS-14B-A-0	0301277	0°	-
KAS-14B-A-90	0301279	90°	-

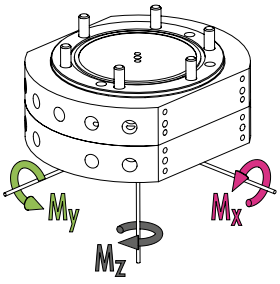
Cable connector for SWO-RF19 / GF19 / SF19 / KF19/ RF14 / GF14 / KF14 / RF10 / KF10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector with cable			
KV-5-SWK-19F-0	0302170	0°	5 m
KV-10-SWK-19F-0	0302171	0°	10 m
KV-5-SWK-19F-90	0302172	90°	5 m
KV-10-SWK-19F-90	0302173	90°	10 m
Tool-side			
Cable connector with cable			
KV-3-SWA-19F-0	0302174	0°	3 m
KV-3-SWA-19F-90	0302175	90°	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

SWS 040

Forces and moments



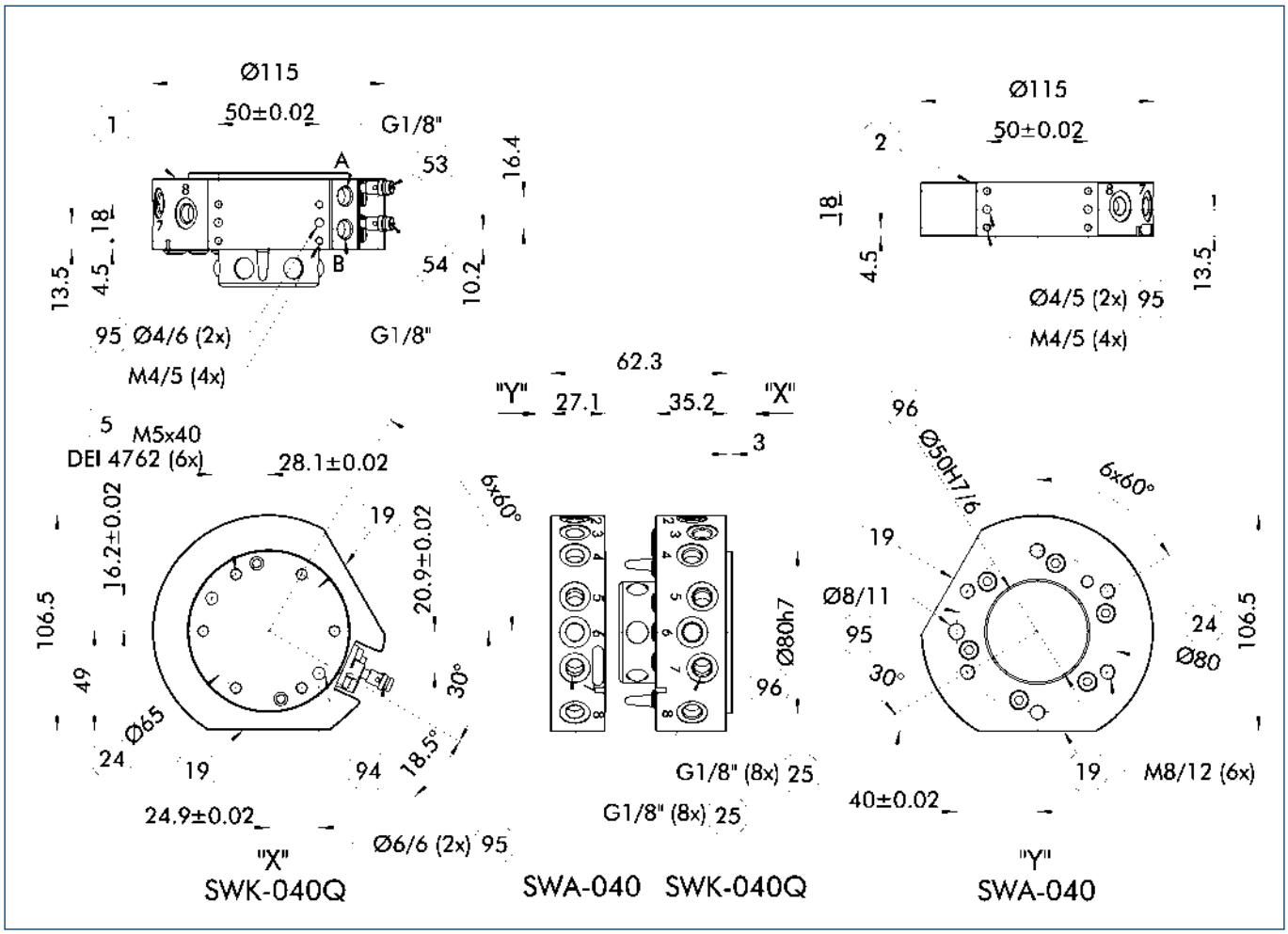
M_x max. 471 Nm
M_z max. 648 Nm
M_y max. 471 Nm

ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-040Q-000-000-SG	SWA-040-000-000
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	50	50
Piston stroke monitoring		integrated	
Locking force	[N]	5600	
Repeat accuracy	[mm]	0.015	0.015
Mass	[kg]	1.25	0.6
max. locking distance	[mm]	3	3
Air connection thread Pneumatic feed-through		8x G1/8“	8x G1/8“
Main connection lock / unlock		G1/8“	
max. permissible XY offset	[mm]	±2	±2
max. permissible angular offset	[°]	±2	±2
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9

Main view



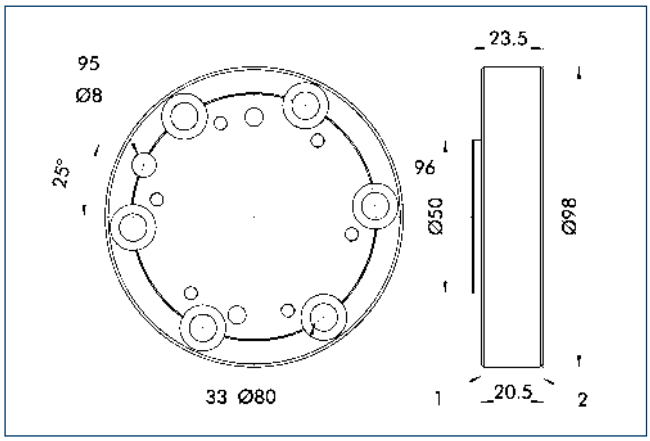
The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(24) Bolt circle
(25) Pneumatic feed-through
(53) Monitoring position unlocked
(54) Monitoring position locked
(94) Optional proximity switch
(95) Fit for a centering pin
(96) Fitting for centering

Adapter plate ISO-A80-R



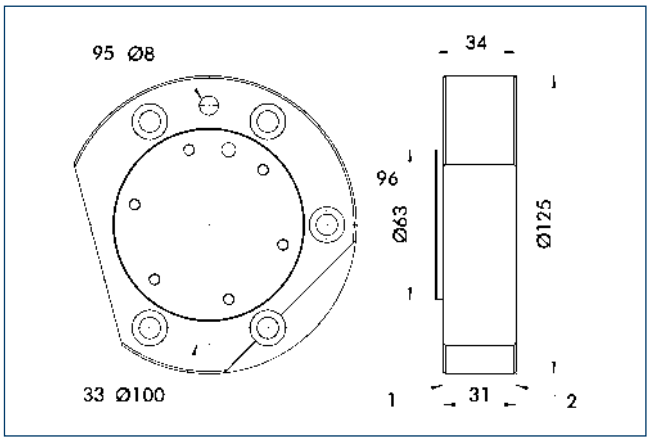
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-040-ISO-A80	0302203	

ⓘ Adapter plate for quick-change master without piston stroke control

Adapter plate ISO-A100-R



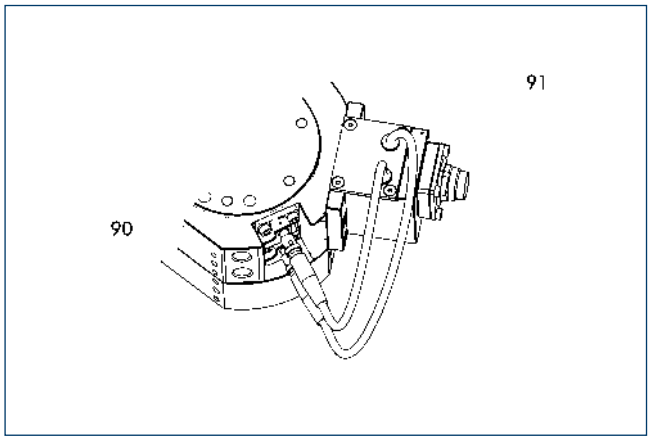
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-040-ISO-A100	0302204	

ⓘ Adapter plate for quick-change master without piston stroke control

Installation of optional E-module



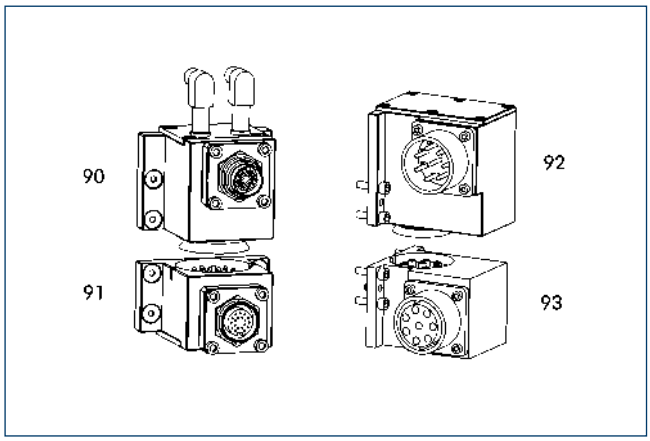
(90) AS-SWK 040Q
(91) Optional electrical module ... W-master with integrated sensor connection

The drawing shows the quick change system with integrated piston stroke control and preassembled inductive proximity sensors. The sensors are directly connected to the E-module.

Description	ID	
Robot-side		
AS-SWK-040Q/076 mounting kit with sensor	9955216	

ⓘ If the SWK was already ordered with piston stroke control (...-SG / ...-SM / ...-SQ), then the mounting kit does not need to be ordered additionally.
A preadjusted sensor with holder is in the scope of delivery of the mounting kit. Two mounting kits are needed per SWK.

Optional electrical modules



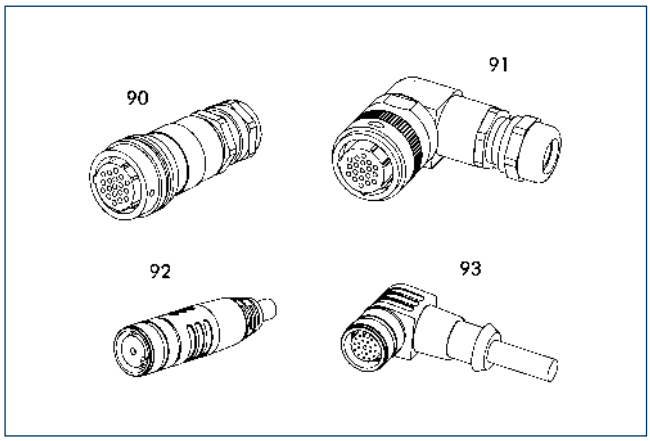
(90) E-module with metric threads, robot-side
(91) E-module with mil-spec. threads, tool-side
(92) E-module with mil-spec. threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-RF19-K	9948654	19	125 V AC/3 A
Tool-side			
SWO-RF10-A	9961313	10	125 V AC/3 A
SWO-RF14-A	9961312	14	125 V AC/3 A
SWO-RF19-A	9948657	19	125 V AC/3 A

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter "SWO-E Electrical Option" or contact us at any time.

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

(92) Connection plug / socket straight with extension cable

(93) Connection plug / socket at an angle with extension cable

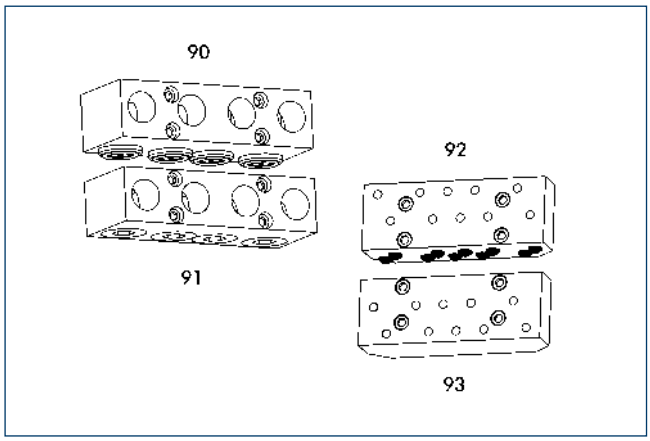
Other cable lengths on request.

Cable connector for SW0-RF19 / GF19 / SF19 / KF19 / RF14 / GF14 / KF14 / RF10 / KF10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector with cable			
KV-5-SWK-19F-0	0302170	0°	5 m
KV-10-SWK-19F-0	0302171	0°	10 m
KV-5-SWK-19F-90	0302172	90°	5 m
KV-10-SWK-19F-90	0302173	90°	10 m
Tool-side			
Cable connector with cable			
KV-3-SWA-19F-0	0302174	0°	3 m
KV-3-SWA-19F-90	0302175	90°	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

Optional pneumatic / fluidic modules



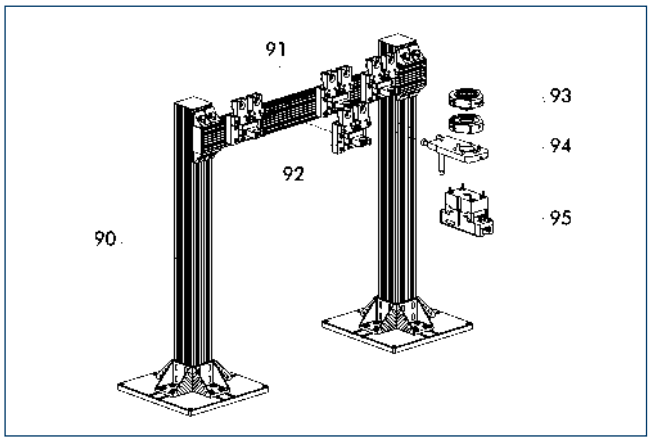
(90) Self-sealing fluid module, robot-side
(91) Self-sealing fluid module, tool-side
(92) Pneumatic module, robot-side
(93) Pneumatic module, tool-side

Modules for transmission of air and fluids from the robot, through the tool changer to the tools.

Description	ID	No. of fluid feed-throughs	Connection
Robot-side			
SWO-FG2-K	9936817	2	G3/8"
SWO-FG4-K	9937333	4	G3/8"
SWO-P05-K	9936895	10	M5
SWO-P14-K	9935830	2	G1/4"
SWO-P186-K	9939024	6	G1/8"
Tool-side			
SWO-FG2-A	9936818	2	G3/8"
SWO-FG4-A	9937334	4	G3/8"
SWO-P05-A	9936896	10	M5
SWO-P14-A	9935825	2	G1/4"
SWO-P186-A	9939025	6	G1/8"

ⓘ For other pneumatic and fluid modules, see chapter "Options" or visit www.schunk.com

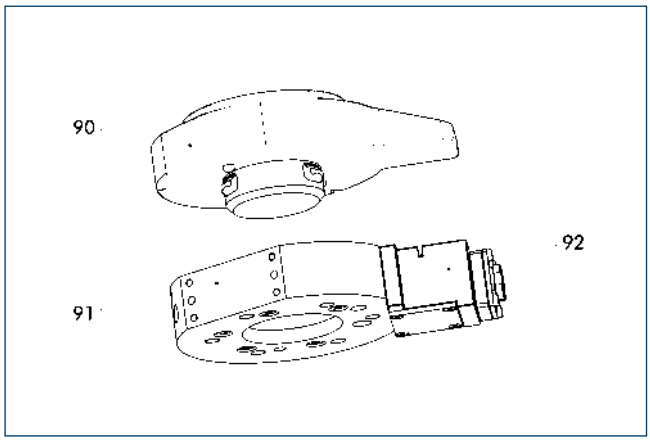
SWM-M modular storage rack



(90) Baseplate with upright profile
(91) Horizontal profile
(92) Storage module
(93) SWS quick-change system
(94) Intermediate plate
(95) Parallel gripper

The modular storage rack is designed for the specific size quick change module. The modular design of the storage rack allows for a standard solution customized to your application. Depending on the number of tools, the storage positions and the size of the tools a customized storage rack can be created for your application. For more information please see chapter “SWM Storage Rack”.

SWD-040 dust cover



(90) SWD protection cover
(92) Optional electrical module
(91) SWA quick-change adapter

The protection cover protects the quick-change adapter in the storage rack against dust and chips. The cover has an integrated clip mechanism which is actuated by locking / unlocking the changing master, allowing the robot to remove the cover from one adapter and place it on another adapter.

Description	ID	
Dust cover		
SWD-040-R00-000	0302254	

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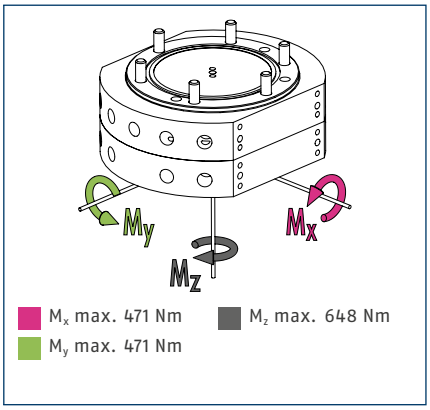
Robot Accessories | Changing | Quick-change System

Forces and moments

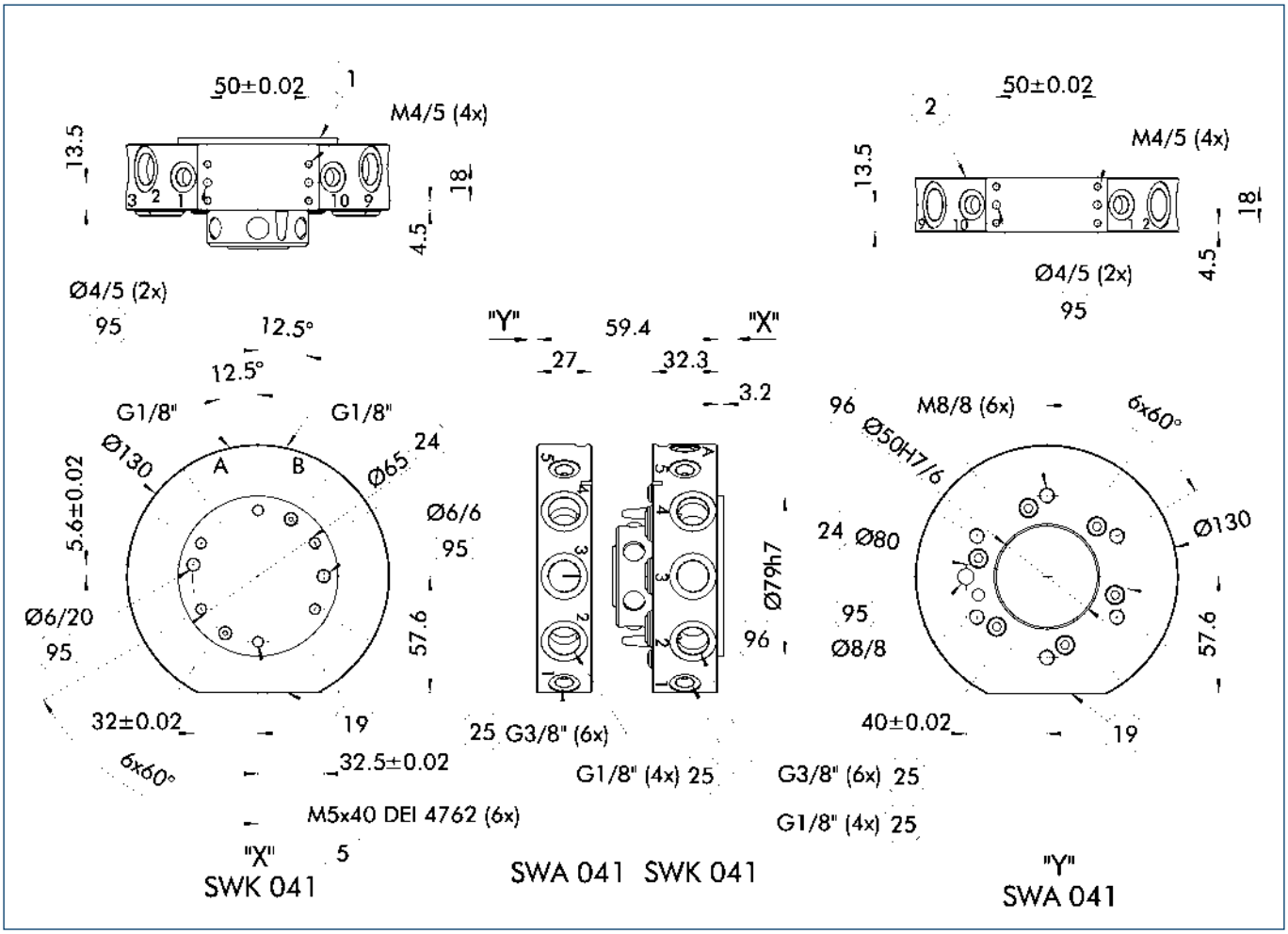


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-041-000-000	SWA-041-000-000
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	50	50
Piston stroke monitoring		optional	
Locking force	[N]	4500	
Repeat accuracy	[mm]	0.015	0.015
Mass	[kg]	1.4	0.7
max. locking distance	[mm]	3	3
Air connection thread Pneumatic feed-through		6x G1/8“	6x G1/8“
Air connection thread Pneumatic feed-through		4x G1/8“	4x G1/8“
Main connection lock / unlock		G1/8“	
max. permissible XY offset	[mm]	±2	±2
max. permissible angular offset	[°]	±2	±2
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9

Main view



The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

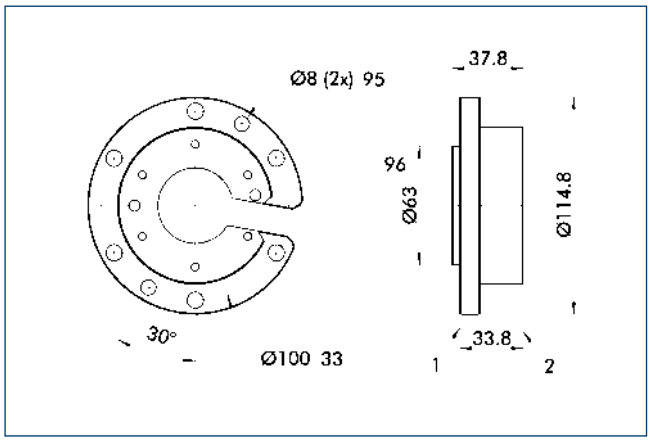
ⓘ The robot-side plate mounted on the SWK is a cover for the piston chamber. It is essential that it is supported by the adapter plate. See the further product information for a note on how to design this adapter plate.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(24) Bolt circle
(25) Pneumatic feed-through
(95) Fit for a centering pin
(96) Fitting for centering

Adapter plate ISO-A100-SIP-R



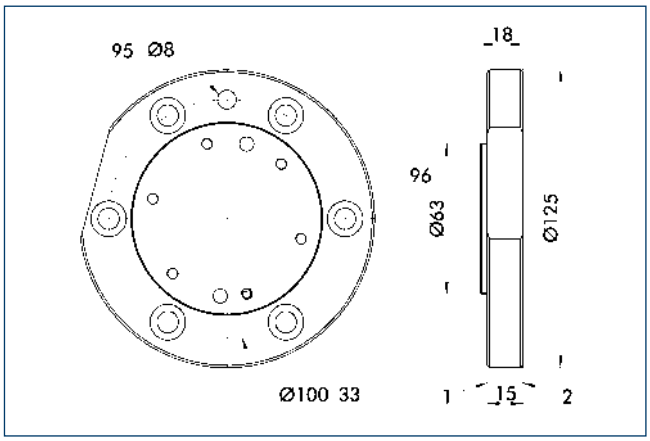
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-040/041-ISO-A100-SIP	0302232	

ⓘ Adapter plate for quick-change master with piston stroke control

Adapter plate ISO-A100-R



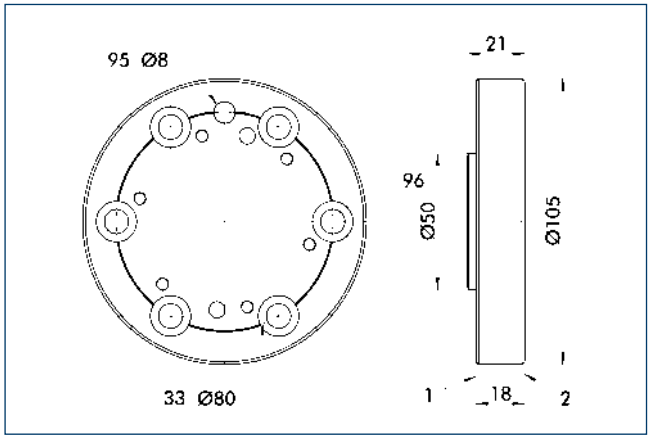
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-041-ISO-A100	0302206	

ⓘ Adapter plate for quick-change master without piston stroke control

Adapter plate ISO-A80-R



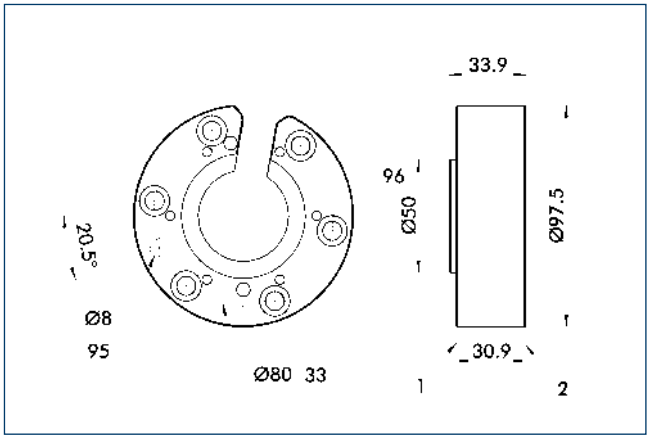
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-041-ISO-A80	0302205	

ⓘ Adapter plate for quick-change master without piston stroke control

Adapter plate ISO-A80-SIP-R



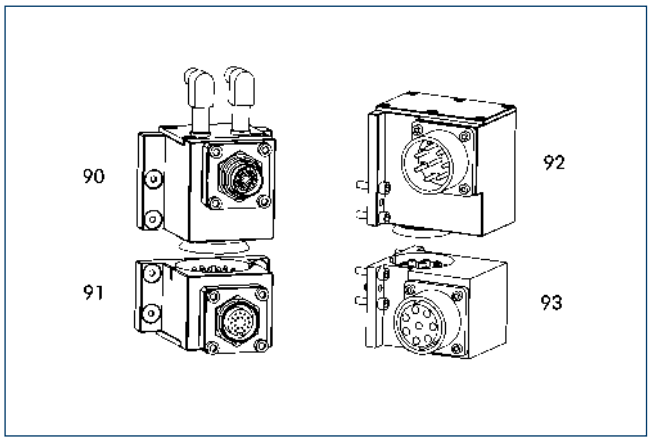
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-041-ISO-A80-SIP	0302235	

ⓘ Adapter plate for quick-change master with piston stroke control

Optional electrical modules



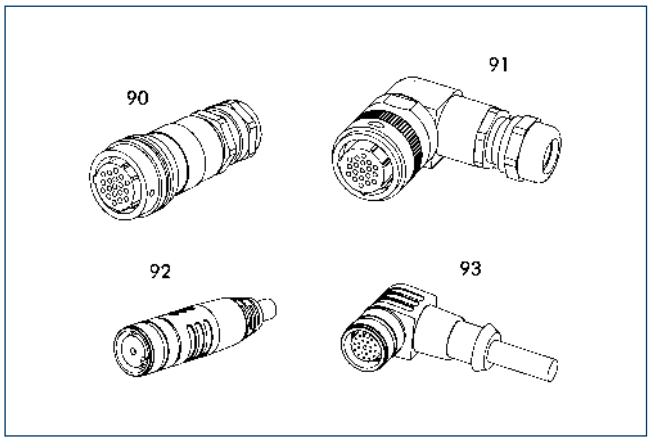
(90) E-module with metric threads, robot-side
(91) E-module with mil-spec. threads, tool-side
(92) E-module with mil-spec. threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-RF19-K	9948654	19	125 V AC/3 A
Tool-side			
SWO-RF10-A	9961313	10	125 V AC/3 A
SWO-RF14-A	9961312	14	125 V AC/3 A
SWO-RF19-A	9948657	19	125 V AC/3 A

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter "SWO-E Electrical Option" or contact us at any time.

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

(92) Connection plug / socket straight with extension cable

(93) Connection plug / socket at an angle with extension cable

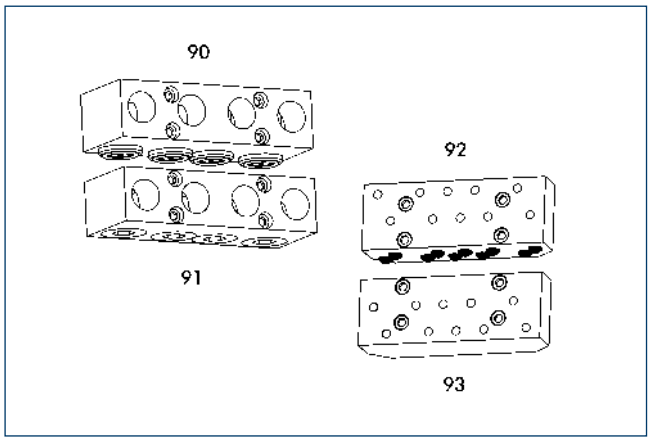
Other cable lengths on request.

Cable connector for SW0-RF19 / GF19 / SF19 / KF19 / RF14 / GF14 / KF14 / RF10 / KF10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector with cable			
KV-5-SWK-19F-0	0302170	0°	5 m
KV-10-SWK-19F-0	0302171	0°	10 m
KV-5-SWK-19F-90	0302172	90°	5 m
KV-10-SWK-19F-90	0302173	90°	10 m
Tool-side			
Cable connector with cable			
KV-3-SWA-19F-0	0302174	0°	3 m
KV-3-SWA-19F-90	0302175	90°	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

Optional pneumatic / fluidic modules



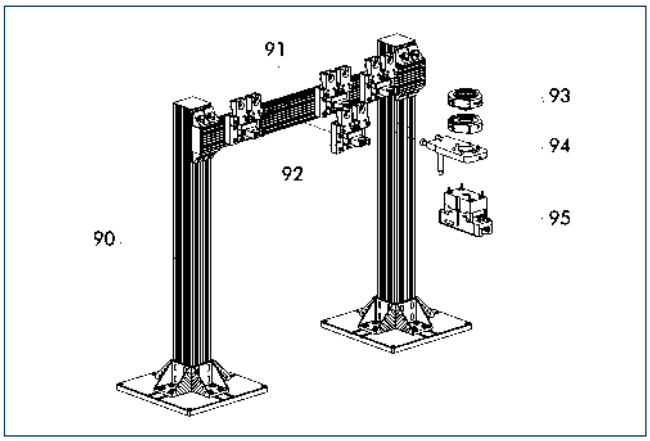
(90) Self-sealing fluid module, robot-side
(91) Self-sealing fluid module, tool-side
(92) Pneumatic module, robot-side
(93) Pneumatic module, tool-side

Modules for transmission of air and fluids from the robot, through the tool changer to the tools.

Description	ID	No. of fluid feed-throughs	Connection
Robot-side			
SWO-FG2-K	9936817	2	G3/8"
SWO-FG4-K	9937333	4	G3/8"
SWO-P05-K	9936895	10	M5
SWO-P14-K	9935830	2	G1/4"
SWO-P186-K	9939024	6	G1/8"
Tool-side			
SWO-FG2-A	9936818	2	G3/8"
SWO-FG4-A	9937334	4	G3/8"
SWO-P05-A	9936896	10	M5
SWO-P14-A	9935825	2	G1/4"
SWO-P186-A	9939025	6	G1/8"

ⓘ For other pneumatic and fluid modules, see chapter "Options" or visit www.schunk.com

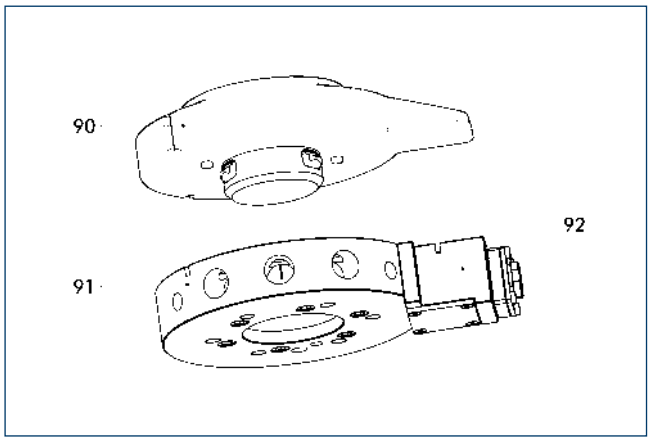
SWM-M modular storage rack



(90) Baseplate with upright profile
(91) Horizontal profile
(92) Storage module
(93) SWS quick-change system
(94) Intermediate plate
(95) Parallel gripper

The modular storage rack is designed for the specific size quick change module. The modular design of the storage rack allows for a standard solution customized to your application. Depending on the number of tools, the storage positions and the size of the tools a customized storage rack can be created for your application. For more information please see chapter "SWM Storage Rack".

SWD-041 dust cover

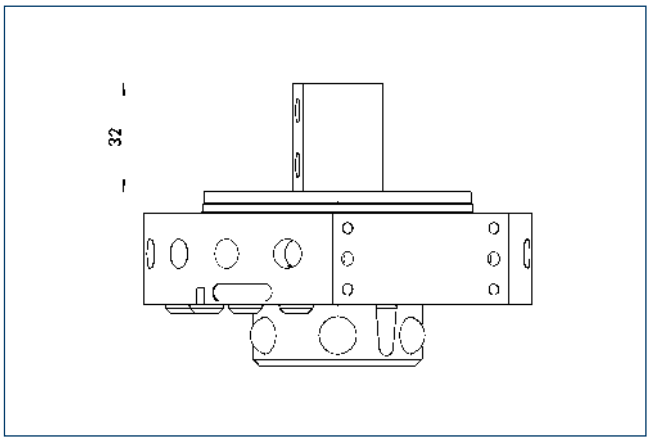


(90) SWD protection cover
(92) Optional electrical module
(91) SWA quick-change adapter

The protection cover protects the quick-change adapter in the storage rack against dust and chips. The cover has an integrated clip mechanism which is actuated by locking / unlocking the changing master, allowing the robot to remove the cover from one adapter and place it on another adapter.

Description	ID	
Dust cover		
SWD-041-R00-000	0302255	

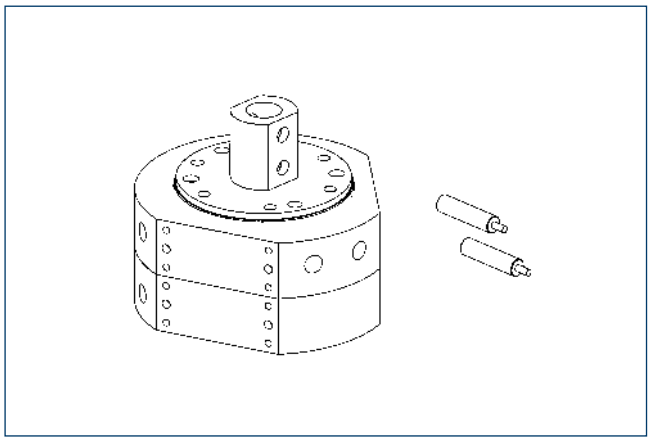
Piston stroke control



The drawing shows the minimum height of the adapter plate that is necessary when installing a piston stroke control.

Description	ID	
Piston stroke control		
SWK-041-SIP	0302348	

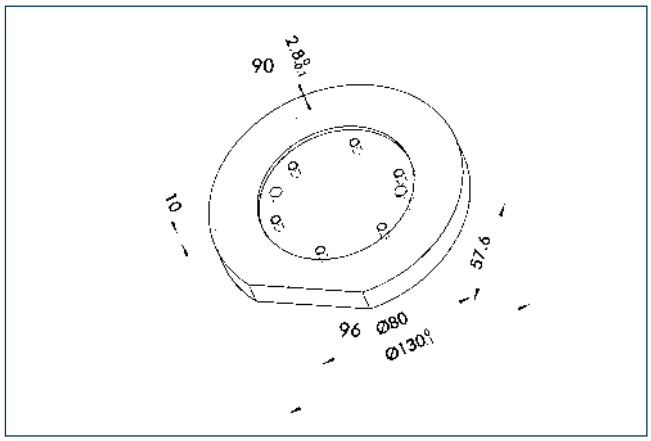
Piston stroke control



Description	ID	Often combined
Inductive proximity switches		
IN 80-S-M12	0301578	
IN 80-S-M8	0301478	
INK 80-S	0301550	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Adapter plate design



(90) Recommended adapter plate depth

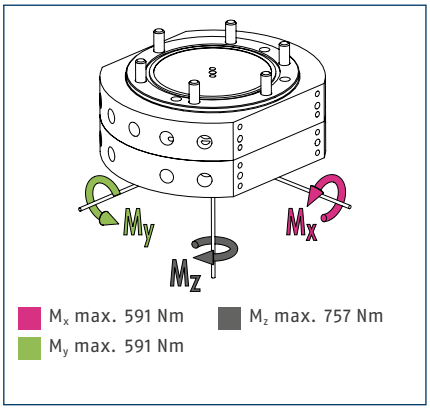
(96) Fitting for centering

Recommended adapter design. An adapter is necessary in order to seal the piston chamber.

SWS 060

Robot Accessories | Changing | Quick-change System

Forces and moments

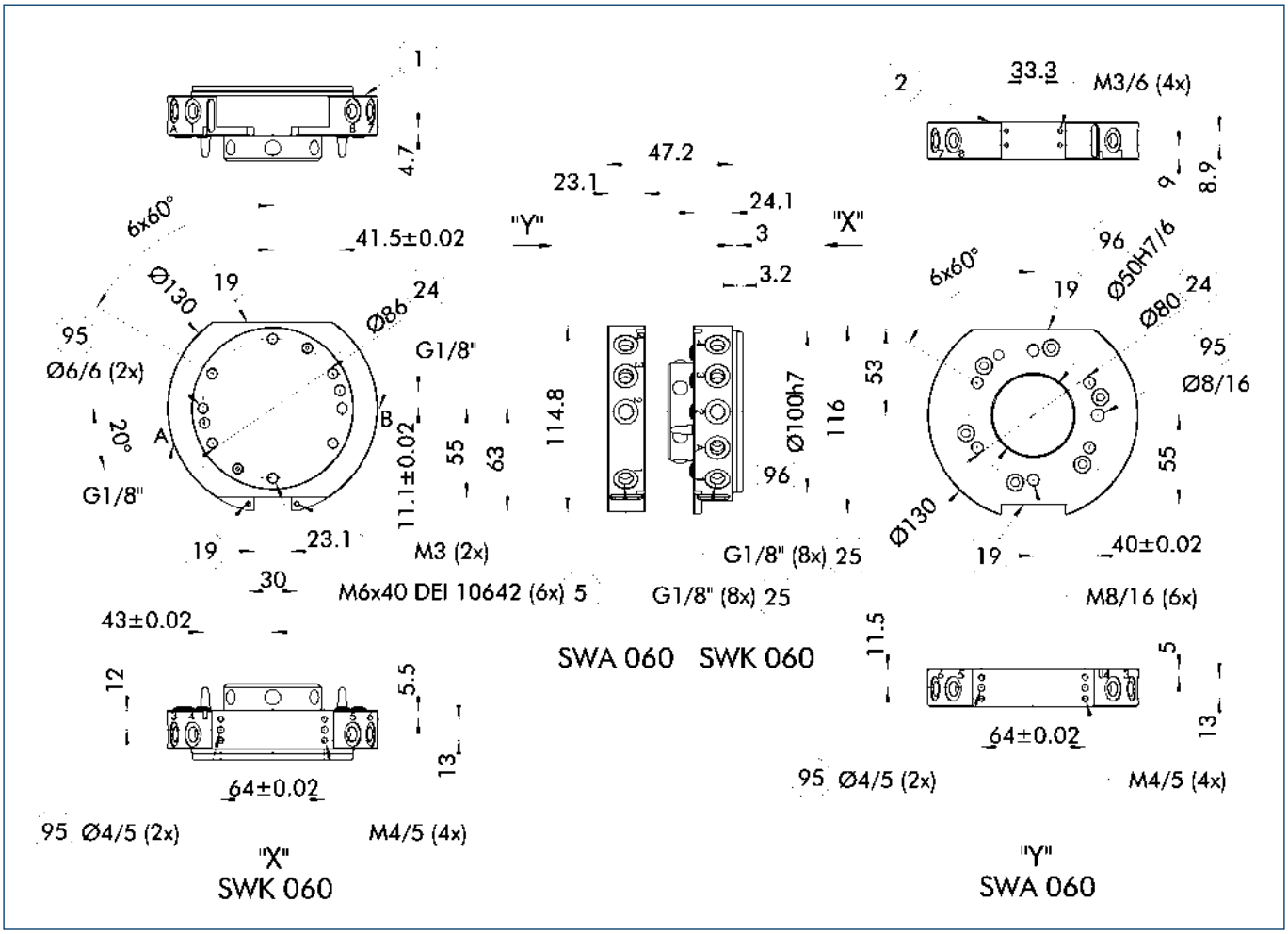


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-060-000-000	SWA-060-000-000
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	75	75
Piston stroke monitoring		optional	
Locking force	[N]	7400	
Repeat accuracy	[mm]	0.015	0.015
Mass	[kg]	1.3	0.7
max. locking distance	[mm]	3	3
Air connection thread Pneumatic feed-through		8x G1/8“	8x G1/8“
Main connection lock / unlock		G1/8“	
max. permissible XY offset	[mm]	±2	±2
max. permissible angular offset	[°]	±1	±1
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9

Main view



The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

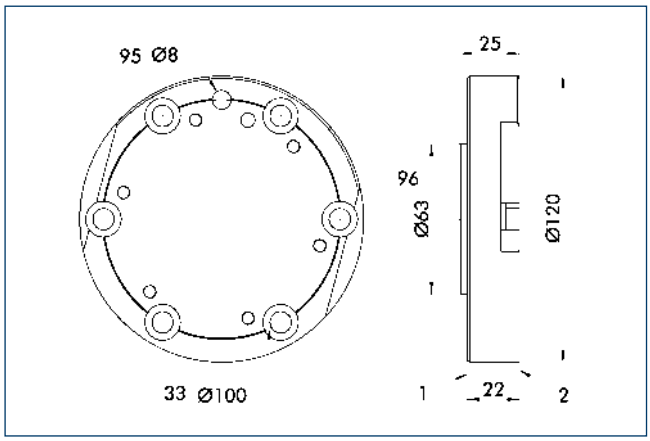
ⓘ The robot-side plate mounted on the SWK is a cover for the piston chamber. It is essential that it is supported by the adapter plate. See the further product information for a note on how to design this adapter plate.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(24) Bolt circle
(25) Pneumatic feed-through
(95) Fit for a centering pin
(96) Fitting for centering

Adapter plate ISO-A100-R



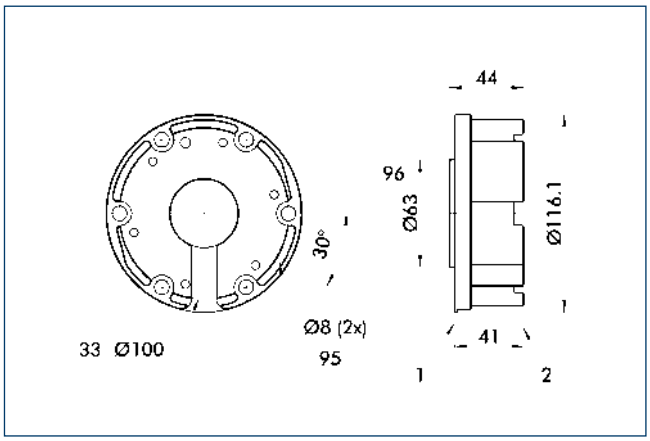
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-060/062-ISO-A100	0302208	

ⓘ Adapter plate for quick-change master without piston stroke control

Adapter plate ISO-A100-SIP-R



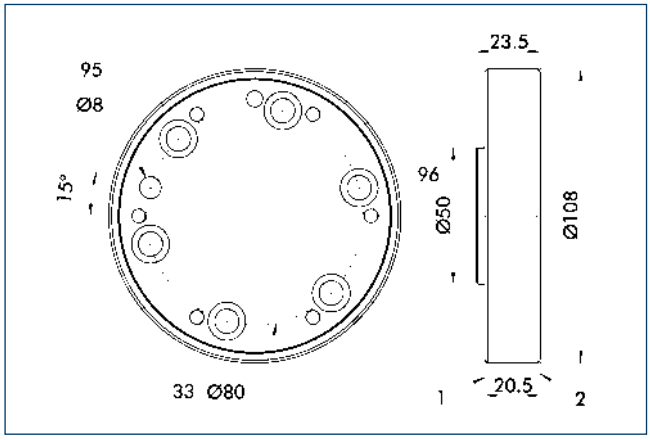
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-060/062-ISO-A100-SIP	0302236	

ⓘ Adapter plate for quick-change master with piston stroke control

Adapter plate ISO-A80-R



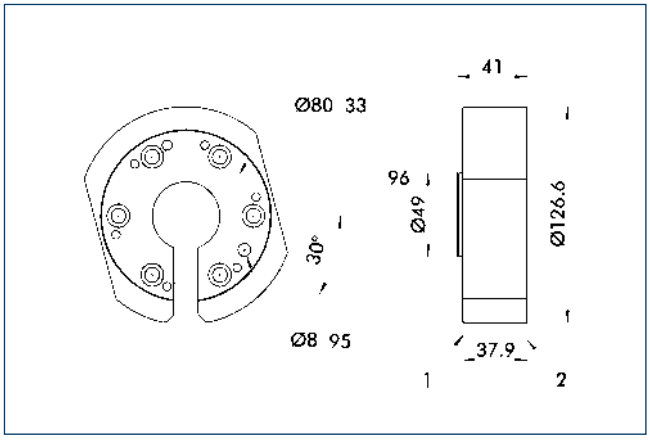
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-060/062-ISO-A80	0302207	

ⓘ Adapter plate for quick-change master without piston stroke control

Adapter plate ISO-A80-SIP-R



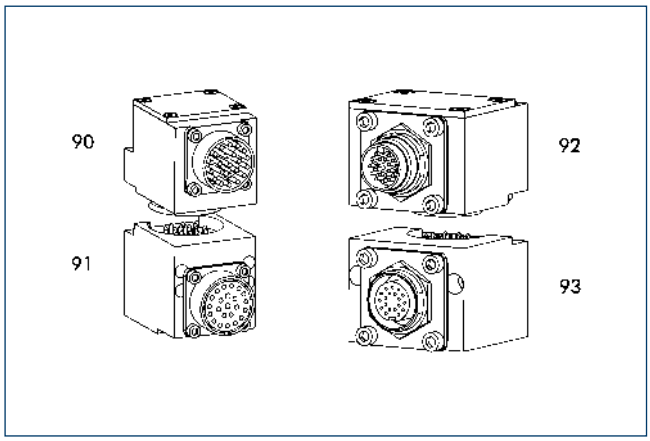
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-060/062-ISO-A80-SIP	0302237	

ⓘ Adapter plate for quick-change master with piston stroke control

Optional electrical modules



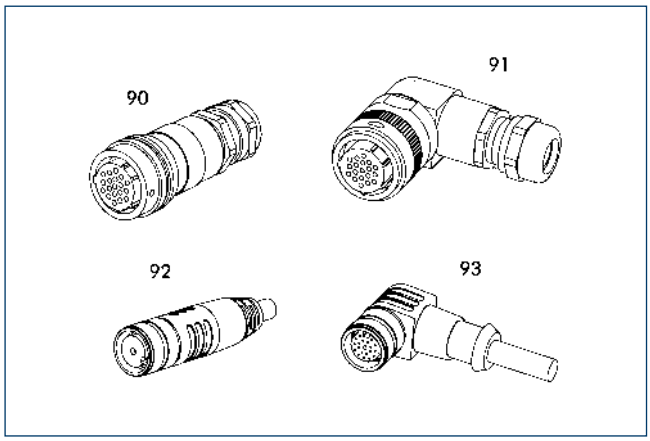
(90) E-module with bayonet fitting, robot-side
(91) E-module with bayonet fitting, tool-side
(92) E-module with metric threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-KF19-K	9959886	19	50 V DC/3 A
Tool-side			
SWO-KF10-A	9961308	10	50 V DC/3 A
SWO-KF14-A	9961307	14	50 V DC/3 A
SWO-KF19-A	9959887	19	50 V DC/3 A

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter "SWO-E Electrical Option" or contact us at any time.

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

(92) Connection plug / socket straight with extension cable

(93) Connection plug / socket at an angle with extension cable

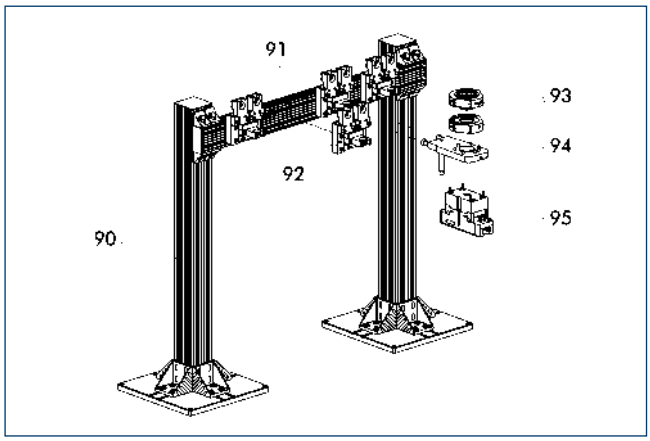
Other cable lengths on request.

Cable connector for SW0-RF19 / GF19 / SF19 / KF19 / RF14 / GF14 / KF14 / RF10 / KF10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector with cable			
KV-5-SWK-19F-0	0302170	0°	5 m
KV-10-SWK-19F-0	0302171	0°	10 m
KV-5-SWK-19F-90	0302172	90°	5 m
KV-10-SWK-19F-90	0302173	90°	10 m
Tool-side			
Cable connector with cable			
KV-3-SWA-19F-0	0302174	0°	3 m
KV-3-SWA-19F-90	0302175	90°	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

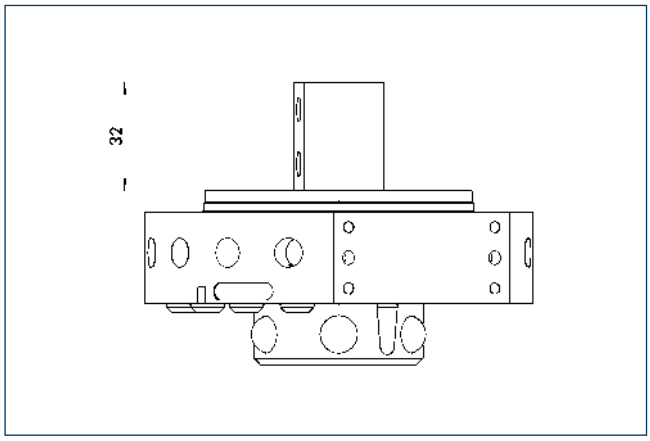
SWM-M modular storage rack



(90) Baseplate with upright profile
(91) Horizontal profile
(92) Storage module
(93) SWS quick-change system
(94) Intermediate plate
(95) Parallel gripper

The modular storage rack is designed for the specific size quick change module. The modular design of the storage rack allows for a standard solution customized to your application. Depending on the number of tools, the storage positions and the size of the tools a customized storage rack can be created for your application. For more information please see chapter “SWM Storage Rack”.

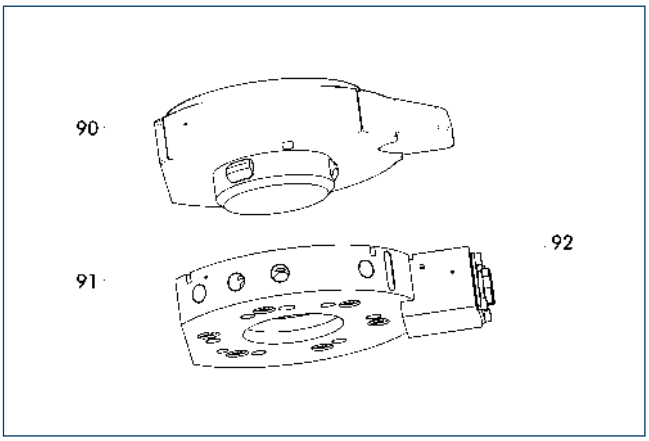
Piston stroke control



The drawing shows the minimum height of the adapter plate that is necessary when installing a piston stroke control.

Description	ID	
Piston stroke control		
SWK-060-SIP	0302365	

SWD-060 dust cover

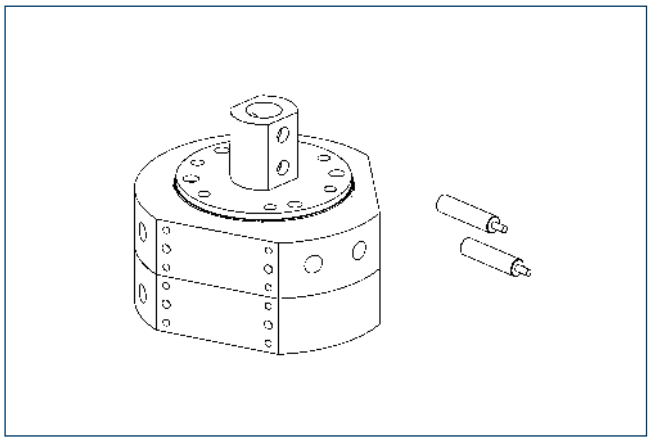


(90) SWD protection cover
(91) SWA quick-change adapter
(92) Optional electrical module

The protection cover protects the quick-change adapter in the storage rack against dust and chips. The cover has an integrated clip mechanism which is actuated by locking / unlocking the changing master, allowing the robot to remove the cover from one adapter and place it on another adapter.

Description	ID	
Dust cover		
SWD-060-K00-000	0302256	

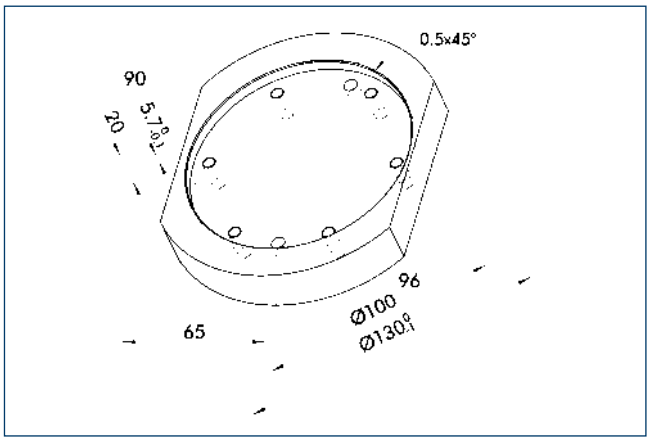
Piston stroke control



Description	ID	Often combined
Inductive proximity switches		
IN 80-S-M12	0301578	
IN 80-S-M8	0301478	
INK 80-S	0301550	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Adapter plate design



(90) Recommended adapter plate depth

(96) Fitting for centering

Recommended adapter design. An adapter is necessary in order to seal the piston chamber.

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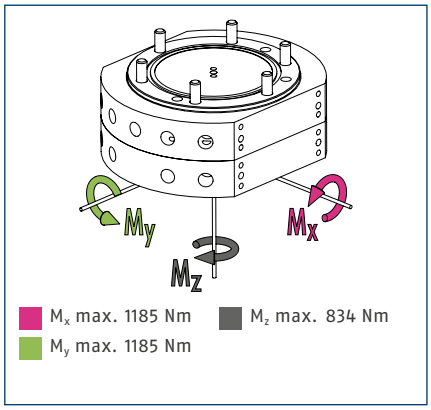
Robot Accessories | Changing | Quick-change System

Forces and moments

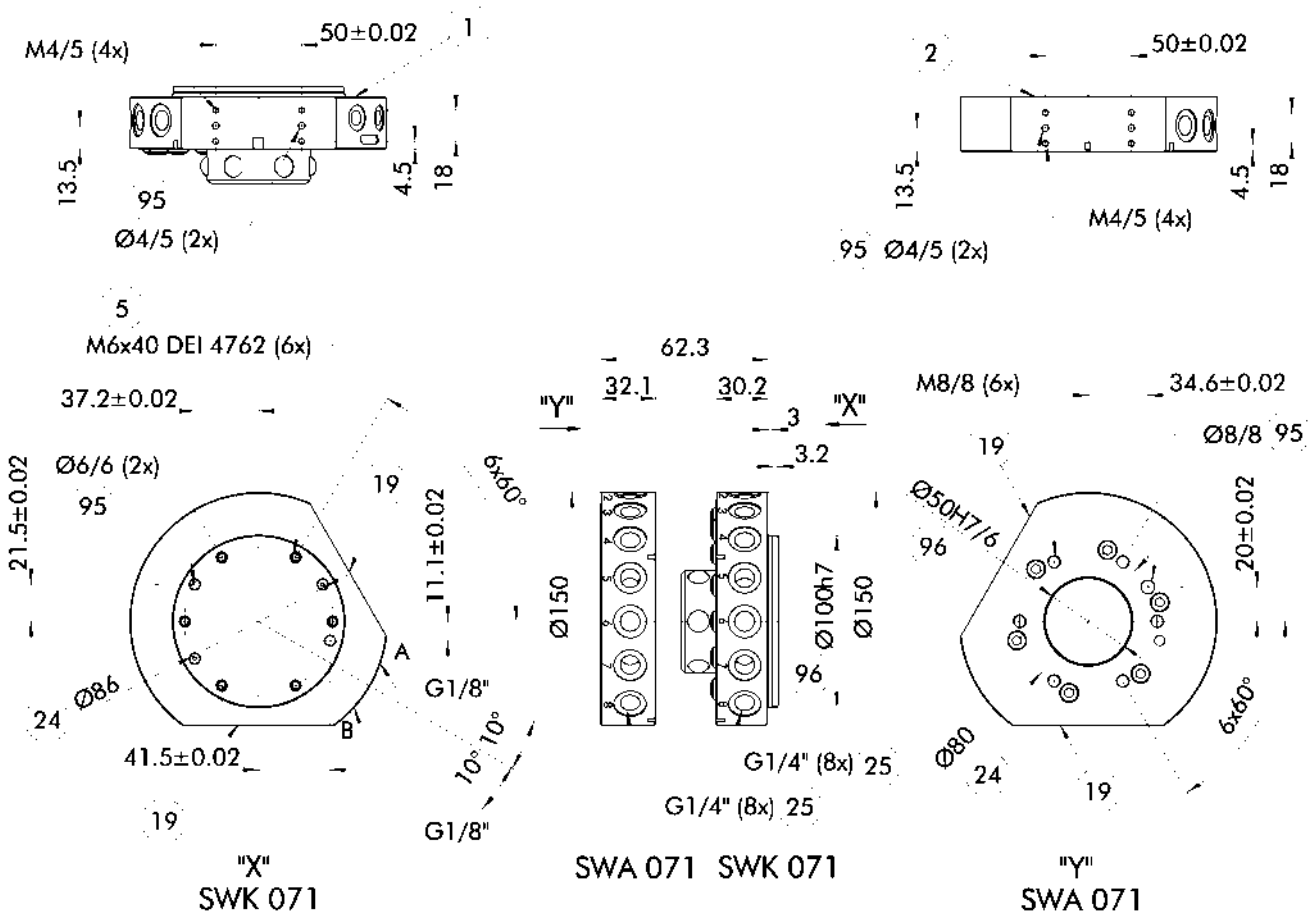


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-071-000-000	SWA-071-000-000
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	79	79
Piston stroke monitoring		optional	
Locking force	[N]	8100	
Repeat accuracy	[mm]	0.015	0.015
Mass	[kg]	1.8	1.3
max. locking distance	[mm]	3	3
Air connection thread Pneumatic feed-through		8x G1/4“	8x G1/4“
Main connection lock / unlock		G1/8“	
max. permissible XY offset	[mm]	±2	±2
max. permissible angular offset	[°]	±1	±1
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9

Main view



The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

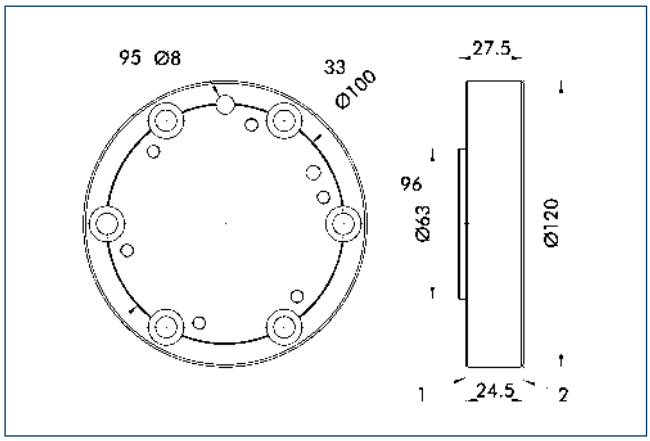
ⓘ The robot-side plate mounted on the SWK is a cover for the piston chamber. It is essential that it is supported by the adapter plate. See the further product information for a note on how to design this adapter plate.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(24) Bolt circle
(25) Pneumatic feed-through
(95) Fit for a centering pin
(96) Fitting for centering

Adapter plate ISO-A100-R



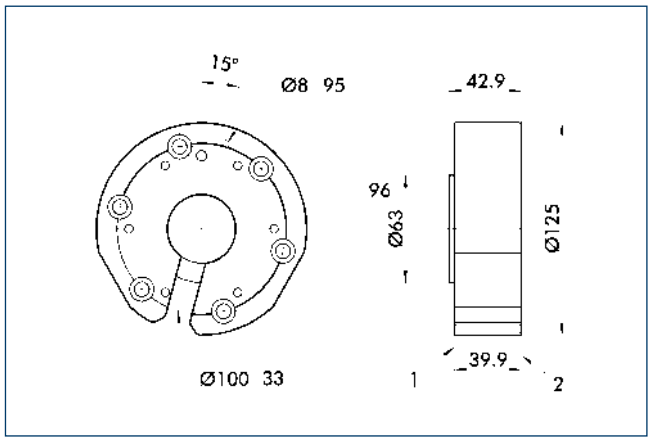
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-071-ISO-A100	0302210	

ⓘ Adapter plate for quick-change master without piston stroke control

Adapter plate ISO-A100-SIP-R



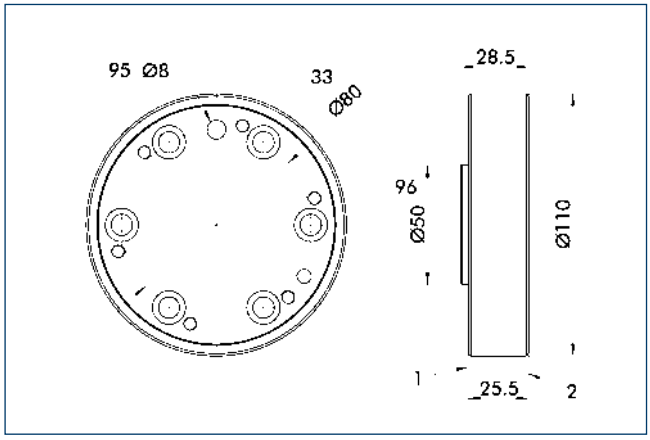
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-071-ISO-A100-SIP	0302238	

ⓘ Adapter plate for quick-change master with piston stroke control

Adapter plate ISO-A80-R



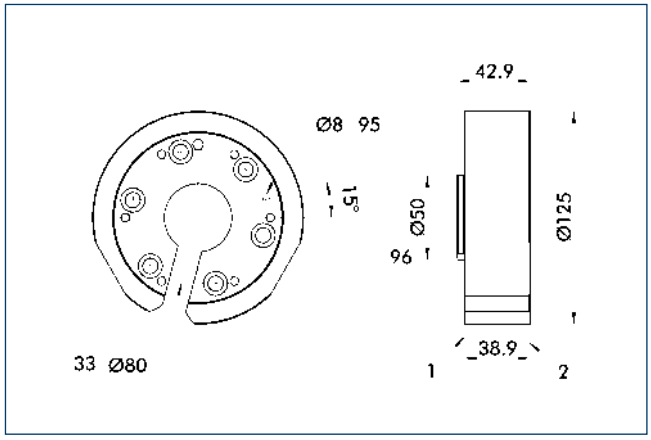
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-071-ISO-A80	0302209	

ⓘ Adapter plate for quick-change master without piston stroke control

Adapter plate ISO-A80-SIP-R



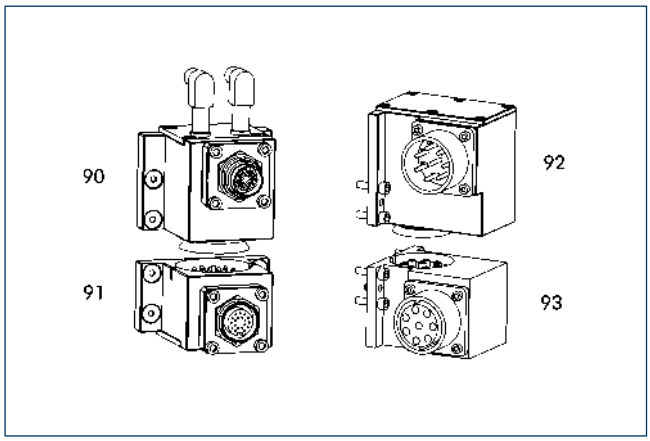
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-071-ISO-A80-SIP	0302239	

ⓘ Adapter plate for quick-change master with piston stroke control

Optional electrical modules



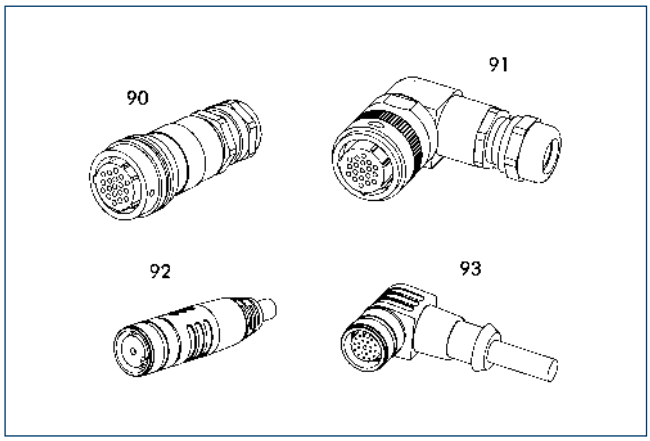
(90) E-module with metric threads, robot-side
(91) E-module with mil-spec. threads, tool-side
(92) E-module with mil-spec. threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-RF19-K	9948654	19	125 V AC/3 A
Tool-side			
SWO-RF10-A	9961313	10	125 V AC/3 A
SWO-RF14-A	9961312	14	125 V AC/3 A
SWO-RF19-A	9948657	19	125 V AC/3 A

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter "SWO-E Electrical Option" or contact us at any time.

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

(92) Connection plug / socket straight with extension cable

(93) Connection plug / socket at an angle with extension cable

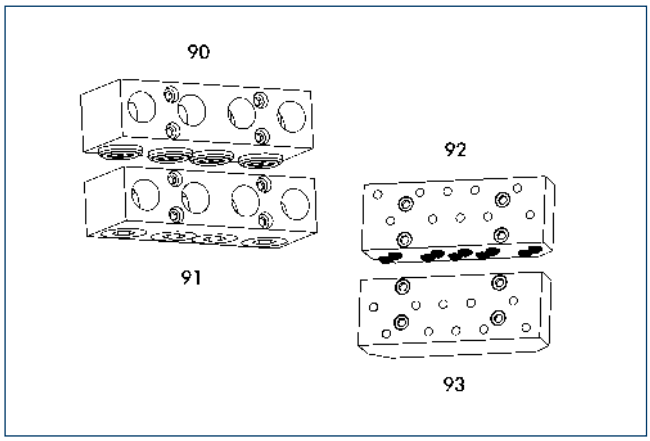
Other cable lengths on request.

Cable connector for SWO-RF19 / GF19 / SF19 / KF19 / RF14 / GF14 / KF14 / RF10 / KF10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector with cable			
KV-5-SWK-19F-0	0302170	0°	5 m
KV-10-SWK-19F-0	0302171	0°	10 m
KV-5-SWK-19F-90	0302172	90°	5 m
KV-10-SWK-19F-90	0302173	90°	10 m
Tool-side			
Cable connector with cable			
KV-3-SWA-19F-0	0302174	0°	3 m
KV-3-SWA-19F-90	0302175	90°	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

Optional pneumatic / fluidic modules



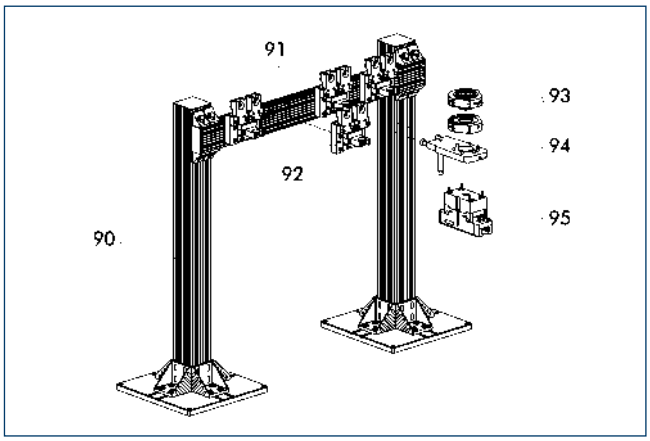
(90) Self-sealing fluid module, robot-side
(91) Self-sealing fluid module, tool-side
(92) Pneumatic module, robot-side
(93) Pneumatic module, tool-side

Modules for transmission of air and fluids from the robot, through the tool changer to the tools.

Description	ID	No. of fluid feed-throughs	Connection
Robot-side			
SWO-FG2-K	9936817	2	G3/8"
SWO-FG4-K	9937333	4	G3/8"
SWO-P05-K	9936895	10	M5
SWO-P14-K	9935830	2	G1/4"
SWO-P186-K	9939024	6	G1/8"
Tool-side			
SWO-FG2-A	9936818	2	G3/8"
SWO-FG4-A	9937334	4	G3/8"
SWO-P05-A	9936896	10	M5
SWO-P14-A	9935825	2	G1/4"
SWO-P186-A	9939025	6	G1/8"

ⓘ For other pneumatic and fluid modules, see chapter "Options" or visit www.schunk.com

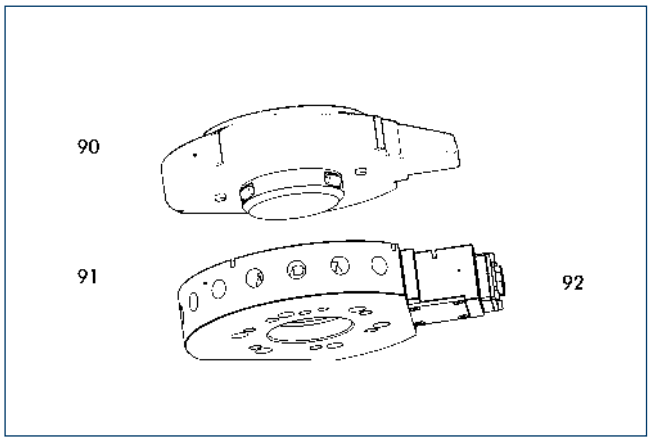
SWM-M modular storage rack



(90) Baseplate with upright profile
(91) Horizontal profile
(92) Storage module
(93) SWS quick-change system
(94) Intermediate plate
(95) Parallel gripper

The modular storage rack is designed for the specific size quick change module. The modular design of the storage rack allows for a standard solution customized to your application. Depending on the number of tools, the storage positions and the size of the tools a customized storage rack can be created for your application. For more information please see chapter "SWM Storage Rack".

SWD-071 dust cover

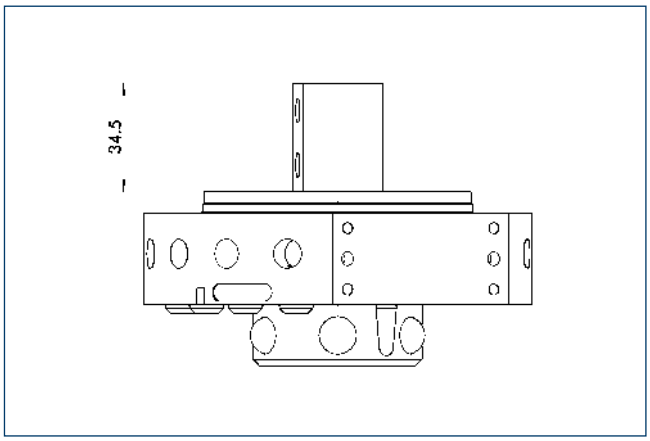


(90) SWD protection cover
(91) SWA quick-change adapter
(92) Optional electrical module

The protection cover protects the quick-change adapter in the storage rack against dust and chips. The cover has an integrated clip mechanism which is actuated by locking / unlocking the changing master, allowing the robot to remove the cover from one adapter and place it on another adapter.

Description	ID	
Dust cover		
SWD-071-R00-000	0302257	

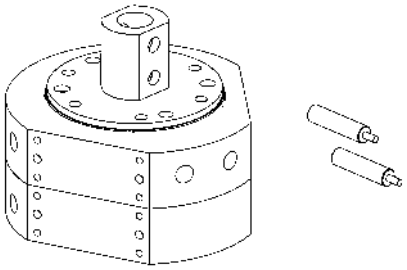
Piston stroke control



The drawing shows the minimum height of the adapter plate that is necessary when installing a piston stroke control.

Description	ID	
Piston stroke control		
SWK-071-SIP	0302375	

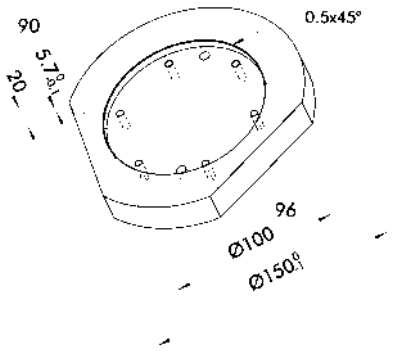
Piston stroke control



Description	ID	Often combined
Inductive proximity switches		
IN 80-S-M12	0301578	
IN 80-S-M8	0301478	
INK 80-S	0301550	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Adapter plate design



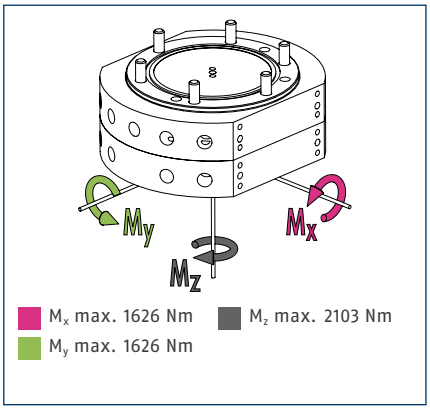
(90) Recommended adapter plate depth
(96) Fitting for centering

Recommended adapter design. An adapter is necessary in order to seal the piston chamber.

SWS 076

Robot Accessories | Changing | Quick-change System

Forces and moments

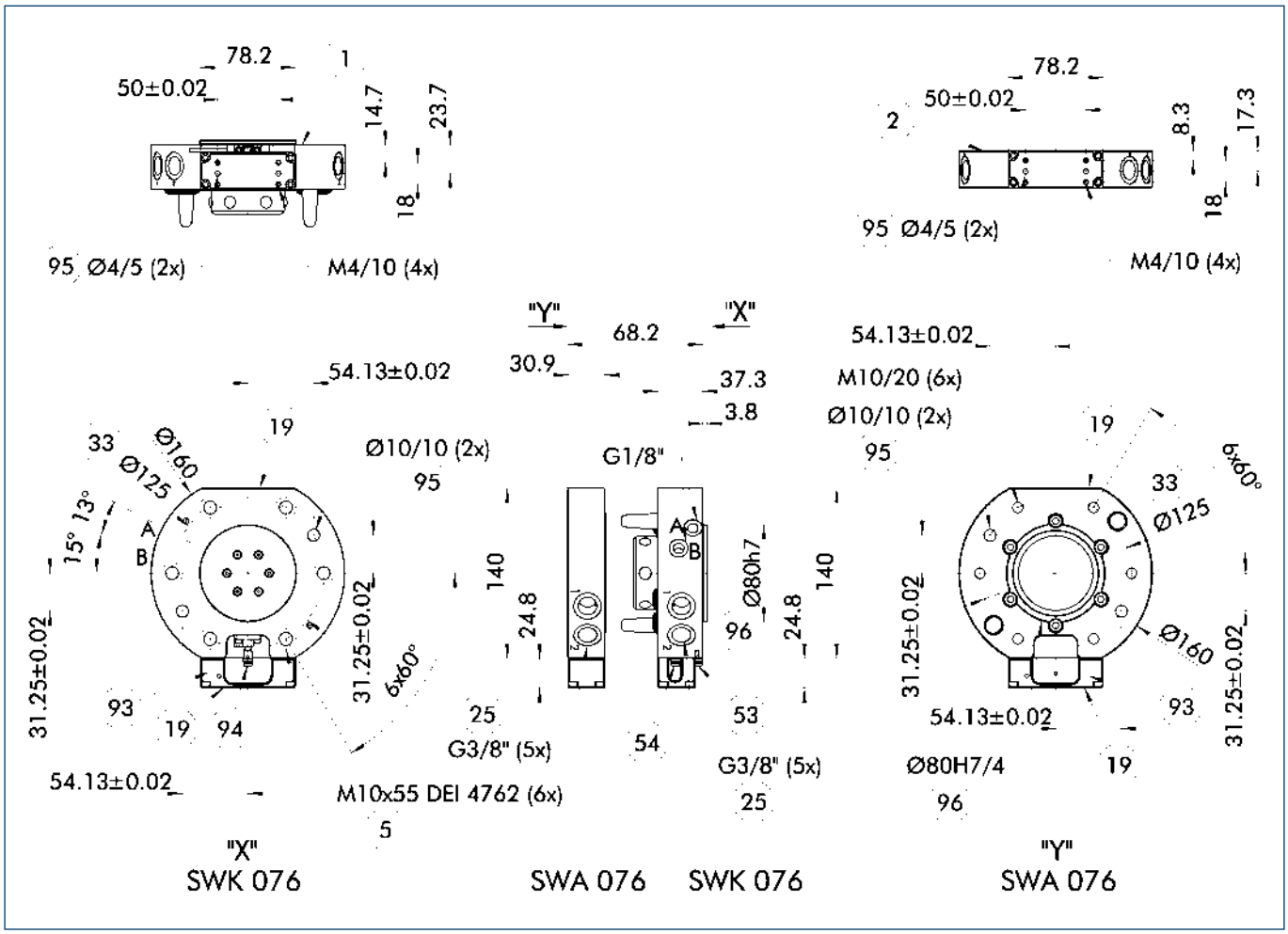


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-076-000-000-SG	SWA-076-000-000
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	100	100
Piston stroke monitoring		integrated	
Locking force	[N]	12000	
Repeat accuracy	[mm]	0.015	0.015
Mass	[kg]	2.25	1.4
max. locking distance	[mm]	2	2
Air connection thread Pneumatic feed-through		5x G1/8“	5x G1/8“
Main connection lock / unlock		G1/8“	
max. permissible XY offset	[m]	±2	±2
max. permissible angular offset	[°]	±1	±1
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9
Robot side connection		ISO 9409-1-125-6-M10	ISO 9409-1-125-6-M10

Main view



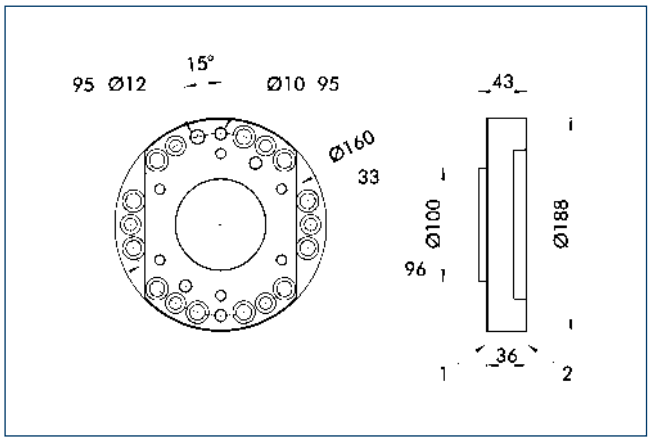
The drawing shows the basic design of the quick-change system with an integrated electric feed-through and does not take into consideration the dimensions of any options described below.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(53) Monitoring position unlocked
(54) Monitoring position locked
(93) Optional distance adapter included in scope of delivery
(94) Optional proximity switch
(95) Fit for a centering pin
(96) Fitting for centering

Adapter plate ISO-A160-M10/M12-R



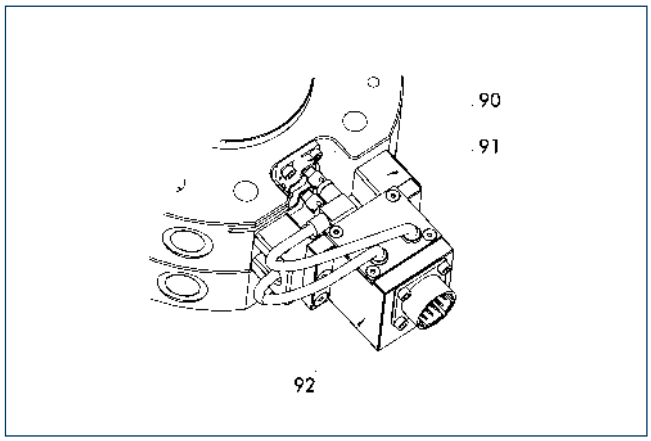
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-076-ISO-A160-M10/M12	0302247	

ⓘ Adapter plate for robots with M10 or M12 mounting patterns

Installation of optional E-module



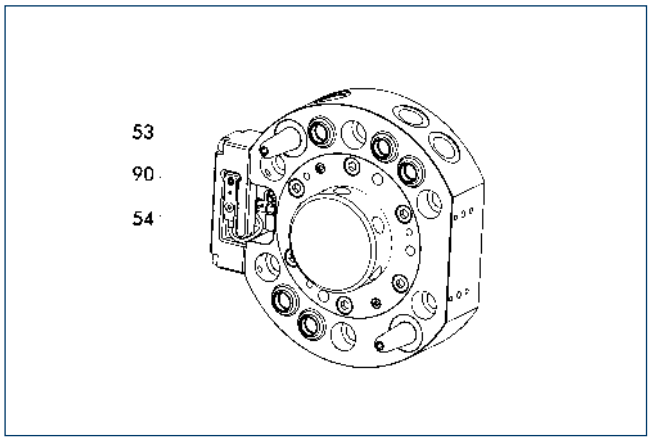
(90) AS-SWK 076
(91) Spacer
(92) Optional electrical module ...R-master with integrated sensor connection

When using the integrated piston stroke monitoring, a spacer is required between the electric optional module and the SWK. The spacer is included in the scope of delivery of the SWK (and the SWA). If the piston stroke monitoring is not used, the spacer is not required.

Description	ID	
Robot-side		
AS-SWK-040Q/076 mounting kit with sensor	9955216	

ⓘ If the SWK was already ordered with piston stroke control (...-SG / ...-SM / ...-SQ), then the mounting kit does not need to be ordered additionally.
A preadjusted sensor with holder is in the scope of delivery of the mounting kit. Two mounting kits are needed per SWK.

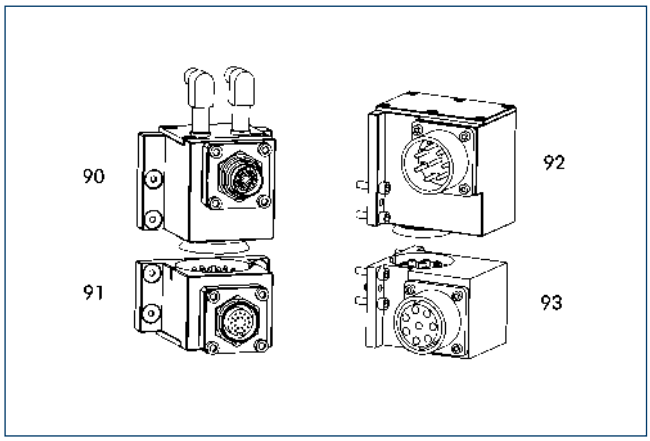
Sensors



(53) Monitoring position unlocked
(54) Monitoring position locked
(90) Ready to lock sensor

Description	ID	
Ready to lock		
INK 8-SL	0302456	

Optional electrical modules



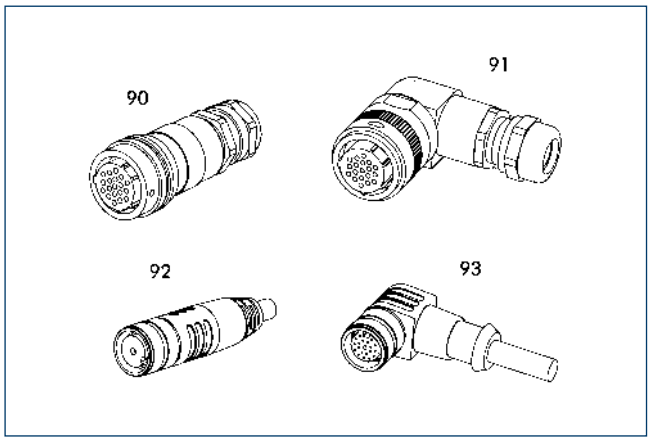
(90) E-module with metric threads, robot-side
(91) E-module with mil-spec. threads, tool-side
(92) E-module with mil-spec. threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-RF19-K	9948654	19	125 V AC/3 A
Tool-side			
SWO-RF10-A	9961313	10	125 V AC/3 A
SWO-RF14-A	9961312	14	125 V AC/3 A
SWO-RF19-A	9948657	19	125 V AC/3 A

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter "SWO-E Electrical Option" or contact us at any time.

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

(92) Connection plug / socket straight with extension cable

(93) Connection plug / socket at an angle with extension cable

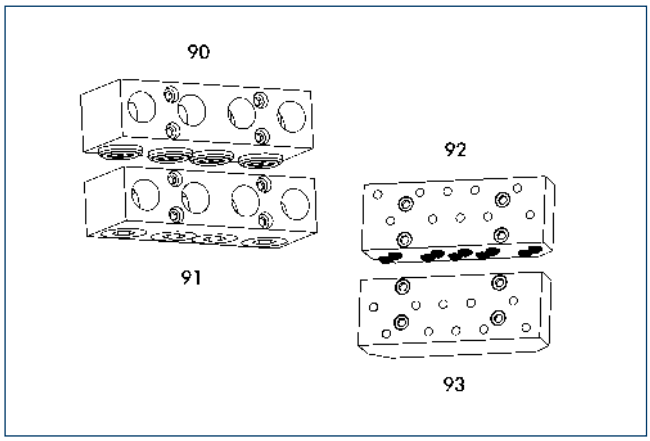
Other cable lengths on request.

Cable connector for SWO-RF19 / GF19 / SF19 / KF19 / RF14 / GF14 / KF14 / RF10 / KF10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector with cable			
KV-5-SWK-19F-0	0302170	0°	5 m
KV-10-SWK-19F-0	0302171	0°	10 m
KV-5-SWK-19F-90	0302172	90°	5 m
KV-10-SWK-19F-90	0302173	90°	10 m
Tool-side			
Cable connector with cable			
KV-3-SWA-19F-0	0302174	0°	3 m
KV-3-SWA-19F-90	0302175	90°	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

Optional pneumatic / fluidic modules



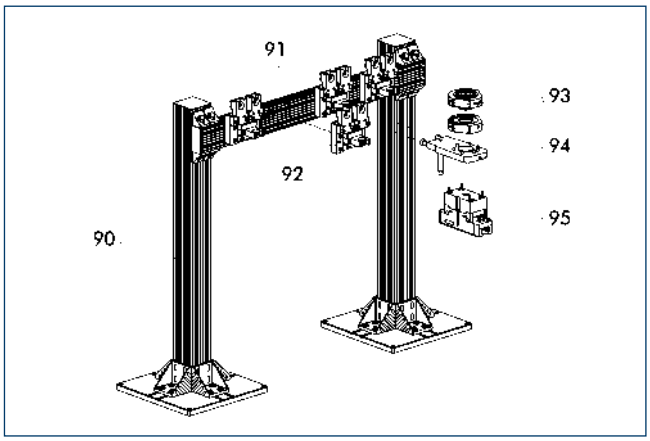
(90) Self-sealing fluid module, robot-side
(91) Self-sealing fluid module, tool-side
(92) Pneumatic module, robot-side
(93) Pneumatic module, tool-side

Modules for transmission of air and fluids from the robot, through the tool changer to the tools.

Description	ID	No. of fluid feed-throughs	Connection
Robot-side			
SWO-FG2-K	9936817	2	G3/8"
SWO-FG4-K	9937333	4	G3/8"
SWO-P05-K	9936895	10	M5
SWO-P14-K	9935830	2	G1/4"
SWO-P186-K	9939024	6	G1/8"
Tool-side			
SWO-FG2-A	9936818	2	G3/8"
SWO-FG4-A	9937334	4	G3/8"
SWO-P05-A	9936896	10	M5
SWO-P14-A	9935825	2	G1/4"
SWO-P186-A	9939025	6	G1/8"

ⓘ For other pneumatic and fluid modules, see chapter "Options" or visit www.schunk.com

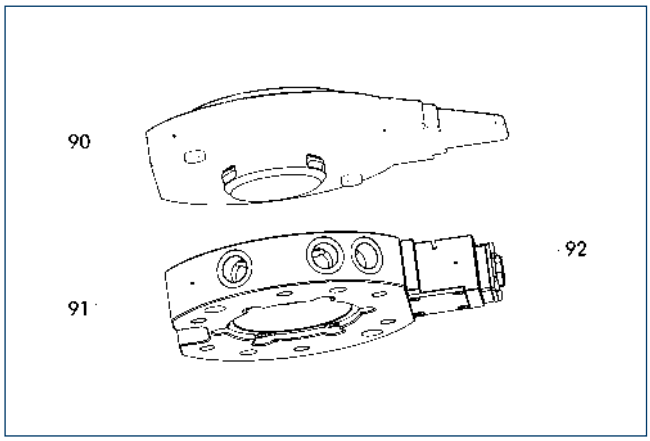
SWM-M modular storage rack



(90) Baseplate with upright profile
(91) Horizontal profile
(92) Storage module
(93) SWS quick-change system
(94) Intermediate plate
(95) Parallel gripper

The modular storage rack is designed for the specific size quick change module. The modular design of the storage rack allows for a standard solution customized to your application. Depending on the number of tools, the storage positions and the size of the tools a customized storage rack can be created for your application. For more information please see chapter "SWM Storage Rack".

SWD-076 dust cover



(90) SWD protection cover
(92) Optional electrical module
(91) SWA quick-change adapter

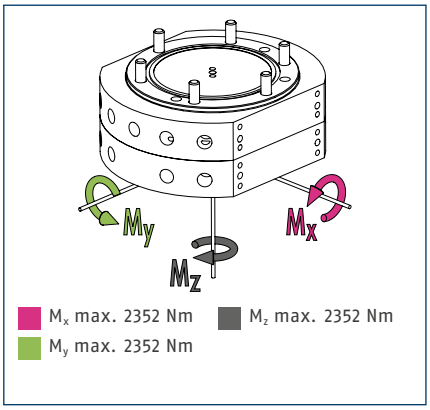
The protection cover protects the quick-change adapter in the storage rack against dust and chips. The cover has an integrated clip mechanism which is actuated by locking / unlocking the changing master, allowing the robot to remove the cover from one adapter and place it on another adapter.

Description	ID	
Dust cover		
SWD-076-000-R00	0302258	

SWS 110

Robot Accessories | Changing | Quick-change System

Forces and moments

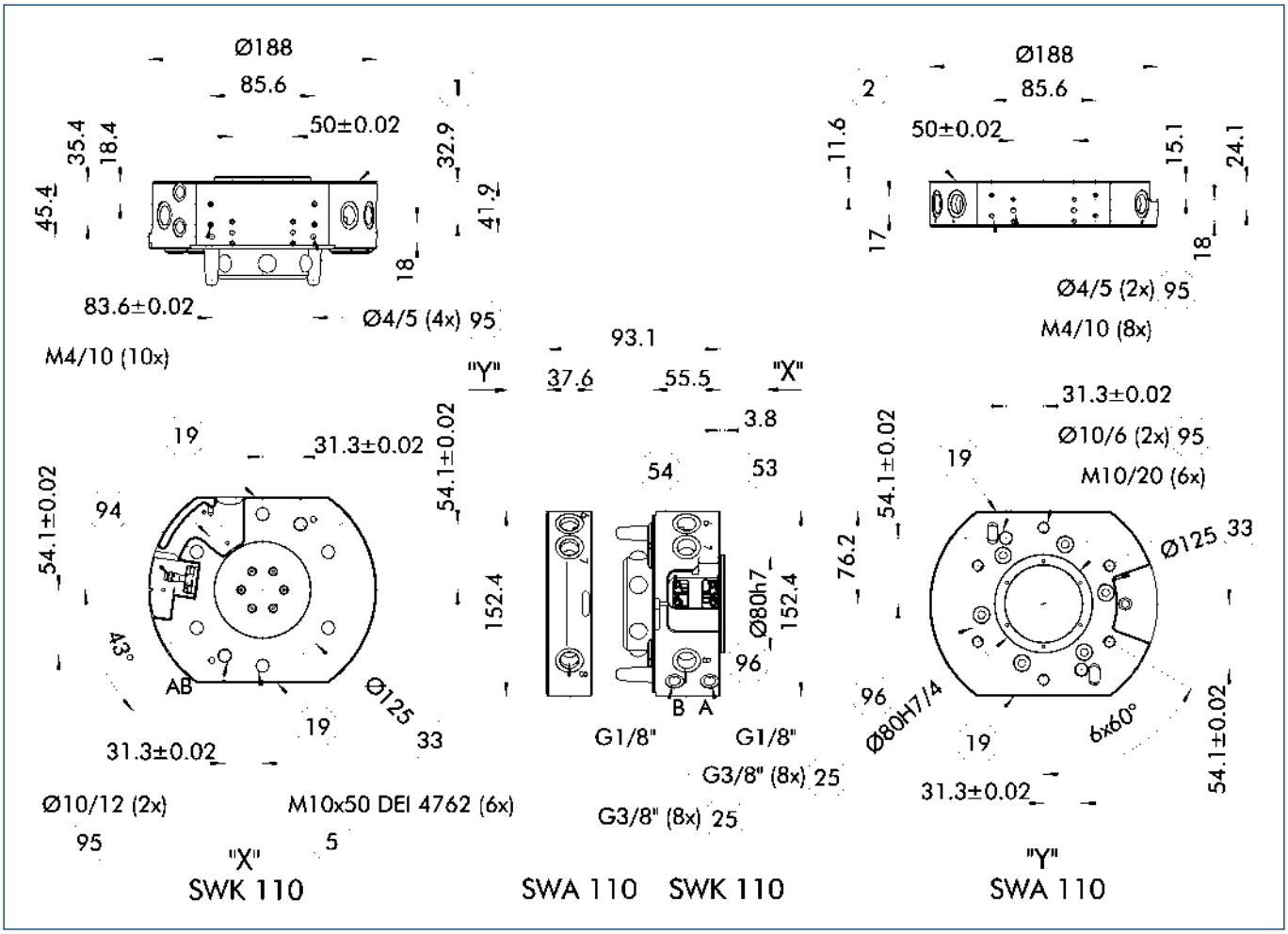


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-110-000-000-SM	SWA-110-000-000
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	150	150
Piston stroke monitoring		integrated	
Locking force	[N]	12000	
Repeat accuracy	[mm]	0.015	0.015
Mass	[kg]	4	2.2
max. locking distance	[mm]	3	3
Air connection thread Pneumatic feed-through		8x G3/8“	8x G3/8“
Main connection lock / unlock		G1/8“	
max. permissible XY offset	[mm]	±2	±2
max. permissible angular offset	[°]	±1	±1
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9
Robot side connection		ISO 9409-1-125-6-M10	ISO 9409-1-125-6-M10

Main view



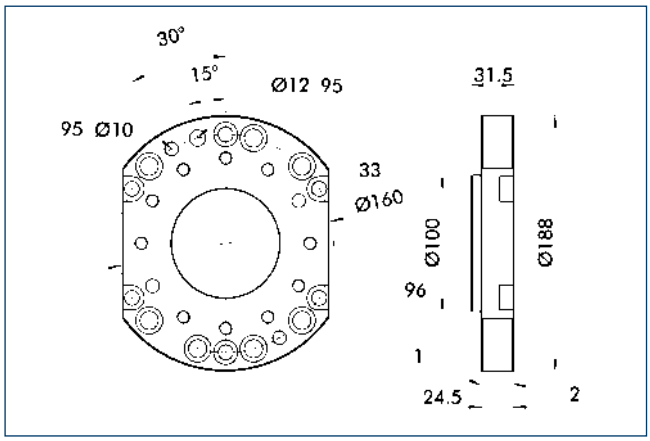
The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(53) Monitoring position unlocked
(54) Monitoring position locked
(94) Optional proximity switch
(95) Fit for a centering pin
(96) Fitting for centering

Adapter plate ISO-A160-M10/M12-R



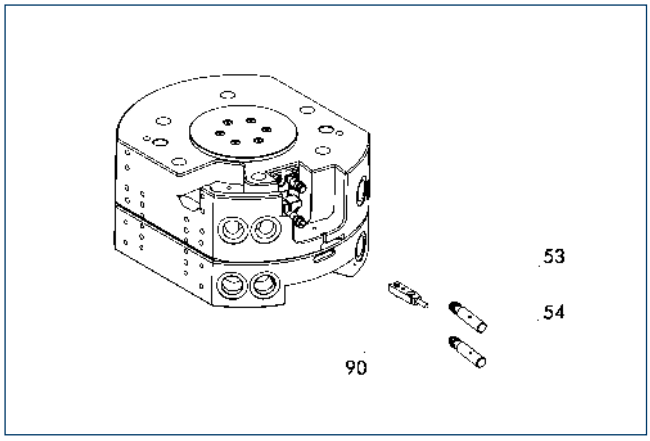
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-110/160/210-ISO-A160-M10/M12	0302225	

ⓘ Adapter plate for robots with M10 or M12 mounting patterns

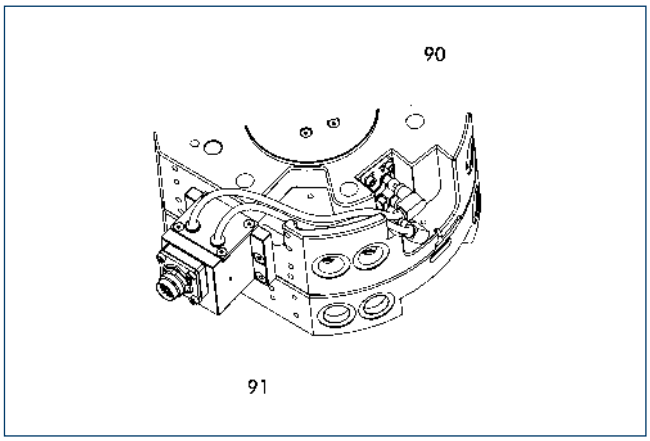
Sensors



(53) Monitoring position unlocked
(54) Monitoring position locked
(90) Ready to lock sensor

Description	ID	
Locking monitoring		
IN 81-S-M8	0302454	
Ready to lock		
INK 8-SL	0302456	

Installation of optional E-module



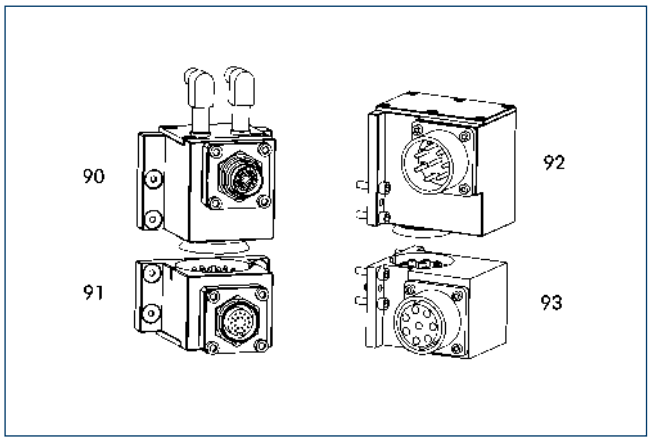
(90) AS-SWK 110
(91) Optional electrical module with integrated sensor connection

The drawing shows the quick-change system with integrated piston stroke monitoring and built in proximity switch; this is connected directly to the E-modules.

Description	ID	
Robot-side		
AS-SWK-110/160 mounting kit with sensor	9957835	

ⓘ If the SWK was already ordered with piston stroke control (...-SG / ...-SM / ...-SQ), then the mounting kit does not need to be ordered additionally.
A preadjusted sensor with holder is in the scope of delivery of the mounting kit. Two mounting kits are needed per SWK.

Optional electrical modules



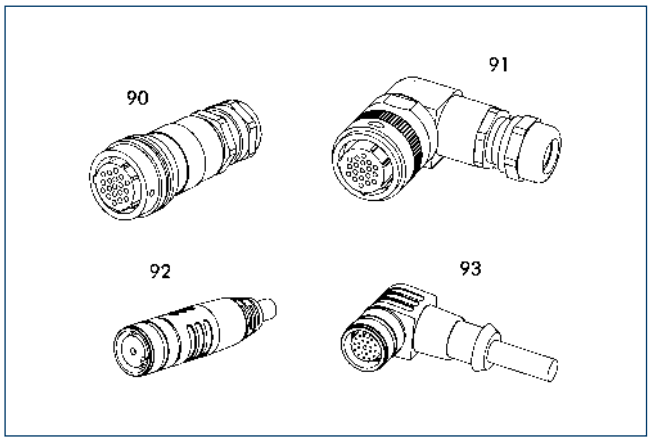
(90) E-module with metric threads, robot-side
(91) E-module with mil-spec. threads, tool-side
(92) E-module with mil-spec. threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-RF19-K	9948654	19	125 V AC/3 A
Tool-side			
SWO-RF10-A	9961313	10	125 V AC/3 A
SWO-RF14-A	9961312	14	125 V AC/3 A
SWO-RF19-A	9948657	19	125 V AC/3 A

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter "SWO-E Electrical Option" or contact us at any time.

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

(92) Connection plug / socket straight with extension cable

(93) Connection plug / socket at an angle with extension cable

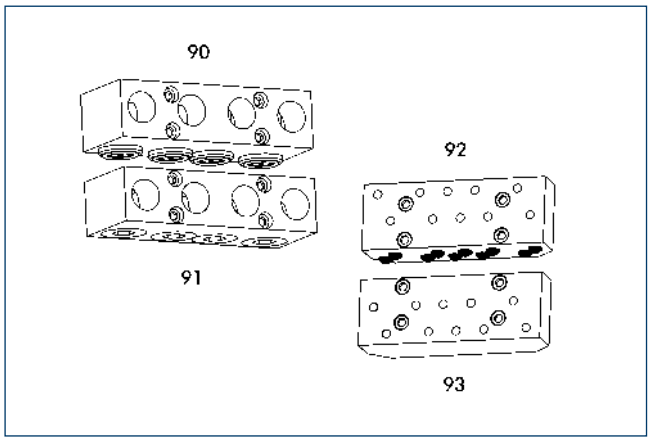
Other cable lengths on request.

Cable connector for SWO-RF19 / GF19 / SF19 / KF19 / RF14 / GF14 / KF14 / RF10 / KF10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector with cable			
KV-5-SWK-19F-0	0302170	0°	5 m
KV-10-SWK-19F-0	0302171	0°	10 m
KV-5-SWK-19F-90	0302172	90°	5 m
KV-10-SWK-19F-90	0302173	90°	10 m
Tool-side			
Cable connector with cable			
KV-3-SWA-19F-0	0302174	0°	3 m
KV-3-SWA-19F-90	0302175	90°	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

Optional pneumatic / fluidic modules



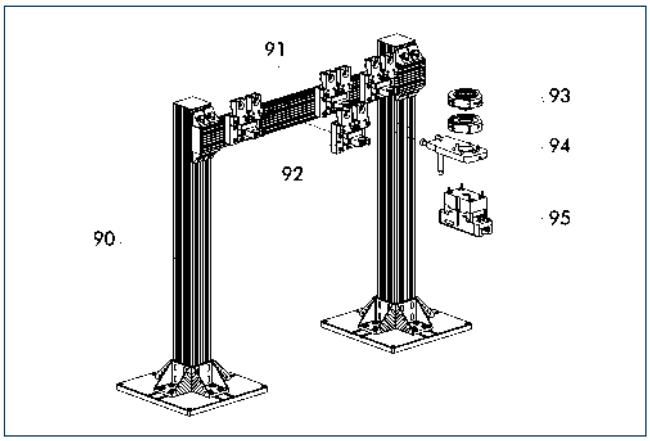
(90) Self-sealing fluid module, robot-side
(91) Self-sealing fluid module, tool-side
(92) Pneumatic module, robot-side
(93) Pneumatic module, tool-side

Modules for transmission of air and fluids from the robot, through the tool changer to the tools.

Description	ID	No. of fluid feed-throughs	Connection
Robot-side			
SWO-FG2-K	9936817	2	G3/8"
SWO-FG4-K	9937333	4	G3/8"
SWO-P05-K	9936895	10	M5
SWO-P14-K	9935830	2	G1/4"
SWO-P186-K	9939024	6	G1/8"
Tool-side			
SWO-FG2-A	9936818	2	G3/8"
SWO-FG4-A	9937334	4	G3/8"
SWO-P05-A	9936896	10	M5
SWO-P14-A	9935825	2	G1/4"
SWO-P186-A	9939025	6	G1/8"

ⓘ For other pneumatic and fluid modules, see chapter "Options" or visit www.schunk.com

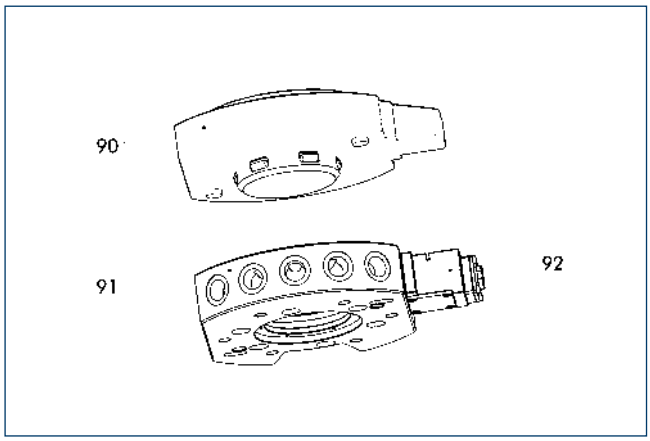
SWM-M modular storage rack



(90) Baseplate with upright profile
(91) Horizontal profile
(92) Storage module
(93) SWS quick-change system
(94) Intermediate plate
(95) Parallel gripper

The modular storage rack is designed for the specific size quick change module. The modular design of the storage rack allows for a standard solution customized to your application. Depending on the number of tools, the storage positions and the size of the tools a customized storage rack can be created for your application. For more information please see chapter "SWM Storage Rack".

SWD-110 dust cover



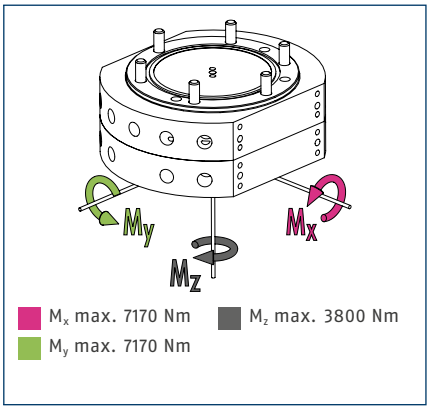
(90) SWD protection cover
(91) SWA quick-change adapter
(92) Optional electrical module

The protection cover protects the quick-change adapter in the storage rack against dust and chips. The cover has an integrated clip mechanism which is actuated by locking / unlocking the changing master, allowing the robot to remove the cover from one adapter and place it on another adapter.

Description	ID	
Dust cover		
SWD-110-R00-000	0302260	

SWS 160

Forces and moments

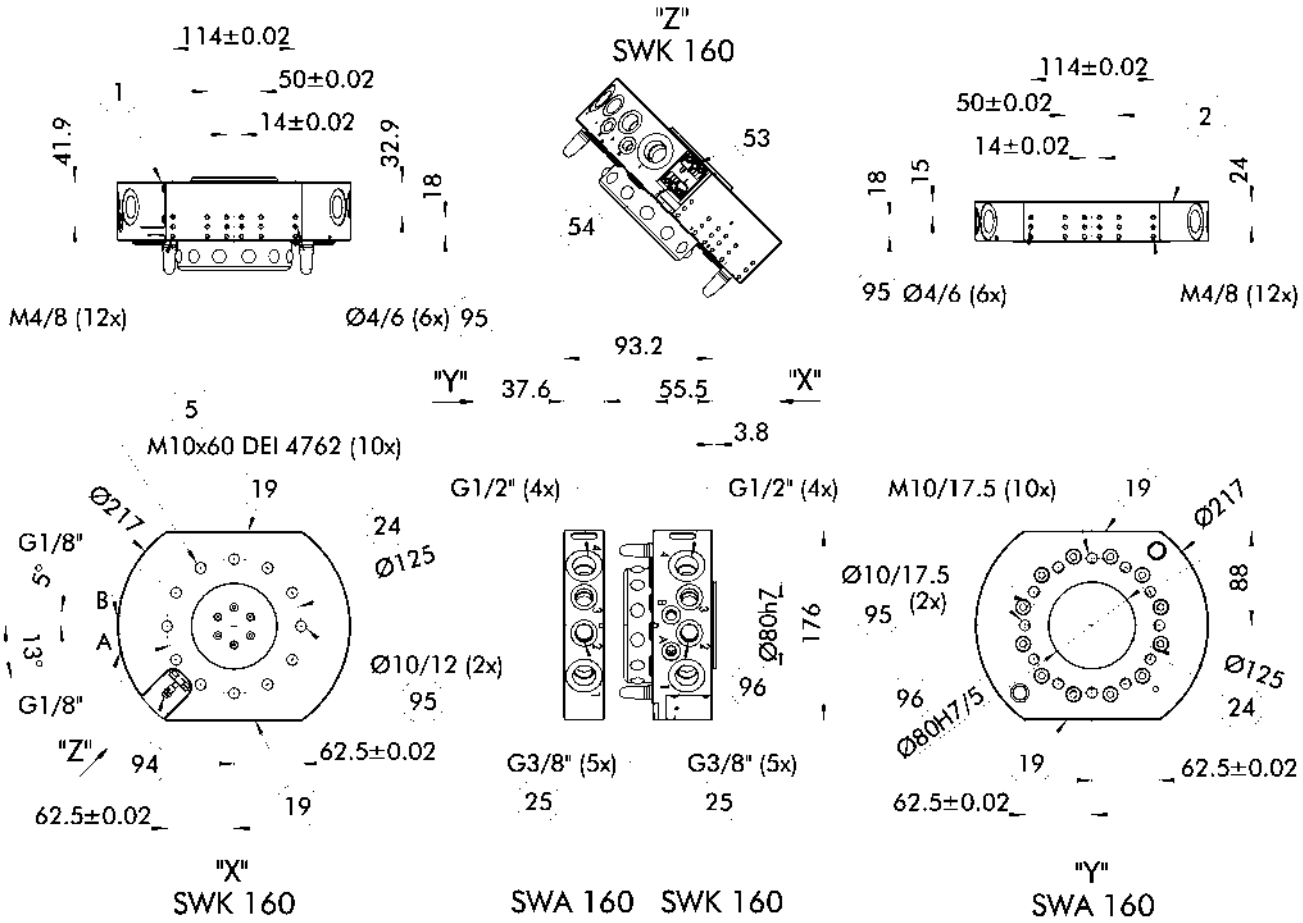


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-160-000-000-SM	SWA-160-000-000
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	300	300
Piston stroke monitoring		integrated	
Locking force	[N]	31000	
Repeat accuracy	[mm]	0.015	0.015
Mass	[kg]	6.44	2.86
max. locking distance	[mm]	2	2
Air connection thread Pneumatic feed-through		5x G3/8“	5x G3/8“
Main connection lock / unlock		G1/8“	
max. permissible XY offset	[mm]	±2	±2
max. permissible angular offset	[°]	±1	±1
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9
Robot side connection		ISO 9409-1-125-6-M10	ISO 9409-1-125-6-M10

Main view



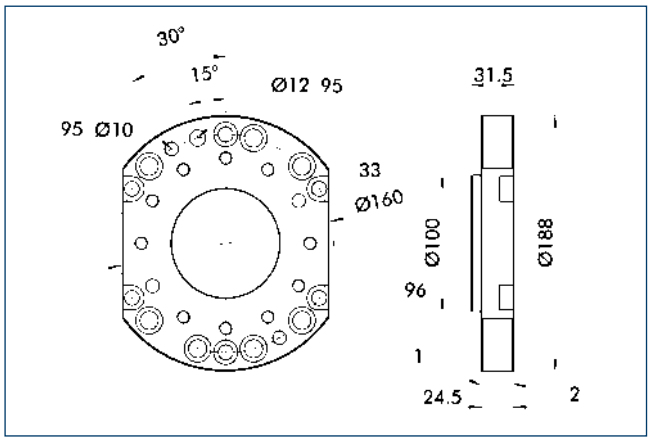
The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(24) Bolt circle
(25) Pneumatic feed-through
(53) Monitoring position unlocked
(54) Monitoring position locked
(94) Optional proximity switch
(95) Fit for a centering pin
(96) Fitting for centering

Adapter plate ISO-A160-M10/M12-R



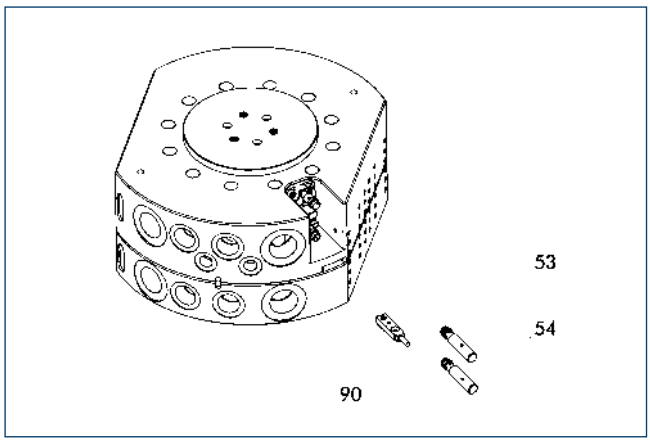
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-160-ISO-A160-M10/M12	0302248	

ⓘ Adapter plate for robots with M10 or M12 mounting patterns

Sensors

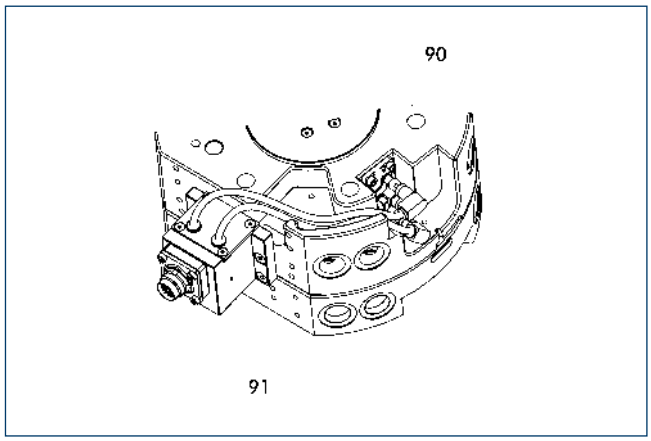


(53) Monitoring position unlocked
(54) Monitoring position locked
(90) Ready to lock sensor

The drawing shows the quick-change system with integrated piston stroke monitoring and built in proximity switch; this is connected directly to the E-modules.

Description	ID	
Locking monitoring		
IN 81-S-M8	0302454	
Ready to lock		
INK 8-SL	0302456	

Installation of optional E-module



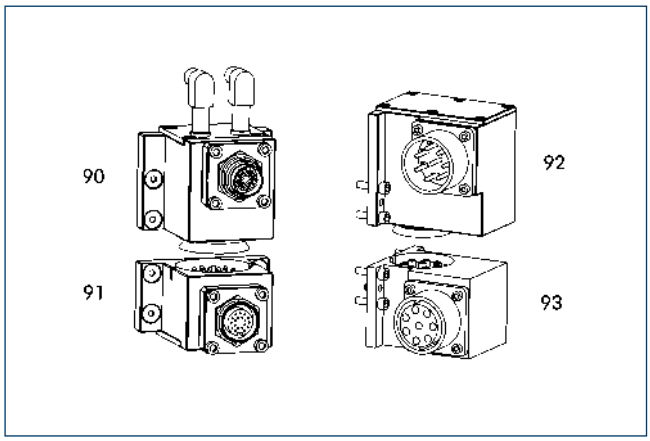
(90) AS-SWK 110
(91) Optional electrical module with integrated sensor connection

The drawing shows the quick-change system with integrated piston stroke monitoring and built in proximity switch; this is connected directly to the E-modules.

Description	ID	
Robot-side		
AS-SWK-110/160 mounting kit with sensor	9957835	

ⓘ If the SWK was already ordered with piston stroke control (...-SG / ...-SM / ...-SQ), then the mounting kit does not need to be ordered additionally.
A preadjusted sensor with holder is in the scope of delivery of the mounting kit. Two mounting kits are needed per SWK.

Optional electrical modules



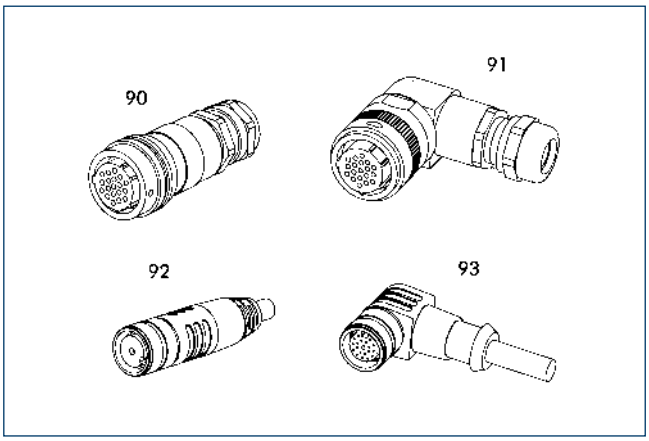
(90) E-module with metric threads, robot-side
(91) E-module with mil-spec. threads, tool-side
(92) E-module with mil-spec. threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-RF19-K	9948654	19	125 V AC/3 A
Tool-side			
SWO-RF10-A	9961313	10	125 V AC/3 A
SWO-RF14-A	9961312	14	125 V AC/3 A
SWO-RF19-A	9948657	19	125 V AC/3 A

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter “SWO-E Electrical Option” or contact us at any time.

Cable connector / cable extension



(90) Connection plug / socket straight
(91) Connection plug / socket at an angle
(92) Connection plug / socket straight with extension cable
(93) Connection plug / socket at an angle with extension cable

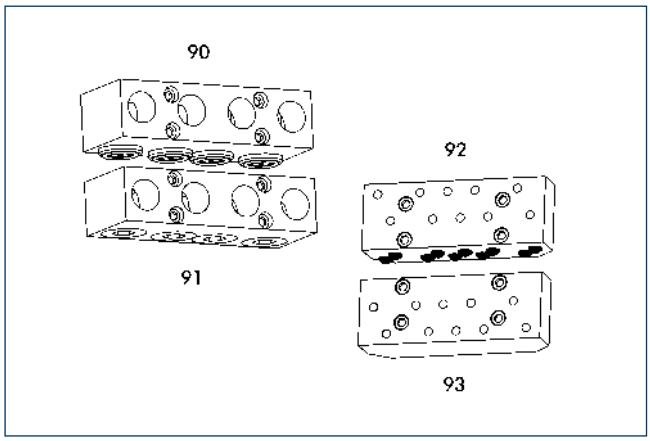
Other cable lengths on request.

Cable connector for SWO-RF19 / GF19 / SF19 / KF19 / RF14 / GF14 / KF14 / RF10 / KF10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector with cable			
KV-5-SWK-19F-0	0302170	0°	5 m
KV-10-SWK-19F-0	0302171	0°	10 m
KV-5-SWK-19F-90	0302172	90°	5 m
KV-10-SWK-19F-90	0302173	90°	10 m
Tool-side			
Cable connector with cable			
KV-3-SWA-19F-0	0302174	0°	3 m
KV-3-SWA-19F-90	0302175	90°	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

Optional pneumatic / fluidic modules



(90) Self-sealing fluid module, robot-side
(91) Self-sealing fluid module, tool-side
(92) Pneumatic module, robot-side
(93) Pneumatic module, tool-side

Modules for transmission of air and fluids from the robot, through the tool changer to the tools.

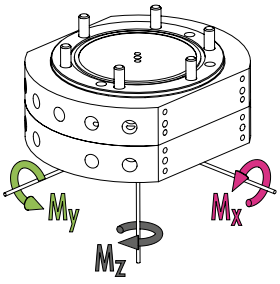
Description	ID	No. of fluid feed-throughs	Connection
Robot-side			
SWO-FG2-K	9936817	2	G3/8“
SWO-FG4-K	9937333	4	G3/8“
SWO-P05-K	9936895	10	M5
SWO-P14-K	9935830	2	G1/4“
SWO-P186-K	9939024	6	G1/8“
Tool-side			
SWO-FG2-A	9936818	2	G3/8“
SWO-FG4-A	9937334	4	G3/8“
SWO-P05-A	9936896	10	M5
SWO-P14-A	9935825	2	G1/4“
SWO-P186-A	9939025	6	G1/8“

ⓘ For other pneumatic and fluid modules, see chapter “Options” or visit www.schunk.com

SWS 300

Robot Accessories | Changing | Quick-change System

Forces and moments



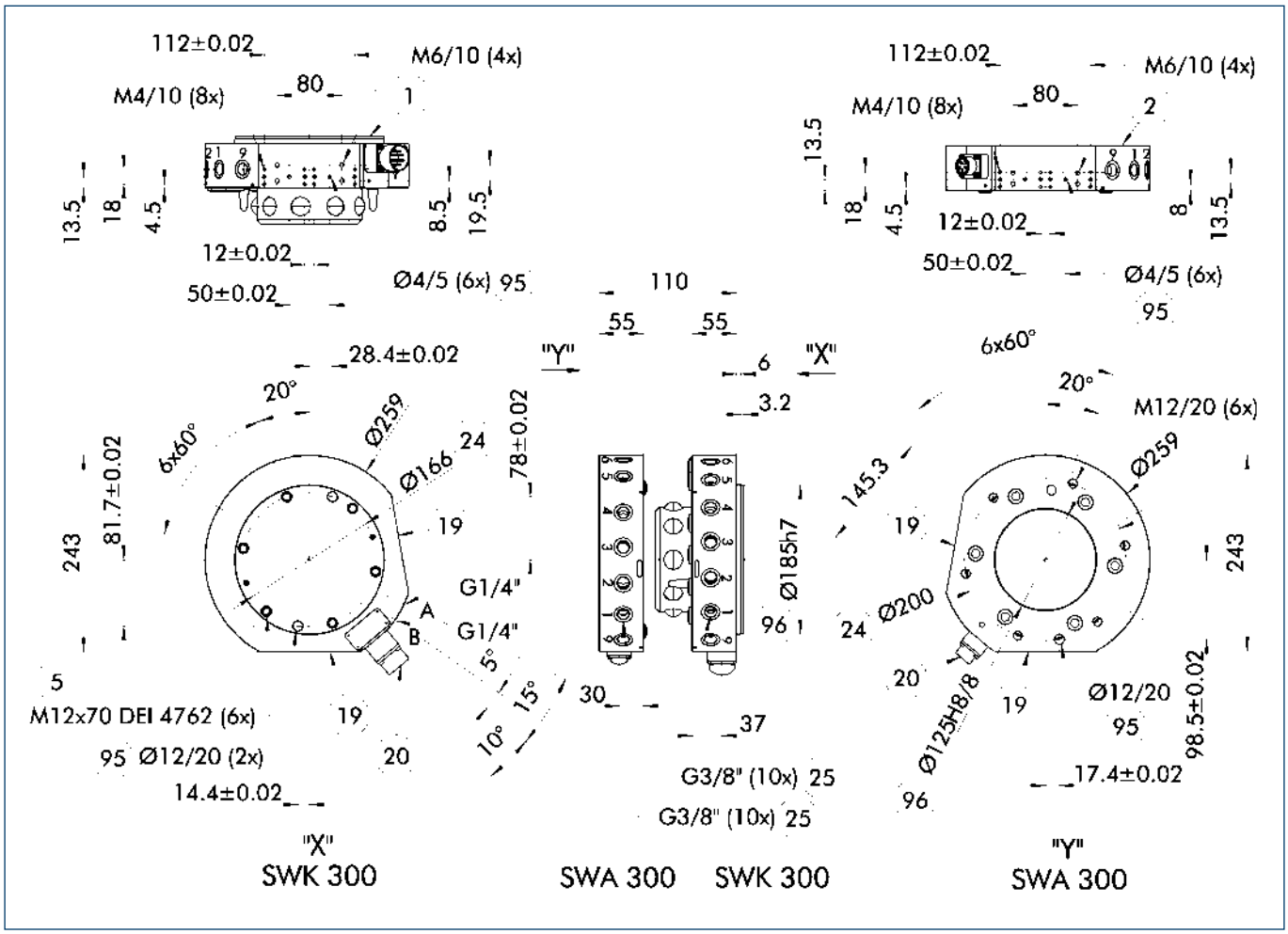
M_x max. 9870 Nm
M_z max. 8460 Nm
M_y max. 9870 Nm

ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-300-000-000	SWA-300-000-000
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	450	450
Piston stroke monitoring		optional	
Locking force	[N]	35000	
Repeat accuracy	[mm]	0.015	0.015
Mass	[kg]	11.8	7.3
max. locking distance	[mm]	2.5	2.5
Air connection thread Pneumatic feed-through		10x G3/8“	10x G3/8“
Main connection lock / unlock		G1/4“	
Number of electrical feed-throughs		5	5
max. permissible XY offset	[mm]	±3	±3
max. permissible angular offset	[°]	±1	±1
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	4.5/6.9	4.5/6.9

Main view



The drawing shows the basic design of the quick-change system with an integrated electric feed-through and does not take into consideration the dimensions of any options described below.

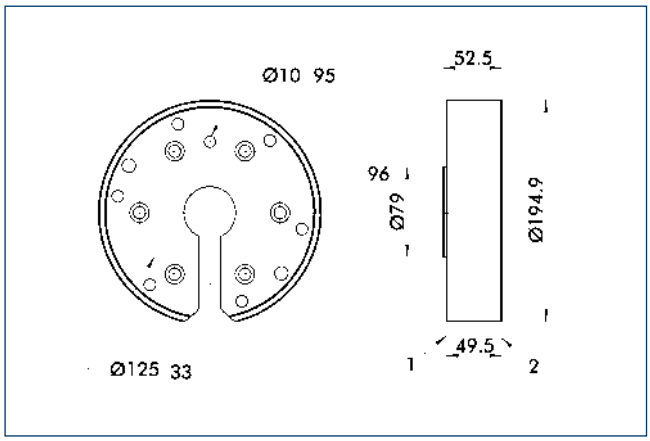
ⓘ The robot-side plate mounted on the SWK is a cover for the piston chamber. It is essential that it is supported by the adapter plate. See the further product information for a note on how to design this adapter plate.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(20) Connection for electric feed-through
(24) Bolt circle
(25) Pneumatic feed-through
(95) Fit for a centering pin
(96) Fitting for centering

Adapter plate ISO-A125-SIP-R



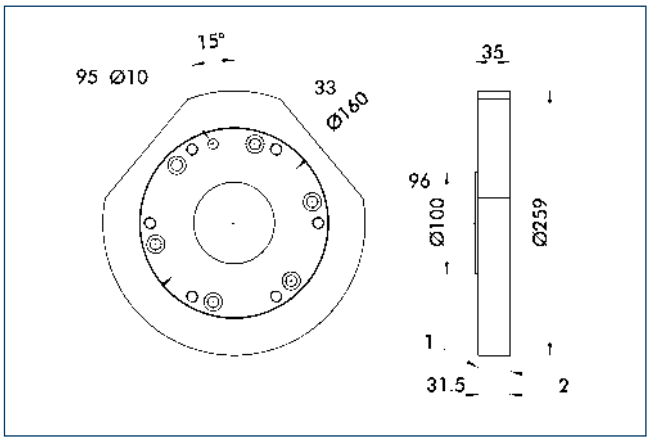
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-300-ISO-A125-SIP	0302244	

ⓘ Adapter plate for quick-change master with piston stroke control

Adapter plate ISO-A160-M10/M12-R



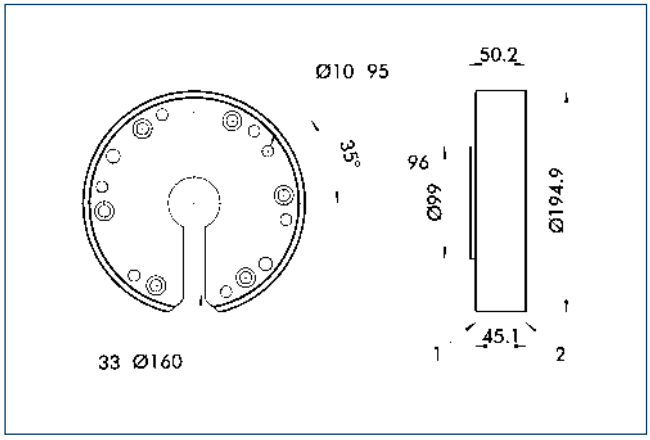
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-300-ISO-A160-M10/M12	0321558	

ⓘ Adapter plate for robots with M10 or M12 mounting patterns

Adapter plate ISO-A160-SIP-R



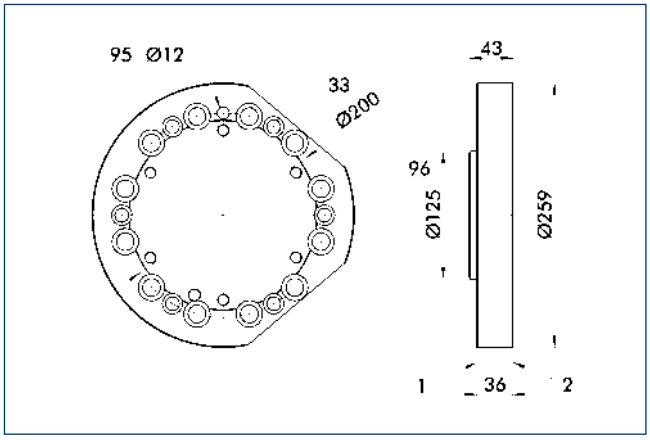
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-300-ISO-A160-SIP	0302245	

ⓘ Adapter plate for quick-change master with piston stroke control

Adapter plate ISO-A200-R



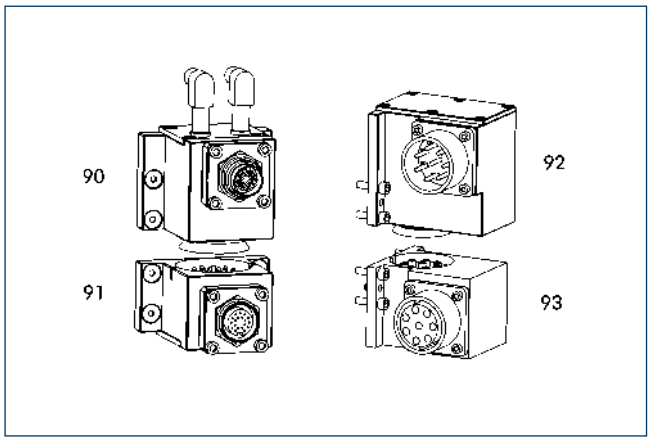
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Robot side adapter plate

Description	ID	
Robot-side		
A-SWK-300-ISO-A200	0321559	

ⓘ Adapter plate for quick-change master without piston stroke control

Optional electrical modules



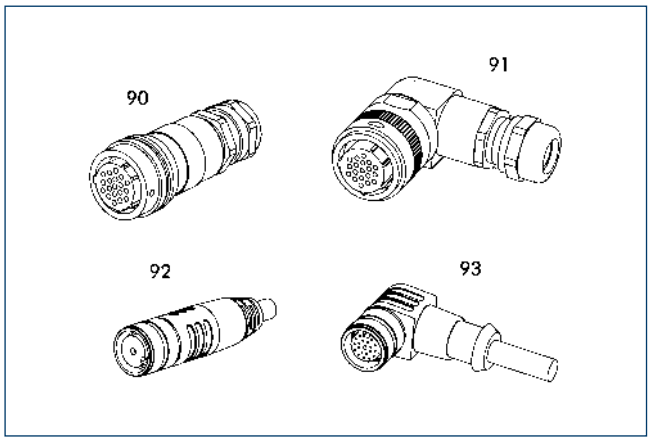
(90) E-module with metric threads, robot-side
(91) E-module with mil-spec. threads, tool-side
(92) E-module with mil-spec. threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-RF19-K	9948654	19	125 V AC/3 A
Tool-side			
SWO-RF10-A	9961313	10	125 V AC/3 A
SWO-RF14-A	9961312	14	125 V AC/3 A
SWO-RF19-A	9948657	19	125 V AC/3 A

ⓘ The modules listed above show only a small selection of the many electrical option possibilities. SCHUNK offers a wide range of electrical feed modules for every application. For further options and technical data, please see chapter "SWO-E Electrical Option" or contact us at any time.

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

(92) Connection plug / socket straight with extension cable

(93) Connection plug / socket at an angle with extension cable

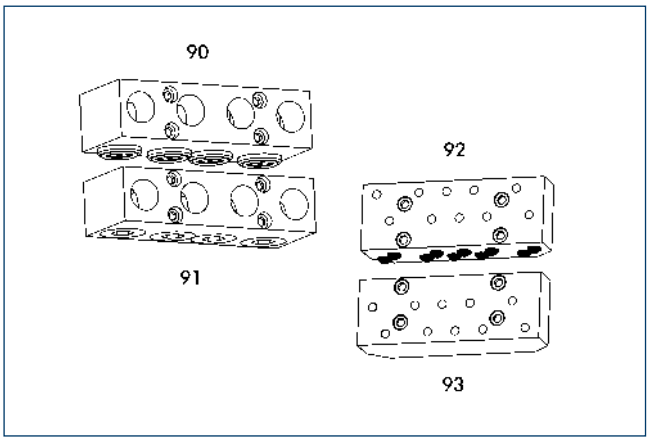
Other cable lengths on request.

Cable connector for SWO-RF19 / GF19 / SF19 / KF19 / RF14 / GF14 / KF14 / RF10 / KF10

Description	ID	Cable outlet	Length
Robot-side			
Cable connector with cable			
KV-5-SWK-19F-0	0302170	0°	5 m
KV-10-SWK-19F-0	0302171	0°	10 m
KV-5-SWK-19F-90	0302172	90°	5 m
KV-10-SWK-19F-90	0302173	90°	10 m
Tool-side			
Cable connector with cable			
KV-3-SWA-19F-0	0302174	0°	3 m
KV-3-SWA-19F-90	0302175	90°	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

Optional pneumatic / fluidic modules



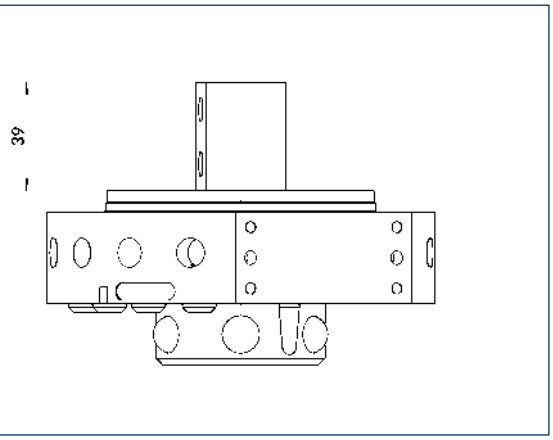
(90) Self-sealing fluid module, robot-side
(91) Self-sealing fluid module, tool-side
(92) Pneumatic module, robot-side
(93) Pneumatic module, tool-side

Modules for transmission of air and fluids from the robot, through the tool changer to the tools.

Description	ID	No. of fluid feed-throughs	Connection
Robot-side			
SWO-FG2-K	9936817	2	G3/8"
SWO-FG4-K	9937333	4	G3/8"
SWO-P05-K	9936895	10	M5
SWO-P14-K	9935830	2	G1/4"
SWO-P186-K	9939024	6	G1/8"
Tool-side			
SWO-FG2-A	9936818	2	G3/8"
SWO-FG4-A	9937334	4	G3/8"
SWO-P05-A	9936896	10	M5
SWO-P14-A	9935825	2	G1/4"
SWO-P186-A	9939025	6	G1/8"

ⓘ For other pneumatic and fluid modules, see chapter "Options" or visit www.schunk.com

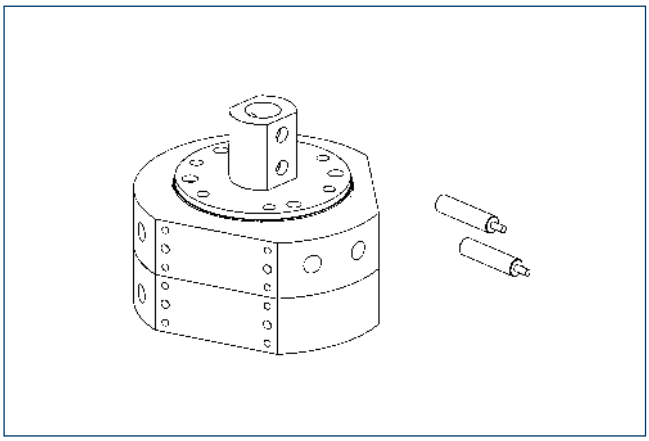
Piston stroke control



The drawing shows the minimum height of the adapter plate that is necessary when installing a piston stroke control.

Description	ID	
Piston stroke control		
SWK-300-SIP	0302475	

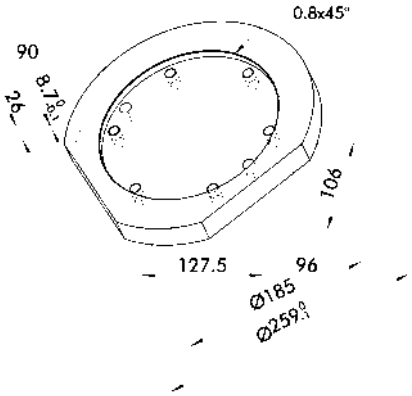
Piston stroke control



Description	ID	Often combined
Inductive proximity switches		
IN 80-S-M12	0301578	
IN 80-S-M8	0301478	
INK 80-S	0301550	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Adapter plate design



(90) Recommended adapter plate depth

(96) Fitting for centering

Recommended adapter design. An adapter is necessary in order to seal the piston chamber.

Electro and Signal Modules

Numerous electro modules are available for the transmission of electrical signals via the quick-change system. Some of the modules can also support I/Os of the quick-change system, e.g. for locking, unlocking, and for RTL (ready to lock) proximity sensors, as well as for the tool ID. All electro modules are equipped with military-style or M16 connectors as standard. Special versions are available on request. All of our standard electro and signal modules are compatible with our automatic SCHUNK SWS-L heavy load systems, by means of an adapter block. Please contact your SCHUNK representative if you need more information.

R19 Master and adapter with bayonet lock

S19 Master with bayonet lock

GF19 Master with bayonet lock

For SWS 005

Designation	Pins	E-data	Cable connector type
B15 master/adapter	15	3 A/50 VAC	D-Sub connector
E10-005 master/adapter	10	3 A/50 VAC	Solder contacts
E2A master/adapter	20	3 A/50 VAC	Solder contacts
E3A master/adapter	30	3 A/50 VAC	Solder contacts

For SWS 011

Designation	Pins	E-data	Cable connector type
A15 master/adapter	15	3 A/50 VAC	D-Sub connector
E10-010 master/adapter	10	3 A/50 VAC	Solder contacts
E20-010 master/adapter	20	3 A/50 VAC	Solder contacts

For SWS-020, 021 and 060

Designation	Pins	E-data	Cable connector type	Note
K12 master/adapter	12	3 A/50 VAC	Threaded connector M12	12 pins for use by customer
KM14 master/adapter	14	5 A/250 VAC	Amphenol PT series bayonet lock	14 pins for use by customer, 12 pins for 5A, 2 pins for 13A
D15 master/adapter	15	3 A/50 VAC	D-Sub connector	15 pins for use by customer
K19 master/adapter	19	3 A/50 VAC	Amphenol PT series bayonet lock	19 pins for use by customer
K14 adapter	14	3 A/50 VAC	Amphenol PT series bayonet lock	Tool coding for 16 tools, suitable for K19 (adapter side only)
KF19 master/adapter	19	3 A/50 VAC	Threaded connector M16	19 pins for use by customer
KG19 master/adapter	19	3 A/50 VAC	Amphenol PT series bayonet lock	Connector can be rotated in 5 positions
K26 master/adapter	26	3 A/50 VAC	Amphenol PT series bayonet lock	26 pins for use by customer

For SWS-040, 041, 071, 076, 110, 160 and 300 -Threaded connector M16

Designation	Pins	E-data	Cable connector type	Note
GF19 master/adapter	19	3 A/125 VAC	Threaded connector M16	Connector can be rotated in 5 positions
RF19 master/adapter	19	3 A/125 VAC	Threaded connector M16	19 pins are for use by the customer with radial cable outlet
RF14 adapter	14	3 A/125 VAC	Threaded connector M16	19 pins (14 pins for use by customer), tool coding for 0 – 9 tools, suitable for RF19 (adapter side only)
SF1 9 master/adapter	19	3 A/125 VAC	Threaded connector M16	19 pins are for use by the customer with axial cable outlet

For SWS-040, 041, 071, 076, 110, 160 and 300 – bayonet lock

Designation	Pins	E-data	Cable connector type	Note
J16 master/adapter	16	3 A/250 VAC	Amphenol PT series bayonet lock	16 pins for use by customer, right angled cable outlet
R19 master/adapter	19	5 A/250 VAC	Amphenol PT series bayonet lock	19 pins for use by customer, right angled cable outlet
R10 adapter	10	5 A/250 VAC	Amphenol PT series bayonet lock	19 pins (10 pins for use by customer), tool coding for 0 – 99 tools, suitable for R19 master (adapter side only)
R14 adapter	14	5 A/250 VAC	Amphenol PT series bayonet lock	19 pins (14 pins for use by customer), tool coding for 0 – 9 tools, suitable for R19 master (adapter side only)
S19 master/adapter	19	5 A/250 VAC	Amphenol PT series bayonet lock	19 pins for use by customer. Cable outlet opposite the contact pins
S14 adapter	14	5 A/250 VAC	Amphenol PT series bayonet lock	19 pins (14 pins for use by customer), tool coding for 0 – 9 tools, suitable for R19 master (adapter side only)
G19 master/adapter	19	5 A/250 VAC	Amphenol PT series bayonet lock	19 pins for use by customer, connector can be rotated in 5 positions
R26 master/adapter	26	3 A/250 VAC	Amphenol PT series bayonet lock	26 pins for use by customer, right angled cable outlet
R21 adapter	21	3 A/250 VAC	Amphenol PT series bayonet lock	26 pins (21 pins for use by customer), tool coding for 0 – 9 tools, suitable for R26 master (adapter side only)
R17 adapter	17	3 A/250 VAC	Amphenol PT series bayonet lock	26 pins (17 pins for use by customer), tool coding for 0 – 99 tools, suitable for R26 master (adapter side only)
S26 master/adapter	26	3 A/250 VAC	Amphenol PT series bayonet lock	26 pins for use by customer. Cable outlet opposite the contact pins
S21 adapter	21	3 A/250 VAC	Amphenol PT series bayonet lock	19 pins (14 pins for use by customer), tool coding for 9 tools, suitable for RF19 (adapter side only)
G26 master/adapter	26	3 A/250 VAC	Amphenol PT series bayonet lock	26 pins for use by customer, connector can be rotated in 5 positions
R32 master/adapter	32	3 A/250 VAC	Amphenol PT series bayonet lock	32 pins for use by customer, right angled cable outlet
R38 master/adapter	19 + 19	5 A/250 VAC	Amphenol PT series bayonet lock	(2) R19 modules mounted next to each other on an adapter plate
R52 master/adapter	26 + 26	3 A/250 VAC	Amphenol PT series bayonet lock	(2) R26 modules mounted next to each other on an adapter plate

For SWS-040, 041, 071, 076, 110, 160 and 300 -Threaded connection

Designation	Pins	E-data	Cable connector type	Note
T19 master/adapter	19	5 A/250 VAC	Amphenol MS with threaded connection	19 pins for use by customer, right angled cable outlet
T14 adapter	14	5 A/250 VAC	Amphenol MS with threaded connection	19 pins (14 pins for use by customer), tool coding for 0 – 9 tools, suitable for T19 master (adapter side only)
T10 adapter	10	5 A/250 VAC	Amphenol MS with threaded connection	19 pins (10 pins for use by customer), tool coding for 0 – 99 tools, suitable for T19 master (adapter side only)
T26 master/adapter	26	3 A/250 VAC	Amphenol MS with threaded connection	26 pins for use by customer, right angled cable outlet

For SWS-040, 041, 071, 076, 110, 160 and 300 -power module -Threaded connection

Designation	Pins	E-data	Cable connector type	Note
MT8 master/adapter	8	20 A/500 VAC/700 VDC	Amphenol MS with threaded connection	Power module connector outlet right
MT8L master/adapter	8	20 A/500 VAC/700 VDC	Amphenol MS with threaded connection	Power module connector outlet left
MT9 master/adapter	9	28 A/500 VAC/700 VDC	Amphenol MS with threaded connection	Suitable for SWS-110 or higher
MT14 master/adapter	14	13 A/500 VAC/700 VDC	Amphenol MS with threaded connection	MT14A-master (for SWK) MT14-adapter (for SWA) with radial cable outlet
MTR14 master/adapter	14	13 A/500 VAC/700 VDC	Amphenol MS with threaded connection	Power module connector outlet parallel to screw-on surface
MT15 master/adapter	15	10 x 4 A/400 VDC 4 x 6 A/400 VDC	Amphenol MS with threaded connection	Power module with radial cable outlet

Pneumatic, Fluid and Vacuum Modules

SCHUNK offers numerous modules for the reliable supply of your application with pneumatic, vacuum and / or fluid media.
Pneumatic modules feature additional feed-throughs on the quick-change system. Low-wear rubber seals in an anodized aluminum housing ensure the leak-proof supply of your application with compressed air or vacuum. The vacuum modules with a high flow rate are equipped with V-rings for the seal. These modules are not suitable for compressed air. Fluid / pneumatic modules with self-sealing feed-throughs are manufactured from corrosion resistant stainless steel. Self-sealing feed-throughs on the master and adapter side enable leak-proof separation of the master and adapter during tool changing. Fluid modules are not suitable for vacuum applications.

P05 Master / adapter

Pneumatic module**

Designation	Size	Ports	Cv value	Suitable for	Note
P18 master / adapter	G1/8"	4	0.65	40, 41, 60*, 71, 76, 110, 160, 300	For pneumatic and vacuum
P186A master / adapter	G1/8"	6	0.65	40, 41, 60*, 71, 76, 110, 160, 300	For pneumatic and vacuum, axial through-hole
P05 master / adapter	M5	10	0.25	40, 41, 60*, 71, 76, 110, 160, 300	For pneumatic and vacuum
P14 master / adapter	G1/4"	2	1.03	40, 41, 60*, 71, 76, 110, 160, 300	For pneumatic and vacuum
P238 master / adapter	G3/8"	2	2.45	40, 41, 60*, 71, 76, 110, 160, 300	For pneumatic and vacuum
P38 master / adapter	G3/8"	4	2.45	76, 110*, 160*, 300*	For pneumatic and vacuum
P38A master / adapter	G3/8"	4	2.45	41, 60*, 71, 76, 110, 160, 300	For pneumatic and vacuum, axial through-hole
P12A master / adapter	G1/2"	2	7.50	41, 60*, 71, 76, 110, 160, 300	For pneumatic and vacuum

Fluidic / pneumatic modules**

Designation	Size	Ports	Cv value	Suitable for	Note
FG2 master / adapter	G3/8"	2	1.4	40, 41, 71, 76, 110, 160, 300	Self-sealing on master and adapter side
FG2A-T	G3/8"	2	1.4	40, 41, 71, 76, 110, 160, 300	Not self-sealing, adapter side only, suitable for FG2 master
FG4 master / adapter	G3/8"	4	1.4	71, 76, 110, 160, 300	Self-sealing on master and adapter side
FG4A-T	G3/8"	4	1.4	71, 76, 110, 160, 300	Not self-sealing, adapter side only, suitable for FG4 master

Vacuum modules

Designation	Size	Ports	Cv value	Suitable for	Note
V34 master / adapter	G3/4“	1	8.0	40, 41, 60*, 71, 76, 110, 160, 300	Vacuum only
V112A master / adapter	G1 1/2"	1		40, 41, 60*, 71, 76, 110, 160, 300	Vacuum only, with axial outlets
V114 master / adapter	G1 1/4"	1		40, 41, 60*, 71, 76, 110, 160, 300	Vacuum only
V200E master / adapter	G2"	1		40, 41, 60*, 71, 76, 110, 160, 300	Vacuum only

* Requires adapter plate for mounting ** Also available with Viton seals

Special Application Modules

SCHUNK offers numerous modules that are suitable for different supply applications, such as ultrasonic welding, video and camera signals, etc. Contact your SCHUNK representative for assistance in selecting a suitable module for your application.

X7B Coax cable module with a 75 ohm contact.

Designation	Note
X7B master/adapter	Coax cable module with a 75 ohm contact. Suitable for SWS-040, 041, 071, 076, 110, 160, 300
X7C master/adapter	High-voltage module for ultrasonic welding 3 A/2000 VAC, 30kHz. Suitable for SWS-040, 041, 071, 076, 110, 160, 300
X7D master/adapter	Coax power module with BNC connector 5 A/500 VAC. Suitable for SWS-040, 041, 071, 076, 110, 160, 300
BP master/adapter	Profibus module, 10 pins, 5 A/24 VAC. Suitable for SWS-110
RX12 master/adapter	Camera modules for Sony XC series camera
JPC adapter	Cover plate on the adapter side for unused G, R, S and T modules on the master side
REP10 master/adapter	Servo power module with M23 connector
RES10 master/adapter	Servo signal module

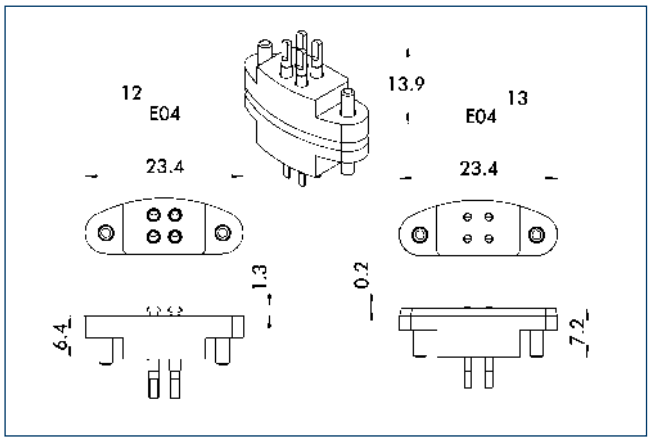
SWO-E E04

Technical data

Description		SWO-E04-K	SWO-E04-A
ID		9960359	9960360
Number of pin contacts		4	4
max. power supply	[A]	3	3
max. voltage	[V AC]	50	50

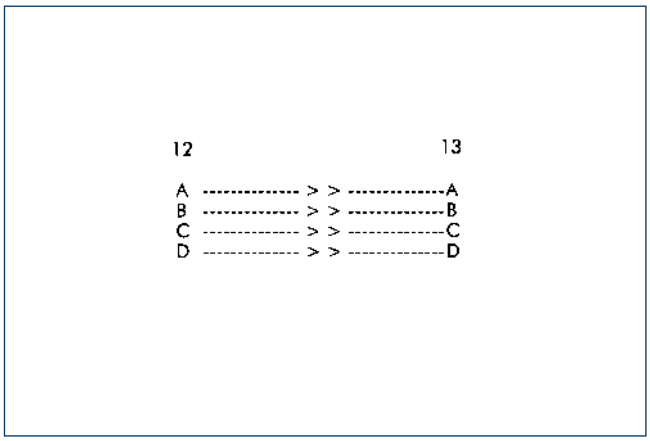
ⓘ Compatible with size: SWS-001

Combination SWO-E04-K and SWO-E04-A



(12) Head side (13) Adapter side

Pin allocation



(12) Head side (13) Adapter side

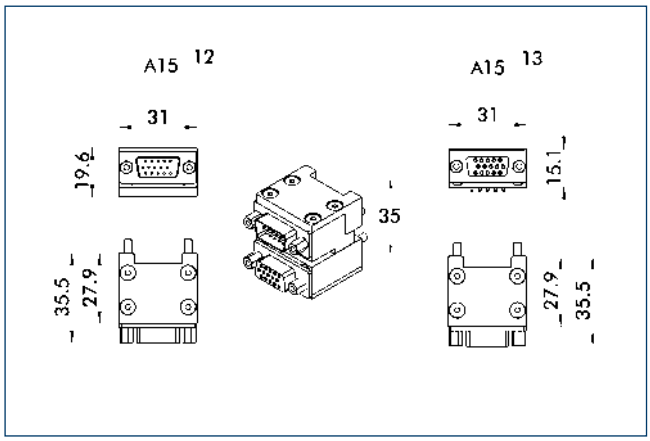
SWO-E A15

Technical data

Description		SWO-A15-K	SWO-A15-A
ID		9936357	9936356
Number of pin contacts		15	15
max. power supply	[A]	3	3
max. voltage	[V AC]	50	50
Connection		D-Sub	D-Sub

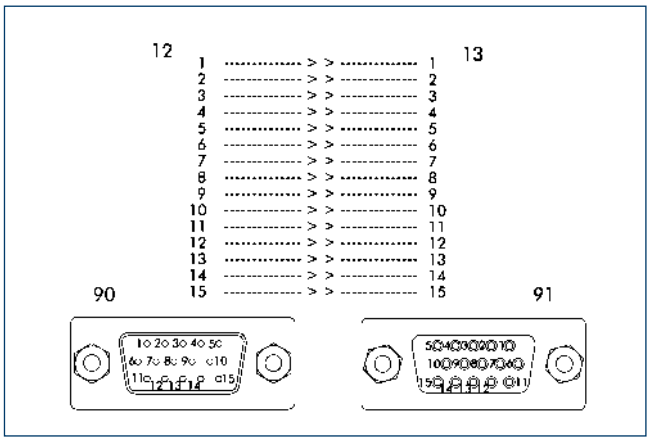
ⓘ Compatible with sizes: SWS-011, HWS-040, HWS-050

Combination SWO-A15-K and SWO-A15-A



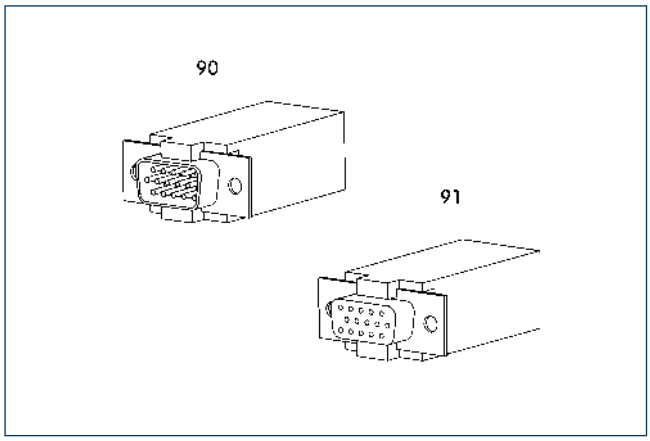
(12) Head side
(13) Adapter side

Pin allocation



(12) Head side
(13) Adapter side
(90) D-sub connecting plug
(91) D-sub connector

Cable connector



(90) D-sub connecting plug
(91) D-sub connector

Description	ID
Straight cable connector, robot-side	
KAS-A15-K-0	0301264
Straight cable connector, tool-side	
KAS-A15-A-0	0301265

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

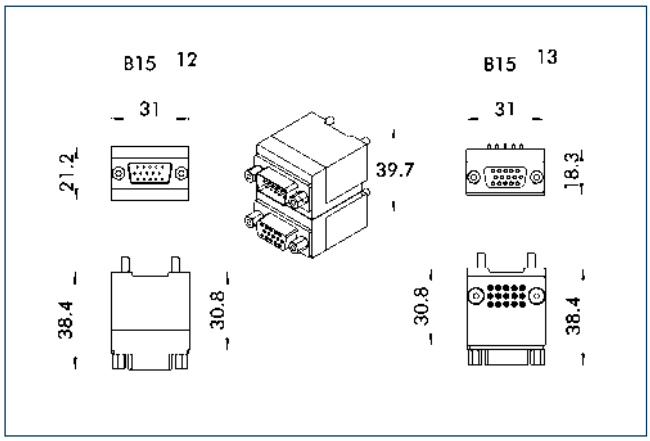
SWO-E B15

Technical data

Description		SWO-B15-K	SWO-B15-A
ID		9937326	9937327
Number of pin contacts		15	15
max. power supply	[A]	3	3
max. voltage	[V AC]	50	50

ⓘ Compatible with size: SWS-005

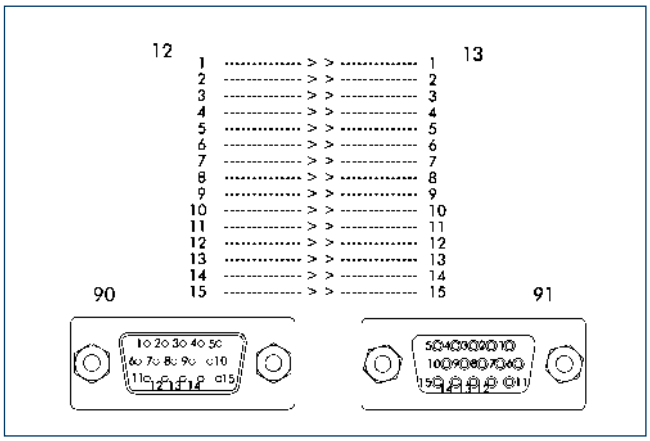
Combination SWO-B15-K and SWO-B15-A



(12) Head side

(13) Adapter side

Pin allocation



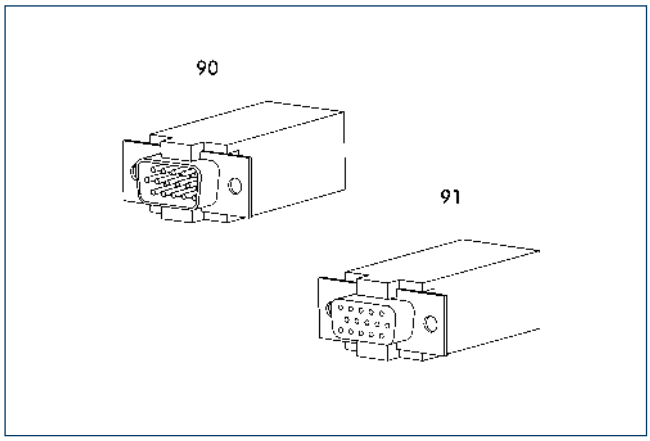
(12) Head side

(13) Adapter side

(90) D-sub connecting plug

(91) D-sub connector

Cable connector



(90) D-sub connecting plug

(91) D-sub connector

Description	ID
Straight cable connector, robot-side	
KAS-A15-K-0	0301264
Straight cable connector, tool-side	
KAS-A15-A-0	0301265

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

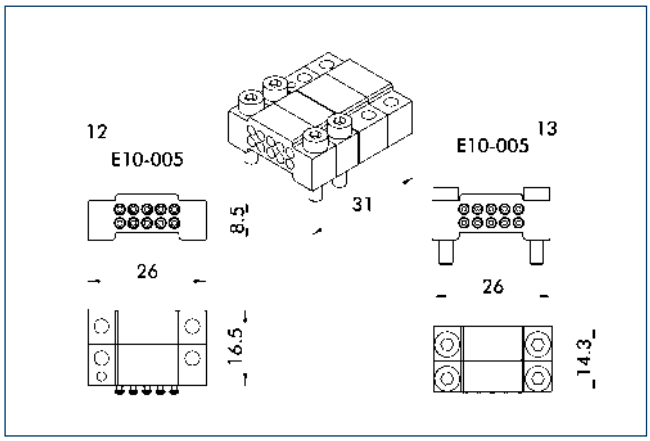
SWO-E E10-005

Technical data

Description		SWO-E10-005-K	SWO-E10-005-A
ID		9935799	9935800
Number of pin contacts		10	10
max. power supply	[A]	3	3
max. voltage	[V AC]	50	50

ⓘ Compatible with size: SWS-005

Combination SWO-E20-K and SWO-E20-A

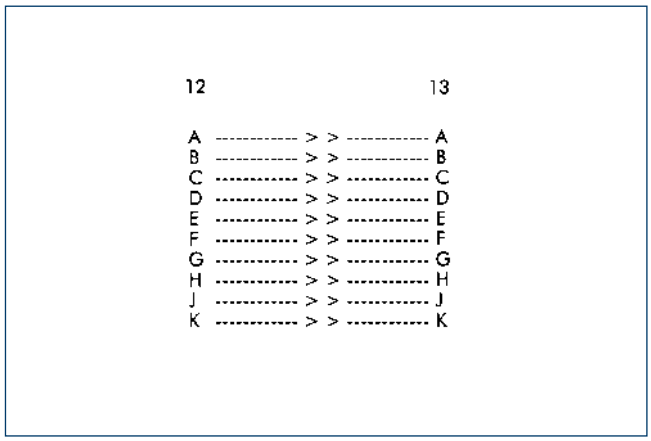


(12) Head side (13) Adapter side

This drawing shows the combination of the modules, including the covers for the solder contacts.

ⓘ The covers are included in the delivery.

Pin allocation



(12) Head side (13) Adapter side

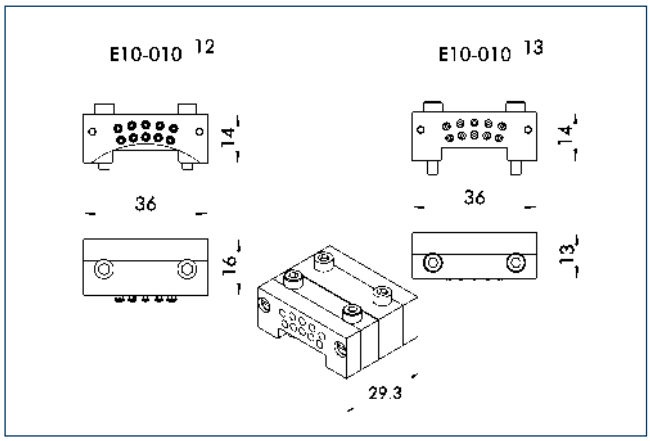
SWO-E E10-010

Technical data

Description		SWO-E10-010-K	SWO-E10-010-A
ID		9935801	9935802
Number of pin contacts		10	10
max. power supply	[A]	3	3
max. voltage	[V AC]	50	50

ⓘ Compatible with sizes: SWS-011, HWS-040, HWS-050

Combination SWO-E20-K and SWO-E20-A

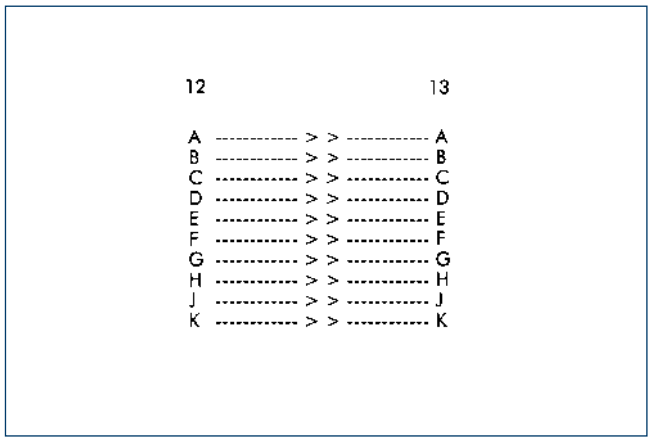


(12) Head side (13) Adapter side

This drawing shows the combination of the modules, including the covers for the solder contacts.

ⓘ The covers are included in the delivery.

Pin allocation



(12) Head side (13) Adapter side

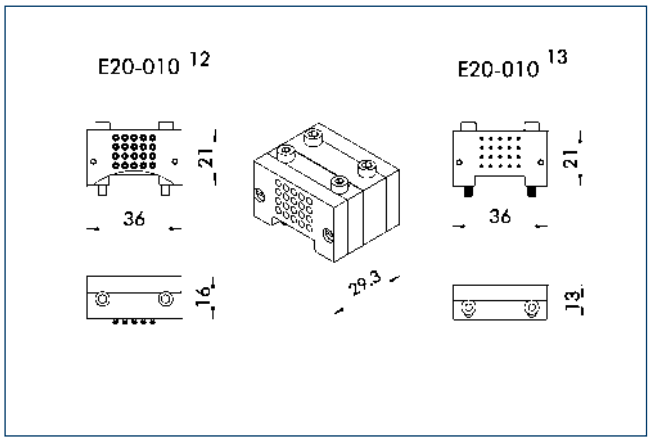
SWO-E E20

Technical data

Description		SWO-E20-K	SWO-E20-A
ID		9936525	9936526
Number of pin contacts		20	20
max. power supply	[A]	3	3
max. voltage	[V AC]	50	50

ⓘ Compatible with sizes: SWS-011, HWS-040, HWS-050

Combination SWO-E10-K and SWO-E10-A

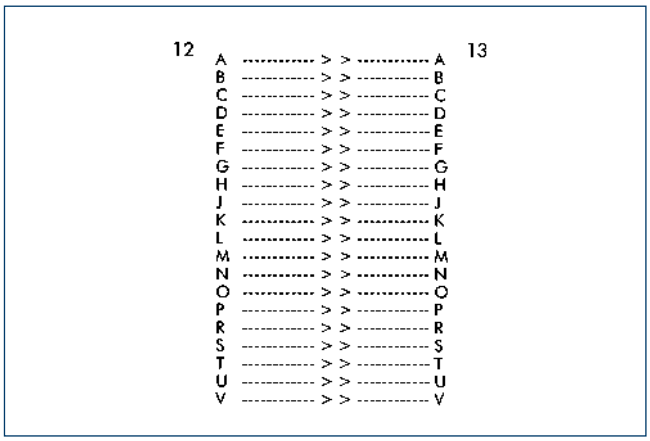


(12) Head side (13) Adapter side

This drawing shows the combination of the modules, including the covers for the solder contacts.

ⓘ The covers are included in the delivery.

Pin allocation



(12) Head side (13) Adapter side

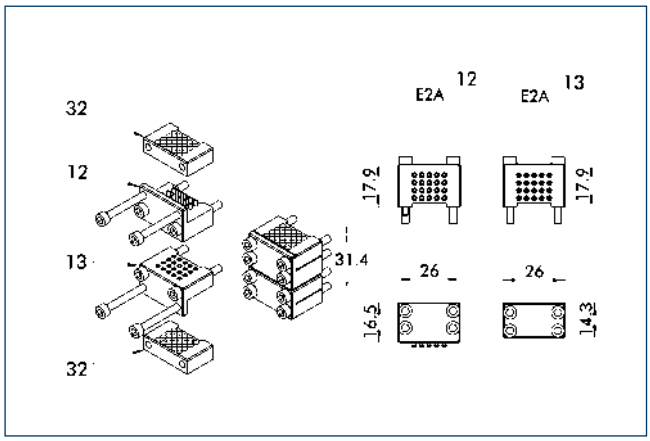
SWO-E E2A

Technical data

Description		SWO-E2A-K	SWO-E2A-A
ID		9941289	9941290
Number of pin contacts		20	20
max. power supply	[A]	3	3
max. voltage	[V AC]	50	50

ⓘ Compatible with size: SWS-005

Combination SWO-E2A-K and SWO-E2A-A

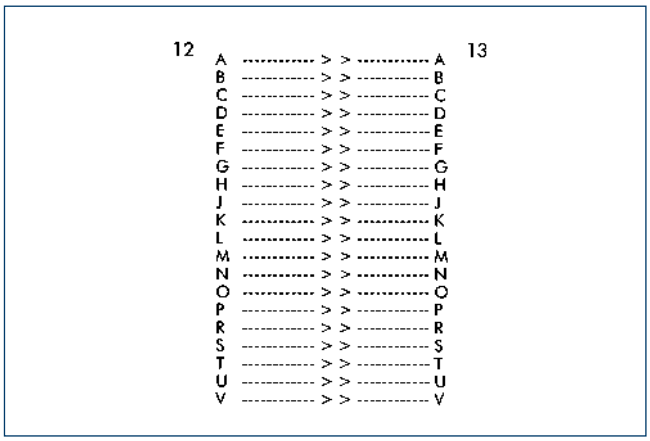


(12) Head side
(32) Cover
(13) Adapter side

This drawing shows the combination of the modules, including the covers for the solder contacts.

ⓘ The covers are included in the delivery.

Pin allocation



(12) Head side
(13) Adapter side

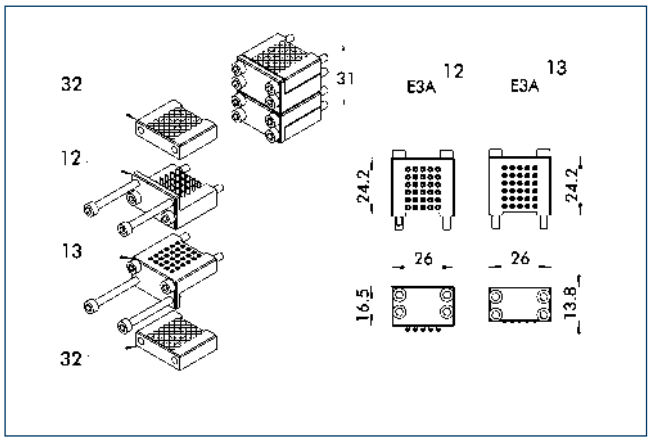
SWO-E E3A

Technical data

Description		SWO-E3A-K	SWO-E3A-A
ID		9941631	9941632
Number of pin contacts		30	30
max. power supply	[A]	3	3
max. voltage	[V AC]	50	50

ⓘ Compatible with size: SWS-005

Combination SWO-E3A-K and SWO-E3A-A

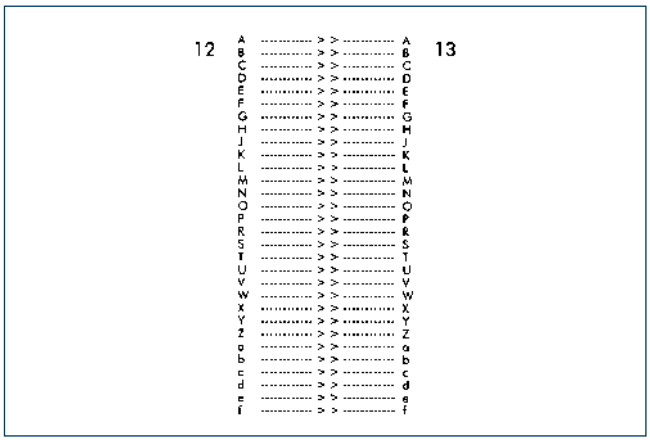


(12) Head side
(32) Cover
(13) Adapter side

This drawing shows the combination of the modules, including the covers for the solder contacts.

ⓘ The covers are included in the delivery.

Pin allocation



(12) Head side
(13) Adapter side

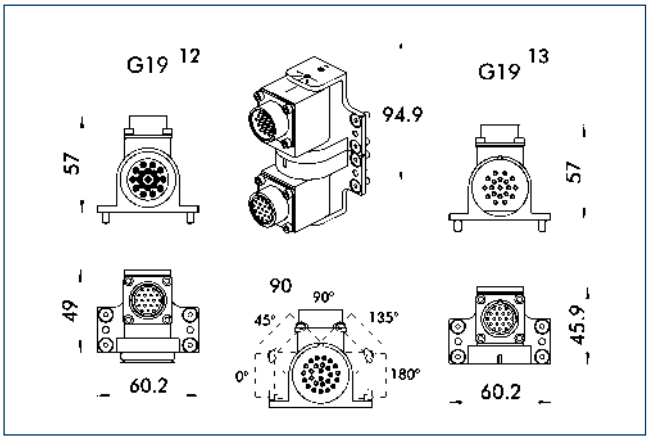
SWO-E G19

Technical data

Description		SWO-G19-K	SWO-G19R-K	SWO-G19W-K	SWO-G19-A	SWO-G14-A	SWO-G10-A
ID		9940649	9949311	9949312	9940650	9961318	9961319
Number of pin contacts		19	15	15	19	14	10
max. power supply	[A]	3	3	3	3	3	3
max. voltage	[V AC]	250	250	250	250	250	250
Number of encodable tools						0-15	0-99
Number of integrated sensor connections			2	2			
Connection		Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock

ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125
Module can be fixed in 5 positions

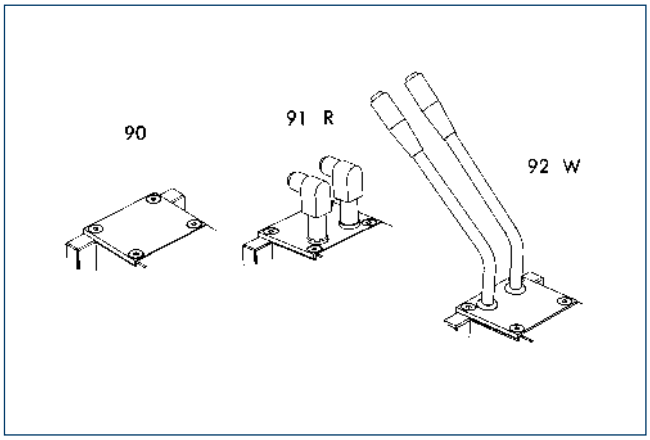
Combination SWO-G19-K and SWO-G19-A



(12) Head side
(13) Adapter side
(90) Swiveling plug in 5 positions

The drawing shows the gripper in the basic version with closed jaws and does not take into consideration the dimensions of any options described below.

Connection versions E-module, head side

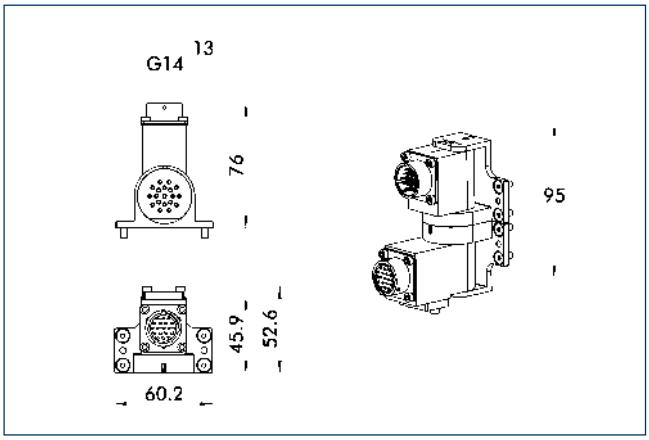


(90) No direct sensor connection provided
(91) Direct, right-angled sensor connection integrated
(92) Direct, straight sensor connection integrated

The illustration shows different possibilities for direct connection of the piston stroke control sensors to the electric module.

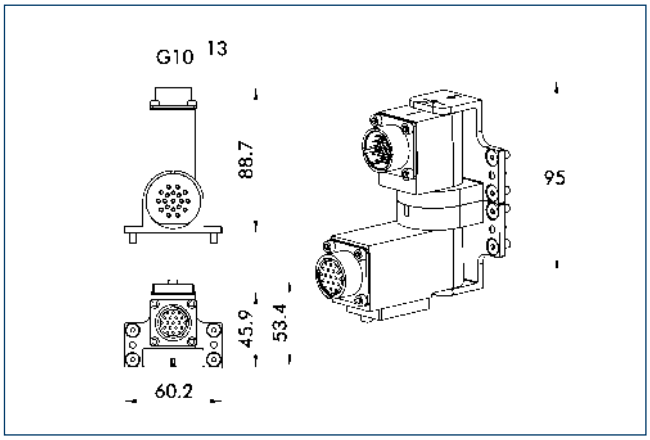
ⓘ Right angled sensor connector is only compatible with the SWS-076 and SWS-110. For the SWS-040Q and the SWS-160 a straight sensor connector is required.

Combination SWO-G19-K and SWO-G14-A



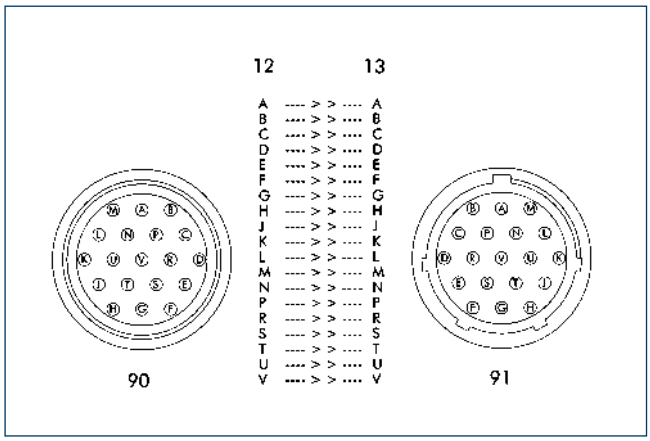
(13) Adapter side

Combination SWO-G19-K and SWO-G10-A



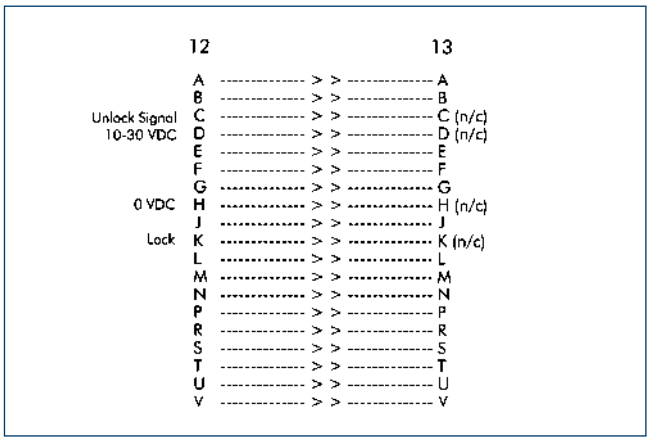
(13) Adapter side

Pin layout for SWO-G19-K with SWO-G14-A



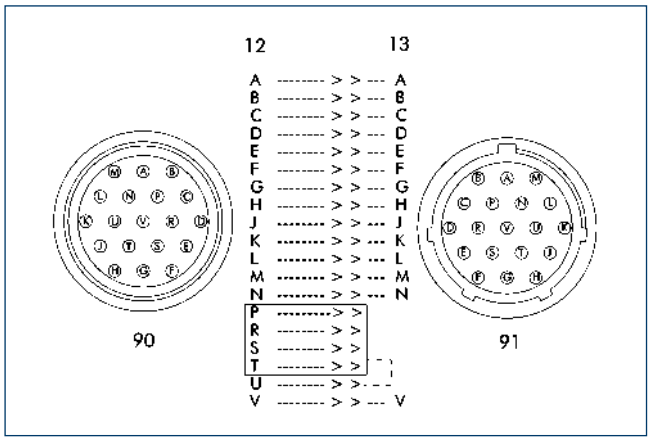
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-G19W/R-K with SWO-G14-A



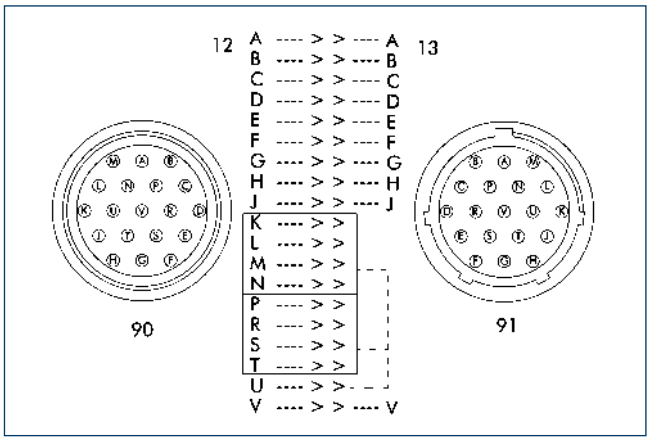
(12) Head side
(13) Adapter side

Pin layout for SWO-G19-K with SWO-G14-A



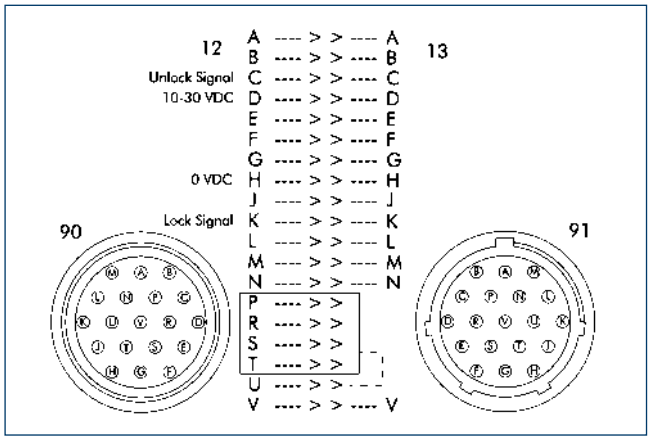
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-G19-K with SWO-G10-A



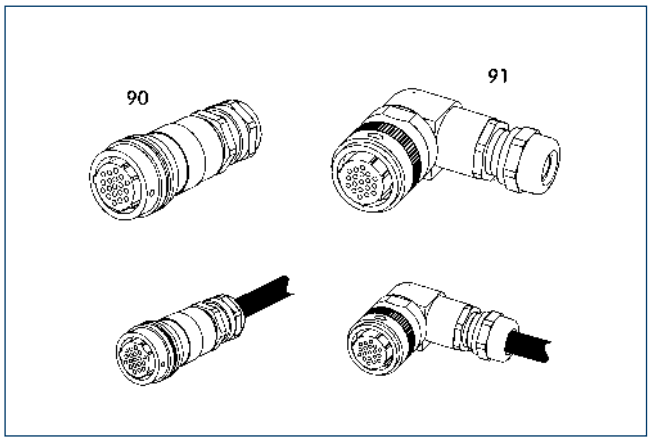
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-G19W/R-K with SWO-G14-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-3-SWK-19B-90	0302179	3 m
KV-5-SWK-19B-90	0302190	5 m
Angled cable connector, robot-side		
KAS-19B-K-90-C	0301294	
Angled cable connector, tool-side		
KAS-19B-A-90-C	0301295	
Angled cable connector with cable, tool-side		
KV-3-SWA-19B-90	0302191	3 m
Straight cable connector, robot-side		
KAS-19B-K-0-C	0301283	
Straight cable connector, tool-side		
KAS-19B-A-0-C	0301284	
Straight cable connector with cable, robot-side		
KV-3-SWK-19B-0	0302176	3 m
KV-5-SWK-19B-0	0302177	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19B-0	0302178	3 m

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

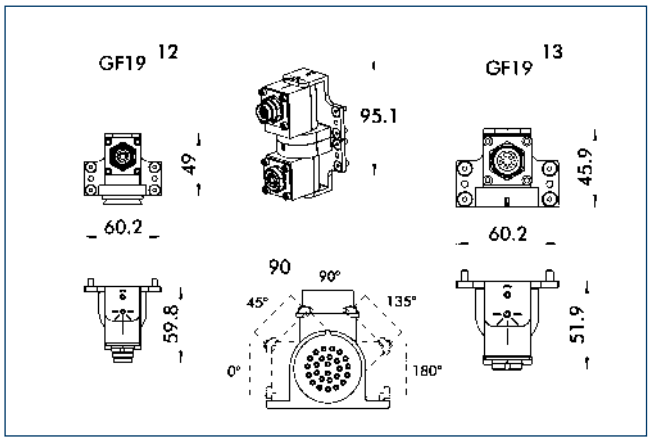
SWO-E GF19

Technical data

Description		SWO-GF19-K	SWO-GF19R-K	SWO-GF19W-K	SWO-GF19-A	SWO-GF14-A
ID		9948655	9961303	9957467	9948658	9957468
Number of pin contacts		19	15	15	19	14
max. power supply	[A]	3	3	3	3	3
max. voltage	[V AC]	125	125	125	125	125
Number of encodable tools						0-15
Number of integrated sensor connections			2	2		
Connection		Threaded connector M16	Threaded connector M16	Threaded connector M16	Threaded connector M16	Threaded connector M16

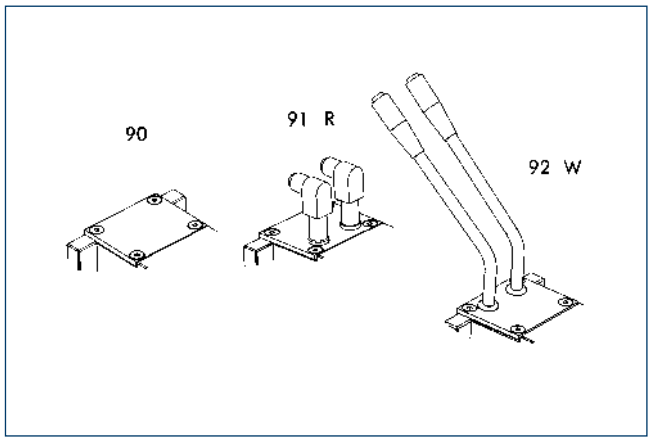
ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125
Module can be fixed in 5 positions

Combination SWO-GF19-K and SWO-GF19-A



(12) Head side
(13) Adapter side
(90) Swiveling plug in 5 positions

Connection versions E-module, head side

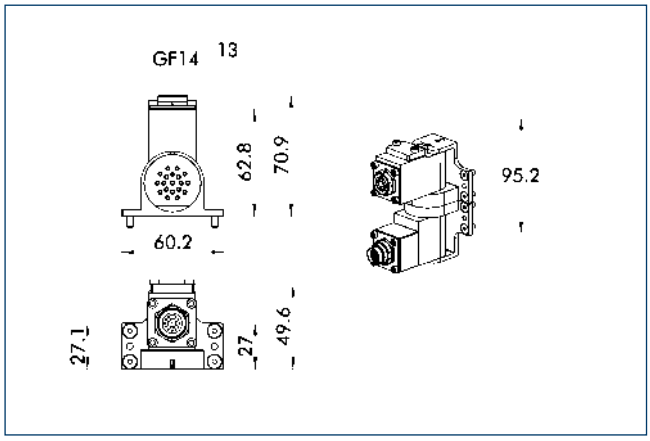


(90) No direct sensor connection provided
(91) Direct, right-angled sensor connection integrated
(92) Direct, straight sensor connection integrated

The illustration shows different possibilities for direct connection of the piston stroke control sensors to the electric module.

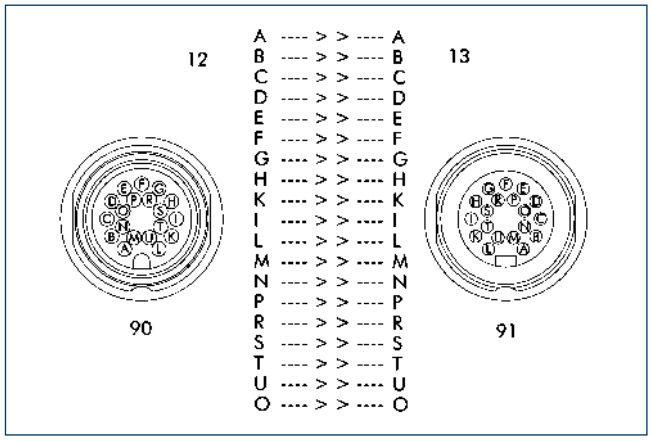
ⓘ Right angled sensor connector is only compatible with the SWS-076 and SWS-110. For the SWS-040Q and the SWS-160 a straight sensor connector is required.

Combination SWO-GF19-K and SWO-GF14-A



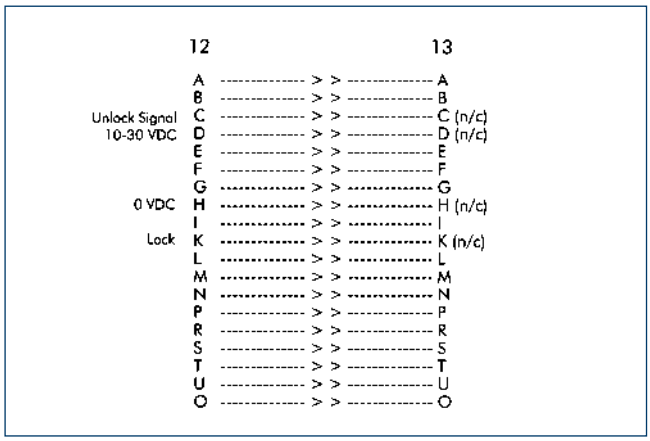
(13) Adapter side

Pin layout for SWO-GF19-K with SWO-GF19-A



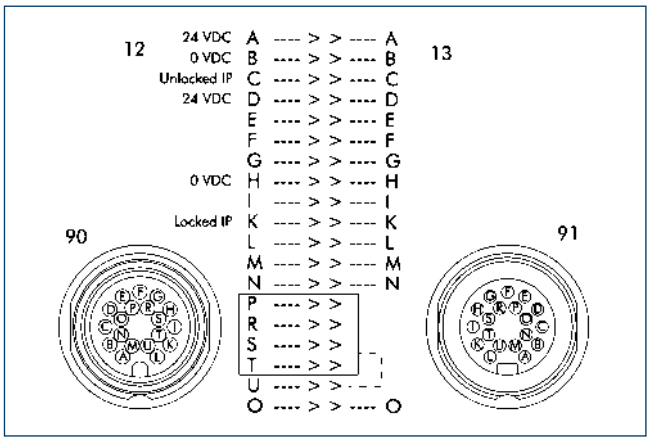
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-GF19W/R-K with SWO-GF19-A



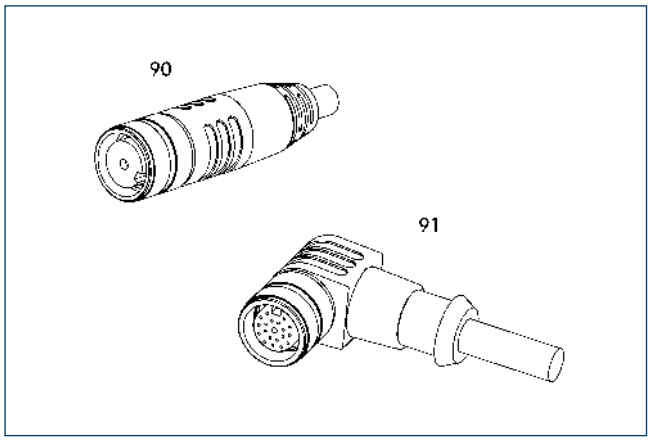
(12) Head side
(13) Adapter side

Pin layout for SWO-GF109W/R-K with SWO-GF14-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector / cable extension

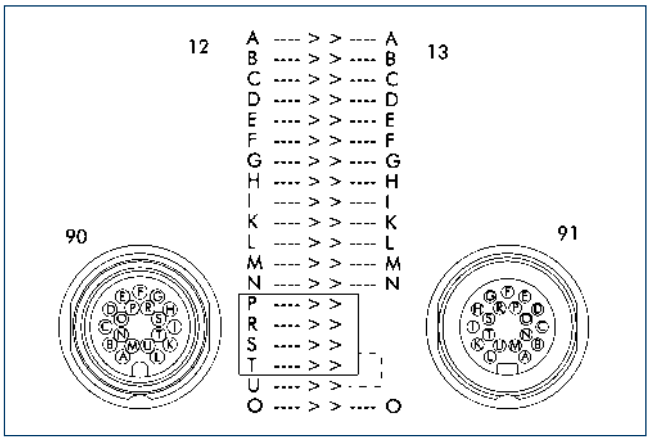


(90) Connection plug / socket straight with extension cable
(91) Connection plug / socket at an angle with extension cable

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-10-SWK-19F-90	0302173	10 m
KV-5-SWK-19F-90	0302172	5 m
Angled cable connector with cable, tool-side		
KV-3-SWA-19F-90	0302175	3 m
Straight cable connector with cable, robot-side		
KV-10-SWK-19F-0	0302171	10 m
KV-5-SWK-19F-0	0302170	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19F-0	0302174	3 m

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

Pin layout for SWO-GF19-K with GWO-GF14-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

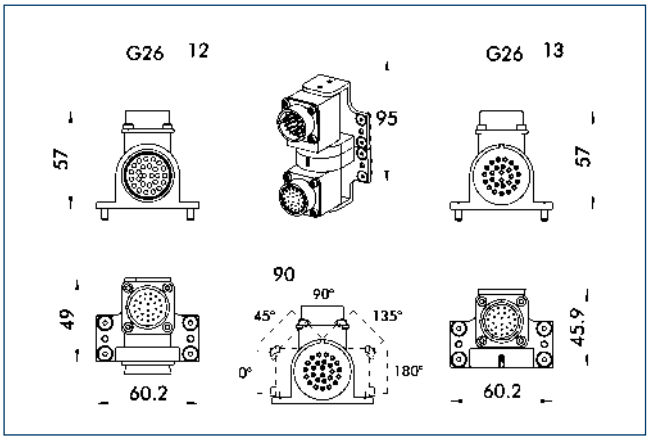
SWO-E G26

Technical data

Description		SWO-G26-K	SWO-G26R-K	SWO-G26W-K	SWO-G26-A	SWO-G21-A	SWO-G17-A
ID		9941560	9959953	9956897	9941561	9961305	9961306
Number of pin contacts		26	21	21	26	21	17
max. power supply	[A]	3	3	3	3	3	3
Max. voltage	[V AC]	250	250	250	250	250	250
Number of encodable tools						0-15	0-99
Number of integrated sensor connections			2	2			
Connection		Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock

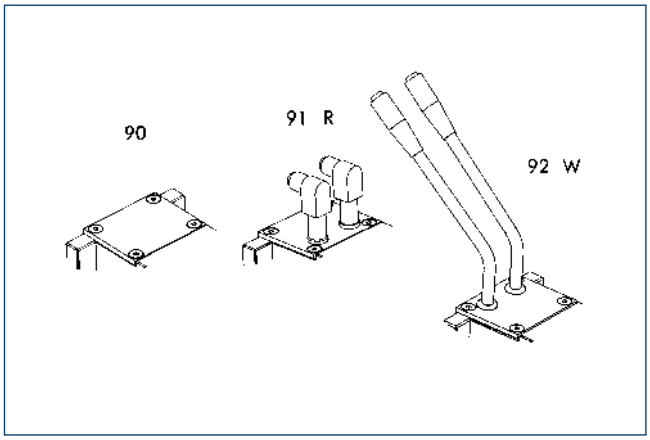
ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125
Module can be fixed in 5 positions

Combination SWO-G26-K and SWO-G26-A



(12) Head side
(13) Adapter side
(90) Swiveling plug in 5 positions

Connection versions E-module, head side

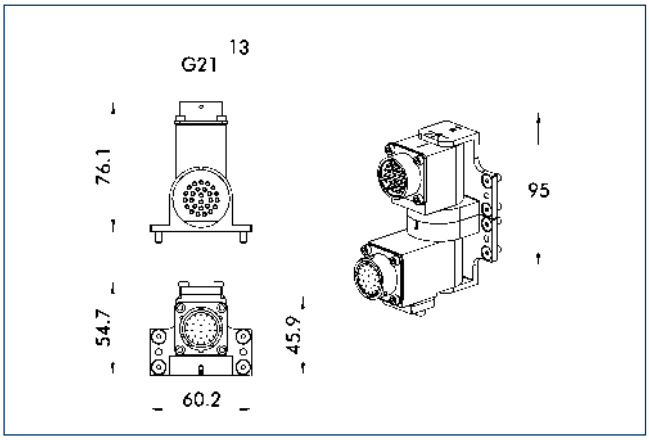


(90) No direct sensor connection provided
(91) Direct, right-angled sensor connection integrated
(92) Direct, straight sensor connection integrated

The illustration shows different possibilities for direct connection of the piston stroke control sensors to the electric module.

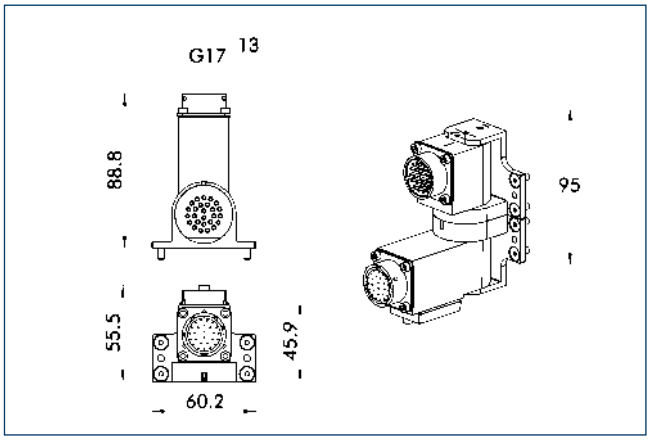
ⓘ Right angled sensor connector is only compatible with the SWS-076 and SWS-110. For the SWS-040Q and the SWS-160 a straight sensor connector is required.

Combination SWO-G26-K and SWO-G21-A



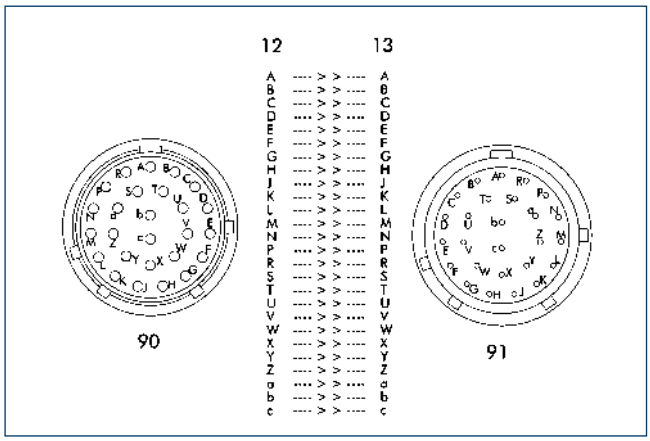
(13) Adapter side

Combination SWO-G26-K and SWO-G17-A



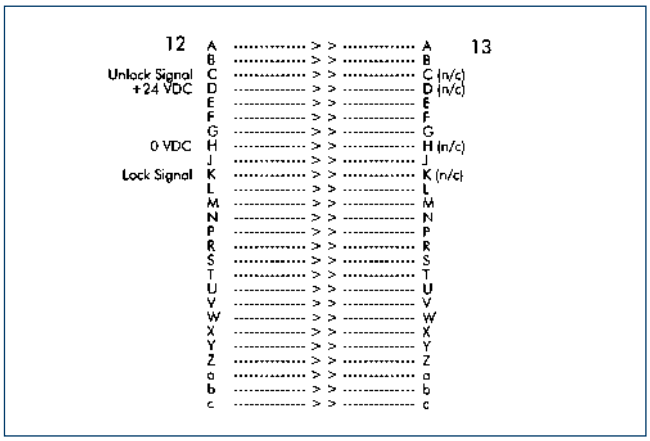
(13) Adapter side

Pin layout for SWO-G26-K with SWO-G26-A



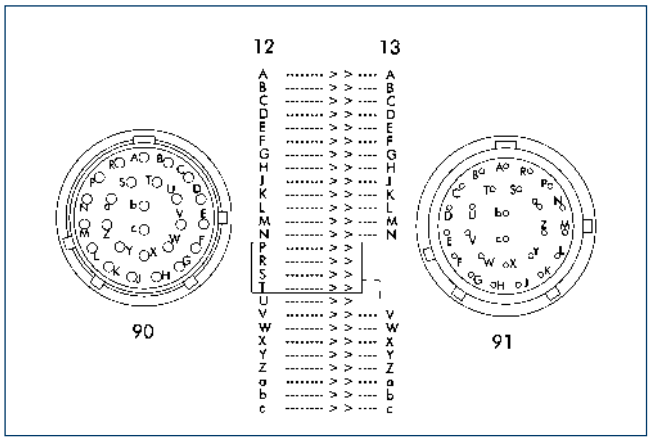
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-G26W/R-K with SWO-G26-A



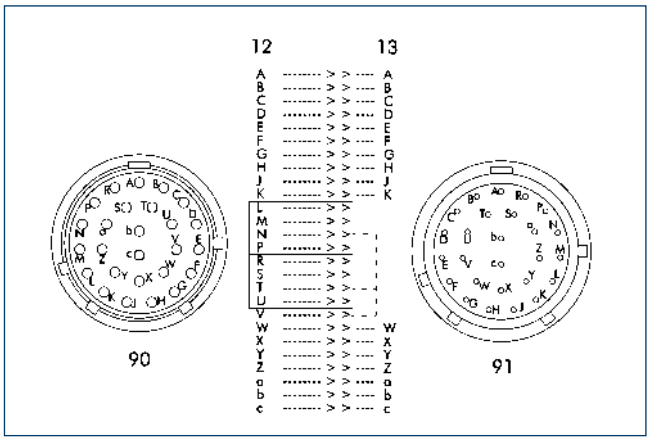
(12) Head side
(13) Adapter side

Pin layout for SWO-G26-K with SWO-G21-A



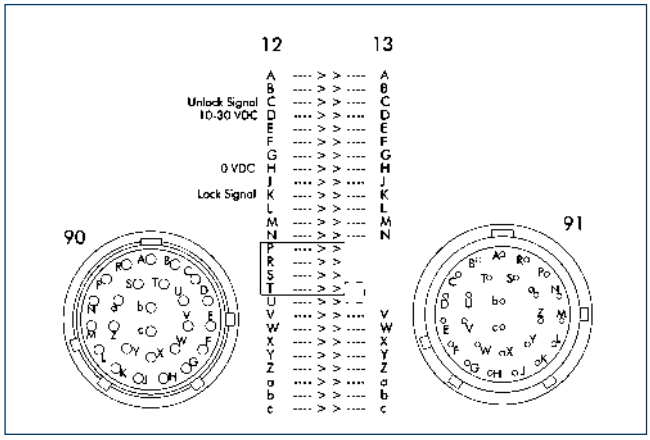
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-G26-K with SWO-G17-A



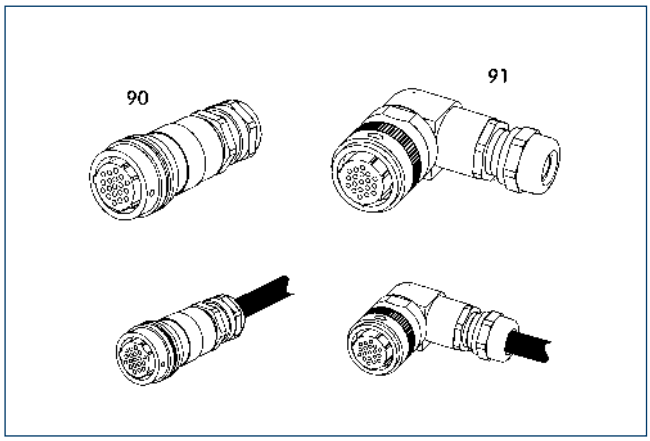
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-G26W/R-K with SWO-G21-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-3-SWK-26B-90	0302185	3 m
KV-5-SWK-26B-90	0302186	5 m
Angled cable connector, robot-side		
KAS-26B-K-90-C	0301296	
Angled cable connector, tool-side		
KAS-26B-A-90-C	0301297	
Angled cable connector with cable, tool-side		
KV-3-SWA-26B-90	0302187	3 m
Straight cable connector, robot-side		
KAS-26B-K-0-C	0301290	
Straight cable connector, tool-side		
KAS-26B-A-0-C	0301291	
Straight cable connector with cable, robot-side		
KV-3-SWK-26B-0	0302192	3 m
KV-5-SWK-26B-0	0302193	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-26B-0	0302184	3 m

Please note that these cable extensions only have 25 pins available.
Pin A is not connected.

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

SWO-E K19

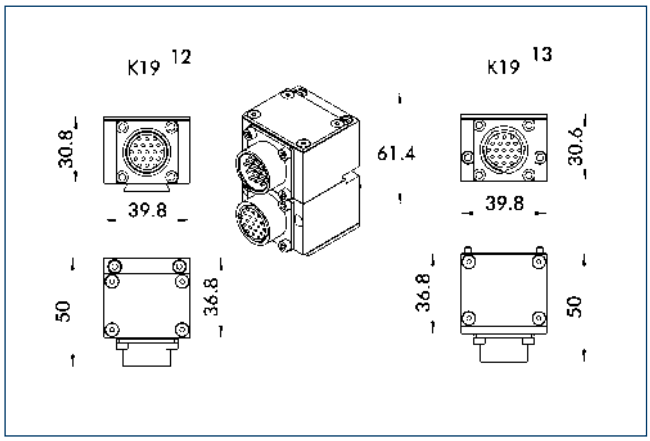
Robot Accessories | Changing | Electrical Options

Technical data

Description		SWO-K19-K	SWO-K19W-K	SWO-K19P-K	SWO-K19-A	SWO-K14-A	SWO-K10-A
ID		9937328	9949316	9949315	9937329	9954959	9960543
Number of pin contacts		19	15	15	19	14	10
max. power supply	[A]	3	3	3	3	3	3
max. voltage	[V AC]	50	50	50	50	50	50
Number of encodable tools						0-15	0-99
Number of integrated sensor connections			2	2			
Connection		Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock

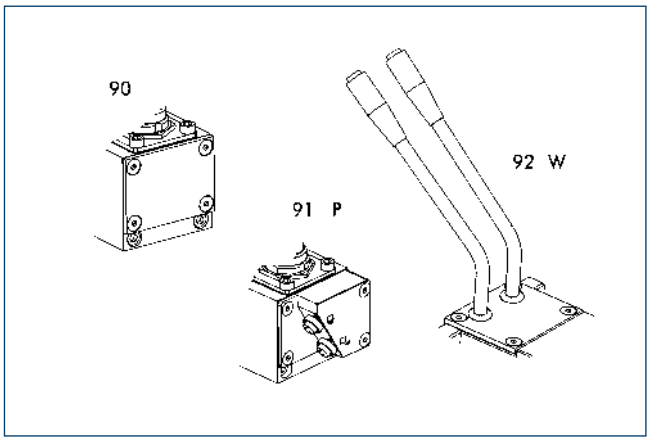
ⓘ Compatible with sizes: SWS-020, SWS-021, SWS-027, SWS-060, HWS-063, HWS-080

Combination SWO-K19-K and SWO-K19-A



(12) Head side
(13) Adapter side

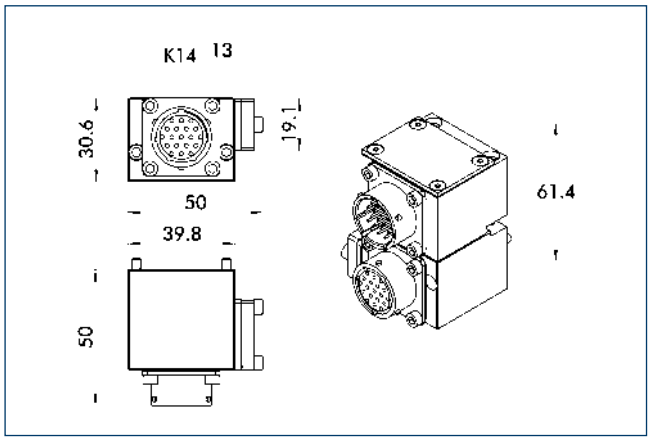
Connection versions E-module, head side



(90) No direct sensor connection provided
(91) Direct sensor connection integrated for SWS-020 and SWS-021
(92) Direct, straight sensor connection with integrated cable for SWS-060

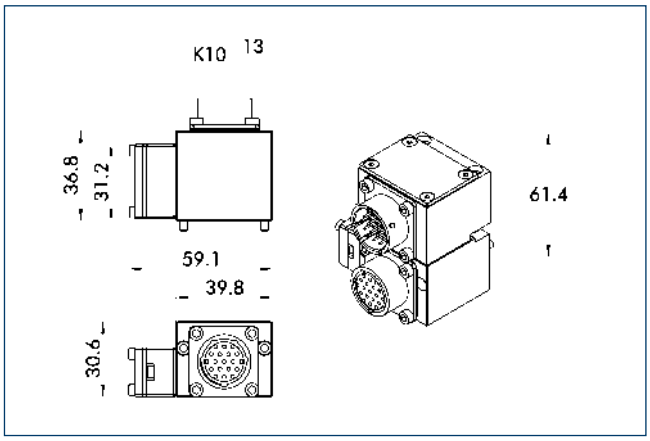
The illustration shows different possibilities for direct connections of the piston stroke control sensors to the electric module.

Combination SWO-K19-K and SWO-K14-A



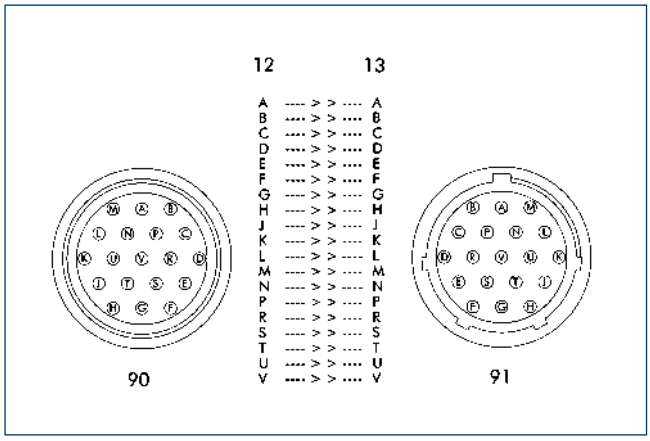
(13) Adapter side

Combination SWO-K19-K and SWO-K10-A



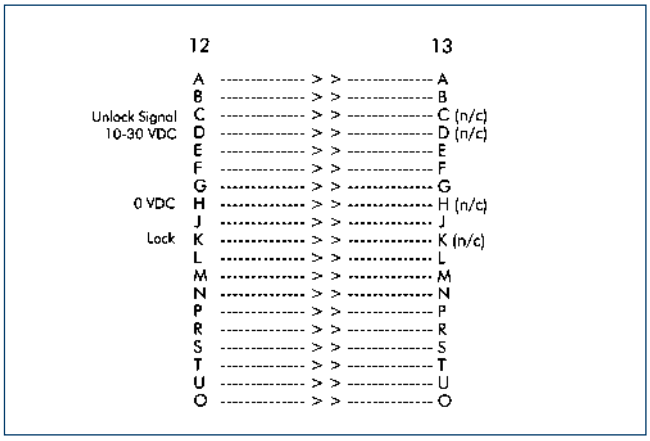
(13) Adapter side

Pin layout for SWO-K19-K with SWO-K19-A



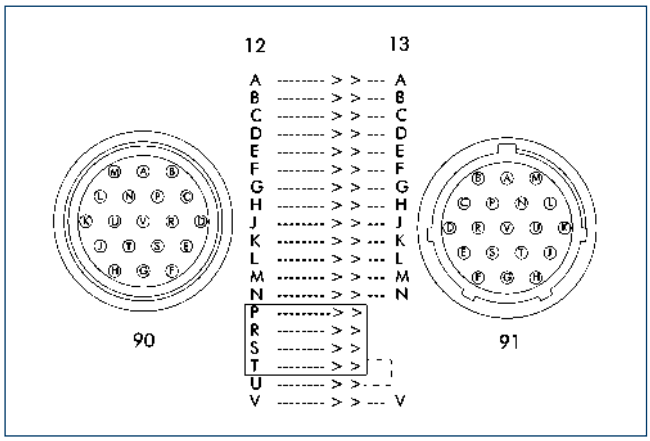
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-K19W/R-K with SWO-K19-A



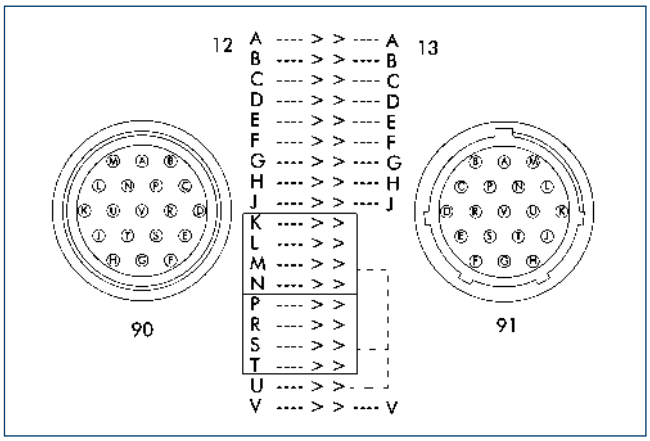
(12) Head side
(13) Adapter side

Pin layout for SWO-K19-K with SWO-K14-A



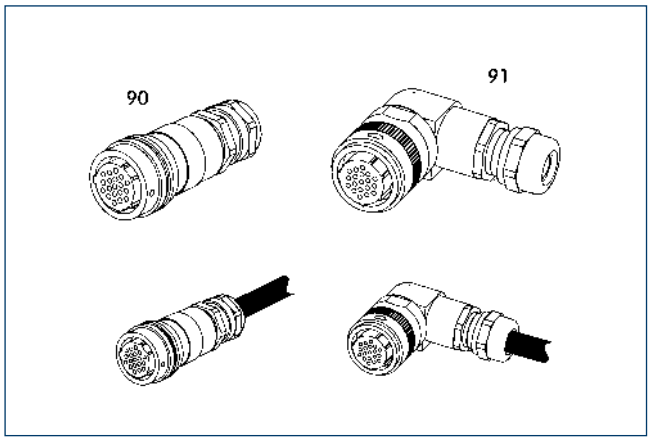
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-K19-K with SWO-K10-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector / cable extension



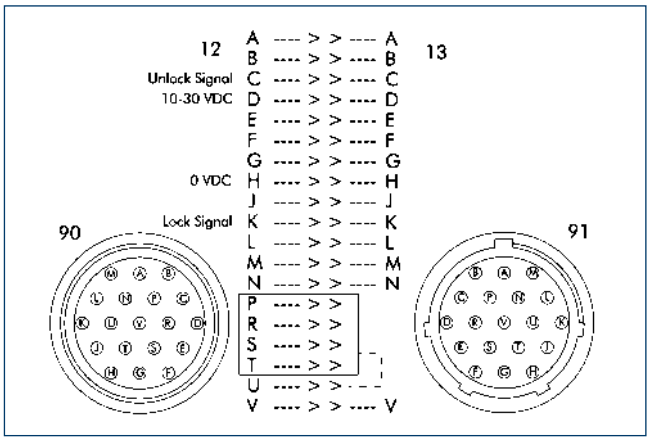
(90) Connection plug / socket straight
(91) Connection plug / socket at an angle

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-3-SWK-19B-90	0302179	3 m
KV-5-SWK-19B-90	0302190	5 m
Angled cable connector, robot-side		
KAS-19B-K-90-C	0301294	
Angled cable connector, tool-side		
KAS-19B-A-90-C	0301295	
Angled cable connector with cable, tool-side		
KV-3-SWA-19B-90	0302191	3 m
Straight cable connector, robot-side		
KAS-19B-K-0-C	0301283	
Straight cable connector, tool-side		
KAS-19B-A-0-C	0301284	
Straight cable connector with cable, robot-side		
KV-3-SWK-19B-0	0302176	3 m
KV-5-SWK-19B-0	0302177	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19B-0	0302178	3 m

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

Pin layout for SWO-K19W/P-K with SWO-K14-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

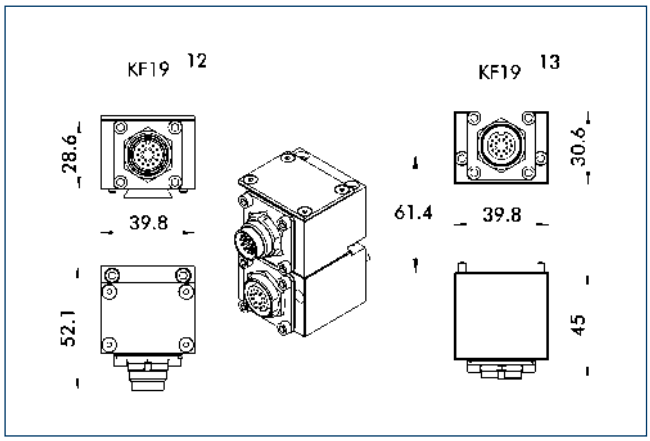
SWO-E KF19

Technical data

Description		SWO-KF19-K	SWO-KF19-A	SWO-KF14-A	SWO-KF10-A
ID		9959886	9959887	9961307	9961308
Number of pin contacts		19	19	14	10
max. power supply	[A]	3	3	3	3
max. voltage	[V DC]	50	50	50	50
Number of encodable tools				0-15	0-99
Connection		Threaded connector M16	Threaded connector M16	Threaded connector M16	Threaded connector M16

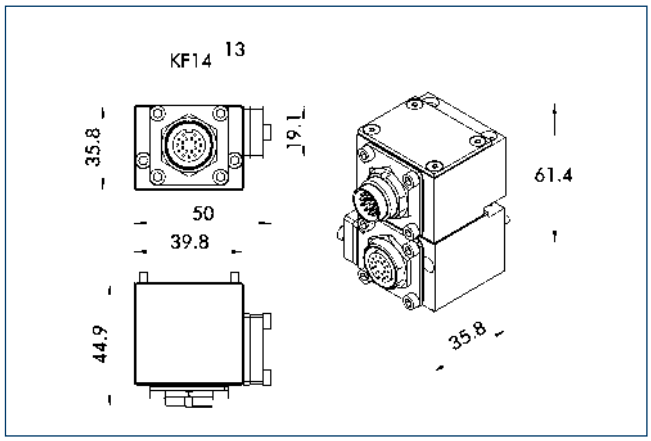
ⓘ Compatible with sizes: SWS-020, SWS-021, SWS-027, SWS-060, HWS-063, HWS-080

Combination SWO-KF19-K and SWO-KF19-A



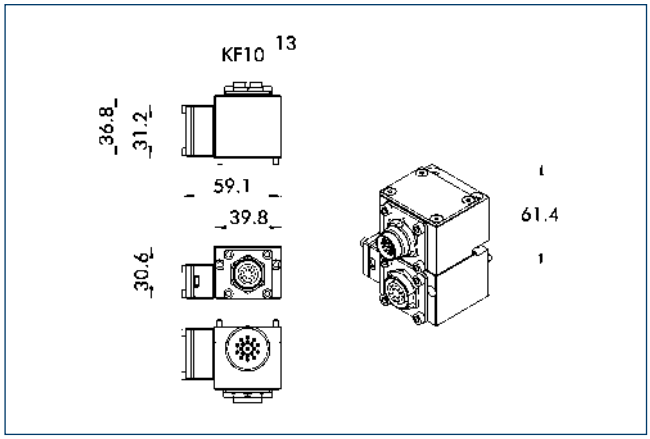
(12) Head side
(13) Adapter side

Combination SWO-KF19-K and SWO-KF14-A



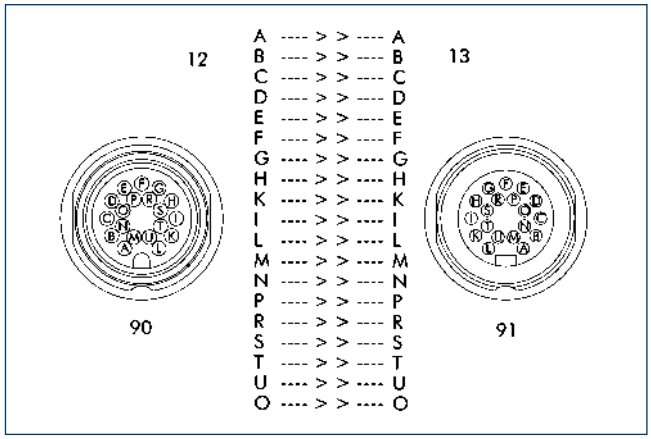
(13) Adapter side

Combination SWO-KF19-K and SWO-KF10-A



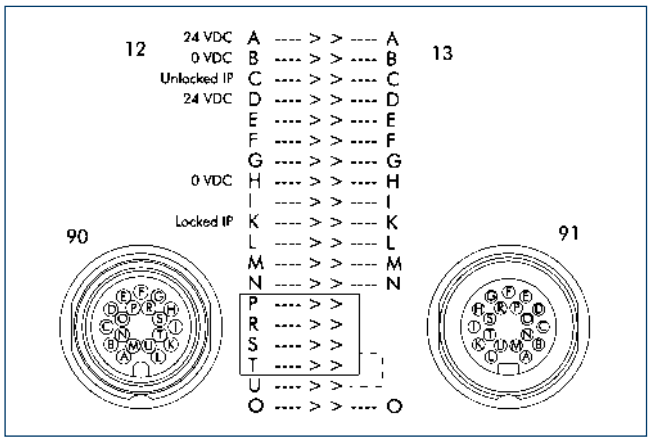
(13) Adapter side

Pin layout for SWO-KF19-K with SWO-KF19-A



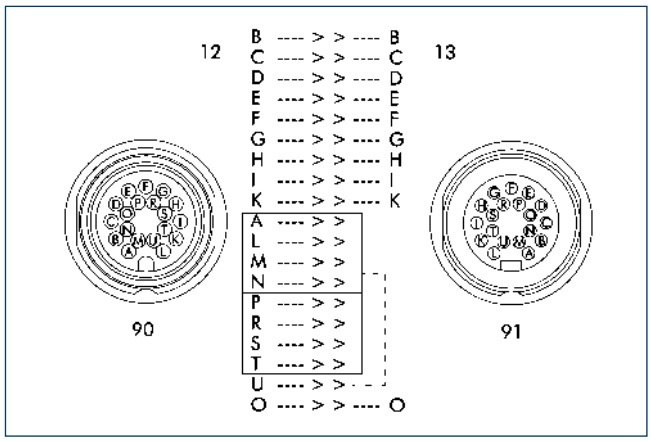
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-KF19-K with SWO-KF14-A



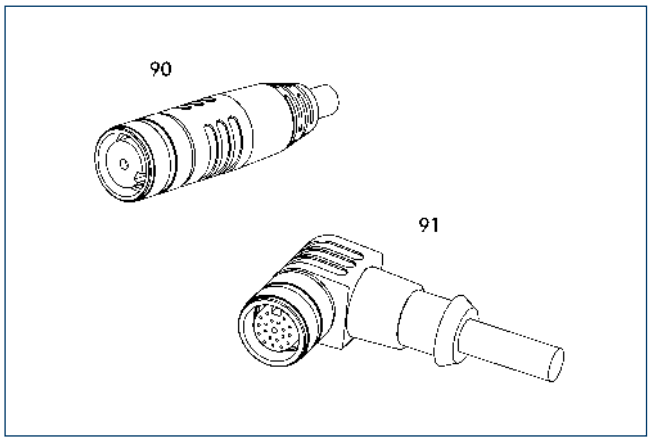
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-KF19-K with SWO-KF10-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector / cable extension



(90) Connection plug / socket straight with extension cable

(91) Connection plug / socket at an angle with extension cable

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-10-SWK-19F-90	0302173	10 m
KV-5-SWK-19F-90	0302172	5 m
Angled cable connector with cable, tool-side		
KV-3-SWA-19F-90	0302175	3 m
Straight cable connector with cable, robot-side		
KV-10-SWK-19F-0	0302171	10 m
KV-5-SWK-19F-0	0302170	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19F-0	0302174	3 m

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

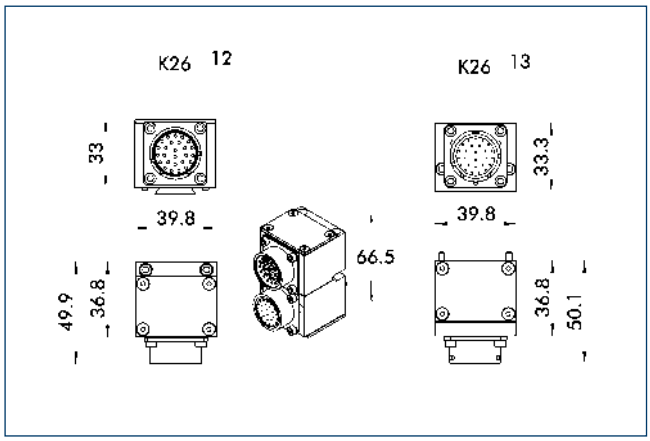
SWO-E K26

Technical data

Description		SWO-K26-K	SWO-K26-A	SWO-K21-A
ID		9937798	9937799	9958100
Number of pin contacts		26	26	21
max. power supply	[A]	3	3	3
max. voltage	[V AC]	50	50	50
Number of encodable tools				0-15
Connection		Bayonet lock	Bayonet lock	Bayonet lock

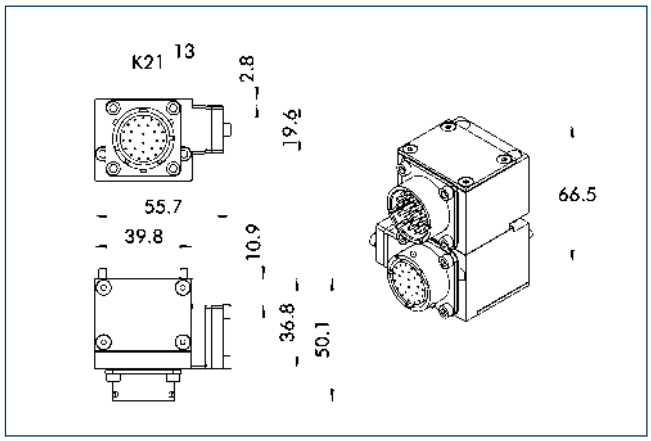
ⓘ Compatible with sizes: SWS-020, SWS-021, SWS-027, SWS-060, HWS-063, HWS-080

Combination SWO-K26-K and SWO-K26-A



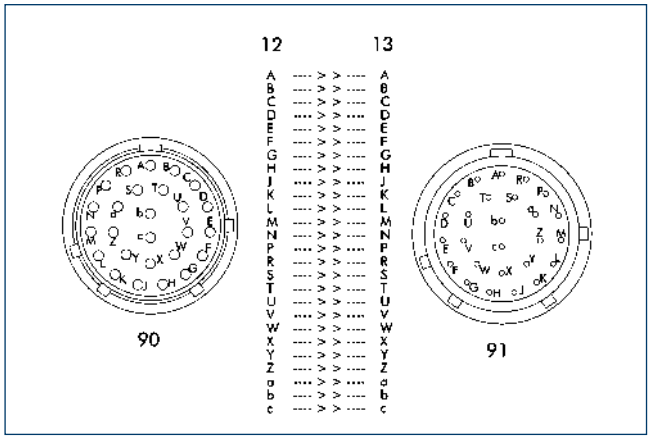
(12) Head side
(13) Adapter side

Combination SWO-K26-K and SWO-K21-A



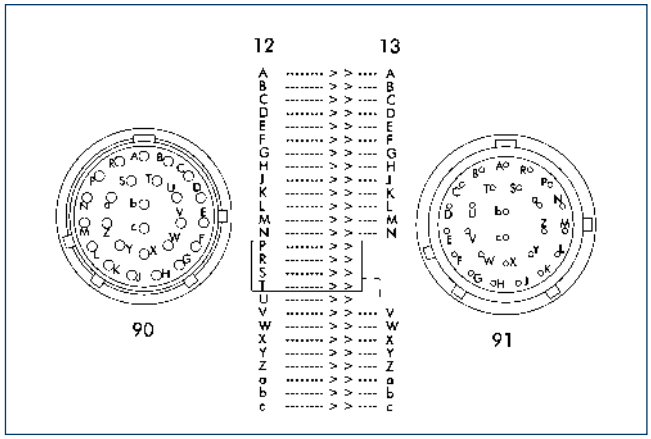
(13) Adapter side

Pin layout for SWO-K26-K with SWO-KF21-A



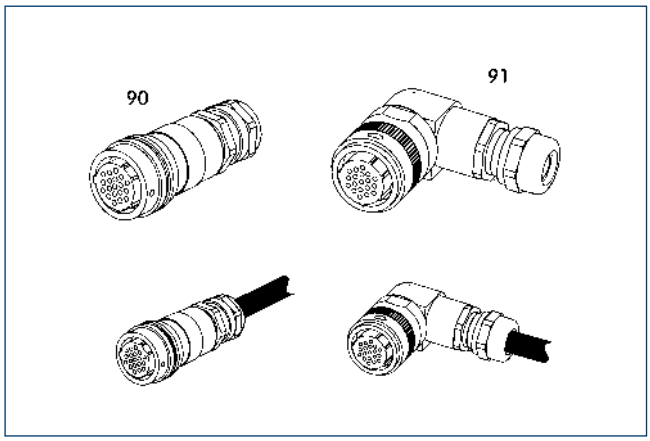
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-K26-K with SWO-KF26-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-3-SWK-26B-90	0302185	3 m
KV-5-SWK-26B-90	0302186	5 m
Angled cable connector, robot-side		
KAS-26B-K-90-C	0301296	
Angled cable connector, tool-side		
KAS-26B-A-90-C	0301297	
Angled cable connector with cable, tool-side		
KV-3-SWA-26B-90	0302187	3 m
Straight cable connector, robot-side		
KAS-26B-K-0-C	0301290	
Straight cable connector, tool-side		
KAS-26B-A-0-C	0301291	
Straight cable connector with cable, robot-side		
KV-3-SWK-26B-0	0302192	3 m
KV-5-SWK-26B-0	0302193	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-26B-0	0302184	3 m

Please note that these cable extensions only have 25 pins available.
Pin A is not connected.

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

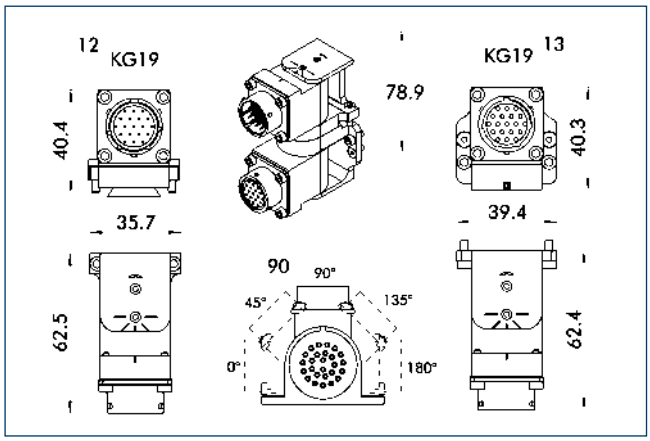
SWO-E KG19

Technical data

Description		SWO-KG19-K	SWO-KG19-A
ID		9950140	9950144
Number of pin contacts		19	19
max. power supply	[A]	3	3
max. voltage	[V DC]	50	50
Connection		Bayonet lock	Bayonet lock

ⓘ Compatible with sizes: SWS-020, SWS-021, SWS-027, SWS-060, HWS-063, HWS-080

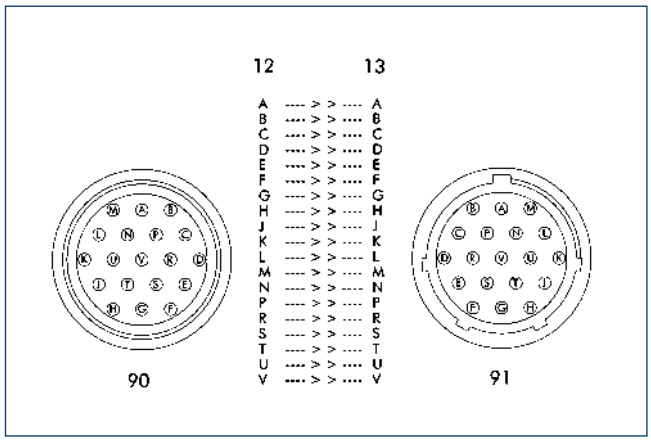
Combination SWO-KG19-K and SWO-KG19-A



(12) Head side
(13) Adapter side
(90) Swiveling plug in 5 positions

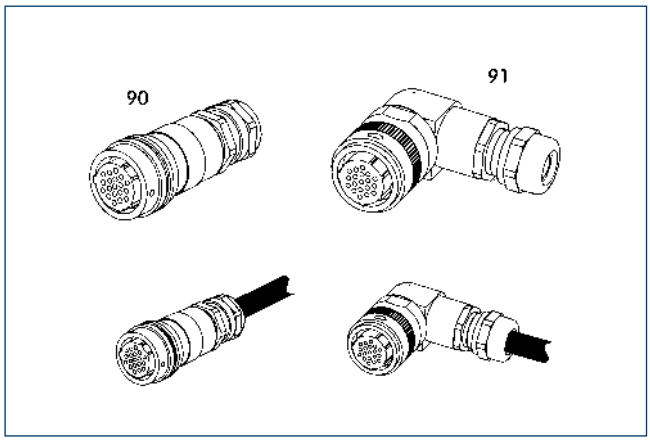
The drawing shows the gripper in the basic version with closed jaws and does not take into consideration the dimensions of any options described below.

Pin layout for SWO-KG19-K with SWO-KG19-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-3-SWK-19B-90	0302179	3 m
KV-5-SWK-19B-90	0302190	5 m
Angled cable connector, robot-side		
KAS-19B-K-90-C	0301294	
Angled cable connector, tool-side		
KAS-19B-A-90-C	0301295	
Angled cable connector with cable, tool-side		
KV-3-SWA-19B-90	0302191	3 m
Straight cable connector, robot-side		
KAS-19B-K-0-C	0301283	
Straight cable connector, tool-side		
KAS-19B-A-0-C	0301284	
Straight cable connector with cable, robot-side		
KV-3-SWK-19B-0	0302176	3 m
KV-5-SWK-19B-0	0302177	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19B-0	0302178	3 m

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

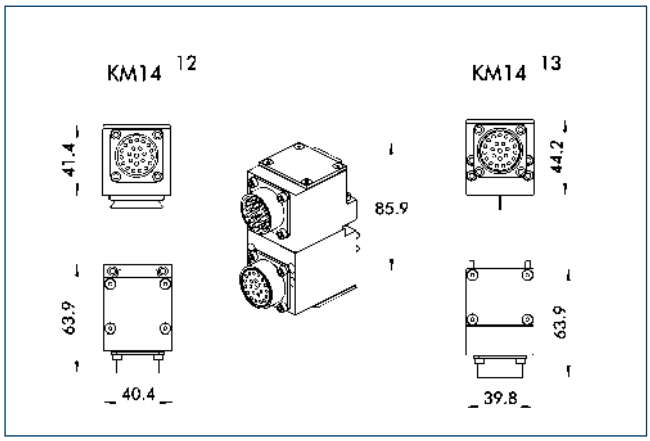
SWO-E KM14

Technical data

Description		SWO-KM14-K	SWO-KM14-A
ID		9940812	9941480
Number of pin contacts		12	12
max. power supply	[A]	5	5
max. voltage	[V AC]	250	250
Number of pin contacts		2	2
max. power supply	[A]	13	13
max. voltage	[V AC]	250	250
Connection		Amphenol MS threaded connector	Amphenol MS threaded connector

ⓘ Compatible with sizes: SWS-020, SWS-021, SWS-027, SWS-060, HWS-063, HWS-080

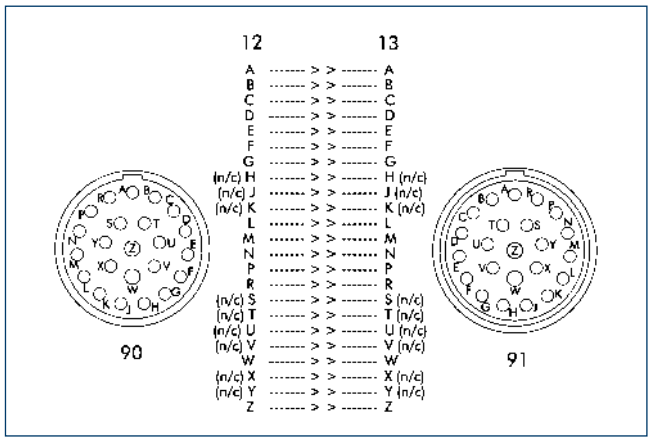
Combination SWO-KM14-K and SWO-KM14-A



12 Head side

13 Adapter side

Pin layout for SWO-KM14-K with SWO-KM14-A



12 Head side

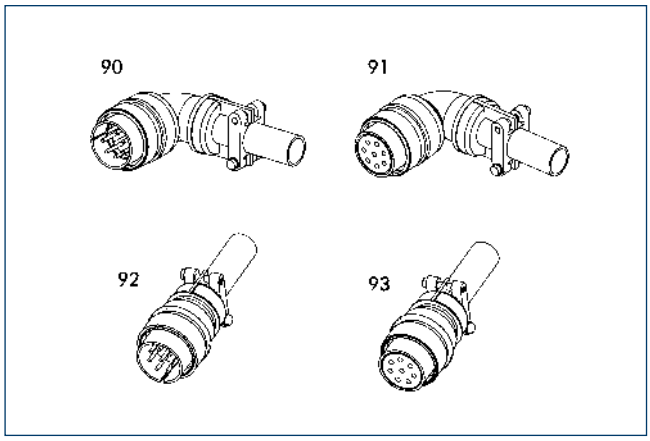
13 Adapter side

90 Plug connection

91 Socket connection

The KM14 module has a total of 14 contacts, which have different technical properties. The contacts W and Z have a higher maximum current. The exact values can be found in the technical data table.

Cable connector



90 Angled plug

91 Angled socket

92 Straight plug

93 Straight socket

Description	ID
Angled cable connector, robot-side	
KAS-14B-K-90	0301278
Angled cable connector, tool-side	
KAS-14B-A-90	0301279
Straight cable connector, robot-side	
KAS-14B-K-0	0301276
Straight cable connector, tool-side	
KAS-14B-A-0	0301277

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

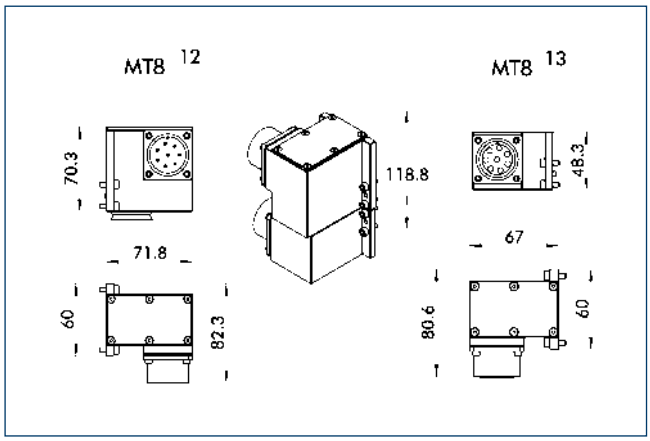
SWO-E MT8

Technical data

Description		SWO-MT8-K	SWO-MT8-A	SWO-MT8L-K	SWO-MT8L-A	SWO-MTS8-K	SWO-MTS8-A
ID		9937157	9937158	9949318	9949317	9961309	9961310
Number of pin contacts		8	8	8	8	8	8
max. power supply	[A]	20	20	20	20	20	20
max. voltage	[V AC]	500	500	500	500	500	500
Connection		Amphenol MS threaded connector	Amphenol MS threaded connector	Amphenol MS threaded connector	Amphenol MS threaded connector	Amphenol MS threaded connector	Amphenol MS threaded connector

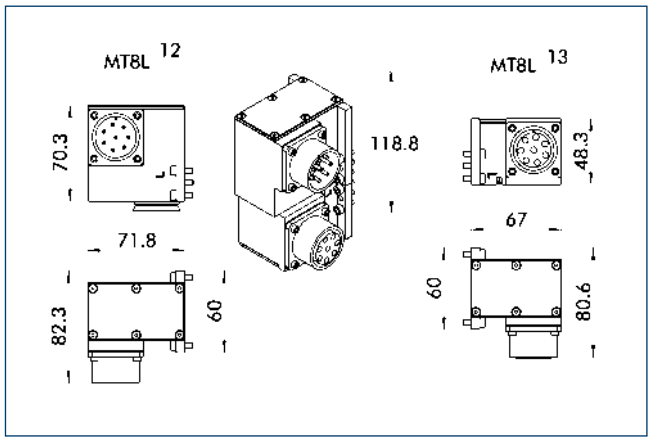
ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

Combination SWO-MT8-K and SWO-MT8-A



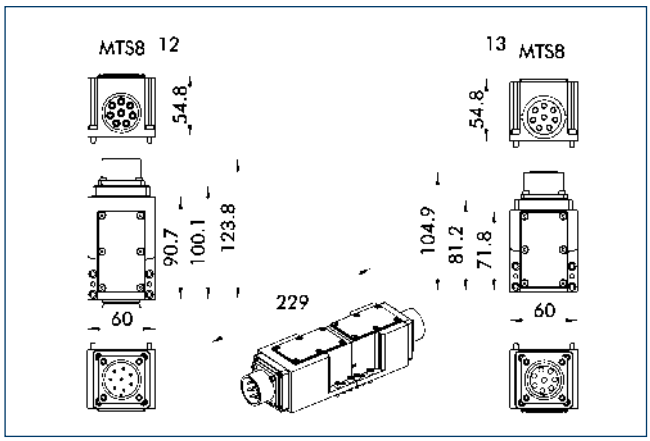
(12) Head side (13) Adapter side

Combination SWO-MT8L-K and SWO-MT8L-A



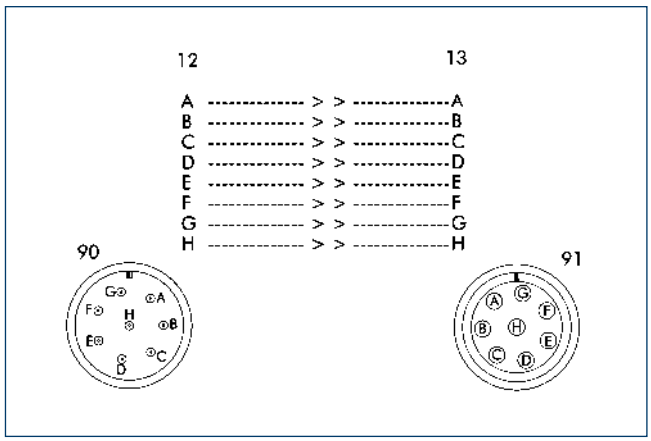
(12) Head side (13) Adapter side

Combination SWO-MTS8-K and SWO-MTS8-A



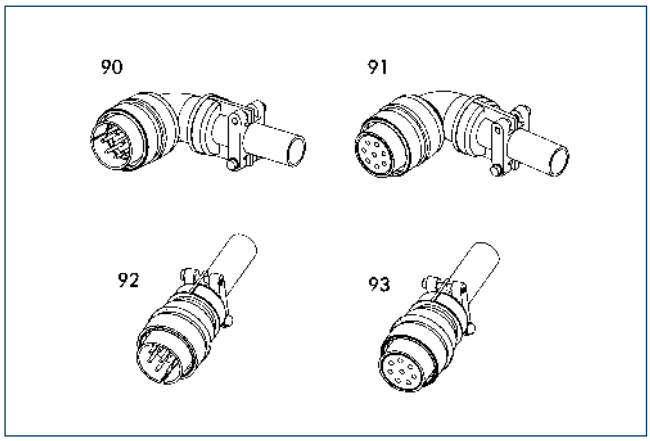
(12) Head side (13) Adapter side

Pin allocation



(12) Head side (13) Adapter side (90) Plug connection (91) Socket connection

Cable connector



90 Angled plug
91 Angled socket
92 Straight plug
93 Straight socket

Description	ID	
Angled cable connector, robot-side		
KAS-08G-K-90	0301270	
Angled cable connector, tool-side		
KAS-08G-A-90	0301271	
Straight cable connector, robot-side		
KAS-08G-K-0	0301268	
Straight cable connector, tool-side		
KAS-08G-A-0	0301269	

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

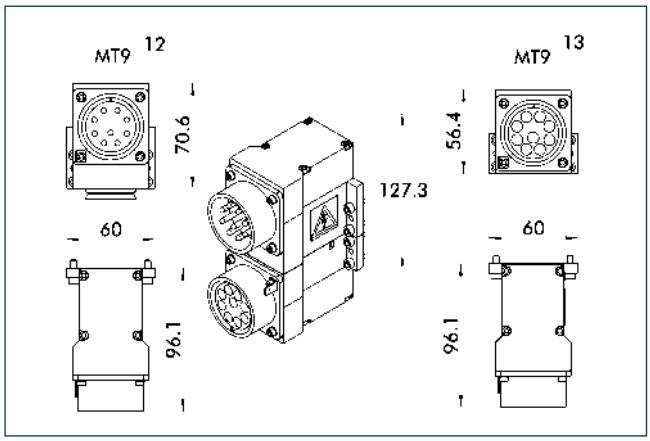
SWO-E MT9

Technical data

Description		SWO-MT9-K	SWO-MT9-A	SWO-MTS9-K	SWO-MTS9-A
ID		9955846	9955847	9900051	9900052
Number of pin contacts		9	9	9	9
max. power supply	[A]	28	28	28	28
max. voltage	[V AC]	500	500	500	500
Connection		Amphenol MS threaded connector	Amphenol MS threaded connector	Amphenol MS threaded connector	Amphenol MS threaded connector

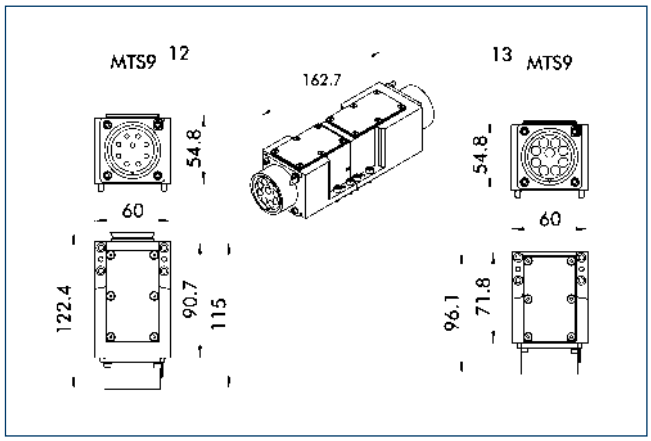
ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

Combination SWO-MT9-K and SWO-MT9-A



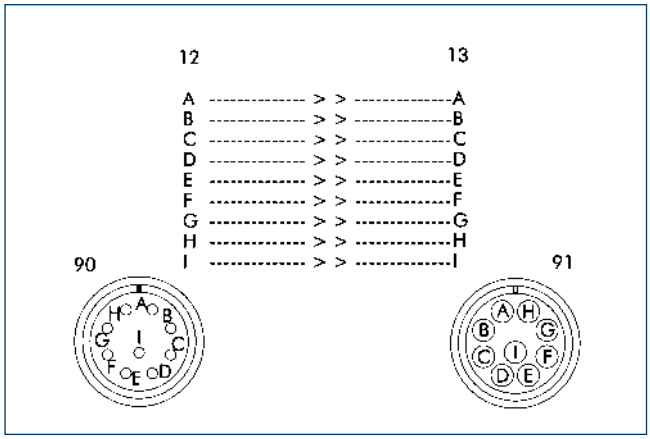
(12) Head side
(13) Adapter side

Combination SWO-MTS9-K and SWO-MTS9-A



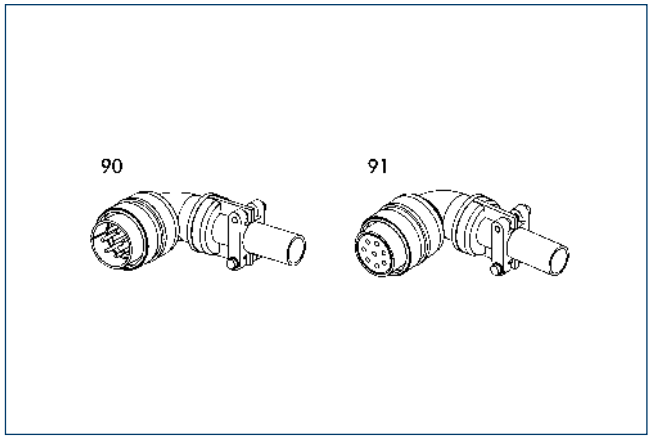
(12) Head side
(13) Adapter side

Pin allocation



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector



(90) Angled plug
(91) Angled socket

Description	ID
Angled cable connector, robot-side	
KAS-09G-K-90	0301238
Angled cable connector, tool-side	
KAS-09G-A-90	0301239

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

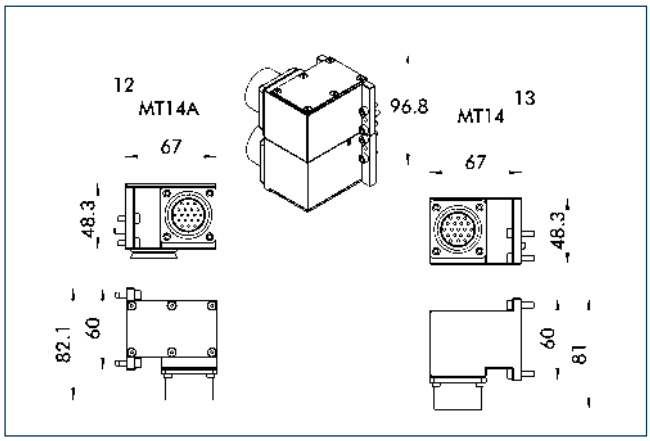
SWO-E MT14

Technical data

Description		SWO-MT14A-K	SWO-MT14-A
ID		9948446	9938528
Number of pin contacts		14	14
max. power supply	[A]	13	13
max. voltage	[V AC]	500	500
Connection		Amphenol MS threaded connector	Amphenol MS threaded connector

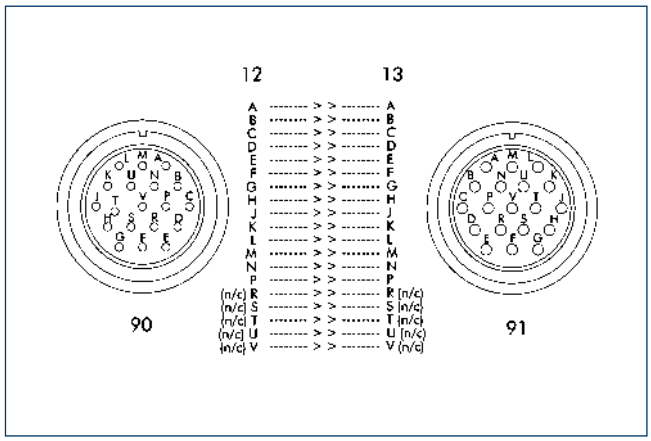
ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

Combination SWO-MT14-K and SWO-MT14-A



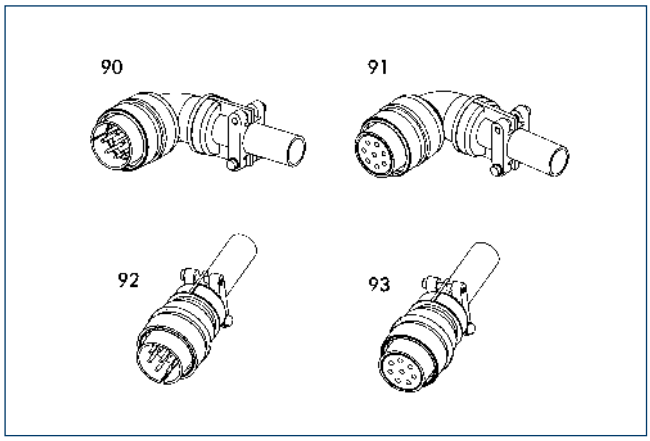
(12) Head side
(13) Adapter side

Pin layout for SWO-MT14A-K with SWO-MT14-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector



(90) Angled plug
(91) Angled socket
(92) Straight plug
(93) Straight socket

Description	ID	
Angled cable connector, robot-side		
KAS-19G-K-90	0301236	
Angled cable connector, tool-side		
KAS-19G-A-90	0301237	
Straight cable connector, robot-side		
KAS-19G-K-0	0301232	
Straight cable connector, tool-side		
KAS-19G-A-0	0301233	

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

SWO-E PG0

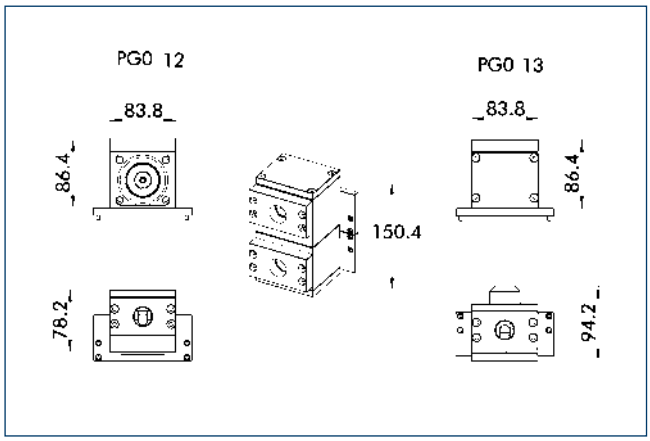
Robot Accessories | Changing | Electrical Options

Technical data

Description		SWO-PG0-K	SWO-PG0-A
ID		9941343	9941344
Number of pin contacts		1	1
max. power supply	[A]	600	600
max. voltage	[V AC]	800	800

ⓘ Compatible with sizes: SWS-110, SWS-160, SWS-300

Combination SWO-PG0-K and SWO-PG0-A



(12) Head side (13) Adapter side

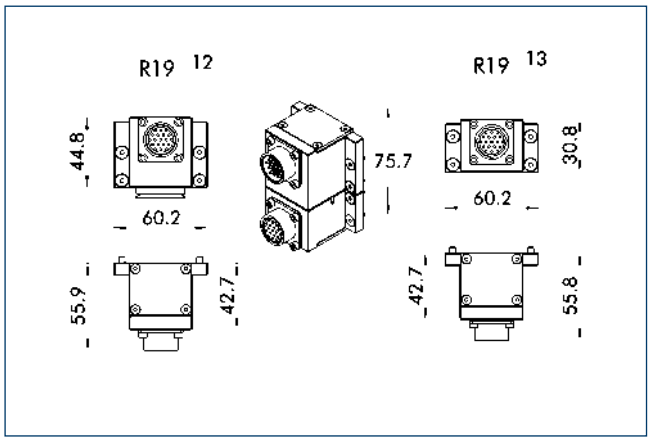
SWO-E R19

Technical data

Description		SWO-R19-K	SWO-R19R-K	SWO-R19W-K	SWO-R19-A	SWO-R14-A	SWO-R10-A
ID		9935815	9942391	9942041	9935816	9935100	9941385
Number of pin contacts		19	15	15	19	14	10
max. power supply	[A]	5	5	5	5	5	5
max. voltage	[V AC]	250	250	250	250	250	250
Number of encodable tools						0-9	0-99
Number of integrated sensor connections			2	2			
Connection		Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock

ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

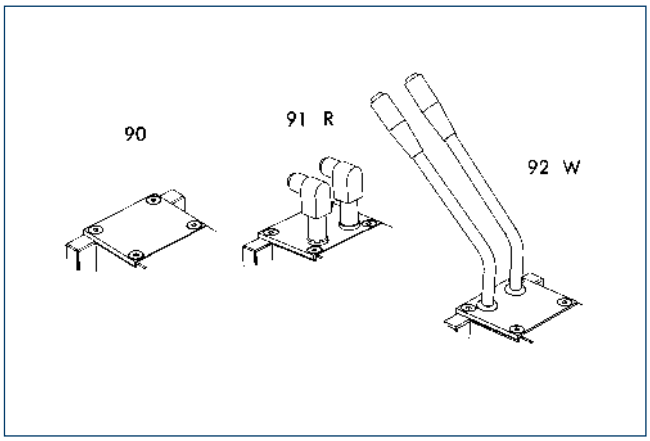
Combination SWO-R19-K and SWO-R19-A



(12) Head side

(13) Adapter side

Connection versions E-module, head side



(90) No direct sensor connection provided

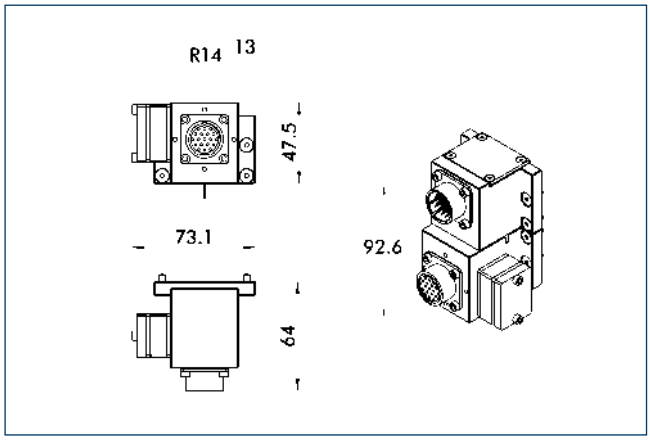
(91) Direct, right-angled sensor connection integrated

(92) Direct, straight sensor connection integrated

The illustration shows different possibilities for direct connection of the piston stroke control sensors to the electric module.

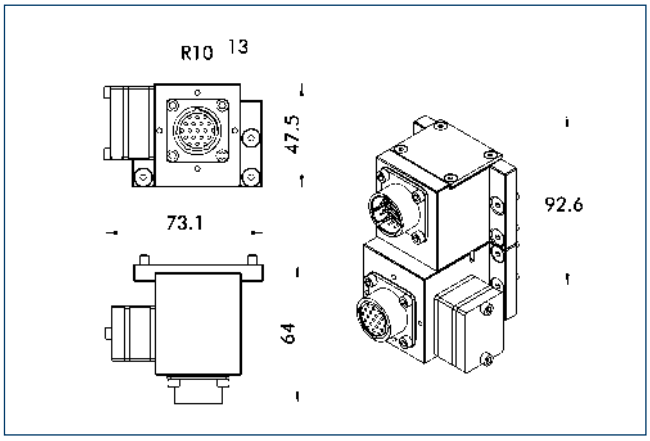
ⓘ Right angled sensor connector is only compatible with the SWS-076 and SWS-110. For the SWS-040Q and the SWS-160 a straight sensor connector is required.

Combination SWO-R19-K and SWO-R14-A



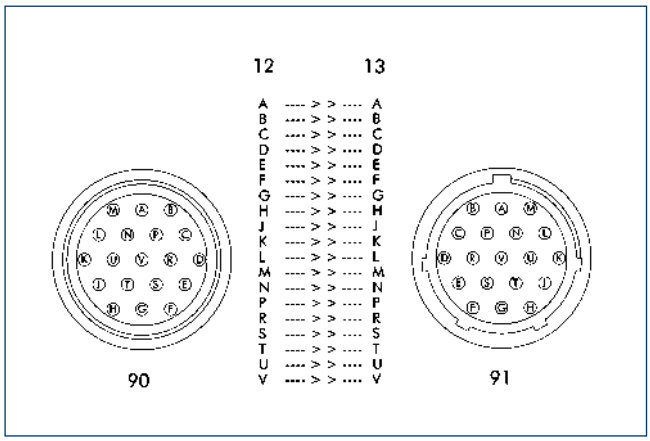
(13) Adapter side

Combination SWO-R19-K and SWO-R10-A



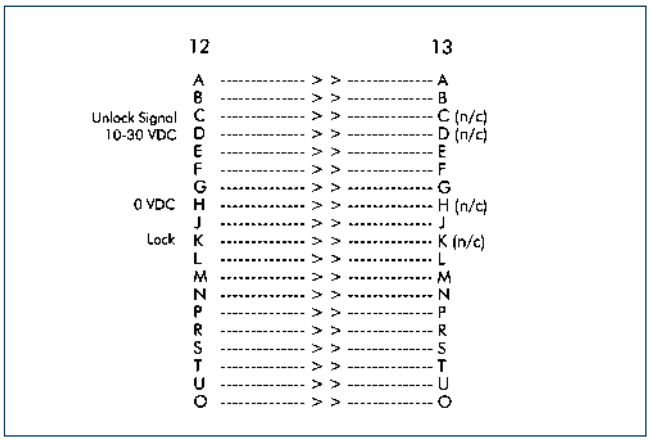
(13) Adapter side

Pin layout for SWO-R19-K with SWO-R19-A



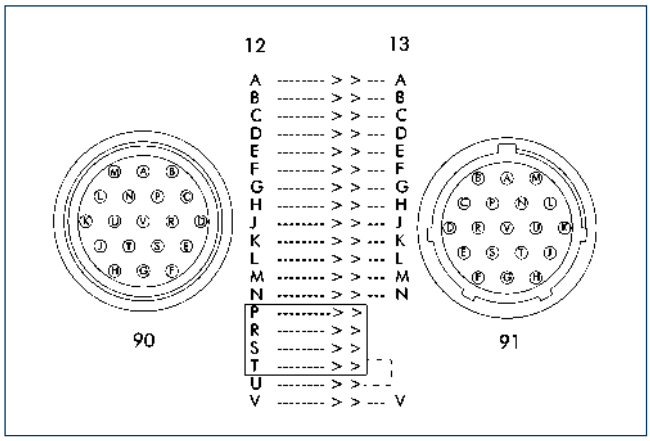
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-R19W/R with SWO-R19-A



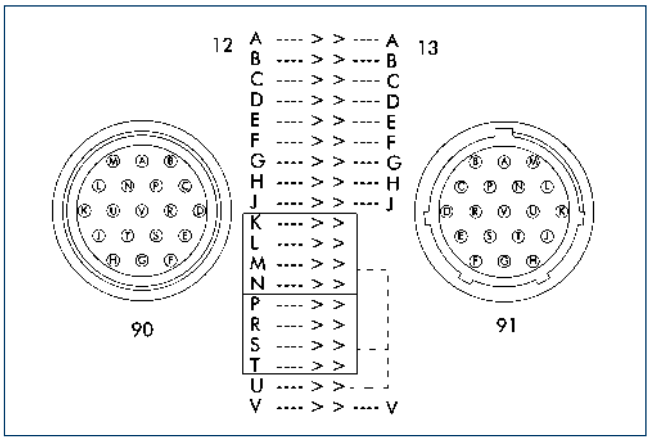
(12) Head side
(13) Adapter side

Pin layout for SWO-R19-K with SWO-R14-A



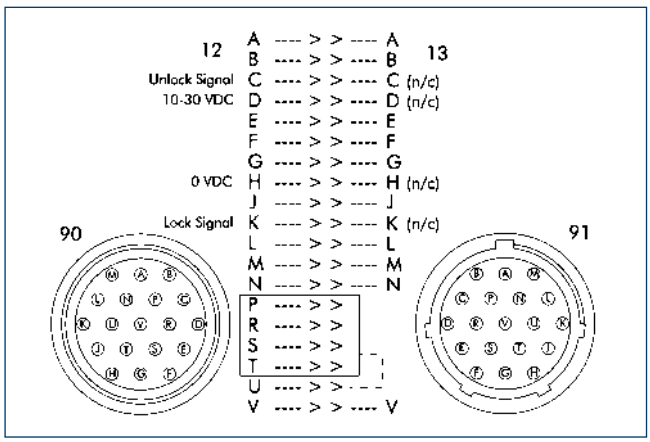
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-R19-K with SWO-R10-A



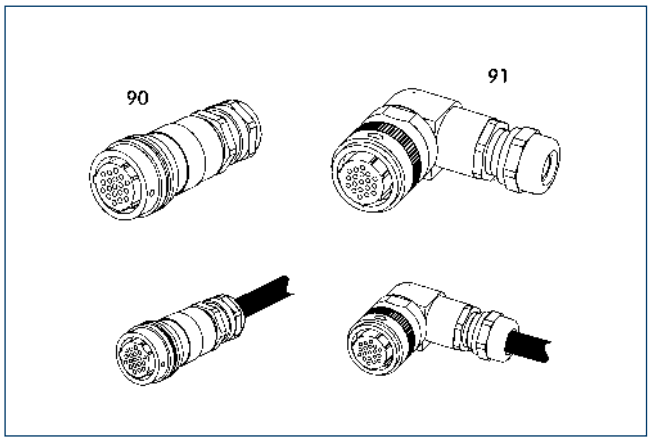
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-R19W/R-K with SWO-R14-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-3-SWK-19B-90	0302179	3 m
KV-5-SWK-19B-90	0302190	5 m
Angled cable connector, robot-side		
KAS-19B-K-90-C	0301294	
Angled cable connector, tool-side		
KAS-19B-A-90-C	0301295	
Angled cable connector with cable, tool-side		
KV-3-SWA-19B-90	0302191	3 m
Straight cable connector, robot-side		
KAS-19B-K-0-C	0301283	
Straight cable connector, tool-side		
KAS-19B-A-0-C	0301284	
Straight cable connector with cable, robot-side		
KV-3-SWK-19B-0	0302176	3 m
KV-5-SWK-19B-0	0302177	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19B-0	0302178	3 m

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

SWO-E RF19

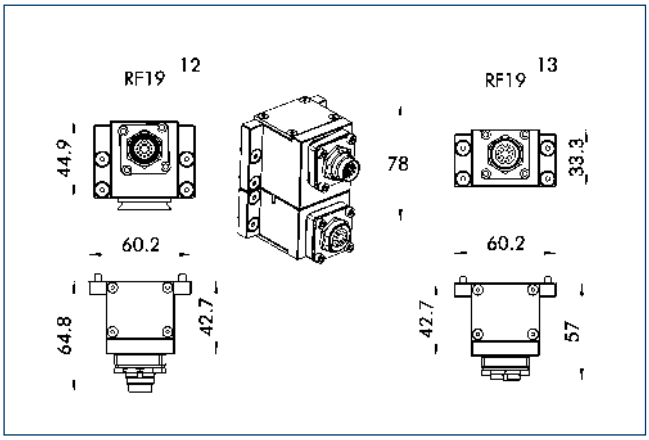
Robot Accessories | Changing | Electrical Options

Technical data

Description		SWO-RF19-K	SWO-RF19R-K	SWO-RF19W-K	SWO-RF19-A	SWO-RF14-A	SWO-RF10-A
ID		9948654	9949324	9949325	9948657	9961312	9961313
Number of pin contacts		19	15	15	19	14	10
max. power supply	[A]	3	3	3	3	3	3
max. voltage	[V AC]	125	125	125	125	125	125
Number of encodable tools						0-9	0-99
Number of integrated sensor connections			2	2			
Connection		Threaded connector M16	Threaded connector M16	Threaded connector M16	Threaded connector M16	Threaded connector M16	Threaded connector M16

ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

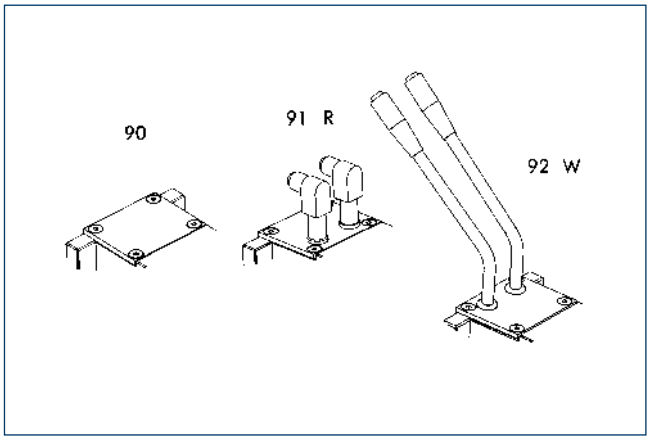
Combination SWO-RF19-K and SWO-RF19-A



(12) Head side

(13) Adapter side

Connection versions E-module, head side



(90) No direct sensor connection provided

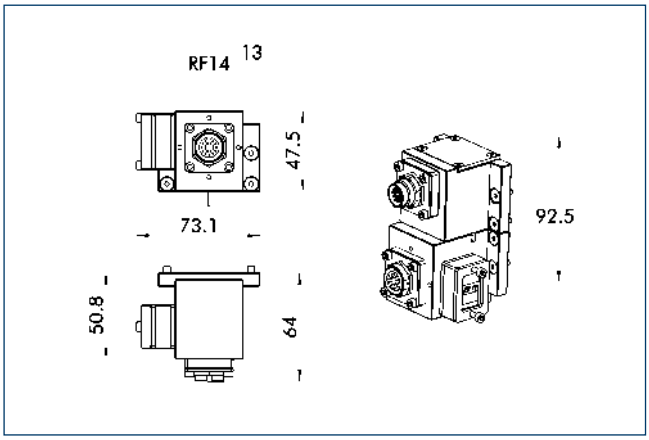
(91) Direct, right-angled sensor connection integrated

(92) Direct, straight sensor connection integrated

The illustration shows different possibilities for direct connection of the piston stroke control sensors to the electric module.

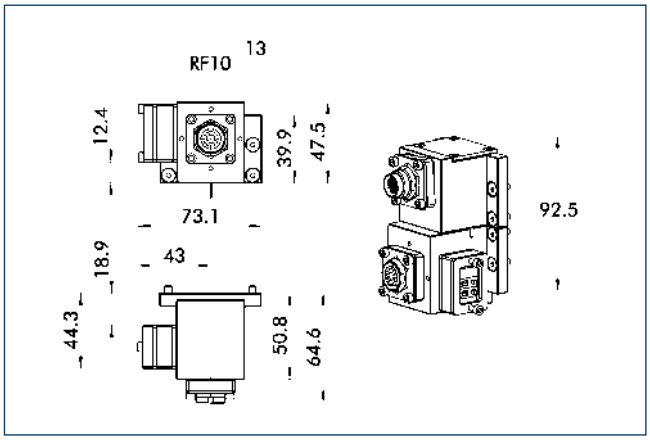
ⓘ Right angled sensor connector is only compatible with the SWS-076 and SWS-110. For the SWS-040Q and the SWS-160 a straight sensor connector is required.

Combination SWO-RF19-K and SWO-RF14-A



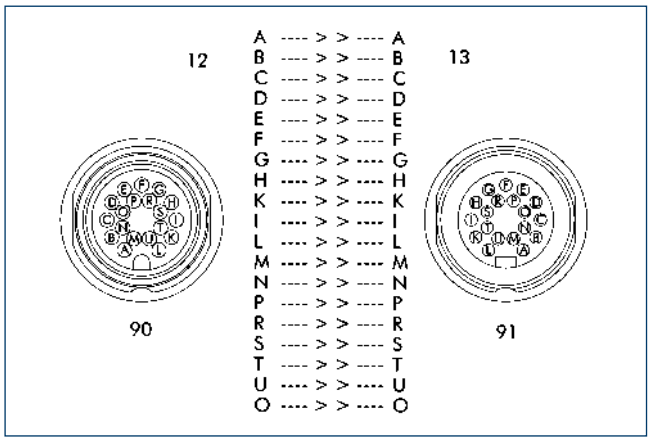
(13) Adapter side

Combination SWO-RF19-K and SWO-RF10-A



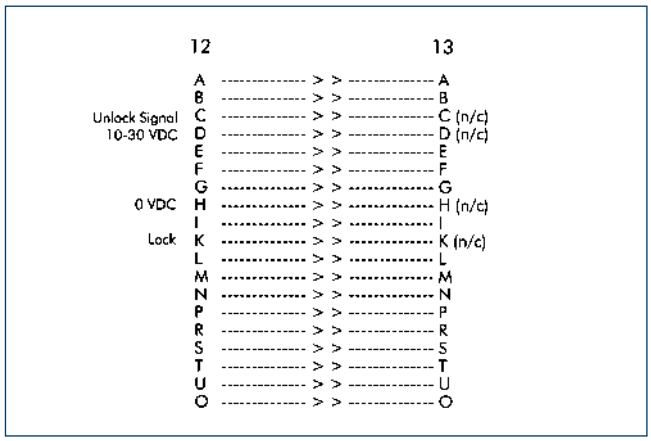
(13) Adapter side

Pin layout for SWO-RF19-K with SWO-RF19-A



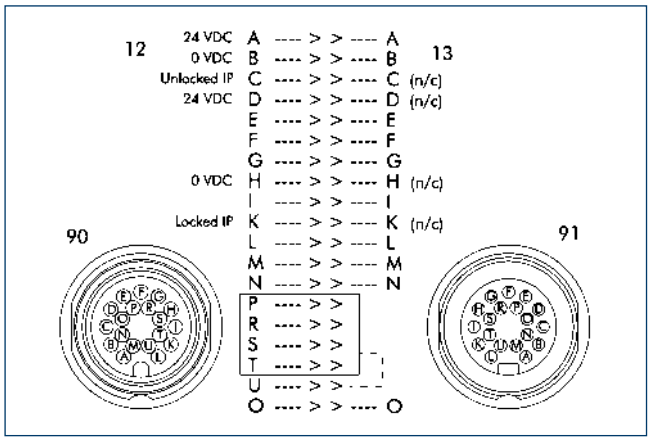
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-RF19W/R-K with SWO-RF19-A



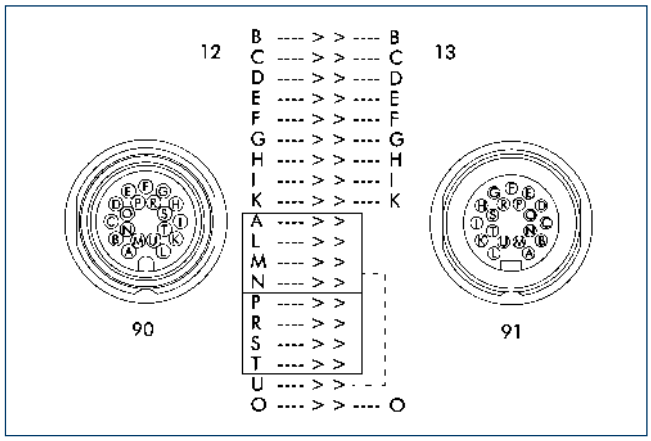
(12) Head side
(13) Adapter side

Pin layout for SWO-RF19W/R-K with SWO-RF14-A



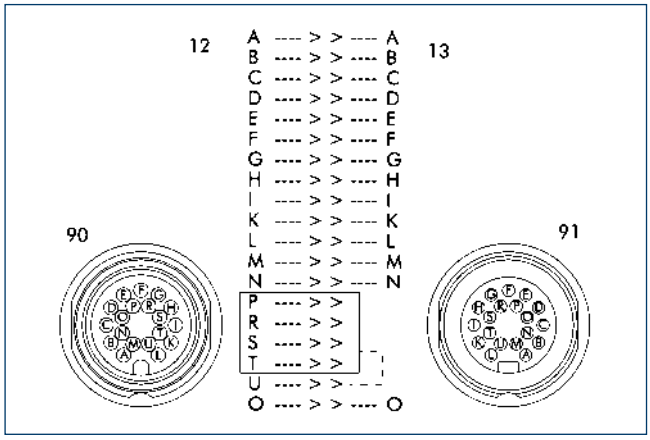
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-RF19-K with SWO-RF10-A



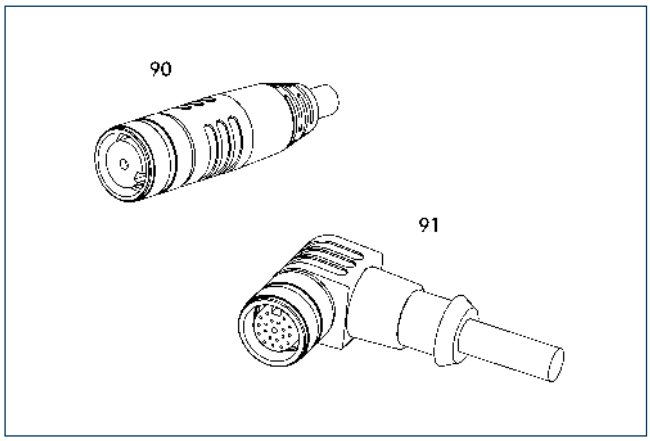
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-RF19-K with SWO-RF14-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector / cable extension



(90) Connection plug / socket straight with extension cable

(91) Connection plug / socket at an angle with extension cable

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-10-SWK-19F-90	0302173	10 m
KV-5-SWK-19F-90	0302172	5 m
Angled cable connector with cable, tool-side		
KV-3-SWA-19F-90	0302175	3 m
Straight cable connector with cable, robot-side		
KV-10-SWK-19F-0	0302171	10 m
KV-5-SWK-19F-0	0302170	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19F-0	0302174	3 m

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

SWO-E R26

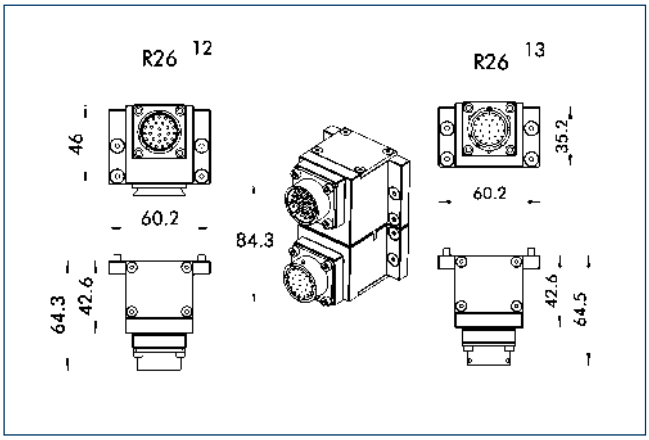
Robot Accessories | Changing | Electrical Options

Technical data

Description		SWO-R26-K	SWO-R26R-K	SWO-R26W-K	SWO-R26-A	SWO-R21-A	SWO-R17-A
ID		9935819	9949320	9942076	9935820	9799841	9941386
Number of pin contacts		26	21	21	26	21	17
max. power supply	[A]	3	3	3	3	3	3
max. voltage	[V AC]	250	250	250	250	250	250
Number of encodable tools						0-9	0-99
Number of integrated sensor connections			2	2			
Connection		Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock

ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

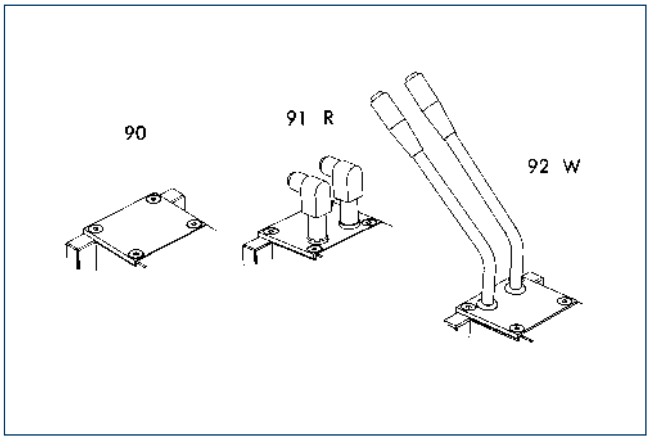
Combination SWO-R26-K and SWO-R26-A



(12) Head side

(13) Adapter side

Connection versions E-module, head side



(90) No direct sensor connection provided

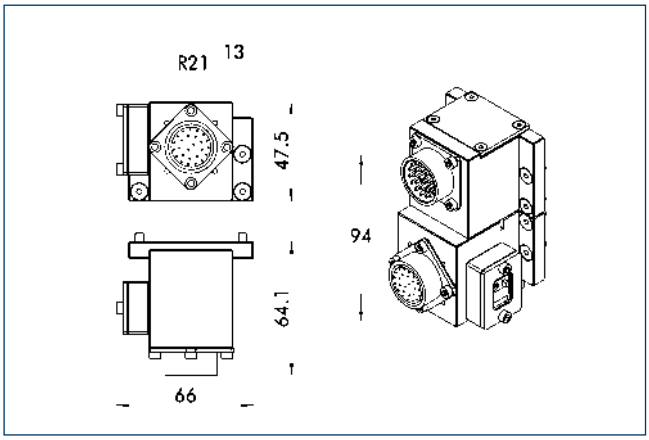
(91) Direct, right-angled sensor connection integrated

(92) Direct, straight sensor connection integrated

The illustration shows different possibilities for direct connection of the piston stroke control sensors to the electric module.

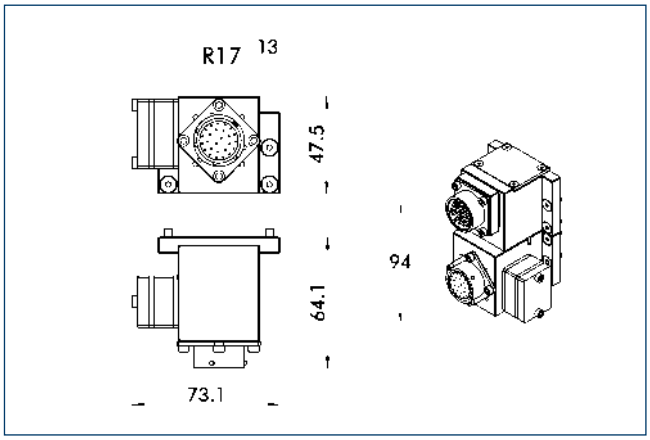
ⓘ Right angled sensor connector is only compatible with the SWS-076 and SWS-110. For the SWS-040Q and the SWS-160 a straight sensor connector is required.

Combination SWO-R26-K and SWO-R21-A



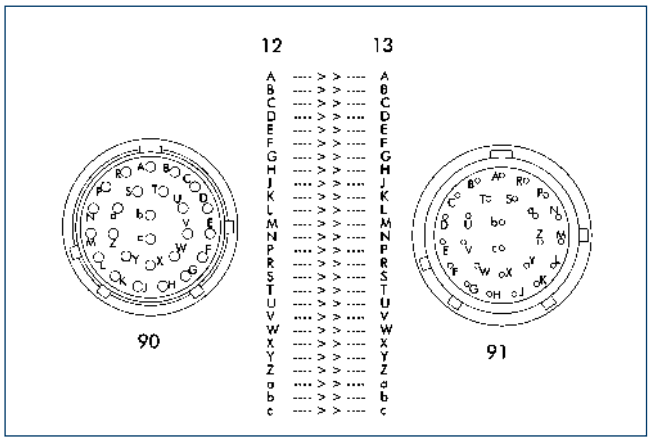
(13) Adapter side

Combination SWO-R26-K and SWO-R17-A



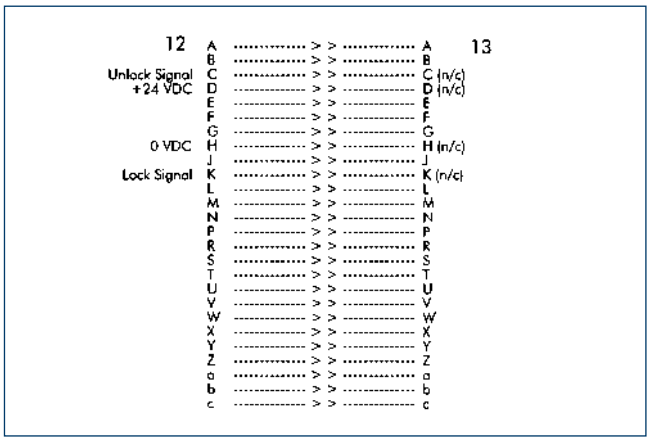
(13) Adapter side

Pin layout for SW0-R26-K with SW0-R26-A



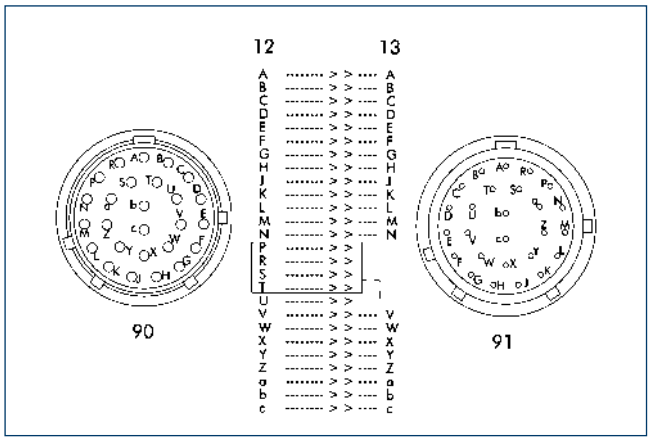
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SW0-R26W/R-K with SW0-R26-A



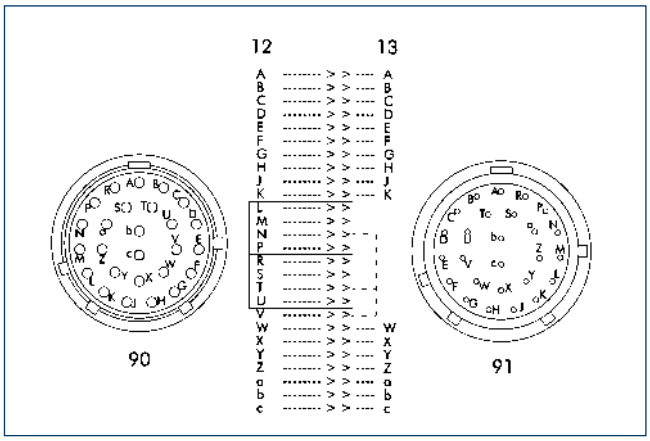
(12) Head side
(13) Adapter side

Pin layout for SW0-R26-K with SW0-R21-A



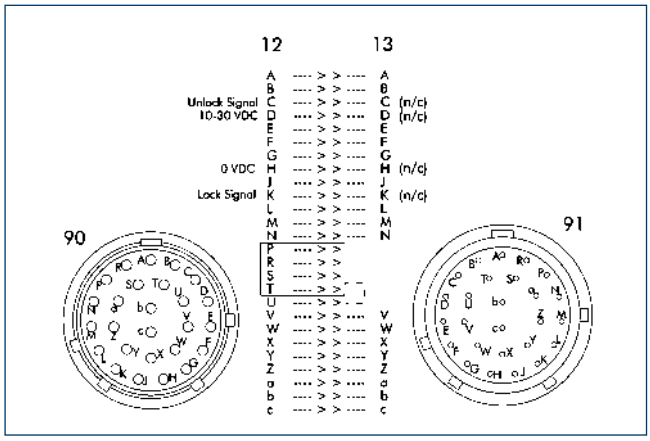
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SW0-R26-K with SW0-R17-A



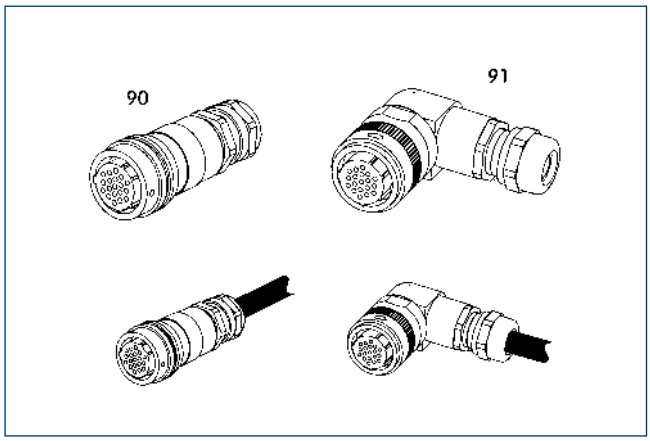
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SW0-R26W/R-K with SW0-R21-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-3-SWK-26B-90	0302185	3 m
KV-5-SWK-26B-90	0302186	5 m
Angled cable connector, robot-side		
KAS-26B-K-90-C	0301296	
Angled cable connector, tool-side		
KAS-26B-A-90-C	0301297	
Angled cable connector with cable, tool-side		
KV-3-SWA-26B-90	0302187	3 m
Straight cable connector, robot-side		
KAS-26B-K-0-C	0301290	
Straight cable connector, tool-side		
KAS-26B-A-0-C	0301291	
Straight cable connector with cable, robot-side		
KV-3-SWK-26B-0	0302192	3 m
KV-5-SWK-26B-0	0302193	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-26B-0	0302184	3 m

Please note that these cable extensions only have 25 pins available.
Pin A is not connected.

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

SWO-E R32

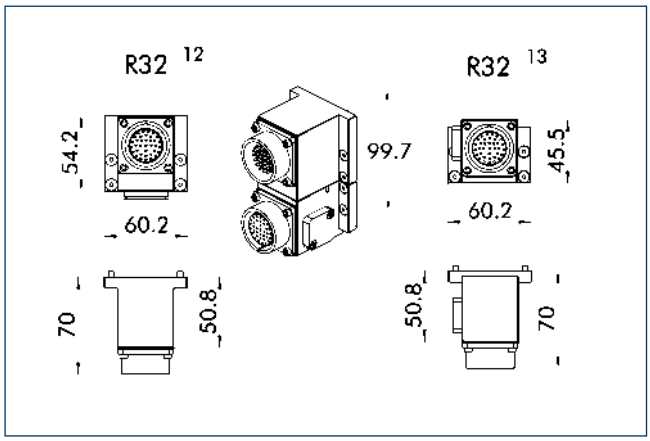
Robot Accessories | Changing | Electrical Options

Technical data

Description		SWO-R32-K	SWO-R32R-K	SWO-R32W-K	SWO-R32-A
ID		9941387	9948853	9942418	9941388
Number of pin contacts		32	32	32	32
max. power supply	[A]	3	3	3	3
max. voltage	[V AC]	250	250	250	250
Number of integrated sensor connections			2	2	
Connection		Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock

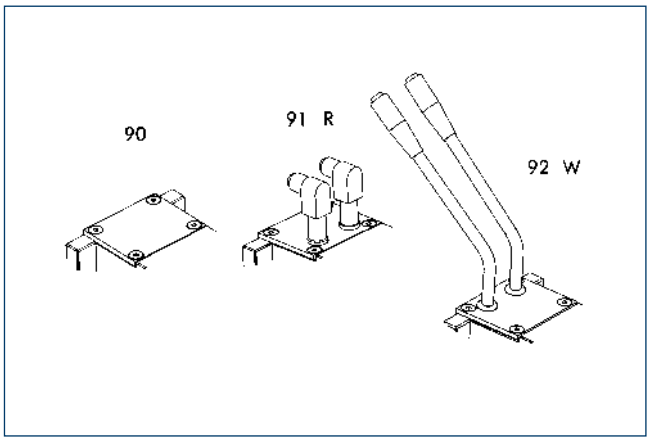
ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

Combination SWO-R32-A and SWO-R32-A



(12) Head side
(13) Adapter side

Connection versions E-module, head side

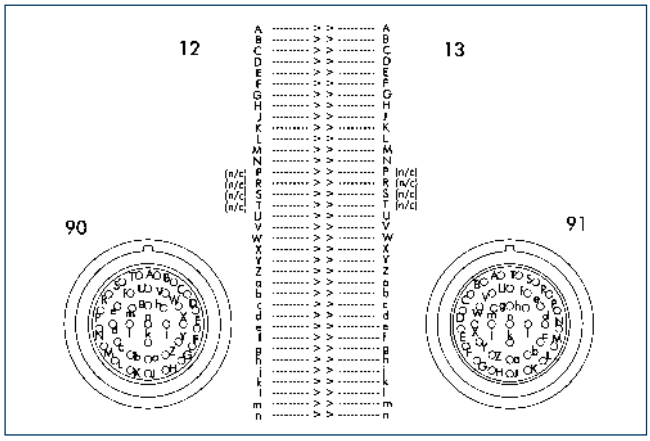


(90) No direct sensor connection provided
(91) Direct, right-angled sensor connection integrated
(92) Direct, straight sensor connection integrated

The illustration shows different possibilities for direct connection of the piston stroke control sensors to the electric module.

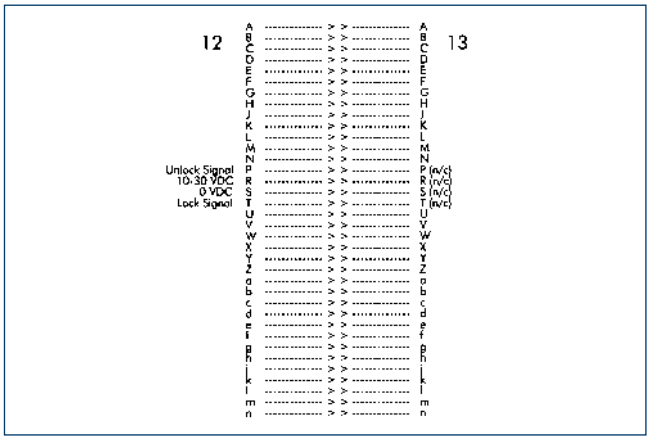
ⓘ Right angled sensor connector is only compatible with the SWS-076 and SWS-110. For the SWS-040Q and the SWS-160 a straight sensor connector is required.

Pin layout for SWO-R32-K with SWO-R32-A



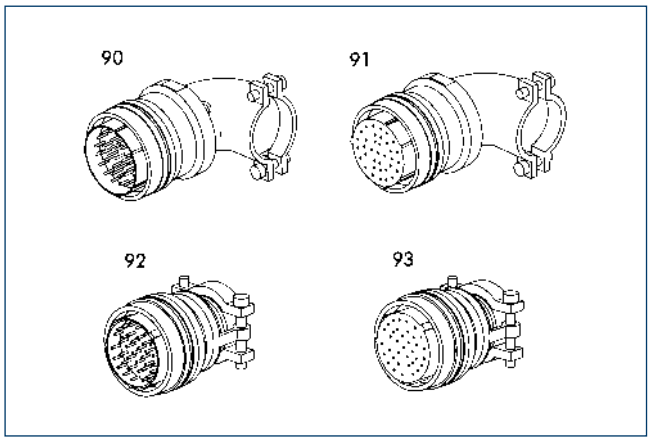
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-R32R/W-K with SWO-R32-A



(12) Head side
(13) Adapter side

Cable connector



90 Angled plug
91 Angled socket
92 Straight plug
93 Straight socket

Description	ID	
Angled cable connector, robot-side		
KAS-36B-K-90	0301274	
Angled cable connector, tool-side		
KAS-36B-A-90	0301275	
Straight cable connector, robot-side		
KAS-36B-K-0	0301272	
Straight cable connector, tool-side		
KAS-36B-A-0	0301273	

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

SWO-E S19

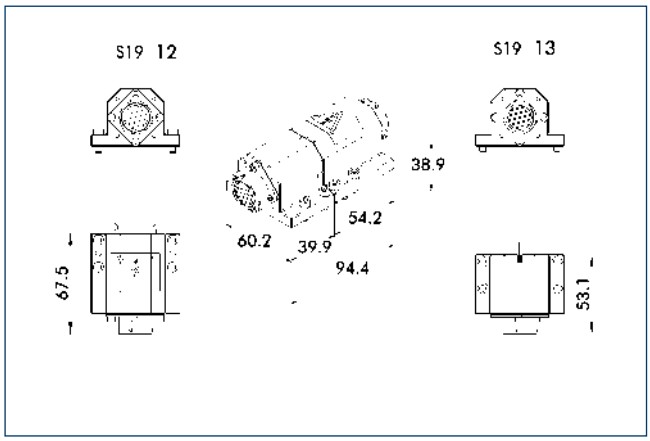
Robot Accessories | Changing | Electrical Options

Technical data

Description		SWO-S19-K	SWO-S19R-K	SWO-S19W-K	SWO-S19-A	SWO-S14-A	SWO-S10-A
ID		9935817	9949326	9949327	9935818	9937330	9951124
Number of pin contacts		19	15	15	19	14	10
max. power supply	[A]	5	5	5	5	5	5
max. voltage	[V AC]	250	250	250	250	250	250
Number of encodable tools						0-9	0-99
Number of integrated sensor connections			2	2			
Connection		Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock

ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

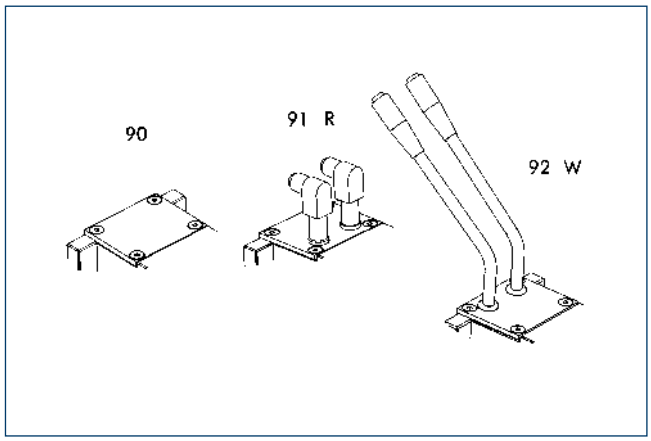
Combination SWO-S19-K and SWO-S19-A



(12) Head side

(13) Adapter side

Connection versions E-module, head side



(90) No direct sensor connection provided

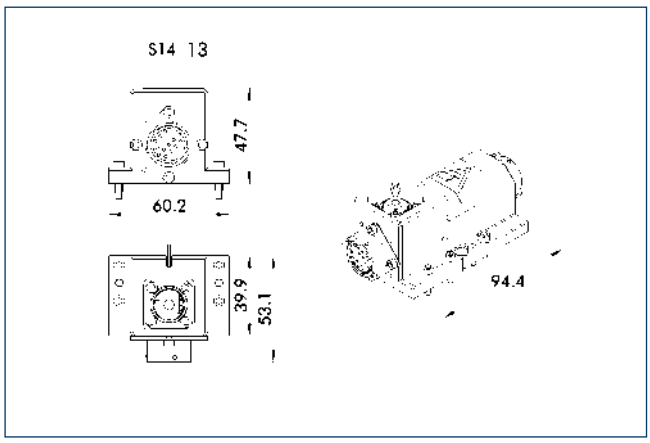
(91) Direct, right-angled sensor connection integrated

(92) Direct, straight sensor connection integrated

The illustration shows different possibilities for direct connection of the piston stroke control sensors to the electric module.

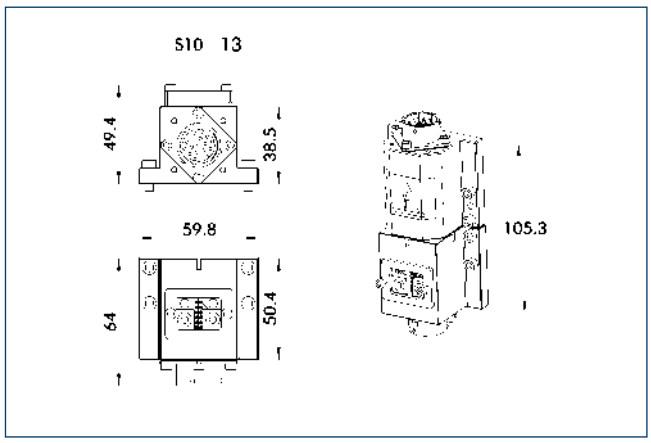
ⓘ Right angled sensor connector is only compatible with the SWS-076 and SWS-110. For the SWS-040Q and the SWS-160 a straight sensor connector is required.

Combination SWO-S19-K and SWO-S14-A



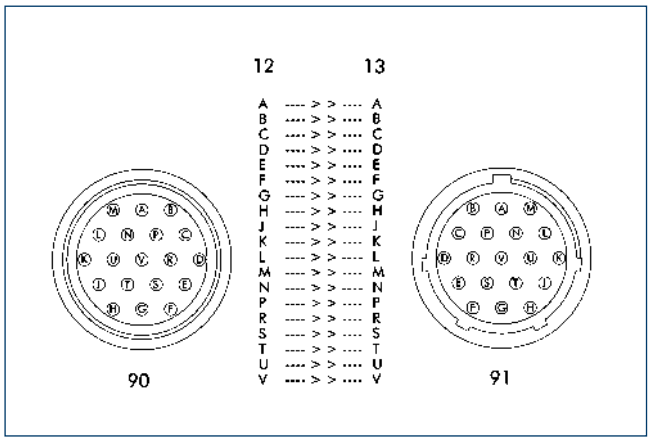
(13) Adapter side

Combination SWO-S19-K and SWO-S10-A



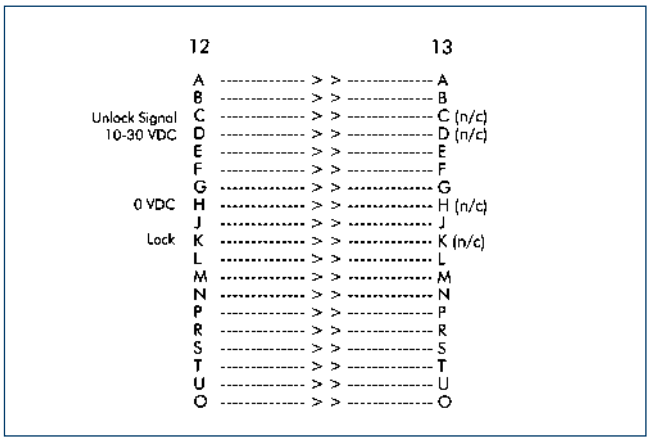
(13) Adapter side

Pin layout for SWO-S19-K with SWO-S19-A



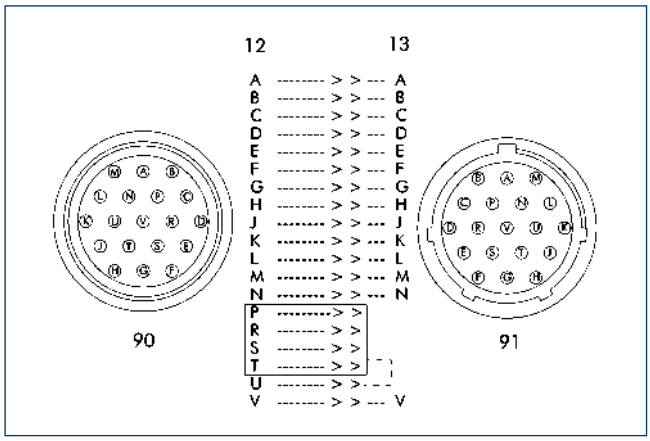
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-S19W/R-K with SWO-S19-A



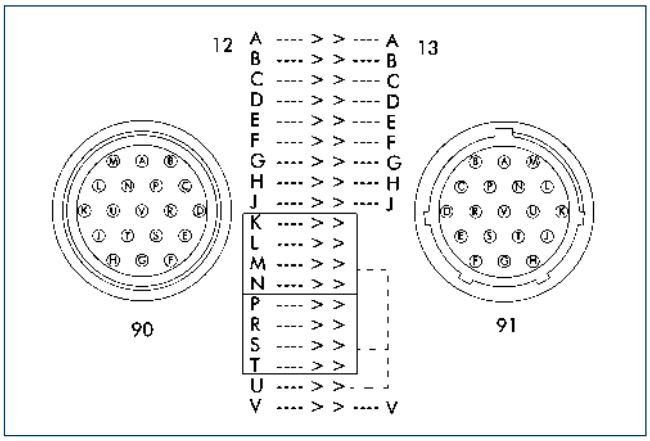
(12) Head side
(13) Adapter side

Pin layout for SWO-S19-K with SWO-S14-A



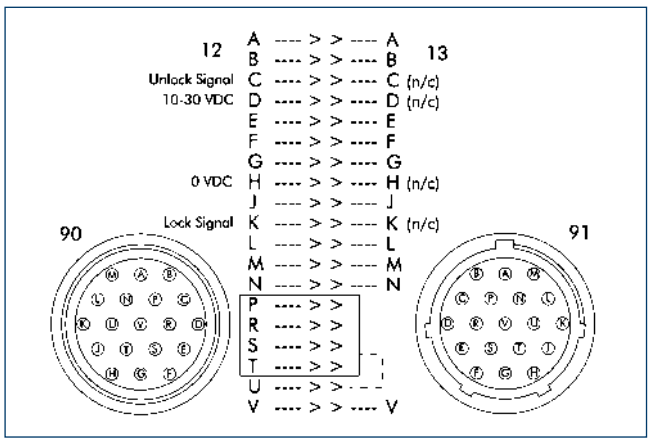
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-S19-K with SWO-S10-A



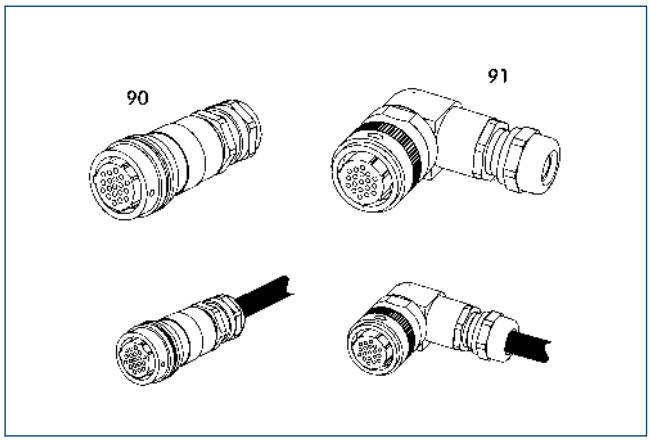
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-S19W/R-K with SWO-S14-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-3-SWK-19B-90	0302179	3 m
KV-5-SWK-19B-90	0302190	5 m
Angled cable connector, robot-side		
KAS-19B-K-90-C	0301294	
Angled cable connector, tool-side		
KAS-19B-A-90-C	0301295	
Angled cable connector with cable, tool-side		
KV-3-SWA-19B-90	0302191	3 m
Straight cable connector, robot-side		
KAS-19B-K-0-C	0301283	
Straight cable connector, tool-side		
KAS-19B-A-0-C	0301284	
Straight cable connector with cable, robot-side		
KV-3-SWK-19B-0	0302176	3 m
KV-5-SWK-19B-0	0302177	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19B-0	0302178	3 m

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

SWO-E S26

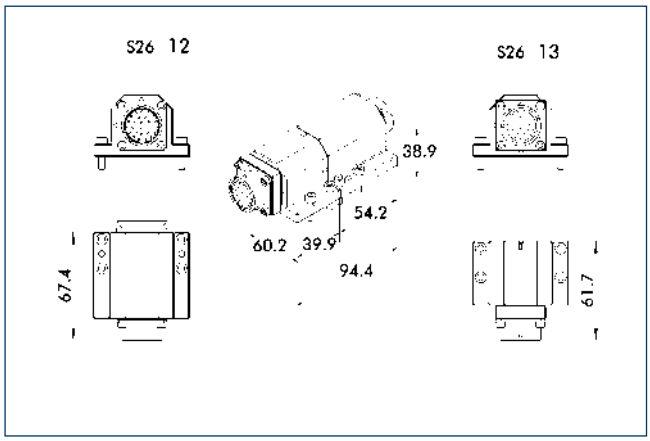
Robot Accessories | Changing | Electrical Options

Technical data

Description		SWO-S26-K	SWO-S26R-K	SWO-S26W-K	SWO-S26-A	SWO-S21-A
ID		9935821	9949328	9949329	9935822	9937331
Number of pin contacts		26	22	22	26	21
max. power supply	[A]	3	3	3	3	3
max. voltage	[V AC]	250	250	250	250	250
Number of encodable tools						0-9
Number of integrated sensor connections			2	2		
Connection		Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock	Bayonet lock

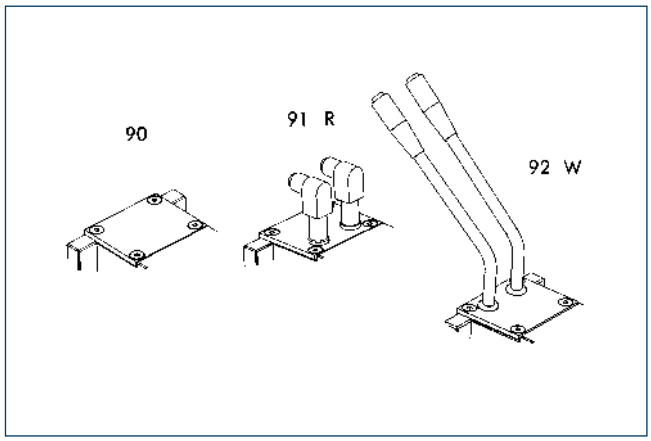
ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

Combination SWO-S26-K and SWO-S26-A



(12) Head side
(13) Adapter side

Connection versions E-module, head side

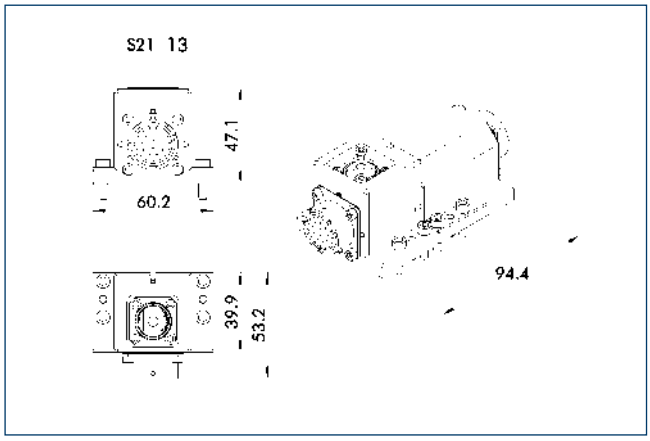


(90) No direct sensor connection provided
(91) Direct, right-angled sensor connection integrated
(92) Direct, straight sensor connection integrated

The illustration shows different possibilities for direct connection of the piston stroke control sensors to the electric module.

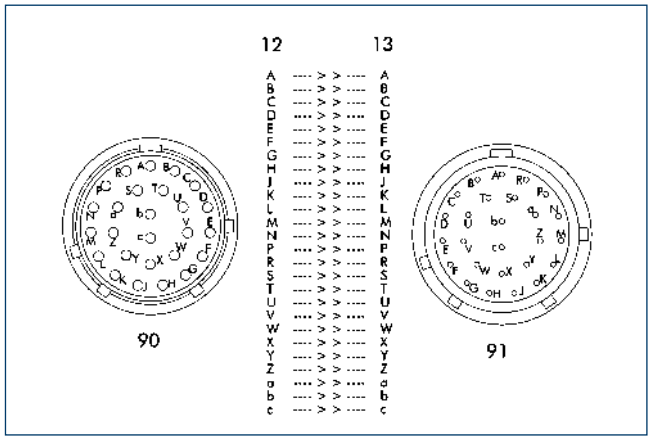
ⓘ Right angled sensor connector is only compatible with the SWS-076 and SWS-110. For the SWS-040Q and the SWS-160 a straight sensor connector is required.

Combination SWO-S26-K and SWO-S21-A



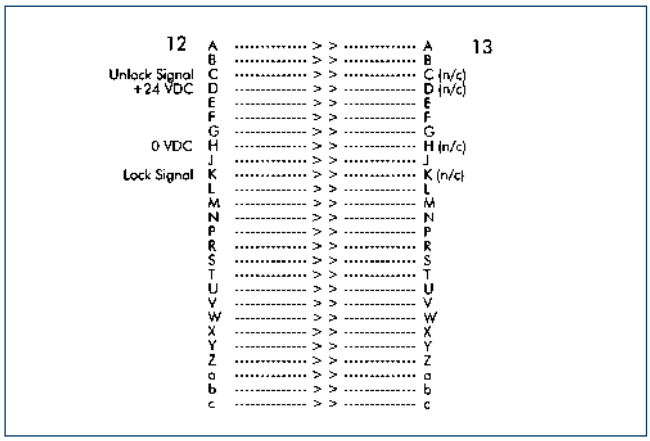
(13) Adapter side

Pin layout for SWO-S26-K with SWO-S26-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

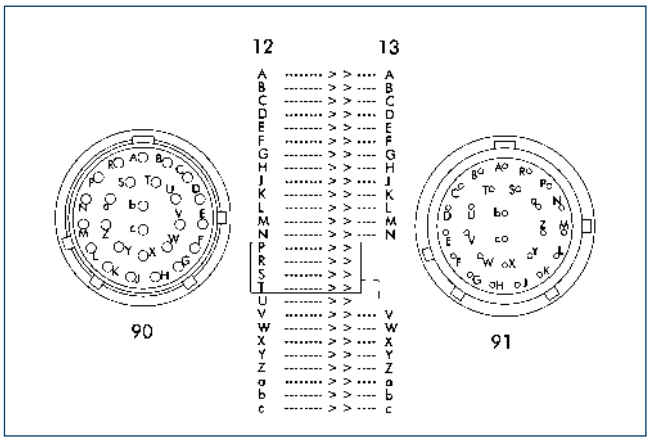
Pin layout for SWO-S26W/R-K with SWO-S26-A



(12) Head side

(13) Adapter side

Pin layout for SWO-S26-K with SWO-S21-A



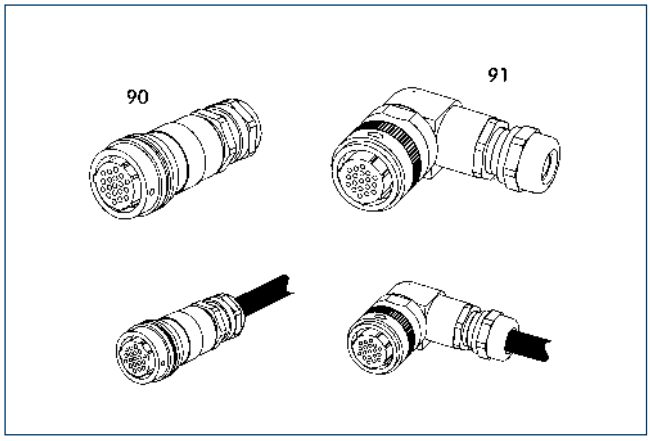
(12) Head side

(13) Adapter side

(90) Plug connection

(91) Socket connection

Cable connector / cable extension



(90) Connection plug / socket straight

(91) Connection plug / socket at an angle

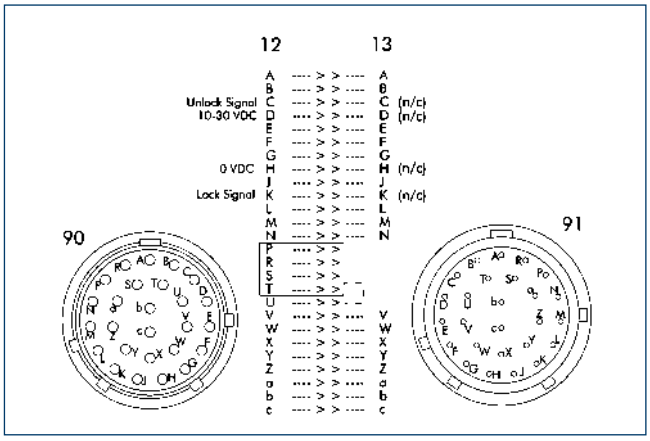
Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-3-SWK-26B-90	0302185	3 m
KV-5-SWK-26B-90	0302186	5 m
Angled cable connector, robot-side		
KAS-26B-K-90-C	0301296	
Angled cable connector, tool-side		
KAS-26B-A-90-C	0301297	
Angled cable connector with cable, tool-side		
KV-3-SWA-26B-90	0302187	3 m
Straight cable connector, robot-side		
KAS-26B-K-0-C	0301290	
Straight cable connector, tool-side		
KAS-26B-A-0-C	0301291	
Straight cable connector with cable, robot-side		
KV-3-SWK-26B-0	0302182	3 m
KV-5-SWK-26B-0	0302183	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-26B-0	0302184	3 m

Please note that these cable extensions only have 25 pins available.
Pin A is not connected.

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

Pin layout for SWO-S26W/R-K with SWO-S21-A



(12) Kopfseite

(13) Adapterseite

(90) Steckeranschluss

(91) Buchsenanschluss

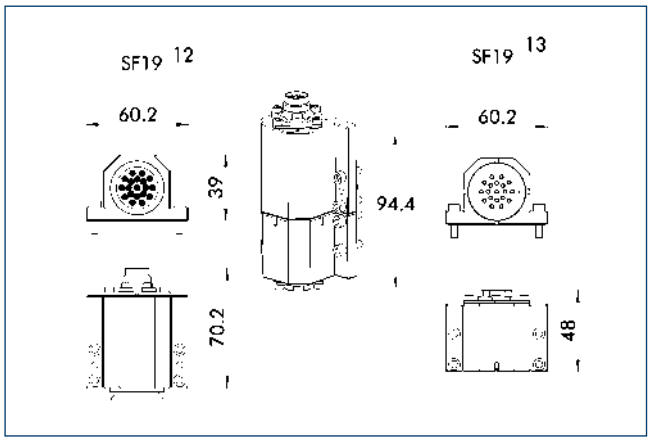
SWO-E SF19

Technical data

Description		SWO-SF19-K	SWO-SF19-A
ID		9948656	9948659
Number of pin contacts		19	19
max. power supply	[A]	3	3
max. voltage	[V AC]	125	125
Connection		Threaded connector M16	Threaded connector M16

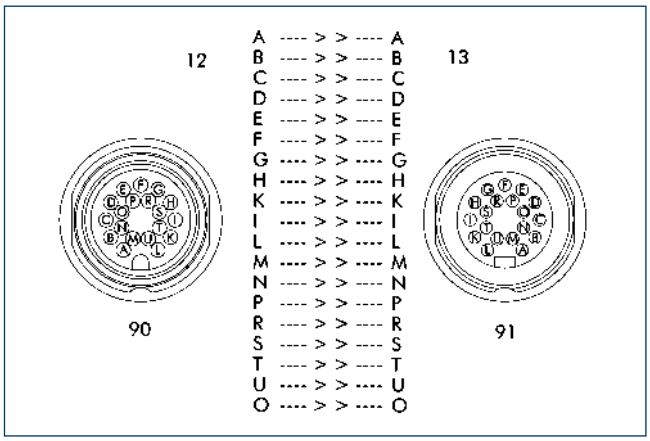
ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

Combination SWO-SF19-K and SWO-SF19-A



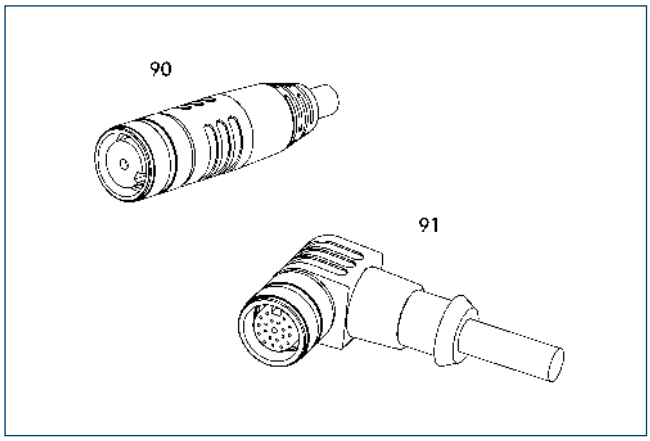
12 Head side
13 Adapter side

Pin layout for SWO-SF19-K with SWO-SF19-A



12 Head side
13 Adapter side
90 Plug connection
91 Socket connection

Cable connector / cable extension



90 Connection plug / socket straight with extension cable
91 Connection plug / socket at an angle with extension cable

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-10-SWK-19F-90	0302173	10 m
KV-5-SWK-19F-90	0302172	5 m
Angled cable connector with cable, tool-side		
KV-3-SWA-19F-90	0302175	3 m
Straight cable connector with cable, robot-side		
KV-10-SWK-19F-0	0302171	10 m
KV-5-SWK-19F-0	0302170	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19F-0	0302174	3 m

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

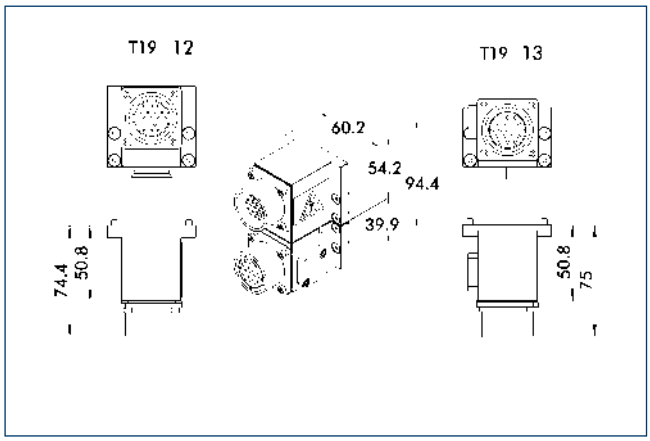
SWO-E T19

Technical data

Description		SWO-T19-K	SWO-T19R-K	SWO-T19W-K	SWO-T19-A	SWO-T14-A	SWO-T10-A
ID		9935823	9949331	9949332	9935824	9937332	9949330
Number of pin contacts		19	15	15	19	14	10
max. power supply	[A]	5	5	5	5	5	5
max. voltage	[V AC]	250	250	250	250	250	250
Number of encodable tools						0-9	0-99
Number of integrated sensor connections			2	2			
Connection		Amphenol MS Threaded connector	Amphenol MS Threaded connector	Amphenol MS Threaded connector	Amphenol MS Threaded connector	Amphenol MS Threaded connector	Amphenol MS Threaded connector

ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

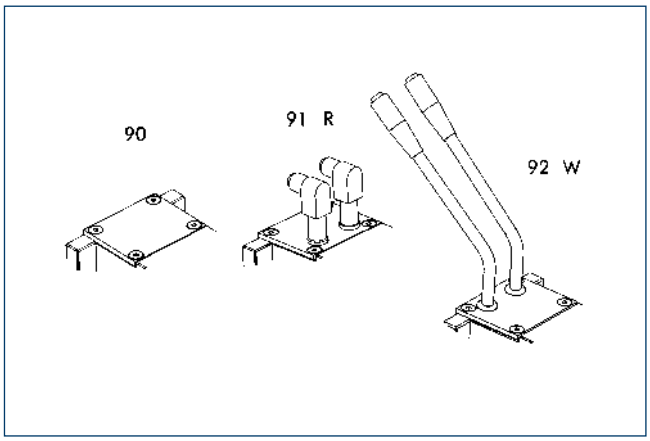
Combination SWO-T19-K and SWO-T19-A



(12) Head side

(13) Adapter side

Connection versions E-module, head side



(90) No direct sensor connection provided

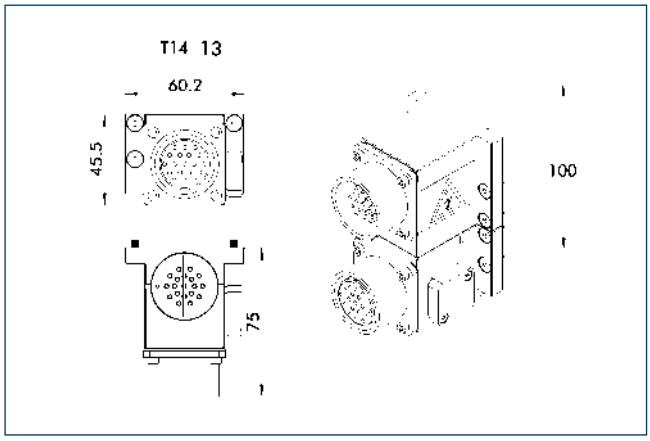
(91) Direct, right-angled sensor connection integrated

(92) Direct, straight sensor connection integrated

The illustration shows different possibilities for direct connection of the piston stroke control sensors to the electric module.

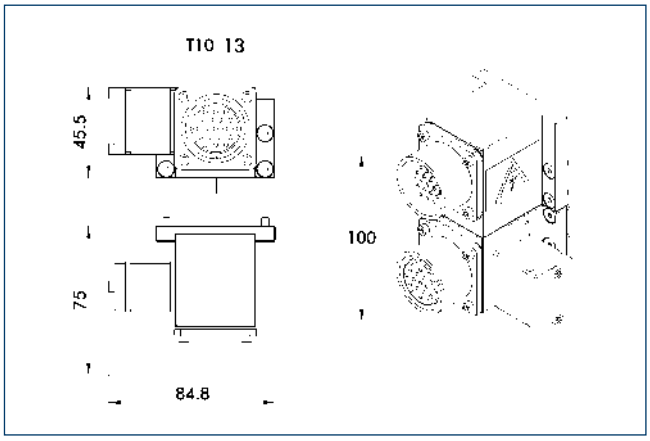
ⓘ Right angled sensor connector is only compatible with the SWS-076 and SWS-110. For the SWS-040Q and the SWS-160 a straight sensor connector is required.

Combination SWO-T19-K and SWO-T14-A



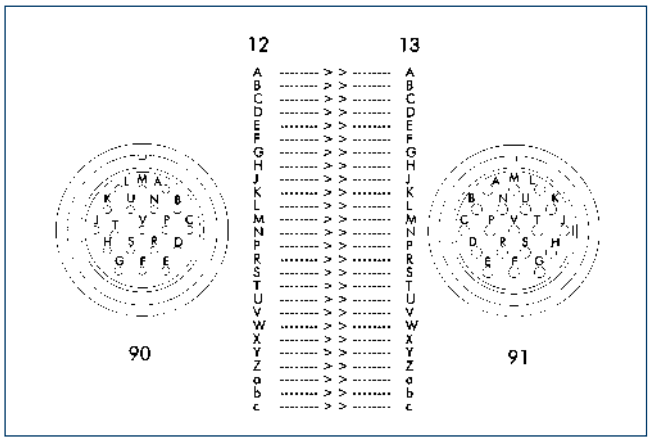
(13) Adapter side

Combination SWO-T19-K and SWO-T10-A



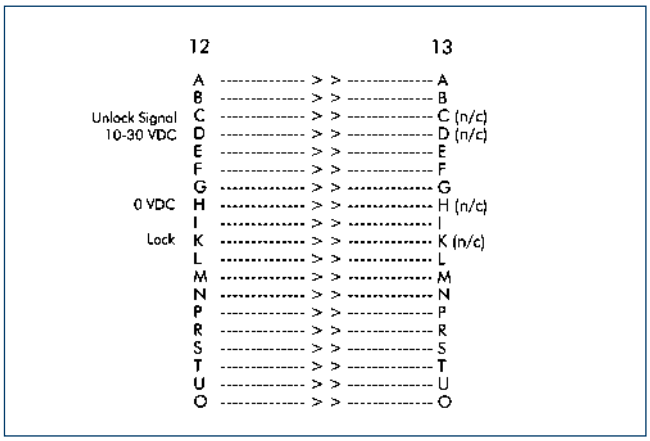
(13) Adapter side

Pin layout for SWO-T19-K with SWO-T19-A



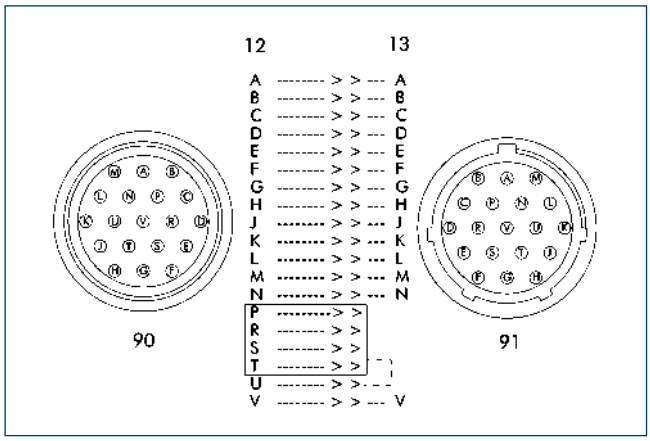
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-T19W/R-K with SWO-T19-A



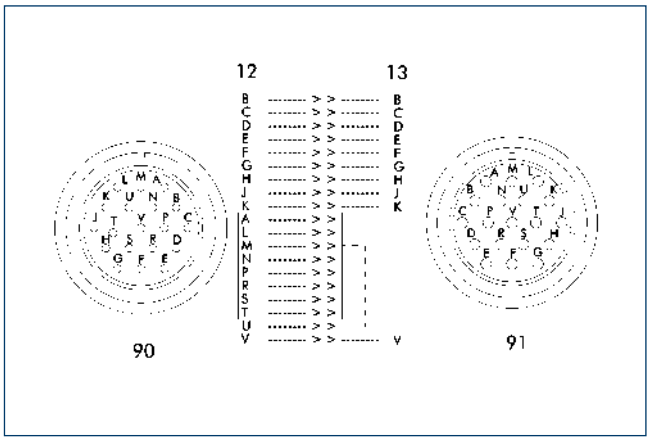
(12) Head side
(13) Adapter side

Pin layout for SWO-T19-K with SWO-T14-A



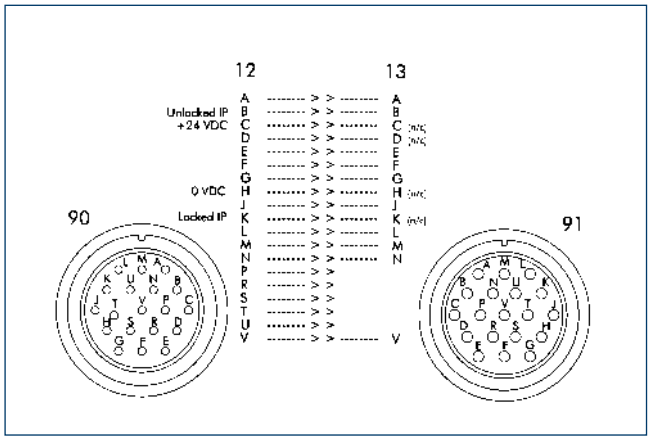
(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-T19-K with SWO-T10-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

Pin layout for SWO-T19W/R-K with SWO-T14-A



(12) Head side
(13) Adapter side
(90) Plug connection
(91) Socket connection

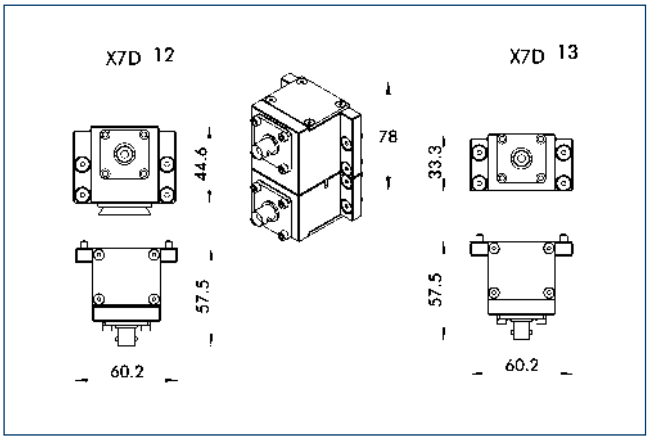
SWO-E X7D

Technical data

Description		SWO-X7D-K	SWO-X7D-A
ID		9961320	9961321
Number of pin contacts		1	1
max. power supply	[A]	5	5
max. voltage	[V AC]	500	500

ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

Combination SWO-X7D-K and SWO-X7D-A



(12) Head side (13) Adapter side

The X7D is a coax power module with a BNC plug.

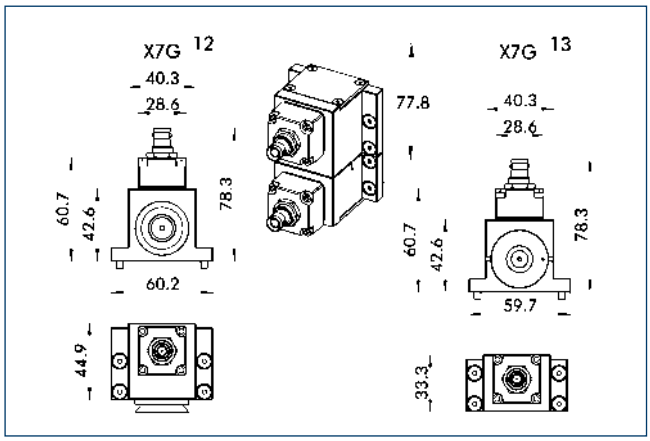
SWO-E X7G

Technical data

Description		SWO-X7G-K	SWO-X7G-A
ID		9958865	9958866
Number of pin contacts		1	1
max. power supply	[A]	3	3
max. voltage	[V AC]	2000	2000

ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300, HWS-100, HWS-125

Combination SWO-X7G-K and SWO-X7G-A



(12) Head side (13) Adapter side

The X7G is a high-voltage module for ultrasonic welding.

SWO-P

Robot Accessories | Changing | Pneumatic Options

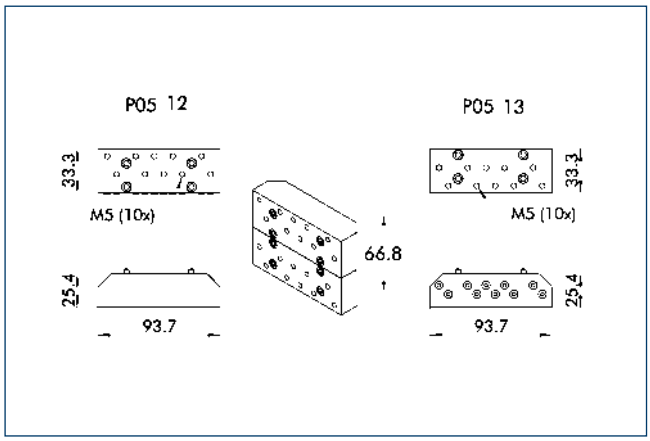
Technical data

Description		SWO-P05-K	SWO-P14-K	SWO-P18-K	SWO-P186-K	SWO-P186A-K	SWO-P238-K
ID		9936895	9935830	9935826	9939024	9948321	9940578
Air connection to screw-on surface		radial	radial	radial	radial	axial	radial
Suitable adapter		SWO-P05-A	SWO-P14-A	SWO-P18-A	SWO-P186-A	SWO-P186A-A	SWO-P238-A
ID		9936896	9935825	9935827	9939025	9948322	9940580
Number of fluid feed-throughs		10	2	4	6	6	2
Connection feed-throughs		M5	G1/4“	G1/8“	G1/8“	G1/8“	G3/8“
Rate of flow at 6 bar (per channel)	[l/min]	250	1050	650	650	650	2450
max. pressure	[bar]	8	8	8	8	8	8

Description		SWO-P38-K	SWO-P38A-K	SWO-P48-K
ID		9935828	9937842	9961330
Air connection to screw-on surface		radial	axial	radial
Suitable adapter		SWO-P38-A	SWO-P38A-A	SWO-P48-A
ID		9935829	9937843	9961331
Number of fluid feed-throughs		4	4	4
Connection feed-throughs		G3/8“	G3/8“	G3/8“
Rate of flow at 6 bar (per channel)	[l/min]	2450	2450	2450
max. pressure	[bar]	8	8	8

ⓘ Compatible with sizes: SWS-040, SWS-041, SWS-071, SWS-076, SWS-110, SWS-160, SWS-300

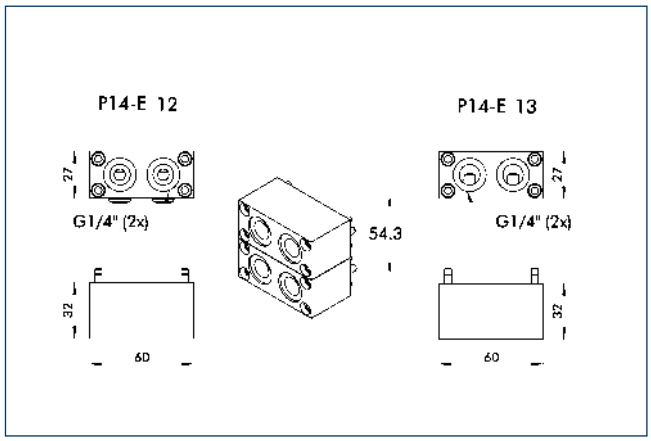
Combination SWO-P05-K and SWO-P05-A



(12) Head side (13) Adapter side

Air connection radial to screw-on surface

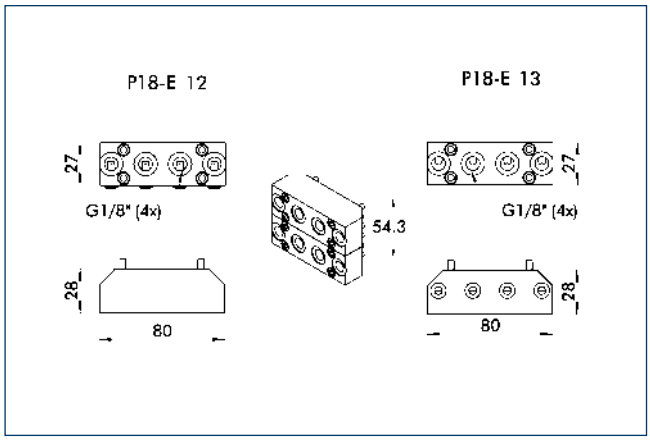
Combination SWO-P14-K and SWO-P14-A



(12) Head side (13) Adapter side

Air connection radial to screw-on surface

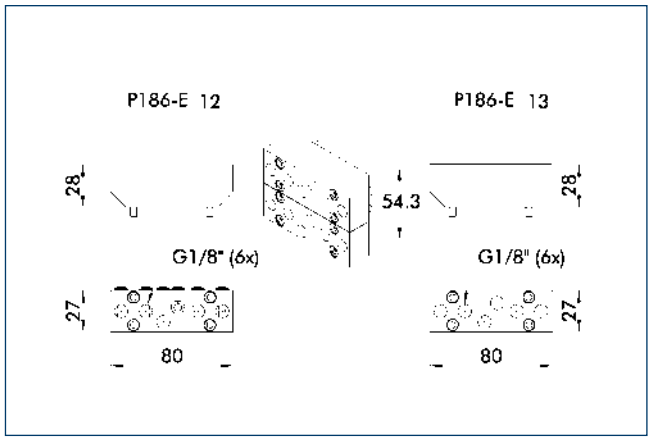
Combination SWO-P18-K and SWO-P18-A



(12) Head side (13) Adapter side

Air connection radial to screw-on surface

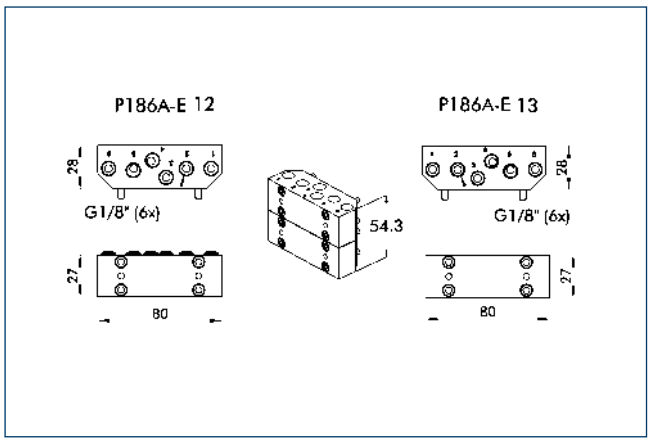
Combination SWO-P186-K and SWO-P186-A



(12) Head side (13) Adapter side

Air connection radial to screw-on surface

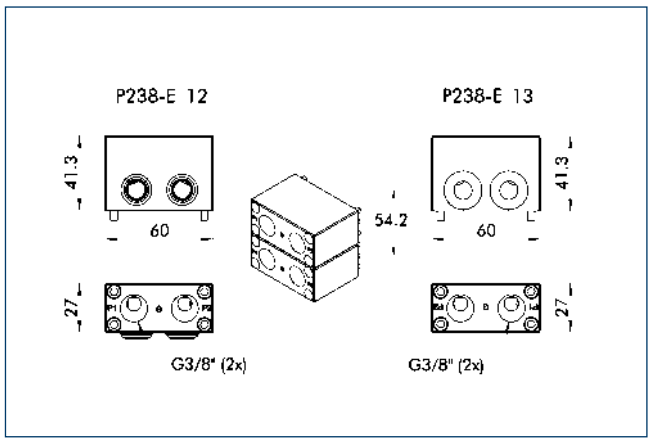
Combination SWO-P186A-K and SWO-P186A-A



(12) Head side (13) Adapter side

Air connection axial to screw-on surface

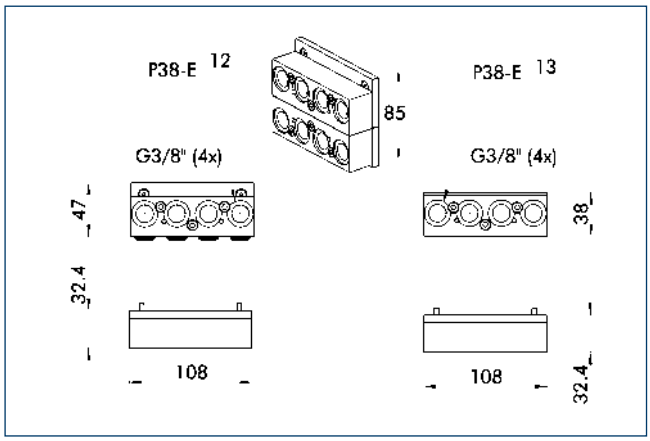
Combination SWO-P238-K and SWO-P238-A



(12) Head side (13) Adapter side

Air connection radial to screw-on surface

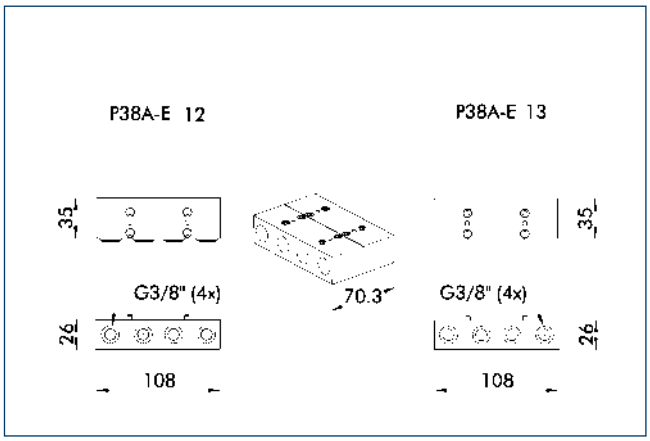
Combination SWO-P38-K and SWO-P38-A



(12) Head side (13) Adapter side

Air connection radial to screw-on surface

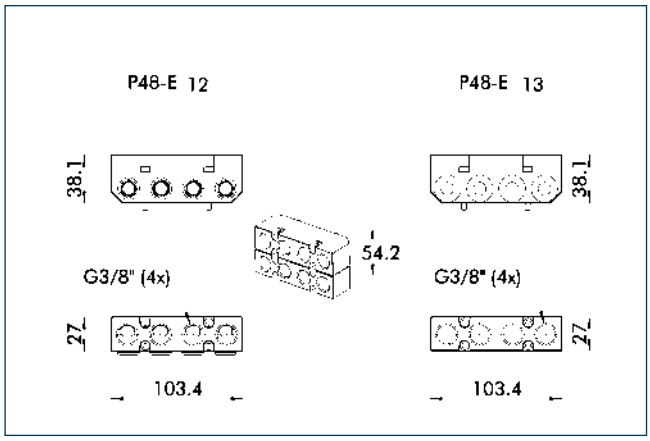
Combination SWO-P38A-K and SWO-P38A-A



(12) Head side (13) Adapter side

Air connection axial to screw-on surface

Combination SWO-P48-K and SWO-P48-A



(12) Head side (13) Adapter side

Air connection radial to screw-on surface

Modular. Flexible. Stable.
SWM Modular Storage Rack

Storage rack

Modular storage racks for small and medium-sized quick-change systems

Field of Application

Wherever storage racks for small and medium-sized quick-change systems are required.

Advantages – Your benefit

Modular System provides customized storage racks

Repeatable set-down points for change adapters

Optional sensors for monitoring of the change adapter

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

SCHUNK SWM Modular Storage Racks

The SWM storage racks are perfectly suited for applications that require short change times between the robot and the tool.
SCHUNK offers three systems:

SWM-S and SWM-M Systems

Suitable for smaller and medium SCHUNK change systems. The extruded upright profiles are extremely sturdy making them ideally suited for mounting on platforms. The centering pins that belong with them consist of durable stainless steel, providing additional stability to the systems. Depositing plates can be equipped with proximity switches.
The proximity switches allow you to monitor the assigned places. The quick-change adapter is deposited without force and without the use of holding mechanics. This guarantees smooth changing processes.

SWM-L System

Suitable for SCHUNK change systems in heavy load applications. Sturdy, heavy-duty all steel welded construction with a long life span and maximum versatility. The system can be customized to individual application requirements on request. This system is predominately used in the automotive industry.

Your benefit:

- **Modular system** permits a versatile, application-specific assembly
- **V-shaped points of support** for exact positioning of the place of deposit and repeatability
- **Aluminum profiles (SWM-S/M) or sturdy all steel welded construction (system SWM-L) as base body** or use of your existing design
- Corrosion-free hardened support pins **sensor monitoring** available as an option
- **Standardized depositing plates** available for all sizes
- **Dirt protection cover** to protect the deposited tools available as an option

SWM-S

SWM-S System: Suitable for change systems of the sizes SWS-005 to SWS-021.

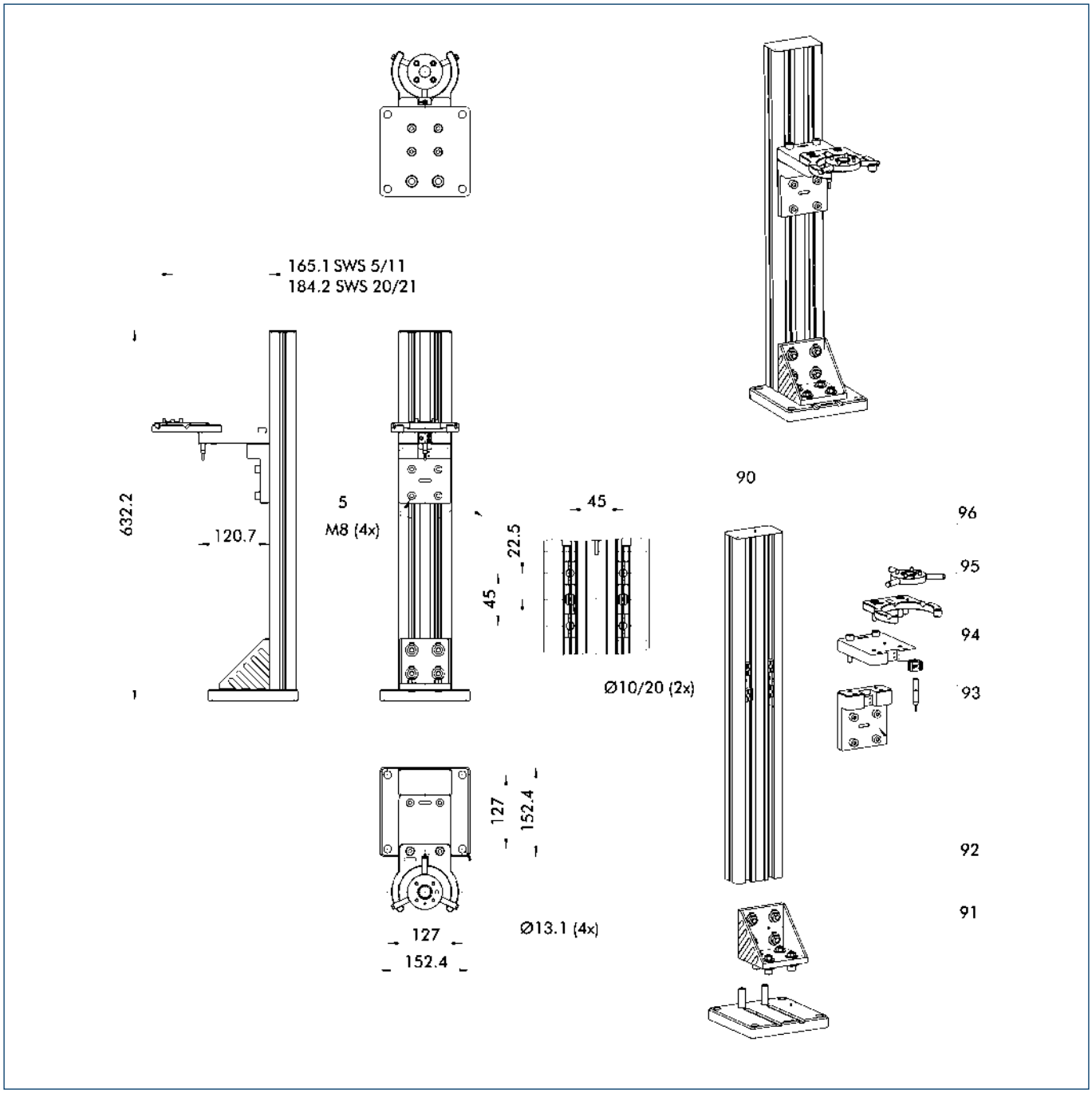
SWM-M

SWM-M System: Suitable for change systems as of sizes SWS-040 to SWS-110.

SWM-L

SWM-L System: Suitable for sizes SWS-160 and SWS-L 210 to SWS-L 510.

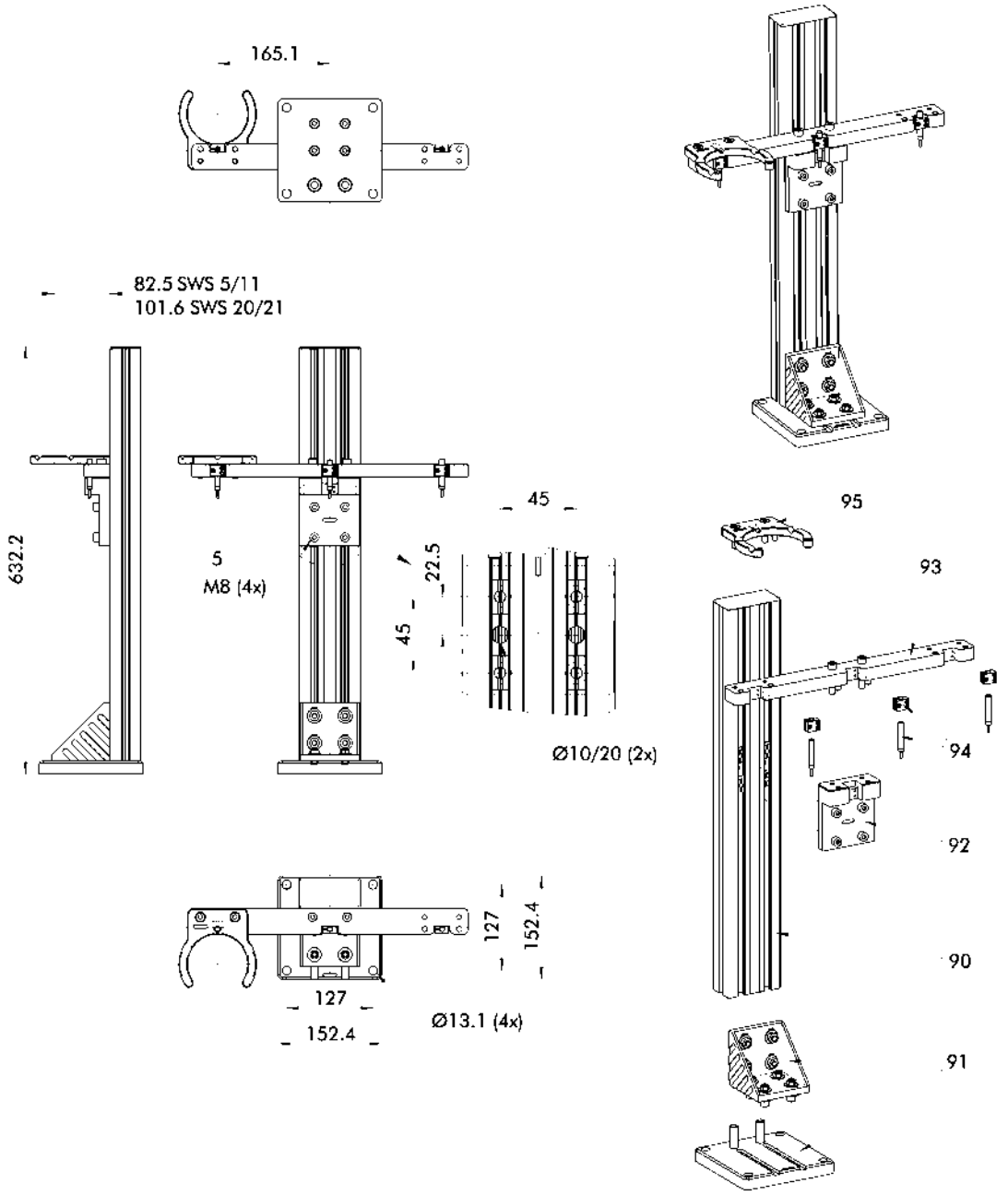
Sample setup



This drawing shows a sample setup of a storage rack with an intermediate plate for increasing the distance between the quick-change adapter or tool and the profile.

- (5) Through-hole for connection with screws
- (90) Vertical profile
- (91) Base plate with bracket
- (92) Fixing block
- (93) Sensor bracket with proximity switch
- (94) Extension adapter
- (95) Storage plate
- (96) Intermediate plate blank with workpiece stop

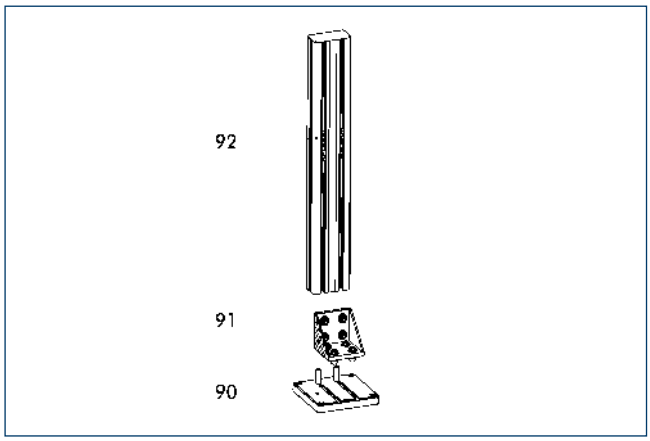
Sample setup



This drawing shows a sample setup of a storage rack for up to three quick-change adapters or tools.

- (5) Through-hole for connection with screws
- (90) Vertical profile
- (91) Base plate with bracket
- (92) Fixing block
- (93) 3-position adapter
- (94) Sensor bracket with proximity switch
- (95) Storage plate

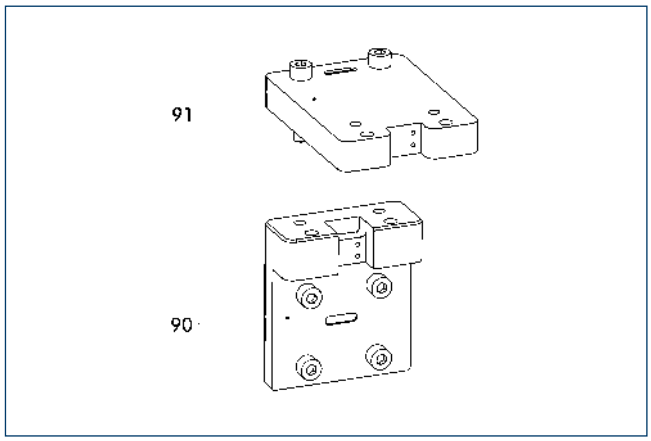
Vertical profile



(90) Base plate
(92) Standprofil
(91) Attachment bracket

Description	ID	Length
Base plate		
SWM-TSS-3311	0302580	
Vertical profile		
SWM-TSS-1020-610	0302586	610 mm
Attachment bracket		
SWM-TSS-1030	0302581	

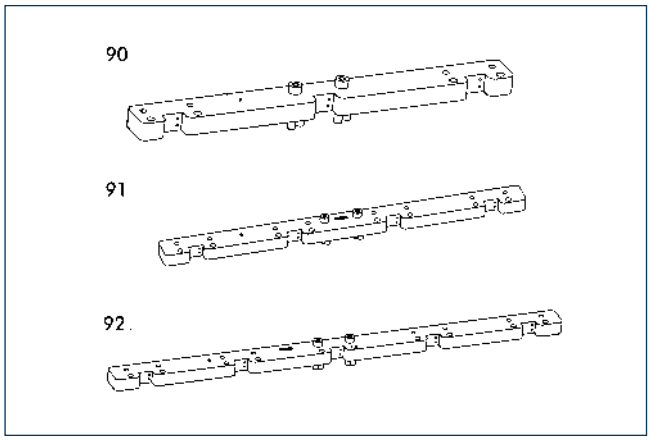
Fixing block



(90) Fixing block
(91) Extension adapter

Description	ID	
Fixing block		
SWM-TSS-3306	0302582	
Extension adapter		
SWM-TSS-3361	0302585	

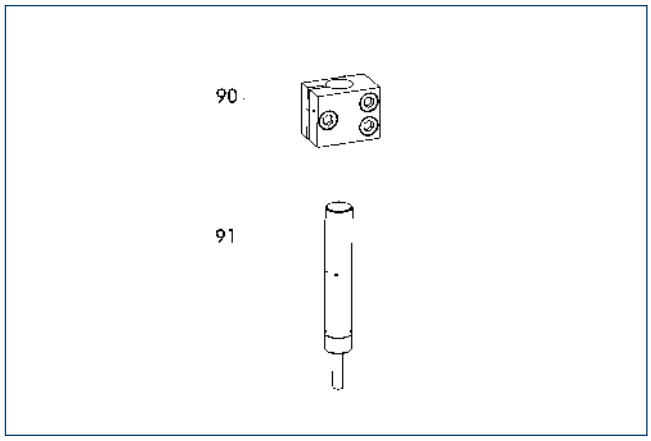
Multi-position adapter



(90) 3-position adapter
(92) 5-position adapter
(91) 4-position adapter

Description	ID	
3-position adapter		
SWM-TSS-3308	0302583	
4-position adapter		
SWM-TSS-3431	0302587	
5-position adapter		
SWM-TSS-3570	0302591	

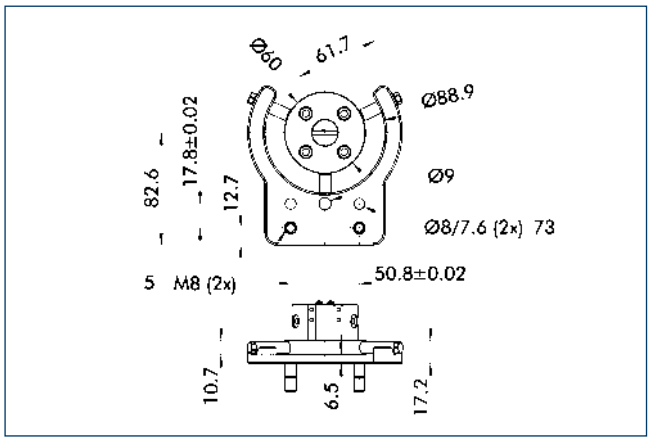
Sensor system



(90) Sensor bracket
(91) Proximity switch

Description	ID	
Sensor bracket		
SWM-TSS-3315	0302584	
Inductive proximity switch		
INW 80/S	0301508	

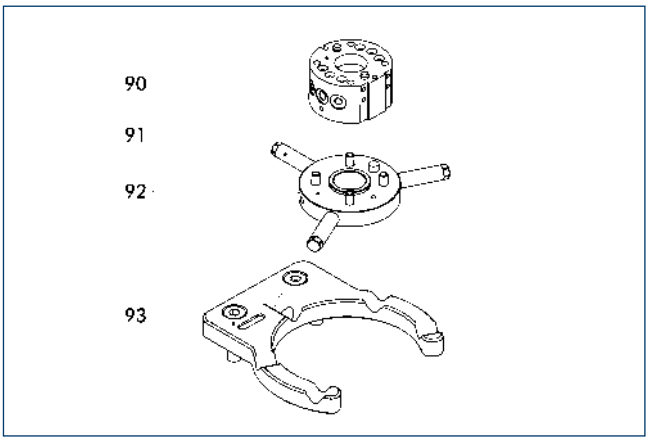
SWS 005 storage module with intermediate plate



(5) Through-hole for connection with screws
(73) Fit for a centering pin

The magazine bolts are screwed into an additional intermediate plate. The plate is a blank with no other mounting options. The workpiece-side mounting holes must be drilled by the user.

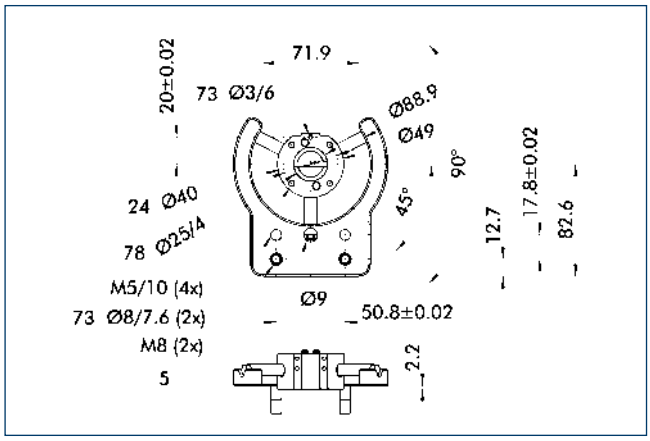
SWS 005 storage module with intermediate plate



(90) SWA 005 quick-change adapter
(91) Workpiece stop
(92) Intermediate plate blank
(93) Storage plate

Description	ID	
Storage plate		
SWM-TSS-3310	0302571	
Intermediate plate blank with 3 workpiece stops		
SWS-005/011 SWM-TSS-3314	0302575	

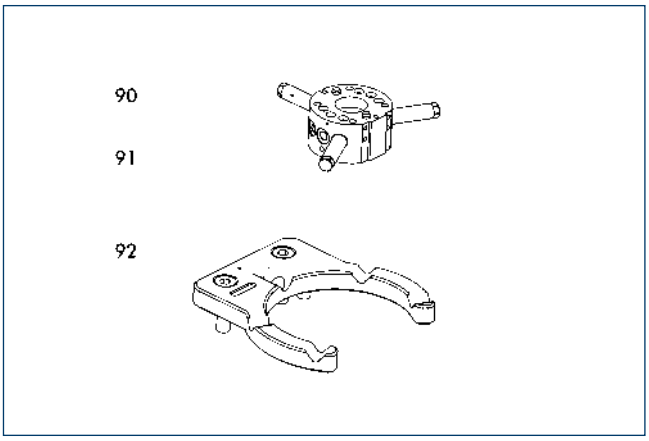
SWS 005 storage module without intermediate plate



(5) Through-hole for connection with screws
(24) Bolt circle
(73) Fit for a centering pin
(78) Fitting for centering

The magazine bolts are screwed into the existing threads for the pneumatic feed-through. This reduces the number of possible feed-throughs.

SWS 005 storage module without intermediate plate

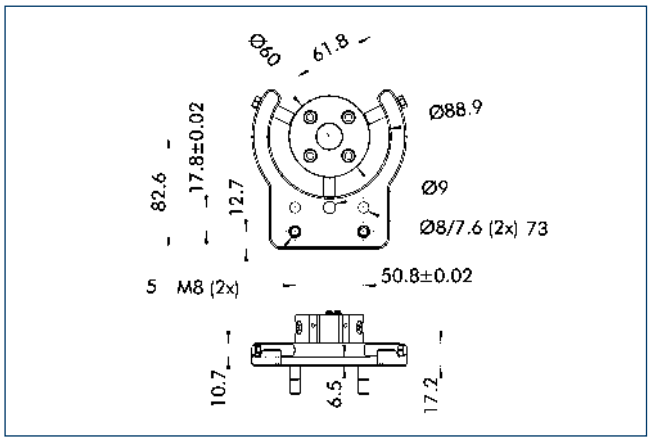


(90) Workpiece stop
(91) SWA 005 quick-change adapter
(92) Storage plate

Description	ID	
Storage plate		
SWM-TSS-3312	0302573	
Workpiece stop*		
SWM-TSS-M5-3303	0302577	

* 3 pins are required per SWA

SWS 011 storage module with intermediate plate

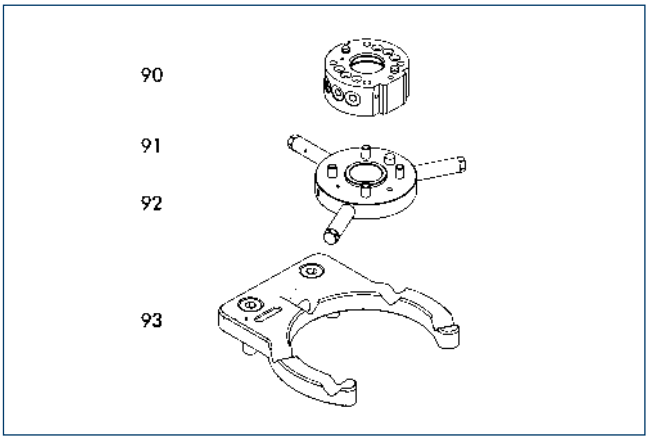


(5) Through-hole for connection with screws

(73) Fit for a centering pin

The magazine bolts are screwed into an additional intermediate plate. The plate is a blank with no other mounting options. The workpiece-side mounting holes must be drilled by the user.

SWS 011 storage module with intermediate plate



(90) SWA 011 quick-change adapter

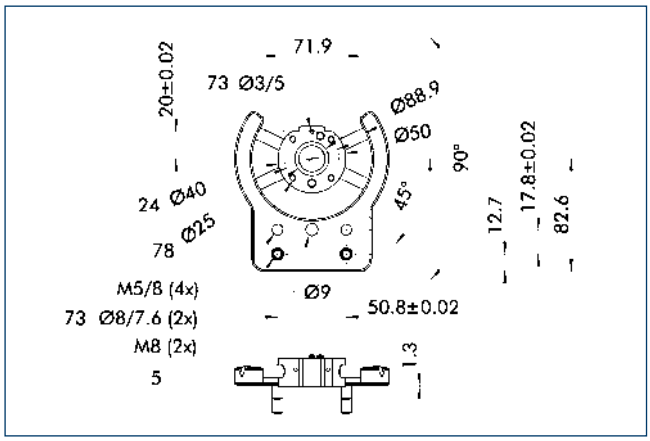
(91) Workpiece stop

(92) Intermediate plate blank

(93) Storage plate

Description	ID	
Storage plate		
SWM-TSS-3310	0302571	
Intermediate plate blank with 3 workpiece stops		
SWS-005/011 SWM-TSS-3314	0302575	

SWS 011 storage module without intermediate plate



(5) Through-hole for connection with screws

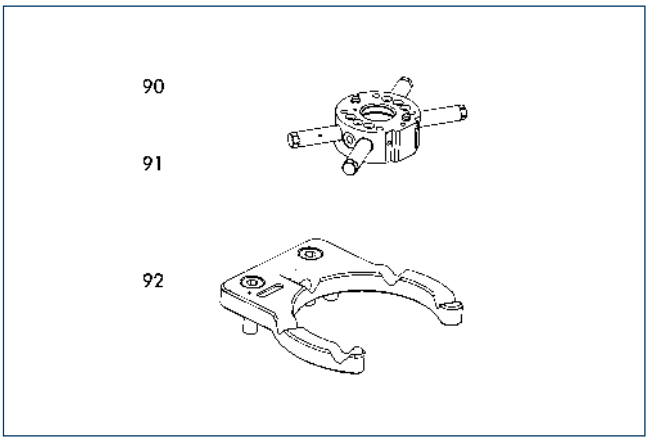
(24) Bolt circle

(73) Fit for a centering pin

(78) Fitting for centering

The magazine bolts are screwed into the existing threads for the pneumatic feed-through. This reduces the number of possible feed-throughs.

SWS 011 storage module without intermediate plate



(90) SWA 011 quick-change adapter

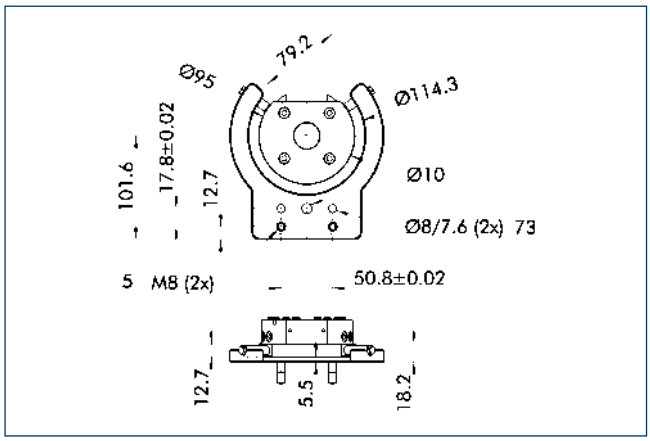
(91) Workpiece stop

(92) Storage plate

Description	ID	
Storage plate		
SWM-TSS-3310	0302571	
Workpiece stop*		
SWM-TSS-M5-3303	0302577	

* 4 pins are required per SWA

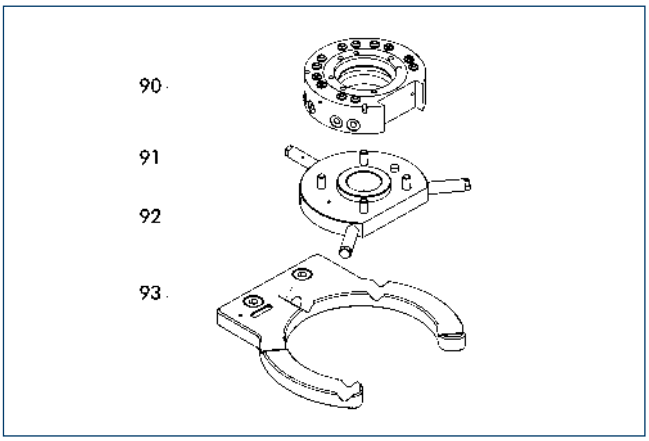
SWS 020 storage module with intermediate plate



(5) Through-hole for connection with screws
(73) Fit for a centering pin

The magazine bolts are screwed into an additional intermediate plate. The plate is a blank with no other mounting options. The workpiece-side mounting holes must be drilled by the user.

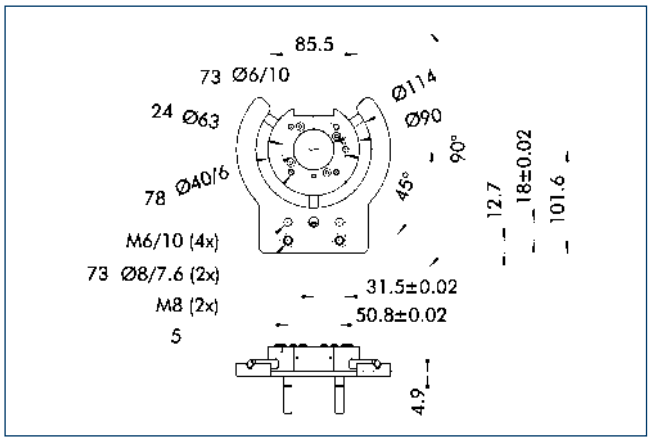
SWS 020 storage module with intermediate plate



(90) SWA 020 quick-change adapter
(91) Workpiece stop
(92) Intermediate plate blank
(93) Storage plate

Description	ID	
Storage plate		
SWM-TSS-3313	0302572	
Intermediate plate blank with 3 workpiece stops		
SWS-020/021 SWM-TSS-3319	0302576	

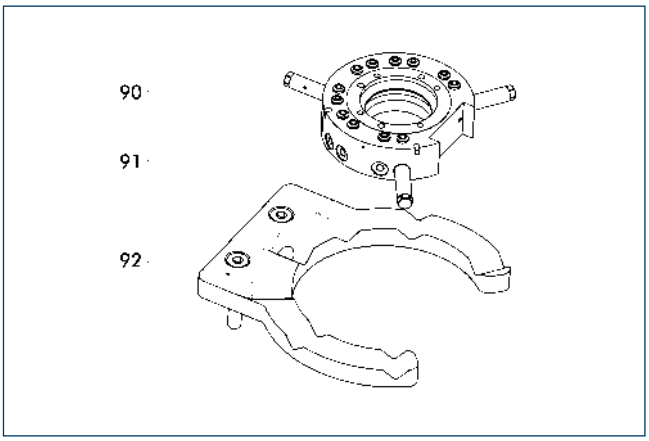
SWS 020 storage module without intermediate plate



(5) Through-hole for connection with screws
(24) Bolt circle
(73) Fit for a centering pin
(78) Fitting for centering

The magazine bolts are screwed into the existing threads for the pneumatic feed-through. This reduces the number of possible feed-throughs.

SWS 020 storage module without intermediate plate

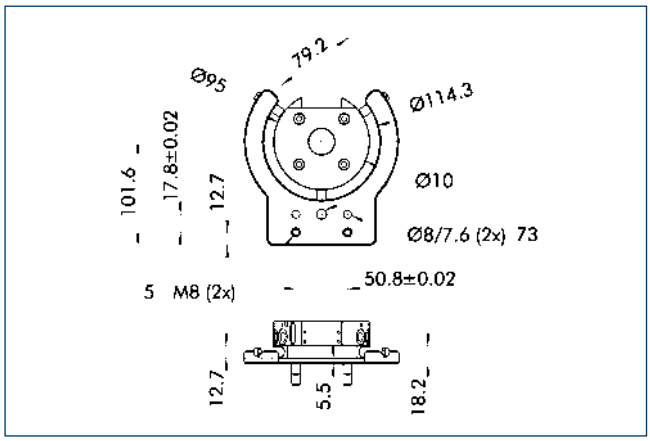


(90) Workpiece stop
(91) SWA 020 quick-change adapter
(92) Storage plate

Description	ID	
Storage plate		
SWM-TSS-3305	0302574	
Workpiece stop*		
SWM-TSS-M5-3303	0302577	

* 3 pins are required per SWA

SWS 021 storage module with intermediate plate

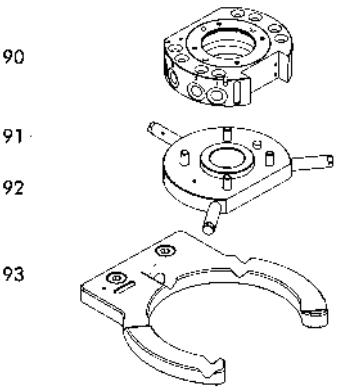


(5) Through-hole for connection with screws

(73) Fit for a centering pin

The magazine bolts are screwed into an additional intermediate plate. The plate is a blank with no other mounting options. The workpiece-side mounting holes must be drilled by the user.

SWS 021 storage module with intermediate plate



(90) SWA 021 quick-change adapter

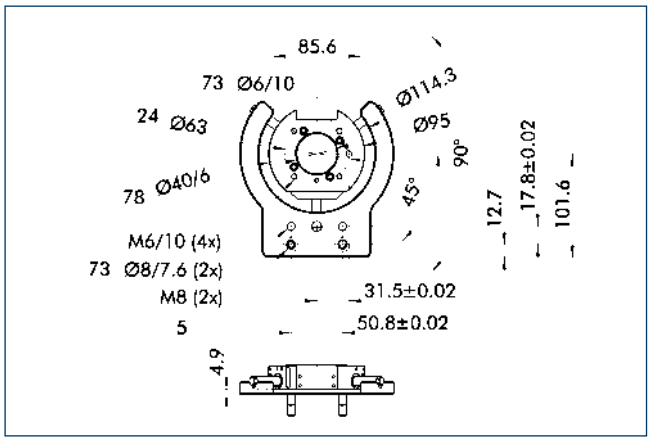
(91) Workpiece stop

(92) Intermediate plate blank

(93) Storage plate

Description	ID	
Storage plate		
SWM-TSS-3313	0302572	
Intermediate plate blank with 3 workpiece stops		
SWS-020/021 SWM-TSS-3319	0302576	

SWS 021 storage module without intermediate plate



(5) Through-hole for connection with screws

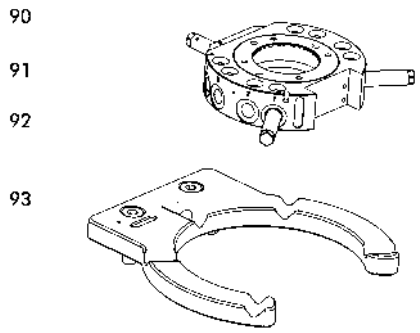
(24) Bolt circle

(73) Fit for a centering pin

(78) Fitting for centering

The magazine bolts are screwed into the existing threads for the pneumatic feed-through. This reduces the number of possible feed-throughs.

SWS 021 storage module without intermediate plate



(90) Workpiece stop

(91) Assembly block for storage bolts

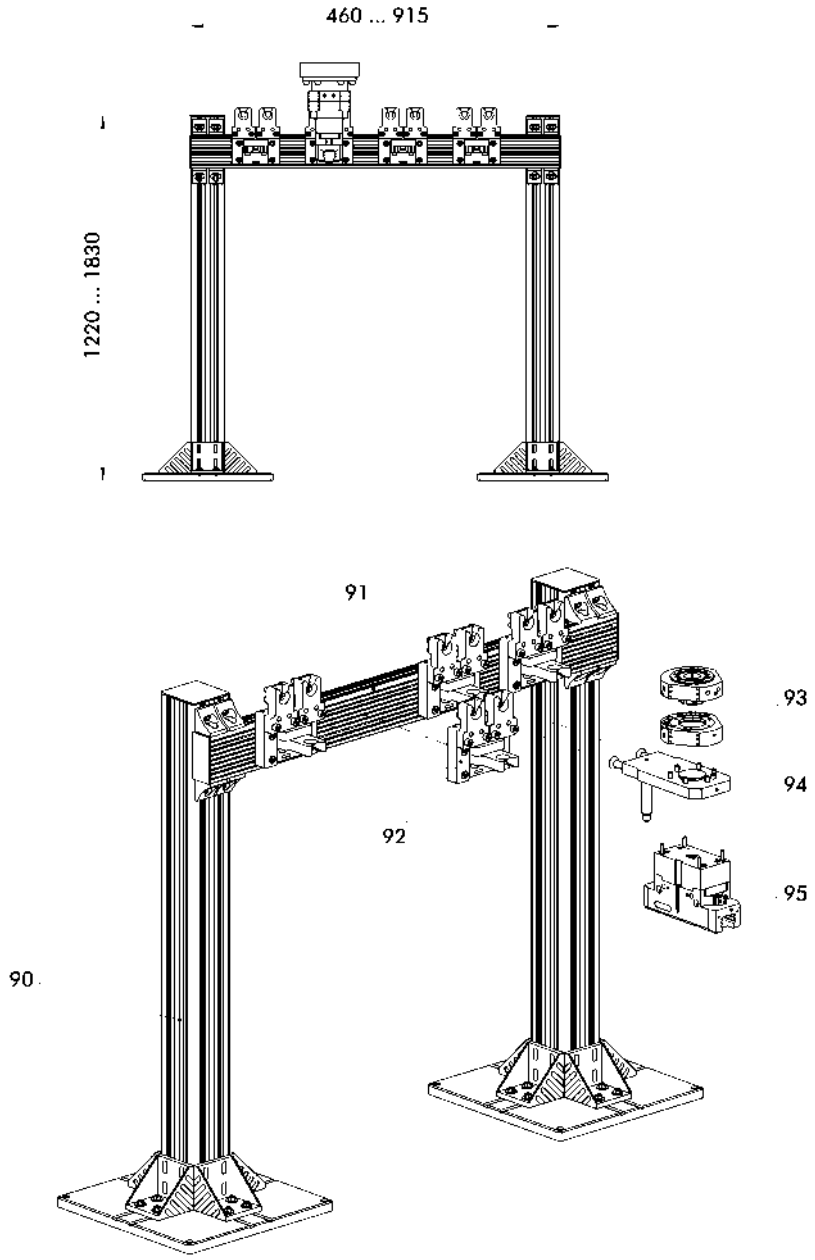
(92) SWA 021 quick-change adapter

(93) Storage plate

Description	ID	
Storage plate		
SWM-TSS-3313	0302572	
Workpiece stop*		
SWM-TSS-M5-3303	0302578	
Assembly block for storage bolts		
SWM-TSS-3360	0302579	

* 4 bolts and 1 assembly block are required per SWA

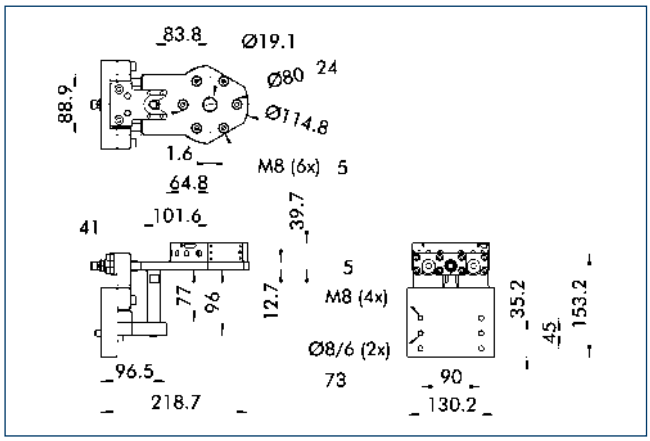
Sample setup



The drawing shows an exemplary set-up of a storage rack with four storage possibilities for quick-change adapters or tools.

90 Baseplate with upright profile
91 Horizontal profile
92 Storage module
93 SWS quick-change system
94 Intermediate plate
95 Parallel gripper

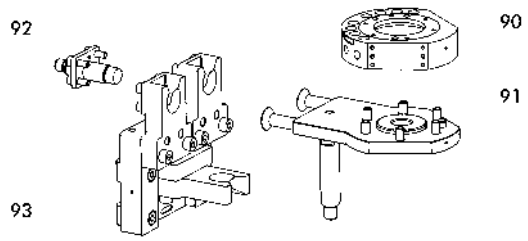
SWS 040 storage module



(5) Through-hole for connection with screws
(24) Bolt circle
(41) Optional proximity switch
(73) Fit for a centering pin

The quick-change adapter is screwed onto an intermediate plate blank. The blank offers no other mounting options. The workpiece-side mounting holes must be drilled by the user.

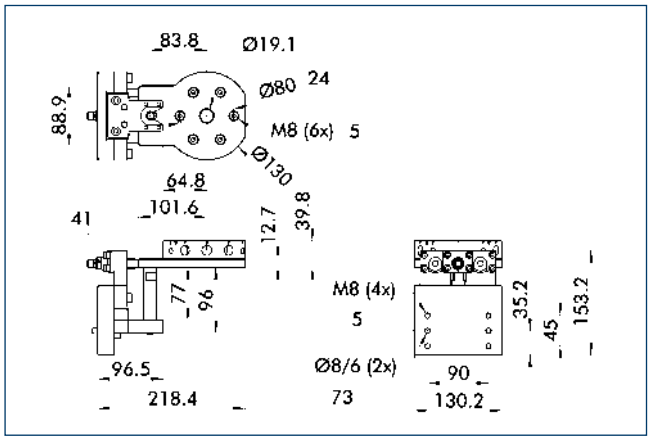
SWS 040 storage module



(90) SWS 040 quick-change adapter
(91) Intermediate plate
(92) Sensor bracket
(93) Storage module

Description	ID	
Intermediate plate		
SWM-TSM-TP-4627	0303216	
Sensor		
IN-B180-S-M12	0303244	
Sensor bracket		
SWM-TSM-SM-4206	0303243	
Storage module		
SWM-TSM-MM-3597	0303212	

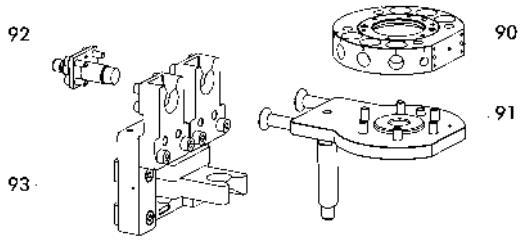
SWS 041 storage module



(5) Through-hole for connection with screws
(24) Bolt circle
(41) Optional proximity switch
(73) Fit for a centering pin

The quick-change adapter is screwed onto an intermediate plate blank. The blank offers no other mounting options. The workpiece-side mounting holes must be drilled by the user.

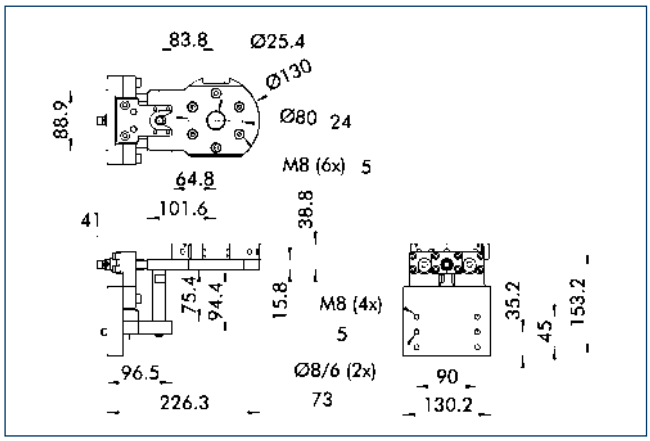
SWS 041 storage module



(90) SWS 041 quick-change adapter
(91) Intermediate plate
(92) Sensor bracket
(93) Storage module

Description	ID	
Intermediate plate		
SWM-TSM-TP-4056	0303217	
Sensor		
IN-B180-S-M12	0303244	
Sensor bracket		
SWM-TSM-SM-4206	0303243	
Storage module		
SWM-TSM-MM-3597	0303212	

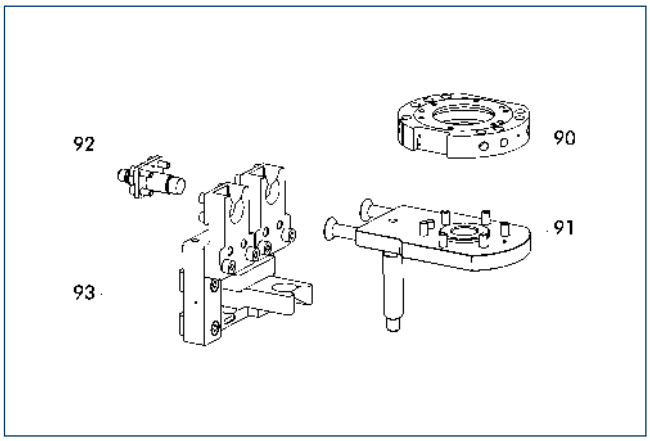
SWS 060 storage module



(5) Through-hole for connection with screws
(24) Bolt circle
(41) Optional proximity switch
(73) Fit for a centering pin

The quick-change adapter is screwed onto an intermediate plate blank. The blank offers no other mounting options. The workpiece-side mounting holes must be drilled by the user.

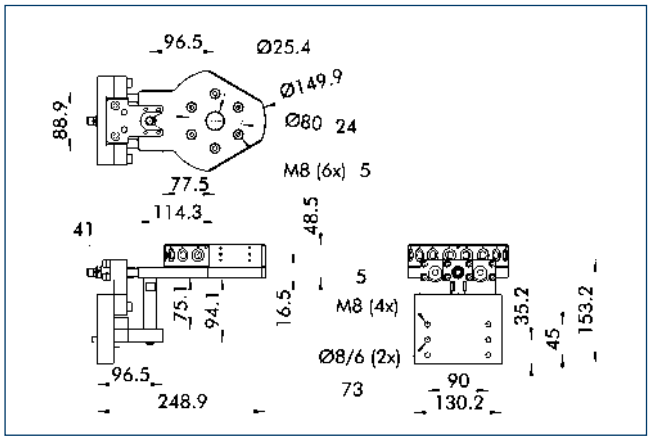
SWS 060 storage module



(90) SWS 060 quick-change adapter
(91) Intermediate plate
(92) Sensor bracket
(93) Storage module

Description	ID	
Intermediate plate		
SWM-TSM-TP-4057	0303218	
Sensor		
IN-B180-S-M12	0303244	
Sensor bracket		
SWM-TSM-SM-4206	0303243	
Storage module		
SWM-TSM-MM-3597	0303212	

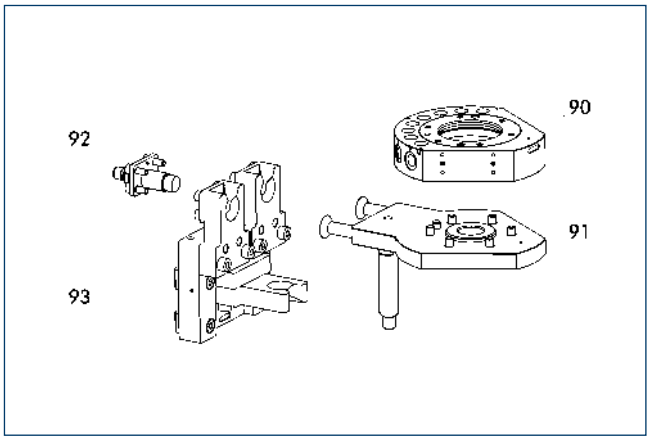
SWS 071 storage module



(5) Through-hole for connection with screws
(24) Bolt circle
(41) Optional proximity switch
(73) Fit for a centering pin

The quick-change adapter is screwed onto an intermediate plate blank. The blank offers no other mounting options. The workpiece-side mounting holes must be drilled by the user.

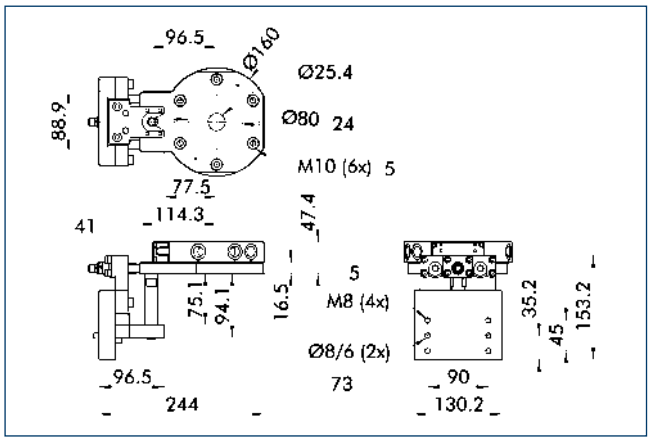
SWS 071 storage module



(90) SWS 071 quick-change adapter
(91) Intermediate plate
(92) Sensor bracket
(93) Storage module

Description	ID	
Intermediate plate		
SWM-TSM-TP-4058	0303219	
Sensor		
IN-B180-S-M12	0303244	
Sensor bracket		
SWM-TSM-SM-4206	0303243	
Storage module		
SWM-TSM-MM-3597	0303212	

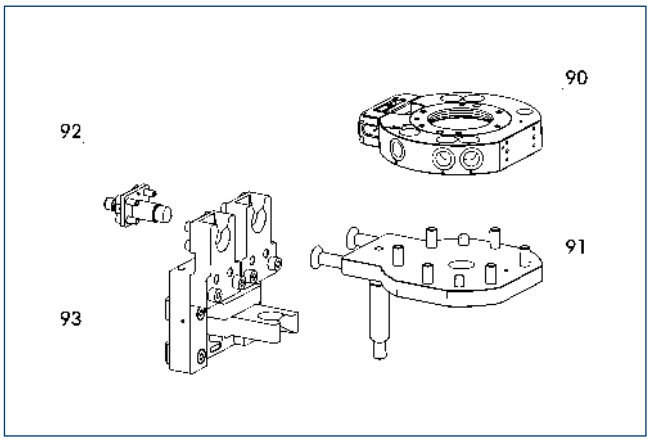
SWS 076 storage module



(5) Through-hole for connection with screws
(24) Bolt circle
(41) Optional proximity switch
(73) Fit for a centering pin

The quick-change adapter is screwed onto an intermediate plate blank. The blank offers no other mounting options. The workpiece-side mounting holes must be drilled by the user.

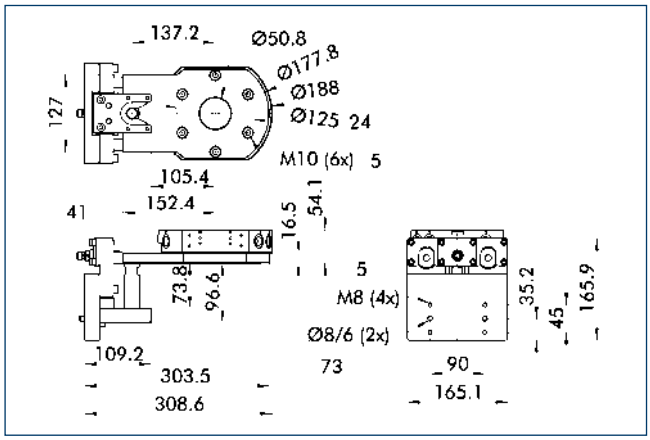
SWS 076 storage module



(90) SWA 076 quick-change adapter
(91) Intermediate plate
(92) Sensor bracket
(93) Storage module

Description	ID	
Intermediate plate		
SWM-TSM-MM-3597	0303212	
Sensor		
IN-B180-S-M12	0303244	
Sensor bracket		
SWM-TSM-SM-4206	0303243	
Storage module		
SWM-TSM-TP-7290	0303268	

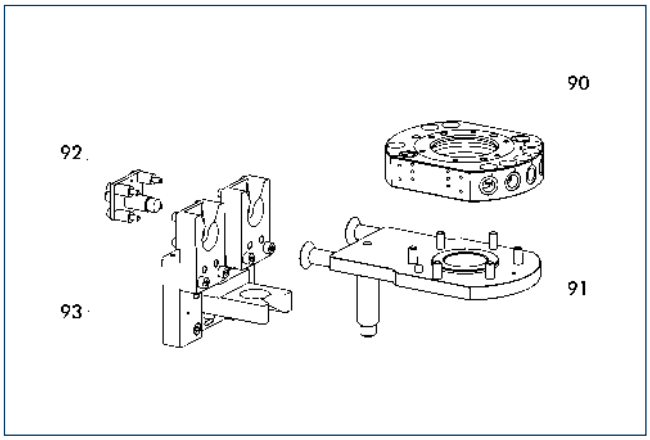
SWS 110 storage module



(5) Through-hole for connection with screws
(24) Bolt circle
(41) Optional proximity switch
(73) Fit for a centering pin

The quick-change adapter is screwed onto an intermediate plate blank. The blank offers no other mounting options. The workpiece-side mounting holes must be drilled by the user.

SWS 110 storage module



(90) SWS 110 quick-change adapter
(91) Intermediate plate
(92) Sensor bracket
(93) Storage module

Description	ID	
Intermediate plate		
SWM-TSM-TP-4059, SWS-110	0303220	
Sensor		
IN-B180-S-M12	0303244	
Sensor bracket		
SWM-TSM-SM-4205	0303245	
Storage module		
SWM-TSM-MM-4018	0303214	

Flexible. Modular. Strong.

SWS-L Quick-change System

Pneumatic tool changing system with patented locking system for heavy loads.

Field of Application

Can be used wherever short changeover times between a handling device and a tool (gripper, pallets, welding gun) are required

Advantages – Your benefit

Patented fail-safe locking mechanism for safe connection between quick-change master and quick-change adapter

Manual emergency unlocking possible no counter-forces from springs

All functional components made from hardened steel for a greater change system load bearing capacity

The same option modules for all sizes that permits the use of standard parts in the production line

Possibility of transmission of electric devices SWS 041 storage module

As standard, many option modules can be attached for highest flexibility of your application

Adapter coding via electric module possible

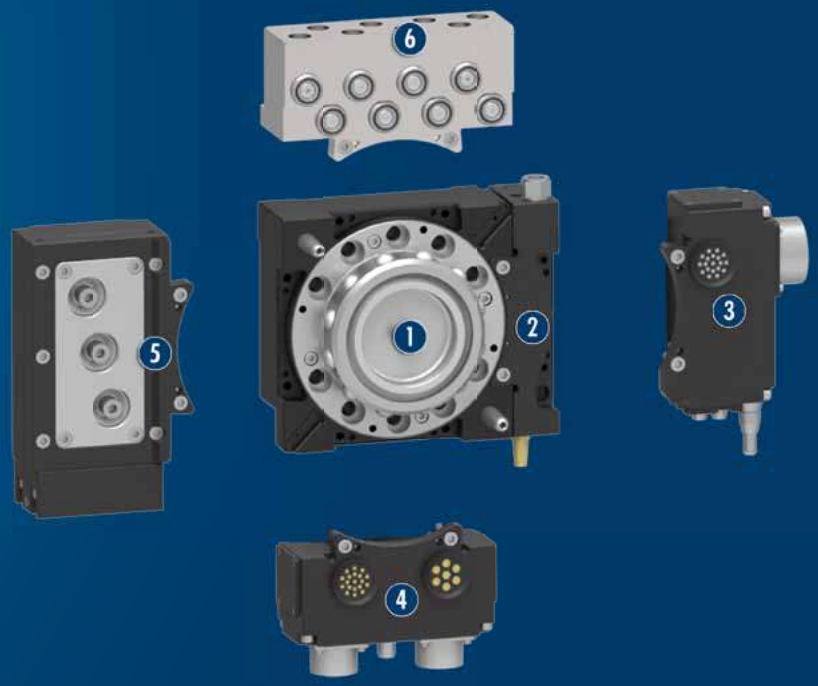
Suitable storage racks for all sizes to ensure the optimal adaption to each application

ISO flange pattern for easy assembly to most types of robots without needing additional adapter plates

Sizes	Handling weight	Moment load M_x	Moment load M_z
Quantity: 4	300 .. 1350 kg	7600 .. 13500 Nm	4060 .. 16200 Nm

Functional Description

Due to the automatic change of the robot tool (e.g. gripper, vacuum gripping system, pneumatically or electrically driven tools, welding guns ...) flexibility of your robot is increased.
The SWS quick-change system consists of a SWK quick-change master and a SWA quick-change adapter. The SWK, mounted onto the robot, couples up the SWA mounted onto your tool. A pneumatically driven locking piston, with its patented design, ensures that the connection is secure. After coupling, pneumatic and electric feed-throughs automatically supply your robot tool.



① **SWS quick-change master**
with patented locking

② **Valve adapter**
with integrated valve for control of the unit

③ **Control module**
for control of the valve adapter and additional signal transmission to the tool

④ **E-module**
for separate transmission of power and sensor signals for servo drives, for example

⑤ **Welding current module**
for high current loads

⑥ **Fluid module, self-sealing**
for drip-free transfer of liquid media

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Operating principle: Locking balls actuated by pistons

Pass through: Variable via attachment modules, depending on the type

Housing: The housing is made of high-tensile, hard-coated aluminum alloy. The functional parts are made of hardened steel.

Scope of delivery: Operating and maintenance instructions, manufacturer's declaration

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and could void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

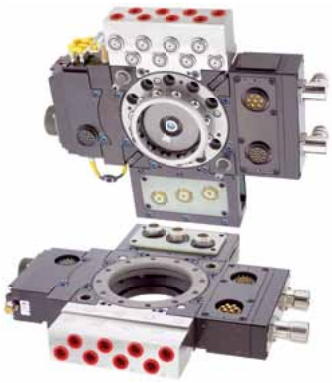
Heavy-load gripper unit with robot quick-change system for changing the handling devices such as grippers and electrode holders.

❶ SWS-L Quick-change System

❷ PZN-plus 3-Finger Universal Gripper

SCHUNK offers more ...

The following components make the SWS-L even more productive – the perfect complement for highest functionality, flexibility, and process reliability.



SWM-L Storage Rack

Cable Connector

Optional Electrical Module

Pneumatic Optional Modules

Extension Cable

Adapter Plates

Inductive Proximity Switches

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

Options and special Information

No-Touch-Locking™: Locking without touching. Ensures that the SWS is securely locked even when the SWK and SWA do not contact.

Patented fail-safe locking mechanism: Large piston diameter and outward ball travel increase moment load. All locking parts are made of Rc 58 stainless steel.

Selection of a SWS Quick-change System

1. Determining the Size

Quick Method:

When low or medium forces and moments act upon the SCHUNK quick-change system, you should choose a quick-change system with a payload that is comparable to that of your robot.

If high moments and forces act upon the SCHUNK quick-change system, please use the following method, which is more precise.

More Precise Method:

The forces and moments are a critical factor in choosing a suitable quick-change system. Proceed as follows to estimate the most unfavorable moment:

- Calculate for the approximate center of gravity (COG) of the heaviest end effector that will be used. Calculate the distance (D) from the COG to the bottom of the tool plate.
- Calculate the mass (m) of the heaviest end effector.
- Multiply m, D and gravity (9,81 m/s²) to determine the approximate static moment (M) (or a moment based on 1 g acceleration).
- Choose a quick-change system with a high moment load that is equal to or greater than M.

Due to their potentially high acceleration, robots can generate moments that are two to three times higher than M. The quick-change systems are designed for absorbing dynamic moments that are three times higher than their static moments.

2. Pneumatic and electrical System

Determine the number of required pneumatic connections and electrical contacts. Larger quick-change systems feature a higher number of pneumatic connections and electrical contacts.

3. Temperature and Chemicals

SCHUNK quick-change systems use nitrile seals for the pneumatic supply to the tool plate. O-rings seal the pneumatic locking mechanism. These O-rings are resistant to most chemical influences and also withstand temperatures in the range from -25 to 65 °C. Please contact your SCHUNK representative if you need information on temperatures or chemical influences in particular environments.

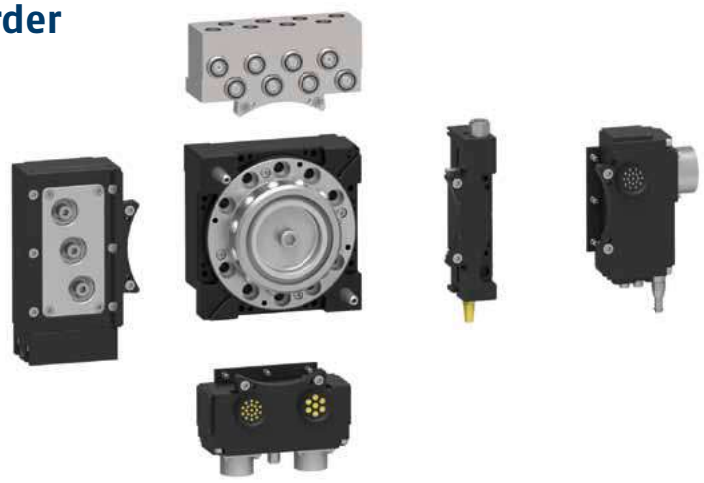
4. Precision Applications

Always be sure to comply with the specifications if you work with applications that require high repeat accuracy.

SWS Sizes

Designation	Recommended handling weight [kg]	Dynamic moment [Nm]		Static moment [Nm]		Pneumatic feed-throughs	Air connections locked and unlocked
		M_x and M_y	M_z	M_x and M_y	M_z		
SWS-001	1.4	2.8	3.45	0.983	1.15	4 x M5	M5
SWS-005	8	37.2	50.7	12.4	16.9	6 x M5	M5
SWS-011	16	74.7	101.7	24.9	33.9	6 x M5	M5
SWS-020	25	169.5	234	56.5	78	12 x M5	M5
SWS-021	25	169.5	234	56.5	78	8 x G1/8"	M5
SWS-027	38	254.1	298.2	84.7	99.4	8 x G1/8"	G1/8"
SWS-040Q	50	678	678	226	226	8 x G1/8"	G1/8"
SWS-041	50	471	648	157	216	6 x G3/8"; 4 x G1/8"	G1/8"
SWS-060	75	591	882	197	294	8 x G1/8"	G1/8"
SWS-071	79	1185	1185	395	395	8 x G1/4"	G1/8"
SWS-076	100	1626	2103	542	701	5 x G3/8"	G1/8"
SWS-110	150	2352	2352	784	784	8 x G3/8"	G1/8"
SWS-160	300	7170	3800	2390	1267	5 x G3/8"; 4 x G1/2"	G1/8"
SWS-210	270	8130	6780	2710	2260		
SWS-300	450	9870	8460	3290	2820	10 x G3/8"	G1/4"
SWS-310	510	9870	9480	3290	3160		
SWS-510	700	14580	10500	4860	3500		
SWS-1210	1350	16260	16260	5420	5420		

SWS-L sample order



SW K - 210 BM/BT - JF2 DA2 - FC2 - PA2 - EF5 - SM

Designation
SW

Side
K = Master (robot side)
A = Adapter (tool side)

Size
210 = SWS-210
310 = SWS-310
510 = SWS-510

Collar or step on the mounting surface
A = No collar (head side), no step (tool side)
B = 80 mm step / collar (only for 210)
C = 100 mm step / collar (only for 210, 310)
D = 125 mm step / collar (only for 310, 510)
E = 160 mm collar (only for 510)

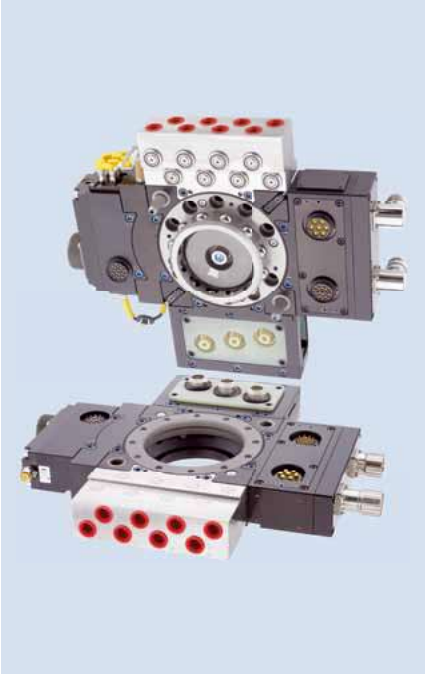
Jxx: Locking and unlocking adapter or a valve adapter (only on surface 'A')
Note: A Jxx module, locking and unlocking adapter or a valve adapter must be mounted on surface A. Signal modules are mounted on the Jxx module. When combining two modules (i.e. JC2 and DD4) on surface A, the description 'A' is a combination of Jxx- and the SWK-210BM-JC2DD4-AA2-0-0-SM

Option modules
Axx = Pneumatic module (anodized aluminum housing, not suitable for fluids)
Dxx = DeviceNet modules
Exx = Servo modules
Fxx = Fluid modules (stainless steel, self-sealing)
Pxx = Power module for welding current
Sxx = Signal modules
Uxx = Stud welding modules
Vxx = Signal modules with valve actuation
'0' = Option not used

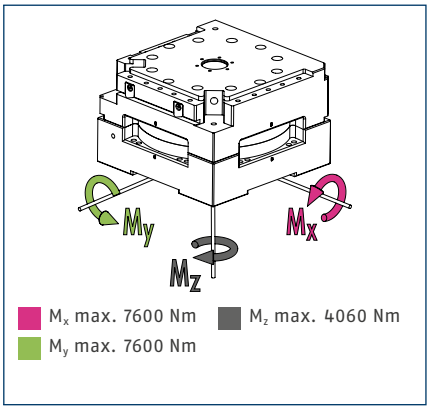
A selection of available modules can be found in the chapter "SWS-L" Options.
Additional variants on request.

Proximity switch monitoring
SM = Inductive proximity switch PNP
0 = No proximity switch
Additional variants on request

SWS-L 210



Forces and moments



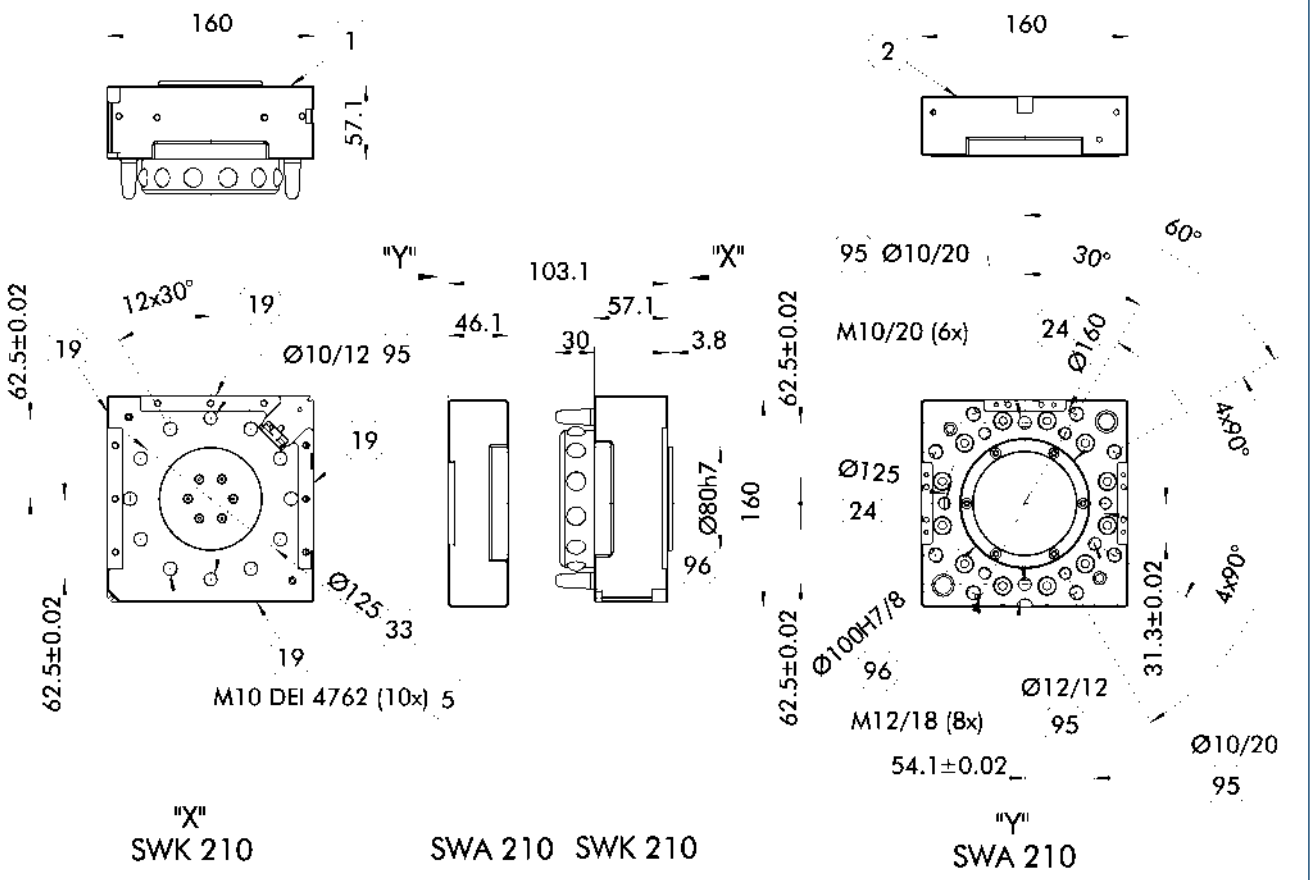
M_x max. 7600 Nm
M_z max. 4060 Nm
M_y max. 7600 Nm

ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-210BM-0-0-0-0-SM	SWA-210CT-0-0-0-0
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	300	300
Piston stroke monitoring		integrated	
Presence monitoring		integrated	
Locking force	[N]	31000	31000
Repeat accuracy	[mm]	0.015	0.015
Mass	[kg]	5.2	2.6
min. / max. locking distance	[mm]	2.5	2.5
max. permissible XY offset	[mm]	±2	±2
max. permissible angular offset	[°]	±1	±1
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	5/6.9	5/6.9
Robot side connection		ISO 9409-1-125-6-M10	ISO 9409-1-125-6-M10

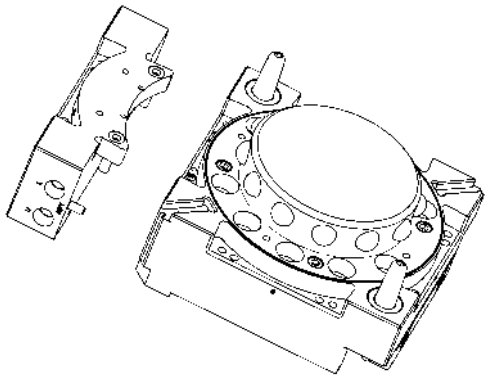
Main view



The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

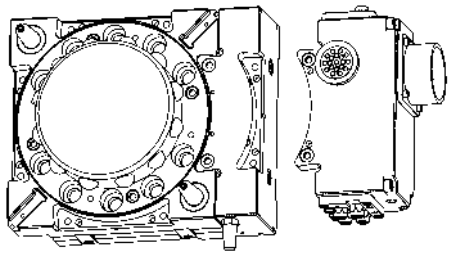
(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(19) Mounting surface for options
(24) Bolt circle
(33) DIN ISO-9409 bolt-hole circle diameter
(95) Fit for a centering pin
(96) Fitting for centering

Actuation



The SWK must be actuated either with a control adapter or a valve adapter with integrated valves. They must be taken into account when selecting the options.

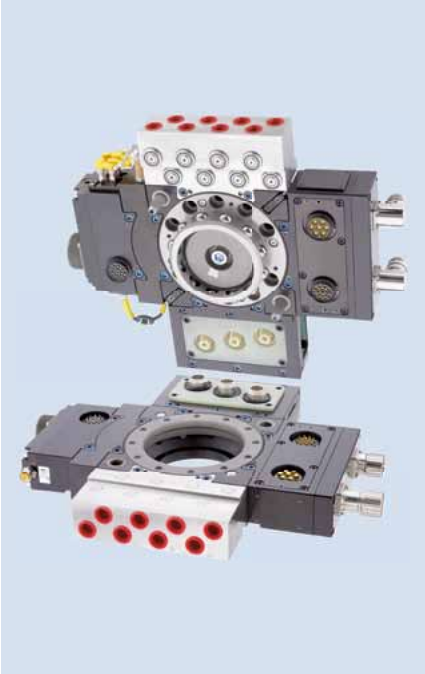
Optional modules



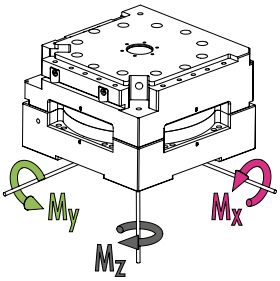
This unit can be equipped with different optional modules for transmitting electric signals, pneumatics or fluids. Please ask for details.

SWS-L 310

Robot Accessories | Changing | Quick-change System



Forces and moments



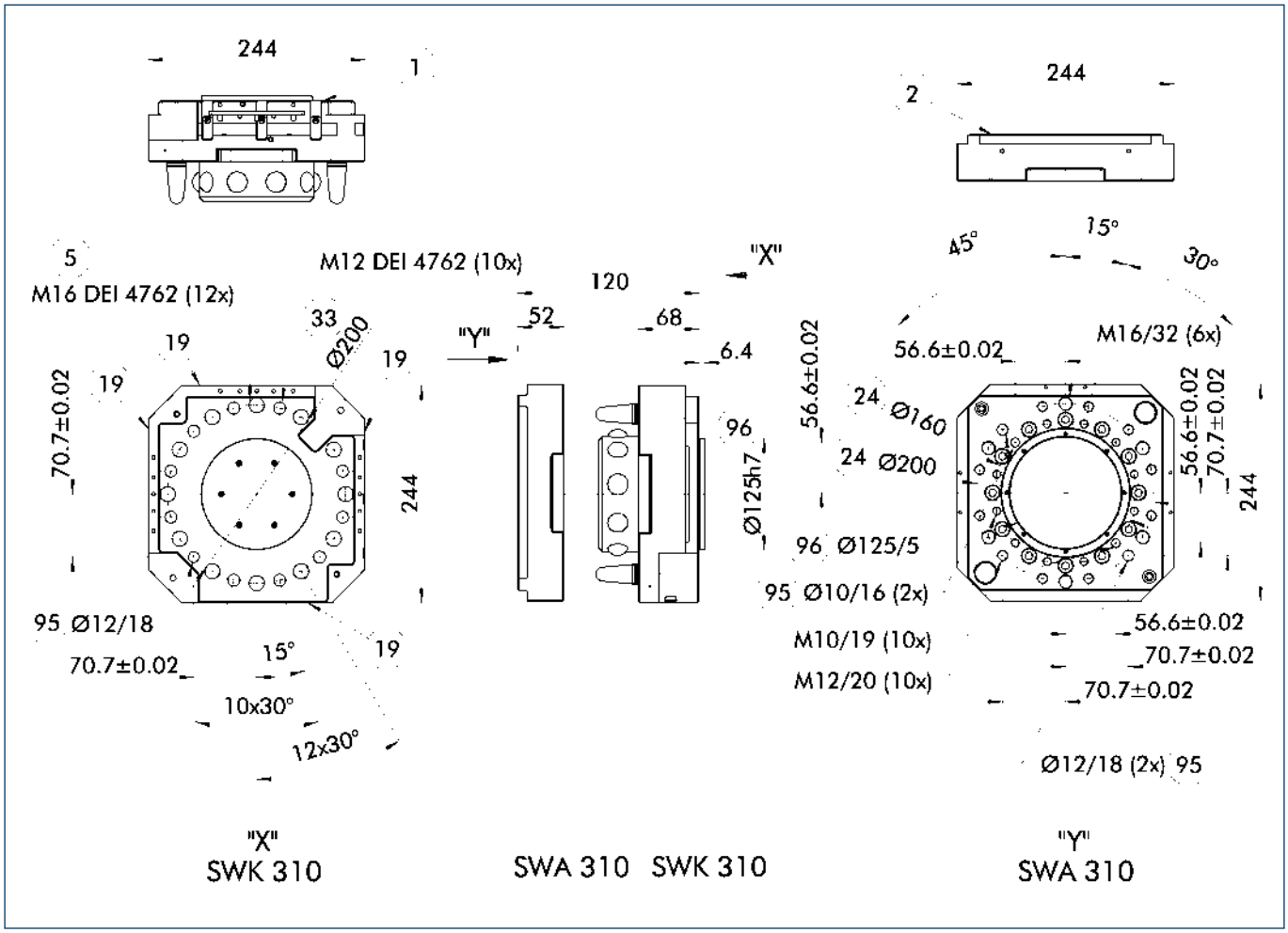
M_x max. 9900 Nm
M_z max. 9600 Nm
M_y max. 9900 Nm

ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-310DM-0-0-0-0-SM	SWA-310DT-0-0-0-0
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	510	510
Piston stroke monitoring		integrated	
Presence monitoring		integrated	
Locking force	[N]	38000	38000
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	12.5	7.5
min. / max. locking distance	[mm]	2.5	2.5
max. permissible XY offset	[mm]	±2	±2
max. permissible angular offset	[°]	±1	±1
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	5/6.9	5/6.9
Robot side connection		ISO 9409-1-200-6-M12 ISO 9409-1-200-12-M16	ISO 9409-1-200-6-M12 ISO 9409-1-200-12-M16

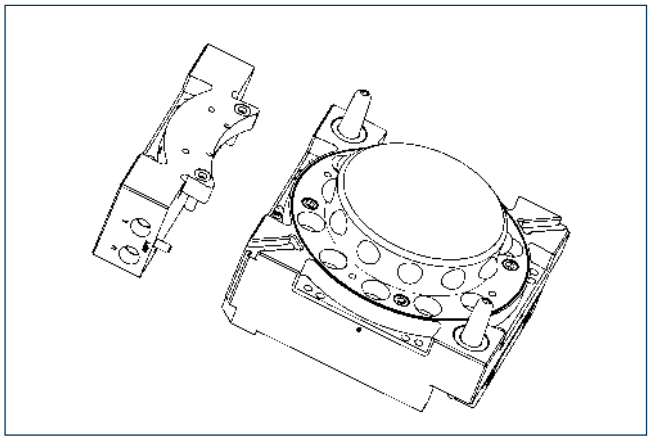
Main view



The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

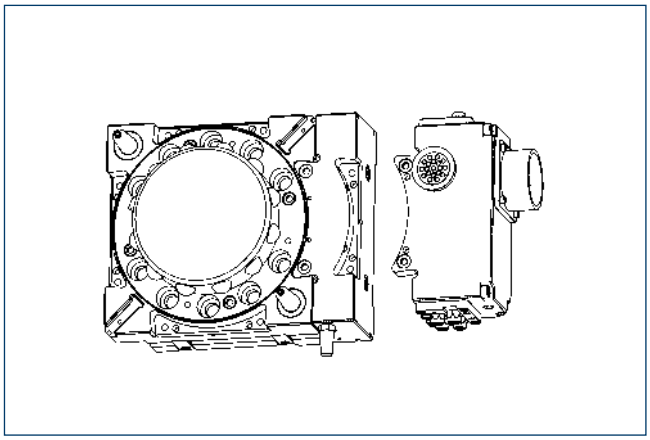
1. Robot side connection
2. Tool side connection
5. Through-hole for connection with screws
19. Mounting surface for options
24. Bolt circle
33. DIN ISO-9409 bolt-hole circle diameter
95. Fit for a centering pin
96. Fitting for centering

Actuation



The SWK must be actuated either with a control adapter or a valve adapter with integrated valves. They must be taken into account when selecting the options.

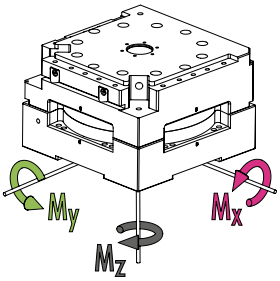
Optional modules



This unit can be equipped with different optional modules for transmitting electric signals, pneumatics or fluids. Please ask for details.

SWS-L 510

Forces and moments



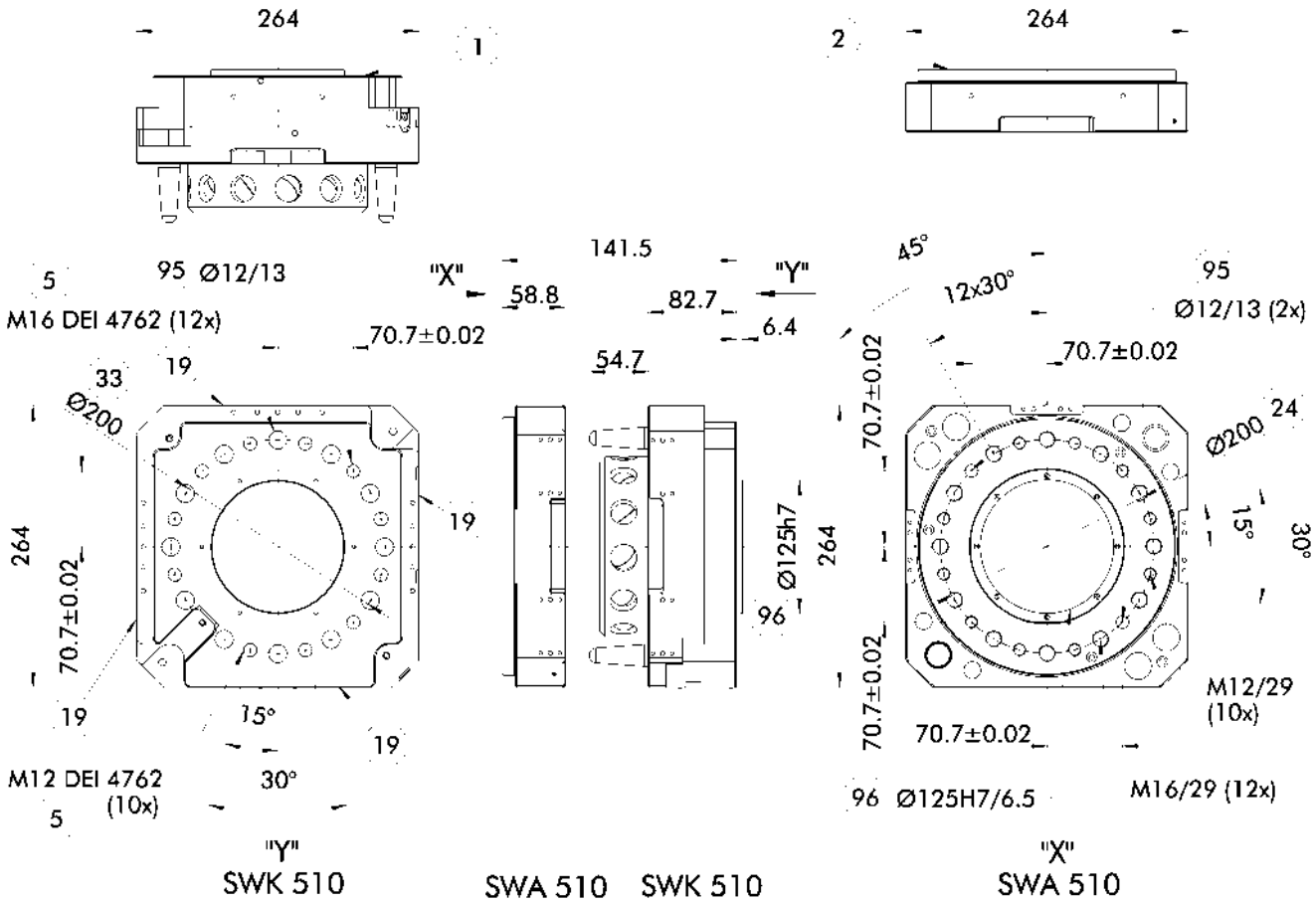
M_x max. 10900 Nm M_z max. 10500 Nm
M_y max. 10900 Nm

ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-510DM-0-0-0-0-SM	SWA-510DT-0-0-0-0
		Miniature change master	Quick-change adapter
Recommended handling weight	[kg]	700	700
Piston stroke monitoring		integrated	
Presence monitoring		integrated	
Locking force	[N]	62000	62000
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	19.3	8.7
min. / max. locking distance	[mm]	2.5	2.5
max. permissible XY offset	[mm]	±2	±2
max. permissible angular offset	[°]	±1	±1
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	5/6.9	5/6.9
Robot side connection		ISO 9409-1-200-6-M12 ISO 9409-1-200-12-M16	ISO 9409-1-200-6-M12 ISO 9409-1-200-12-M16

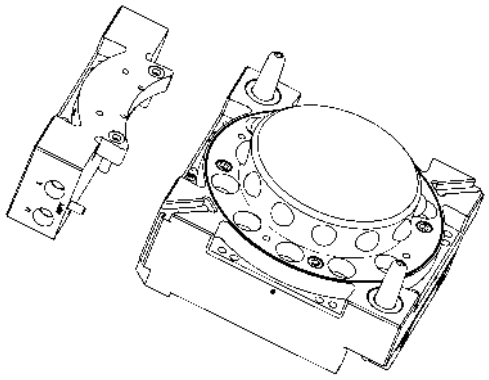
Main view



The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

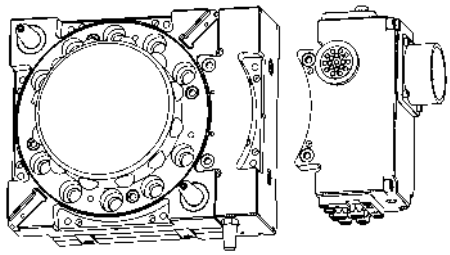
1. Robot side connection
2. Tool side connection
5. Through-hole for connection with screws
19. Mounting surface for options
24. Bolt circle
33. DIN ISO-9409 bolt-hole circle diameter
95. Fit for a centering pin
96. Fitting for centering

Actuation



The SWK must be actuated either with a control adapter or a valve adapter with integrated valves. They must be taken into account when selecting the options.

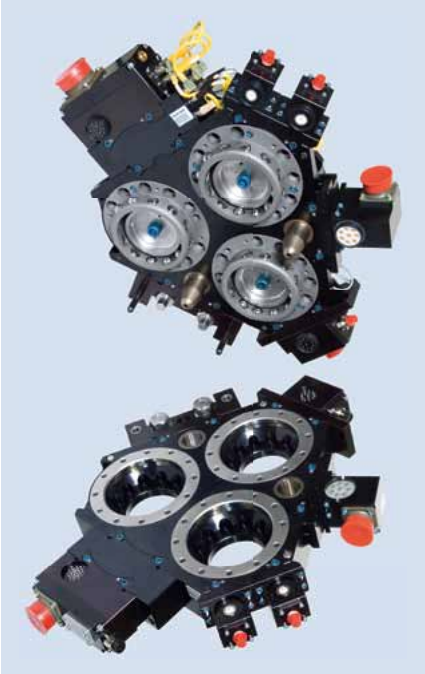
Optional modules



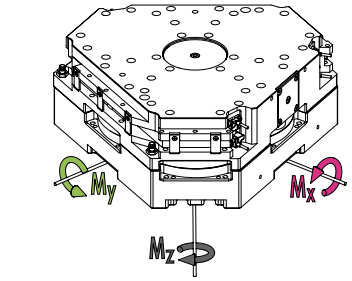
This unit can be equipped with different optional modules for transmitting electric signals, pneumatics or fluids. Please ask for details.

SWS-L 1210

Robot Accessories | Changing | Quick-change System



Forces and moments



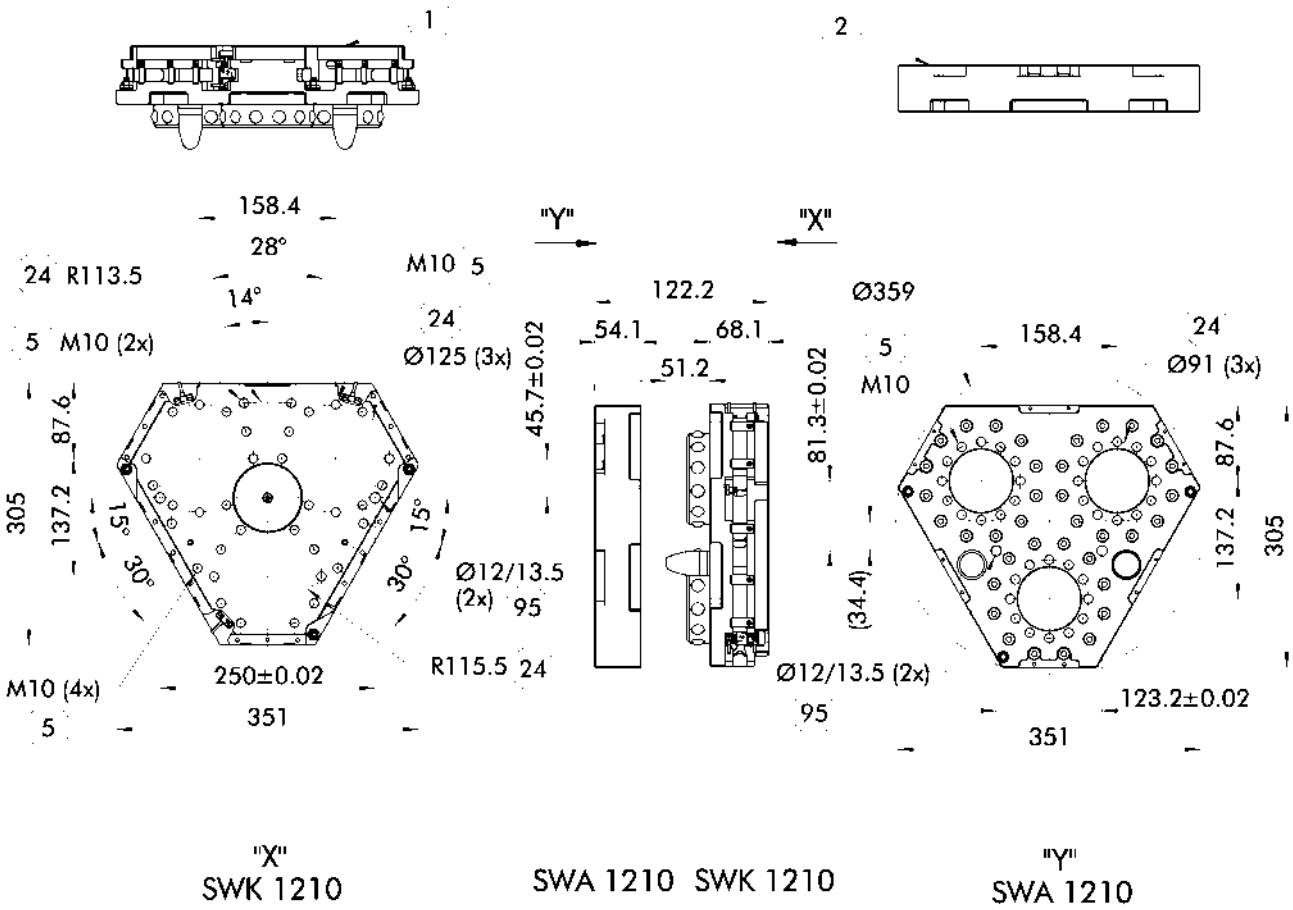
M_x max. 13500 Nm M_z max. 16200 Nm
M_y max. 13500 Nm

ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		SWK-L-1210AM-0-0-0-0-0-0-SL	SWA-L-1210AT-0-0-0-0-0-0
		Quick-change master	Quick-change adapter
Recommended handling weight	[kg]	1350	1350
Piston stroke monitoring		integrated	
Presence monitoring		integrated	
Locking force	[N]	93000	93000
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	18	10
min. / max. locking distance	[mm]	1	1
max. permissible XY offset	[mm]	±2	±2
max. permissible angular offset	[°]	±1	±1
min. / max. ambient temperature	[°C]	5/60	5/60
min. / max. operating pressure	[bar]	5/6.9	5/6.9

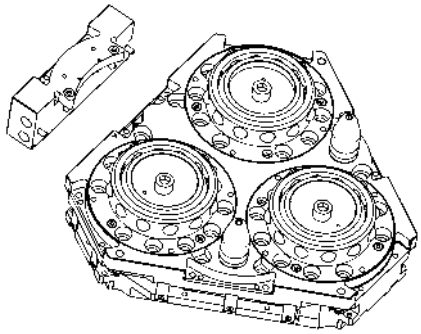
Main view



The drawing shows the basic design of the quick-change system and does not take into consideration the dimensions of any options described below.

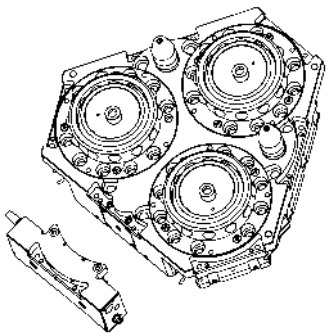
(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(24) Bolt circle
(95) Fit for a centering pin

Actuation



The SWK must be actuated either with a control adapter or a valve adapter with integrated valves. They must be taken into account when selecting the options.

Optional modules



This unit can be equipped with different optional modules for transmitting electric signals, pneumatics or fluids. Please ask for details.

Locking and unlocking Adapter and Valve Adapter

Locking and unlocking Adapter

The SWK-L quick-change master is supplied with compressed air by means of the locking and unlocking adapter. It is mounted on surface A and contains two air connections, one for locking and one for unlocking the quick-change master. The system is controlled by a valve provided by the customer.

Valve Adapter

As an alternative to the locking and unlocking adapter, it is possible to use a valve adapter. A double- or single-acting solenoid valve is integrated in the valve adapter to control the quick-change master. The contol can be transmitted by cables provided by the customer or via a mounted electro module.

Locking and unlocking adapter

Designation	Note	Note
SWO-L-JB2-K	Connecting plate for locking and unlocking, suitable for SWK-L 210	Only mountable on surface A
SWO-L-JB3-K	Connecting plate for locking and unlocking, suitable for SWK-L 310 and SWK-L 510	Only mountable on surface A

Valve adapter

Designation	Note
SWO-L-JD2-K	Valve adapter for SWK-L 210 with integrated valve, valve with spring return. Only one air connection is required for actuating the quick-change master. The valve adapter is controlled via a VA2 or VB2 module that is mounted on the JD2.
SWO-L-JD3-K	Valve adapter for SWK-L 310 and SWK-L 510 with integrated valve, valve with spring return. Only one air connection is required for actuating the quick-change master. The valve is controlled via a VA2 or VB2 module that is mounted on the JD3.
SWO-L-JU2-K	Valve adapter for SWK-L 210 with integrated valve, single acting. Only one air connection is required for actuating the quick-change master. The valve is controlled via a VA2 or VB2 module that is mounted on the JU2.
SWO-L-JU3-K	Valve adapter for SWK-L 310 and SWK-L 510 with integrated valve, double acting. Valve with spring return. Only one air connection is required for actuating the quick-change master. The valve is controlled via a VA2 or VB2 module that is mounted on the JU3.

Spacer

If further modules are to be mounted on the mounting surface A, a spacer **must be** mounted on the tool side of the quick-change adapter.

Designation	Note
SWA-L-20-1192	SWA 210/310/510 spacer

Signal Modules

SAx Signal Module

- The SAx signal module enables signal transmission to the quick-change adapter as well as control of the quick-change master.
- The electrical connection is established via an amphenol connector of the MS series. (Customized connections are possible.)
- The two ready-to-lock (RTL1 and RTL2) sensors and the proximity switches for "unlocked" and "locked" (U and L) can be connected directly on the SAx. The signals are transmitted to the robot controller via the amphenol connector.
- Up to 19 electrical signals are available.
- Up to 999 tools can be optionally coded on the quick-change adapter.

VA2 Signal Module

- The VA2 signal module enables signal transmission to the quick-change adapter as well as control of the quick-change master.
- The electrical connection is established via an amphenol connector of the MS series. (Customized connections are possible.)
- The two ready-to-lock (RTL1 and RTL2) sensors and the proximity switches for "unlocked" and "locked" (U and L) can be connected directly on the VA2. The signals are transmitted to the robot controller via the amphenol connector.
- Up to 19 electrical signals are available.
- Up to 999 tools can be optionally coded on the quick-change adapter.
- If a valve block is used, the switch signal can be tapped directly at the VA2 signal module.
- TSI monitoring is available optionally. The TSI ensures that the actuating valve can be actuated only in the changing position in the magazine.

SAx signal module

Designation	Note
SWO-L-SA2-K	Signal module, 26-pin amphenol connector, 19-pin block, connection of L/U/R1/R2 sensors, without valve actuation (compatible with SA2-T, SA3-T, SA4-T and SA5-T)
SWO-L-SA2-A	Signal module, 19-pin amphenol connector, 19-pin block, 19 electrical signals to the feed-through
SWO-L-SA3-A	Signal module, 19-pin amphenol connector, 19-pin block, 15 electrical signals to the feed-through, tool coding 0 – 9
SWO-L-SA4-A	Signal module, 19-pin amphenol connector, 19-pin block, 11 electrical signals to the feed-through, tool coding 0 – 99
SWO-L-SA5-A	Signal module, 19-pin amphenol connector, 19-pin block, 7 electrical signals to the feed-through, tool coding 0 – 999

VA2 signal module

Designation	Note
SWO-L-VA2-K	Signal module, 26-pin amphenol connector, 19-pin block, connection of L/U/R1/R2 sensors, with valve actuation (compatible with SA2-T, SA3-T, SA4-T and SA5-T)
SWO-L-SA2-A	Signal module, 19-pin amphenol connector, 19-pin block, 19 electrical signals to the feed-through
SWO-L-SA3-A	Signal module, 19-pin amphenol connector, 19-pin block, 15 electrical signals to the feed-through, tool coding 0 – 9
SWO-L-SA4-A	Signal module, 19-pin amphenol connector, 19-pin block, 11 electrical signals to the feed-through, tool coding 0 – 99
SWO-L-SA5-A	Signal module, 19-pin amphenol connector, 19-pin block, 7 electrical signals to the feed-through, tool coding 0 – 999

Actuation / Signal Modules – Fieldbus

Numerous electro modules are available that feature a bus connection to the SCHUNK quick-change system. These modules use an integrated single or double solenoid valve to control the locking / unlocking of the quick-change system. Such fieldbus modules also support the I/Os of the quick-change system, e.g. for locking and unlocking and for the sensors for tool presence monitoring (ready to lock) and for 5-digit tool coding. SCHUNK modules also features support for DeviceNet, Ethernet / IP TM and ProfiNet.
In addition, quick-change systems from SCHUNK support other bus modules (e.g. Profibus, Interbus, etc.). The use of a fieldbus module for actuation of the quick-change system offers many advantages over discrete modules.
The central processor of the fieldbus module features additional diagnostic and monitoring functions not offered by a discrete actuation module, which significantly simplifies error diagnosis and detection.
TSI (Tool Stand Interlock) with feedback (a locking device for unlocking the solenoid valve circuit to prevent release of the tool if it is not seated firmly in the tool magazine) and other safety-related circuits are supported by fieldbus modules.
Connections that conform to the industry standard are used, which eliminates the use of expensive and / or unique connection interfaces.

Some fieldbus modules feature an integrated web server for retrieving information on the configuration and status and for troubleshooting.
Fieldbus modules are available in numerous configurations that support different control systems.

DeviceNet actuation / signal modules

Designation	Connector type	Description
SWO-L-DA2-K/A	4- and 5-pin mini-connector	Quick connect capable DeviceNet module, with actuation of the integrated valve, lock / unlock / ready-to-lock sensors, TSI on the master and ODVATM compliant
SWO-L-DB2-K/A	4- and 5-pin mini-connector	Quick connect capable DeviceNet module, with actuation of the integrated valve, TSI on the master and ODVATM compliant
SWO-L-DR2-K/A	4- and 5-pin mini-connector	Pass-through module for DeviceNet, ODVA capable

Ethernet actuation / signal modules

Designation	Connector type	Description
SWO-L-DK8-K	M12 connector 4-pin D-coded	Ethernet/IP modules, with actuation of the integrated valve, 5-digit tool ID and lock / unlock / ready-to-lock sensors, suitable for SWA-L-DK4
SWO-L-DK4-A	M12 connector 4-pin D-coded	Ethernet/IP pass-through module with tool ID, suitable for SWK-L-DK8-M or SWK-L-DKA
SWO-L-DKA-K	M12 connector 4-pin D-coded	Ethernet/IP modules, support for DHCP communication protocol, 5-digit tool ID and lock / unlock / ready-to-lock sensors, suitable for SWA-L-DK4

Welding Current Modules

The welding current module is responsible for conducting the current from the power supply to the customer's tool. It consists of three rhodium-coated copper contacts. Each contact can conduct 200 amperes at up to 600 volts. To prevent sparking, the quick-change system must never be separated without first disconnecting the power supply to the master. The installation of overcurrent protection in the primary circuit is recommended. The robot-side contact pins are recessed to prevent inadvertent contact with the operator.
The central contact on the tool-side module is also used as a lead contact. The electrical cable is fastened to the module with the cable clips provided by the customer. The plates are available in sizes PG29, 1-1/2 NPT and 1-1/4 NPT.

Welding current modules

Designation	Voltage	Current	Number of contacts	Cable size
SWK/SWA-L-PA2	600 VAC	200 A	3	#2
SWK/SWA-L-PB2	600 VAC	200 A	2	#2

Servo Modules

A servo module can be mounted on the quick-change system to support connection of a servo motor. The signal circuit and the motor circuit are separated from each other as specified as well as electrically insulated from each other and from the quick-change system. The robot-side contacts are recessed to prevent inadvertent contact with the operator. The electrical circuits are equipped with an EMI/RF shield to protect against noise. To prevent damage to the contacts, the unit may be separated only after disconnecting the power supply and after discharging. Contact SCHUNK to determine whether a design that suits your requirements already exists.

Pneumatic, Fluid and Vacuum Modules

SCHUNK offers numerous modules for the reliable supply of your application with pneumatic, vacuum and / or fluid media. Pneumatic modules are available with self-sealing or pass-through openings, which in both cases feature a housing made of anodized aluminum. In the pass-through pneumatic connections, rubber sleeves are used to achieve a lasting and reliable seal. They are suitable for both vacuum and compressed air applications. For connections with high flow rates for vacuum applications V-rings that cannot withstand positive pressure are used for the seal. Fluid / pneumatic modules are manufactured from stainless steel and are equipped with self-sealing connections with O-ring seals. This prevents corrosion as well as loss of fluid and / or air during tool changing.

Pneumatic, fluid and vacuum Modules

Designation	Connections	Number of connections	Cv value	Description
SWO-L-AK2-K/A	G1/4"	10	1.4	Self-sealing. Compressed air only.
SWO-L-AG2-K/A	G3/8" + G3/4"	4 + 2	1.6	(4) G3/8" self-sealing and (2) G3/4" for vacuum
SWO-L-AF2-K/A	G3/8"	8	2.45	"Open" feed-throughs for compressed air only.
SWO-L-AH2-K	G3/8"	8	1.6	Self-sealing. Compressed air only. Suitable for all AH adapter modules.
SWO-L-AH2-A	G3/8"	8	1.6	(4) Self-sealing, (4) "open" feed-throughs for compressed air. Suitable for AH2 master module.
SWO-L-AH3-A	G3/8"	8	1.6	"Open" feed-throughs for compressed air. Suitable for AH2 master module.
SWO-L-AH4-A	G3/8"	8	1.6	Self-sealing for compressed air. Suitable for AH2 master module.
SWO-L-AM2-K/A	G1/2"	2	1.6	Self-sealing. Compressed air only.
SWO-L-AM3-A	G1/2"	2	1.6	"Open" feed-throughs for compressed air. Suitable for AM2 master module.
SWO-L-AQ2-K/A	G1/2"	4	3.1	Self-sealing. Compressed air only.
SWO-L-AL2-K/A	G3/4"	2	8.0	Self-sealing. Compressed air only.
SWO-L-FC2-K	G3/8"	8	1.6	Self-sealing. Suitable for all FC adapter modules.
SWO-L-FC2-A	G3/8"	8	1.6	(4) Self-sealing, (4) "open" feed-throughs. Suitable for FC2 master module.
SWO-L-FC3-A	G3/8"	8	1.6	"Open" feed-throughs. Suitable for FC2 master module.
SWO-L-FC4-A	G3/8"	8	1.6	Self-sealing. Suitable for FC2 master module.

Hydraulic Modules

SCHUNK offers numerous hydraulic pass-through modules on which flush-mounted and self-sealing stainless steel valves can be used on the master and adapter. These modules are available for many different sizes and pressure ranges.
Due to the size and the hydraulic separating forces, these modules can be used only in combination with the larger quick-change systems SWS-L from SCHUNK. Pressure accumulators must be used and the pressure must be interrupted during tool changing to ensure a proper connection.
Contact SCHUNK if you need application instructions or information on special applications.

Hydraulic Modules

Designation	Connections	Max. pressure	Cv value
SWO-L-HB2-K/A	2 x G3/8" and 1 x G1/4"	158 bar	1.23 / 0.46
SWO-L-HB3-K/A	2 x G3/8"	158 bar	1.23
SWO-L-HB6-K/A	2 x G3/8"	496 bar	1.23

Optical Fiber Modules

An optical fiber module can be mounted on the quick-change system to establish a high-speed data connection to a tool. Optical fiber applications can include Interbus or Profibus communication hardware. Optical fiber modules from SCHUNK feature specific designs for the plug & play use of these components. A shield on the lens coupling and a robust IP65 housing provide for improved resistance and durability.

Modular. Stable. Robust.

SWS-L Storage Rack

Modular storage racks for quick-change systems starting with size SWS-160

The SCHUNK SWM-L storage rack is designed for stability, a long life and flexibility.
The freely configurable system ensures the optimal storage rack for every application.
Compact design with up to two tools per rack, selectable rack height, protective cover, and sensor.
The SWM-L is used successfully in the automotive industry around the world.

Your advantages and benefits

Compact hook or stud racks provide a compact and effective storage method.

Robust, powder-coated, welded racks for a long life, also in harsh conditions.

Optional sensors and switches for presence monitoring, position of the dust cover and tool stand interlock.

Optional dust cover for protecting the tool from dust, welding spatter and other impurities.

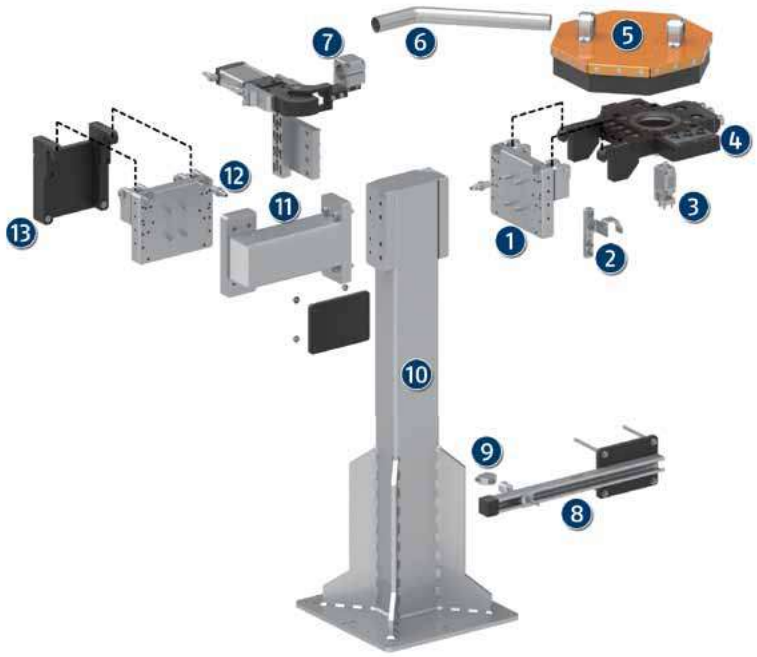
SWM-L system with studs and sockets

The storage system is available as a rigid or flexible system. The intermediate tool plate is designed for bolting on the quick-change system and your tool. The vertical tool plate can be used for direct bolting of your tool, in which case the quick-change adapter is likewise mounted directly on your tool. A dust cover and sensor are also provided.

1. Intermediate tool plate
2. Quick-change adapter
3. Dust cover
4. Lever for dust cover
5. Swing clamping element for dust cover
6. Extension
7. Sensor for presence monitoring
8. TSI sensor
9. Rigid storage rack
10. TSI sensor
11. Rack
12. Tool support
13. Rigid storage rack
14. Vertical tool plate

SWM-L system with hooks and hanger

The SCHUNK SWM-L storage rack is available either as a "rigid" or "flexible" system.
The intermediate hook tool plate is designed for bolting on the quick-change system in combination with your tool.
The vertical hook tool plate can be used for direct bolting of your tool, in which case the quick-change adapter is likewise mounted directly on your tool. A dust cover and sensor are also provided.



1. Rigid storage rack
2. TSI sensor
3. TSI sensor
4. Quick-change adapter with intermediate hook tool plate
5. Dust cover
6. Lever for dust cover
7. Swing clamping element for dust cover
8. Tool support
9. Tool support
10. Rack
11. Extension
12. Sensor for presence monitoring
13. Vertical hook tool plate

ⓘ Please contact us if you require additional product information: SCHUNK Technical Hotline +49-7133-103-2696

Compact. Loadable. Precise.

NSR-A Pallet-change System

Pneumatic tool change system with patented locking system.

Field of Application

Used where short changeover between a handling device and a tool are beneficial such as a gripper handling a pallet

Advantages – Your benefit

Very compact design for loading pallets extremely close to the machine table and confined spaces

Patented locking mechanism for high locking force

Form-fit locking with fail-safe for safe connection between pallet-change master and pallet-change adapter

All functional components made from hardened steel for a greater change system load bearing capacity

Integrated piston-stroke control and tool presence control for monitoring

Integrated drive in housing for compact dimensions and fewer interfering contours

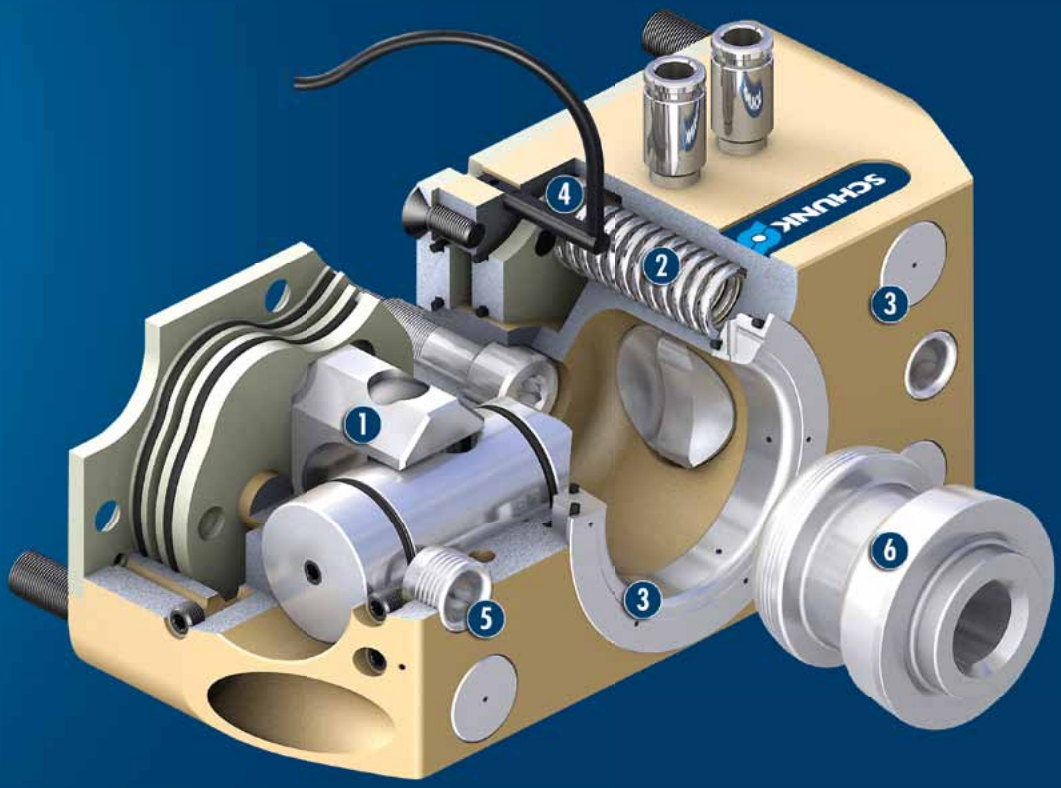
Wide range of electric, pneumatic, and fluid modules for universal energy transmission possibilities

Sizes	Handling weight	Moment load M_x	Moment load M_z
Quantity: 1	75 kg	75 Nm	200 Nm

Functional Description

Due to the automatic quick-change of the robot tool (e.g. gripper, vacuum gripping system, pneumatically or electrically driven tools, welding guns ...) flexibility of your robot increases.
The NSR-A pallet-change system consists of a NSR-A pallet-change master and a SPA pallet-change adapter.

The NSR-A, mounted onto the robot, couples up the NSR-SPA mounted onto your tool. A pneumatically driven locking piston, with its patented design, ensures that the connection is secure. After coupling, pneumatic and electric feed-throughs automatically supply your robot tool.



① **Locking mechanism**
fail-safe and robust

② **Compression springs**
integrated spring for locking force maintenance

③ **Steel ring**
with integrated blow-off function for cleaning the contact surfaces

④ **Piston stroke monitoring**
Monitoring of locking

⑤ **Anti-twist protection**
For secure force transmission

⑥ **Conical clamping pin**
for compensating positioning errors in the X-Y plane during locking

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Operating principle: Interior wedge hook kinematics

Pass through: Optional via electrical modules and / or fluid modules

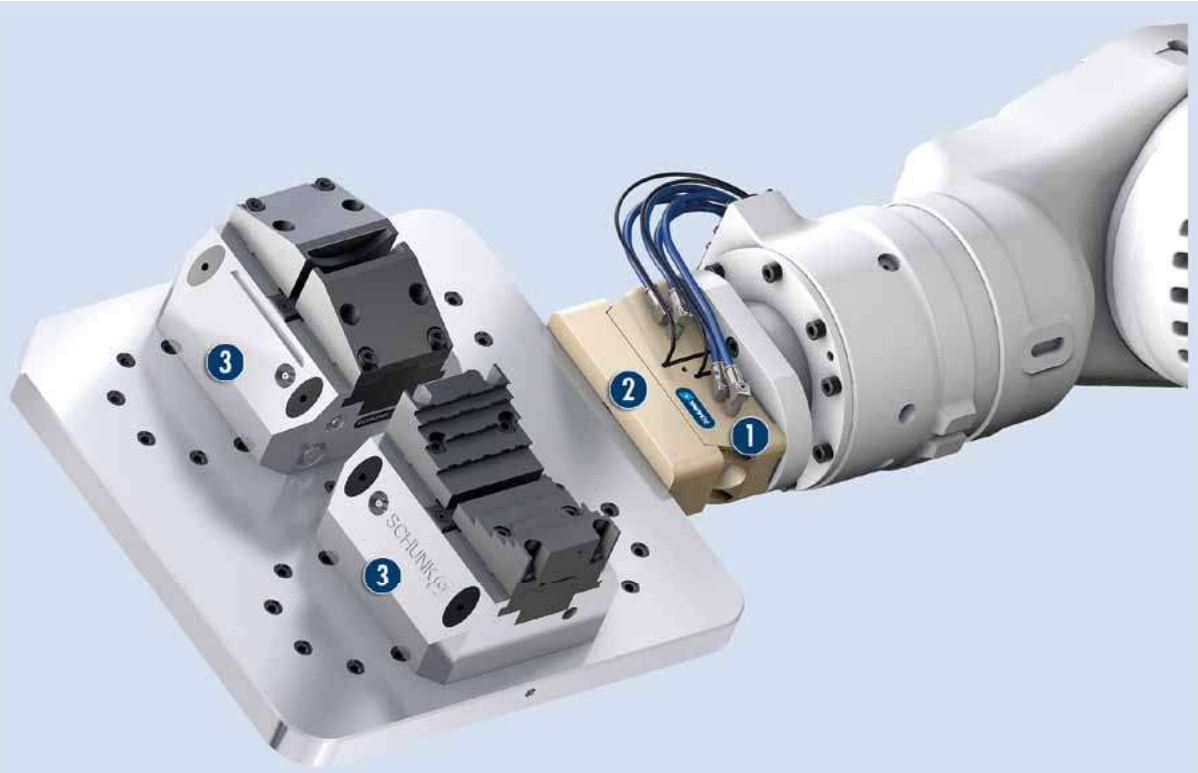
Housing: The housing is made of high-tensile, hard-coated aluminum alloy. The functional parts are made of hardened steel.

Scope of delivery: Robot-side mounting screws

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.



Application example

The slim design of the pallet-change-System NSR-A allows pallet handling extremely close to the machine table and limited space. The tool can be used in clean and dirty environments and pass the energy securely.

1. NSR-A Pallet-change Master
2. NSR-SPA-APL Pallet-change Adapter
3. Pneumatically actuated KSP plus clamping force block

SCHUNK offers more ...

The following components make the NSR-A even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Fittings

Magnetic Switches

Inductive Proximity Switches

Pneumatic Optional Modules

Clamping Pins

Optional Electrical Module

Extension Cable

PGN-plus Universal Gripper

PZN-plus Centric Gripper

PWG-plus Angular Gripper

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

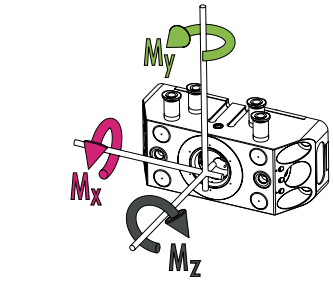
Options and special Information

Powerful and Compact: The high locking force creats an excetionally rigid system with excellent holding power for maximum torques. Handling of heavy pallets (350 kg with a pallet size of 400 x 400 mm) therefore becomes safer and easier.

NSR-A 100

Robot Accessories | Changing | Pallet-change System

Forces and moments



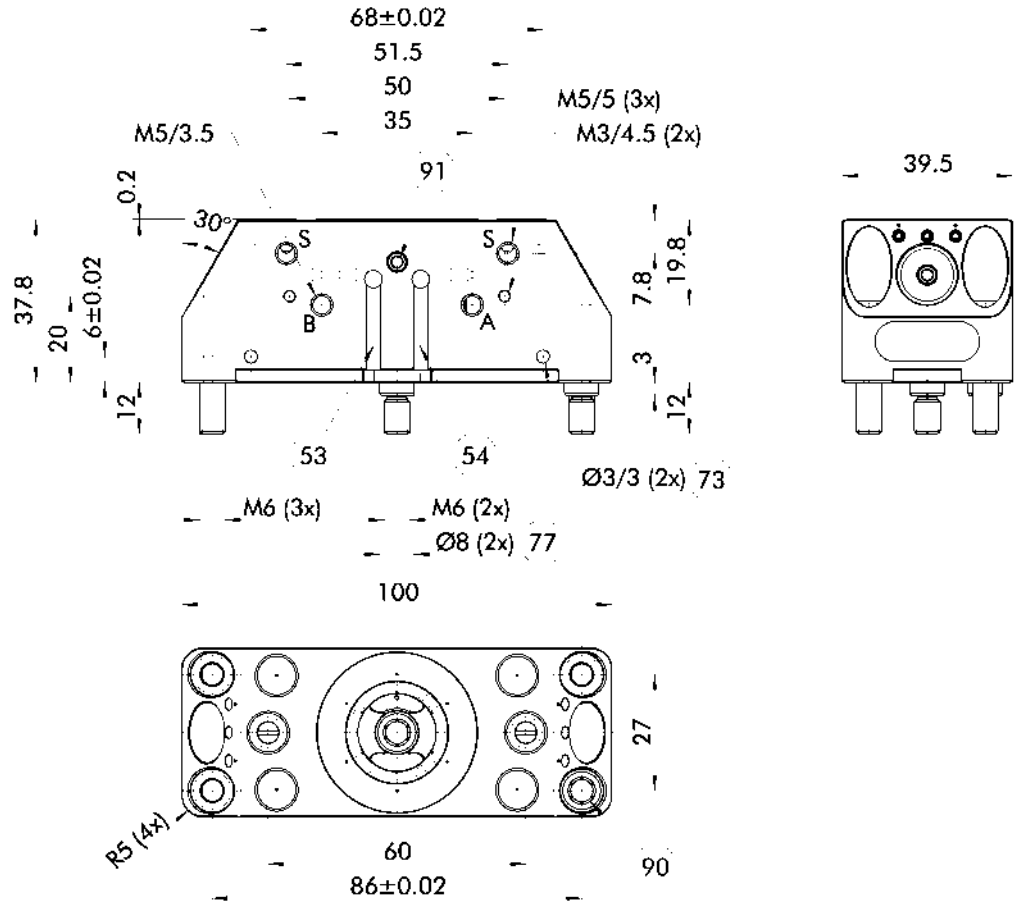
M_x max. s. Tab
M_z max. s. Tab
M_y max. s. Tab

ⓘ The indicated values are the maximum mechanical loads. The design must take into account loads resulting from dynamics.

Technical data

Description		NSR-A-100-000-000	NSR-SPA-100-M6/M8
		Palett changing master	Clamping pins
ID		0303170	0303171
max. payload	[kg]	75	75
max. static moment M_x / M_y	[Nm]	75	
max. static moment M_z	[Nm]	200	
Repeat accuracy	[mm]	0.005	0.005
Mass	[kg]	0.4	0.025
min. / max. locking distance	[mm]	1	1
Main connection lock / unlock		M5	
min. / max. ambient temperature	[°C]	15/60	

Main view



The main view shows the pallet changing system prepared for piston stroke monitoring and tool presence check without proximity switches.

A, a Air connection locked

B, b Air connection unlocked

S Air purge connection (0.5 ... 1 bar)

(53) Monitoring Position unlocked

(54) Monitoring Position locked

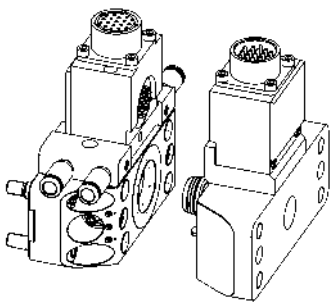
(73) Fit for centering pins

(77) Clearance for shoulder bolts

(90) Fitting screw for positional orientation (in accessory kit)

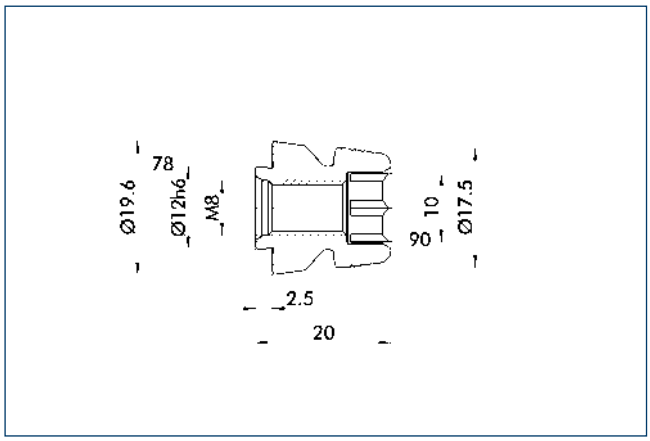
(91) Presence monitoring

Optional modules



This unit can be equipped with different optional modules for transmitting electric signals, pneumatics, or fluids. Please ask for details.

Clamping pin SPA

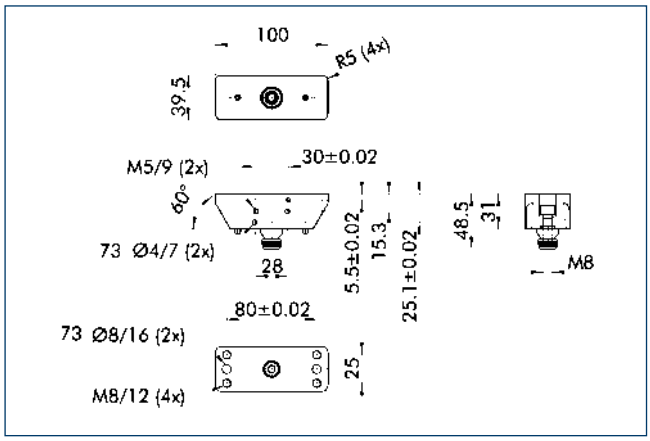


78 Fitting for centering

90 Wrench size

Description	ID	
Clamping pin		
NSR-SPA-100-M6/M8	0303171	

Pallet adapter – straight

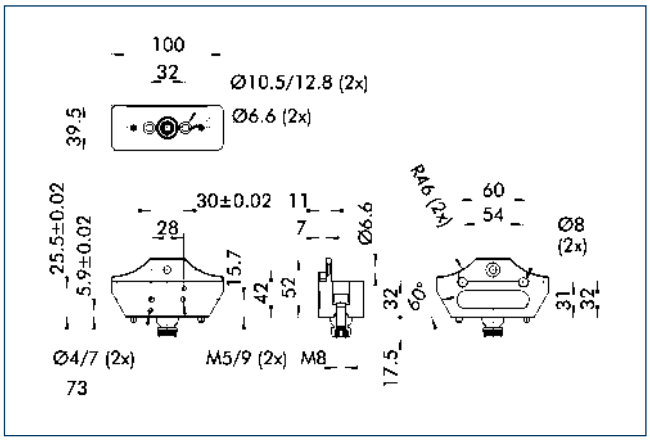


73 Fit for centering pins

Description	ID	
Adapter plate		
NSR-SPA-100-PKL-0-SB	0303180	

Clamping pin included in the scope of delivery.

Pallet adapter – angled

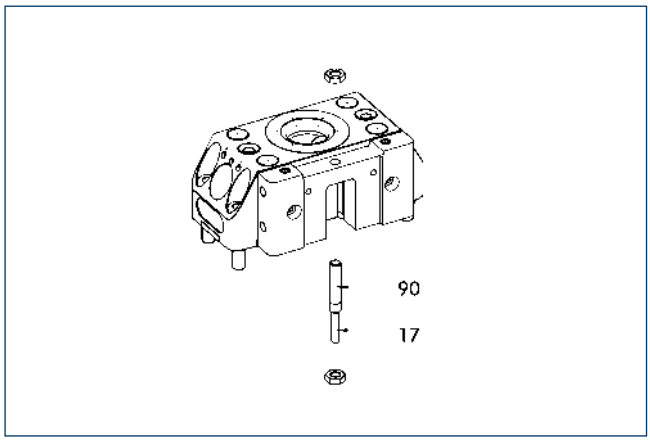


73 Fit for centering pins

Description	ID	
Adapter plate		
NSR-SPA-100-PKL-90-SB	0303179	

Clamping pin included in the scope of delivery.

IN 50 inductive proximity switches

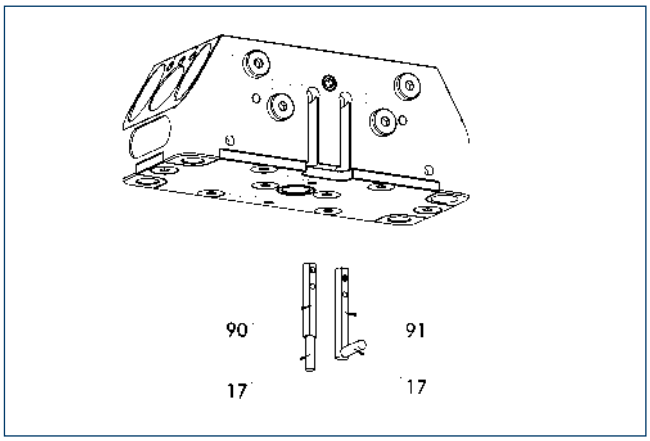


(17) Cable outlet
(90) IN ... sensor

Inductive proximity switches for the tool presence check.

Description	ID	Often combined
Inductive proximity switches		
IN 50-S-M12	0301575	
IN 50-S-M8	0301568	●
INK 50-S	0301560	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

MMS electronic Magnetic Switches



(17) Cable outlet
(91) MMS 22...-SA sensor
(90) Sensor MMS 22..

Description	ID	Often combined
MMS electronic magnetic switches		
MMS 22-S-M8-PNP	0301032	●
MMSK 22-S-PNP	0301034	
MMS electronic magnetic switches with lateral cable outlet		
MMS 22-S-M8-PNP-SA	0301042	●
MMSK 22-S-PNP-SA	0301044	
Cable extensions		
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
Sensor distributor		
V2-M8	0301775	●
V4-M8	0301746	
V8-M8	0301751	

ⓘ Two sensors (closer / NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Flexible. Compact. Productive.

HWS Manual Change System

Manual tool change system with integrated air feed-through and optional electric feed-through

Field of Application

Excellently suitable for flexible production, for products with a large range of variants.

Advantages – Your benefit

Series with six unit sizes for optimal size selection and a broad application range

Integrated pneumatic feed-through for a secure energy supply of the handling modules and tools

Mounting option of additional pneumatic or electric units for optimal adaption to your application

Wide range of electric, pneumatic, and fluid modules for universal energy transmission possibilities

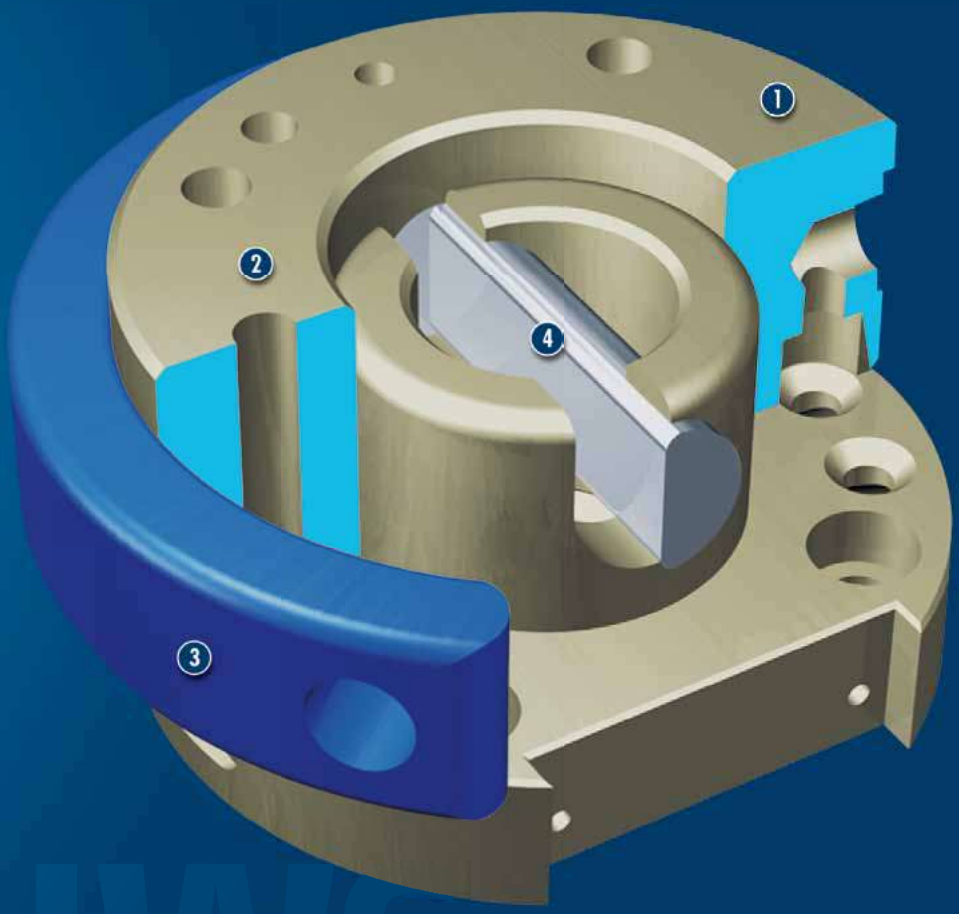
ISO flange pattern for easy assembly to most types of robots without needing additional adapter plates

Easy handling without additional tools quickly and easily removable at any time

Sizes	Handling weight	Moment load M_x	Moment load M_z
Quantity: 6	8 .. 54 kg	50 .. 320 Nm	40 .. 250 Nm

Functional Description

The manual hand change system HWS consists of a HWK hand change master, and a HWA hand change adapter. The HWK hand change master is form-fit locked without scope with the hand change adapter HWA. Therefore a semi-cylindrical bolt is turned by 180° with a hand lever. The integrated, pneumatic feed-throughs supply the tool with energy.



① **Direct assembly**
by using a standardized ISO 9409 interface for robots

② **Housing**
Weight-optimized through application of high-strength aluminum alloy

③ **Hand lever**
for manual actuation

④ **Locking**
Patented, easy, and safe

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Actuation: manually by hand lever

Operating principle: The master and adapter are locked and unlocked by turning the manual lever.

Energy transmission: Optional via electrical modules and / or fluid modules. Pneumatic feed-through is already integrated.

Housing: The housing is made of high-tensile, hard-coated aluminum alloy. The functional parts are made of hardened steel.

Scope of delivery: without mounting screws

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Flexible assembly unit for various product versions. Simple and quick tool changing using a quick-change system.

1. HWS consisting of HWK and HWA
2. PGN-plus Universal Gripper

SCHUNK offers more ...

The following components make the HWS even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Optional Electrical Module

Cable Connector

Fittings

Extension Cable

AGE Compensation Units

PZN-plus Centric Gripper

DDF 2 Rotary Feed-through

PGN-plus Universal Gripper

PWG-plus Angular Gripper

FDB Deburring Spindles

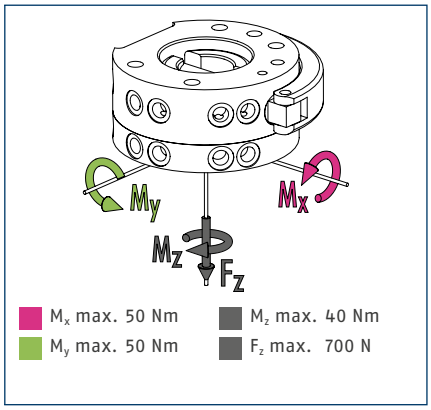
OPR Collision and Overload Sensors

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

HWS 040

Robot Accessories | Changing | Manual Change System

Forces and moments

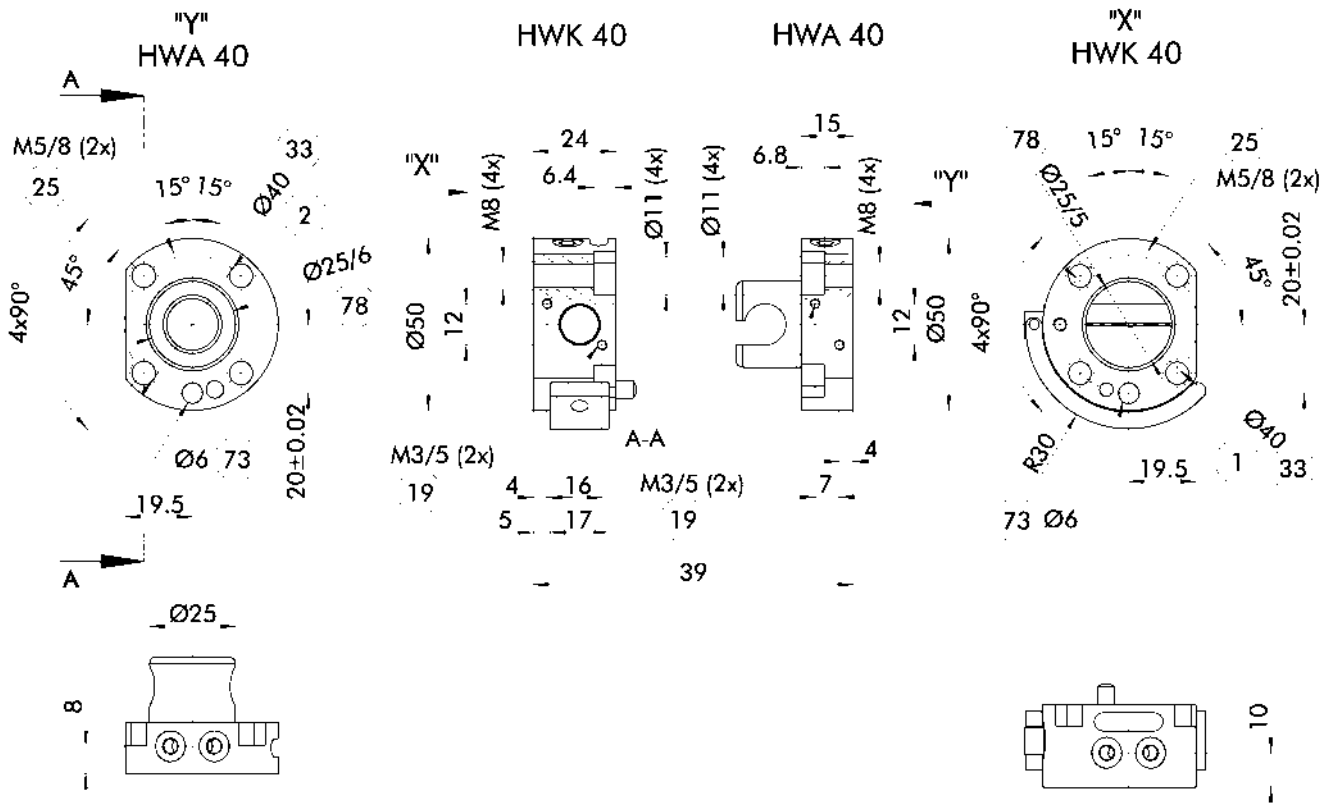


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		HWK-040-000-000	HWA-040-000-000
		Manual change master	Manual change adapter
ID		0302740	0302741
max. payload	[kg]	8	8
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	0.12	0.06
max. locking distance	[mm]	5	5
Number of pneumatic feed-throughs		2	2
Air connection thread Pneumatic feed-through		M5	M5
Graduated circle diameter	[mm]	40	40
Robot side connection		ISO 9409-1-40-4-M6	ISO 9409-1-40-4-M6
min. / max. ambient temperature	[°C]	5/60	5/60

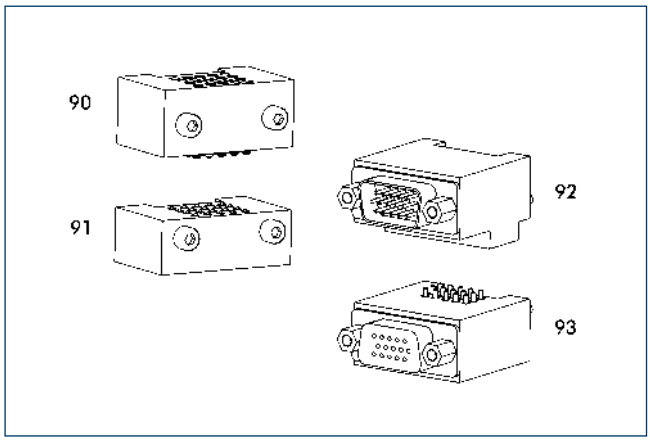
Main view



The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(19) Mounting surface for options
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Optional electrical modules



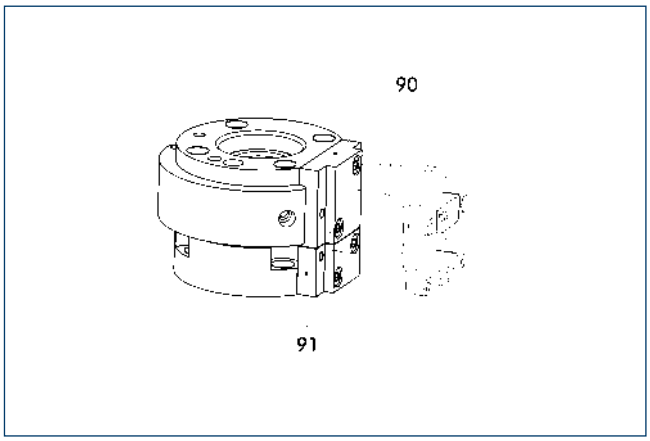
(90) E..., robot-side
(91) E..., tool-side
(92) A.../B... robot-side
(93) A.../B... tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-A15-K	9936357	15	50 V AC/3 A
SWO-E10-010-K	9935801	10	50 V AC/3 A
Tool-side			
SWO-A15-A	9936356	15	50 V AC/3 A
SWO-E10-010-A	9935802	10	50 V AC/3 A

ⓘ For other modules and technical data, see chapter “Options” or visit www.schunk.com

Adapter plate for optional electrical modules

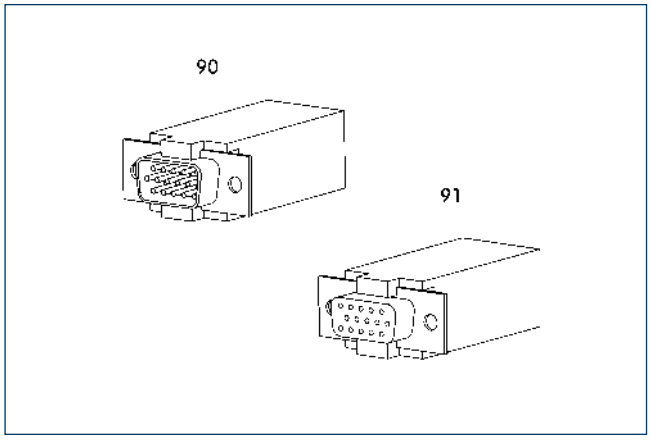


(90) Apapter plate robot-side
(91) Apapter plate tool-side

Description	ID
Robot-side	
HWK-040-AKO	0302745
Tool-side	
HWA-040-AKO	0302746

The adapter plates are needed to mount the optional electical modules.

Cable connector

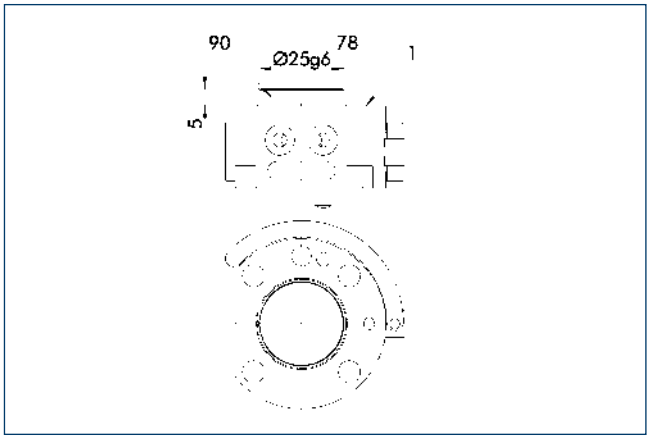


(90) D-sub connecting plug
(91) D-sub connector

Description	ID
Straight cable connector, robot-side	
KAS-A15-K-0	0301264
Straight cable connector, tool-side	
KAS-A15-A-0	0301265

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

Centering for HWK



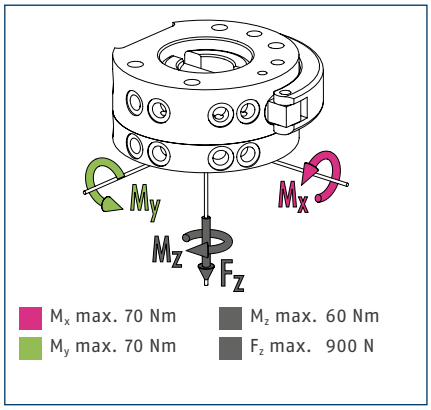
(1) Connector, robot-side
(78) Fitting for centering
(90) Centering disc

Description	ID
A-HWK-040-BOSS	0302742

HWS 050

Robot Accessories | Changing | Manual Change System

Forces and moments

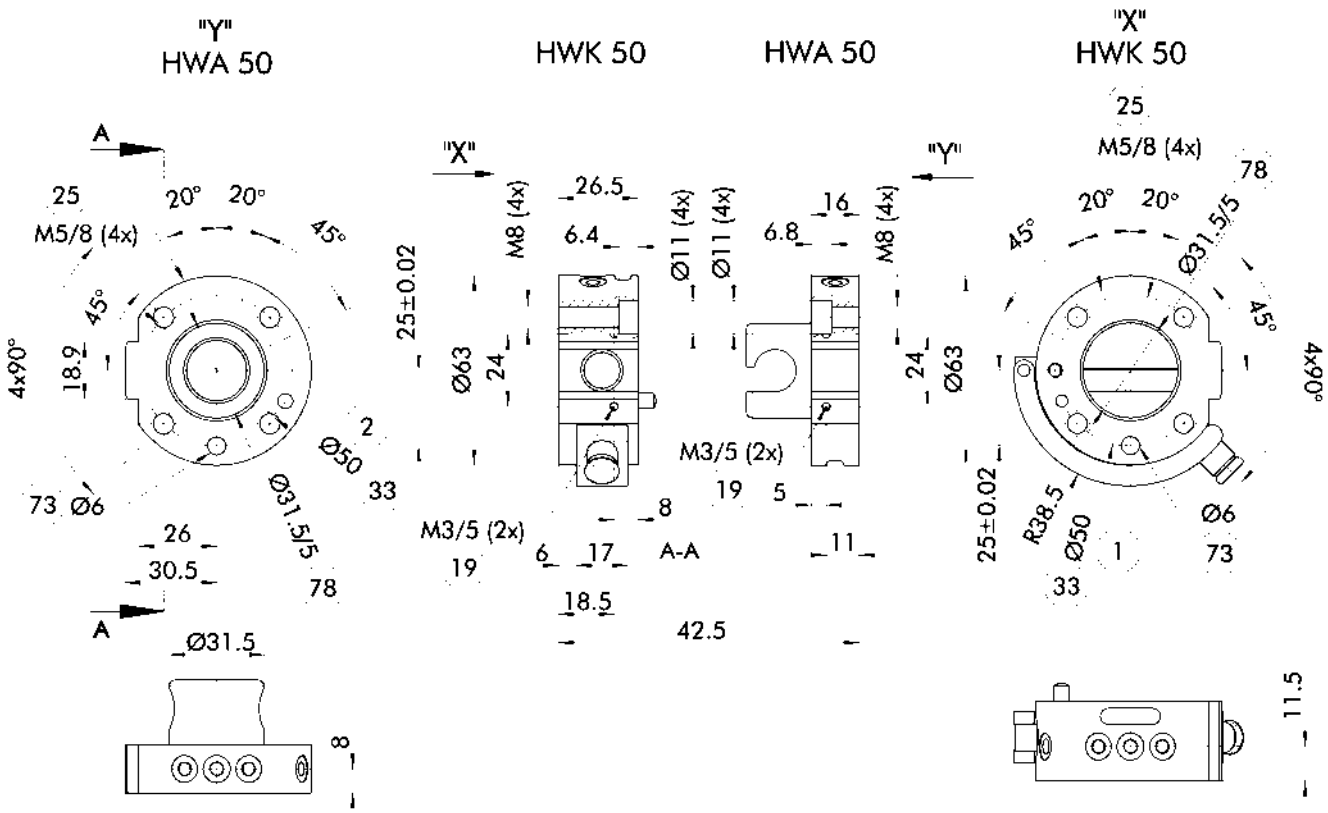


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		HWK-050-000-000	HWA-050-000-000
		Manual change master	Manual change adapter
ID		0302750	0302751
max. payload	[kg]	12	12
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	0.23	0.12
max. locking distance	[mm]	6	6
Number of pneumatic feed-throughs		4	4
Air connection thread Pneumatic feed-through		M5	M5
Graduated circle diameter	[mm]	50	50
Robot side connection		ISO 9409-1-50-4-M6	ISO 9409-1-50-4-M6
min. / max. ambient temperature	[°C]	5/60	5/60

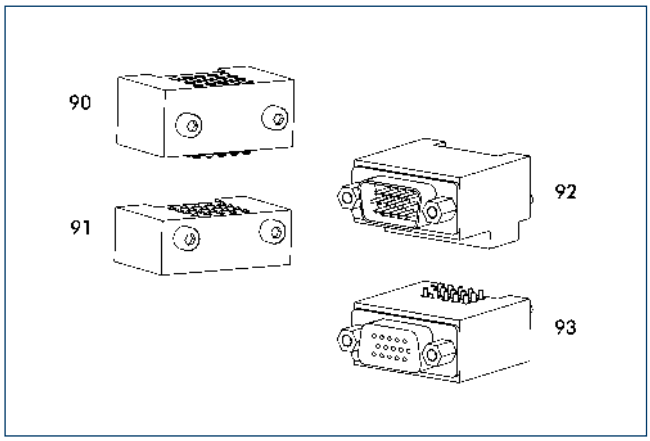
Main view



The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(19) Mounting surface for options
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Optional electrical modules



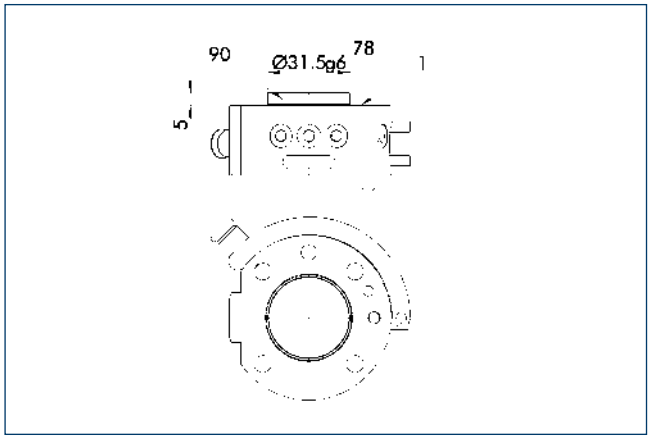
(90) E..., robot-side
(91) E..., tool-side
(92) A.../B... robot-side
(93) A.../B... tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-A15-K	9936357	15	50 V AC/3 A
SWO-E10-010-K	9935801	10	50 V AC/3 A
Tool-side			
SWO-A15-A	9936356	15	50 V AC/3 A
SWO-E10-010-A	9935802	10	50 V AC/3 A

ⓘ For other modules and technical data, see chapter “Options” or visit www.schunk.com

Centering for HWK

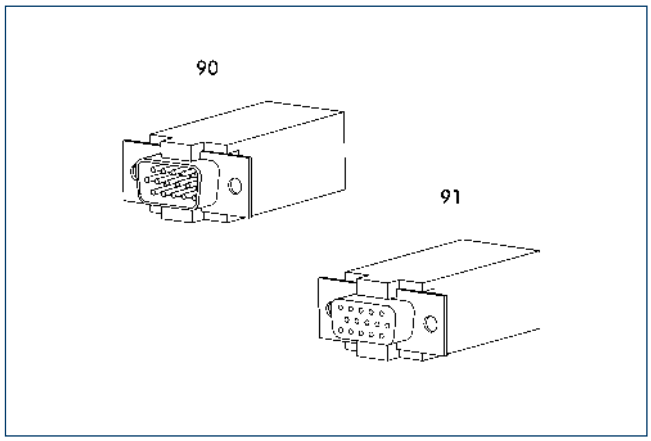


(1) Connector, robot-side
(78) Fitting for centering
(90) Centering disc

Description	ID	
A-HWK-050-BOSS	0302752	

ⓘ Serves as a fitting disc for centering on mechanical interface, such as a robot.

Cable connector



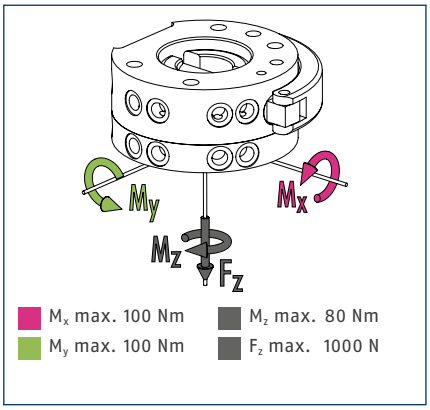
(90) D-sub connecting plug
(91) D-sub connector

Description	ID	
Straight cable connector, robot-side		
KAS-A15-K-0	0301264	
Straight cable connector, tool-side		
KAS-A15-A-0	0301265	

ⓘ For other cable connections, see chapter “Options” or visit www.schunk.com

HWS 063

Forces and moments

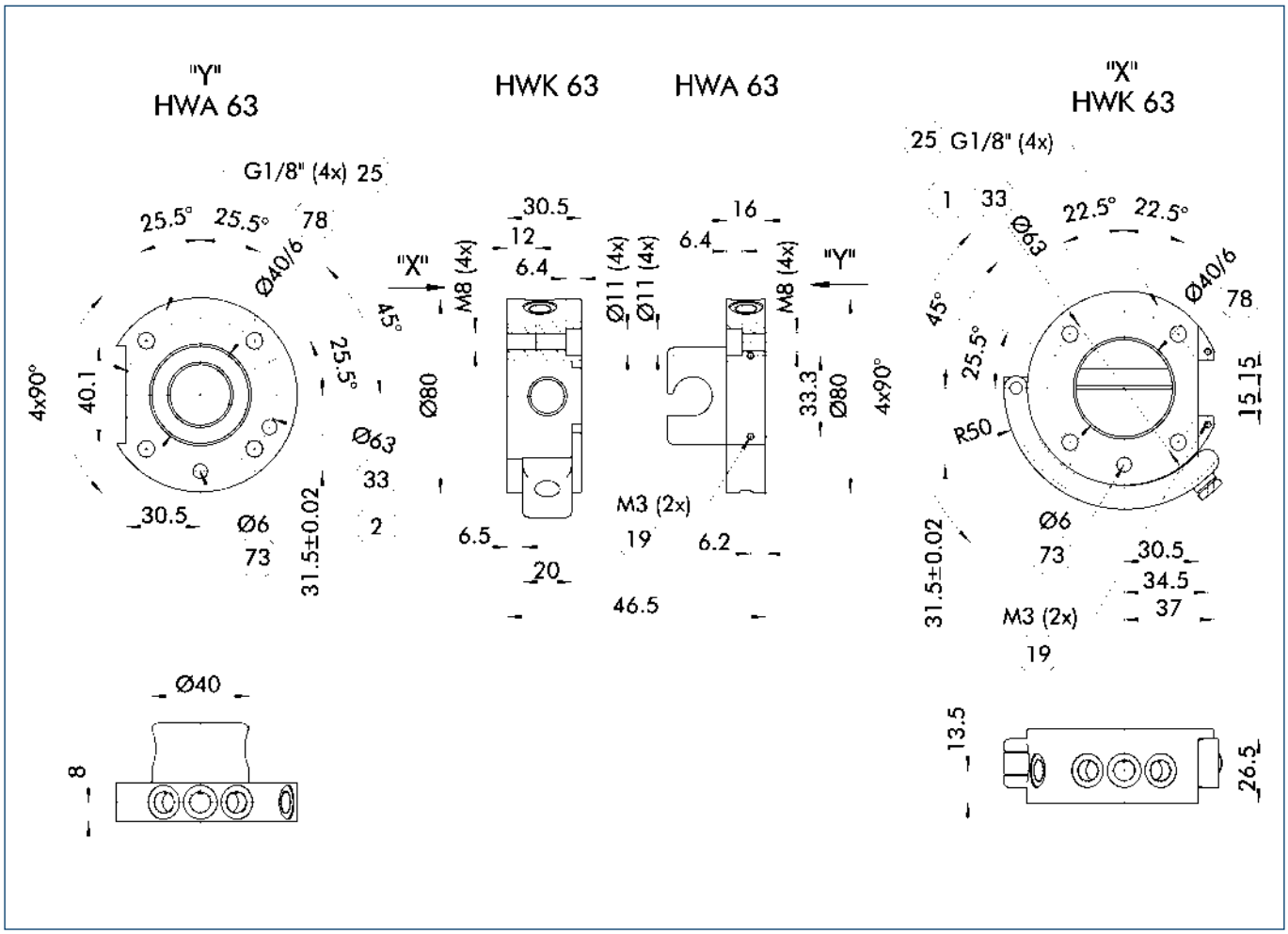


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		HWK-063-000-000	HWA-063-000-000
		Manual change master	Manual change adapter
ID		0302763	0302764
max. payload	[kg]	16	16
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	0.4	0.2
max. locking distance	[mm]	8	8
Number of pneumatic feed-throughs		4	4
Air connection thread Pneumatic feed-through		G1/8“	G1/8“
Graduated circle diameter	[mm]	63	63
Robot side connection		ISO 9409-1-63-4-M6	ISO 9409-1-63-4-M6
min. / max. ambient temperature	[°C]	5/60	5/60

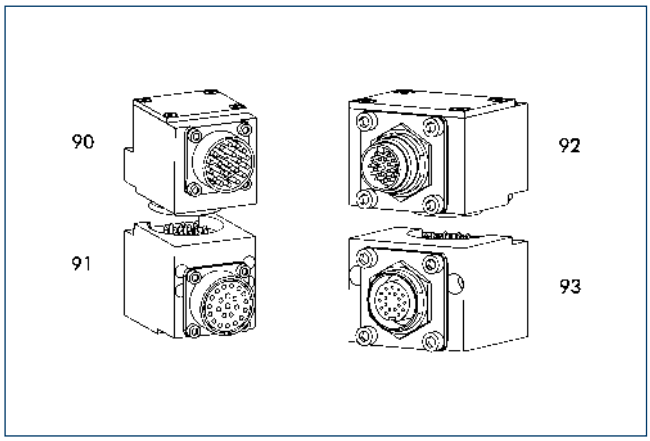
Main view



The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(19) Mounting surface for options
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Optional electrical modules



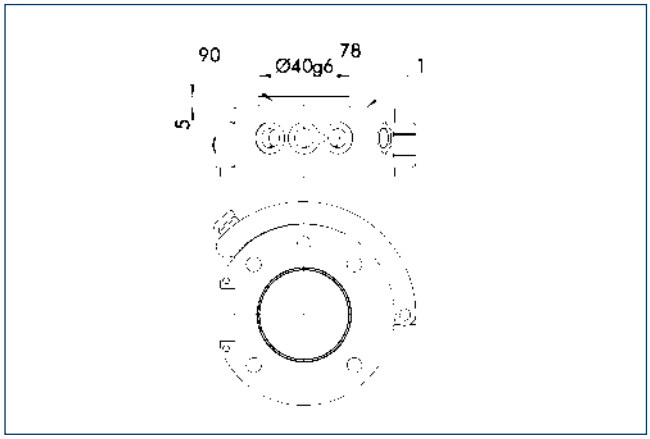
(90) E-module with bayonet fitting, robot-side
(91) E-module with bayonet fitting, tool-side
(92) E-module with metric threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-K19-K	9937328	19	50 V AC/3 A
SWO-K26-K	9937798	26	50 V AC/3 A
SWO-KF19-K	9959886	19	50 V DC/3 A
Tool-side			
SWO-K19-A	9937329	19	50 V AC/3 A
SWO-K26-A	9937799	26	50 V AC/3 A
SWO-KF19-A	9959887	19	50 V DC/3 A

ⓘ For other modules and technical data, see chapter “Options” or visit www.schunk.com

Centering for HWK

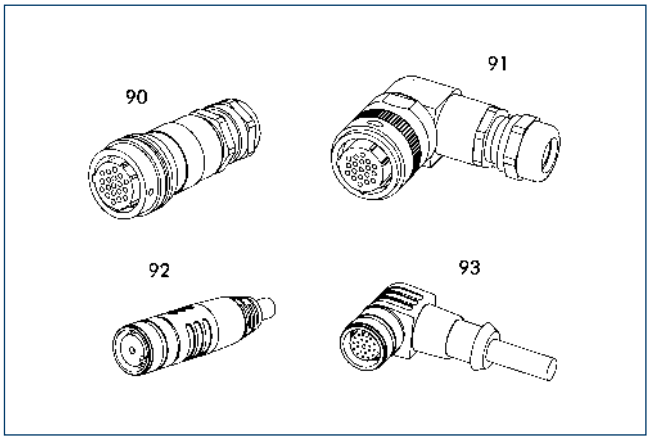


(1) Connector, robot-side
(78) Fitting for centering
(90) Centering disc

Description	ID	
A-HWK-063-BOSS	0302765	

ⓘ Serves as a fitting disc for centering on mechanical interface, such as a robot.

Cable connector / cable extension



(90) Connection plug / socket straight
(91) Connection plug / socket at an angle
(92) Connection plug / socket straight with extension cable
(93) Connection plug / socket at an angle with extension cable

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-10-SWK-19F-90	0302173	10 m
KV-3-SWK-19B-90	0302179	3 m
KV-3-SWK-26B-90	0302185	3 m
KV-5-SWK-19B-90	0302190	5 m
KV-5-SWK-19F-90	0302172	5 m
KV-5-SWK-26B-90	0302186	5 m
Angled cable connector, robot-side		
KAS-19B-K-90-C	0301294	
KAS-26B-K-90-C	0301296	
Angled cable connector, tool-side		
KAS-19B-A-90-C	0301295	
KAS-19G-A-90	0301237	
KAS-26B-A-90-C	0301297	
KAS-36B-A-90	0301275	
Angled cable connector with cable, tool-side		
KV-3-SWA-19B-90	0302191	3 m
KV-3-SWA-19F-90	0302175	3 m
KV-3-SWA-26B-90	0302187	3 m
Straight cable connector, robot-side		
KAS-19B-K-0-C	0301283	
KAS-26B-K-0-C	0301290	
Straight cable connector, tool-side		
KAS-19B-A-0-C	0301284	
KAS-19G-A-0	0301233	
Straight cable connector with cable, robot-side		
KV-10-SWK-19F-0	0302171	10 m
KV-3-SWK-19B-0	0302176	3 m
KV-3-SWK-26B-0	0302192	3 m
KV-5-SWK-19B-0	0302177	5 m
KV-5-SWK-19F-0	0302170	5 m
KV-5-SWK-26B-0	0302193	5 m
Straight cable connector, tool-side		
KV-3-SWA-19B-0	0302178	3 m
KV-3-SWA-26F-0	0302174	3 m
KV-3-SWA-26B-0	0302184	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

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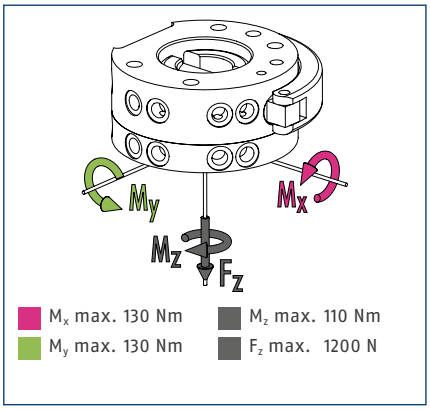
Forces and moments

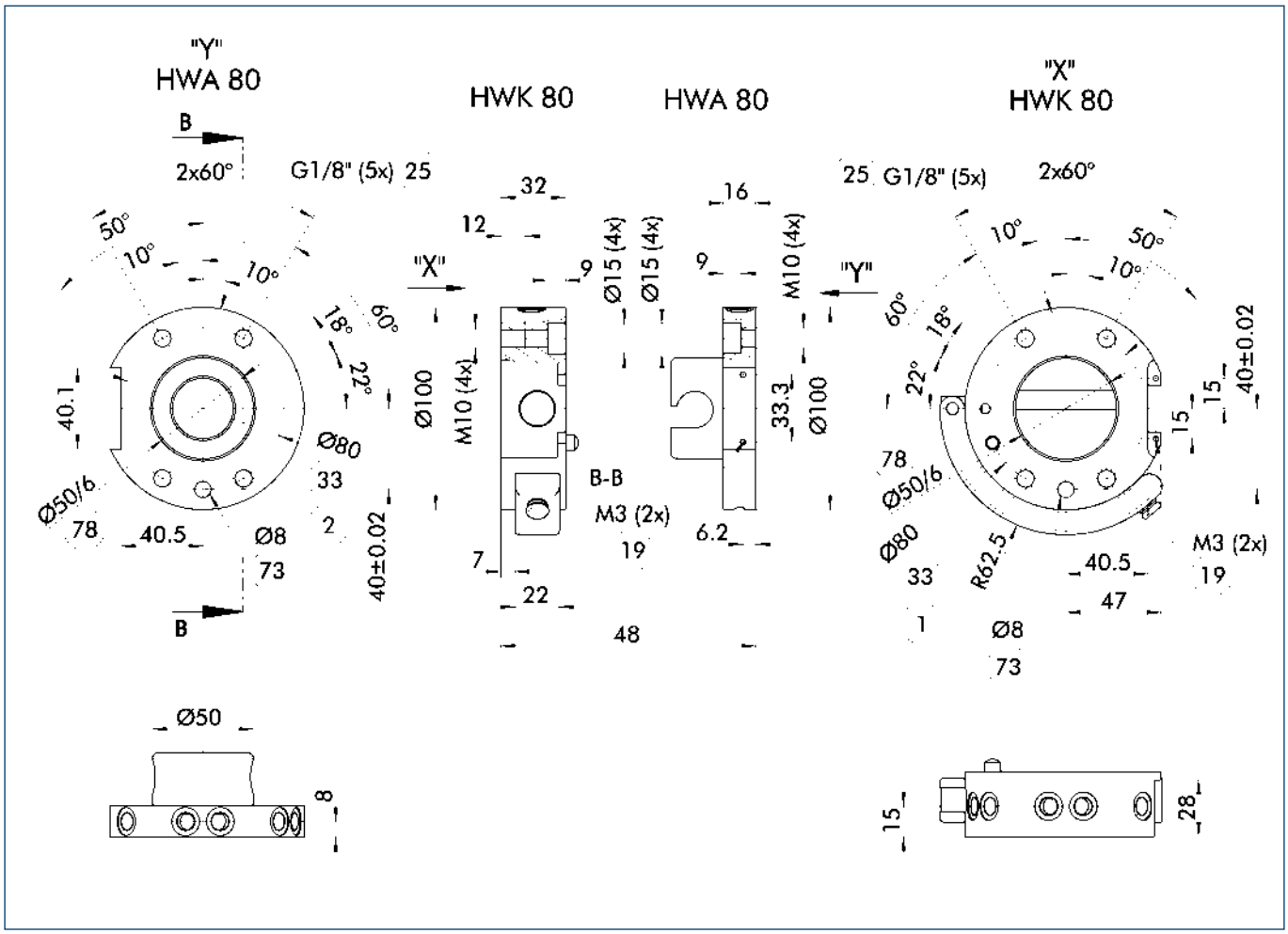


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		HWK-080-000-000	HWA-080-000-000
		Manual change master	Manual change adapter
ID		0302780	0302781
max. payload	[kg]	24	24
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	0.6	0.3
max. locking distance	[mm]	8	8
Number of pneumatic feed-throughs		5	5
Air connection thread Pneumatic feed-through		G1/8“	G1/8“
Graduated circle diameter	[mm]	80	80
min. / max. ambient temperature	[°C]	5/60	5/60

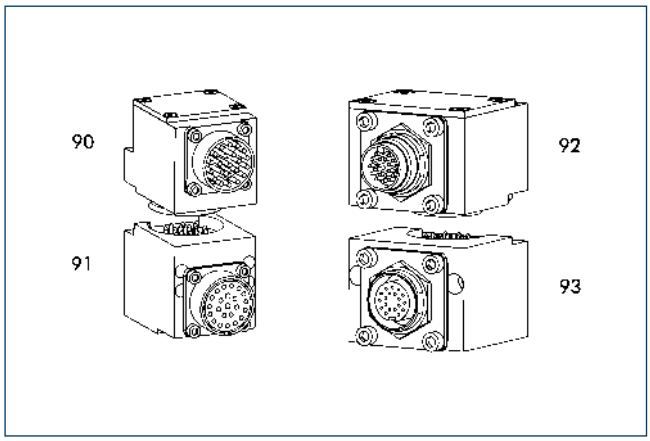
Main view



The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
19. Mounting surface for options
25. Pneumatic feed-through
33. DIN ISO-9409 bolt-hole circle diameter
73. Fit for a centering pin
78. Fitting for centering

Optional electrical modules



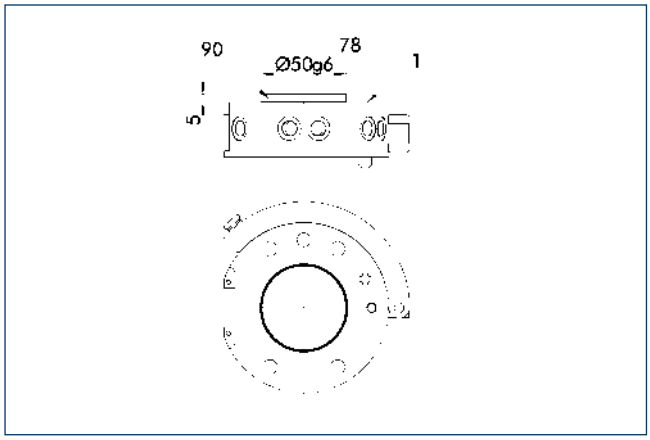
(90) E-module with bayonet fitting, robot-side
(91) E-module with bayonet fitting, tool-side
(92) E-module with metric threads, robot-side
(93) E-module with mil-spec. threads, tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-K19-K	9937328	19	50 V AC/3 A
SWO-K26-K	9937798	26	50 V AC/3 A
SWO-KF19-K	9959886	19	50 V DC/3 A
Tool-side			
SWO-K19-A	9937329	19	50 V AC/3 A
SWO-K26-A	9937799	26	50 V AC/3 A
SWO-KF19-A	9959887	19	50 V DC/3 A

ⓘ For other modules and technical data, see chapter “Options” or visit www.schunk.com

Centering for HWK

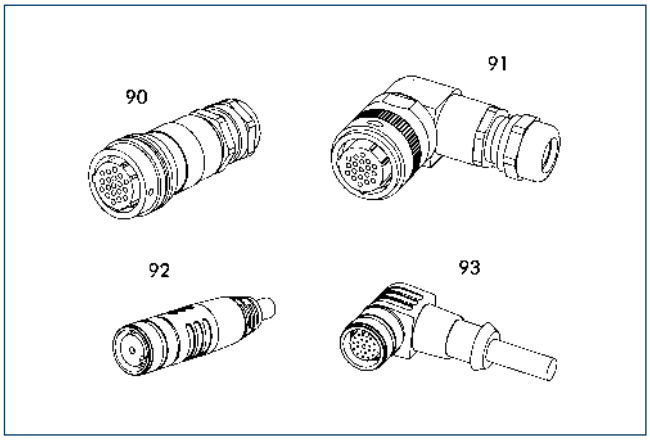


(1) Connector, robot-side
(78) Fitting for centering
(90) Centering disc

Description	ID	
A-HWK-080-BOSS	0302782	

ⓘ Serves as a fitting disc for centering on mechanical interface, such as a robot.

Cable connector / cable extension



(90) Connection plug / socket straight
(91) Connection plug / socket at an angle
(92) Connection plug / socket straight with extension cable
(93) Connection plug / socket at an angle with extension cable

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-10-SWK-19F-90	0302173	10 m
KV-3-SWK-19B-90	0302179	3 m
KV-3-SWK-26B-90	0302185	3 m
KV-5-SWK-19B-90	0302190	5 m
KV-5-SWK-19F-90	0302172	5 m
KV-5-SWK-26B-90	0302186	5 m
Angled cable connector, robot-side		
KAS-19B-K-90-C	0301294	
KAS-26B-K-90-C	0301296	
Angled cable connector, tool-side		
KAS-19B-A-90-C	0301295	
KAS-26B-A-90-C	0301297	
Angled cable connector with cable, tool-side		
KV-3-SWA-19B-90	0302191	3 m
KV-3-SWA-19F-90	0302175	3 m
KV-3-SWA-26B-90	0302187	3 m
Straight cable connector, robot-side		
KAS-19B-K-0-C	0301283	
KAS-26B-K-0-C	0301290	
Straight cable connector, tool-side		
KAS-19B-A-0-C	0301284	
KAS-26B-A-0-C	0301291	
Straight cable connector with cable, robot-side		
KV-10-SWK-19F-0	0302171	10 m
KV-3-SWK-19B-0	0302176	3 m
KV-3-SWK-26B-0	0302192	3 m
KV-5-SWK-19B-0	0302177	5 m
KV-5-SWK-19F-0	0302170	5 m
KV-5-SWK-26B-0	0302193	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19B-0	0302178	3 m
KV-3-SWA-19F-0	0302174	3 m
KV-3-SWA-26B-0	0302184	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

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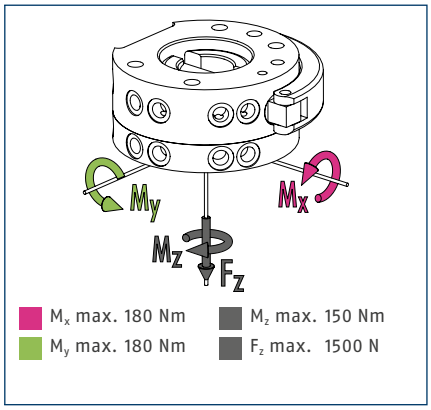
Forces and moments

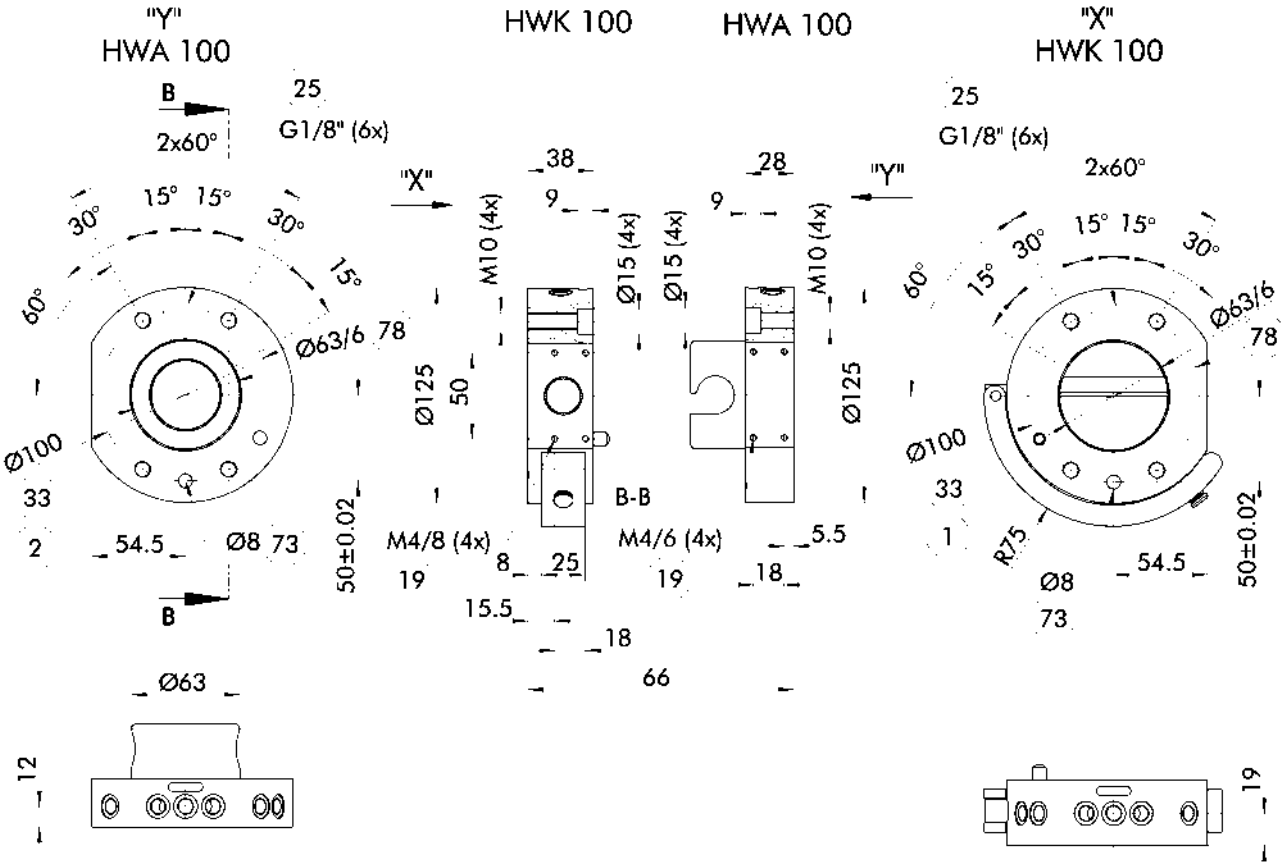


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		HWK-100-000-000	HWA-100-000-000
		Manual change master	Manual change adapter
ID		0302800	0302801
max. payload	[kg]	30	30
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	1.2	0.9
max. locking distance	[mm]	8	8
Number of pneumatic feed-throughs		6	6
Air connection thread Pneumatic feed-through		G1/8“	G1/8“
Graduated circle diameter	[mm]	100	100
min. / max. ambient temperature	[°C]	5/60	5/60

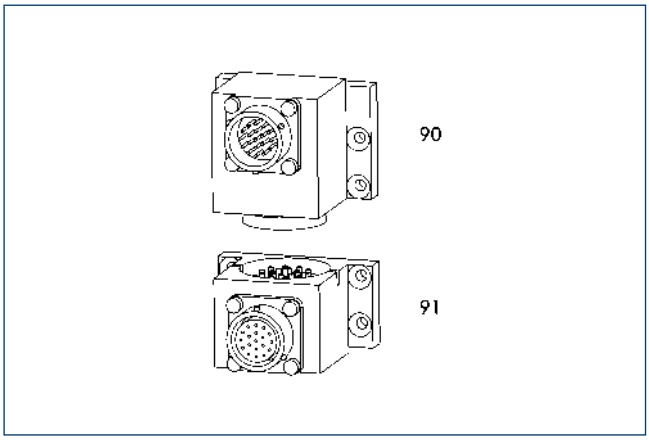
Main view



The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
19. Mounting surface for options
25. Pneumatic feed-through
33. DIN ISO-9409 bolt-hole circle diameter
73. Fit for a centering pin
78. Fitting for centering

Optional electrical modules



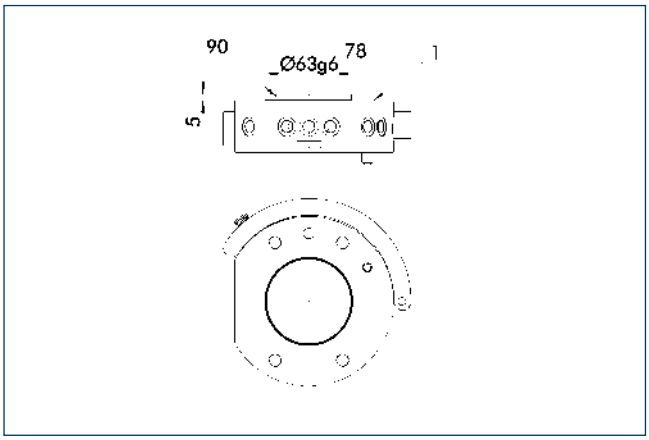
(90) Robot-side
(91) Tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-G19-K	9940649	19	250 V AC/3 A
SWO-G26-K	9941560	26	250 V AC/3 A
SWO-GF19-K	9948655	19	125 V AC/3 A
SWO-R19-K	9935815	19	250 V AC/5 A
SWO-R26-K	9935819	26	250 V AC/3 A
SWO-RF19-K	9948654	19	125 V AC/3 A
Tool-side			
SWO-G19-A	9940650	19	250 V AC/3 A
SWO-G26-A	9941561	26	250 V AC/3 A
SWO-GF19-A	9948658	19	125 V AC/3 A
SWO-R19-A	9935816	19	250 V AC/5 A
SWO-R26-A	9935820	26	250 V AC/3 A
SWO-RF19-A	9948657	19	125 V AC/3 A

ⓘ For other modules and technical data, see chapter “Options” or visit www.schunk.com

Centering for HWK

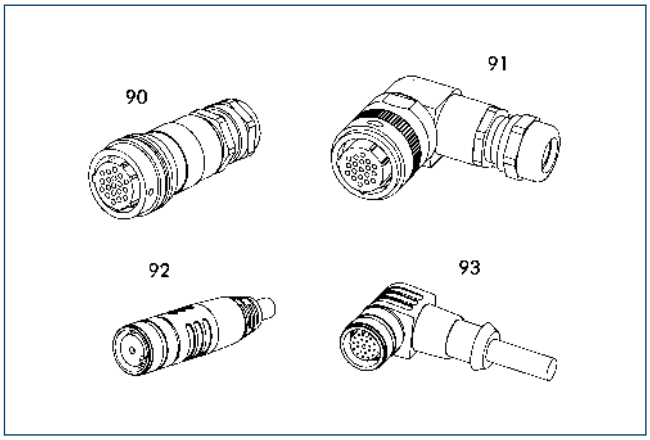


(1) Connector, robot-side
(78) Fitting for centering
(90) Centering disc

Description	ID	
A-HWK-100-BOSS	0302802	

ⓘ Serves as a fitting disc for centering on mechanical interface, such as a robot.

Cable connector / cable extension



(90) Connection plug / socket straight
(91) Connection plug / socket at an angle
(92) Connection plug / socket straight with extension cable
(93) Connection plug / socket at an angle with extension cable

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-10-SWK-19F-90	0302173	10 m
KV-3-SWK-19B-90	0302179	3 m
KV-3-SWK-26B-90	0302185	3 m
KV-5-SWK-19B-90	0302190	5 m
KV-5-SWK-19F-90	0302172	5 m
KV-5-SWK-26B-90	0302186	5 m
Angled cable connector, robot-side		
KAS-19B-K-90-C	0301294	
KAS-26B-K-90-C	0301296	
Angled cable connector, tool-side		
KAS-19B-A-90-C	0301295	
KAS-26B-A-90-C	0301297	
Angled cable connector with cable, tool-side		
KV-3-SWA-19B-90	0302191	3 m
KV-3-SWA-19F-90	0302175	3 m
KV-3-SWA-26B-90	0302187	3 m
Straight cable connector, robot-side		
KAS-19B-K-0-C	0301283	
KAS-26B-K-0-C	0301290	
Straight cable connector, tool-side		
KAS-19B-A-0-C	0301284	
KAS-26B-A-0-C	0301291	
Straight cable connector with cable, robot-side		
KV-10-SWK-19F-0	0302171	10 m
KV-3-SWK-19B-0	0302176	3 m
KV-3-SWK-26B-0	0302192	3 m
KV-5-SWK-19B-0	0302177	5 m
KV-5-SWK-19F-0	0302170	5 m
KV-5-SWK-26B-0	0302193	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19B-0	0302178	3 m
KV-3-SWA-19F-0	0302174	3 m
KV-3-SWA-26B-0	0302184	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

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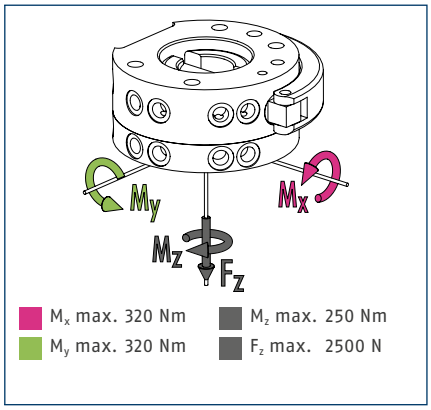
Robot Accessories | Changing | Manual Change System

Forces and moments

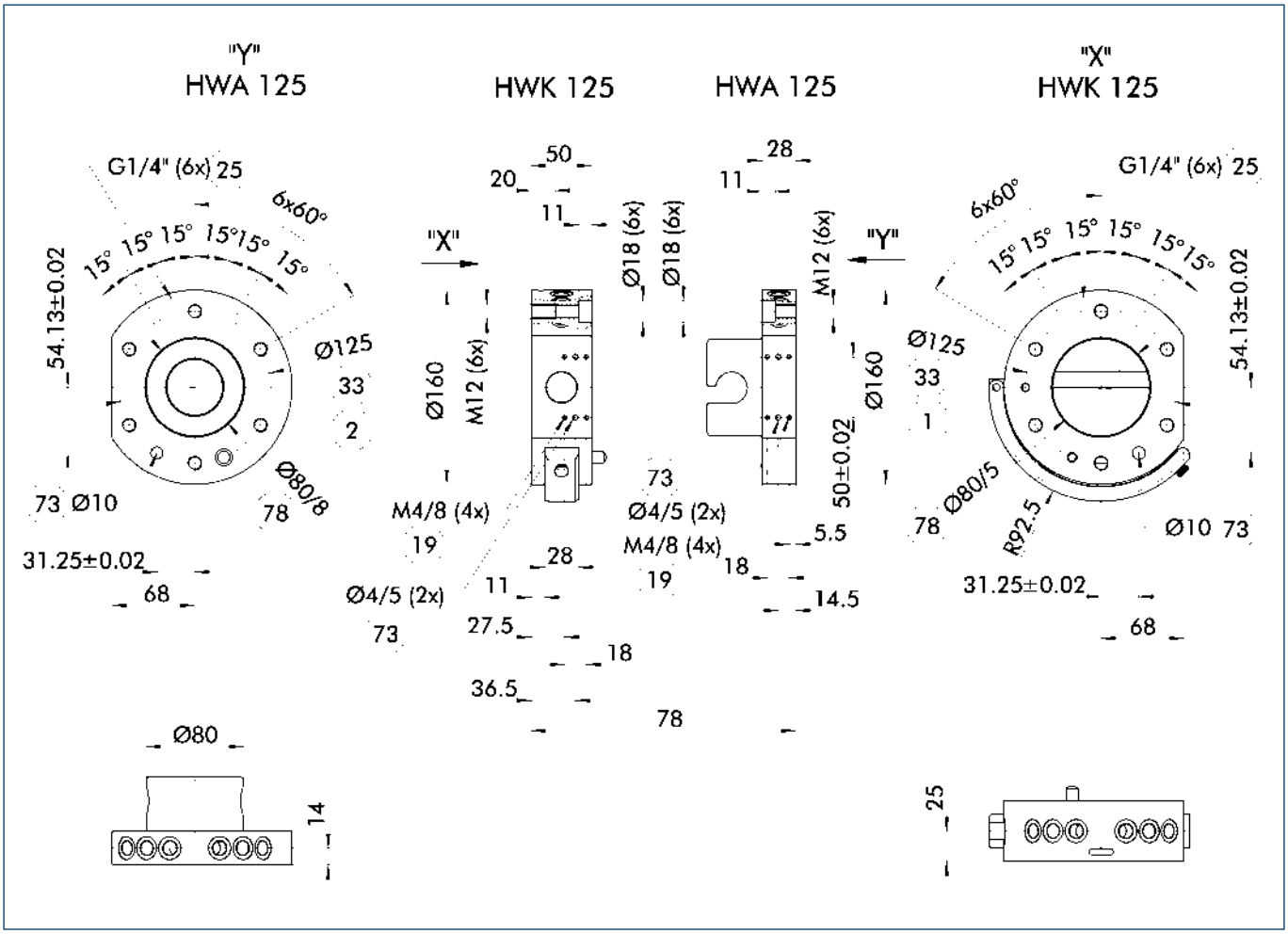


ⓘ This is the max. sum of all forces and moments (from acceleration or deceleration, process forces or moments, emergency stop situations, etc.) which are permitted to act on the tool change system while still ensuring proper functioning.

Technical data

Description		HWK-125-000-000	HWA-125-000-000
		Manual change master	Manual change adapter
ID		0302825	0302826
max. payload	[kg]	54	54
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	2.4	1.5
max. locking distance	[mm]	10	10
Number of pneumatic feed-throughs		6	6
Air connection thread Pneumatic feed-through		G1/4“	G1/4“
Graduated circle diameter	[mm]	125	125
Robot side connection		ISO 9409-1-125-6-M10	ISO 9409-1-125-6-M10
min. / max. ambient temperature	[°C]	5/60	5/60

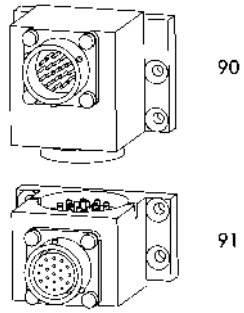
Main view



The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
19. Mounting surface for options
25. Pneumatic feed-through
33. DIN ISO-9409 bolt-hole circle diameter
73. Fit for a centering pin
78. Fitting for centering

Optional electrical modules



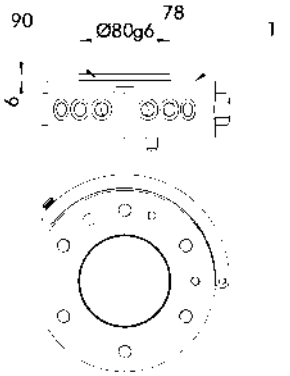
(90) Robot-side
(91) Tool-side

Modules for transmission of electrical signals from the robot through the tool changer to the tools.

Description	ID	No. Pins	Elec. Rating
Robot-side			
SWO-G19-K	9940649	19	250 V AC/3 A
SWO-G26-K	9941560	26	250 V AC/3 A
SWO-GF19-K	9948655	19	125 V AC/3 A
SWO-R19-K	9935815	19	250 V AC/5 A
SWO-R26-K	9935819	26	250 V AC/3 A
SWO-RF19-K	9948654	19	125 V AC/3 A
Tool-side			
SWO-G19-A	9940650	19	250 V AC/3 A
SWO-G26-A	9941561	26	250 V AC/3 A
SWO-GF19-A	9948658	19	125 V AC/3 A
SWO-R19-A	9935816	19	250 V AC/5 A
SWO-R26-A	9935820	26	250 V AC/3 A
SWO-RF19-A	9948657	19	125 V AC/3 A

ⓘ For other modules and technical data, see chapter “Options” or visit www.schunk.com

Centering for HWK

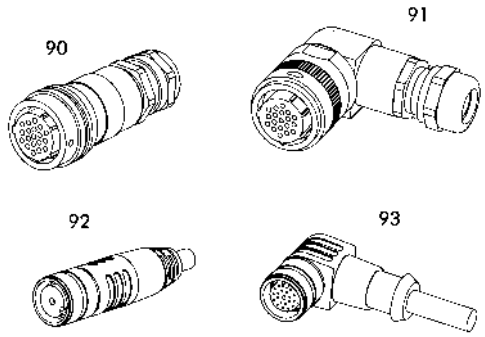


(1) Connector, robot-side
(90) Centering disc
(78) Fitting for centering

Description	ID	
A-HWK-125-BOSS	0302827	

ⓘ Serves as a fitting disc for centering on mechanical interface, such as a robot.

Cable connector / cable extension



(90) Connection plug / socket straight
(91) Connection plug / socket at an angle
(92) Connection plug / socket straight with extension cable
(93) Connection plug / socket at an angle with extension cable

Other cable lengths on request.

Description	ID	Length
Angled cable connector with cable, robot-side		
KV-10-SWK-19F-90	0302173	10 m
KV-3-SWK-19B-90	0302179	3 m
KV-3-SWK-26B-90	0302185	3 m
KV-5-SWK-19B-90	0302190	5 m
KV-5-SWK-19F-90	0302172	5 m
KV-5-SWK-26B-90	0302186	5 m
Angled cable connector, robot-side		
KAS-19B-K-90-C	0301294	
KAS-26B-K-90-C	0301296	
Angled cable connector, tool-side		
KAS-19B-A-90-C	0301295	
KAS-26B-A-90-C	0301297	
Angled cable connector with cable, tool-side		
KV-3-SWA-19B-90	0302191	3 m
KV-3-SWA-19F-90	0302175	3 m
KV-3-SWA-26B-90	0302187	3 m
Straight cable connector, robot-side		
KAS-19B-K-0-C	0301283	
KAS-26B-K-0-C	0301290	
Straight cable connector, tool-side		
KAS-19B-A-0-C	0301284	
KAS-26B-A-0-C	0301291	
Straight cable connector with cable, robot-side		
KV-10-SWK-19F-0	0302171	10 m
KV-3-SWK-19B-0	0302176	3 m
KV-3-SWK-26B-0	0302192	3 m
KV-5-SWK-19B-0	0302177	5 m
KV-5-SWK-19F-0	0302170	5 m
KV-5-SWK-26B-0	0302193	5 m
Straight cable connector with cable, tool-side		
KV-3-SWA-19B-0	0302178	3 m
KV-3-SWA-19F-0	0302174	3 m
KV-3-SWA-26B-0	0302184	3 m

ⓘ For other cable connections / extensions, see chapter “Options” or visit www.schunk.com

Compact. Flat. Productive.

CWS Compact Change System

Compact manual change system with integrated air feed-through for direct mounting the most important SCHUNK gripping and compensating modules.

Field of Application

Ideally suited for use in laboratory technology and assembly automation.

Advantages – Your benefit

High productivity through fast manual gripper change, especially with small and medium lot sizes

Flat and weight-reduced through direct assembly of the gripper onto the change system without adapter plate

Series with five different sizes for optimal size selection and a broad application range

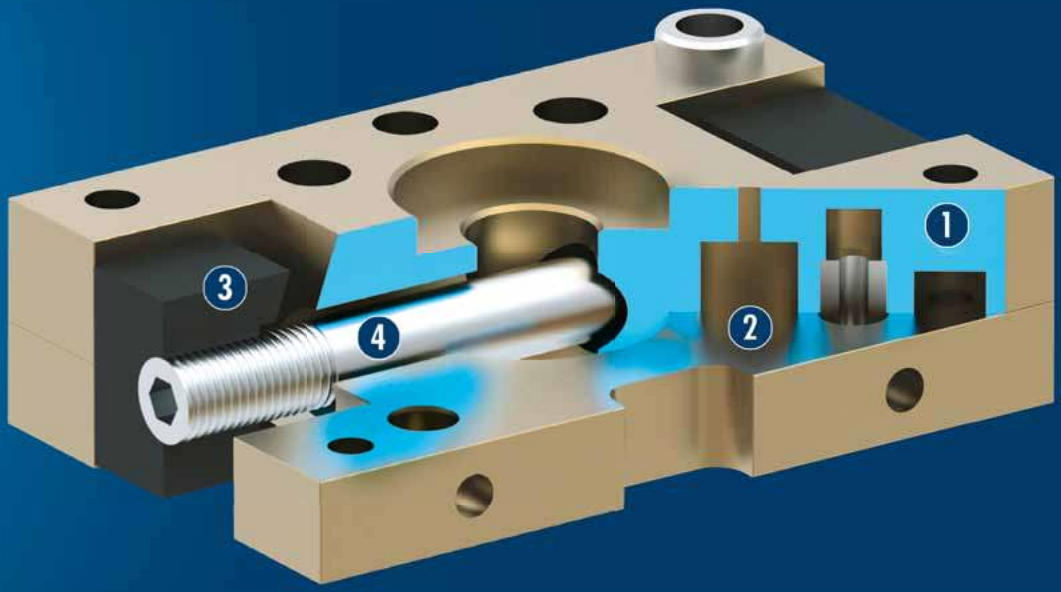
Integrated pneumatic feed-through for secure energy supply of the gripping modules

ISO flange pattern for easy assembly to most types of robots without needing additional adapter plates

Sizes	Handling weight	Moment load M_x	Moment load M_z
Quantity: 5	10 .. 28 kg	20 .. 110 Nm	3.3 .. 66.7 Nm

Functional Description

The CWS compact change system consists of a CWK change master and a CWA change adapter. A form-fit connection is established between the CWK change master and the change adapter with two clamping jaws connected via a thread spindle. Four integrated pneumatic feed-throughs reliably supply the gripper with pneumatic and optionally leave room for two additional pneumatic uses.



① **Housing**
Weight-optimized through application of high-strength aluminum alloy

② **Air feed-through**
Integration into housing means no interfering contours

③ **Clamping jaw**
for a form-fit safe hold

④ **Drive spindle**
for manually locking and unlocking the change system

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Actuation: manually via Allen key, provided by the customer

Operating principle: by turning the threaded spindle, the clamping jaws are clamped or unclamped

Pass through: Integrated pneumatic feed-through

Housing: The housing is made of high-tensile, hard-coated aluminum alloy. The functional parts are made of hardened steel.

Scope of delivery: Centering sleeves for mounting and direct connection

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Flexible assembly unit for various product versions. Simple and quick tool changing using a quick-change system.

1. CWS Compact Change System
2. PGN-plus Universal Gripper
3. LM Linear Module

SCHUNK offers more ...

The following components make the CWS even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Centering Sleeves

Fittings

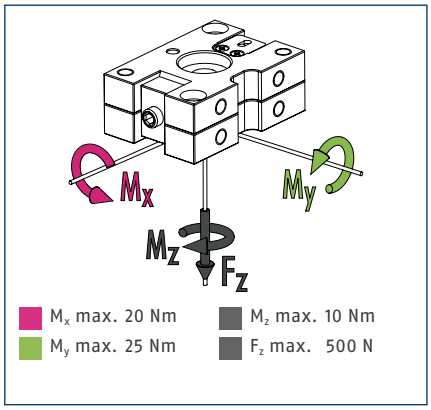
PGN-plus Universal Gripper

PWG-plus Angular Gripper

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

CWS 050

Forces and moments



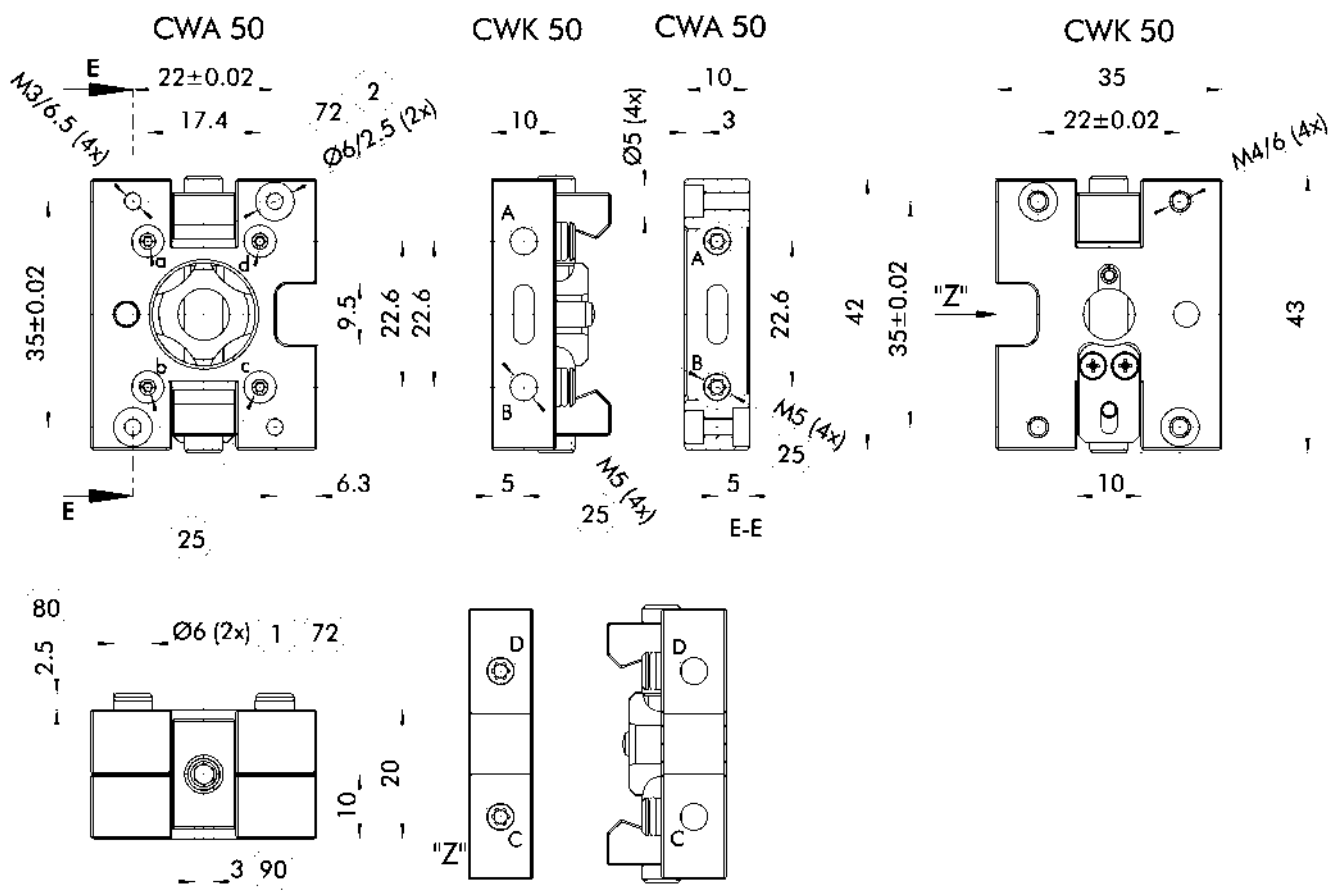
ⓘ This is the max. sum of all torques (acceleration torques, process forces, acceleration forces etc.) that are permitted to act on the change system in order to ensure error-free functioning.

Technical data

Description		CWK-050-P	CWA-050-P
		Compact change master	Compact change adapter
ID		0305750	0305751
max. payload	[kg]	10	10
max. static moment M_x	[Nm]	6.7	6.7
max. static moment M_y	[Nm]	8.3	8.3
max. static moment M_z	[Nm]	3.3	3.3
Repeat accuracy	[mm]	0.01	0.01
Mass	[g]	50	20
Number of pneumatic feed-throughs		4	4
min. / max. ambient temperature	[°C]	5/60	5/60
Direct connection to*			PGN-plus 50

ⓘ *and for other gripper with the same mounting pattern

Main view



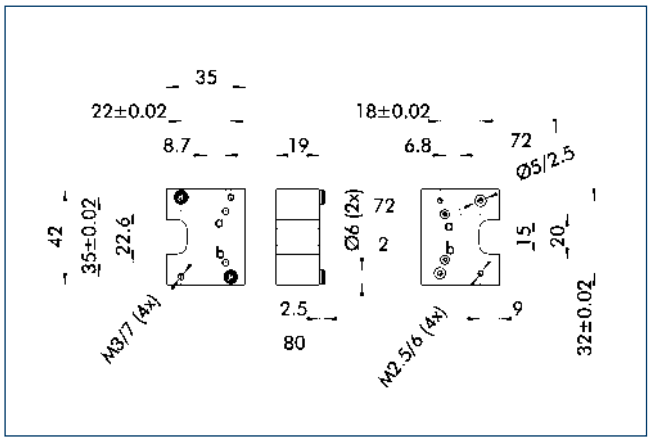
The drawing shows the basic design of the gripper change system and does not take into consideration the dimensions of any options described below.

(1) Robot side connection
(2) Tool side connection
(25) Pneumatic feed-through
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part
(90) Wrench size

CWS 050

Robot Accessories | Changing | Compact Change System

Adapter plate between CWA-064 and PGN-plus 50

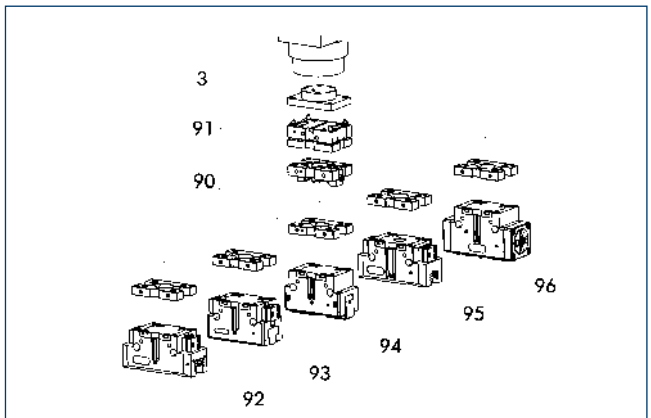


(1) Robot side connection
(2) Tool side connection
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part

Air feed-throughs are integrated in the adapter plate. Therefore the matching gripper can be directly connected without using hoses.

Description	ID	Height
Tool-side		
A-CWA-050-040-P	0305754	19 mm

Modular system



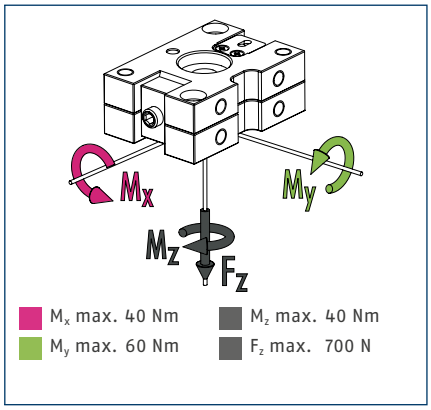
(3) Adapter plate
(90) CWS compact change system
(91) TCU tolerance compensation unit
(92) PGN-plus 2-finger parallel gripper
(93) JGP 2-finger parallel gripper
(94) PWG-plus 2-finger angular gripper
(95) PGB 2-finger parallel gripper
(96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

CWS 064

Robot Accessories | Changing | Compact Change System

Forces and moments



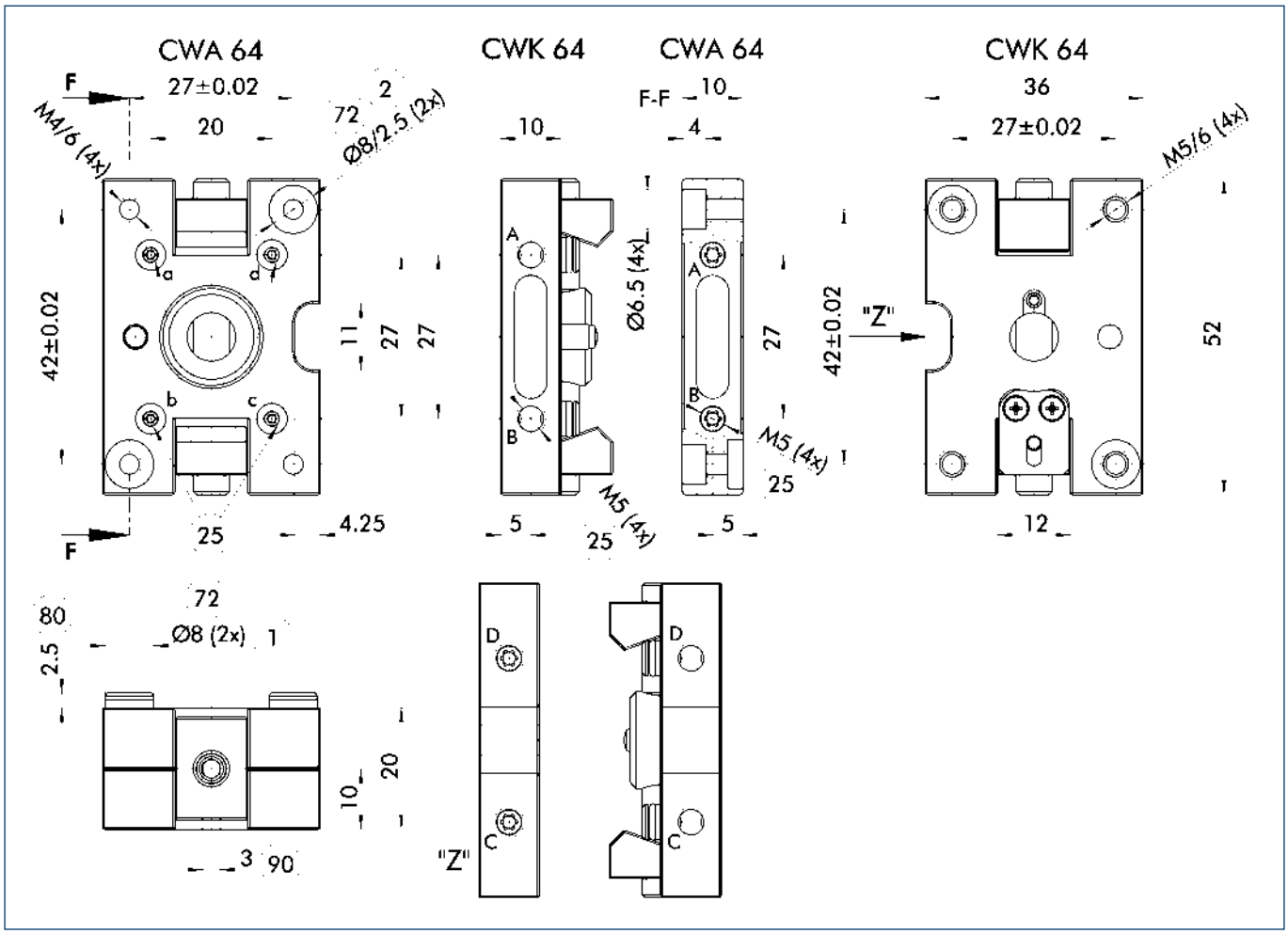
ⓘ This is the max. sum of all torques (acceleration torques, process forces, acceleration forces etc.) that are permitted to act on the change system in order to ensure error-free functioning.

Technical data

Description		CWK-064-P	CWA-064-P
		Compact change master	Compact change adapter
ID		0305764	0305765
max. payload	[kg]	16	16
max. static moment M_x	[Nm]	13.3	13.3
max. static moment M_y	[Nm]	20	20
max. static moment M_z	[Nm]	13.3	13.3
Repeat accuracy	[mm]	0.01	0.01
Mass	[g]	75	32
Number of pneumatic feed-throughs		4	4
min. / max. ambient temperature	[°C]	5/60	5/60
Direct connection to*			PGN-plus 64

ⓘ *and for other gripper with the same mounting pattern

Main view

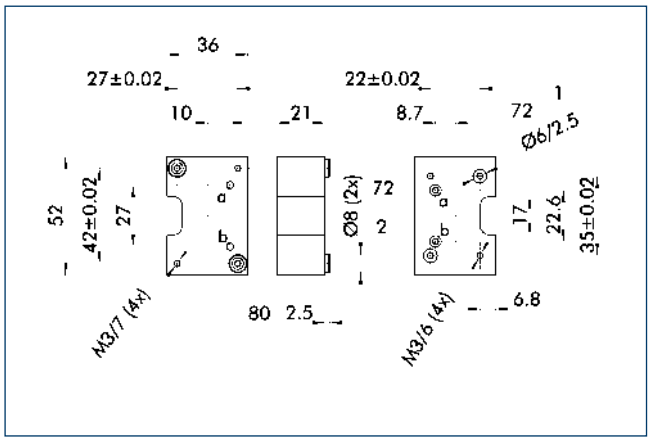


The drawing shows the basic design of the gripper change system and does not take into consideration the dimensions of any options described below.

(1) Robot side connection
(2) Tool side connection
(25) Pneumatic feed-through
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part
(90) Wrench size

CWS 064

Adapter plate between CWA-064 and PGN-plus 50

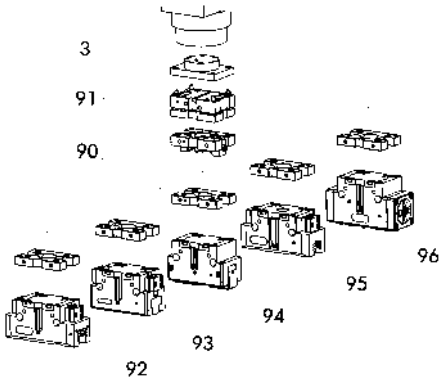


(1) Robot side connection
(2) Tool side connection
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part

Air feed-throughs are integrated in the adapter plate. Therefore the matching gripper can be directly connected without using hoses.

Description	ID	Height
Tool-side		
A-CWA-064-050-P	0305768	21 mm

Modular system



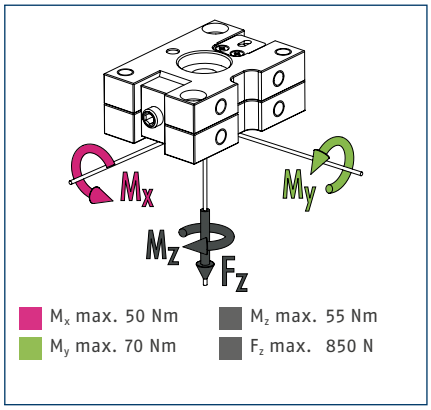
(3) Adapter plate
(90) CWS compact change system
(91) TCU tolerance compensation unit
(92) PGN-plus 2-finger parallel gripper
(93) 2-Finger Parallel Gripper JGP
(94) PWG-plus 2-finger angular gripper
(95) PGB 2-finger parallel gripper
(96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

CWS 080

Robot Accessories | Changing | Compact Change System

Forces and moments



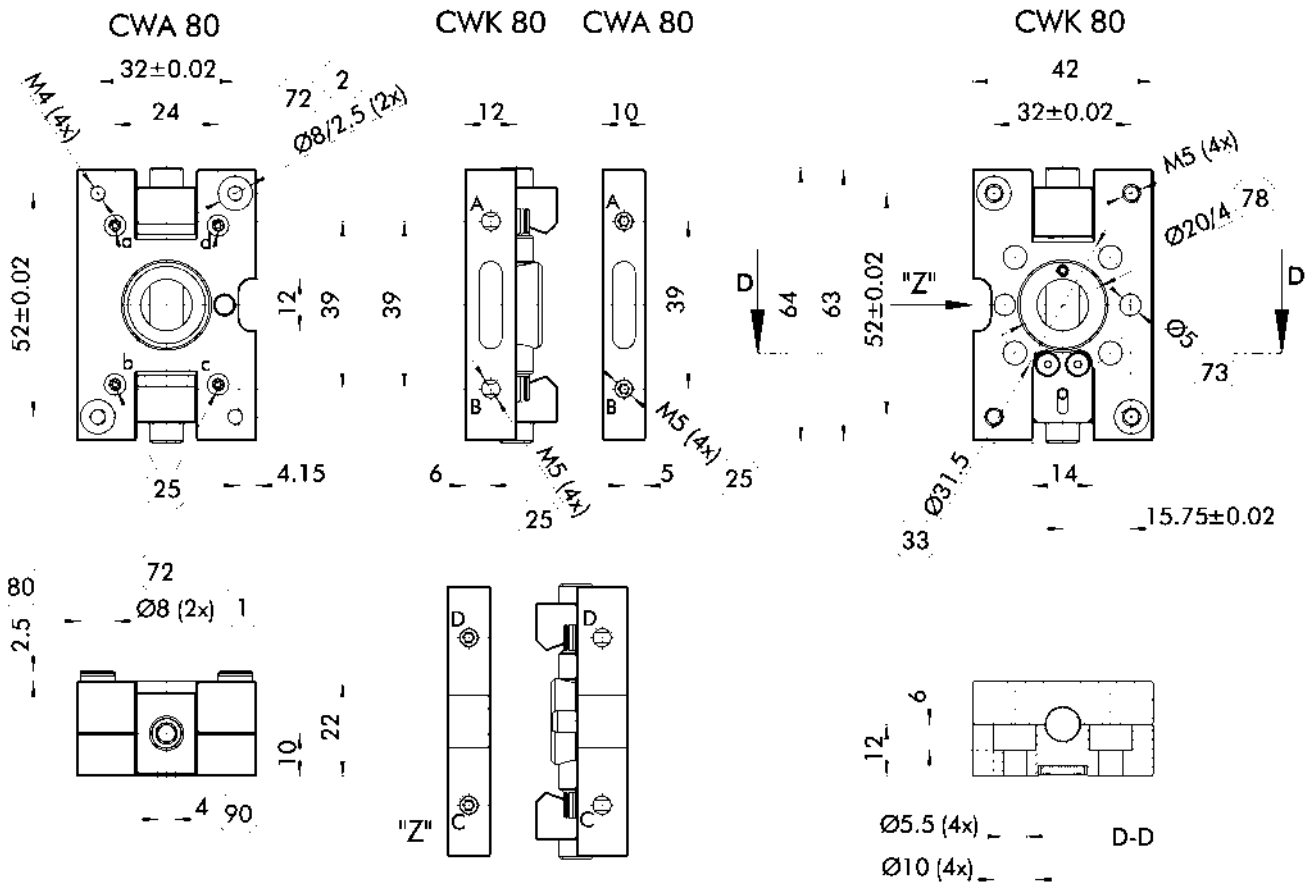
ⓘ This is the max. sum of all torques (acceleration torques, process forces, acceleration forces etc.) that are permitted to act on the change system in order to ensure error-free functioning.

Technical data

Description		CWK-080-P	CWA-080-P
		Compact change master	Compact change adapter
ID		0305780	0305781
max. payload	[kg]	20	20
max. static moment M_x	[Nm]	16.7	16.7
max. static moment M_y	[Nm]	23.3	23.3
max. static moment M_z	[Nm]	18.3	18.3
Repeat accuracy	[mm]	0.01	0.01
Mass	[g]	115	45
Number of pneumatic feed-throughs		4	4
min. / max. ambient temperature	[°C]	5/60	5/60
Direct connection to*			PGN-plus 80

ⓘ *and for other gripper with the same mounting pattern

Main view

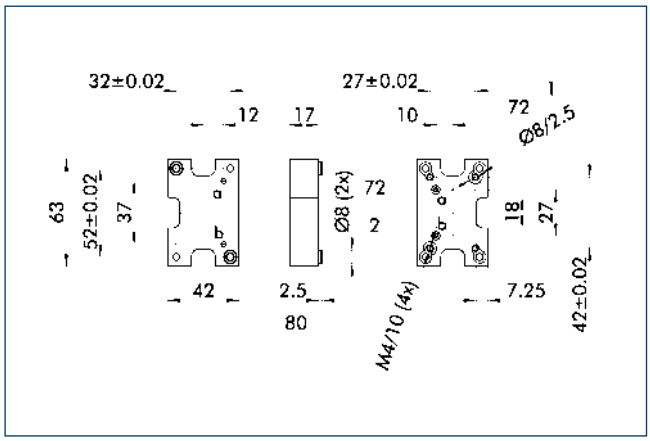


The drawing shows the basic design of the gripper change system and does not take into consideration the dimensions of any options described below.

(1) Robot side connection
(2) Tool side connection
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(72) Fitting for centering sleeve
(73) Fit for a centering pin
(78) Fitting for centering
(80) Depth of the centering sleeve hole in the mating part
(90) Wrench size

CWS 080

Adapter plate between CWA-080 and PGN-plus 64

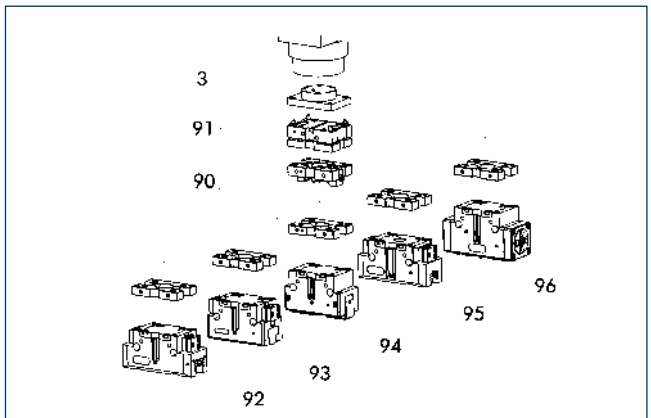


(1) Robot side connection
(2) Tool side connection
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part

Air feed-throughs are integrated in the adapter plate. Therefore the matching gripper can be directly connected without using hoses.

Description	ID	Height
Tool-side		
A-CWA-080-064-P	0305784	17 mm

Modular system



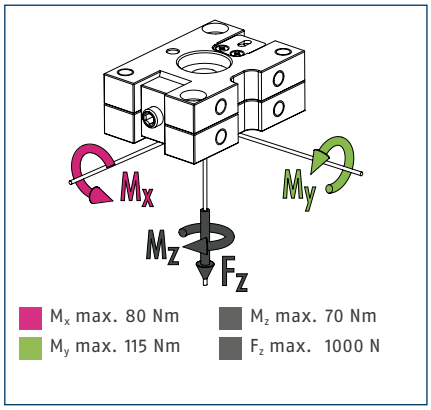
(3) Adapter plate
(90) CWS compact change system
(91) TCU tolerance compensation unit
(92) PGN-plus 2-finger parallel gripper
(93) JGP 2-finger parallel gripper
(94) PWG-plus 2-finger angular gripper
(95) PGB 2-finger parallel gripper
(96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

CWS 100

Robot Accessories | Changing | Compact Change System

Forces and moments



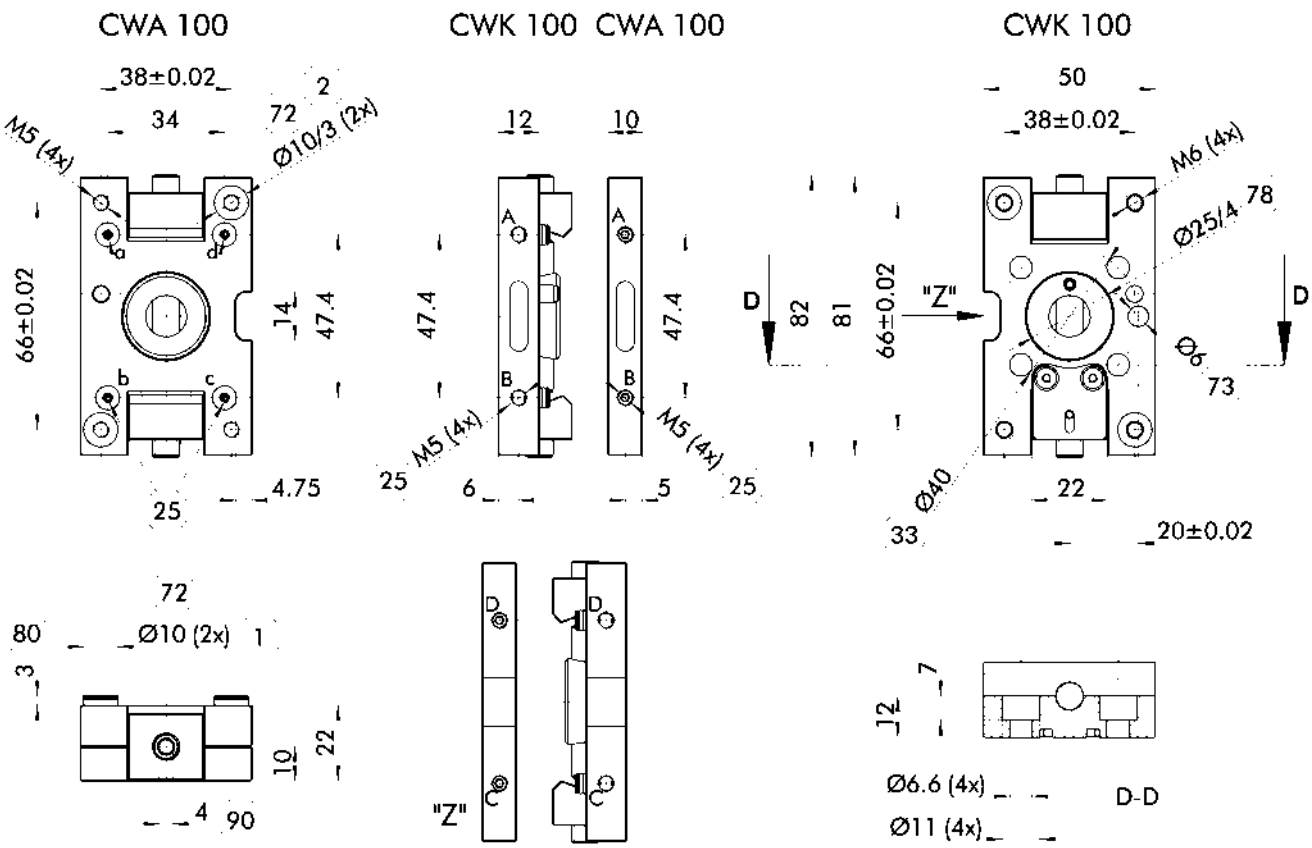
ⓘ This is the max. sum of all torques (acceleration torques, process forces, acceleration forces etc.) that are permitted to act on the change system in order to ensure error-free functioning.

Technical data

Description		CWK-100-P	CWA-100-P
		Compact change master	Compact change adapter
ID		0305800	0305801
max. payload	[kg]	24	24
max. static moment M_x	[Nm]	26.7	26.7
max. static moment M_y	[Nm]	38.3	38.3
max. static moment M_z	[Nm]	23.3	23.3
Repeat accuracy	[mm]	0.01	0.01
Mass	[g]	185	70
Number of pneumatic feed-throughs		4	4
min. / max. ambient temperature	[°C]	5/60	5/60
Direct connection to*			PGN-plus 100

ⓘ *and for other gripper with the same mounting pattern

Main view



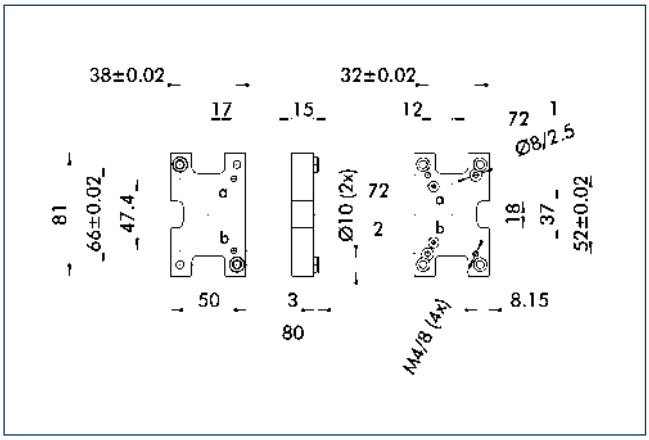
The drawing shows the basic design of the gripper change system and does not take into consideration the dimensions of any options described below.

1. Robot side connection
2. Tool side connection
25. Pneumatic feed-through
33. DIN ISO-9409 bolt-hole circle diameter
72. Fitting for centering sleeve
73. Fit for a centering pin
78. Fitting for centering
80. Depth of the centering sleeve hole in the mating part
90. Wrench size

CWS 100

Robot Accessories | Changing | Compact Change System

Adapter plate between CWA-100 and PGN-plus 80

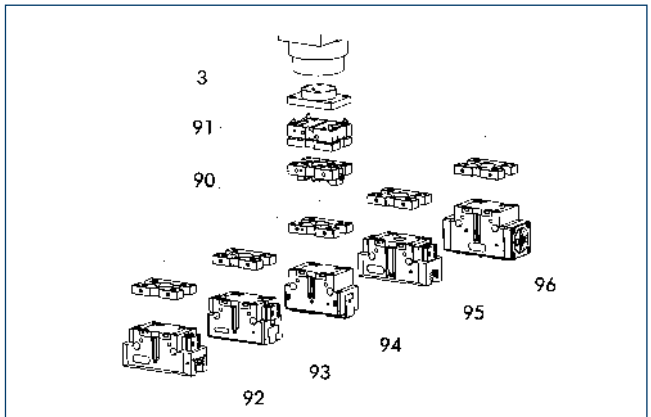


(1) Robot side connection
(2) Tool side connection
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part

Air feed-throughs are integrated in the adapter plate. Therefore the matching gripper can be directly connected without using hoses.

Description	ID	Height
Tool-side		
A-CWA-100-080-P	0305804	15 mm

Modular system



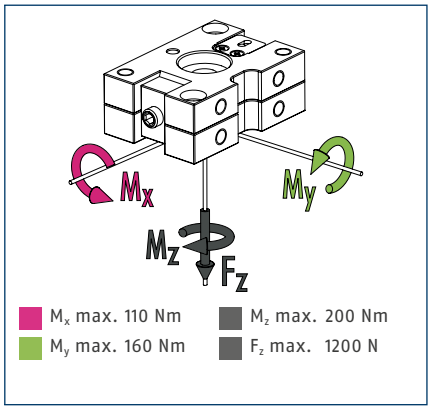
(3) Adapter plate
(90) CWS compact change system
(91) TCU tolerance compensation unit
(92) PGN-plus 2-finger parallel gripper
(93) JGP 2-finger parallel gripper
(94) PWG-plus 2-finger angular gripper
(95) PGB 2-finger parallel gripper
(96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

CWS 125

Robot Accessories | Changing | Compact Change System

Forces and moments



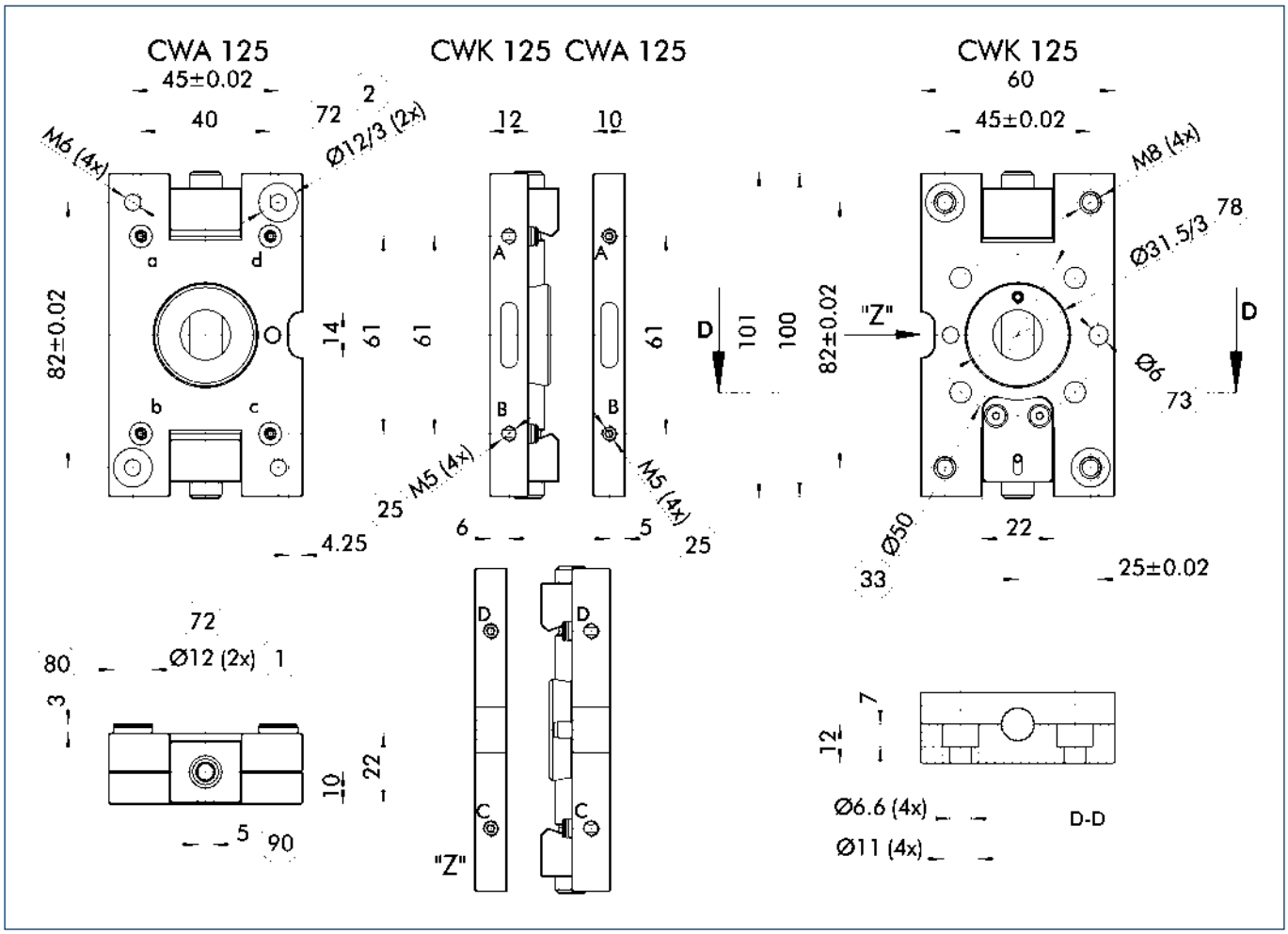
ⓘ This is the max. sum of all torques (acceleration torques, process forces, acceleration forces etc.) that are permitted to act on the change system in order to ensure error-free functioning.

Technical data

Description		CWK-125-P	CWA-125-P
		Compact change master	Compact change adapter
ID		0305825	0305826
max. payload	[kg]	28	28
max. static moment M_x	[Nm]	36.7	36.7
max. static moment M_y	[Nm]	53.3	53.3
max. static moment M_z	[Nm]	66.7	66.7
Repeat accuracy	[mm]	0.01	0.01
Mass	[g]	320	125
Number of pneumatic feed-throughs		4	4
min. / max. ambient temperature	[°C]	5/60	5/60
Direct connection to*			PGN-plus 125

ⓘ *and for other gripper with the same mounting pattern

Main view

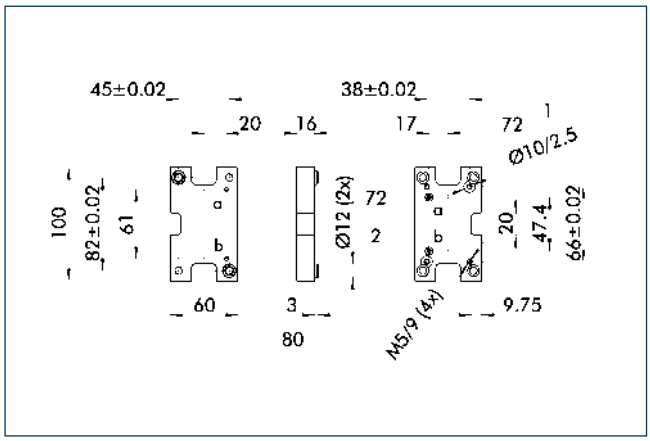


The drawing shows the basic design of the gripper change system and does not take into consideration the dimensions of any options described below.

(1) Robot side connection
(2) Tool side connection
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(72) Fitting for centering sleeve
(73) Fit for a centering pin
(78) Fitting for centering
(80) Depth of the centering sleeve hole in the mating part
(90) Wrench size

CWS 125

Adapter plate between CWA-125 and PGN-plus 100

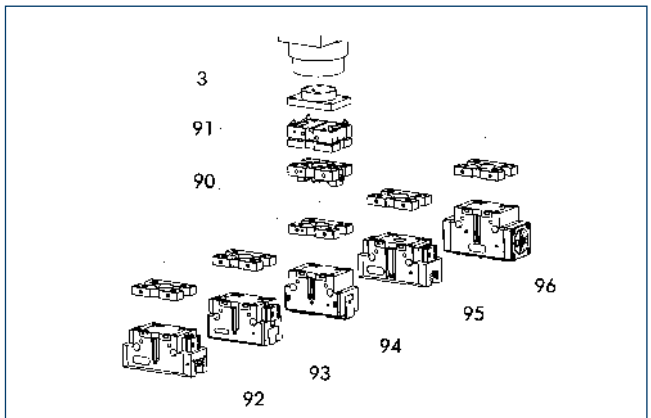


(1) Robot side connection
(2) Tool side connection
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part

Air feed-throughs are integrated in the adapter plate. Therefore the matching gripper can be directly connected without using hoses.

Description	ID	Height
Tool-side		
A-CWA-125-100-P	0305829	16 mm

Modular system



(3) Adapter plate
(90) CWS compact change system
(91) TCU tolerance compensation unit
(92) PGN-plus 2-finger parallel gripper
(93) JGP 2-finger parallel gripper
(94) PWG-plus 2-finger angular gripper
(95) PGB 2-finger parallel gripper
(96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Flat. Compact. Cost-effective.

FWS Flat Change System

Manual tool changing system for small manipulators and grippers, with integrated air and electrical feed-through.

Field of Application

The changer is ideally suited for confined spaces between the effector and the robot arm due to its low height and the low weight makes rapid changes possible. Up to eight electric and two pneumatic feed-throughs are centrally positioned, and make the FWS ideal for automation components with internal supply lines. A spacer ring can also be used as a radial cable feed-through.

Advantages – Your benefit

Extremely flat design (total height only 14 mm) minimizes the projection and reduces the load on the drives

Operation of changer without additional tools quick and easy change

Integrated feed-through for up to eight pneumatic and two pneumatic feed-throughs

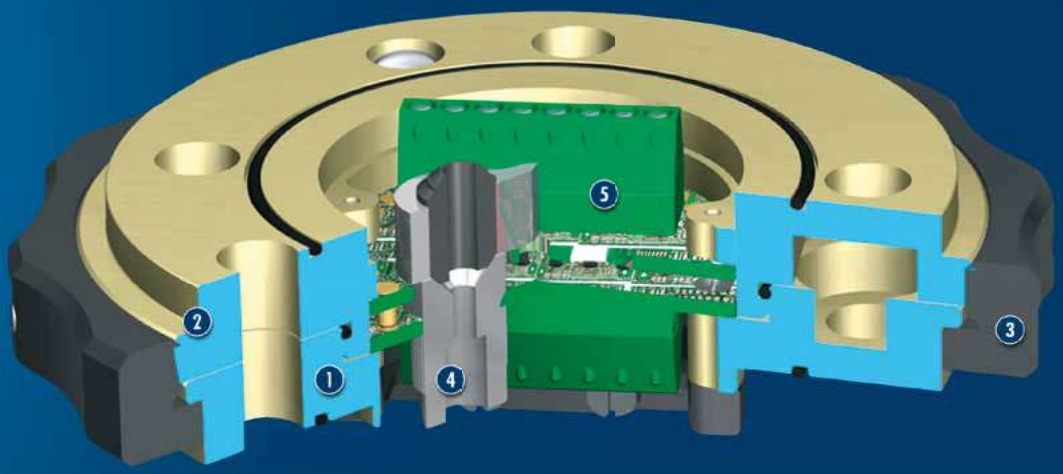
Centrically arranged electrical and pneumatic feed-through minimizes the interfering contour, no exterior wiring or hosing

ISO flange pattern direct mounting to ISO 9409-50-4-M6 flange pattern

Sizes	Handling weight	Moment load M_x	Moment load M_z
Quantity: 1	6 kg	90 Nm	90 Nm

Functional Description

The FWS is a manual change system that consists of a robot-side FWK change master which is screwed to an effector-side FWA change adapter with a coupling ring. With its two pneumatic and eight electrical (up to 12 A max.) interior feed-through elements, the FWS is suitable especially for automation components that have interior supply lines.



① **FWK robot-side change master**
with ISO screw connection diagram for direct mounting on the robot flange

② **FWA tool-side change adapter**

③ **Coupling ring**
for manual actuation of the change system

④ **Air feed-through**
Integration into housing means no interfering contours

⑤ **Electrical feed-through**
for electrical energy and signal transmission

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Actuation: manually via an intergrated locking ring

Operating principle: The master and adapter sides can be locked or unlocked via rotation of the locking ring

Pass through: optionally with electric or pneumatic feed-through

Housing: Aluminum alloy, anodized

Scope of delivery: Robot-side mounting screws

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Lightweight arm in the field of service robotics

1. SDH servo-electric 3-Finger Gripping Hand
2. PRL servo-electric Swivel Unit
3. FWS Flat Manual Change System

SCHUNK offers more ...

The following components make the FWS even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

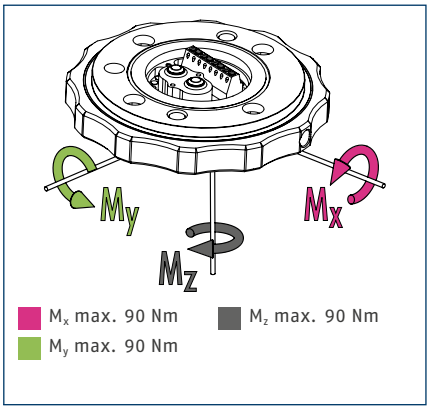
PRL Servo-electric Swivel Unit

EGP Electric Parallel Gripper

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

FWS 50

Forces and moments

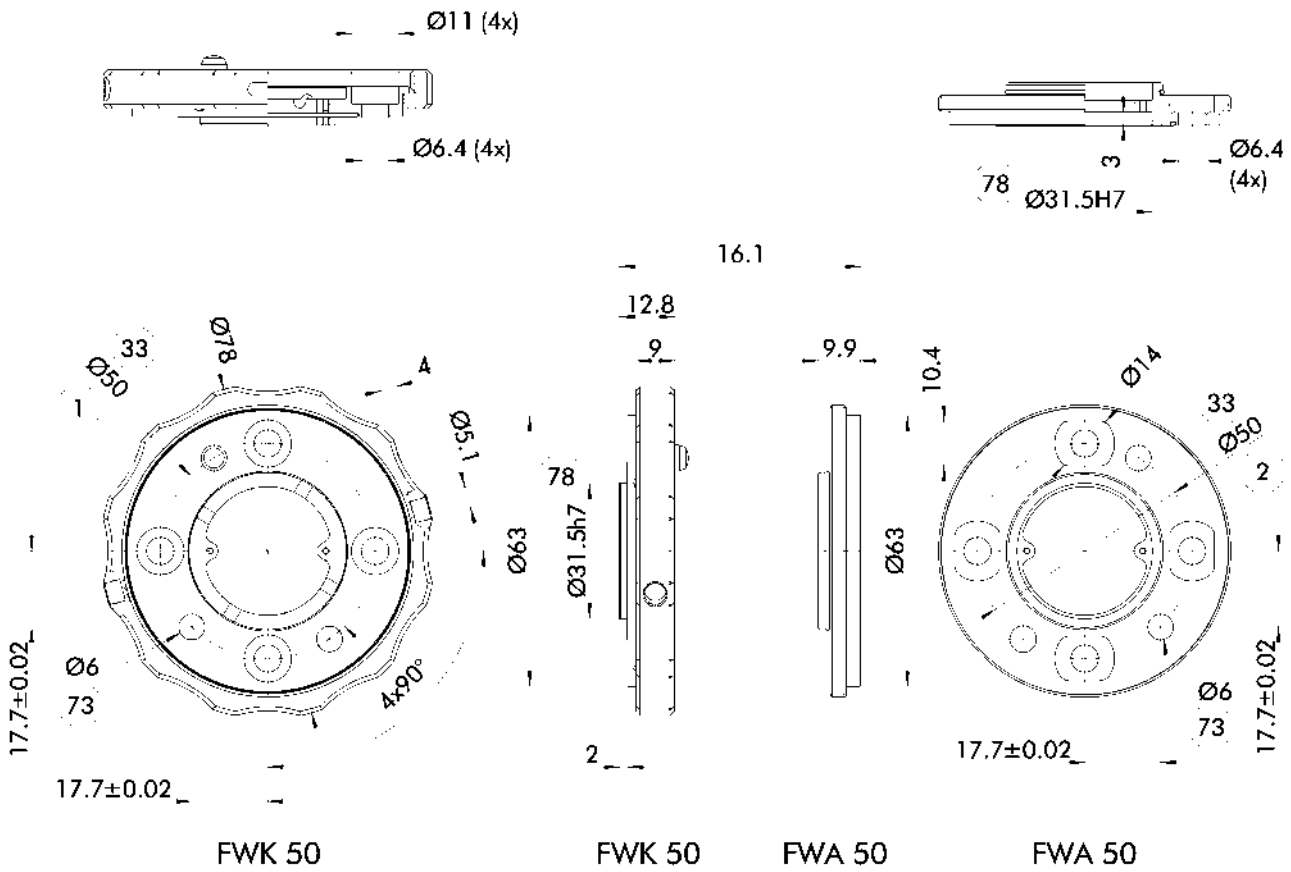


ⓘ This is the max. sum of all torques (acceleration torques, process forces, acceleration forces etc.) that are permitted to act on the change system in order to ensure error-free functioning.

Technical data

Description		FWK-050-0P-0E	FWA-050-0P-0E	FWK-050-2P-8E	FWA-050-2P-8E	FWK-050-4P-0E	FWA-050-4P-0E
		Flat change master	Flat change adapter	Flat change master	Flat change adapter	Flat change master	Flat change adapter
ID		0320600	0320601	0320602	0320603	0320604	0320605
max. payload	[kg]	6	6	6	6	6	6
max. static moment M_x / M_y	[Nm]	30	30	30	30	30	30
max. static moment M_z	[Nm]	30	30	30	30	30	30
Mass	[kg]	0.085	0.045	0.094	0.052	0.098	0.06
Number of pneumatic feed-throughs		0	0	2	2	4	4
Number of electrical feed-throughs		0	0	8	8	0	0
Robot side connection		ISO 9409-1-50-4-M6		ISO 9409-1-50-4-M6		ISO 9409-1-50-4-M6	

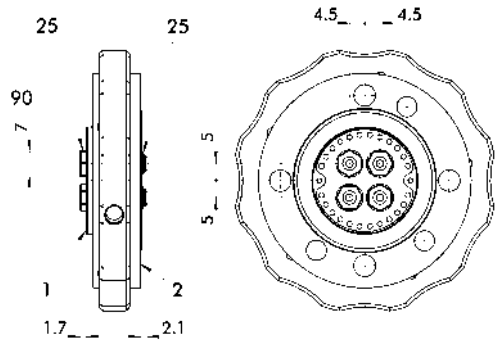
Main view



The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

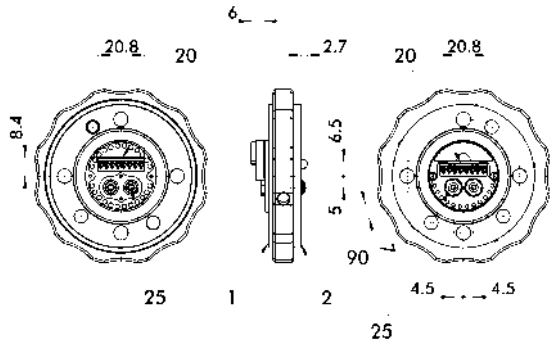
FWK-050-4P-0E and FWA-050-4P-0E



(1) Robot side connection
(2) Tool side connection
(25) Pneumatic feed-through
(90) Wrench size

The view shows the unit with 4x air.

FWK-050-2P-8E and FWA-050-2P-8E



(1) Robot side connection
(2) Tool side connection
(20) Connection for electric feed-through
(25) Pneumatic feed-through
(90) Wrench size

The view shows the unit with 2x air and 8x electrics.

Up to 85% higher Service Life due to efficient sealing method.

Feeding through

DDF 2 Rotary Feed-through

Series	Size	Page
DDF 2		348
DDF 2	031	352
DDF 2	040	356
DDF 2	040-1	360
DDF 2	050	364
DDF 2	050-1	368
DDF 2	063	372

Series	Size	Page
DDF 2	080	376
DDF 2	080-1	380
DDF 2	100	384
DDF 2	100-1	388
DDF 2	125	392
DDF 2	160	396

DDF-SE Stationary Rotary Feed-through

Series	Size	Page
DDF-SE		400
DDF-SE	80	404
DDF-SE	120	406

Powerful. Flexible. Energy-efficient.

DDF 2 Rotary Feed-through

For media feed-through of electric signals and pneumatics for use on robots with infinite rotation.

Field of Application

Robot applications with unlimited rotational movement

Advantages – Your benefit

Combined air- and electrical feed-through for extensive supply to your gripper system / tool

ISO flange pattern for easy assembly to most types of robots without needing additional adapter plates

Complete series of 12 sizes for best selection of size

Electric plug contacts for easy change in case of cable break at the robot arm or gripper

Steel shaft adapted power specifications for modern robot types

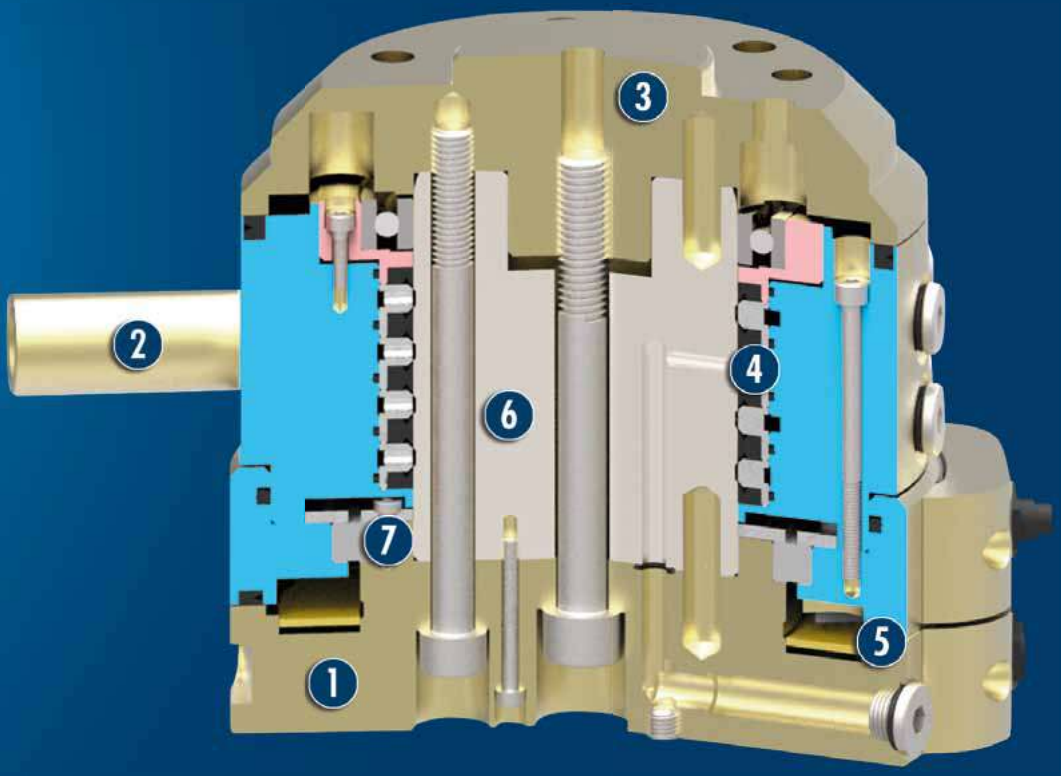
Three compensation directions in one unit Variant 1: For feeding pneumatic and electric signals, Variant 2: For feeding pneumatics, Variant 3: For feeding electric signals

New, smooth-running and particularly long lasting seals ensure a low starting and continuous torque, so that smaller and more economical drives can be used and particularly gentle rotary movements are possible.

Sizes	max. rotational speed	Pneumatic feed-through	Electric feed-through
Quantity: 12	90 .. 120 1/min		4 .. 10

Functional Description

The DDF 2 facilitates rotation of the robot axis by more than 360°, without hoses and cables twisting around the axis. Integrated air feed-throughs and slip ring contacts reliably supply the tool with power, even at high speeds. The integrated ISO flange is mounted on the robot's manual flange. A ring surrounds the shaft. The ring is connected to a non-rotating part of the robot via a torque support. When the robot flange turns, the shaft turns in the ring.
A slip ring which is integrated in the shaft and the housing, thereby transmits electrical signals from the fixed housing into the rotating shaft. Electrics and up to four pneumatic lines are fed-through.



① **Housing**
Weight-optimized through application of high-strength aluminum alloy

② **Torque support**
for torque support at the robot

③ **ISO flange**
for easy assembly on the robot flange

④ **Pneumatic feed-through**
for supply of grippers, linear units, and other end-effectors

⑤ **Slip ring**
for feed-through of up to ten electric signals

⑥ **Steel Shaft**
for transmission of the rotary movement

⑦ **Rolling-contact bearing**
for transmission of the finger movement without any backlash

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes about the Series

Mounting: Standardized ISO 9409 interface (robot-side)

Pass through: Pneumatic and electrical signals

Housing: High-strength, hard-coated aluminum alloy

Scope of delivery: Cable connector, small components for mounting, operating and maintenance instructions, manufacturer's declaration

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

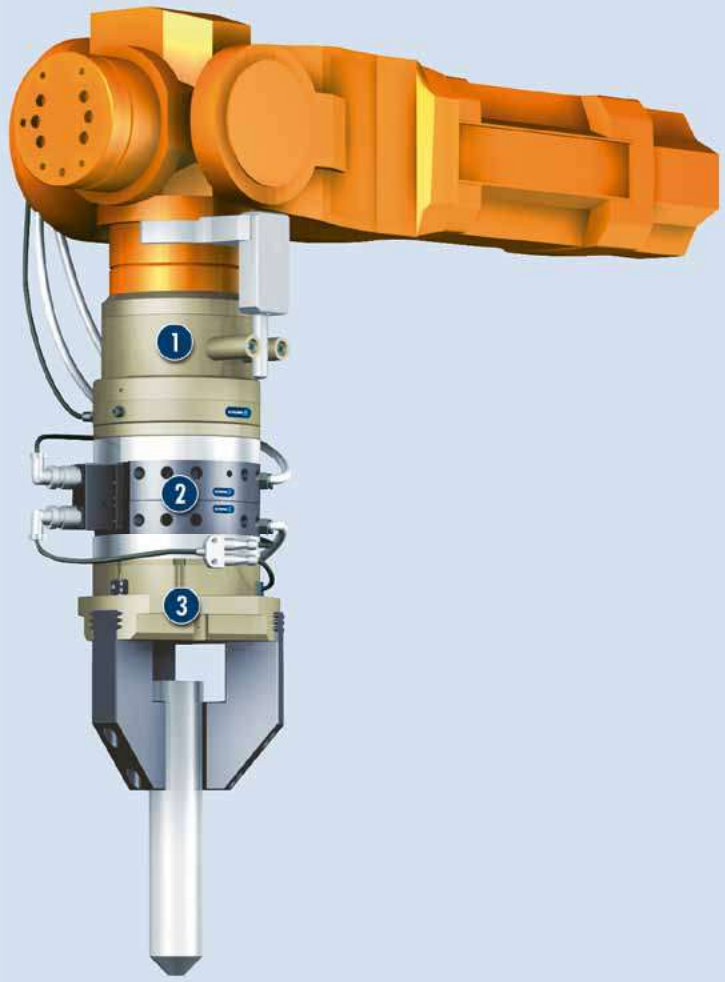
Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we already have solutions. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Insertion tool for assembling small to medium-sized axes. Due to the rotary feed-through, the axes can be turned several times to an unlimited extent (> 360°). Slip ring contacts integrated in the rotary feed-through reliably supply the gripper with power.

1. DDF 2 Rotary Feed-through
2. SWS Quick-change System
3. PZN-plus 3-Finger Centric Gripper



SCHUNK offers more ...

The following components make the product DDF 2 even more productive – the suitable addition for the highest functionality, flexibility, reliability, and controlled production.

Extension Cable

Adapter plates

Fittings

Quick-change System

Centric Gripper

Parallel Gripper

Compensation unit

Angular Gripper

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

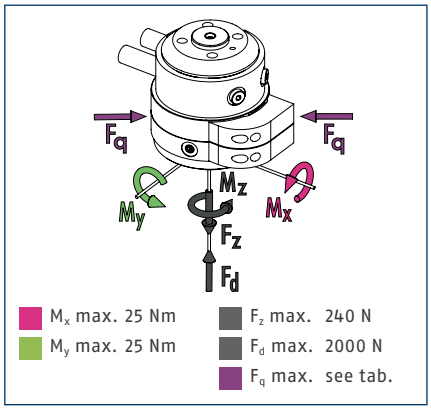
Options and special Information

Version with pneumatic and electrical feed-throughs: 2 to 4 pneumatic feed throughs for up to 10 bar and 4 to 10 electrical feed-throughs for 1 A/60 V signals
Version with pneumatic feed-throughs: 2 to 4 pneumatic feed-throughs for up to 10 bar
Version with electrical feed-throughs: 4 to 10 electrical feed-throughs for 1 A/60 V signals
Suitable for pressure and vacuum applications: Please contact us for further information.

DDF 2 031

Robot Accessories | Feeding through | Rotary Feed-through

Forces and moments



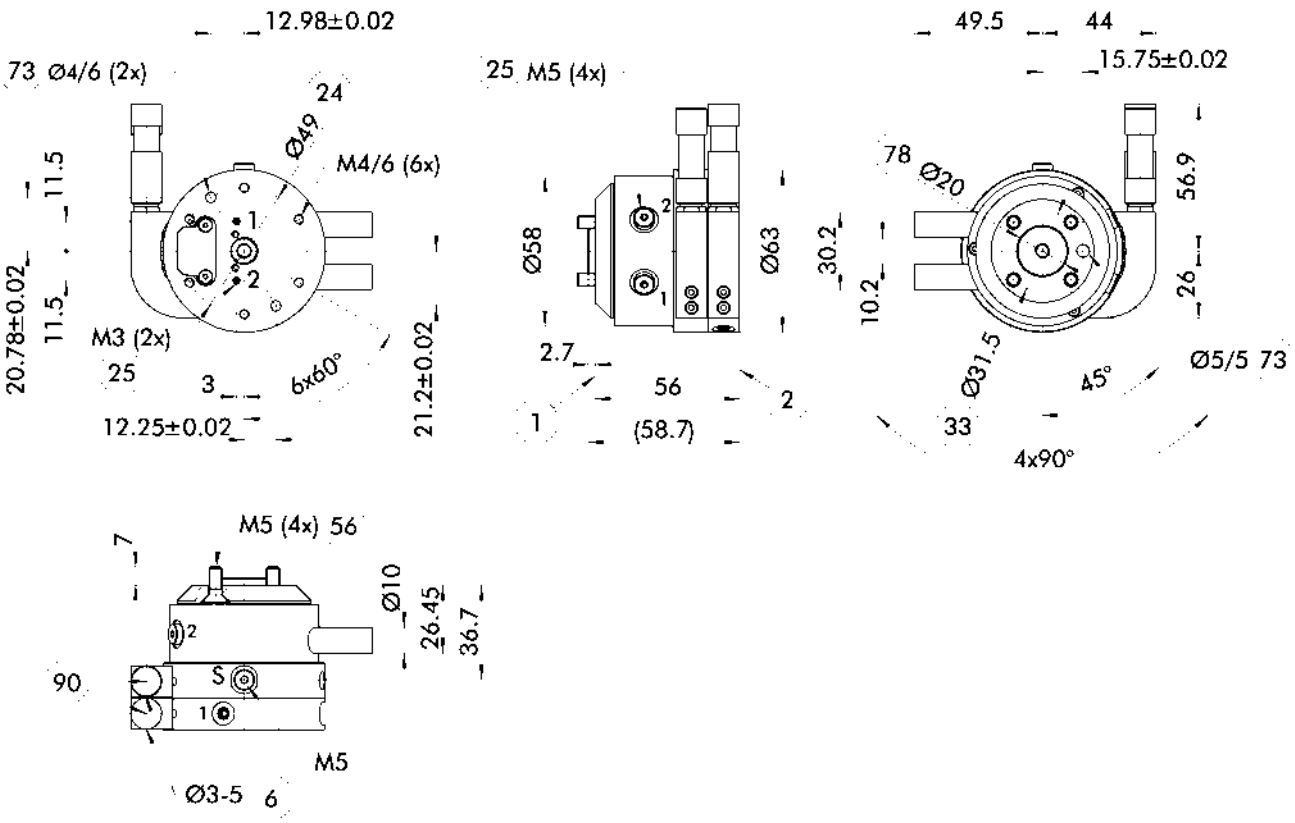
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2-031-P2-E4	DDF 2-031-P2	DDF 2-031-E4
ID		0323034	0323035	0323036
max. payload	[kg]	6	6	6
max. rotational speed	[1/min]	120	120	120
max. rotational speed	[°/s]	720	720	720
Continuous torque	[Nm]	0.8	0.8	0.5
Starting torque	[Nm]	1.3	1.3	0.7
Rotary movement	[°]	> 360	> 360	> 360
Air connection thread pneumatic feed-through		2x M5	2x M5	
max. pressure per connection	[bar]	10	10	
Rate of flow at 6 bar (per channel)	[l/min]	100	100	
Number of electrical feed-throughs		4		4
Voltage	[V]	60		60
Current strength	[A]	1		1
Mass	[kg]	0.5	0.45	0.35
Robot side connection		ISO 9409-1-31.5-4-M5	ISO 9409-1-31.5-4-M5	ISO 9409-1-31.5-4-M5
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. dynamic moment M_x*	[Nm]	15	15	15
max. dynamic moment M_y*	[Nm]	15	15	15
max. dynamic torsional moment M_z*	[Nm]	10	10	10
max. lateral force F_q*	[N]	60	60	60

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

Main view DDF 2 with electric and pneumatic feed through

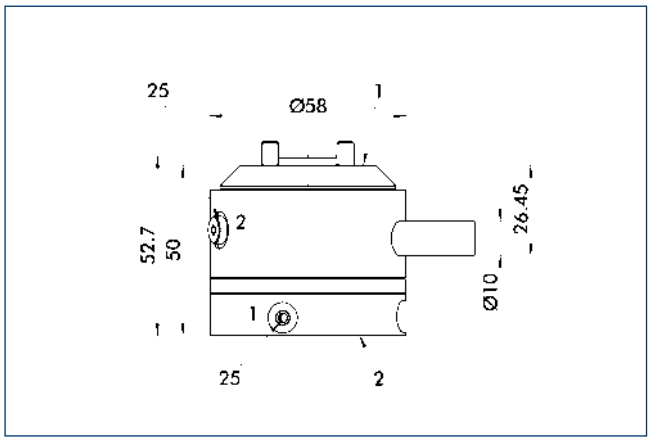


The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(24) Bolt circle
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for centering pins
(78) Fitting for centering
(90) Cable connectors/sockets included in the accessory pack

DDF 2 031

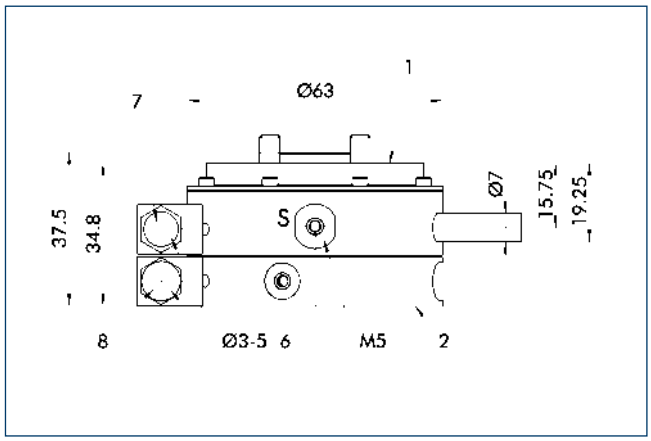
Version DDF 2 with only pneumatic feed through



① Robot side connection
② Tool side connection
㉕ Pneumatic feed-through

Dimensional changes for the version with “only pneumatic feed through”.

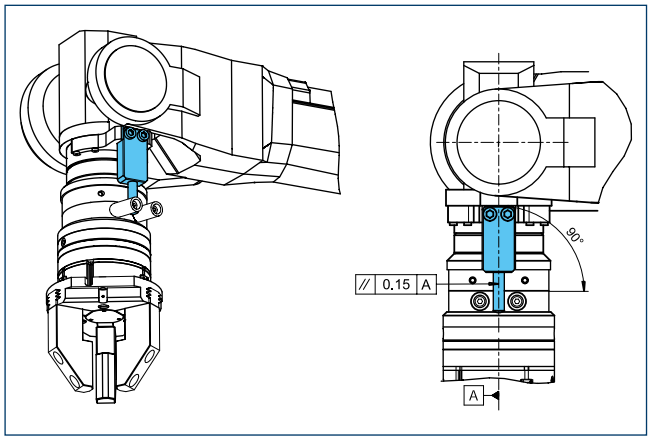
Version DDF 2 with only electrical feed through



S Air purge connection (0.5 ... 1 bar)
① Robot side connection
② Tool side connection
⑥ Cable diameter to be used
⑦ Cable socket in the accessories kit
⑧ Cable connector in the accessories kit

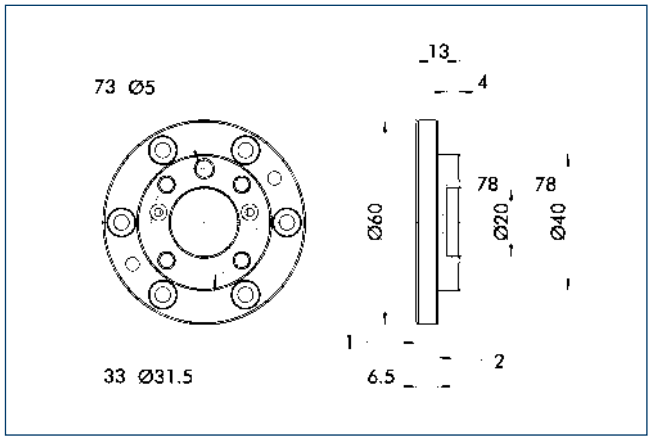
Dimensional changes for the version with “only pneumatic feed through”.

Mounting instruction



Design note for customer provided torque support.

DDF 2-031-T adapter plates



① Robot side connection
② Tool side connection
㉝ DIN ISO-9409 bolt-hole circle diameter
㉝ Fit for centering pins
㉘ Fitting for centering

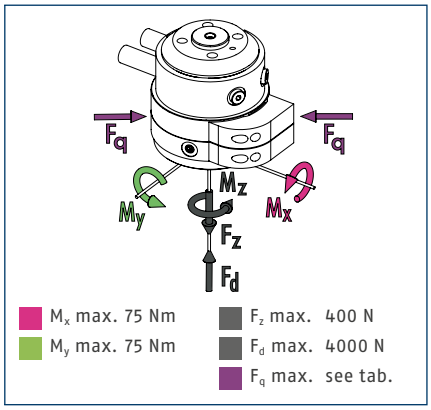
Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-031-T	0323220	13

DDF 2 040

Robot Accessories | Feeding through | Rotary Feed-through

Forces and moments



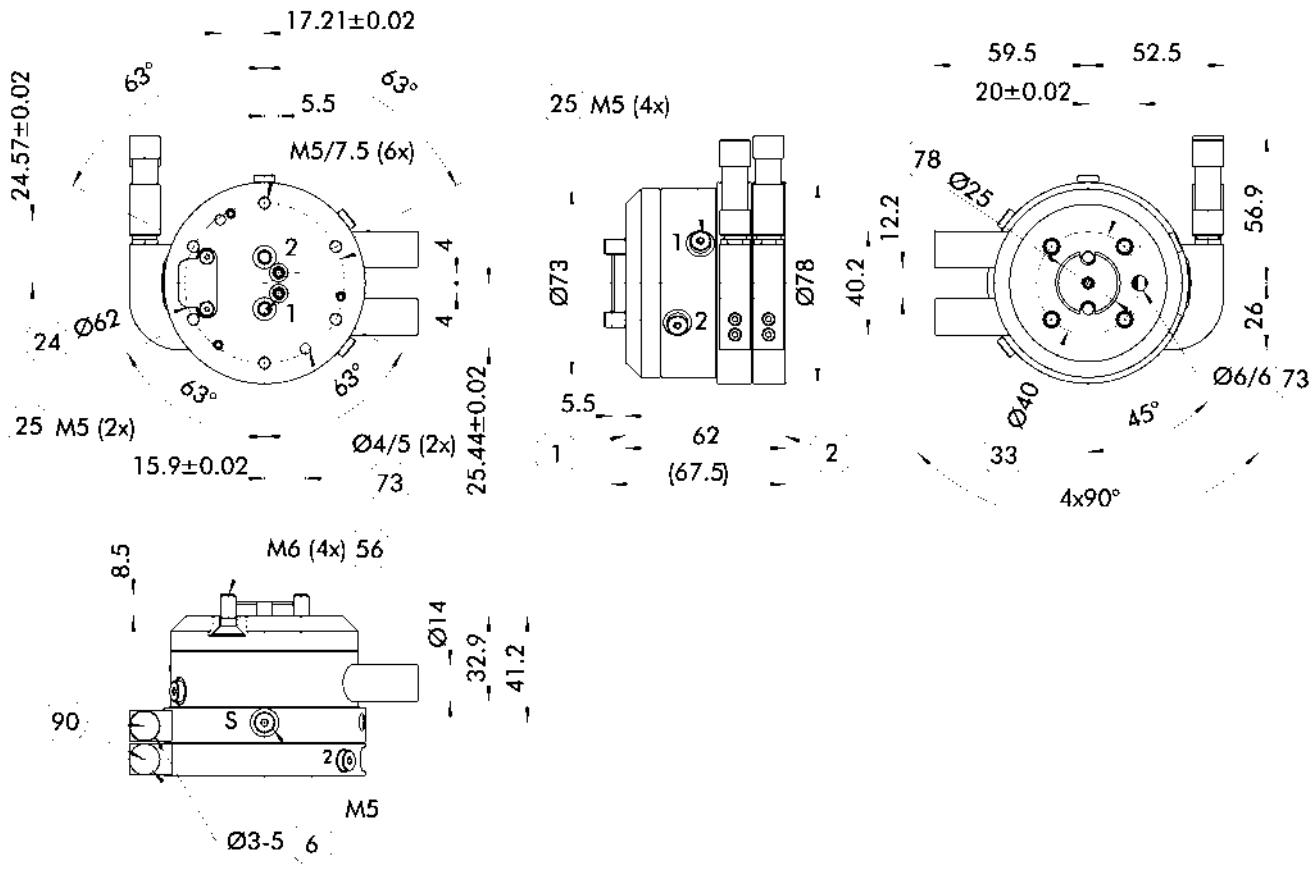
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2-040-P2-E4	DDF 2-040-P2	DDF 2-040-E4
ID		0323046	0323038	0323039
max. payload	[kg]	10	10	10
max. rotational speed	[1/min]	120	120	120
max. rotational speed	[°/s]	720	720	720
Continuous torque	[Nm]	1.5	1.5	1
Starting torque	[Nm]	2	2	1.3
Rotary movement	[°]	> 360	> 360	> 360
Air connection thread pneumatic feed-through		2x M5	2x M5	
max. pressure per connection	[bar]	10	10	
Rate of flow at 6 bar (per channel)	[l/min]	200	200	
Number of electrical feed-throughs		4		4
Voltage	[V]	60		60
Current strength	[A]	1		1
Mass	[kg]	0.9	0.75	0.45
Robot side connection		ISO 9409-1-40-4-M6	ISO 9409-1-40-4-M6	ISO 9409-1-40-4-M6
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. dynamic moment M_x*	[Nm]	25	25	25
max. dynamic moment M_y*	[Nm]	25	25	25
max. dynamic torsional moment M_z*	[Nm]	20	20	20
max. lateral force F_q*	[N]	100	100	100

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

Main view DDF 2 with electric and pneumatic feed through



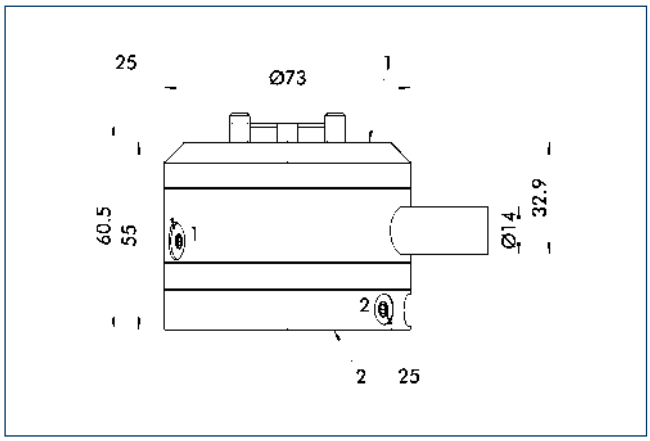
The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(24) Bolt circle
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for centering pins
(78) Fitting for centering
(90) Cable connectors/sockets included in the accessory pack

DDF 2 040

Robot Accessories | Feeding through | Rotary Feed-through

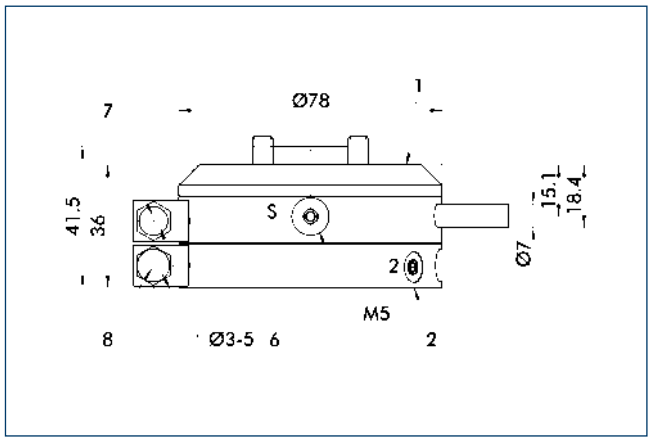
Version DDF 2 with only pneumatic feed through



① Robot side connection
② Tool side connection
㉕ Pneumatic feed-through

Dimensional changes for the version with “only pneumatic feed through”.

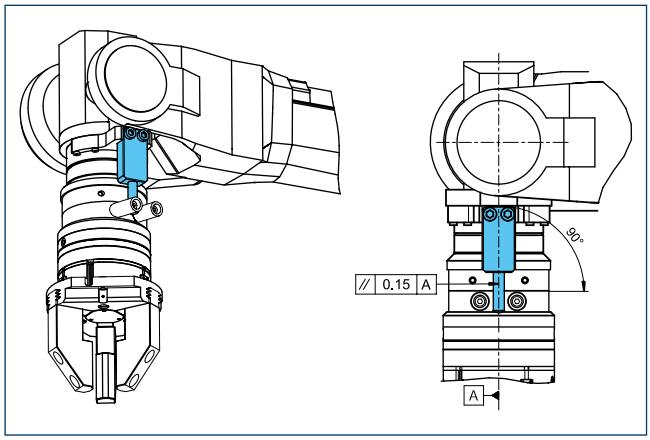
Version DDF 2 with only electrical feed through



S Air purge connection (0.5 ... 1 bar)
① Robot side connection
② Tool side connection
⑥ Cable diameter to be used
⑦ Cable socket in the accessories kit
⑧ Cable connector in the accessories kit

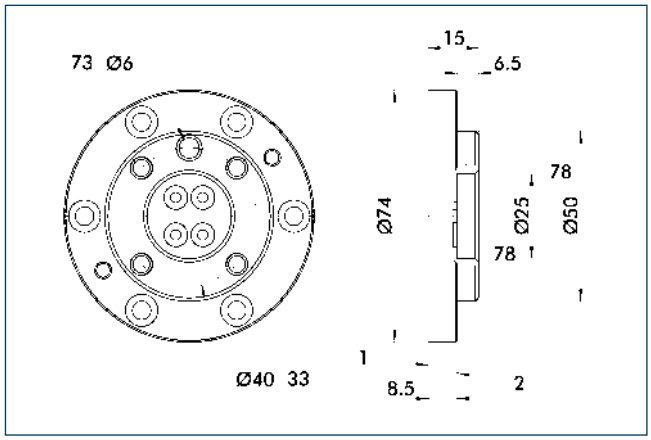
Dimensional changes for the version with “only electrical feed through”.

Mounting instruction



Design note for customer provided torque support.

DDF 2-040-1-T adapter plates



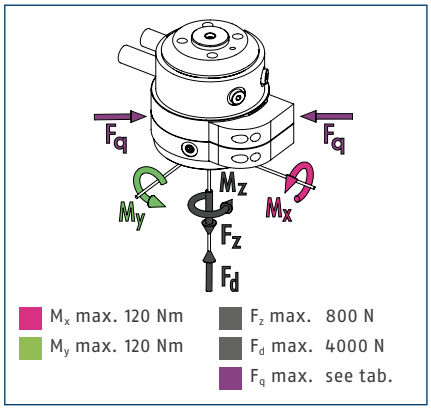
① Robot side connection
② Tool side connection
㉝ DIN ISO-9409 bolt-hole circle diameter
㉝ Fit for centering pins
㉘ Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-040-T	0323221	15

DDF 2 040-1

Forces and moments



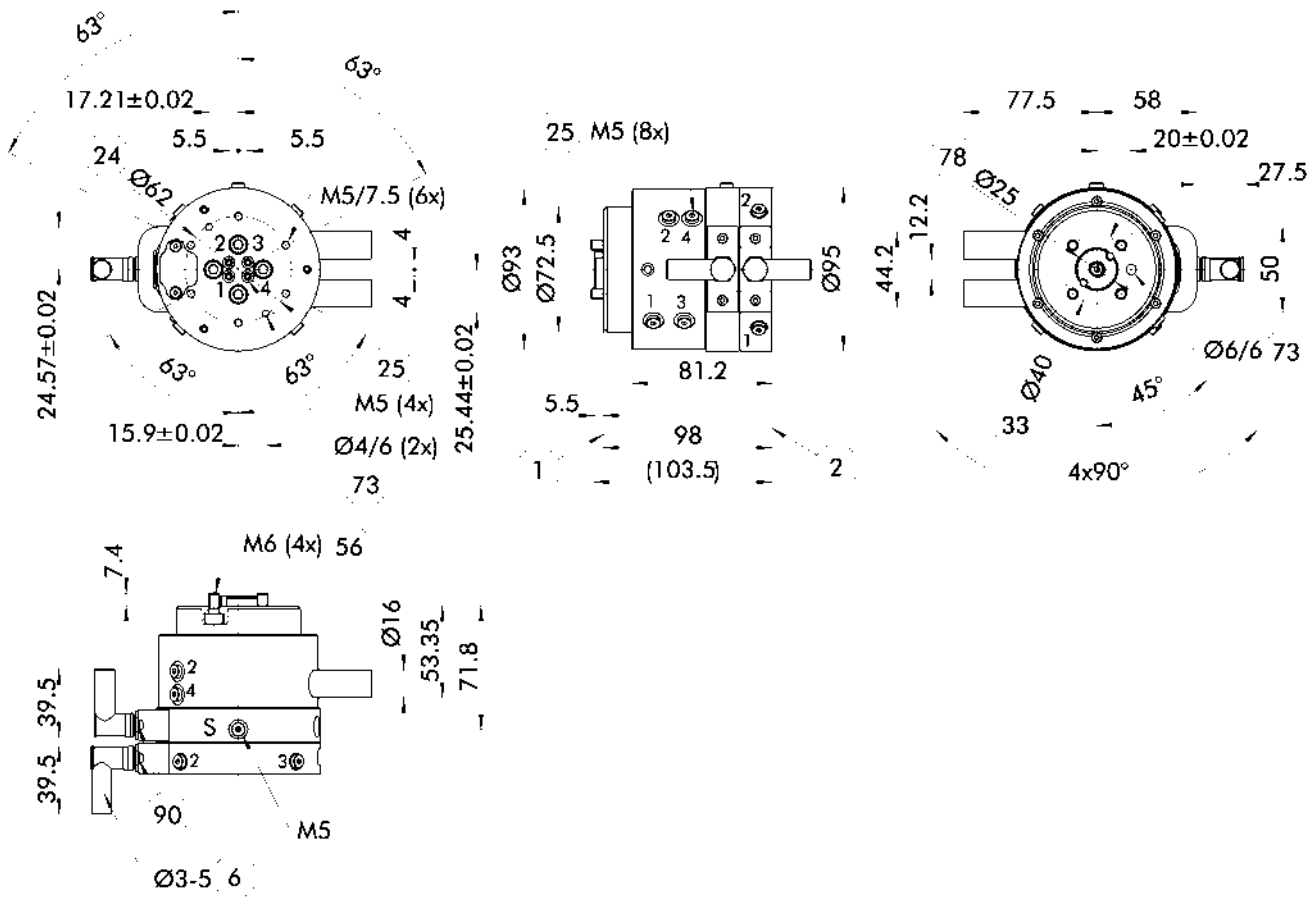
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2-040-1-P4-E6
ID		0323048
max. payload	[kg]	20
max. rotational speed	[1/min]	110
max. rotational speed	[°/s]	660
Continuous torque	[Nm]	3
Starting torque	[Nm]	4.5
Rotary movement	[°]	> 360
Air connection thread pneumatic feed-through		4x M5
max. pressure per connection	[bar]	10
Rate of flow at 6 bar (per channel)	[l/min]	150
Number of electrical feed-throughs		6
Voltage	[V]	60
Current strength	[A]	1
Mass	[kg]	2
Robot side connection		ISO 9409-1-40-4-M6
min. / max. ambient temperature	[°C]	5/60
max. dynamic moment M_x*	[Nm]	55
max. dynamic moment M_y*	[Nm]	55
max. dynamic torsional moment M_z*	[Nm]	45
max. lateral force F_q*	[N]	200

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

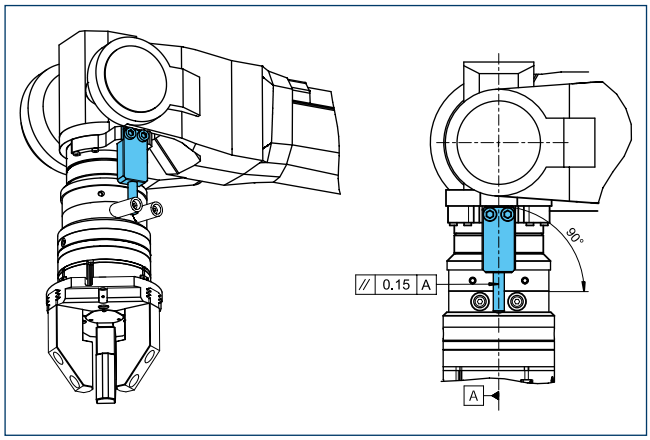
Main view DDF 2 with electric and pneumatic feed through



The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(24) Bolt circle
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for centering pins
(78) Fitting for centering
(90) Cable connectors/sockets included in the accessory pack

Mounting instruction

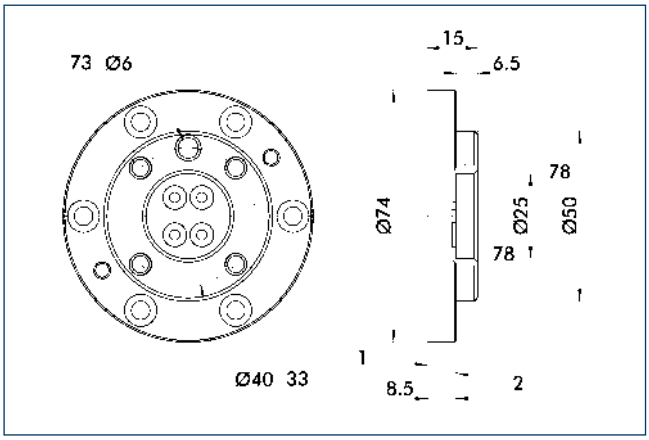


Design note for customer provided torque support.

DDF 2 040-1

Robot Accessories | Feeding through | Rotary Feed-through

DDF 2-040-1-T adapter plates

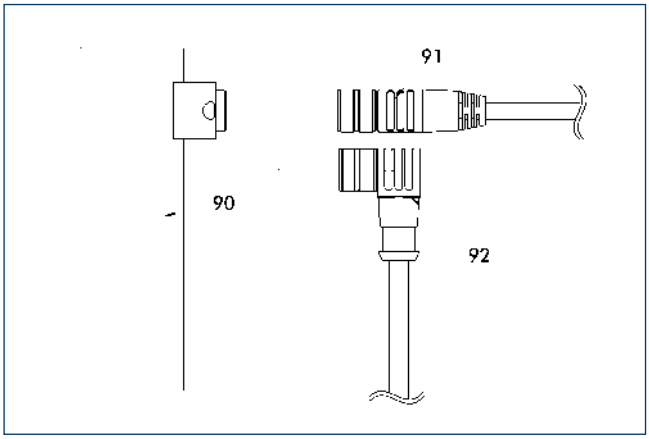


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for centering pins
(78) Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-040-T	0323221	15

Cable connector / cable extension



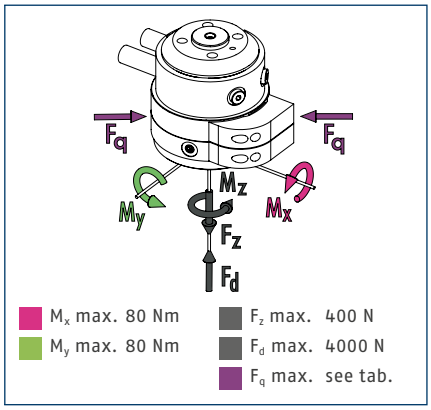
(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

Description	ID	Length [m]	Connection electric cabinet sided
Robot-side			
KA-BW9-L7P-0200	0323001	2	open wires
KA-BW9-L7P-0500	0323003	5	open wires
Tool-side			
KA-SW9-L7P-0200	0323002	2	open wires
KA-SW9-L7P-0500	0323004	5	open wires

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

DDF 2 050

Forces and moments



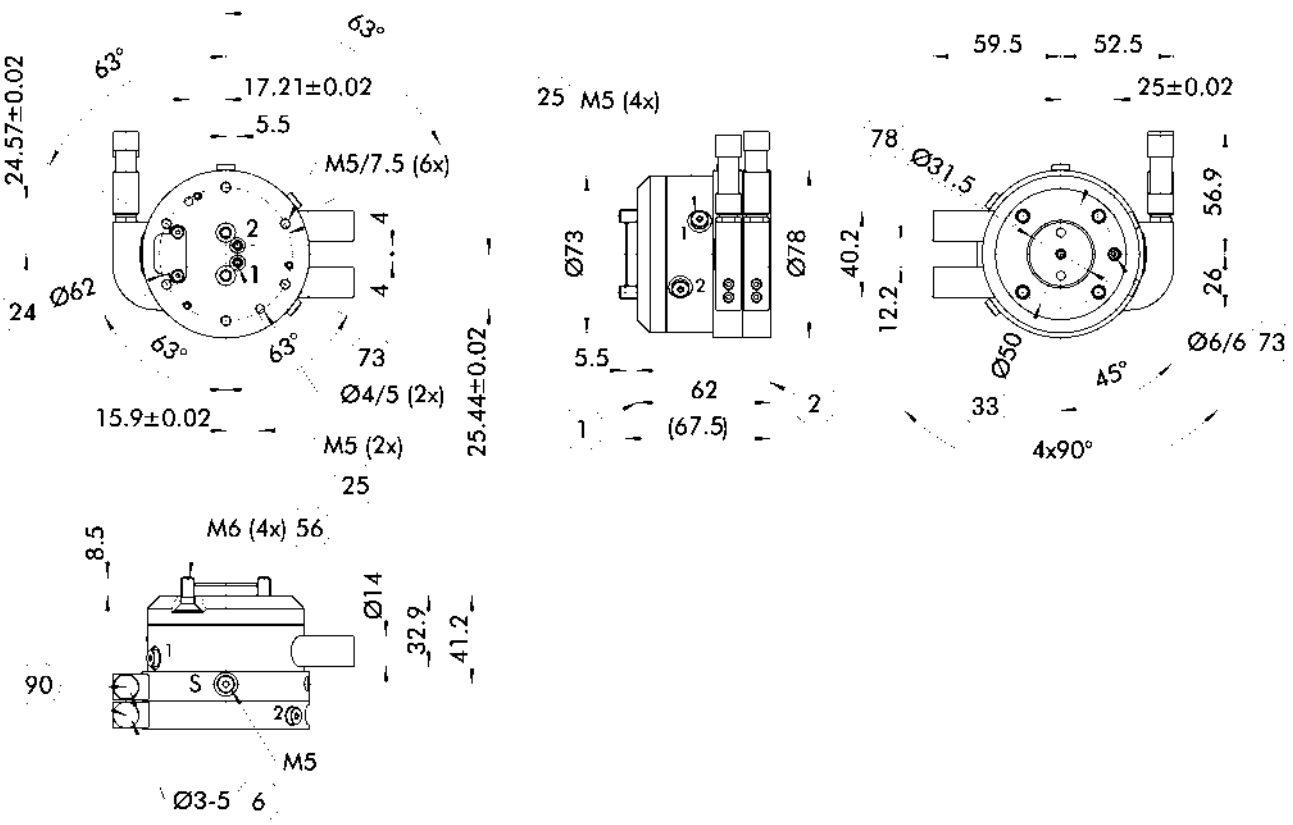
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2 -050-P2-E4	DDF 2-050-P2	DDF 2-050-E4
ID		0323056	0323059	0323060
max. payload	[kg]	10	10	10
max. rotational speed	[1/min]	120	120	120
max. rotational speed	[°/s]	720	720	720
Continuous torque	[Nm]	1.5	1.5	1
Starting torque	[Nm]	2	2	1.3
Rotary movement	[°]	> 360	> 360	> 360
Air connection thread pneumatic feed-through		2x M5	2x M5	
max. pressure per connection	[bar]	10	10	
Rate of flow at 6 bar (per channel)	[l/min]	200	200	
Number of electrical feed-throughs		4		4
Voltage	[V]	60		60
Current strength	[A]	1		1
Mass	[kg]	0.95	0.75	0.45
Robot side connection		ISO 9409-1-50-4-M6	ISO 9409-1-50-4-M6	ISO 9409-1-50-4-M6
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. dynamic moment M_x*	[Nm]	25	25	25
max. dynamic moment M_y*	[Nm]	25	25	25
max. dynamic torsional moment M_z*	[Nm]	20	20	20
max. lateral force F_q*	[N]	100	100	100

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

Main view DDF 2 with electric and pneumatic feed through



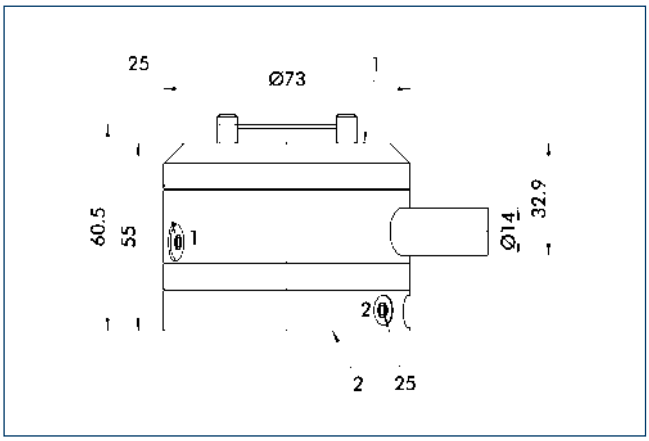
The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(24) Bolt circle
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for centering pins
(78) Fitting for centering
(90) Cable connectors/sockets included in the accessory pack

DDF 2 050

Robot Accessories | Feeding through | Rotary Feed-through

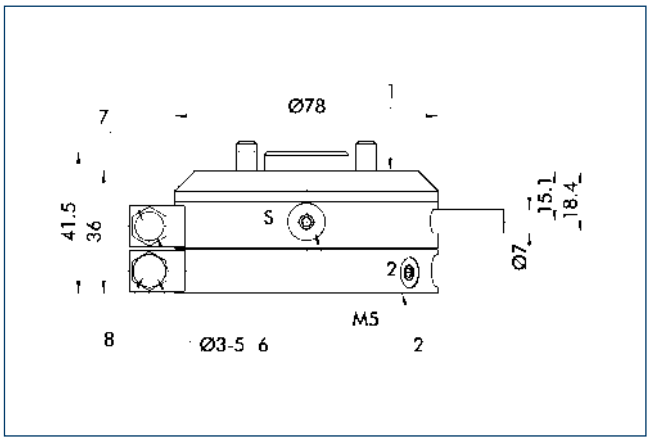
Version DDF 2 with only pneumatic feed through



① Robot side connection
② Tool side connection
㉕ Pneumatic feed-through

Dimensional changes for the version with “only pneumatic feed through”.

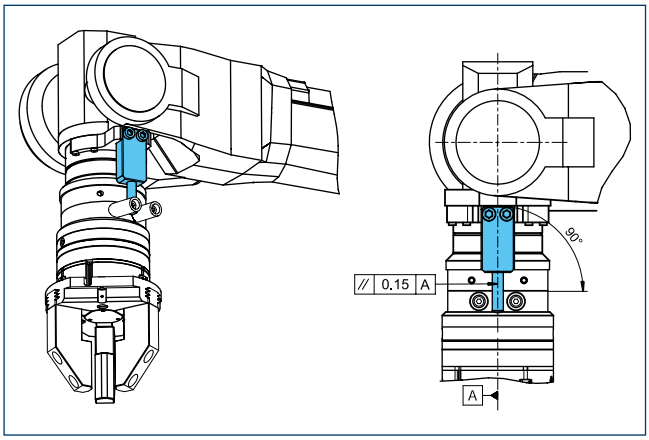
Version DDF 2 with only electrical feed through



S Air purge connection (0.5 ... 1 bar)
① Robot side connection
② Tool side connection
⑥ Cable diameter to be used
⑦ Cable socket in the accessories kit
⑧ Cable connector in the accessories kit

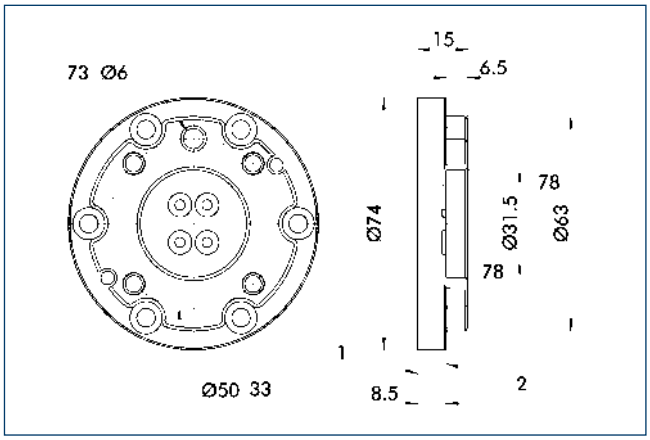
Dimensional changes for the version with “only electrical feed through”.

Mounting instruction



Design note for customer provided torque support.

DDF 2-050-1-T adapter plate



① Robot side connection
② Tool side connection
㉝ DIN ISO-9409 bolt-hole circle diameter
㉝ Fit for centering pins
㉝ Fitting for centering

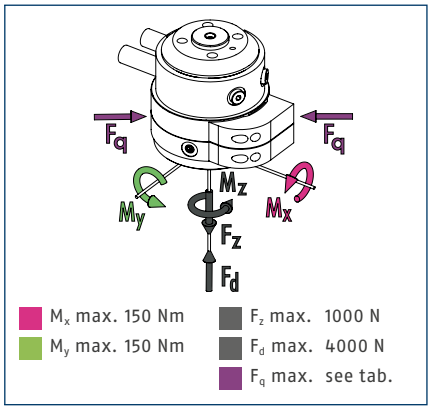
Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-050-T	0323222	15

DDF 2 050-1

Robot Accessories | Feeding through | Rotary Feed-through

Forces and moments



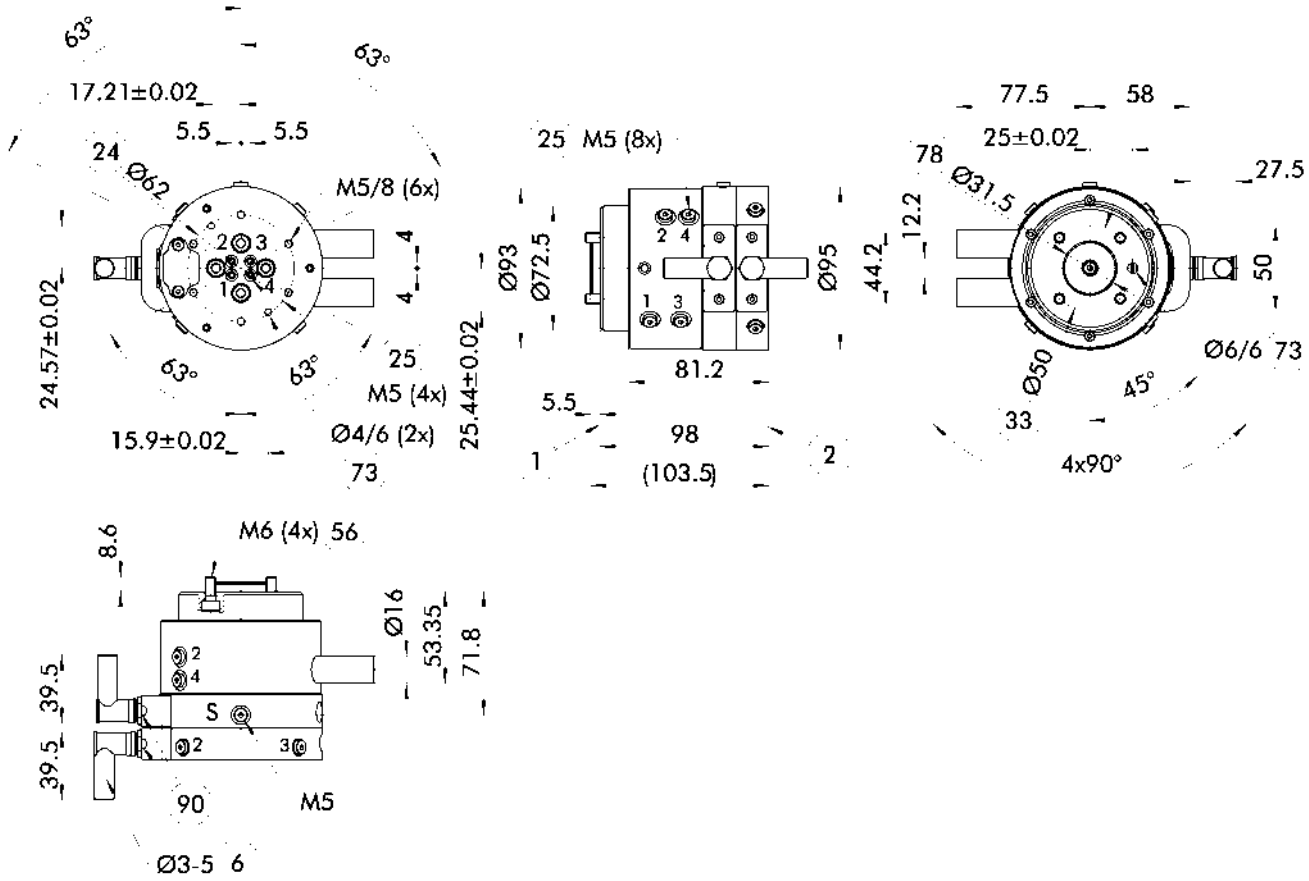
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2-050-1-P4-E6
ID		0323058
max. payload	[kg]	25
max. rotational speed	[1/min]	110
max. rotational speed	[°/s]	660
Continuous torque	[Nm]	3
Starting torque	[Nm]	4.5
Rotary movement	[°]	> 360
Air connection thread pneumatic feed-through		4x M5
max. pressure per connection	[bar]	10
Rate of flow at 6 bar (per channel)	[l/min]	150
Number of electrical feed-throughs		6
Voltage	[V]	60
Current strength	[A]	1
Mass	[kg]	2.1
Robot side connection		ISO 9409-1-50-4-M6
min. / max. ambient temperature	[°C]	5/60
max. dynamic moment M_x*	[Nm]	60
max. dynamic moment M_y*	[Nm]	60
max. dynamic torsional moment M_z*	[Nm]	50
max. lateral force F_q*	[N]	250

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

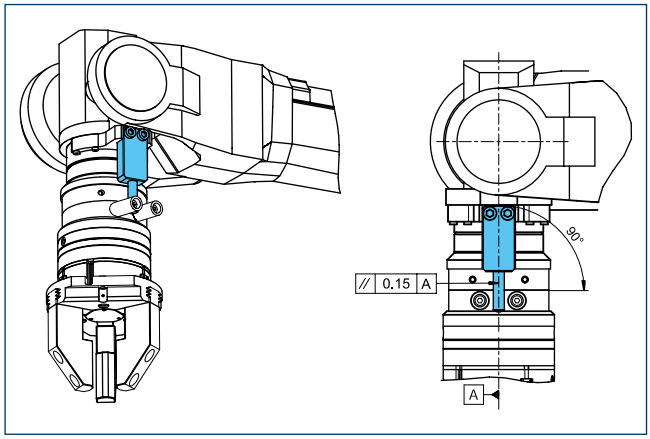
Main view DDF 2 with electric and pneumatic feed through



The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(24) Bolt circle
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for centering pins
(78) Fitting for centering
(90) Cable connectors/sockets included in the accessory pack

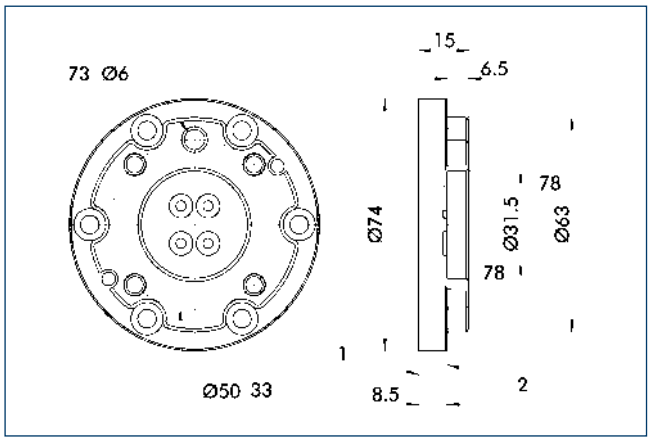
Mounting instruction



Design note for customer provided torque support.

DDF 2 050-1

DDF 2-050-1-T adapter plate

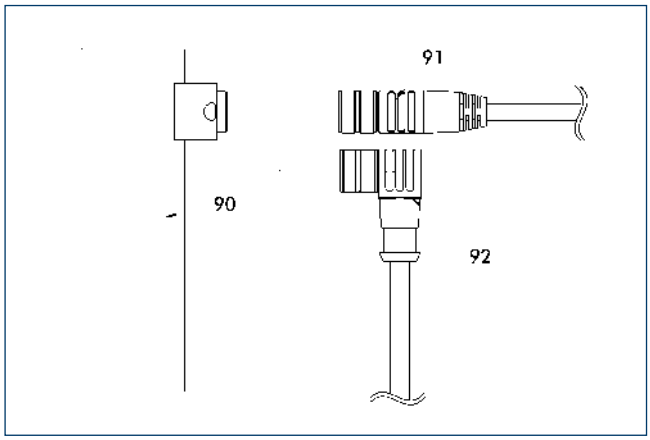


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for centering pins
(78) Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-050-T	0323222	15

Cable connector / cable extension



(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

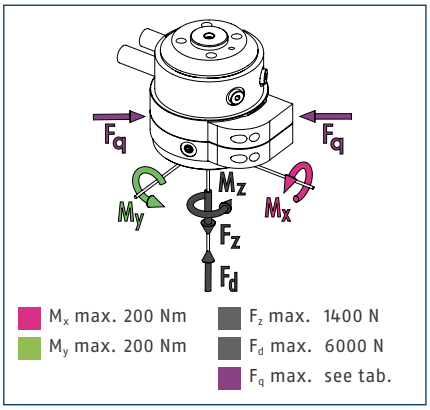
Description	ID	Length [m]	Connection electric cabinet sided
Robot-side			
KA-BW9-L7P-0200	0323001	2	open wires
KA-BW9-L7P-0500	0323003	5	open wires
Tool-side			
KA-SW9-L7P-0200	0323002	2	open wires
KA-SW9-L7P-0500	0323004	5	open wires

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

DDF 2 063

Robot Accessories | Feeding through | Rotary Feed-through

Forces and moments



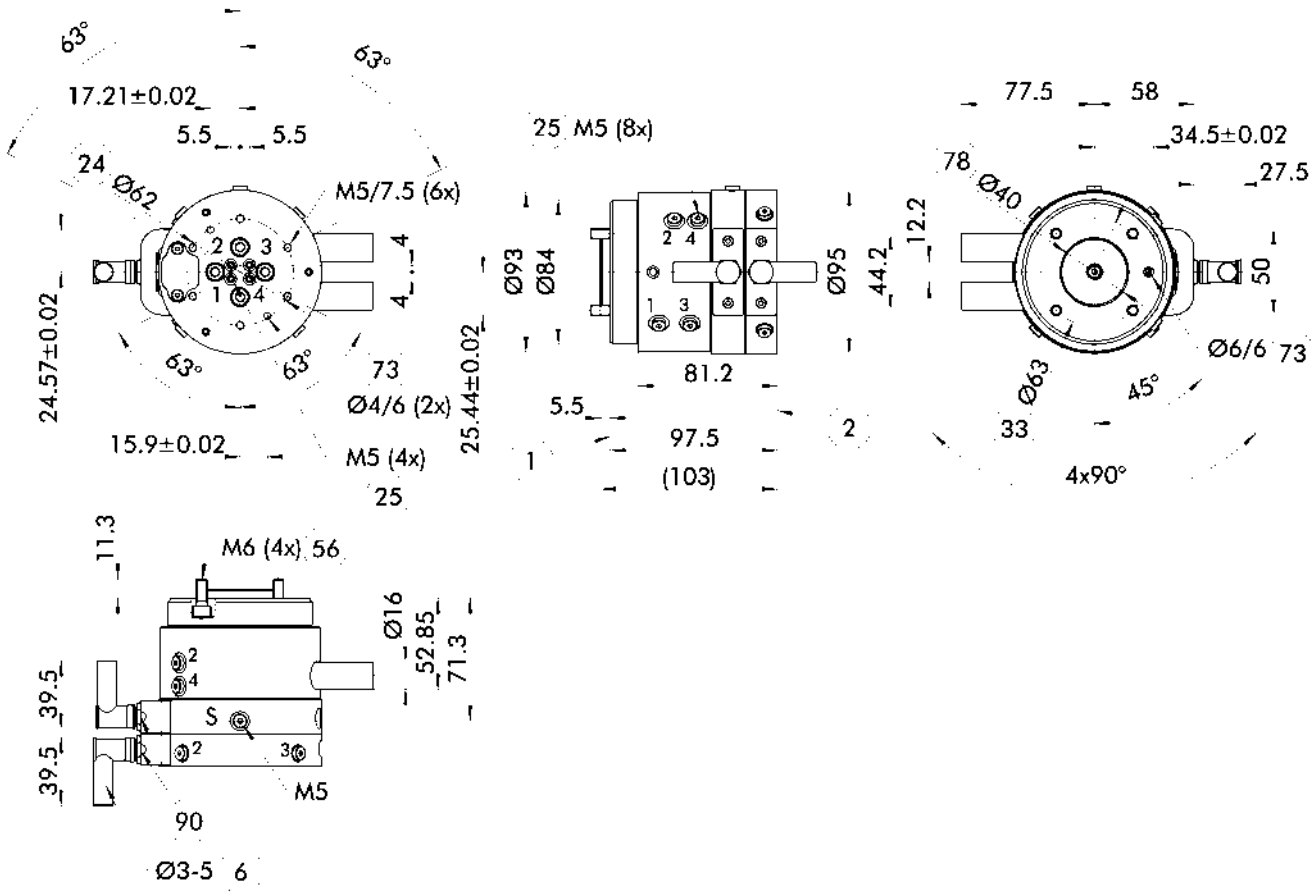
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2-063-P4-E6	DDF 2-063-P4	DDF 2-063-E6
ID		0323068	0323069	0323070
max. payload	[kg]	35	35	35
max. rotational speed	[1/min]	110	110	110
max. rotational speed	[°/s]	660	660	660
Continuous torque	[Nm]	3	3	2
Starting torque	[Nm]	4.5	4.5	2.5
Rotary movement	[°]	> 360	> 360	> 360
Air connection thread pneumatic feed-through		4x M5	4x M5	
max. pressure per connection	[bar]	10	10	
Rate of flow at 6 bar (per channel)	[l/min]	150	150	
Number of electrical feed-throughs		6		6
Voltage	[V]	60		60
Current strength	[A]	1		1
Mass	[kg]	2.2	1.95	0.95
Robot side connection		ISO 9409-1-63-4-M6	ISO 9409-1-63-4-M6	ISO 9409-1-63-4-M6
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. dynamic moment M_x*	[Nm]	85	85	85
max. dynamic moment M_y*	[Nm]	85	85	85
max. dynamic torsional moment M_z*	[Nm]	60	60	60
max. lateral forces F_q*	[N]	350	350	350

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

Main view DDF 2 with electric and pneumatic feed through



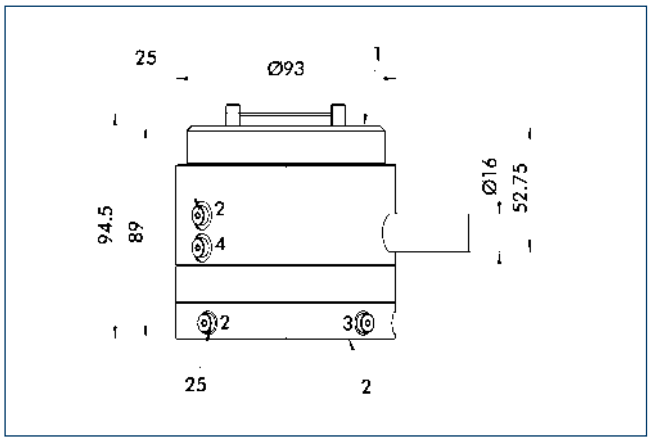
The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(24) Bolt circle
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for centering pins
(78) Fitting for centering
(90) Cable connectors/sockets included in the accessory pack

DDF 2 063

Robot Accessories | Feeding through | Rotary Feed-through

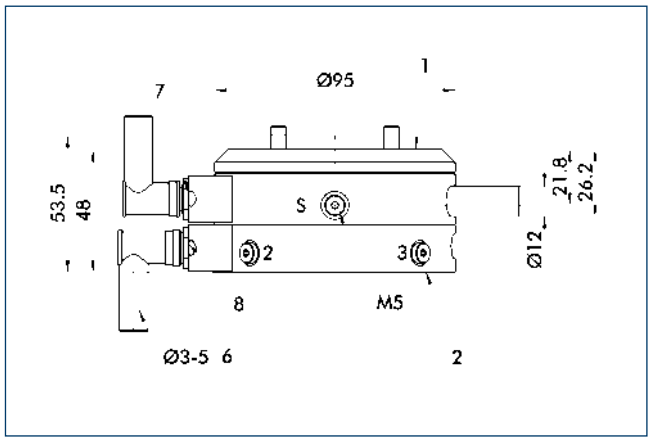
Version DDF 2 with only pneumatic feed through



(1) Robot side connection
(2) Tool side connection
(25) Pneumatic feed-through

Dimensional changes for the version with “only pneumatic feed through”.

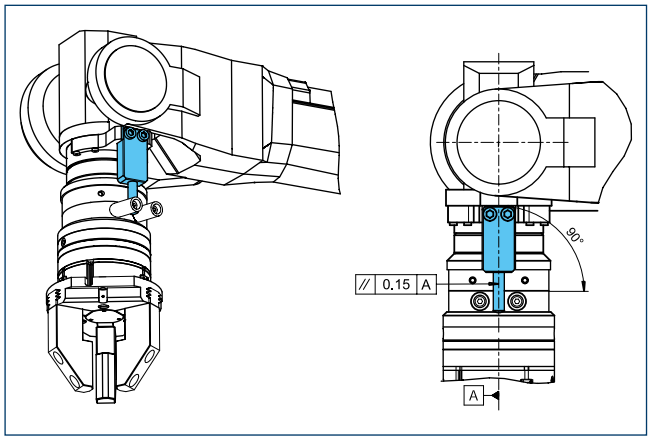
Version DDF 2 with only electrical feed through



S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(7) Cable socket in the accessories kit
(8) Cable connector in the accessories kit

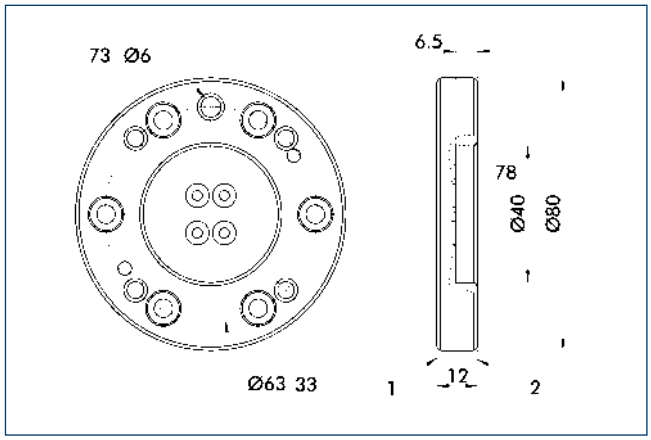
Dimensional changes for the version with “only electrical feed through”.

Mounting instruction



Design note for customer provided torque support.

DDF 2-063-T adapter plates

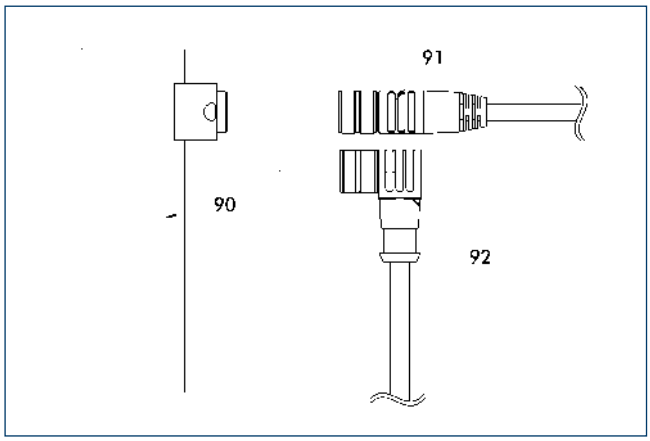


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for centering pins
(78) Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-063-T	0323223	12

Cable connector / cable extension



(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

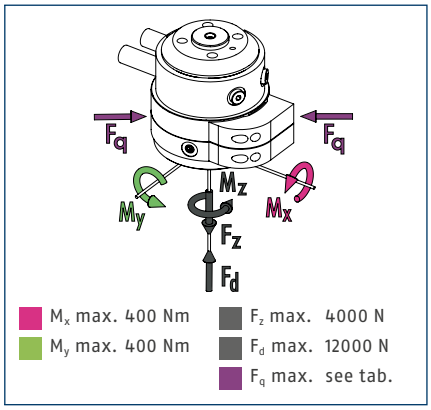
Description	ID	Length [m]	Connection electric cabinet sided
Robot-side			
KA-BW9-L7P-0200	0323001	2	open wires
KA-BW9-L7P-0500	0323003	5	open wires
Tool-side			
KA-SW9-L7P-0200	0323002	2	open wires
KA-SW9-L7P-0500	0323004	5	open wires

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

DDF 2 080

Robot Accessories | Feeding through | Rotary Feed-through

Forces and moments



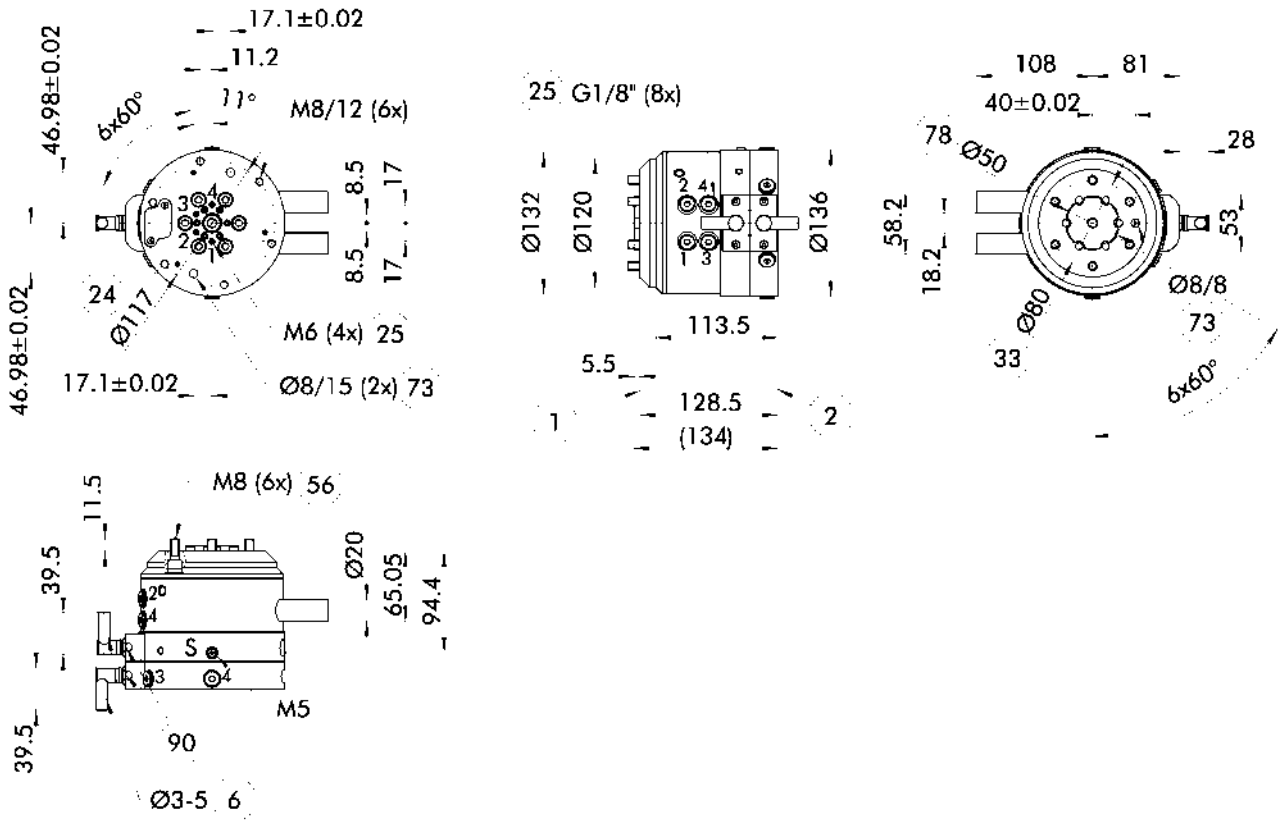
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2-080-P4-E6	DDF 2-080-P4	DDF 2-080-E6
ID		0323092	0323082	0323083
max. payload	[kg]	100	100	100
max. rotational speed	[1/min]	100	100	100
max. rotational speed	[°/s]	600	600	600
Continuous torque	[Nm]	8	8	3
Starting torque	[Nm]	10	10	3.5
Rotary movement	[°]	> 360	> 360	> 360
Air connection thread pneumatic feed-through		4x G1/8“	4x G1/8“	
max. pressure per connection	[bar]	10	10	
Rate of flow at 6 bar (per channel)	[l/min]	240	240	
Number of electrical feed-throughs		6		6
Voltage	[V]	60		60
Current strength	[A]	1		1
Mass	[kg]	5.9	5.3	2.6
Robot side connection		ISO 9409-1-80-6-M8	ISO 9409-1-80-6-M8	ISO 9409-1-80-6-M8
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. dynamic moment M_x*	[Nm]	250	250	250
max. dynamic moment M_y*	[Nm]	250	250	250
max. dynamic torsional moment M_z*	[Nm]	180	180	180
max. lateral forces F_q*	[N]	1000	1000	1000

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

Main view DDF 2 with electric and pneumatic feed through

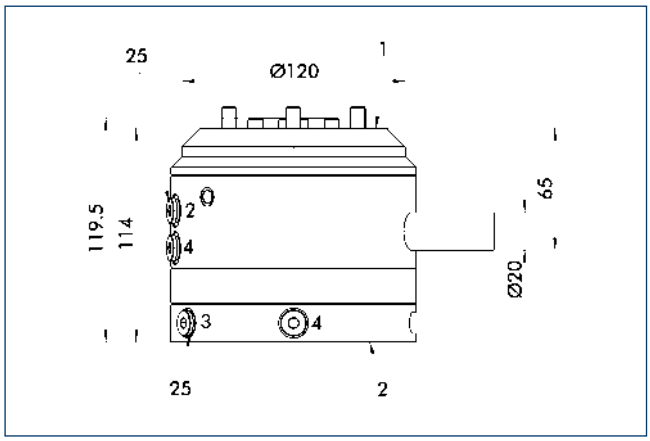


The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(24) Bolt circle
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for centering pins
(78) Fitting for centering
(90) Cable connectors/sockets included in the accessory pack

DDF 2 080

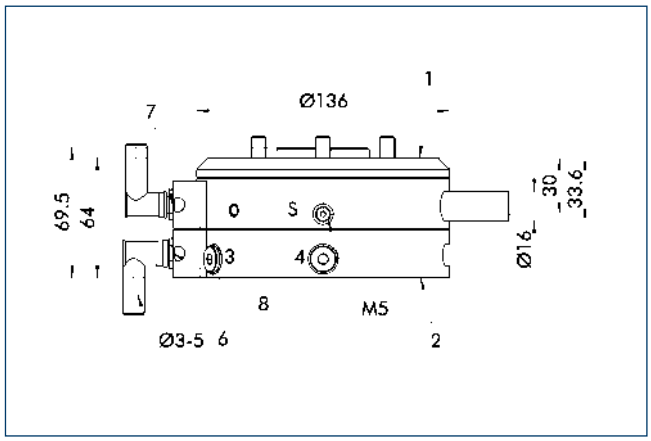
Version DDF 2 with only pneumatic feed through



(1) Robot side connection
(2) Tool side connection
(25) Pneumatic feed-through

Dimensional changes for the version with “only pneumatic feed through”.

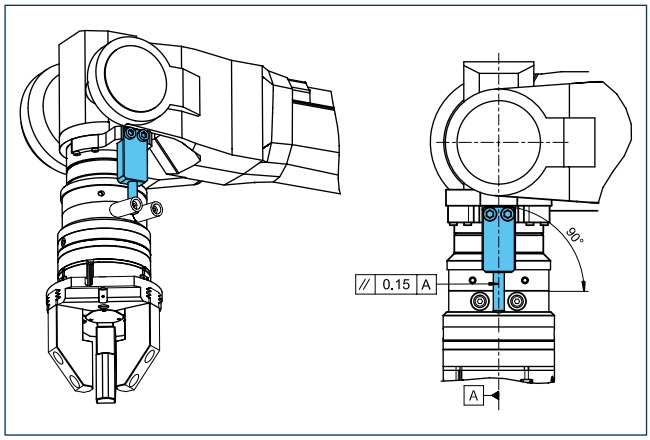
Version DDF 2 with only electrical feed through



S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(7) Cable socket in the accessories kit
(8) Cable connector in the accessories kit

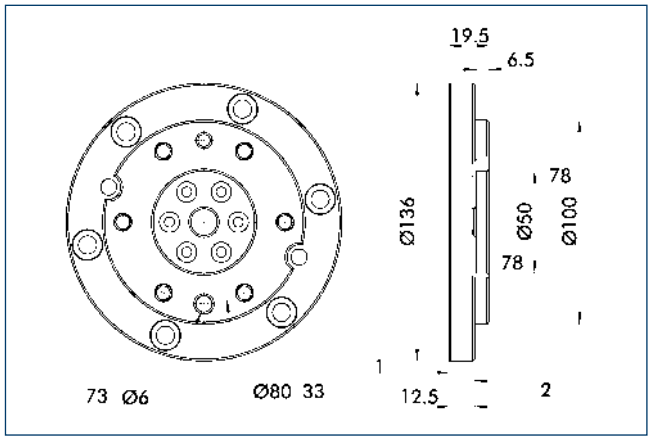
Dimensional changes for the version with “only electrical feed through”.

Mounting instruction



Design note for customer provided torque support.

DDF 2-080-1-T adapter plate

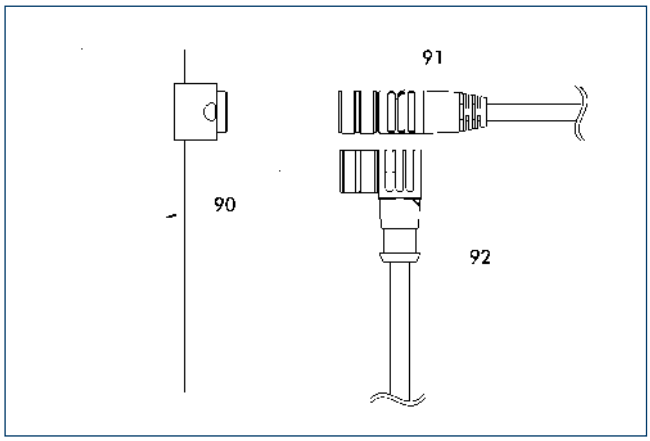


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for centering pins
(78) Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-080-T	0323224	19.5

Cable connector / cable extension



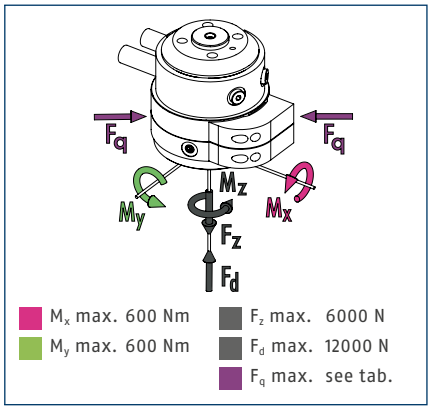
(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

Description	ID	Length [m]	Connection electric cabinet sided
Robot-side			
KA-BW9-L7P-0200	0323001	2	open wires
KA-BW9-L7P-0500	0323003	5	open wires
Tool-side			
KA-SW9-L7P-0200	0323002	2	open wires
KA-SW9-L7P-0500	0323004	5	open wires

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

DDF 2 080-1

Forces and moments



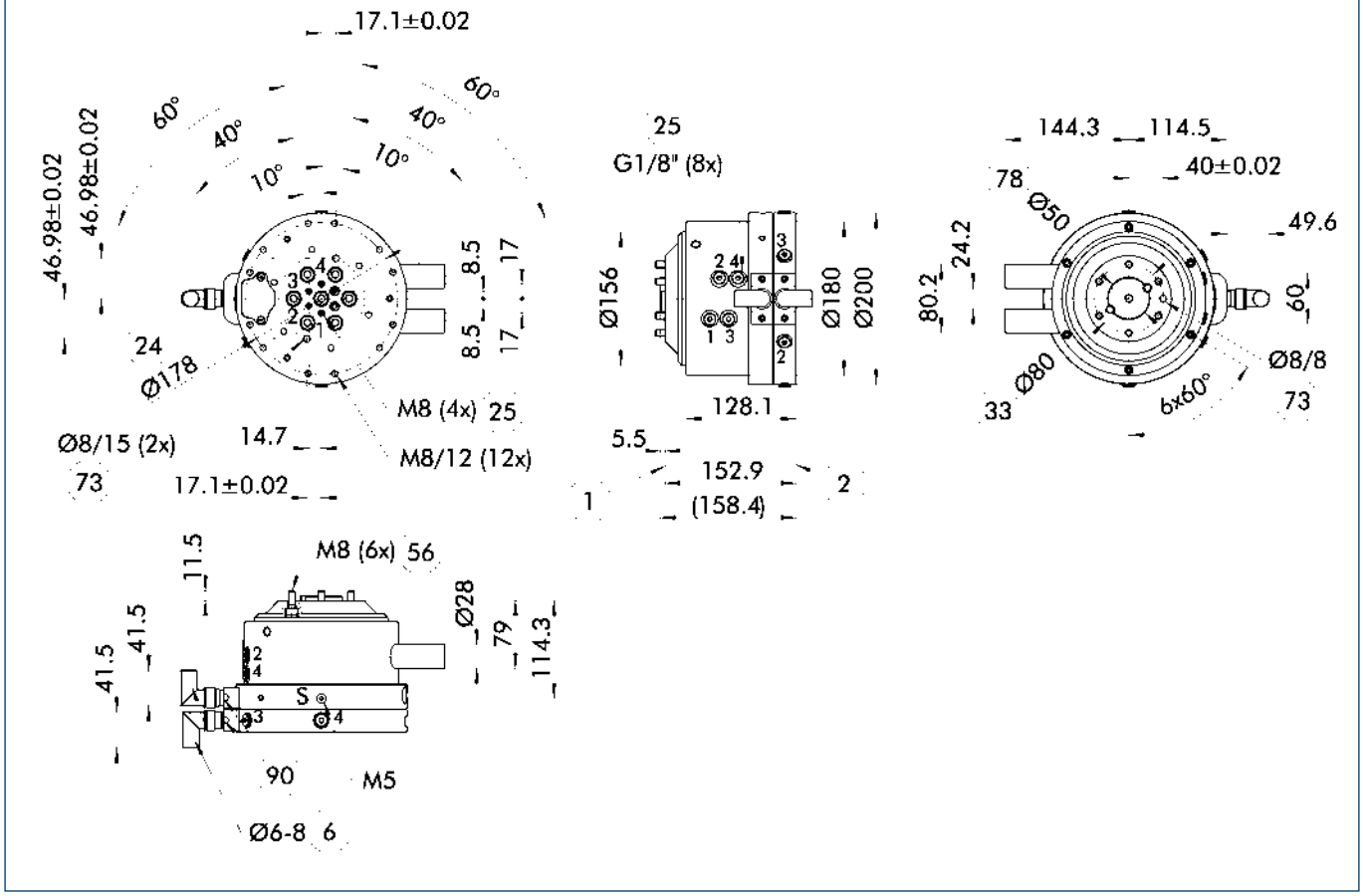
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2-080-1-P4-E10
ID		0323093
max. payload	[kg]	150
max. rotational speed	[1/min]	90
max. rotational speed	[°/s]	540
Continuous torque	[Nm]	22
Starting torque	[Nm]	25
Rotary movement	[°]	> 360
Air connection thread pneumatic feed-through		4x G1/8“
max. pressure per connection	[bar]	10
Rate of flow at 6 bar (per channel)	[l/min]	400
Number of electrical feed-throughs		10
Voltage	[V]	60
Current strength	[A]	1
Mass	[kg]	13.1
Robot side connection		ISO 9409-1-80-6-M8
min. / max. ambient temperature	[°C]	5/60
max. dynamic moment M_x*	[Nm]	400
max. dynamic moment M_y*	[Nm]	400
max. dynamic torsional moment M_z*	[Nm]	300
max. lateral forces F_q*	[N]	1500

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

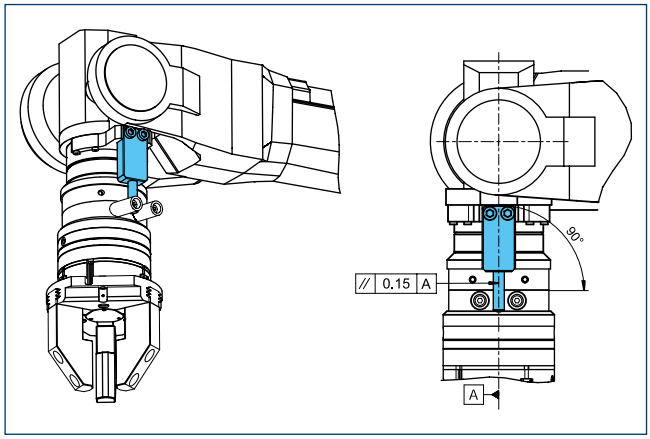
Main view DDF 2 with electric and pneumatic feed through



The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(24) Bolt circle
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for centering pins
(78) Fitting for centering
(90) Cable connectors/sockets included in the accessory pack

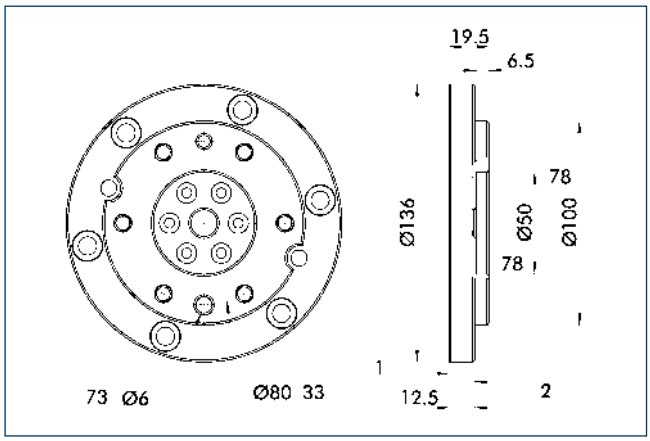
Mounting instruction



Design note for customer provided torque support.

DDF 2 080-1

DDF 2-080-1-T adapter plate

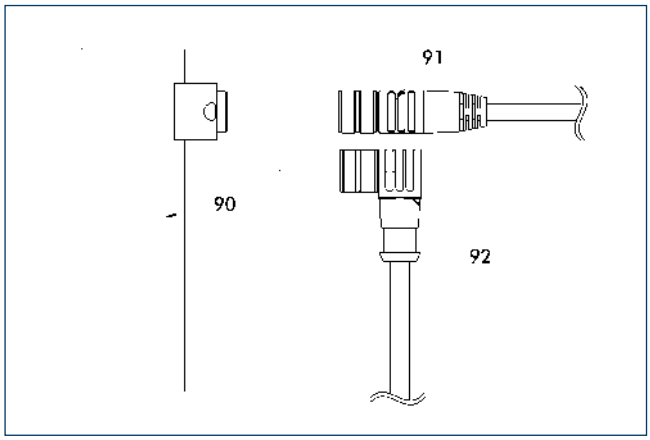


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for centering pins
(78) Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-080-T	0323224	19.5

Cable connector / cable extension



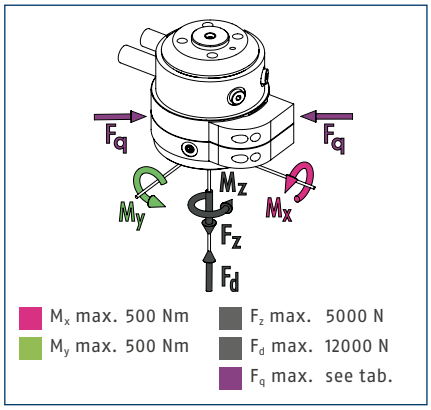
(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

Description	ID	Length [m]	Connection electric cabinet sided
Robot-side			
KA BW16-L 12P-0500	0323005	5	open wires
Tool-side			
KA SW16-L 12P-0500	0323006	5	open wires

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

DDF 2 100

Forces and moments



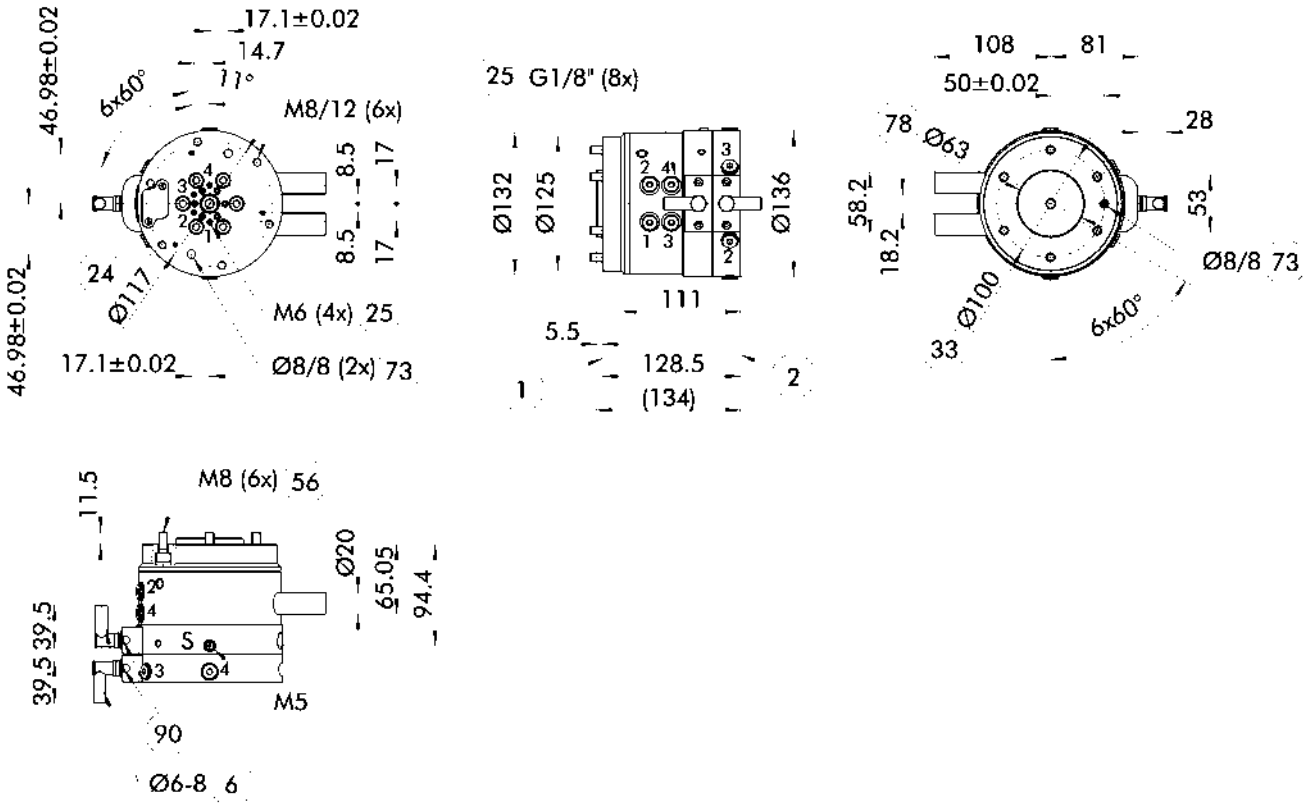
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2-100-P4-E6	DDF 2-100-P4	DDF 2-100-E6
ID		0323112	0323114	0323115
max. payload	[kg]	125	125	125
max. rotational speed	[1/min]	100	100	100
max. rotational speed	[°/s]	600	600	600
Continuous torque	[Nm]	8	8	3
Starting torque	[Nm]	10	10	3.5
Rotary movement	[°]	> 360	> 360	> 360
Air connection thread pneumatic feed-through		4x G1/8“	4x G1/8“	
max. pressure per connection	[bar]	10	10	
Rate of flow at 6 bar (per channel)	[l/min]	240	240	
Number of electrical feed-throughs		6		6
Voltage	[V]	60		60
Current strength	[A]	1		1
Mass	[kg]	6.1	5.5	2.8
Robot side connection		ISO 9409-1-100-6-M8	ISO 9409-1-100-6-M8	ISO 9409-1-100-6-M8
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. dynamic moment M_x*	[Nm]	290	290	290
max. dynamic moment M_y*	[Nm]	290	290	290
max. dynamic torsional moment M_z*	[Nm]	200	200	200
max. lateral forces F_q*	[N]	1250	1250	1250

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

Main view DDF 2 with electric and pneumatic feed through

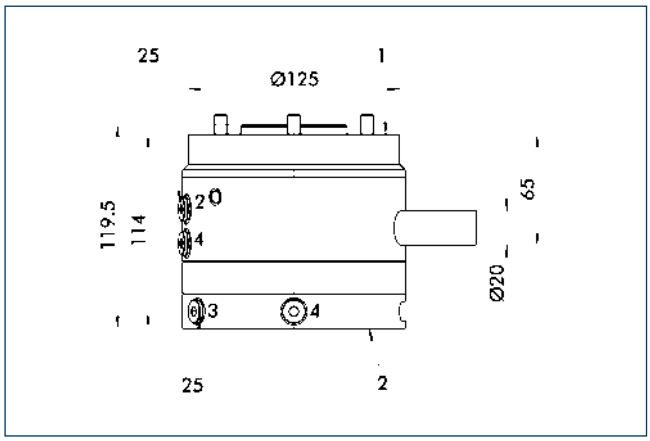


The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(24) Bolt circle
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for centering pins
(78) Fitting for centering
(90) Cable connectors/sockets included in the accessory pack

DDF 2 100

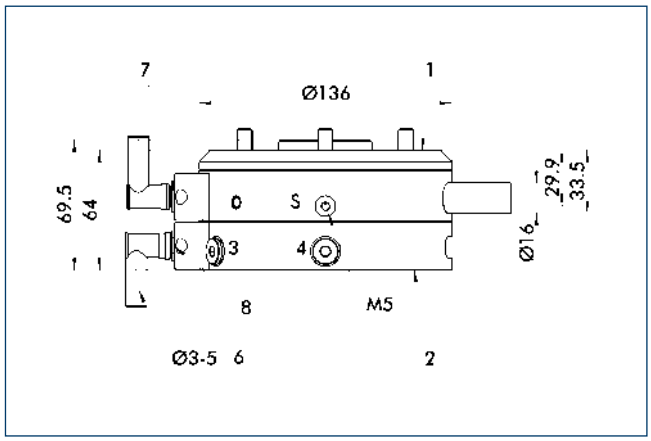
Version DDF 2 with only pneumatic feed through



① Robot side connection
② Tool side connection
㉕ Pneumatic feed-through

Dimensional changes for the version with “only pneumatic feed through”.

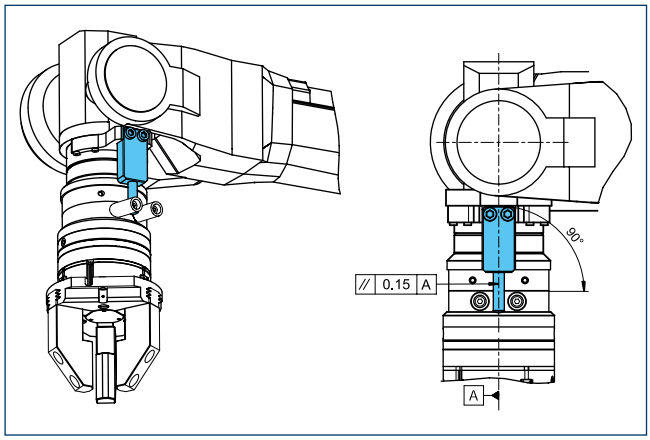
Version DDF 2 with only electrical feed through



S Air purge connection (0.5 ... 1 bar)
① Robot side connection
② Tool side connection
⑥ Cable diameter to be used
⑦ Cable socket in the accessories kit
⑧ Cable connector in the accessories kit

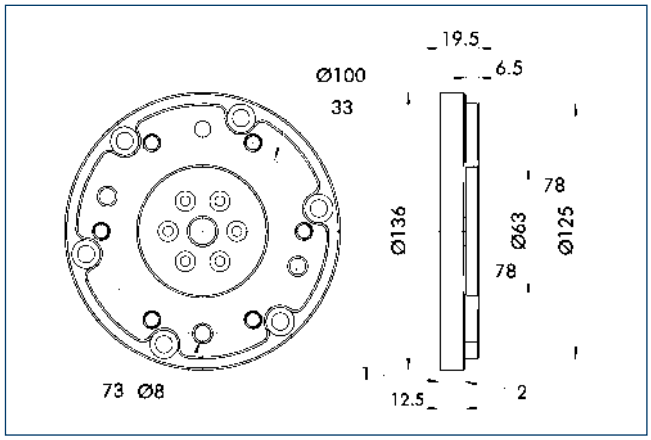
Dimensional changes for the version with “only electrical feed through”.

Mounting instruction



Design note for customer provided torque support.

DDF 2-100-1-T adapter plate

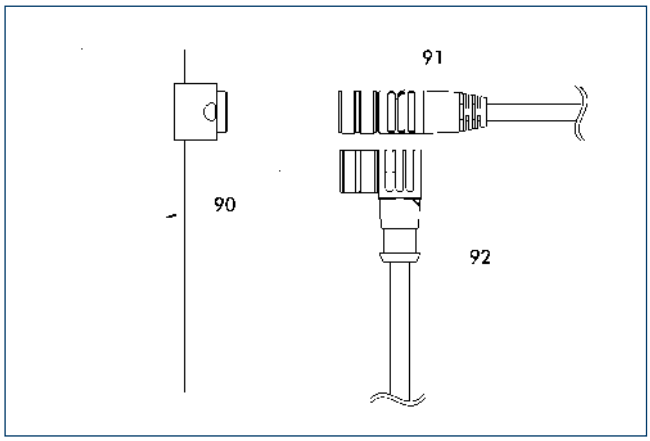


① Robot side connection
② Tool side connection
㉝ DIN ISO-9409 bolt-hole circle diameter
㉝ Fit for centering pins
㉞ Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-100-T	0323225	19.5

Cable connector / cable extension



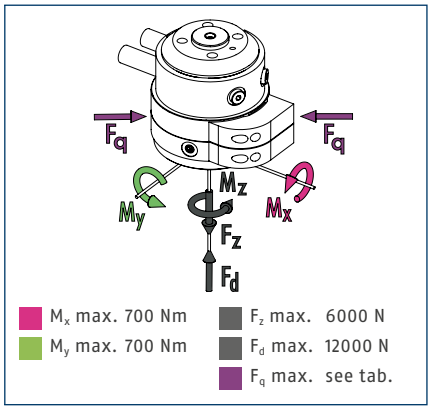
(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

Description	ID	Length [m]	Connection electric cabinet sided
Robot-side			
KA-BW9-L7P-0200	0323001	2	open wires
KA-BW9-L7P-0500	0323003	5	open wires
Tool-side			
KA-SW9-L7P-0200	0323002	2	open wires
KA-SW9-L7P-0500	0323004	5	open wires

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

DDF 2 100-1

Forces and moments



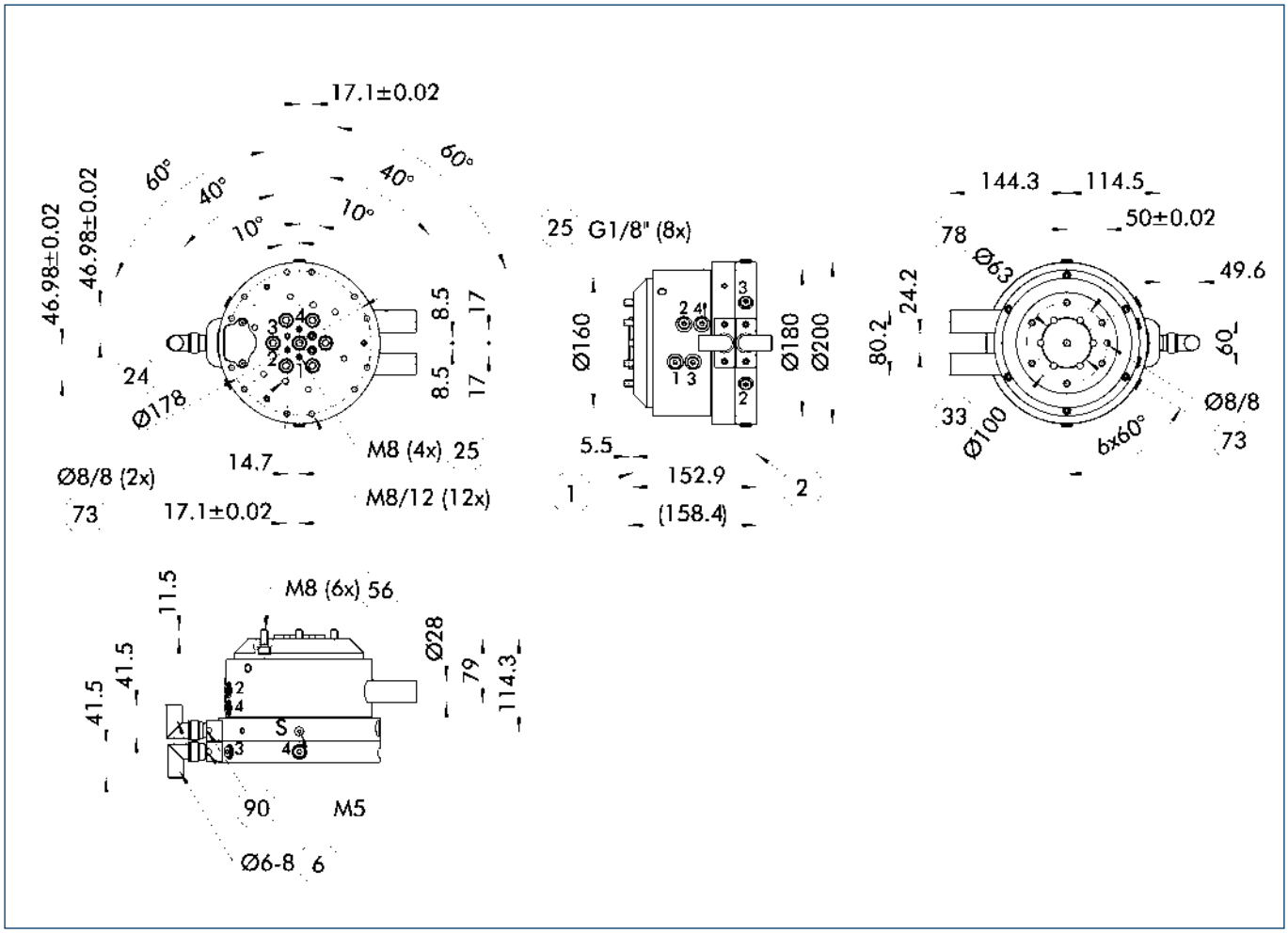
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2-100-1-P4-E10
ID		0323113
max. payload	[kg]	175
max. rotational speed	[1/min]	90
max. rotational speed	[°/s]	540
Continuous torque	[Nm]	22
Starting torque	[Nm]	25
Rotary movement	[°]	> 360
Air connection thread pneumatic feed-through		4x G1/8“
max. pressure per connection	[bar]	10
Rate of flow at 6 bar (per channel)	[l/min]	400
Number of electrical feed-throughs		10
Voltage	[V]	60
Current strength	[A]	1
Mass	[kg]	13.3
Robot side connection		ISO 9409-1-100-6-M8
min. / max. ambient temperature	[°C]	5/60
max. dynamic moment M_x*	[Nm]	450
max. dynamic moment M_y*	[Nm]	450
max. dynamic torsional moment M_z*	[Nm]	350
max. lateral forces F_q*	[N]	1750

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

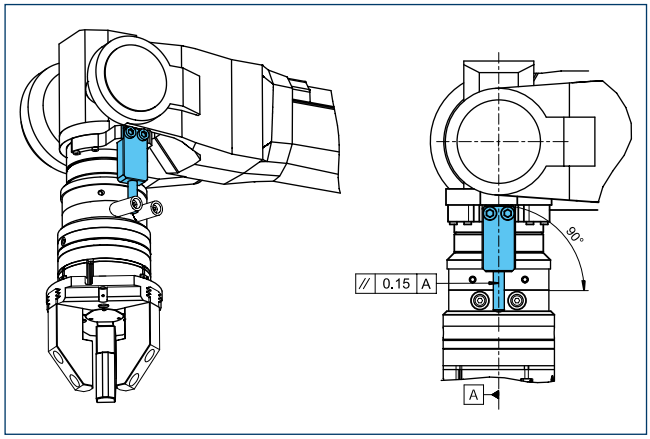
Main view DDF 2 with electric and pneumatic feed through



The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(24) Bolt circle
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for centering pins
(78) Fitting for centering
(90) Cable connectors/sockets included in the accessory pack

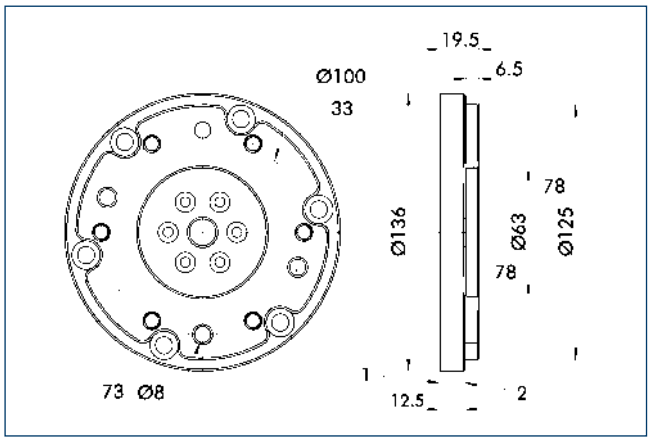
Mounting instruction



Design note for customer provided torque support.

DDF 2 100-1

DDF 2-100-1-T adapter plate

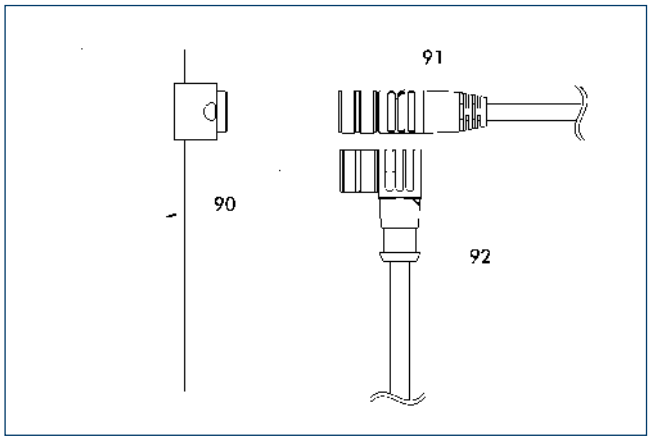


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for centering pins
(78) Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-100-T	0323225	19.5

Cable connector / cable extension



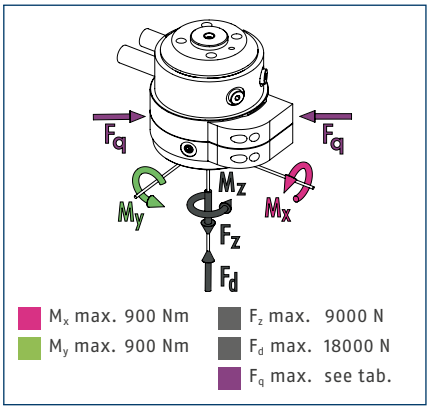
(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

Description	ID	Length [m]	Connection electric cabinet sided
Robot-side			
KA BW16-L 12P-0500	0323005	5	open wires
Tool-side			
KA SW16-L 12P-0500	0323006	5	open wires

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

DDF 2 125

Forces and moments



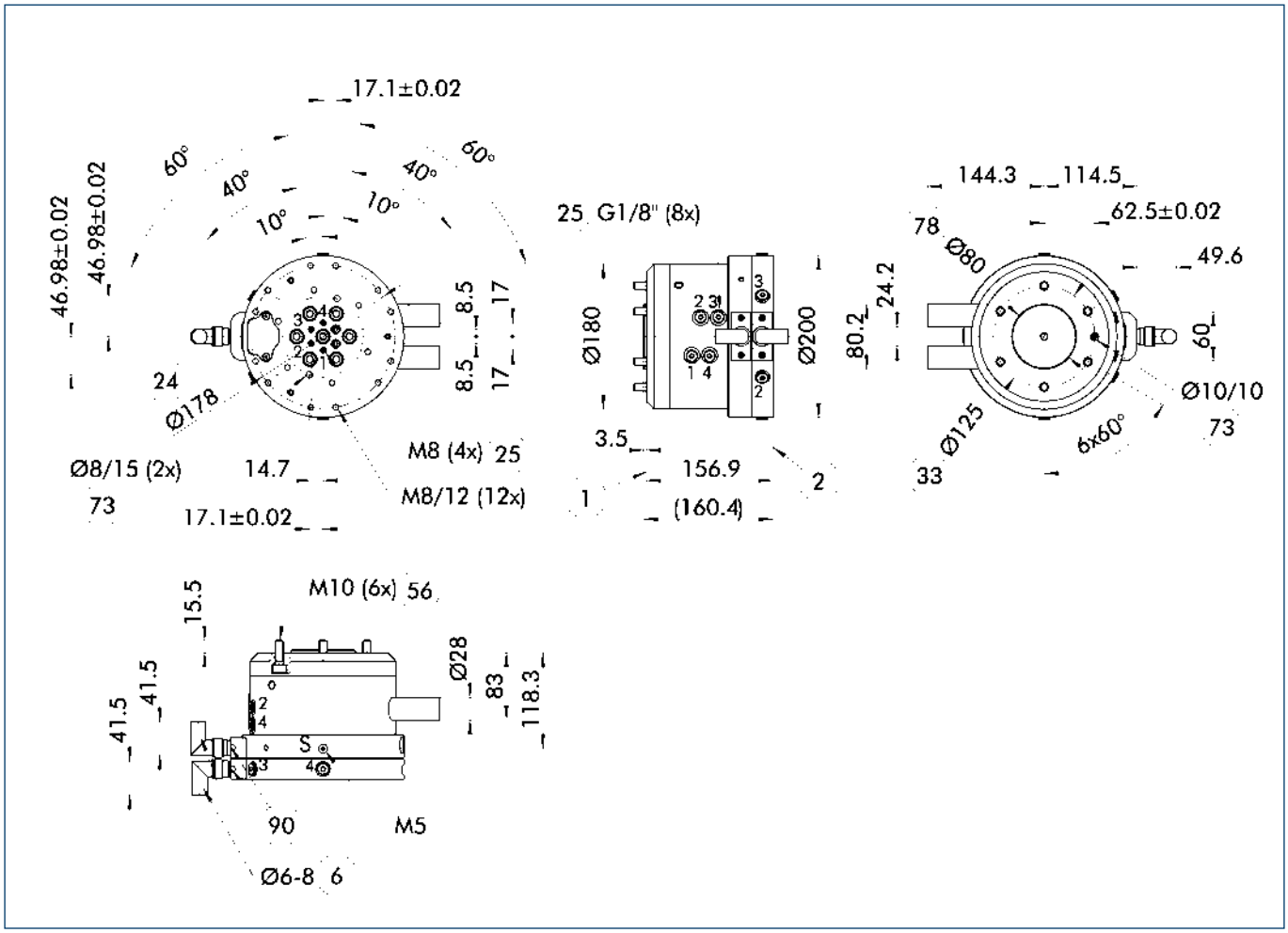
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2-125-P4-E10	DDF 2-125-P4	DDF 2-125-E10
ID		0323137	0323133	0323134
max. payload	[kg]	225	225	225
max. rotational speed	[1/min]	90	90	90
max. rotational speed	[°/s]	540	540	540
Continuous torque	[Nm]	22	22	10
Starting torque	[Nm]	25	25	12
Rotary movement	[°]	> 360	> 360	> 360
Air connection thread pneumatic feed-through		4x G1/8“	4x G1/8“	
max. pressure per connection	[bar]	10	10	
Rate of flow at 6 bar (per channel)	[l/min]	400	400	
Number of electrical feed-throughs		10		10
Voltage	[V]	60		60
Current strength	[A]	1		1
Mass	[kg]	13.9	13.4	5.9
Robot side connection		ISO 9409-1-125-6-M10	ISO 9409-1-125-6-M10	ISO 9409-1-125-6-M10
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. dynamic moment M_x*	[Nm]	520	520	520
max. dynamic moment M_y*	[Nm]	520	520	520
max. dynamic torsional moment M_z*	[Nm]	400	400	400
max. lateral forces F_q*	[N]	2250	2250	2250

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

Main view DDF 2 with electric and pneumatic feed through



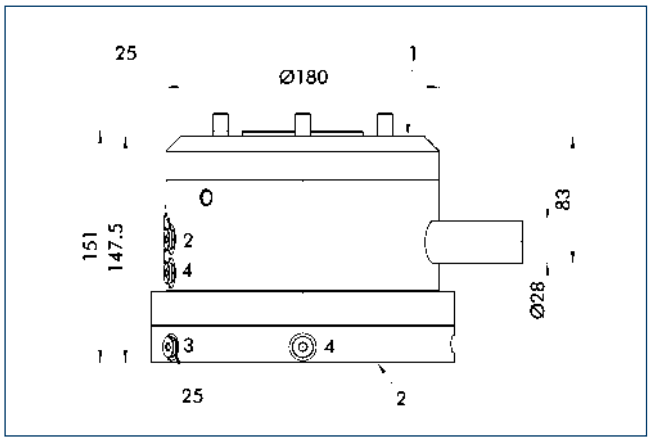
The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(24) Bolt circle
(25) Pneumatic feed-through
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for centering pins
(78) Fitting for centering
(90) Cable connectors/sockets included in the accessory pack

DDF 2 125

Robot Accessories | Feeding through | Rotary Feed-through

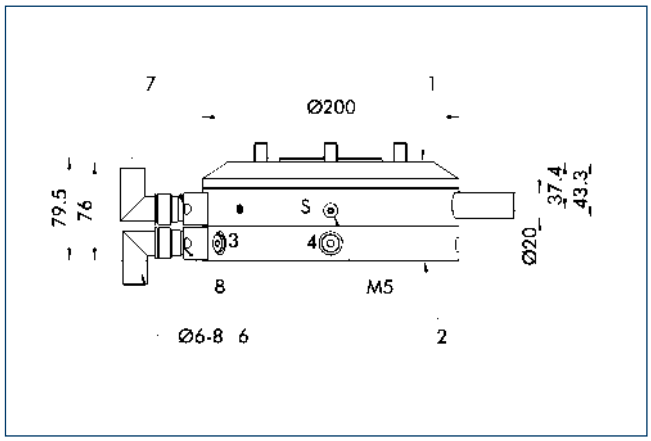
Version DDF 2 with only pneumatic feed through



(1) Robot side connection
(2) Tool side connection
(25) Pneumatic feed-through

Dimensional changes for the version with “only pneumatic feed through”.

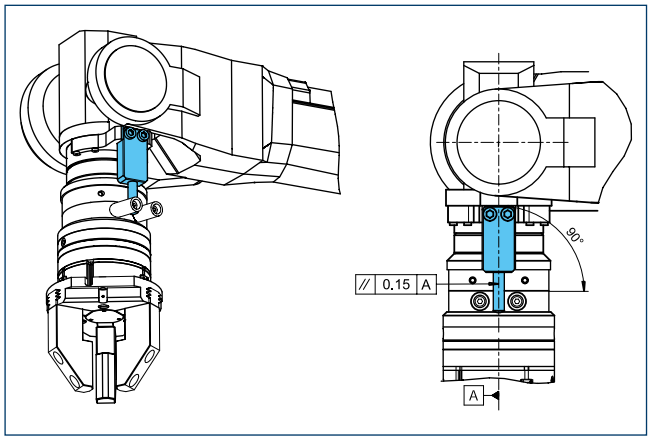
Version DDF 2 with only electrical feed through



S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(7) Cable socket in the accessories kit
(8) Cable connector in the accessories kit

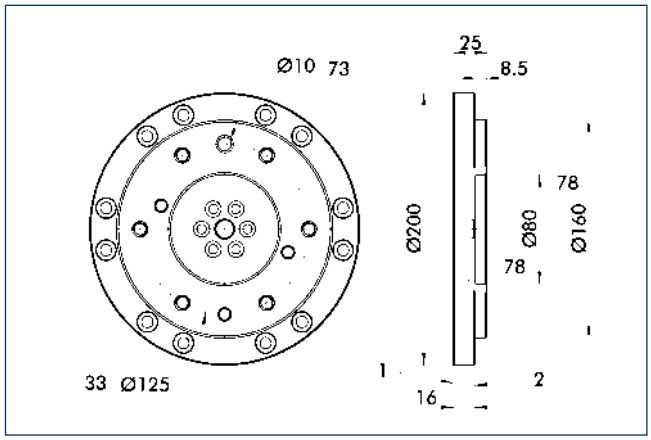
Dimensional changes for the version with “only electrical feed through”.

Mounting instruction



Design note for customer provided torque support.

DDF 2-125-T adapter plates

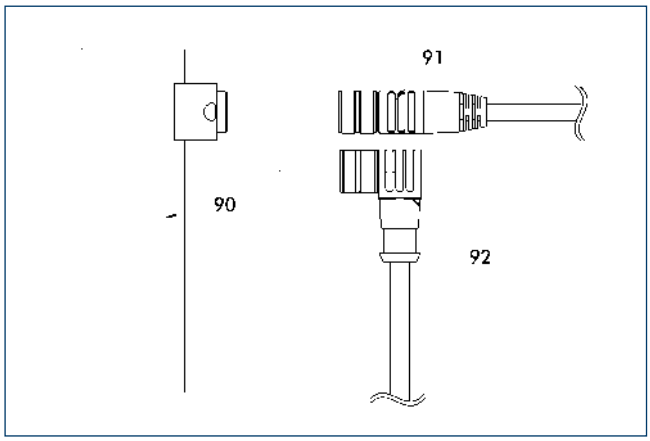


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for centering pins
(78) Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-125-T	0323226	25

Cable connector / cable extension



(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

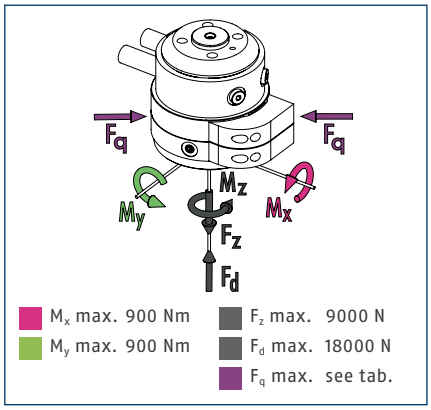
Description	ID	Length [m]	Connection electric cabinet sided
Robot-side			
KA BW16-L 12P-0500	0323005	5	open wires
Tool-side			
KA SW16-L 12P-0500	0323006	5	open wires

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

DDF 2 160

Robot Accessories | Feeding through | Rotary Feed-through

Forces and moments



- M_x max. 900 Nm
- M_y max. 900 Nm
- F_z max. 9000 N
- F_d max. 18000 N
- F_q max. see tab.

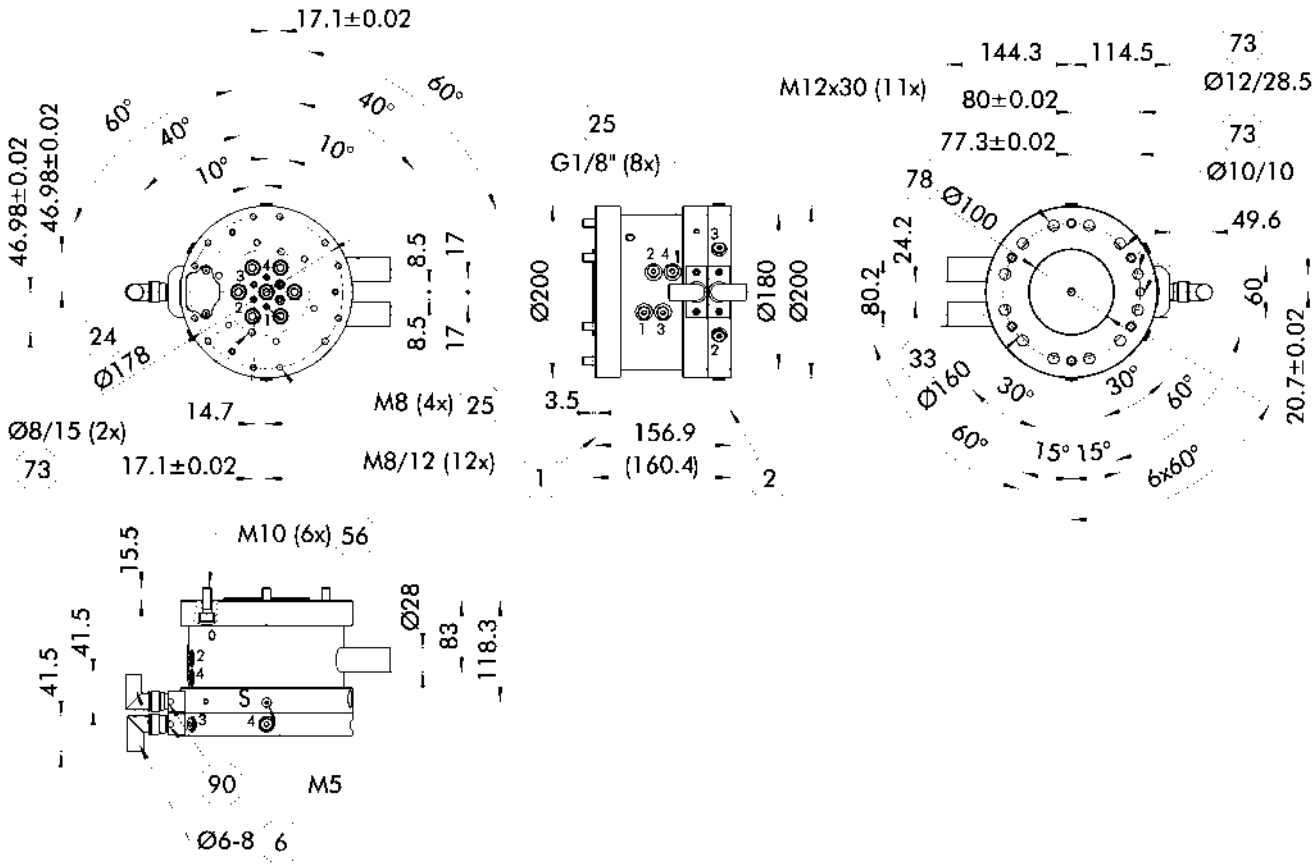
ⓘ Maximum allowable static forces and moments which are allowed to act on the rotary feed through.

Technical data

Description		DDF 2-160-P4-E10	DDF 2-160-P4	DDF 2-160-E10
ID		0323173	0323162	0323163
max. payload	[kg]	250	250	250
max. rotational speed	[1/min]	90	90	90
max. rotational speed	[°/s]	540	540	540
Continuous torque	[Nm]	22	22	10
Starting torque	[Nm]	25	25	12
Rotary movement	[°]	> 360	> 360	> 360
Air connection thread pneumatic feed-through		4x G1/8“	4x G1/8“	
max. pressure per connection	[bar]	10	10	
Rate of flow at 6 bar (per channel)	[l/min]	400	400	
Number of electrical feed-throughs		10		10
Voltage	[V]	60		60
Current strength	[A]	1		1
Mass	[kg]	14.2	13.8	6.2
Robot side connection		ISO 9409-1-160-6-M10	ISO 9409-1-160-6-M10	ISO 9409-1-160-6-M10
		ISO 9409-1-160-11-M12	ISO 9409-1-160-11-M12	ISO 9409-1-160-11-M12
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. dynamic moment M_x*	[Nm]	550	550	550
max. dynamic moment M_y*	[Nm]	550	550	550
max. dynamic torsional moment M_z*	[Nm]	400	400	400
max. lateral forces F_q*	[N]	2500	2500	2500

ⓘ *This is the max. total of all loads (acceleration forces and torques, process forces, emergency stops, etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

Main view DDF 2 with electric and pneumatic feed through



The main view shows the DDF 2 without consideration for following options but with pneumatic and electrical feed-throughs including connector for robot side and tool side. These are included with delivery.

S Air purge connection (0.5 ... 1 bar)

(1) Robot side connection

(2) Tool side connection

(6) Cable diameter to be used

(24) Bolt circle

(25) Pneumatic feed-through

(33) DIN ISO-9409 bolt-hole circle diameter

(56) Included in delivery

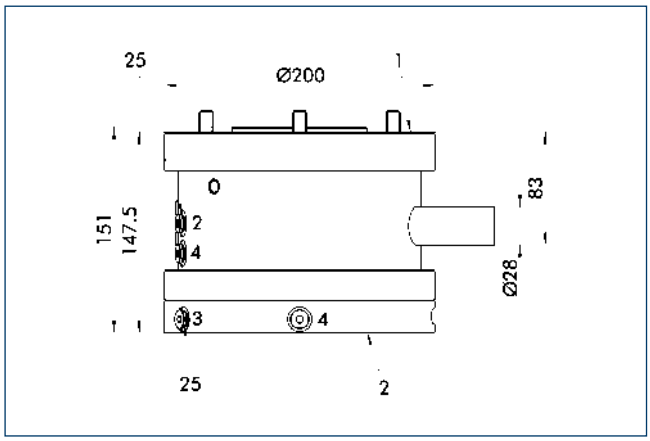
(73) Fit for centering pins

(78) Fitting for centering

(90) Cable connectors/sockets included in the accessory pack

DDF 2 160

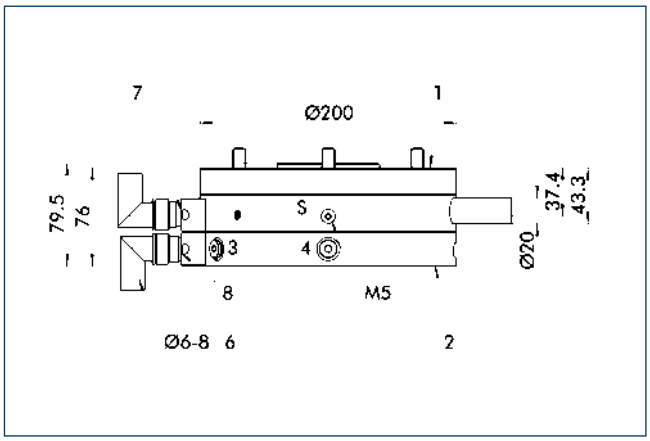
Version DDF 2 with only pneumatic feed through



(1) Robot side connection
(2) Tool side connection
(25) Pneumatic feed-through

Dimensional changes for the version with “only pneumatic feed through”.

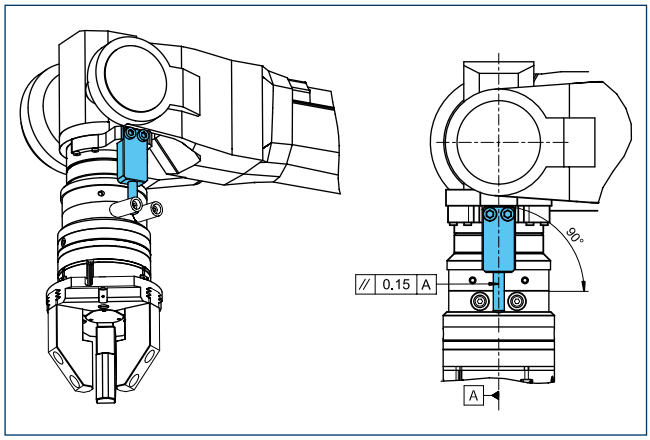
Version DDF 2 with only electrical feed through



S Air purge connection (0.5 ... 1 bar)
(1) Robot side connection
(2) Tool side connection
(6) Cable diameter to be used
(7) Cable socket in the accessories kit
(8) Cable connector in the accessories kit

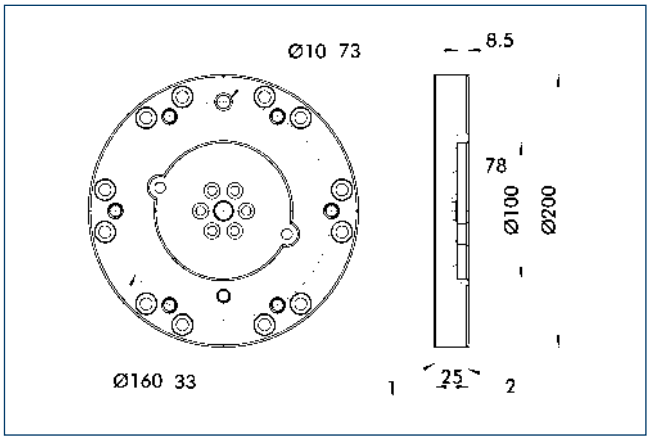
Dimensional changes for the version with “only electrical feed through”.

Mounting instruction



Design note for customer provided torque support

DDF 2-160-T adapter plates

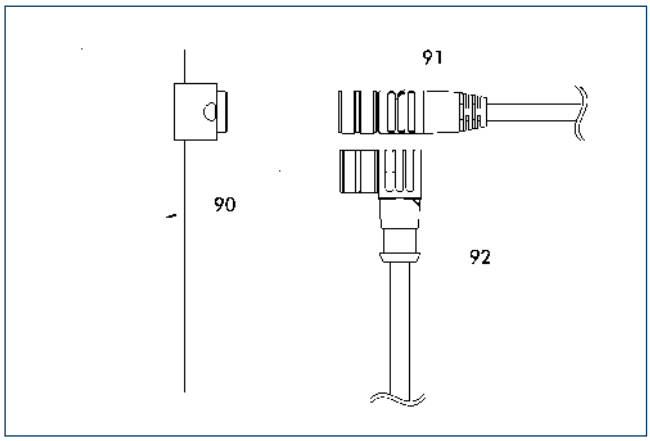


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for centering pins
(78) Fitting for centering

Tool-side adapter plate with ISO 9404 screw connection pattern.

Description	ID	Height [mm]
Tool-side		
A-DDF 2-160-T	0323227	25

Cable connector / cable extension



(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

Description	ID	Length [m]	Connection electric cabinet sided
Robot-side			
KA BW16-L 12P-0500	0323005	5	open wires
Tool-side			
KA SW16-L 12P-0500	0323006	5	open wires

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

High-speed Turning – up to 500 RPM

DDF-SE Stationary Rotary Feed-through

For media feed-through of electric signals and pneumatics for stationary use.

Field of Application

For use on rotary indexing tables and rotating actuators

Advantages – Your benefit

Combined pneumatic- and electrical feed-through for extensive supply to your gripping system / tool

Standardized shaft end for easy gear assembly

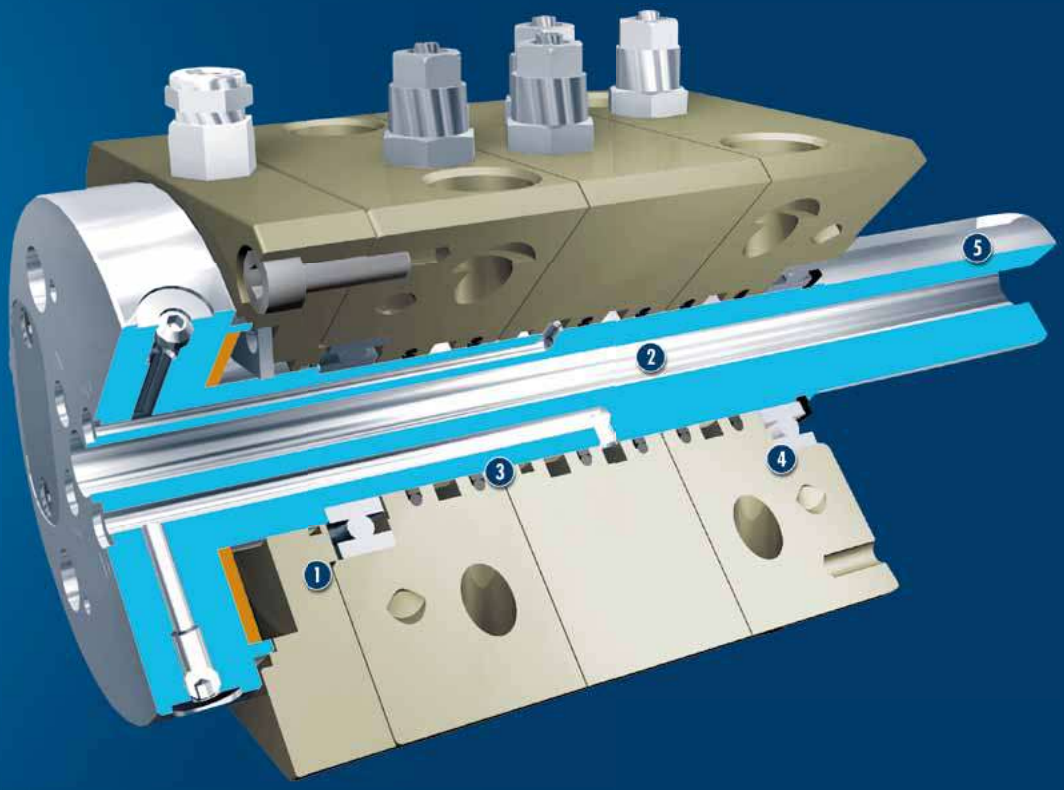
Up to 500 1/min your gripping system will be process-reliably supplied with pneumatics and electrics – even at fast, infinite rotations.

Sizes Quantity: 2	max. rotational speed 300 .. 500 1/min	Pneumatic feed-through 4 .. 6	Electric feed-through 6 .. 8

Functional Description

The DDF-SE allows rotary motions of more than 360° of your tool without hoses and cables twisting around the axis. Integrated slip ring contacts provide the tool with energy – even at high speeds of 500 rpm.

Electrics and up to six pneumatic lines are fed through. The drive motor is flanged with a standard shaft end with keyway. In order to minimize the axial offset between the motor and DDF-SE, a coupling should be provided.



① **Slip ring**
for feed-through of up to eight electric signals

② **Center bore**
for feed-through of workpieces, sensor systems, and end-effectors

③ **Air feed-through**
for supply of grippers, linear units, and other end-effectors

④ **Ball bearings**
for absorption of high forces and moments

⑤ **Steel shaft with keyway**
for fast and direct mounting

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Mounting: Bores and threads for staionary use

Pass through: Pneumatic and electrical signals

Housing: The housing is made of high-tensile, hard-coated aluminum alloy. The functional parts are made of hardened steel.

Scope of delivery: Connection cable with open wire strands

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

The gripper is safely powered by a rotary feed-through while a component is turned (stationary application).

1. Drive Motor
2. Coupling
3. DDF-SE Stationary Rotary Feed-through
4. PZB-plus 3-Finger Centric Gripper

SCHUNK offers more ...

The following components make the DDF-SE even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Fittings

PZN-plus Centric Gripper

PGN-plus Universal Gripper

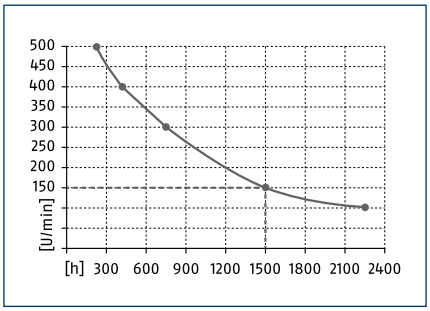
PWG-plus Angular Gripper

HWS Manual Gripper Change System

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

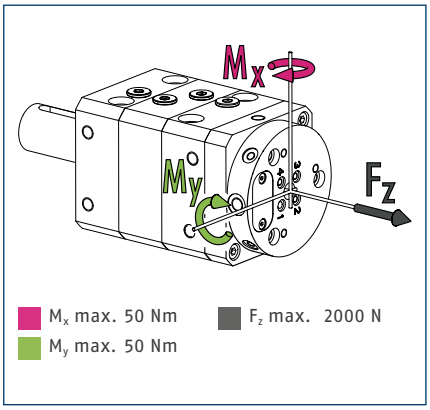
DDF-SE 80

Life span of seals



Life span of seals (at 6 bar pressure), example: DDF-080 SE is driven at a constant 150 min^{-1} in 3-shift operation (24 hours). Life span of seals: The seals should be replaced after 1,500 hours. (Set of seals available from SCHUNK)

Forces and moments

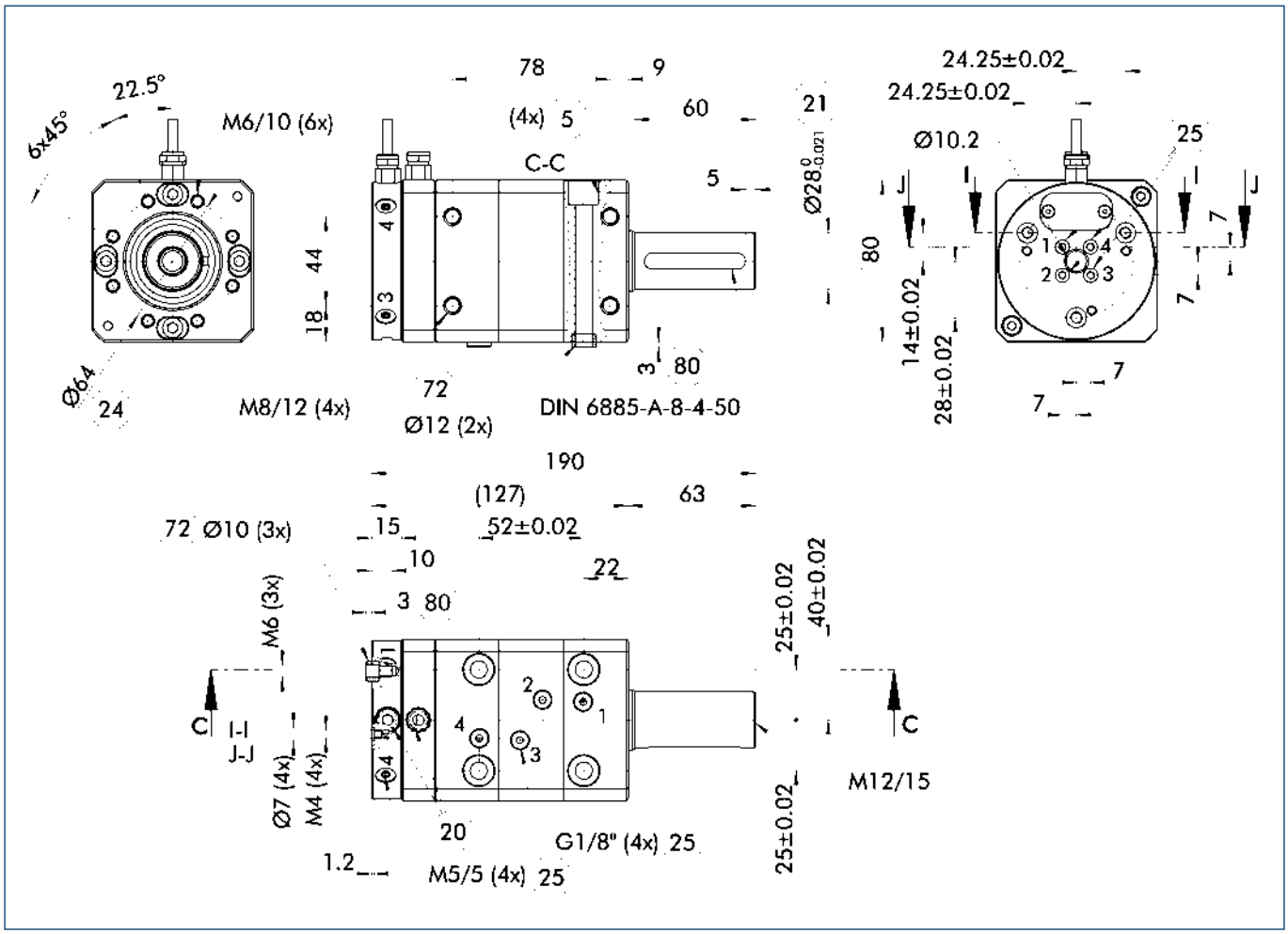


ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

Technical data

Description		DDF-SE-080
ID		0323280
max. rotational speed	[1/min]	500
Continuous torque	[Nm]	4
Starting torque	[Nm]	6
Rotary movement	[°]	> 360
Number of pneumatic feed-throughs		4
Max. pressure per connection	[bar]	10
Number of electrical feed-throughs		6
max. voltage	[V]	60
max. current strength	[A]	1
Mass	[kg]	3.3
min. / max. ambient temperature	[°C]	5/60
max. static bending moment M_x	[Nm]	60
max. static bending moment M_y	[Nm]	60

Main view



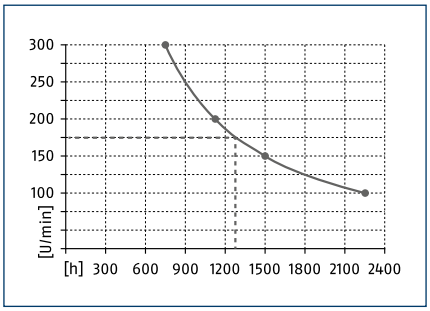
The main view shows the unit in its basic version.

(5) Through-hole for connection with screws
(20) Connection for electric feed-through
(21) Drive connection
(24) Bolt circle
(25) Pneumatic feed-through
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part

DDF-SE 120

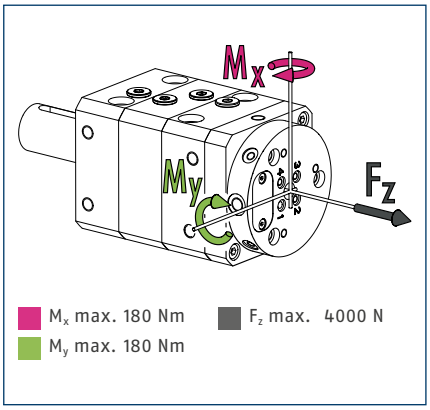
Robot Accessories | Feeding through | Stationary Rotary Feed-throughs

Life span of seals



Life span of seals (with 6 bar pressure), Example: DDF-120 SE is driven with a constant 175 rpm in 3-shift operation (24 hours). Life span of seals: The seals should be replaced after 1,300 hours. (Set of seals available from SCHUNK)

Forces and moments

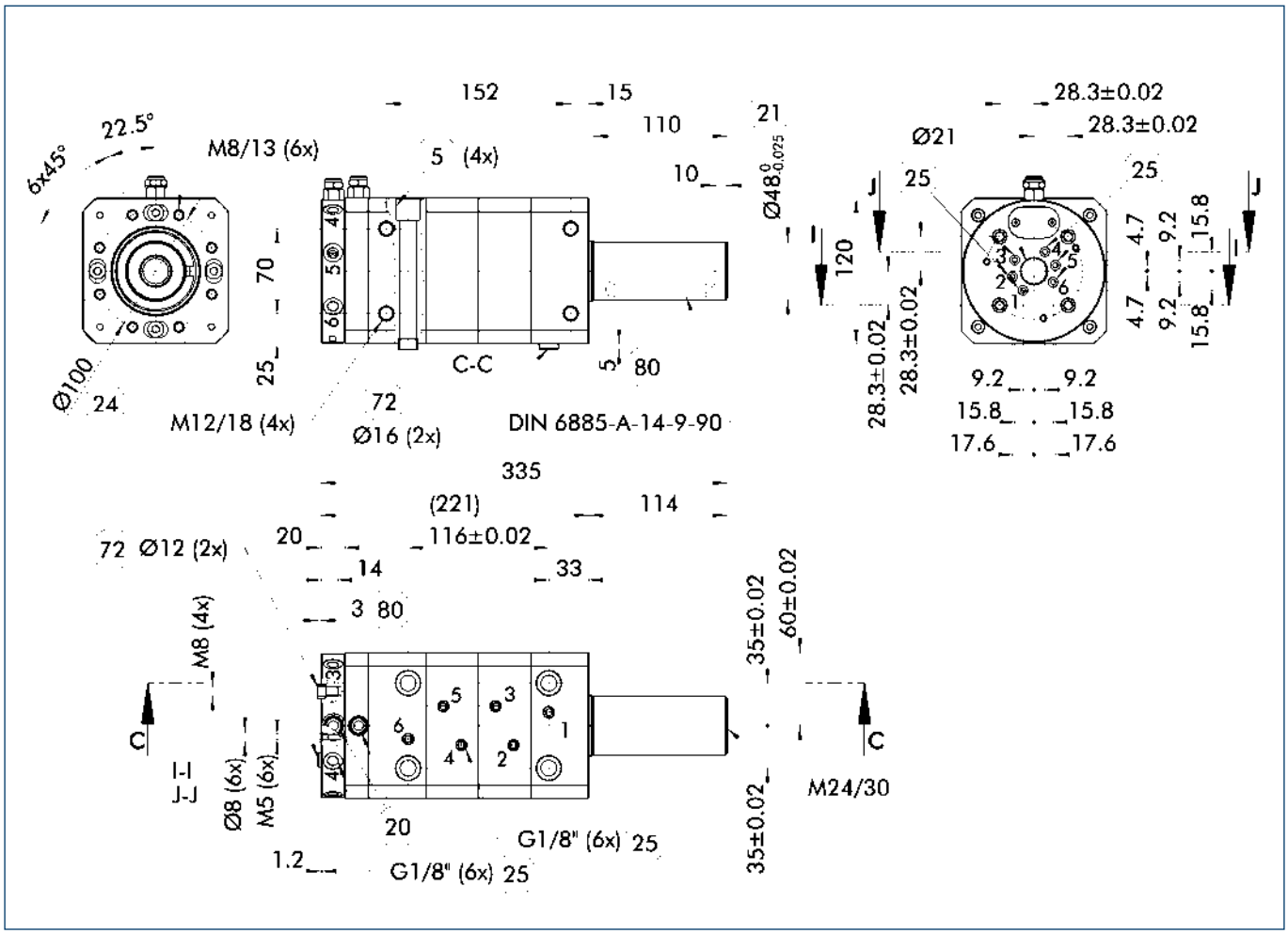


ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), which can affect a rotary feed-through, in order to guarantee error-free function.

Technical data

Description		DDF-SE-120
ID		0323285
max. rotational speed	[1/min]	300
Continuous torque	[Nm]	13
Starting torque	[Nm]	20
Rotary movement	[°]	> 360
Number of pneumatic feed-throughs		6
max. pressure per connection	[bar]	10
Number of electrical feed-throughs		8
max. voltage	[V]	60
max. current strength	[A]	1
Mass	[kg]	9
min. / max. ambient temperature	[°C]	5/60
max. static bending moment M_x	[Nm]	250
max. static bending moment M_y	[Nm]	250

Main view



The main view shows the unit in its basic version.

(5) Through-hole for connection with screws
(20) Connection for electric feed-through
(21) Drive connection
(24) Bolt circle
(25) Pneumatic feed-through
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part

Collision Protection with a low Triggering Torque starting at 0.4 Nm.

Protecting

OPS Collision and Overload Sensor

Series	Size	Page
OPS		410
OPS	080	414
OPS	100	418
OPS	160	422
OPS	200	426

OPR Collision and Overload Sensor

Series	Size	Page
OPR		430
OPR	048	434
OPR	061	438
OPR	081	442
OPR	101	446
OPR	131	450
OPR	176	454
OPR	221	458

Compliant. Highly responsive. Easier monitoring.

OPS Collision and Overload Protection Sensor

To avoid damage to robots and handling devices in the event of a collision or overload conditions.

Field of Application

The ideal solution for all robot applications whereby the robot, the tool or the workpiece are to be protected in the event of a collision from serious damage.

Advantages – Your benefit

Triggering force and torque can be adjusted via the operating pressure for optimal protection of your robots and components during application.

Integrated monitoring for signal transmission in case of collision, whereby the robot can be stopped

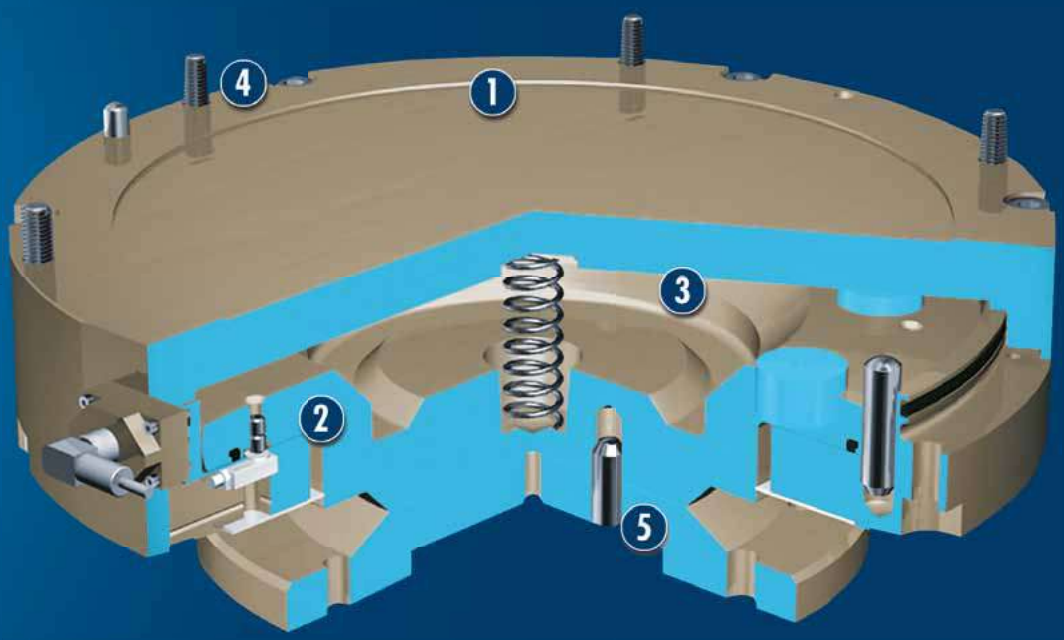
ISO adapter plates as an option for easy assembly to most of robot types without any manufacturing costs / work

Sizes	Triggering force F_d	Triggering moment M_x	Triggering moment M_y	Triggering moment M_z
Quantity: 4	500 .. 7000 N	7.5 .. 430 Nm	7.5 .. 430 Nm	15 .. 450 Nm

Functional Description

In the event of a collision, the tool plate deflects while simultaneously actuating the system's emergency stop mechanism.

After deflection a manual reset of the OPS can be done and the unit can be returned into its original position.



① **Housing**
weight-optimized through application of high-strength aluminum alloy

② **Sensor system**
for reliable electronic monitoring

③ **Pneumatic pistons**
pneumatic for ease of setting sensitivy

④ **Centering and mounting possibilities**
for easy and fast attachment

⑤ **Tool plate**
Deflects in the event of a collision

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Scope of delivery: Angular plug with 5 m cable and open wire strand, operating and maintenance instructions, manufacturer's declaration

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void the warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Assembly unit for intermediate sleeves with various diameters. The unit is equipped with a collision protection device to prevent damages.

1. PFH 2-Finger Parallel Gripper with workpiece-specific gripper fingers
2. OPS Collision Sensor

SCHUNK offers more ...

The following components make the OPS even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Adapter Plates

Fittings

Sensor Cables

SWS Quick-change System

DDF 2 Rotary Feed-through

Centric Gripper PZN-plus

HWS Manual Gripper Change System

PGN-plus Universal Gripper

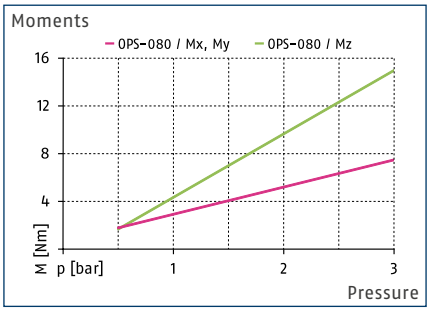
PWG-plus Angular Gripper

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

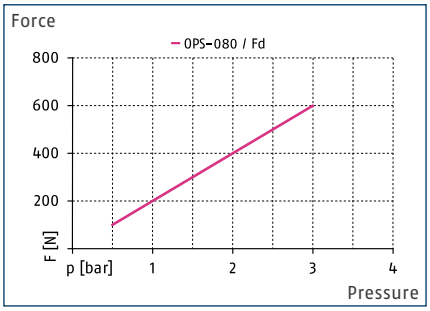
OPS 080

Robot Accessories | Protecting | Collision and Overload Protection Sensor

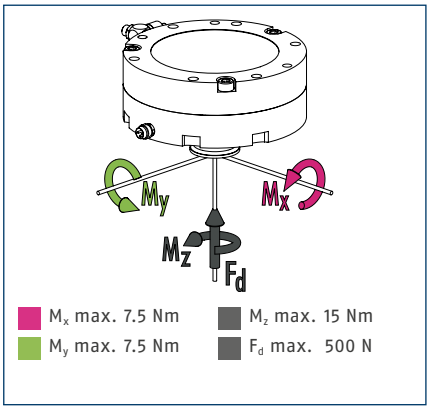
Triggering moment M_x, M_y, M_z



Triggering force F_d



Forces and moments

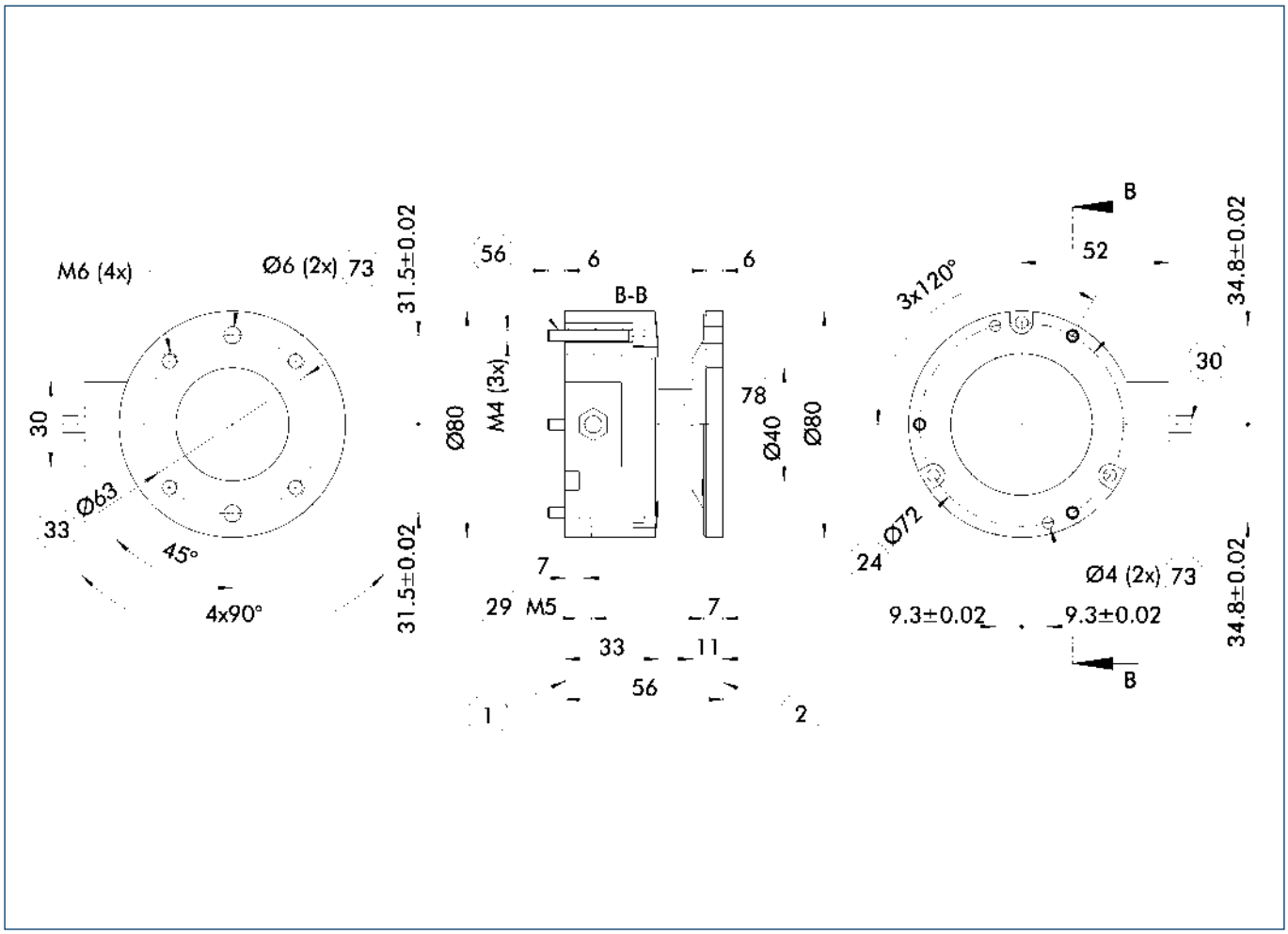


ⓘ The type of the collision sensors for the respective application are defined through the forces and moments.

Technical data

Description		OPS-080
ID		0321125
Axial displacement	[mm]	12
Angular displacement	[°]	12
Rotatory displacement	[°]	360
Supply voltage	[V]	10 – 30
Repeat accuracy	[mm]	±0.02
Sensitivity	[mm]	0.1
Rotation repeat accuracy	[min]	5
min. / max. operating pressure	[bar]	0.5/3
Mass	[kg]	0.4
min. / max. ambient temperature	[°C]	5/60

Main view



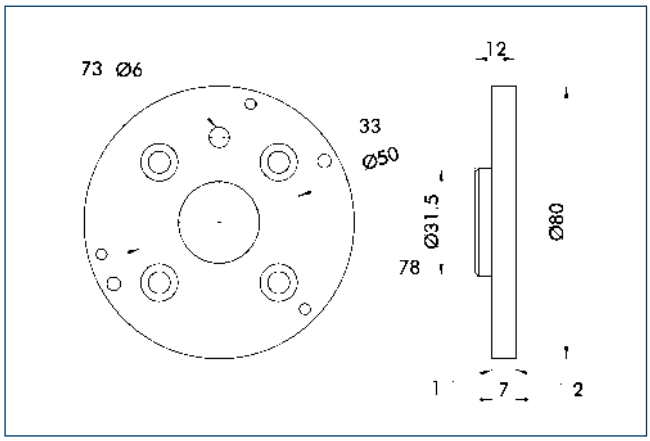
The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(29) P air connection
(30) Cable connector in the accessory pack with 5 m connection cable
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for a centering pin
(78) Fitting for centering

OPS 080

Robot Accessories | Protecting | Collision and Overload Protection Sensor

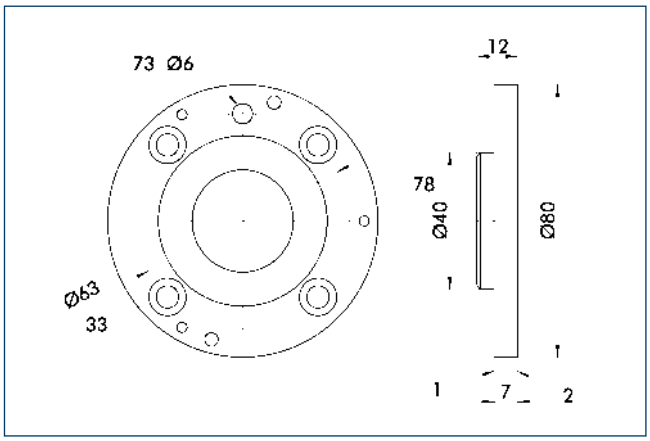
Adapter plate ISO 9409-A50 robot side



(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Description	ID	
Adapter plate		
A-OPS-080-ISO-A50-R	0321114	

Adapter plate ISO 9409-A63 robot side



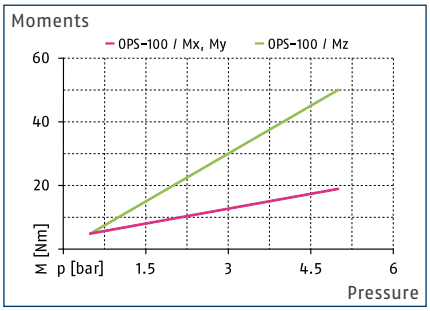
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Description	ID	
Adapter plate		
A-OPS-080-ISO-A63-R	0321115	

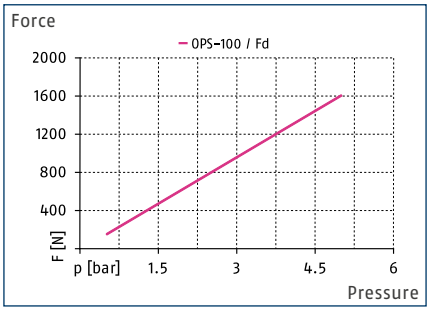
OPS 100

Robot Accessories | Protecting | Collision and Overload Protection Sensor

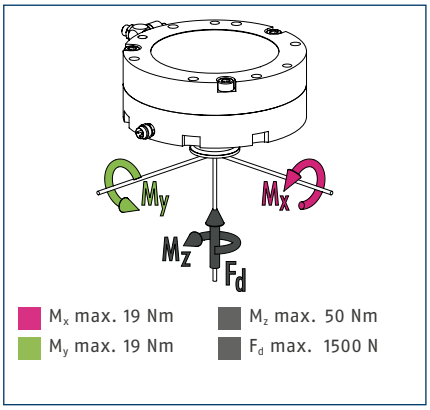
Triggering moment M_x, M_y, M_z



Triggering force F_d



Forces and moments

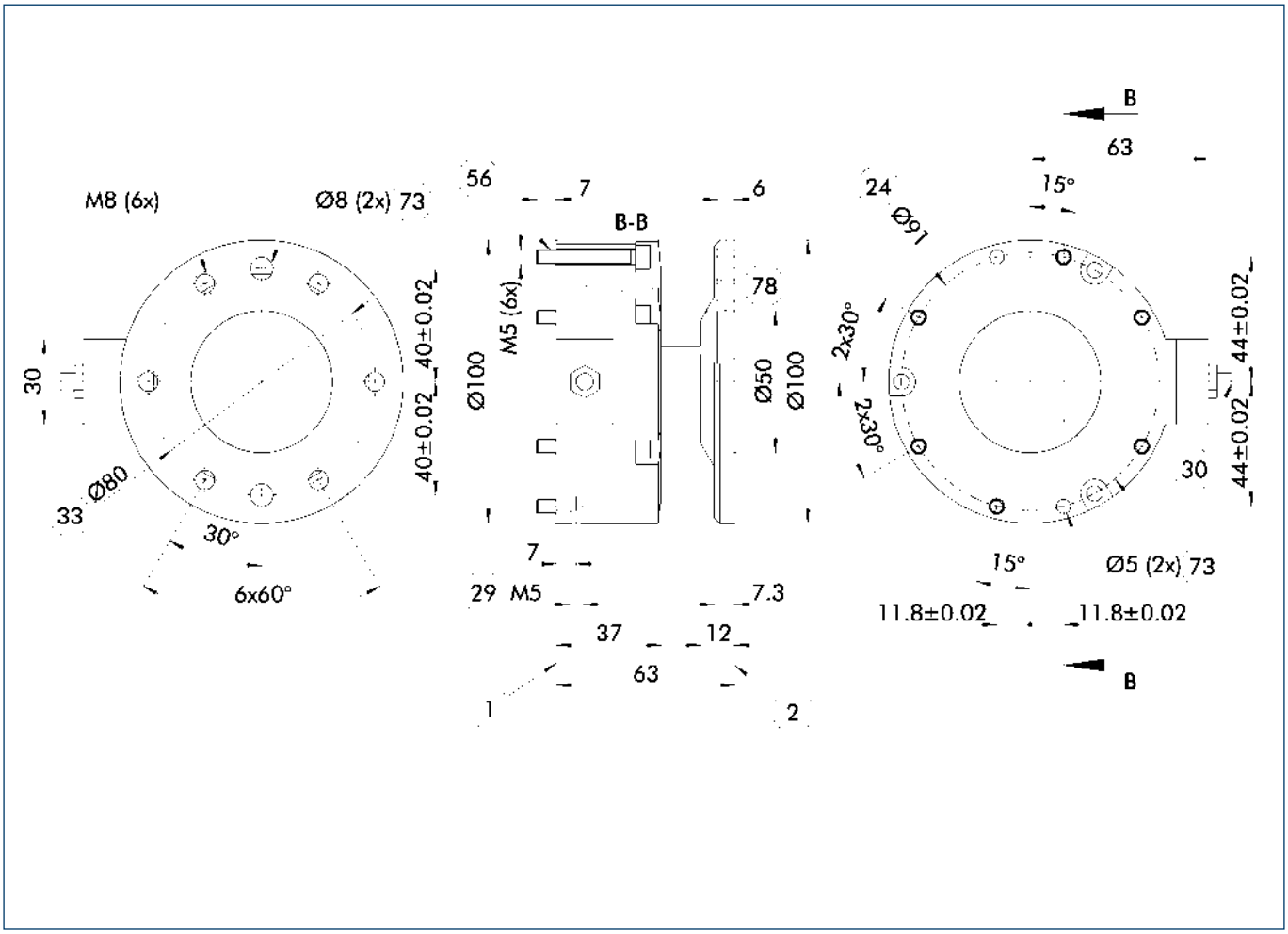


ⓘ The type of the collision sensors for the respective application are defined through the occuring forces and moments.

Technical data

Description		OPS-100
ID		0321130
Axial displacement	[mm]	14
Angular displacement	[°]	12
Rotatory displacement	[°]	360
Supply voltage	[V]	10 – 30
Repeat accuracy	[mm]	±0.02
Sensitivity	[mm]	0.1
Rotation repeat accuracy	[min]	5
min. / max. operating pressure	[bar]	0.5/5
Mass	[kg]	0.7
min. / max. ambient temperature	[°C]	5/60

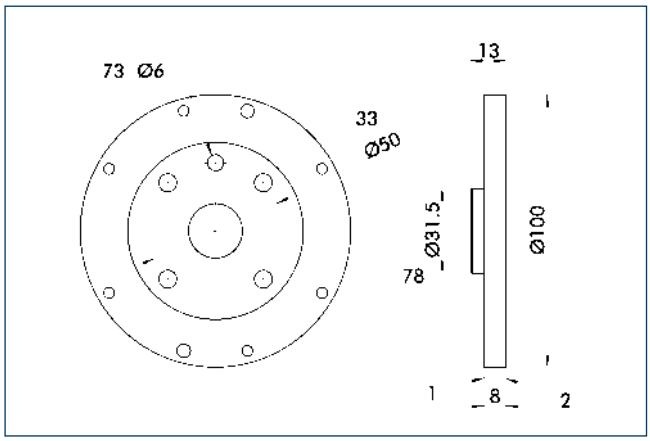
Main view



The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
24. Bolt circle
29. P air connection
30. Cable connector in the accessory pack with 5 m connection cable
33. DIN ISO-9409 bolt-hole circle diameter
56. Included in delivery
73. Fit for a centering pin
78. Fitting for centering

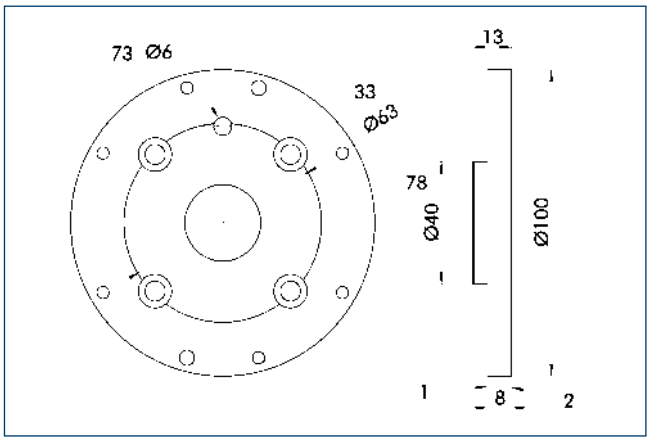
Adapter plate ISO 9409-A50 robot side



(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Description	ID	
Adapter plate		
A-OPS-100-ISO-A50-R	0321122	

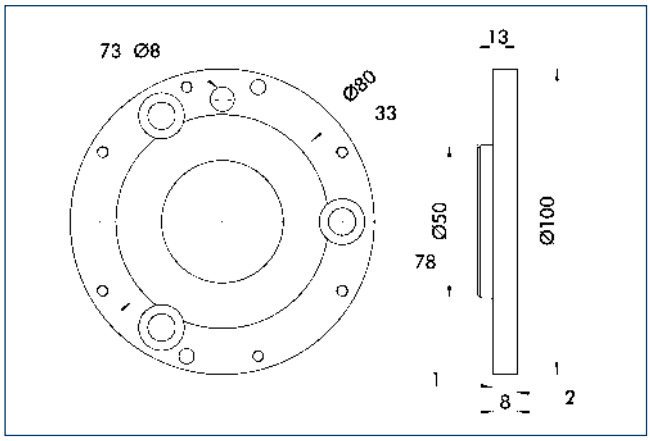
Adapter plate ISO 9409-A63 robot side



(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Description	ID	
Adapter plate		
A-OPS-100-ISO-A63-R	0321123	

Adapter plate ISO 9409-A80 robot side



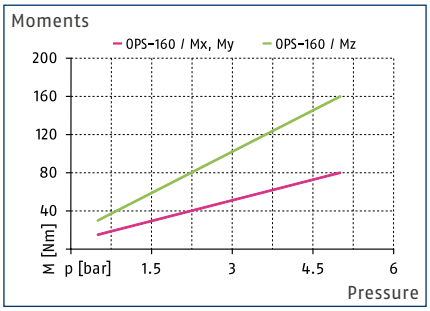
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Description	ID	
Adapter plate		
A-OPS-100-ISO-A80-R	0321116	

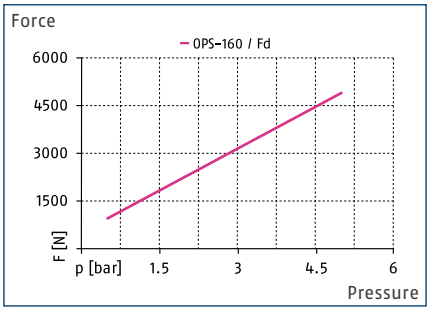
OPS 160

Robot Accessories | Protecting | Collision and Overload Protection Sensor

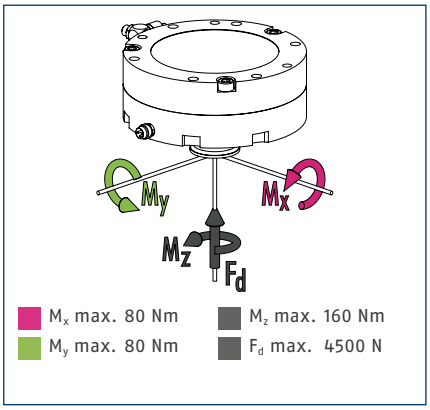
Triggering moment M_x, M_y, M_z



Triggering force F_d



Forces and moments

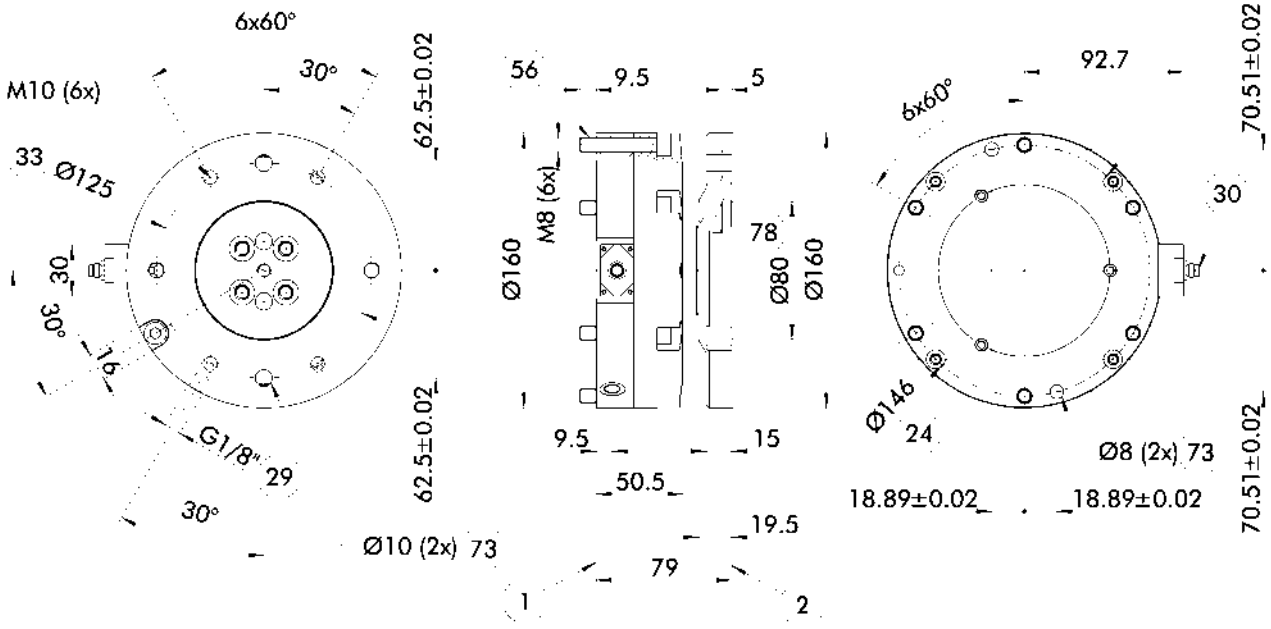


ⓘ The type of the collision sensors for the respective application are defined through the occuring forces and moments.

Technical data

Description		OPS-160
ID		0321135
Axial displacement	[mm]	8
Angular displacement	[°]	5
Rotatory displacement	[°]	360
Supply voltage	[V]	10 – 30
Repeat accuracy	[mm]	±0.02
Sensitivity	[mm]	0.2
Rotation repeat accuracy	[min]	5
min. / max. operating pressure	[bar]	0.5/5
Mass	[kg]	4.3
min. / max. ambient temperature	[°C]	5/60

Main view



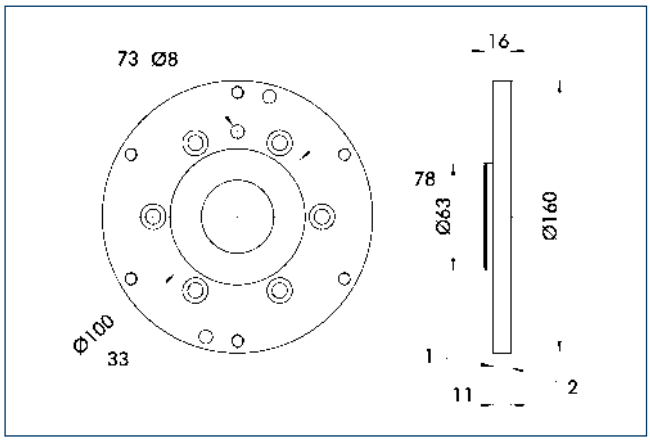
The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(29) P air connection
(30) Cable connector in the accessory pack with 5 m connection cable
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for a centering pin
(78) Fitting for centering

OPS 160

Robot Accessories | Protecting | Collision and Overload Protection Sensor

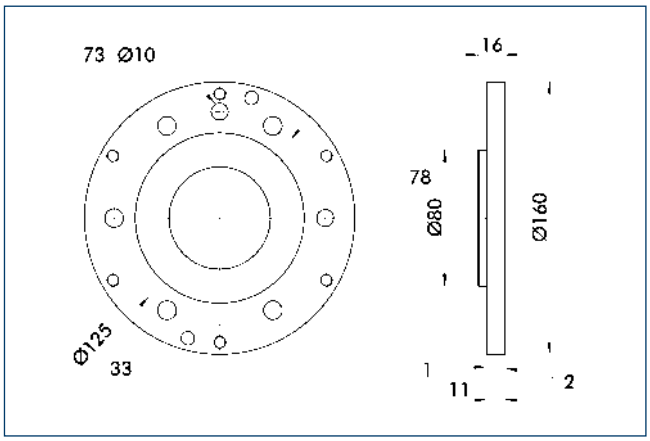
Adapter plate ISO 9409-A100 robot side



(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Description	ID	
Adapter plate		
A-OPS-160-ISO-A100-R	0321224	

Adapter plate ISO 9409-A125 robot side



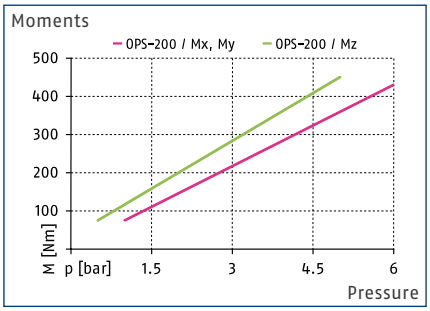
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Description	ID	
Adapter plate		
A-OPS-160-ISO-A125-R	0321117	

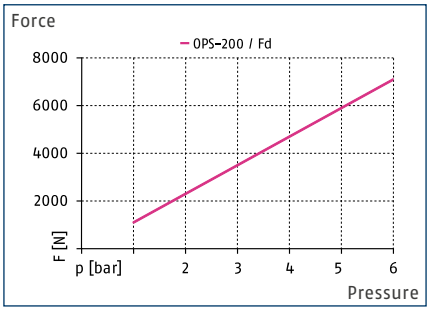
OPS 200

Robot Accessories | Protecting | Collision and Overload Protection Sensor

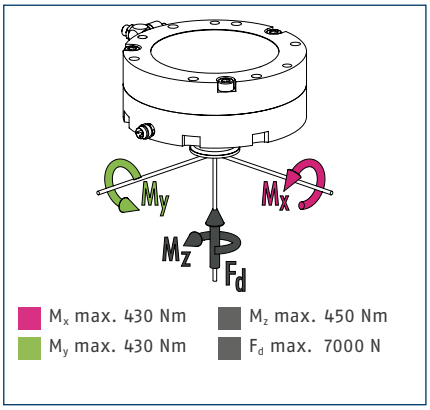
Triggering moment M_x, M_y, M_z



Triggering force F_d



Forces and moments

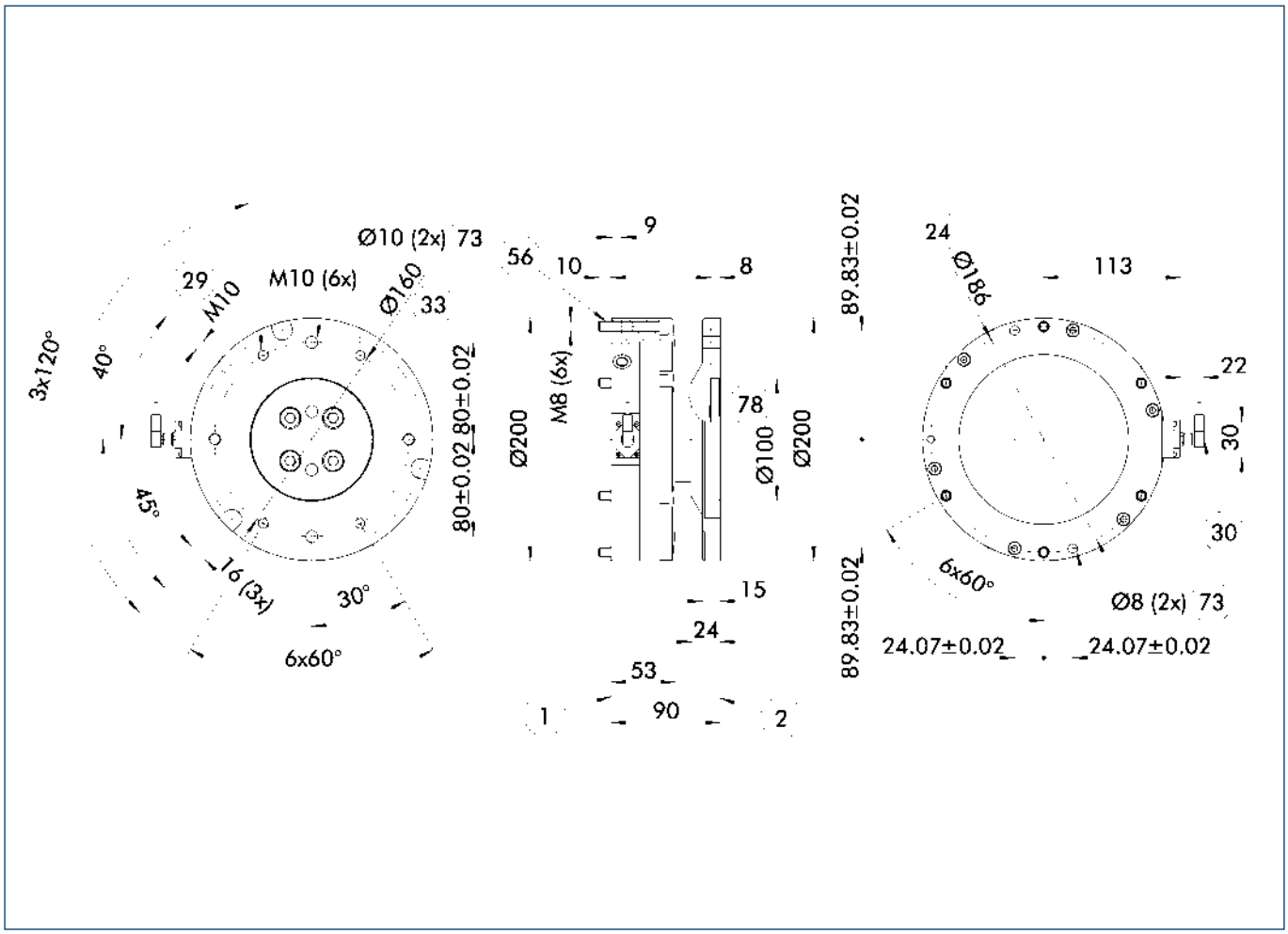


ⓘ The type of the collision sensors for the respective application are defined through the occuring forces and moments.

Technical data

Description		OPS-200	OPS-200-VS
ID		0321140	0321141
Axial displacement	[mm]	9.5	9.5
Angular displacement	[°]	4	4
Rotatory displacement	[°]	360	45
Supply voltage	[V]	10 – 30	10 – 30
Repeat accuracy	[mm]	±0.05	±0.05
Sensitivity	[mm]	0.3	0.3
Rotation repeat accuracy	[min]	5	5
min. / max. operating pressure	[bar]	1/6	1/6
Mass	[kg]	7	7
min. / max. ambient temperature	[°C]	5/60	5/60

Main view

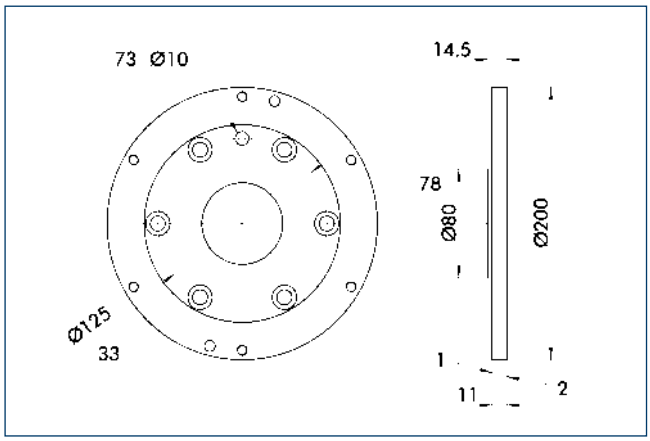


The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
24. Bolt circle
29. P air connection
30. Cable connector in the accessory pack with 5 m connection cable
33. DIN ISO-9409 bolt-hole circle diameter
56. Included in delivery
73. Fit for a centering pin
78. Fitting for centering

OPS 200

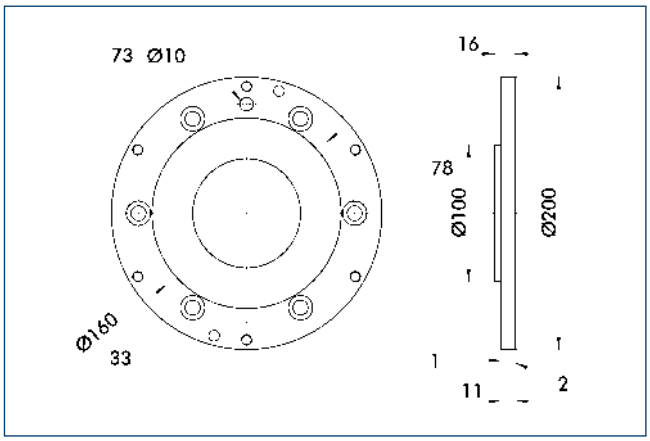
Adapter plate ISO 9409-A125 robot side



(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Description	ID	
Adapter plate		
A-OPS-200-ISO-A125-R	0321126	

Adapter plate ISO 9409-A160 robot side



(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Description	ID	
Adapter plate		
A-OPS-200-ISO-A160-R	0321118	

Compliant. Highly responsive. Automatic reset.

OPR Collision and Overload Protection Sensor

To assist in preventing damage to robots and tooling in the event of a collision or overload situation.

Field of Application

The ideal solution for all robot applications whereby the robot, the tool or the workpiece need to be protected from serious damage in the event of a collision.

Advantages – Your benefit

Automatic reset for faster production restart after a collision

Triggering force and torque can be adjusted via the operating pressure for optimal monitoring of your robots and components during the process

Integrated monitoring for signal transmission in case of collision. The robot will stop immediately in the event of a collision.

ISO adapter plates as an option for easy assembly with most robot types without any manufacturing costs / work

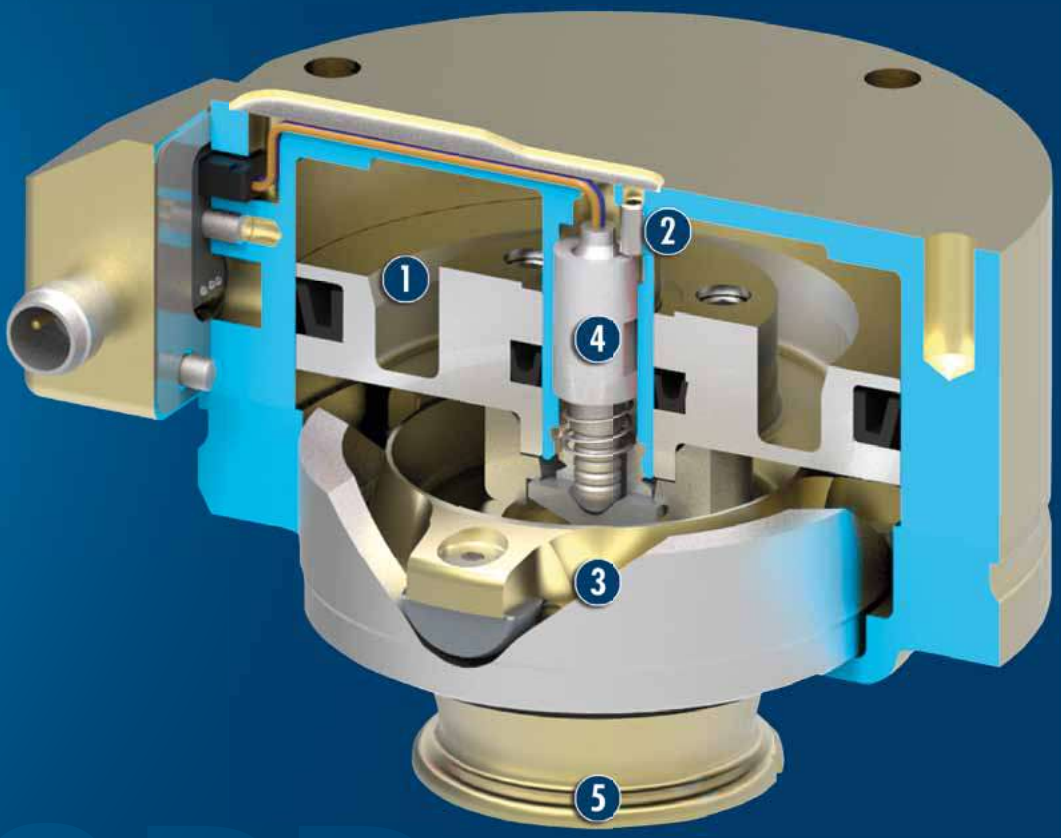
One option includes integrated springs for optimal monitoring of the robot and the components at low process forces and for sensitive applications

Mechanical flexibility on collisions allows an immediate reaction to any collision or overload.

Sizes	Triggering force F_d	Triggering moment M_x	Triggering moment M_y	Triggering moment M_z
Quantity: 7	440 .. 14000 N	6 .. 2000 Nm	6 .. 2000 Nm	6.9 .. 1500 Nm

Functional Description

In the event of a collision, the tool plate deflects while simultaneously actuating the system's emergency stop mechanism. The OPR automatically returns to zero position when the gripper moves away from the collision object. Production can continue immediately as manual resetting is not necessary.



① **Pneumatic pistons**
pneumatic for ease of setting sensitivy

② **Adjustment screw**
for adjusting the switching point

③ **Bearing**
for absorption of high forces and moments

④ **Monitoring**
via mechanical switch

⑤ **Tool plate**
Deflects in the event of a collision

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Operating principle: Integrated cylinder pistons

Splash protection: Optional

Scope of delivery: Angular plug with 5 m cable and open wire strand, operating and maintenance instructions, manufacturer's declaration

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Triple transfer unit for packaging with small boxboards

❶ SWG 2-Finger Angular Gripper

❷ OPR Collision Sensor

SCHUNK offers more ...

The following components make the OPR even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Adapter Plates

Fittings

Sensor Cables

SWS Quick-change System

NSR-A Pallet Change System

PZN-plus Centric Gripper

HWS Manual Gripper Change System

PGN-plus Universal Gripper

PWG-plus Angular Gripper

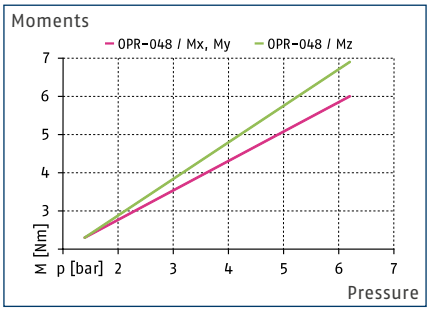
DDF 2 Rotary Feed-through

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

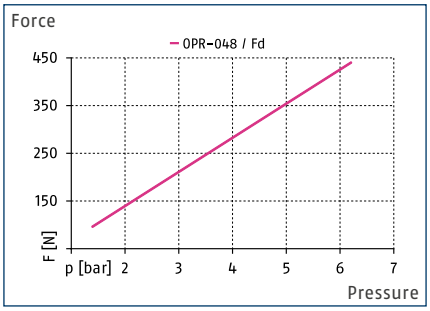
OPR 048

Robot Accessories | Protecting | Collision and Overload Protection

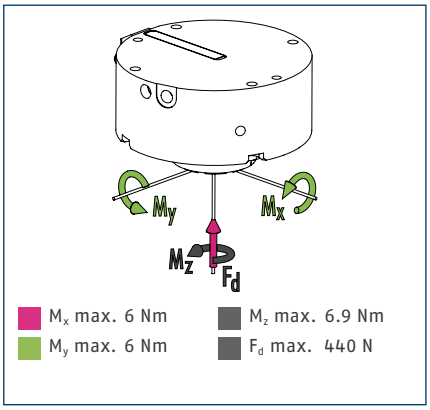
Triggering moment M_x, M_y, M_z



Triggering force F_d



Forces and moments

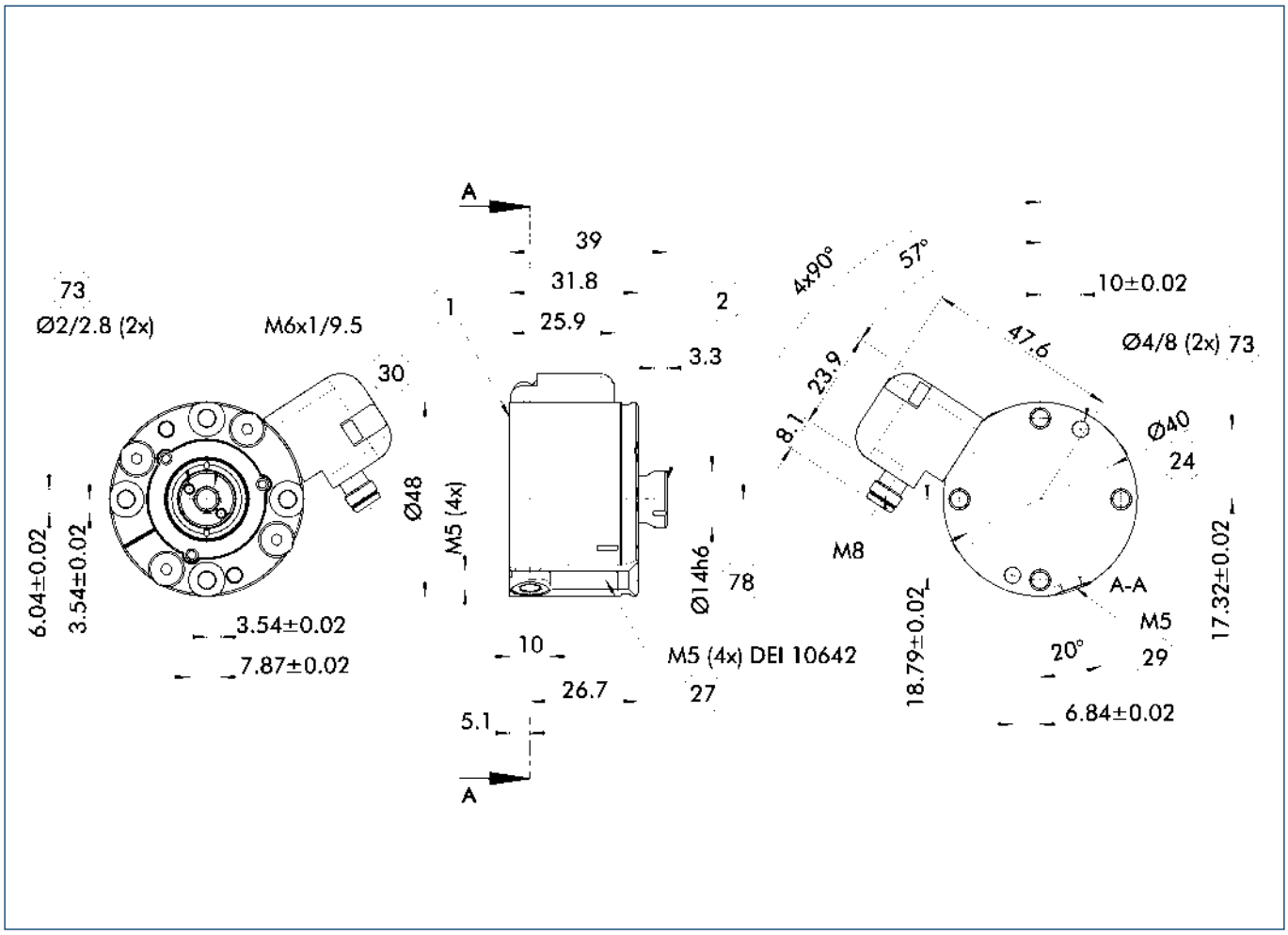


ⓘ The type of the collision sensors for the respective application are defined through the occuring forces and moments.

Technical data

Description		OPR-048-P00	OPR-048-P05	OPR-048-P10	OPR-048-P15
ID		0321341	0321342	0321343	0321344
Axial displacement	[mm]	5.1	5.1	5.1	5.1
Angular displacement	[°]	13	13	13	13
Rotatory displacement	[°]	20	20	20	20
min. angular triggering moment M_x, M_y	[Nm]	2.3	2.7	3.2	3.6
min. triggering moment rotary M_z	[Nm]	2.3	2.7	3.1	3.5
Spring triggering force	[N]		24	48	72
Angular spring displacement	[Nm]		0.4	0.9	1.3
Rotatory spring displacement	[Nm]		0.4	0.8	1.2
Repeat accuracy	[mm]	±0.025	±0.025	±0.025	±0.025
Sensitivity	[mm]	0.5	0.5	0.5	0.5
Rotation repeat accuracy	[min]	5	5	5	5
min. / max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Mass	[kg]	0.24	0.25	0.25	0.25
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Supply voltage	[V]	10 – 30	10 – 30	10 – 30	10 – 30

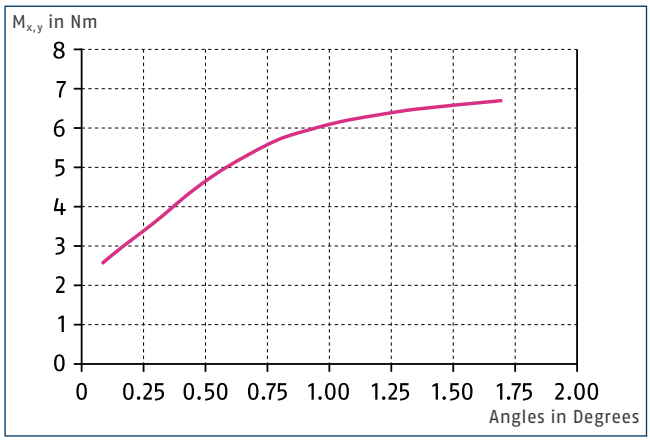
Main view



The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
24. Bolt circle
27. Through-holes for screw connections
29. P air connection
30. Cable connector in the accessory pack with 5 m connection cable
73. Fit for a centering pin
78. Fitting for centering

Moment loading

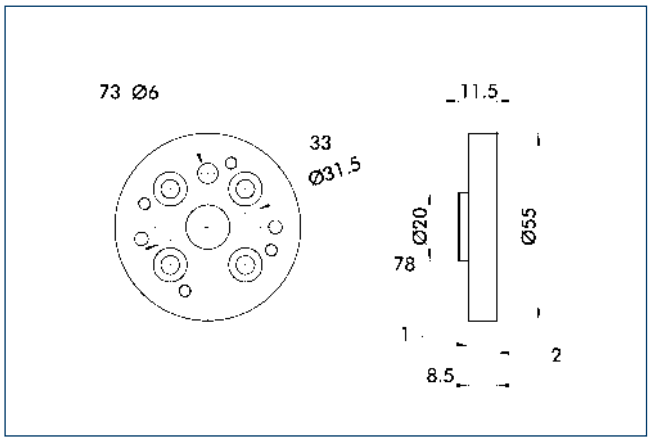


The chart shows the angular deflection of the OPR in the dependence of the moment $M_{x,y}$ with maximal permissible operating pressure.

OPR 048

Robot Accessories | Protecting | Collision and Overload Protection

Adapter plate ISO 9409-A31.5-R

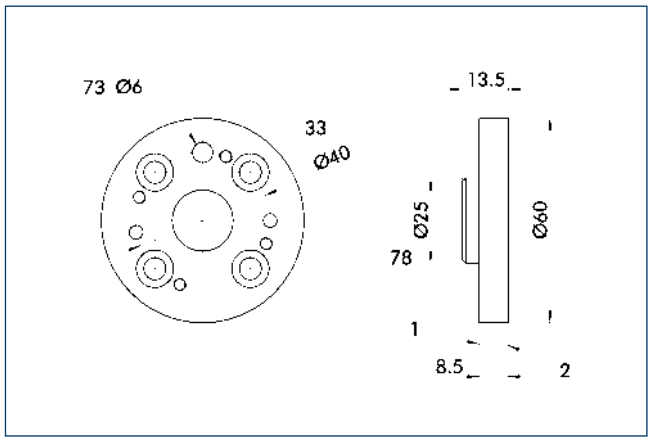


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-31.5-4-M5 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-048-ISO-A31-R	0321347	

Adapter plate ISO 9409-A40-R

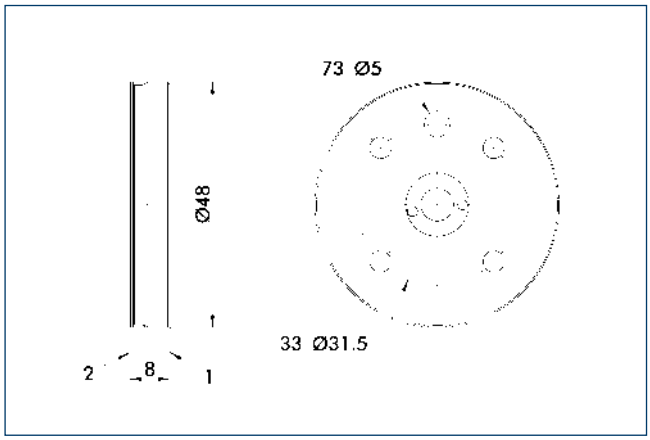


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-40-4-M6 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-048-ISO-A40-R	0321348	

Adapter plate ISO 9409-A31.5-T

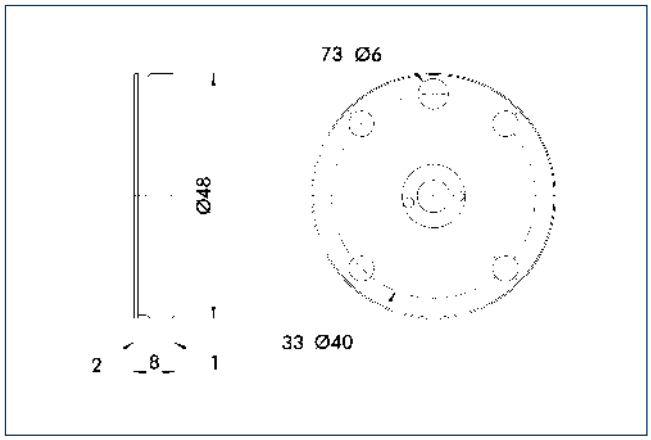


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin

Tool-side adapter plate with ISO 9409-31.5-M5 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-048-ISO-A31-T	0321356	

Adapter plate ISO 9409-A40-T

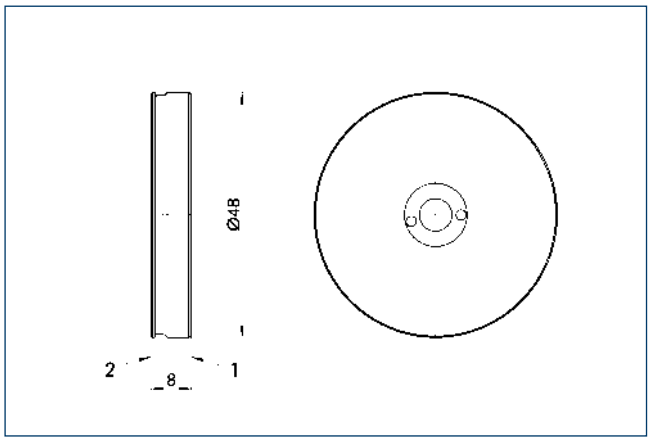


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin

Tool-side adapter plate with ISO 9409-40-4-M6 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-048-ISO-A40-T	0321357	

Adapter plate BLANK-T

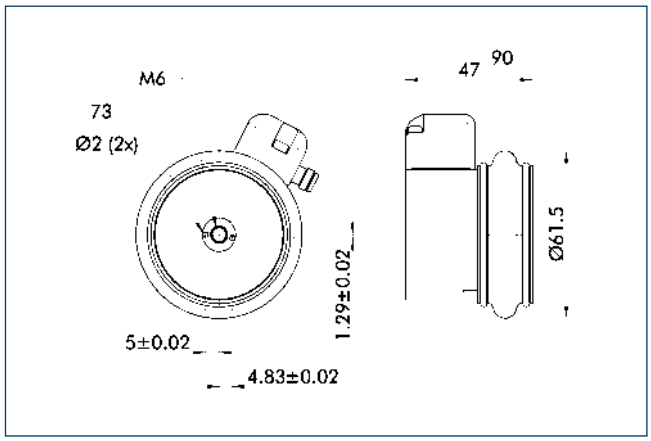


① Robot side connection ② Tool side connection

Tool-side adapter plate BLANK to be machined by the customer.

Description	ID	
Tool-side		
A-OPR-048-BLANK-T	0321355	

OPR-048 proctection cover



(73) Fit for a centering pin

(90) Total height with adapter plate with flange pattern according to ISO 9409-A31.5/A40 and also without flange pattern

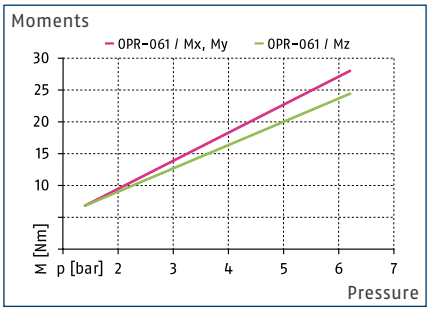
The cover protects the OPR against coolant up to IP65.

Description	ID	IP class
Protection cover		
OPR-048 Flexboot	0321351	65

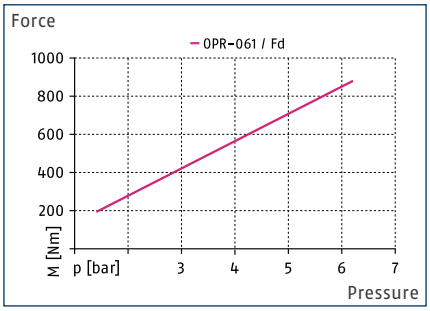
Please note that a tool side adapter plate is required when using the protective cover.

OPR 061

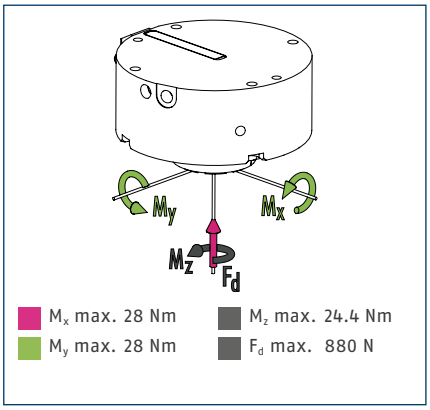
Triggering moment M_x, M_y, M_z



Triggering force F_d



Forces and moments

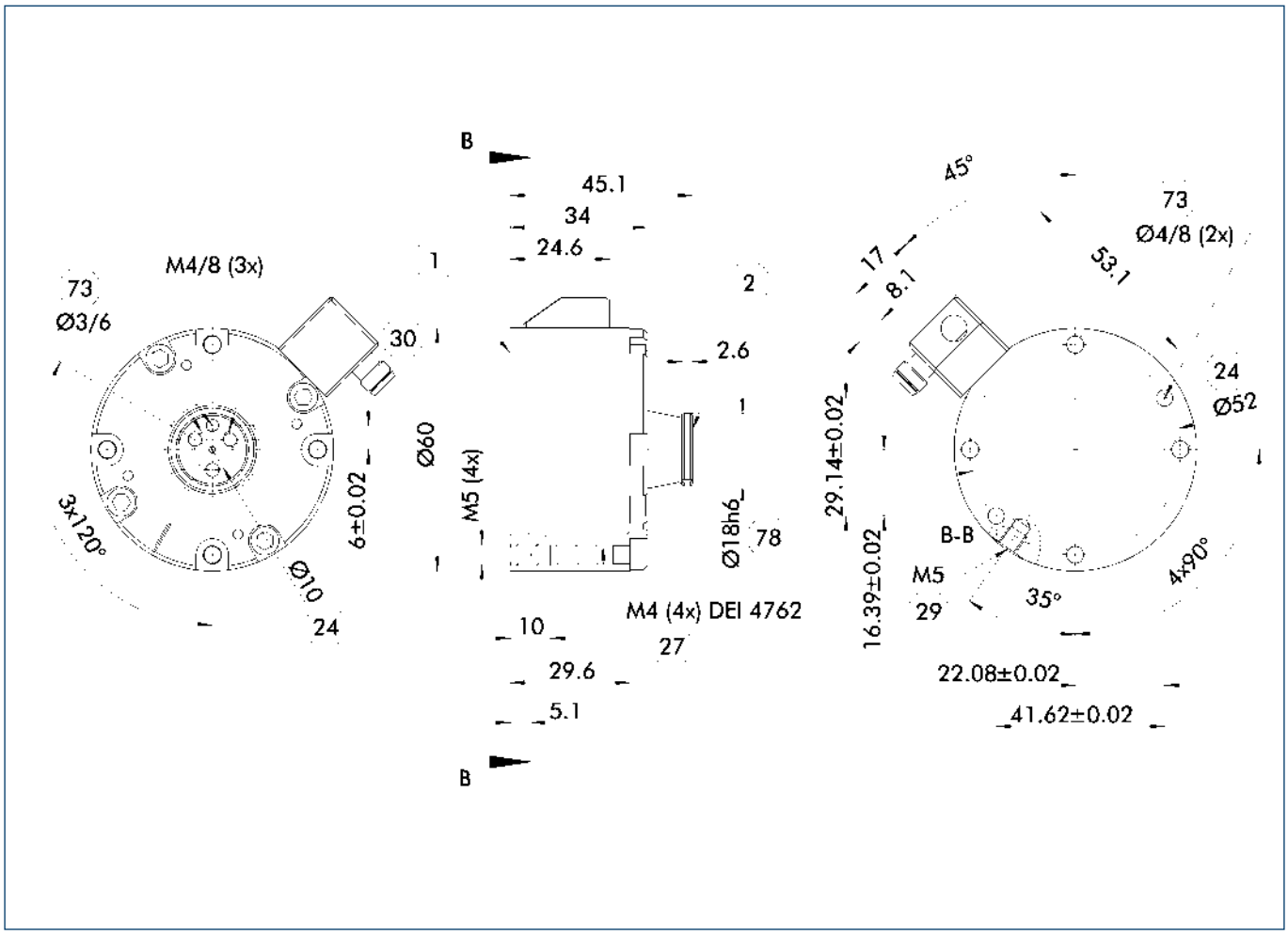


ⓘ The typ of the collision sensors for the respective application are defined through the occuring forces and moments.

Technical data

Description		OPR-061-P00	OPR-061-P05	OPR-061-P10	OPR-061-P15
ID		0321361	0321362	0321363	0321364
Axial displacement	[mm]	5.6	5.6	5.6	5.6
Angular displacement	[°]	11	11	11	11
Rotatory displacement	[°]	20	20	20	20
min. angular triggering moment M_x, M_y	[Nm]	6.8	8.6	10.3	12.1
min. triggering moment rotary M_z	[Nm]	6.8	8.5	10.1	11.8
Spring triggering force	[N]		48	96	144
Angular spring displacement	[Nm]		1.8	3.5	5.3
Rotatory spring displacement	[Nm]		1.7	3.3	5
Repeat accuracy	[mm]	0.025	0.025	0.025	0.025
Sensitivity	[mm]	0.5	0.5	0.5	0.5
Rotation repeat accuracy	[min]	5	5	5	5
min. / max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Mass	[kg]	0.32	0.33	0.33	0.33
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Supply voltage	[V]	10 – 30	10 – 30	10 – 30	10 – 30
Options and their characteristics					
Splash-proof version		OPR-061-P00-S	OPR-061-P05-S	OPR-061-P10-S	OPR-061-P15-S
ID		0321365	0321366	0321367	0321368
IP class		65	65	65	65

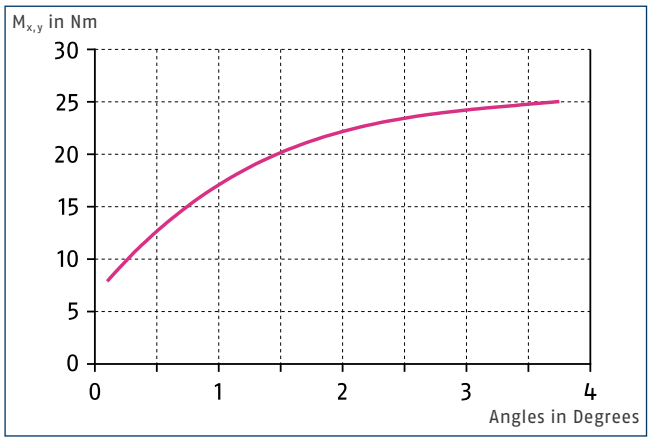
Main view



The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(27) Through-holes for screw connections
(29) P air connection
(30) Cable connector in the accessory pack with 5 m connection cable
(73) Fit for a centering pin
(78) Fitting for centering

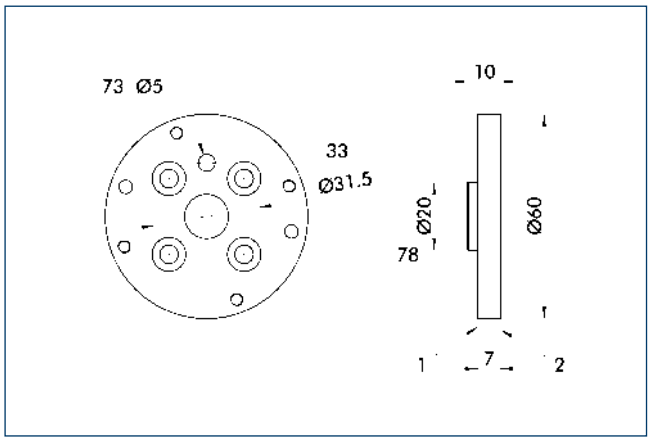
Moment loading



The chart shows the angular deflection of the OPR in the dependence of the moment $M_{x,y}$ with maximal permissible operating pressure.

OPR 061

Adapter plate ISO 9409-A31.5-R

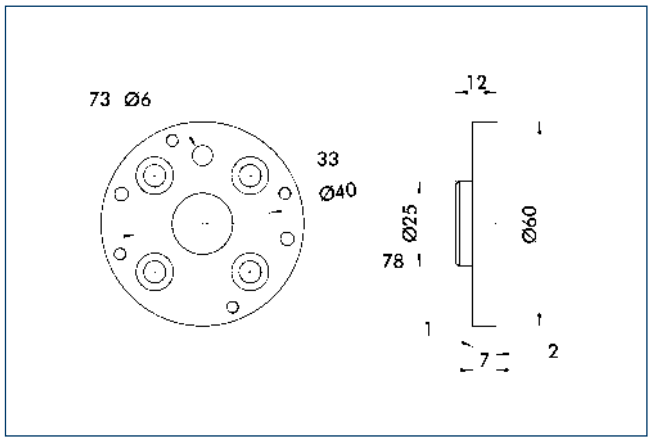


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-31.5-4-M5 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-061-ISO-A31-R	0321369	

Adapter plate ISO 9409-A40-R

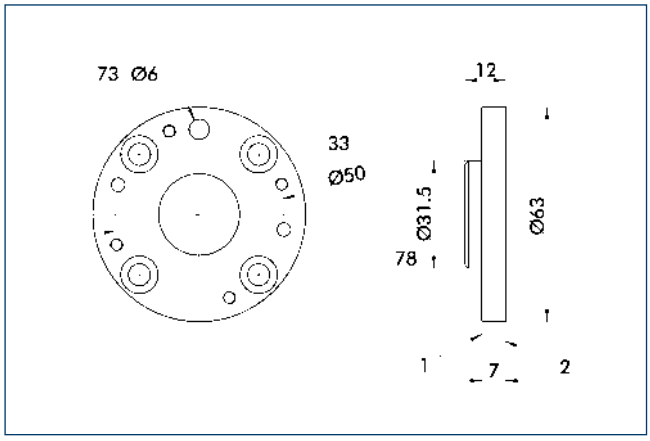


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-40-4-M6 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-061-ISO-A40-R	0321370	

Adapter plate ISO 9409-A50-R

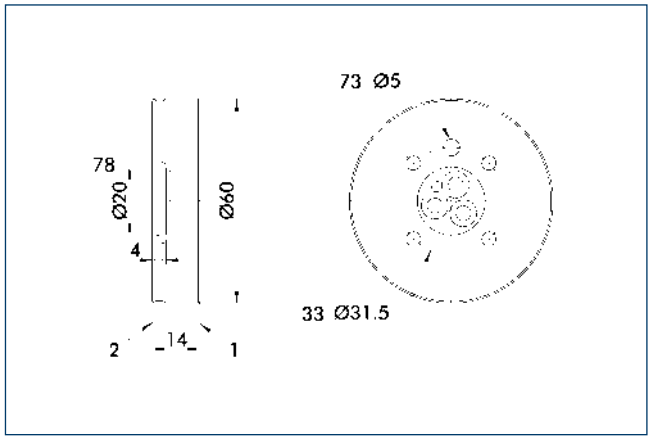


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-50-4-M6 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-061-ISO-A50-R	0321371	

Adapter plate ISO 9409-A31.5-T

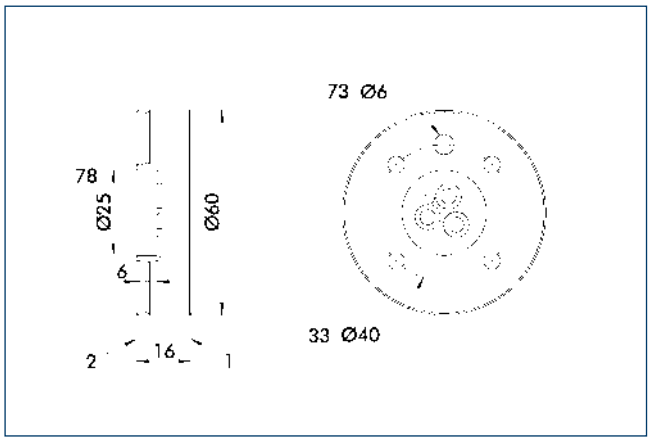


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-31.5-4-M5 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-061-ISO-A31-T	0321372	

Adapter plate ISO 9409-A40-T

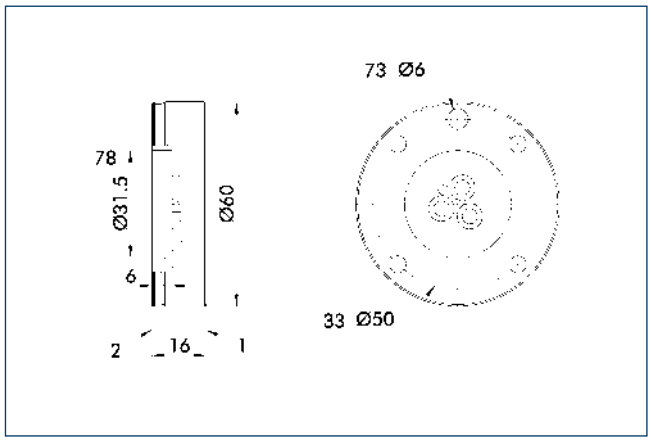


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-40-4-M6 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-061-ISO-A40-T	0321373	

Adapter plate ISO 9409-A50-T

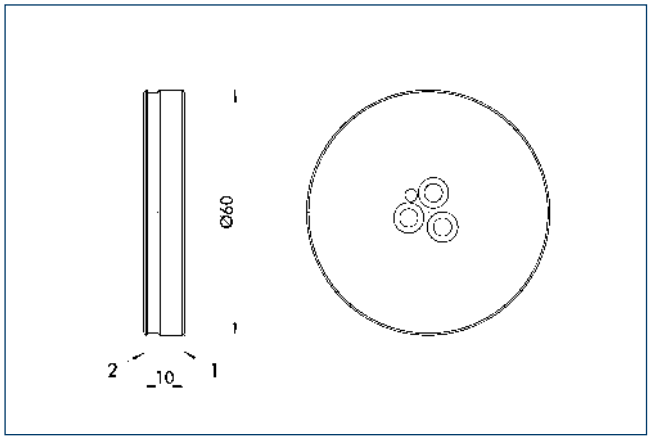


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-50-4-M6 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-061-ISO-A50-T	0321374	

Adapter plate BLANK-T

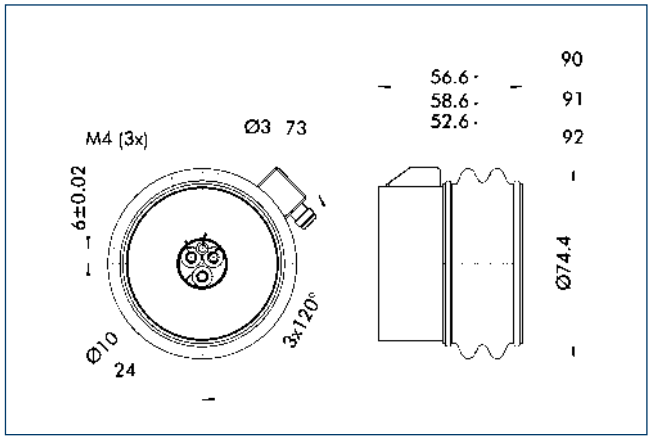


(1) Robot side connection
(2) Tool side connection

Tool-side adapter plate BLANK to be machined by the customer.

Description	ID	
Tool-side		
A-OPR-061-BLANK-T	0321375	

OPR-061 protection cover



(24) Bolt circle
(73) Fit for centering pins
(90) Total height with adapter plate with flange pattern according to ISO 9409-A31.5
(91) Total height with adapter plate with flange pattern according to ISO 9409-A40/A50
(92) Total height with adapter plate without flange pattern

The cover protects the OPR against coolant up to IP65.

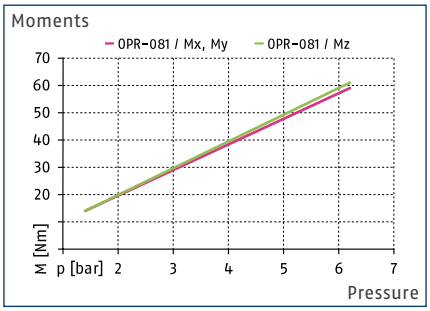
Description	ID	IP class
Protection cover		
OPR-061 Flexboot	0321376	65

Please note that a tool side adapter plate is required when using the protective cover.

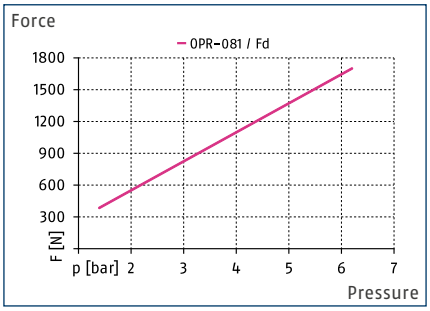
OPR 081

Robot Accessories | Protecting | Collision and Overload Protection

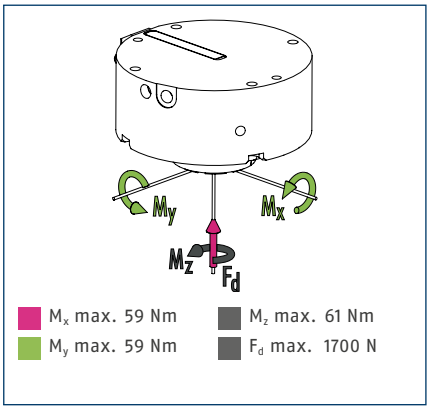
Triggering moment M_x, M_y, M_z



Triggering force F_d



Forces and moments

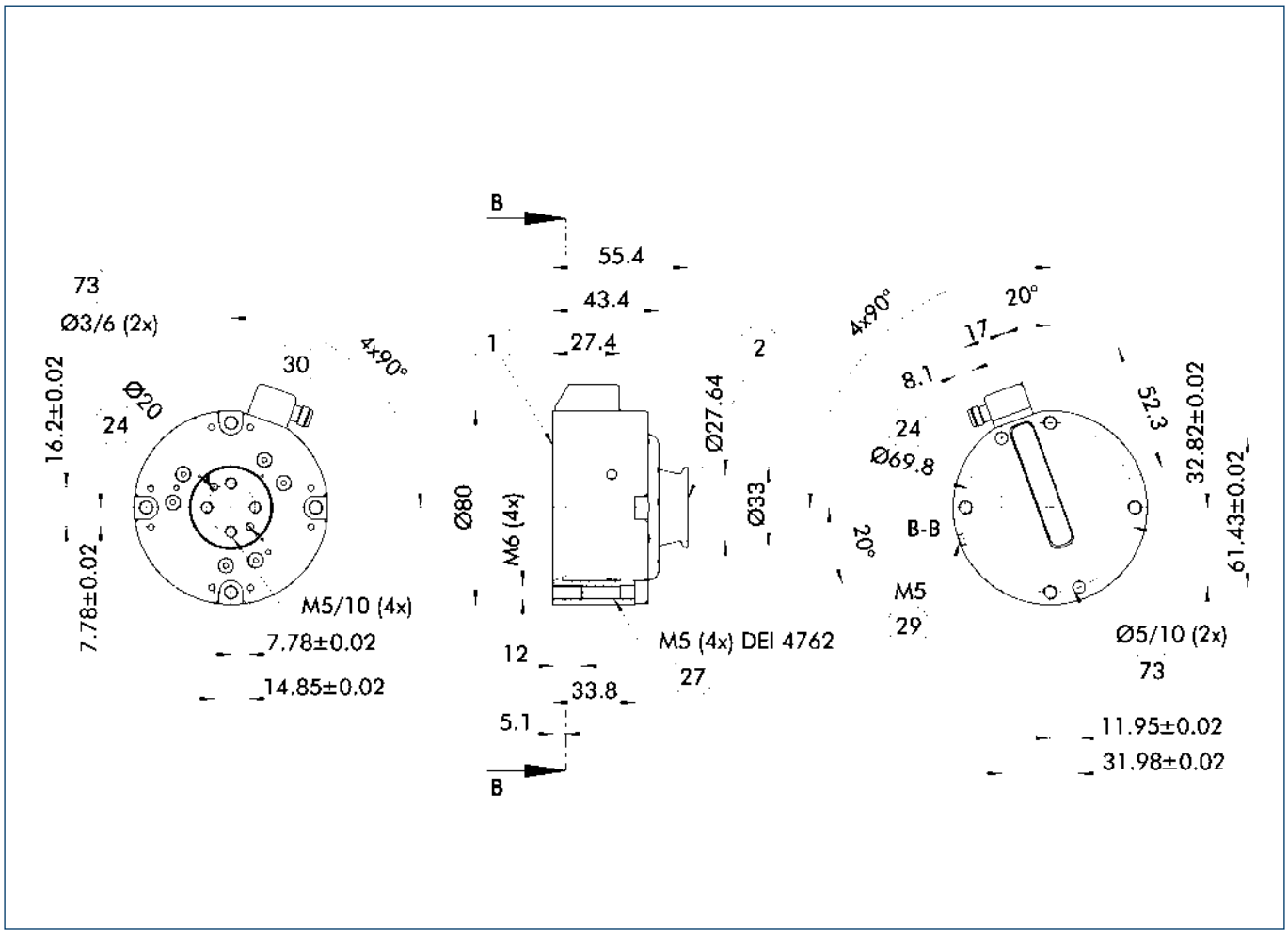


ⓘ The type of the collision sensors for the respective application are defined through the occuring forces and moments.

Technical data

Description		OPR-081-P00	OPR-081-P05	OPR-081-P10	OPR-081-P15
ID		0321381	0321382	0321383	0321384
Axial displacement	[mm]	8.6	8.6	8.6	8.6
Angular displacement	[°]	13	13	13	13
Rotatory displacement	[°]	25	25	25	25
min. angular triggering moment M_x, M_y	[Nm]	14	17.3	20.6	24
min. triggering moment rotary M_z	[Nm]	14	17.5	21	24.5
Spring triggering force	[N]		95	191	286
Angular spring displacement	[Nm]		3.3	6.6	10
Rotatory spring displacement	[Nm]		3.5	7	10.5
Repeat accuracy	[mm]	0.025	0.025	0.025	0.025
Sensitivity	[mm]	0.5	0.5	0.5	0.5
Rotation repeat accuracy	[min]	5	5	5	5
min. / max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Mass	[kg]	0.58	0.6	0.6	0.6
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Supply voltage	[V]	10 – 30	10 – 30	10 – 30	10 – 30
Options and their characteristics					
Splash-proof version		OPR-081-P00-S	OPR-081-P05-S	OPR-081-P10-S	OPR-081-P15-S
ID		0321385	0321386	0321387	0321388
IP class		65	65	65	65

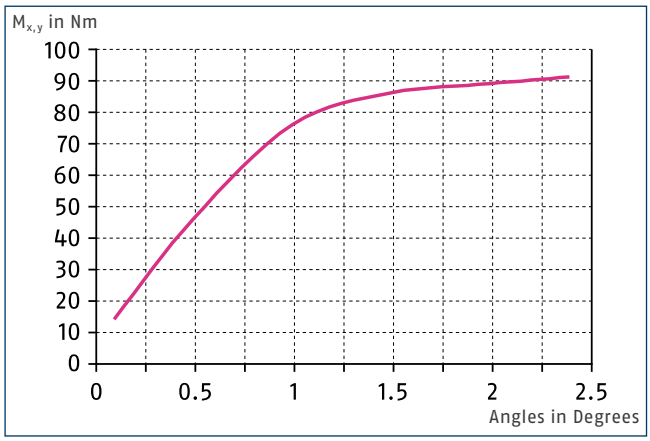
Main view



The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
24. Bolt circle
27. Through-holes for screw connections
29. P air connection
30. Cable connector in the accessory pack with 5 m connection cable
73. Fit for a centering pin

Moment loading

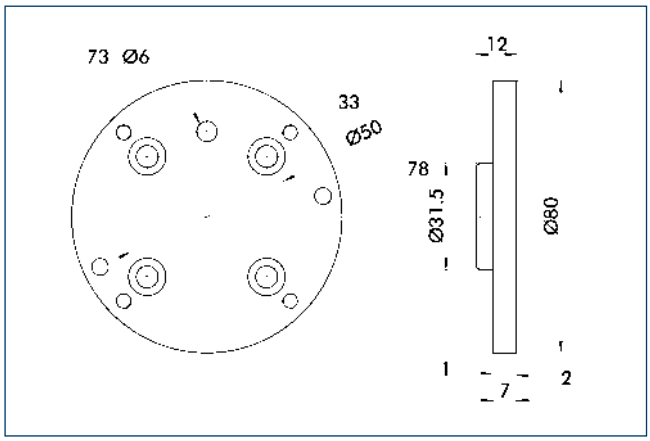


The chart shows the angular deflection of the OPR in the dependence of the moment $M_{x,y}$ with maximal permissible operating pressure.

OPR 081

Robot Accessories | Protecting | Collision and Overload Protection

Adapter plate ISO 9409-A50-R

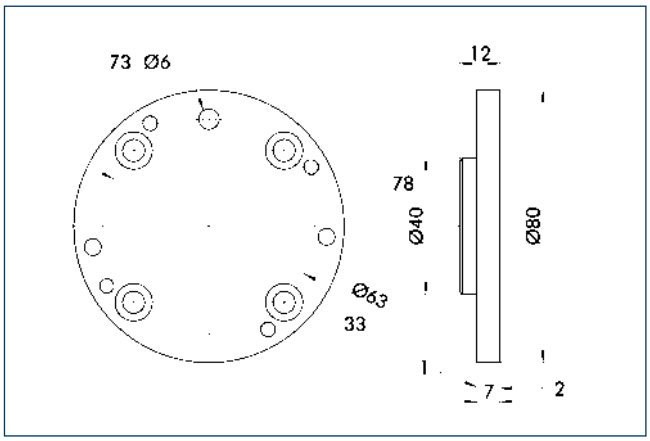


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-50-4-M6 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-081-ISO-A50-R	0321190	

Adapter plate ISO 9409-A63-R

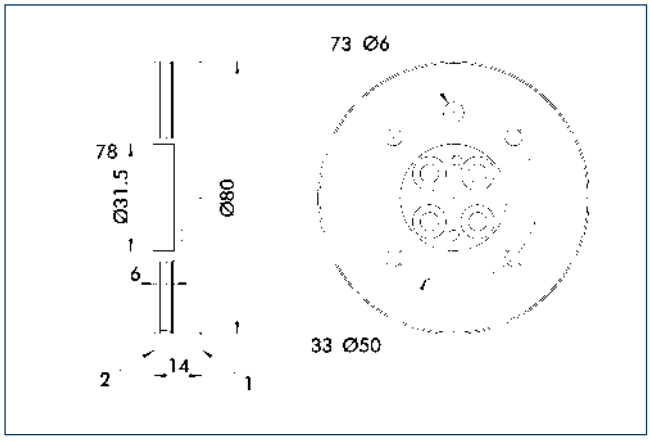


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-63-4-M6 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-081-ISO-A63-R	0321191	

Adapter plate ISO 9409-A50-T

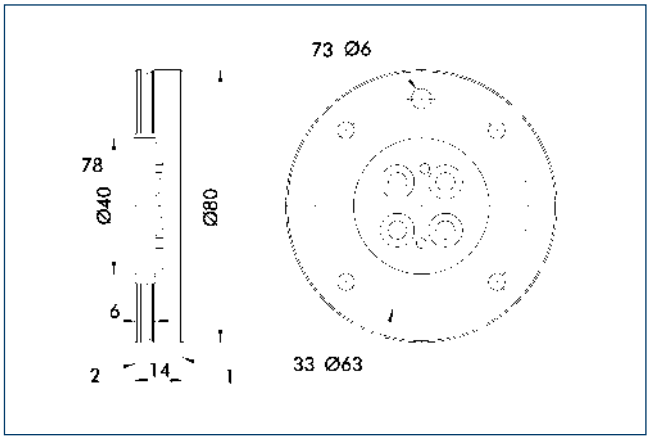


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-50-4-M6 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-081-ISO-A50-T	0321192	

Adapter plate ISO 9409-A63-T

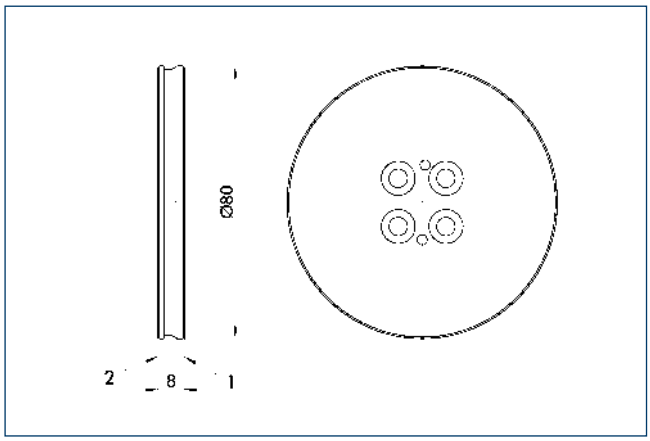


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-63-4-M6 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-081-ISO-A63-T	0321193	

Adapter plate BLANK-T

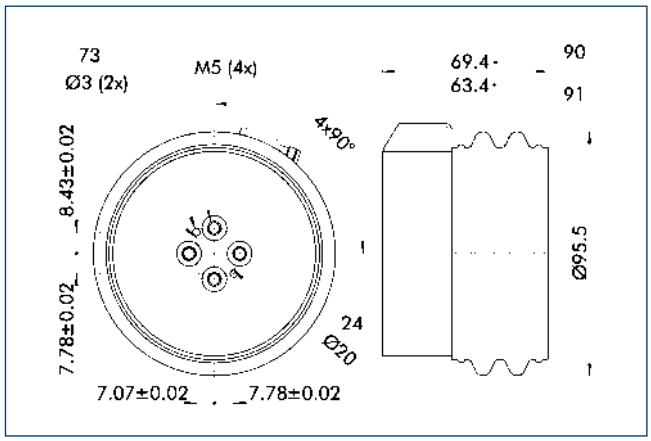


① Robot side connection ② Tool side connection

Tool-side adapter plate BLANK to be machined by the customer.

Description	ID	
Tool-side		
A-OPR-081-BLANK-T	0321194	

OPR-081 protection cover



⑳④ Bolt circle
⑦③ Fit for centering pins
⑨⓪ Total height with adapter plate with flange pattern according to ISO 9409-A31.5
⑨① Total height with adapter plate with flange pattern according to ISO 9409-A40/A50
⑨② Total height with adapter plate without flange pattern

The cover protects the OPR against coolant up to IP65.

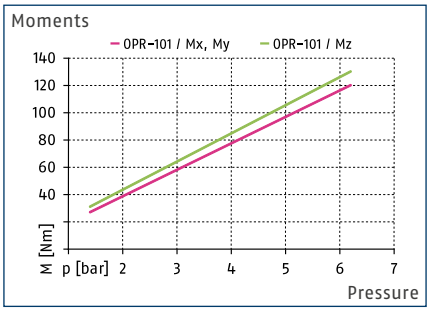
Description	ID	IP class
Protection cover		
OPR-081 Flexboot	0321195	65

Please note that a tool side adapter plate is required when using the protective cover.

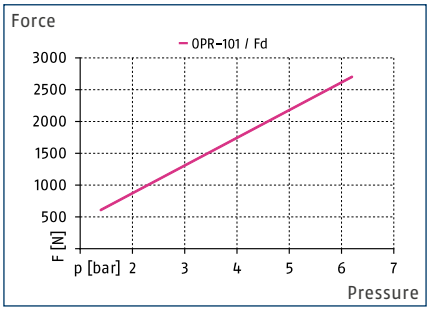
OPR 101

Robot Accessories | Protecting | Collision and Overload Protection

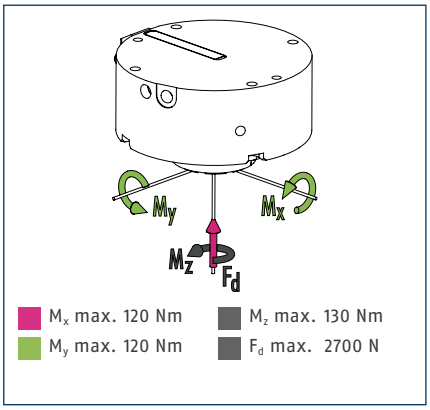
Triggering moment M_x, M_y, M_z



Triggering force F_d



Forces and moments

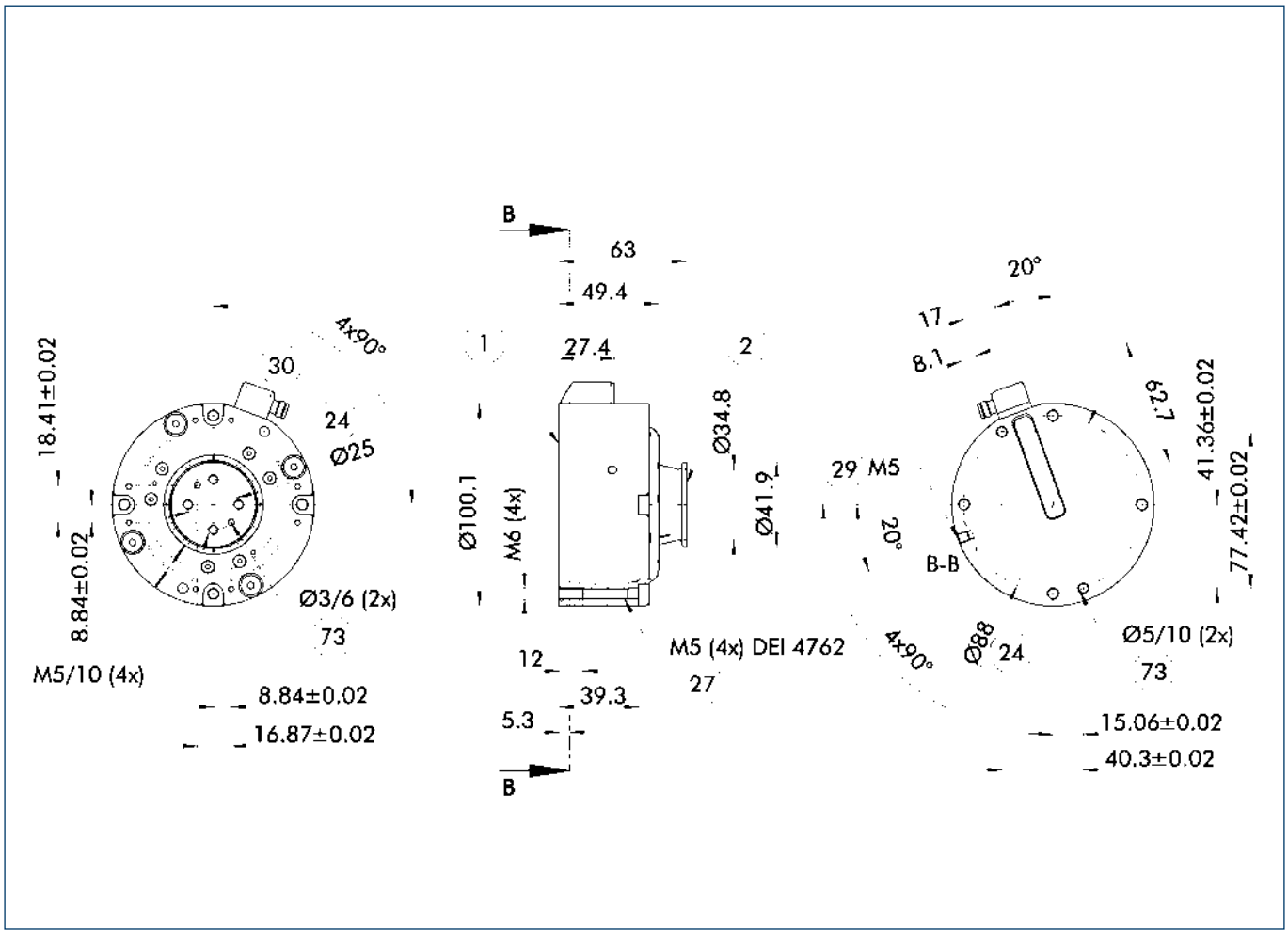


ⓘ The type of the collision sensors for the respective application are defined through the occuring forces and moments.

Technical data

Description		OPR-101-P00	OPR-101-P05	OPR-101-P10	OPR-101-P15
ID		0321401	0321402	0321403	0321404
Axial displacement	[mm]	10	10	10	10
Angular displacement	[°]	12	12	12	12
Rotatory displacement	[°]	25	25	25	25
min. angular triggering moment M_x, M_y	[Nm]	27	33.6	40.3	46.9
min. triggering moment rotary M_z	[Nm]	31	39	46.9	54.9
Spring triggering force	[N]		151	303	454
Angular spring displacement	[Nm]		6.6	13.3	19.9
Rotatory spring displacement	[Nm]		8	15.9	23.9
Repeat accuracy	[mm]	0.025	0.025	0.025	0.025
Sensitivity	[mm]	0.5	0.5	0.5	0.5
Rotation repeat accuracy	[min]	5	5	5	5
min. / max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Mass	[kg]	1.2	1.3	1.3	1.3
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Supply voltage	[V]	10 – 30	10 – 30	10 – 30	10 – 30
Options and their characteristics					
Splash-proof version		OPR-101-P00-S	OPR-101-P05-S	OPR-101-P10-S	OPR-101-P15-S
ID		0321405	0321406	0321407	0321408
IP class		65	65	65	65

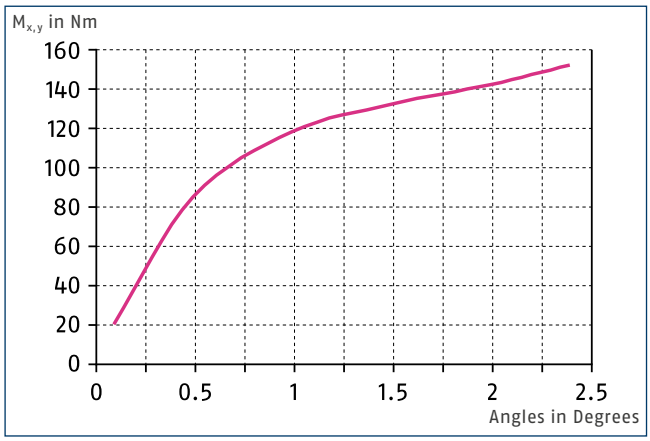
Main view



The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(27) Through-holes for screw connections
(29) P air connection
(30) Cable connector in the accessory pack with 5 m connection cable
(73) Fit for a centering pin

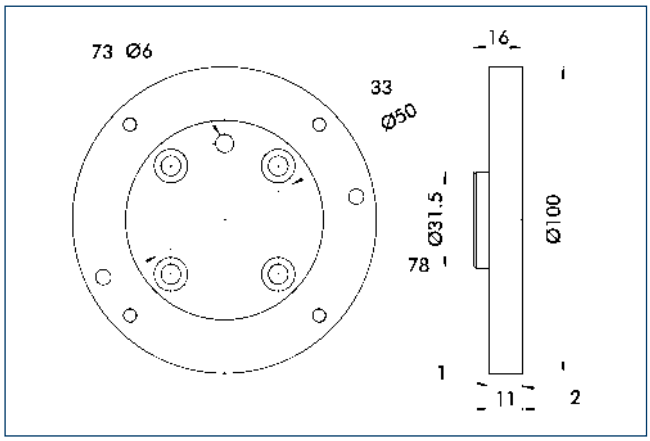
Moment loading



The chart shows the angular deflection of the OPR in the dependence of the moment $M_{x,y}$ with maximal permissible operating pressure.

OPR 101

Adapter plate ISO 9409-A50-R

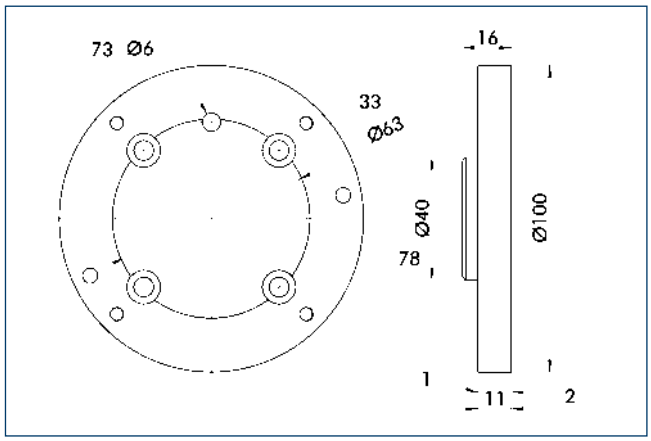


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-50-4-M8 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-101-ISO-A50-R	0321410	

Adapter plate ISO 9409-A63-R

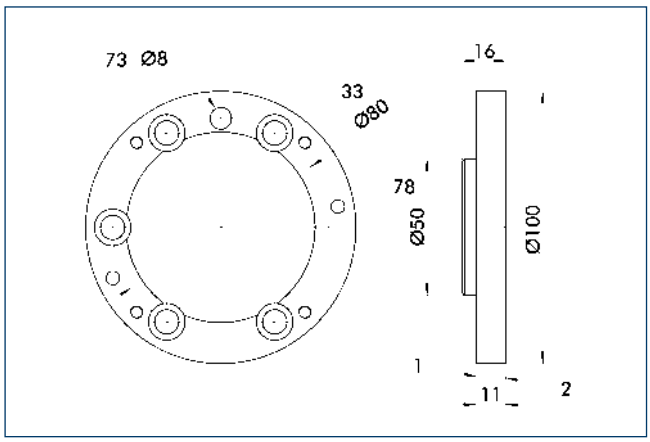


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-63-4-M6 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-101-ISO-A63-R	0321411	

Adapter plate ISO 9409-A80-R

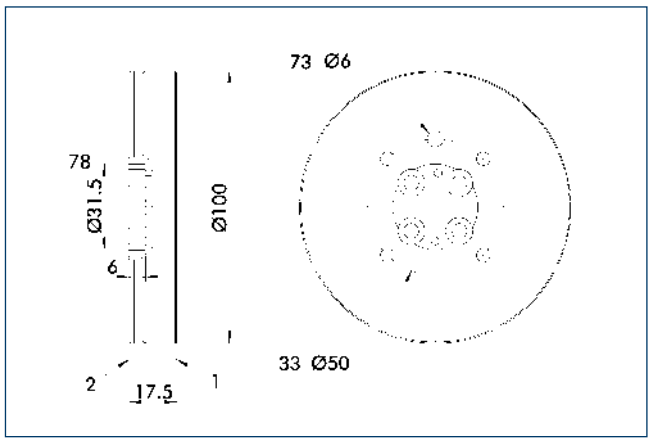


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-80-6-M8 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-101-ISO-A80-R	0321412	

Adapter plate ISO 9409-A50-T

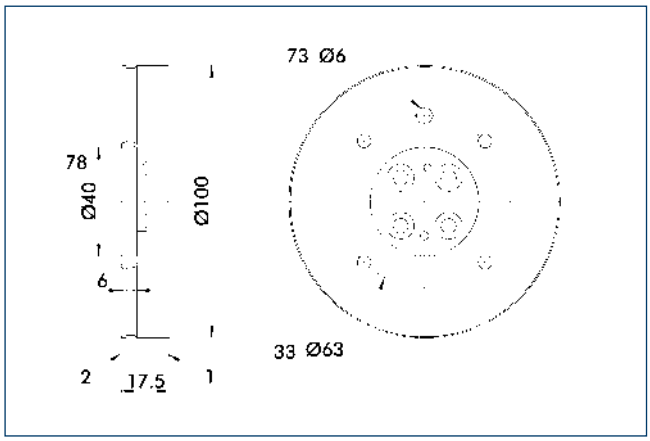


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-50-4-M6 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-101-ISO-A50-T	0321413	

Adapter plate ISO 9409-A63-T

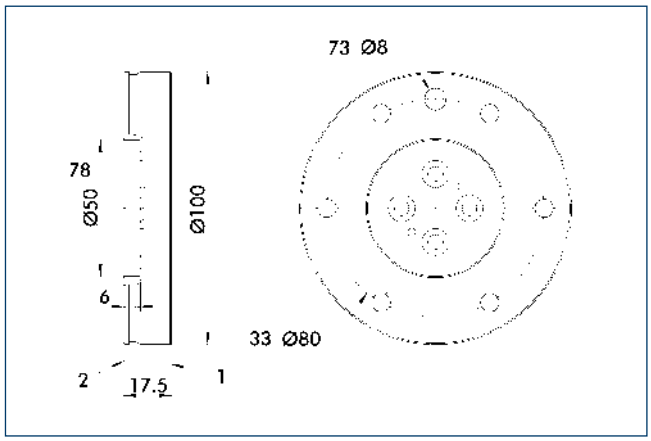


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-63-4-M6 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-101-ISO-A63-T	0321414	

Adapter plate ISO 9409-A80-T

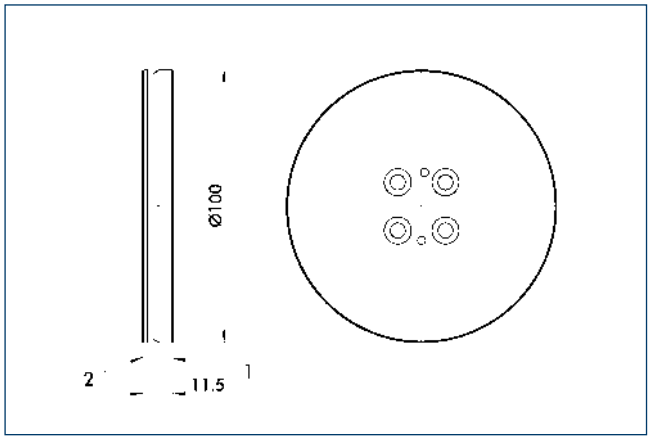


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-80-6-M8 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-101-ISO-A80-T	0321415	

Adapter plate BLANK-T

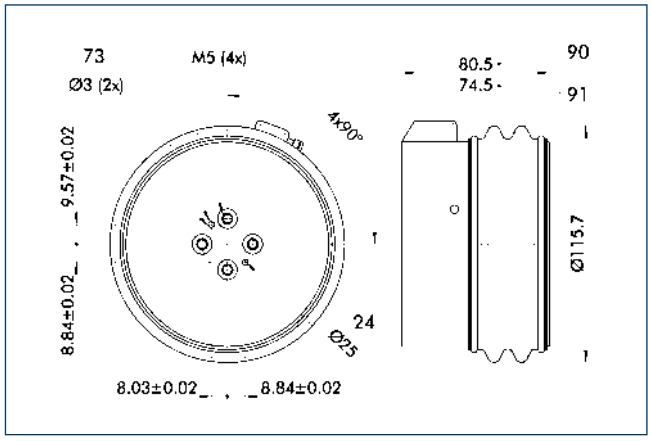


(1) Robot side connection
(2) Tool side connection

Tool-side adapter plate BLANK to be machined by the customer.

Description	ID	
Tool-side		
A-OPR-101-BLANK-T	0321417	

OPR-101 protection cover



(24) Bolt circle
(73) Fit for centering pins
(90) Total height with adapter plate with flange pattern according to ISO 9409-A31.5
(91) Total height with adapter plate with flange pattern according to ISO 9409-A40/A50
(92) Total height with adapter plate without flange pattern

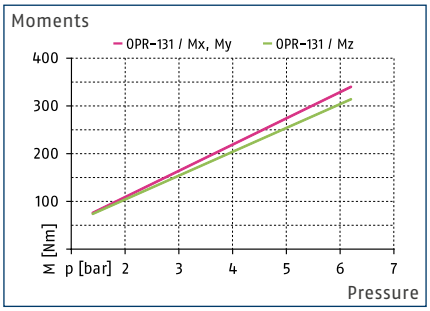
The cover protects the OPR against coolant up to IP65.

Description	ID	IP class
Protection cover		
OPR-101 Flexboot	0321416	65

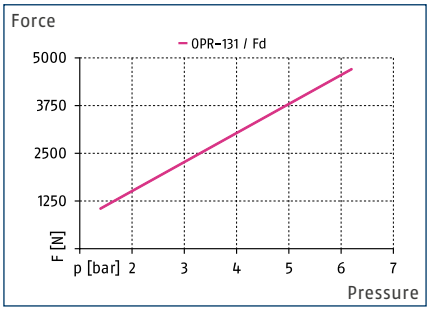
Please note that a tool side adapter plate is required when using the protective cover.

OPR 131

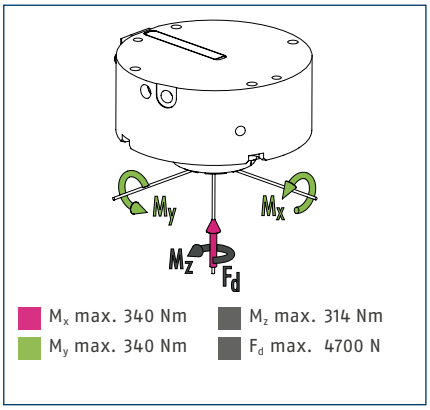
Triggering moment M_x, M_y, M_z



Triggering force F_d



Forces and moments

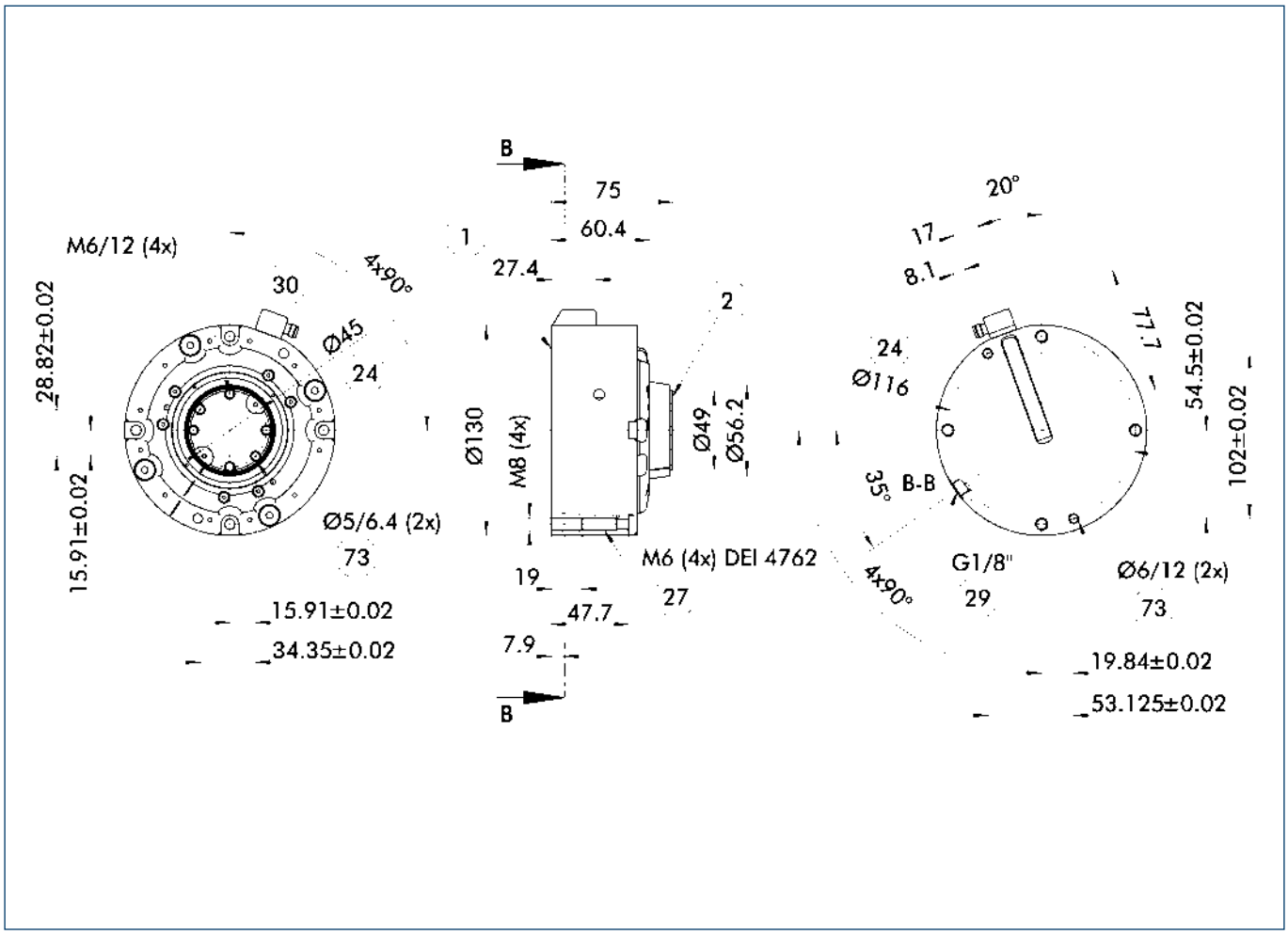


ⓘ The type of the collision sensors for the respective application are defined through the occuring forces and moments.

Technical data

Description		OPR-131-P00	OPR-131-P05	OPR-131-P10
ID		0321431	0321432	0321433
Axial displacement	[mm]	11.5	11.5	11.5
Angular displacement	[°]	10	10	10
Rotatory displacement	[°]	20	20	20
min. angular triggering moment M_x, M_y	[Nm]	76	94.8	113.7
min. triggering moment rotary M_z	[Nm]	74	92.6	111.1
Spring triggering force	[N]		262	523
Angular spring displacement	[Nm]		18.8	37.7
Rotatory spring displacement	[Nm]		18.6	37.1
Repeat accuracy	[mm]	0.025	0.025	0.025
Sensitivity	[mm]	0.5	0.5	0.5
Rotation repeat accuracy	[min]	5	5	5
min. / max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5
Mass	[kg]	2.3	2.4	2.4
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
Supply voltage	[V]	10 – 30	10 – 30	10 – 30
Options and their characteristics				
Splash-proof version		OPR-131-P00-S	OPR-131-P05-S	OPR-131-P10-S
ID		0321435	0321436	0321437
IP class		65	65	65

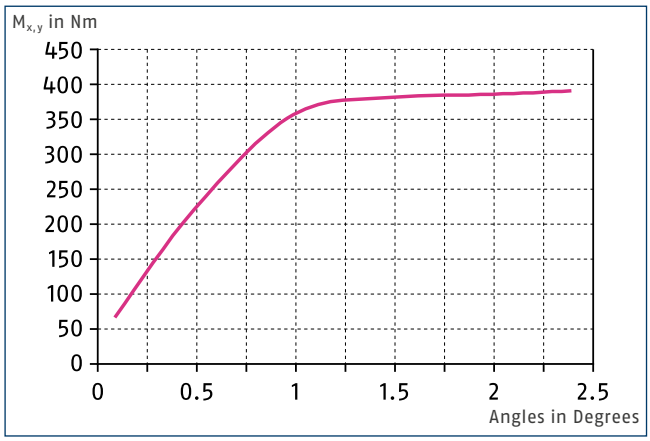
Main view



The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
24. Bolt circle
27. Through-holes for screw connections
29. P air connection
30. Cable connector in the accessory pack with 5 m connection cable
73. Fit for a centering pin

Moment loading

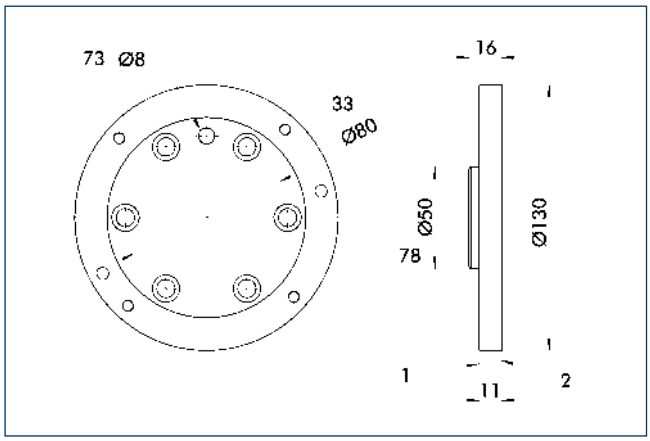


The chart shows the angular deflection of the OPR in the dependence of the moment M_{x+y} with maximal permissible operating pressure.

OPR 131

Robot Accessories | Protecting | Collision and Overload Protection

Adapter plate ISO 9409-A80-R

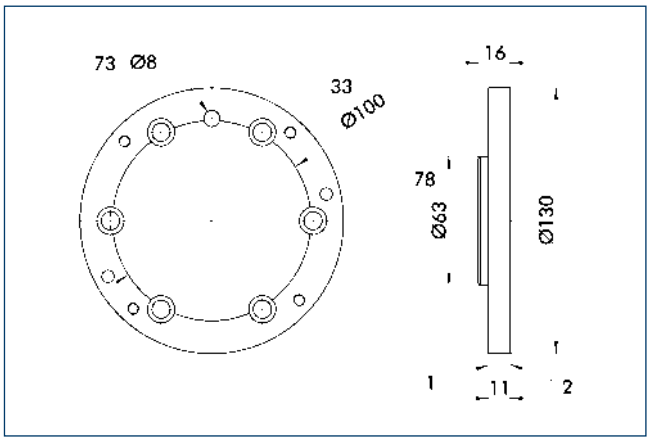


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-80-6-M8 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-131-ISO-A80-R	0321440	

Adapter plate ISO 9409-A100-R

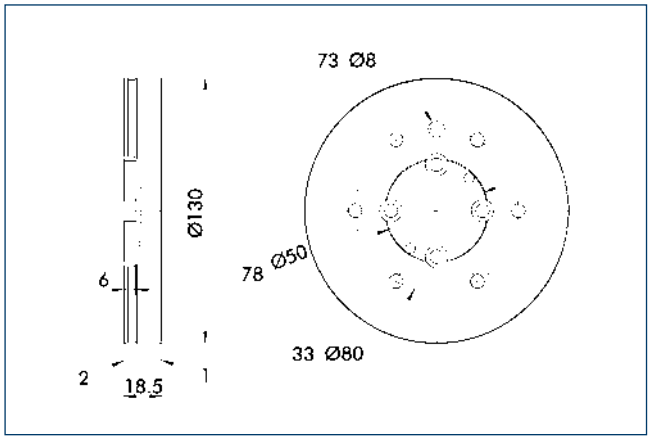


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-100-6-M8 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-131-ISO-A100-R	0321441	

Adapter plate ISO 9409-A80-T

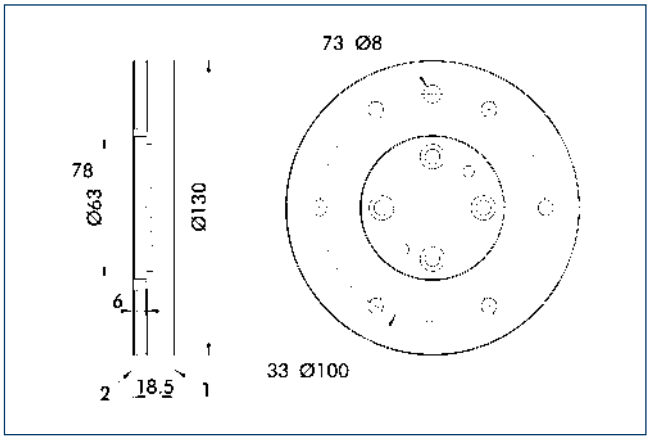


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-80-6-M8 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-131-ISO-A80-T	0321444	

Adapter plate ISO 9409-A100-T

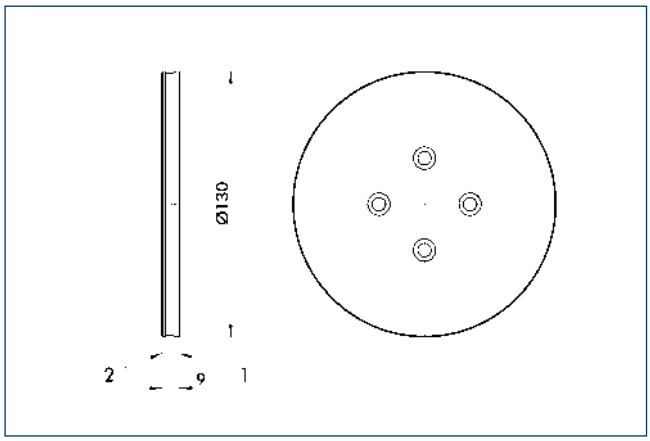


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-100-6-M8 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-131-ISO-A100-T	0321445	

Adapter plate BLANK-T

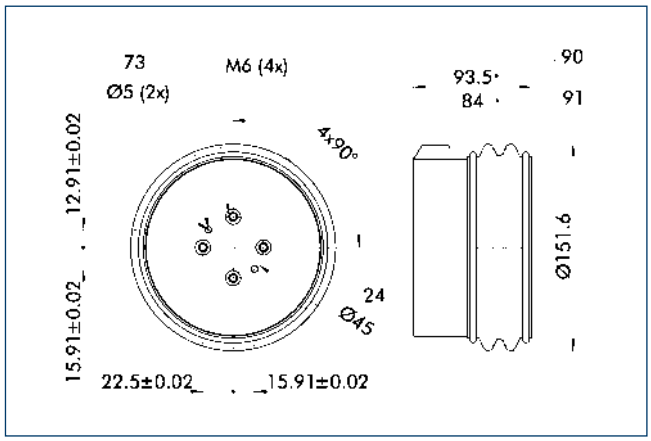


① Robot side connection ② Tool side connection

Tool-side adapter plate BLANK to be machined by the customer.

Description	ID	
Tool-side		
A-OPR-131-BLANK-T	0321551	

OPR-131 protection cover



24 Bolt circle
73 Fit for centering pins
90 Total height with adapter plate with flange pattern according to ISO 9409-A31.5
91 Total height with adapter plate with flange pattern according to ISO 9409-A40/A50
92 Total height with adapter plate without flange pattern

The cover protects the OPR against coolant up to IP65.

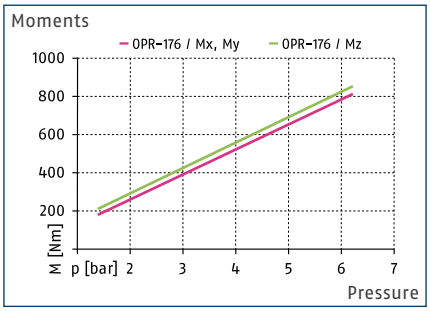
Description	ID	IP class
Protection cover		
OPR-131 Flexboot	0321447	65

Please note that a tool side adapter plate is required when using the protective cover.

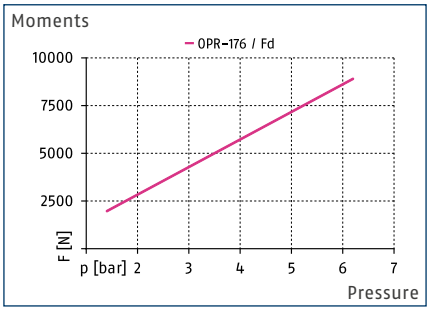
OPR 176

Robot Accessories | Protecting | Collision and Overload Protection

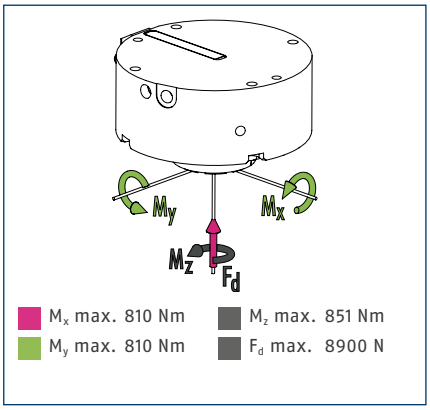
Triggering moment M_x, M_y, M_z



Triggering force F_d



Forces and moments

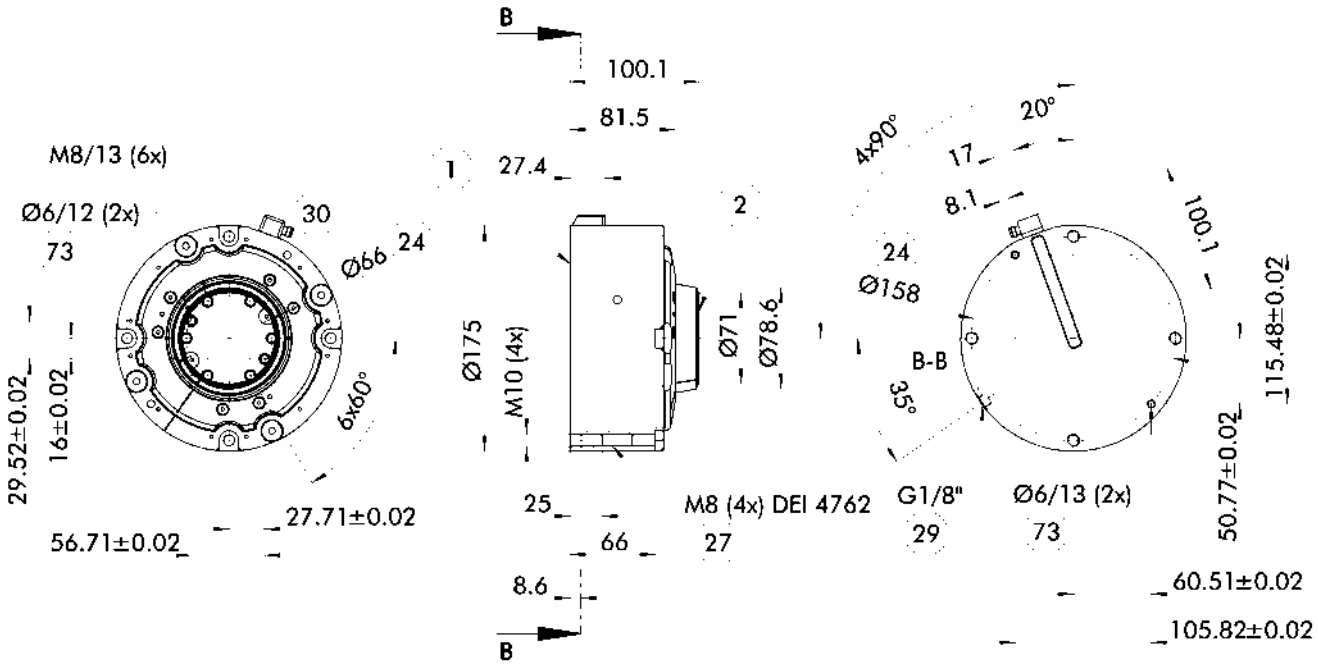


ⓘ The type of the collision sensors for the respective application are defined through the occuring forces and moments.

Technical data

Description		OPR-176-P00	OPR-176-P05	OPR-176-P10	OPR-176-P15
ID		0321476	0321477	0321478	0321479
Axial displacement	[mm]	16	16	16	16
Angular displacement	[°]	10	10	10	10
Rotatory displacement	[°]	20	20	20	20
min. angular triggering moment M_x, M_y	[Nm]	180	223.5	266.9	310
min. triggering moment rotary M_z	[Nm]	211	263.7	316	369
Spring triggering force	[N]		494	988	1483
Angular spring displacement	[Nm]		43.5	86.9	130
Rotatory spring displacement	[Nm]		52.7	105	158
Repeat accuracy	[mm]	0.025	0.025	0.025	0.025
Sensitivity	[mm]	0.5	0.5	0.5	0.5
Rotation repeat accuracy	[min]	5	5	5	5
min. / max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Mass	[kg]	5.4	5.5	5.5	5.5
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Supply voltage	[V]	10 – 30	10 – 30	10 – 30	10 – 30
Options and their characteristics					
Splash-proof version		OPR-176-P00-S	OPR-176-P05-S	OPR-176-P10-S	OPR-176-P15-S
ID		0321480	0321481	0321482	0321483
IP class		65	65	65	65

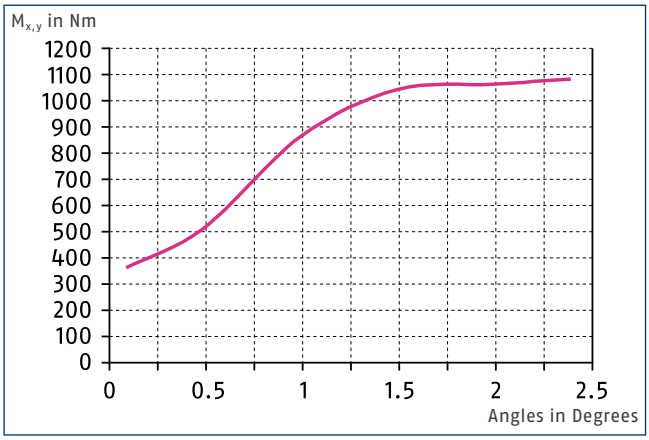
Main view



The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
24. Bolt circle
27. Through-holes for screw connections
29. P air connection
30. Cable connector in the accessory pack with 5 m connection cable
73. Fit for a centering pin

Moment loading

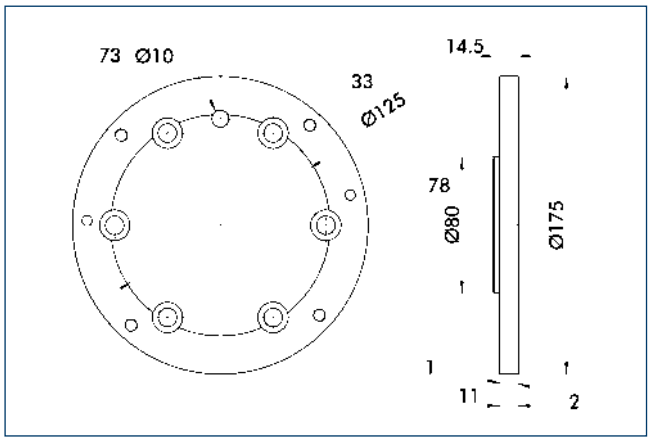


The chart shows the angular deflection of the OPR in the dependence of the moment M_{x+y} with maximal permissible operating pressure.

OPR 176

Robot Accessories | Protecting | Collision and Overload Protection

Adapter plate ISO 9409-A125-R

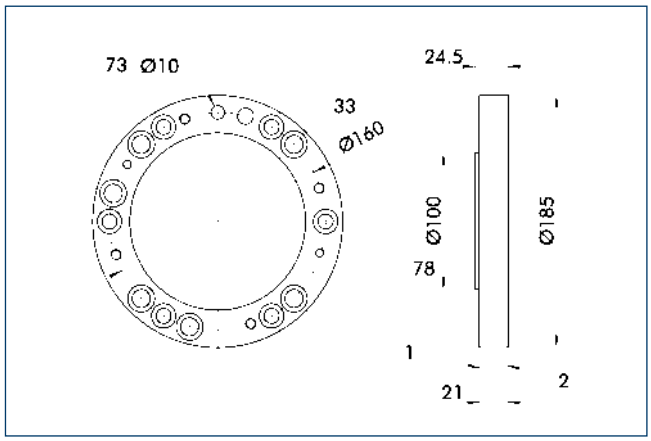


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-125-6-M10 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-176-ISO-A125-R	0321485	

Adapter plate ISO 9409-A160-R

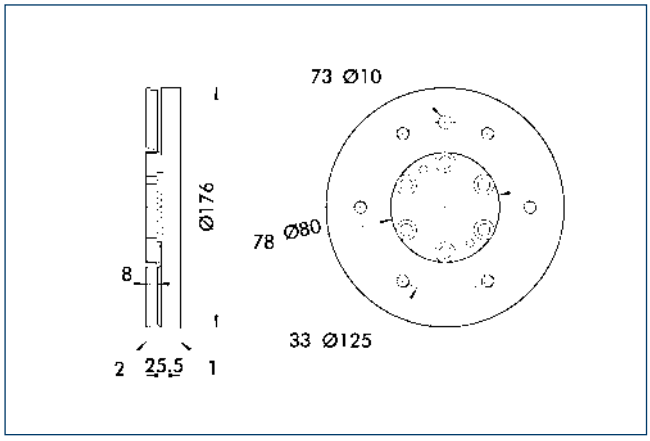


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-160-6-M10 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-176-ISO-A160-R	0321486	

Adapter plate ISO 9409-A125-T

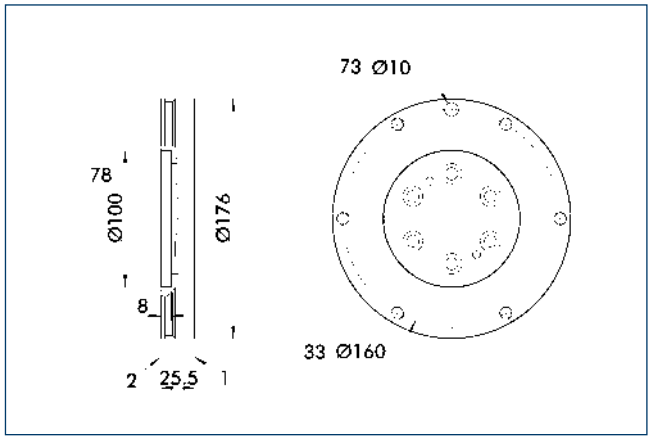


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-125-6-M10 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-176-ISO-A125-T	0321552	

Adapter plate ISO 9409-A160-T

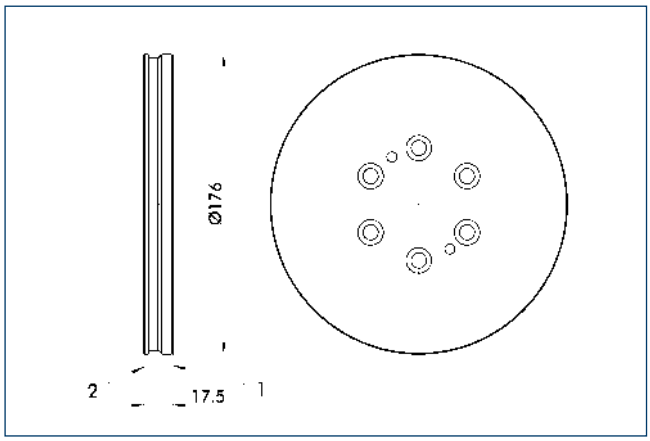


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-160-6-M10 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-176-ISO-A160-T	0321553	

Adapter plate BLANK-T

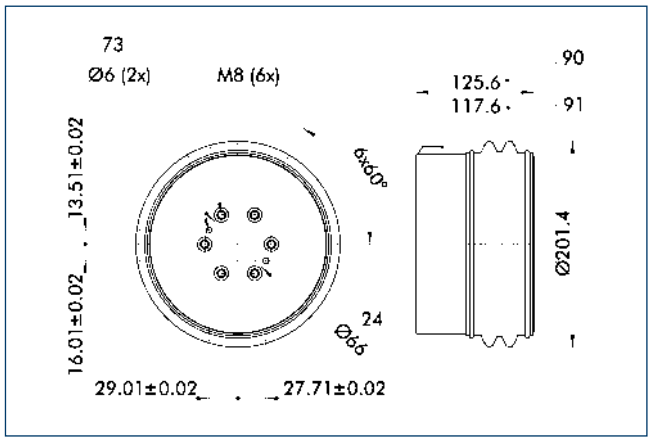


① Robot side connection ② Tool side connection

Tool-side adapter plate BLANK to be machined by the customer.

Description	ID	
Tool-side		
A-OPR-176-BLANK-T	0321489	

OPR-176 protection cover



㉔ Bolt circle
㉝ Fit for centering pins
㉚ Total height with adapter plate with flange pattern according to ISO 9409-A31.5
㉛ Total height with adapter plate with flange pattern according to ISO 9409-A40/A50
㉜ Total height with adapter plate without flange pattern

The cover protects the OPR against coolant up to IP65.

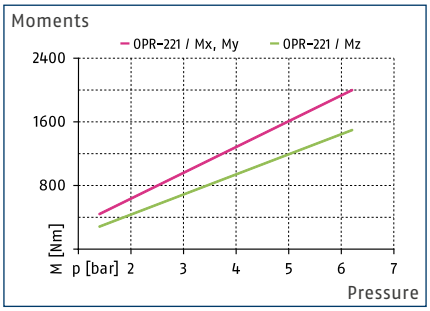
Description	ID	IP class
Protection cover		
OPR-176 Flexboot	0321492	65

Please note that a tool side adapter plate is required when using the protective cover.

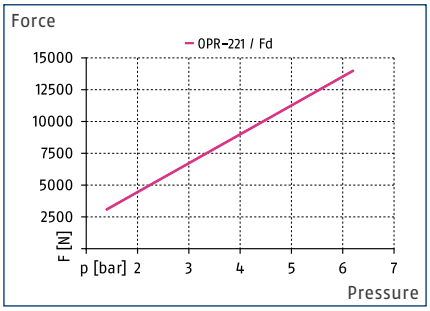
OPR 221

Robot Accessories | Protecting | Collision and Overload Protection

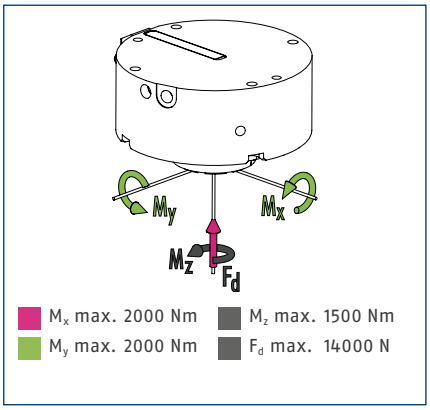
Triggering moment M_x, M_y, M_z



Triggering force F_d



Forces and moments

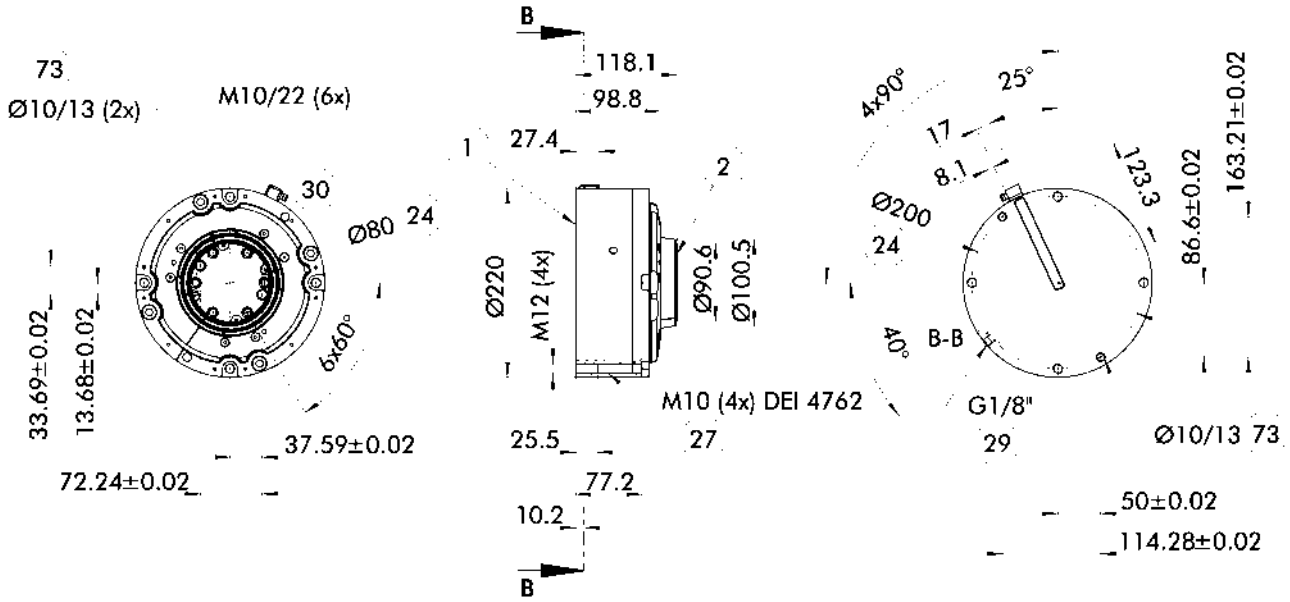


ⓘ The type of the collision sensors for the respective application are defined through the occuring forces and moments.

Technical data

Description		OPR-221-P00	OPR-221-P05	OPR-221-P10	OPR-221-P15
ID		0321521	0321522	0321523	0321524
Axial displacement	[mm]	16	16	16	16
Angular displacement	[°]	8	8	8	8
Rotatory displacement	[°]	20	20	20	20
min. angular triggering moment M_x, M_y	[Nm]	440	549	722	766
min. triggering moment rotary M_z	[Nm]	282	337.2	392	448
Spring triggering force	[N]		767	1534	2301
Angular spring displacement	[Nm]		109	217	326
Rotatory spring displacement	[Nm]		55.2	110	166
Repeat accuracy	[mm]	0.025	0.025	0.025	0.025
Sensitivity	[mm]	0.5	0.5	0.5	0.5
Rotation repeat accuracy	[min]	5	5	5	5
min. / max. operating pressure	[bar]	1.4/6.2	1.4/5.9	1.4/5.5	1.4/5.2
Mass	[kg]	11.4	11.7	11.7	11.7
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60
Supply voltage	[V]	10 – 30	10 – 30	10 – 30	10 – 30
Options and their characteristics					
Splash-proof version		OPR-221-P00-S	OPR-221-P05-S	OPR-221-P10-S	OPR-221-P15-S
ID		0321525	0321526	0321527	0321528
IP class		65	65	65	65

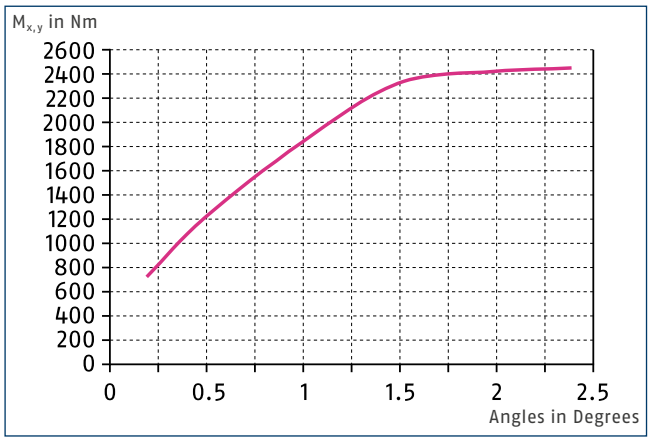
Main view



The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
24. Bolt circle
27. Through-holes for screw connections
29. P air connection
30. Cable connector in the accessory pack with 5 m connection cable
73. Fit for a centering pin

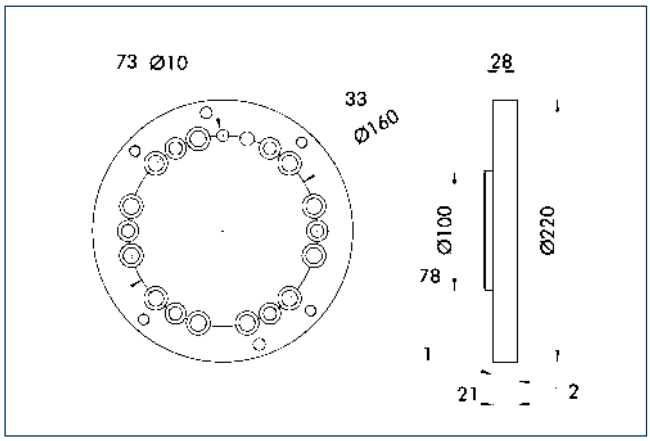
Moment loading



The chart shows the angular deflection of the OPR in the dependence of the moment M_{x+y} with maximal permissible operating pressure.

OPR 221

Adapter plate ISO 9409-A160-R

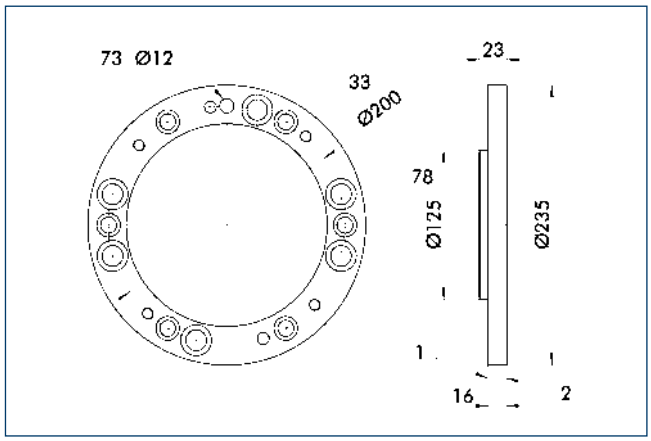


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-160-6-M10 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-221-ISO-A160-R	0321530	

Adapter plate ISO 9409-A200-R

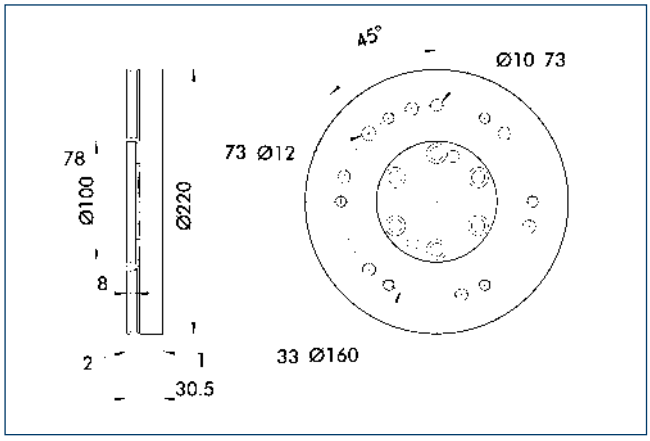


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-200-6-M10 screw connection diagram.

Description	ID	
Adapter plate		
A-OPR-221-ISO-A200+IRB7600	0321531	

Adapter plate ISO 9409-A160-T

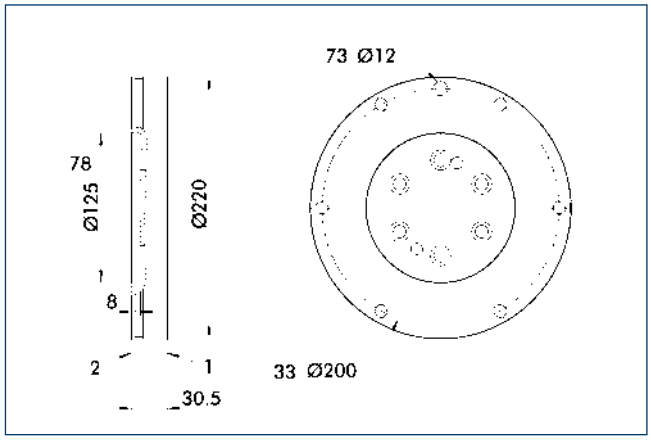


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-160-6-M10 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-221-ISO-A160-T	0321532	

Adapter plate ISO 9409-A200-T

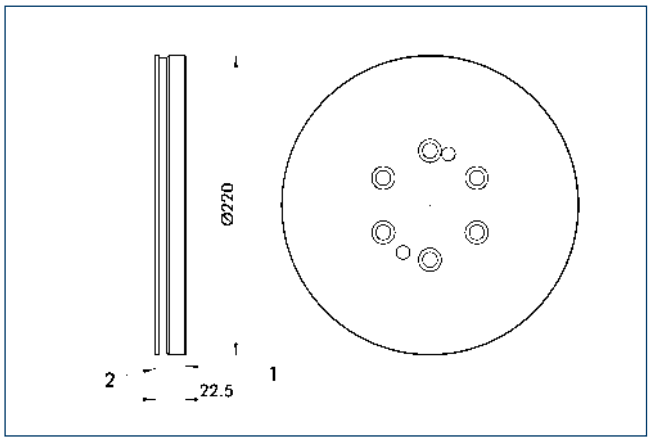


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409-200-6-M10 screw connection diagram.

Description	ID	
Tool-side		
A-OPR-221-ISO-A200-T	0321533	

Adapter plate BLANK-T

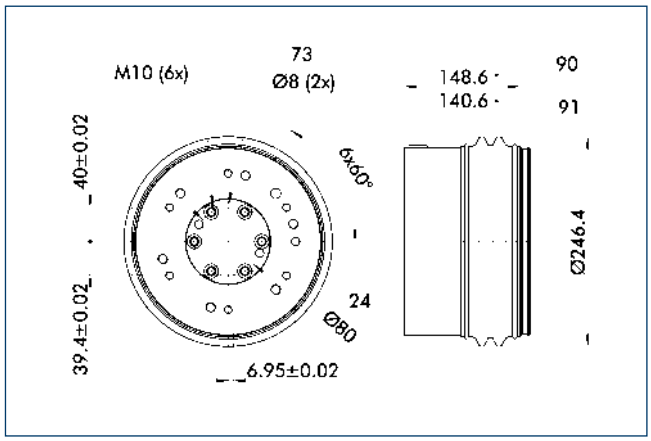


① Robot side connection ② Tool side connection

Tool-side adapter plate BLANK to be machined by the customer.

Description	ID	
Tool-side		
A-OPR-221-BLANK-T	0321534	

OPR-221 protection cover



(24) Bolt circle
(73) Fit for centering pins
(90) Total height with adapter plate with flange pattern according to ISO 9409-A31.5
(91) Total height with adapter plate with flange pattern according to ISO 9409-A40/A50
(92) Total height with adapter plate without flange pattern

The cover protects the OPR against coolant up to IP65.

Description	ID	IP class
Protection cover		
OPR-221 Flexboot	0321535	65

Please note that a tool side adapter plate is required when using the protective cover.

Compensation in all 3 Axis Directions and with a Compensation Stroke of up to 12 mm.

Compensating

AGE-Z 2 Compensation Unit

Series	Size	Page
AGE-Z 2		464
AGE-Z 2	50	468
AGE-Z 2	63	472
AGE-Z 2	80	476

AGE-XY Compensation Unit

Series	Size	Page
AGE-XY		480
AGE-XY	050	486
AGE-XY	063	490
AGE-XY	080	494

XY Compensation Unit with spring return

Series	Size	Page
AGE-F		498
AGE-F	031	502
AGE-F	040	506
AGE-F	063	510
AGE-F	080	514

AGE-S-XYZ Compensation Unit

Series	Size	Page
AGE-S		518
AGE-S	100	524
AGE-S	125	528
AGE-S	160	532
AGE-S	200	536

TCU-P Tolerance Compensation Unit

Series	Size	Page
TCU-P		540
TCU-P	050	544
TCU-P	064	548
TCU-P	080	552
TCU-P	100	556
TCU-P	125	560
TCU-P	160	564
TCU-P	200	568

TCU-Z Tolerance Compensation Unit

Series	Size	Page
TCU-Z		572
TCU-Z	050	576
TCU-Z	064	578
TCU-Z	080	582
TCU-Z	100	586
TCU-Z	125	590
TCU-Z	160	594
TCU-Z	200	598

FUS Insertion Unit

Series	Size	Page
FUS		602
FUS	001-30	606
FUS	001	608
FUS	100	610
FUS	200	614
FUS	400	618

Compact. Compliant. Flexible.

AGE-Z 2 Compensation Unit

Compensation unit compensating in Z-direction.

Field of Application

Palletizing, joining, and assembly of workpieces

Advantages – Your benefit

ISO flange pattern for easy assembly to most types of robots without needing additional adapter plates

Locking for fixing the unit rigidly in a defined, extended or retracted position

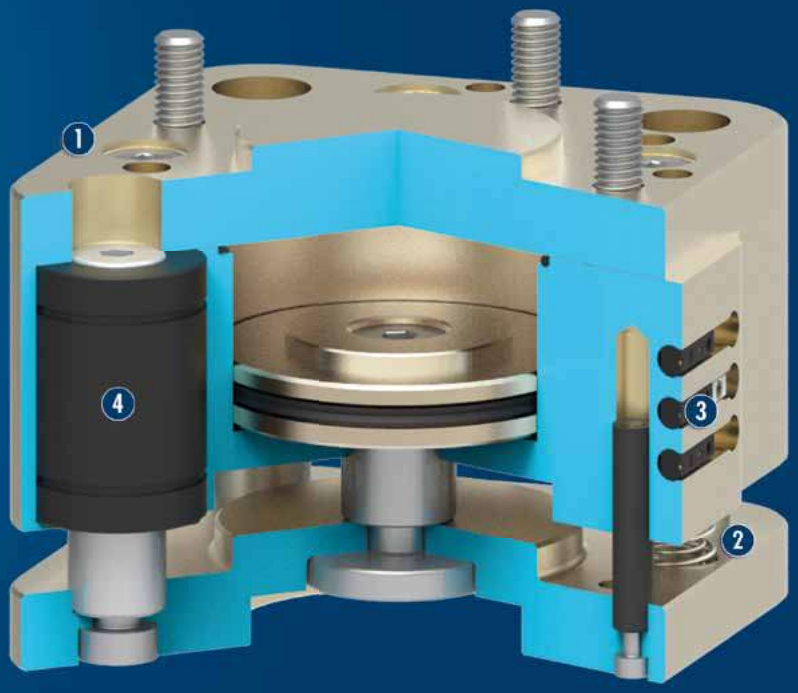
Compact design for minimum installation height

Can be combined with AGE-XY without additional adapter plate

Sizes	Handling weight	Compensation Z
Quantity: 3	5 .. 12 kg	8 .. 10 mm

Functional Description

The compensation unit AGE-Z 2 enables a Z-compensation of different pickup and stacking positions. The compensation unit is guided by a ball guide without play. Compression springs define the rigidity of the AGE-Z 2. It can be increased by additional actuation of the pneumatic cylinder. Moreover, the cylinder allows locking of the unit for dynamic movements. Monitoring of the retracted and extended positions is possible via sensors.



① **Housing**
Weight-optimized through application of high-strength aluminum alloy

② **Compression springs**
for defined pressure forces when depositing

③ **Monitoring groove**
stroke monitoring of the locking piston with magnetic switches

④ **Ball bearings, free from play**
for great torque capacity at minimum size

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Guiding system: scope-free ball guides

Monitoring: via magnetic or inductive sensor

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Housing: hard anodized aluminum alloy, functional parts made of hardened steel

Scope of delivery: Robot-side mounting screws

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void the warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Robot-gripper unit with compliant Z-axis for compensating tolerances during use.

1. AGE-Z 2 Compensation Unit
2. PZN-plus 3-Finger Centric Gripper
3. SWS Quick-change System
4. Electric Module
5. Cable Connector

SCHUNK offers more ...

The following components make the AGE-Z 2 even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Fittings

MMS Magnetic Switch

Sensor Cables

PGN-plus Universal Gripper

EGM Electrical Magnetic Gripper

HWS Manual Gripper Change System

PZN-plus Centric Gripper

SWS Quick-change System

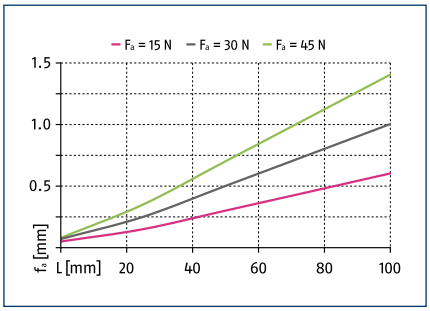
OPR Collision and Overload Sensor

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

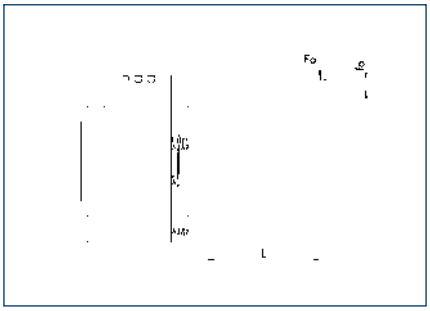
AGE-Z 2 50

Robot Accessories | Compensating | Z-Compensation Unit

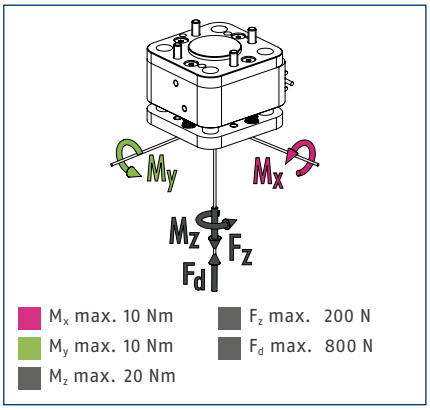
Load chart



Deflection



Forces and moments



M_x max. 10 Nm
M_y max. 10 Nm
M_z max. 20 Nm
F_z max. 200 N
F_d max. 800 N

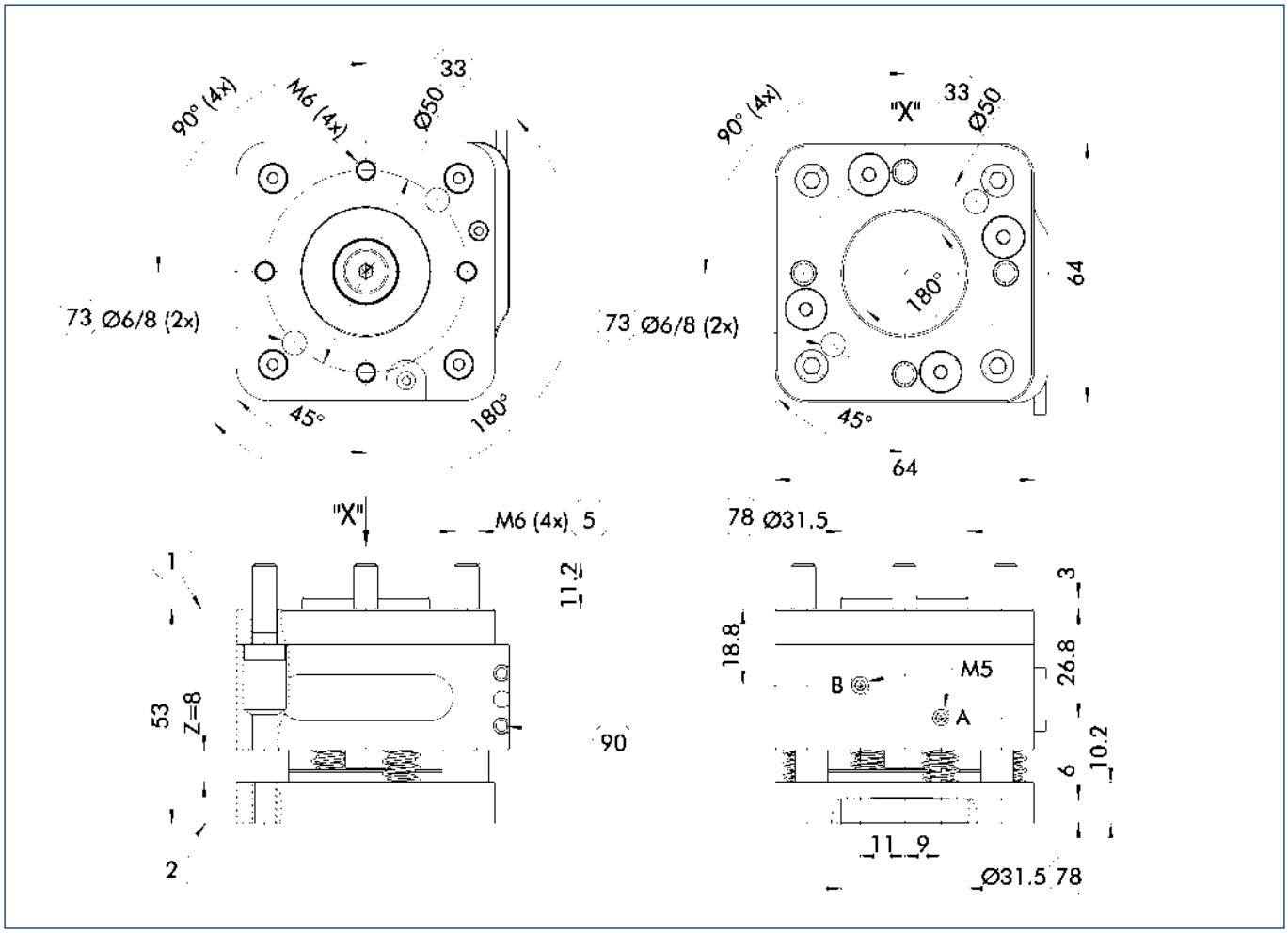
ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-Z 2-050-1	AGE-Z 2-050-2
ID		0324453	0324454
Compensation Z	[mm]	8	8
max. vertical payload	[kg]	5	5
Locking force retracted at 6 bar	[N]	300	280
Locking force extended at 6 bar	[N]	500	500
min. spring force	[N]	20	40
max. spring force	[N]	40	60
max. operating pressure	[bar]	6	6
Repeat accuracy	[mm]	0.02	0.02
Robot side connection		ISO 9409-1-50-4-M6	ISO 9409-1-50-4-M6
Mass	[kg]	0.55	0.55

The load chart shows the AGE-Z deflection under load and in the unlocked state

Main view

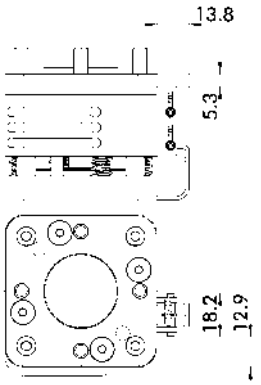


The main view shows the AGE-Z 2 in extended position.

A, a Unit, retracted
B, b Unit, extended

1. Robot side connection
2. Tool side connection
5. Through-hole for connection with screws
33. DIN ISO-9409 bolt-hole circle diameter
73. Fit for a centering pin
78. Fitting for centering
90. MMS 22... sensor

Mounting kit for IN 5 proximity switch

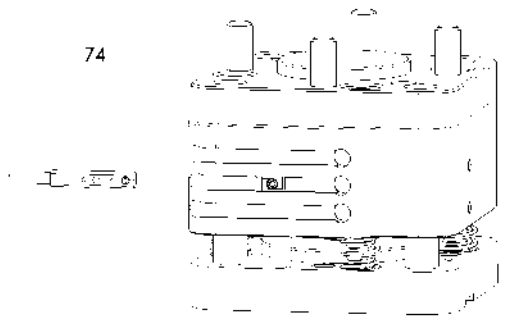


End position monitoring mounted with mounting kit

Description	ID	
Mounting kit for proximity switch		
AS-AGE-Z 2-IN5	0324490	

ⓘ This mounting kit needs to be ordered seperately as an accessory.

MMS-P programmable magnetic switch



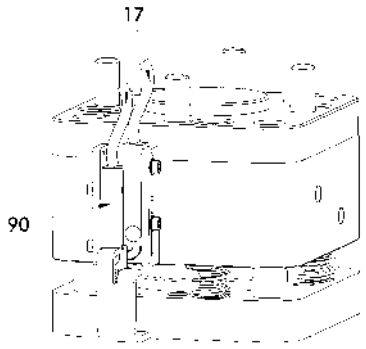
(74) Stop for MMS-P

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

IN 5 inductive proximity switches over mounting kit



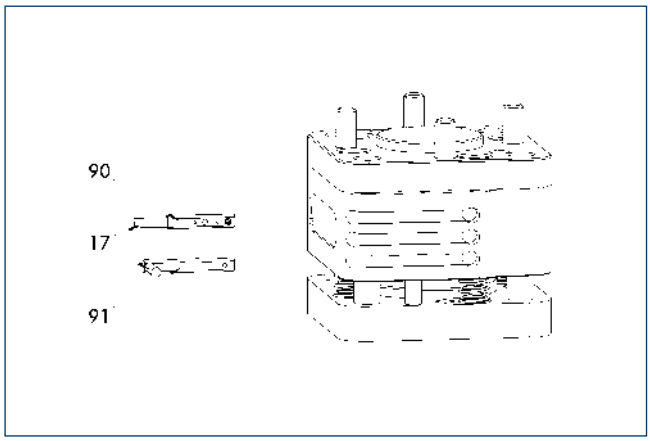
(17) Cable outlet (90) IN ... sensor

End position monitoring via two inductive sensors.

Description	ID	Often combined
Inductive proximity switches		
IN 5-S-M12	0301569	
IN 5-S-M8	0301469	●
INK 5-S	0301501	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

MMS electronic magnetic switches



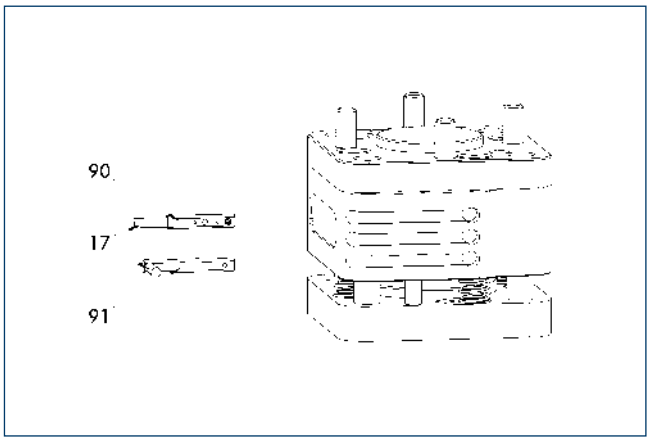
(17) Cable outlet
(91) MMS 22...-SA sensor
(90) MMS 22... sensor

End position monitoring for mounting in the C-slot

Description	ID	Often combined
MMS electronic magnetic switches		
MMS 22-S-M8-PNP	0301032	●
MMSK 22-S-PNP	0301034	
MMS electronic magnetic switches with lateral cable outlet		
MMS 22-S-M8-PNP-SA	0301042	●
MMSK 22-S-PNP-SA	0301044	
Cable extensions		
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
Sensor distributor		
V2-M8	0301775	●
V4-M8	0301746	
V8-M8	0301751	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

MMS PI1 programmable magnetic switch



(17) Cable outlet
(91) MMS 22...-PI1-...-SA sensor
(90) MMS 22...PI1-... sensor

Position monitoring with a programmable position per each sensor. The electronic system is integrated in the sensor. Programmable via magnetic teach-in tool MT (included in delivery) or plug-in teachable tool ST (on option). Monitoring of the end position is integrated in the C-slot. If the plug-in teachable tools need to be directly indicated as an accessory of the actuator, the magnetic switches MMS...-PI... at the actuators can be only taught via the plug-in teach tool ST.

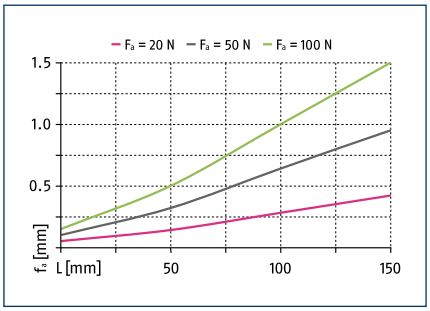
Description	ID	Often combined
MMS PI1 programmable magnetic switch		
MMS 22-PI1-S-M8-PNP	0301160	●
MMSK 22-PI1-S-PNP	0301162	
MMS PI1-HD programmable magnetic switch with stainless steel housing		
MMS 22-PI1-S-M8-PNP-HD	0301110	●
MMSK 22-PI1-S-PNP-HD	0301112	
MMS PI1 programmable magnetic switch with lateral cable outlet		
MMS 22-PI1-S-M8-PNP-SA	0301166	●
MMSK 22-PI1-S-PNP-SA	0301168	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

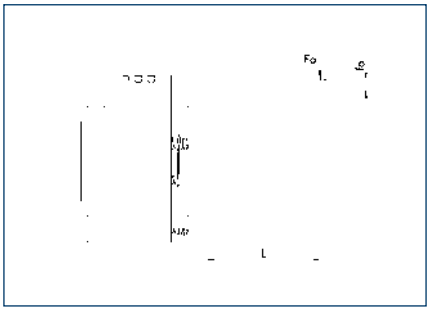
AGE-Z 2 63

Robot Accessories | Compensating | Z-Compensation Unit

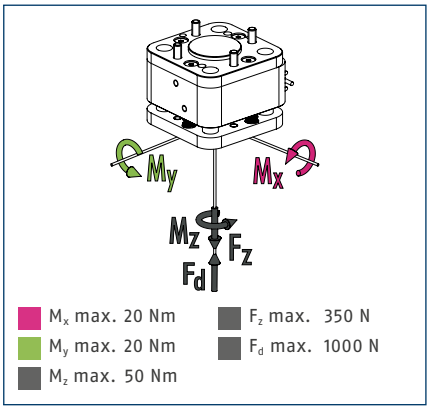
Load chart



Deflection



Forces and moments



M_x max. 20 Nm	F_z max. 350 N
M_y max. 20 Nm	F_d max. 1000 N
M_z max. 50 Nm	

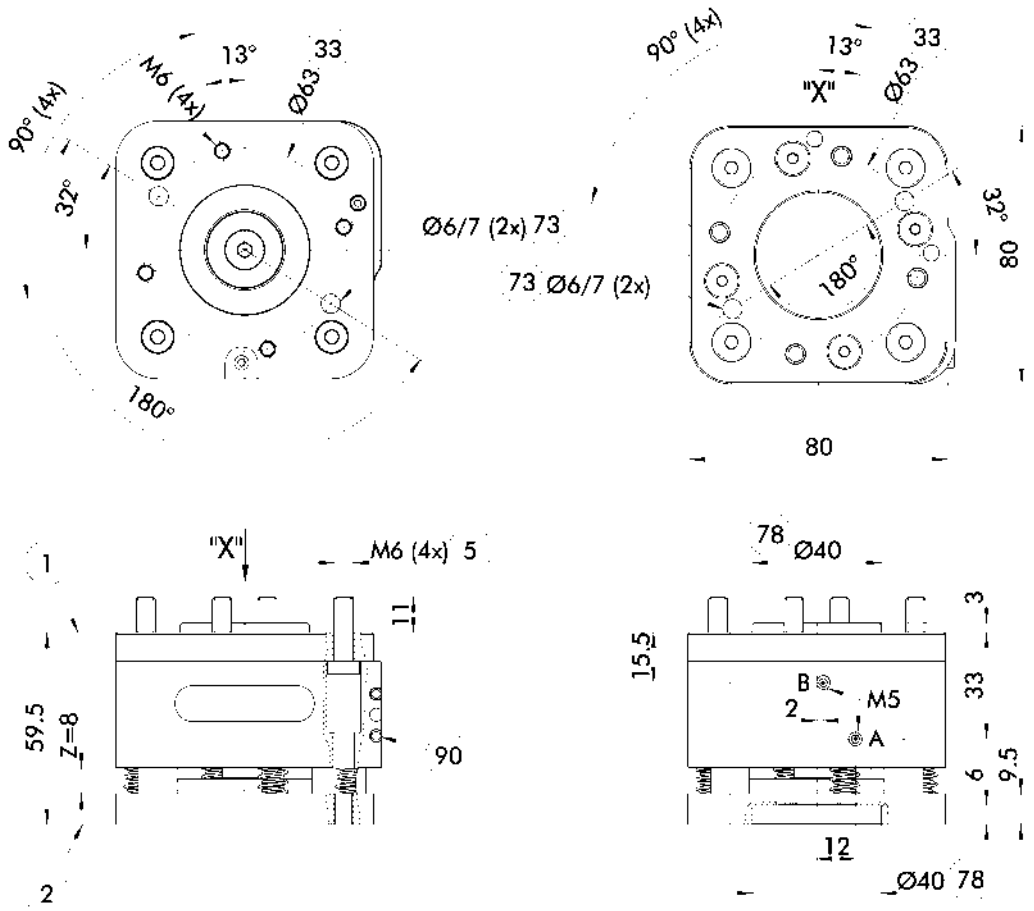
ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-Z 2-063-1	AGE-Z 2-063-2
ID		0324466	0324467
Compensation Z	[mm]	8	8
max. vertical payload	[kg]	9	9
Locking force retracted at 6 bar	[N]	800	750
Locking force extended at 6 bar	[N]	900	900
min. spring force	[N]	40	60
max. spring force	[N]	60	100
max. operating pressure	[bar]	6	6
Repeat accuracy	[mm]	0.02	0.02
Robot side connection		ISO 9409-1-63-4-M6	ISO 9409-1-63-4-M6
Mass	[kg]	0.8	0.8

The load chart shows the AGE-Z deflection under load and in the unlocked state

Main view

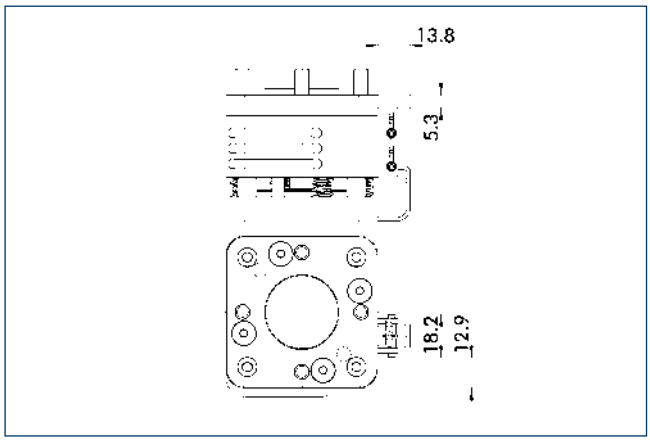


The main view shows the AGE-Z 2 in extended position.

A, a Unit, retracted
B, b Unit, extended

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering
(90) MMS 22... sensor

Mounting kit for IN 5 proximity switch

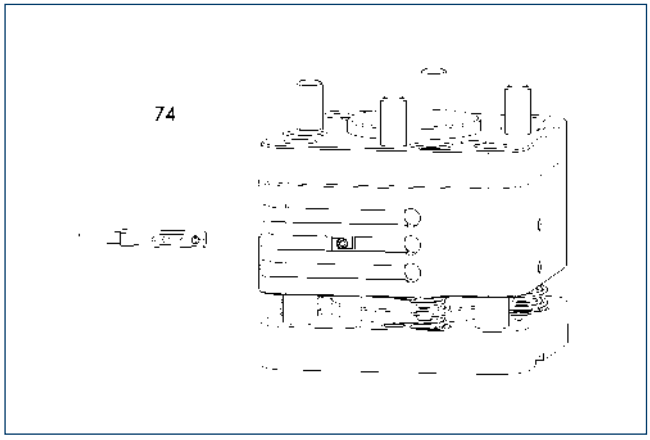


End position monitoring mounted with mounting kit

Description	ID	
Mounting kit for proximity switch		
AS-AGE-Z 2-IN5	0324490	

ⓘ This mounting kit needs to be ordered seperately as an accessory.

MMS-P programmable magnetic switch



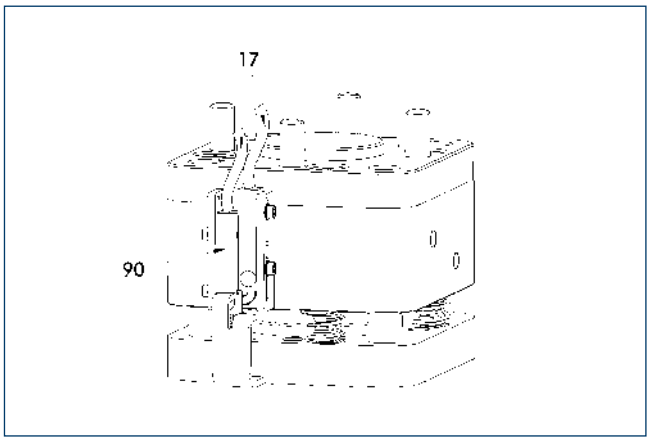
(74) Stop for MMS-P

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

IN 5 inductive proximity switches over mounting kit



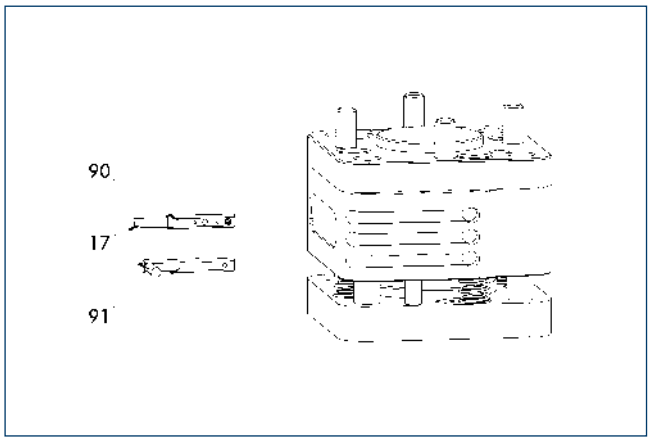
(17) Cable outlet (90) IN ... sensor

End position monitoring via two inductive sensors.

Description	ID	Often combined
Inductive proximity switches		
IN 5-S-M12	0301569	
IN 5-S-M8	0301469	●
INK 5-S	0301501	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

MMS electronic magnetic switches



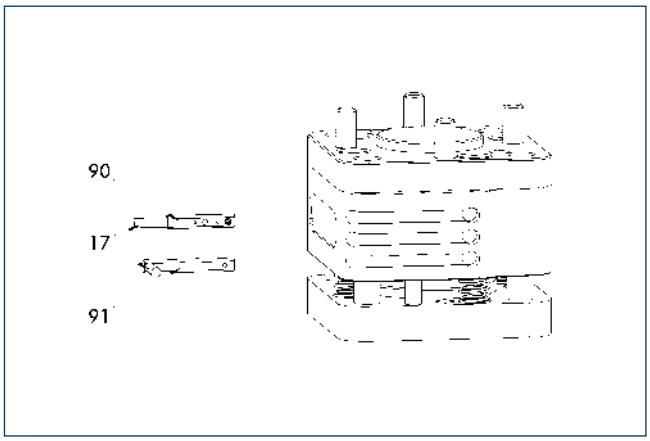
(17) Cable outlet
(91) MMS 22...-SA sensor
(90) MMS 22... sensor

End position monitoring for mounting in the C-slot

Description	ID	Often combined
MMS electronic magnetic switches		
MMS 22-S-M8-PNP	0301032	●
MMSK 22-S-PNP	0301034	
MMS electronic magnetic switches with lateral cable outlet		
MMS 22-S-M8-PNP-SA	0301042	●
MMSK 22-S-PNP-SA	0301044	
Cable extensions		
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
Sensor distributor		
V2-M8	0301775	●
V4-M8	0301746	
V8-M8	0301751	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

MMS PI1 programmable magnetic switch



(17) Cable outlet
(91) MMS 22...-PI1-...-SA sensor
(90) MMS 22...PI1-... sensor

Position monitoring with a programmable position per each sensor. The electronic system is integrated in the sensor. Programmable via magnetic teach-in tool MT (included in delivery) or plug-in teachable tool ST (on option). Monitoring of the end position is integrated in the C-slot. If the plug-in teachable tools need to be directly indicated as an accessory of the actuator, the magnetic switches MMS...-PI... at the actuators can be only taught via the plug-in teach tool ST.

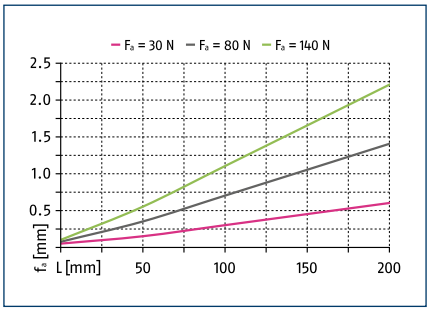
Description	ID	Often combined
MMS PI1 programmable magnetic switch		
MMS 22-PI1-S-M8-PNP	0301160	●
MMSK 22-PI1-S-PNP	0301162	
MMS PI1-HD programmable magnetic switch with stainless steel housing		
MMS 22-PI1-S-M8-PNP-HD	0301110	●
MMSK 22-PI1-S-PNP-HD	0301112	
MMS PI1 programmable magnetic switch with lateral cable outlet		
MMS 22-PI1-S-M8-PNP-SA	0301166	●
MMSK 22-PI1-S-PNP-SA	0301168	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

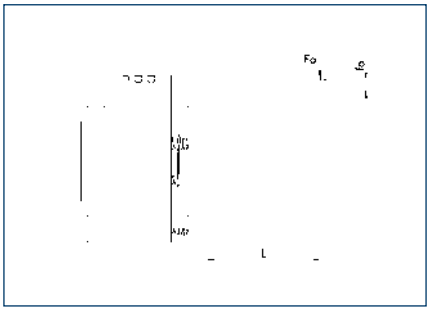
AGE-Z 2 80

Robot Accessories | Compensating | Z-Compensation Unit

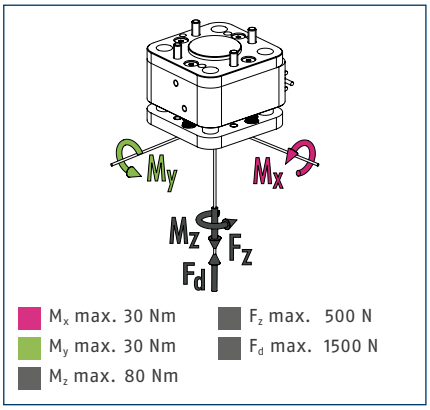
Load chart



Deflection



Forces and moments



M_x max. 30 Nm	F_z max. 500 N
M_y max. 30 Nm	F_d max. 1500 N
M_z max. 80 Nm	

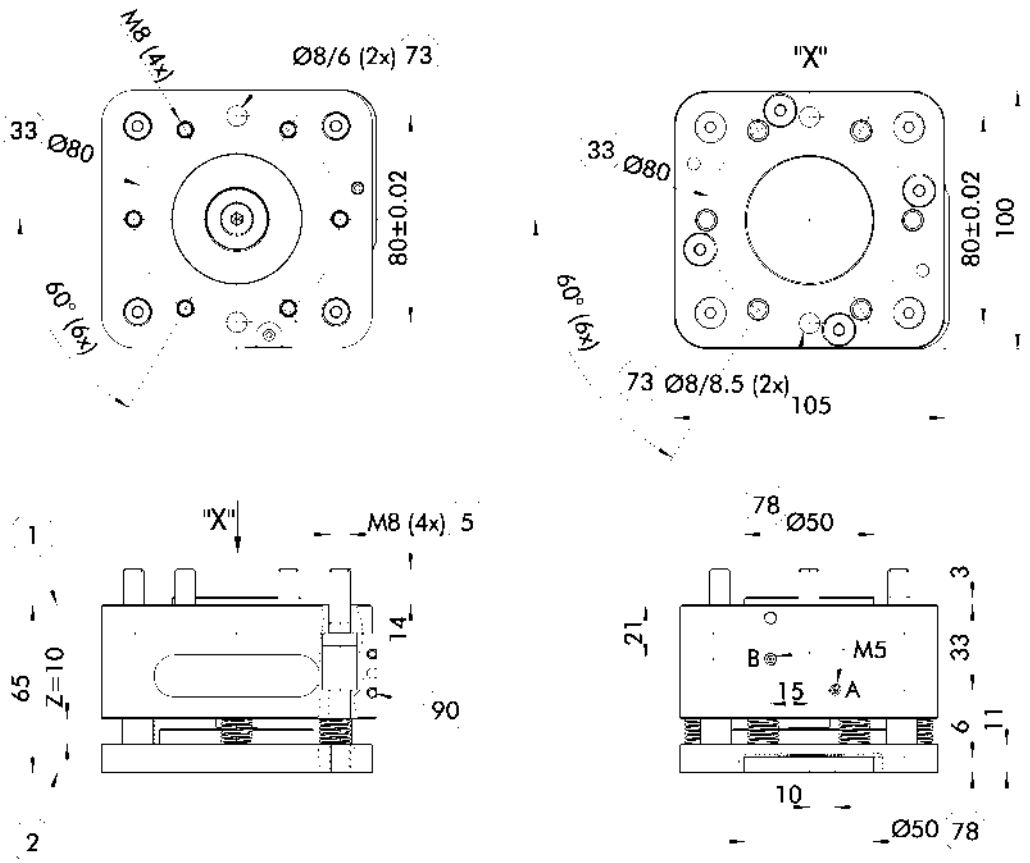
ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while stil maintaining error-free function.

Technical data

Description		AGE-Z 2-080-1	AGE-Z 2-080-2
ID		0324483	0324484
Compensation Z	[mm]	10	10
max. vertical payload	[kg]	12	12
Locking force retracted at 6 bar	[N]	1450	1450
Locking force extended at 6 bar	[N]	1500	1500
min. spring force	[N]	70	90
max. spring force	[N]	100	120
max. operating pressure	[bar]	6	6
Repeat accuracy	[mm]	0.02	0.02
Robot side connection		ISO 9409-1-80-4-M8	ISO 9409-1-80-4-M8
Mass	[kg]	1.7	1.7

The load chart shows the AGE-Z deflection under load and in the unlocked state

Main view

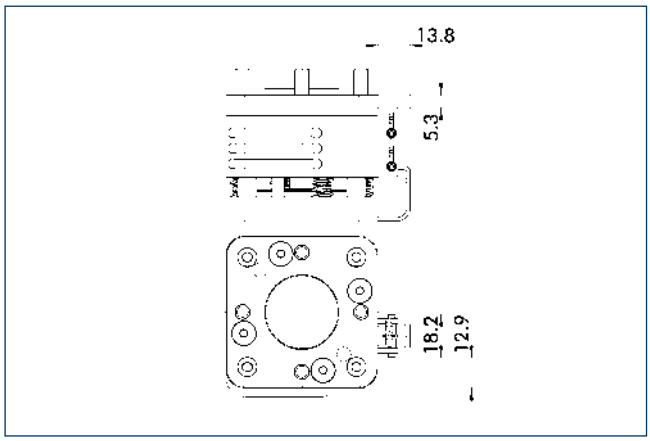


The main view shows the AGE-Z 2 in extended position.

A, a Unit, retracted
B, b Unit, extended

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering
(90) MMS 22... sensor

Mounting kit for IN 5 proximity switch

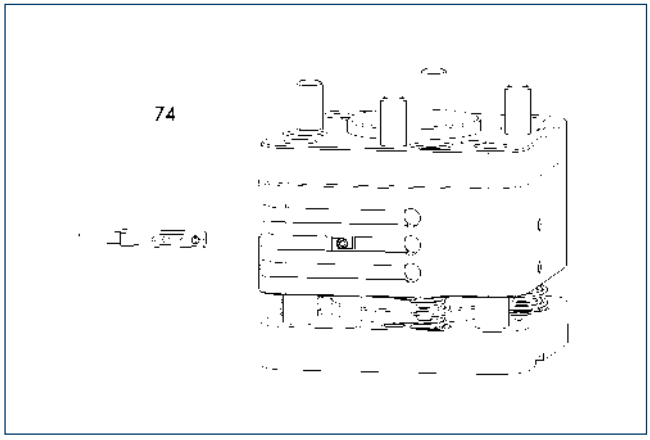


End position monitoring mounted with mounting kit

Description	ID	
Mounting kit for proximity switch		
AS-AGE-Z 2-IN5	0324490	

ⓘ This mounting kit needs to be ordered separately as an accessory.

MMS-P programmable magnetic switch



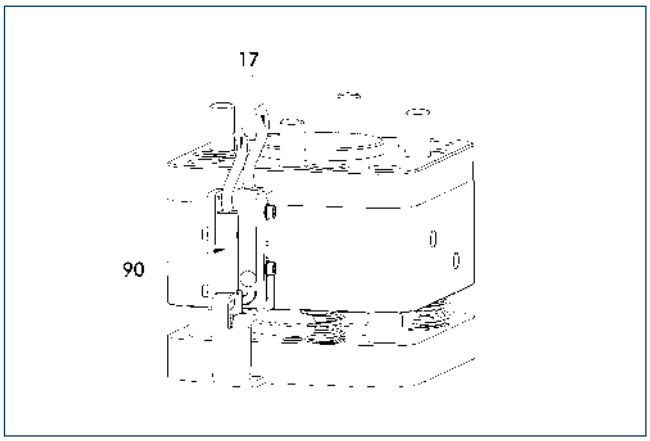
(74) Stop for MMS-P

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

IN 5 inductive proximity switches over mounting kit



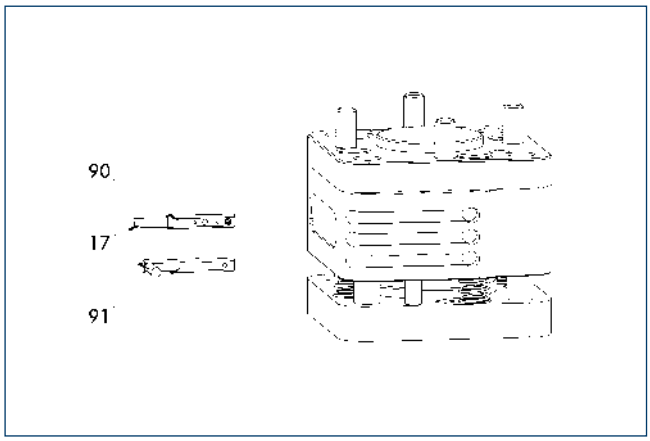
(17) Cable outlet (90) IN ... sensor

End position monitoring via two inductive sensors.

Description	ID	Often combined
Inductive proximity switches		
IN 5-S-M12	0301569	
IN 5-S-M8	0301469	●
INK 5-S	0301501	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

MMS electronic magnetic switches



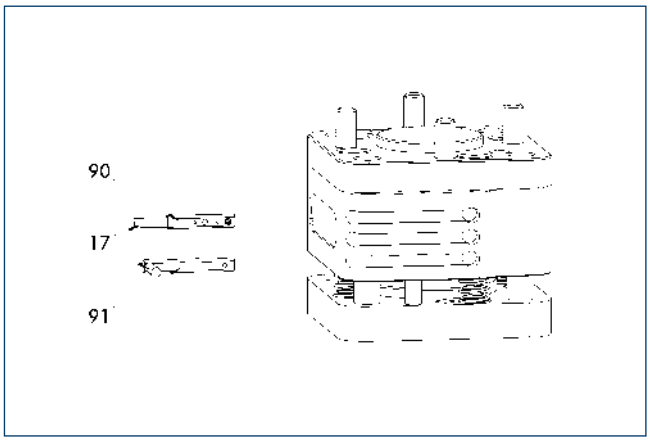
(17) Cable outlet
(91) MMS 22...-SA sensor
(90) MMS 22... sensor

End position monitoring for mounting in the C-slot

Description	ID	Often combined
MMS electronic magnetic switches		
MMS 22-S-M8-PNP	0301032	●
MMSK 22-S-PNP	0301034	
MMS electronic magnetic switches with lateral cable outlet		
MMS 22-S-M8-PNP-SA	0301042	●
MMSK 22-S-PNP-SA	0301044	
Cable extensions		
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
Sensor distributor		
V2-M8	0301775	●
V4-M8	0301746	
V8-M8	0301751	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

MMS PI1 programmable magnetic switch



(17) Cable outlet
(91) MMS 22...-PI1-...-SA sensor
(90) MMS 22...PI1-... sensor

Position monitoring with a programmable position per each sensor. The electronic system is integrated in the sensor. Programmable via magnetic teach-in tool MT (included in delivery) or plug-in teachable tool ST (on option). Monitoring of the end position is integrated in the C-slot. If the plug-in teachable tools need to be directly indicated as an accessory of the actuator, the magnetic switches MMS...-PI... at the actuators can be only taught via the plug-in teach tool ST.

Description	ID	Often combined
MMS PI1 programmable magnetic switch		
MMS 22-PI1-S-M8-PNP	0301160	●
MMSK 22-PI1-S-PNP	0301162	
MMS PI1-HD programmable magnetic switch with stainless steel housing		
MMS 22-PI1-S-M8-PNP-HD	0301110	●
MMSK 22-PI1-S-PNP-HD	0301112	
MMS PI1 programmable magnetic switch with lateral cable outlet		
MMS 22-PI1-S-M8-PNP-SA	0301166	●
MMSK 22-PI1-S-PNP-SA	0301168	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Compact. Smooth. Robust.

AGE-XY Compensation Unit

Compensation unit for applications in assembly, loading, and unloading of machines and workpiece carriers. The use of AGE-XY makes it possible to securely grip and transfer workpieces despite position or angular offsets.

Field of Application

Palletizing, joining, and assembly of workpieces

Advantages – Your benefit

ISO flange pattern for easy assembly to most types of robots without needing additional adapter plates

Robust slide guidance for high moment load at minimum space

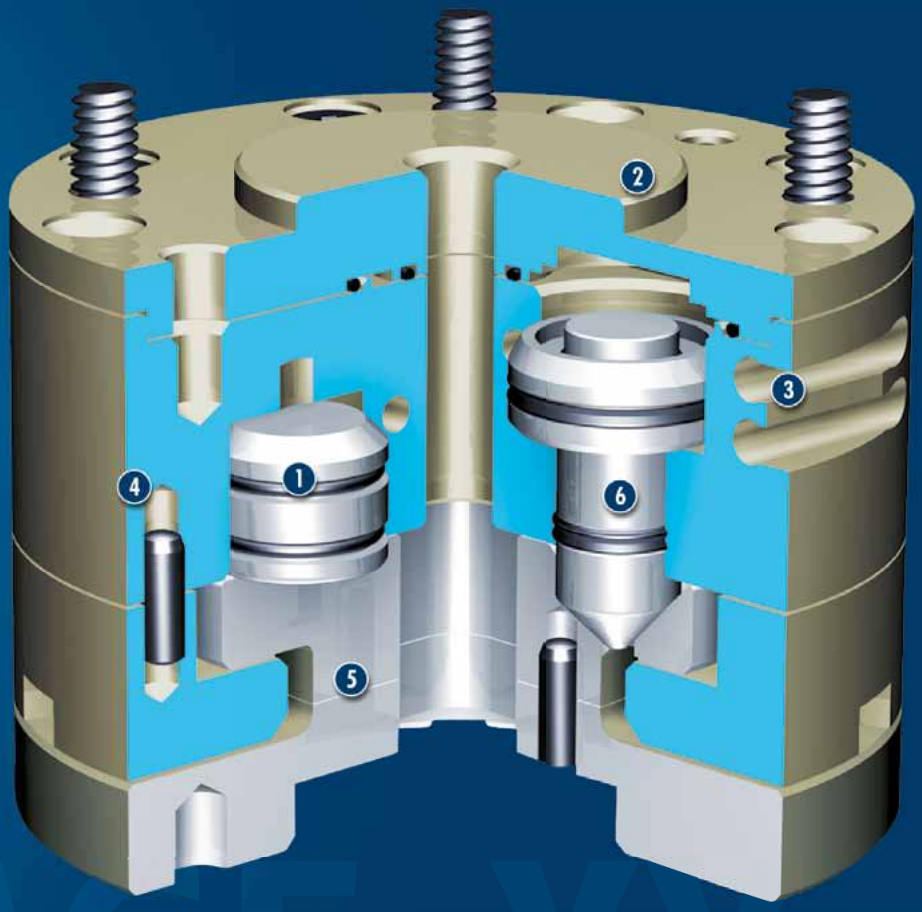
Centrical locking for centering the unit in a defined position

Pneumatic position storage for eccentric locking in a deflected position

Sizes	Handling weight	Compensation XY	Rotary compensation angle
Quantity: 3	6 .. 15 kg	±2.5 .. 4 mm	±12 .. 16°

Functional Description

The AGE-XY compensation unit allows activation of the linear motion in XY-direction of the robots or handling units. After compensation, the workpiece can be centrically aligned again.



① **Position memory**
Locking in any position using two pneumatically driven pistons and frictional connection

② **Direct assembly**
by using a standardized ISO 9409 interface for robots

③ **Monitoring**
Stroke monitoring of the locking piston with magnetic switches

④ **Housing**
Weight-optimized through application of high-strength aluminum alloy

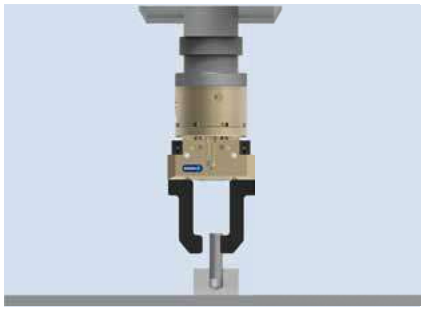
⑤ **Compensation body**
for compensating positioning errors in the XY-plane

⑥ **Locking**
Pneumatically driven centric locking

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

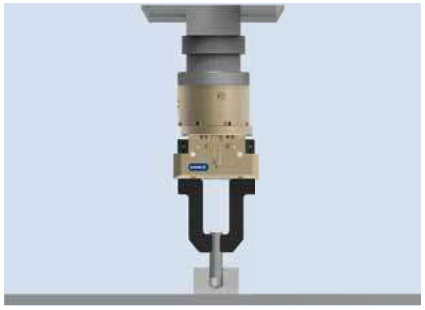
Detailed functional Description

Case A, removal: AGE unlocked – Gripper open



The robot travels towards the workpiece with a gripper unit consisting of an AGE (compensation unit) and gripper. There is an axial offset due to tolerances / imprecision.

Case A, removal: AGE unlocked – Gripper closed

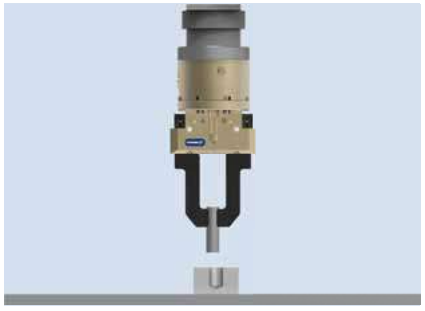


An unlocked AGE can be used to compensate the existing axial offset between the gripper and workpiece axes.

Case A, removal: AGE locked (position memory) – Gripper closed

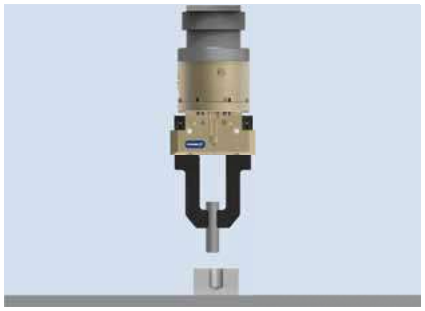
The robot can remove the workpiece. The deflected position of the AGE can be locked via the integrated position memory.

Case A, removal: AGE centrically locked – Gripper closed



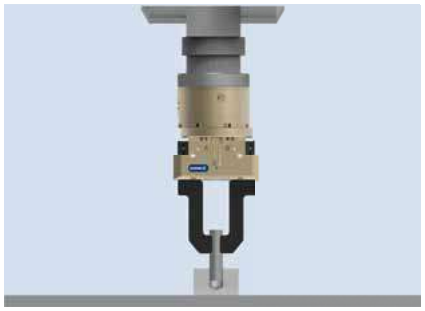
The position memory of the AGE is unlocked and the centered AGE lock is activated. That renders the original axis offset, as the gripper and robot axis are now centered relative to one another.

Case B, joining: AGE centrically locked – Gripper closed



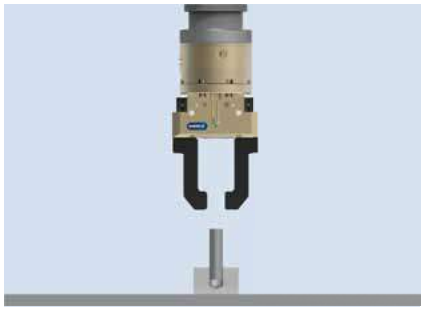
The robot travels towards the workpiece with a gripper unit consisting of an AGE (compensation unit) and gripper. There is an axial offset due to tolerances / imprecision.

Case B, joining: AGE unlocked – Gripper closed



An unlocked AGE can be used to compensate the existing axial offset between the gripper and workpiece axes and the workpiece can be joined.

Case B, joining: AGE unlocked – Gripper open



The robot moves away from the center of compliance with the gripper unit, the unit is then centrically locked and the gripper is closed.

General Notes to the Series

Monitoring: By magnetic switch

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Housing: hard anodized aluminum alloy, functional parts made of hardened steel

Scope of delivery: Robot-side mounting screws

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void the warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Assembly unit for mounting a pin in a bore with tolerances for the position. The compensation unit compensates for the planar offset without turning or tilting the workpiece.

1. PGF 80 2-Finger Parallel Gripper with special finger and workpiece (pin)
2. AGE-XY-80 Compensation Unit

SCHUNK offers more ...

The following components make the AGE-XY even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Fittings

MMS Magnetic Switch

Sensor Cables

PGN-plus Universal Gripper

OPR Collision and Overload Sensor

HWS Manual Gripper Change System

PZN-plus Centric Gripper

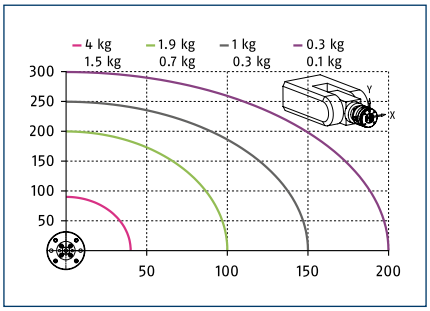
SWS Quick-change System

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

AGE-XY 050

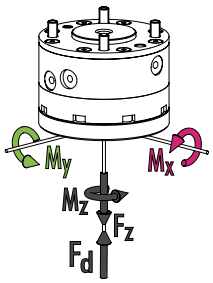
Robot Accessories | Compensating | XY-Compensation Unit

Load chart



Location of the center of mass depending on the payload at horizontal application. A higher value of mass is valid for centrical locking, and a lower value of mass for position storage.

Forces and moments



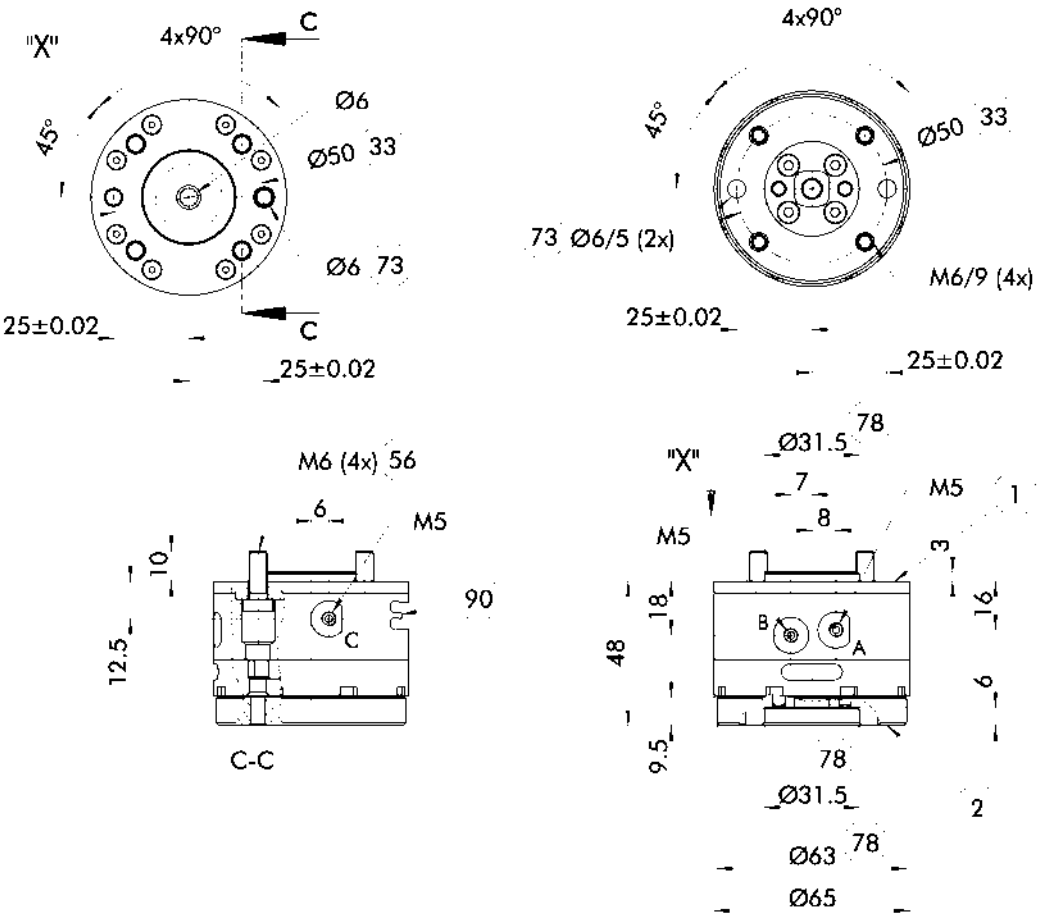
M_x max. 16 Nm
M_y max. 16 Nm
M_z max. 3.5 Nm
F_z max. 300 N
F_d max. 1700 N

ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-XY-050	AGE-XY-050-P
ID		0324450	0324451
Compensation XY	[mm]	±2.5	±2.5
Rotary compensation angle	[°]	±12	±12
max. vertical payload	[kg]	6	6
max. payload horizontal	[kg]	4	4
Recommended payload position storage	[kg]		1.5
Locking force	[N]	235	235
max. load centric locking	[N]	130	130
max. radial force, position storage	[N]		45
Rotation moment position stroke	[Nm]		1.2
max. displacement force distance in Z	[mm]	120	120
min. / max. operating pressure	[bar]	2.5/8	2.5/8
Nominal operating pressure	[bar]	6	6
Repeat accuracy	[mm]	0.1	0.1
Robot side connection		ISO 9409-1-50-4-M6	ISO 9409-1-50-4-M6
Mass	[kg]	0.46	0.47
min. / max. ambient temperature	[°C]	5/60	5/60

Main view

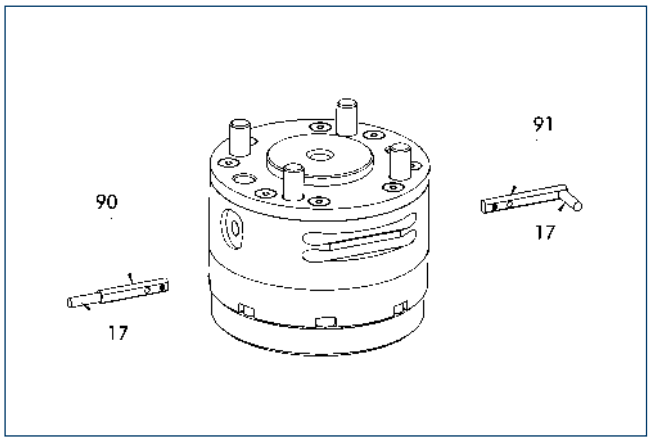


The main view shows the unit in its basic version.

A, a Air connection locked
B, b Air connection unlocked
C, c Air connection position memory XY
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for a centering pin
(78) Fitting for centering
(90) Groove for magnetic switch

AGE-XY 050

Sensor system

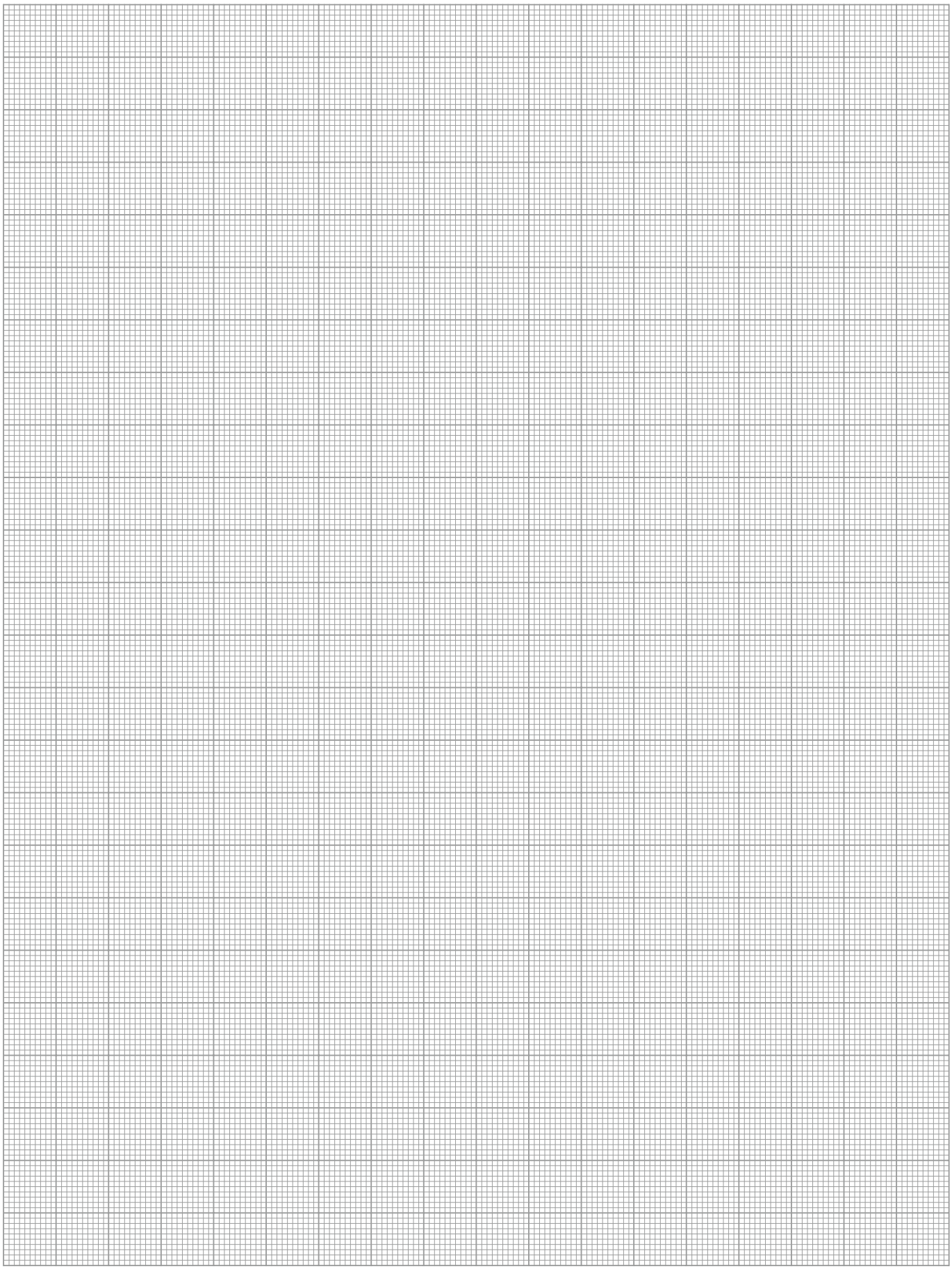


(17) Cable outlet
(91) MMS 22...-SA sensor
(90) MMS 22.. sensor

End position monitoring for mounting in the C-slot

Description	ID	
MMS electronic magnetic switches		
MMS 22-S-M8-PNP	0301032	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	
Cable extensions		
KA BG08-L 3P-0200-PNP	0301497	
Sensor distributor		
V2-M8	0301775	

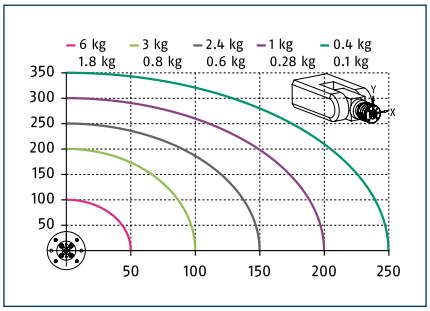
ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



AGE-XY 063

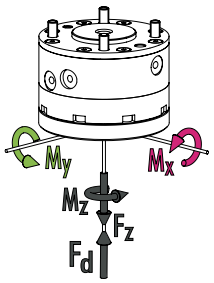
Robot Accessories | Compensating | XY-Compensation Unit

Load chart



Location of the center of mass depending on the payload at horizontal application. A higher value of mass is valid for centrical locking, and a lower value of mass for position storage.

Forces and moments



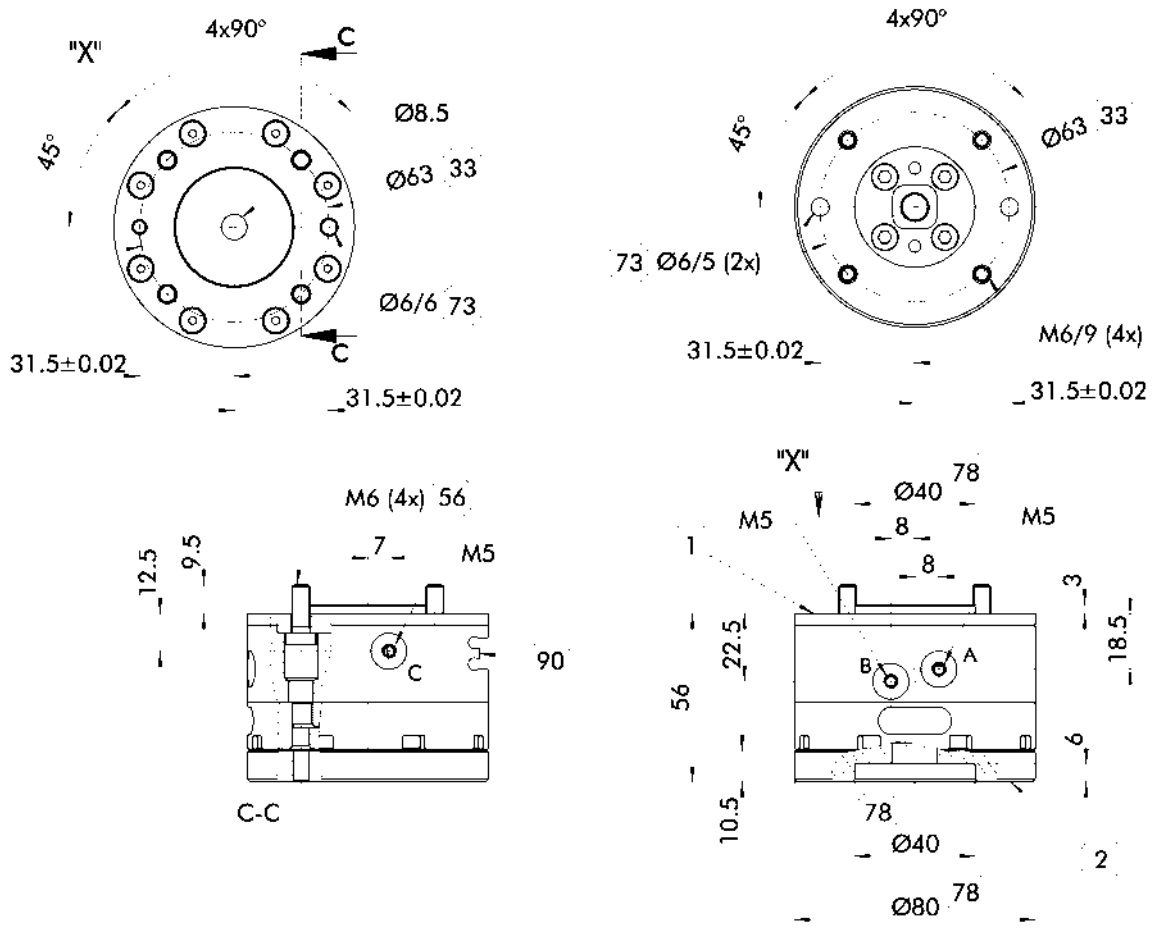
M_x max. 26 Nm
M_y max. 26 Nm
M_z max. 6 Nm
F_z max. 450 N
F_d max. 2600 N

ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-XY-063	AGE-XY-063-P
ID		0324463	0324464
Compensation XY	[mm]	±3	±3
Rotary compensation angle	[°]	±12	±12
max. vertical payload	[kg]	9	9
max. payload horizontal	[kg]	6	6
Recommended payload position storage	[kg]		1.8
Locking force	[N]	370	370
max. load centric locking	[N]	200	200
max. radial force, position storage	[N]		50
Rotation moment position stroke	[Nm]		1.7
max. displacement force distance in Z	[mm]	160	160
min. / max. operating pressure	[bar]	2.5/8	2.5/8
Nominal operating pressure	[bar]	6	6
Repeat accuracy	[mm]	0.1	0.1
Robot side connection		ISO 9409-1-63-4-M6	ISO 9409-1-63-4-M6
Mass	[kg]	0.83	0.85
min. / max. ambient temperature	[°C]	5/60	5/60

Main view

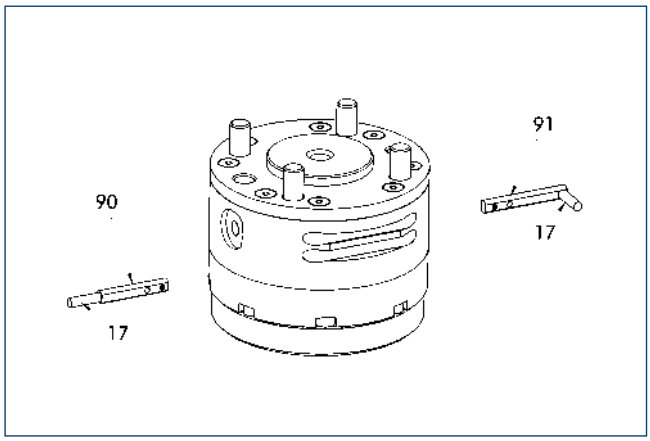


The main view shows the unit in its basic version.

A, a Air connection locked
B, b Air connection unlocked
C, c Air connection position memory XY
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for a centering pin
(78) Fitting for centering
(90) Groove for magnetic switch

AGE-XY 063

Sensor system

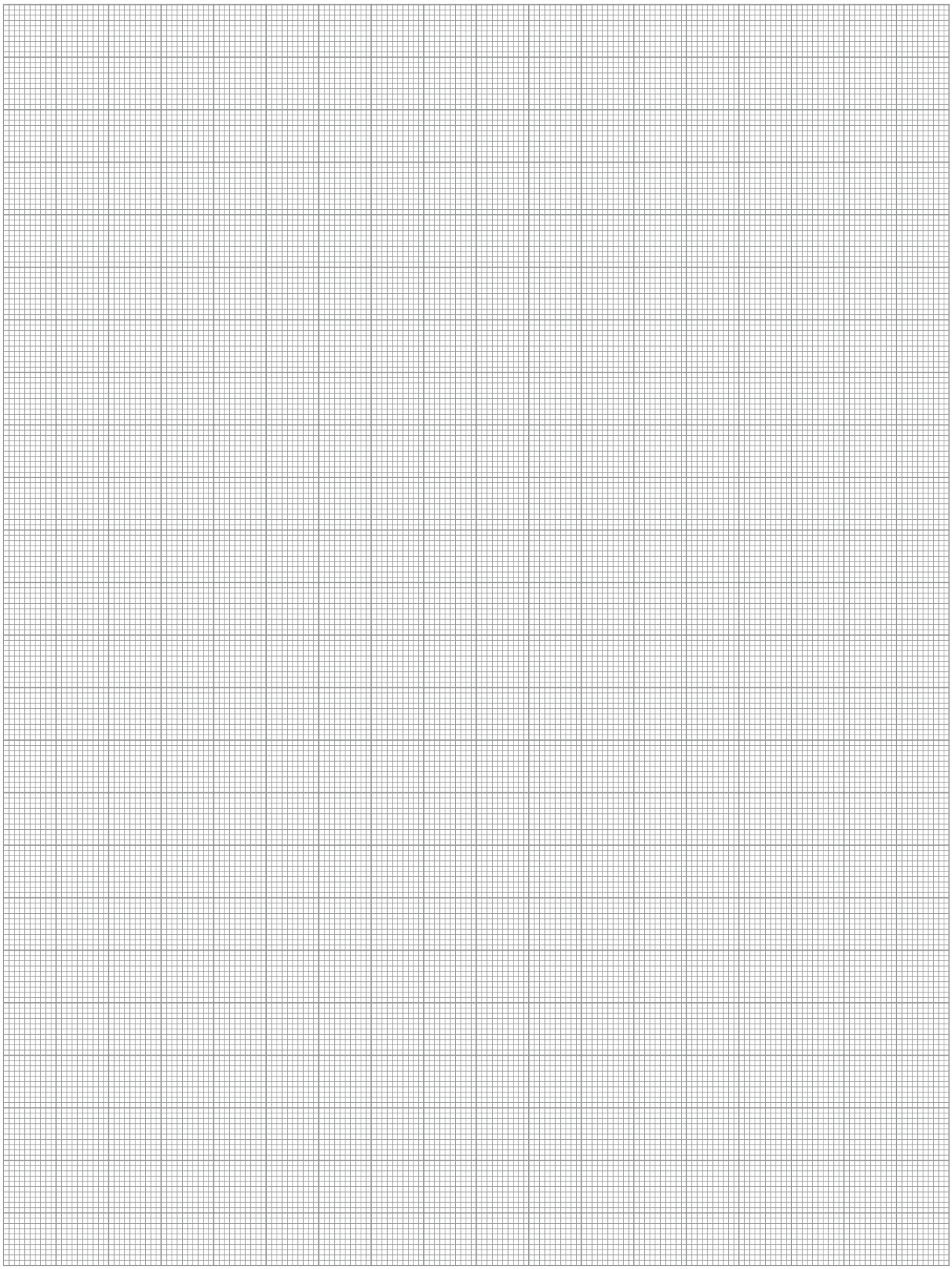


(17) Cable outlet
(91) MMS 22...-SA sensor
(90) MMS 22.. sensor

End position monitoring for mounting in the C-slot

Description	ID	
MMS electronic magnetic switches		
MMS 22-S-M8-PNP	0301032	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	
Cable extensions		
KV BW08-SG08 3P-0200-PNP	0301497	
Sensor distributor		
V2-M8	0301775	

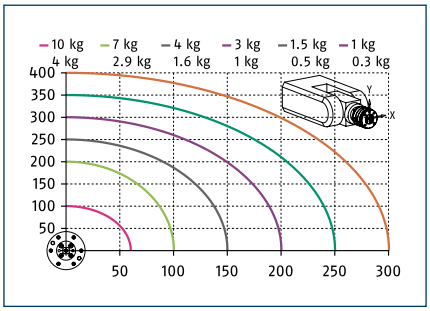
ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



AGE-XY 080

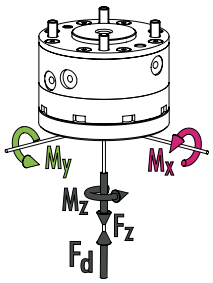
Robot Accessories | Compensating | XY-Compensation Unit

Load chart



Location of the center of mass depending on the payload at horizontal application. A higher value of mass is valid for centrical locking, and a lower value of mass for position storage.

Forces and moments



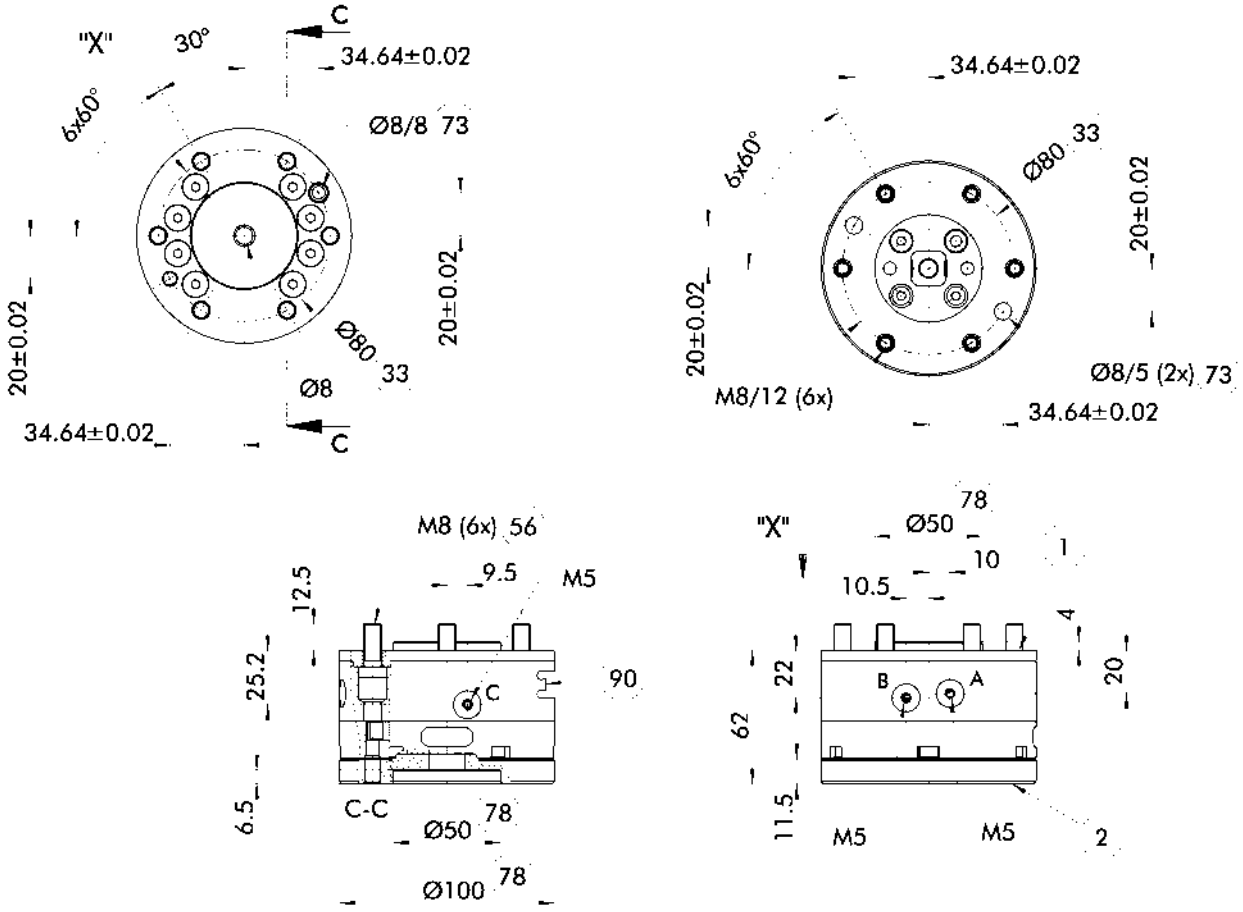
M_x max. 30 Nm
M_y max. 30 Nm
M_z max. 9 Nm
F_z max. 750 N
F_d max. 3200 N

ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-XY-080	AGE-XY-080-P
ID		0324480	0324481
Compensation XY	[mm]	±4	±4
Rotary compensation angle	[°]	±16	±16
max. vertical payload	[kg]	15	15
max. payload horizontal	[kg]	10	10
Recommended payload position storage	[kg]		4
Locking force	[N]	580	580
max. load centric locking	[N]	310	310
max. radial force, position storage	[N]		145
Rotation moment position stroke	[Nm]		4
max. displacement force distance in Z	[mm]	200	200
min. / max. operating pressure	[bar]	2.5/8	2.5/8
Nominal operating pressure	[bar]	6	6
Repeat accuracy	[mm]	0.1	0.1
Robot side connection		ISO 9409-1-A-80	ISO 9409-1-A-80
Mass	[kg]	1.49	1.5
min. / max. ambient temperature	[°C]	5/60	5/60

Main view

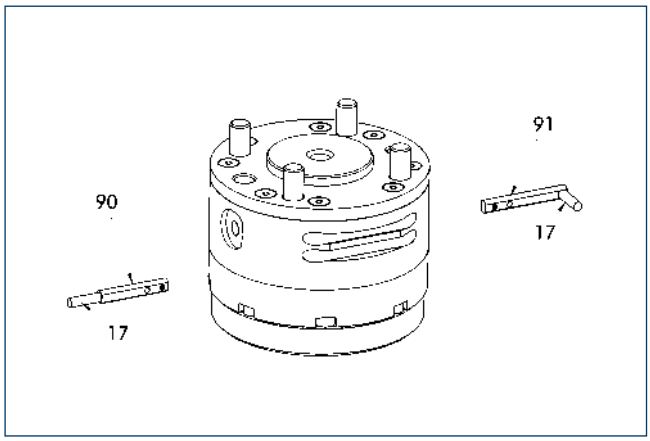


The main view shows the unit in its basic version.

A, a Air connection locked
B, b Air connection unlocked
C, c Air connection position memory XY
(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for a centering pin
(78) Fitting for centering
(90) Groove for magnetic switch

AGE-XY 080

Sensor system



(17) Cable outlet
(91) MMS 22...-SA sensor
(90) MMS 22... sensor

End position monitoring for mounting in the C-slot

Description	ID	
MMS electronic magnetic switches		
MMS 22-S-M8-PNP	0301032	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	
Cable extensions		
KV BW08-SG08 3P-0200-PNP	0301497	
Sensor distributor		
V2-M8	0301775	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Flat. Flexible. Compact.

XY Compensation Unit with Spring Return

Compensation unit for assembly applications, for loading and unloading of machines, and workpiece carriers. Due to the use of an AGE-F, workpieces with position misalignment can be safely gripped and fed.

Field of Application

Palletizing, joining, and assembly of workpieces

Advantages – Your benefit

Spring reset in three different spring strengths for a defined, centric position at a repeat accuracy of 0.02 mm

Direct assembly of grippers of the PGN-plus and PZN-plus series without additional adapter plates.

Cross roller guides for smooth compensation at low compensation forces

Adjustable compensation stroke for minimizing interfering contours

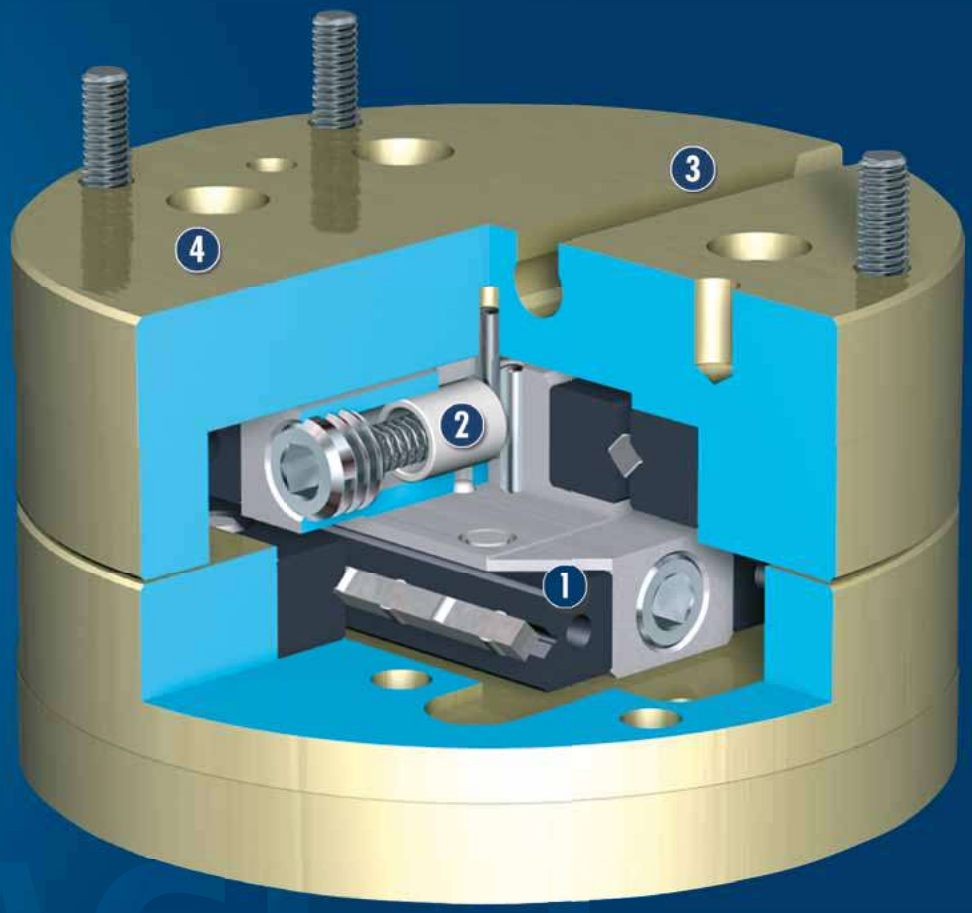
Adjustable spring force for adjusting the spring force according to the application

Sizes
Quantity: 4

Handling weight
1.5 .. 32 kg

Compensation XY
±1.5 .. 5 mm

Functional Description



① **Linear guidance**
Smooth-running cross roller guidance

② **Spring-actuated reset**
Different spring forces for safe centering without pneumatic system

③ **Groove for magnetic switch**
for monitoring the compensating stroke in X- and Y-stroke

④ **Housing**
Weight-optimized through application of high-strength aluminum alloy

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Guidance system: smooth-running cross roller guidance

Monitoring: By magnetic switch

Actuation: spring return with spring forces from 0.5 N to 190 N

Housing: hard anodized aluminum alloy, functional parts made of hardened steel

Scope of delivery: Including robot-side mounting screws

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void the warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Assembly unit for mounting a pin in a bore with tolerances for the position. The compensation unit compensates for the planar offset without turning or tilting the workpiece.

1. AGE-F Compensation Unit
2. PGN-plus 2-Finger Universal Gripper

SCHUNK offers more ...

The following components make the AGE-F even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Adapter Plates

Magnetic Switches

Extension Cable

PGN-plus Universal Gripper

PWG-plus Angular Gripper

HWS Manual Gripper Change System

PZN-plus Centric Gripper

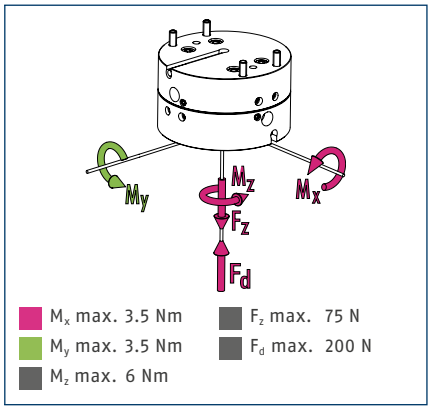
SWS Quick-change System

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

AGE-F 031

Robot Accessories | Compensating | Compensation Unit

Forces and moments

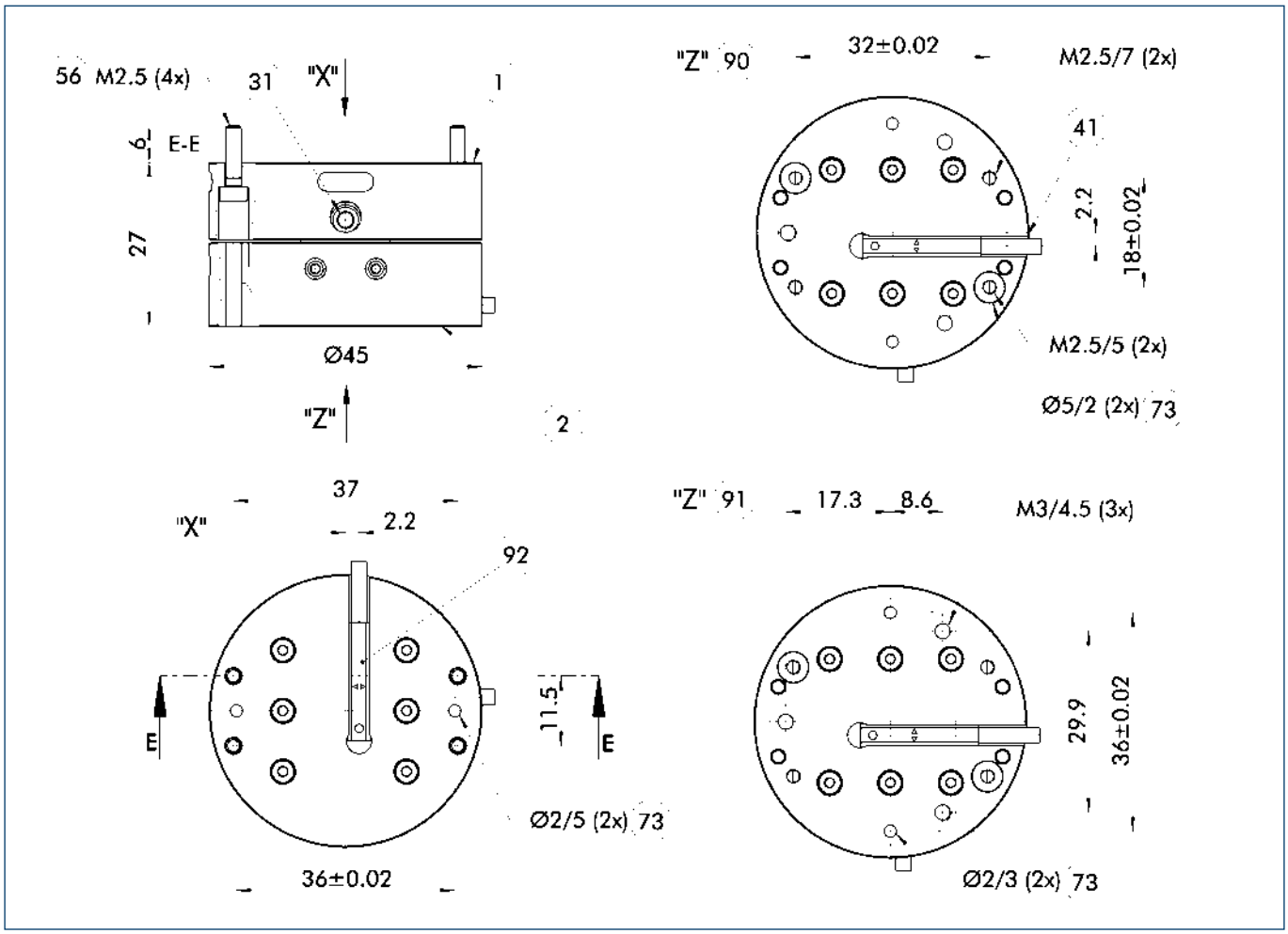


ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-F-XY-031-1	AGE-F-XY-031-2	AGE-F-XY-031-3
ID		0324900	0324901	0324902
Compensation XY	[mm]	±1.5	±1.5	±1.5
max. payload	[kg]	1.5	1.5	1.5
min. reset force	[N]	0.5	2	5
max. reset force	[N]	2	3.5	7
Spring rate	[N/mm]	1	1	1.3
Repeat accuracy	[mm]	±0.01	±0.01	±0.01
Mass	[kg]	0.123	0.123	0.123
min. / max. ambient temperature	[°C]	5/80	5/80	5/80

Main view



The main view shows the product with proximity switch, which is optional.

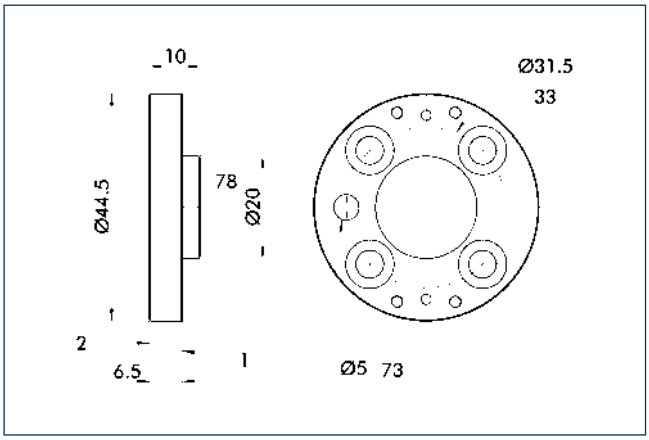
ⓘ Screws for robot-side mounting are already fitted

(1) Robot side connection
(2) Tool side connection
(31) Back stop for stroke limitation
(41) Optional proximity switch
(56) Included in delivery
(73) Fit for a centering pin
(90) Mounting interface PGN-plus 40
(91) Mounting interface PZN-plus 40
(92) Magnetic switches

AGE-F 031

Robot Accessories | Compensating | Compensation Unit

Adapter plate ISO 9409-31.5-4-M5

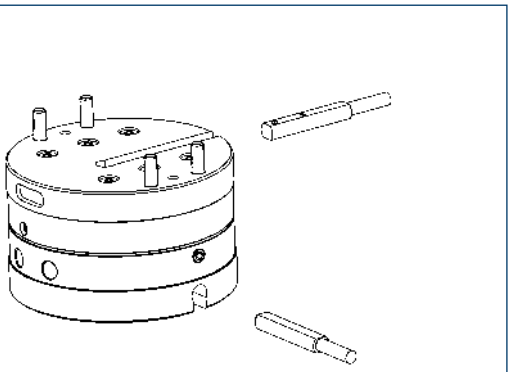


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Robot-side adapter plate with ISO 9409-31.5-4-M5 screw connection diagram.

Description	ID	Height
Robot-side		
A-AGE-F-XY-031	0324903	10 mm

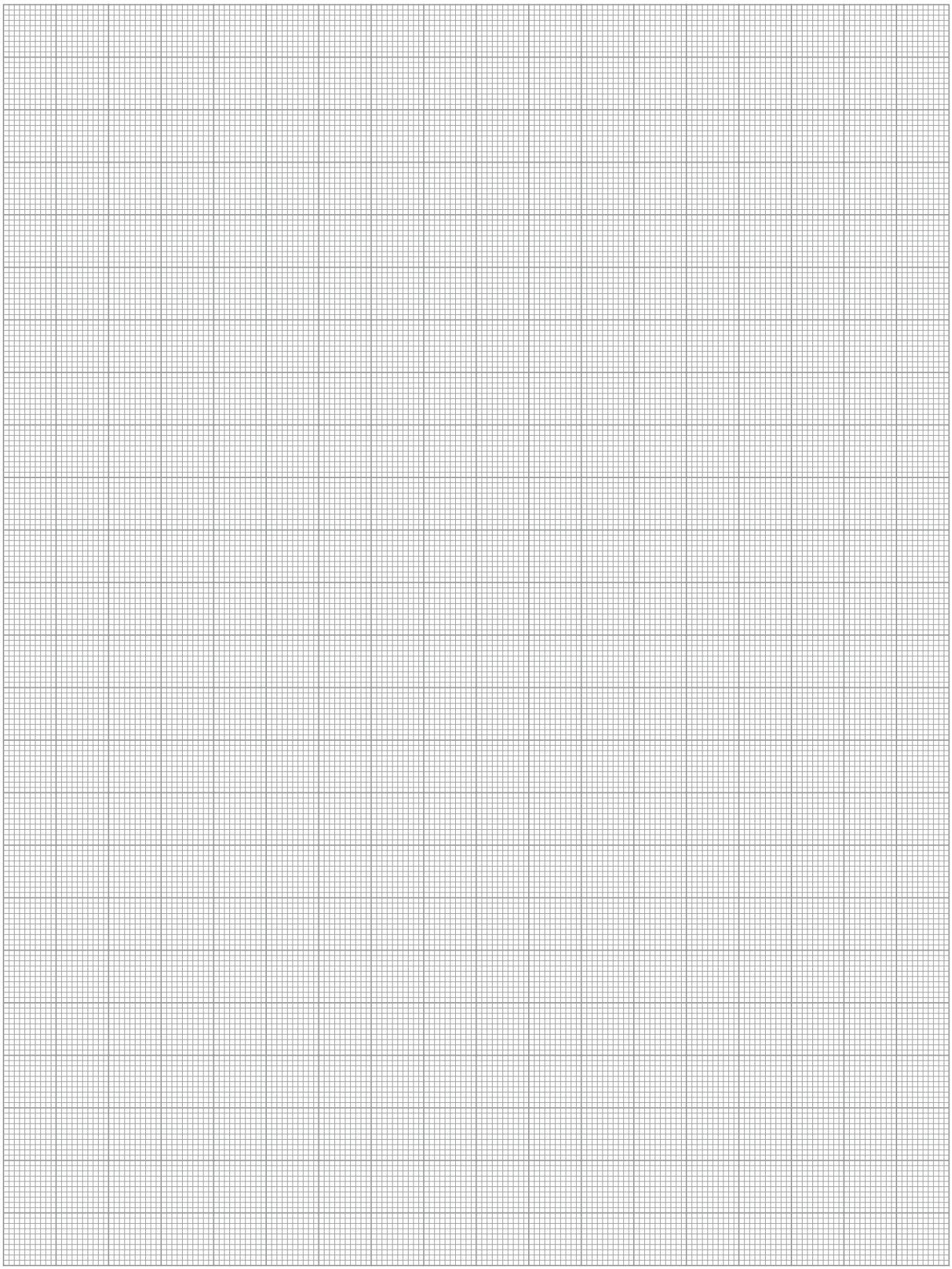
Sensor system



End position monitoring for mounting in the C-slot

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

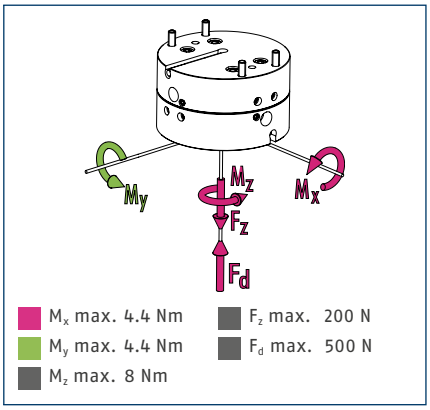
ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



AGE-F 040

Robot Accessories | Compensating | Compensation Unit

Forces and moments



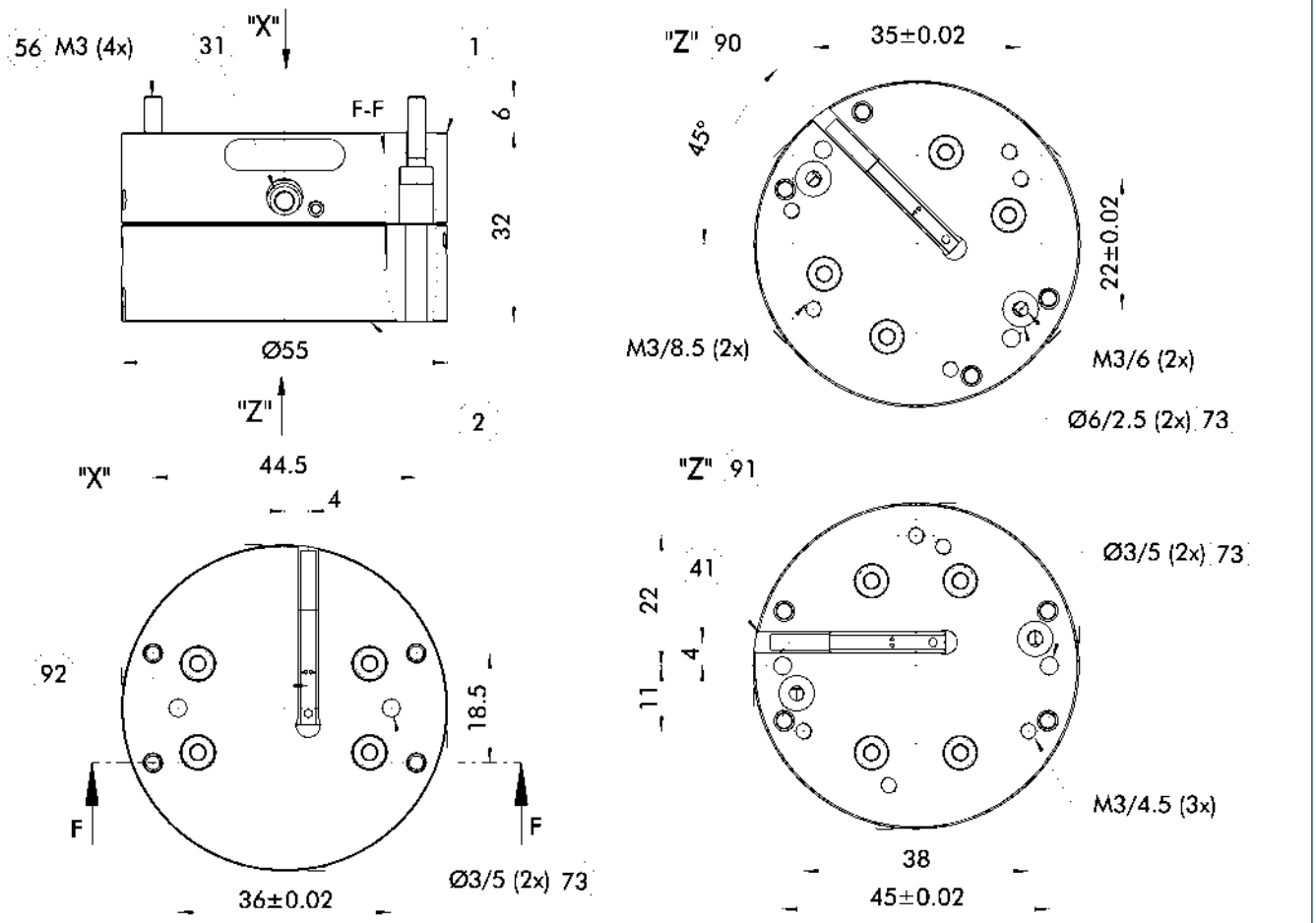
M_x max. 4.4 Nm
M_y max. 4.4 Nm
M_z max. 8 Nm
F_z max. 200 N
F_d max. 500 N

ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-F-XY-040-1	AGE-F-XY-040-2	AGE-F-XY-040-3
ID		0324920	0324921	0324922
Compensation XY	[mm]	±2	±2	±2
max. payload	[kg]	4	4	4
min. reset force	[N]	2	2.5	3
max. reset force	[N]	3	5	7
Spring rate	[N/mm]	0.5	1.3	2
Repeat accuracy	[mm]	±0.01	±0.01	±0.01
Mass	[kg]	0.23	0.23	0.23
min. / max. ambient temperature	[°C]	5/80	5/80	5/80

Main view



The main view shows the product with proximity switch, which is optional.

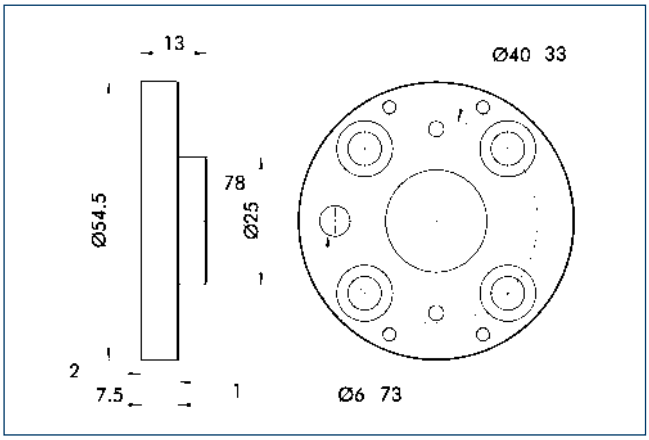
ⓘ Screws for robot-side mounting are already fitted

(1) Robot side connection
(2) Tool side connection
(31) Back stop for stroke limitation
(41) Optional proximity switch
(56) Included in delivery
(73) Fit for a centering pin
(90) Mounting interface PGN-plus 50
(91) Mounting interface PZN-plus 50
(92) Magnetic switches

AGE-F 040

Robot Accessories | Compensating | Compensation Unit

Adapter plate ISO 9409-40-4-M6

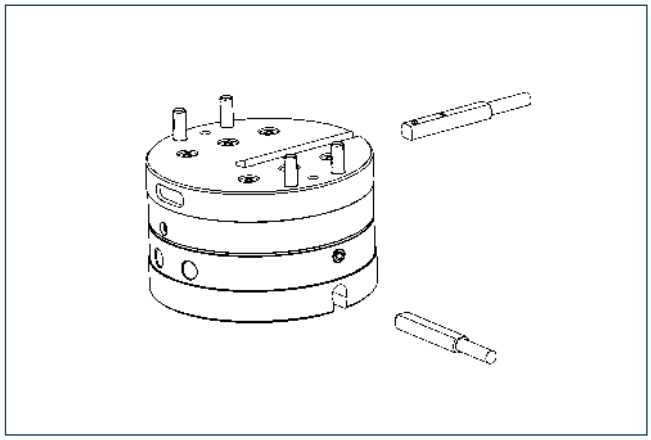


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection diagram

Description	ID	Height
Robot-side		
A-AGE-F-XY-040	0324923	13 mm

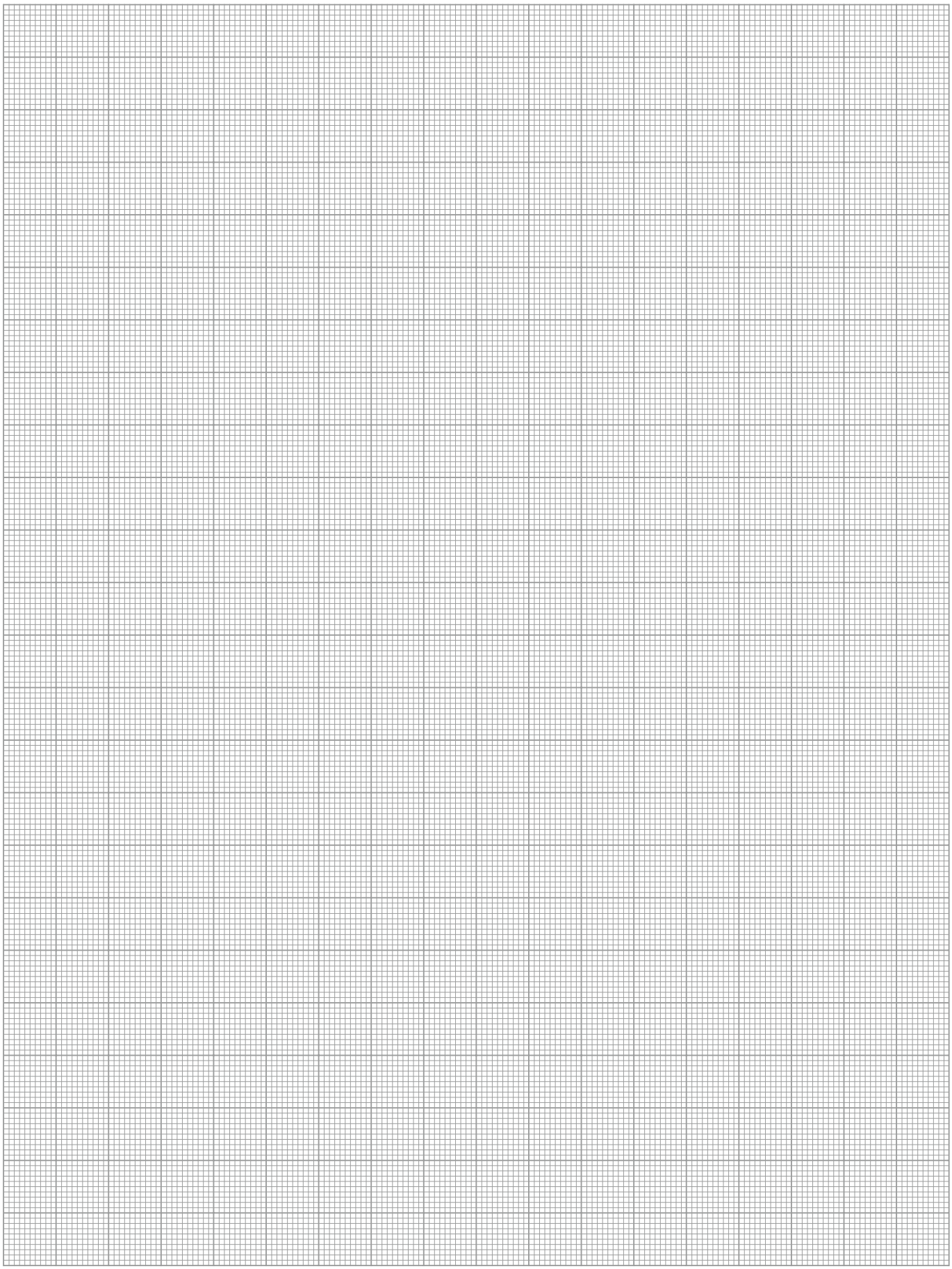
Sensor system



End position monitoring for mounting in the C-slot

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

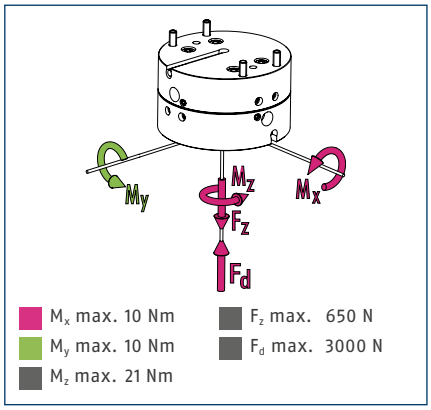
ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



AGE-F 063

Robot Accessories | Compensating | Compensation Unit

Forces and moments



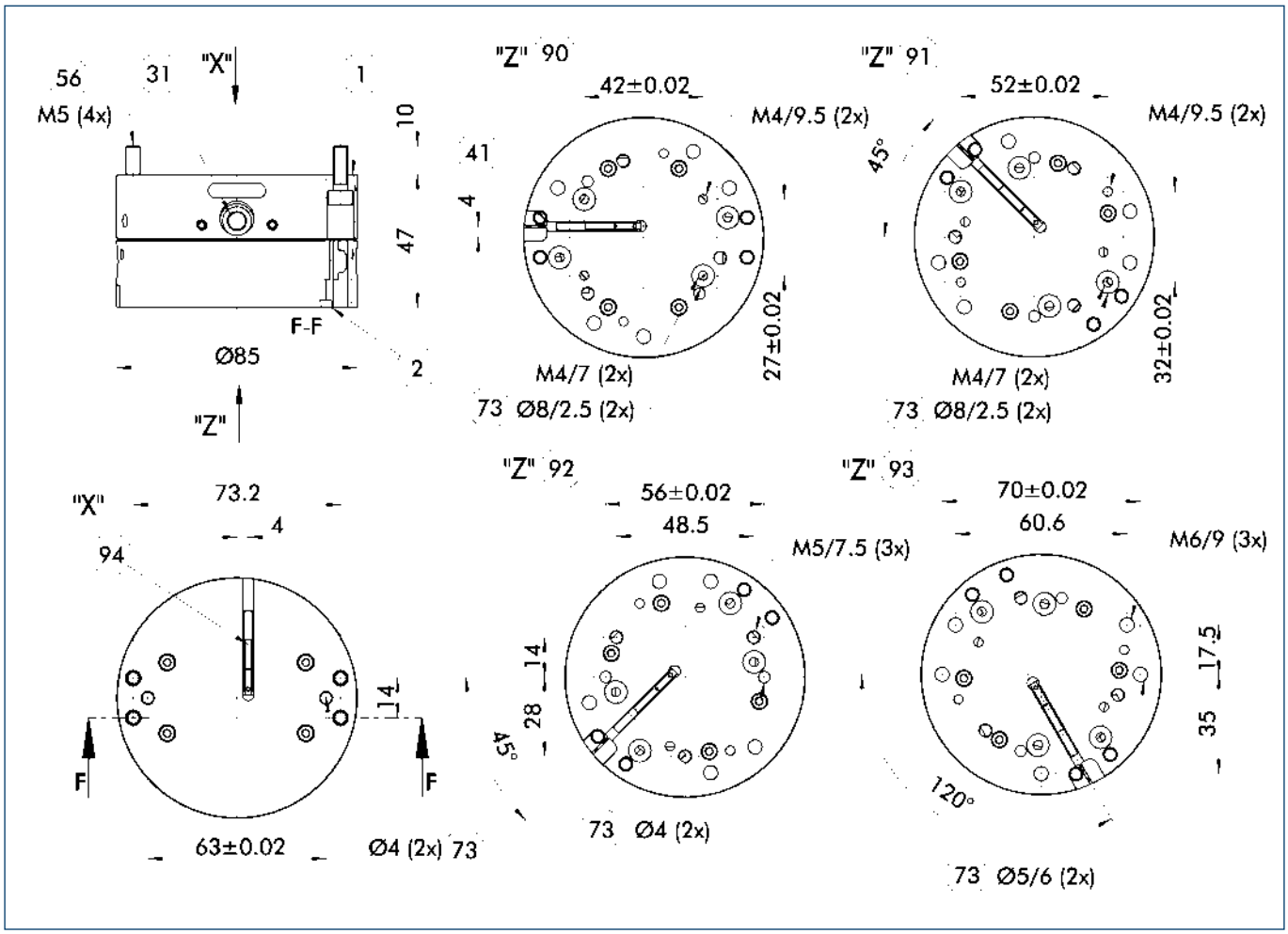
M_x max. 10 Nm
M_y max. 10 Nm
M_z max. 21 Nm
F_z max. 650 N
F_d max. 3000 N

ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-F-XY-063-1	AGE-F-XY-063-2	AGE-F-XY-063-3
ID		0324940	0324941	0324942
Compensation XY	[mm]	±4	±4	±4
max. payload	[kg]	12.5	12.5	12.5
min. reset force	[N]	12	13	18
max. reset force	[N]	20	32	45
Spring rate	[N/mm]	2	4.8	6.8
Repeat accuracy	[mm]	±0.01	±0.01	±0.01
Mass	[kg]	0.78	0.78	0.78
min. / max. ambient temperature	[°C]	5/80	5/80	5/80

Main view



The main view shows the product with proximity switch, which is optional.

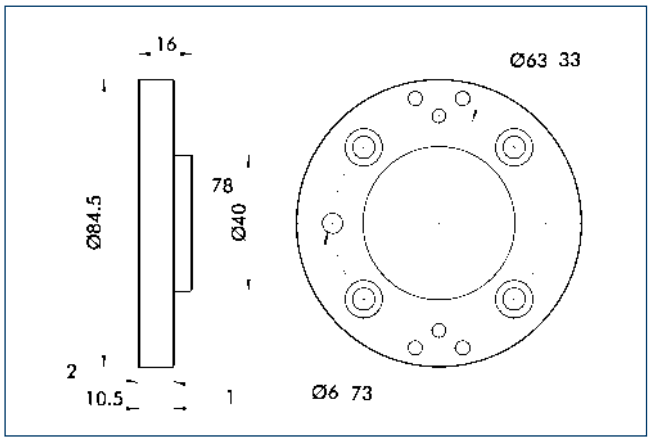
ⓘ Screws for robot-side mounting are already fitted

(1) Robot side connection
(2) Tool side connection
(31) Back stop for stroke limitation
(41) Optional proximity switch
(56) Included in delivery
(73) Fit for a centering pin
(90) Mounting interface PGN-plus 64
(91) Mounting interface PGN-plus 80
(92) Mounting interface PZN-plus 64
(93) Mounting interface PZN-plus 80
(94) Magnetic switches

AGE-F 063

Robot Accessories | Compensating | Compensation Unit

Adapter plate ISO 9409-63-4-M6

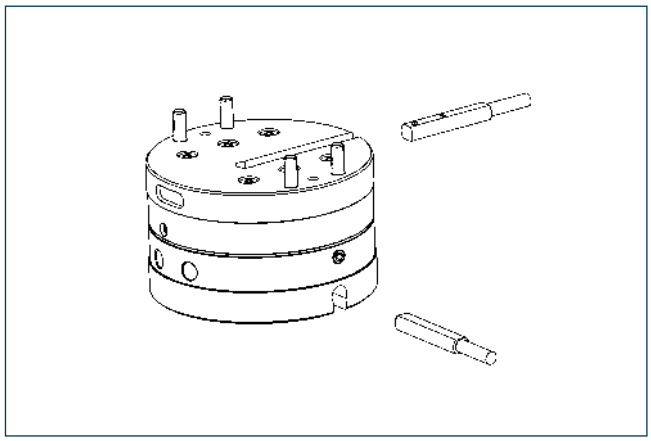


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection diagram

Description	ID	Height
Robot-side		
A-AGE-F-XY-063	0324943	16 mm

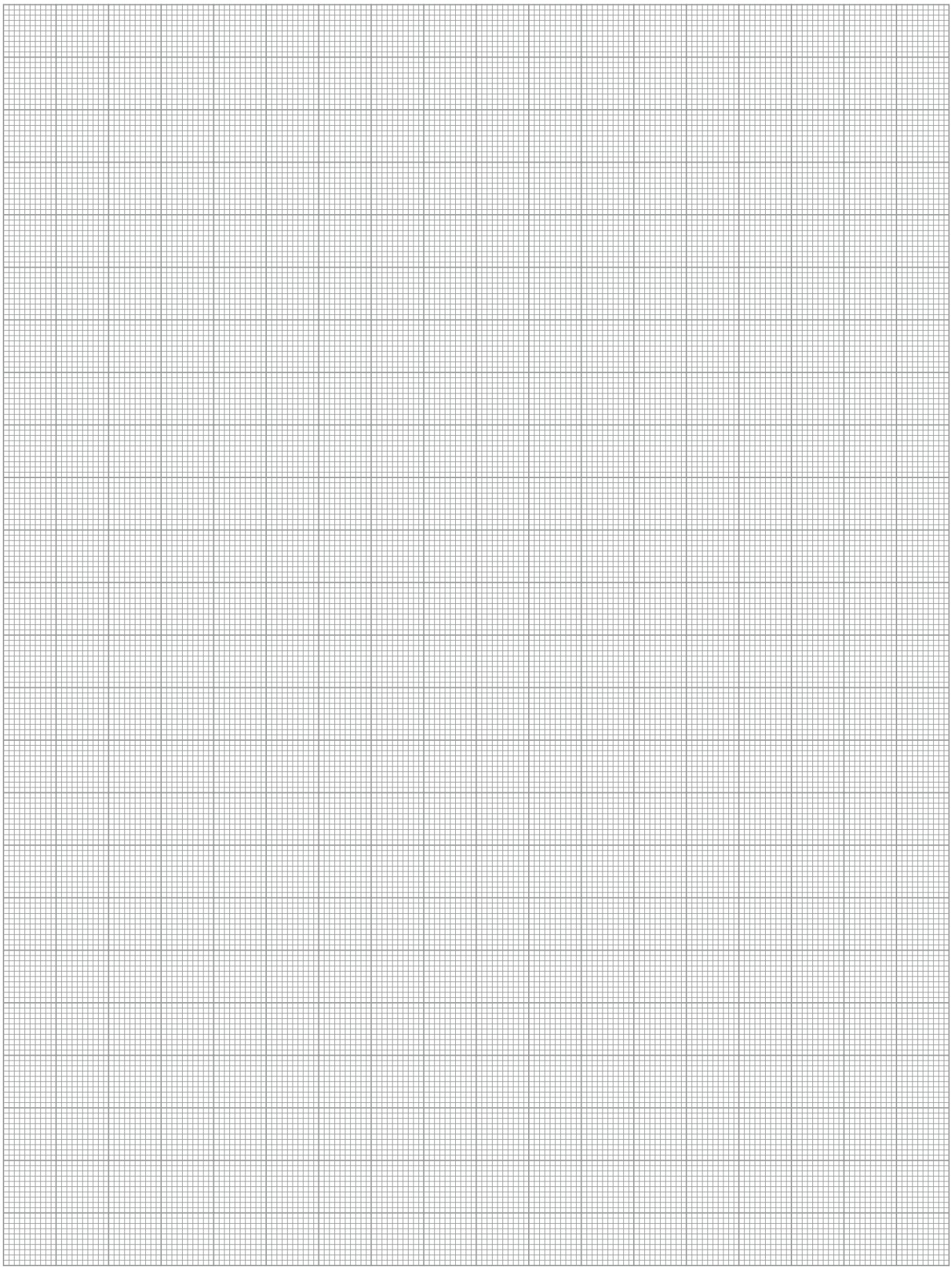
Sensor system



End position monitoring for mounting in the C-slot

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

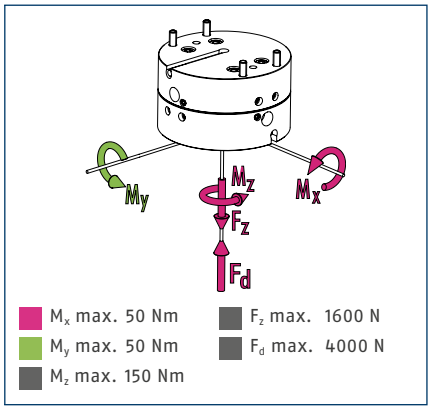
ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



AGE-F 080

Robot Accessories | Compensating | Compensation Unit

Forces and moments



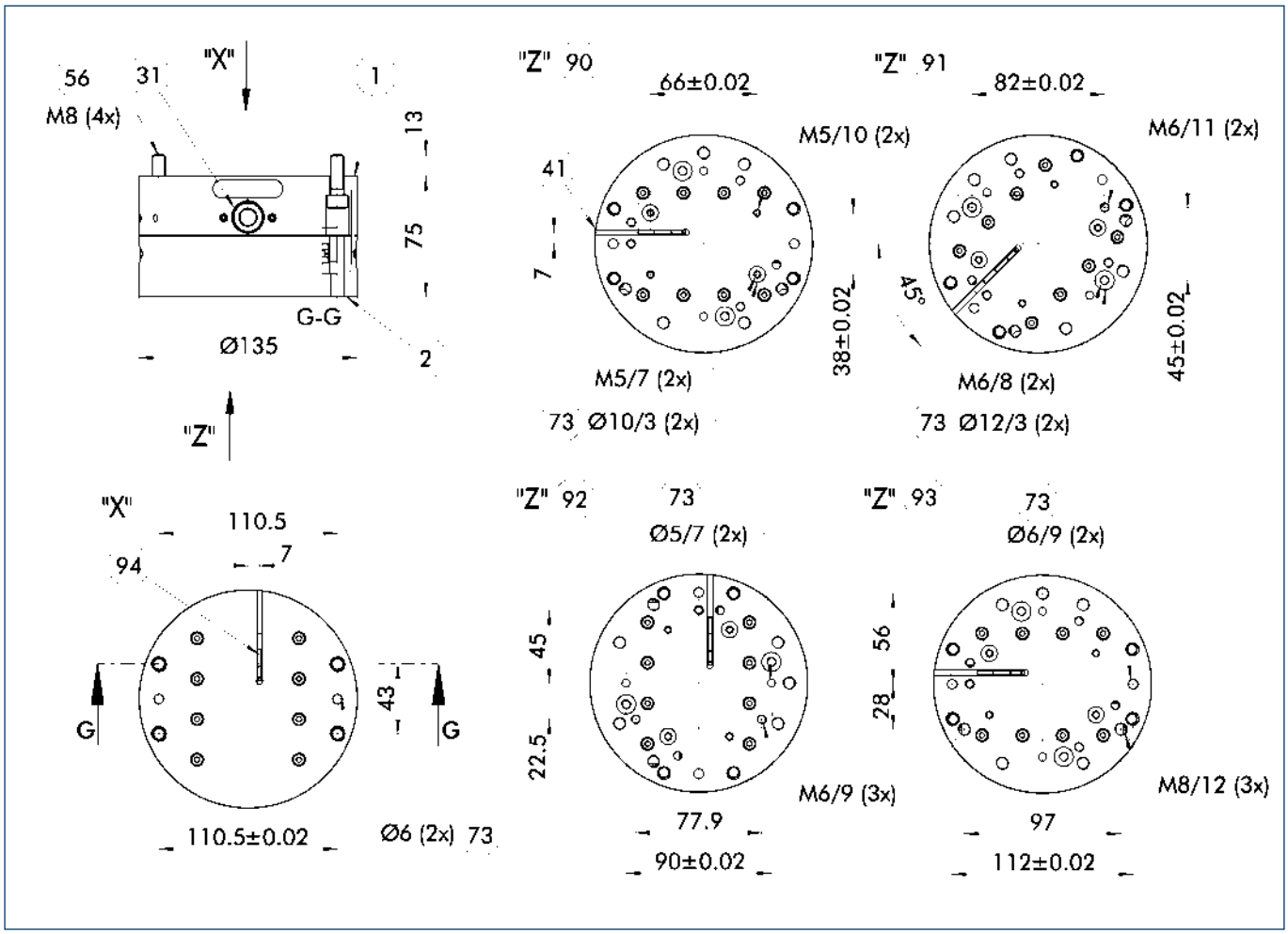
- M_x max. 50 Nm
- M_y max. 50 Nm
- M_z max. 150 Nm
- F_z max. 1600 N
- F_d max. 4000 N

ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-F-XY-080-1	AGE-F-XY-080-2	AGE-F-XY-080-3
ID		0324960	0324961	0324962
Compensation XY	[mm]	±5	±5	±5
max. payload	[kg]	32	32	32
min. reset force	[N]	36	55	65
max. reset force	[N]	70	130	190
Spring rate	[N/mm]	6.8	15	25
Repeat accuracy	[mm]	±0.01	±0.01	±0.01
Mass	[kg]	3.13	3.13	3.13
min. / max. ambient temperature	[°C]	5/80	5/80	5/80

Main view



The main view shows the product with proximity switch, which is optional.

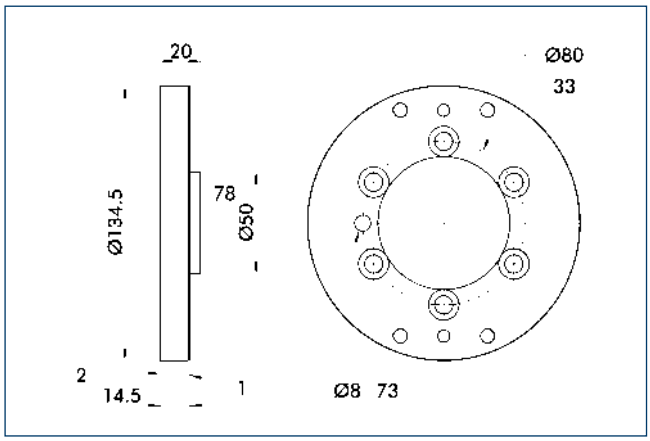
ⓘ Screws for robot-side mounting are already fitted

(1) Robot side connection
(2) Tool side connection
(31) Back stop for stroke limitation
(41) Optional proximity switch
(56) Included in delivery
(73) Fit for a centering pin
(90) Mounting interface PGN-plus 100
(91) Mounting interface PGN-plus 125
(92) Mounting interface PZN-plus 100
(93) Mounting interface PZN-plus 125
(94) Magnetic switches

AGE-F 080

Robot Accessories | Compensating | Compensation Unit

Adapter plate ISO 9409-80-6-M8

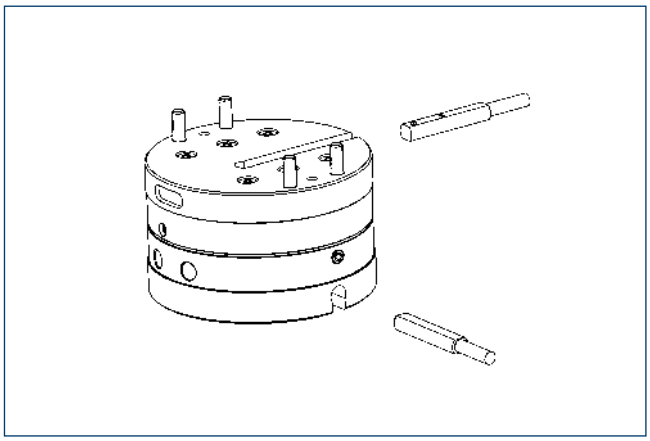


(1) Robot side connection
(2) Tool side connection
(33) DIN ISO-9409 bolt-hole circle diameter
(73) Fit for a centering pin
(78) Fitting for centering

Tool-side adapter plate with ISO 9409 screw connection diagram

Description	ID	Height
Robot-side		
A-AGE-F-XY-080	0324963	20 mm

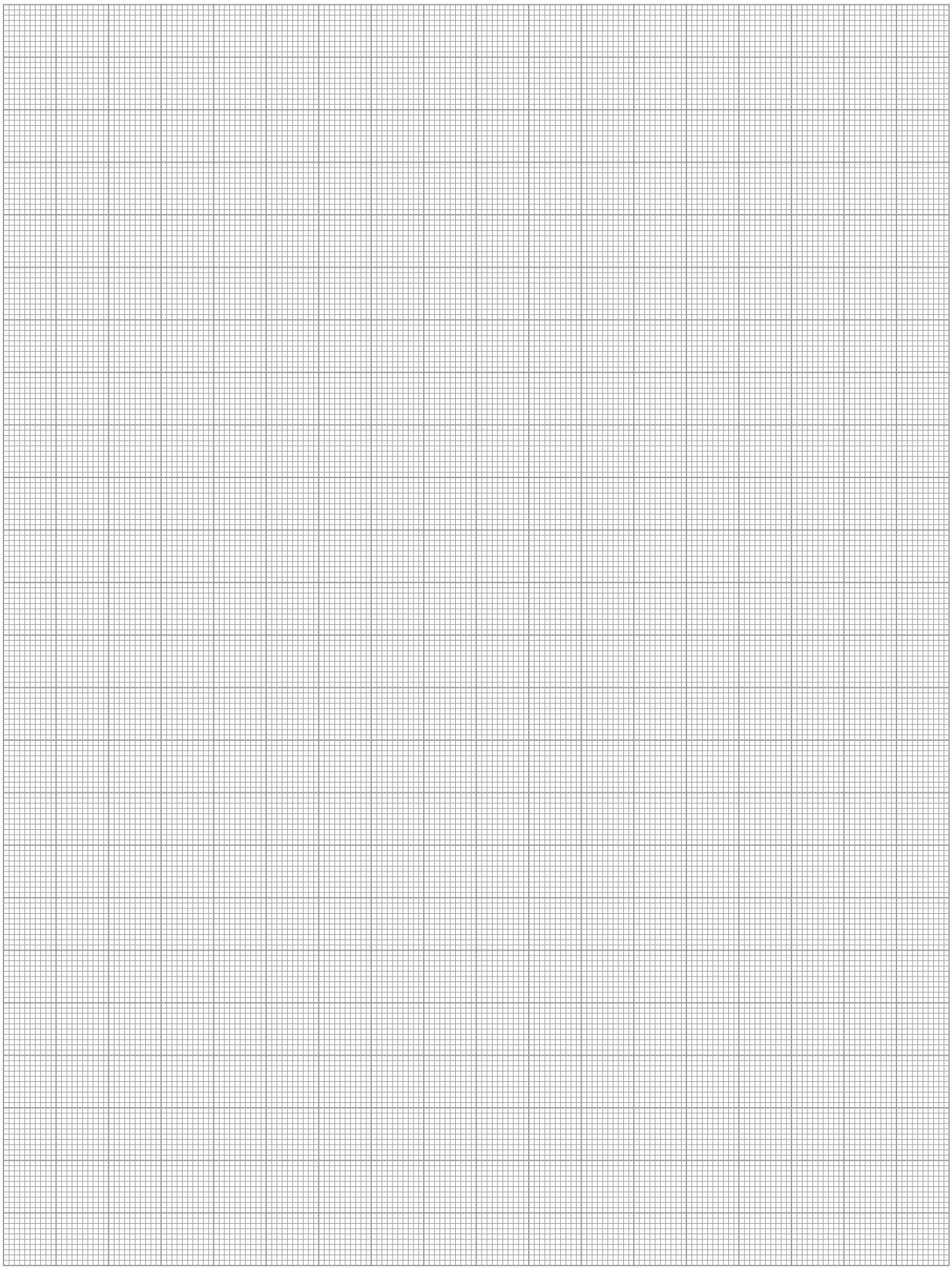
Sensor system



End position monitoring for mounting in the C-slot

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



Modular. Precise. Robust.

AGE-S-XYZ Compensation Unit

Compensation unit compensating in XY- and Z-direction.

Field of Application

Palletizing, joining, and assembly of workpieces

Advantages – Your benefit

ISO flange pattern for easy assembly to most types of robots without needing additional adapter plates

Three compensation directions in one unit compact design for minimum installation height

Centrical locking for fixing the unit rigidly in a defined, centrical position

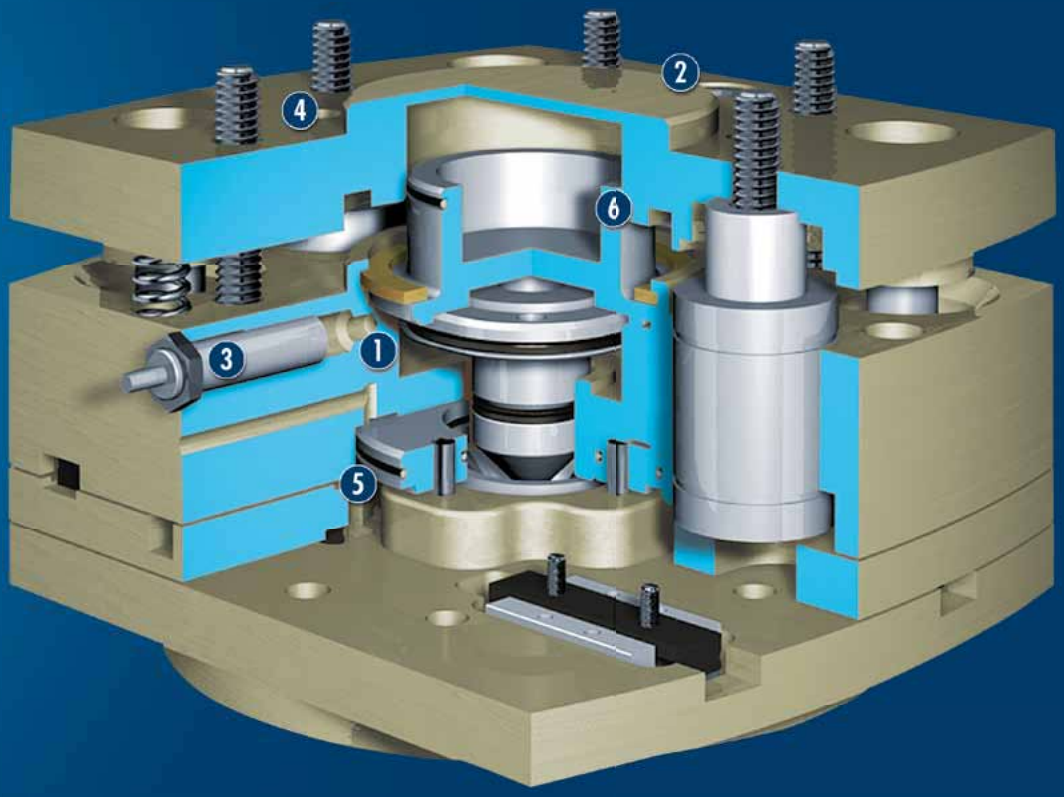
Pneumatic position storage for eccentric locking in an offset position

Sizes	Handling weight	Compensation XY	Compensation Z
Quantity: 4	9 .. 160 kg	±4 .. 12 mm	10 .. 14 mm

Functional Description

The AGE-S compensation unit extends the AGE series (AGE-XY / AGE-Z / AGE-F) for the medium and heavy load range, and provides perfect compensation in all automation tasks. Robust and highly precise linear guidances with excellent guiding stability permit maximum handling weight, and maximum compensation distances.

During handling in XY- as well as Z-direction, the unit can be made rigid using the integrated pneumatic lock, and eccentrically locked using the position memory in XY-direction.



① **Position memory**
Locking in any position using two pneumatically driven pistons and frictional connection

② **Direct assembly**
by using a standardized ISO 9409 interface for robots

③ **Monitoring**
Stroke monitoring of the locking piston with electronic magnetic switch

④ **Housing**
Weight-optimized through application of high-strength aluminum alloy

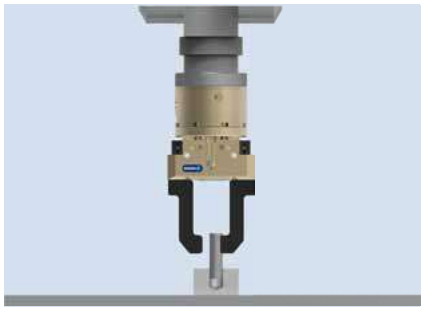
⑤ **Compensation body**
for compensating positioning errors in the X-Y plane

⑥ **Locking**
Pneumatically driven centric locking

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

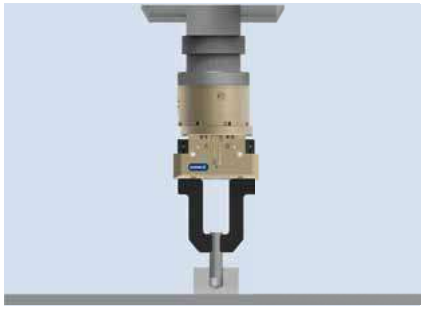
Detailed functional Description

Case A, removal: AGE unlocked – Gripper open



The robot travels towards the workpiece with a gripper unit consisting of an AGE (compensation unit) and gripper. There is an axial offset due to tolerances / imprecision.

Case A, removal: AGE unlocked – Gripper closed

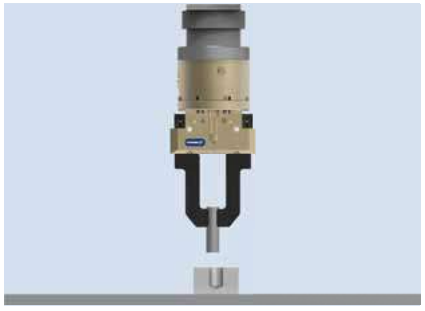


An unlocked AGE can be used to compensate the existing axial offset between the gripper and workpiece axes.

Case A, removal: AGE locked (position memory) – Gripper closed

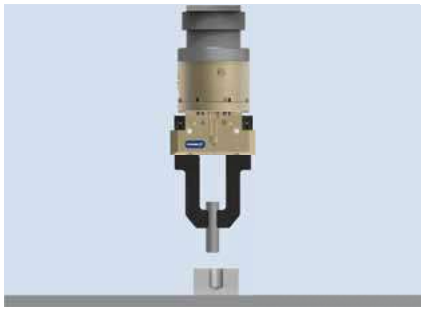
The robot can remove the workpiece. The deflected position of the AGE can be locked via the integrated position memory.

Case A, removal: AGE centrically locked – Gripper closed



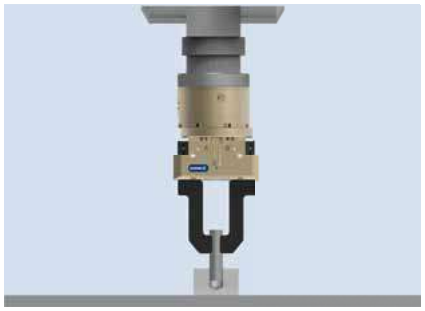
The position memory of the AGE is unlocked and the centered AGE lock is activated. That renders the original axis offset, as the gripper and robot axis are now centered relative to one another.

Case B, joining: AGE centrically locked – Gripper closed



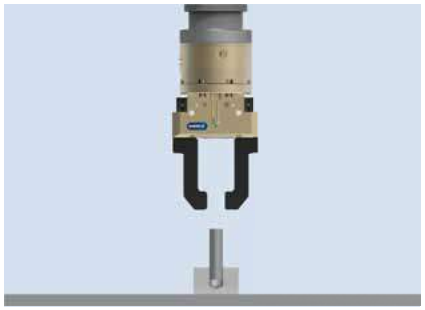
The robot travels towards the workpiece with a gripper unit consisting of an AGE (compensation unit) and gripper. There is an axial offset due to tolerances / imprecision.

Case B, joining: AGE unlocked – Gripper closed



An unlocked AGE can be used to compensate the existing axial offset between the gripper and workpiece axes and the workpiece can be joined.

Case B, joining: AGE unlocked – Gripper open



The robot moves away from the center of compliance with the gripper unit, the unit is then centrically locked and the gripper is closed.

General Notes to the Series

Monitoring: XY locking and unlocking via a magnetic switch and Z-stroke via inductive proximity switch

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Housing: The housing is made of high-tensile, hard-coated aluminum alloy. The functional parts are made of hardened steel.

Scope of delivery: Robot-side mounting screws

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

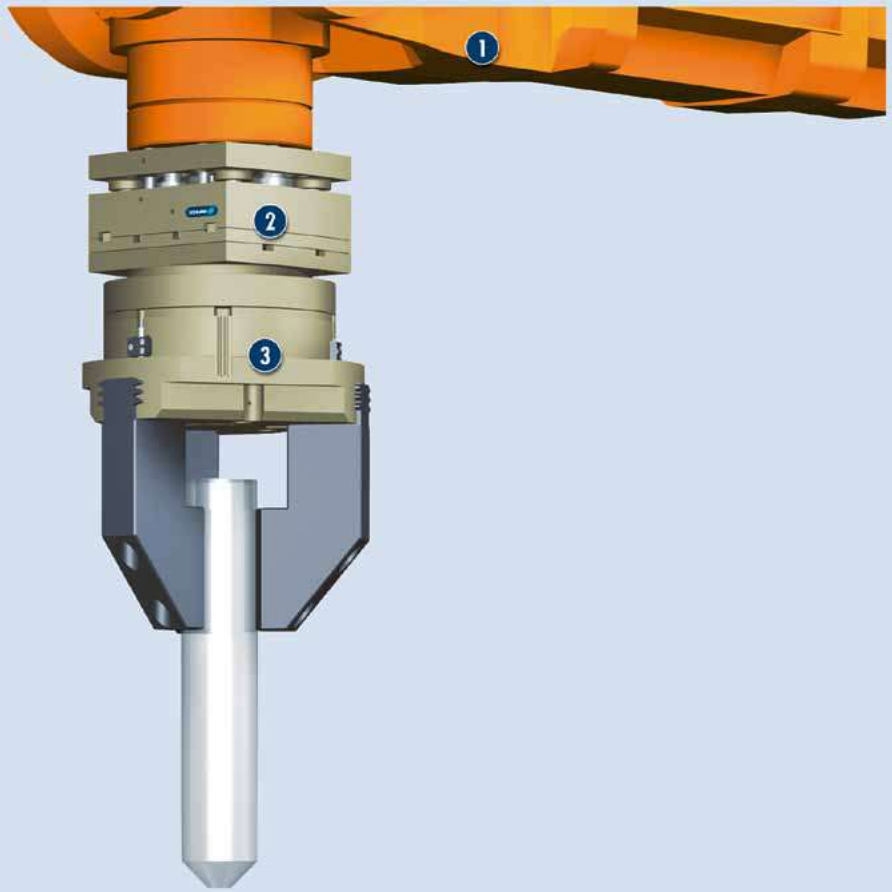
Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Lifting and putting down components in an undefined position using the compensation unit and a 3-finger centric gripper.

1. Robots
2. AGE-S-XYZ Compensation Unit
3. PZN-plus 3-Finger Centric Gripper



SCHUNK offers more ...

The following components make the AGE-S even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Fittings

Inductive Proximity Switches

Sensor Cables

Magnetic Switches

PZN-plus Centric Gripper

DDF 2 Rotary Feed-through

PGN-plus Universal Gripper

SWS Quick-change System

OPR Collision and Overload Sensor

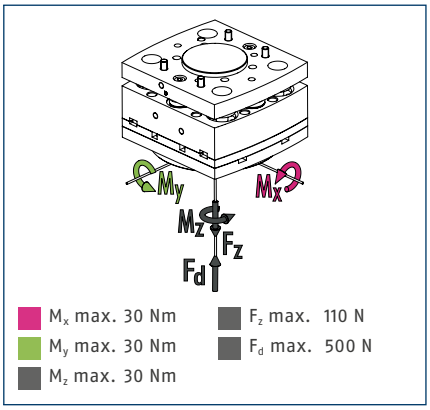
EGM Electrical Magnetic Gripper

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

AGE-S 100

Robot Accessories | Compensating | XYZ-Compensation Unit

Forces and moments



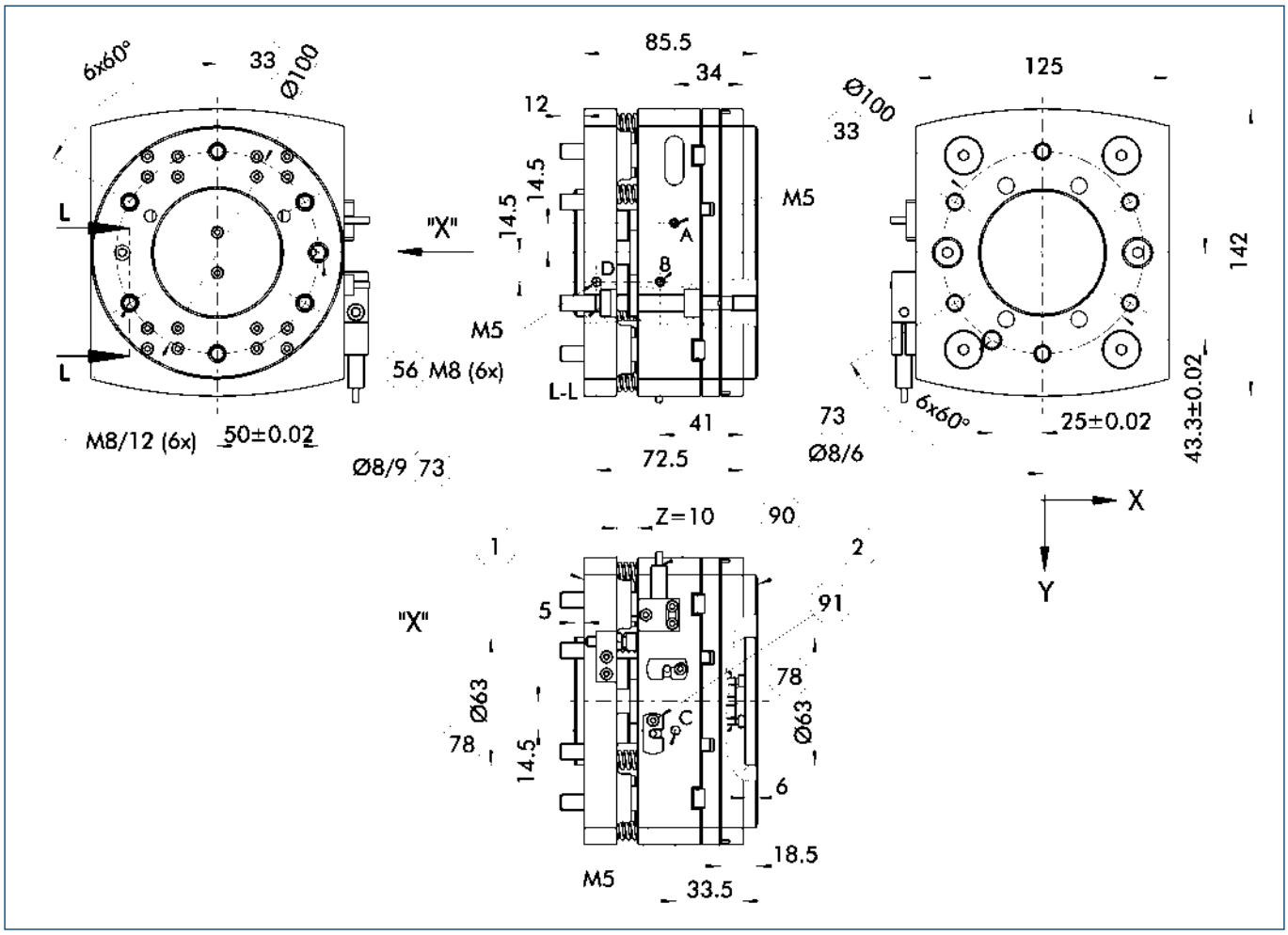
- M_x max. 30 Nm
- M_y max. 30 Nm
- M_z max. 30 Nm
- F_z max. 110 N
- F_d max. 500 N

ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-S-XYZ-100-0	AGE-S-XYZ-100-P	AGE-S-XY-100-0	AGE-S-XY-100-P	AGE-S-Z-100-0
ID		0324502	0324504	0324500	0324503	0324501
Compensation XY	[mm]	±4	±4	±4	±4	
Compensation Z	[mm]	10	10			10
max. vertical payload	[kg]	9	9	9	9	9
max. payload horizontal	[kg]	5.5	5.5	5.5	5.5	5.5
Locking force	[N]	800	800	800	800	
max. radial force, position storage	[N]		126		126	
Stroke Z	[N]	800	800			800
min. spring force	[N]	240	240			240
min. / max. operating pressure	[bar]	2.5/8	2.5/8	2.5/8	2.5/8	2.5/8
Nominal operating pressure	[bar]	6	6	6	6	6
Repeat accuracy	[mm]	0.1	0.1	0.1	0.1	0.1
Robot side connection		ISO 9409-1-100-6-M8	ISO 9409-1-100-6-M8	ISO 9409-1-100-6-M8	ISO 9409-1-100-6-M8	ISO 9409-1-100-6-M8
Tool side connection		ISO 9409-1-100-6-M8	ISO 9409-1-100-6-M8	ISO 9409-1-100-6-M8	ISO 9409-1-100-6-M8	ISO 9409-1-100-6-M8
Mass	[kg]	3.6	3.6	2.6	2.6	3.2
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60	5/60

Main view



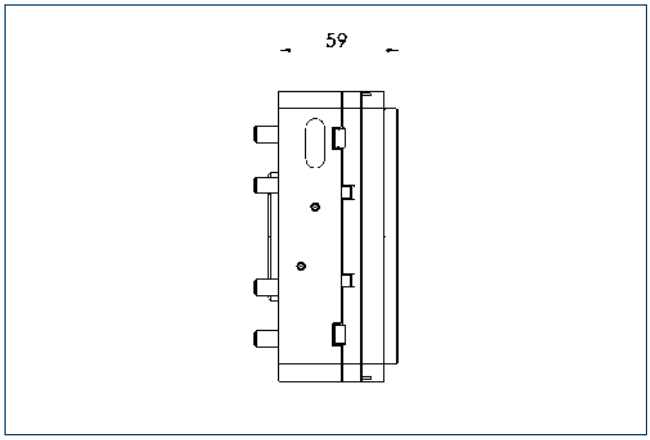
The main view shows the product with proximity switch, which is optional.

A, a Air connection unlocked
B, b Air connection locked
C, c Air connection position memory XY
D, d Air connection locked Z

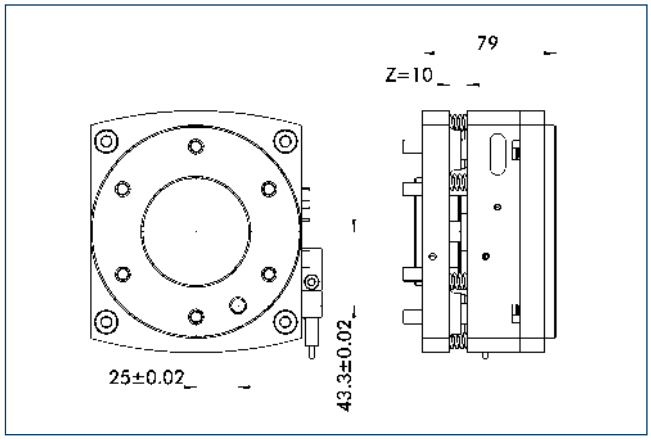
(1) Robot side connection
(2) Tool side connection

(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for a centering pin
(78) Fitting for centering
(90) IN ... sensor
(91) MMS-K 65

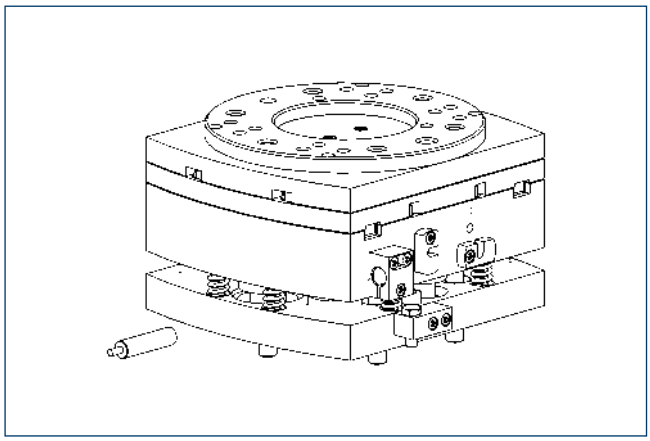
Dimensional change AGE-S-100-XY



Dimensional change AGE-S-100-Z



Sensor systems for Z-stroke

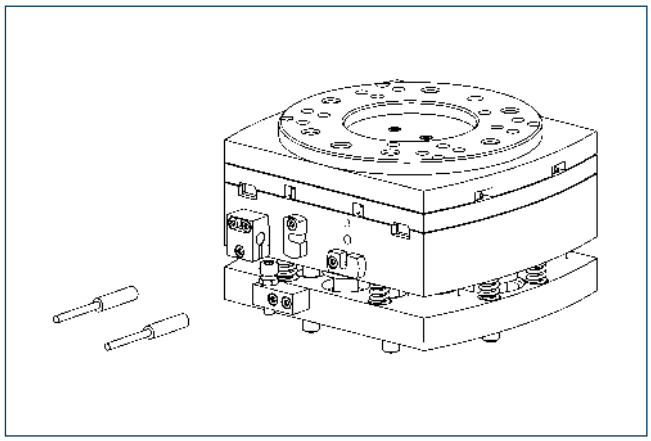


Can be mounted directly for Z-stroke or end position monitoring

Description	ID	Often combined
Inductive proximity switches		
IN 80-S-M12	0301578	
IN 80-S-M8	0301478	●
IN-B 80 S-M8	0301477	
INK 80-S	0301550	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension.

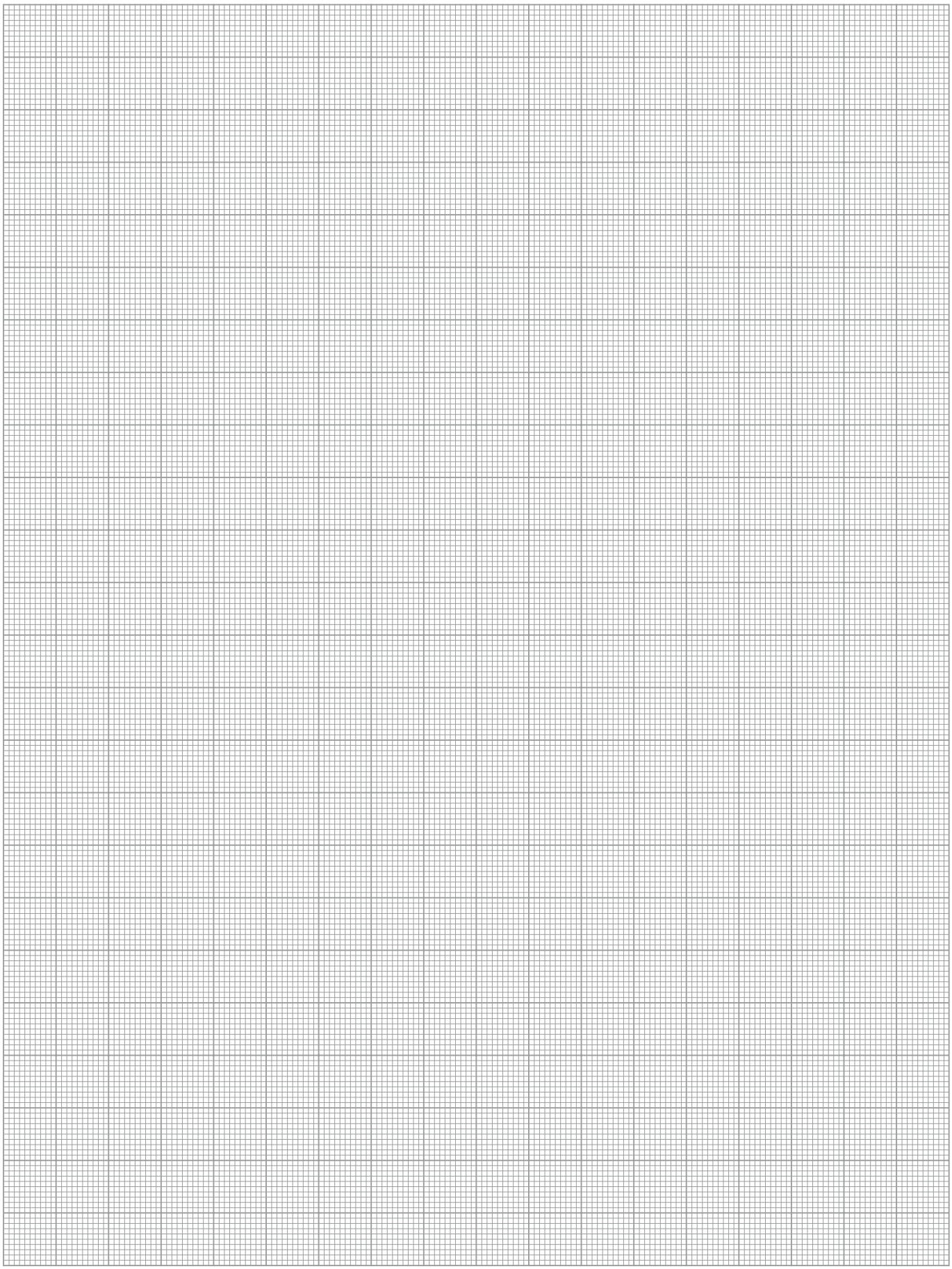
Sensor systems for centric locking



Sensor monitoring of the locking device

Description	ID	
MMS electronic magnetic switches		
MMS-K 65-5-PNP	0301423	

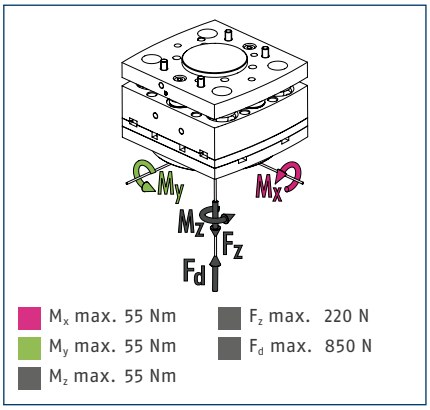
ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



AGE-S 125

Robot Accessories | Compensating | XYZ-Compensation Unit

Forces and moments



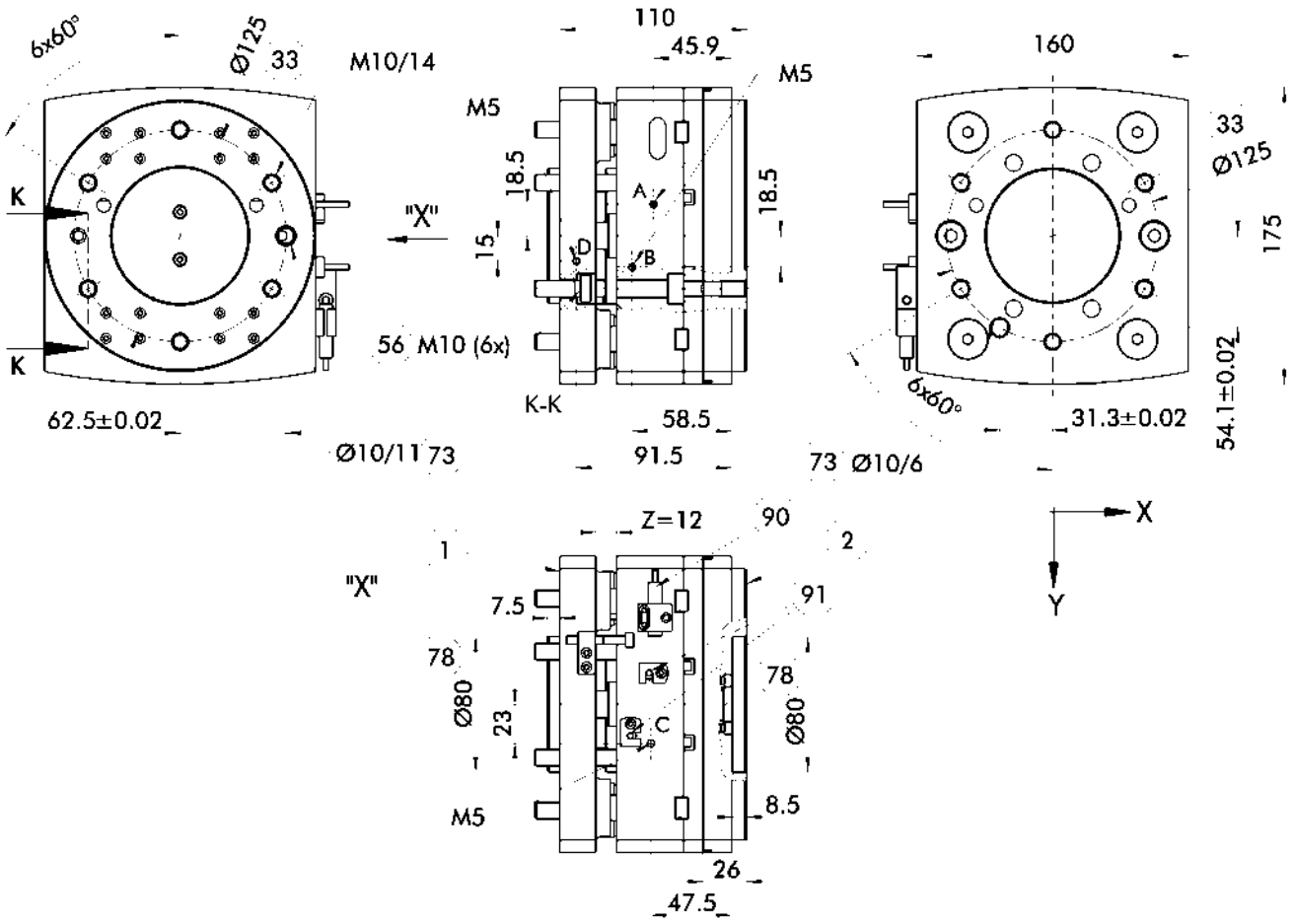
- M_x max. 55 Nm
- M_y max. 55 Nm
- M_z max. 55 Nm
- F_z max. 220 N
- F_d max. 850 N

ⓘ This is the max. total of all loads (accelera-tion forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-S-XYZ-125-0	AGE-S-XYZ-125-P	AGE-S-XY-125-0	AGE-S-XY-125-P	AGE-S-Z-125-0
ID		0324527	0324529	0324525	0324528	0324526
Compensation XY	[mm]	±7	±7	±7	±7	
Compensation Z	[mm]	12	12			12
max. vertical payload	[kg]	18	18	18	18	18
max. payload horizontal	[kg]	11	11	11	11	11
Locking force	[N]	1100	1100	1100	1100	
max. radial force, position storage	[N]		198		198	
Stroke Z	[N]	1200	1200			1200
min. spring force	[N]	360	360	0	0	360
min. / max. operating pressure	[bar]	2.5/8	2.5/8	2.5/8	2.5/8	2.5/8
Nominal operating pressure	[bar]	6	6	6	6	6
Repeat accuracy	[mm]	0.1	0.1	0.1	0.1	0.1
Robot side connection		ISO 9409-1-125-6-M12	ISO 9409-1-125-6-M12	ISO 9409-1-125-6-M12	ISO 9409-1-125-6-M12	ISO 9409-1-125-6-M12
Tool side connection		ISO 9409-1-125-6-M12	ISO 9409-1-125-6-M12	ISO 9409-1-125-6-M12	ISO 9409-1-125-6-M12	ISO 9409-1-125-6-M12
Mass	[kg]	7.4	7.4	5.3	5.3	6
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60	5/60

Main view



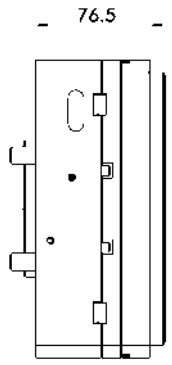
The main view shows the product with proximity switch, which is optional.

A, a Air connection unlocked
B, b Air connection locked
C, c Air connection position memory XY
D, d Air connection locked Z

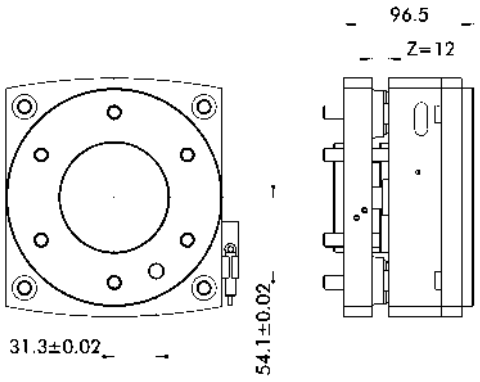
(1) Robot side connection
(2) Tool side connection

(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for a centering pin
(78) Fitting for centering
(90) IN ... sensor
(91) MMS-K 65

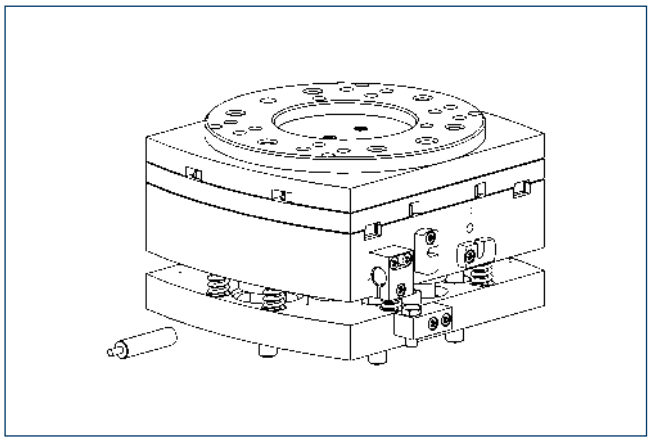
Dimensional change AGE-S-125-XY



Dimensional change AGE-S-125-Z



Sensor systems for Z-stroke

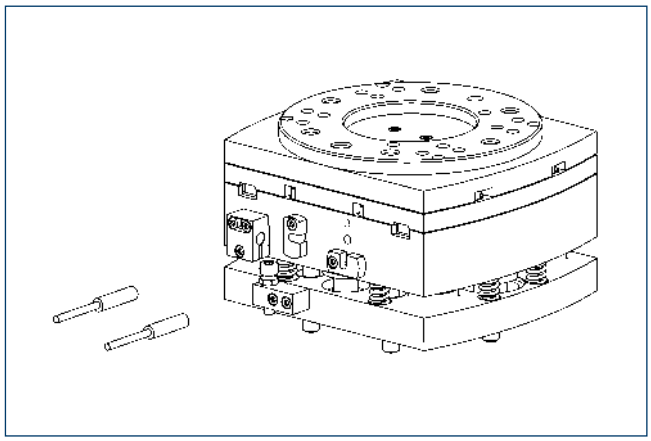


Can be mounted directly for Z-stroke or end position monitoring

Description	ID	Often combined
Inductive proximity switches		
IN 80-S-M12	0301578	
IN 80-S-M8	0301478	●
IN-B 80 S-M8	0301477	
INK 80-S	0301550	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension.

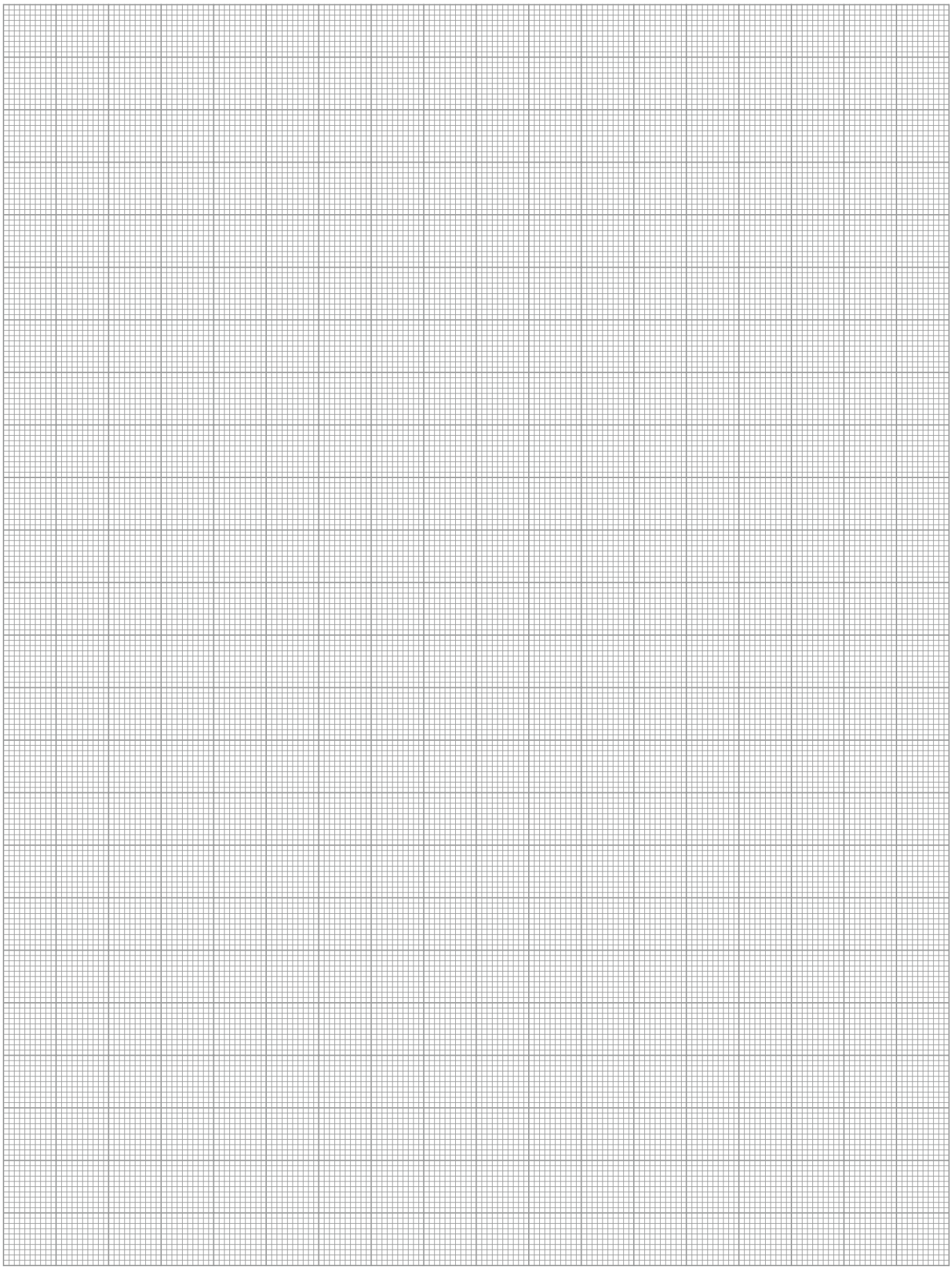
Sensor systems for centric locking



Sensor monitoring of the locking device

Description	ID	
MMS electronic magnetic switches		
MMS-K 65-5-PNP	0301423	

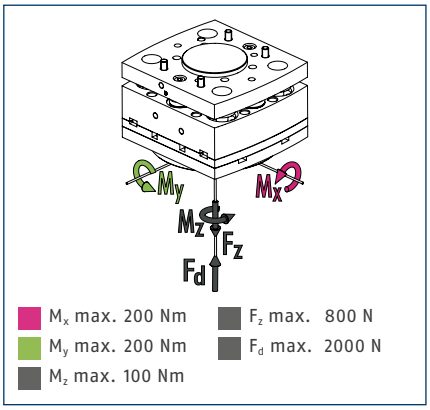
ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



AGE-S 160

Robot Accessories | Compensating | XYZ-Compensation Unit

Forces and moments



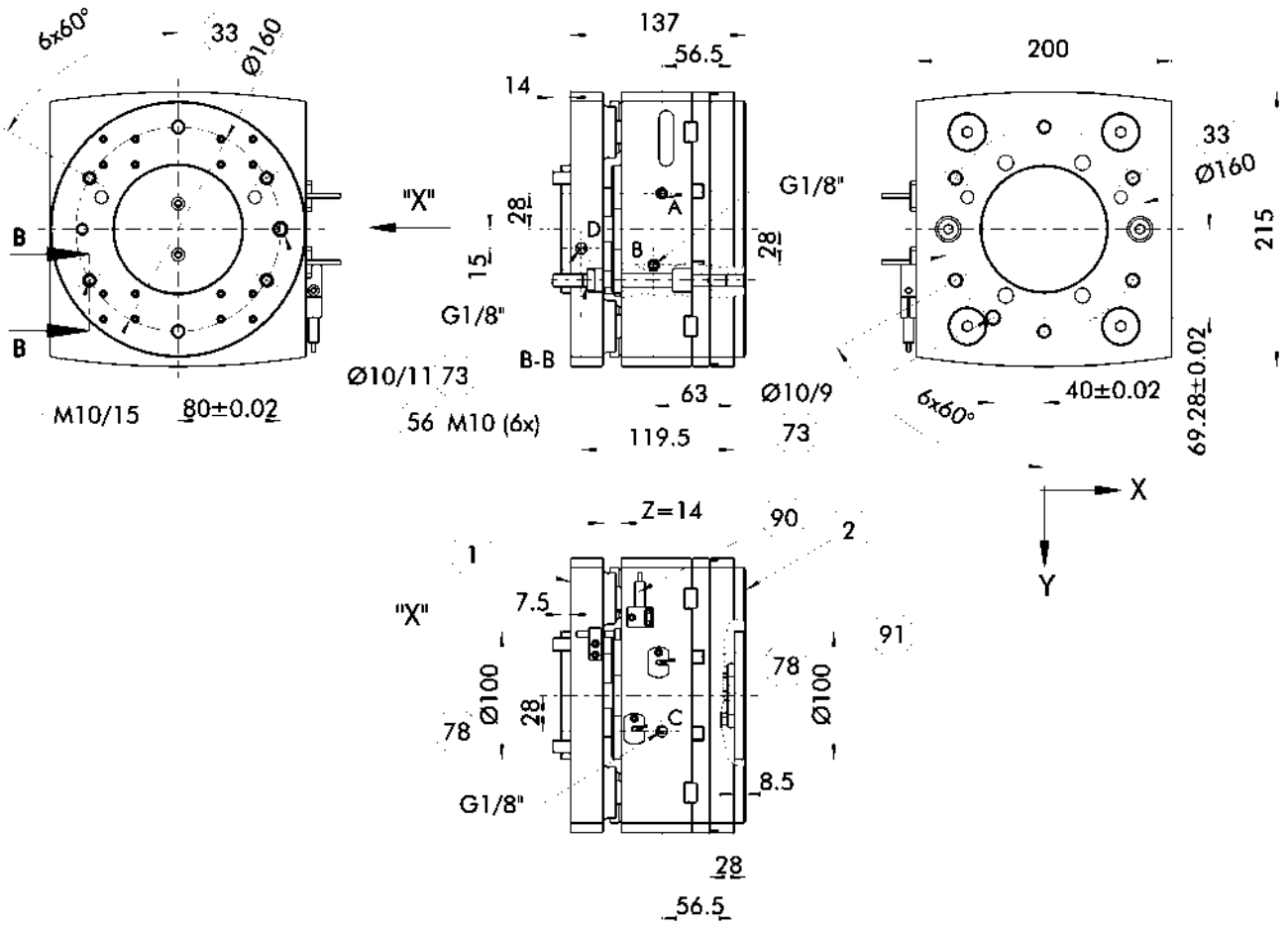
- M_x max. 200 Nm
- M_y max. 200 Nm
- M_z max. 100 Nm
- F_z max. 800 N
- F_d max. 2000 N

ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-S-XYZ-160-0	AGE-S-XYZ-160-P	AGE-S-XY-160-0	AGE-S-XY-160-P	AGE-S-Z-160-0
ID		0324562	0324564	0324560	0324563	0324561
Compensation XY	[mm]	±10	±10	±10	±10	
Compensation Z	[mm]	14	14			14
max. vertical payload	[kg]	60	60	60	60	60
max. payload horizontal	[kg]	40	40	40	40	40
Locking force	[N]	1800	1800	1800	1800	
max. radial force, position storage	[N]		309		309	
Stroke Z	[N]	1900	1900			1900
min. spring force	[N]	640	640			640
min. / max. operating pressure	[bar]	2.5/8	2.5/8	2.5/8	2.5/8	2.5/8
Nominal operating pressure	[bar]	6	6	6	6	6
Repeat accuracy	[mm]	0.1	0.1	0.1	0.1	0.1
Robot side connection		ISO 9409-1-160-6-M10	ISO 9409-1-160-6-M10	ISO 9409-1-160-6-M10	ISO 9409-1-160-6-M10	ISO 9409-1-160-6-M10
Tool side connection		ISO 9409-1-160-6-M10	ISO 9409-1-160-6-M10	ISO 9409-1-160-6-M10	ISO 9409-1-160-6-M10	ISO 9409-1-160-6-M10
Mass	[kg]	14.5	14.5	10.5	10.5	11.8
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60	5/60

Main view



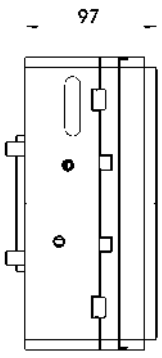
The main view shows the product with proximity switch, which is optional.

A, a Air connection unlocked
B, b Air connection locked
C, c Air connection position memory XY
D, d Air connection locked Z

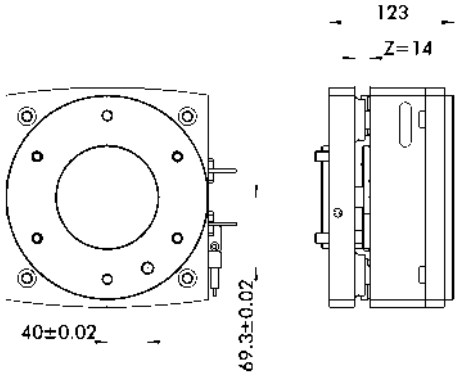
(1) Robot side connection
(2) Tool side connection

(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for a centering pin
(78) Fitting for centering
(90) IN ... sensor
(91) MMS-K 65

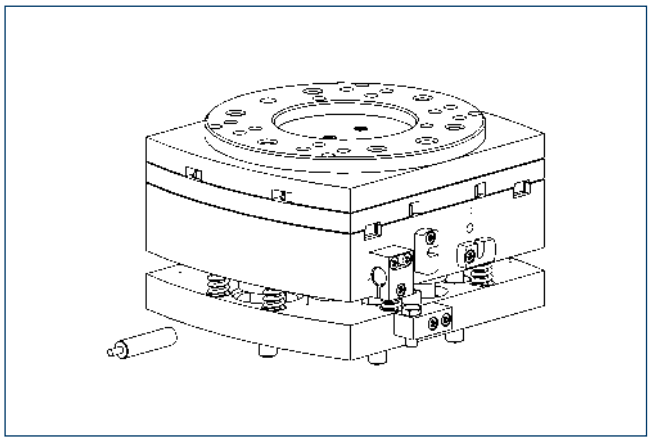
Dimensional change AGE-S-160-XY



Dimensional change AGE-S-160-Z



Sensor systems for Z-stroke

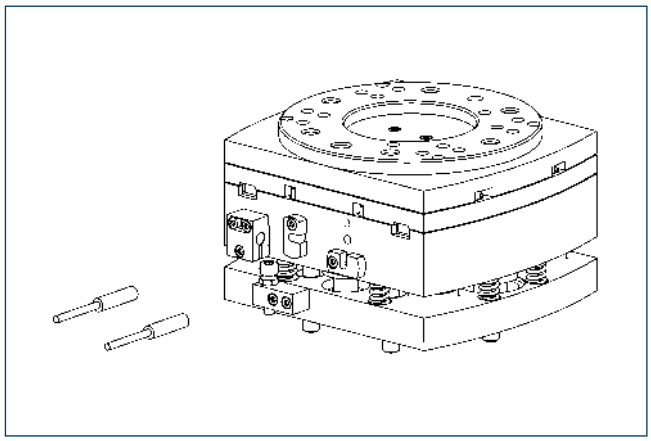


Can be mounted directly for Z-stroke or end position monitoring

Description	ID	Often combined
Inductive proximity switches		
IN 80-S-M12	0301578	
IN 80-S-M8	0301478	●
IN-B 80 S-M8	0301477	
INK 80-S	0301550	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension.

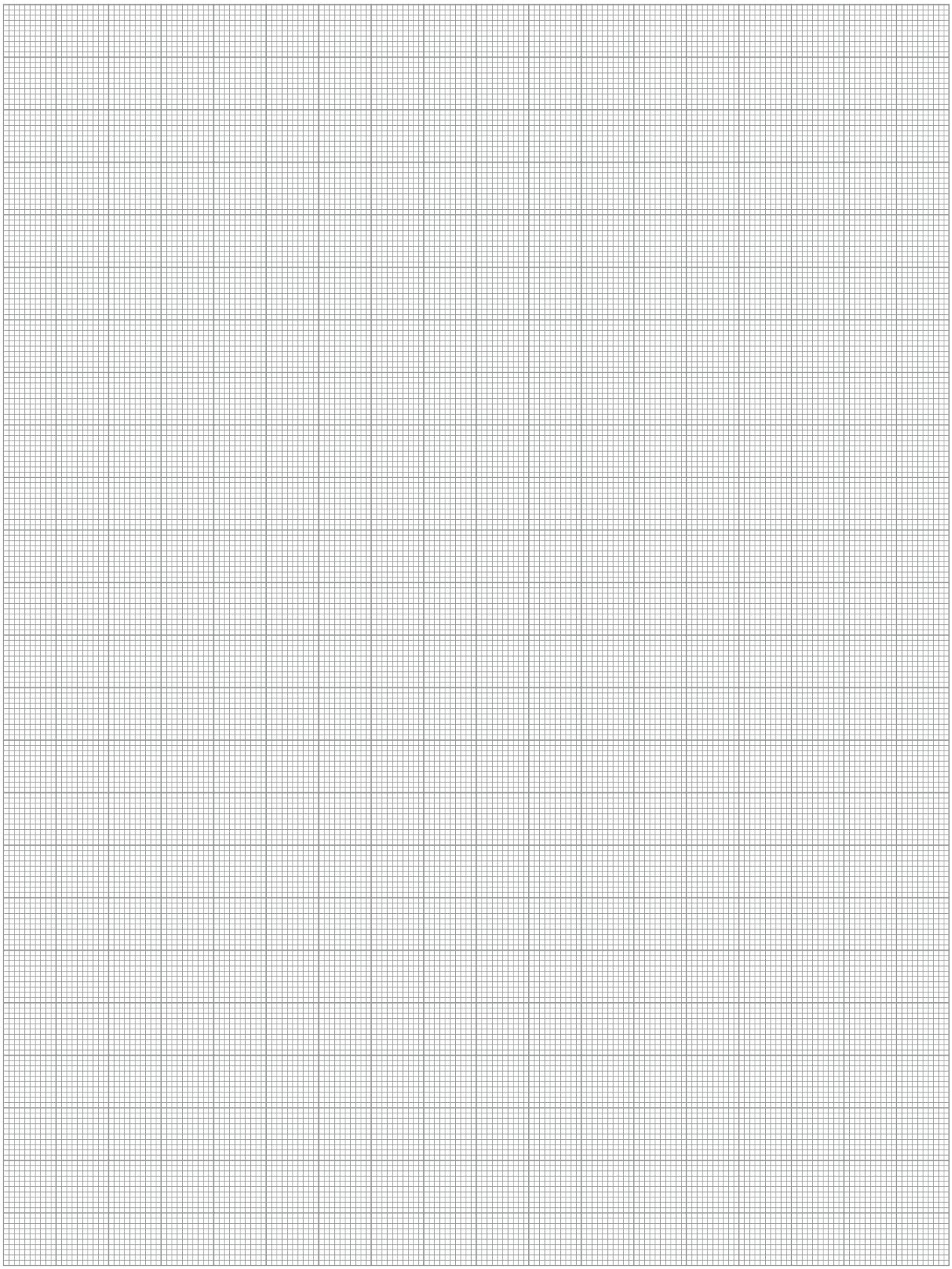
Sensor systems for centric locking



Sensor monitoring of the locking device

Description	ID	
MMS electronic magnetic switches		
MMS-K 65-5-PNP	0301423	

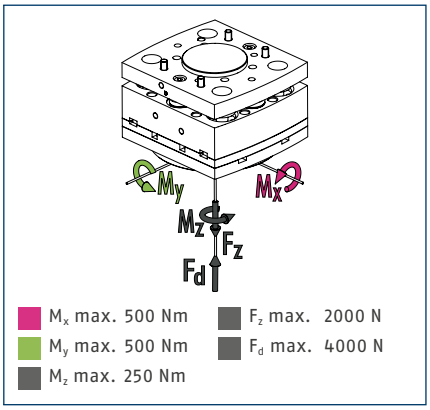
ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



AGE-S 200

Robot Accessories | Compensating | XYZ-Compensation Unit

Forces and moments



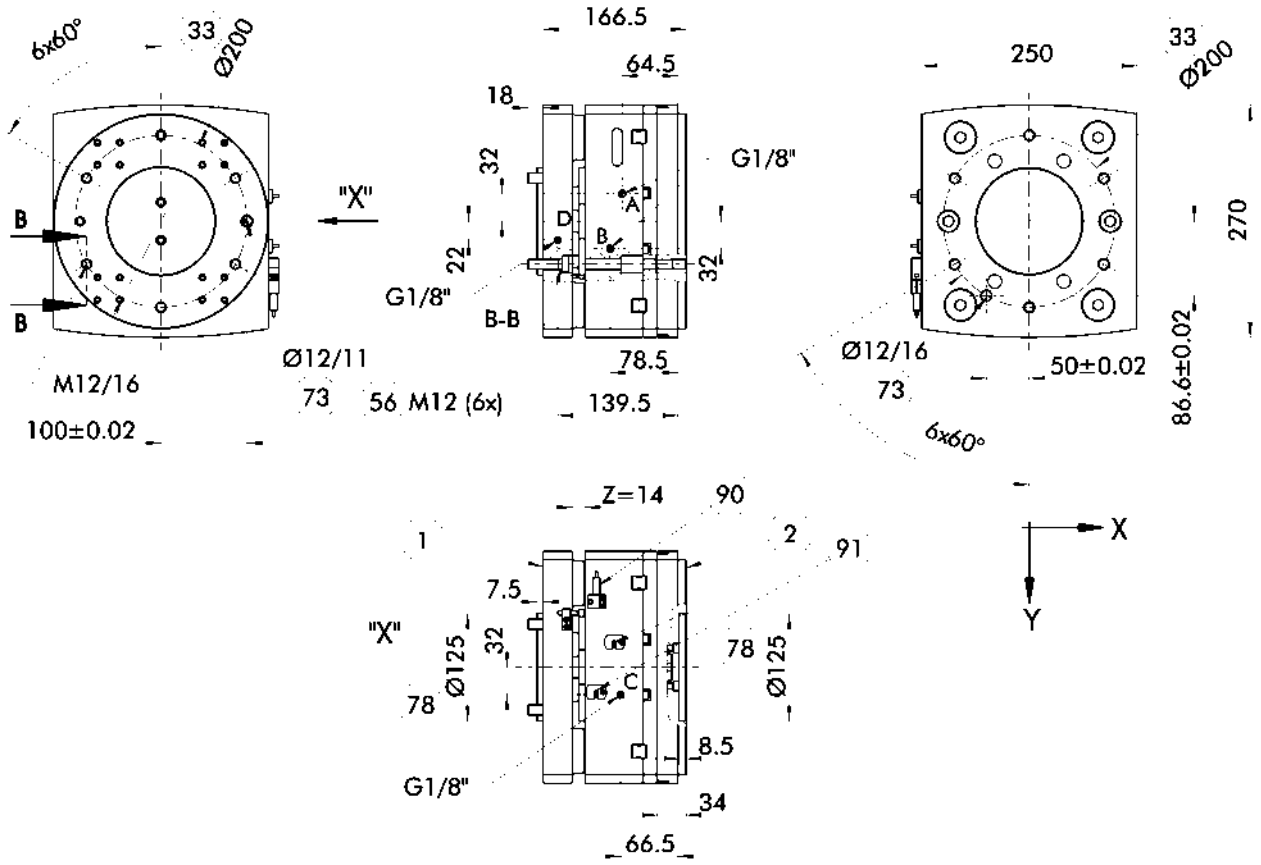
- M_x max. 500 Nm
- M_y max. 500 Nm
- M_z max. 250 Nm
- F_z max. 2000 N
- F_d max. 4000 N

ⓘ This is the max. total of all loads (acceleration forces and torques, process forces etc.), that can affect a compensation unit while still maintaining error-free function.

Technical data

Description		AGE-S-XYZ-200-0	AGE-S-XYZ-200-P	AGE-S-XY-200-0	AGE-S-XY-200-P	AGE-S-Z-200-0
ID		0324602	0324604	0324600	0324603	0324601
Compensation XY	[mm]	±12	±12	±12	±12	
Compensation Z	[mm]	14	14			14
max. vertical payload	[kg]	160	160	160	160	160
max. payload horizontal	[kg]	100	100	100	100	100
Locking force	[N]	2700	2700	2700	2700	
max. radial force, position storage	[N]		492		492	
Stroke Z	[N]	3000	3000			3000
min. spring force	[N]	1100	1100			1100
min. / max. operating pressure	[bar]	2.5/8	2.5/8	2.5/8	2.5/8	2.5/8
Nominal operating pressure	[bar]	6	6	6	6	6
Repeat accuracy	[mm]	0.1	0.1	0.1	0.1	0.1
Robot side connection		ISO 9409-1-200-6-M12	ISO 9409-1-200-6-M12	ISO 9409-1-200-6-M12	ISO 9409-1-200-6-M12	ISO 9409-1-200-6-M12
Tool side connection		ISO 9409-1-200-6-M12	ISO 9409-1-200-6-M12	ISO 9409-1-200-6-M12	ISO 9409-1-200-6-M12	ISO 9409-1-200-6-M12
Mass	[kg]	29.5	29.5	21	21	23.5
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60	5/60

Main view



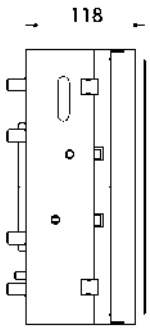
The main view shows the product with proximity switch, which is optional.

A, a Air connection unlocked
B, b Air connection locked
C, c Air connection position memory XY
D, d Air connection locked Z

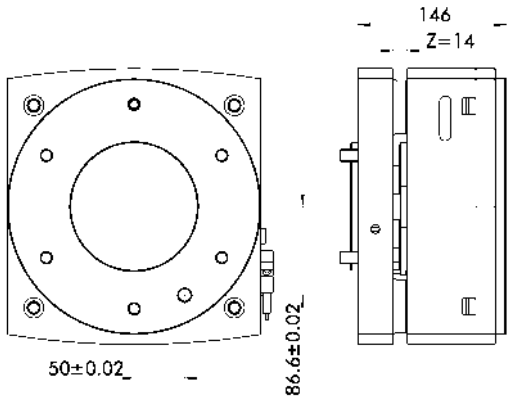
(1) Robot side connection
(2) Tool side connection

(33) DIN ISO-9409 bolt-hole circle diameter
(56) Included in delivery
(73) Fit for a centering pin
(78) Fitting for centering
(90) IN ... sensor
(91) MMS-K 65

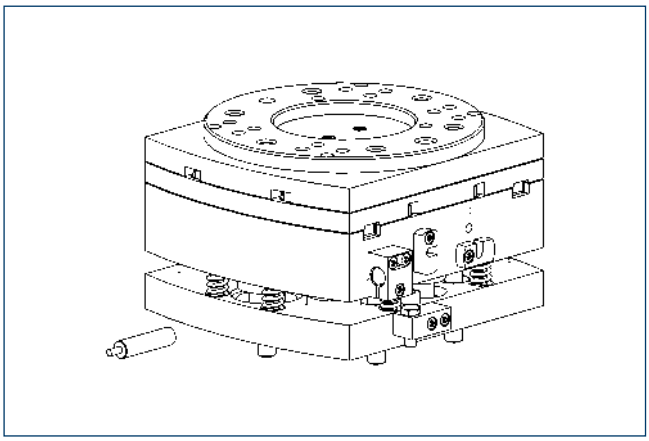
Dimensional change AGE-S-200-XY



Dimensional change AGE-S-200-Z



Sensor systems for Z-stroke

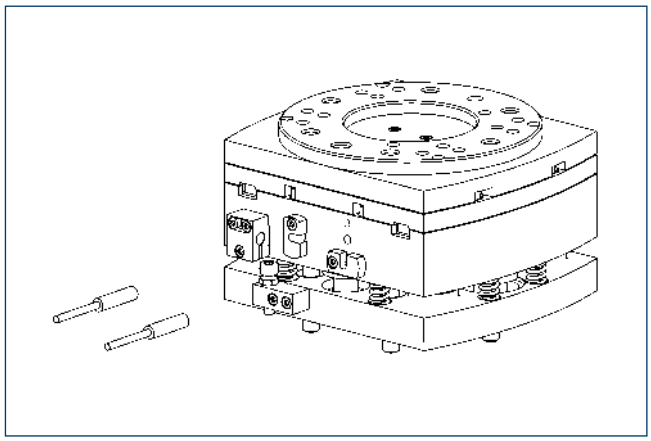


Can be mounted directly for Z-stroke or end position monitoring

Description	ID	Often combined
Inductive proximity switches		
IN 80-S-M12	0301578	
IN 80-S-M8	0301478	●
IN-B 80 S-M8	0301477	
INK 80-S	0301550	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension.

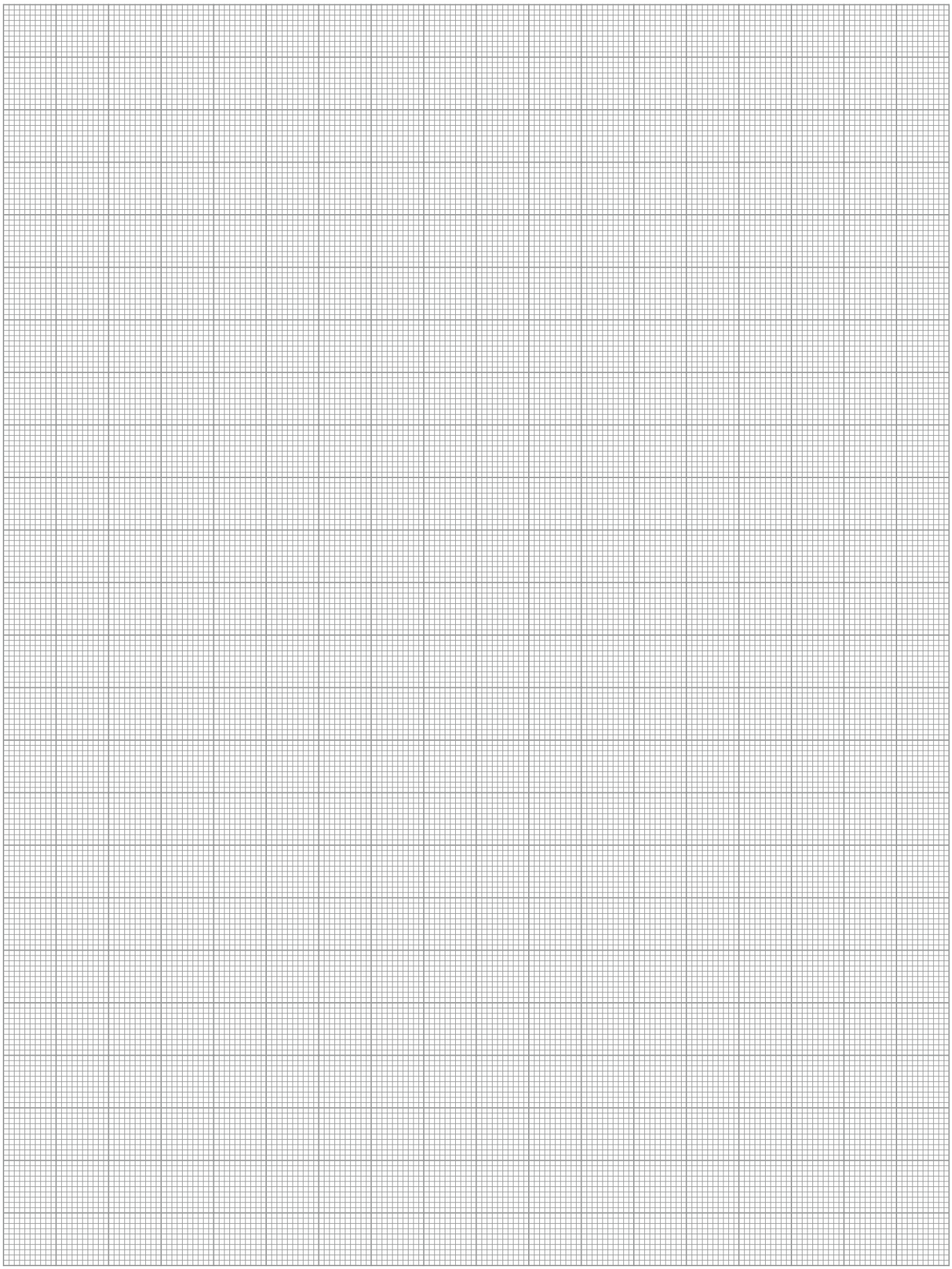
Sensor systems for centric locking



Sensor monitoring of the locking device

Description	ID	
MMS electronic magnetic switches		
MMS-K 65-5-PNP	0301423	

ⓘ Two sensors (closer/NO) are required for each unit, plus extension cables as an option. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



Compact. Flexible. Productive.

TCU-P Tolerance Compensation Unit

The TCU is compensated on the basis of elastomers that compensate in all three directions, enabling them to correct angle errors and to carry out rotational compensation. Pneumatic locking is also available as an option to allow the compensation unit to be set to rigid. As a result, it is possible to prevent the tool or the gripper vibrating during movement of the robot arm. PGN-plus grippers and grippers with the same screw connection pattern on the base side can be mounted on the unit without adaptation.

Field of Application

For universal use in clean and slightly dirty environments, with special requirements for the corrosion resistance and antistatic properties of the gripper unit

Advantages – Your benefit

Compensation of workpiece-related tolerances and position inaccuracies reduced risk of jamming, necessary assembly forces are reduced and wear of the workpiece and handling device is minimized

Direct assembly of parallel grippers no need for additional adapter plates

Compact design minimized height and weight

Pneumatic locking long life span of the elastomers, rigid unit during travel

Monitoring of locking for process reliable sequences and shorter cycle times

Sizes
Quantity: 7

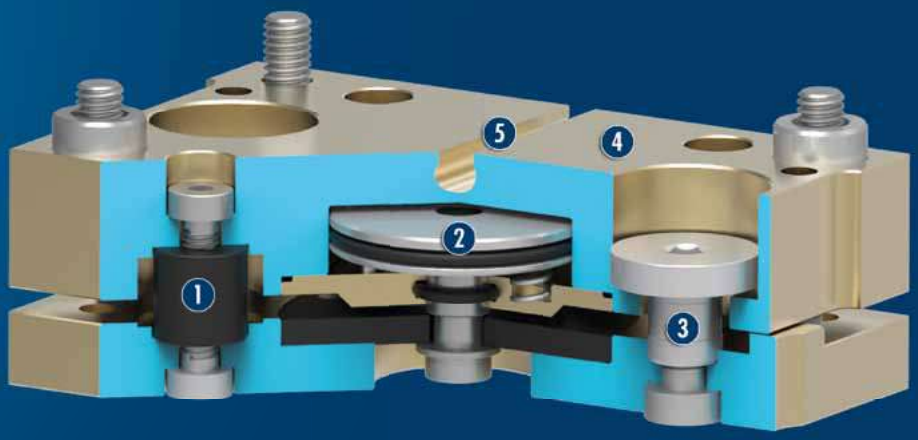
Workpiece weight
3 .. 50 kg

Deflection
1°

Functional Description

The TCU's function is based on the interaction between the two base plates, which are connected to each other by a set of flexible elastomer elements. As a result, the TCU can compensate tolerances in the X-, Y-, and Z-directions, allowing it to correct angle errors and provide rotational compensation. Pneumatic locking is also available as an option to allow the compensation unit to be set to rigid.

As a result, it is possible to prevent the tool or the gripper vibrating during movement of the robot arm or the linear axis. This increases the application's repeat accuracy and extends the service life of the elastomer elements. Direct assembly of the appropriate gripper types without additional adapter plates enables a flat and weight-reduced compensation system.



① **Elastomers**
allow compensation motion

② **Locking mechanism**
for a rigid connection between the machine and tool sides

③ **Overload pin**
to protect the elastomers

④ **Interface machine side**
the same mounting pattern as on the tool side

⑤ **Monitoring groove**
for electronic magnetic sensor

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Monitoring: by magnetic switch

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Material: Elastomer material

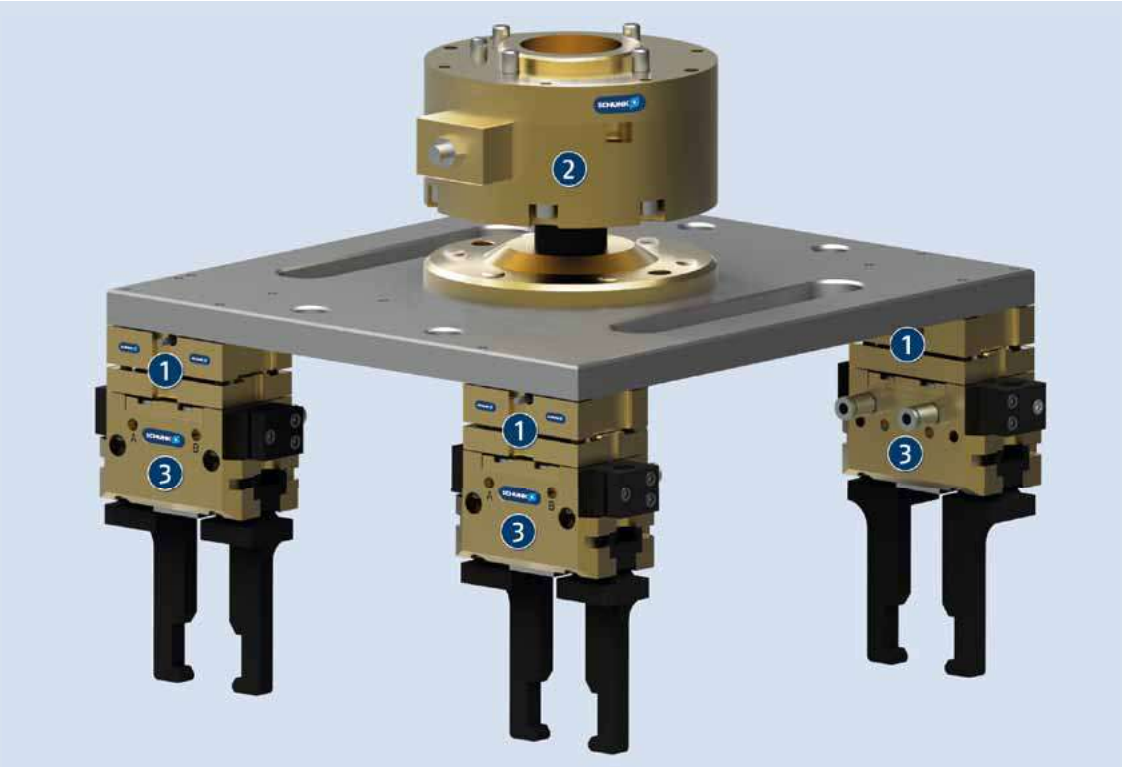
Housing: Aluminum alloy

Scope of delivery: Robot-side mounting screws

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: the weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.



Application example

In applications where several grippers are used, the tolerance variations of the workpieces are compensated for by the tolerance compensation units. The application is also monitored by a collision sensor.

1. TCU Tolerance Compensation Unit
2. OPS Collision Sensor
3. JGP 2-Finger Parallel Gripper with workpiece-specific gripper fingers

SCHUNK offers more ...

The following components make the TCU-P even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Fittings

Magnetic Switches

Sensor Cables

SDV-P Pressure Maintenance Valve

PWG-plus Angular Gripper

PGN-plus Universal Gripper

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

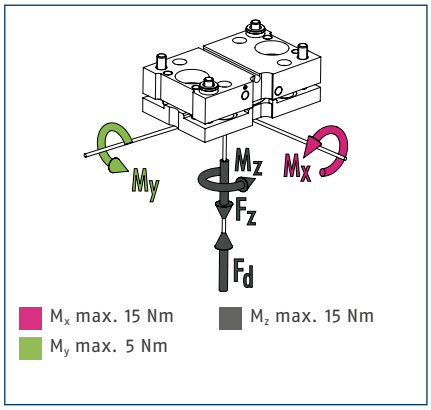
Options and special Information

Monitoring of the locking: by magnetic switch
Connections: two plug-in connections for hose
Ambient temperature: 5 °C to 90 °C
Operating pressure: from 4 bar to 8 bar

TCU-P 050

Robot Accessories | Compensating | Tolerance Compensation Unit

Forces and moments



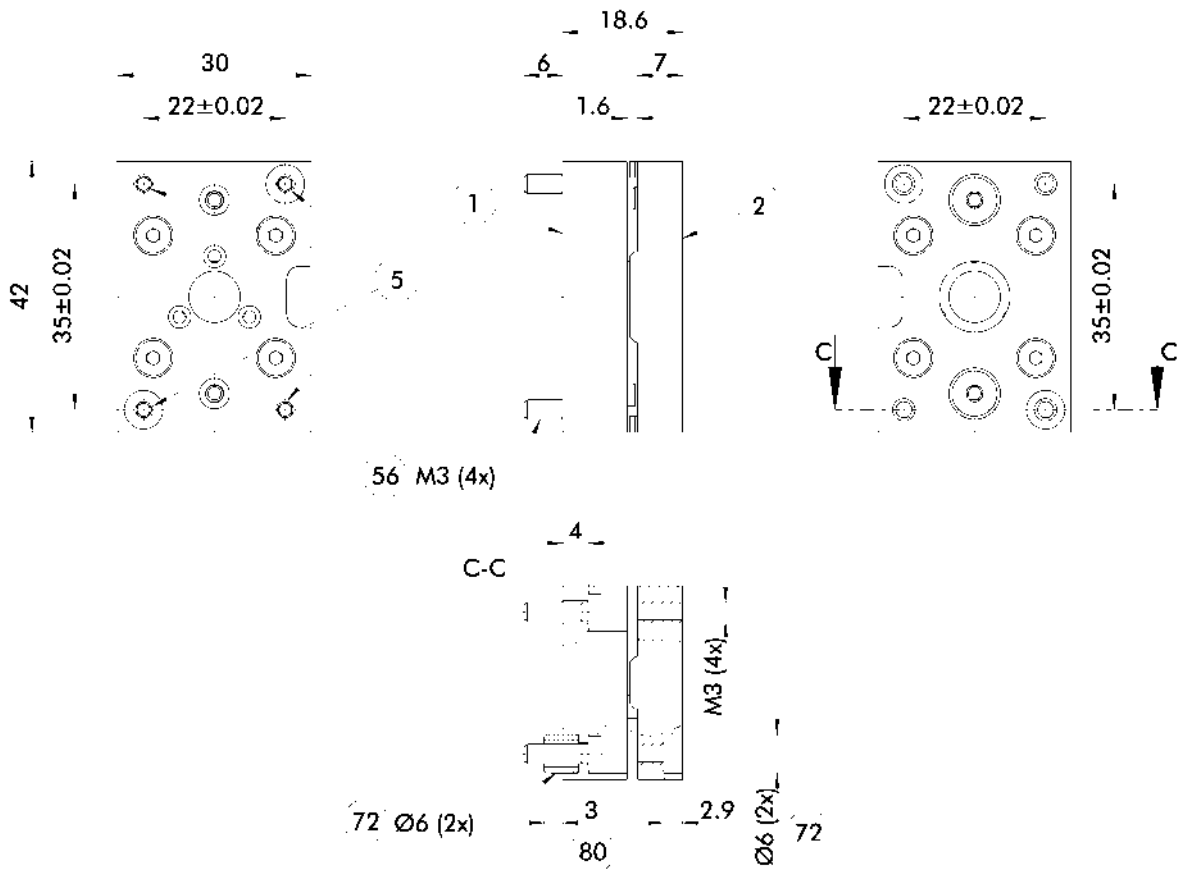
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-050-3-0V-P
ID		0324757
Hardness of the elastomer	[Shore]	68
Deflection X	[°]	1
Deflection Y	[°]	1
Deflection Z	[°]	1.5
Mass	[kg]	0.1
Locking device		without locking
max. force F_d	[N]	500
Direct connection to*		PGN-plus 50

*and for other gripper with the same mounting pattern

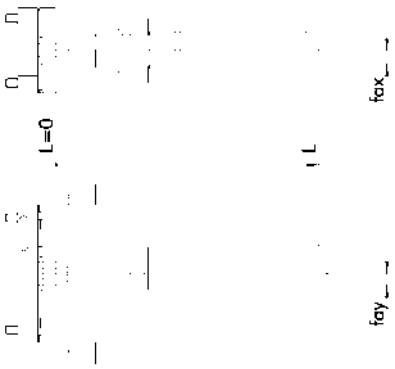
Main view without centric locking (0V)

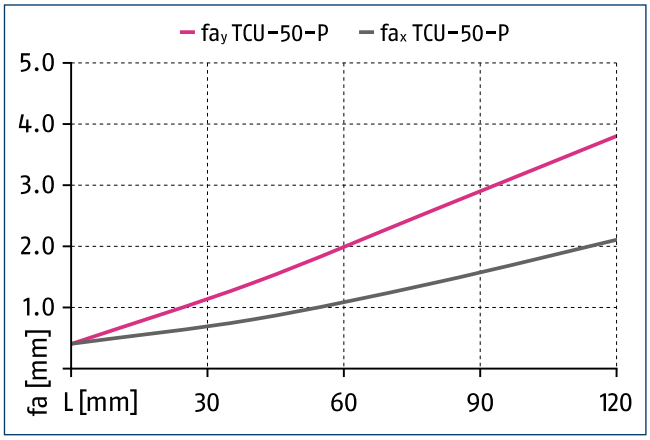


The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
5. Through-hole for connection with screws
56. Included in delivery
72. Fitting for centering sleeve
80. Depth of the centering sleeve hole in the mating part

Maximum deflection



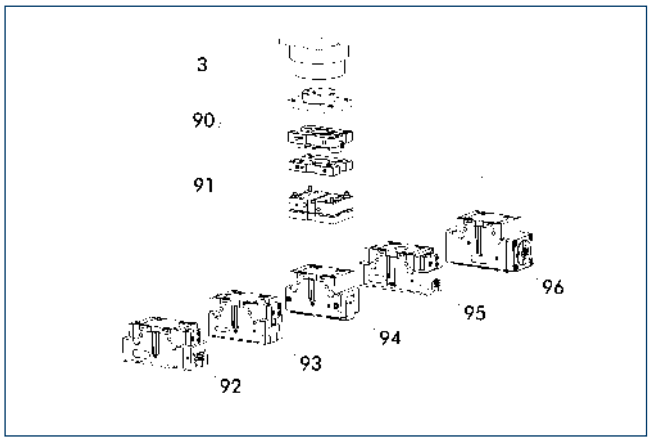


Deflection (fa) dependent upon the length (L) to the center of mass

TCU-P 050

Robot Accessories | Compensating | Tolerance Compensation Unit

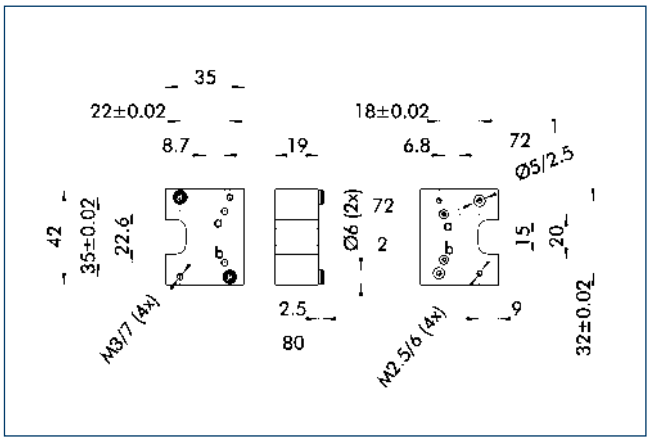
Modular system



(3) Adapter plate
(90) CWS compact change system
(91) TCU tolerance compensation unit
(92) PGN-plus 2-finger parallel gripper
(93) JGP 2-finger parallel gripper
(94) PWG-plus 2-finger angular gripper
(95) PGB 2-finger parallel gripper
(96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

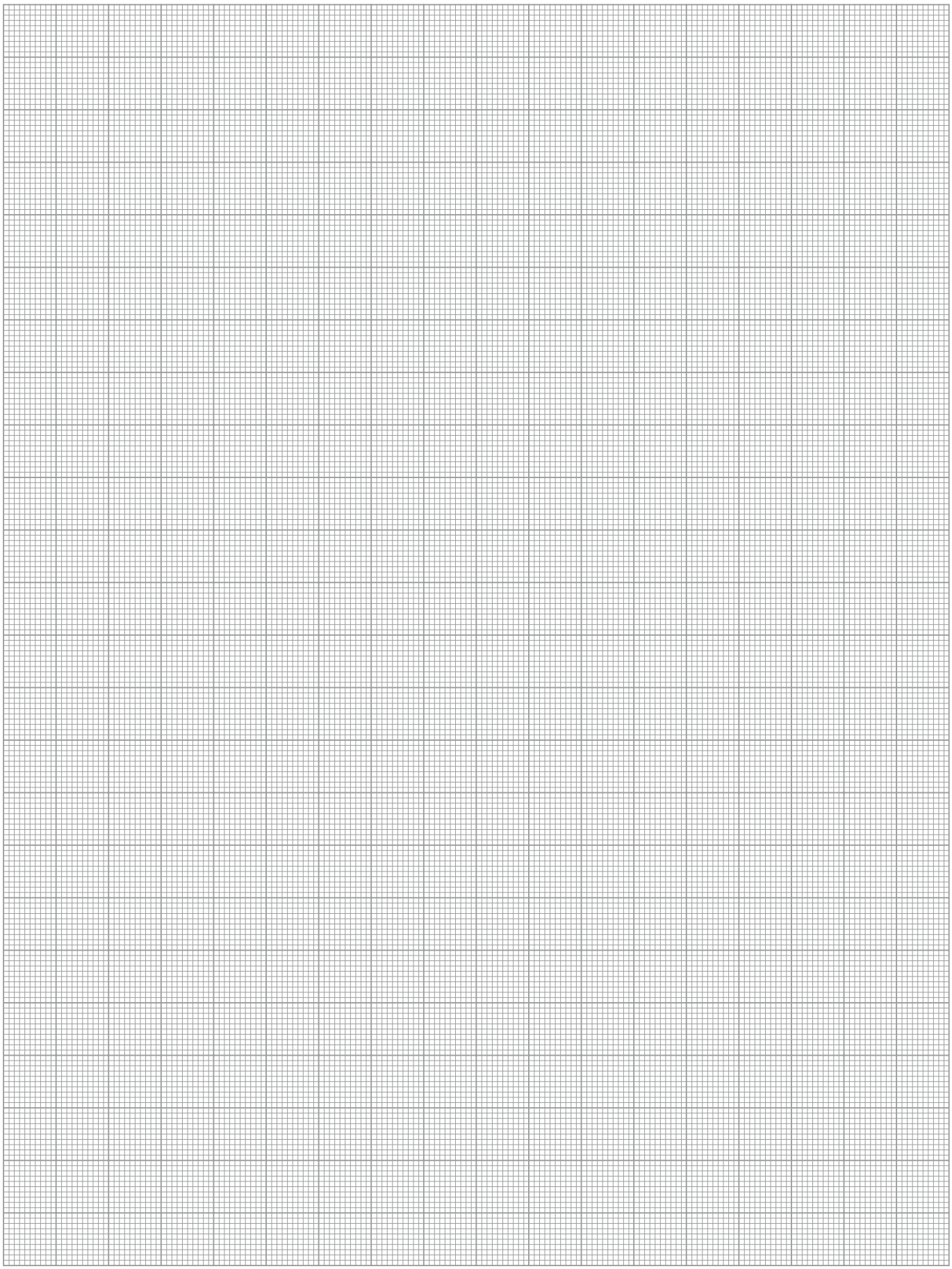
Adapter plate between TCU-P 050 and PGN-plus 40



(1) Connection robot-side
(2) Connection tool-side
(72) Fit for centering sleeves
(80) Depth of the centering sleeve hole in the mating part

The adapter plate has integrated air feed-throughs in order to be able to use the hose-free direct connection of the appropriate gripper.

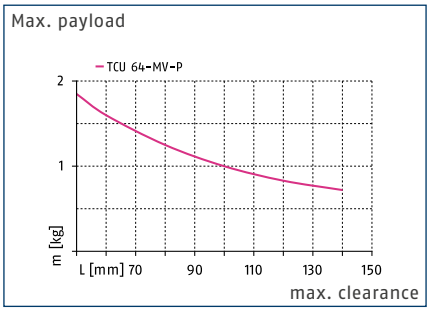
Description	ID	Height
Tool-side		
A-CWA-050-040-P	0305754	19 mm



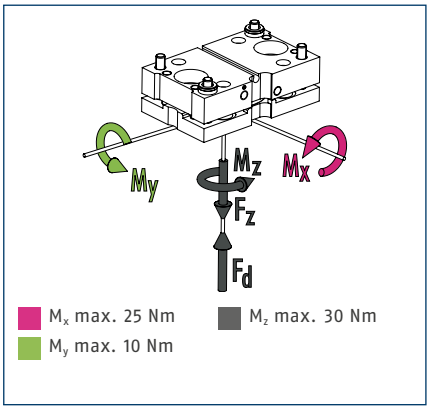
TCU-P 064

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



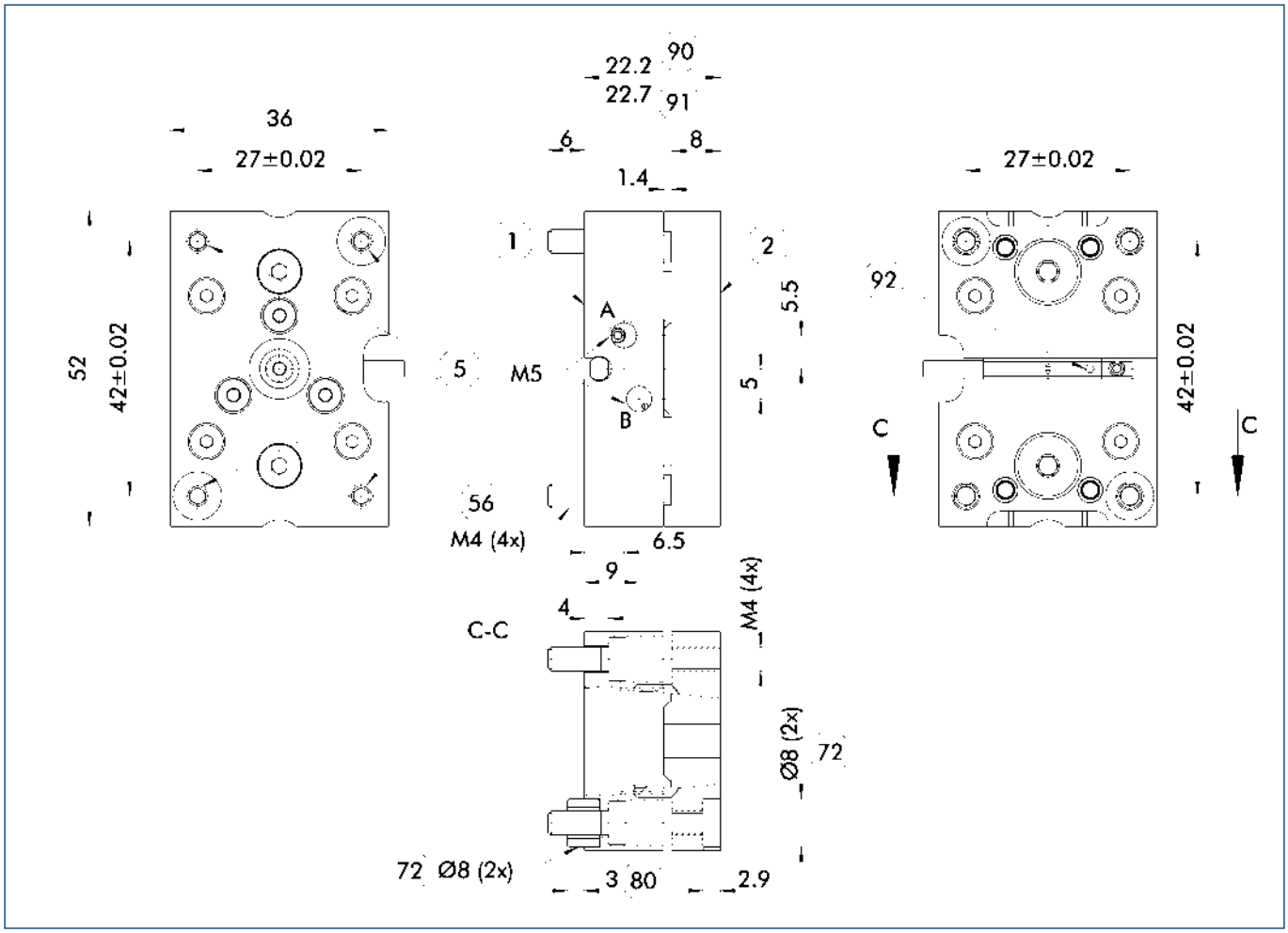
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-064-3-MV-P	TCU-064-3-OV-P
ID		0324774	0324775
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	1.5	1.5
Deflection Z	[°]	2	2
Repeat accuracy	[mm]	0.1	
Mass	[kg]	0.1	0.08
min. / max. operating pressure	[bar]	4/8	
Locking device		with locking	without locking
Locking moment M_x	[Nm]	1	
Locking moment M_y	[Nm]	0.8	
Locking moment M_z	[Nm]	2	
Locking force F_z	[N]	30	
Max. force F_d	[N]	1100	1100
Direct connection to*		PGN-plus 64	PGN-plus 64

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



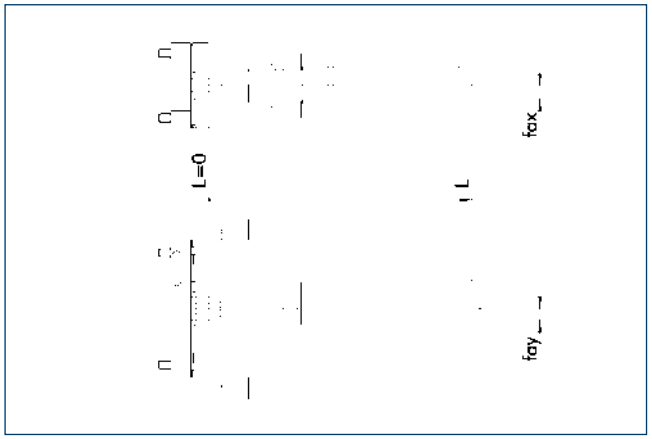
The main view shows the unit in its basic version.

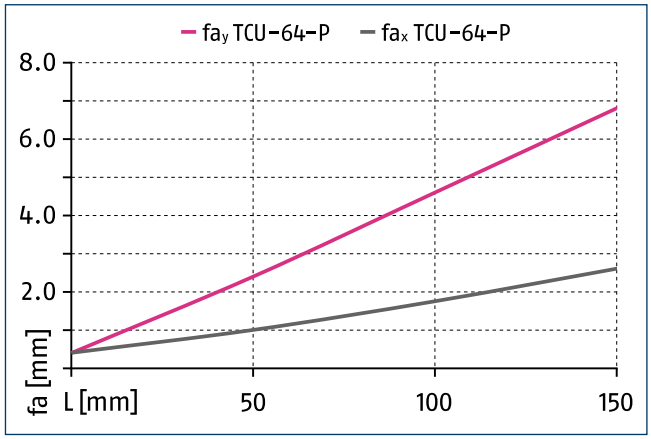
A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(56) Included in delivery
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection

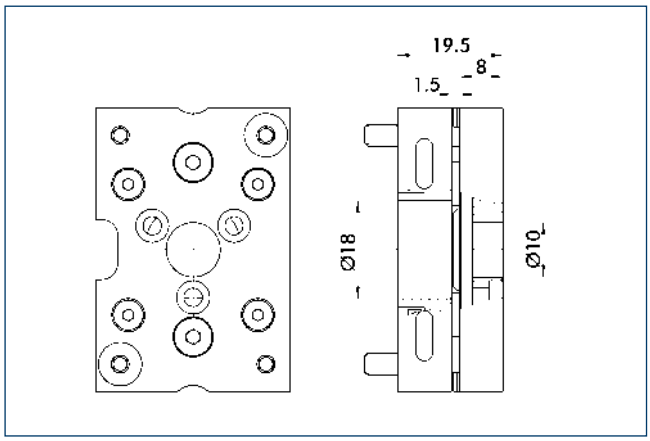




Deflection (fa) dependent upon the length (L) to the center of mass

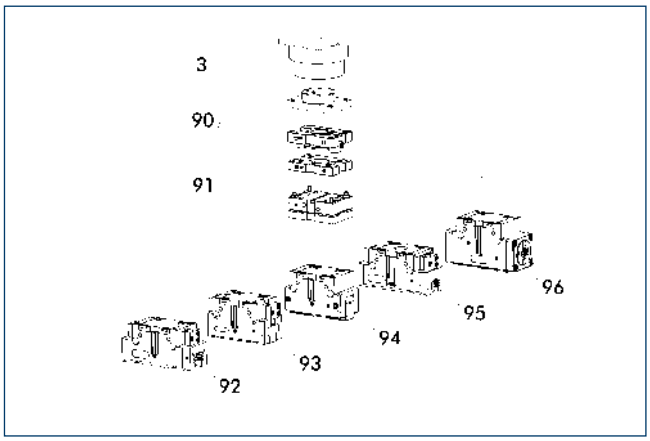
TCU-P 064

Version without locking (0V)



Dimensional changes for the version without locking

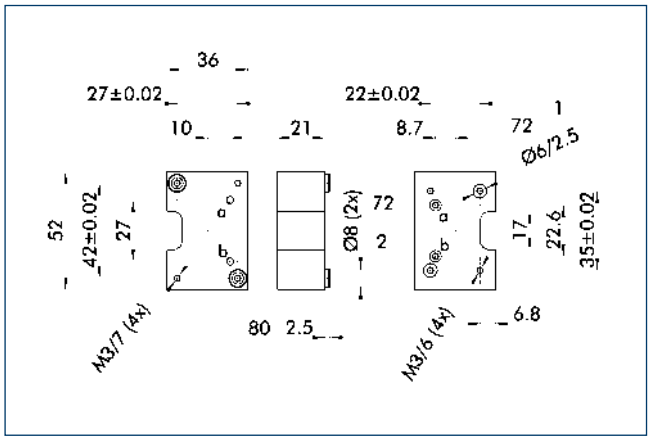
Modular system



- (3) Adapter plate
- (90) CWS compact change system
- (91) TCU tolerance compensation unit
- (92) PGN-plus 2-finger parallel gripper
- (93) JGP 2-finger parallel gripper
- (94) PWG-plus 2-finger angular gripper
- (95) PGB 2-finger parallel gripper
- (96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Adapter plate between TCU-P 064 and PGN-plus 50

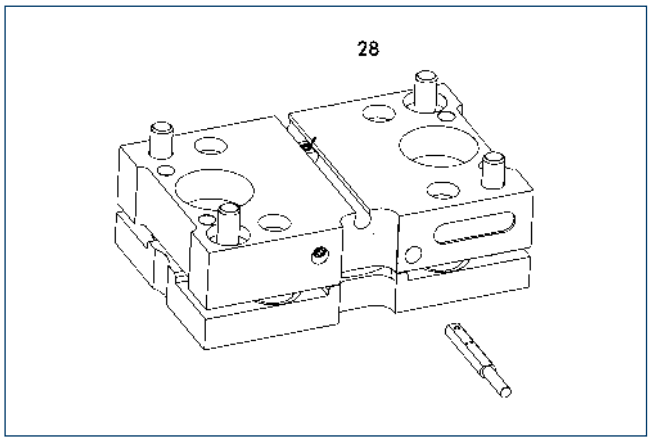


- (1) Connection robot-side
- (2) Connection tool-side
- (72) Fit for centering sleeves
- (80) Depth of the centering sleeve hole in the mating part

The adapter plate has integrated air feed-throughs in order to be able to use the hose-free direct connection of the appropriate gripper.

Description	ID	Height
Tool-side		
A-CWA-064-050-P	0305768	21 mm

Sensor system



28 Stop for MMS-P

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

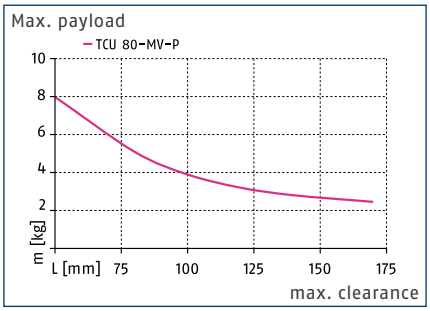
Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

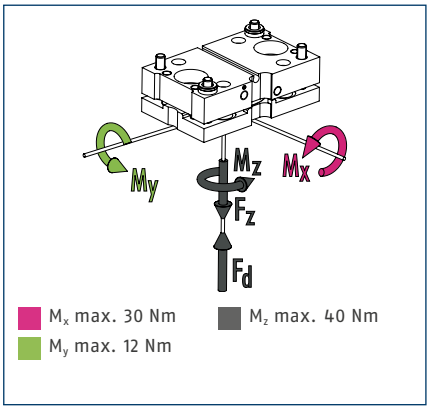
TCU-P 080

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



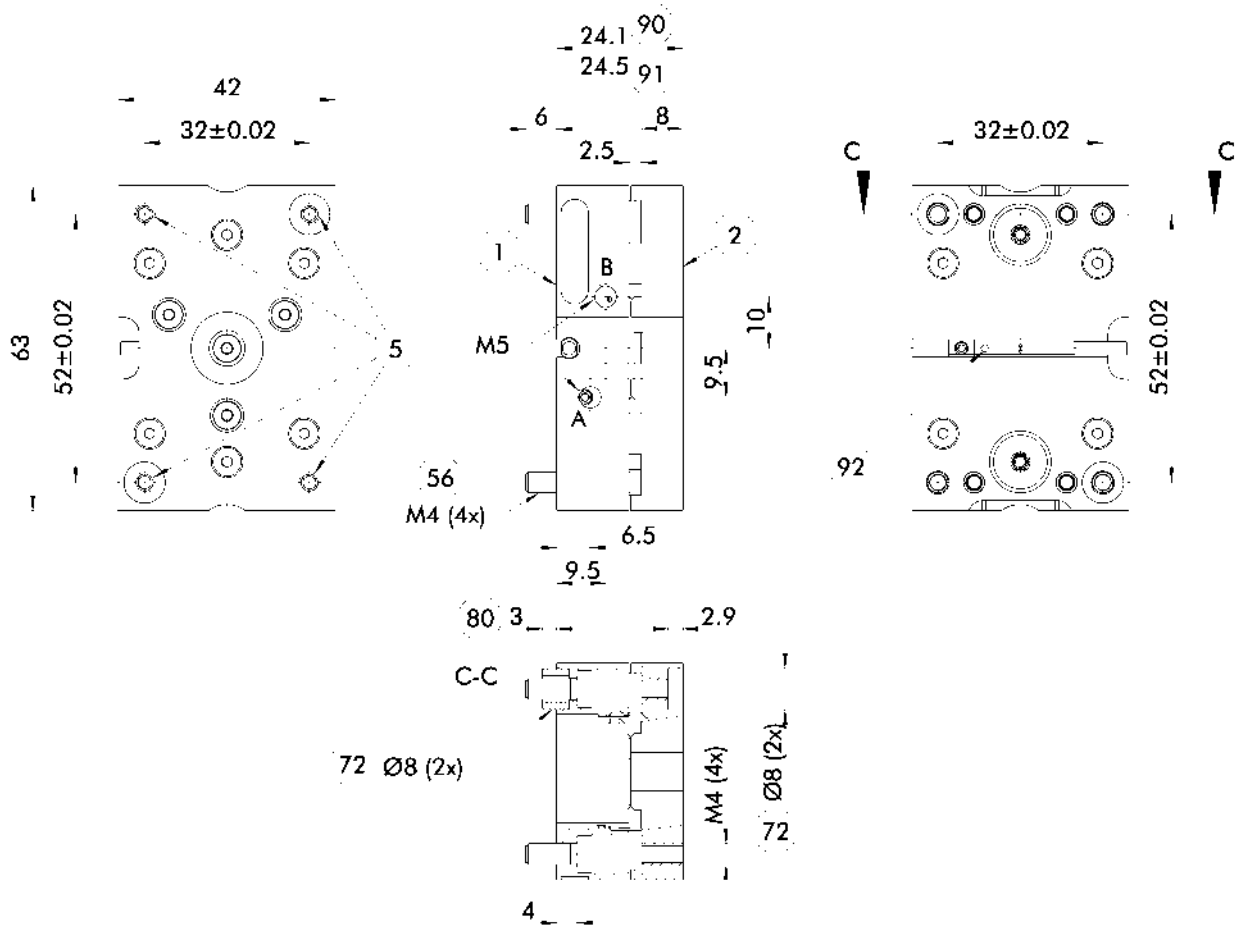
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-080-3-MV-P	TCU-080-3-OV-P
ID		0324792	0324793
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	1.5	1.5
Deflection Z	[°]	2	2
Repeat accuracy	[mm]	0.1	
Mass	[kg]	0.15	0.1
min. / max. operating pressure	[bar]	4/8	
Locking device		with locking	without locking
Locking moment M_x	[Nm]	4	
Locking moment M_y	[Nm]	3	
Locking moment M_z	[Nm]	6	
Locking force F_z	[N]	70	
Max. force F_d	[N]	1500	1500
Direct connection to*		PGN-plus 80	PGN-plus 80

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



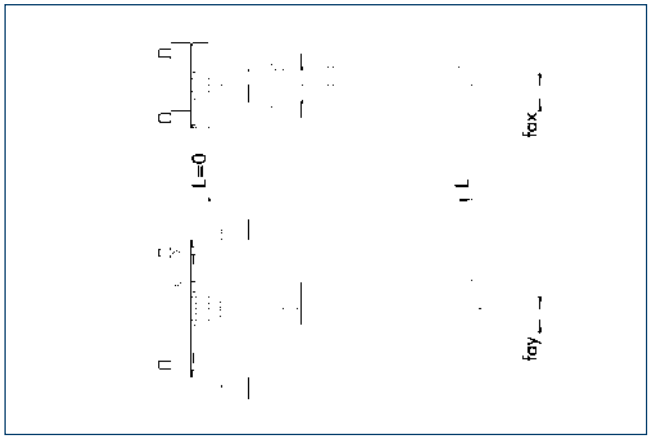
The main view shows the unit in its basic version.

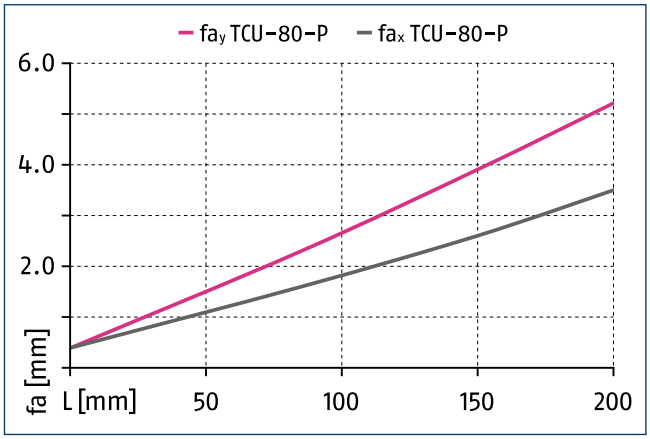
A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(56) Included in delivery
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection



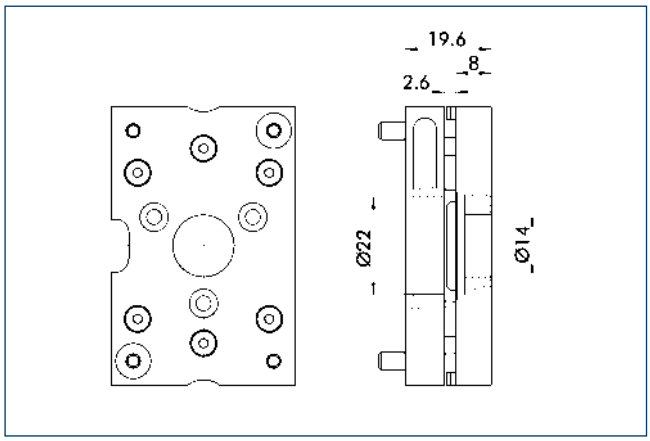


Deflection (fa) dependent upon the length (L) to the center of mass

TCU-P 080

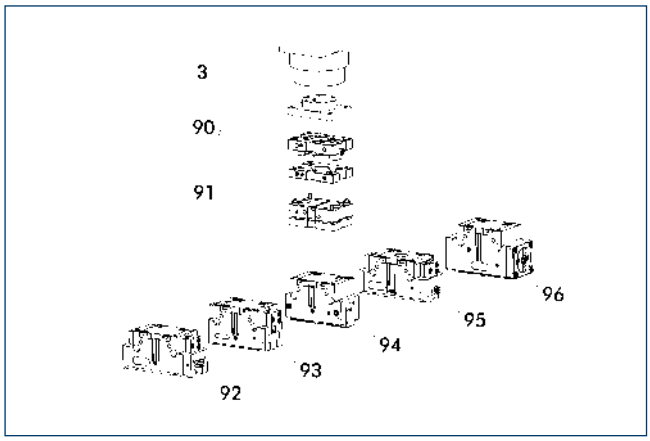
Robot Accessories | Compensating | Tolerance Compensation Unit

Version without locking (OV)



Dimensional changes for the version without locking

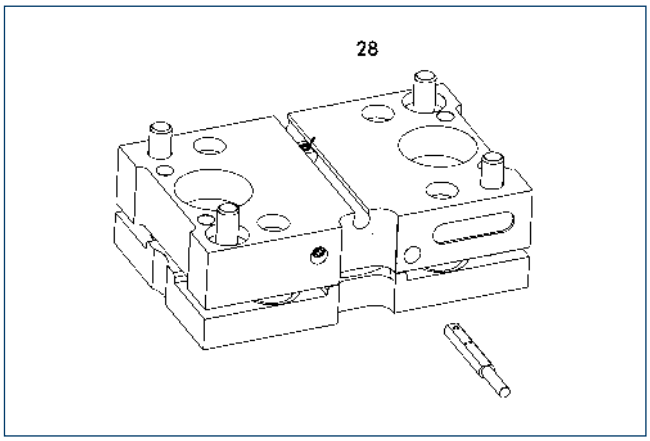
Modular system



(3) Adapter plate
(90) CWS compact change system
(91) TCU tolerance compensation unit
(92) PGN-plus 2-finger parallel gripper
(93) JGP 2-finger parallel gripper
(94) PWG-plus 2-finger angular gripper
(95) PGB 2-finger parallel gripper
(96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Sensor system



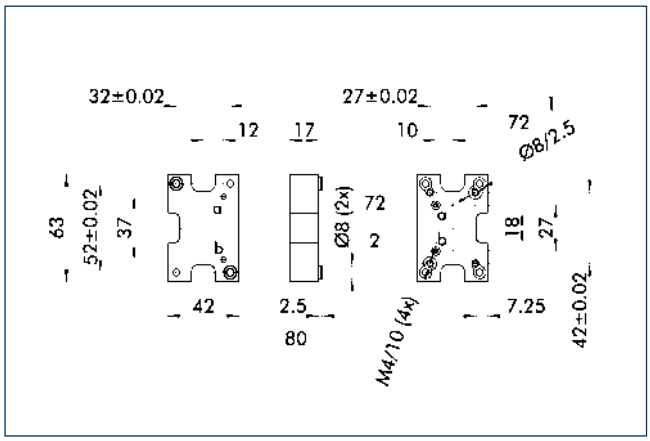
(28) Stop for MMS-P

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Adapter plate between TCU-P 080 and PGN-plus 64



(1) Connection robot-side
(2) Connection tool-side
(72) Fit for centering sleeves
(80) Depth of the centering sleeve hole in the mating part

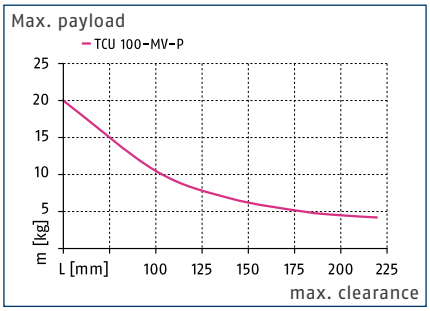
The adapter plate has integrated air feed-throughs in order to be able to use the hose-free direct connection of the appropriate gripper.

Description	ID	Height
Tool-side		
A-CWA-080-064-P	0305784	17 mm

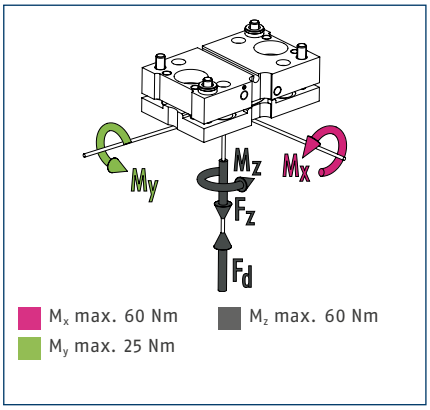
TCU-P 100

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



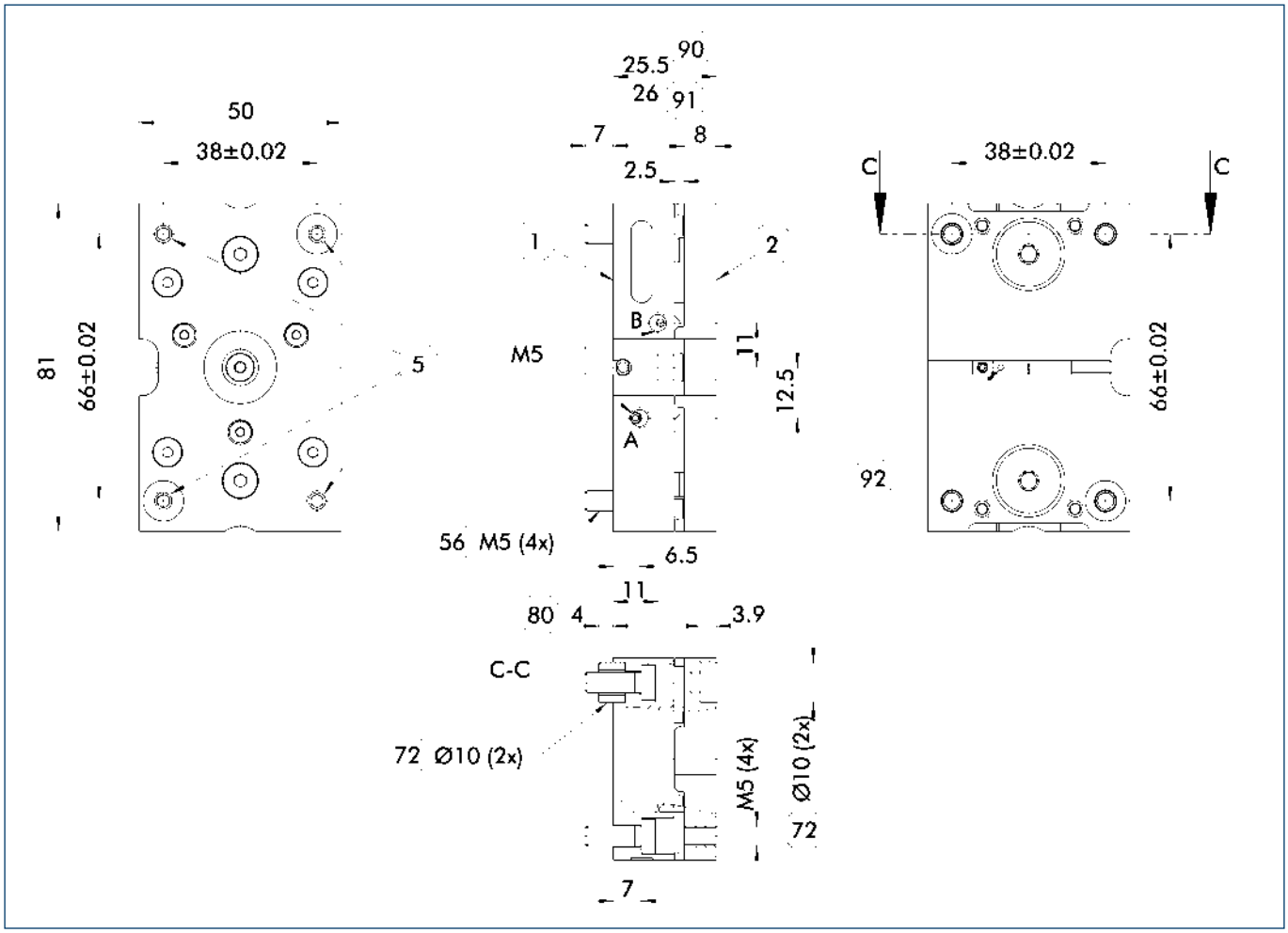
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-100-2-MV-P	TCU-100-3-OV-P
ID		0324808	0324811
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	1.5	1.5
Deflection Z	[°]	1.2	1.2
Repeat accuracy	[mm]	0.05	
Mass	[kg]	0.27	0.22
min. / max. operating pressure	[bar]	4/8	
Locking device		with locking	without locking
Locking moment M_x	[Nm]	15	
Locking moment M_y	[Nm]	8	
Locking moment M_z	[Nm]	25	
Locking force F_z	[N]	200	
Max. force F_d	[N]	2000	2000
Direct connection to*		PGN-plus 100	PGN-plus 100

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



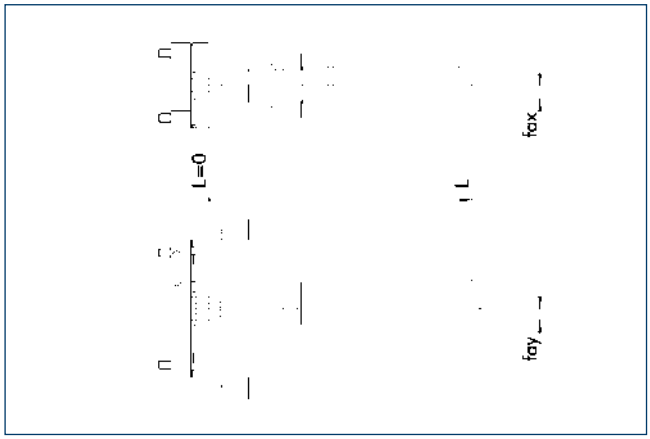
The main view shows the unit in its basic version.

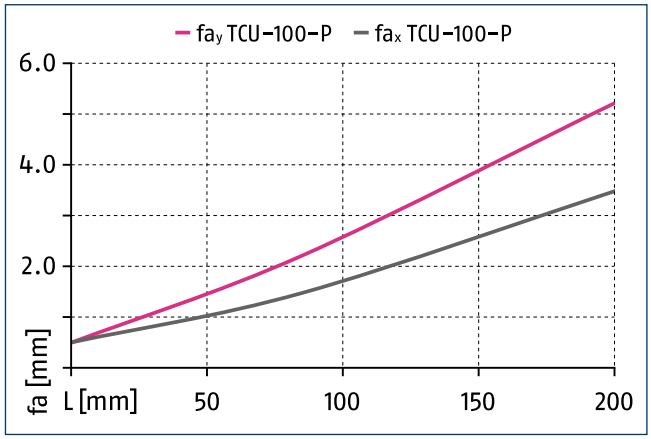
A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(56) Included in delivery
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection



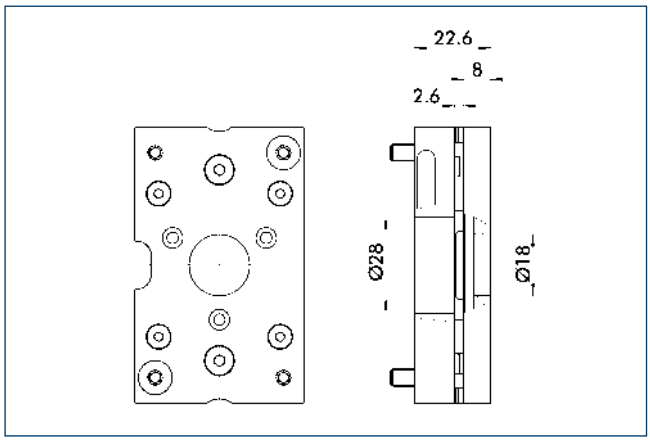


Deflection (fa) dependent upon the length (L) to the center of mass

TCU-P 100

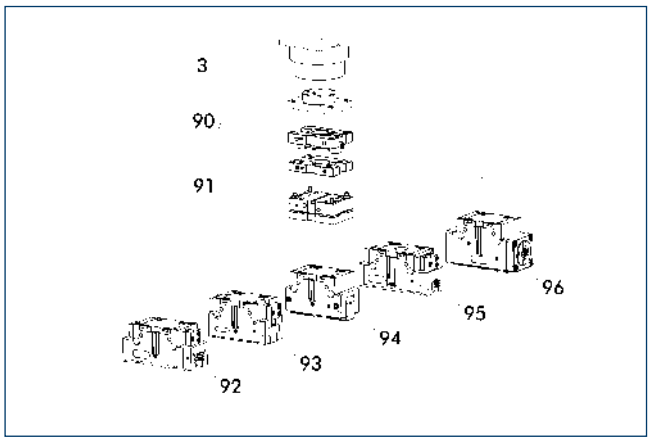
Robot Accessories | Compensating | Tolerance Compensation Unit

Version without locking (0V)



Dimensional changes for the version without locking

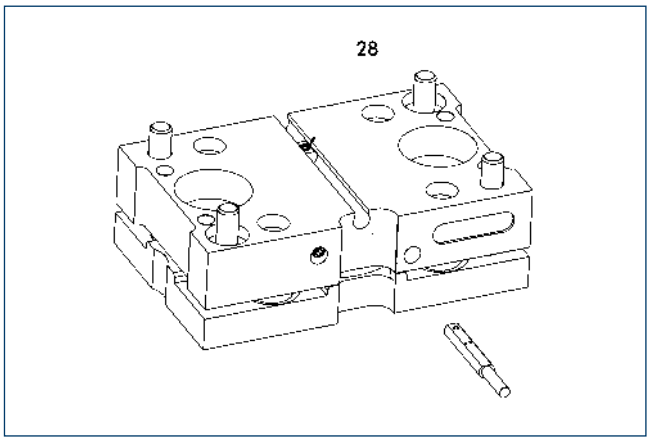
Modular system



(3) Adapter plate
(90) CWS compact change system
(91) TCU tolerance compensation unit
(92) PGN-plus 2-finger parallel gripper
(93) JGP 2-finger parallel gripper
(94) PWG-plus 2-finger angular gripper
(95) PGB 2-finger parallel gripper
(96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Sensor system



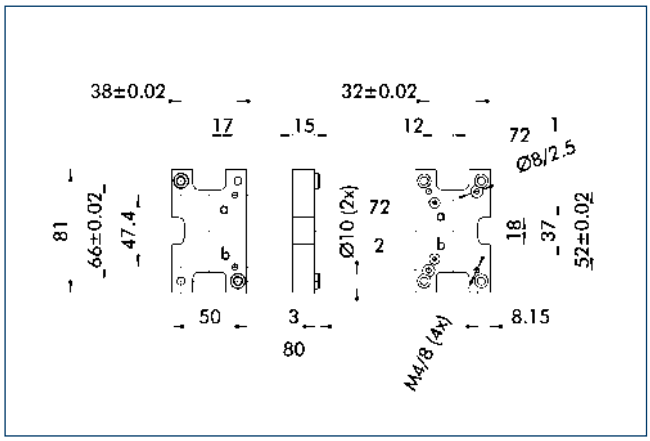
(28) Stop for MMS-P

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Adapter plate between TCU-P 100 and PGN-plus 80



(1) Connection robot-side
(2) Connection tool-side
(72) Fit for centering sleeves
(80) Depth of the centering sleeve hole in the mating part

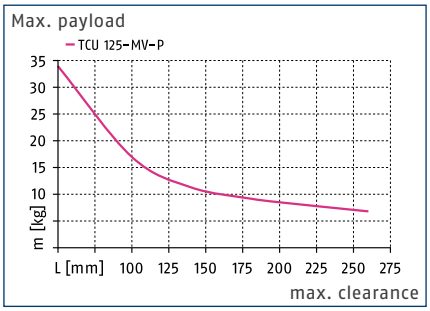
The adapter plate has integrated air feed-throughs in order to be able to use the hose-free direct connection of the appropriate gripper.

Description	ID	Height
Tool-side		
A-CWA-100-080-P	0305804	15 mm

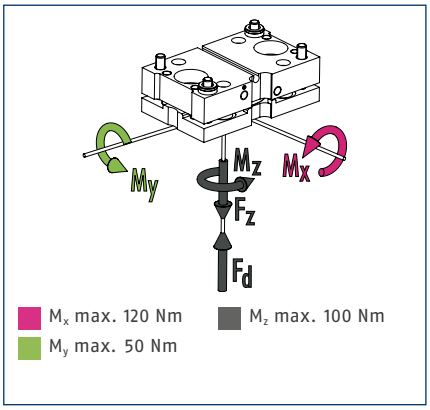
TCU-P 125

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



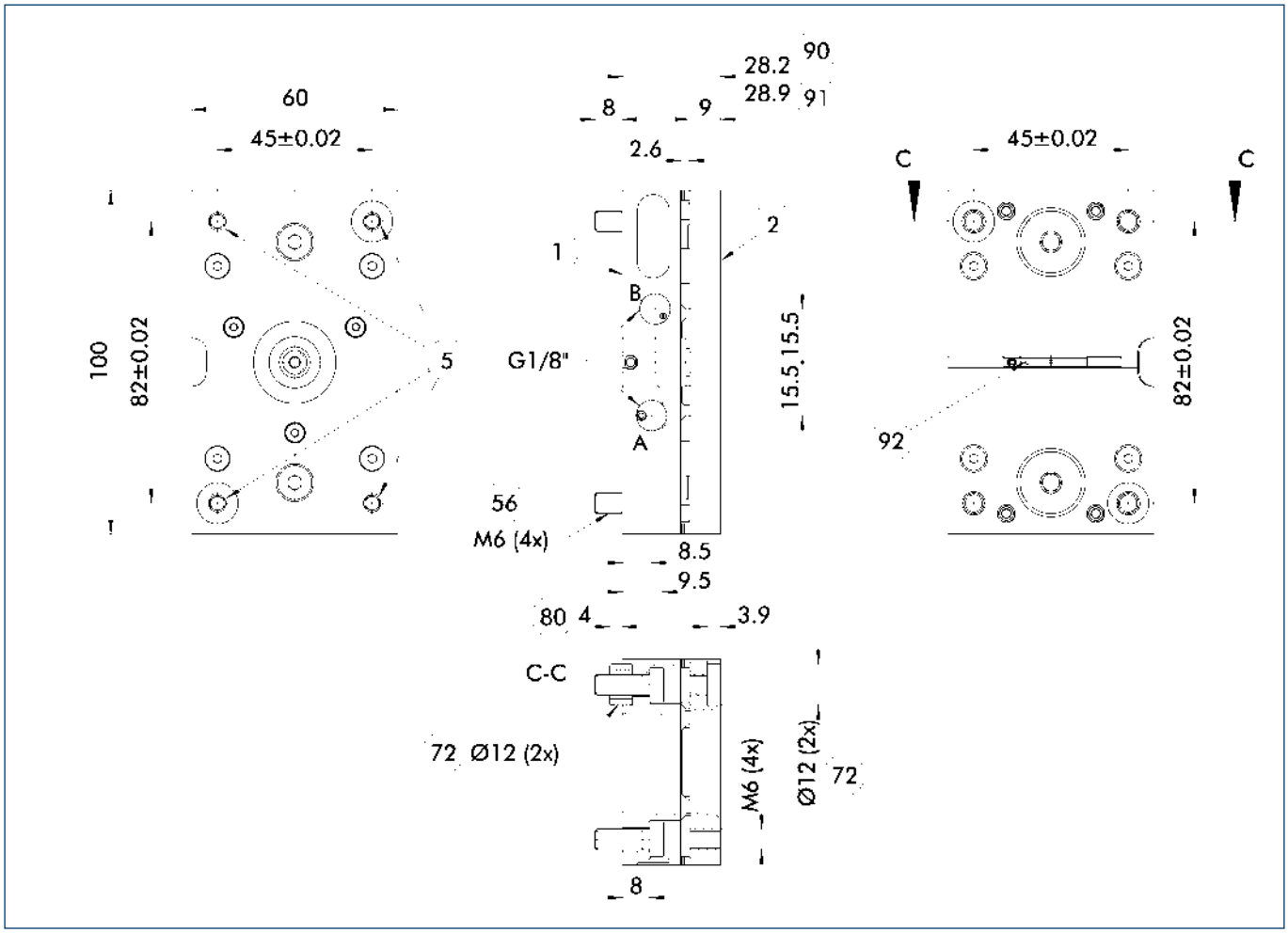
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-125-3-MV-P	TCU-125-3-OV-P
ID		0324828	0324829
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	1.5	1.5
Deflection Z	[°]	1.5	1.5
Repeat accuracy	[mm]	0.05	
Mass	[kg]	0.4	0.3
min. / max. operating pressure	[bar]	4/8	
Locking device		with locking	without locking
Locking moment M_x	[Nm]	25	
Locking moment M_y	[Nm]	10	
Locking moment M_z	[Nm]	40	
Locking force F_z	[N]	300	
Max. force F_d	[N]	2800	2800
Direct connection to*		PGN-plus 125	PGN-plus 125

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



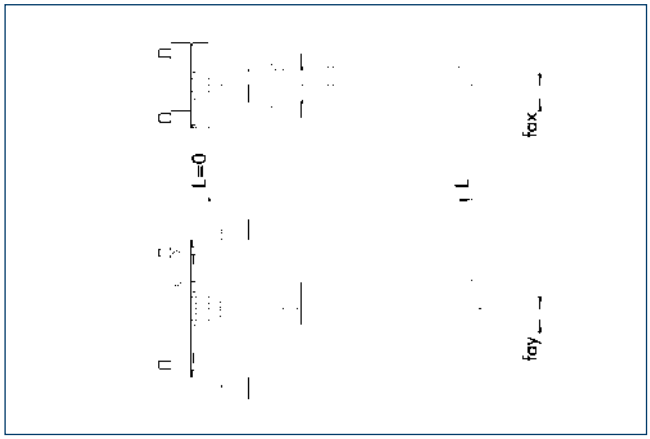
The main view shows the unit in its basic version.

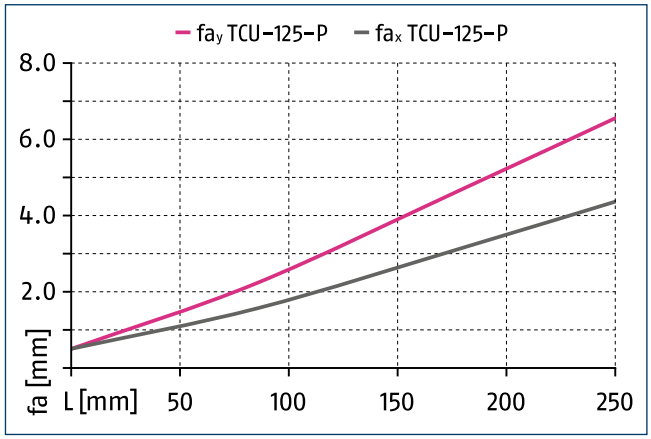
A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(56) Included in delivery
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection



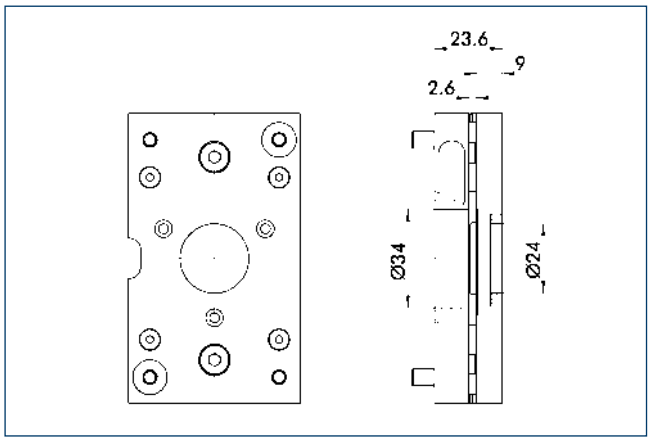


Deflection (fa) dependent upon the length (L) to the center of mass

TCU-P 125

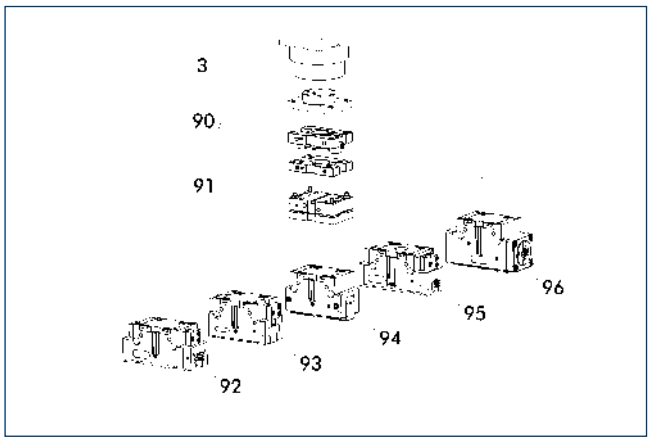
Robot Accessories | Compensating | Tolerance Compensation Unit

Version without locking (0V)



Dimensional changes for the version without locking

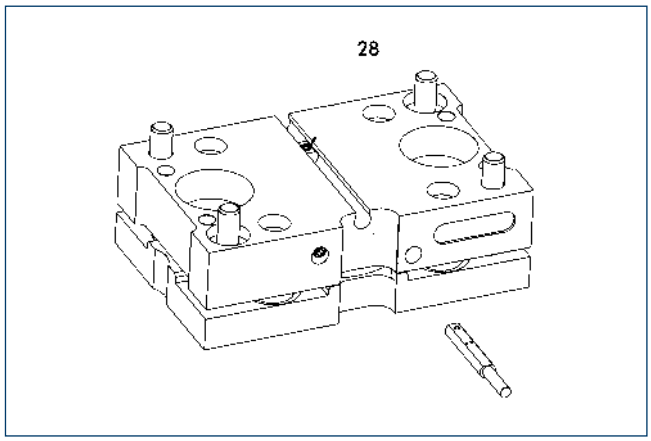
Modular system



(3) Adapter plate
(90) CWS compact change system
(91) TCU tolerance compensation unit
(92) PGN-plus 2-finger parallel gripper
(93) JGP 2-finger parallel gripper
(94) PWG-plus 2-finger angular gripper
(95) PGB 2-finger parallel gripper
(96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Sensor system



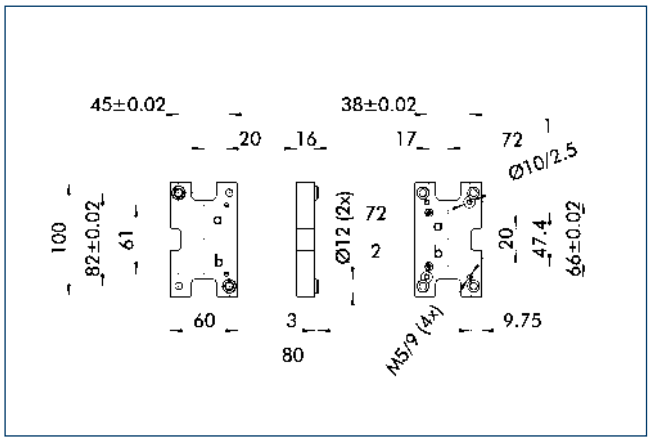
(28) Stop for MMS-P

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

Adapter plate between TCU-P 125 and PGN-plus 100



(1) Connection robot-side
(2) Connection tool-side
(72) Fit for centering sleeves
(80) Depth of the centering sleeve hole in the mating part

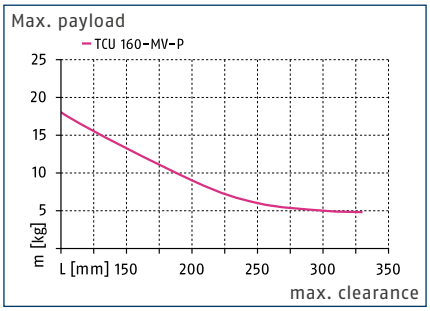
The adapter plate has integrated air feed-throughs in order to be able to use the hose-free direct connection of the appropriate gripper.

Description	ID	Height
Tool-side		
A-CWA-125-100-P	0305829	16 mm

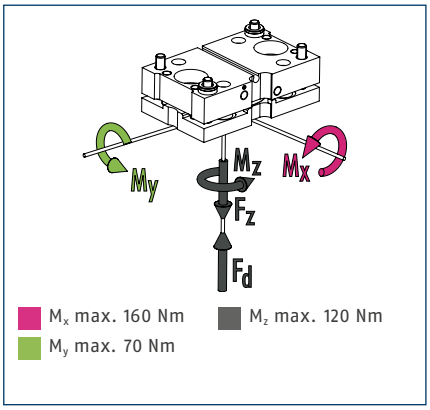
TCU-P 160

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



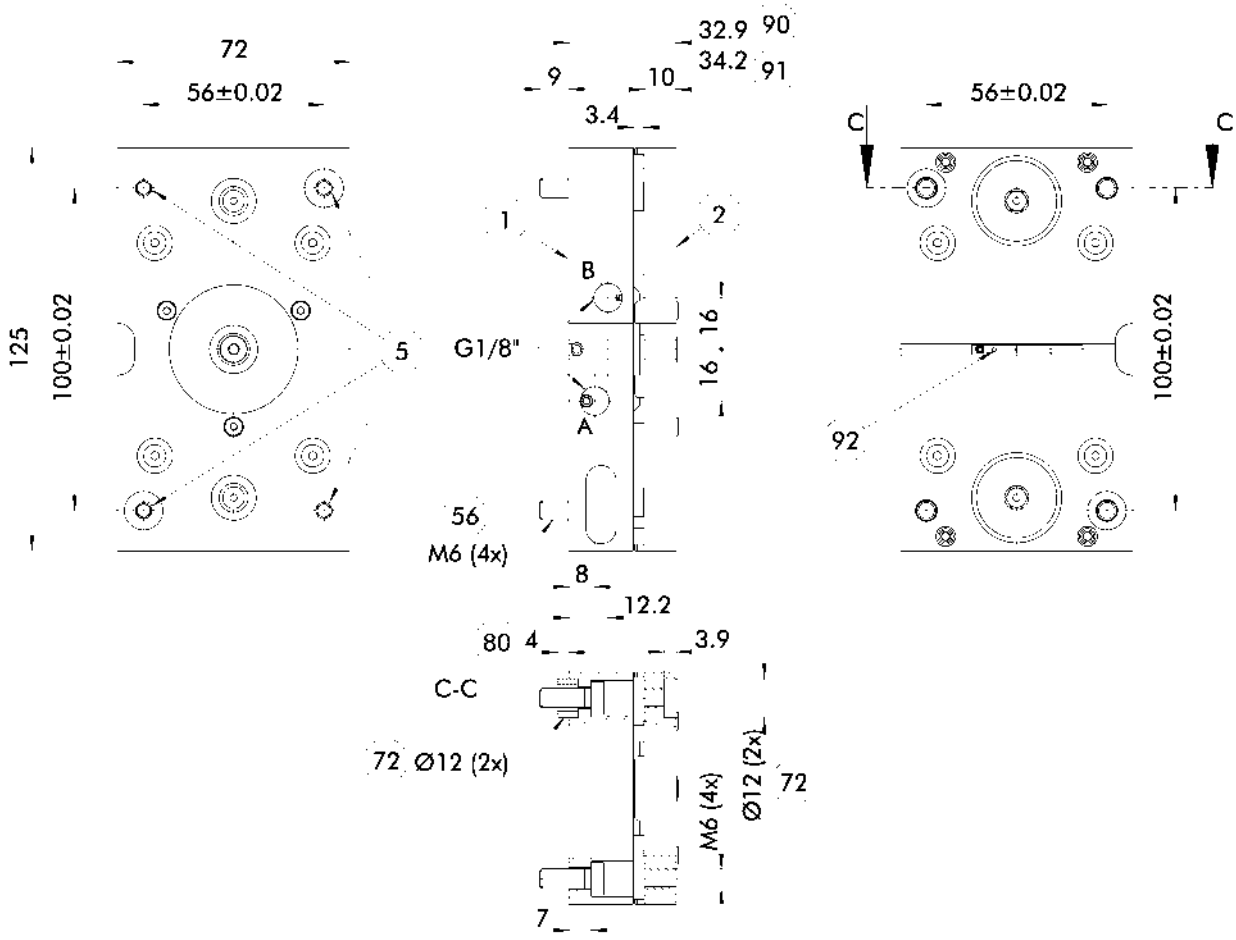
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-160-3-MV-P	TCU-160-3-OV-P
ID		0324846	0324847
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	2	2
Deflection Z	[°]	1.5	1.5
Repeat accuracy	[mm]	0.02	
Mass	[kg]	0.7	0.55
min. / max. operating pressure	[bar]	4/8	
Locking device		with locking	without locking
Locking moment M_x	[Nm]	30	
Locking moment M_y	[Nm]	18	
Locking moment M_z	[Nm]	50	
Locking force F_z	[N]	400	
Max. force F_d	[N]	4300	4300
Direct connection to*		PGN-plus 160	PGN-plus 160

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



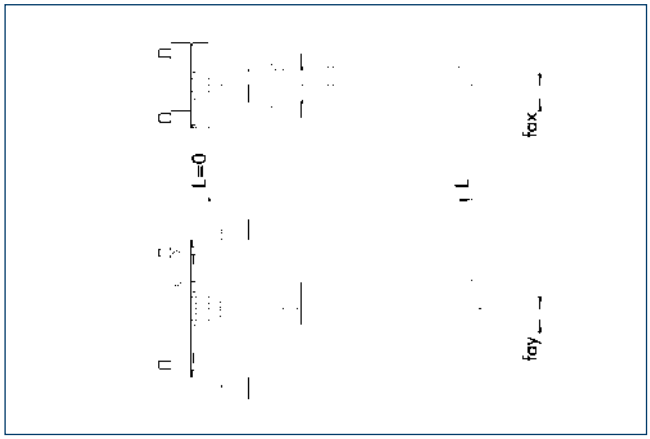
The main view shows the unit in its basic version.

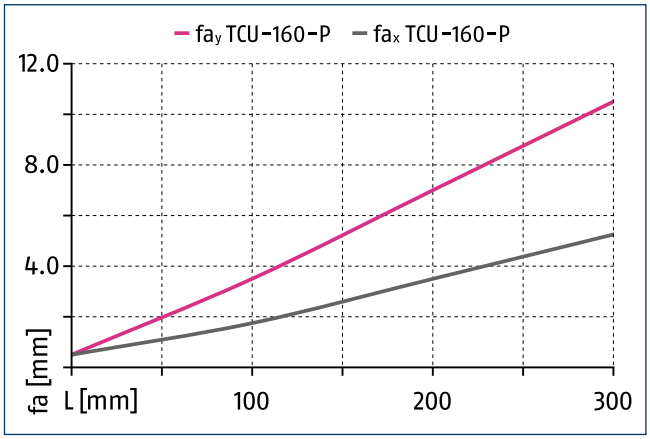
A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(56) Included in delivery
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection



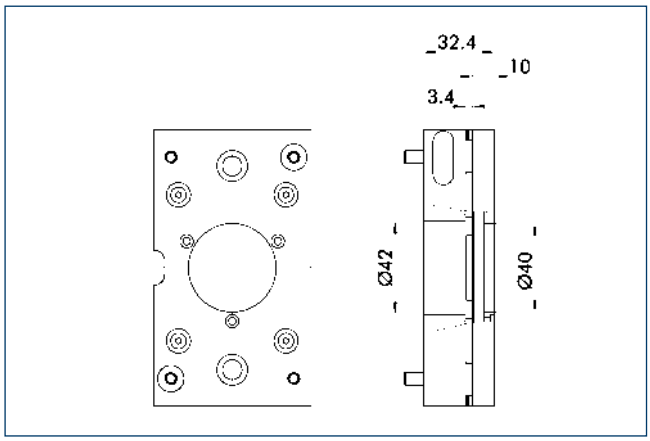


Deflection (fa) dependent upon the length (L) to the center of mass

TCU-P 160

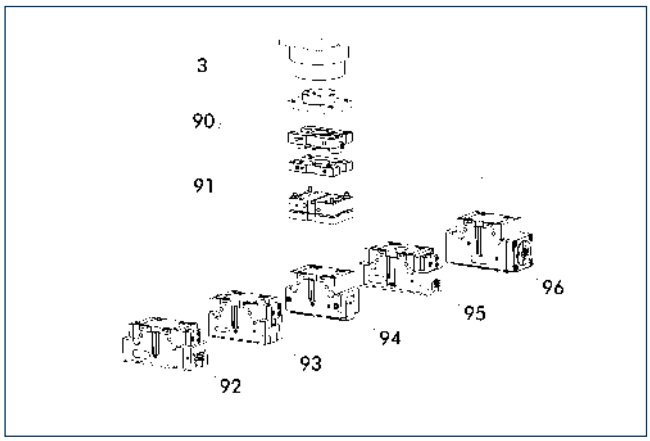
Robot Accessories | Compensating | Tolerance Compensation Unit

Version without locking (OV)



Dimensional changes for the version without locking

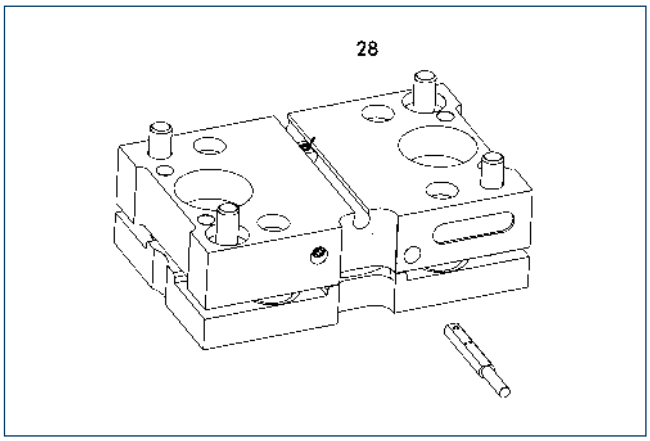
Modular system



(3) Adapter plate
(90) CWS compact change system
(91) TCU tolerance compensation unit
(92) PGN-plus 2-finger parallel gripper
(93) JGP 2-finger parallel gripper
(94) PWG-plus 2-finger angular gripper
(95) PGB 2-finger parallel gripper
(96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Sensor system

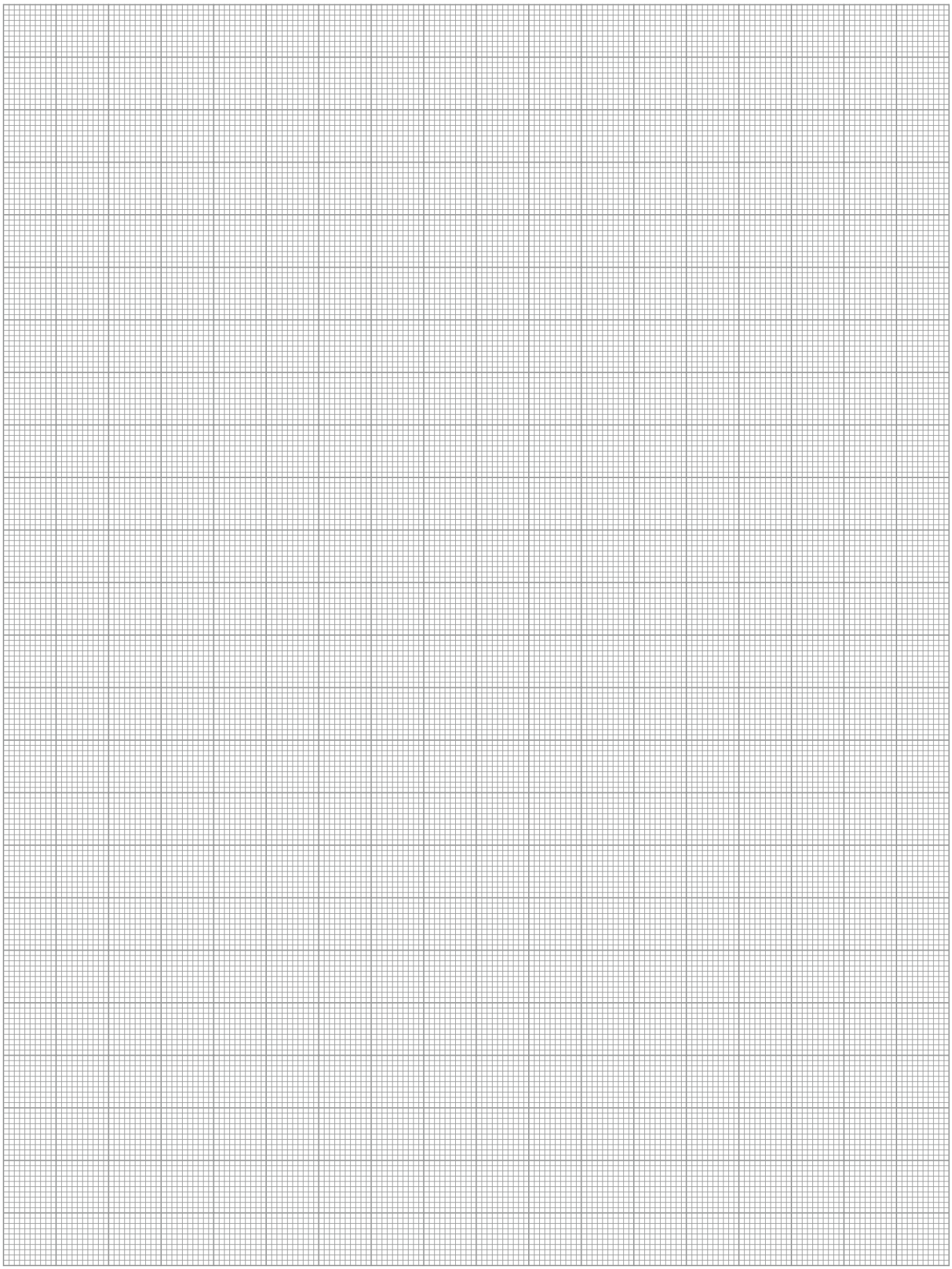


(28) Stop for MMS-P

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

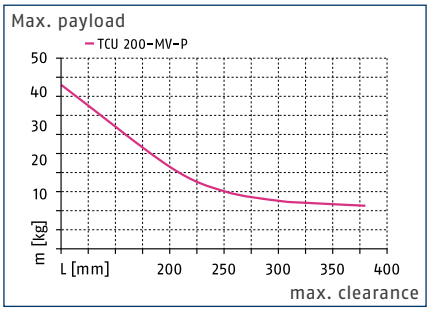
ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



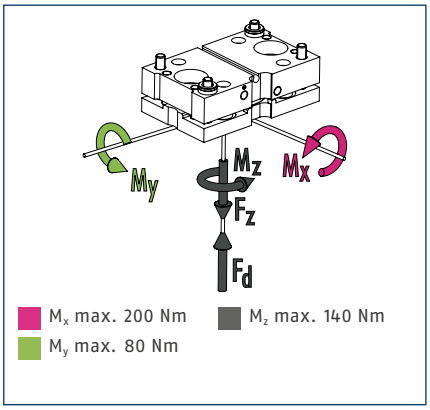
TCU-P 200

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



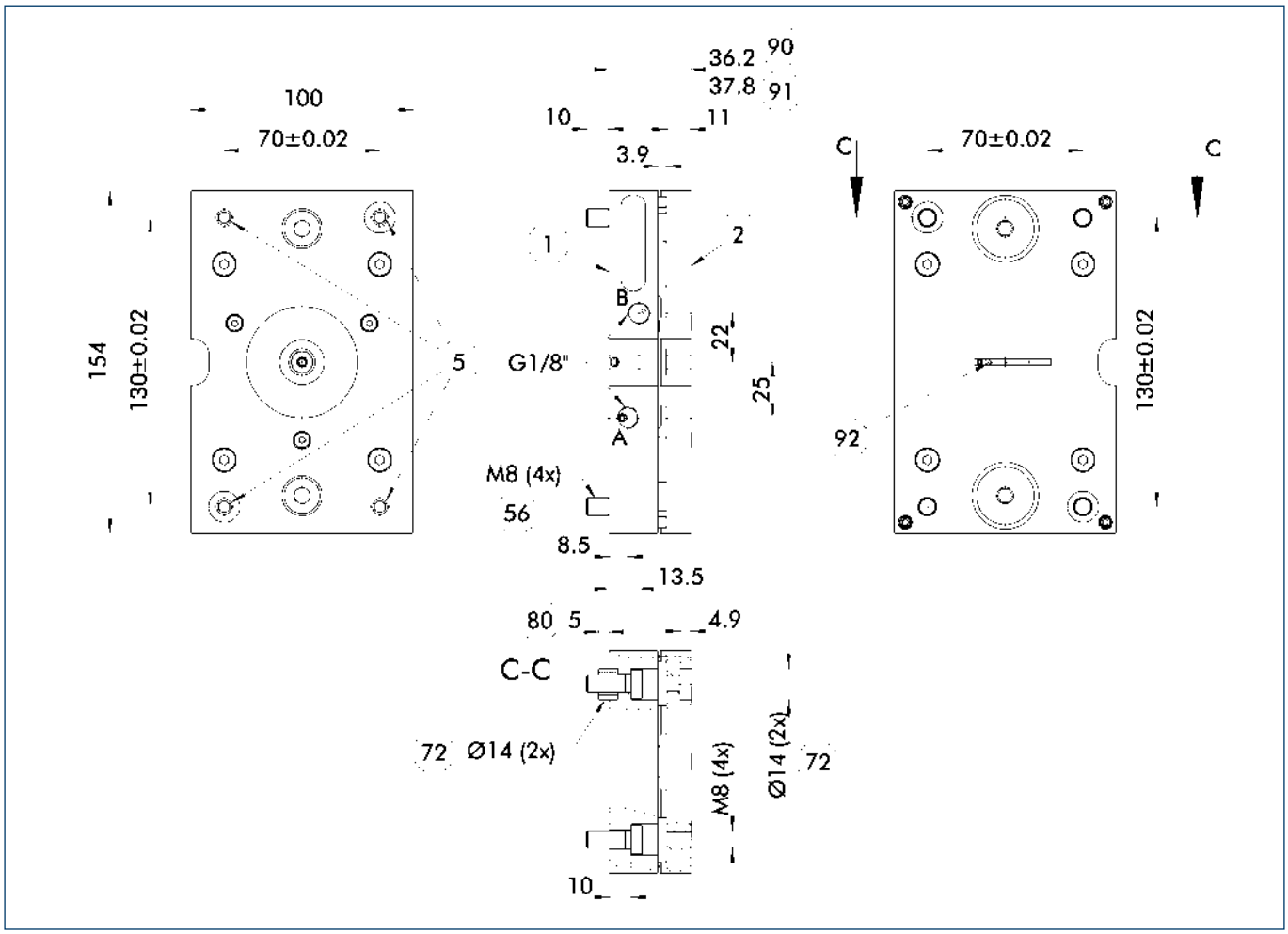
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-200-3-MV-P	TCU-200-3-OV-P
ID		0324864	0324865
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	2	2
Deflection Z	[°]	1.5	1.5
Repeat accuracy	[mm]	0.02	
Mass	[kg]	1.3	1
min. / max. operating pressure	[bar]	4/8	
Locking device		with locking	without locking
Locking moment M_x	[Nm]	50	
Locking moment M_y	[Nm]	25	
Locking moment M_z	[Nm]	75	
Locking force F_z	[N]	700	
Max. force F_d	[N]	5000	5000
Direct connection to*		PGN-plus 200	PGN-plus 200

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



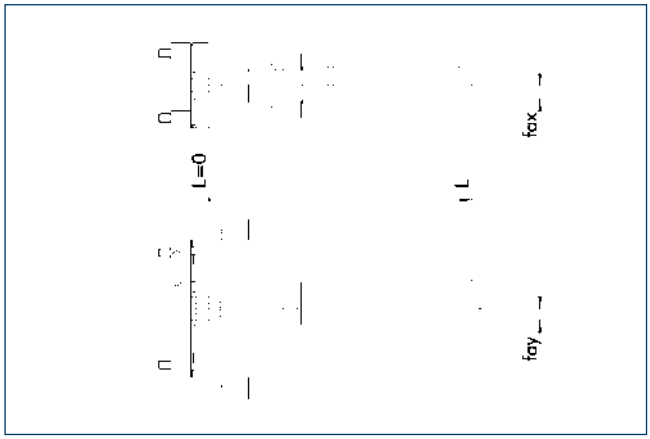
The main view shows the unit in its basic version.

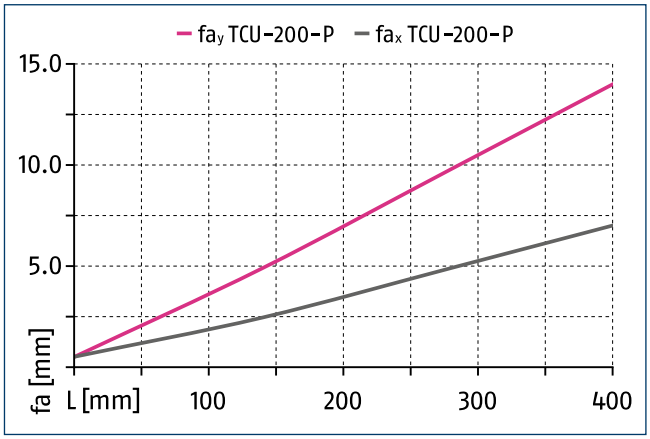
A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(56) Included in delivery
(72) Fitting for centering sleeve
(80) Depth of the centering sleeve hole in the mating part
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection



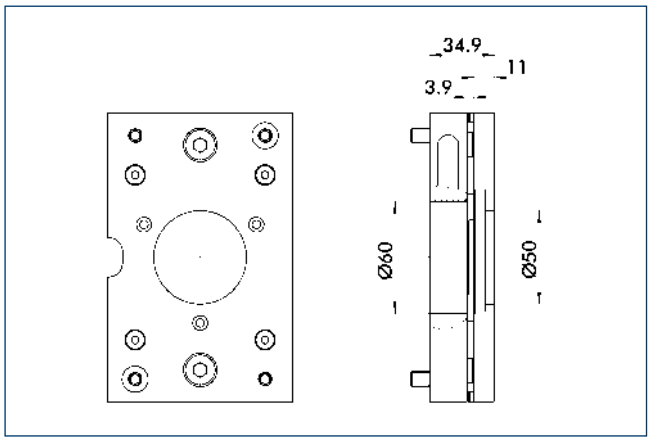


Deflection (fa) dependent upon the length (L) to the center of mass

TCU-P 200

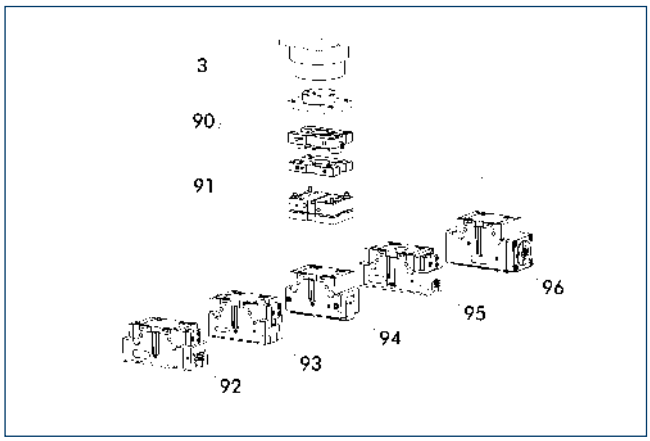
Robot Accessories | Compensating | Tolerance Compensation Unit

Version without locking (0V)



Dimensional changes for the version without locking

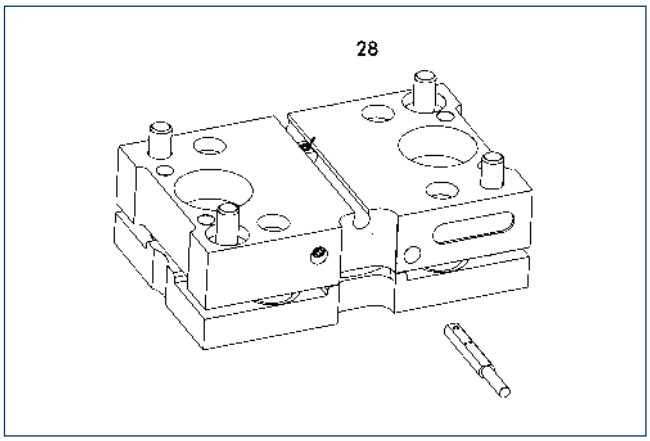
Modular system



(3) Adapter plate
(90) CWS compact change system
(91) TCU tolerance compensation unit
(92) PGN-plus 2-finger parallel gripper
(93) JGP 2-finger parallel gripper
(94) PWG-plus 2-finger angular gripper
(95) PGB 2-finger parallel gripper
(96) DPG-plus sealed gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Sensor system

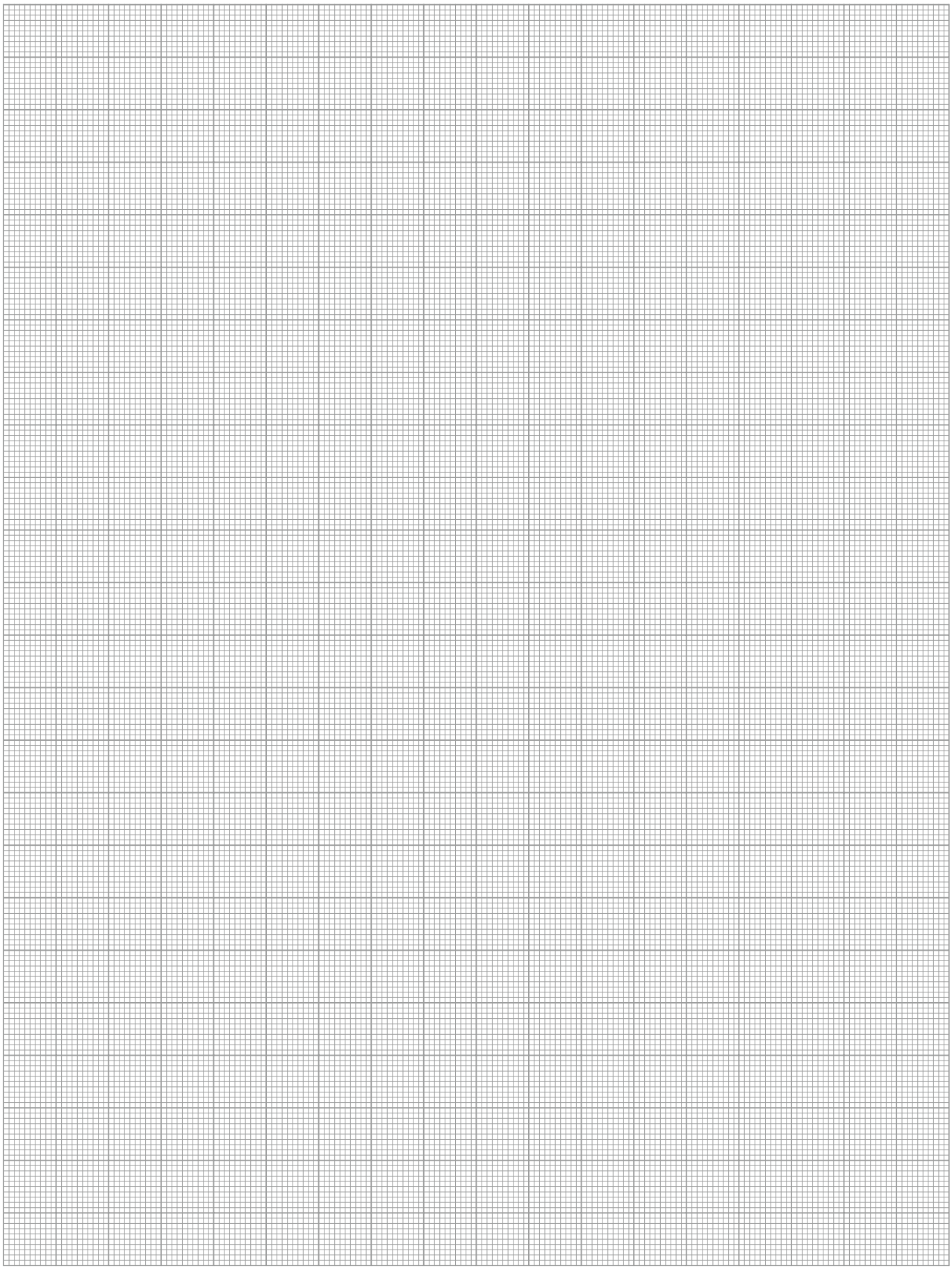


(28) Stop for MMS-P

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



Compact. Flexible. Productive.

TCU-Z Tolerance Compensation Unit

The TCU is compensated on the basis of elastomers that compensate in all three directions, enabling them to correct angle errors and to carry out rotational compensation. Pneumatic locking is also available as an option to allow the compensation unit to be set to rigid. As a result, it is possible to prevent the tool or the gripper vibrating during movement of the robot arm. PZN-plus grippers and grippers with the same screw connection pattern on the base side can be mounted on the unit without adaptation.

Field of Application

For universal use in clean and slightly dirty environments, with special requirements for the corrosion resistance and antistatic properties of the gripper unit

Advantages – Your benefit

Compensation of workpiece-related tolerances and position inaccuracies reduced risk of jamming, necessary assembly forces are reduced and wear of the workpiece and handling device is minimized

Direct assembly of parallel grippers no need for additional adapter plates

Compact design minimized height and weight

Pneumatic locking long life span of the elastomers, rigid unit during travel

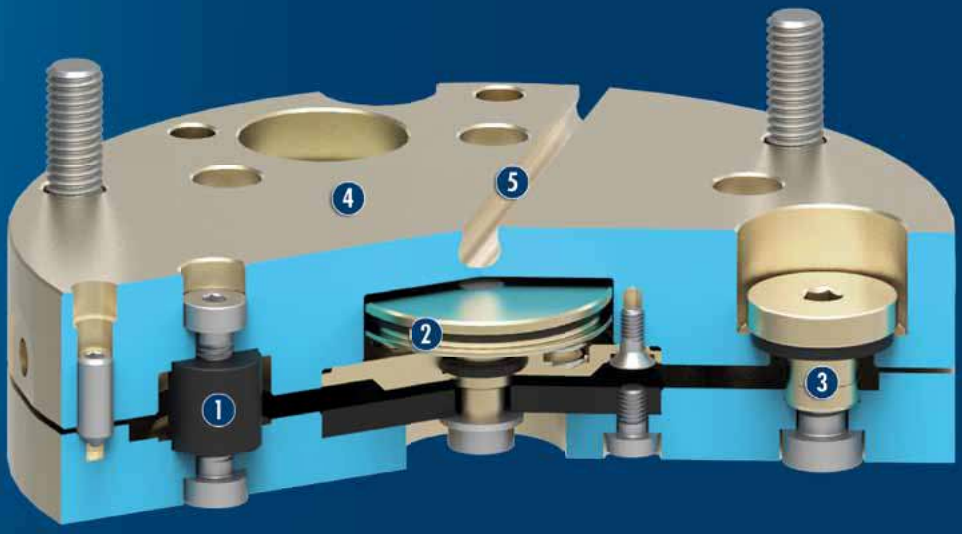
Monitoring of locking for process reliable sequences and shorter cycle times

Sizes	Workpiece weight	Deflection
Quantity: 7	3 .. 60 kg	1°

Functional Description

The TCU's function is based on the interaction between the two base plates, which are connected to each other by a set of flexible elastomer elements. As a result, the TCU can compensate tolerances in the X-, Y-, and Z-directions, allowing it to correct angle errors and provide rotational compensation. Pneumatic locking is also available as an option to allow the compensation unit to be set to rigid.

As a result, it is possible to prevent the tool or the gripper vibrating during movement of the robot arm or the linear axis. This increases the application's repeat accuracy and extends the service life of the elastomer elements. Direct assembly of the appropriate gripper types without additional adapter plates enables a flat and weight-reduced compensation system.



① **Elastomers**
allow compensation motion

② **Locking mechanism**
for a rigid connection between the machine and tool sides

③ **Overload pin**
to protect the elastomers

④ **Interface machine side**
the same mounting pattern as on the tool side

⑤ **Monitoring groove**
for electronic magnetic sensor

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Monitoring: by magnetic switch

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Material: Elastomer material

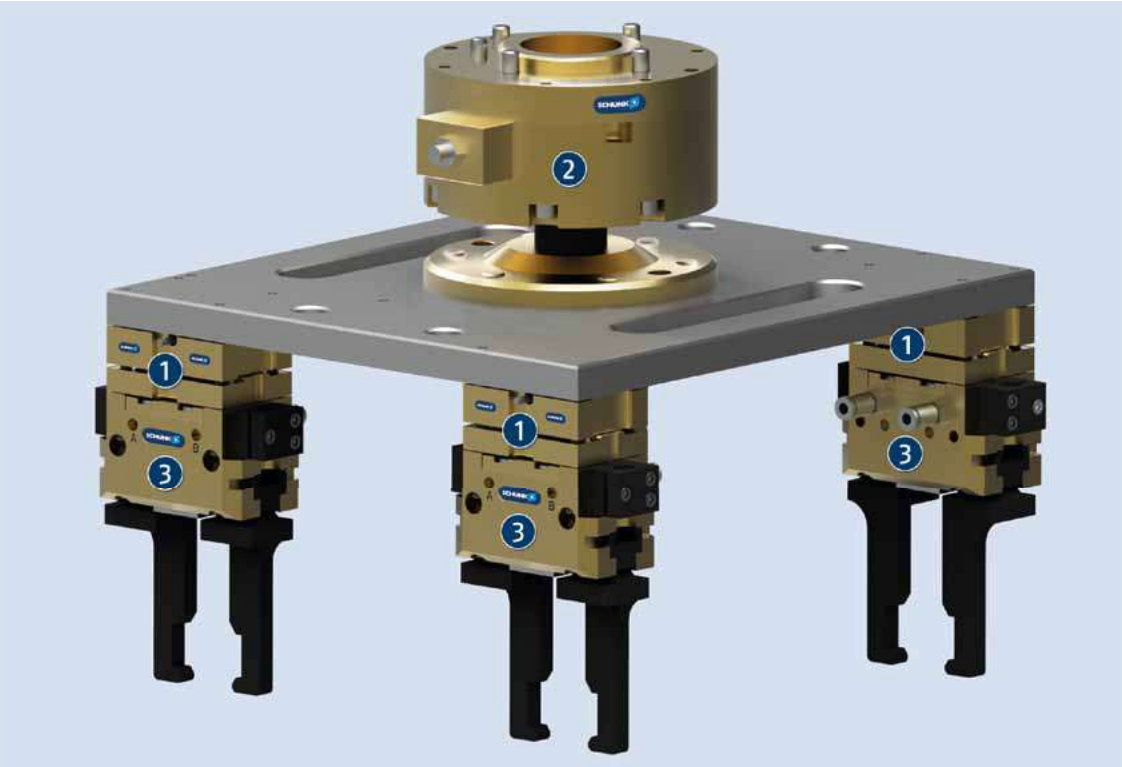
Housing: Aluminum alloy

Scope of delivery: Robot-side mounting screws

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.



Application example

In applications where several grippers are used, the tolerance variations of the workpieces are compensated by the tolerance compensation units. The application is also monitored by a collision sensor.

1. TCU Tolerance Compensation Unit
2. OPS Collision Sensor
3. JGP 2-Finger Parallel Gripper with workpiece-specific gripper fingers

SCHUNK offers more ...

The following components make the TCU-Z even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Fittings

Magnetic Switches

Sensor Cables

SDV-P Pressure Maintenance Valve

PZN-plus Centric Gripper

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

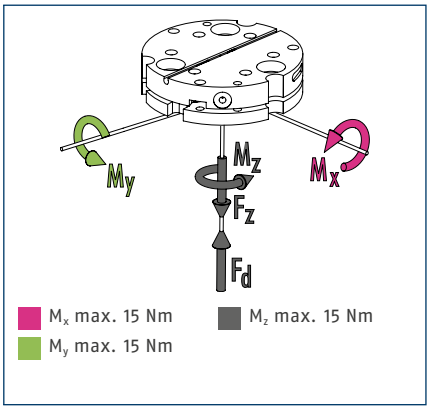
Options and special Information

Monitoring of the locking: by magnetic switch
Connections: two plug-in connections for hose
Ambient temperature: 5 °C to 90 °C
Operating pressure: from 4 bar to 8 bar

TCU-Z 050

Robot Accessories | Compensating | Tolerance Compensation Unit

Forces and moments



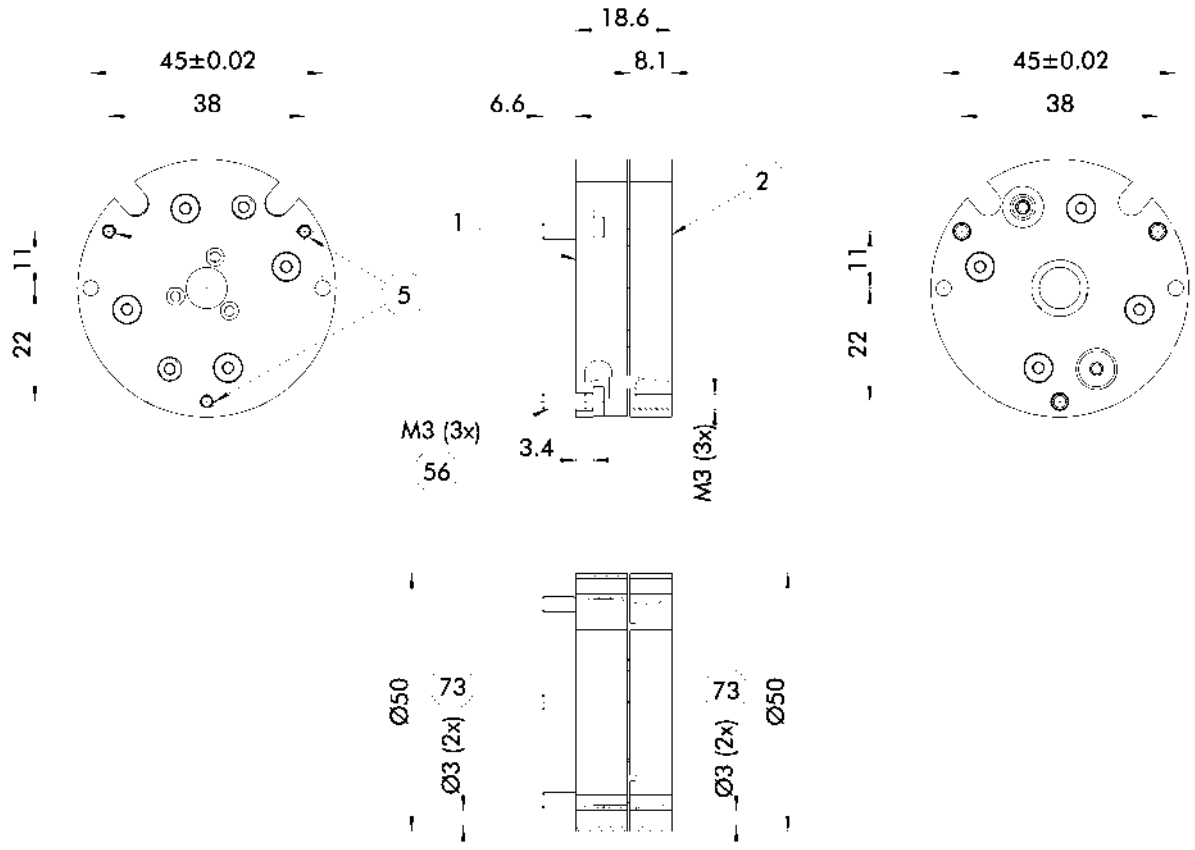
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-050-3-0V-Z
ID		0324749
Hardness of the elastomer	[Shore]	68
Deflection X	[°]	1
Deflection Y	[°]	1
Deflection Z	[°]	1.5
Mass	[kg]	0.09
min. / max. operating pressure	[bar]	4/8
max. force F_d	[N]	500
Direct connection to*		PZN-plus 50

*and for other gripper with the same mounting pattern

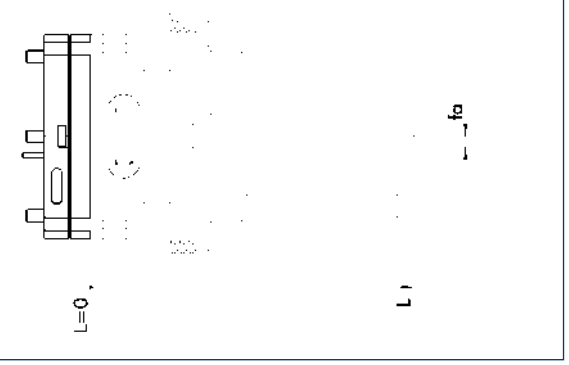
Main view without centric locking (0V)

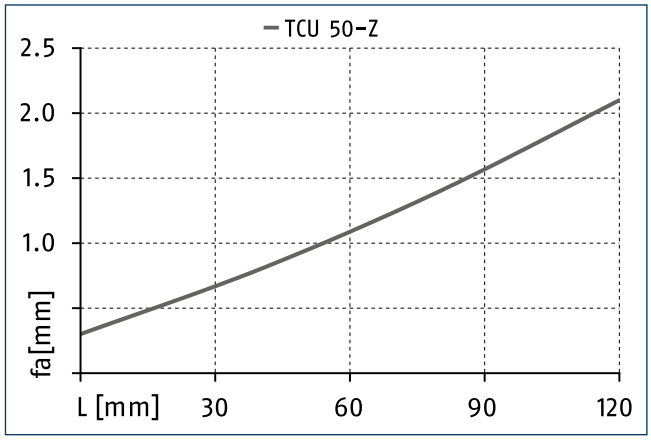


The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(56) Included in delivery
(73) Fit for a centering pin

Maximum deflection

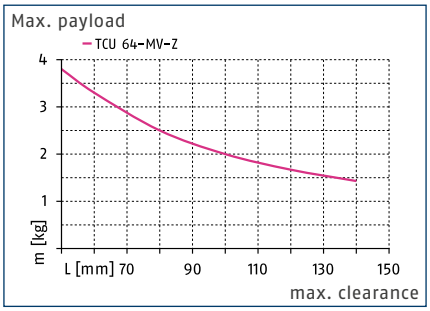




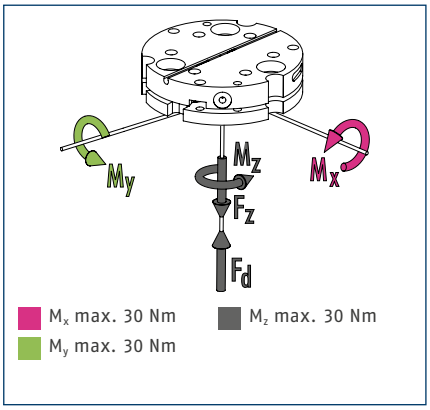
TCU-Z 064

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



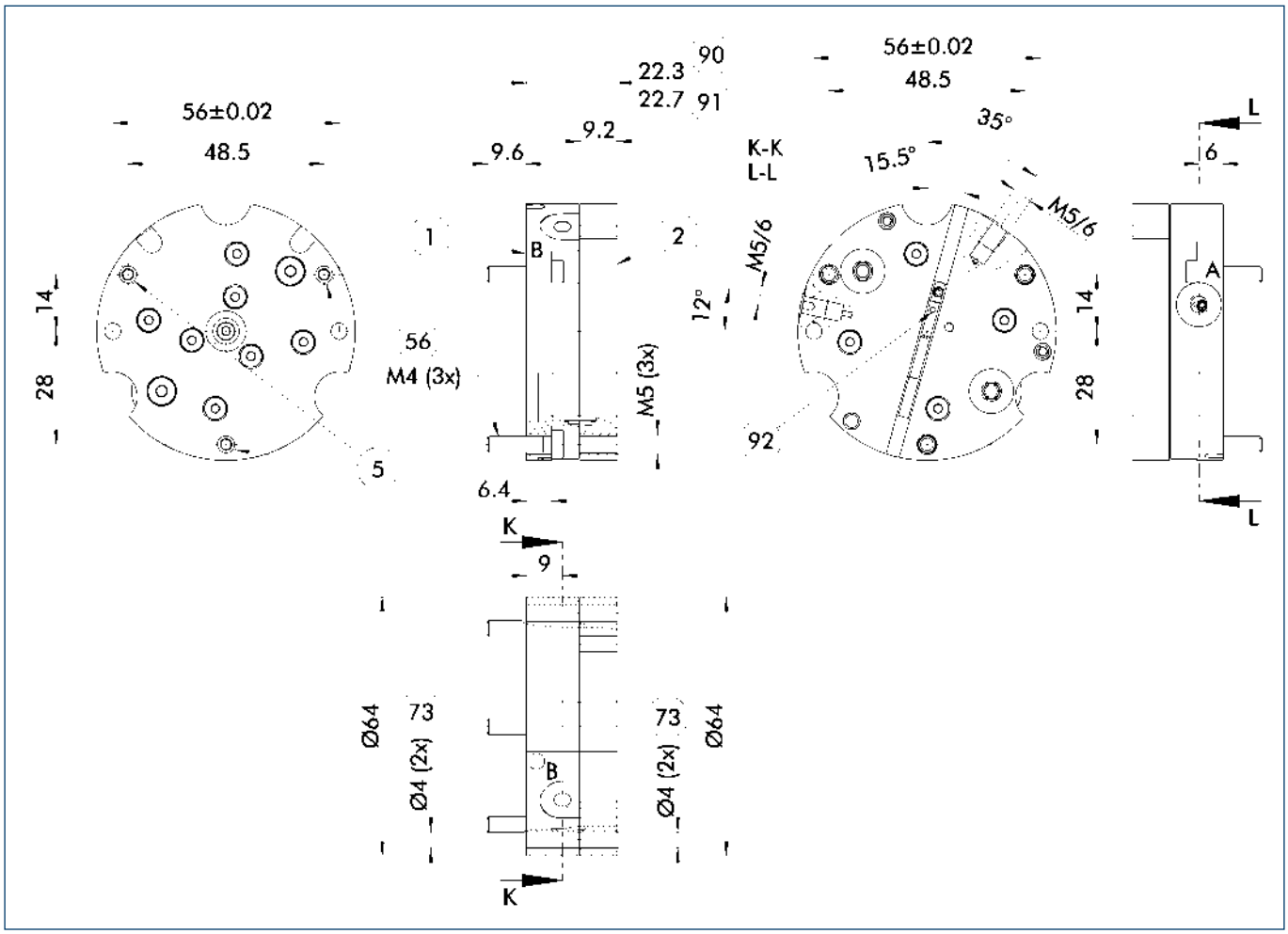
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-064-3-MV-Z	TCU-064-3-OV-Z
ID		0324766	0324767
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	1	1
Deflection Z	[°]	1	1
Repeat accuracy	[mm]	0.1	
Mass	[kg]	0.18	0.15
min. / max. operating pressure	[bar]	4/8	4/8
Locking device		with locking	without locking
Locking moment M_x	[Nm]	1	
Locking moment M_y	[Nm]	1	
Locking moment M_z	[Nm]	4	
Locking force F_z	[N]	30	
max. force F_d	[N]	1100	1100
Direct connection to*		PZN-plus 64	PZN-plus 64

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



The main view shows the unit in its basic version.

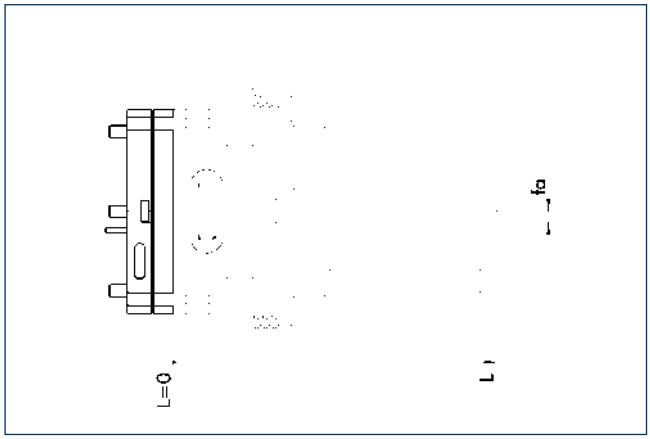
A, a Air connection locked

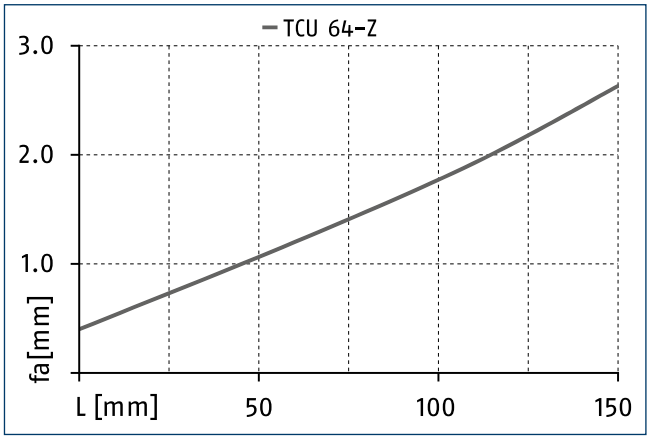
B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws

(56) Included in delivery
(73) Fit for a centering pin
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection

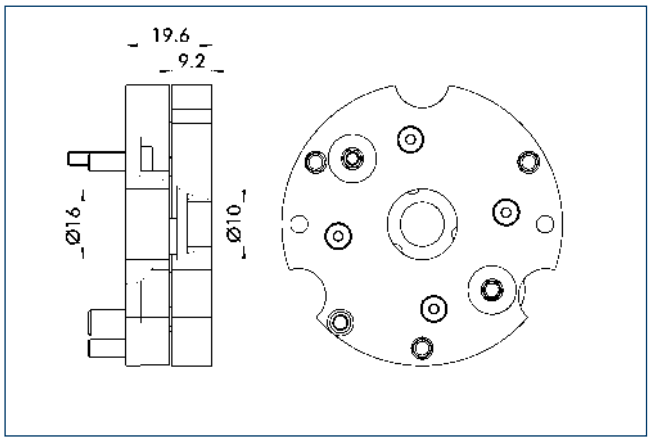




TCU-Z 064

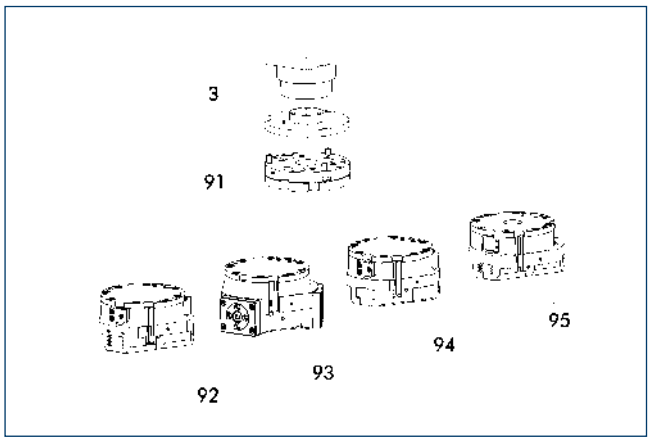
Robot Accessories | Compensating | Tolerance Compensation Unit

Version without locking (0V)



Dimensional changes for the version without locking

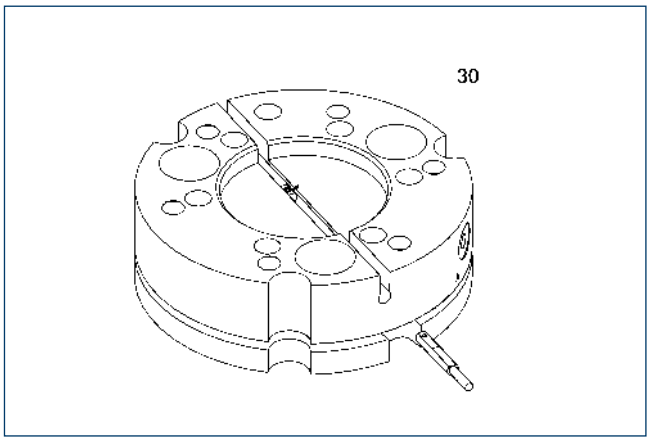
Modular system



(3) Adapter plate
(91) TCU tolerance compensation unit
(92) PZN-plus 3-finger centric gripper
(93) DPZ-plus 3-finger sealed gripper
(94) JGZ 2-finger centric gripper
(95) PZB-plus 2-finger centric gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Sensor system

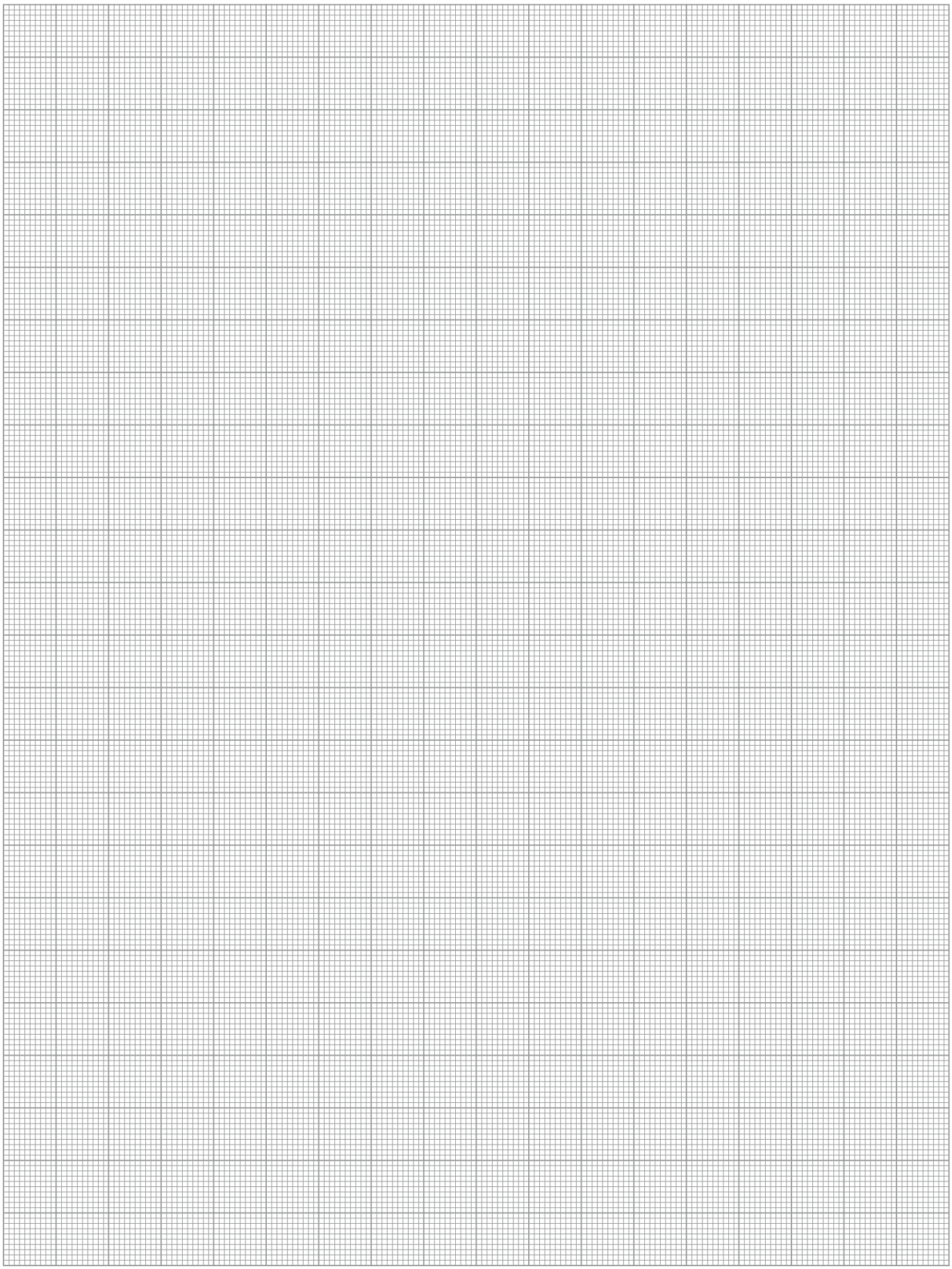


(30) Cable connector in the accessory pack with 5 m connection cable

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

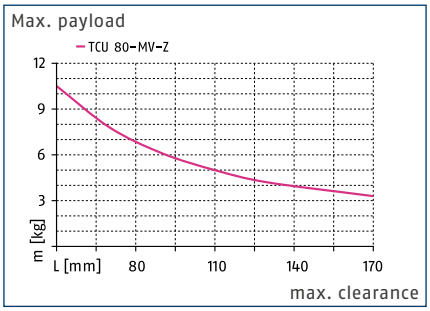
ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



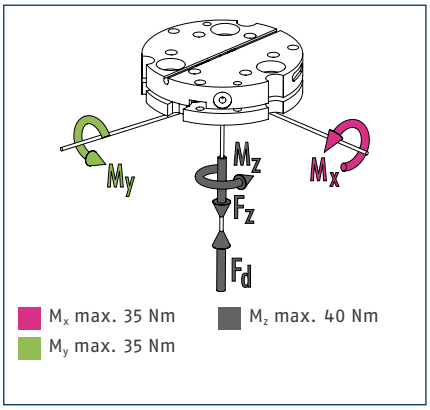
TCU-Z 080

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



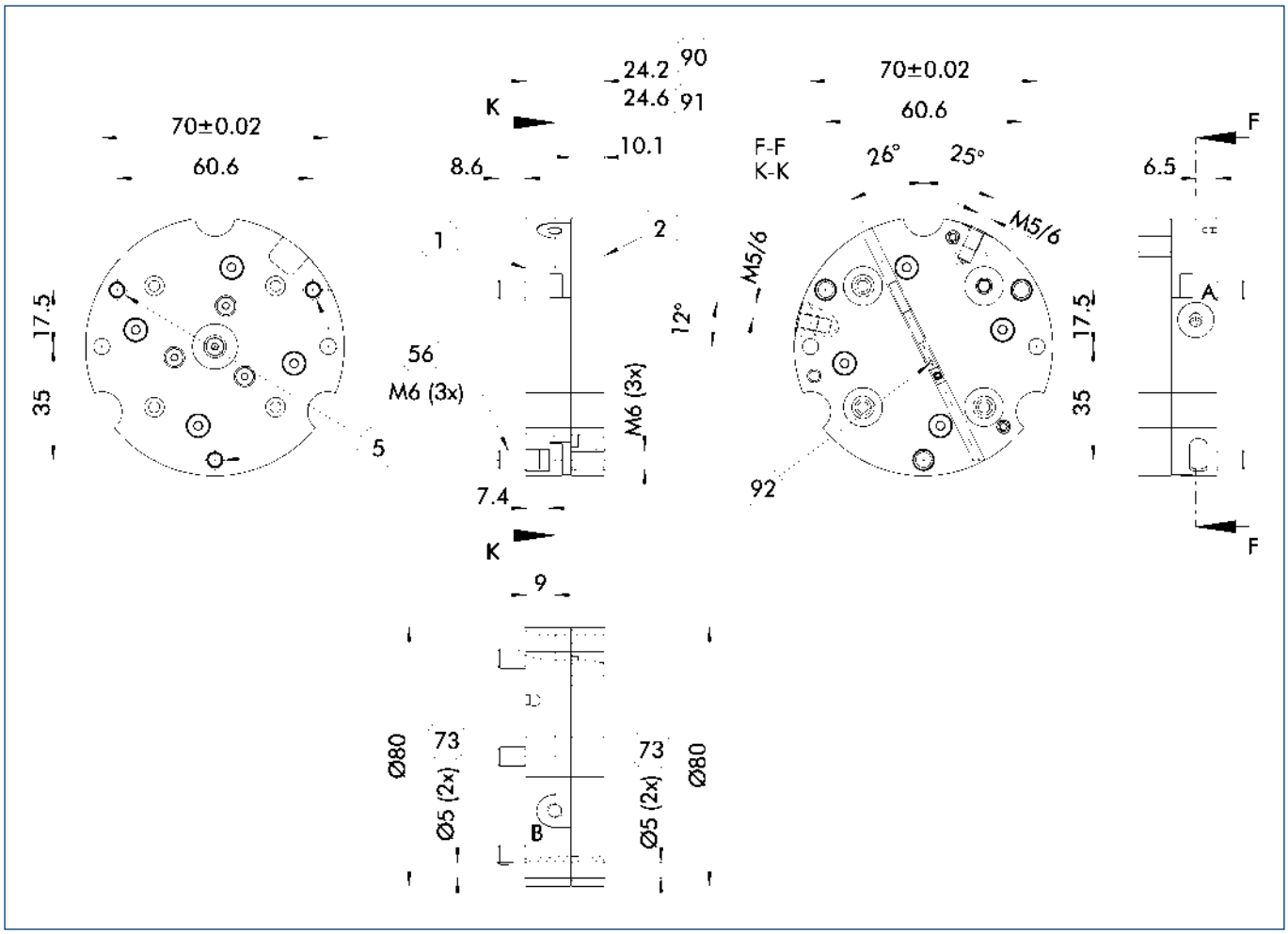
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-080-3-MV-Z	TCU-080-3-OV-Z
ID		0324784	0324785
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	1	1
Deflection Z	[°]	1	1
Repeat accuracy	[mm]	0.05	
Mass	[kg]	0.25	0.3
min. / max. operating pressure	[bar]	4/8	4/8
Locking device		with locking	without locking
Locking moment M_x	[Nm]	5	
Locking moment M_y	[Nm]	5	
Locking moment M_z	[Nm]	6	
Locking force F_z	[N]	100	
max. force F_d	[N]	1500	1500
Direct connection to*		PZN-plus 80	PZN-plus 80

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



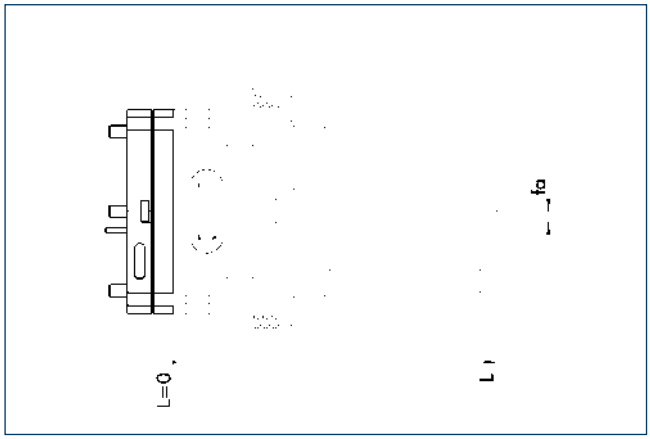
The main view shows the unit in its basic version.

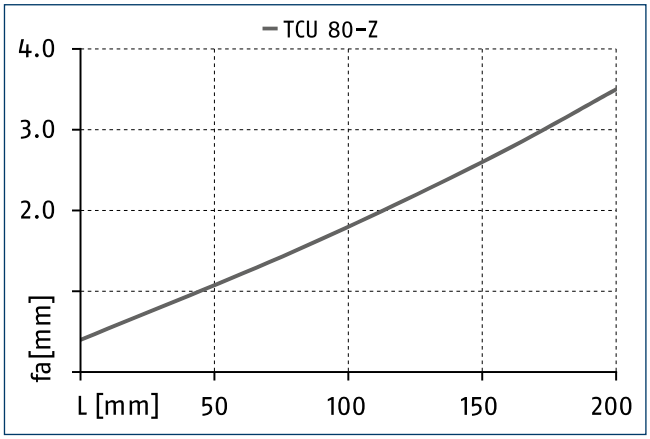
A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(56) Included in delivery
(73) Fit for a centering pin
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection

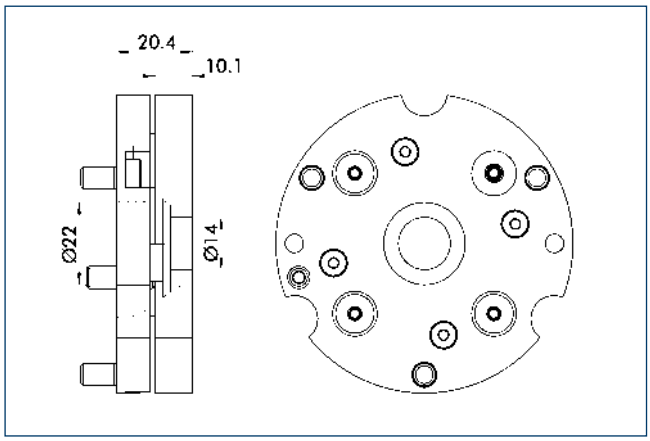




TCU-Z 080

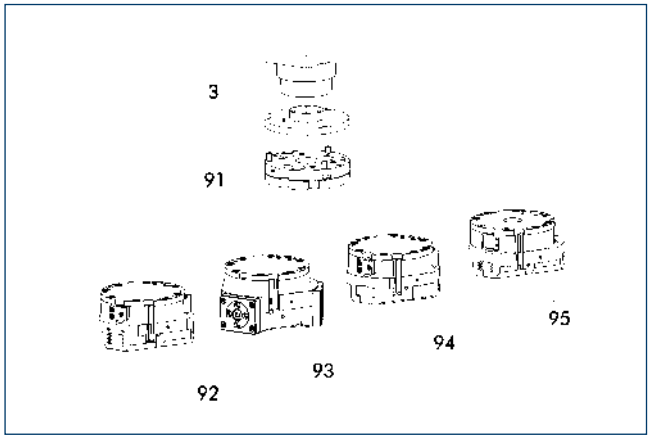
Robot Accessories | Compensating | Tolerance Compensation Unit

Version without locking (0V)



Dimensional changes for the version without locking

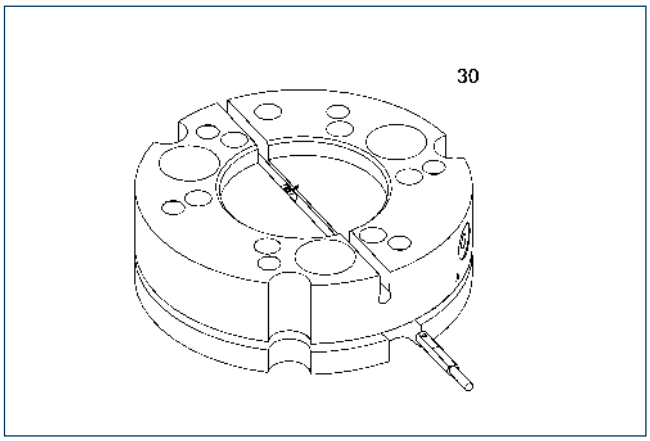
Modular system



(3) Adapter plate
(91) TCU tolerance compensation unit
(92) PZN-plus 3-finger centric gripper
(93) DPZ-plus 3-finger sealed gripper
(94) JGZ 2-finger centric gripper
(95) PZB-plus 2-finger centric gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Sensor system

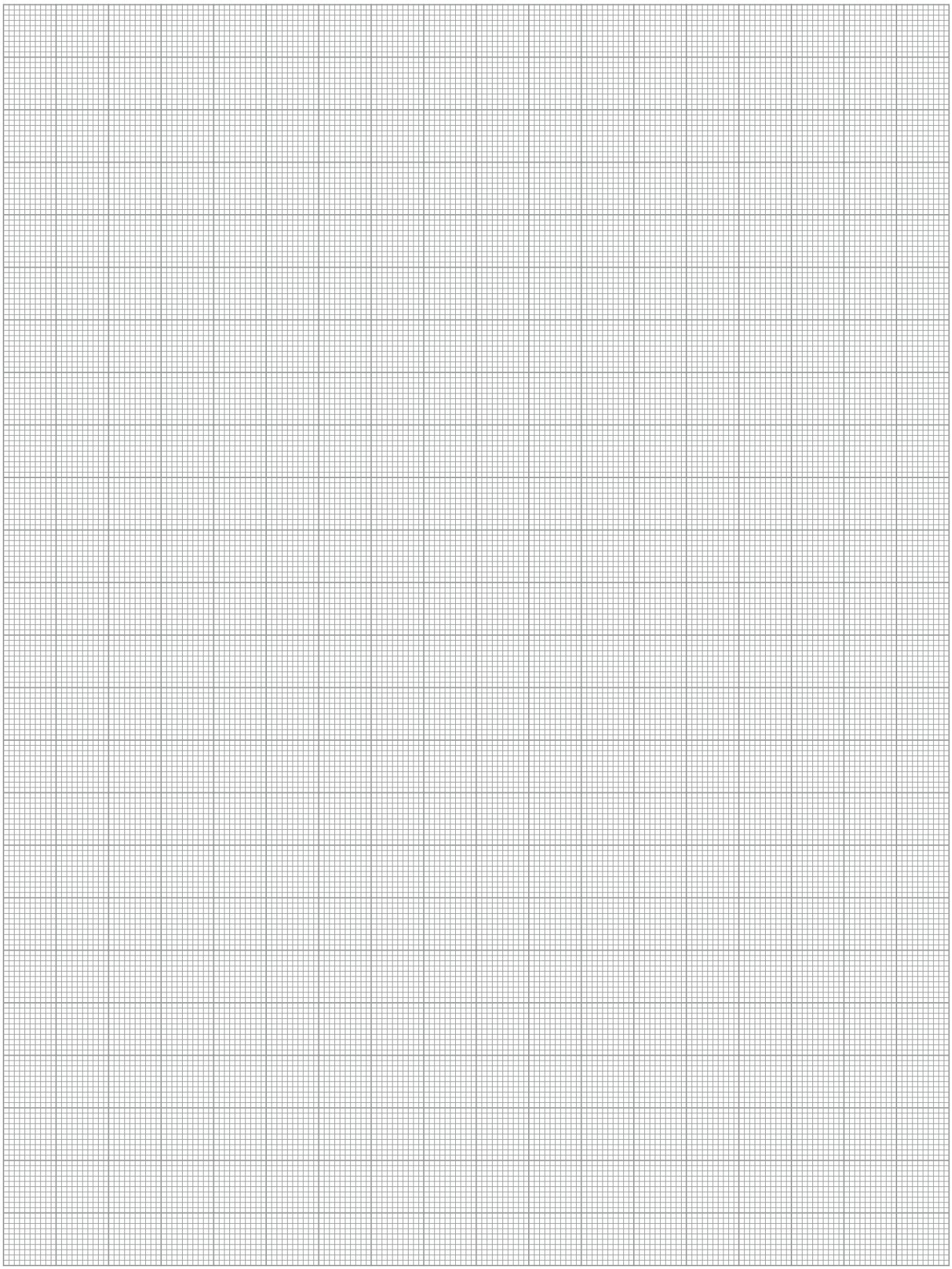


(30) Cable connector in the accessory pack with 5 m connection cable

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

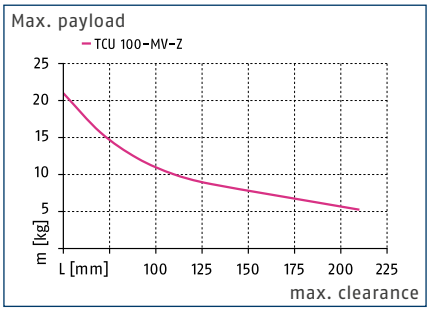
ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



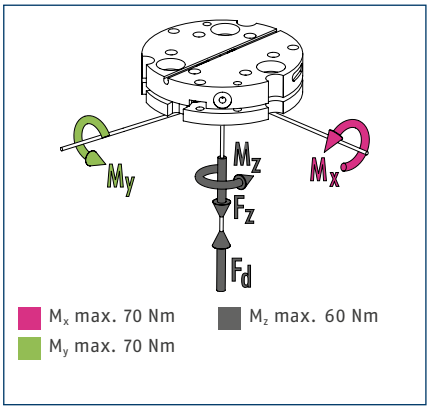
TCU-Z 100

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



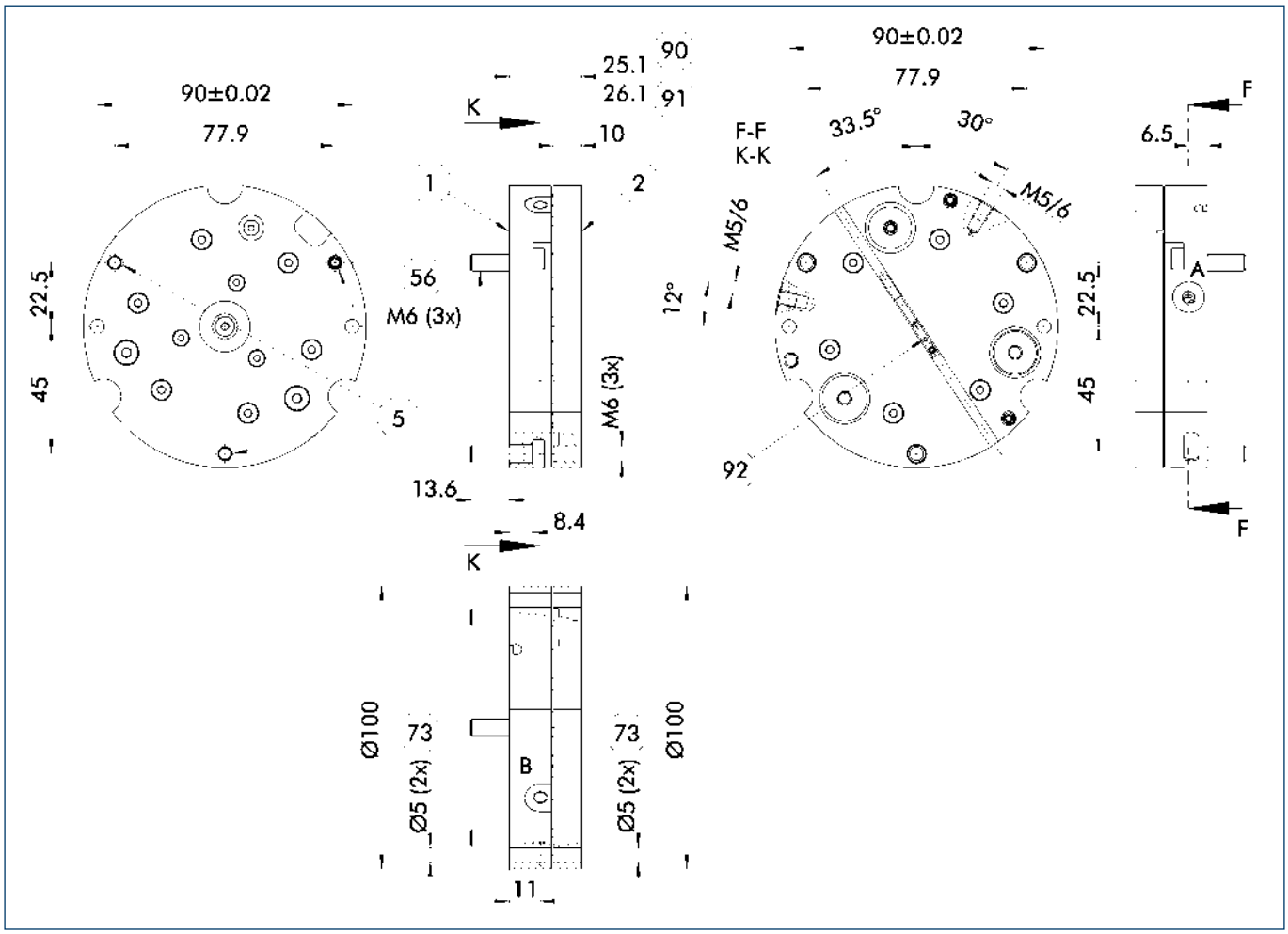
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-100-2-MV-Z	TCU-100-2-OV-Z
ID		0324798	0324799
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	1	1
Deflection Z	[°]	1	1
Repeat accuracy	[mm]	0.05	
Mass	[kg]	0.48	0.47
min. / max. operating pressure	[bar]	4/8	4/8
Locking device		with locking	without locking
Locking moment M_x	[Nm]	10	22
Locking moment M_y	[Nm]	10	22
Locking moment M_z	[Nm]	20	9
Locking force F_z	[N]	150	
max. force F_d	[N]	2000	2000
Direct connection to*		PZN-plus 100	PZN-plus 100

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



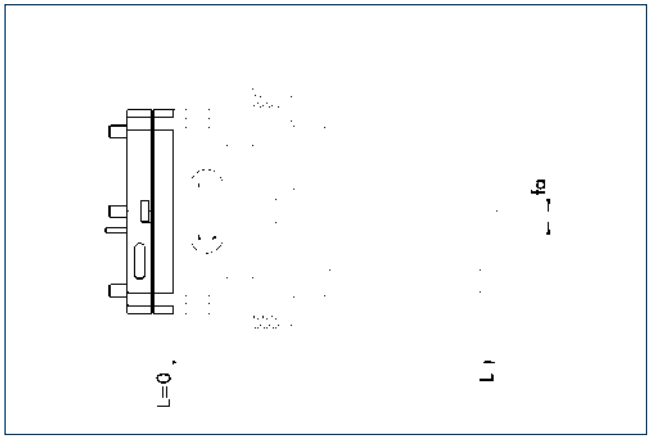
The main view shows the unit in its basic version.

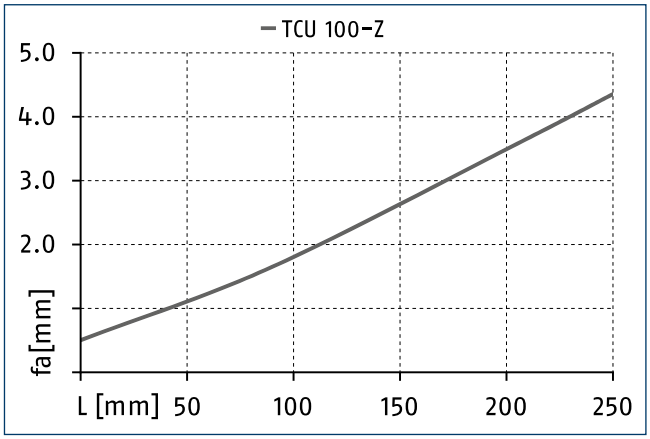
A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(56) Included in delivery
(73) Fit for a centering pin
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection

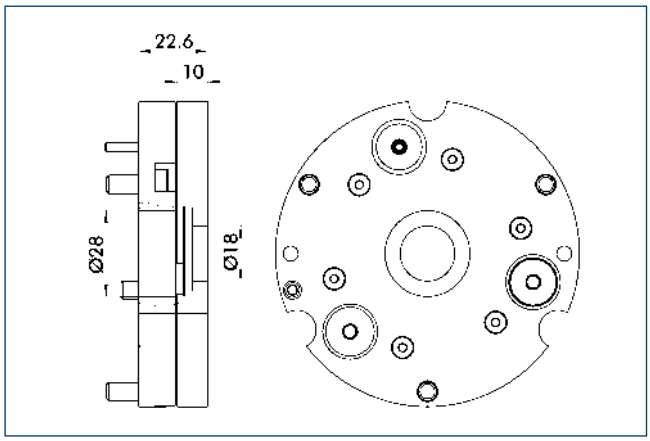




TCU-Z 100

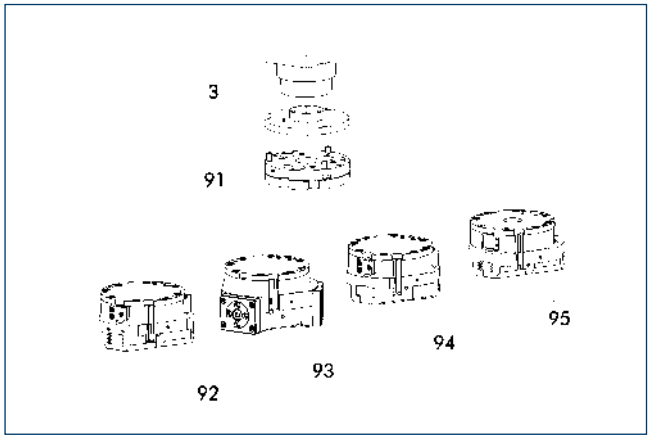
Robot Accessories | Compensating | Tolerance Compensation Unit

Version without locking (OV)



Dimensional changes for the version without locking

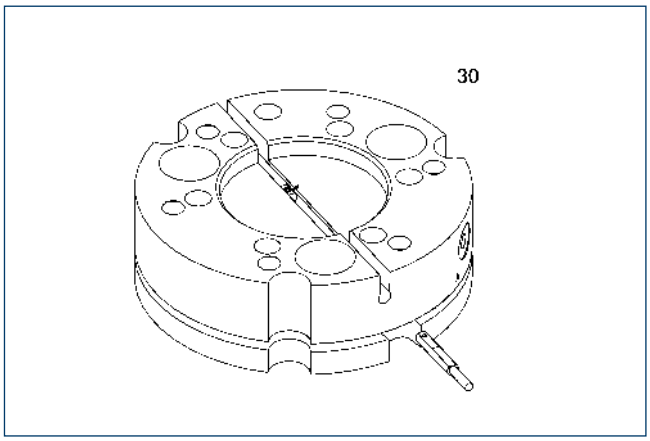
Modular system



(3) Adapter plate
(91) TCU tolerance compensation unit
(92) PZN-plus 3-finger centric gripper
(93) DPZ-plus 3-finger sealed gripper
(94) JGZ 2-finger centric gripper
(95) PZB-plus 2-finger centric gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Sensor system

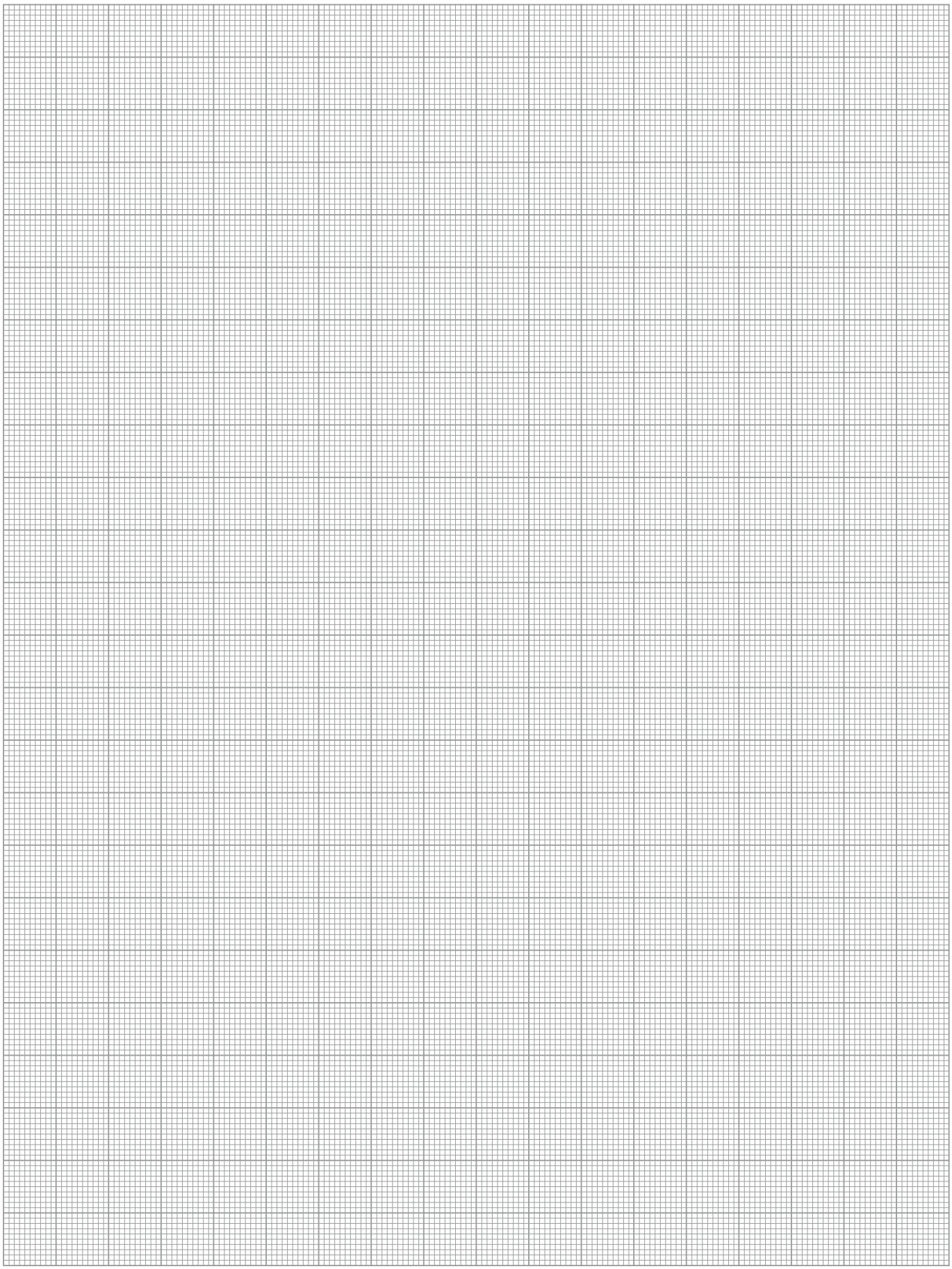


(30) Cable connector in the accessory pack with 5 m connection cable

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

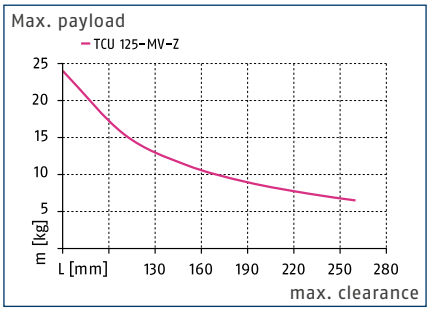
ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



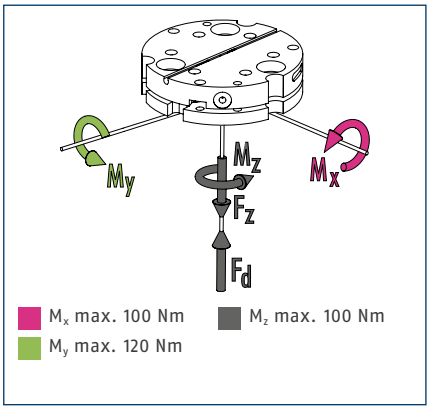
TCU-Z 125

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



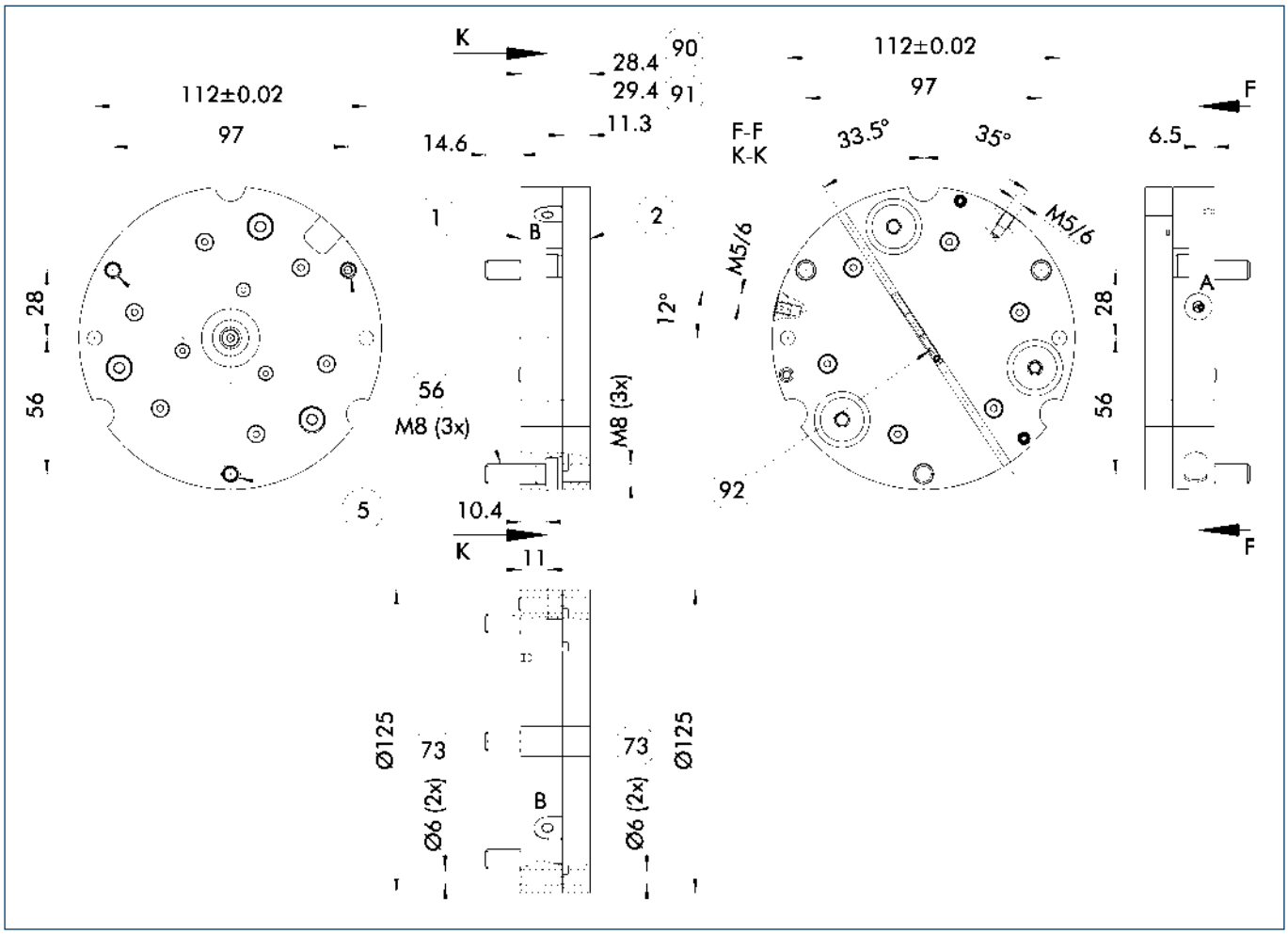
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-125-3-MV-Z	TCU-125-3-OV-Z
ID		0324820	0324821
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	1	1
Deflection Z	[°]	1	1
Repeat accuracy	[mm]	0.05	
Mass	[kg]	0.85	0.65
min. / max. operating pressure	[bar]	4/8	4/8
Locking device		with locking	without locking
Locking moment M_x	[Nm]	25	
Locking moment M_y	[Nm]	25	
Locking moment M_z	[Nm]	25	
Locking force F_z	[N]	350	
max. force F_d	[N]	2800	2800
Direct connection to*		PZN-plus 125	PZN-plus 125

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



The main view shows the unit in its basic version.

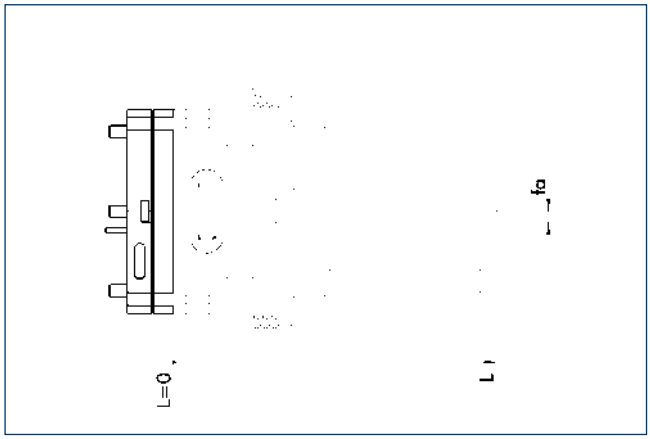
A, a Air connection locked

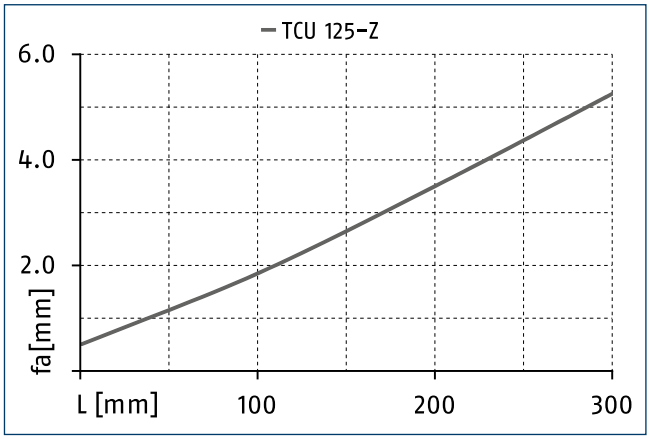
B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws

(56) Included in delivery
(73) Fit for a centering pin
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection

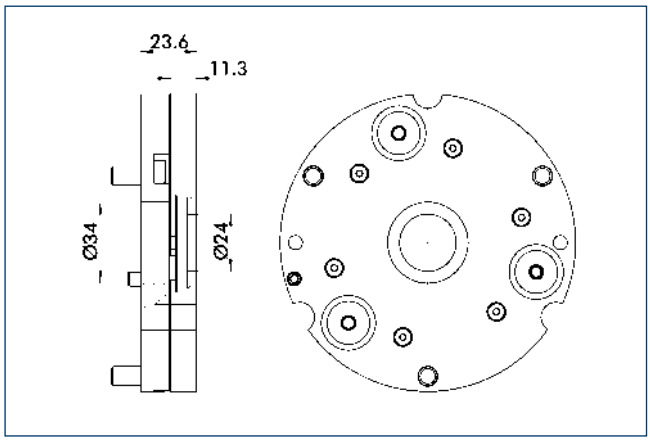




TCU-Z 125

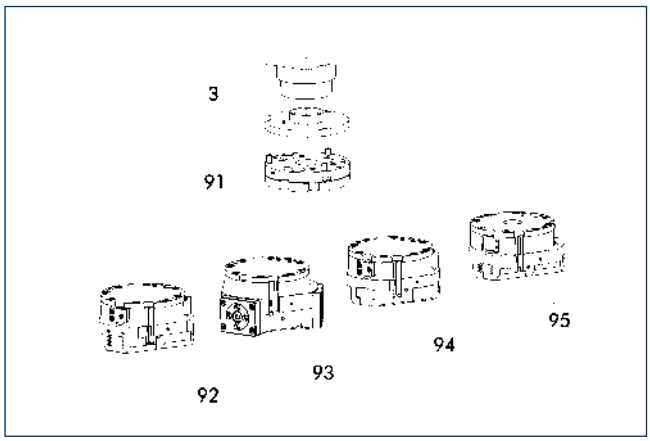
Robot Accessories | Compensating | Tolerance Compensation Unit

Main view without centric locking (0V)



Dimensional changes for the version without locking

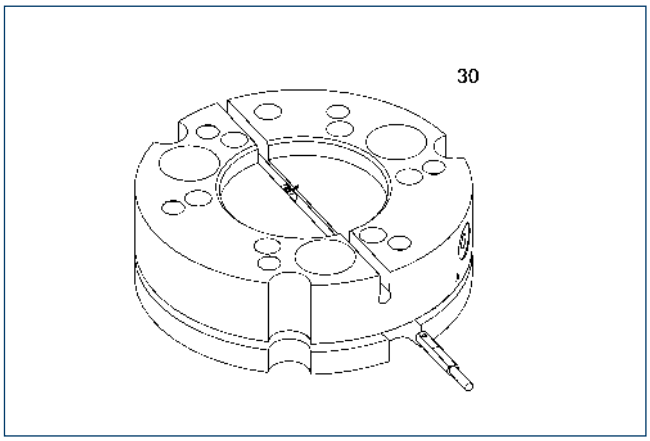
Modular system



(3) Adapter plate
(91) TCU tolerance compensation unit
(92) PZN-plus 3-finger centric gripper
(93) DPZ-plus 3-finger sealed gripper
(94) JGZ 2-finger centric gripper
(95) PZB-plus 2-finger centric gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Sensor system

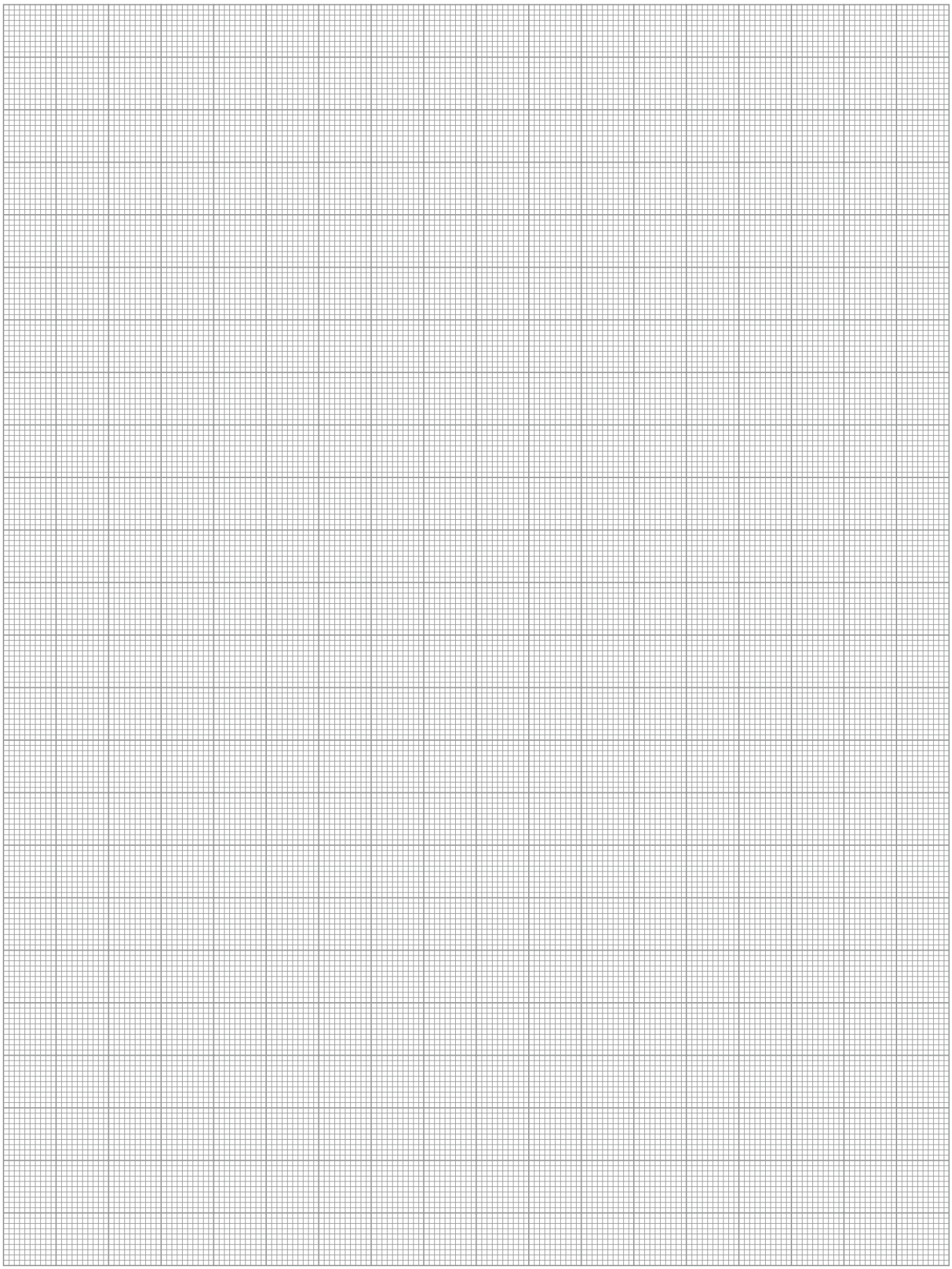


(30) Cable connector in the accessory pack with 5 m connection cable

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

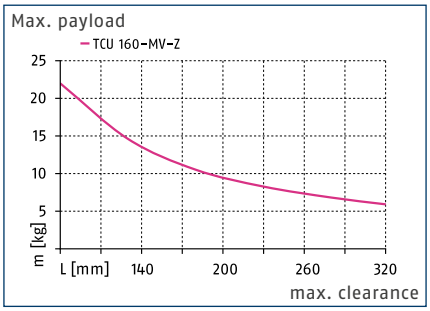
ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



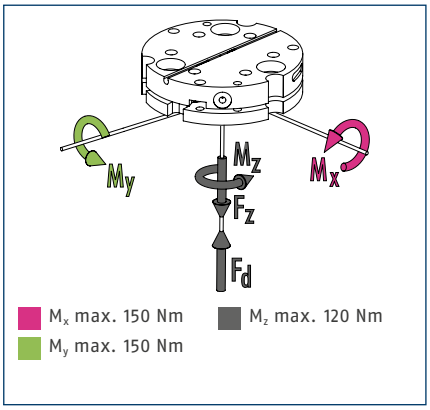
TCU-Z 160

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



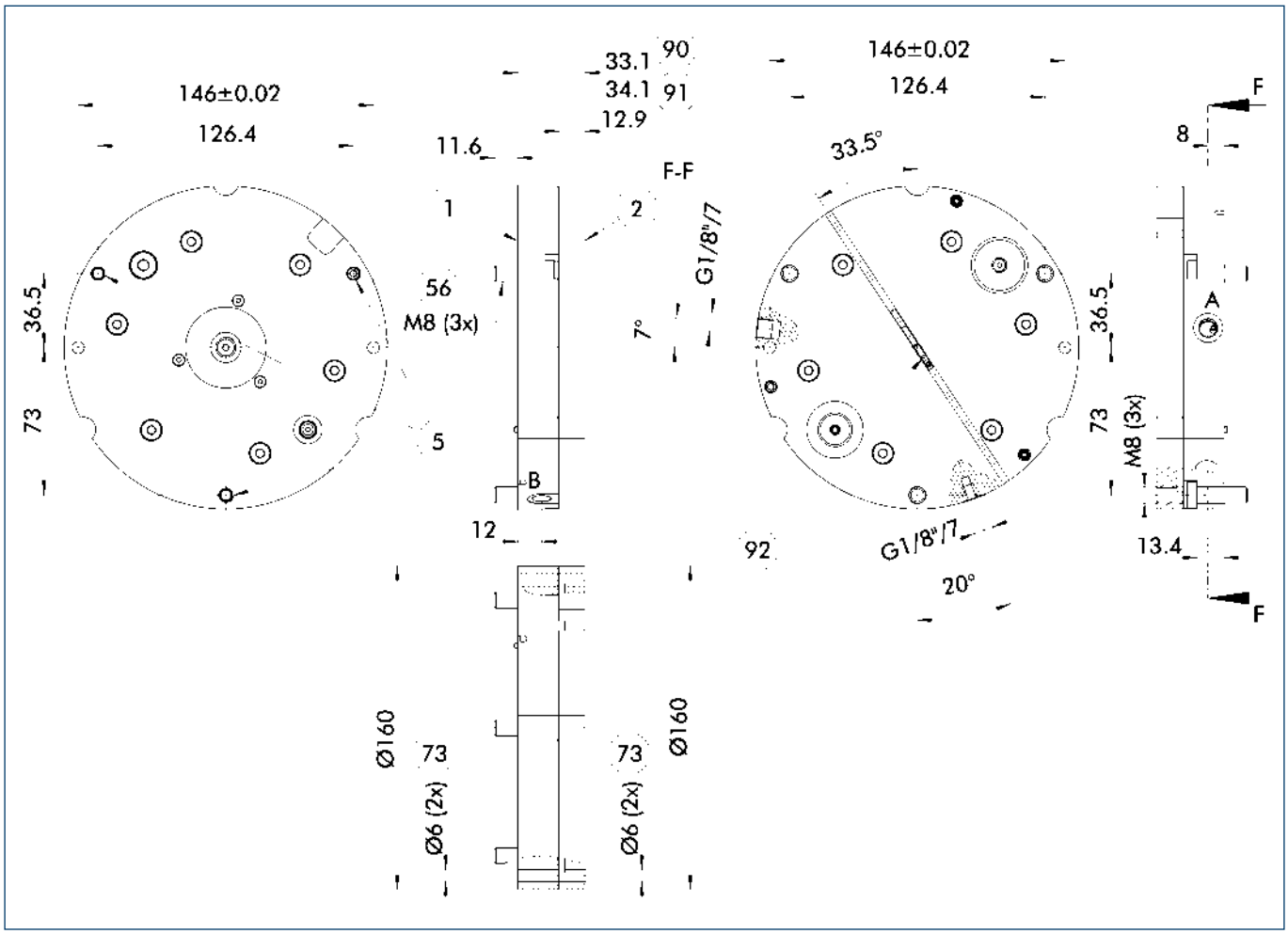
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-160-3-MV-Z	TCU-160-3-OV-Z
ID		0324838	0324839
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	1	1
Deflection Z	[°]	1	1
Repeat accuracy	[mm]	0.05	
Mass	[kg]	1.63	1.35
min. / max. operating pressure	[bar]	4/8	4/8
Locking device		with locking	without locking
Locking moment M_x	[Nm]	30	
Locking moment M_y	[Nm]	30	
Locking moment M_z	[Nm]	30	
Locking force F_z	[N]	400	
max. force F_d	[N]	4300	4300
Direct connection to*		PZN-plus 160	PZN-plus 160

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



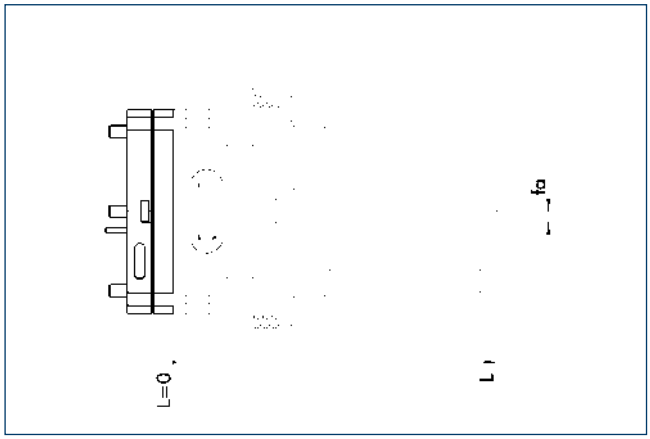
The main view shows the unit in its basic version.

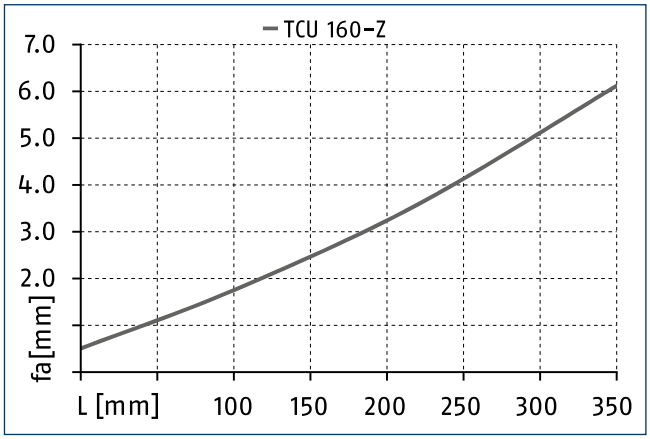
A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(56) Included in delivery
(73) Fit for a centering pin
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection

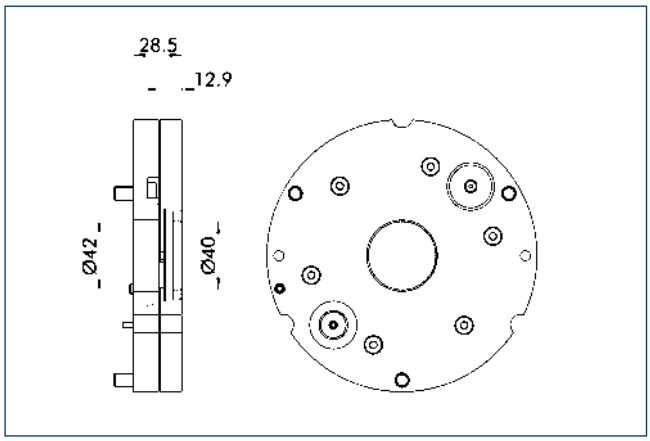




TCU-Z 160

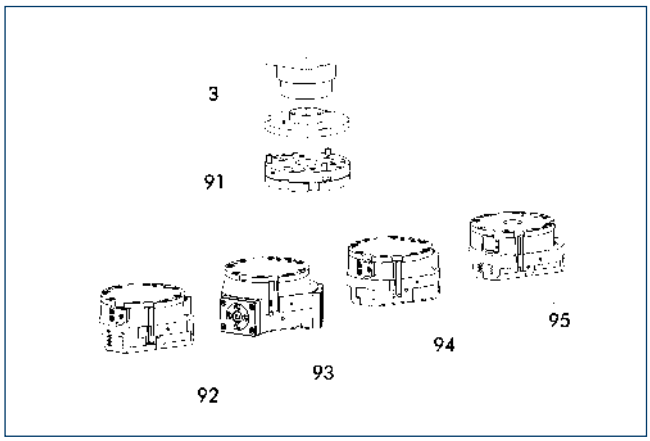
Robot Accessories | Compensating | Tolerance Compensation Unit

Version without locking (0V)



Dimensional changes for the version without locking

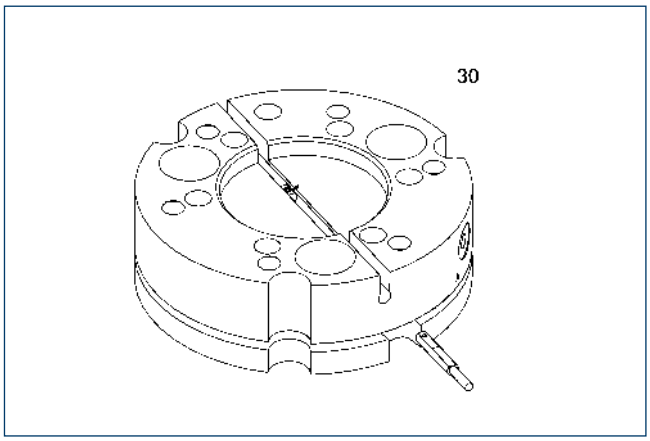
Modular system



(3) Adapter plate
(91) TCU tolerance compensation unit
(92) PZN-plus 3-finger centric gripper
(93) DPZ-plus 3-finger sealed gripper
(94) JGZ 2-finger centric gripper
(95) PZB-plus 2-finger centric gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Sensor system

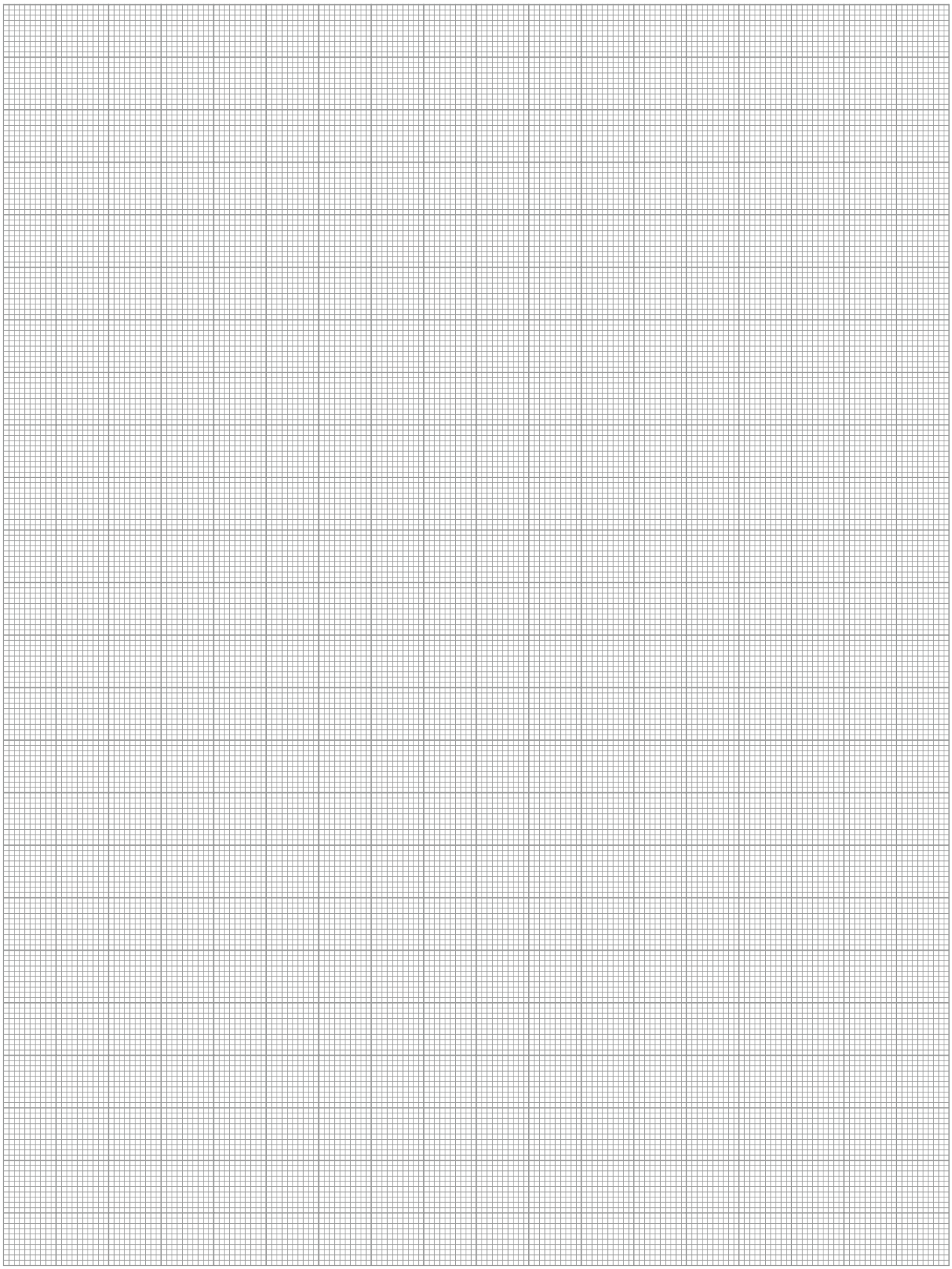


(30) Cable connector in the accessory pack with 5 m connection cable

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

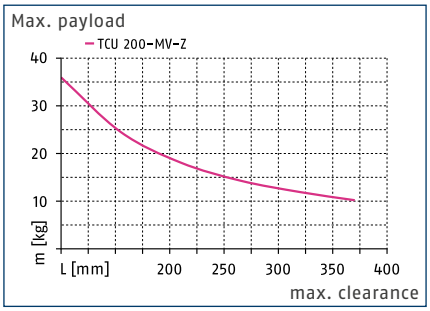
ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



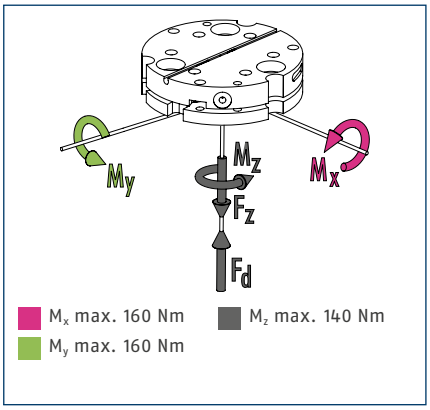
TCU-Z 200

Robot Accessories | Compensating | Tolerance Compensation Unit

Load chart



Forces and moments



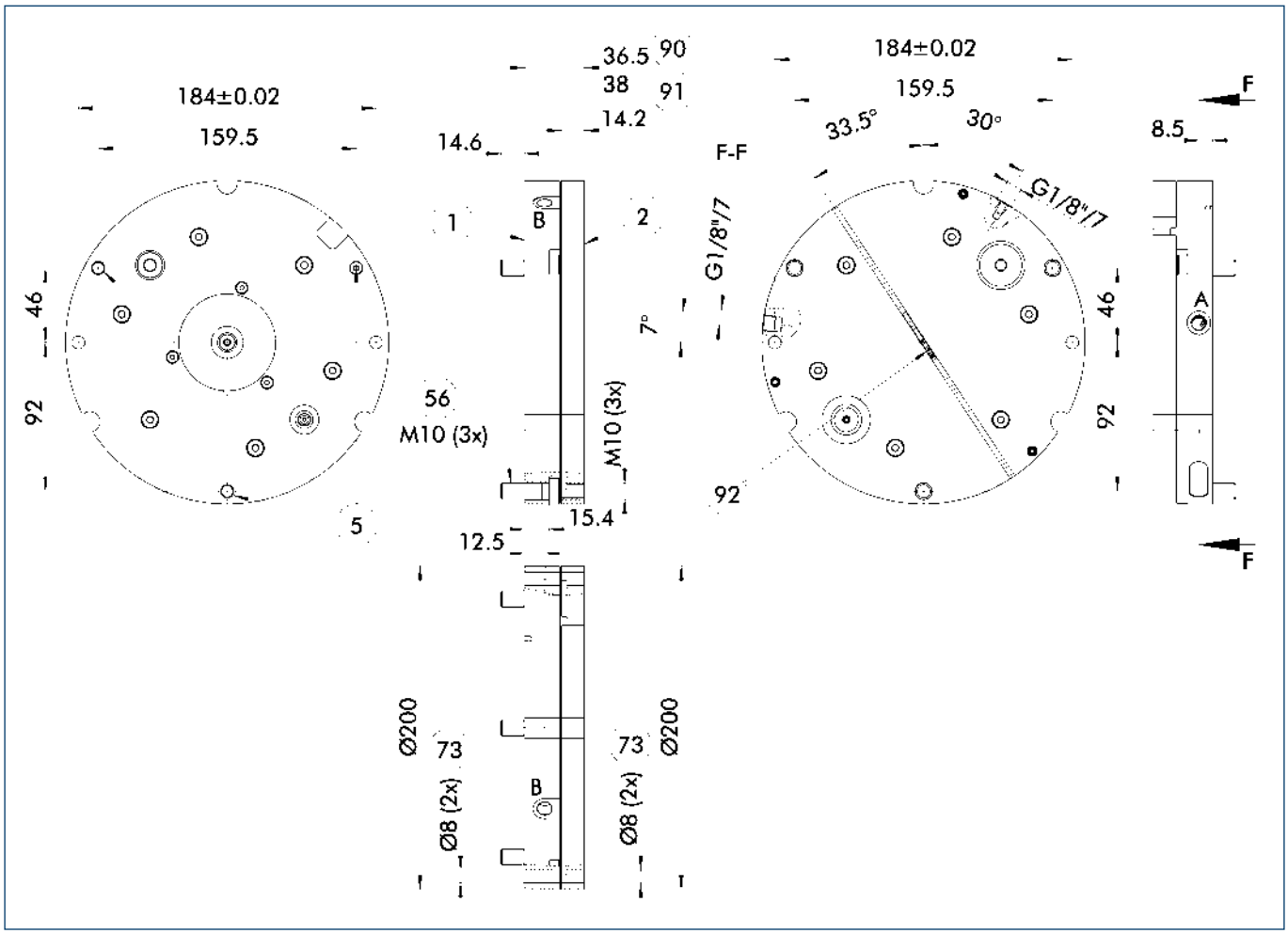
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		TCU-200-3-MV-Z	TCU-200-3-OV-Z
ID		0324856	0324857
Hardness of the elastomer	[Shore]	68	68
Deflection X	[°]	1	1
Deflection Y	[°]	1	1
Deflection Z	[°]	1	1
Repeat accuracy	[mm]	0.02	
Mass	[kg]	2.75	2.45
min. / max. operating pressure	[bar]	4/8	4/8
Locking device		with locking	without locking
Locking moment M_x	[Nm]	100	
Locking moment M_y	[Nm]	100	
Locking moment M_z	[Nm]	50	
Locking force F_z	[N]	800	
max. force F_d	[N]	5000	5000
Direct connection to*		PZN-plus 200	PZN-plus 200

*and for other gripper with the same mounting pattern

Main view with centric locking (MV)



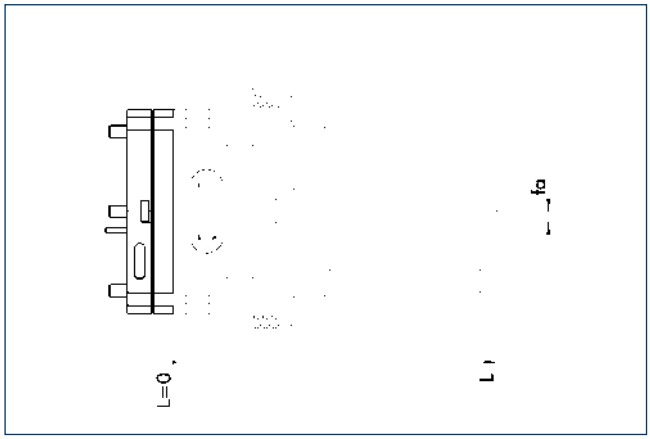
The main view shows the unit in its basic version.

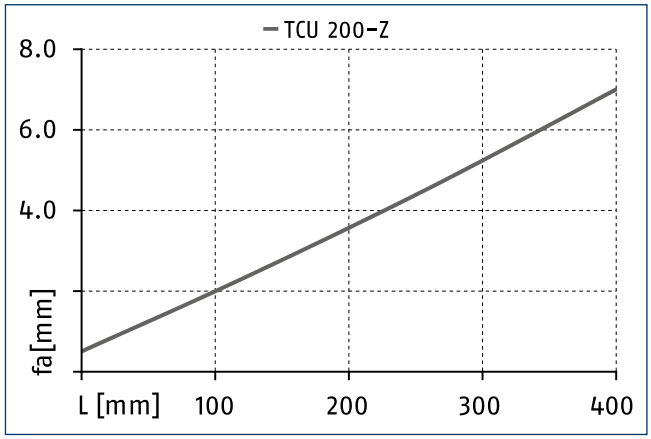
A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection
(2) Tool side connection
(5) Through-hole for connection with screws
(56) Included in delivery
(73) Fit for a centering pin
(90) Unit locked
(91) Unit unlocked
(92) MMS-P

Maximum deflection

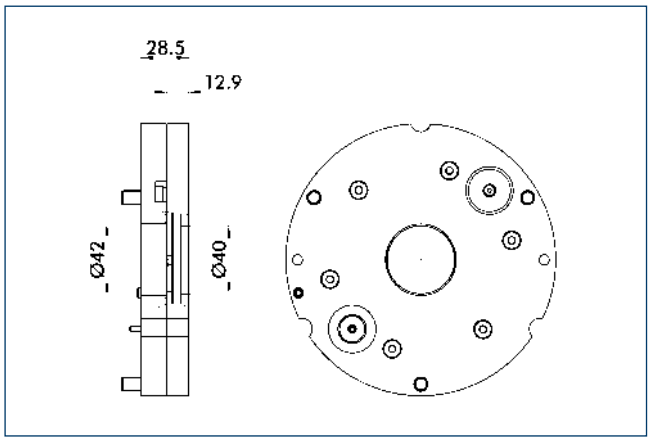




TCU-Z 200

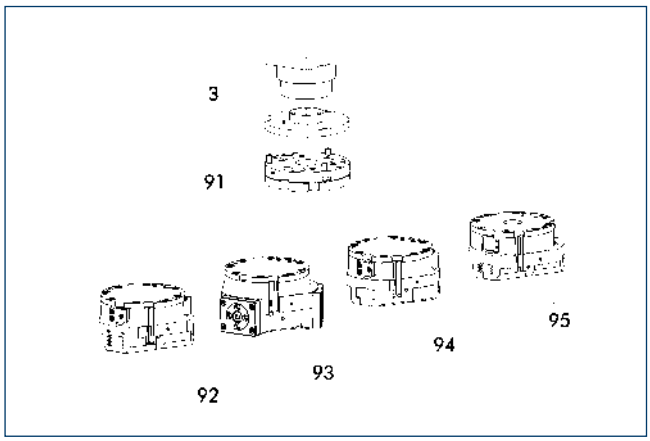
Robot Accessories | Compensating | Tolerance Compensation Unit

Version without locking (0V)



Dimensional changes for the version without locking

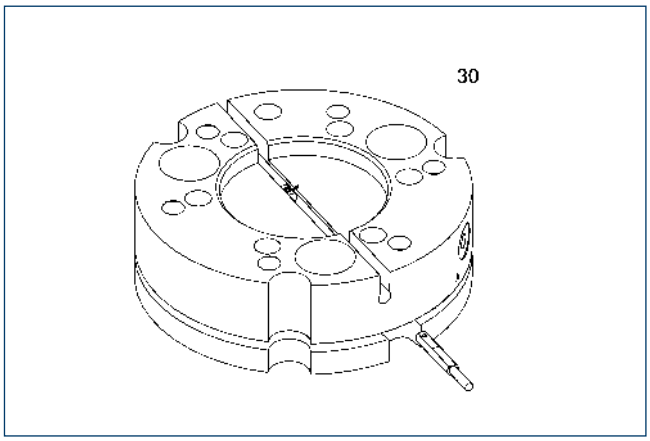
Modular system



(3) Adapter plate
(91) TCU tolerance compensation unit
(92) PZN-plus 3-finger centric gripper
(93) DPZ-plus 3-finger sealed gripper
(94) JGZ 2-finger centric gripper
(95) PZB-plus 2-finger centric gripper

The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.

Sensor system

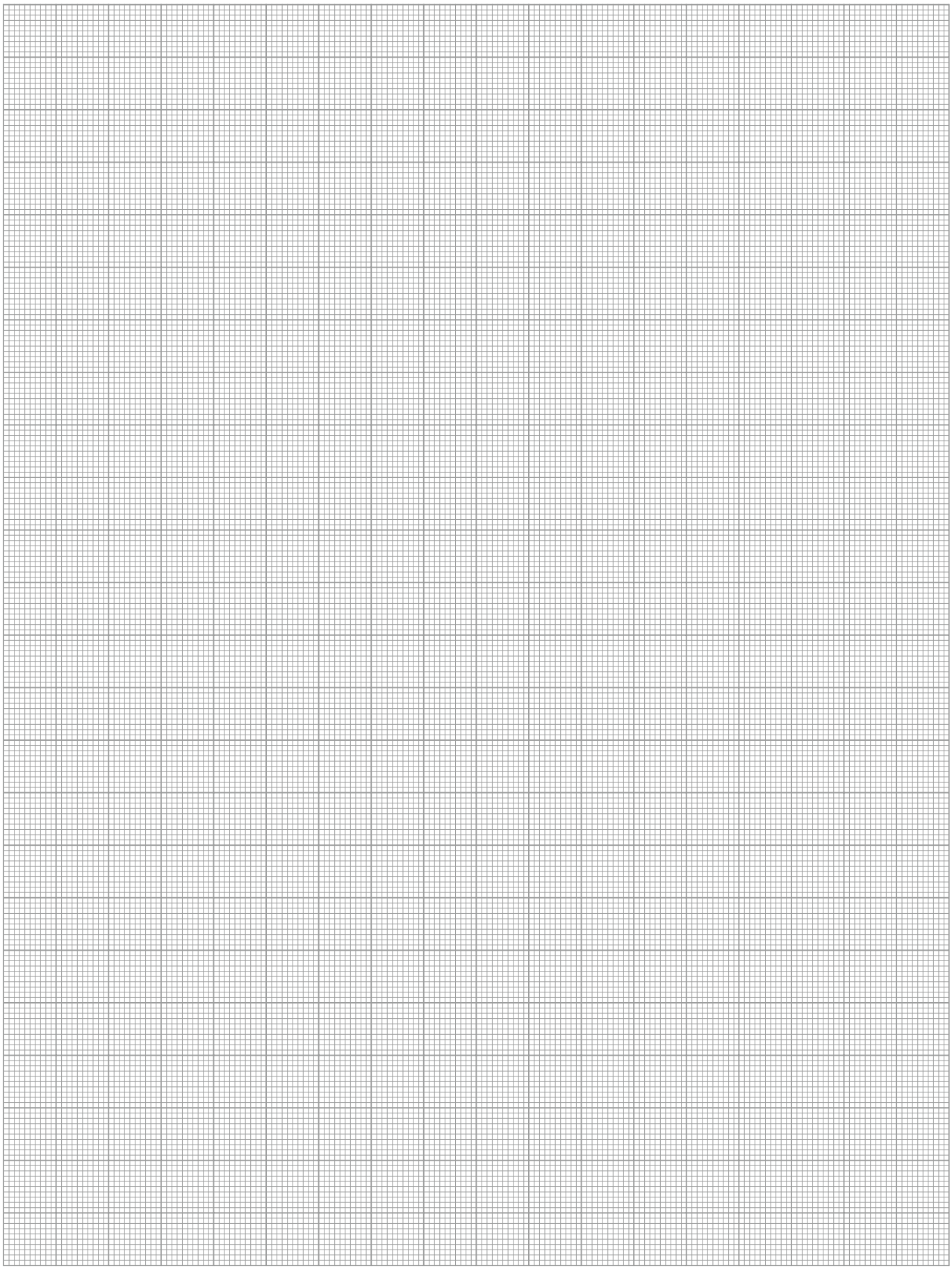


(30) Cable connector in the accessory pack with 5 m connection cable

Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Often combined
MMS-P programmable magnetic switch		
MMSK-P 22-S-PNP	0301371	
MMS-P 22-S-M8-PNP	0301370	●
Clip		
CLI-M8	0301463	
Connection cables		
KA BG08-L 4P-0500	0307767	●
KA BG08-L 4P-1000	0307768	
KA BW08-L 4P-0500	0307765	
KA BW08-L 4P-1000	0307766	
Sensor distributor		
V2-M8-4P-2XM8-3P	0301380	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



Compliant. Precise. Reliable.

FUS Insertion Unit

Symmetrical insertion unit with centric locking and monitoring.

Field of Application

Assembly tasks with very little play among the parts to be aligned

Advantages – Your benefit

Pneumatic, centric locking puts the unit back to a defined zero position and protects the elastomers

Layered elastomer construction soft and flexible when aligning, rigid when pressing in

Compensates alignment errors thereby reducing the danger of jamming

Sizes
Quantity: 5

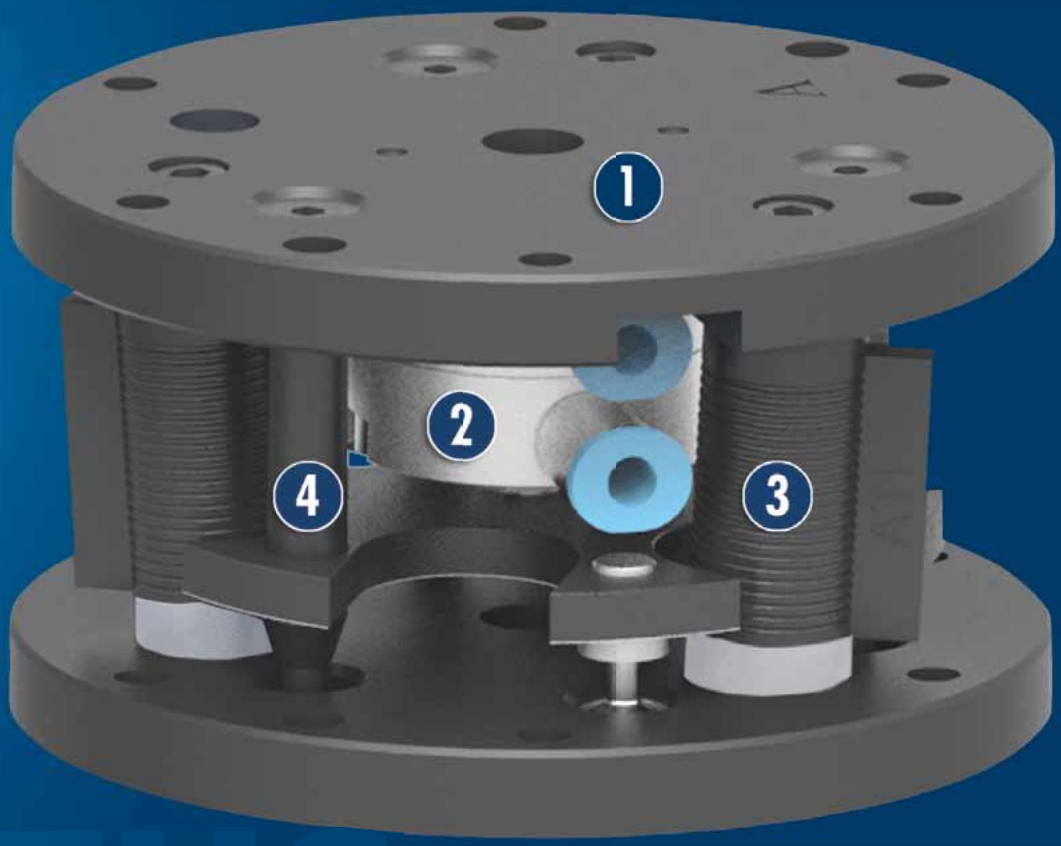
Compensation XY
±1.7 .. 2.2 mm

Rotary compensation angle
2.5 .. 5°

Functional Description

The FUS' function is based on the interaction between the two base plates, which are connected to each other by a set of 3 or 6 flexible elastomer elements. As a result, the FUS can compensate tolerances in the X- and Y-directions, allowing it to correct angle errors and provide rotational compensation.

The FUS offers pneumatic locking to allow the compensation unit to be set to rigid. As a result, it is possible to prevent the tool or the gripper vibrating during movement of the robot arm or the linear axis. This increases the application's repeat accuracy and extends the service life of the elastomer elements.



① **Adapter flange**
Individual screw connection diagrams can be easily integrated

② **Pneumatic locking**
for a rigid connection between the machine and tool sides

③ **Elastomers**
allow for the compensation

④ **Overload pin**
to protect the elastomers

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Monitoring: by inductive proximity switch

Actuation: pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

Material: Elastomer material

Housing: Aluminum

Scope of delivery: without mounting screws

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

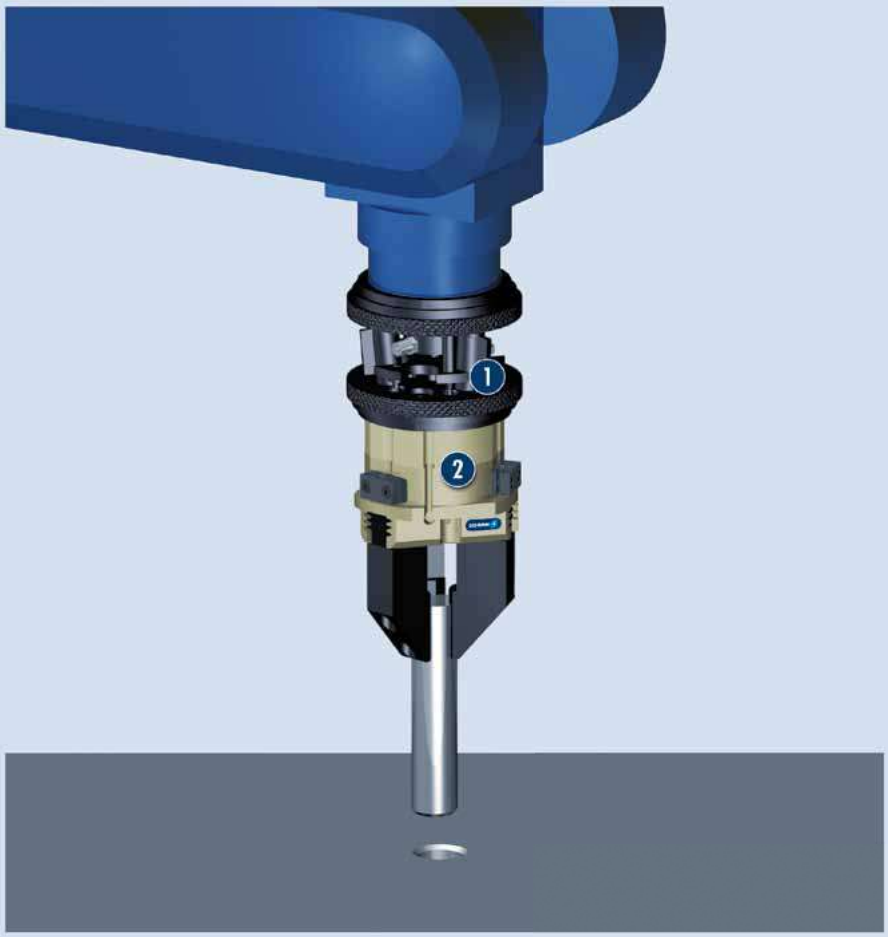
Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Inserting a bolt into a bore

1. FUS-113B Insertion Unit
2. PZN-plus 80 3-Finger Centric Gripper



SCHUNK offers more ...

The following components make the FUS even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Inductive Proximity Switches

Extension Cable

PGN-plus Universal Gripper

SWS Quick-change Systems

PWG-plus Angular Gripper

MWS Manual Gripper Change Systems

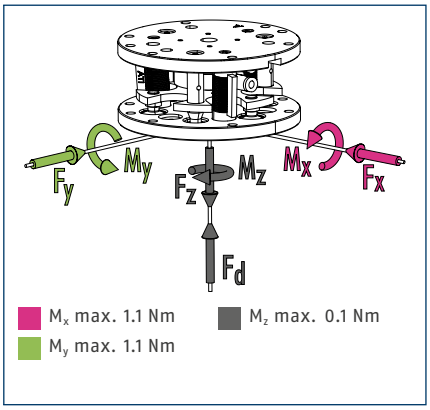
PZN-plus Centric Gripper

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

FUS 001-30

Robot Accessories | Compensating | Insertion Unit

Forces and moments

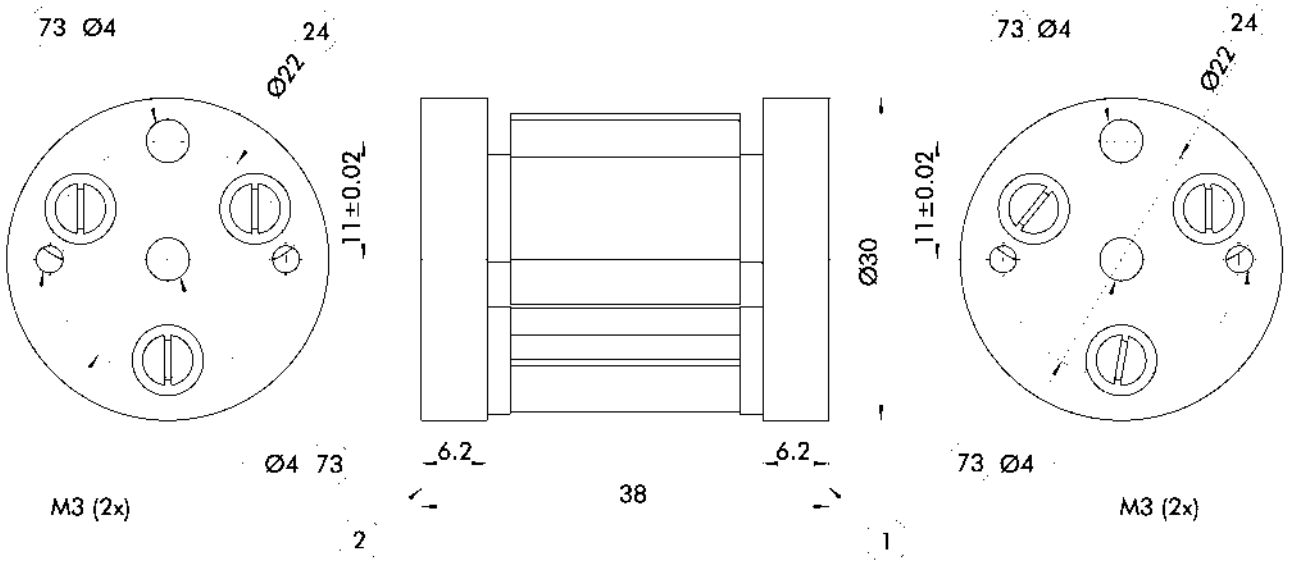


ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		FUS-001-30
ID		0320280
Compensation tension / pressure	[mm]	0.4
Compensation XY	[mm]	±1.7
Angular compensation	[°]	1
Rotary compensation angle	[°]	4.5
Stiffness tension / pressure	[N/mm]	385
Stiffness displacement	[N/mm]	7.5
Compensation center clearance	[mm]	23
Repeat accuracy	[mm]	0.05
Mass	[kg]	0.05
min. / max. operating pressure	[bar]	5/6
min. / max. ambient temperature	[°C]	5/60
max. force F_x/F_y horizontal installation	[N]	3
max. force F_z	[N]	9
max. force F_d	[N]	160

Main view



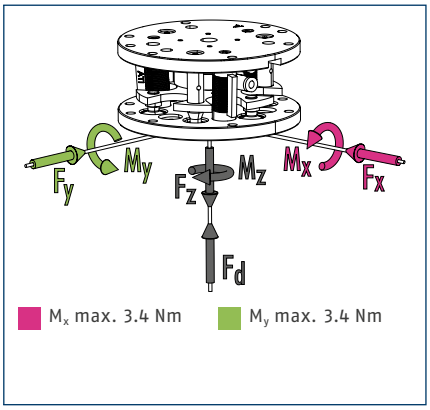
The main view shows the unit in its basic version.

1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin

FUS 001

Robot Accessories | Compensating | Insertion Unit

Forces and moments

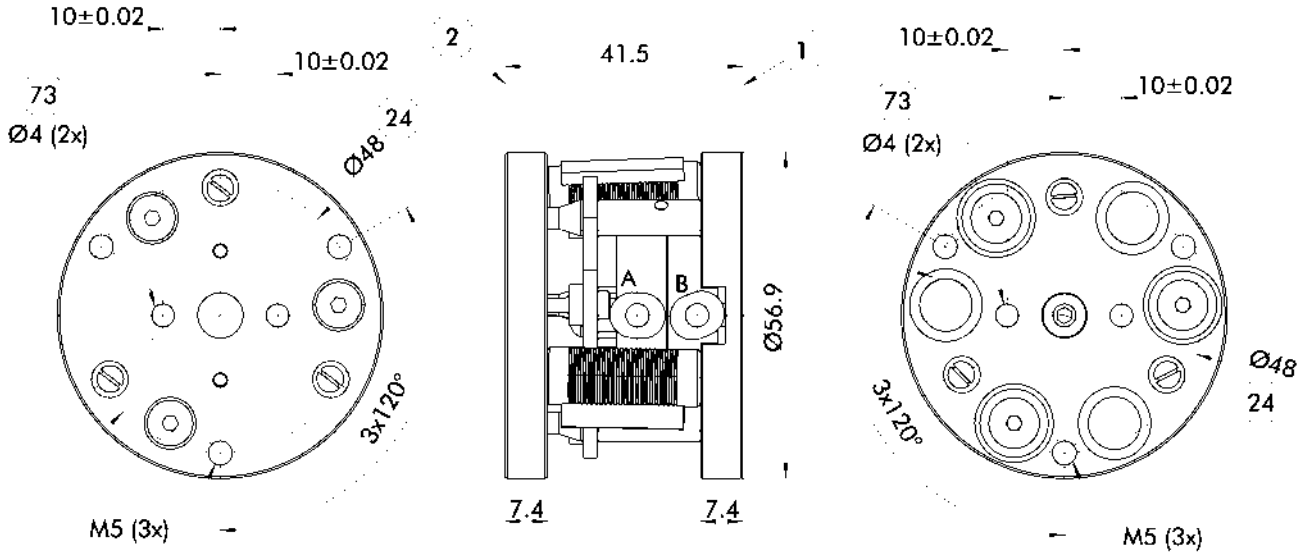


ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		FUS-001
ID		0320518
Compensation XY	[mm]	±1.7
Angular compensation	[°]	1
Rotary compensation angle	[°]	4.5
Stiffness displacement	[N/mm]	1.7
Compensation center clearance	[mm]	23
Repeat accuracy	[mm]	0.05
Mass	[kg]	0.18
min. / max. operating pressure	[bar]	5/6
min. / max. ambient temperature	[°C]	5/60
max. force F_x/F_y vertical installation	[N]	22
max. force F_x/F_y horizontal installation	[N]	6.7
max. force F_z	[N]	22
max. force F_d	[N]	360

Main view



The main view shows the unit in its basic version.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection

(2) Tool side connection

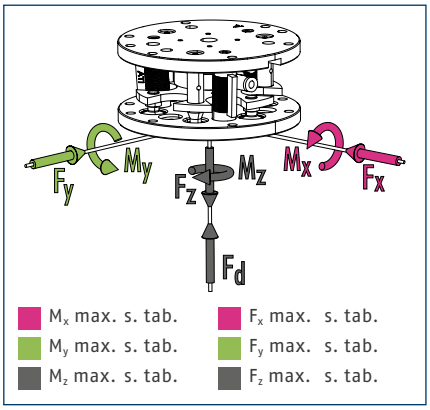
(24) Bolt circle

(73) Fit for a centering pin

FUS 100

Robot Accessories | Compensating | Insertion Unit

Forces and moments

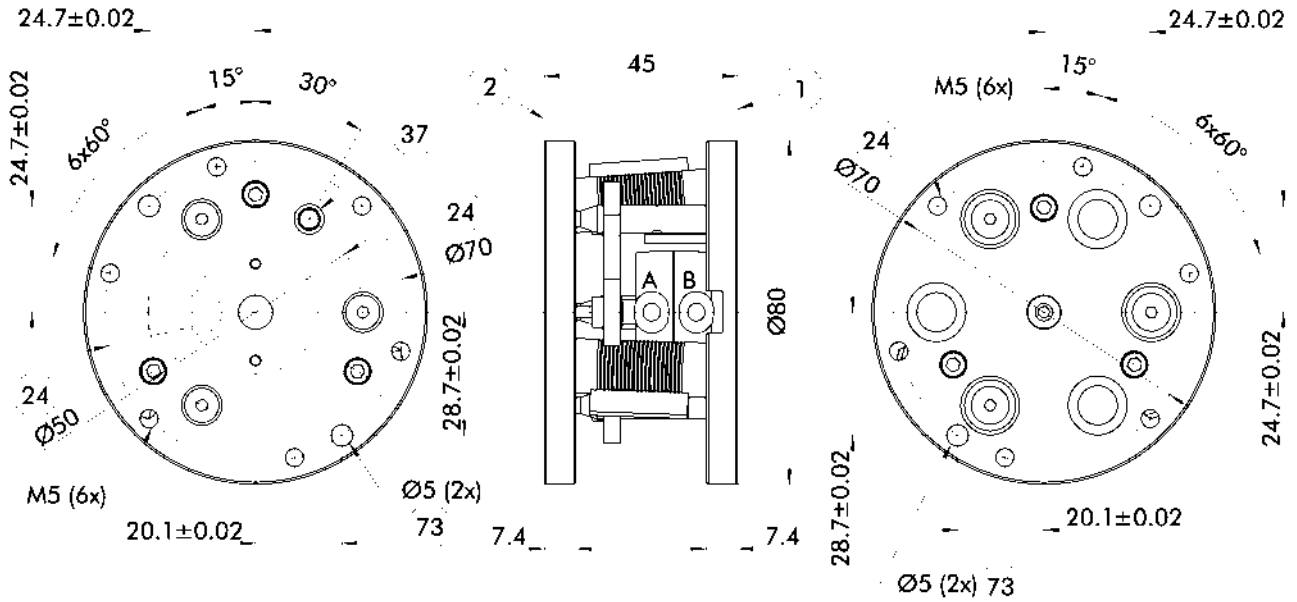


ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		FUS-111B	FUS-112B	FUS-113B
ID		0320519	0320522	0320525
Compensation XY	[mm]	±2.2	±2.2	±2.2
Angular compensation	[°]	1.1	1.1	1.1
Rotary compensation angle	[°]	5	5	5
Stiffness displacement	[N/mm]	11	7	27
Compensation center clearance	[mm]	120	69	61
Mass	[kg]	0.31	0.31	0.31
min. / max. operating pressure	[bar]	5/6	5/6	5/6
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. force F_x/F_y vertical installation	[N]	45	45	80
max. force F_x/F_y horizontal installation	[N]	8.9	8.9	27
max. force F_z	[N]	44	44	80
max. force F_d	[N]	1300	530	1300
Moments M_x max./M_y max.	[Nm]	5.1/5.1	5.1/5.1	7.9/7.9

Main view



The main view shows the unit in its basic version.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection

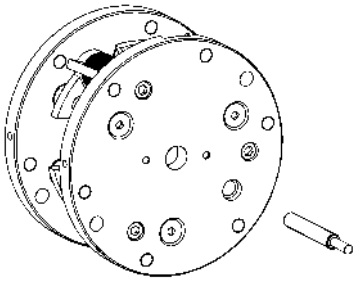
(2) Tool side connection

(24) Bolt circle

(37) Sensor connection

(73) Fit for a centering pin

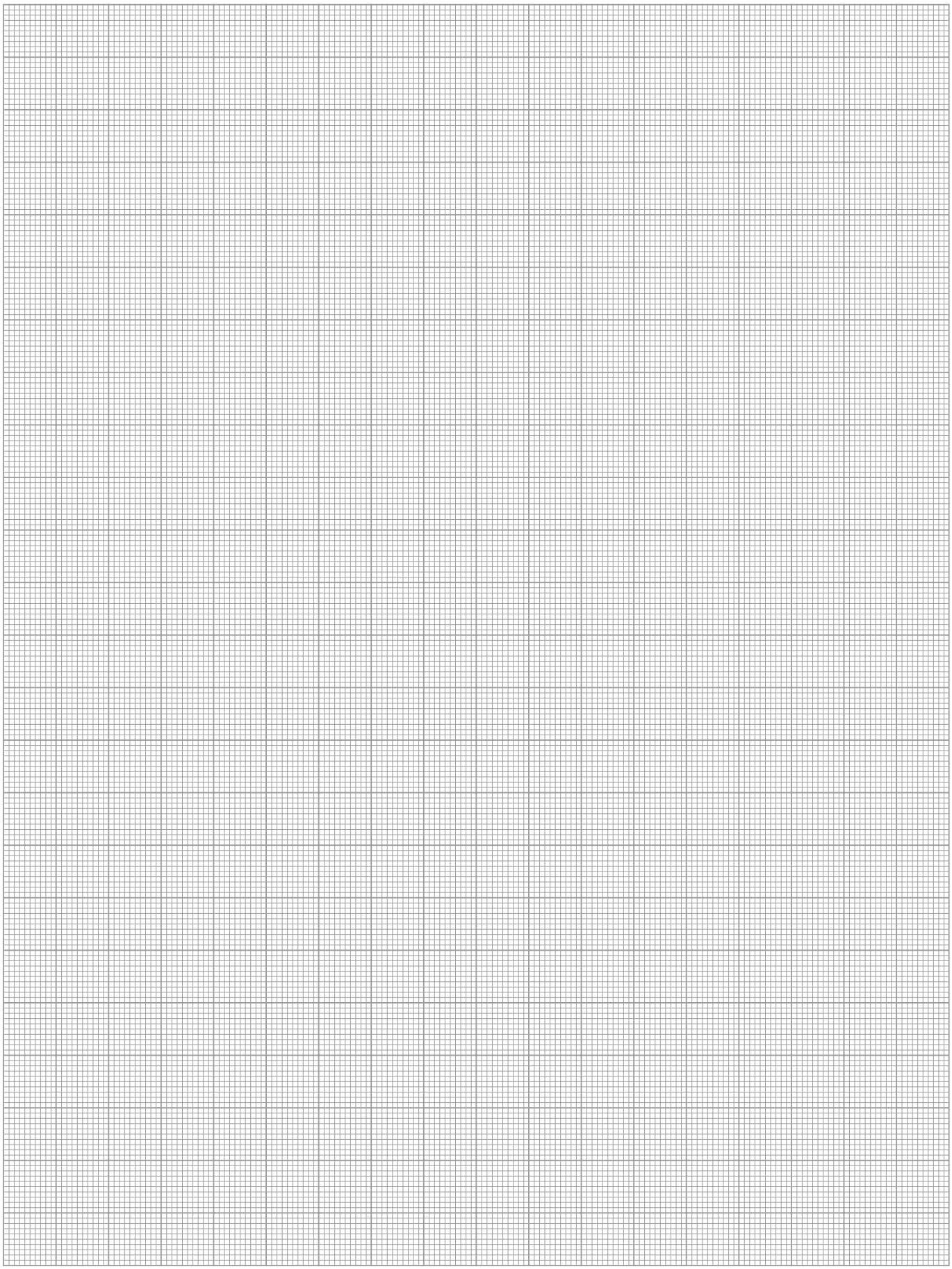
Sensor system



Locking sensor for monitoring the lock condition

Description	ID	Often combined
Inductive proximity switches		
IN 50-S-M12	0301575	
IN 50-S-M8	0301568	
INK 50-S	0301560	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

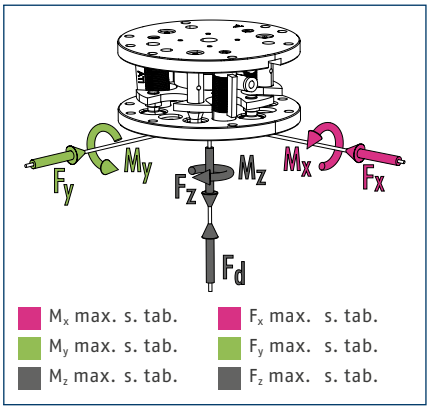
ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



FUS 200

Robot Accessories | Compensating | Insertion Unit

Forces and moments



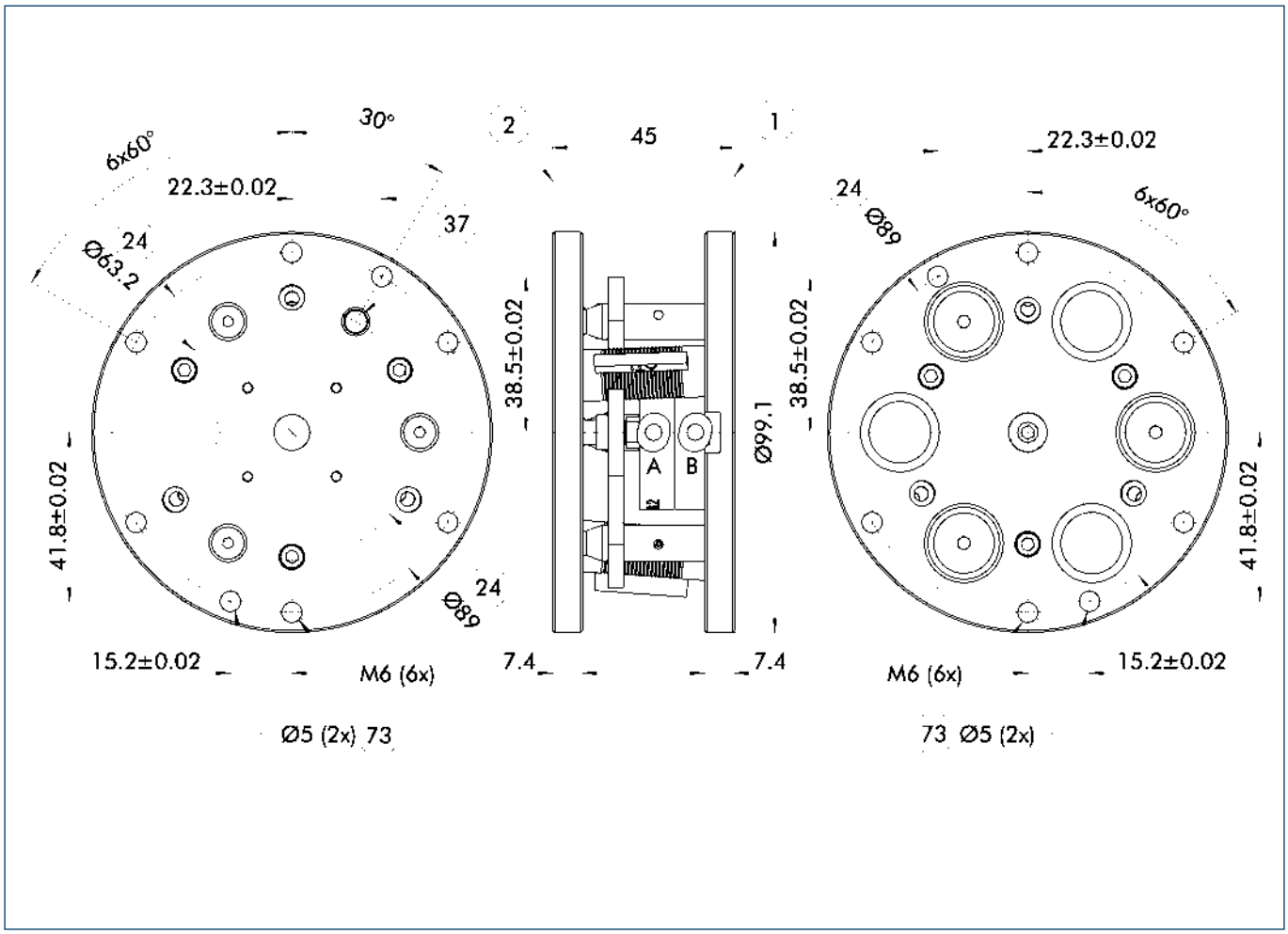
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		FUS-211A	FUS-211B	FUS-211C	FUS-212A	FUS-212B	FUS-212C
ID		0320527	0320528	0320529	0320530	0320531	0320532
Compensation XY	[mm]	±2.2	±2.2	±2.2	±2.2	±2.2	±2.2
Angular compensation	[°]	1.1	1.1	1.1	1.1	1.1	1.1
Rotary compensation angle	[°]	4	4	4	4	4	4
Stiffness displacement	[N/mm]	11	11	23	7	7	14
Compensation center clearance	[mm]	140	150	150	81	91	86
Mass	[kg]	0.5	0.5	0.5	0.5	0.5	0.5
min. / max. operating pressure	[bar]	5/6	5/6	5/6	5/6	5/6	5/6
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60	5/60	5/60
max. force F_x/F_y vertical installation	[N]	53	53	107	62	62	125
max. force F_x/F_y horizontal installation	[N]	8.9	8.9	18	8.9	8.9	18
max. force F_z	[N]	53	53	110	62	62	120
max. force F_d	[N]	1300	1400	2700	620	710	1300
Moments M_x max./M_y max.	[Nm]	6.8/6.8	7.3/7.3	14/14	6.8/6.8	7.3/7.3	14/14

Description		FUS-213A	FUS-213B	FUS-213C
ID		0320533	0320534	0320535
Compensation XY	[mm]	±2.2	±2.2	±2.2
Angular compensation	[°]	1.1	1.1	1.1
Rotary compensation angle	[°]	4	4	4
Stiffness displacement	[N/mm]	26	26	52
Compensation center clearance	[mm]	74	82	79
Mass	[kg]	0.5	0.5	0.5
min. / max. operating pressure	[bar]	5/6	5/6	5/6
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. force F_x/F_y vertical installation	[N]	98	98	196
max. force F_x/F_y horizontal installation	[N]	27	27	54
max. force F_z	[N]	98	98	196
max. force F_d	[N]	1360	1400	2770
Moments M_x max./M_y max.	[Nm]	8.5/8.5	9/9	17.5/17.5

Main view



The main view shows the unit in its basic version.

A, a Air connection locked

B, b Air connection unlocked

(1) Robot side connection

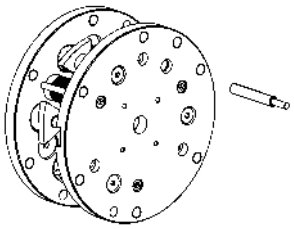
(2) Tool side connection

(24) Bolt circle

(37) Sensor connection

(73) Fit for a centering pin

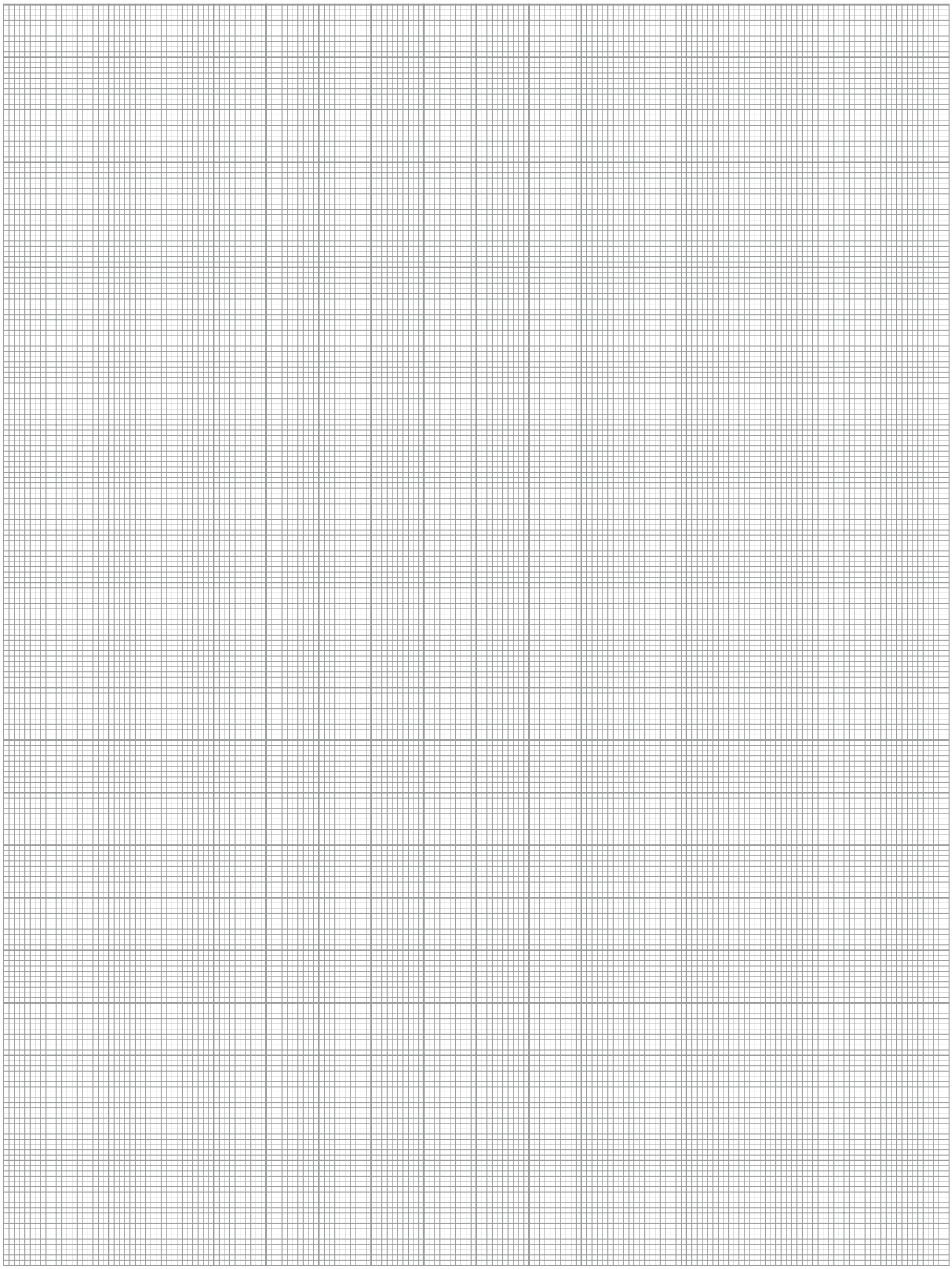
Sensor system



Locking sensor for monitoring the lock condition

Description	ID	Often combined
Inductive proximity switches		
IN 50-S-M12	0301575	
IN 50-S-M8	0301568	
INK 50-S	0301560	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

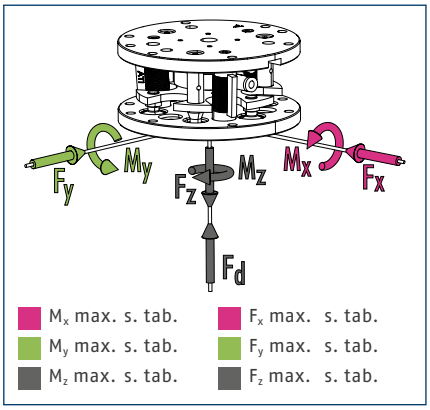
ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



FUS 400

Robot Accessories | Compensating | Insertion Unit

Forces and moments

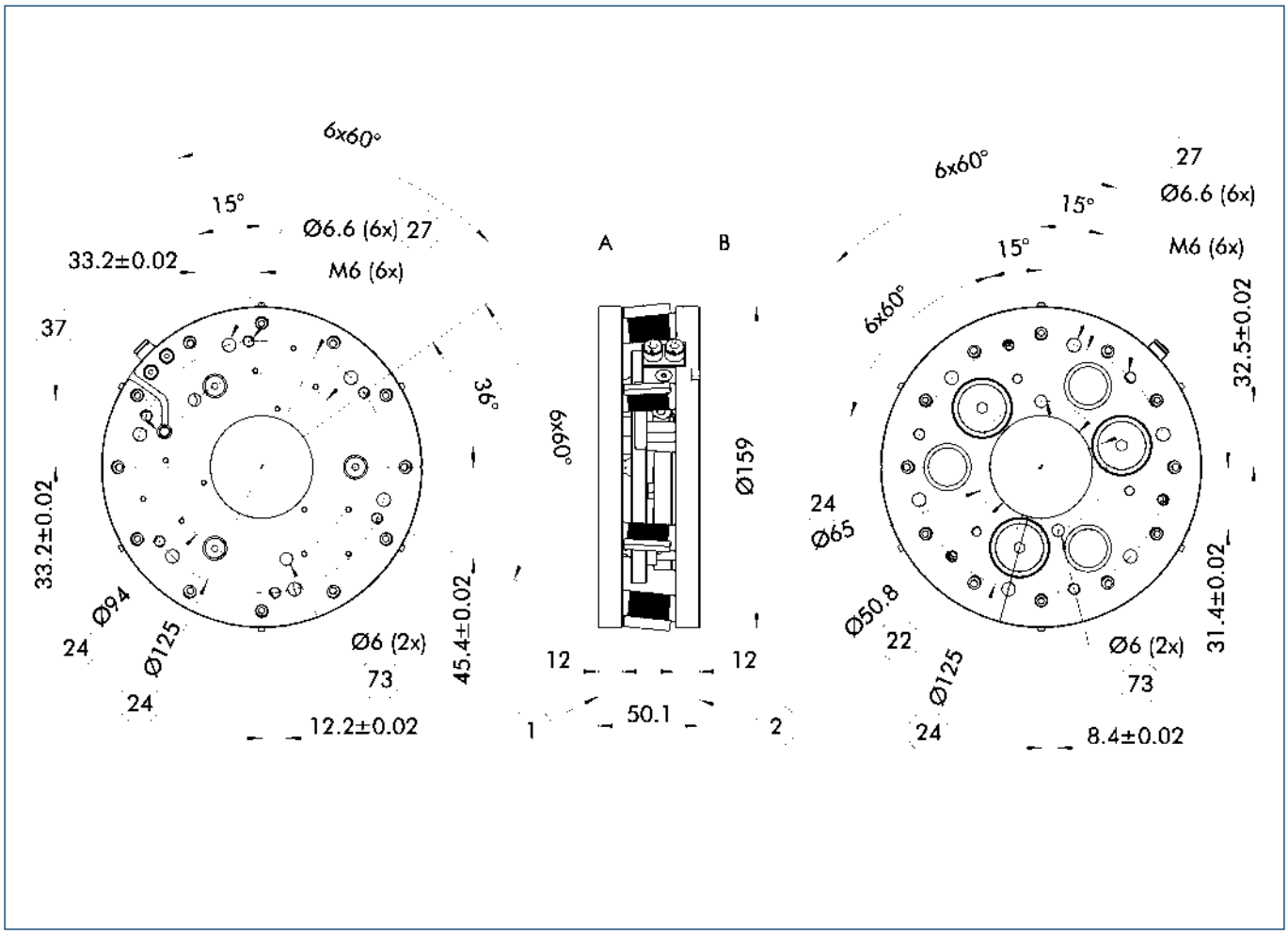


ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

Description		FUS-413C	FUS-413D
ID		0320338	0320339
Compensation tension / pressure	[mm]	1.3	1.3
Compensation XY	[mm]	±2.2	±2.2
Angular compensation	[°]	1	1
Rotary compensation angle	[°]	2.5	2.5
Stiffness tension / pressure	[N/mm]	6300	12600
Stiffness displacement	[N/mm]	60	120
Compensation center clearance	[mm]	225	225
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	1.6	1.8
min. / max. operating pressure	[bar]	5/6	5/6
min. / max. ambient temperature	[°C]	5/60	5/60
max. force F_x/F_y vertical installation	[N]	196	391
max. force F_x/F_y horizontal installation	[N]	27	54
max. force F_z	[N]	200	395
max. force F_d	[N]	2750	5490
Moments M_x max./M_y max.	[Nm]	22.6/22.6	45.2/45.2

Main view



The main view shows the unit in its basic version.

A, a Air connection locked

B, b Air connection unlocked

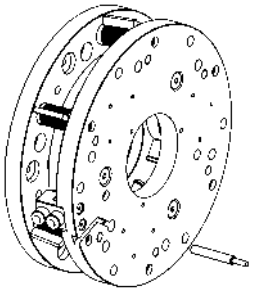
(1) Robot side connection
(2) Tool side connection

(22) Center bore
(24) Bolt circle
(27) Through-holes for screw connections
(37) Sensor connection
(73) Fit for a centering pin

FUS 400

Robot Accessories | Compensating | Insertion Unit

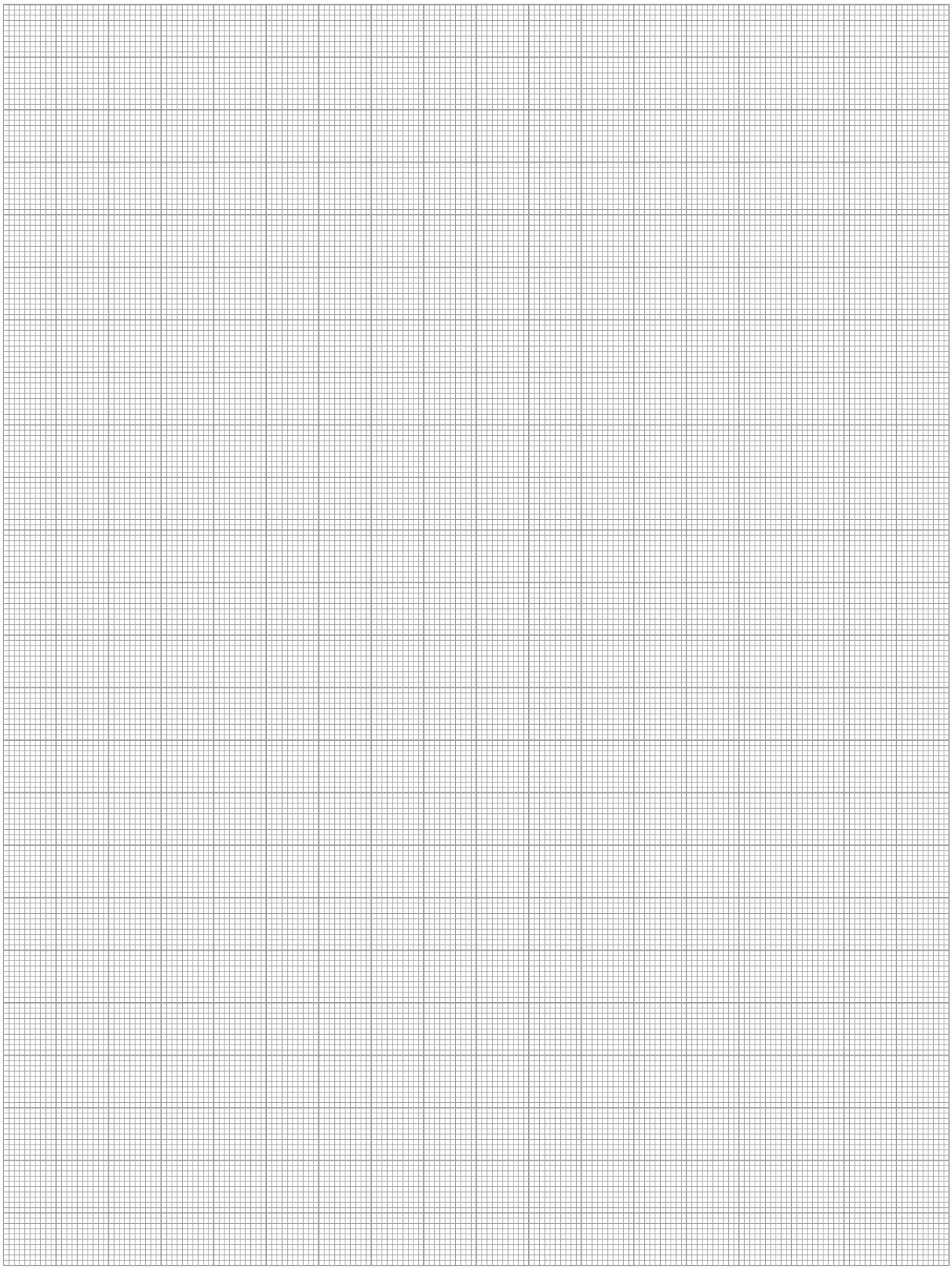
Sensor system



Locking sensor for monitoring the lock condition

Description	ID	Often combined
Inductive proximity switches		
IN 50-S-M12	0301575	
IN 50-S-M8	0301568	
INK 50-S	0301560	
Cable extensions		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
Clip		
CLI-M12	0301464	
CLI-M8	0301463	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
Sensor distributor		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

ⓘ Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.



Measuring in all 6 Degrees of Freedom. Force Measuring Range up to 40,000 N, and a Moment Measuring Range up to 6,000 N.

Measuring

6-Axis Force / Moment Sensor FT

Series	Size	Page
FT		624
FT	Nano17	634
FT	Nano17-Titan	638
FT	Nano25	640
FT	Nano43	644
FT	Mini40	646
FT	Mini45	650
FT	Mini85	654

Series	Size	Page
FT	Gamma	658
FT	Delta	662
FT	Theta	668
FT	Omega85	672
FT	Omega160	676
FT	Omega191	680
FT	Omega250	682
FT	Omega331	686

Robust. Flexible. Precise.

6-Axis Force / Moment Sensor FT

Rigid 6-axis force / torque sensor for precision measurements in all six degrees of freedom.

Field of Application

Universally applicable in robotic applications such as haptics, medicine, grinding, testing, inserting, and research and development

Advantages – Your benefit

Many sizes with different ranges of measurement

The sensor measures in all 6 degrees of freedom forces as well as moments

Rotation and translation of the coordinates system in all three directions

Integrated temperature compensation to guarantee the defined measuring accuracy

Easy integration into the process due to easy interface compatibility

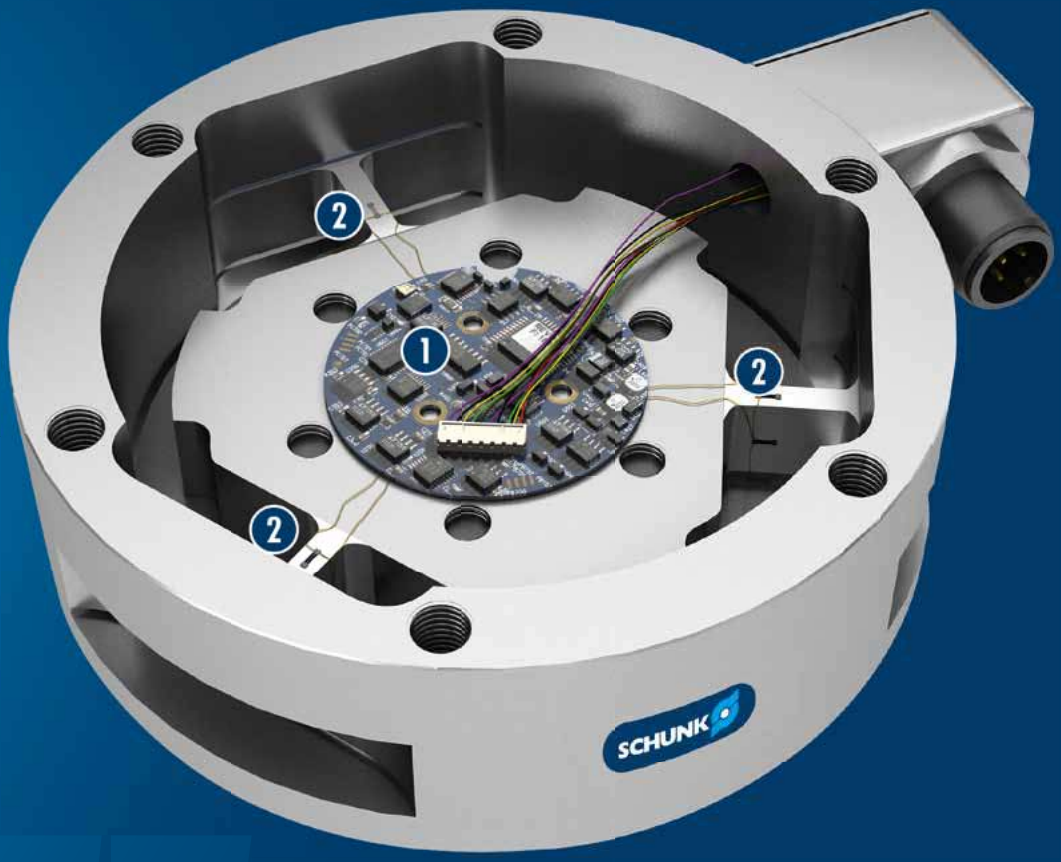
Robust design due to a higher overload range for a long tool life

IP protection IP60, 65, 68 available as an option

Sizes	Measuring range of force	Measuring range of moment load
Quantity: 15	±8 .. 40000 N	±0.05 .. 6000 Nm

Functional Description

The resistance strain gauges (DMS) of the 6-axis force moment sensor measure the occuring forces in all 6 degrees of freedom (F_x, F_y, F_z, T_x, T_y, and T_z). The signals of the DMS are reinforced inside the sensor.



① **Electronics**
integration into housing means no interfering contours (starting from size gamma)

② **Resistance strain gauges**
Silicon gages provide a signal 75 times stronger than conventional foil gages. This signal is amplified resulting in near-zero noise distortion.

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Measuring accuracy: less than +/- 1 % of the upper range value at 22 °C

Evaluation via: Ethernet, ProfiNet, DeviceNet, DAQ, USB, RS232, Analog

Splash protection: IP60, 65, 68

Housing: Aluminum and stainless steel

Scope of delivery: Electronic processor and connection cable

Warranty: 12 months (details, general terms and conditions and operation manuals can be downloaded under www.schunk.com)

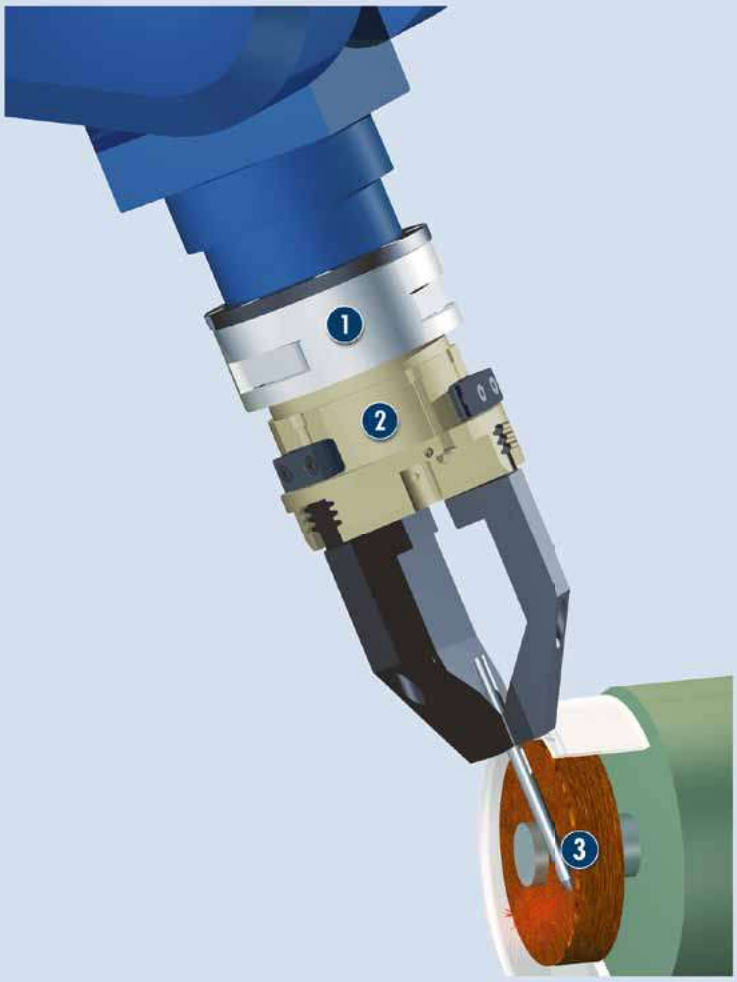
Harsh environmental conditions: Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

Handling weight: The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

Application example

Application of sharpening with force-torque-sensor to measure and control the robot.

1. FT-Delta 6-Axis-Sensor
2. PZN-plus 64 3-Finger Centric Gripper
3. Robot-supported deburring of round bars



SCHUNK offers more ...

The following components make the FT even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

FTN Ethernet Version

FTD DAQ Version

FTD Stand-Alone Version FTS

Adapter Plates

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

Options and special Information

6-axis force-torque sensor: Strain gauges (DMS) measure the strain applied in all six degrees of freedom (F_x, F_y, F_z, T_x, T_y, T_z). The DMS signals are amplified in the sensor. Due to the size, the interface board for the Nano and Mini series is located in the power supply box (IFPS) instead of the sensor.
Power supply box: In the voltage supply box is the potential transformer, which changes the 5 V tension of the PC into tension usable for the sensor. With nano and mini system also the amplifier board is integrated in the box beside the potential transformer.
Sensor cable: With the nano and mini sensors the sensor cables are soldered in the sensor. With larger sensors a plug on the sensor housing is for the attachment of the sensor cables. The highly flexible sensor cable protects the sensor signals against electrical fields and mechanical loads.
Amplifier / Multiplex board / NetBox: The amplifier board converts the signals from the strain gauges into a signal usable for the DAQ Card and NetBox. The MULTIPLEX board strengthens the signals from the strain gauges and transfers them to the controller.
NetBox: The primary function of the NetBox is to communicate with the sensor and with the equipment of the user and to process the data. Communication is done via Ethernet/IP and CANbus. Via the CANbus connection, the NetBox can react and communicate to DeviceNet instructions.
Stand-Alone-Controller: The Stand-Alone-Controller is connected to the sensor or the Multiplex Box. It converts the multiplexed DMS signals to forces and moments. Functions such as tool transformation are implemented in the controller.

General Information

SCHUNK 6-axis force / torque sensors measure the full 6 components of force and torque **(F_x, F_y, F_z, M_x, M_y, M_z)** through the use of a monolithic instrumented transducer. SCHUNK FT sensors are equipped with silicon strain gauges, which provide for excellent noise immunity. The following interfaces are available for all sizes: **FTN (Ethernet, DeviceNet optionally with ProfiNet), FTD (PCI, USB), FTS (analog voltage 0 – 10 V, DIO) or FTW (Wireless).**

Characteristics

SCHUNK FT sensors feature diverse high-performance functions:

- **Zero offset:**
  Moves and / or rotates the FT reference system.
- **Demo program:**
  Enables settings and data logging.
- **Zeroing:**
  Provides a simple way to compensate for the tool weight.
- **Threshold comparison:**
  Generates an output code if a user-defined threshold is exceeded (FTN and FTS).
- **Built-in temperature compensation:**
  Ensures accuracy of the measurements over a large temperature range.
- **Overload:**
  SCHUNK FT sensors are especially robust and durable. The safety factor can be as high as 40 times the measurement range, depending on the particular size.
- **Immune measuring signal:**
  Silicon strain gauges provide a signal 75 times stronger than conventional foil strain gauges and reduce the signal noise to virtually zero.
- **IP protection class:**
  SCHUNK FT sensors are optionally available in versions with IP60, 65 or 68 protection.

Accuracy

Accuracy is the difference between the applied load and the actual measured load.
The maximum measuring inaccuracy refers to the maximum value that can be measured with the sensor (see example below for Gamma SI-32-2.5).
The reproducibility or repeatability is the difference between the measured values when the same load is applied each time.

Note:
Often it is irrelevant to know the size of the actual measured load. It is crucial that the same load always results in the same measured values.

Example: Gamma SI-32-2.5

Name	Calibration	F_x	F_y	F_z	T_x	T_y	T_z
Gamma	SI-32-2.5	0.75 %	1.00 %	0.75 %	1.00 %	1.25 %	1.00 %

F_x max. measurement range is 32 N, max. measuring inaccuracy is 0.24 N.
F_z max. measurement range is 100 N, max. measuring inaccuracy is 0.75 N.

Resolution

The resolution is the smallest change in the load that represents a change in the output values of the measured forces and moments.
The smaller the resolution of an FT sensor, the larger is the sensitivity of the sensor. This is important when the application requires a "tactile sense".

Technical Data

Type	Analysis	Output speed	Latency time
FTN	Via Ethernet, DeviceNet optionally with ProfiNet	7000 Hz 7000 Hz	500 µs 288 µs
FTD	Via DAQ card (PCI)	16.67 kHz to 41.67 kHz	1 / Output speed
FTS	Analog voltage 0 – 10 V or DIO	560 Hz 2500 Hz	2585 µs 800 µs

Application in Practice

SCHUNK 6-axis force / torque sensors are already in use in numerous robot-controlled applications:

- **Joining processes:**
  Joining or assembly of workpieces by using a robot.
- **Deburring, polishing, grinding:**
  Optimal results due to constant contact pressures.
- **Force / moment feedback:**
  Control of manipulators (e.g. defusing of bombs).
- **Medicine:**
  Development of artificial limbs and simulation of surgery.
- **Product tests:**
  Tactile measurements for automotive parts and smartphone displays.
- **Research and development:**
  Used at many universities and research facilities due to very precise and reproducible measurements.
- **Service robotics**
  Flexible and versatile due to the compact design.

The force / torque feedback between the robot and the SCHUNK FT sensor allows a significant increase in quality of the automated grinding of air supply chambers for fireplaces.

FTN – the All-round Sensor for your Interfaces

The FTN sensor is connected by means of Ethernet or DeviceNet (optional ProfiNet) to the system.
The web browser interface facilitates configuration and adjustment of the FTN sensor.

Product features

- Fully ODVA™-compliant Ethernet/IP interface (optionally available with ProfiNet).
- The FTN NetBox has IP65 protection.
- The NetBox is supplied using Power over Ethernet (PoE) or an external power supply (11 V to 24 V).
- Up to 16 sensor calibrations can be stored permanently in the system for selection by the user.

Scope of delivery:
FT sensor, sensor cable, NetBox, optional RJ45 adapter

1. FT sensor
2. Sensor cable
3. NetBox
4. Optionally with RJ45 adapter

FTD – for simple Data Acquisition via PC

The FTD sensor is connected to the PC by means of a DAQ card. The 6 analog output signals of the sensor are converted to digital signals by means of the electronics in the DAQ card. Afterwards, the software (provided by the customer) uses the calibration matrix to graphically display the occurring forces and moments on the PC.

Product features

- Highest possible output speed (see table on page 629)
- Numerous DAQ cards can be used
- Dual calibration possible

Scope of delivery:
FT sensor, sensor cable, power supply box, optionally with DAQ card (PCI or USB)

1. FT sensor with sensor cable
2. Voltage supply box
3. Optionally with DAQ card (PCI)
4. Optionally with DAQ card (USB)
5. Cable for DAQ card

FTS – the autonomous Measuring System

The SCHUNK FTS sensor is connected by means of the RS-232 interface, analog outputs and / or single I/O connections. The stand-alone controller digitalizes the 6 analog output signals of the sensor and uses the calibration matrix to calculate the occurring forces and moments (F_x, F_y, F_z, M_x, M_y, M_z).

Product features

- Autonomous measuring system
- Dual calibration possible
- Discrete I/O (e.g. good / bad inspection)
- Integrated RS-232 interface allows direct configuration on the PC
- Measured forces and moments are output via analog voltages (±5 V / ±10 V)

Scope of delivery:
FT sensor, sensor cable, stand-alone controller

1. FT sensor with sensor cable
2. Stand-alone controller (left: rear view; right: front view)
3. Amplifier box (MUX box)
4. Connecting cable from amplifier box to stand-alone controller

Selection Scheme for Sensors

1. Calculation of the expected forces and moments

Generally, the moment load is the decisive variable in selecting a sensor. The tool weight and the application process generate forces that can act upon the sensor as moments. The moment is calculated from the applied force (static and dynamic) multiplied by the lever arm. The lever arm is the distance from the point of application of the force to the zero point of the sensor. The design must also take into account forces and moments that can act upon the sensor outside of normal operation.

2. Pre-selection of the sensor based on forces and moments

Use the table below for this step.

3. Definition of the resolution

Check whether the resolution of the sensor matches your requirements. It is possible that the sensor selected based on the forces and moments does not fulfill the requirements for the resolution.
As a rule of thumb, the larger the measurement range, the smaller the resolution.

Example

The maximum expected force that will act upon the sensor is 98 N (10 kg). This force acts upon the sensor from a distance of 25 cm. The moment is therefore 24.5 Nm.

The FT-Delta-SI-330-30 would be suitable for this application (measuring range 330 N and 30 Nm). The overload safety is 230 Nm (M_{xy}).

Information for robot applications

In a crash situation, enormous forces and moments act upon the sensor due to the inertia and braking deceleration of the robot.
To protect the sensor, we recommend using collision and overload protection of the type OPS or OPR.

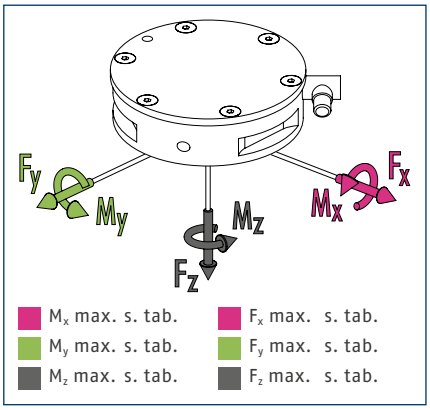
FT Quick Overview

Designation	Max F_x, F_y [±N]	Max F_z [±N]	Max M_x, M_y, M_z [±Nm]	Mass [kg]	Diameter [mm]	Height [mm]
Nano17 Titanium	32	56.4	0.2	0.00907	17	14
Nano17	50	70	0.5	0.00907	17	14
Nano17 IP65/IP68	50	70	0.5	0.0408	20	22
Nano25	250	1000	6	0.0635	25	22
Nano25 IP65/IP68	250	1000	6	0.136	28	27
Nano43	36	36	0.5	0.0408	43	11
Mini27 Titanium	80	160	4	0.0318	27	18
Mini40	80	240	4	0.0499	40	12
Mini40 IP65/IP68	80	240	4	0.272	53	21
Mini45 Titanium	240	480	12	0.0998	45	18
Mini45	580	1160	20	0.0907	45	16
Mini45 IP65/IP68	580	1160	20	0.39	58	25
Mini58	2800	6800	120	0.499	58	30
Mini58 IP60	2800	6800	120	0.522	82	36
Mini58 IP65/IP68	2800	6800	120	0.803	66	38
Mini85	1900	3800	80	0.635	85	30
Gamma	130	400	10	0.254	75	33
Gamma IP60	130	400	10	0.467	99	40
Gamma IP65	130	400	10	1.09	110	52
GammaIP68	130	400	10	1.98	110	52
Delta	660	1980	60	0.912	94	33
Delta IP60	660	1980	60	1.81	120	47
Delta IP65	660	1980	60	1.77	130	52

Designation	Max F_x, F_y [±N]	Max F_z [±N]	Max M_x, M_y, M_z [±Nm]	Mass [kg]	Diameter [mm]	Height [mm]
Delta IP68	660	1980	60	2.63	100	52
Theta	2500	6250	400	4.99	150	61
Theta IP60	2500	6250	400	8.62	190	74
Theta IP65/IP68	2500	6250	400	9	160	75
Omega85	1900	3800	80	0.658	85	34
Omega85 IP65/IP68	1900	3800	80	1.91	93	39
Omega160	2500	6250	400	2.72	160	56
Omega160 IP60	2500	6250	400	7.67	190	58
Omega160 IP65/IP68	2500	6250	400	7.26	170	66
Omega191	7200	18000	1400	on request	on request	on request
Omega191 IP60	7200	18000	1400	on request	on request	on request
Omega191 IP65/IP68	7200	18000	1400	on request	on request	on request
Omega250 IP60/IP65/IP68	16000	32000	2000	31.8	290	95
Omega331	40000	88000	6000	47	330	110

FT Nano17

Forces and moments

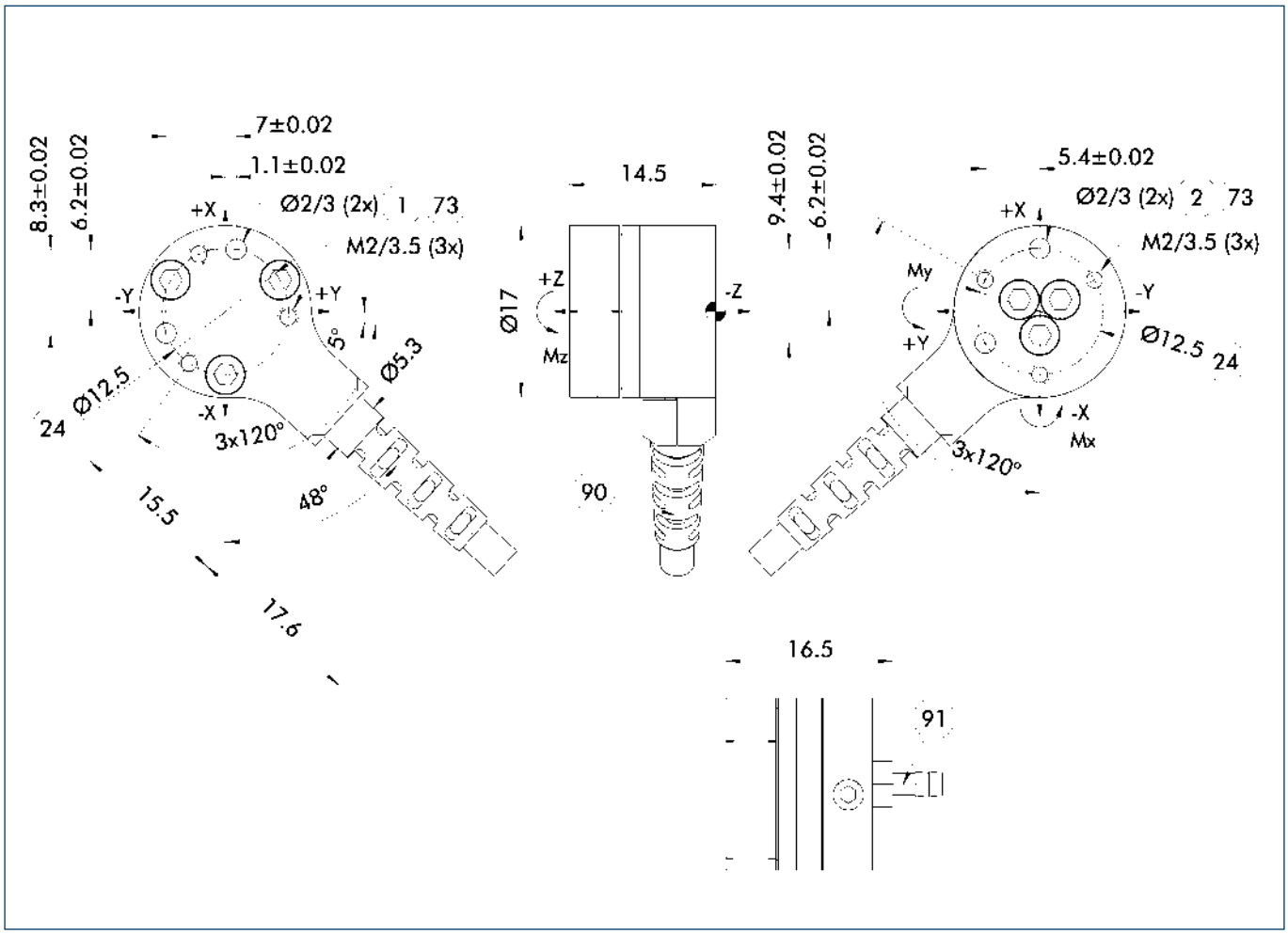


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Nano-17	FTN-Nano-17	FTN-Nano-17
Calibration		SI-12-0.12	SI-25-0.25	SI-50-0.5
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	0.0091	0.0091	0.0091
Measuring range F_x, F_y	[N]	±12	±25	±50
Measuring range F_z	[N]	±17	±35	±70
Measuring range M_x, M_y	[Nm]	±0.12	±0.25	±0.5
Measuring range M_z	[Nm]	±0.12	±0.25	±0.5
Overload F_x, F_y	[N]	±350	±350	±350
Overload F_z	[N]	±800	±800	±800
Overload M_x, M_y	[Nm]	±2.6	±2.6	±2.6
Overload M_z	[Nm]	±3.1	±3.1	±3.1
Resonant Frequency F_x, F_y, M_z	[Hz]	7200	7200	7200
Resonant Frequency F_z, M_x, M_y	[Hz]	7200	7200	7200
Resolution F_x, F_y	[N]	1/320	1/160	1/80
Resolution F_z	[N]	1/320	1/160	1/80
Resolution M_x, M_y	[Nmm]	1/64	1/32	1/16
Resolution M_z	[Nmm]	1/64	1/32	1/16
Technical data deviating from FTD				
Description		FTD-Nano-17	FTD-Nano-17	FTD-Nano-17
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	1/320	1/160	1/80
Resolution F_z	[N]	1/320	1/160	1/80
Resolution M_x, M_y	[Nmm]	1/64	1/32	1/16
Resolution M_z	[Nmm]	1/64	1/32	1/16
Technical data deviating from FTS				
Description		FTS-Nano-17	FTS-Nano-17	FTS-Nano-17
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	1/160	1/80	1/40
Resolution F_z	[N]	1/160	1/80	1/40
Resolution M_x, M_y	[Nmm]	1/32	1/16	1/8
Resolution M_z	[Nmm]	1/32	1/16	1/8

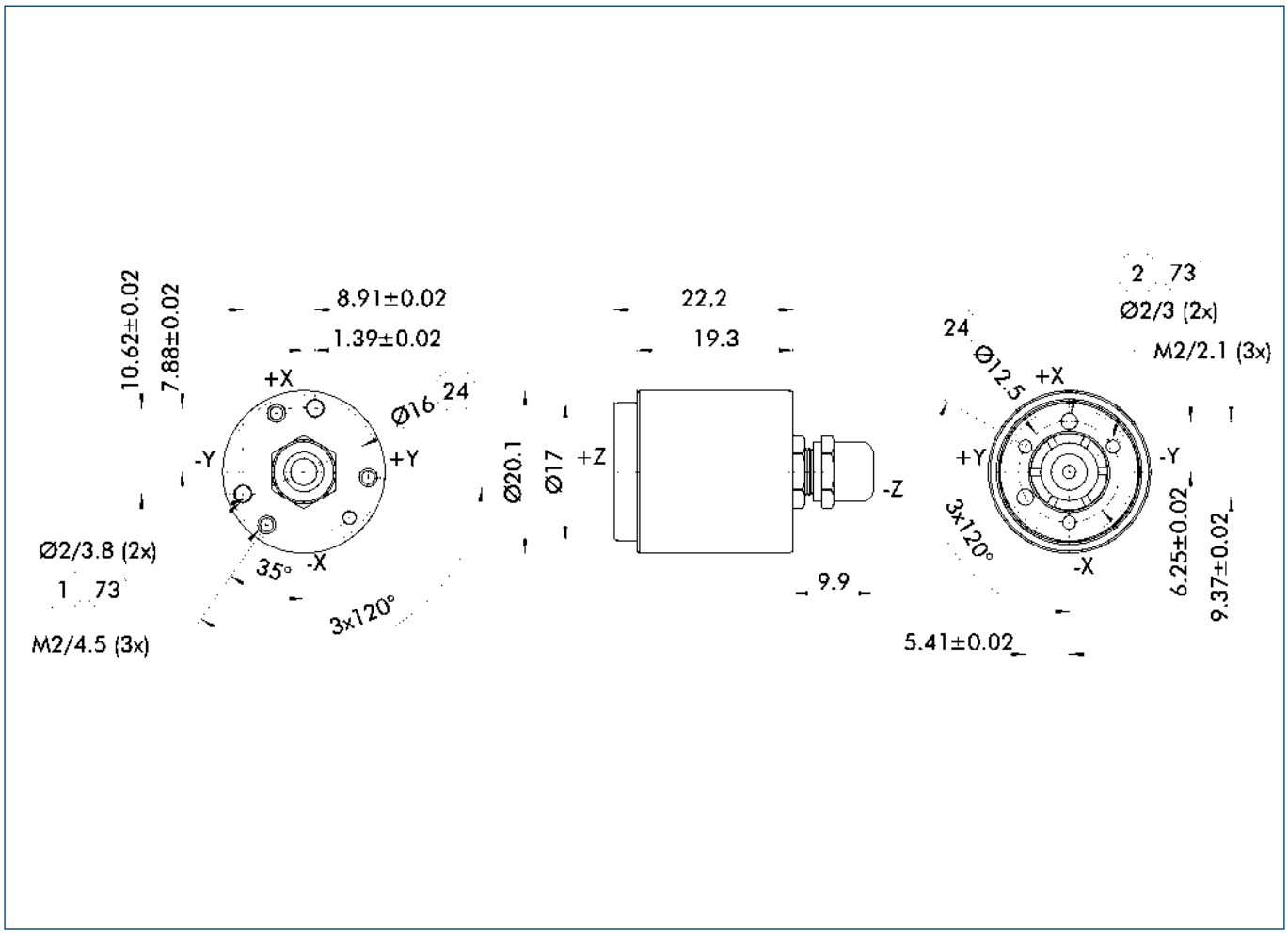
Main view



The main view shows the unit in its basic version.

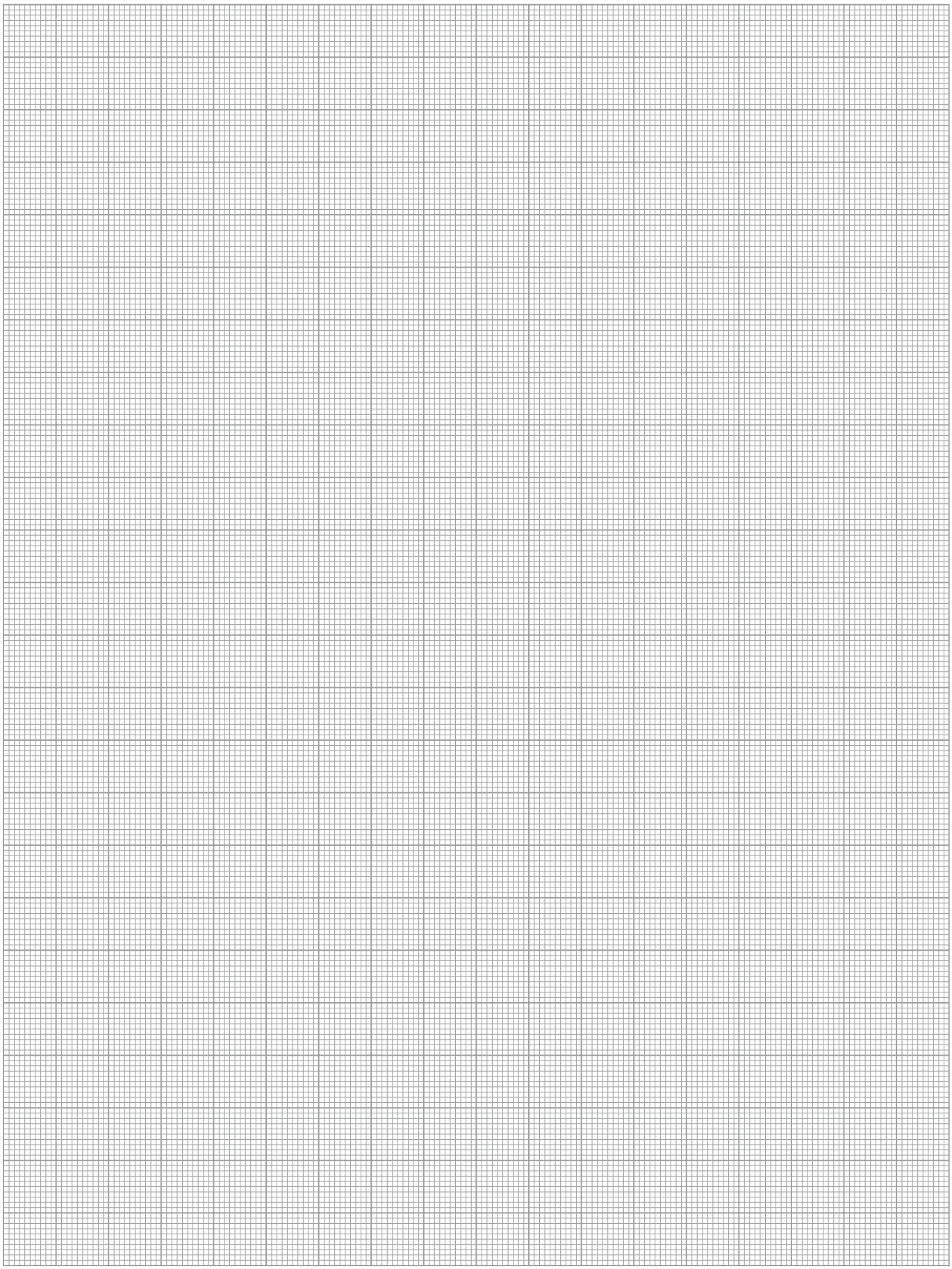
(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin
(90) Radial cable outlet with strain relief
(91) Axial cable outlet

IP65 / IP68 main view



The main view shows the product with IP-protection.

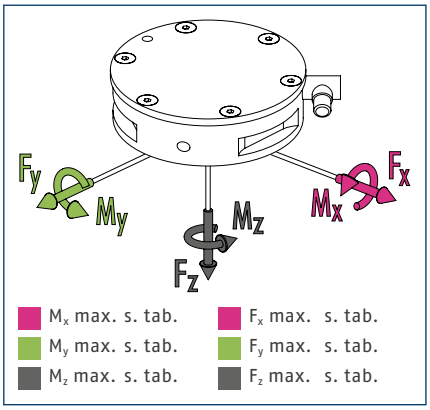
1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin



FT Nano17-Titan

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

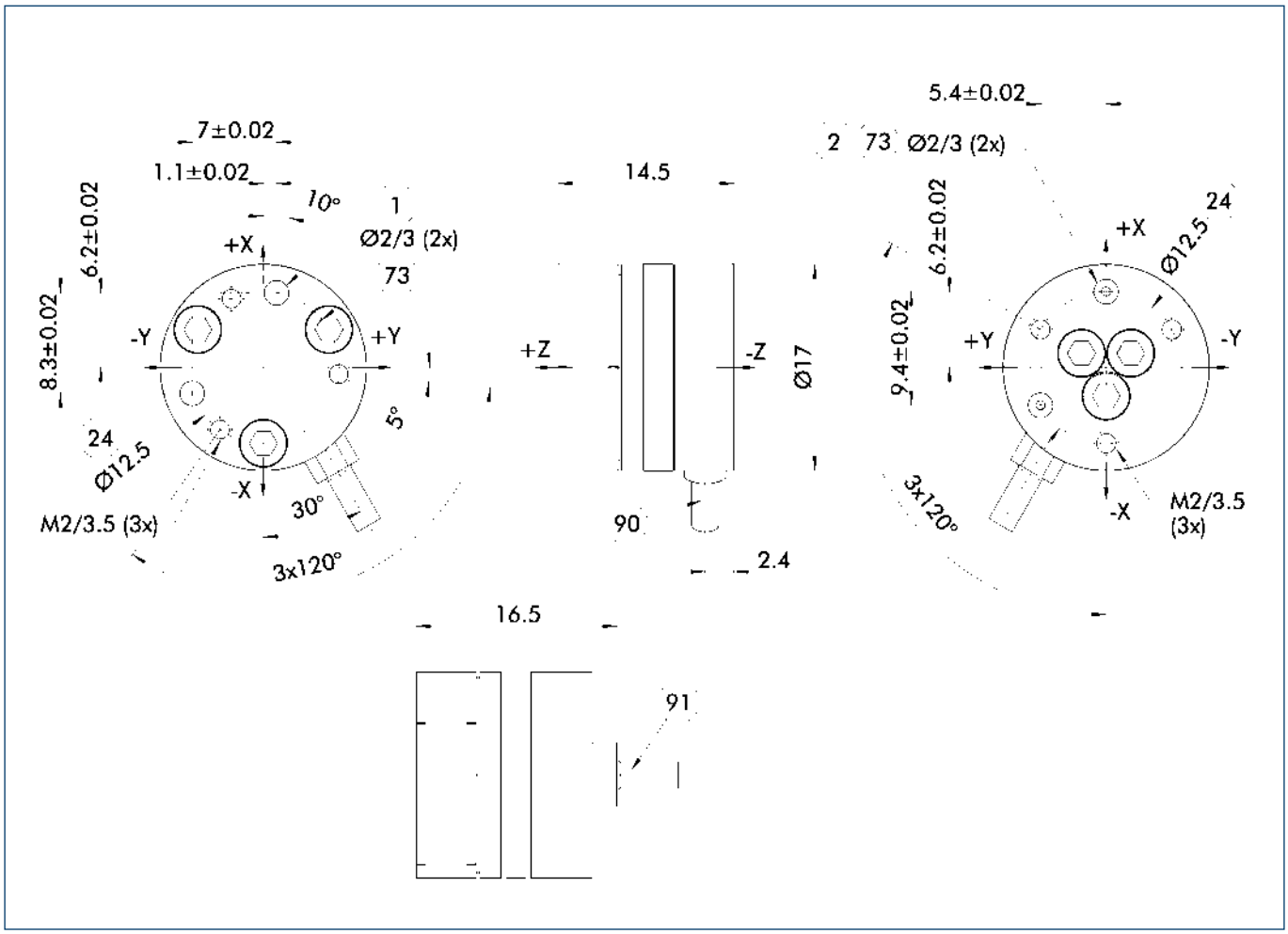


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Nano-17-T	FTN-Nano-17-T	FTN-Nano-17-T
Calibration		SI-8-0.05	SI-16-0.1	SI-32-0.2
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	0.01	0.01	0.01
Measuring range F_x, F_y	[N]	±8	±16	±32
Measuring range F_z	[N]	±14.1	±28.2	±56.4
Measuring range M_x, M_y	[Nm]	±0.05	±0.1	±0.2
Measuring range M_z	[Nm]	±0.05	±0.1	±0.2
Overload F_x, F_y	[N]	±160	±160	±160
Overload F_z	[N]	±310	±310	±310
Overload M_x, M_y	[Nm]	±500	±500	±500
Overload M_z	[Nm]	±610	±610	±610
Resonant Frequency F_x, F_y, M_z	[Hz]	3000	3000	3000
Resonant Frequency F_z, M_x, M_y	[Hz]	3000	3000	3000
Resolution F_x, F_y	[N]	1/682	1/341	1/171
Resolution F_z	[N]	1/682	1/341	1/171
Resolution M_x, M_y	[Nmm]	3/364	3/182	3/92
Resolution M_z	[Nmm]	5/728	5/364	5/184
Technical data deviating from FTD				
Description		FTD-Nano-17-T	FTD-Nano-17-T	FTD-Nano-17-T
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	1/682	1/341	1/171
Resolution F_z	[N]	1/682	1/341	1/171
Resolution M_x, M_y	[Nmm]	3/364	3/182	3/92
Resolution M_z	[Nmm]	5/728	5/364	5/184
Technical data deviating from FTS				
Description		FTS-Nano-17-T	FTS-Nano-17-T	FTS-Nano-17-T
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	1/341	2/341	2/171
Resolution F_z	[N]	1/341	2/341	2/171
Resolution M_x, M_y	[Nmm]	3/182	3/91	3/46
Resolution M_z	[Nmm]	5/364	5/182	5/92

Main view



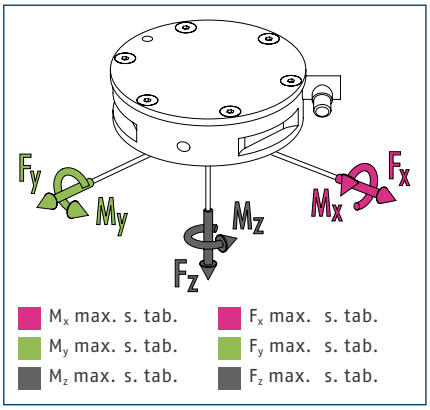
The main view shows the unit in its basic version.

1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin
90 Radial cable outlet with strain relief
91 Axial cable outlet

FT Nano25

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

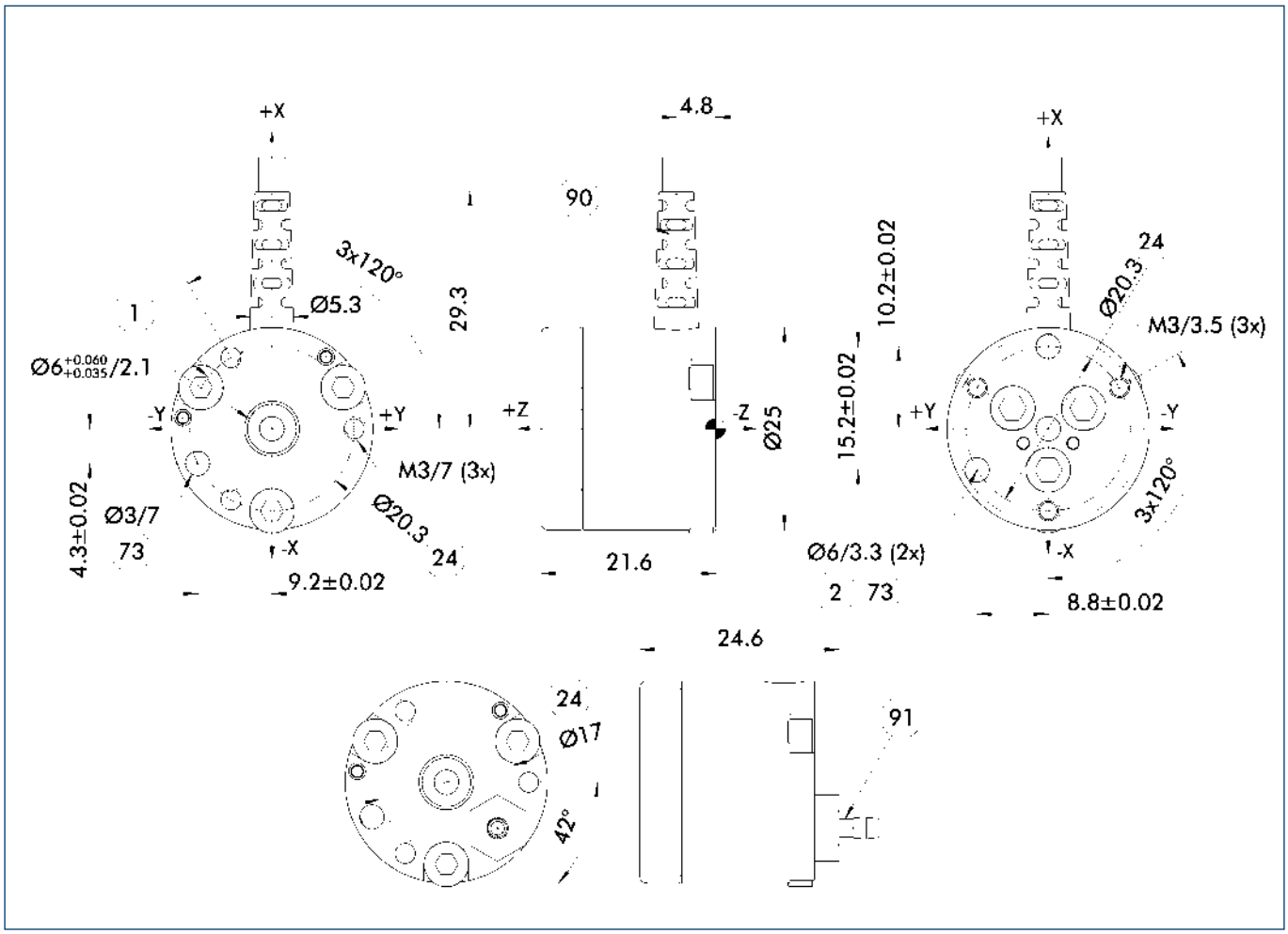


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Nano-25	FTN-Nano-25
Calibration		SI-125-3	SI-250-6
Evaluation via		Ethernet	Ethernet
Mass	[kg]	0.063	0.063
Measuring range F_x, F_y	[N]	±125	±250
Measuring range F_z	[N]	±500	±1000
Measuring range M_x, M_y	[Nm]	±3	±6
Measuring range M_z	[Nm]	±3	±3.4
Overload F_x, F_y	[N]	±2300	±2300
Overload F_z	[N]	±7300	±7300
Overload M_x, M_y	[Nm]	±43	±43
Overload M_z	[Nm]	±63	±63
Resonant Frequency F_x, F_y, M_z	[Hz]	3600	3600
Resonant Frequency F_z, M_x, M_y	[Hz]	3800	3800
Resolution F_x, F_y	[N]	1/48	1/24
Resolution F_z	[N]	1/16	1/8
Resolution M_x, M_y	[Nm]	1/1320	1/660
Resolution M_z	[Nm]	1/2640	1/1320
Technical data deviating from FTD			
Description		FTD-Nano-25	FTD-Nano-25
Evaluation via		DAQ	DAQ
Resolution F_x, F_y	[N]	1/48	1/24
Resolution F_z	[N]	1/16	1/8
Resolution M_x, M_y	[Nm]	1/1320	1/660
Resolution M_z	[Nm]	1/2640	1/1320
Technical data deviating from FTS			
Description		FTS-Nano-25	FTS-Nano-25
Evaluation via		Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	1/24	1/12
Resolution F_z	[N]	1/8	1/4
Resolution M_x, M_y	[Nm]	1/660	1/330
Resolution M_z	[Nm]	1/1320	1/660

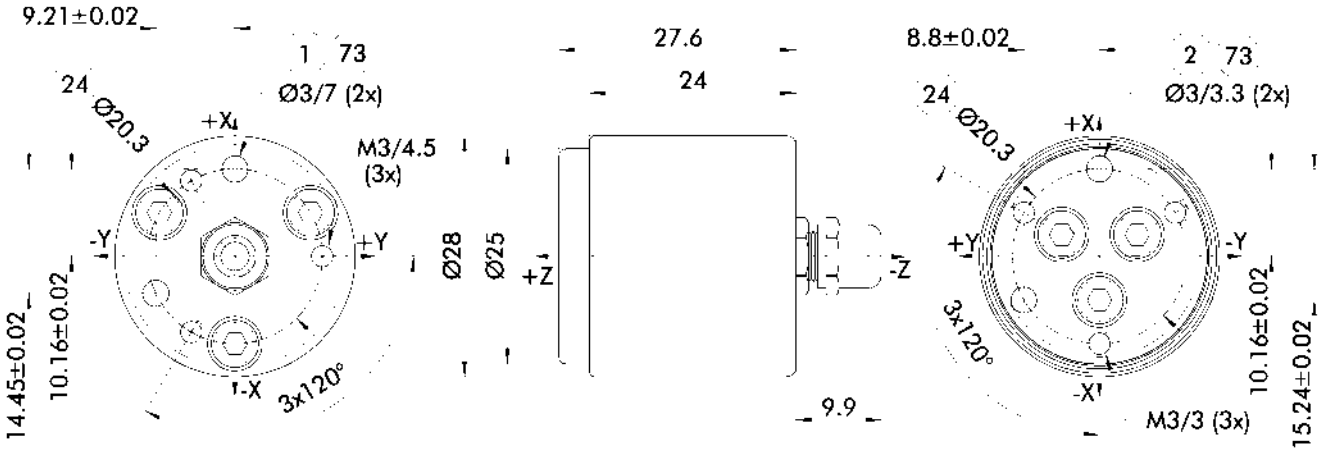
Main view



The main view shows the unit in its basic version.

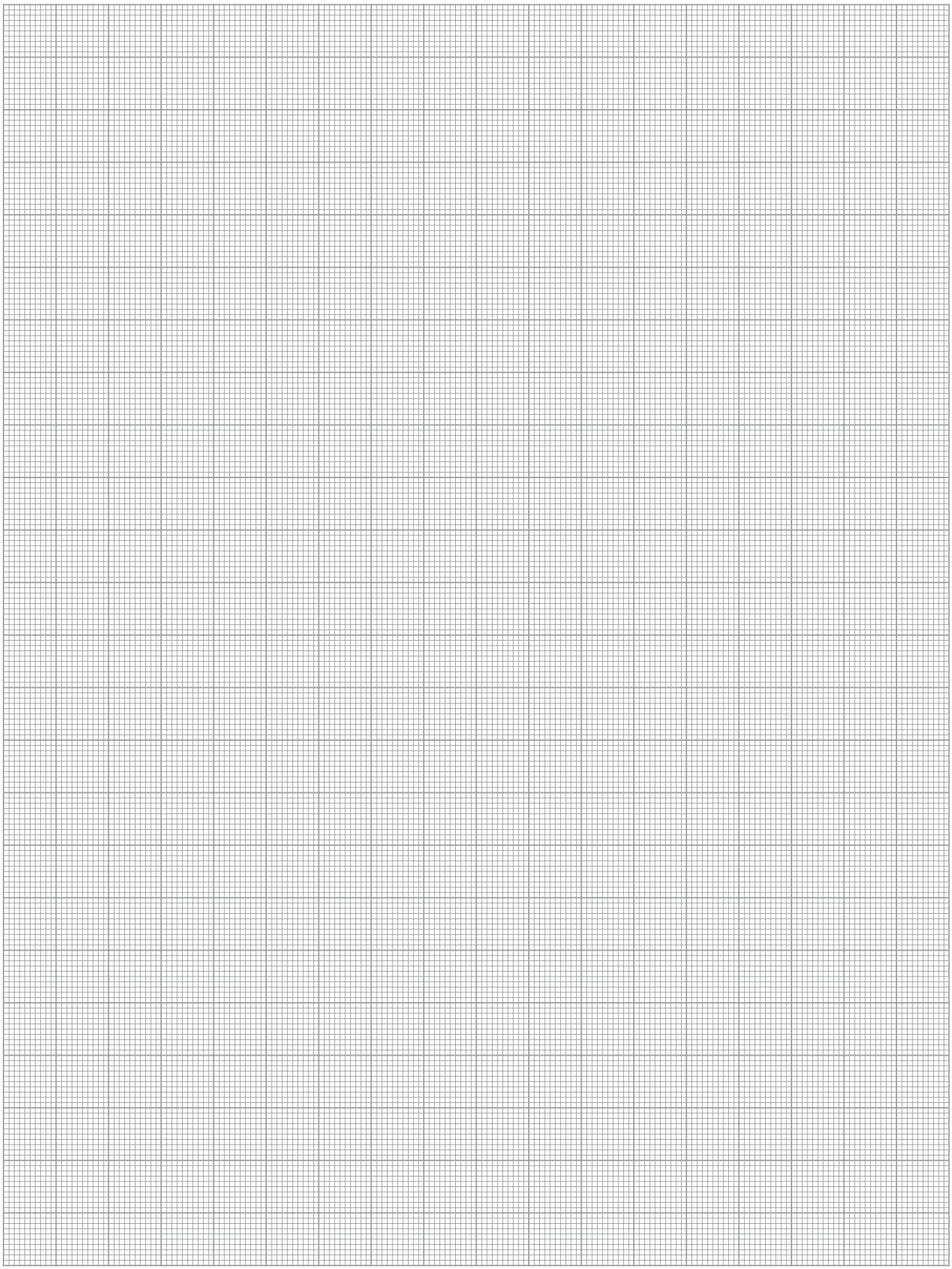
(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin
(90) Radial cable outlet with strain relief
(91) Axial cable outlet

IP65 / IP68 main view



The main view shows the product with IP-protection.

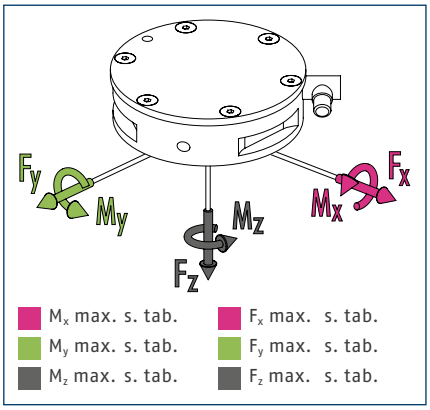
(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin



FT Nano43

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

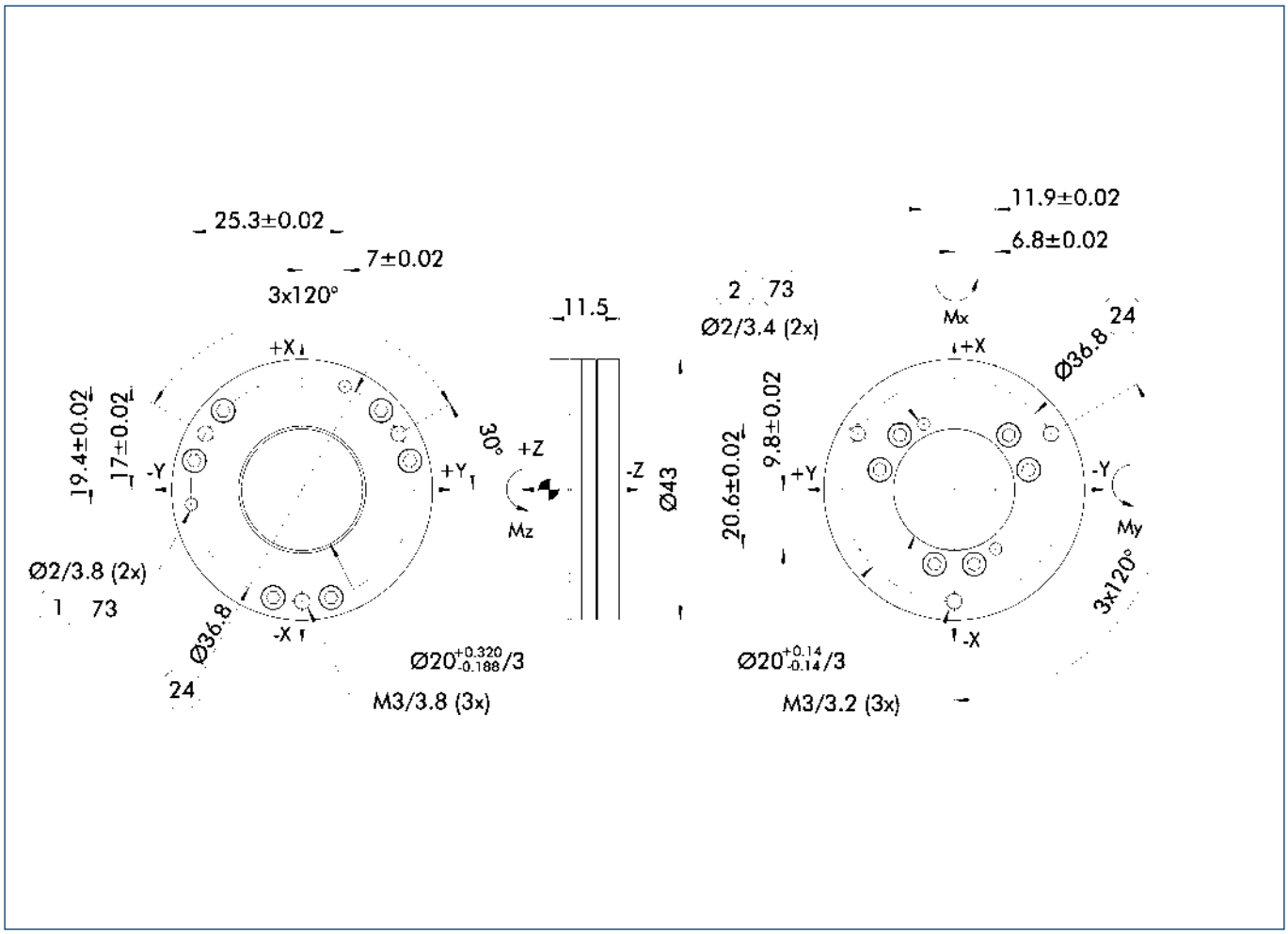


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Nano-43	FTN-Nano-43	FTN-Nano-43
Calibration		SI-9-0.125	SI-18-0.25	SI-36-0.5
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	0.039	0.039	0.039
Measuring range F_x, F_y	[N]	±9	±18	±36
Measuring range F_z	[N]	±9	±18	±36
Measuring range M_x, M_y	[Nm]	±0.13	±0.25	±0.5
Measuring range M_z	[Nm]	±0.13	±0.25	±0.5
Overload F_x, F_y	[N]	±300	±300	±300
Overload F_z	[N]	±380	±380	±380
Overload M_x, M_y	[Nm]	±3.2	±3.2	±3.2
Overload M_z	[Nm]	±4.6	±4.6	±4.6
Resonant Frequency F_x, F_y, M_z	[Hz]	2800	2800	2800
Resonant Frequency F_z, M_x, M_y	[Hz]	2300	2300	2300
Resolution F_x, F_y	[N]	1/512	1/256	1/128
Resolution F_z	[N]	1/512	1/256	1/128
Resolution M_x, M_y	[Nmm]	1/40	1/20	1/10
Resolution M_z	[Nmm]	1/40	1/20	1/10
Technical data deviating from FTD				
Description		FTD-Nano-43	FTD-Nano-43	FTD-Nano-43
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	1/512	1/256	1/128
Resolution F_z	[N]	1/512	1/256	1/128
Resolution M_x, M_y	[Nmm]	1/40	1/20	1/10
Resolution M_z	[Nmm]	1/40	1/20	1/10
Technical data deviating from FTS				
Description		FTS-Nano-43	FTS-Nano-43	FTS-Nano-43
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	1/256	1/128	1/64
Resolution F_z	[N]	1/256	1/128	1/64
Resolution M_x, M_y	[Nmm]	1/20	1/10	1/5
Resolution M_z	[Nmm]	1/20	1/10	1/5

Main view



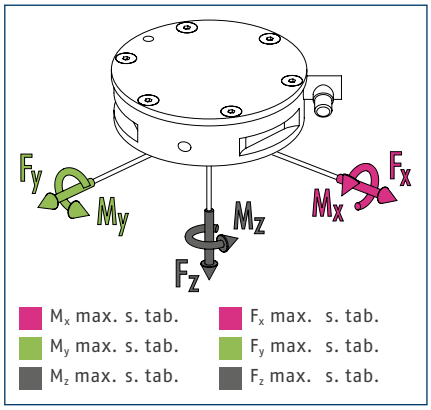
The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin

FT Mini40

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

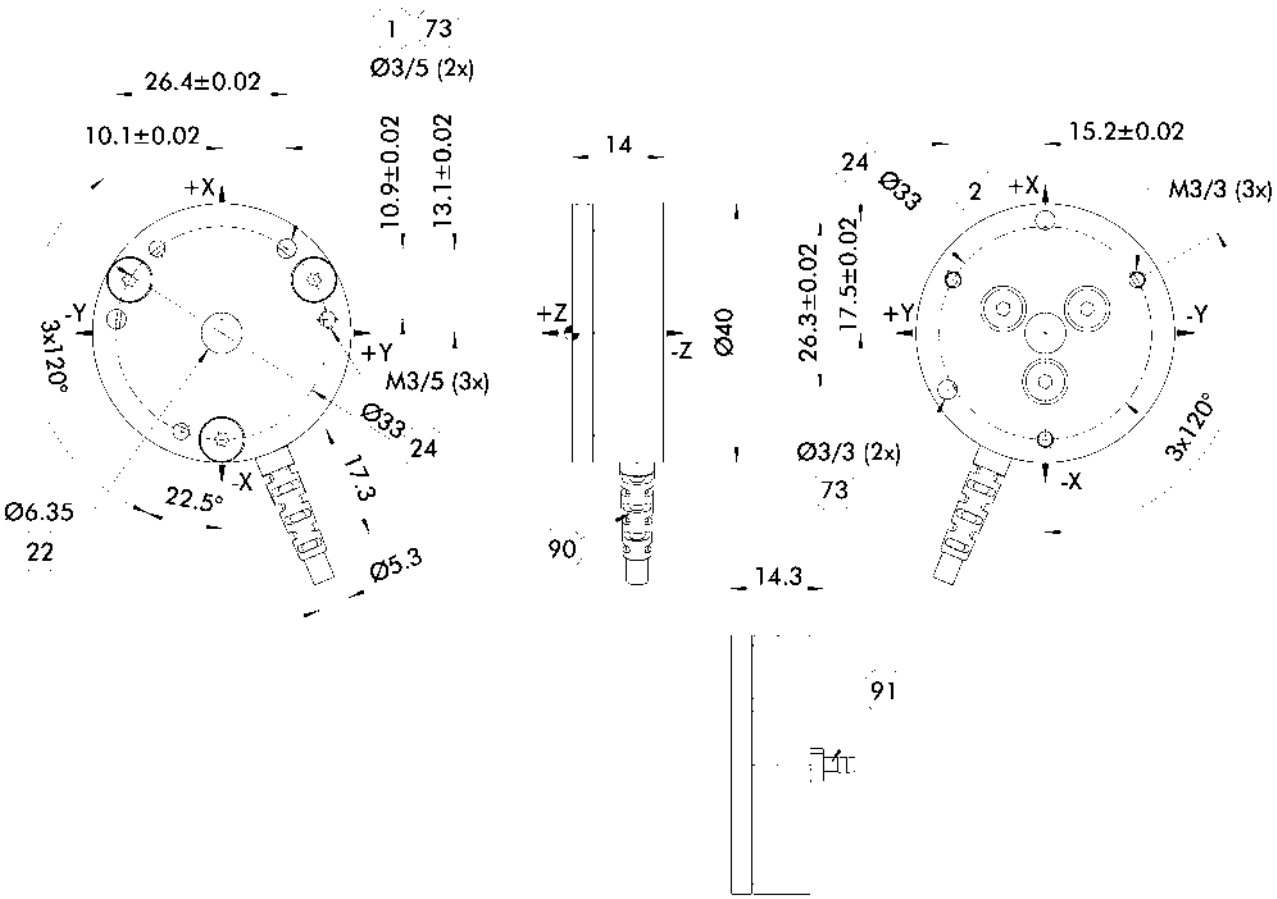


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Mini-40	FTN-Mini-40	FTN-Mini-40
Calibration		SI-20-1	SI-40-2	SI-80-4
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	0.049	0.049	0.049
Measuring range F_x, F_y	[N]	±20	±40	±80
Measuring range F_z	[N]	±60	±120	±240
Measuring range M_x, M_y	[Nm]	±1	±2	±4
Measuring range M_z	[Nm]	±1	±2	±4
Overload F_x, F_y	[N]	±810	±810	±810
Overload F_z	[N]	±2400	±2400	±2400
Overload M_x, M_y	[Nm]	±19	±19	±19
Overload M_z	[Nm]	±20	±20	±20
Resonant Frequency F_x, F_y, M_z	[Hz]	3200	3200	3200
Resonant Frequency F_z, M_x, M_y	[Hz]	4900	4900	4900
Resolution F_x, F_y	[N]	1/200	1/100	1/50
Resolution F_z	[N]	1/100	1/50	1/25
Resolution M_x, M_y	[Nm]	1/8000	1/4000	1/2000
Resolution M_z	[Nm]	1/8000	1/4000	1/2000
Technical data deviating from FTD				
Description		FTD-Mini-40	FTD-Mini-40	FTD-Mini-40
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	1/200	1/100	1/50
Resolution F_z	[N]	1/100	1/50	1/25
Resolution M_x, M_y	[Nm]	1/8000	1/4000	1/2000
Resolution M_z	[Nm]	1/8000	1/4000	1/2000
Technical data deviating from FTS				
Description		FTS-Mini-40	FTS-Mini-40	FTS-Mini-40
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	1/100	1/50	1/25
Resolution F_z	[N]	1/50	1/25	2/25
Resolution M_x, M_y	[Nm]	1/4000	1/2000	1/1000
Resolution M_z	[Nm]	1/4000	1/2000	1/1000

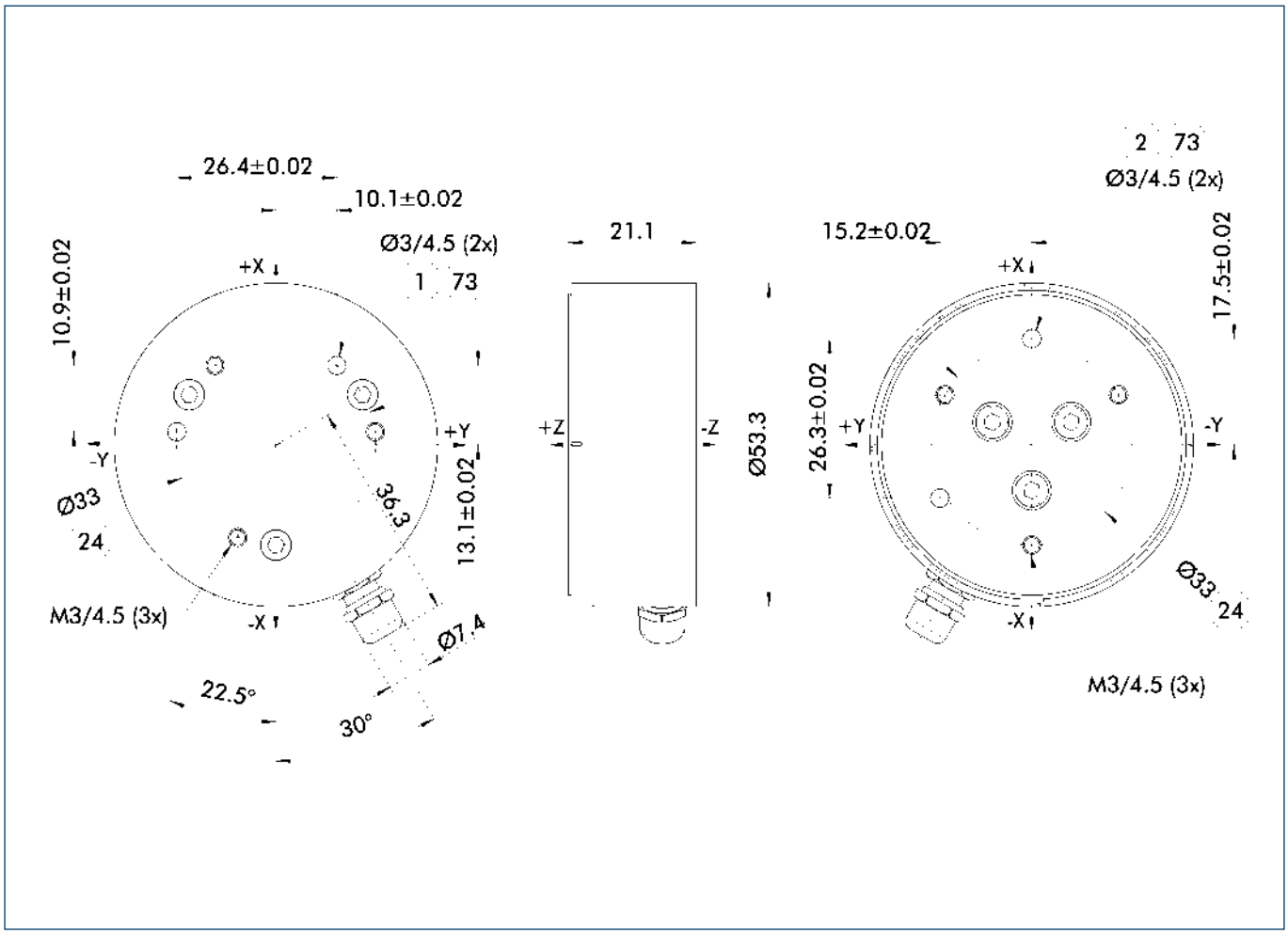
Main view



The main view shows the unit in its basic version.

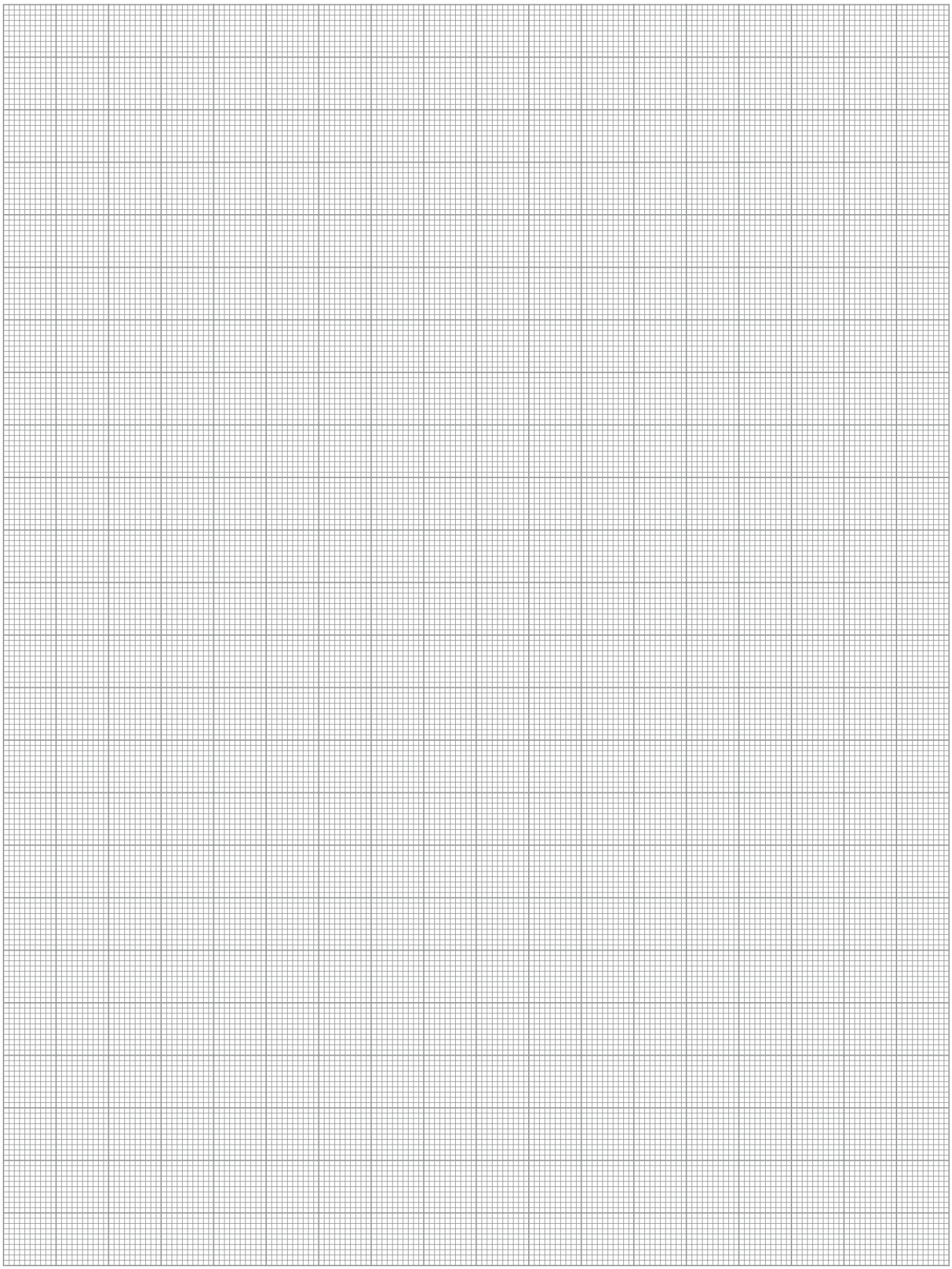
1 Robot side connection
2 Tool side connection
22 Center bore
24 Bolt circle
73 Fit for a centering pin
90 Radial cable outlet with strain relief
91 Axial cable outlet

IP65 / IP68 main view



The main view shows the product with IP-protection.

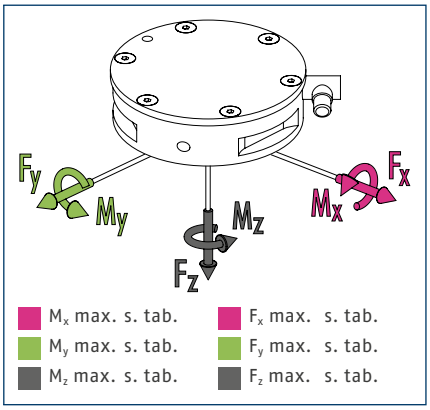
1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin



FT Mini45

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

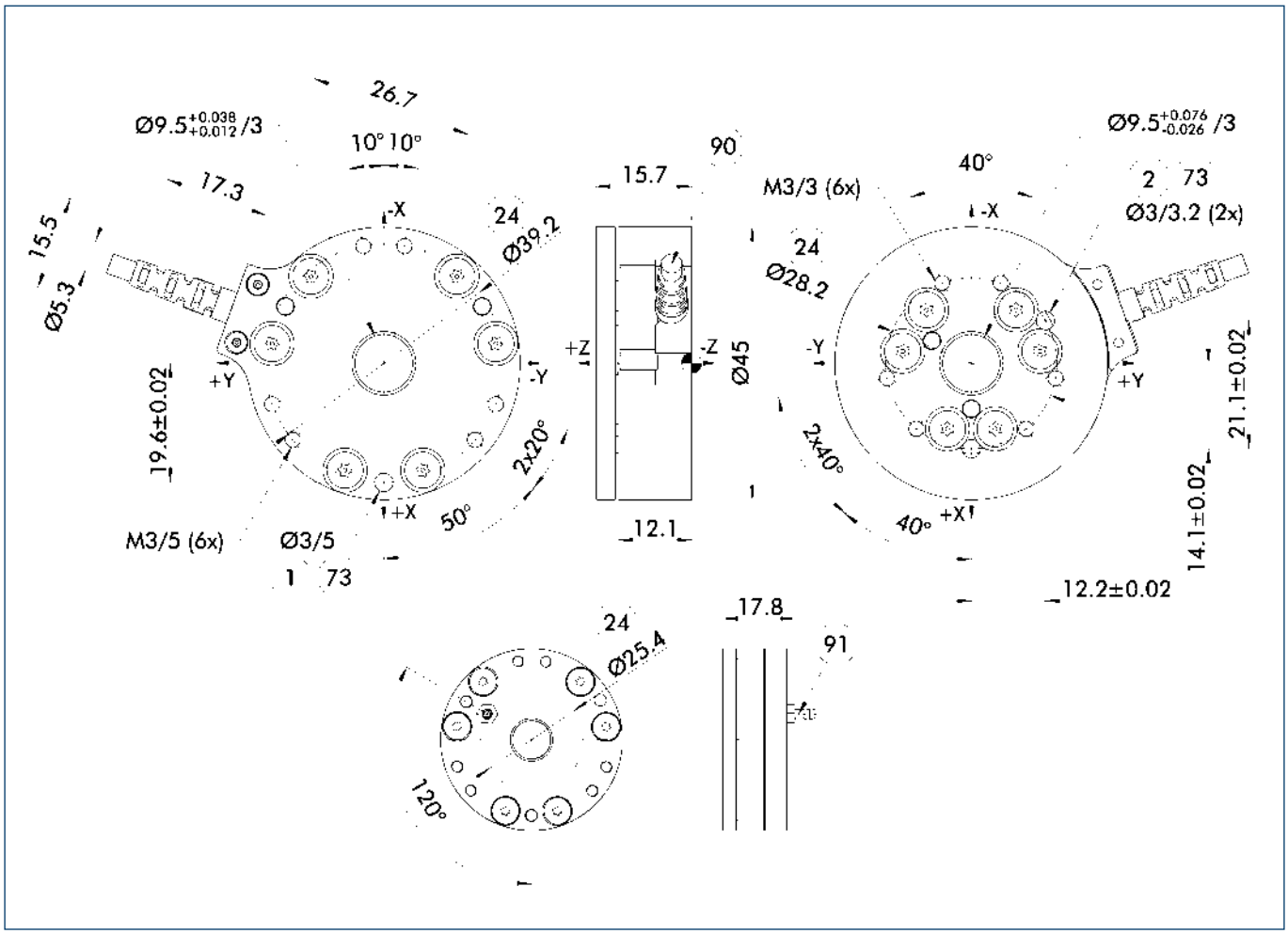


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Mini-45	FTN-Mini-45	FTN-Mini-45
Calibration		SI-145-5	SI-290-10	SI-580-20
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	0.091	0.091	0.091
Measuring range F_x, F_y	[N]	±145	±290	±580
Measuring range F_z	[N]	±290	±580	±1160
Measuring range M_x, M_y	[Nm]	±5	±10	±20
Measuring range M_z	[Nm]	±5	±10	±20
Overload F_x, F_y	[N]	±5100	±5100	±5100
Overload F_z	[kN]	±10000	±10000	±10000
Overload M_x, M_y	[Nm]	±110	±110	±110
Overload M_z	[Nm]	±140	±140	±140
Resonant Frequency F_x, F_y, M_z	[Hz]	5600	5600	5600
Resonant Frequency F_z, M_x, M_y	[Hz]	5400	5400	5400
Resolution F_x, F_y	[N]	1/16	1/8	1/4
Resolution F_z	[N]	1/16	1/8	1/4
Resolution M_x, M_y	[Nm]	1/752	1/376	1/188
Resolution M_z	[Nm]	1/1504	1/752	1/376
Technical data deviating from FTD				
Description		FTD-Mini-45	FTD-Mini-45	FTD-Mini-45
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	1/16	1/8	1/4
Resolution F_z	[N]	1/16	1/8	1/4
Resolution M_x, M_y	[Nm]	1/752	1/376	1/188
Resolution M_z	[Nm]	1/1504	1/752	1/376
Technical data deviating from FTS				
Description		FTS-Mini-45	FTS-Mini-45	FTS-Mini-45
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	1/8	1/4	1/2
Resolution F_z	[N]	1/8	1/4	1/2
Resolution M_x, M_y	[Nm]	1/376	1/188	1/94
Resolution M_z	[Nm]	1/752	1/376	1/188

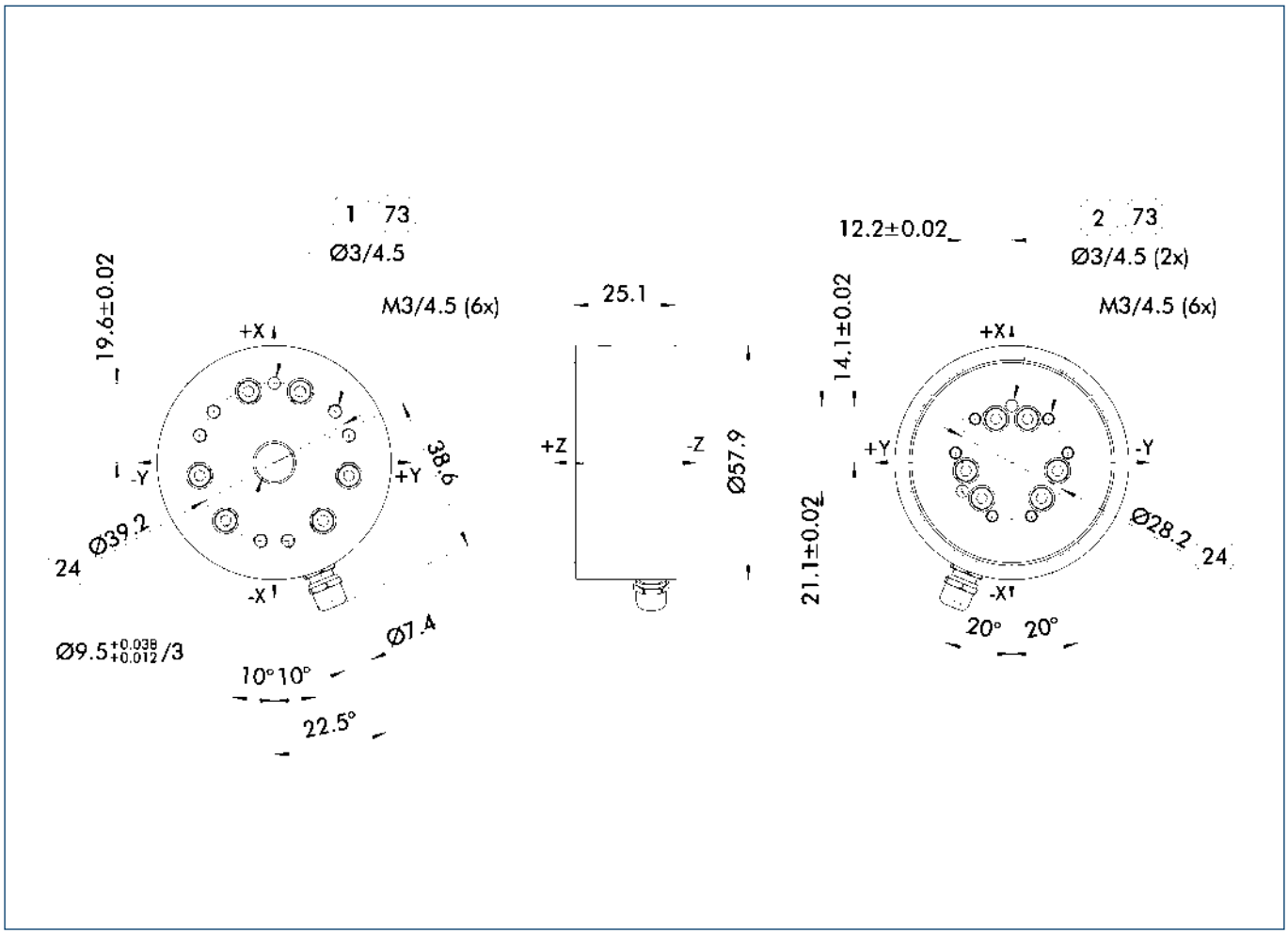
Main view



The main view shows the unit in its basic version.

1. Robot side connection
2. Tool side connection
24. Bolt circle
73. Fit for a centering pin
90. Radial cable outlet with strain relief
91. Axial cable outlet

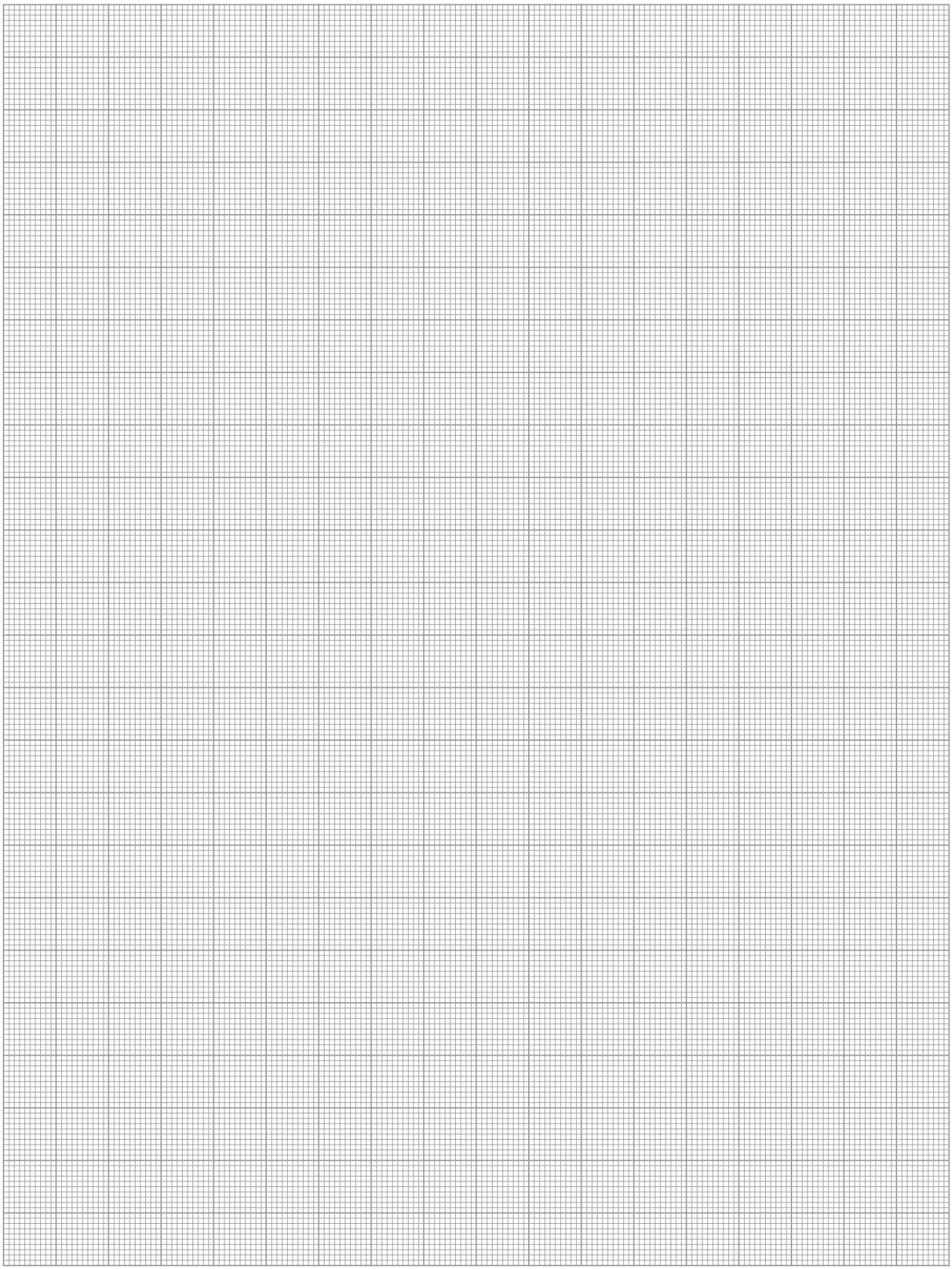
IP65 / IP68 main view



The main view shows the product with IP-protection.

1. Robot side connection
2. Tool side connection

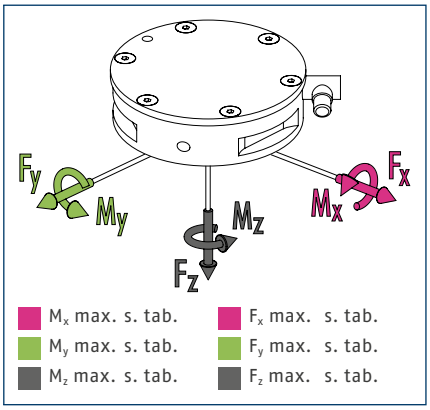
24. Bolt circle
73. Fit for a centering pin



FT Mini85

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

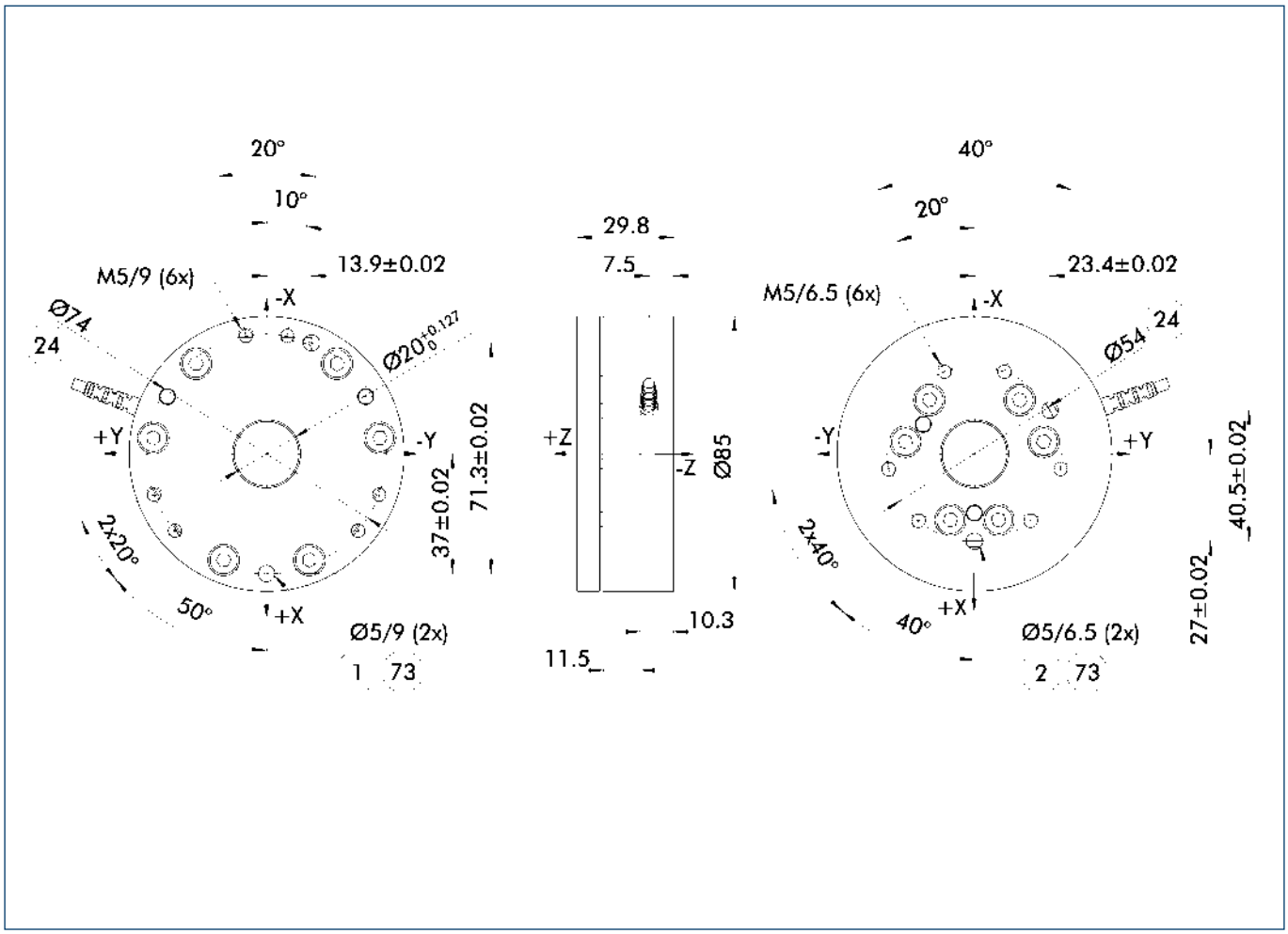


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Mini85	FTN-Mini85	FTN-Mini85
Calibration		SI-475-20	SI-950-40	SI-1900-80
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	0.635	0.635	0.635
Measuring range F_x, F_y	[N]	±475	±950	±1900
Measuring range F_z	[N]	±950	±1900	±3800
Measuring range M_x, M_y	[Nm]	±20	±40	±80
Measuring range M_z	[Nm]	±20	±40	±80
Overload F_x, F_y	[N]	±13000	±13000	±13000
Overload F_z	[N]	±27000	±27000	±27000
Overload M_x, M_y	[Nm]	±500	±500	±500
Overload M_z	[Nm]	±610	±610	±610
Resonant Frequency F_x, F_y, M_z	[Hz]	2400	2400	2400
Resonant Frequency F_z, M_x, M_y	[Hz]	3100	3100	3100
Resolution F_x, F_y	[N]	9/112	9/56	9/28
Resolution F_z	[N]	3/28	3/14	3/7
Resolution M_x, M_y	[Nm]	5/1496	5/748	5/374
Resolution M_z	[Nm]	7/2992	7/1496	7/748
Technical data deviating from FTD				
Description		FTD-Mini85	FTD-Mini85	FTD-Mini85
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	9/112	9/56	9/28
Resolution F_z	[N]	3/28	3/14	3/7
Resolution M_x, M_y	[Nm]	5/1496	5/748	5/374
Resolution M_z	[Nm]	7/2992	7/1496	7/748
Technical data deviating from FTS				
Description		FTS-Mini85	FTS-Mini85	FTS-Mini85
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	9/56	9/28	9/14
Resolution F_z	[N]	3/14	3/7	6/7
Resolution M_x, M_y	[Nm]	5/748	5/374	5/187
Resolution M_z	[Nm]	7/1496	7/748	7/374

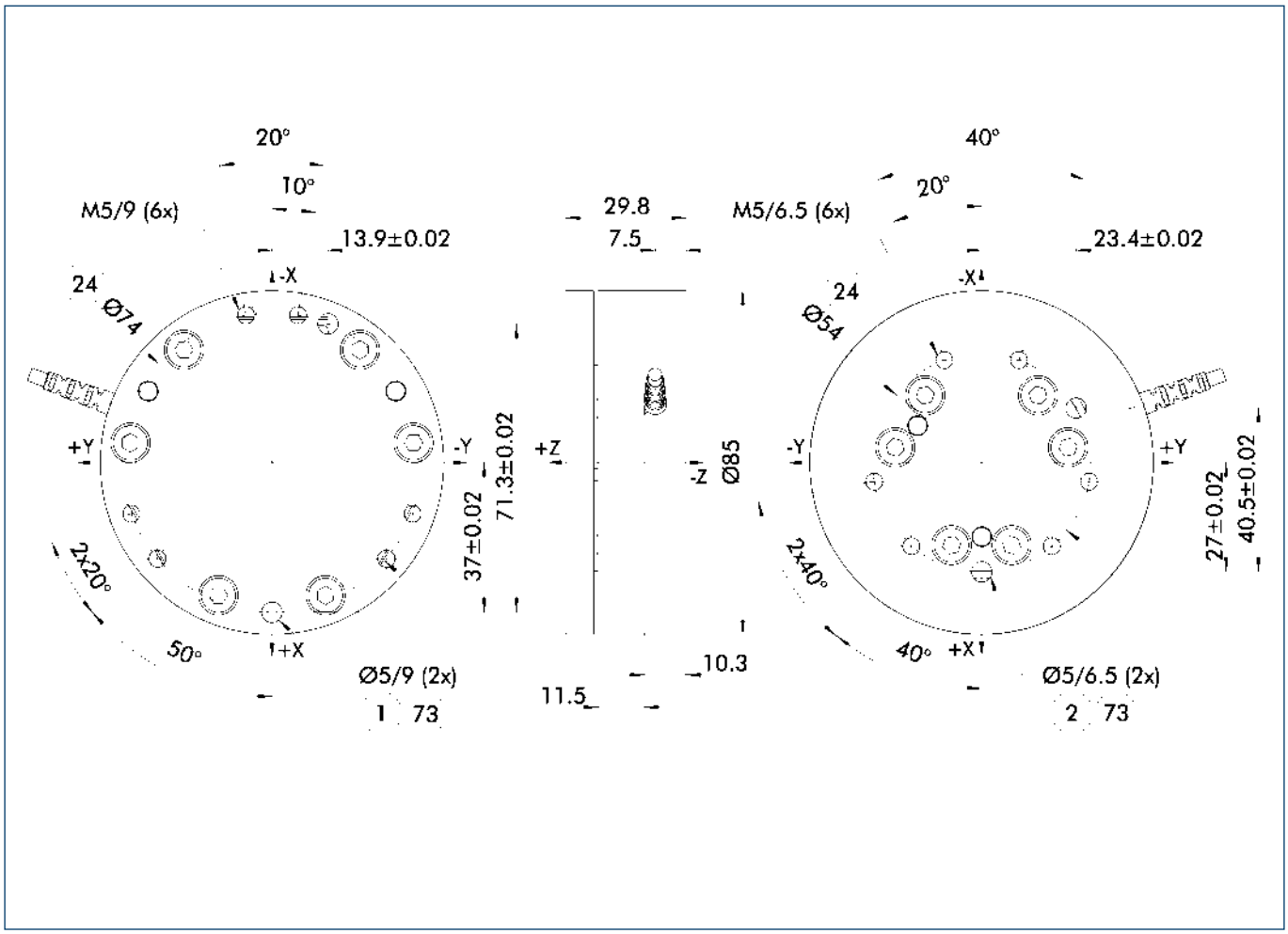
Main view



This view shows the unit with a through-bore.

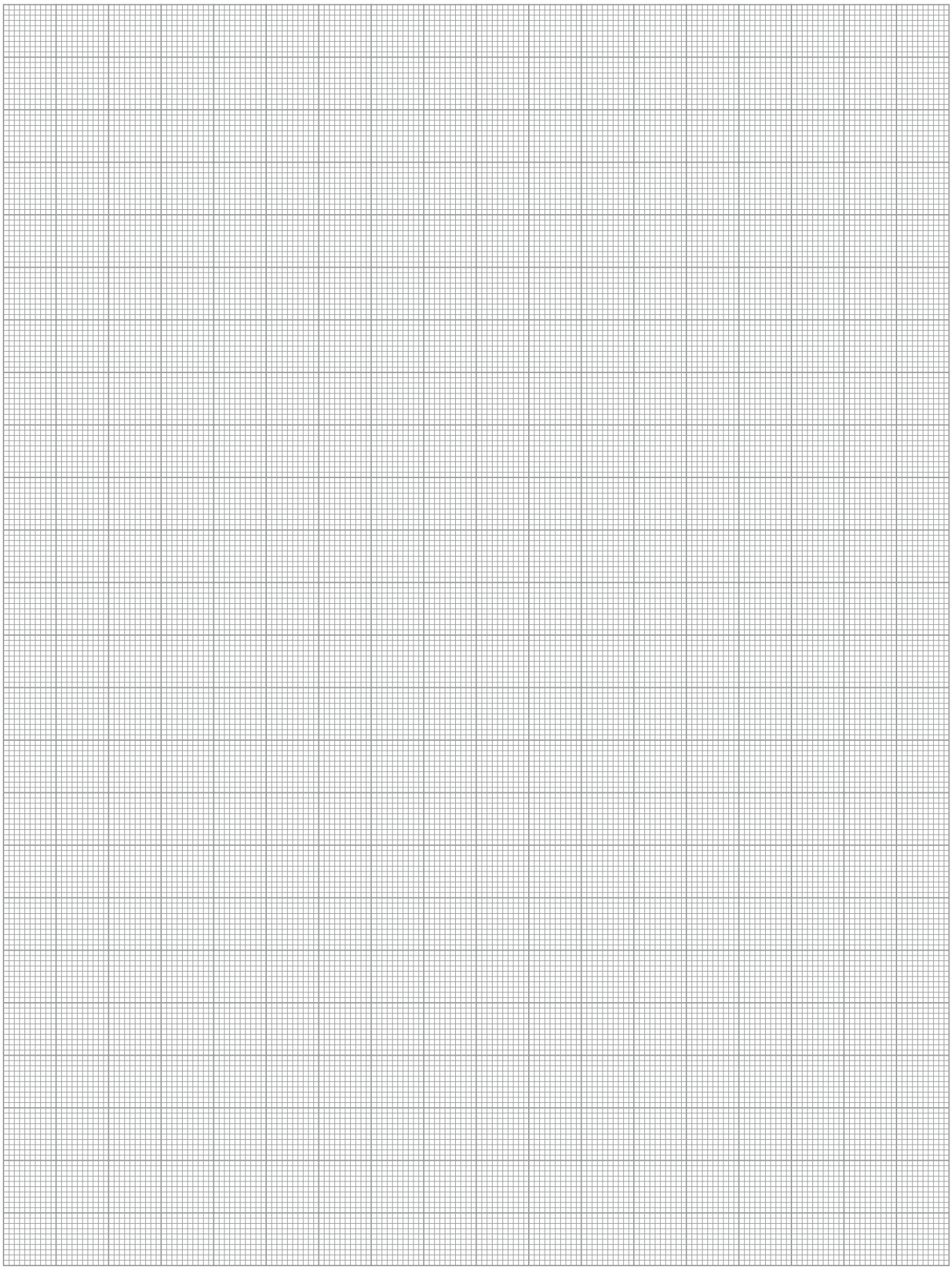
(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin

Main view



The main view shows the unit in its basic version.

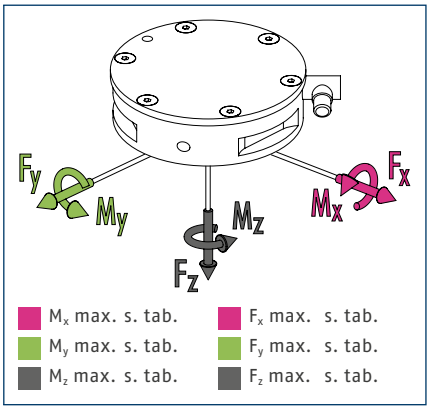
(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin



FT Gamma

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

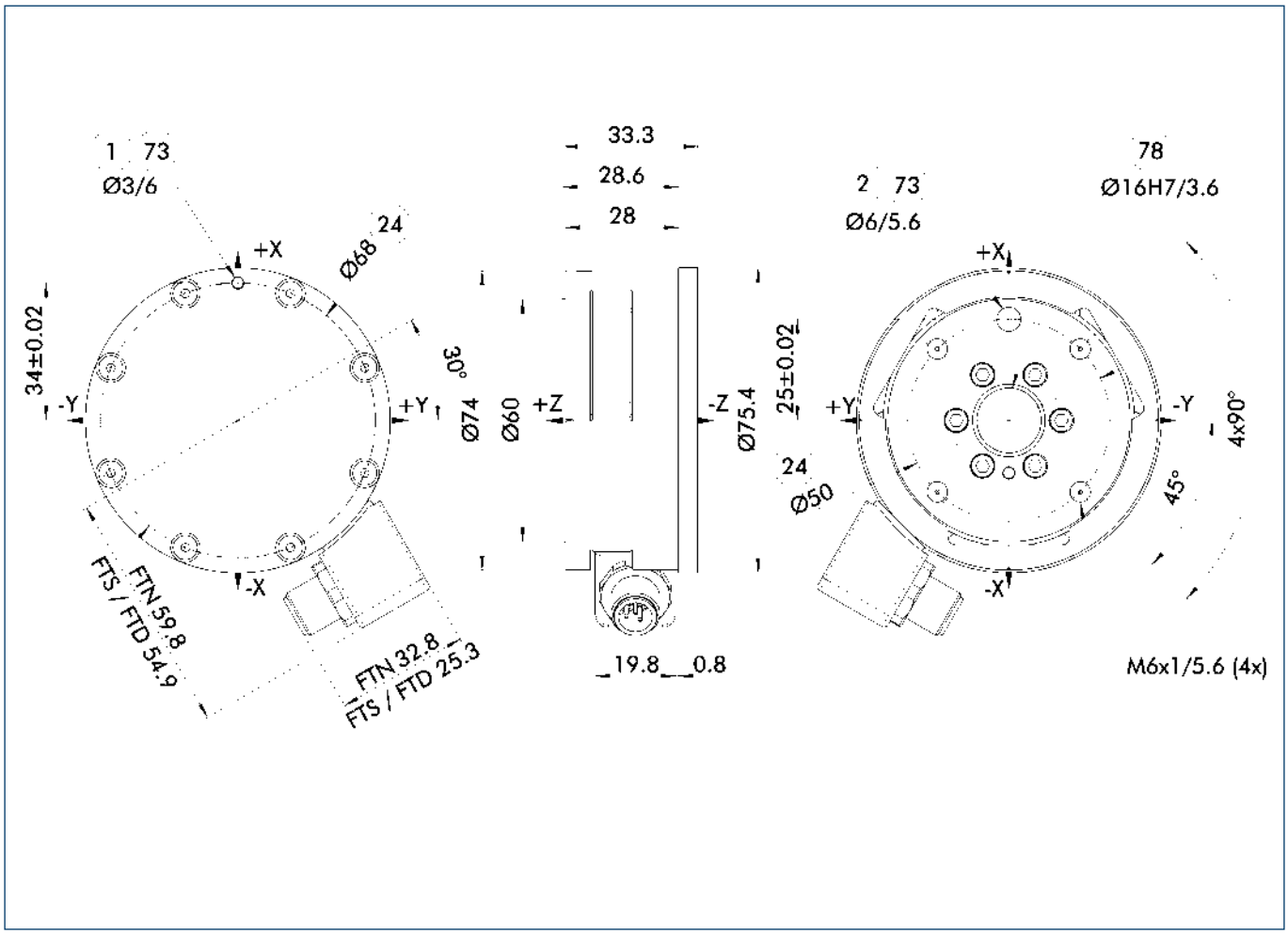


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Gamma	FTN-Gamma	FTN-Gamma
Calibration		SI-32-2.5	SI-65-5	SI-130-10
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	0.225	0.225	0.225
Measuring range F_x, F_y	[N]	±32	±65	±130
Measuring range F_z	[N]	±100	±200	±400
Measuring range M_x, M_y	[Nm]	±2.5	±5	±10
Measuring range M_z	[Nm]	±2.5	±5	±10
Overload F_x, F_y	[N]	±1200	±1200	±1200
Overload F_z	[N]	±4100	±4100	±4100
Overload M_x, M_y	[Nm]	±79	±79	±79
Overload M_z	[Nm]	±82	±82	±82
Resonant Frequency F_x, F_y, M_z	[Hz]	1400	1400	1400
Resonant Frequency F_z, M_x, M_y	[Hz]	2000	2000	2000
Resolution F_x, F_y	[N]	1/160	1/80	1/40
Resolution F_z	[N]	1/80	1/40	1/20
Resolution M_x, M_y	[Nm]	1/2000	10/13333	1/800
Resolution M_z	[Nm]	1/2000	10/13333	1/800
Technical data deviating from FTD				
Description		FTD-Gamma	FTD-Gamma	FTD-Gamma
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	1/160	1/80	1/40
Resolution F_z	[N]	1/80	1/40	1/20
Resolution M_x, M_y	[Nm]	1/2000	10/13333	1/800
Resolution M_z	[Nm]	1/2000	10/13333	1/800
Technical data deviating from FTS				
Description		FTS-Gamma	FTS-Gamma	FTS-Gamma
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	1/80	1/40	1/20
Resolution F_z	[N]	1/40	1/20	1/10
Resolution M_x, M_y	[Nm]	1/1000	5/3333	1/400
Resolution M_z	[Nm]	1/1000	5/3333	1/400

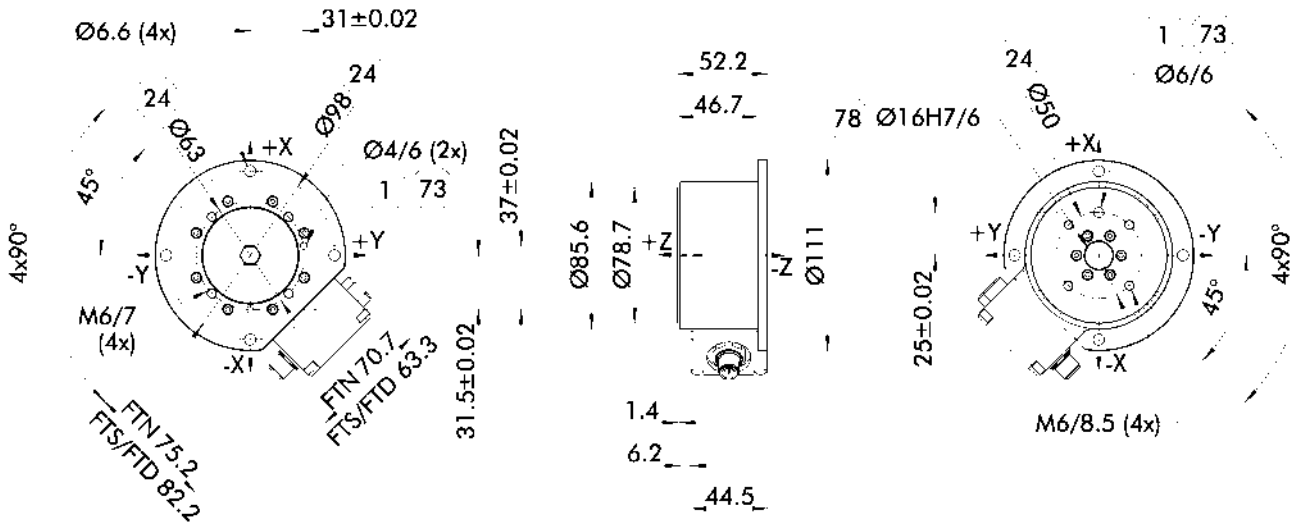
Main view



The main view shows the unit in its basic version.

1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin
78 Fitting for centering

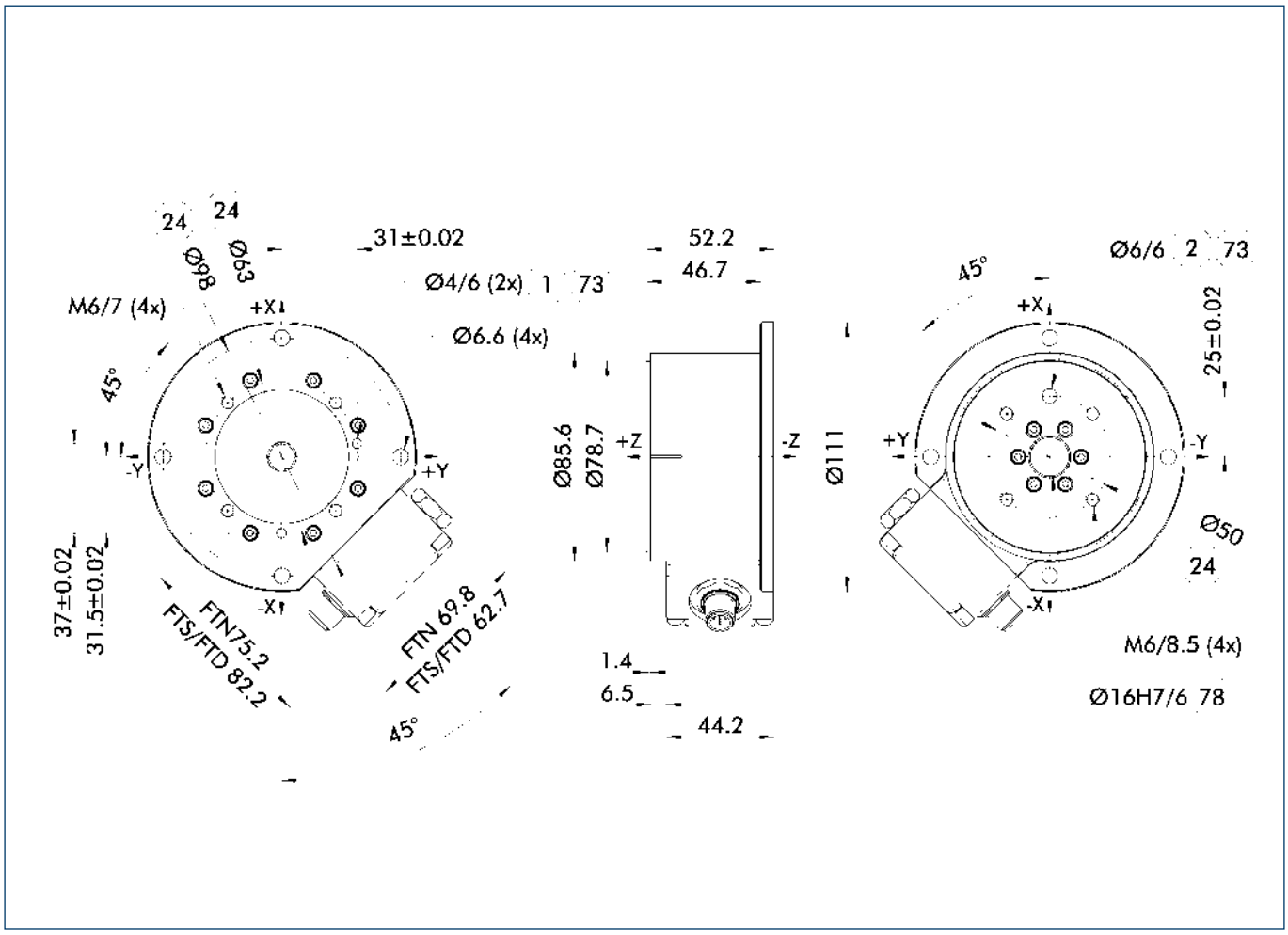
Main view IP65



The main view shows the product with IP-protection.

1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin
78 Fitting for centering

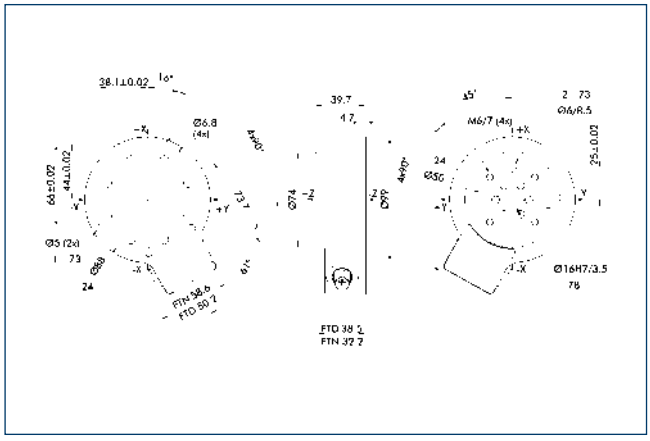
Main view IP68



The main view shows the product with IP-protection.

1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin
78 Fitting for centering

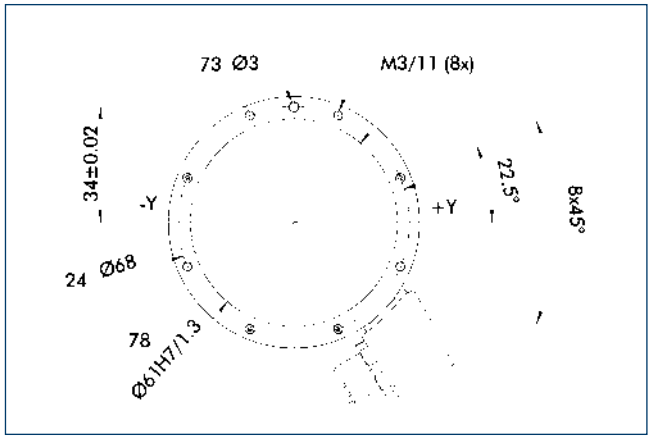
Main view IP60



1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin
78 Fitting for centering

The main view shows the product with IP-protection.

Adapter plate design



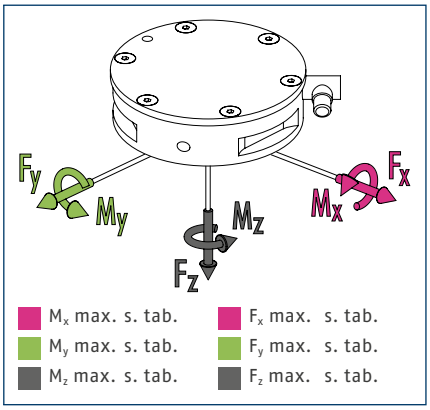
24 Bolt circle
73 Fit for a centering pin
78 Fitting for centering

The additional view shows the product without cover plate. The adapter plate acts as a cover for the standard version.

FT Delta

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

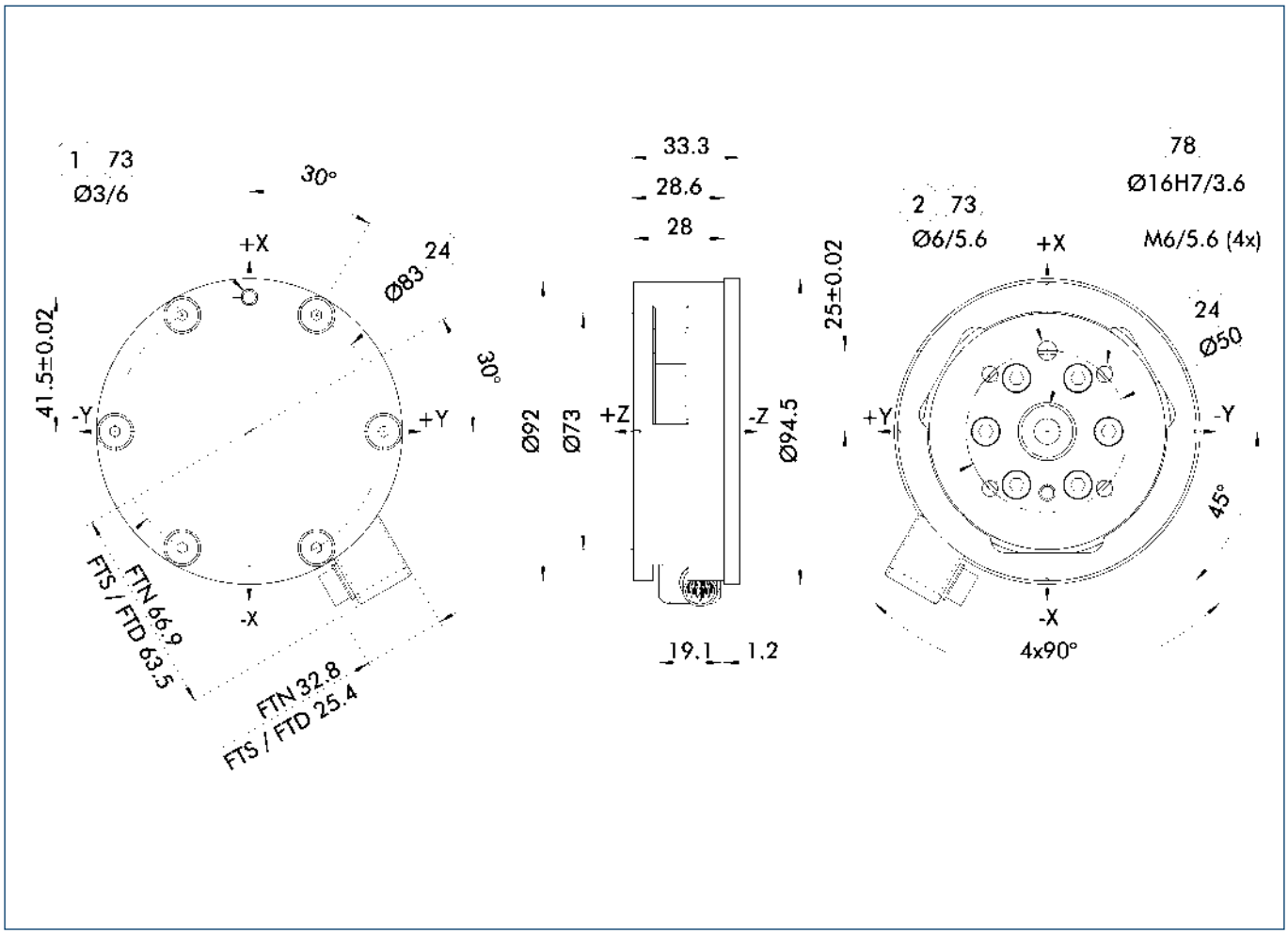


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Delta	FTN-Delta	FTN-Delta
Calibration		SI-165-15	SI-330-30	SI-660-60
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	0.913	0.913	0.913
Measuring range F_x, F_y	[N]	±165	±330	±660
Measuring range F_z	[N]	±495	±990	±1980
Measuring range M_x, M_y	[Nm]	±15	±30	±60
Measuring range M_z	[Nm]	±15	±30	±60
Overload F_x, F_y	[N]	±3700	±3700	±3700
Overload F_z	[N]	±10000	±10000	±10000
Overload M_x, M_y	[Nm]	±280	±280	±280
Overload M_z	[Nm]	±400	±400	±400
Resonant Frequency F_x, F_y, M_z	[Hz]	1500	1500	1500
Resonant Frequency F_z, M_x, M_y	[Hz]	1700	1700	1700
Resolution F_x, F_y	[N]	1/32	1/16	1/8
Resolution F_z	[N]	1/16	1/8	1/4
Resolution M_x, M_y	[Nm]	1/528	5/1333	10/1333
Resolution M_z	[Nm]	1/528	5/1333	10/1333
Technical data deviating from FTD				
Description		FTD-Delta	FTD-Delta	FTD-Delta
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	1/32	1/16	1/8
Resolution F_z	[N]	1/16	1/8	1/4
Resolution M_x, M_y	[Nm]	1/528	5/1333	10/1333
Resolution M_z	[Nm]	1/528	5/1333	10/1333
Technical data deviating from FTS				
Description		FTS-Delta	FTS-Delta	FTS-Delta
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	1/16	1/8	1/4
Resolution F_z	[N]	1/8	1/4	1/2
Resolution M_x, M_y	[Nm]	1/264	10/1333	5/333
Resolution M_z	[Nm]	1/264	10/1333	5/333

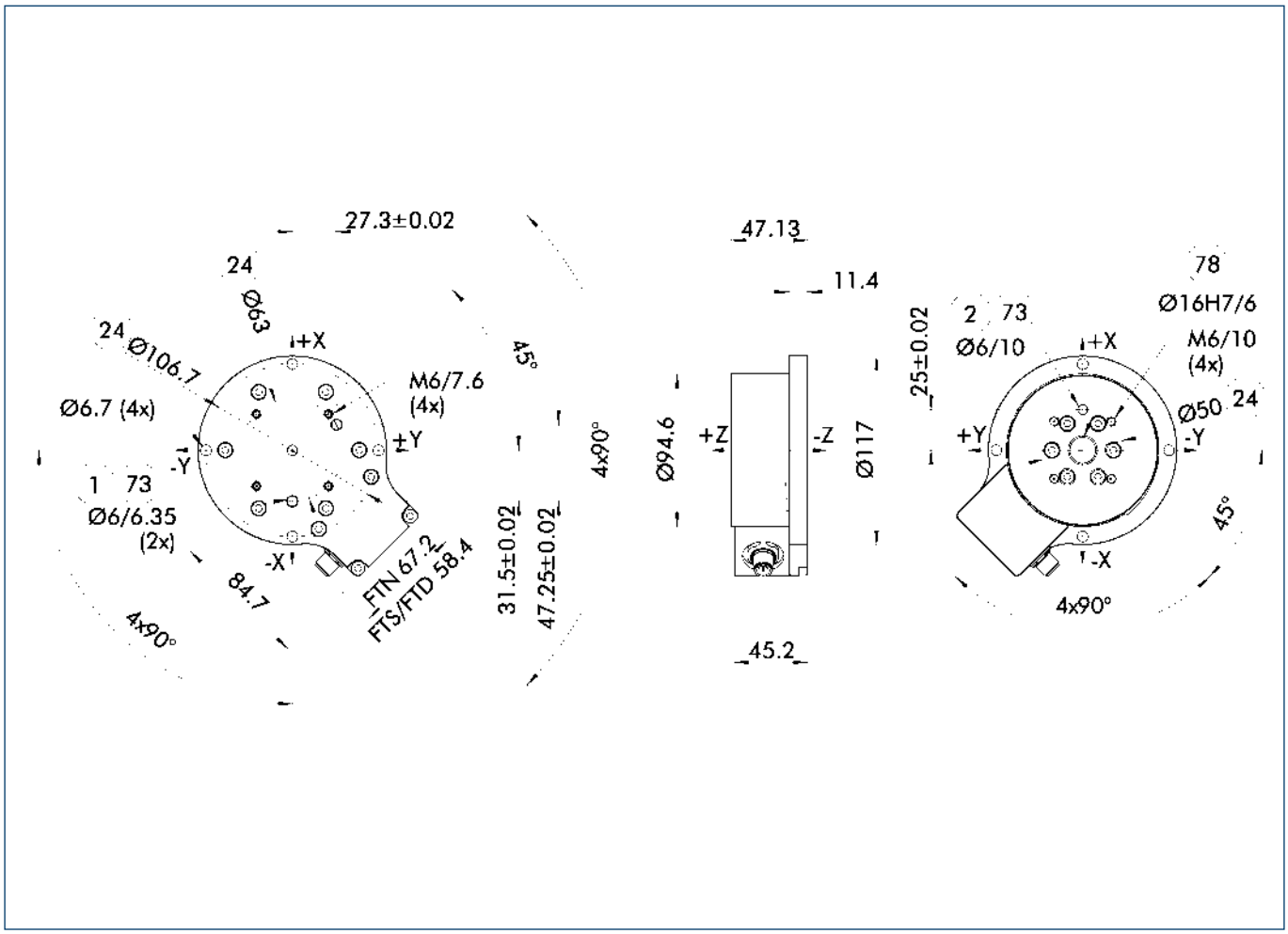
Main view



The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin
(78) Fitting for centering

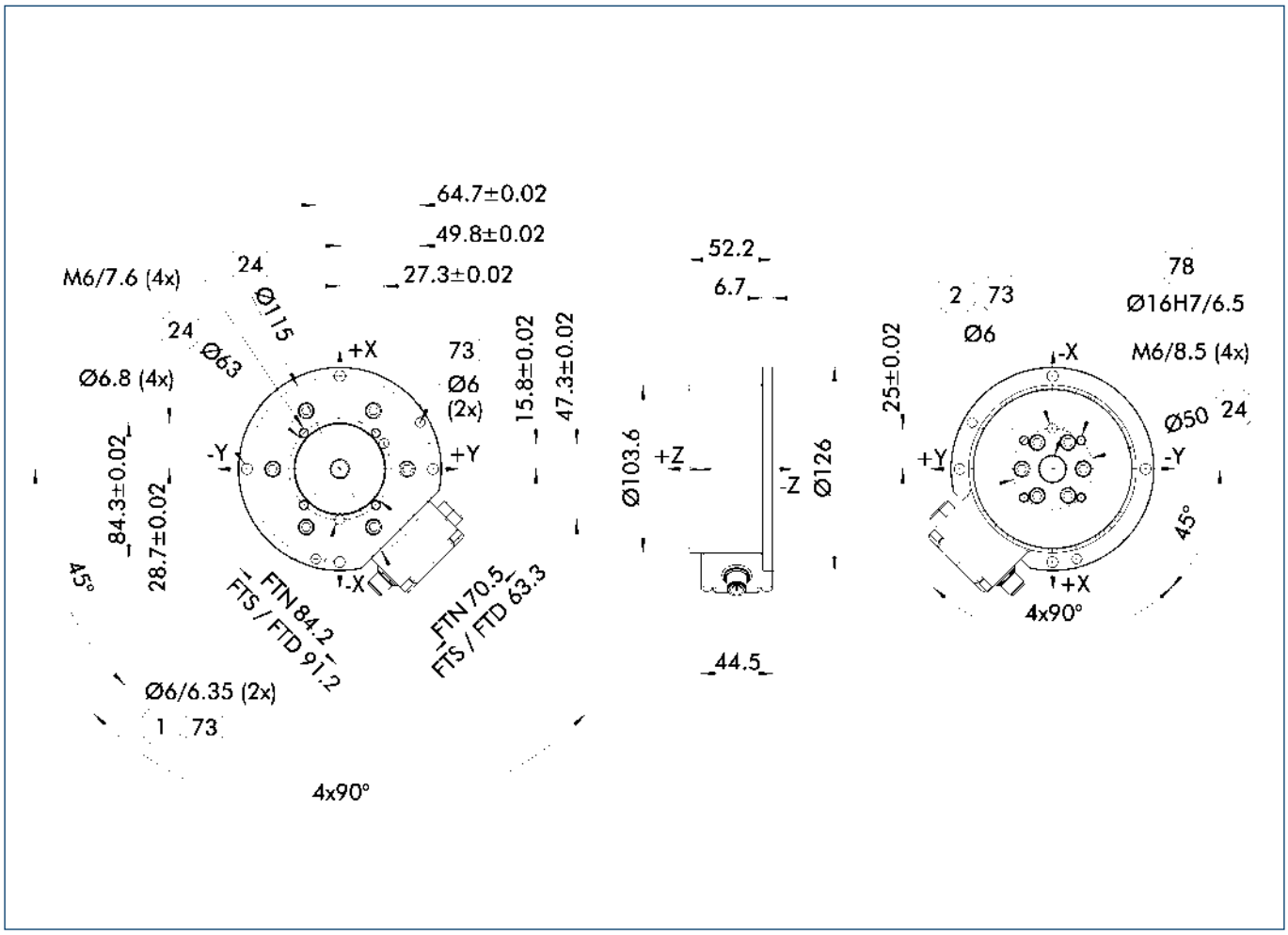
Main view IP60



The main view shows the product with IP-protection.

1. Robot side connection
2. Tool side connection
24. Bolt circle
73. Fit for a centering pin
78. Fitting for centering

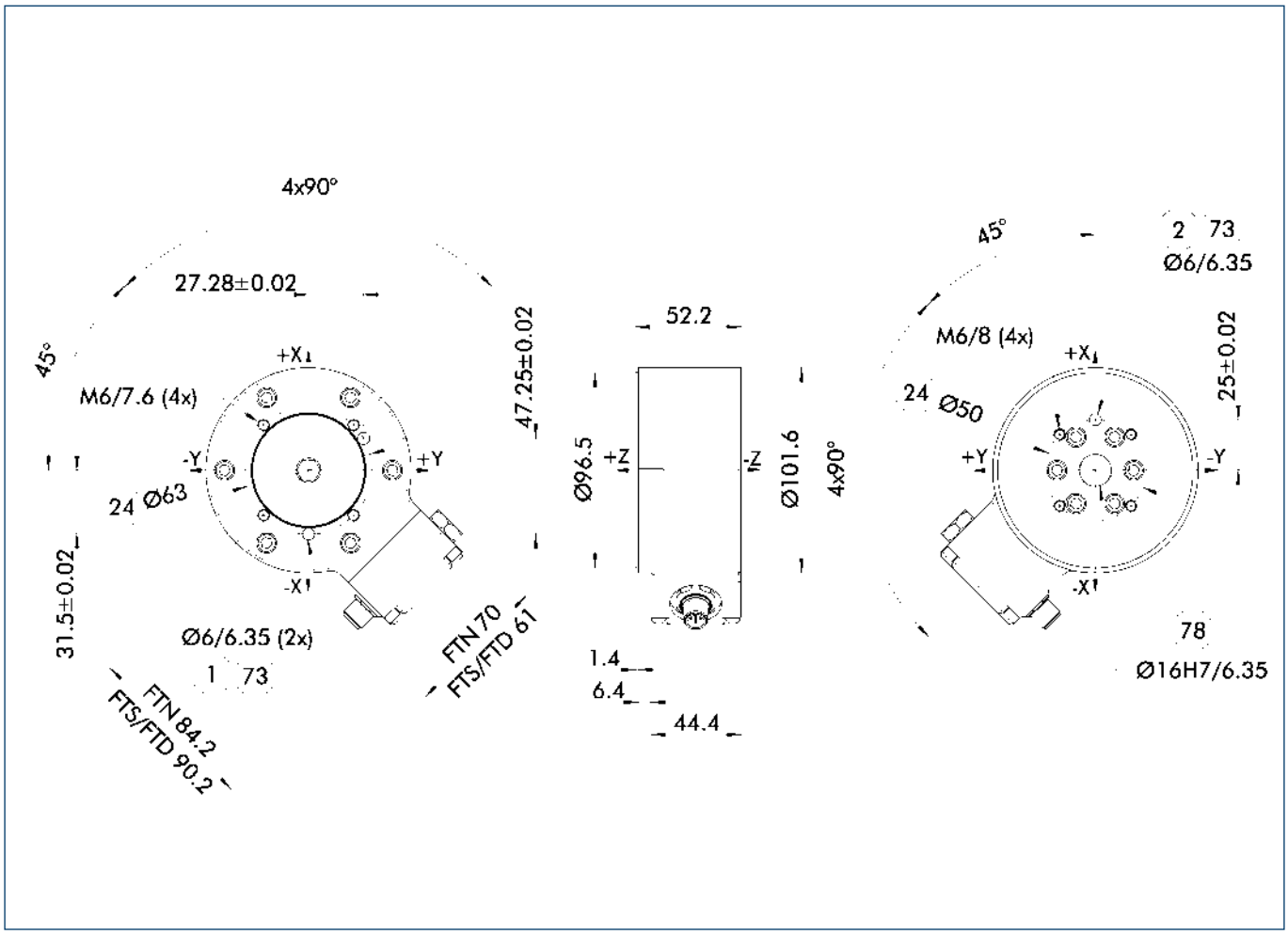
Main view IP65



The main view shows the product with IP-protection.

1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin
78 Fitting for centering

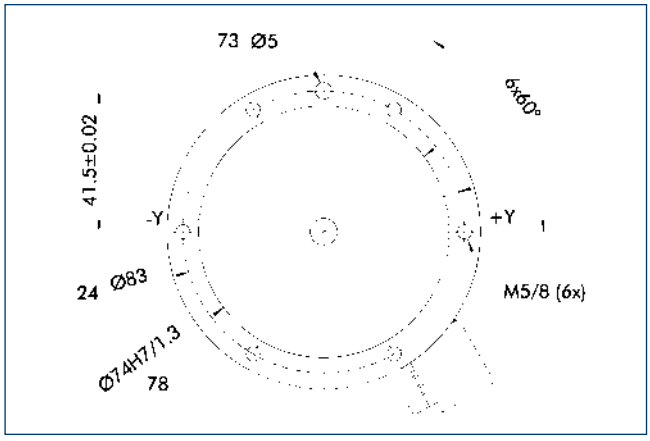
Main view IP68



The main view shows the product with IP-protection.

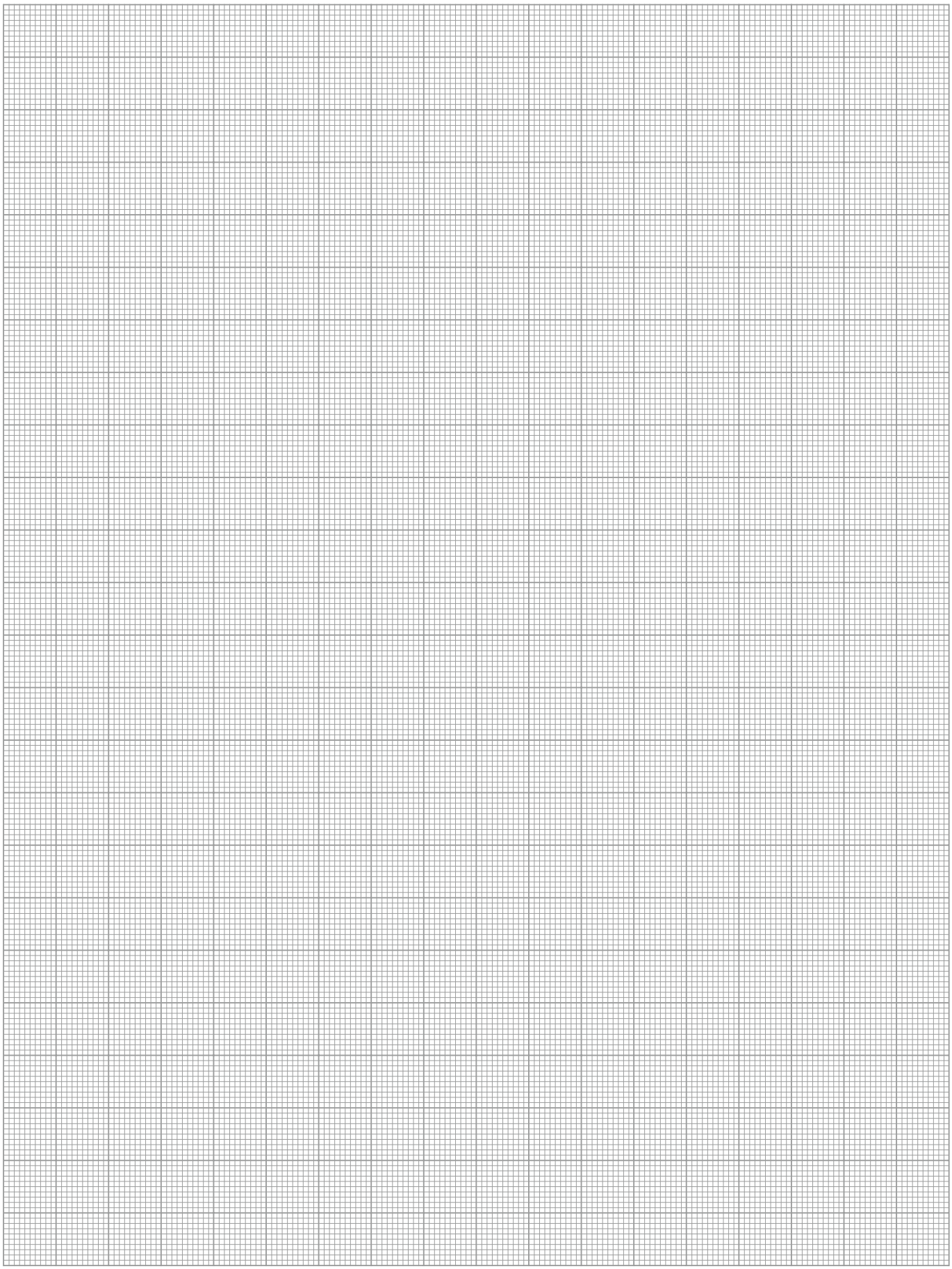
(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin
(78) Fitting for centering

Adapter plate design



(24) Bolt circle
(73) Fit for a centering pin
(78) Fitting for centering

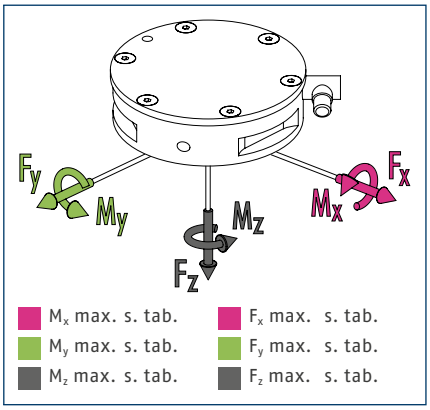
The additional view shows the product without cover plate. The adapter plate acts as a cover for the standard version.



FT Theta

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

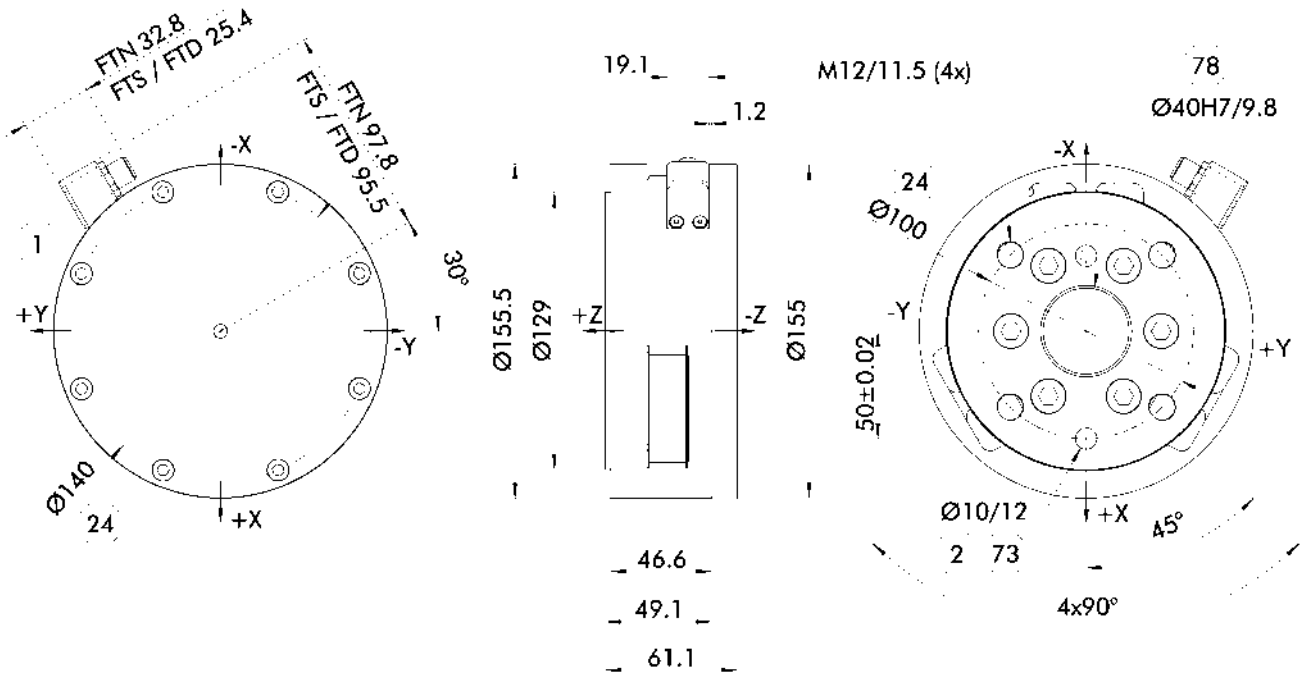


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Theta	FTN-Theta	FTN-Theta
Calibration		SI-1000-120	SI-1500-240	SI-2500-400
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	4.99	4.99	4.99
Measuring range F_x, F_y	[N]	±1000	±1500	±2500
Measuring range F_z	[N]	±2500	±3750	±6250
Measuring range M_x, M_y	[Nm]	±120	±240	±400
Measuring range M_z	[Nm]	±120	±240	±400
Overload F_x, F_y	[N]	±20000	±20000	±20000
Overload F_z	[N]	±51000	±51000	±51000
Overload M_x, M_y	[Nm]	±2000	±2000	±2000
Overload M_z	[Nm]	±2000	±2000	±2000
Resonant Frequency F_x, F_y, M_z	[Hz]	680	680	680
Resonant Frequency F_z, M_x, M_y	[Hz]	820	820	820
Resolution F_x, F_y	[N]	1/4	1/2	1/2
Resolution F_z	[N][kN]	1/4	1/2	1/1
Resolution M_x, M_y	[Nm]	1/40	1/20	1/20
Resolution M_z	[Nm]	1/80	1/40	1/20
Technical data deviating from FTD				
Description		FTD-Theta	FTD-Theta	FTD-Theta
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	1/4	1/2	1/2
Resolution F_z	[N]	1/4	1/2	1/1
Resolution M_x, M_y	[Nm]	1/40	1/20	1/20
Resolution M_z	[Nm]	1/80	1/40	1/20
Technical data deviating from FTS				
Description		FTS-Theta	FTS-Theta	FTS-Theta
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	1/2	1/1	1/1
Resolution F_z	[N]	1/2	1/1	2/1
Resolution M_x, M_y	[Nm]	1/20	1/10	1/10
Resolution M_z	[Nm]	1/40	1/20	1/10

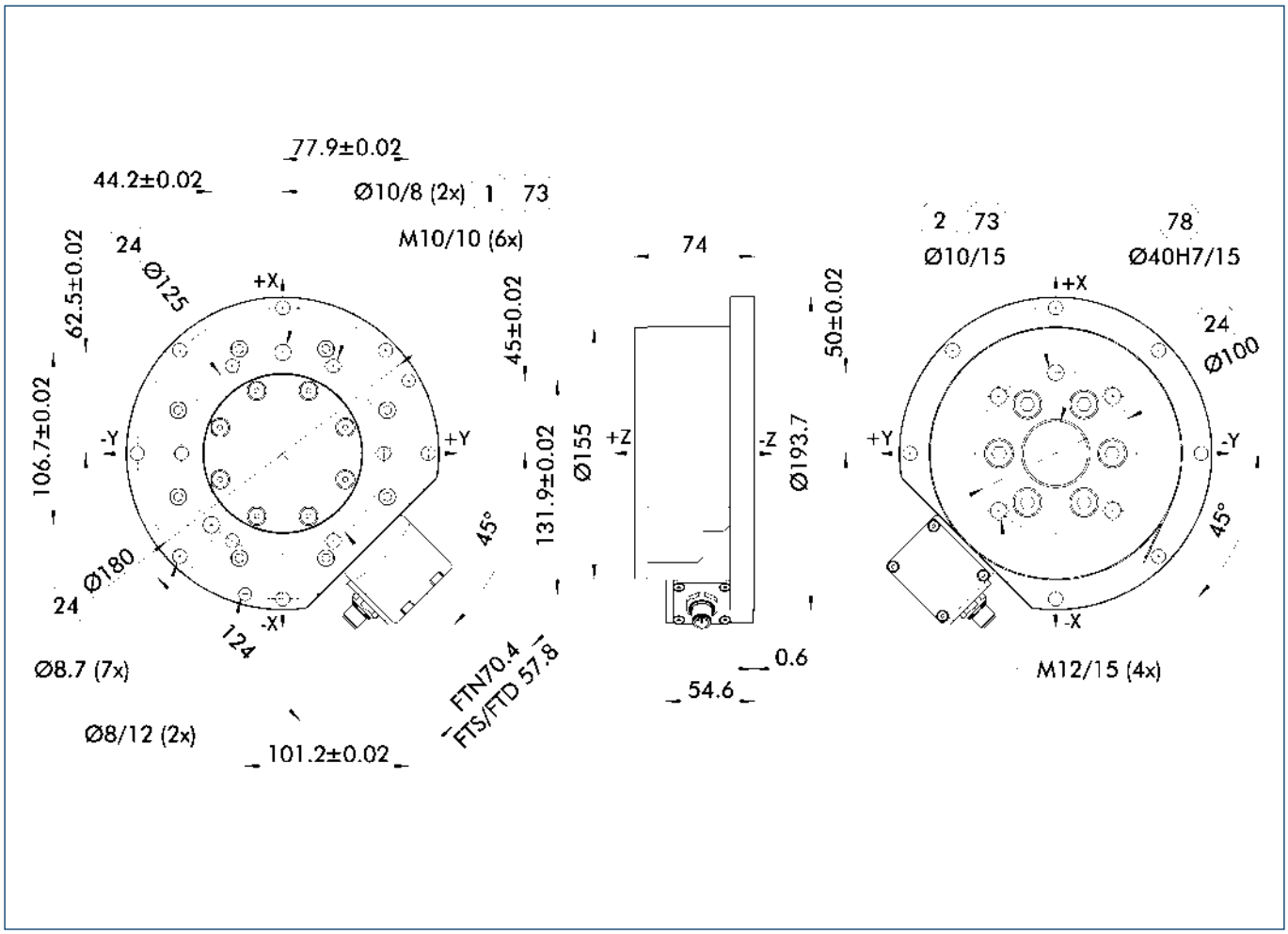
Main view



The main view shows the unit in its basic version.

1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin
78 Fitting for centering

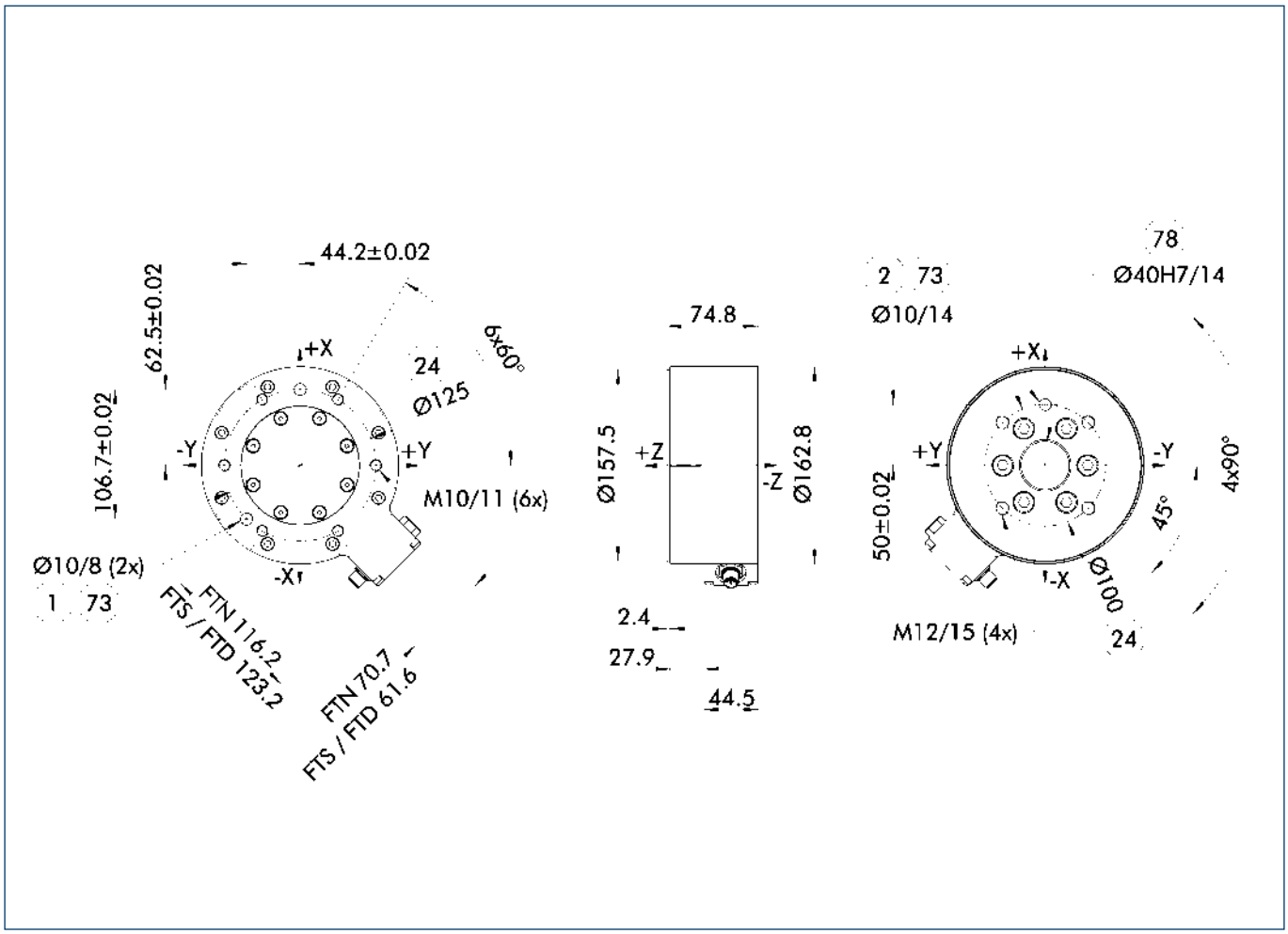
Main view IP60



The main view shows the product with IP-protection.

1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin
78 Fitting for centering

IP65 / IP68 main view



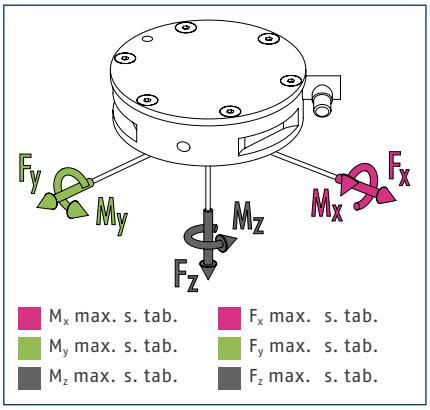
The main view shows the product with IP-protection.

1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin
78 Fitting for centering

FT Omega85

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

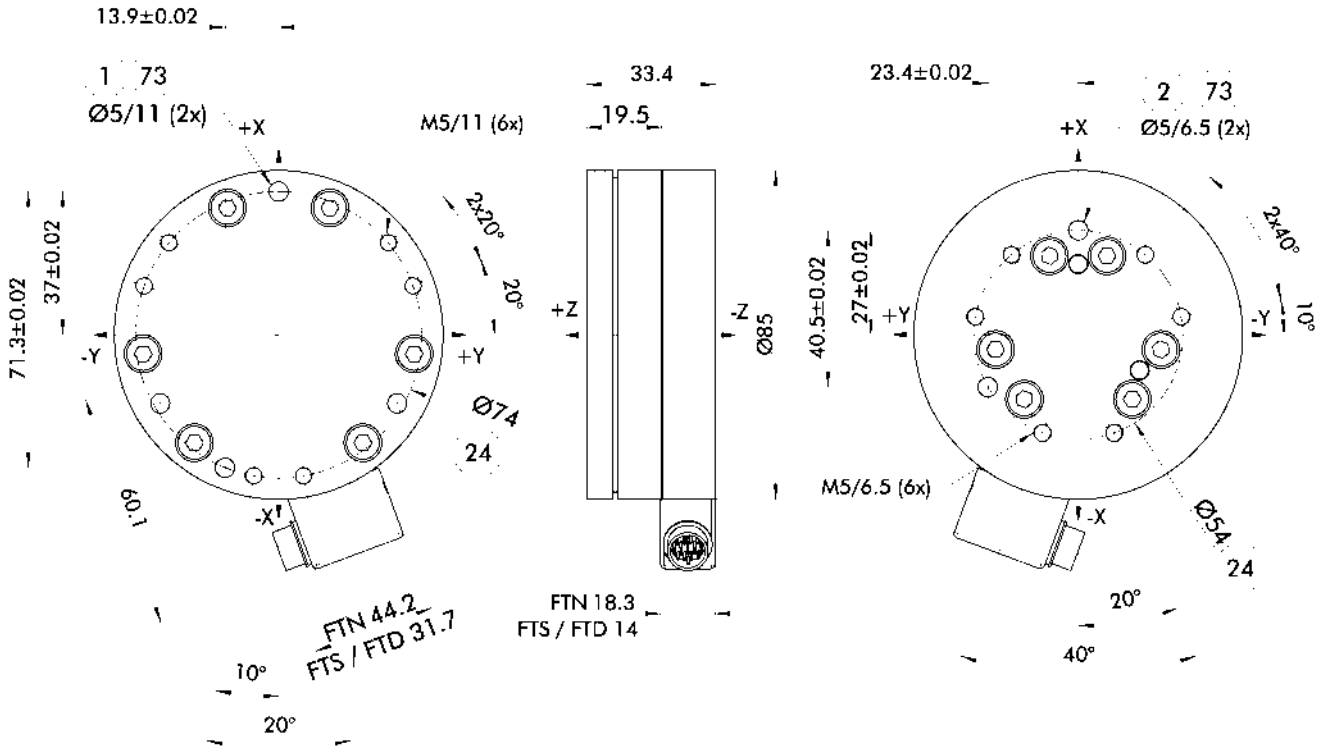


ⓘ For load index see technical data table.

FTN technical data

Description		FT-Omega85	FT-Omega85	FT-Omega85
Calibration		SI-475-20	SI-950-40	SI-1900-80
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	0.658	0.658	0.658
Measuring range F_x, F_y	[N]	±475	±950	±1900
Measuring range F_z	[N]	±950	±1900	±3800
Measuring range M_x, M_y	[Nm]	±20	±40	±80
Measuring range M_z	[Nm]	±20	±40	±80
Overload F_x, F_y	[N]	±13000	±13000	±13000
Overload F_z	[N]	±27000	±27000	±27000
Overload M_x, M_y	[Nm]	±500	±500	±500
Overload M_z	[Nm]	±610	±610	±610
Resonant Frequency F_x, F_y, M_z	[Hz]	2100	2100	2100
Resonant Frequency F_z, M_x, M_y	[Hz]	3000	3000	3000
Resolution F_x, F_y	[N]	1/14	1/7	2/7
Resolution F_z	[N]	3/28	3/14	3/7
Resolution M_x, M_y	[Nm]	5/1496	5/748	5/374
Resolution M_z	[Nm]	7/2992	7/1496	7/748
Technical data deviating from FTD				
Description		FT-Omega85	FT-Omega85	FT-Omega85
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	1/14	1/7	2/7
Resolution F_z	[N]	3/28	3/14	3/7
Resolution M_x, M_y	[Nm]	5/1496	5/748	5/374
Resolution M_z	[Nm]	7/2992	7/1496	7/748
Technical data deviating from FTS				
Description		FTS-Omega85	FT-Omega85	FT-Omega85
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	1/7	2/7	4/7
Resolution F_z	[N]	3/14	3/7	6/7
Resolution M_x, M_y	[Nm]	5/748	5/374	5/187
Resolution M_z	[Nm]	7/1496	7/748	7/374

Main view



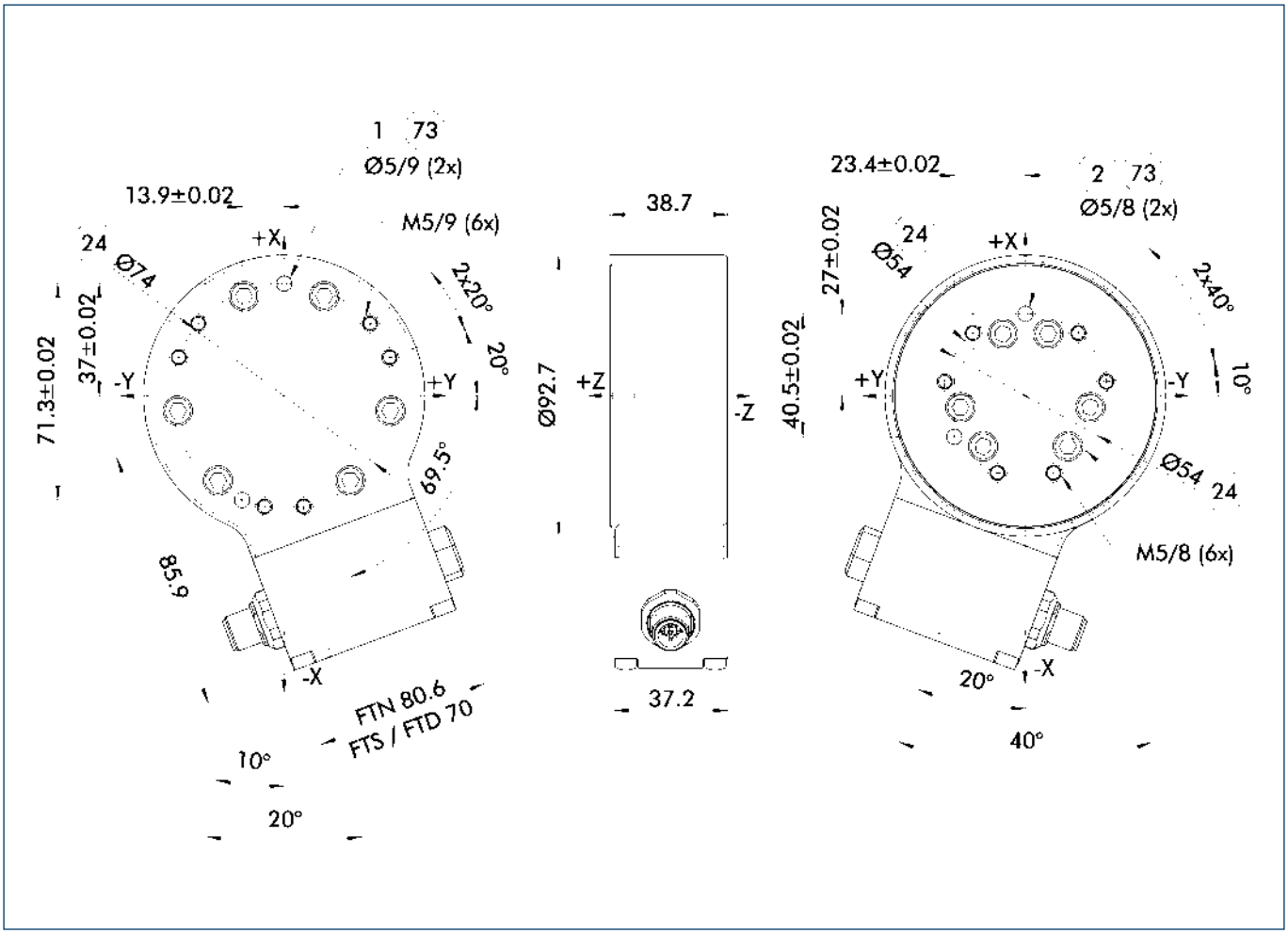
The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin

FT Omega85

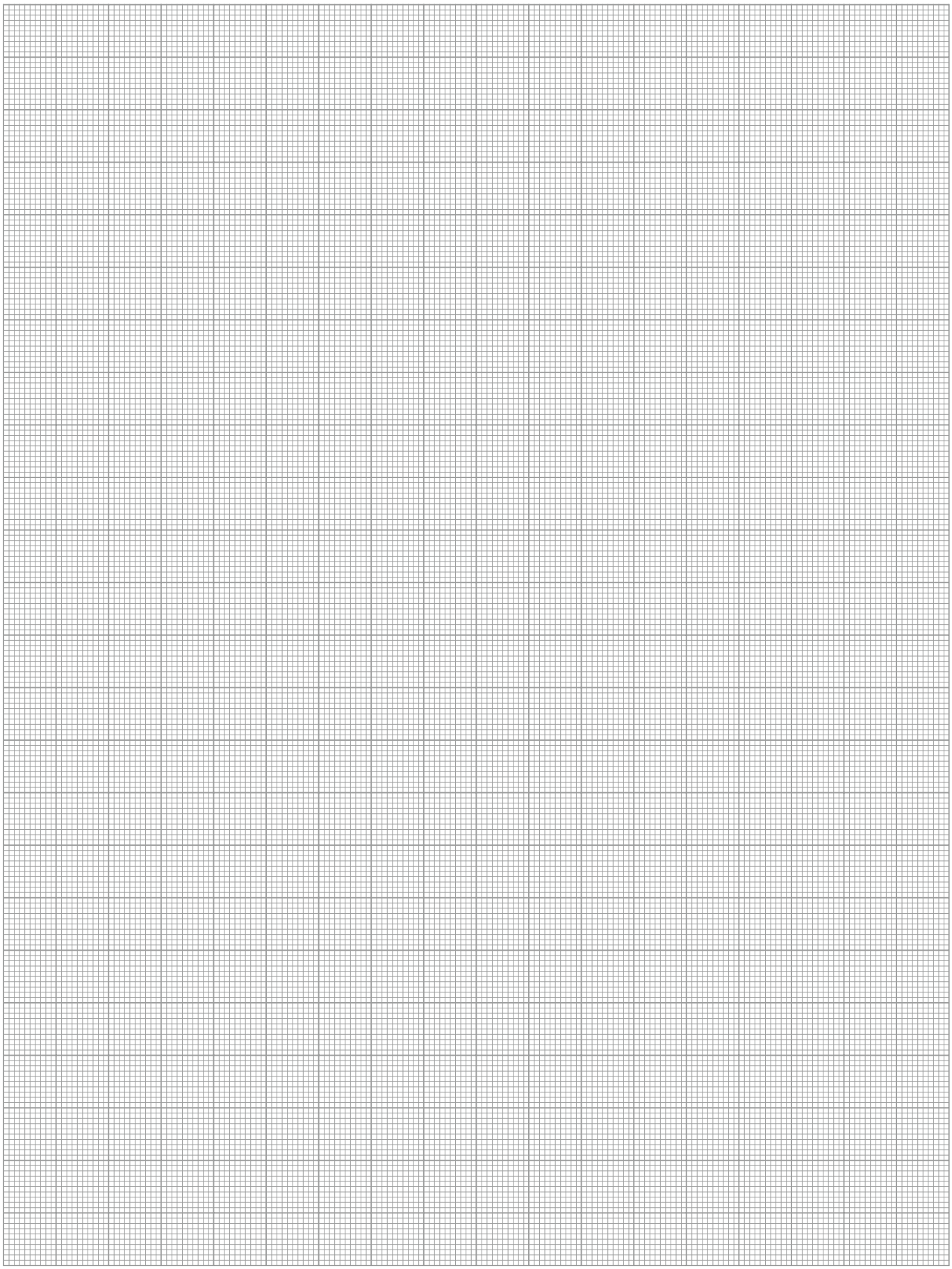
Robot Accessories | Measuring | Force / Torque Sensor

IP65 / IP68 main view



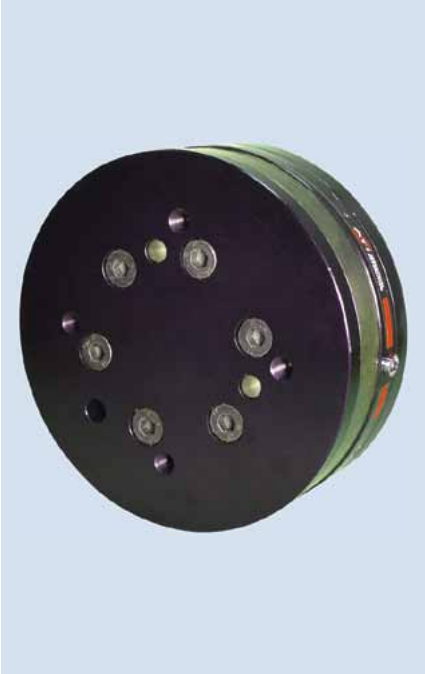
The main view shows the product with IP-protection.

① Robot side connection
② Tool side connection
㉔ Bolt circle
㉝ Fit for a centering pin

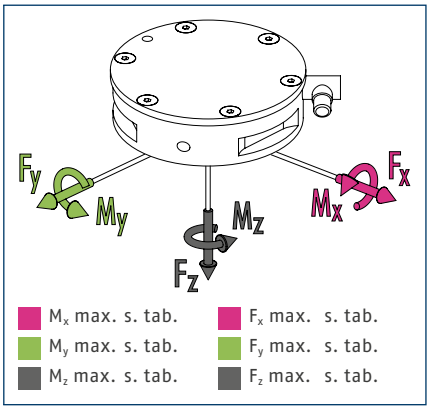


FT 0mega160

Robot Accessories | Measuring | Force / Torque Sensor



Forces and moments

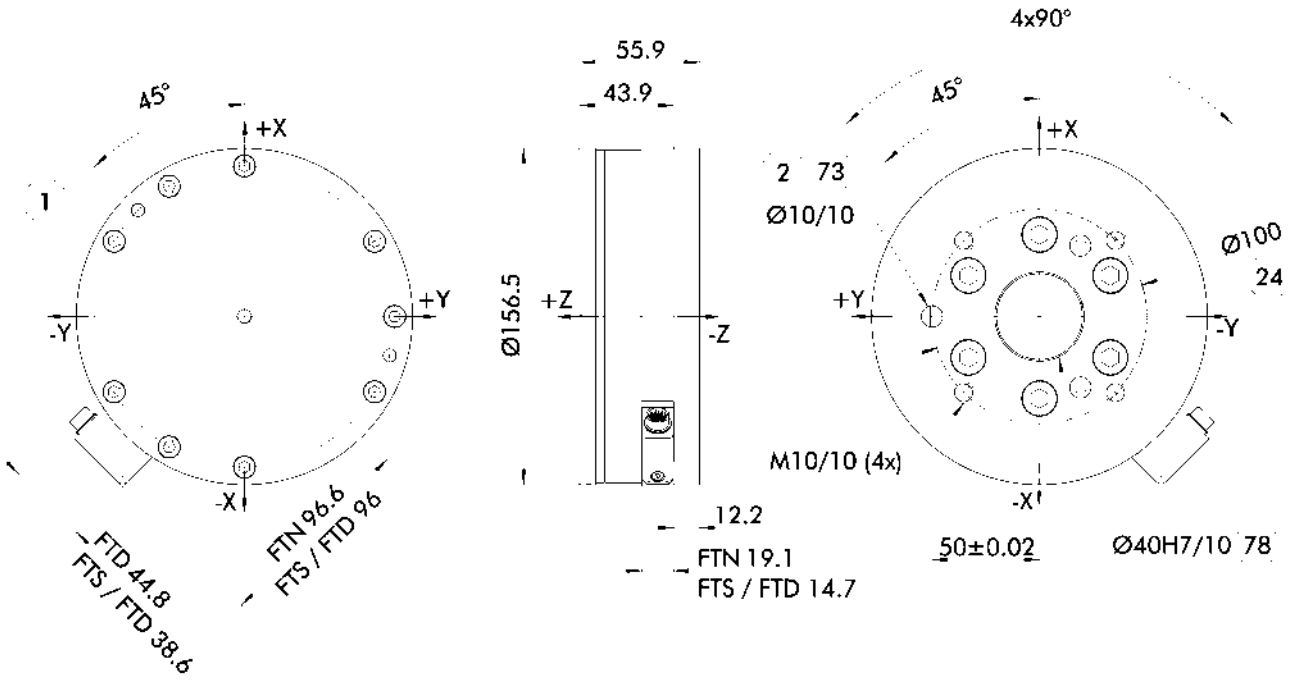


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-0mega-160	FTN-0mega-160	FTN-0mega-160
Calibration		SI-1000-120	SI-1500-240	SI-2500-400
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	2.72	2.72	2.72
Measuring range F_x, F_y	[N]	±1000	±1500	±2500
Measuring range F_z	[N]	±2500	±3750	±6250
Measuring range M_x, M_y	[Nm]	±120	±240	±400
Measuring range M_z	[Nm]	±120	±240	±400
Overload F_x, F_y	[N]	±18000	±18000	±18000
Overload F_z	[N]	±48000	±48000	±48000
Overload M_x, M_y	[Nm]	±1700	±1700	±1700
Overload M_z	[Nm]	±1900	±1900	±1900
Resonant Frequency F_x, F_y, M_z	[Hz]	1300	1300	1300
Resonant Frequency F_z, M_x, M_y	[Hz]	1000	1000	1000
Resolution F_x, F_y	[N]	1/4	1/4	1/2
Resolution F_z	[N]	1/4	1/2	3/4
Resolution M_x, M_y	[Nm]	1/40	1/20	1/20
Resolution M_z	[Nm]	1/80	1/40	1/20
Technical data deviating from FTD				
Description		FTD-0mega-160	FTD-0mega-160	FTD-0mega-160
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	1/4	1/4	1/2
Resolution F_z	[N]	1/4	1/2	3/4
Resolution M_x, M_y	[Nm]	1/40	1/20	1/20
Resolution M_z	[Nm]	1/80	1/40	1/20
Technical data deviating from FTS				
Description		FTS-0mega-160	FTS-0mega-160	FTS-0mega-160
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	1/2	1/2	1/1
Resolution F_z	[N]	1/2	1/1	3/2
Resolution M_x, M_y	[Nm]	1/20	1/10	1/10
Resolution M_z	[Nm]	1/40	1/20	1/10

Main view



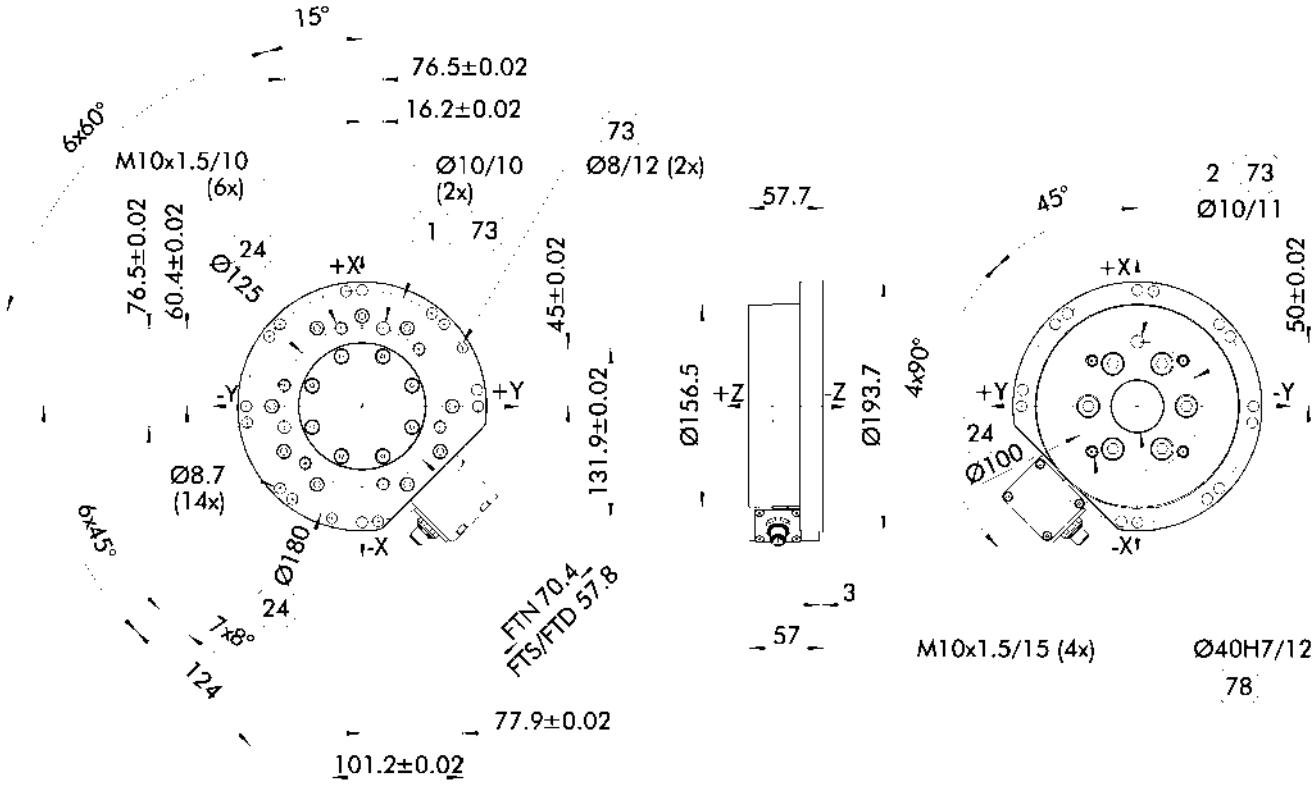
The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin
(78) Fitting for centering

FT Omega160

Robot Accessories | Measuring | Force / Torque Sensor

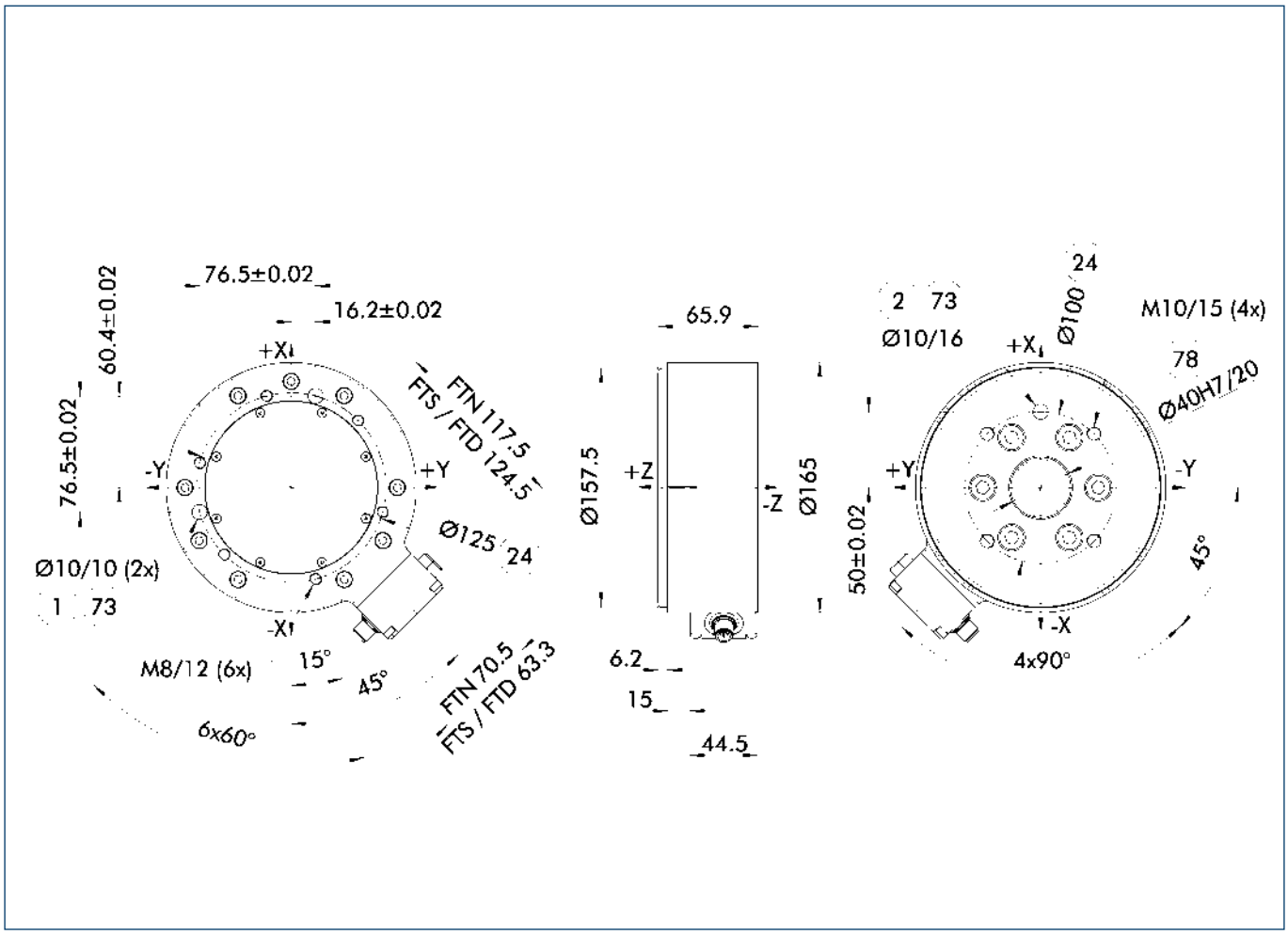
Main view IP60



The main view shows the product with IP-protection.

1 Robot side connection
2 Tool side connection
24 Bolt circle
73 Fit for a centering pin
78 Fitting for centering

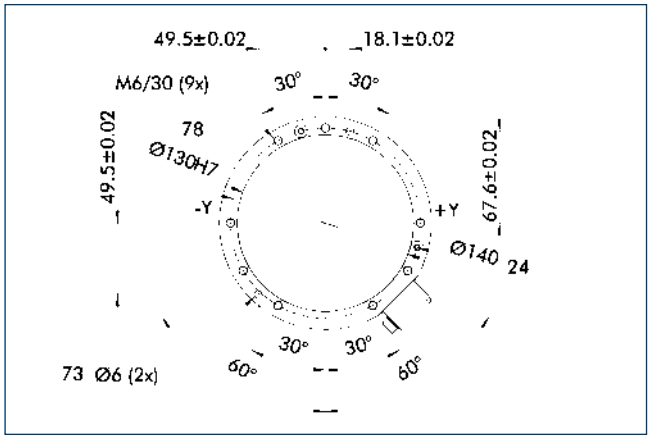
IP65 / IP68 main view



The main view shows the product with IP-protection.

(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin
(78) Fitting for centering

Adapter plate design



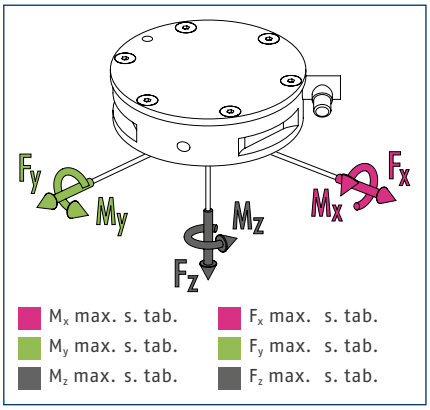
(24) Bolt circle
(78) Fitting for centering
(73) Fit for a centering pin

The additional view shows the product without cover plate. The adapter plate acts as a cover for the standard version.

FT Omega191

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

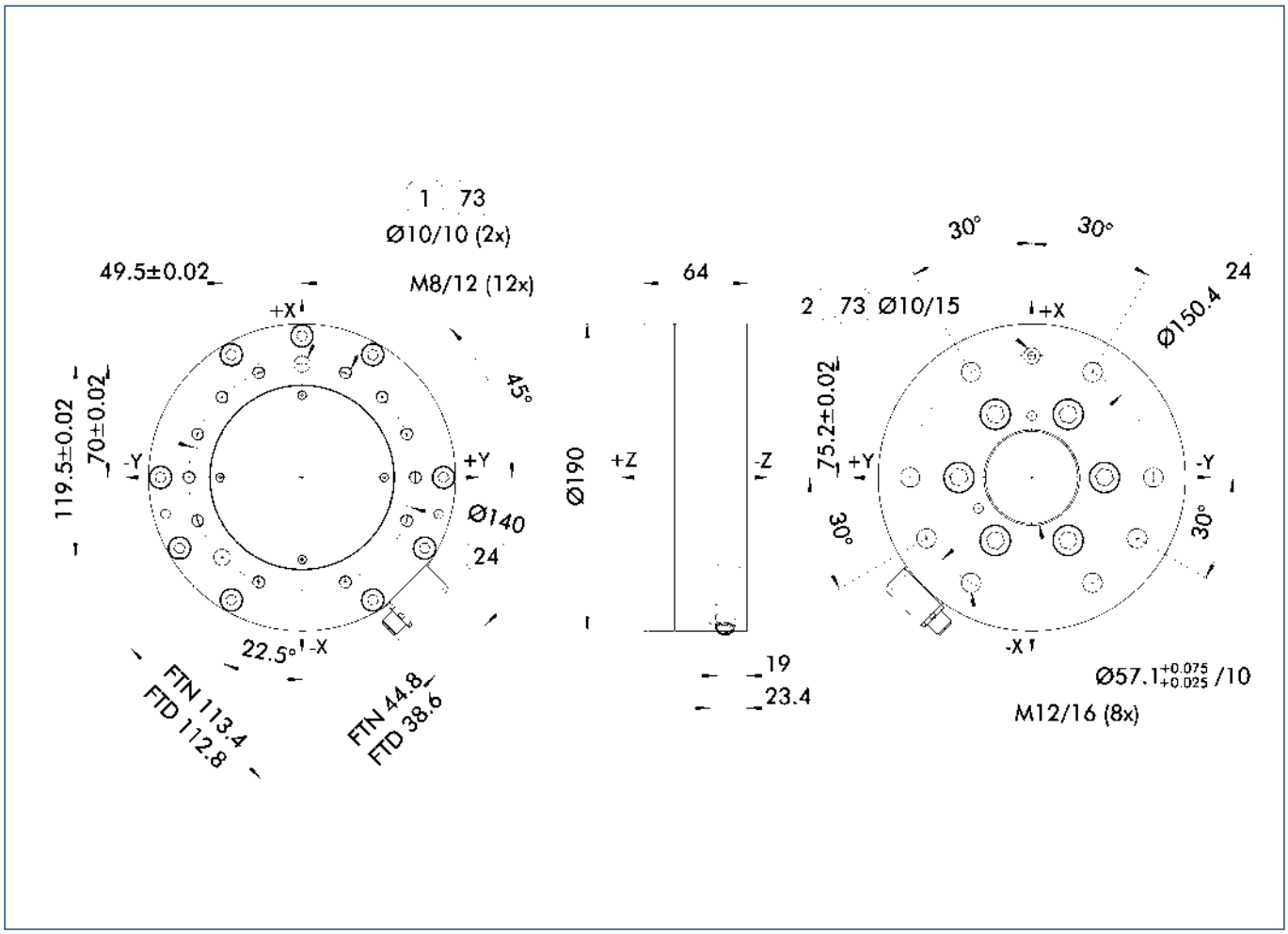


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Omega-191	FTN-Omega-191	FTN-Omega-191
Calibration		SI-1800-350	SI-3600-700	SI-7200-1400
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	10.15	10.15	10.15
Measuring range F_x, F_y	[N]	±1800	±3600	±7200
Measuring range F_z	[N]	±4500	±9000	±18000
Measuring range M_x, M_y	[Nm]	±350	±700	±1400
Measuring range M_z	[Nm]	±350	±700	±1400
Overload F_x, F_y	[N]	±36000	±36000	±36000
Overload F_z	[N]	±11000	±11000	±11000
Overload M_x, M_y	[Nm]	±6800	±6800	±6800
Overload M_z	[Nm]	±6800	±6800	±6800
Resolution F_x, F_y	[N]	3/8	3/4	3/2
Resolution F_z	[N]	3/4	3/2	3/1
Resolution M_x, M_y	[Nm]	5/96	5/48	5/24
Resolution M_z	[Nm]	5/144	5/72	5/36
Technical data deviating from FTD				
Description		FTD-Omega-191	FTD-Omega-191	FTD-Omega-191
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	3/8	3/4	3/2
Resolution F_z	[N]	3/4	3/2	3/1
Resolution M_x, M_y	[Nm]	5/96	5/48	5/24
Resolution M_z	[Nm]	5/144	5/72	5/36
Technical data deviating from FTS				
Description		FTS-Omega-191	FTS-Omega-191	FTS-Omega-191
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	3/4	3/2	3/1
Resolution F_z	[N]	3/2	3/1	6/1
Resolution M_x, M_y	[Nm]	5/48	5/24	5/12
Resolution M_z	[Nm]	5/72	5/36	5/18

Main view



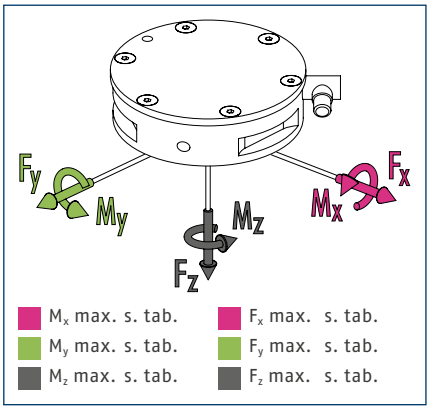
The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin

FT Omega250

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

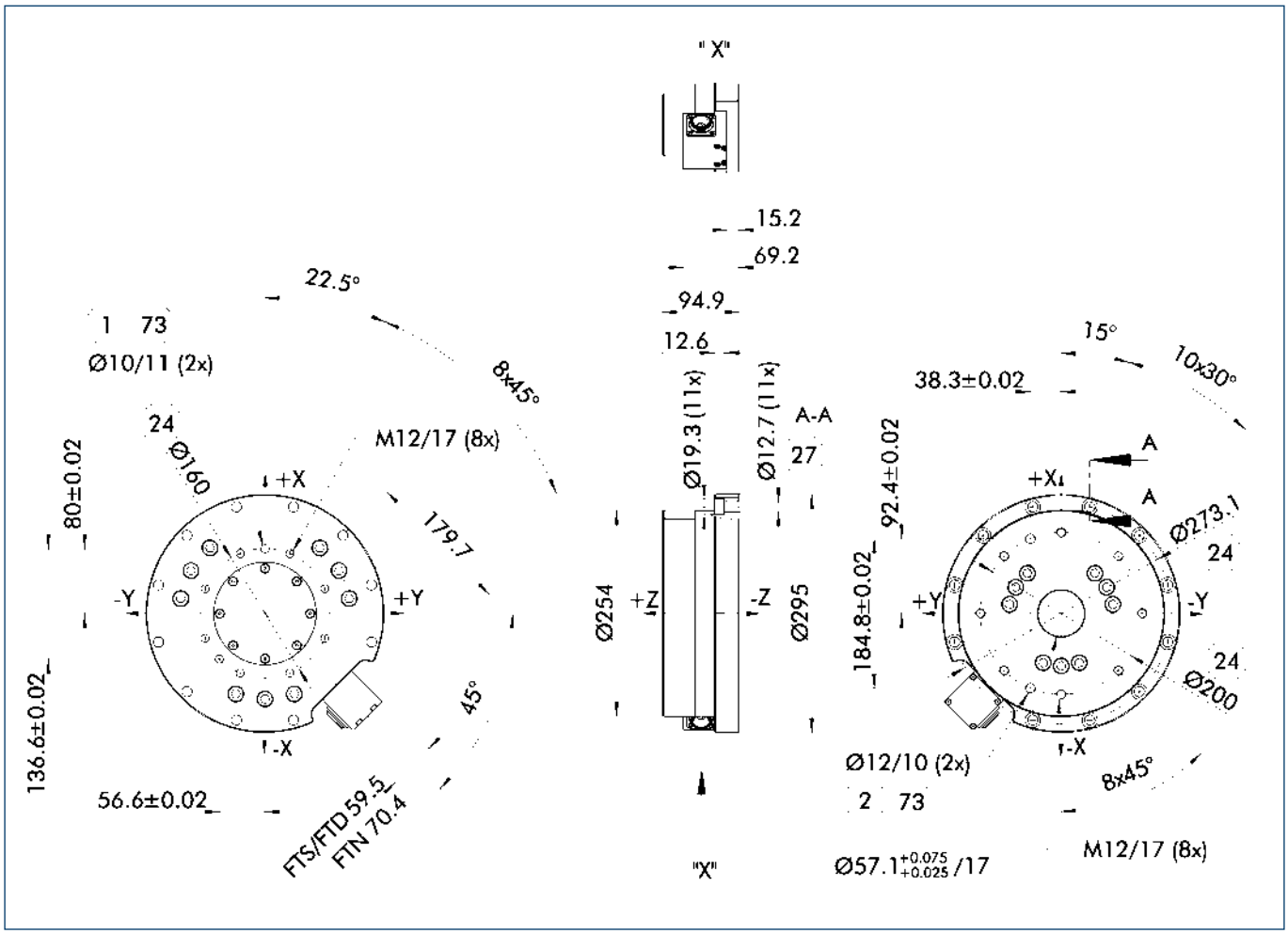


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Omega-250-IP60	FTN-Omega-250-IP60	FTN-Omega-250-IP60
Calibration		SI-4000-500	SI-8000-1000	SI-16000-2000
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	31.8	31.8	31.8
Measuring range F_x, F_y	[N]	±4000	±8000	±16000
Measuring range F_z	[N]	±8000	±16000	±32000
Measuring range M_x, M_y	[Nm]	±500	±1000	±2000
Measuring range M_z	[Nm]	±500	±1000	±2000
Overload F_x, F_y	[N]	±160000	±160000	±160000
Overload F_z	[N]	±330000	±330000	±330000
Overload M_x, M_y	[Nm]	±21000	±21000	±21000
Overload M_z	[Nm]	±25000	±25000	±25000
Resolution F_x, F_y	[N]	1/1	2/1	4/1
Resolution F_z	[N]	2/1	4/1	8/1
Resolution M_x, M_y	[Nm]	1/8	1/4	1/2
Resolution M_z	[Nm]	1/8	1/4	1/2
Technical data deviating from FTD				
Description		FTD-Omega-250-IP60	FTD-Omega-250-IP60	FTD-Omega-250-IP60
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[N]	1/1	2/1	4/1
Resolution F_z	[N]	2/1	4/1	8/1
Resolution M_x, M_y	[Nm]	1/8	1/4	1/2
Resolution M_z	[Nm]	1/8	1/4	1/2
Technical data deviating from FTS				
Description		FTS-Omega-250-IP60	FTS-Omega-250-IP60	FTS-Omega-250-IP60
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[N]	2/1	4/1	8/1
Resolution F_z	[N]	4/1	8/1	16/1
Resolution M_x, M_y	[Nm]	1/4	1/2	1/1
Resolution M_z	[Nm]	1/4	1/2	1/1

Main view IP60



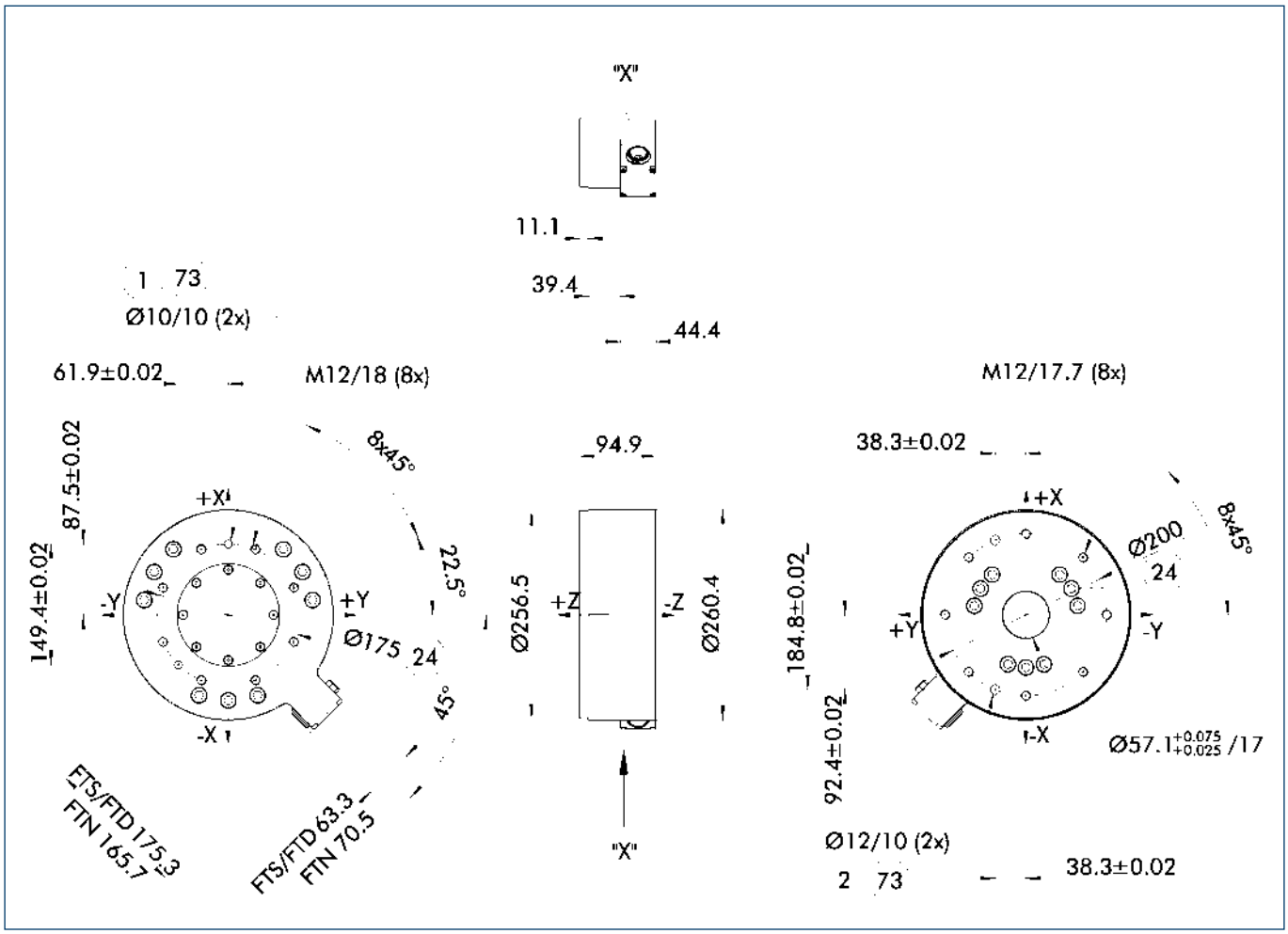
The main view shows the product with IP-protection.

1. Robot side connection
2. Tool side connection
24. Bolt circle
27. Through-holes for screw connections
73. Fit for a centering pin

FT Omega250

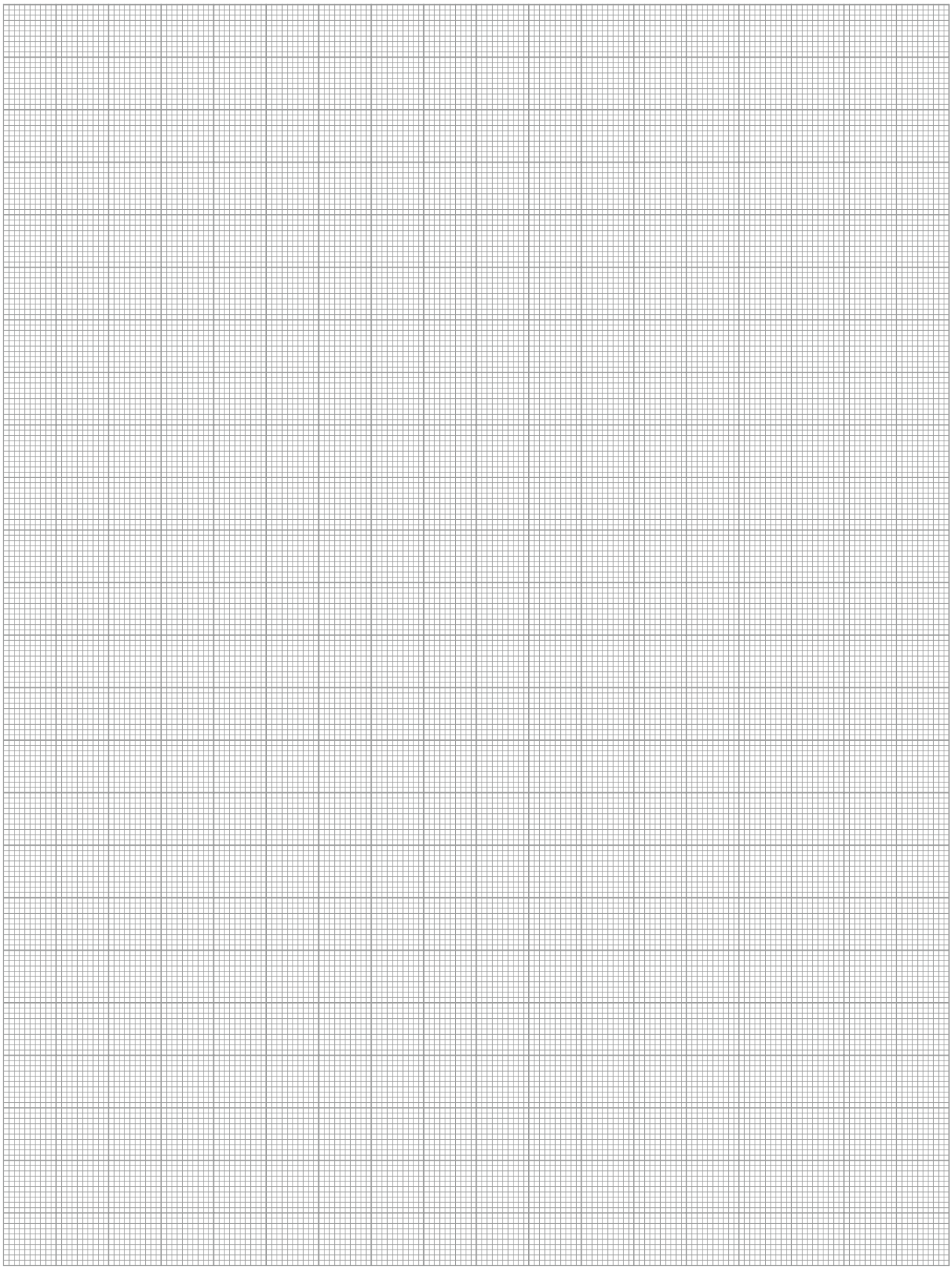
Robot Accessories | Measuring | Force / Torque Sensor

IP65 / IP68 main view



The main view shows the product with IP-protection.

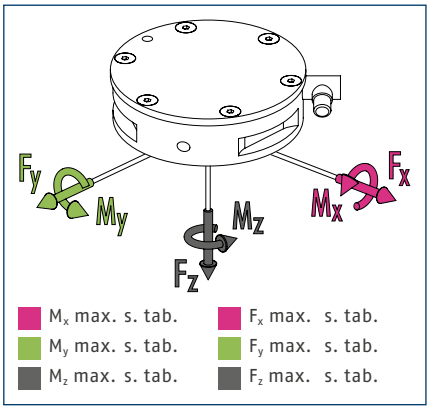
1. Robot side connection
2. Tool side connection
24. Bolt circle
73. Fit for a centering pin



FT Omega331

Robot Accessories | Measuring | Force / Torque Sensor

Forces and moments

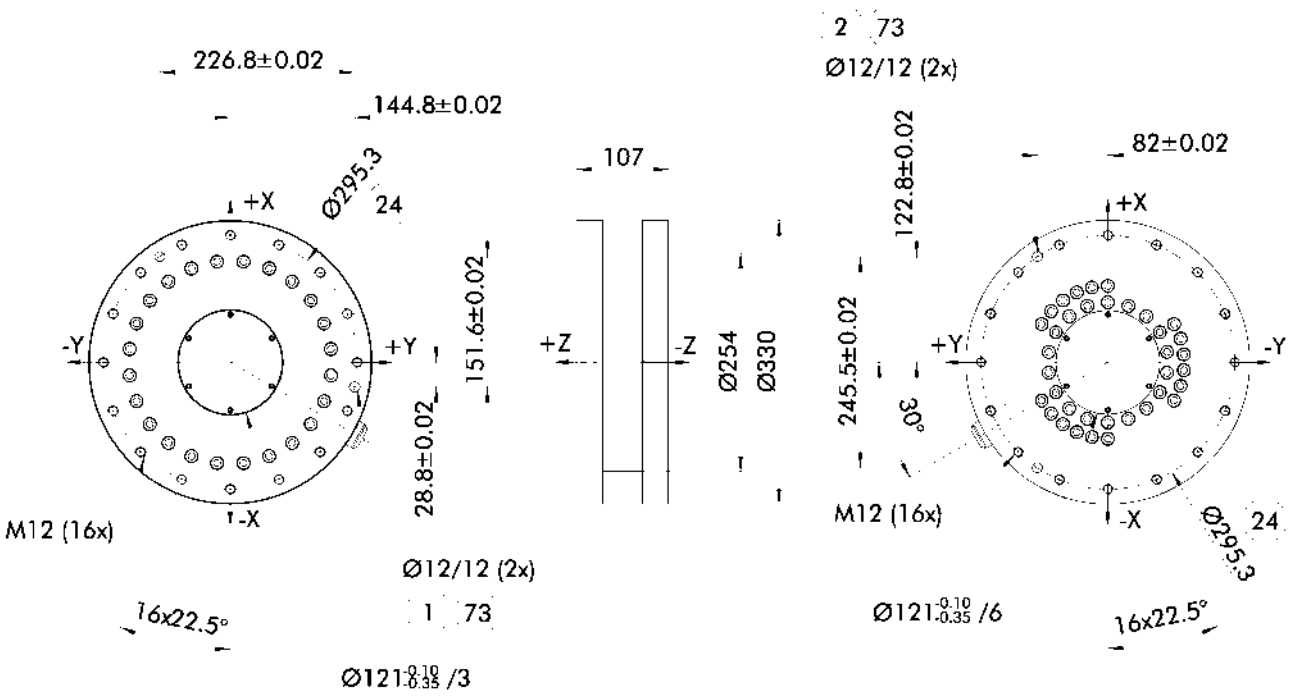


ⓘ For load index see technical data table.

FTN technical data

Description		FTN-Omega-331	FTN-Omega-331	FTN-Omega-331
Calibration		SI-10000-1500	SI-20000-3000	SI-40000-6000
Evaluation via		Ethernet	Ethernet	Ethernet
Mass	[kg]	47	47	47
Measuring range F_x, F_y	[N]	±10000	±20000	±40000
Measuring range F_z	[N]	±22000	±44000	±88000
Measuring range M_x, M_y	[Nm]	±1500	±3000	±6000
Measuring range M_z	[Nm]	±1500	±3000	±6000
Overload F_x, F_y	[N]	±260000	±260000	±260000
Overload F_z	[N]	±520000	±520000	±520000
Overload M_x, M_y	[Nm]	±32000	±32000	±32000
Overload M_z	[Nm]	±46000	±46000	±46000
Resolution F_x, F_y	[kN]	1/480	1/240	1/120
Resolution F_z	[kN]	1/240	1/120	1/60
Resolution M_x, M_y	[kNm]	3/8000	3/4000	3/2000
Resolution M_z	[kNm]	3/16000	3/8000	3/4000
Technical data deviating from FTD				
Description		FT-Omega-331	FTD-Omega-331	FTD-Omega-331
Evaluation via		DAQ	DAQ	DAQ
Resolution F_x, F_y	[kN]	1/480	1/240	1/120
Resolution F_z	[kN]	1/240	1/120	1/60
Resolution M_x, M_y	[kNm]	3/8000	3/4000	3/2000
Resolution M_z	[kNm]	3/16000	3/8000	3/4000
Technical data deviating from FTS				
Description		FTS-Omega-331	FTS-Omega-331	FTS-Omega-331
Evaluation via		Stand-Alone	Stand-Alone	Stand-Alone
Resolution F_x, F_y	[kN]	1/240	1/120	1/60
Resolution F_z	[kN]	1/120	1/60	1/30
Resolution M_x, M_y	[kNm]	3/4000	3/2000	3/1000
Resolution M_z	[kNm]	3/8000	3/4000	3/2000

Main view



The main view shows the unit in its basic version.

(1) Robot side connection
(2) Tool side connection
(24) Bolt circle
(73) Fit for a centering pin

Automatic deburring of Workpieces with up to 65,000 Rotations per Minute.

Finishing

FDB Deburring Spindle

Series	Size	Page
FDB		690
FDB	150	694
FDB	300	698

Series	Size	Page
FDB	340	702
FDB	660	706

FDB-AC Deburring Spindle

Series	Size	Page
FDB-AC		710
FDB-AC	90	714
FDB-AC	180	718

MFT Polishing Spindle

Series	Size	Page
MFT		722
MFT	390	726

Compliant. Robust. Precise.

FDB Deburring Spindle

Flexible deburring spindle for use with robots.

Field of Application

Standard solution for versatile and robot-guided deburring of all sorts of workpieces

Advantages – Your benefit

Flexible high-frequency spindle for maximum flexibility when deburring

Pneumatically-adjustable rigidity of the cutting spindle for clean chamfer edges in every installation position

High RPM for high feed rates

Flexible use on robot arm or as stationary unit

Sizes	Idle speed max.	Power
Quantity: 4	30000 .. 65000 1/min	150 .. 660 W

Functional Description

The drive of the unit is carried out via a pneumatic spindle with torque of up to 65,000 rpm per minute – depending on the module size. The spindle is swivel mounted for being able to maintain the tolerances of the whole machining contour.

The maximum length at the milling cutter tip amounts to ±9 mm. The force (rigidity), which is required for moving (oscillating) the spindle, is adjusted via a second air connection. Depending on the pressure, the force at the milling cutter's cross section amount to 3.1 N to 42.3 N.

① **Pneumatic spindle**
High-performance spindle with up to 65,000 rpm

② **Ring cylinder**
for adjusting the pressure force on the workpiece

③ **Bearing**
of the oscillating suspension of the compressed air motor

④ **Air connection**
for actuation of the ring cylinder

⑤ **Air connection**
with large cross-section for compressed air motor

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Mounting: on robot arm or as stationary unit

Actuation: pneumatic, with filtered compressed air (10 microns): dry and non-lubricated

Scope of delivery: Spindle with collets and pneumatics screw connection.

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Environmental conditions: Please note that the unit is not suitable for use in an area where coolants or cutting fluids are present.

Application example

Robot-controlled deburring of connecting rod cast parts

1. FDB Flexible Deburring Spindle
2. SWS Quick-change System
3. Clamping Force Block

SCHUNK offers more ...

The following components make the FDB even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Fittings

Collet Chucks

SWS Quick-change System

HWS Manual Gripper Change System

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

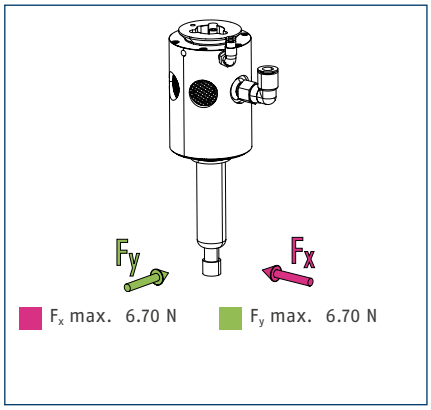
Options and special Information

Universally: The FDB is not restricted to use on a robot arm, due to its flexible assembly possibilities. It can also be used as a fixed tool with a moving workpiece.

FDB 150

Robot Accessories | Finishing | Deburring Spindle

Forces and moments

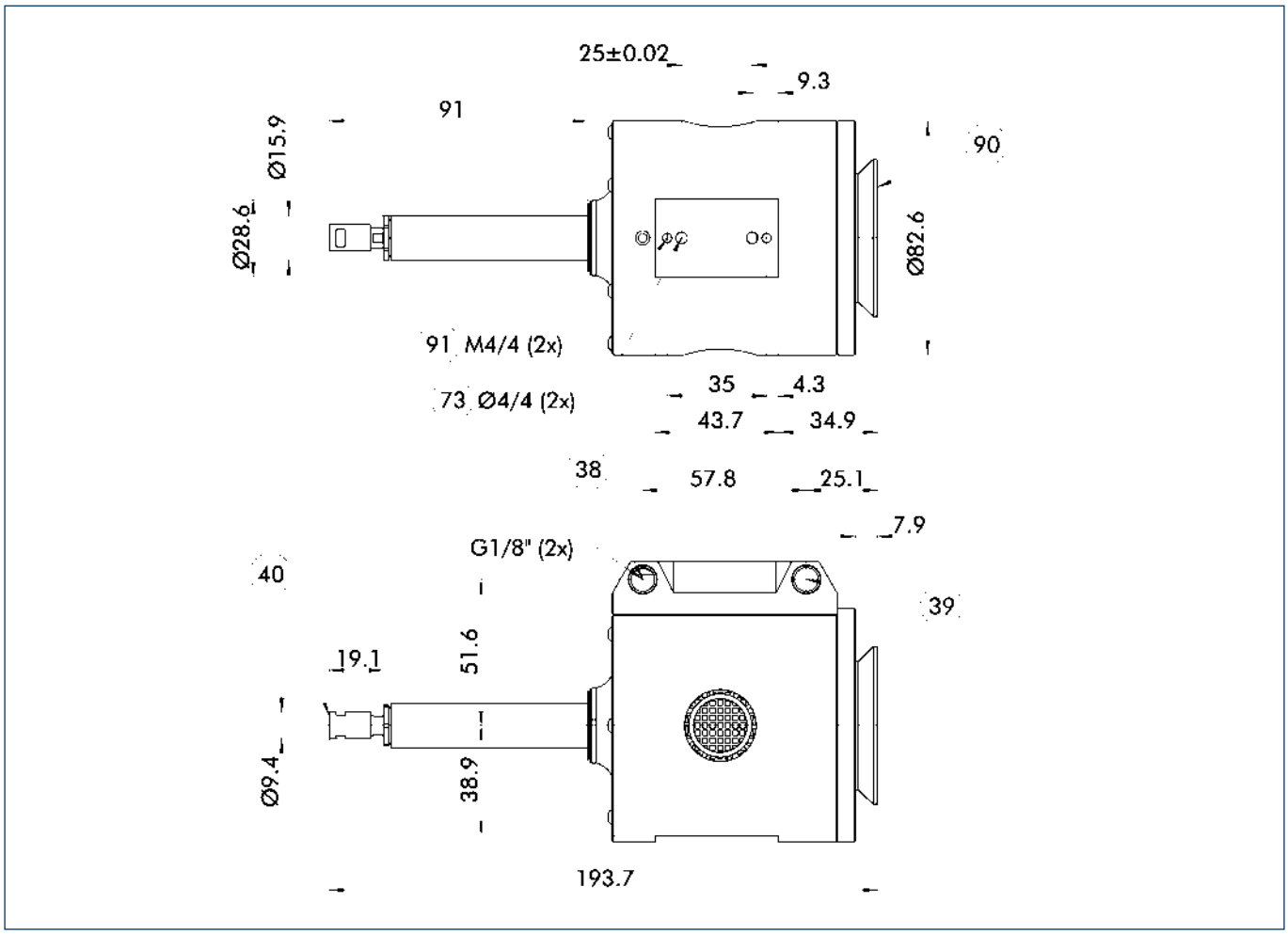


ⓘ The indicated forces show the maximum compensation forces.

Technical data

Description		FDB-150	FDB-150-RS
ID		0322200	0322205
Power	[W]	150	150
max. compensation X	[mm]	±5.1	±5.1
max. compensation Y	[mm]	±5.1	0
Recommended compensation	[mm]	±2.5	±5.1
min. compliance force	[N]	3.1	3.1
max. compliance force	[N]	6.7	6.7
min. compliance pressure	[bar]	1.4	1.4
max. compliance pressure	[bar]	4.1	4.1
Idle speed	[1/min]	65000	65000
Idle air consumption	[l/s]	1.4	1.4
Stalled air consumption	[l/s]	3.8	3.8
Collet size	[mm]	3	3
Mass	[kg]	1.11	1.11
min. / max. ambient temperature	[°C]	5/60	5/60

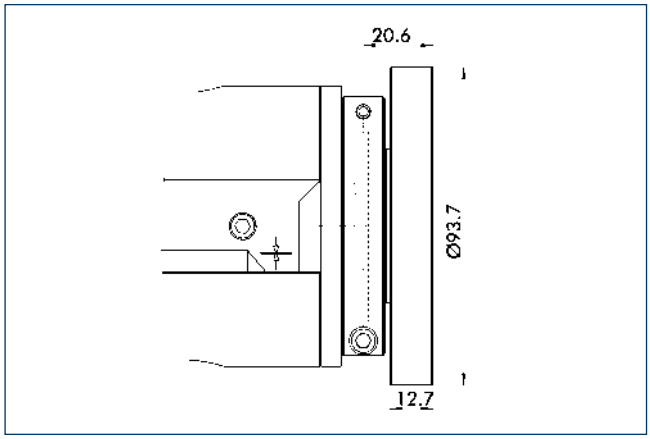
Main view



The main view shows the unit in its basic version.

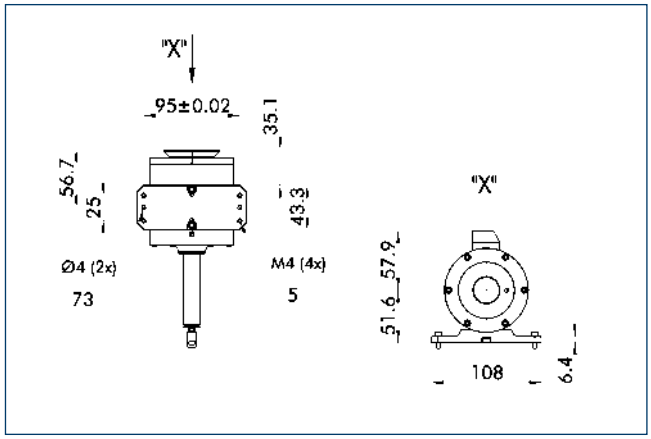
(38) Spindle air connection
(39) Compensation air connection
(40) Collet
(73) Fit for a centering pin
(90) Axial connection
(91) Radial connection

Adapter plates, axial



Description	ID	Height
Robot-side		
A-FDB-axial-151-340	0322210	20.6 mm

Adapter plates, radial



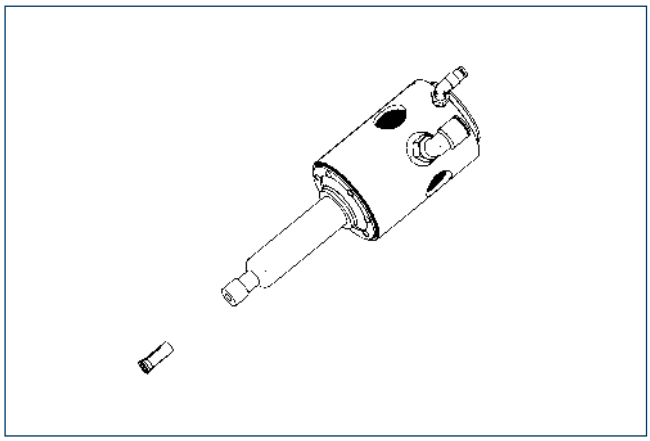
(5) Through-hole for connection with screws
(73) Fit for a centering pin

Description	ID	
Stationary		
A-FDB-radial-151	0322212	

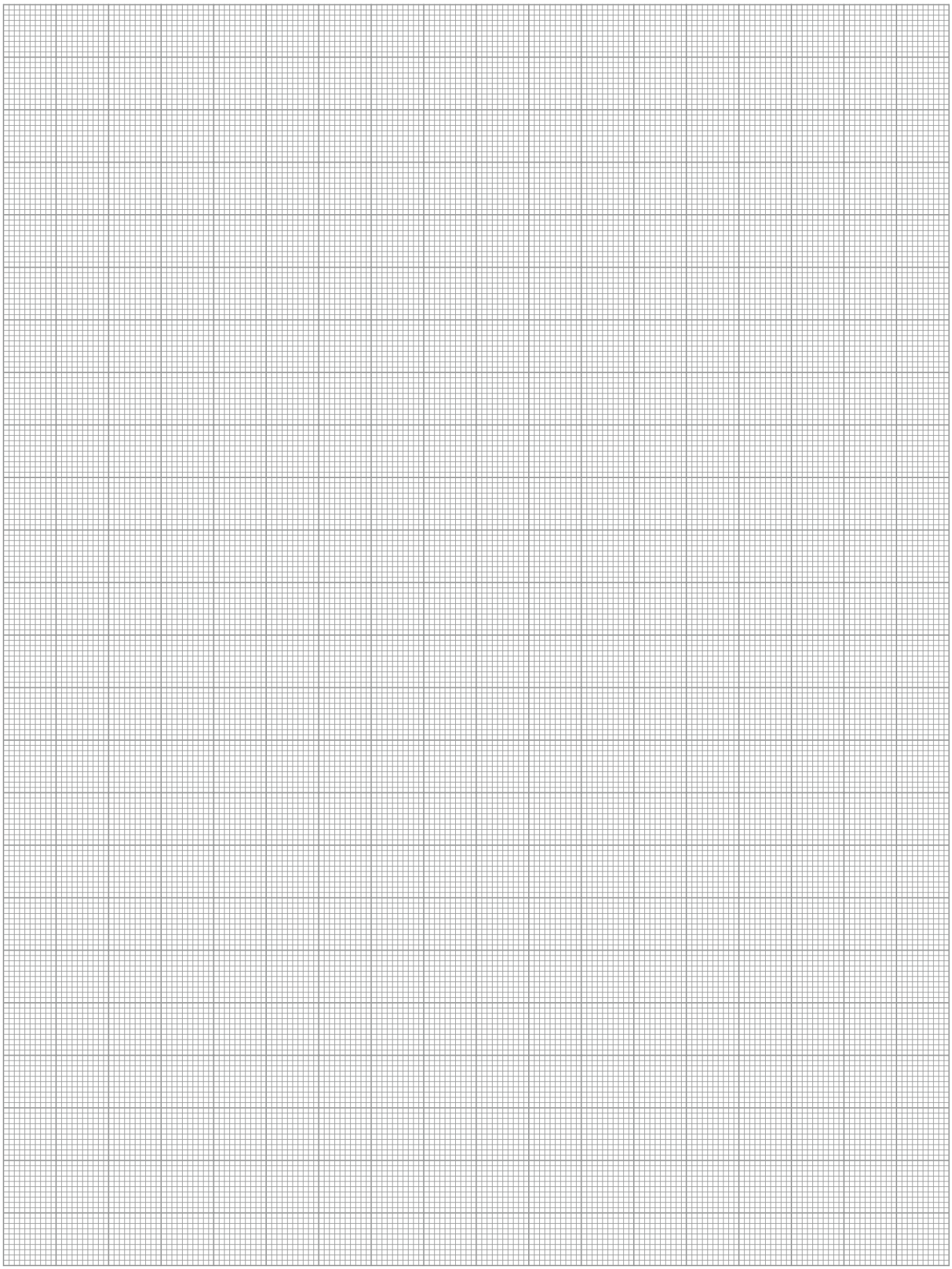
FDB 150

Robot Accessories | Finishing | Deburring Spindle

Collets



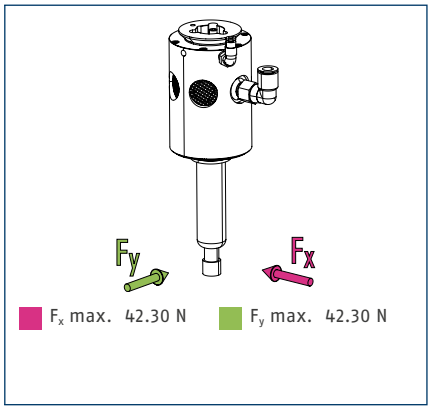
Description	ID	Diameter
Collet FDB-C-12142	0322221	3 mm
Collet FDB-C-12149	0322224	1/8“



FDB 300

Robot Accessories | Finishing | Deburring Spindle

Forces and moments

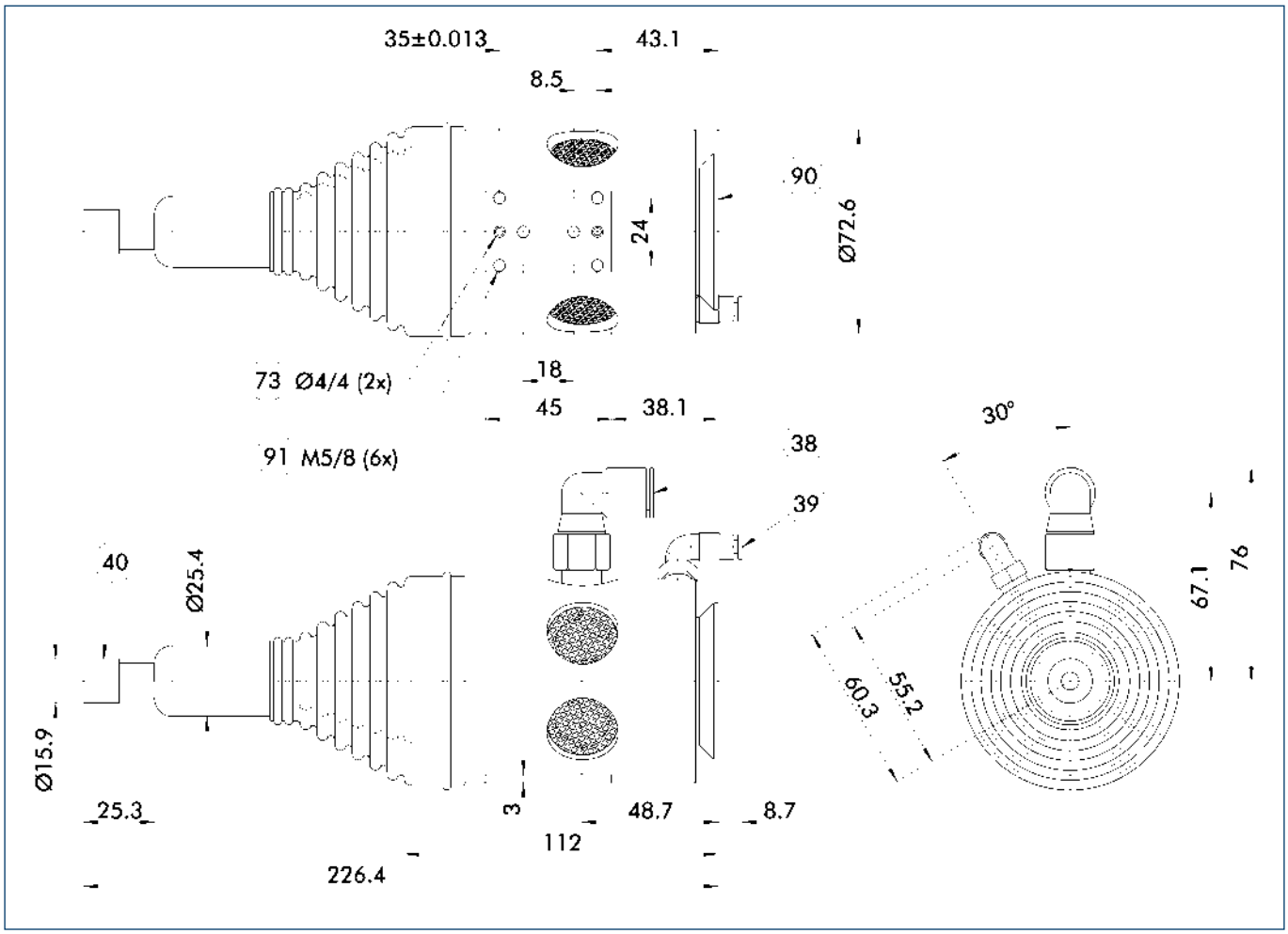


ⓘ The indicated forces show the maximum compensation forces.

Technical data

Description		FDB-300
ID		0322202
Power	[W]	300
max. compensation X	[mm]	±7.6
max. compensation Y	[mm]	±7.6
Recommended compensation	[µm]	±3.8
min. compliance force	[N]	6.7
max. compliance force	[N]	42.3
min. compliance pressure	[bar]	0.3
max. compliance pressure	[bar]	4.1
Idle speed	[1/min]	30000
Idle air consumption	[l/s]	2.8
Stalled air consumption	[l/s]	10
Collet size	[mm]	6
Mass	[kg]	1.15
min. / max. ambient temperature	[°C]	5/60

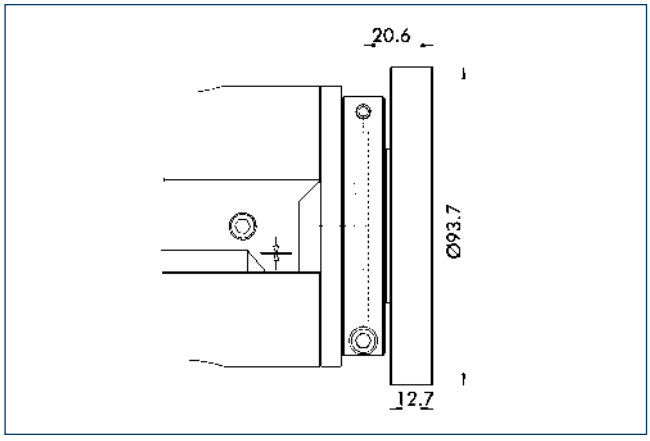
Main view



The main view shows the unit in its basic version.

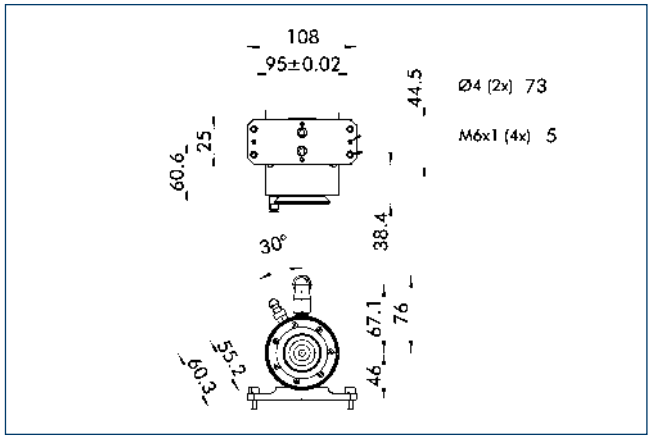
(38) Spindle air connection
(39) Compensation air connection
(40) Collet
(73) Fit for a centering pin
(90) Axial connection
(91) Radial connection

Adapter plates, axial



Description	ID	Height
Robot-side		
A-FDB-axial-151-340	0322210	20.6 mm

Adapter plates, radial



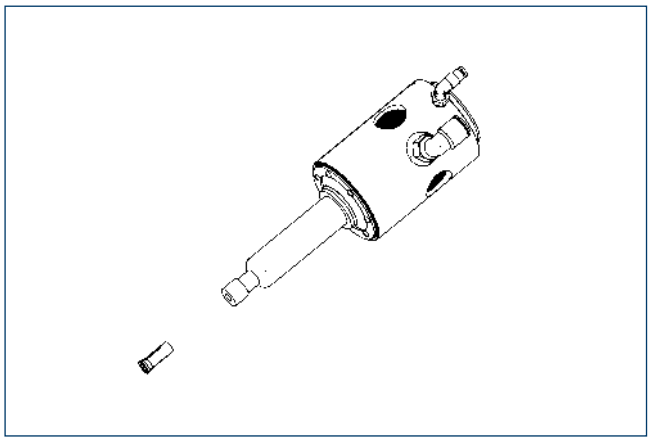
(5) Through-hole for connection with screws
(73) Fit for a centering pin

Description	ID	
Stationary		
A-FDB-radial-300-340	0322213	

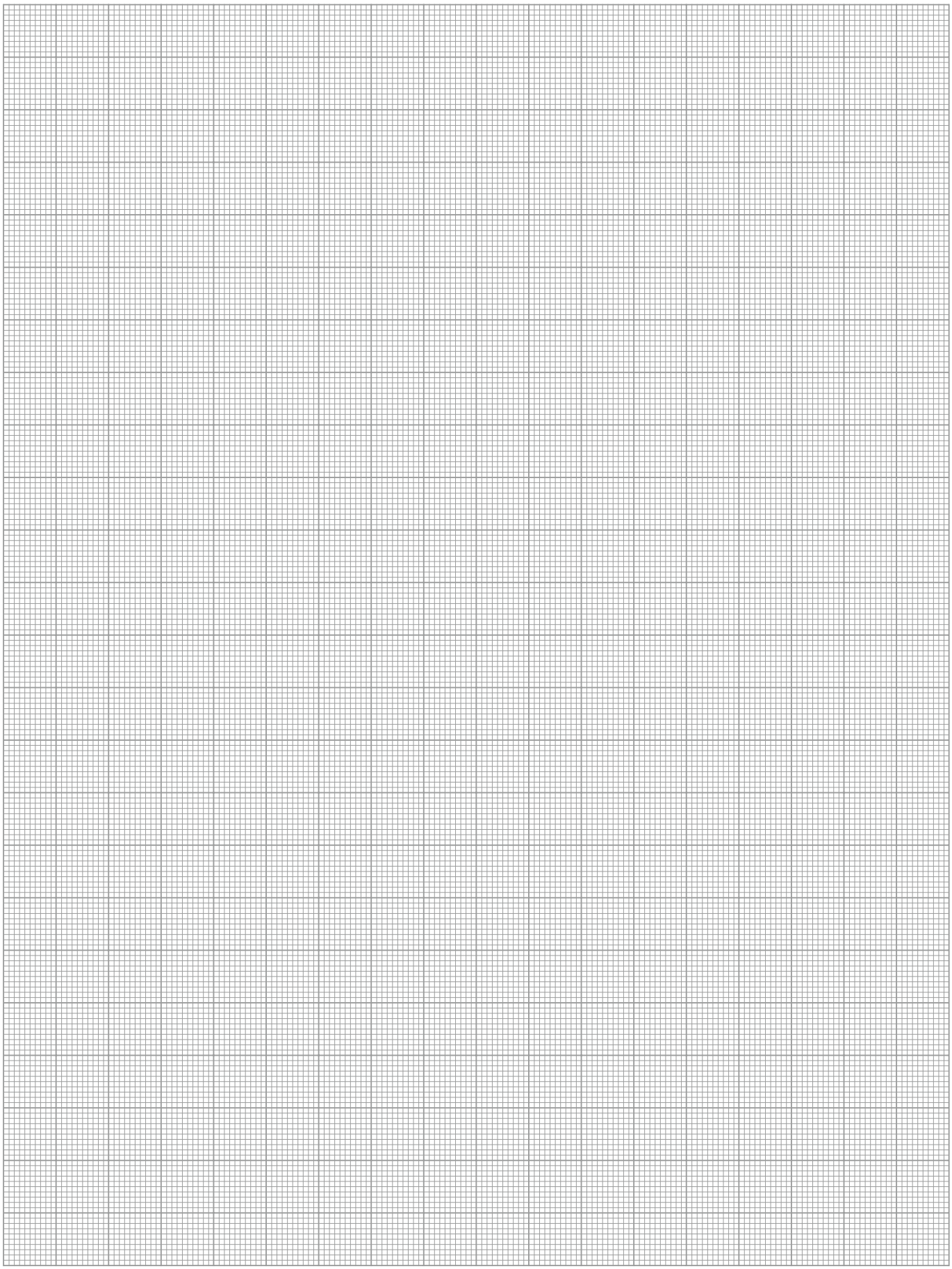
FDB 300

Robot Accessories | Finishing | Deburring Spindle

Collets



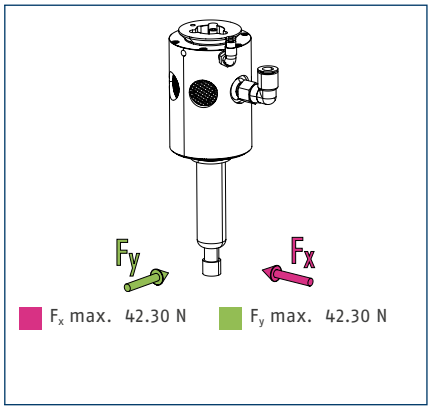
Description	ID	Diameter
Collet FDB-C-12442	0322220	3 mm
Collet FDB-C-12443	0322226	1/8“
Collet FDB-C-12445	0322222	6 mm
Collet FDB-C-12446	0322225	1/4“



FDB 340

Robot Accessories | Finishing | Deburring Spindle

Forces and moments

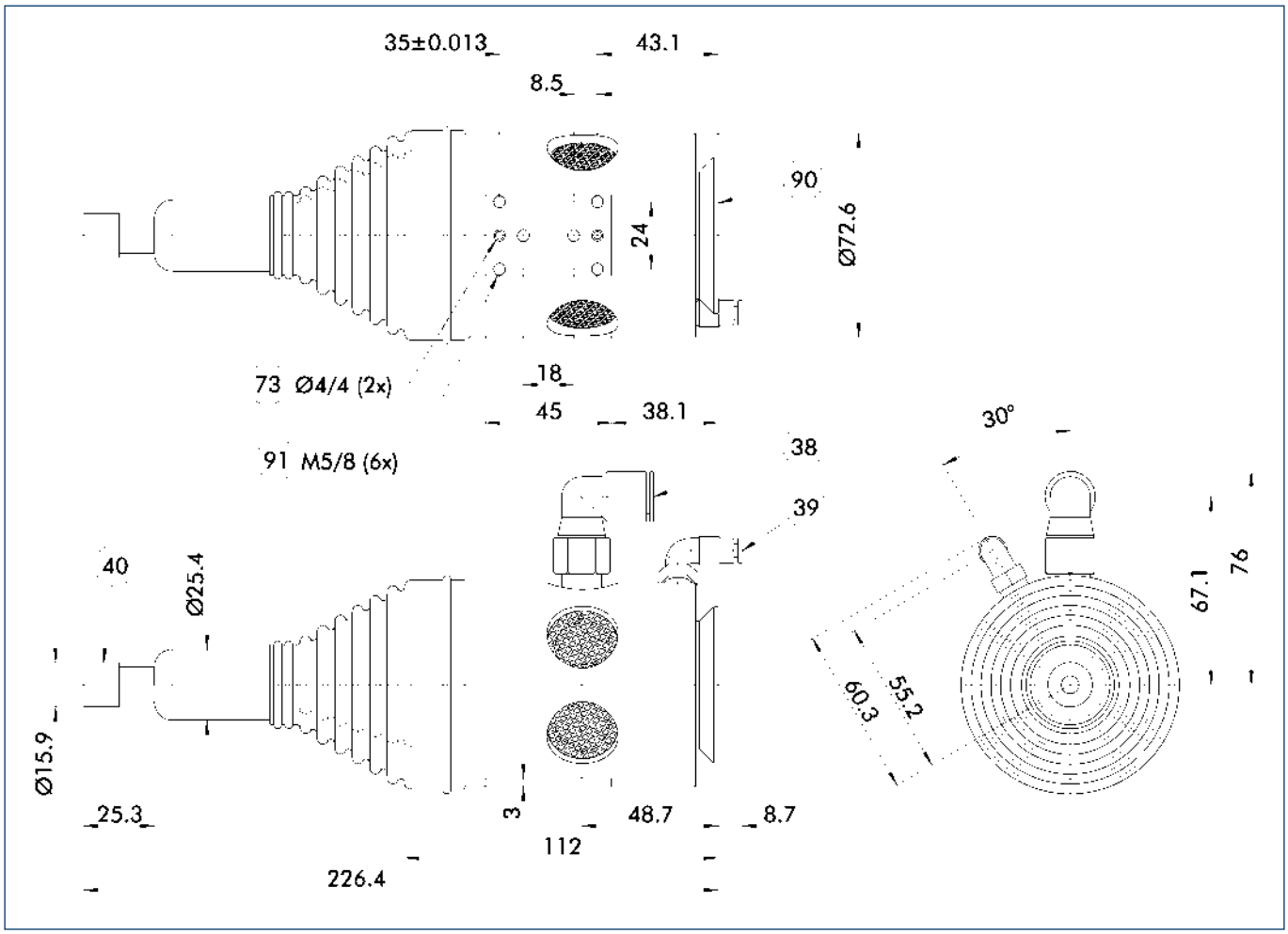


ⓘ The indicated forces show the maximum compensation forces.

Technical data

Description		FDB-340	FDB-340-RS
ID		0322201	0322208
Power	[W]	340	340
max. compensation X	[mm]	±7.6	±5.6
max. compensation Y	[mm]	±7.6	0
Recommended compensation	[mm]	±3.8	±3.8
min. compliance force	[N]	12	8.9
max. compliance force	[N]	42	47
min. compliance pressure	[bar]	0.3	0.3
max. compliance pressure	[bar]	4.1	4.1
Idle speed	[1/min]	40000	40000
Idle air consumption	[l/s]	2.8	2.8
Stalled air consumption	[l/s]	10	10
Collet size	[mm]	6	6
Mass	[kg]	1.15	1.13
min. / max. ambient temperature	[°C]	5/60	5/60

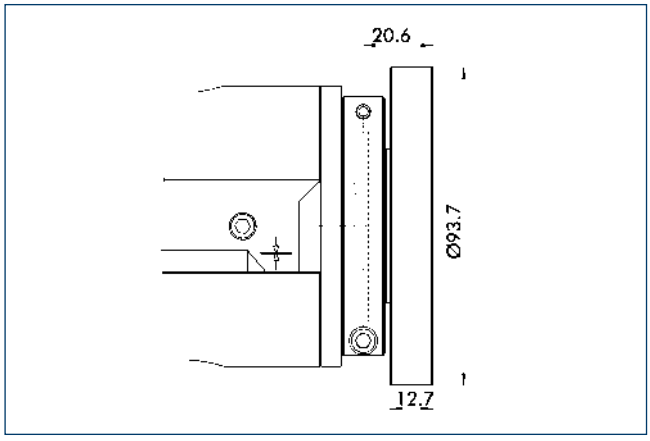
Main view



The main view shows the unit in its basic version.

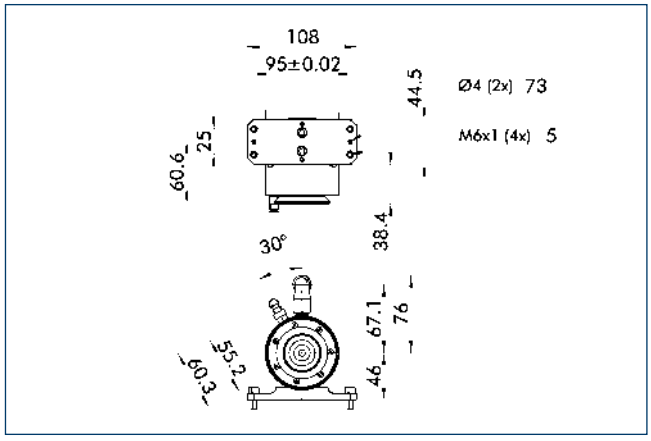
(38) Spindle air connection
(39) Compensation air connection
(40) Collet
(73) Fit for a centering pin
(90) Axial connection
(91) Radial connection

Adapter plates, axial



Description	ID	Height
Robot-side		
A-FDB-axial-151-340	0322210	20.6 mm

Adapter plates, radial



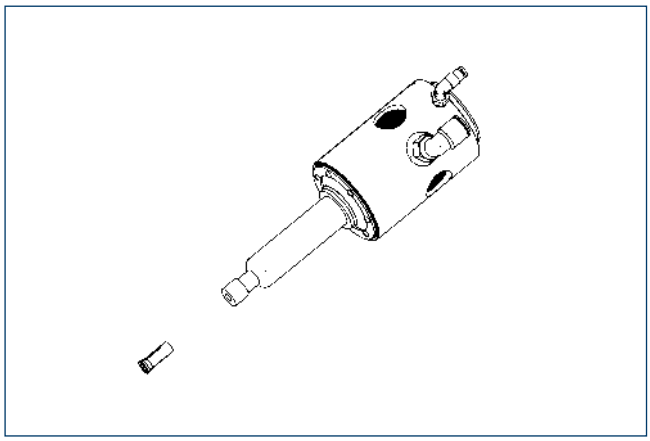
(5) Through-hole for connection with screws
(73) Fit for a centering pin

Description	ID	
Stationary		
A-FDB-radial-300-340	0322213	

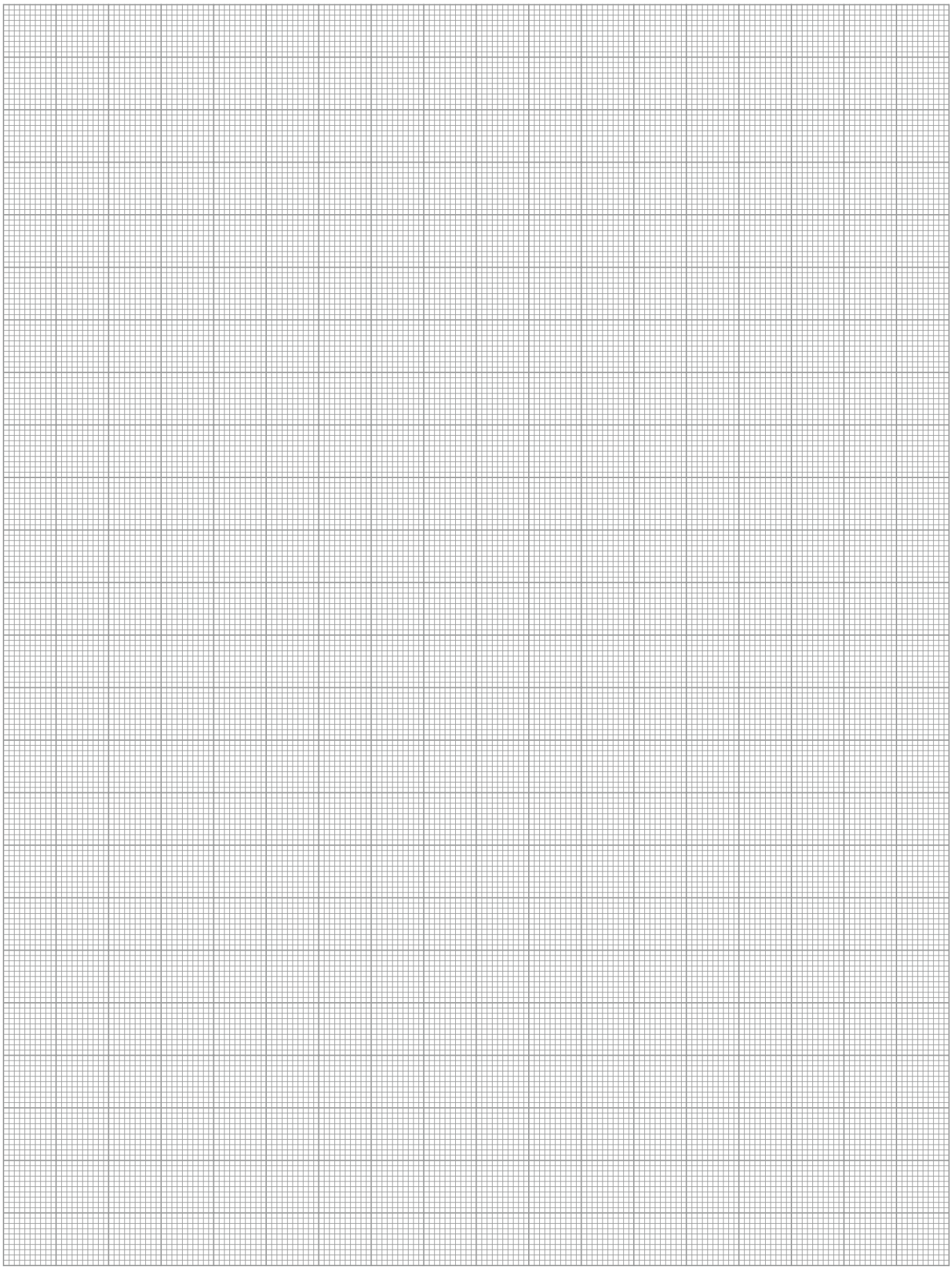
FDB 340

Robot Accessories | Finishing | Deburring Spindle

Collets



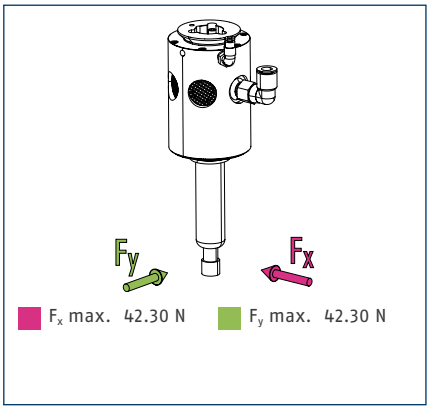
Description	ID	Diameter
Collet FDB-C-12442	0322220	3 mm
Collet FDB-C-12443	0322226	1/8“
Collet FDB-C-12445	0322222	6 mm
Collet FDB-C-12446	0322225	1/4“



FDB 660

Robot Accessories | Finishing | Deburring Spindle

Forces and moments

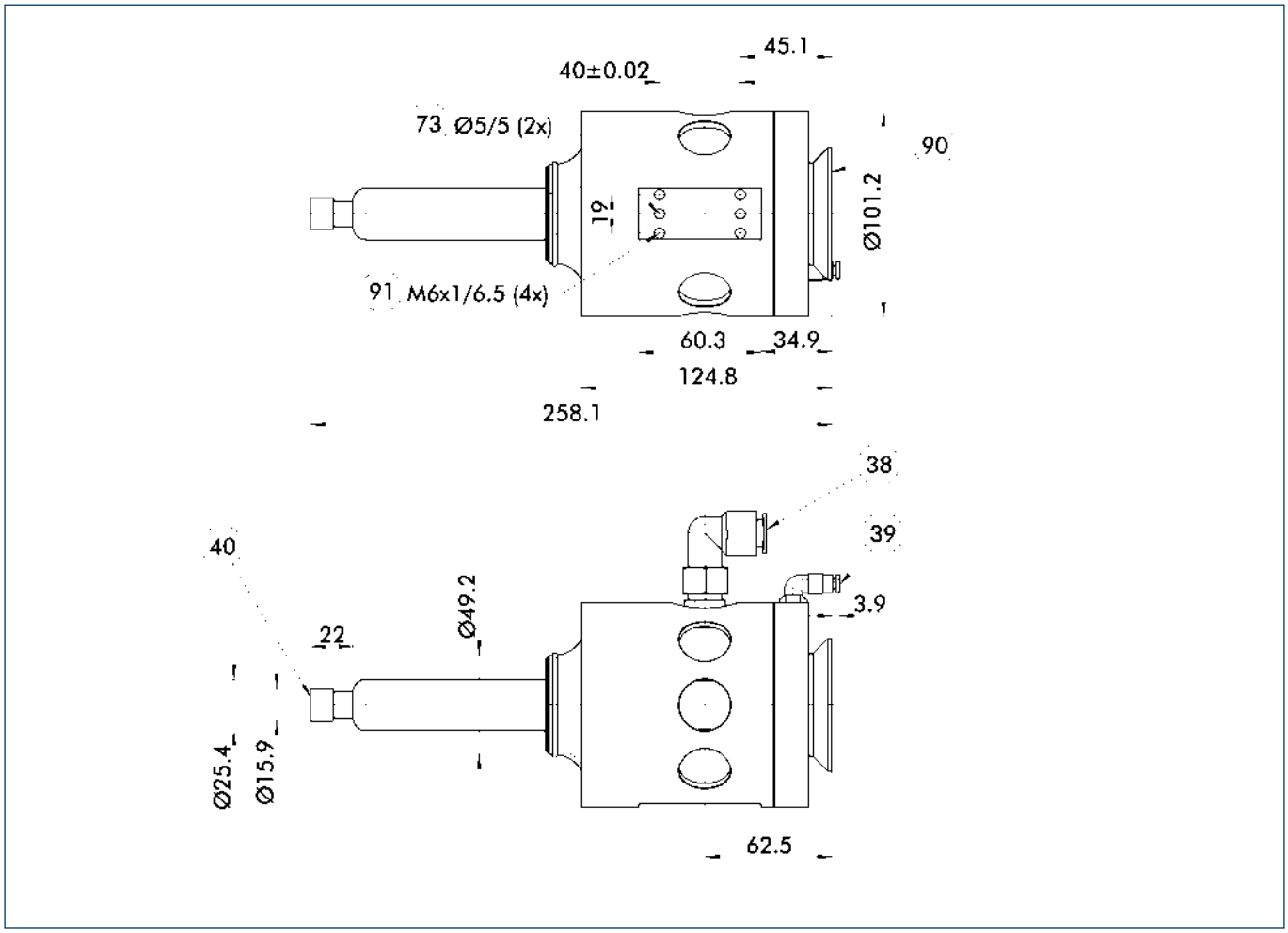


ⓘ The indicated forces show the maximum compensation forces.

Technical data

Description		FDB-660
ID		0322203
Power	[W]	660
max. compensation X	[mm]	±8.9
max. compensation Y	[mm]	±8.9
Recommended compensation	[mm]	±4.4
min. compliance force	[N]	12
max. compliance force	[N]	42
min. compliance pressure	[bar]	0.3
max. compliance pressure	[bar]	4.1
Idle speed	[1/min]	40000
Idle air consumption	[l/s]	5.4
Stalled air consumption	[l/s]	18
Collet size	[mm]	6
Mass	[kg]	2.22
min. / max. ambient temperature	[°C]	5/60

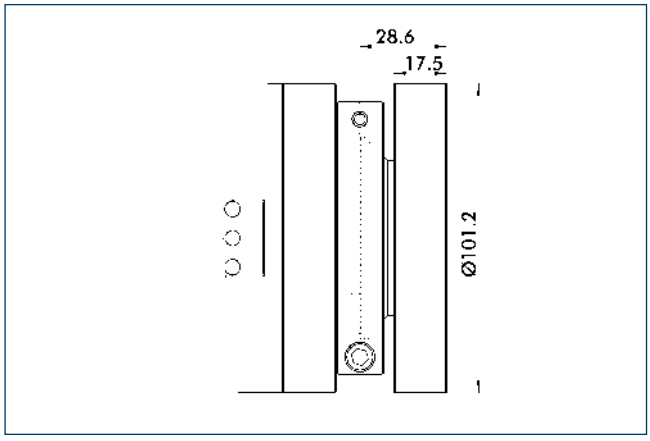
Main view



The main view shows the unit in its basic version.

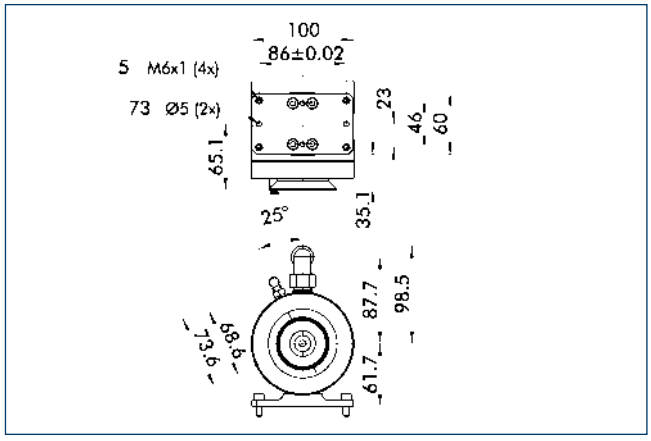
(38) Spindle air connection
(39) Compensation air connection
(40) Collet
(73) Fit for a centering pin
(90) Axial connection
(91) Radial connection

Adapter plates, axial



Description	ID	Height
Robot-side		
A-FDB-axial-660	0322211	28.6 mm

Adapter plates, radial



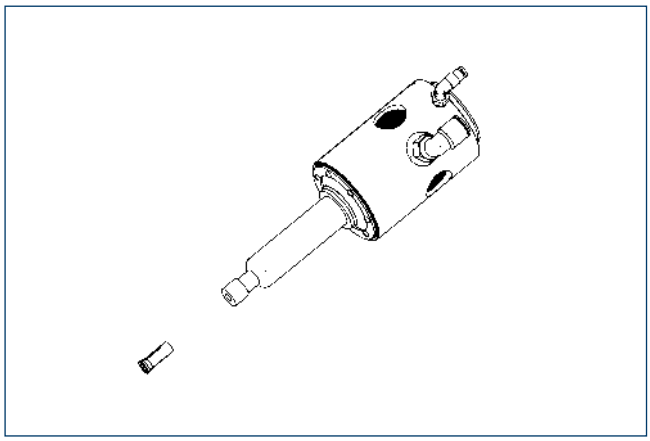
(5) Through-hole for connection with screws
(73) Fit for a centering pin

Description	ID	
Stationary		
A-FDB-radial-660	0322214	

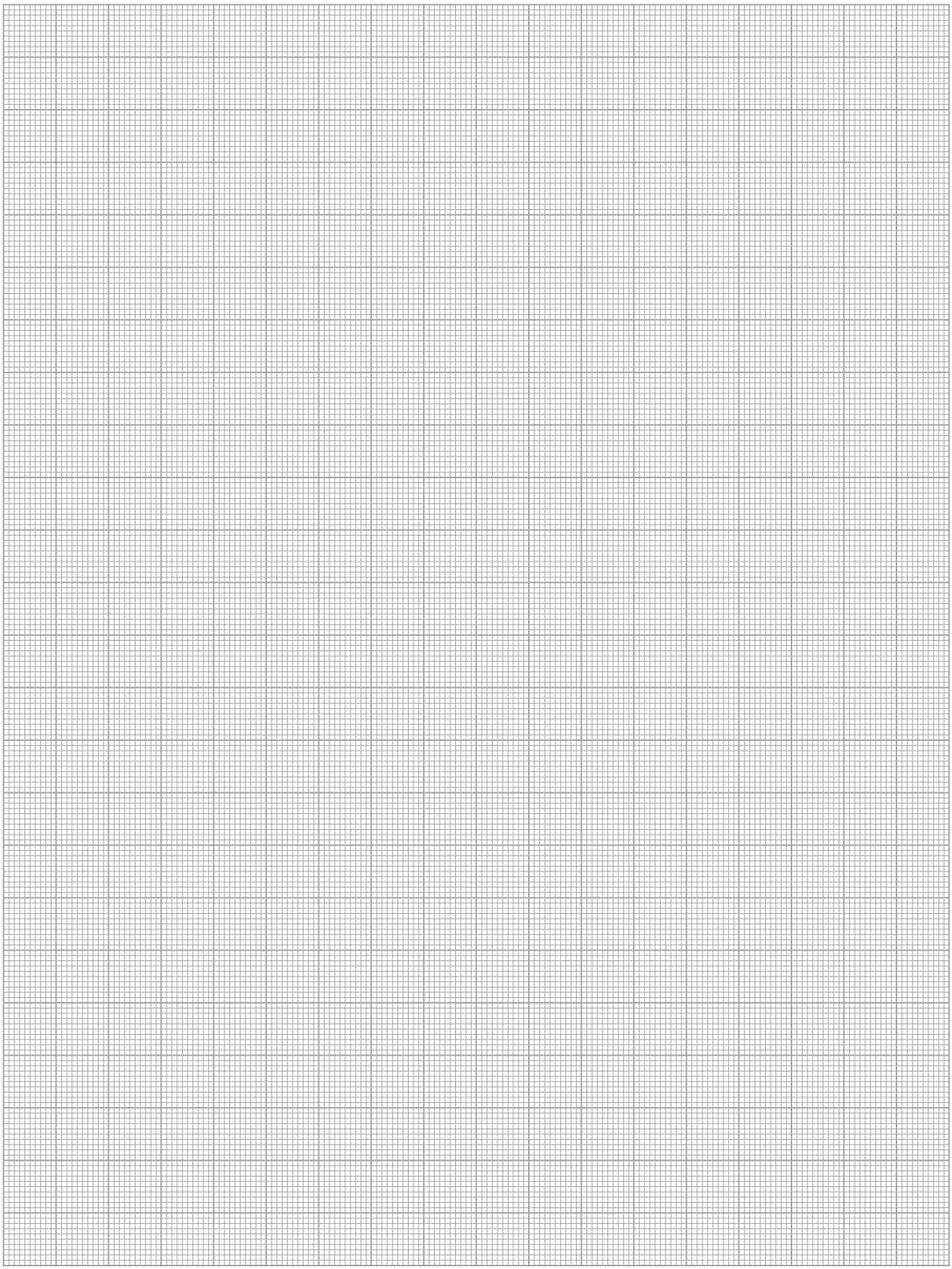
FDB 660

Robot Accessories | Finishing | Deburring Spindle

Collets



Description	ID	Diameter
Collet FDB-C-12442	0322220	3 mm
Collet FDB-C-12443	0322226	1/8“
Collet FDB-C-12445	0322222	6 mm
Collet FDB-C-12446	0322225	1/4“



Compliant. Reliable. Flexible.

FDB-AC Deburring Spindle

Flexible deburring spindle for use with robots.

Field of Application

Standard solution for versatile and robot-guided deburring of all sorts of workpieces

Advantages – Your benefit

Flexible high-frequency spindle for maximum flexibility when deburring

Pneumatically-adjustable rigidity of the cutting spindle for clean chamfer edges in every installation position

High RPM for high feed rates

Flexible use on robot arm or as stationary unit

Sizes	Idle speed max.	Power
Quantity: 2	30000 1/min	250 W

Functional Description

The unit is driven via a pneumatic spindle, which is available in straight and 90° version at a speed of up to 30,000 rotations per minute. The spindle is axially mounted and therefore can compensate tolerances while following up the machining contour. The maximum pathe at the milling cutter tip amounts to ±4 mm. The power (rigidity), which is required for moving the spindle (axially), is controlled via a second air connection. Depending on the pressure, a force between 1 N to 25 N effects on the cut surface.

① **Milling cutter**
conical 90° for optimal deburring

② **Compensation piston**
for adjusting the pressure force on the workpiece

③ **Pneumatic spindle**
High performance spindle with up to 30,000 1/min

④ **Pneumatic connection for the spindle**
with large cross-section for compressed air motor

⑤ **Pneumatic connection for compensation**
Adjustable stiffness of the compensating spindle via oiled air

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Mounting: on robot arm or as stationary unit

Actuation: pneumatic, via oiled air pressure

Scope of delivery: Clamping tool and mills

Warranty: 24 months (details, general terms and conditions and operation manuals can be downloaded at www.schunk.com)

Environmental conditions: Please note that the unit is not suitable for use in an area where coolants or cutting fluids are present.

Application example

Robot-controlled deburring of connecting rod cast parts

1. SWS Quick-change System
2. FDB-AC-90 Axially-Compliant Deburring Spindle
3. Clamping Force Block

SCHUNK offers more ...

The following components make the FDB-AC even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Milling Cutter

SWS Quick-change Systems

DDF 2 Rotary Feed-through

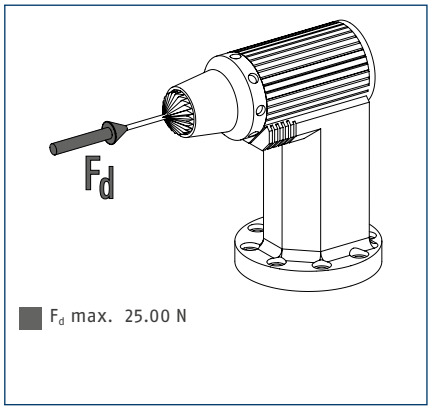
HWS Manual Gripper Change Systems

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

FDB-AC 90

Robot Accessories | Finishing | Deburring Spindle

Forces and moments

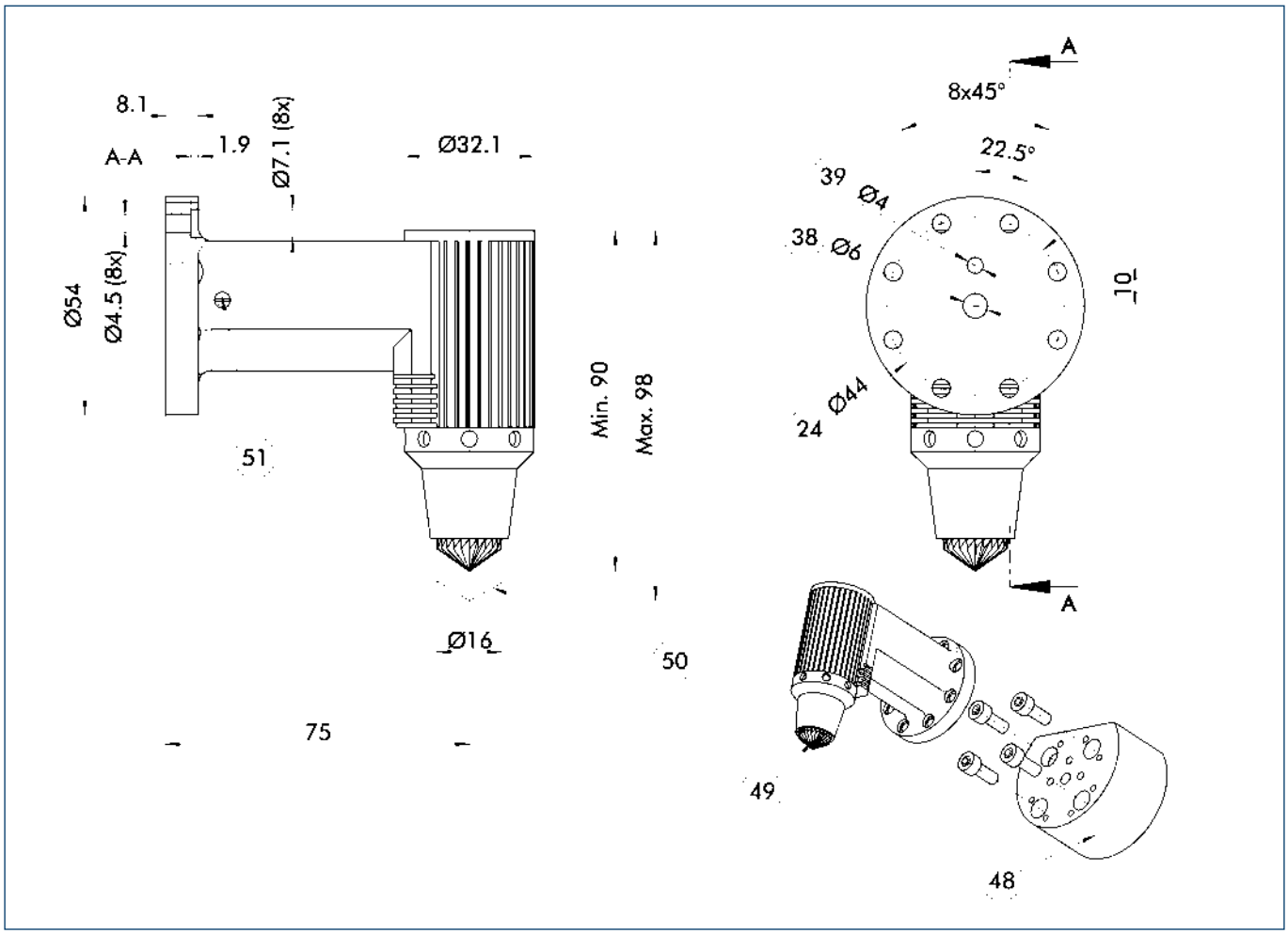


ⓘ The shown force shows the maximum compensation force.

Technical data

Description		FDB-AC-90
ID		0322206
Power	[W]	250
max. compensation	[mm]	±4.1
Recommended compensation	[mm]	±2
min. compliance force	[N]	1
max. compliance force	[N]	25
min. compliance pressure	[bar]	1
max. compliance pressure	[bar]	3
Idle speed	[1/min]	30000
Idle air consumption	[l/s]	6.6
Mass	[kg]	0.5
min. / max. ambient temperature	[°C]	5/60

Main view



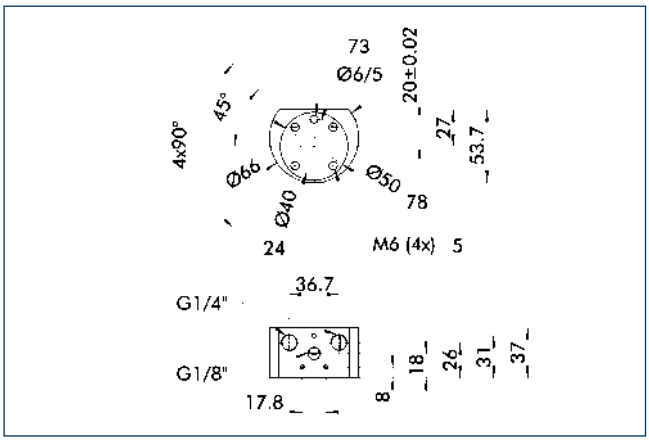
The main view shows the unit in its basic version.

(24) Bolt circle
(38) Spindle air connection
(39) Compensation air connection
(48) Adapter is needed for air supply
(49) Milling cutter
(50) Axial compensation
(51) Adjustment screw

FDB-AC 90

Robot Accessories | Finishing | Deburring Spindle

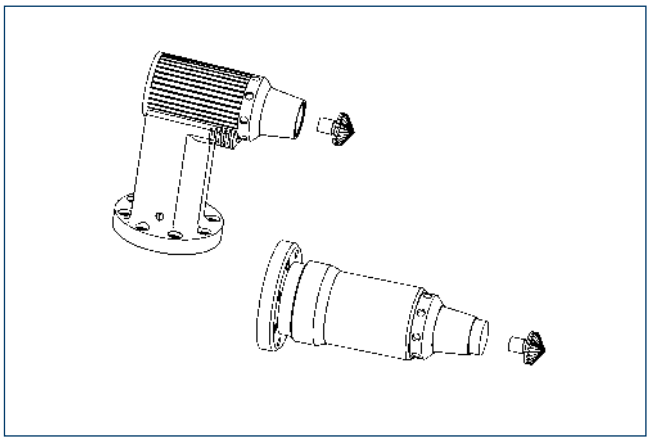
Adapter for air supply



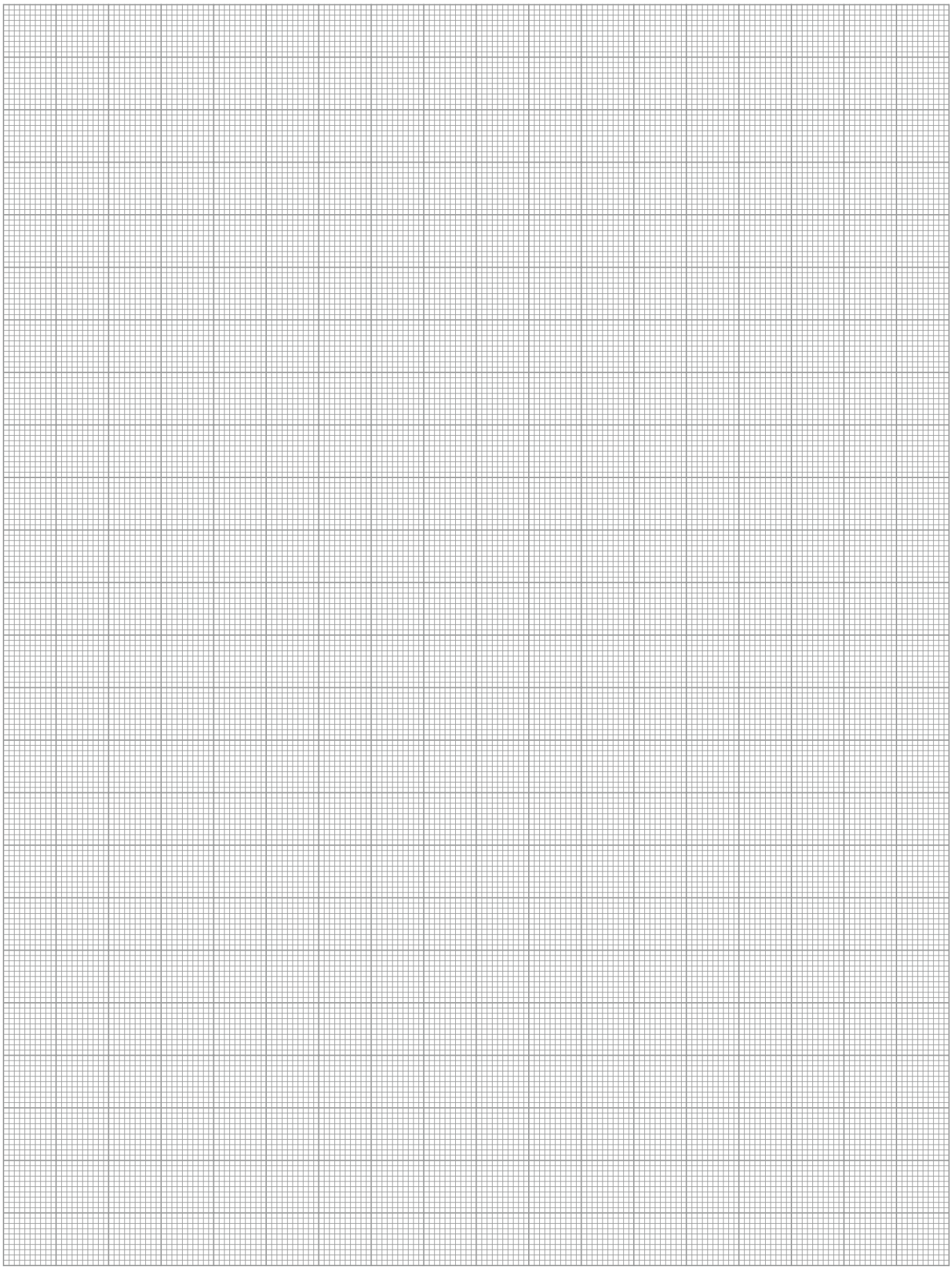
(5) Through-hole for connection with screws
(24) Bolt circle
(73) Fit for a centering pin
(78) Fitting for centering

Description	ID	Height
Robot-side		
A-FDB-AC	9951358	37 mm

Cutters for replacements



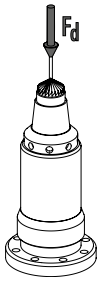
Description	ID	Application	Angle
FDB-AC-DT-4759-C2	9951359	Hard metal	90°
FDB-AC-DT-4795-C5	9951360	Steel	90°
FDB-AC-DT-4153-C5	9955883	Finishing	90°
FDB-AC-DT-43967	9871164	Plastics / Compounds	90°
FDB-AC-DT-1010-C2	9954737	Soft metal	80°



FDB-AC 180

Robot Accessories | Finishing | Deburring Spindle

Forces and moments



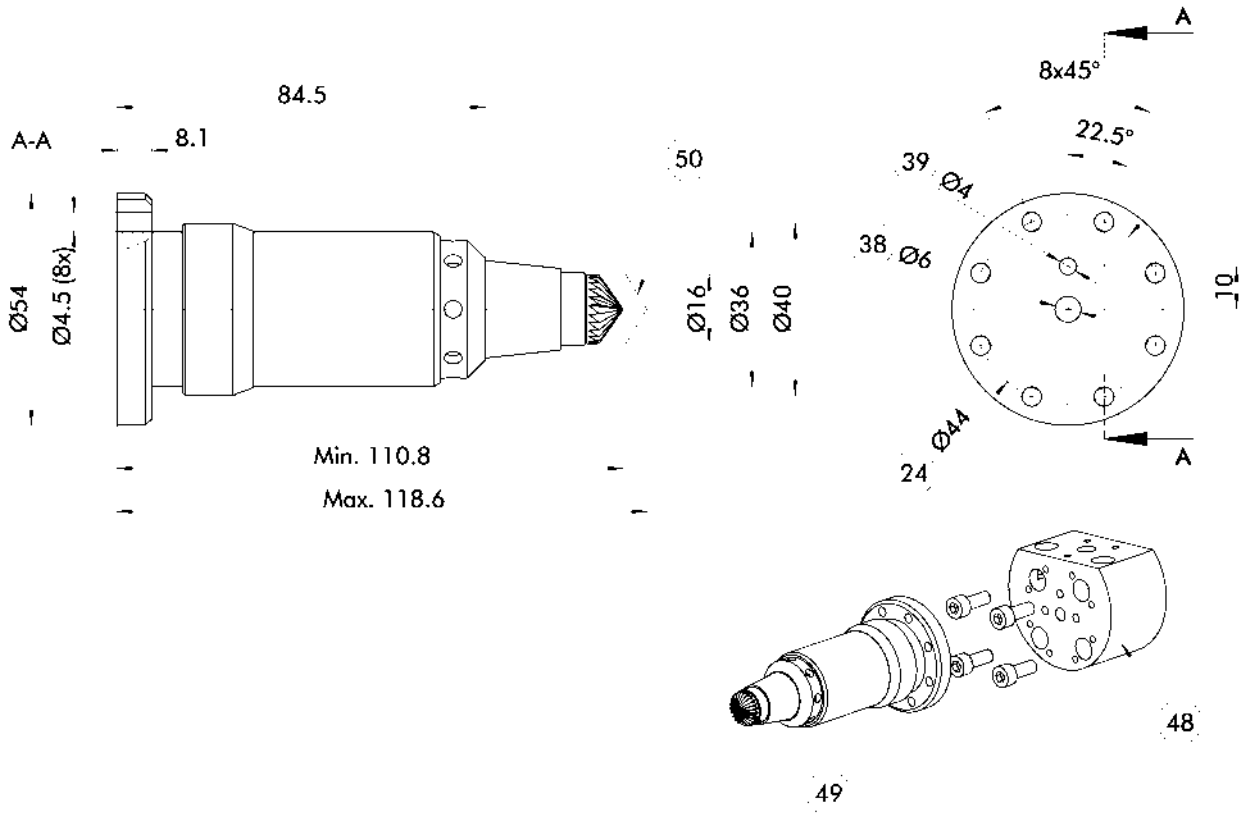
F_d max. 25.00 N

ⓘ The shown force shows the maximum compensation force.

Technical data

Description		FDB-AC-180
ID		0322207
Power	[W]	250
max. compensation	[mm]	±4.1
Recommended compensation	[µm]	±2
min. compliance force	[N]	1
max. compliance force	[N]	25
min. compliance pressure	[bar]	1
max. compliance pressure	[bar]	3
Idle speed	[1/min]	30000
Idle air consumption	[l/s]	6.6
Mass	[kg]	0.51
min. / max. ambient temperature	[°C]	5/60

Main view



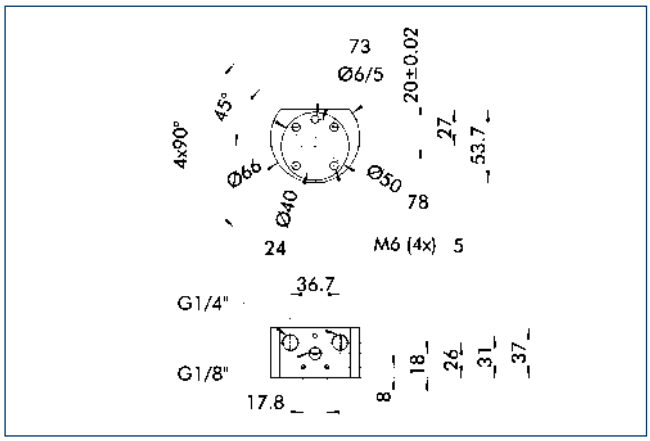
The main view shows the unit in its basic version.

(24) Bolt circle
(38) Spindle air connection
(39) Compensation air connection
(48) Adapter is needed for air supply
(49) Milling cutter
(50) Axial compensation

FDB-AC 180

Robot Accessories | Finishing | Deburring Spindle

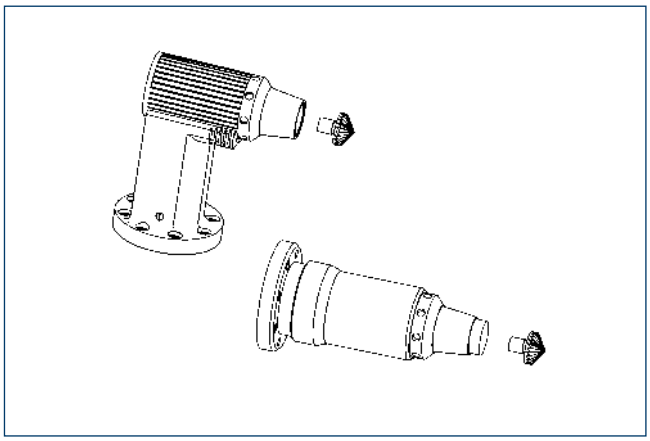
Adapter for air supply



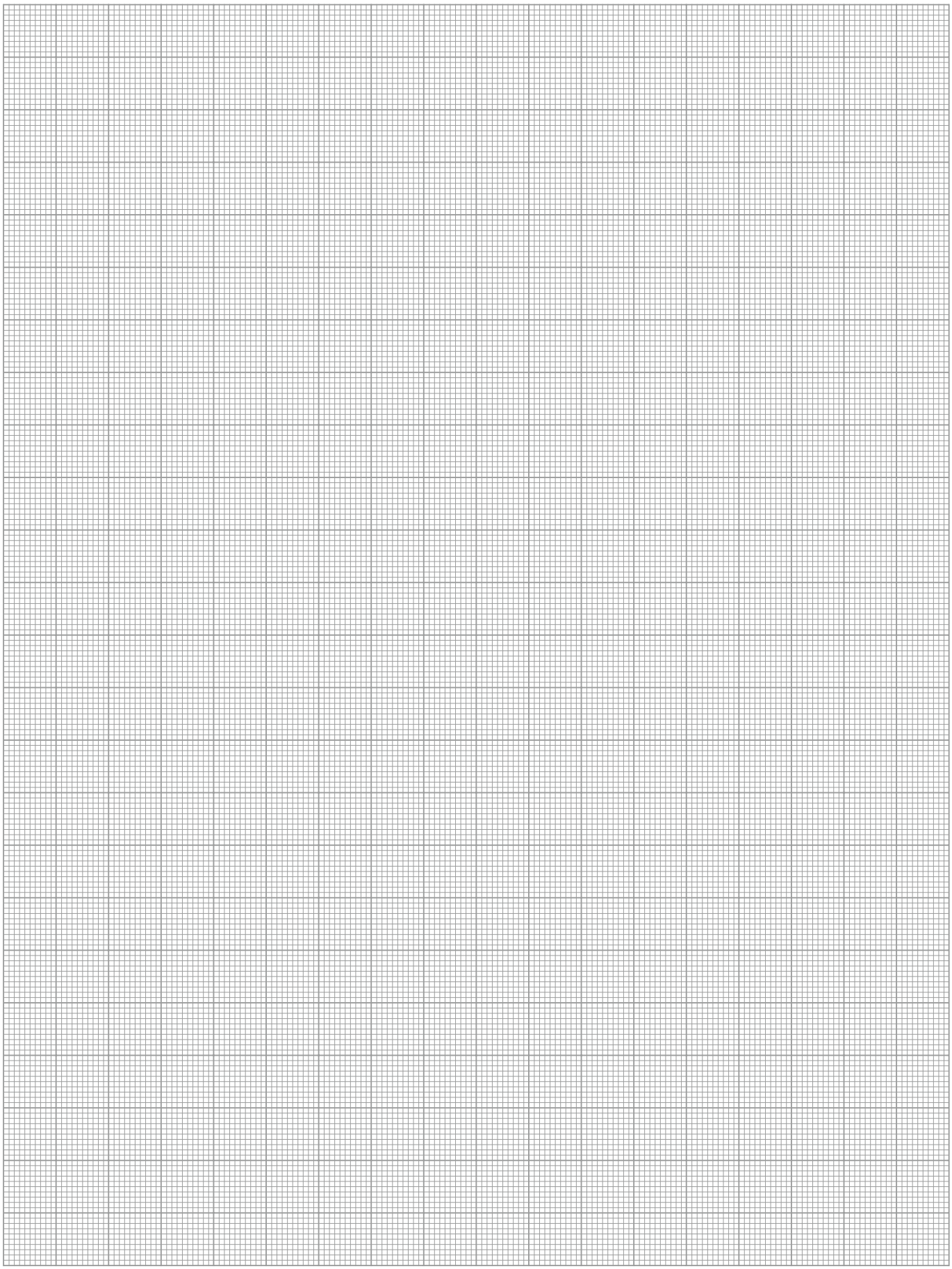
(5) Through-hole for connection with screws
(24) Bolt circle
(73) Fit for a centering pin
(78) Fitting for centering

Description	ID	Height
Robot-side		
A-FDB-AC	9951358	37 mm

Cutters for replacements



Description	ID	Application	Angle
FDB-AC-DT-4579-C2	9951359	Hard metal	90°
FDB-AC-DT-4579-C5	9951360	Steel	90°
FDB-AC-DT-4153-C5	9955883	Finishing	90°
FDB-AC-DT-43967	9871164	Plastics / Compounds	90°
FDB-AC-DT-1010-C2	9954737	Soft metal	80°



Productive. Compliant. Robust.

MFT Polishing Spindle

Compliant polishing spindle for use on a robot.

Field of Application

Standard solution for flexible and robot guided polishing of various workpieces and for different surfaces

Advantages – Your benefit

Flexible high-frequency spindle for maximum flexibility when polishing

Adjustable rigidity of the spindle via air pressure for smooth surfaces in every installation position

High speeds for high feed rates

Sensor system optional for stroke retracted / extended and rotational speed monitoring

Sizes	Idle speed max.	Power
Quantity: 1	5600 1/min	390 W

Functional Description

Different tools such as wire brushes, grinding wheels, polishing brushes or deburring tools can be secured via the tool mounting on the MFT. The application pressure can be regulated via air pressure and ranges from 14 N (3.1 lbf) at 0.34 bar to 74 N at 4.1 bar. The MFT is also optimal for uneven surfaces since it can compensate in the axial direction up to 15 mm while still applying a constant application pressure. This force control guarantees high stiffness perpendicular to the surface and the desired compensation in the machining direction.

① **Tool mounting**
for different tool diameters

② **Dust cover**
protects the bearings from contamination

③ **Pneumatic spindle**
High performance spindle with up to 5,600 1/min

④ **Bearing**
for compensation of the pneumatic spindle

⑤ **Silencer**
for exhaust

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

General Notes to the Series

Actuation: pneumatic, via dry, filtered and lubricated air

Environmental conditions: Please note that the unit is not suitable for use in an area where coolants or cutting fluids are present.

Application example

Robot application for deburring a workpiece after machining

1. MFT Polishing Spindle
2. SWS Quick-change System
3. Clamping Force Block

SCHUNK offers more ...

The following components make the MFT even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Adapter Plates

Fittings

SWS Quick-change System

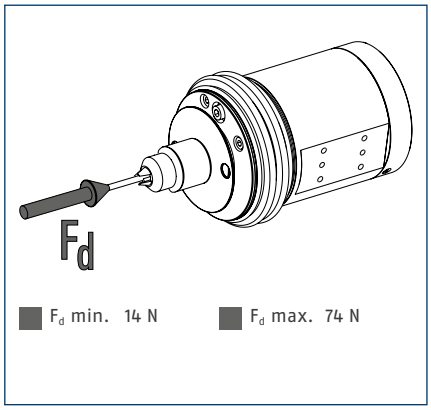
HWS Manual Gripper Change System

ⓘ Further information regarding the products can be found on the following products pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

MFT 390

Robot Accessories | Finishing | Polishing Spindle

Forces and moments



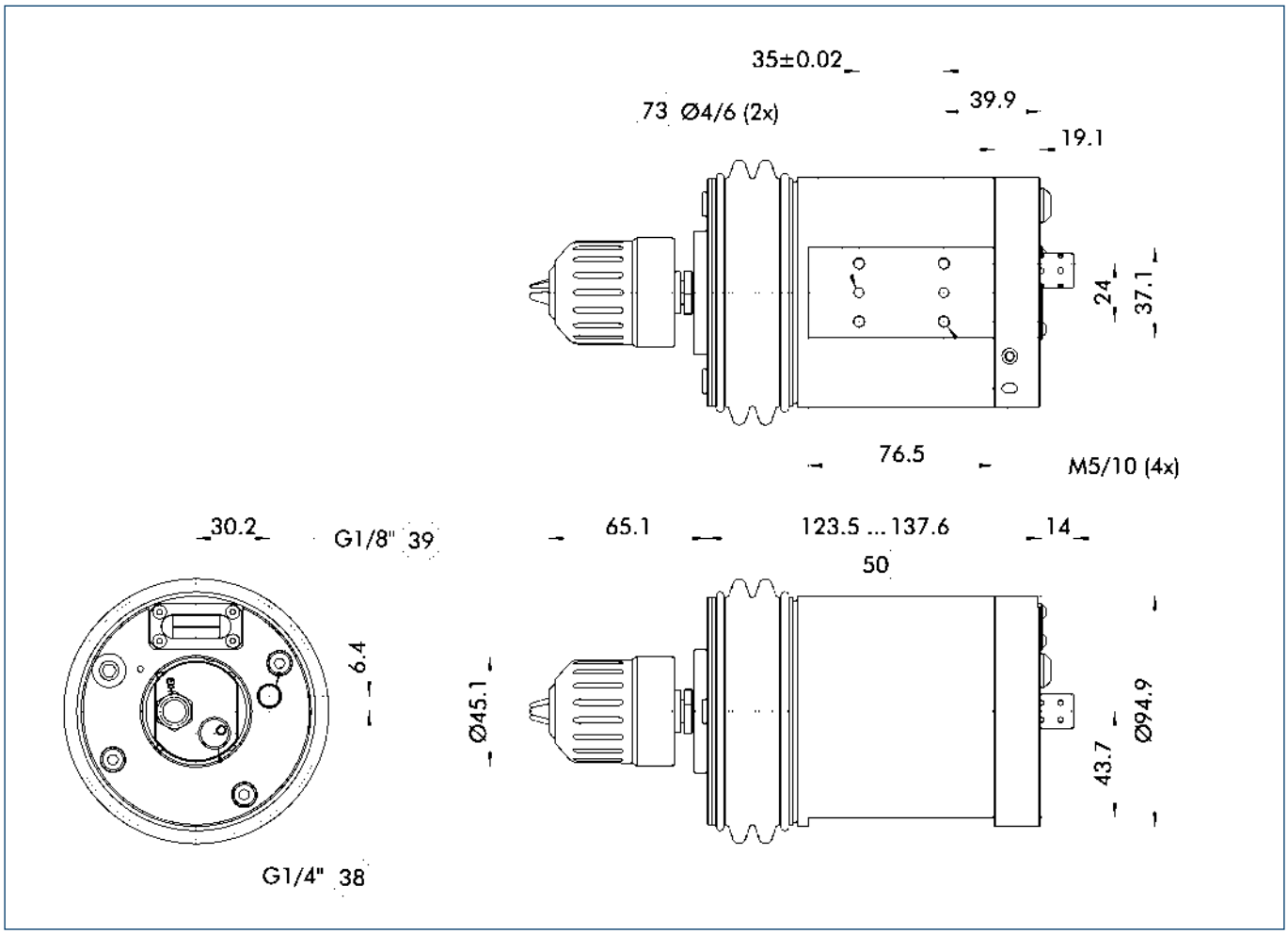
ⓘ The shown force shows the maximum compensation force.

Technical data

Description		MFT-390-F-0-0	MFT-390-F-R-0	MFT-390-F-0-T	MFT-390-F-R-T
ID		0322250	0322251	0322252	0322253
Power	[W]	390	390	390	390
max. compensation	[mm]	15	15	15	15
Recommended compensation	[mm]	±7.5	±7.5	±7.5	±7.5
min. compliance force	[N]	14	14	14	14
max. compliance force	[N]	74	74	74	74
Idle speed	[1/min]	5600	5600	5600	5600
Mass	[kg]	3.3	3.3	3.3	3.3
Air consumption	[l/s]	9	9	9	9
Stroke monitoring, retracted*		no	yes	no	yes
Stroke monitoring, extended*		yes	yes	yes	yes
Tachometer sensor*		no	no	yes	yes
max. clamping diameter	[mm]	9.5	9.5	9.5	9.5

* Inductive sensors are included in the scope of delivery

Main view



(38) Spindle air connection
(39) Compensation air connection
(50) Axial compensation
(73) Fit for a centering pin

SCHUNK Original Accessories Fit 100%.

Accessories

Sensor System

IN Inductive Proximity Switches

Series	Size	Page
IN		732
IN	5	734
IN	8	736
IN	41	738
IN	50	740
IN	80	742
IN	120	746

MMS Electronic Magnetic Switches

Series	Size	Page
MMS		748
MMS	22	750
MMS	65	754

MMS PI1 Programmable Magnetic Switch

Series	Size	Page
MMS PI1		756
MMS PI1	22	758

MMS PI2 Programmable Magnetic Switch

Series	Size	Page
MMS PI2		762
MMS PI2	22	754

MMS-P Programmable Magnetic Switch

Series	Size	Page
MMS-P		768
MMS-P	22	770

Sensor System Accessories

SST Sensor Tester

Series	Size	Page
SST		772

CLI Clip

Series	Size	Page
CLI		776

Cable, Connector, and Distributor

KA Connection Cable

Series	Size	Page
KA		780
KA	M8	782
KA	M9	784

Series	Size	Page
KA	M12	786
KA	M16	788

KBU / KST Cable Connector

Series	Size	Page
KBU / KST		790
KBU / KST	M8	792
KBU / KST	M12	794

Series	Size	Page
KBU / KST	M16	796

KV Cable Extensions

Series	Size	Page
KV		798
KV	M8	800
KV	M12	802

V Sensor Distributor

Series	Size	Page
Sensor Distributor		804
Sensor Distributor	Y	806
Sensor Distributor	V2	808

Series	Size	Page
Sensor Distributor	V4	810
Sensor Distributor	V8	812

Fastening Elements

ZHU / ZH Centering Elements

Series	Size	Page
Centering elements		814
Centering elements	ZHU	816

Valves and Screw Connection

WV Elbow Fittings

Series	Size	Page
WV		818

SWV Swivel Fittings

Series	Size	Page
SWV		822

DRV Banjo Fittings with One-way Flow Control Valves

Series	Size	Page
DRV		826

Reliable. Non-contact. Easy Assembly.

IN Inductive Proximity Switches

Inductive proximity switches are used to monitor the current status of automation components. SCHUNK supplies them in two versions – IN (sensor with 30 cm molded cable and cable connector) and INK (sensor with 2 m supply cable and wire strands for connecting).

Field of Application

For monitoring of gripping and rotary modules, linear modules, and robot accessories. Inductive SCHUNK sensors detect metals without contact and are resistant to vibration, dust, and humidity. For connection with a digital input module (utilization categorie DC-12).

Advantages – Your benefit

Mounting using brackets for easy and fast attachment

Version with LED-display for checking the switching position directly at the sensor

Version with connector for fast and easy exchangeability of the extension cable

Very flexible cable in PUR-version for a long service lifetime and resistance against many chemicals

Proximity switches for flush installation for minimal interfering contours in the application

Options and special Information

Protection class as per DIN 40050 IP67 in plugged position for use in clean or dusty environments or if in contact with water. Functionability in case of contact with other mediums (coolant, acids, bases, etc.) is often given, however cannot be guaranteed by SCHUNK.

Power supply 10 – 30 V DC, residual ripple < 15%

Type of switching PNP

Warranty 24 months (details, general terms and conditions, and operation manuals can be downloaded at www.schunk.com)

Application Example

① **IN Plug-in sensors**

② **SRU-plus Universal Rotary Actuator**

③ **PGN-plus Universal Gripper**

④ **KST Cable Connector**

SCHUNK offers more ...

The following components make the IN even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Sensor Cables

Sensor Distributor

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com.
Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

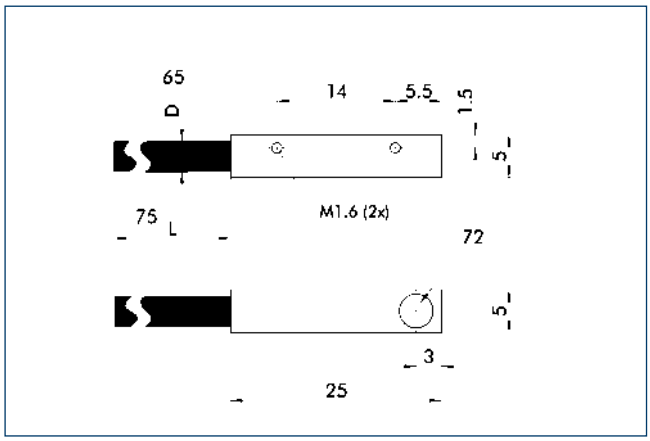
CAD data, operating manuals and other current product documents are available at **www.schunk.com**

IN 5

Technical data

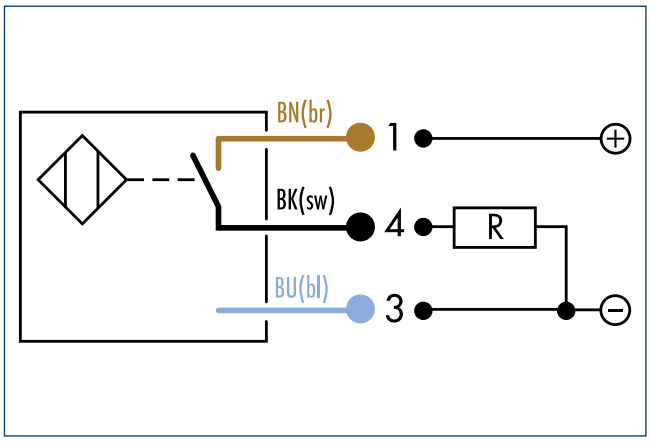
Description		IN 5-S-M8	IN 5-S-M12	INK 5-S
ID		0301469	0301569	0301501
Switching function		Closer	Closer	Closer
Type of switching		PNP	PNP	PNP
Switching distance	[mm]	1	1	1
Switching hysterisis from the nominal switching distance		< 15%	< 15%	< 15%
max. switching frequency	[Hz]	3000	3000	3000
Product weight	[kg]	0.05	0.05	0.06
min. / max. ambient temperature	[°C]	-25/70	-25/70	-25/70
IP class (sensor)		67	67	67
IP class (sensor connected)		67	67	67
LED display in sensor		no	no	no
Type of voltage		DC	DC	DC
Nominal voltage	[V]	24	24	24
min. voltage	[V]	10	10	10
max. voltage	[V]	30	30	30
Voltage drop	[V]	1.5	1.5	1.5
max. switching current	[A]	0.2	0.2	0.2
Cable diameter D	[mm]	3.5	3.5	3.5
min. bending radius (dynamically)	[mm]	35	35	35
min. bending radius (statically)	[mm]	17.5	17.5	17.5
Number of wires		3	3	3
Wire cross section	[mm²]	0.14	0.14	0.14
Cable length L	[cm]	30	30	200
Cable connector / cable end		M8	M12	open wires

IN 5 main view

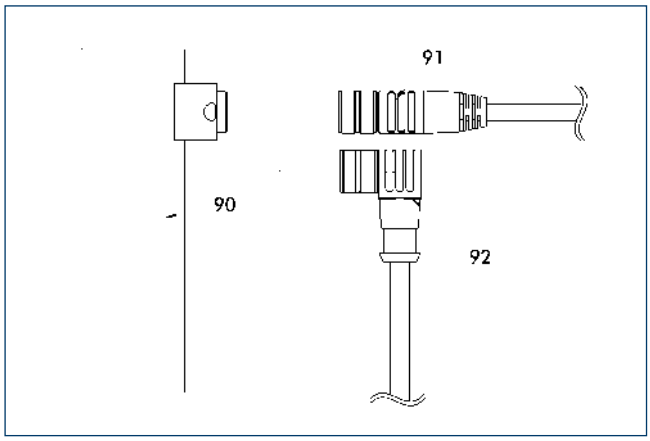


(65) Cable diameter
(75) Cable length
(72) Active sensor surface

Circuit diagram of PNP closer



Cable connector / cable extension



(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

Description	ID	Length	Connection electric cabinet sided	Often combined
Connection cables				
KA BG08-L 3P-0300-PNP	0301622	3 m	open wires	●
KA BG08-L 3P-0500-PNP	0301623	5 m	open wires	
KA BG12-L 3P-0500-PNP	30016369	5 m	open wires	
KA BW08-L 3P-0300-PNP	0301594	3 m	open wires	
KA BW08-L 3P-0500-PNP	0301502	5 m	open wires	
KA BW12-L 3P-0300-PNP	0301503	3 m	open wires	
KA BW12-L 3P-0500-PNP	0301507	5 m	open wires	
Cable extensions				
KV BG12-SG12 3P-0030-PNP	0301999	0.3 m	Connector	
KV BG12-SG12 3P-0060-PNP	0301998	0.6 m	Connector	
KV BW08-SG08 3P-0030-PNP	0301495	0.3 m	Connector	
KV BW08-SG08 3P-0100-PNP	0301496	1 m	Connector	
KV BW08-SG08 3P-0200-PNP	0301497	2 m	Connector	●
KV BW12-SG12 3P-0030-PNP	0301595	0.3 m	Connector	
KV BW12-SG12 3P-0100-PNP	0301596	1 m	Connector	
KV BW12-SG12 3P-0200-PNP	0301597	2 m	Connector	

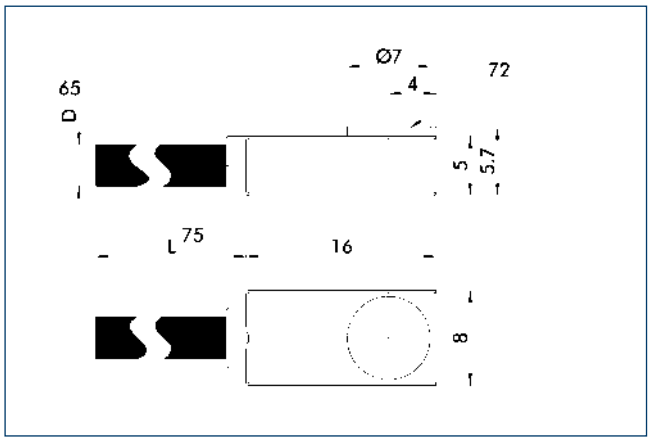
ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

IN 8

Technical data

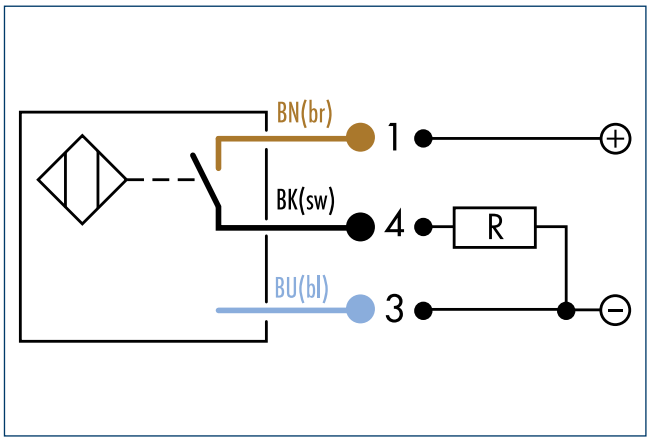
Description		IN 8-S-M8	IN 8-S-M12	INK 8-S
ID		0301481	0301581	9700052
Switching function		Closer	Closer	Closer
Type of switching		PNP	PNP	PNP
Switching distance	[mm]	1.5	1.5	0.8
Switching hysterisis from the nominal switching distance		< 10%	< 10%	< 15%
max. switching frequency	[Hz]	3000	3000	3000
Product weight	[kg]	0.04	0.08	0.01
min. / max. ambient temperature	[°C]	-25/70	-25/70	-25/70
IP class (sensor)		67	67	67
IP class (sensor connected)		67	67	67
LED display in sensor		no	no	no
Type of voltage		DC	DC	DC
Nominal voltage	[V]	24	24	24
min. voltage	[V]	10	10	10
max. voltage	[V]	30	30	30
Voltage drop	[V]	1.5	1.5	1.5
max. switching current	[A]	0.2	0.2	0.2
Cable diameter D	[mm]	3.5	3.5	3.5
min. bending radius (dynamically)	[mm]	35	35	35
min. bending radius (statically)	[mm]	17.5	17.5	17.5
Number of wires		3	3	3
Wire cross section	[mm²]	0.14	0.14	0.14
Cable length L	[cm]	30	30	200
Cable connector / cable end		M8	M12	open wires

IN 8 main view

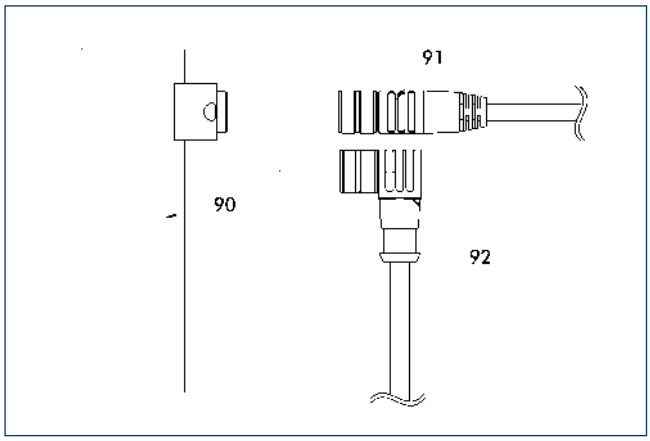


(65) Cable diameter
(72) Active sensor surface
(75) Cable length

Circuit diagram of PNP closer



Cable connector / cable extension



(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

Description	ID	Length	Connection electric cabinet sided	Often combined
Connection cables				
KA BG08-L 3P-0300-PNP	0301622	3 m	open wires	●
KA BG08-L 3P-0500-PNP	0301623	5 m	open wires	
KA BG12-L 3P-0500-PNP	30016369	5 m	open wires	
KA BW08-L 3P-0300-PNP	0301594	3 m	open wires	
KA BW08-L 3P-0500-PNP	0301502	5 m	open wires	
KA BW12-L 3P-0300-PNP	0301503	3 m	open wires	
KA BW12-L 3P-0500-PNP	0301507	5 m	open wires	
Cable extensions				
KV BG12-SG12 3P-0030-PNP	0301999	0.3 m	Connector	
KV BG12-SG12 3P-0060-PNP	0301998	0.6 m	Connector	
KV BW08-SG08 3P-0030-PNP	0301495	0.3 m	Connector	
KV BW08-SG08 3P-0100-PNP	0301496	1 m	Connector	
KV BW08-SG08 3P-0200-PNP	0301497	2 m	Connector	●
KV BW12-SG12 3P-0030-PNP	0301595	0.3 m	Connector	
KV BW12-SG12 3P-0100-PNP	0301596	1 m	Connector	
KV BW12-SG12 3P-0200-PNP	0301597	2 m	Connector	

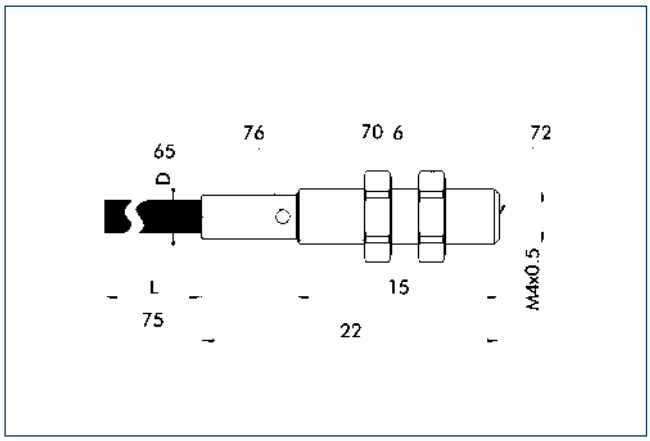
ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

IN 41

Technical data

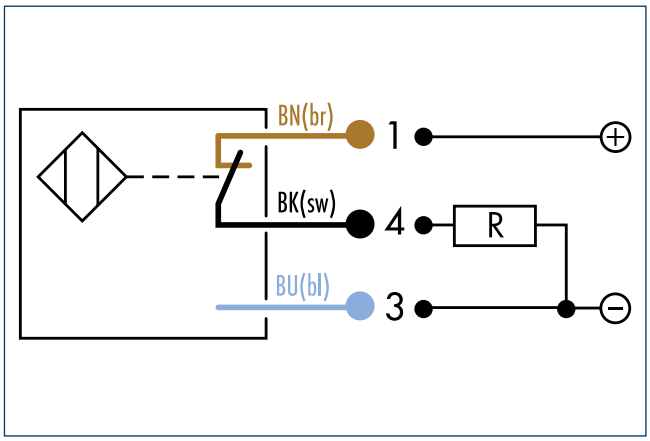
Description		IN 41-S-M8
ID		9941216
Switching hysterisis from the nominal switching distance		< 15%
max. switching frequency	[Hz]	3000
min. / max. ambient temperature	[°C]	-25/70
IP class (sensor)		67
IP class (sensor connected)		67
LED display in sensor		no
Type of voltage		DC
Nominal voltage	[V]	24
min. voltage	[V]	10
max. voltage	[V]	30
Voltage drop	[V]	1.5
max. switching current	[A]	0.2
Cable diameter D	[mm]	3.5
min. bending radius (dynamically)	[mm]	35
min. bending radius (statically)	[mm]	17.5
Number of wires		3
Wire cross section	[mm²]	0.14

IN 41 main view

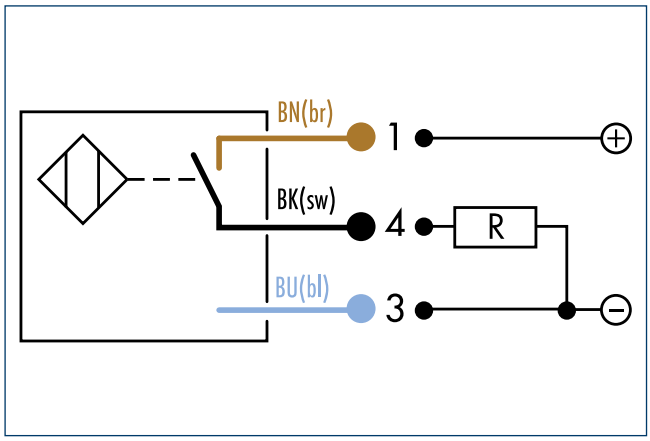


(65) Cable diameter
(70) Wrench size
(72) Active sensor surface
(75) Cable length
(76) LED

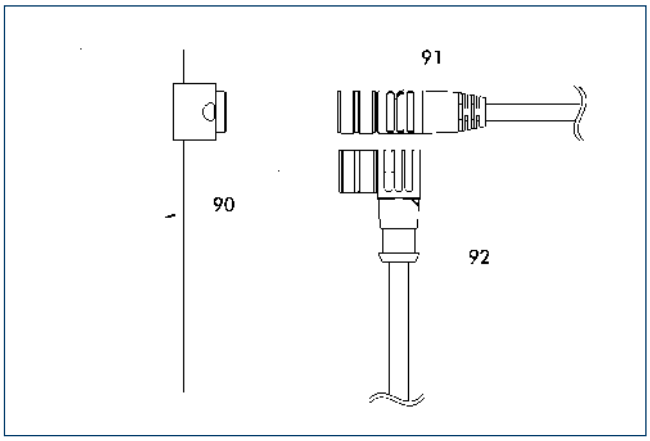
Wiring diagram opener PNP



Circuit diagram of PNP closer



Cable connector / cable extension



(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

Description	ID	Length	Connection electric cabinet sided	Often combined
Connection cables				
KA BG08-L 3P-0300-PNP	0301622	3 m	open wires	●
KA BG08-L 3P-0500-PNP	0301623	5 m	open wires	
KA BW08-L 3P-0300-PNP	0301594	3 m	open wires	
KA BW08-L 3P-0500-PNP	0301502	5 m	open wires	
Cable extensions				
KV BW08-SG08 3P-0030-PNP	0301495	0.3 m	Connector	
KV BW08-SG08 3P-0100-PNP	0301496	1 m	Connector	
KV BW08-SG08 3P-0200-PNP	0301497	2 m	Connector	●

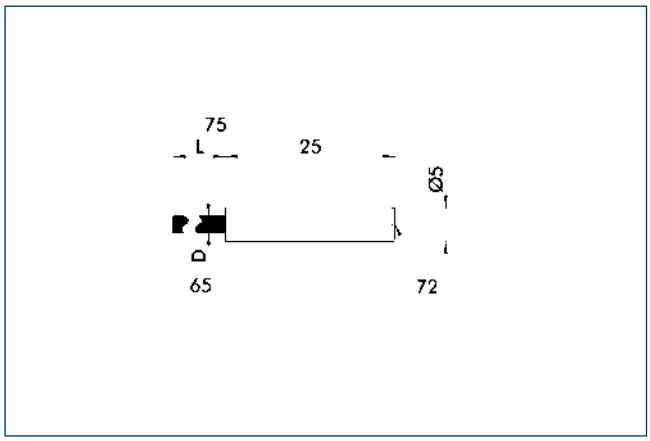
ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

IN 50

Technical data

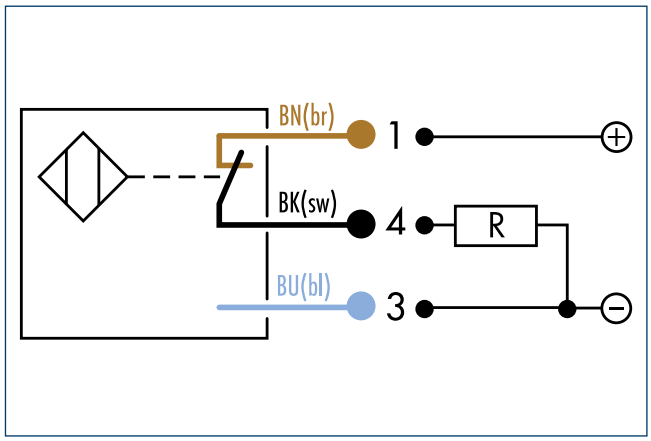
Description		IN 50-S-M8	IN 50-S-M12	INK 50-S
ID		0301568	0301575	0301560
Switching function		Closer	Closer	Closer
Type of switching		PNP	PNP	PNP
Switching distance	[mm]	1	1	1
Switching hysterisis from the nominal switching distance		< 5%	< 5%	< 5%
max. switching frequency	[Hz]	3000	3000	3000
Product weight	[kg]	0.07	0.07	0.01
min. / max. ambient temperature	[°C]	-25/70	-25/70	-25/70
IP class (sensor)		67	67	67
IP class (sensor connected)		67	67	67
LED display in sensor		yes	yes	no
Type of voltage		DC	DC	DC
Nominal voltage	[V]	24	24	24
min. voltage	[V]	10	10	10
max. voltage	[V]	30	30	30
Voltage drop	[V]	2	2	2
max. switching current	[A]	0.2	0.2	0.2
Cable diameter D	[mm]	3.5	3.5	3.5
min. bending radius (dynamically)	[mm]	35	35	35
min. bending radius (statically)	[mm]	17.5	17.5	17.5
Number of wires		3	3	3
Wire cross section	[mm²]	0.14	0.14	0.14
Cable length L	[cm]	30	30	200
Cable connector / cable end		M8	M12	open wires

IN 50 main view

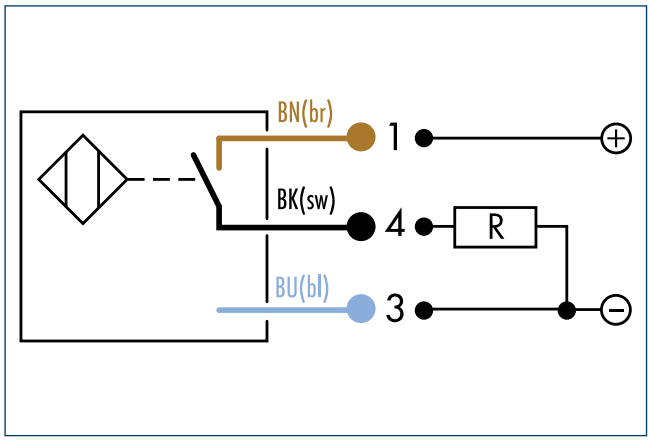


(65) Cable diameter
(72) Active sensor surface
(75) Cable length

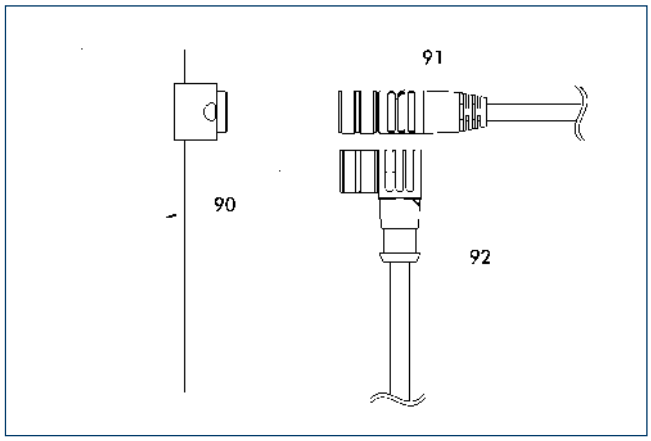
Wiring diagram opener PNP



Circuit diagram of PNP closer



Cable connector / cable extension



(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

Description	ID	Length	Connection electric cabinet sided	Often combined
Connection cables				
KA BG08-L 3P-0300-PNP	0301622	3 m	open wires	●
KA BG08-L 3P-0500-PNP	0301623	5 m	open wires	
KA BG12-L 3P-0500-PNP	30016369	5 m	open wires	
KA BW08-L 3P-0300-PNP	0301594	3 m	open wires	
KA BW08-L 3P-0500-PNP	0301502	5 m	open wires	
KA BW12-L 3P-0300-PNP	0301503	3 m	open wires	
KA BW12-L 3P-0500-PNP	0301507	5 m	open wires	
Cable extensions				
KV BG12-SG12 3P-0030-PNP	0301999	0.3 m	Connector	
KV BG12-SG12 3P-0060-PNP	0301998	0.6 m	Connector	
KV BW08-SG08 3P-0030-PNP	0301495	0.3 m	Connector	
KV BW08-SG08 3P-0100-PNP	0301496	1 m	Connector	
KV BW08-SG08 3P-0200-PNP	0301497	2 m	Connector	●
KV BW12-SG12 3P-0030-PNP	0301595	0.3 m	Connector	
KV BW12-SG12 3P-0100-PNP	0301596	1 m	Connector	
KV BW12-SG12 3P-0200-PNP	0301597	2 m	Connector	

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

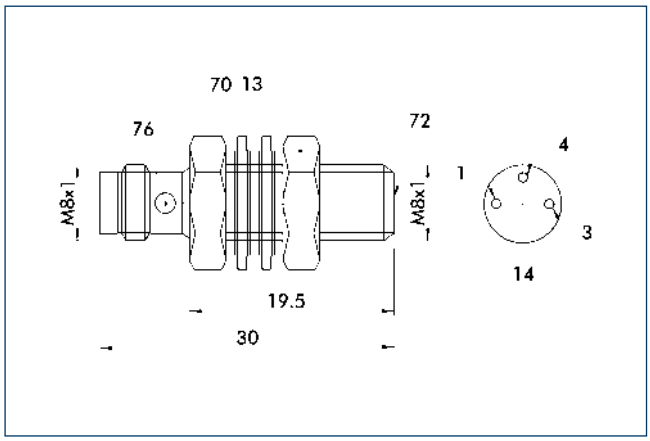
IN 80

Technical data

Description		IN 80-S-M8	IN 80-S-M12	INK 80-S	IN 80-O-M8	IN 80-O-M12	INK 80-O
ID		0301478	0301578	0301550	0301488	0301588	0301551
Switching function		Closer	Closer	Closer	Opener	Opener	Opener
Type of switching		PNP	PNP	PNP	PNP	PNP	PNP
Switching distance	[mm]	1.5	1.5	1.5	1.5	1.5	1.5
Switching hysterisis from the nominal switching distance		< 15%	< 15%	< 10%	< 15%	< 15%	< 10%
max. switching frequency	[Hz]	3000	3000	3000	3000	3000	3000
Product weight	[kg]	0.06	0.06	0.07	0.06	0.08	0.07
min. / max. ambient temperature	[°C]	-25/70	-25/70	-25/70	-25/70	-25/70	-25/70
IP class (sensor)		67	67	67	67	67	67
IP class (sensor connected)		67	67	67	67	67	67
LED display in sensor		yes	yes	yes	yes	yes	yes
Type of voltage		DC	DC	DC	DC	DC	DC
Nominal voltage	[V]	24	24	24	24	24	24
min. voltage	[V]	10	10	10	10	10	10
max. voltage	[V]	30	30	30	30	30	30
Voltage drop	[V]	1.5	1.5	1.5	1.5	1.5	1.5
max. switching current	[A]	0.2	0.2	0.2	0.2	0.2	0.2
Cable diameter D	[mm]	3.5	3.5	3.5	3.5	3.5	3.5
min. bending radius (dynamically)	[mm]	35	35	35	35	35	35
min. bending radius (statically)	[mm]	17.5	17.5	17.5	17.5	17.5	17.5
Number of wires		3	3	3	3	3	3
Wire cross section	[mm²]	0.14	0.14	0.14	0.14	0.14	0.14
Cable length L	[cm]	30	30	200	30	30	200
Cable connector / cable end		M8	M12	open wires	M8	M12	open wires
Options and their characteristics							
Version with lateral cable outlet		IN 80-S-M8-SA	IN 80-S-M12-SA	INK 80-S-SA			
ID		0301483	0301587	0301566			

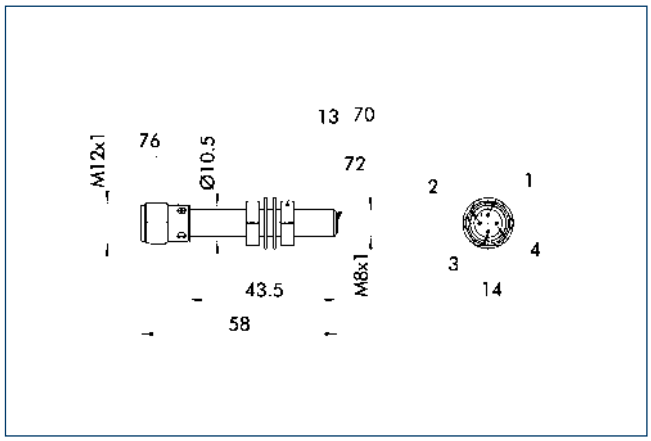
Description		IN 80-SL-M12	INK 80-SL	IN-B 80 S-M8	IN-B 80-S-M12	IN-C 80-S-M8
ID		0301529	0301579	0301477	0301479	0301475
Switching function		Closer	Closer	Closer	Closer	Closer
Type of switching		PNP	PNP	PNP	PNP	PNP
Switching distance	[mm]	3	3	1.5	1.5	1.5
Switching hysterisis from the nominal switching distance		< 10%	< 10%	< 15%	< 15%	< 15%
max. switching frequency	[Hz]	500	500	3000	3000	3000
Product weight	[kg]	0.03	0.09	0.02	0.02	0.01
min. / max. ambient temperature	[°C]	-25/70	-25/70	-25/70	-25/70	-25/70
IP class (sensor)		67	67	67	68	68
IP class (sensor connected)		67	67	67	68	68
LED display in sensor		yes	yes	yes	yes	yes
Type of voltage		DC	DC	DC	DC	DC
Nominal voltage	[V]	24	24	24	24	24
min. voltage	[V]	10	10	10	10	10
max. voltage	[V]	30	30	30	30	30
Voltage drop	[V]	1.5	1.5	1.5	1.5	1.5
max. switching current	[A]	0.2	0.2	0.2	0.2	0.1
Cable diameter D	[mm]	3.5	3.5	3.5	3.5	3.5
min. bending radius (dynamically)	[mm]	35	35	35	35	35
min. bending radius (statically)	[mm]	17.5	17.5	17.5	17.5	17.5
Number of wires		3	3	3	3	3
Wire cross section	[mm²]	0.14	0.14	0.14	0.14	0.14
Cable length L	[cm]	30	200			
Cable connector / cable end		M12	open wires	M8	M12	M8

IN-C 80 main view



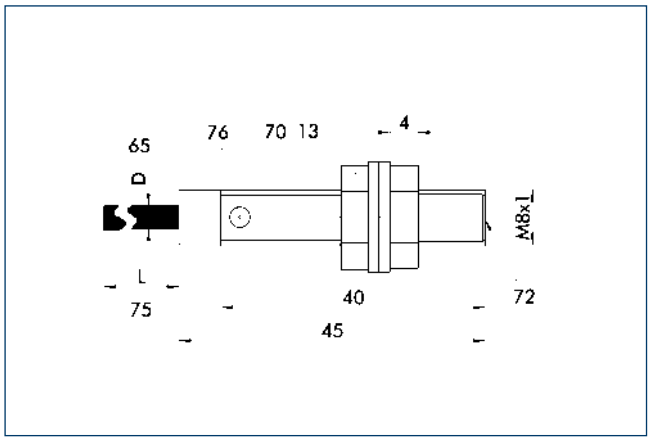
(14) Connector
(70) Wrench size
(72) Active sensor surface
(76) LED

IN-B 80 main view



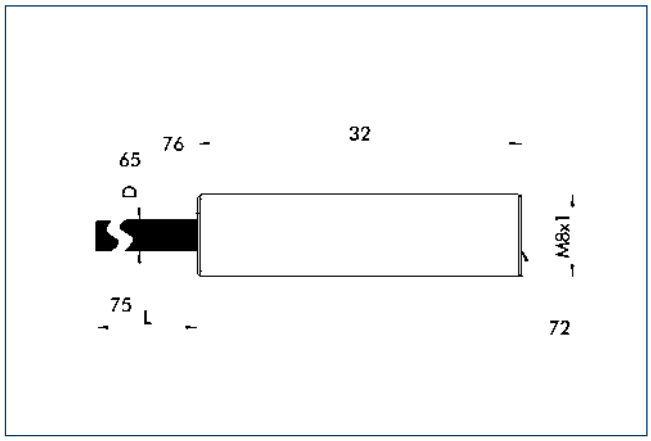
(14) Connector
(70) Wrench size
(72) Active sensor surface
(76) LED

IN 80-SL main view



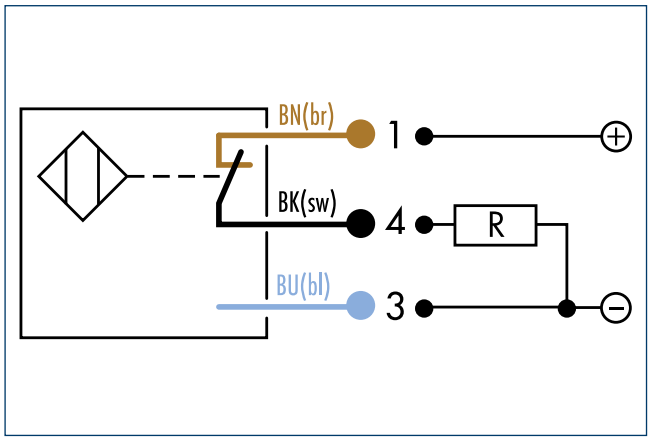
(65) Cable diameter
(70) Wrench size
(72) Active sensor surface
(75) Cable length
(76) LED

IN 80 main view

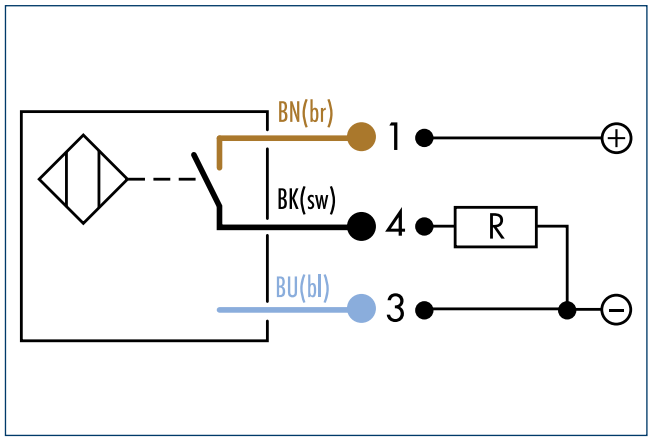


(65) Cable diameter
(72) Active sensor surface
(75) Cable length
(76) LED

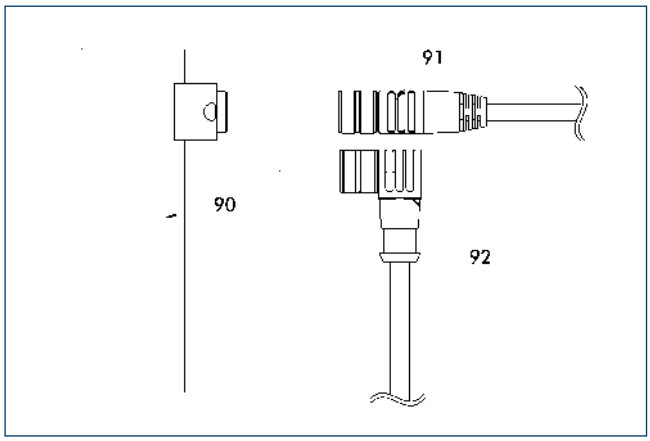
Wiring diagram opener PNP



Circuit diagram of PNP closer



Cable connector / cable extension



(90) Connecting point for component

(91) Cable with straight connection

(92) Cable with angular connection

Description	ID	Length	Connection electric cabinet sided	Often combined
Connection cables				
KA BG08-L 3P-0300-PNP	0301622	3 m	open wires	●
KA BG08-L 3P-0500-PNP	0301623	5 m	open wires	
KA BG12-L 3P-0500-PNP	30016369	5 m	open wires	
KA BW08-L 3P-0300-PNP	0301594	3 m	open wires	
KA BW08-L 3P-0500-PNP	0301502	5 m	open wires	
KA BW12-L 3P-0300-PNP	0301503	3 m	open wires	
KA BW12-L 3P-0500-PNP	0301507	5 m	open wires	
Cable extensions				
KV BG12-SG12 3P-0030-PNP	0301999	0.3 m	Connector	
KV BG12-SG12 3P-0060-PNP	0301998	0.6 m	Connector	
KV BW08-SG08 3P-0030-PNP	0301495	0.3 m	Connector	
KV BW08-SG08 3P-0100-PNP	0301496	1 m	Connector	
KV BW08-SG08 3P-0200-PNP	0301497	2 m	Connector	●
KV BW12-SG12 3P-0030-PNP	0301595	0.3 m	Connector	
KV BW12-SG12 3P-0100-PNP	0301596	1 m	Connector	
KV BW12-SG12 3P-0200-PNP	0301597	2 m	Connector	

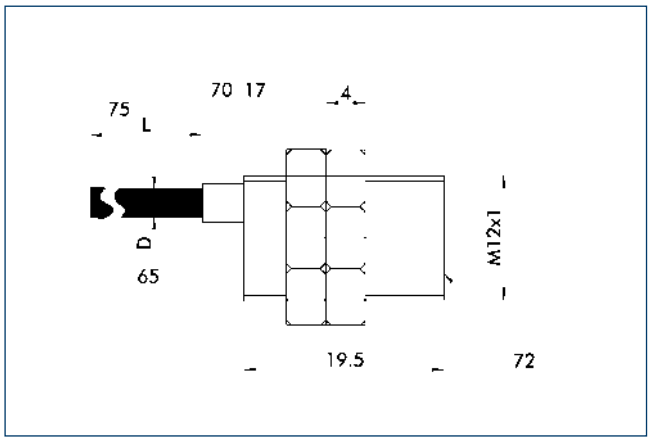
ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

IN 120

Technical data

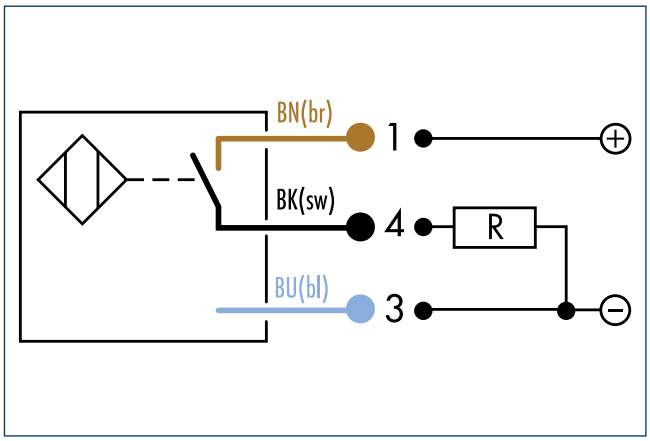
Description		IN 120-S-M12	INK 120-S
ID		0301592	0301562
Switching function		Closer	Closer
Type of switching		PNP	PNP
Switching distance	[mm]	2	2
Switching hysterisis from the nominal switching distance		< 10%	< 10%
max. switching frequency	[Hz]	800	800
Product weight	[kg]	0.07	0.13
min. / max. ambient temperature	[°C]	-25/70	-25/70
IP class (sensor)		67	67
IP class (sensor connected)		67	67
LED display in sensor		no	no
Type of voltage	[V]	DC	DC
Nominal voltage	[V]	24	24
min. voltage	[V]	10	10
max. voltage	[V]	30	30
Voltage drop	[A]	1.5	1.5
max. switching current	[mm]	0.2	0.2
Cable diameter D	[mm]	3.5	3.5
min. bending radius (dynamically)	[mm]	35	35
min. bending radius (statically)		17.5	17.5
Number of wires	[mm²]	3	3
Wire cross section	[cm]	0.14	0.14
Cable length L		30	200
Cable connector / cable end		M12	open wires

IN 120 main view

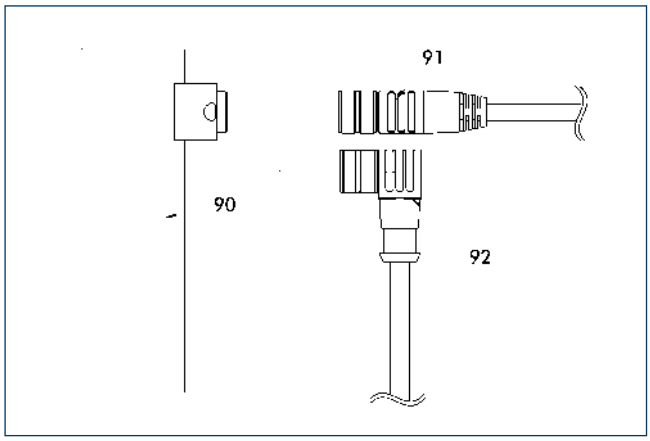


(65) Cable diameter
(70) Wrench size
(72) Active sensor surface
(75) Cable length

Circuit diagram of PNP closer



Cable connector / cable extension



(90) Connecting point for component
(91) Cable with straight connection
(92) Cable with angular connection

Description	ID	Length	Connection electric cabinet sided
Connection cables			
KA BG12-L 3P-0500-PNP	30016369	5 m	open wires
KA BW12-L 3P-0300-PNP	0301503	3 m	open wires
KA BW12-L 3P-0500-PNP	0301507	5 m	open wires
Cable extensions			
KV BG12-SG12 3P-0030-PNP	0301999	0.3 m	Connector
KV BG12-SG12 3P-0060-PNP	0301998	0.6 m	Connector
KV BW12-SG12 3P-0030-PNP	0301595	0.3 m	Connector
KV BW12-SG12 3P-0100-PNP	0301596	1 m	Connector
KV BW12-SG12 3P-0200-PNP	0301597	2 m	Connector

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

Non-Contact. Reliable. Easy Assembly.

MMS Electronic Magnetic Switches

Magnetic switches are used for monitoring the position of automation components. They detect the approach of a magnet without contact and, above a certain switching threshold, enable their output.

Field of Application

For use in the monitoring of gripping and rotary modules, linear modules, and robot accessories. Magnetic switches from SCHUNK detect metals without contact or wear, and are resistant to vibration, dust, and humidity. Magnetic switches are fitted in slots, and therefore do not form any additional interfering contours. For connection with a digital input module (utilization categorie DC-12).

Advantages – Your benefit

Installation into the sensor groove for space-saving, easy and fast assembly

Version with LED-display for checking the switching position directly at the sensor

Version with connector for fast and easy exchangeability of the extension cable

Very flexible cable in PUR-version for a long service lifetime and resistance against many chemicals

Options and special Information

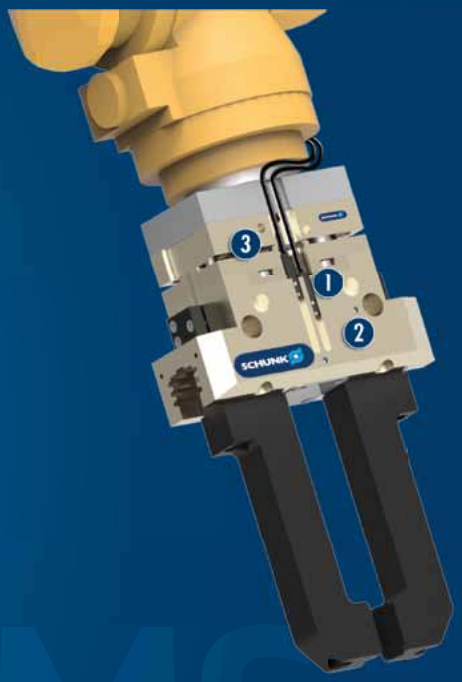
ATEX version EX for explosive environments

Protection class as per DIN 40050 IP67 in plugged position for use in clean or dusty environments or if in contact with water. Functionability in case of contact with other mediums (coolant, acids, bases, etc.) is often given, however cannot be guaranteed by SCHUNK.

Power supply 10 – 30 V DC, residual ripple < 10%

Sources of interference Sensors can be influenced by other magnetic fields in the immediate vicinity. Disturbing magnetic fields can be generated by motors, electric welders, permanent magnets or magnetized material (so-called soft magnets) such as allen keys, metal chips, etc.

Application Example



① **MMS Magnetic Switch**

② **PGN-plus Universal Gripper**

③ **TCU-P Tolerance Compensation Unit**

SCHUNK offers more ...

The following components make the MMS even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Sensor Cables

Connector Clip

Sensor Distributor

SST Sensor Tester

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com.
Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

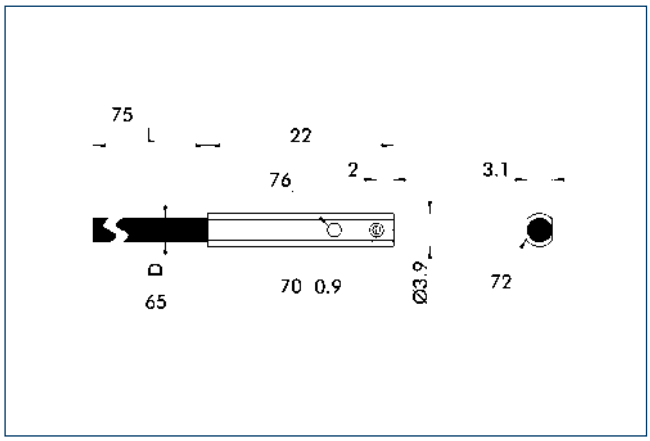
CAD data, operating manuals and other current product documents are available at **www.schunk.com**

MMS 22

Technical data

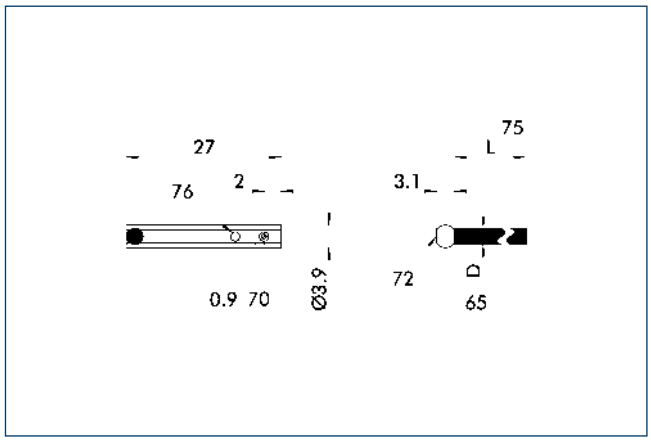
Description		MMS 22-S-M8-PNP	MMS 22-S-M8-NPN	MMSK 22-S-PNP	MMSK 22-S-NPN
ID		0301032	0301033	0301034	0301035
Switching function		Closer	Closer	Closer	Closer
Type of switching		PNP	NPN	PNP	NPN
Product weight	[kg]	0.01	0.01	0.04	0.04
min. / max. ambient temperature	[°C]	-10/70	-10/70	-10/70	-10/70
IP class (sensor)		67	67	67	67
IP class (sensor connected)		67	67	67	67
LED display in sensor		yes	yes	yes	yes
Type of voltage		DC	DC	DC	DC
Nominal voltage	[V]	24	24	24	24
min. voltage	[V]	10	10	10	10
max. voltage	[V]	30	30	30	30
Voltage drop	[V]	2	2	2	2
max. switching current	[A]	0.005	0.005	0.005	0.005
Cable diameter D	[mm]	2.1	2.1	2.1	2.1
min. bending radius (dynamically)	[mm]	21	21	21	21
min. bending radius (statically)	[mm]	10.5	10.5	10.5	10.5
Number of wires		3	3	3	3
Wire cross section	[mm²]	0.14	0.14	0.14	0.14
Cable length L	[cm]	30	30	200	200
Cable connector / cable end		M8	M8	open wires	open wires
Options and their characteristics					
Version with lateral cable outlet		MMS 22-S-M8-PNP-SA	MMS 22-S-M8-NPN-SA	MMSK 22-S-PNP-SA	MMSK 22-S-NPN-SA
ID		0301042	0301043	0301044	0301045

MMS 22 main view



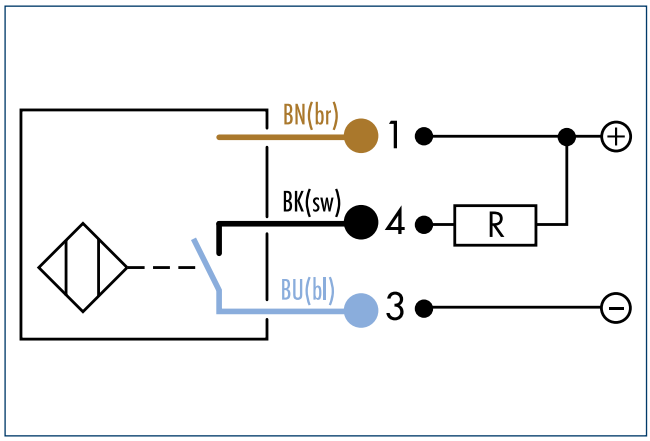
(65) Cable diameter
(70) Wrench size
(72) Active sensor surface
(75) Cable length
(76) LED

MMS 22-SA main view

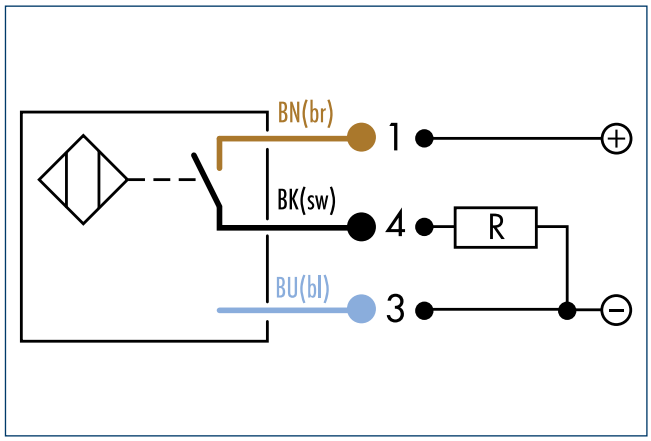


(65) Cable diameter
(70) Wrench size
(72) Active sensor surface
(75) Cable length
(76) LED

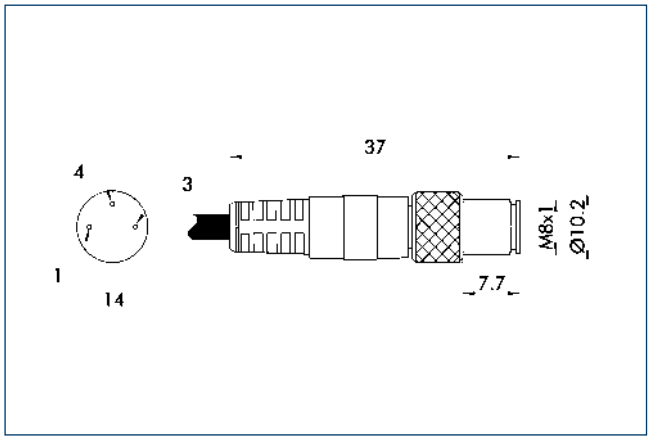
Circuit diagram of NPN closer



Circuit diagram of PNP closer

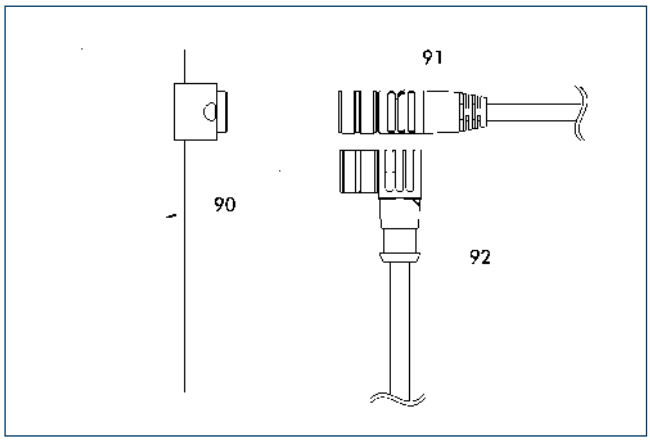


M8 connector



(14) Connector

Cable connector / cable extension



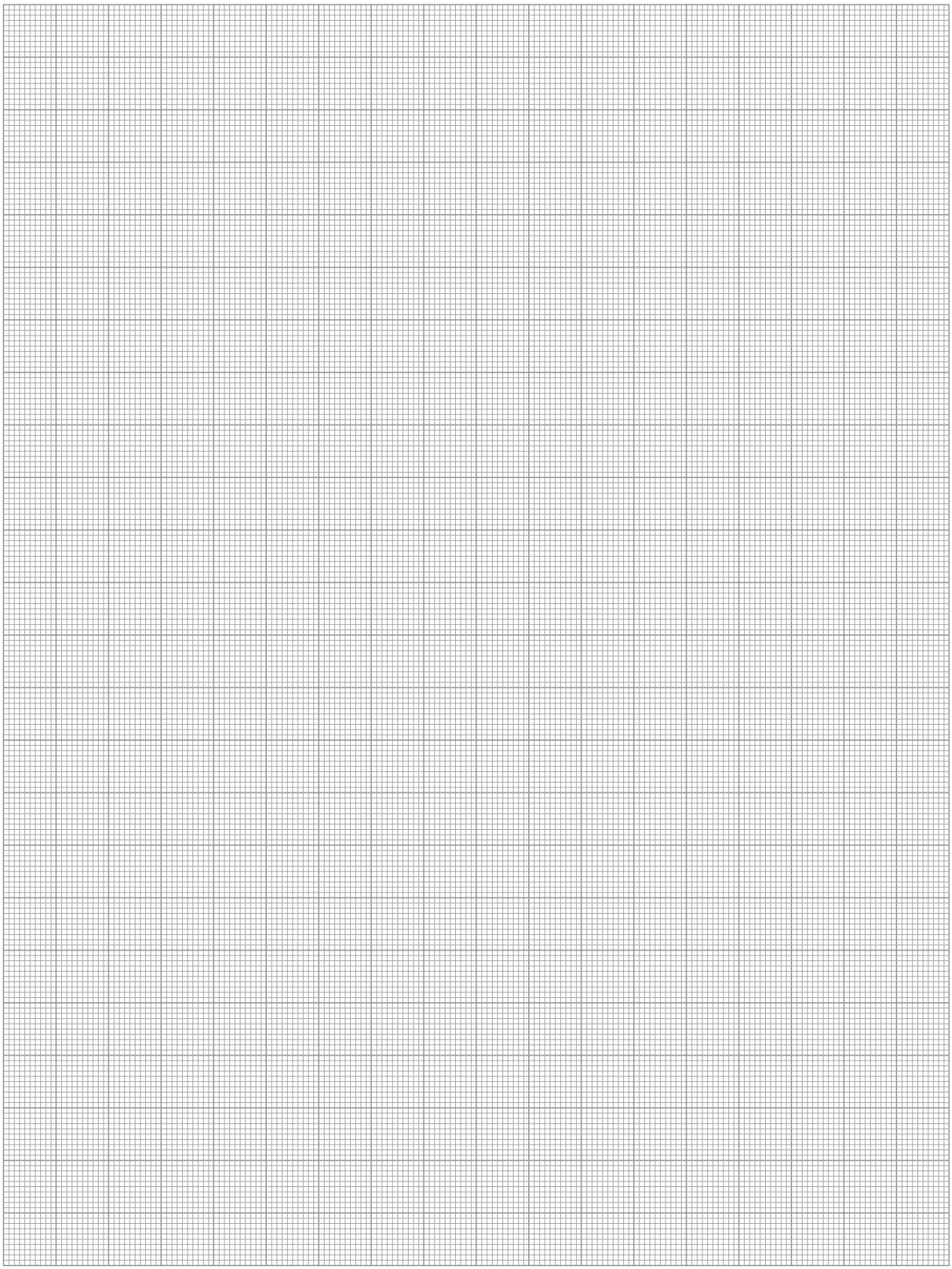
90 Connecting point for component

91 Cable with straight connection

92 Cable with angular connection

Description	ID	Length	Connection electric cabinet sided	Often combined
Connection cables				
KA BG08-L 3P-0300-PNP	0301622	3 m	open wires	●
KA BG08-L 3P-0500-PNP	0301623	5 m	open wires	
KA BW08-L 3P-0300-NPN	0301602	3 m	open wires	
KA BW08-L 3P-0300-PNP	0301594	3 m	open wires	
KA BW08-L 3P-0500-NPN	9641116	5 m	open wires	
KA BW08-L 3P-0500-PNP	0301502	5 m	open wires	
Cable extensions				
KV BW08-SG08 3P-0030-PNP	0301495	0.3 m	Connector	
KV BW08-SG08 3P-0100-PNP	0301496	1 m	Connector	
KV BW08-SG08 3P-0200-PNP	0301497	2 m	Connector	●

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

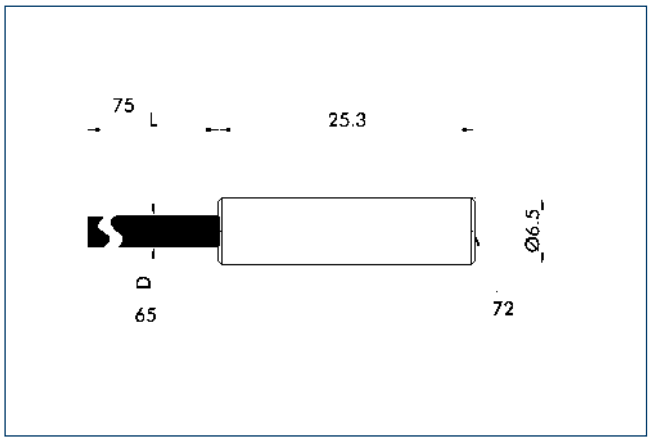


MMS 65

Technical data

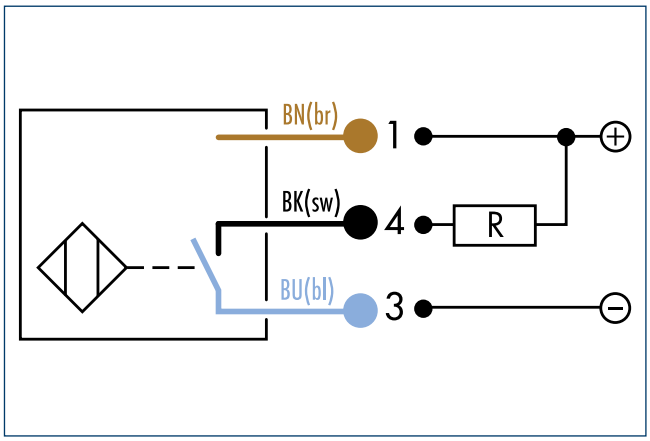
Description		MMS-K 65-5-PNP	MMS-K 65-5-NPN
ID		0301423	0301424
Switching function		Closer	Closer
Type of switching		PNP	NPN
min. / max. ambient temperature	[°C]	-20/70	-20/70
IP class (sensor)		67	67
IP class (sensor connected)		67	67
LED display in sensor		no	no
Type of voltage		DC	DC
Nominal voltage	[V]	24	24
min. voltage	[V]	10	10
max. voltage	[V]	30	30
Voltage drop	[V]	1.5	1.5
max. switching current	[A]	0.2	0.2
min. bending radius (dynamically)	[mm]	21	21
min. bending radius (statically)	[mm]	10.5	10.5
Number of wires		3	3
Wire cross section	[mm²]	0.14	0.14
Cable length L	[cm]	200	200
Cable connector / cable end		open wires	open wires

MMS-K 65 main view

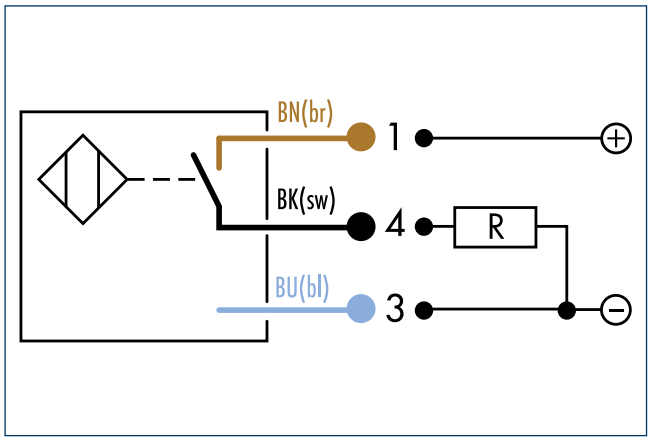


(65) Cable diameter
(72) Active sensor surface
(75) Cable length

Circuit diagram of NPN closer



Circuit diagram of PNP closer



Programmable. Precise. Easy Assembly.

MMS PI1 Programmable Magnetic Switch

Magnetic switches are used for monitoring the position of automation components. They detect the approach of a magnet without contact and, above a certain switching threshold, enable their output.

Field of Application

For use in the monitoring of gripping and rotary modules, linear modules, and robot accessories. Magnetic switches from SCHUNK detect metals without contact or wear, and are resistant to vibration, dust, and humidity. Magnetic switches are fitted in slots, and therefore do not form any additional interfering contours. For connection with a digital input module (utilization categorie DC-12).

Advantages – Your benefit

Individual switching point – without interfering contours The magnetic switch can be completely inserted. Therefore there are no interfering contours due to overhanging sensors

Programmable within no time due to non-contact adjustment of the switching points and hysteresis

Adjustable hysteresis for precise position monitoring – even at very low strokes

Ideal for small spaces due to wired teaching (on option!)

Version with LED-display for checking the switching position directly at the sensor

Version with connector for fast and easy exchangeability of the extension cable

Very flexible cable in PUR-version for a long service lifetime and resistance against many chemicals

Installation into the sensor groove for space-saving, easy and fast assembly

Options and special Information

Protection class as per DIN 40050 IP67 in plugged position for use in clean or dusty environments or if in contact with water. Functionability in case of contact with other mediums (coolant, acids, bases, etc.) is often given, however cannot be guaranteed by SCHUNK.

Power supply 10 – 30 V DC, residual ripple < 10%

Sources of interference Sensors can be influenced by other magnetic fields in the immediate vicinity. Disturbing magnetic fields can be generated by motors, electric welders, permanent magnets or magnetized material (so-called soft magnets) such as allen keys, metal chips, etc.

Application Example

① **Actuator**

② **MMS 22-PI1 C-Slot Sensor**

③ **Non-Contact MT Teaching Tool**

SCHUNK offers more ...

The following components make the MMS PI1 even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Magnet Teaching Tool

Plug Teaching Tool

Sensor Distributor

Sensor Cables

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com.
Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

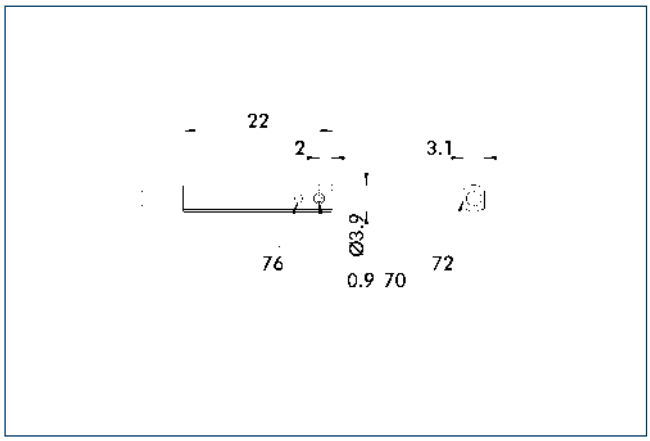
MMS PI1 22

Accessories | Sensor System | Programmable Magnetic Switch

Technical data

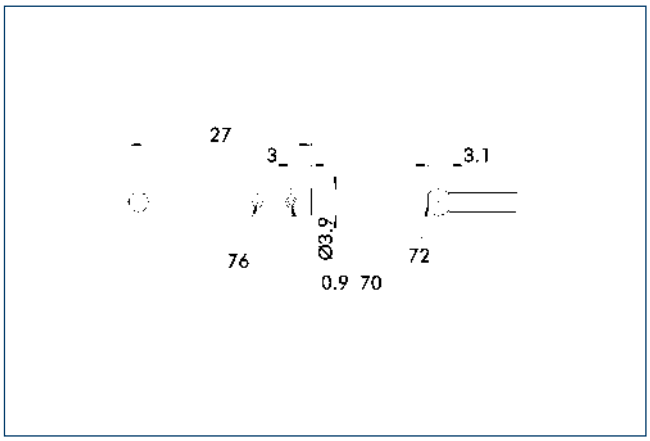
Description		MMS 22-PI1-S-M8-PNP	MMS 22-PI1-S-M8-NPN	MMSK 22-PI1-S-PNP	MMSK 22-PI1-S-NPN
ID		0301160	0301161	0301162	0301163
Switching function		Closer	Closer	Closer	Closer
Type of switching		PNP	NPN	PNP	NPN
Typical switching time	[s]	0.001	0.001	0.001	0.001
max. switching frequency	[Hz]	1000	1000	1000	1000
Product weight	[kg]	0.01	0.01	0.04	0.04
min. / max. ambient temperature	[°C]	-10/70	-10/70	-10/70	-10/70
IP class (sensor)		67	67	67	67
IP class (sensor connected)		67	67	67	67
LED display in sensor		yes	yes	yes	yes
Type of voltage		DC	DC	DC	DC
Nominal voltage	[V]	24	24	24	24
min. voltage	[V]	10	10	10	10
max. voltage	[V]	30	30	30	30
Voltage drop	[V]	1.5	1.5	1.5	1.5
max. switching current	[A]	0.05	0.05	0.05	0.05
Cable diameter D	[mm]	2.1	2.1	2.1	2.1
min. bending radius (dynamically)	[mm]	21	21	21	21
min. bending radius (statically)	[mm]	10.5	10.5	10.5	10.5
Number of wires		3	3	3	3
Wire cross section	[mm²]	0.14	0.14	0.14	0.14
Cable length L	[cm]	30	30	200	200
Cable connector / cable end		M8	M8	open wires	open wires
Options and their characteristics					
Version with lateral cable outlet		MMS 22-PI1-S-M8-PNP-SA	MMS 22-PI1-S-M8-NPN-SA	MMSK 22-PI1-S-PNP-SA	MMSK 22-PI1-S-NPN-SA
ID		0301166	0301167	0301168	0301169
Heavy duty version		MMS 22-PI1-S-M8-PNP-HD	MMS 22-PI1-S-M8-NPN-HD	MMSK 22-PI1-S-PNP-HD	MMSK 22-PI1-S-NPN-HD
ID		0301110	0301111	0301112	0301113

MMS 22-PI1 main view



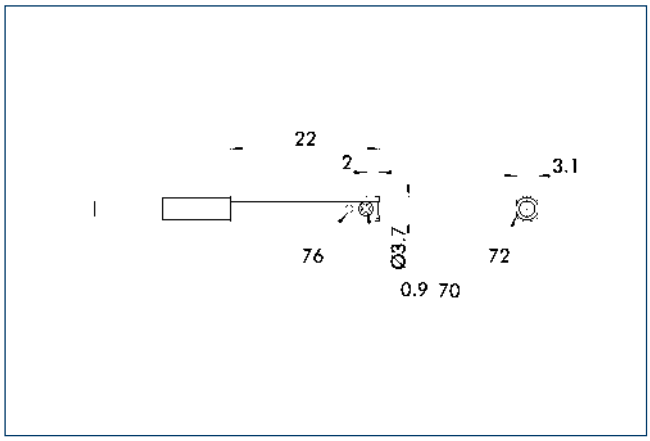
(70) Wrench size
(72) Active sensor surface
(76) LED

MMS 22-PI1-SA main view



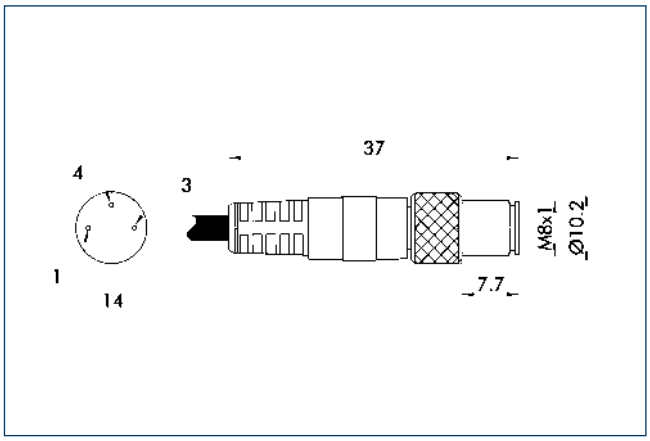
(70) Wrench size
(72) Active sensor surface
(76) LED

MMS 22-PI1-HD main view



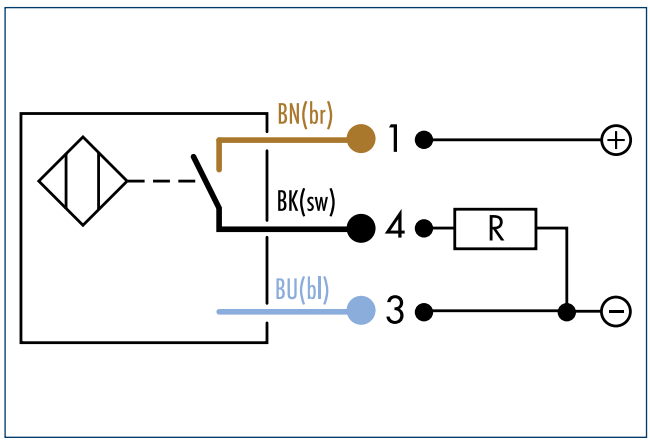
(70) Wrench size
(72) Active sensor surface
(76) LED

M8 connector

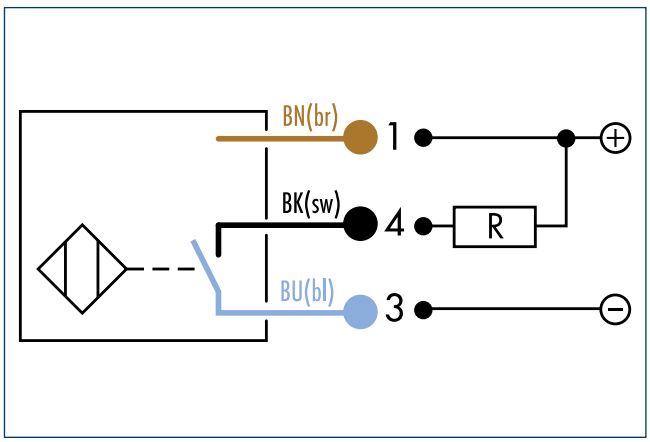


(14) Connector

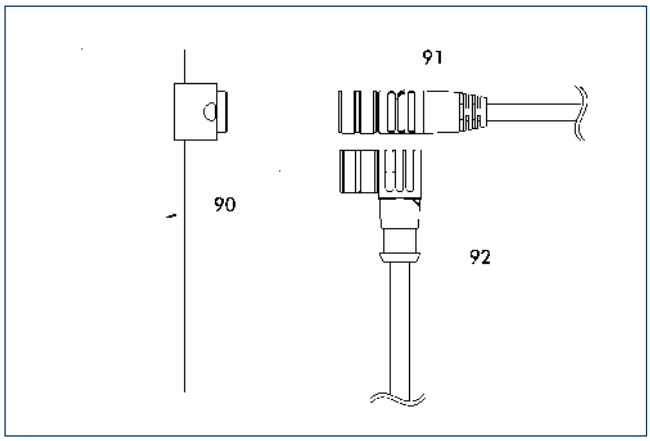
Circuit diagram of PNP closer



Circuit diagram of NPN closer



Cable connector / cable extension



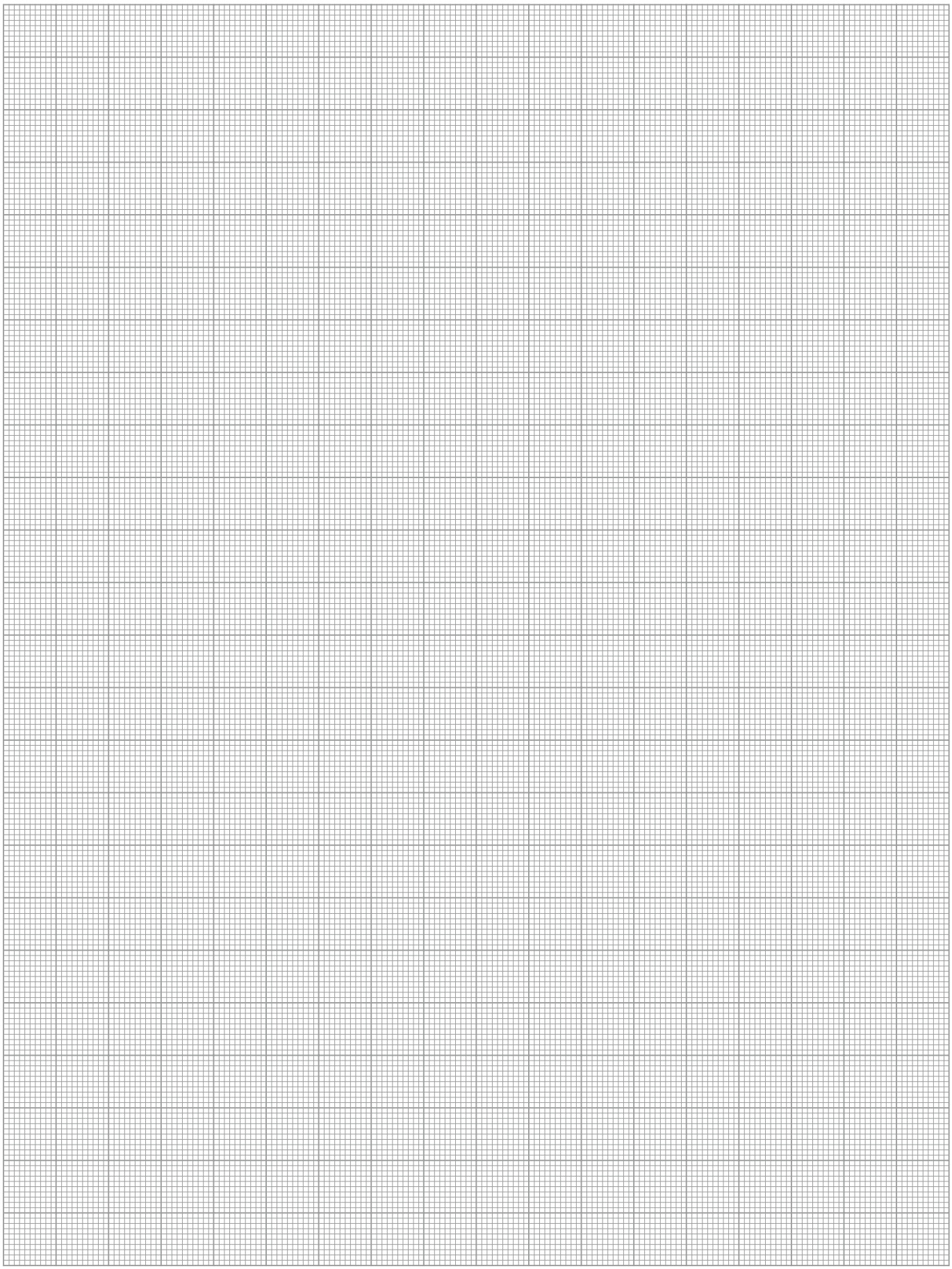
(90) Connecting point for component

(91) Cable with straight connection

(92) Cable with angular connection

Description	ID	Length	Connection electric cabinet sided	Often combined
Connection cables				
KA BG08-L 3P-0300-PNP	0301622	3 m	open wires	●
KA BG08-L 3P-0500-PNP	0301623	5 m	open wires	
KA BW08-L 3P-0300-NPN	0301602	3 m	open wires	
KA BW08-L 3P-0300-PNP	0301594	3 m	open wires	
KA BW08-L 3P-0500-NPN	9641116	5 m	open wires	
KA BW08-L 3P-0500-PNP	0301502	5 m	open wires	
Cable extensions				
KV BW08-SG08 3P-0030-PNP	0301495	0.3 m	Connector	
KV BW08-SG08 3P-0100-PNP	0301496	1 m	Connector	
KV BW08-SG08 3P-0200-PNP	0301497	2 m	Connector	●

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.



Programmable. Precise. Easy Assembly.

MMS PI2 Programmable Magnetic Switch

Magnetic switches are used for monitoring the position of automation components. They detect the approach of a magnet without contact and, above a certain switching threshold, enable their output.

Field of Application

For use in the monitoring of gripping and rotary modules, linear modules, and robot accessories. Magnetic switches from SCHUNK detect metals without contact or wear, and are resistant to vibration, dust, and humidity. Magnetic switches are fitted in slots, and therefore do not form any additional interfering contours. For connection with a digital input module (utilization categorie DC-12).

Advantages – Your benefit

Individual switching point – without interfering contours The magnetic switch can be completely inserted. Therefore there are no interfering contours due to overhanging sensors

Programmable within no time due to non-contact adjustment of the switching points and hysteresis

Adjustable hysteresis for precise position monitoring – even at very low strokes

Ideal for confined spaces due to wired teaching (optional)

Version with LED-display for checking the switching position directly at the sensor

Version with connector for fast and easy exchangeability of the extension cable

Very flexible cable in PUR-version for a long service lifetime and resistance against many chemicals

Installation into the sensor groove for space-saving, easy and fast assembly

Options and special Information

Protection class as per DIN 40050 IP67 in plugged position for use in clean or dusty environments or if in contact with water. Functionability in case of contact with other mediums (coolant, acids, bases, etc.) is often given, however cannot be guaranteed by SCHUNK.

Power supply 10 – 30 V DC, residual ripple < 10%

Sources of interference. Sensors can be influenced by other magnetic fields in the immediate vicinity. Disturbing magnetic fields can be generated by motors, electric welders, permanent magnets or magnetized material (so-called soft magnets) such as allen keys, metal chips, etc.

Application Example

① **Actuator**

② **MMS 22-PI2 C-Slot Sensor**

④ **Cable-Based ST Teaching Tool**

SCHUNK offers more ...

The following components make the MMS PI2 even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Magnet Teaching Tool

Plug Teaching Tool

Distributor Y

Sensor Cables

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com.
Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

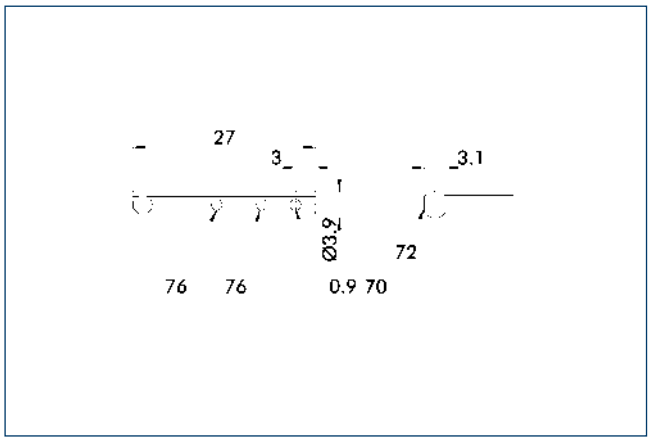
MMS PI2 22

Accessories | Sensor System | Programmable Magnetic Switch

Technical data

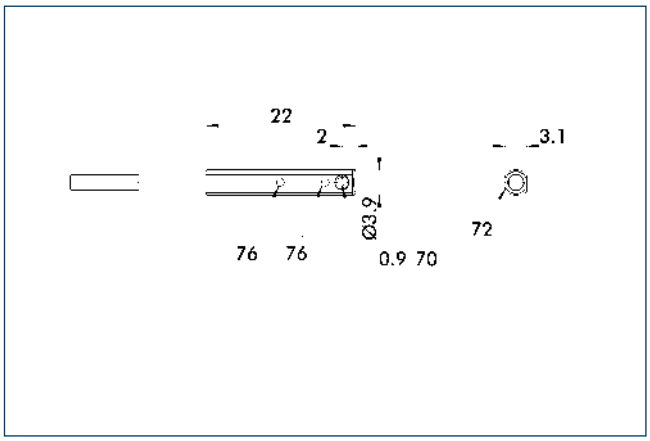
Description		MMS 22-PI2-S-M8-PNP	MMS 22-PI2-S-M8-NPN	MMSK 22-PI2-S-PNP	MMSK 22-PI2-S-NPN
ID		0301180	0301181	0301182	0301183
Switching function		Closer	Closer	Closer	Closer
Type of switching		PNP	NPN	PNP	NPN
Typical switching time	[s]	0.001	0.001	0.001	0.001
max. switching frequency	[Hz]	1000	1000	1000	1000
Product weight	[kg]	0.01	0.01	0.04	0.04
min. / max. ambient temperature	[°C]	-10/70	-10/70	-10/70	-10/70
IP class (sensor)		67	67	67	67
IP class (sensor connected)		67	67	67	67
LED display in sensor		no	no	no	no
Type of voltage		DC	DC	DC	DC
Nominal voltage	[V]	24	24	24	24
min. voltage	[V]	10	10	10	10
max. voltage	[V]	30	30	30	30
Voltage drop	[V]	2	2	2	2
max. switching current	[A]	0.03	0.03	0.03	0.03
Cable diameter D	[mm]	2.5	2.5	2.5	2.5
min. bending radius (dynamically)	[mm]	21	21	21	21
min. bending radius (statically)	[mm]	10.5	10.5	10.5	10.5
Number of wires		4	4	4	4
Wire cross section	[mm²]	0.14	0.14	0.14	0.14
Cable length L	[cm]	30	30	200	200
Cable connector / cable end		M8	M8	open wires	open wires
Options and their characteristics					
Version with lateral cable outlet		MMS 22-PI2-S-M8-PNP-SA	MMS 22-PI2-S-M8-NPN-SA	MMSK 22-PI2-S-PNP-SA	MMSK 22-PI2-S-NPN-SA
ID		0301186	0301187	0301188	0301189
Heavy duty version		MMS 22-PI2-S-M8-PNP-HD	MMS 22-PI2-S-M8-NPN-HD	MMSK 22-PI2-S-PNP-HD	MMSK 22-PI2-S-NPN-HD
ID		0301130	0301131	0301132	0301133

MMS 22-PI2-SA main view



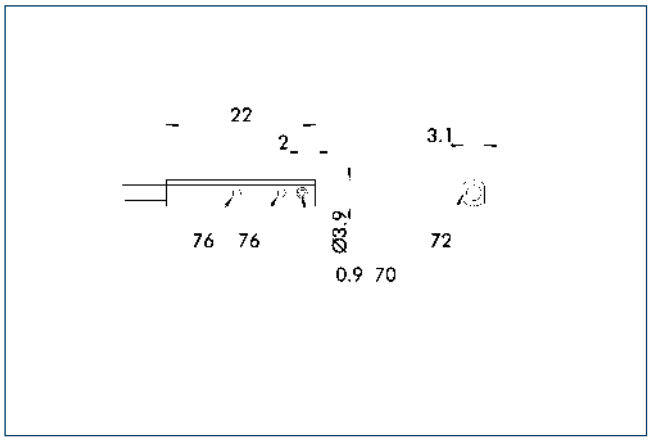
(70) Wrench size
(72) Active sensor surface
(76) LED

MMS 22-PI2-HD main view



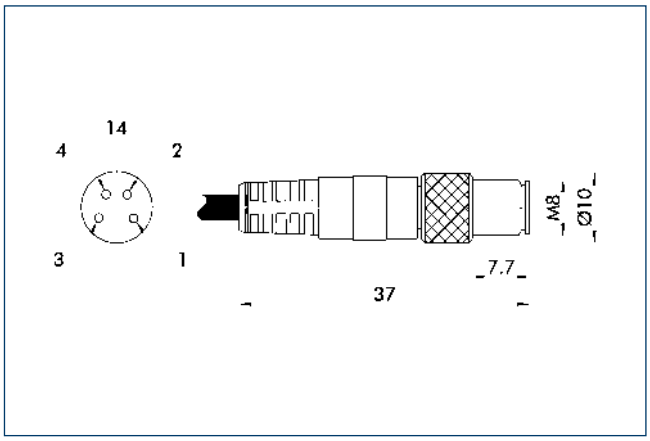
(70) Wrench size
(72) Active sensor surface
(76) LED

MMS 22-PI2 main view



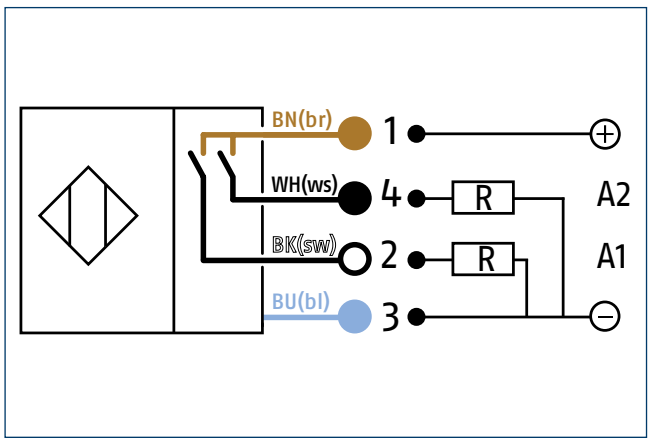
(70) Wrench size
(72) Active sensor surface
(76) LED

M8 4PIN Trapez connector

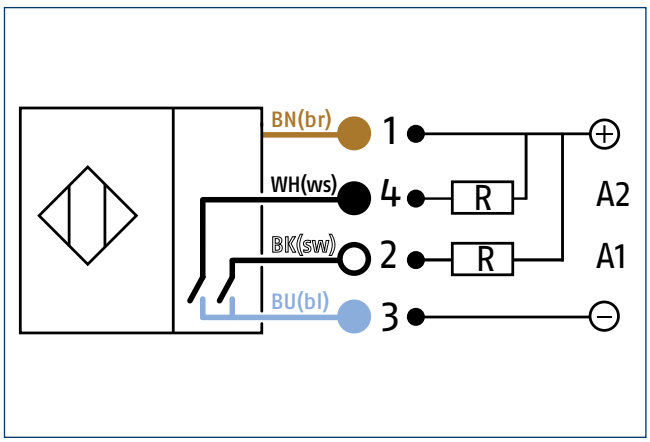


(14) Connector

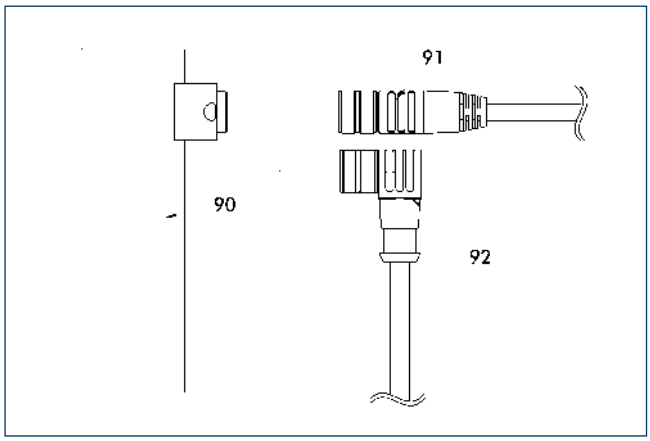
Wiring diagram closer PNP



Wiring diagram closer NPN



Cable connector / cable extension



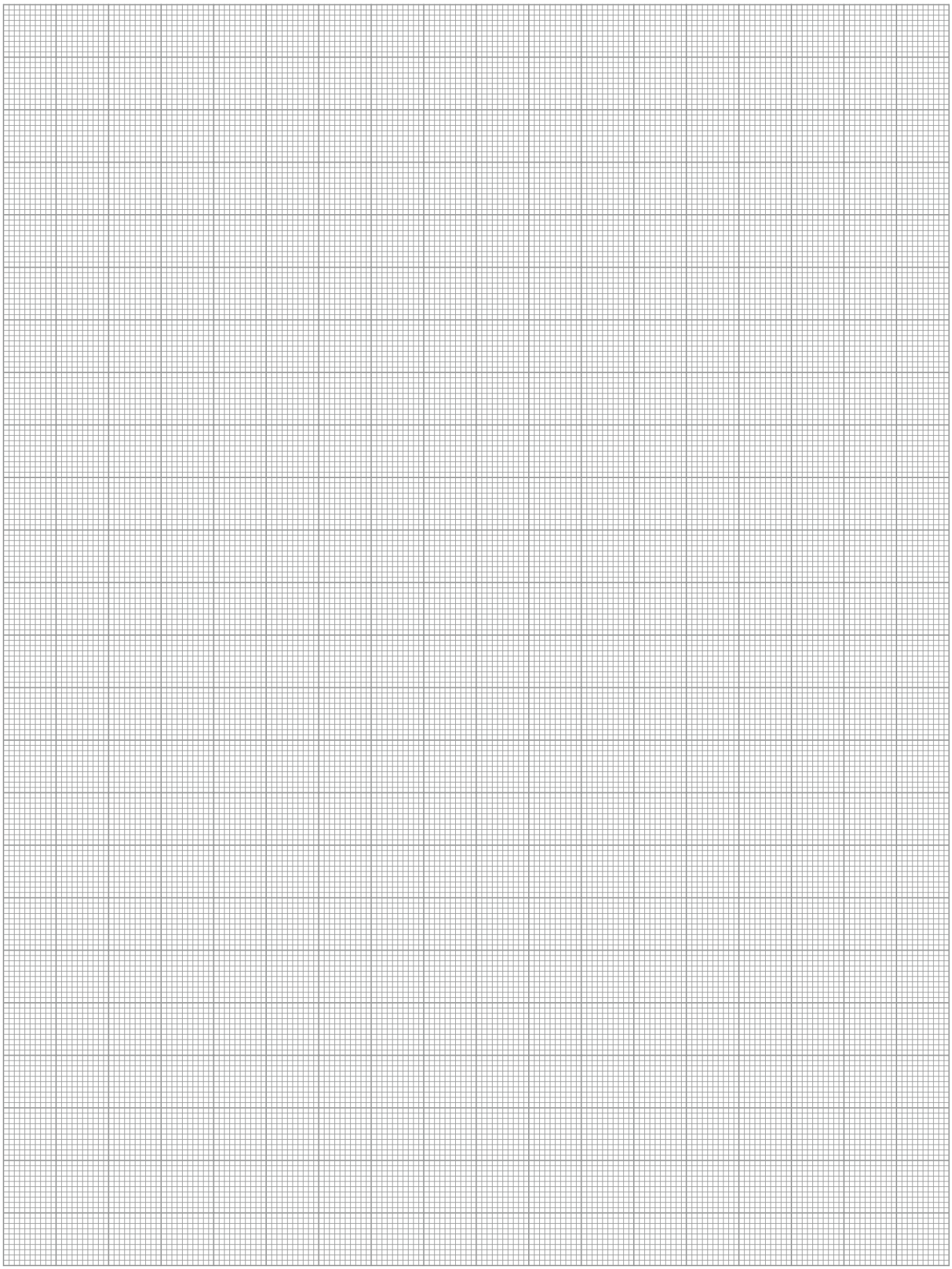
(90) Connecting point for component

(91) Cable with straight connection

(92) Cable with angular connection

Description	ID	Length	Connection electric cabinet sided	Often combined
Connection cables				
KA BG08-L 4P-0500	0307767	5 m	open wires	●
KA BG08-L 4P-1000	0307768	10 m	open wires	
KA BW08-L 4P-0500	0307765	5 m	open wires	
KA BW08-L 4P-1000	0307766	10 m	open wires	

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.



Programmable. Flexible. Easy Assembly.

MMS-P Programmable Magnetic Switch

Magnetic switches are used for monitoring the position of automation components. They detect the approach of a magnet without contact and, above a certain switching threshold, enable their output.

Field of Application

Used for monitoring of gripping and rotary modules, linear modules, and robot accessories. Magnetic switches from SCHUNK detect metals without contact or wear, and are resistant to vibration, dust, and humidity. Magnetic switches are fitted in slots, and therefore do not form any additional interfering contours. For connection with a digital input module (utilization categorie DC-12).

Advantages – Your benefit

Installation into the sensor groove for space-saving, easy and fast assembly

Very flexible cable in PUR-version for a long service lifetime and resistance against many chemicals

Version with connector for fast and easy exchangeability of the extension cable

A programmable C-slot switch for two switching points

Programmable switching off hysterisis for exact postions

Version with LED-display for checking the switching position directly at the sensor

Options and special Information

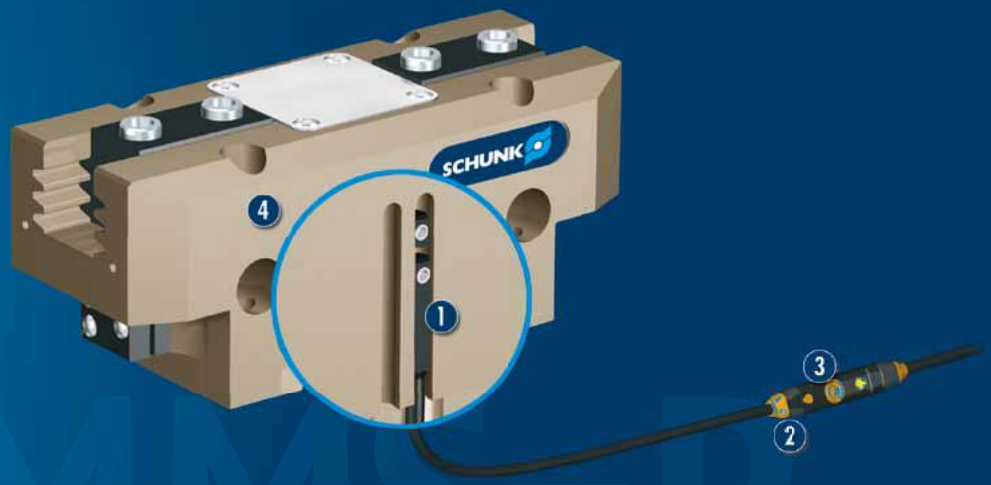
Protection class as per DIN 40050 IP67 in plugged position for use in clean or dusty environments or if in contact with water. Functionability in case of contact with other mediums (coolant, acids, bases, etc.) is often given, however cannot be guaranteed by SCHUNK.

Power supply 10 – 30 V DC, residual ripple < 10%

Sources of interference. Sensors can be influenced by other magnetic fields in the immediate vicinity. Disturbing magnetic fields can be generated by motors, electric welders, permanent magnets or magnetized material (so-called soft magnets) such as allen keys, metal chips, etc.

Functional Description

One switch detects the two conditions “open” and “closed” making it more cost effective as only one switch needs to be purchased. In contrast to conventional solutions, the switching point of the sensor is taught by pushing the button at the current piston position. If the automatically determined standard switching hysterisis should be optimized, it can be programmed.



① **Sensor of the MMS-P 22**

② **Electronics of the MMS-P 22**

③ **Key button for programming**

④ **Actuator with preset stop**

SCHUNK offers more ...

The following components make the MMS-P even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Connector Clip

Sensor Cables

Sensor Distributor

SST Sensor Tester

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com.
Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

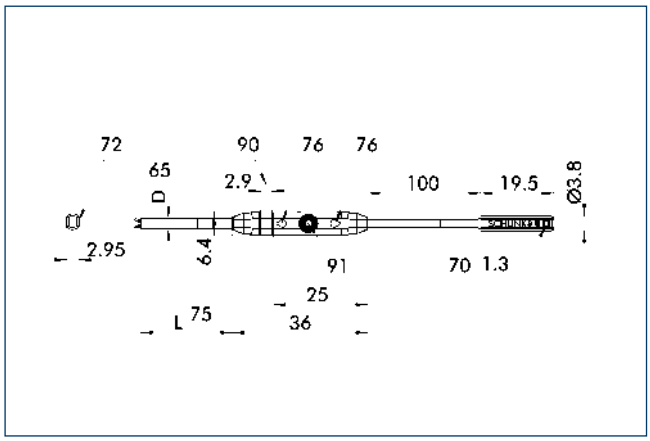
MMS-P 22

Accessories | Sensor System | Programmable Magnetic Switch

Technical data

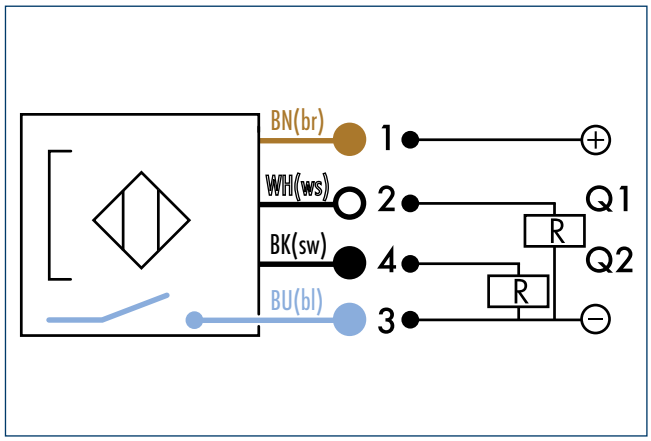
Description		MMS-P 22-S-M8-PNP	MMSK-P 22-S-PNP
ID		0301370	0301371
Switching function		Closer	Closer
Type of switching		PNP	PNP
Typical switching time	[s]	0.001	0.001
Product weight	[kg]	0.01	0.02
min. / max. ambient temperature	[°C]	5/55	5/55
IP class (sensor)		67	67
IP class (sensor connected)		67	67
LED display in sensor		yes	yes
Type of voltage		DC	DC
Nominal voltage	[V]	24	24
min. voltage	[V]	12	12
max. voltage	[V]	30	30
Voltage drop	[V]	2.2	2.2
max. switching current	[A]	0.1	0.1
Cable diameter D	[mm]	2.6	2.6
min. bending radius (dynamically)	[mm]	39	39
min. bending radius (statically)	[mm]	26	26
Number of wires		4	4
Wire cross section	[mm²]	0.08	0.08
Cable length L	[cm]	60	200
Cable connector / cable end		M8	open wires

MMS-P main view

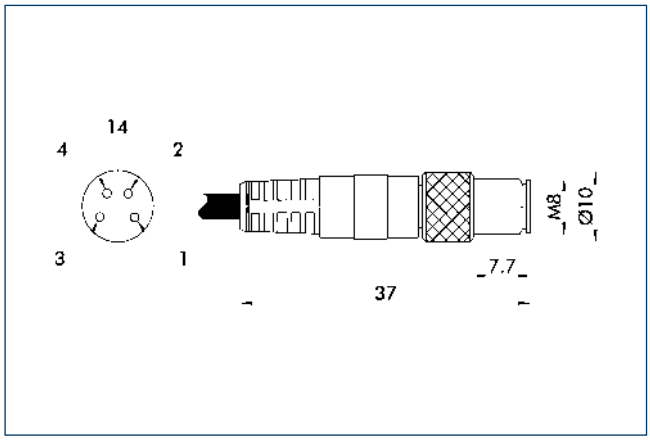


65 Cable diameter
70 Wrench size
72 Active sensor surface
75 Cable length
76 LED
90 Rib for cable connector
91 Key button

Wiring diagram closer PNP

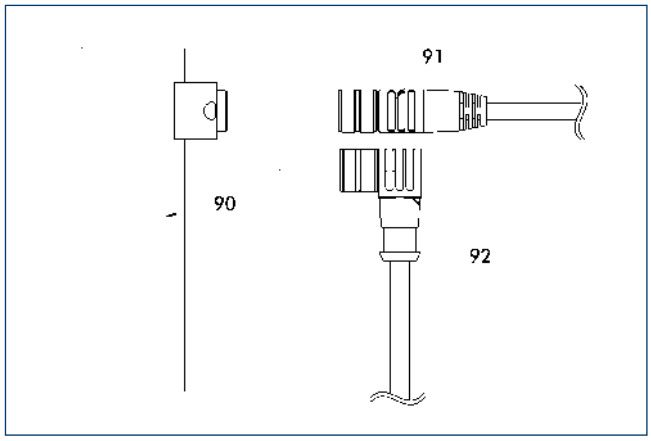


M8 4PIN trapez connector



14 Connector

Cable connector / cable extension



90 Connecting point for component
91 Cable with straight connection
92 Cable with angular connection

Description	ID	Length	Connection electric cabinet sided	Often combined
Connection cables				
KA BG08-L 4P-0500	0307767	5 m	open wires	●
KA BG08-L 4P-1000	0307768	10 m	open wires	
KA BW08-L 4P-0500	0307765	5 m	open wires	
KA BW08-L 4P-1000	0307766	10 m	open wires	

ⓘ BG stands for a connection cable with a straight female connector and BW for an angled female connector.

Versatile. Productive. Energy-efficient.

SST Sensor Tester

The SST sensor tester enables the rapid testing and adjustment of inductive sensors, magnetic switches, and reed contacts. The necessary power is supplied by a 9 V compound battery.

Field of Application

Sensor testing and adjustment of the switching point (sensor calibration)

Advantages – Your benefit

Visual and acoustic signal for simple function checking and adjustment

For 2- and 3-wire DC technology enabling the connection of reed contacts, capacitive, and inductive sensors

Tests possible without dismantling sensors for short maintenance times

Connections for M8 and M12 or open cable ends possible ensuring suitability for all SCHUNK sensors

PNP and NPN sensors can be tested

Operating voltage with 9 V compound battery for mobile use

Automatic shut-off function for an extended battery life

Options and special Information

Please note that only one SST input (M8 or M12 or cable terminal input) can be used at the same time.

If the toggle switch points towards the sticker (name plate) then the sensor is in PNP mode. If not, NPN is selected.

Application Example

① **SST Sensor Tester**

② **IN 80 Inductive Proximity Switches**

③ **Metal Plate**

SCHUNK offers more ...

The following components make the SST even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

OAS Optical Distance Sensor

MMS 22 Sensor

IN ... Sensor

Inductive Proximity Sensor

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

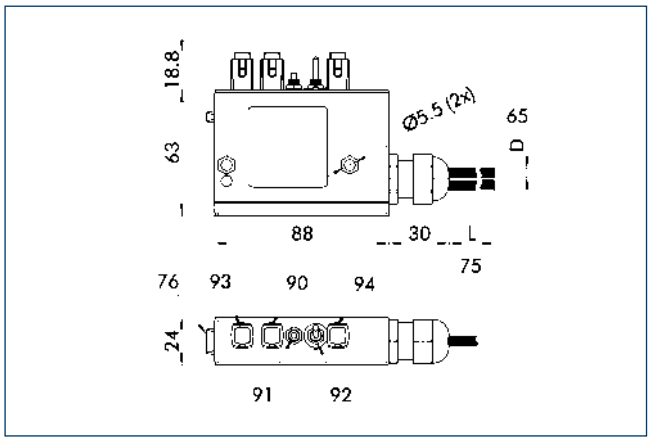
SST

Accessories | Sensor System Accessories | Sensor Tester

Technical data

Description		SST
ID		0301400
Connection 1		M8x1
Connection 2		M12x1
Connection 3		Direct clamping
Housing material		Plastic
IP class		20

SST main view



(65) Cable diameter
(75) Cable length
(76) LED
(90) Signal / 4
(91) ON button
(92) PNP / NPN switch
(93) Power supply UB/1
(94) Power supply GND/3

ⓘ Power supply 9 V DC (block battery type LR 61)

Versatile. Light. Easy.

CLI Clip

The clip allows easy fixing of two straight sensor plug connectors.

Field of Application

Universal applicable where sensors are used

Advantages – Your benefit

Clip for an M8 or M12 connector for flexible use

Through-hole for quick and easy fastening via a screw

Made from PA material suitable for many application areas

Options and special Information

Easy assembly: The CLI clip allows fixing of two straight M8 / M12 sensor plug connectors. The connectors can be disassembled / assembled without the use of tools which simplifies the process of changing sensors or cables.

Application Example

① **Clip**

② **PGN-plus Universal Gripper**

③ **SRU-plus Universal Rotary Actuator**

④ **KA Connection Cable**

⑤ **Cable Extensions**

SCHUNK offers more ...

The following components make the CLI even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

IN ... Sensor

MMS 22 Sensor

OAS Optical Distance Sensor

Sensor Cables

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

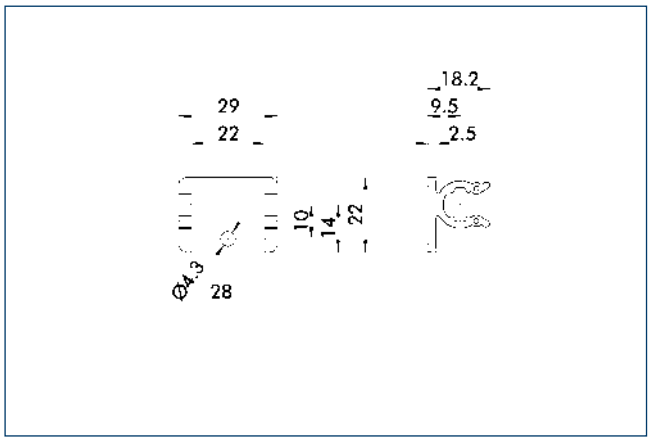
CAD data, operating manuals and other current product documents are available at **www.schunk.com**

CLI

Technical data

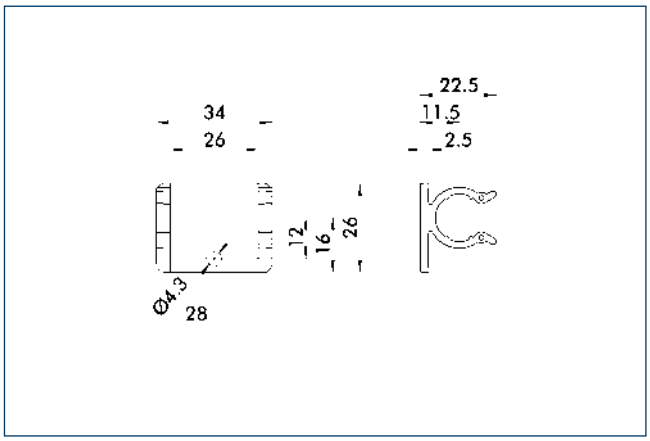
Description		CLI-M8	CLI-M12
ID		0301463	0301464
Mass	[g]	10	10
Material		PA	PA
Connector size		M8	M12

CLI-M8 main view



28 Through-hole

CLI-M12 main view



28 Through-hole

Easy. Robust. Compact.

KA Connection Cable

The SCHUNK KA connection cable is ideal for supplying SCHUNK components, and for leading signals.

Field of Application

The KA connection cables are used for every sensor, gripping, rotating, and linear module, and also for numerous components of the robot accessories.

Advantages – Your benefit

Industrial standard plug connector for fast and easy commissioning

Connection cable with open wire strands for individual design of connection cables

Options and special Information

Troublefree combination with SCHUNK KBU / KST. Therefore the connection cables can be adjusted to the suitable length, and equipped with connectors.

Application Example

① **Clip**

② **PGN-plus Universal Gripper**

③ **SRU-plus Universal Rotary Actuator**

④ **KA Connection Cable**

⑤ **Cable Extensions**

SCHUNK offers more ...

The following components make the KA even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Inductive Proximity Sensor

MMS 22 Sensor

EGP Electric Parallel Gripper

Sensor Distributor

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

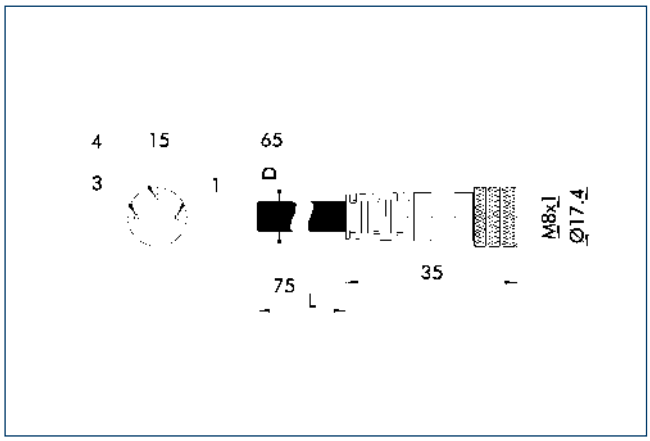
CAD data, operating manuals and other current product documents are available at **www.schunk.com**

KA M8

Technical data

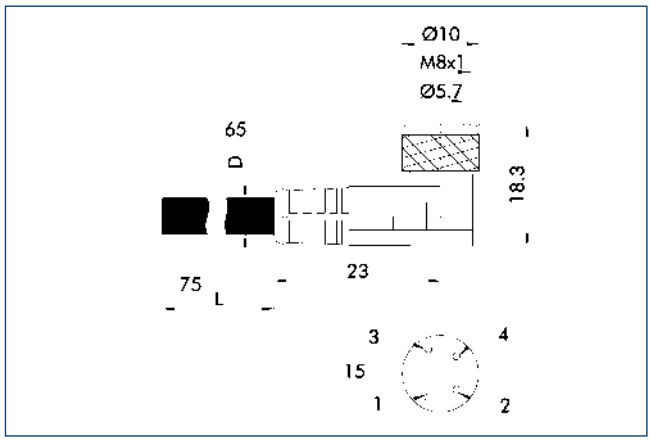
Straight PNP					
Description		KA BG08-L 3P-0300-PNP	KA BG08-L 3P-0500-PNP	KA BG08-L 4P-0500	KA BG08-L 4P-1000
ID		0301622	0301623	0307767	0307768
Connection sensor side		Socket	Socket	Socket	Socket
Connection electric cabinet sided		open wires	open wires	open wires	open wires
Angle electric cabinet sided	[°]	0	0	0	0
Cable length	[m]	3	5	5	10
Number of wires		3	3	4	4
Wire cross section	[mm²]	0.14	0.14	0.24	0.24
Mass	[kg]	0.09	0.18		
max. current per wire	[A]	0.5	0.5	0.5	0.5
max. total current	[A]	0.5	0.5	0.5	0.5
Angular NPN					
Description		KA BW08-L 3P-0300-NPN	KA BW08-L 3P-0500-NPN		
ID		0301602	9641116		
Connection sensor side		Socket	Socket		
Connection electric cabinet sided		open wires	open wires		
Angle electric cabinet sided	[°]	0	0		
Cable length	[m]	3	5		
Number of wires		3	3		
Wire cross section	[mm²]	0.14	0.14		
Mass	[kg]	0.12	0.2		
max. current per wire	[A]	0.5	0.5		
max. total current	[A]	0.5	0.5		
Angular PNP					
Description		KA BW08-L 3P-0300-PNP	KA BW08-L 3P-0500-PNP	KA BW08-L 4P-0500	KA BW08-L 4P-1000
ID		0301594	0301502	0307765	0307766
Connection sensor side		Socket	Socket	Socket	Socket
Connection electric cabinet sided		open wires	open wires	open wires	open wires
Angle electric cabinet sided	[°]	0	0	0	0
Cable length	[m]	3	5	5	10
Number of wires		3	3	4	4
Wire cross section	[mm²]	0.14	0.14	0.24	0.24
Mass	[kg]	0.12	0.2		
max. current per wire	[A]	0.5	0.5	0.5	0.5
max. total current	[A]	0.5	0.5	0.5	0.5

KA BG08-L 3P main view



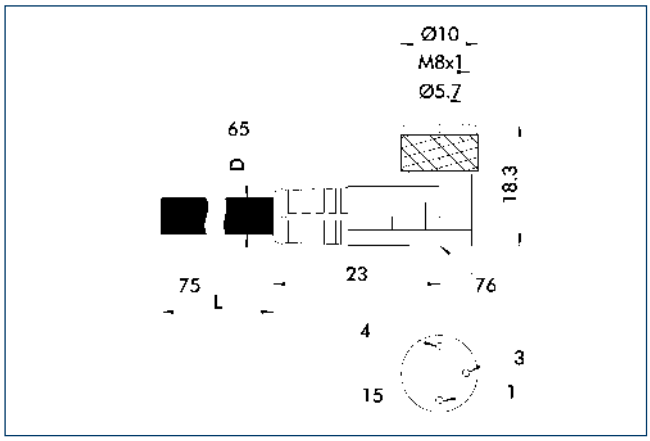
(15) Socket
(75) Cable length
(65) Cable diameter

KA BW08-L 4P main view



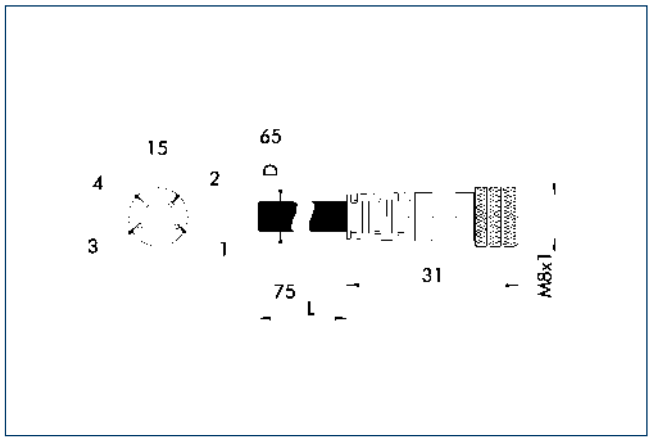
(15) Socket
(75) Cable length
(65) Cable diameter

KA BW08-L 3P main view



(15) Socket
(75) Cable length
(65) Cable diameter
(76) LED

KA BG08-L 4P main view



(15) Socket
(75) Cable length
(65) Cable diameter

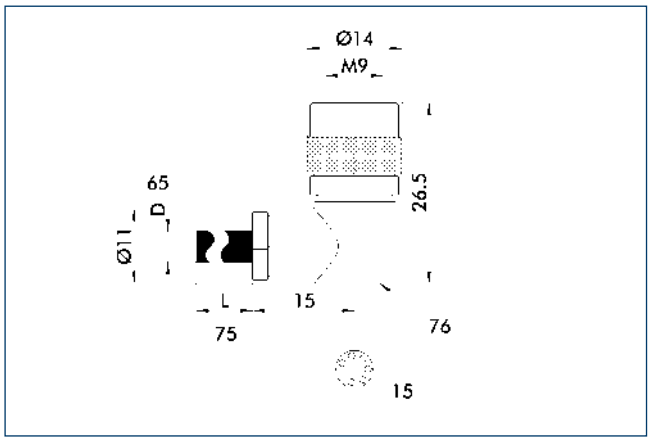
KA M9

Accessories | Cable, Connector, and Distributor | Connection Cable

Technical data

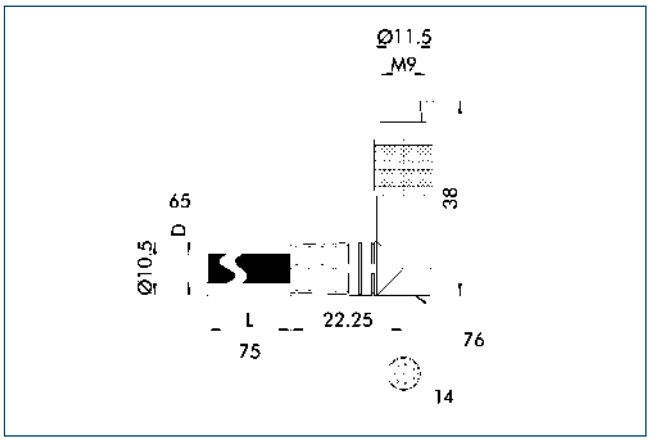
Socket			
Description		KA-BW9-L7P-0200	KA-BW9-L7P-0500
ID		0323001	0323003
Connection electric cabinet sided		open wires	open wires
Angle electric cabinet sided	[°]	0	0
Cable length	[m]	2	5
Number of wires		7	7
Wire cross section	[mm²]	0.14	0.14
max. current per wire	[A]	0.5	0.5
max. total current	[A]	0.5	0.5
Connector			
Description		KA-SW9-L7P-0200	KA-SW9-L7P-0500
ID		0323002	0323004
Connection electric cabinet sided		open wires	open wires
Angle electric cabinet sided	[°]	0	0
Cable length	[m]	2	5
Number of wires		7	7
Wire cross section	[mm²]	0.14	0.14
max. current per wire	[A]	0.5	0.5
max. total current	[A]	0.5	0.5

KA BW09-L7P main view



(15) Socket
(65) Cable diameter
(75) Cable length
(76) LED

KA SW09-L7P main view



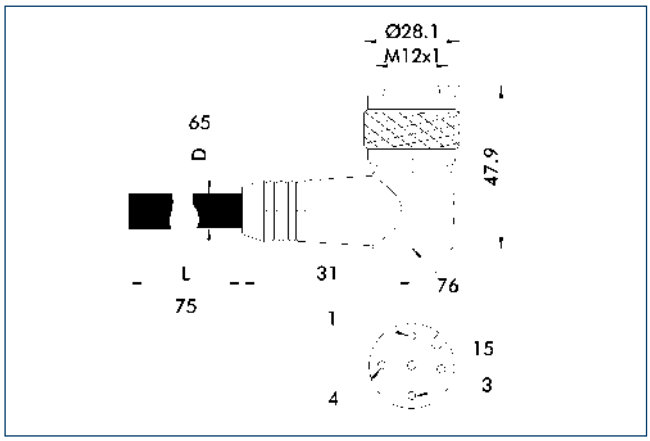
(14) Connector
(65) Cable diameter
(75) Cable length
(76) LED

KA M12

Technical data

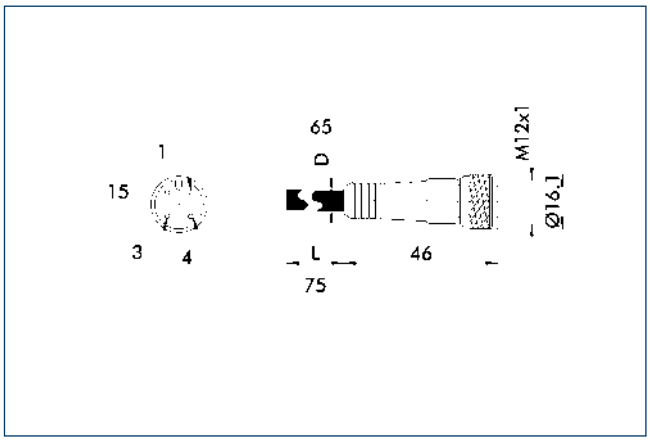
Straight PNP			
Description		KA BG12-L 3P-0500-PNP	
ID		30016369	
Connection sensor side		Socket	
Connection electric cabinet sided		open wires	
Angle electric cabinet sided	[°]	0	
Cable length	[m]	5	
Number of wires		3	
Wire cross section	[mm²]	0.14	
Mass	[kg]	0.18	
max. current per wire	[A]	0.5	
max. total current	[A]	0.5	
Angular PNP			
Description		KA BW12-L 3P-0500-PNP	KA BW12-L 3P-0300-PNP
ID		0301507	0301503
Connection sensor side		Socket	Socket
Connection electric cabinet sided		open wires	open wires
Angle electric cabinet sided	[°]	0	0
Cable length	[m]	5	3
Number of wires		3	3
Wire cross section	[mm²]	0.14	0.14
Mass	[kg]	0.2	0.14
max. current per wire	[A]	0.5	0.5
max. total current	[A]	0.5	0.5

KA BW12-L 3P main view



(15) Socket
(65) Cable diameter
(75) Cable length
(76) LED

KA BG12-L 3P main view



(15) Socket
(65) Cable diameter
(75) Cable length

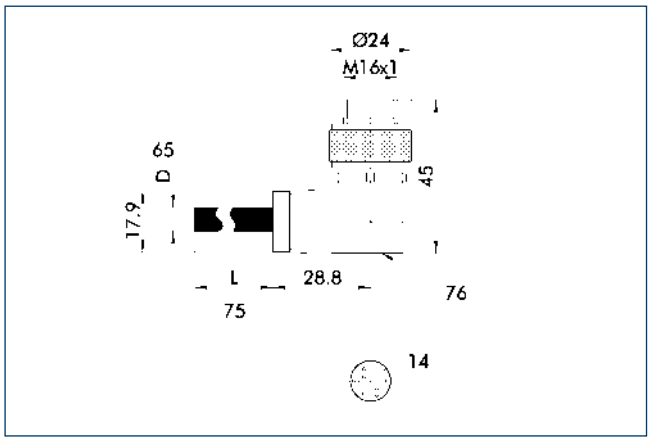
KA M16

Accessories | Cable, Connector, and Distributor | Connection Cable

Technical data

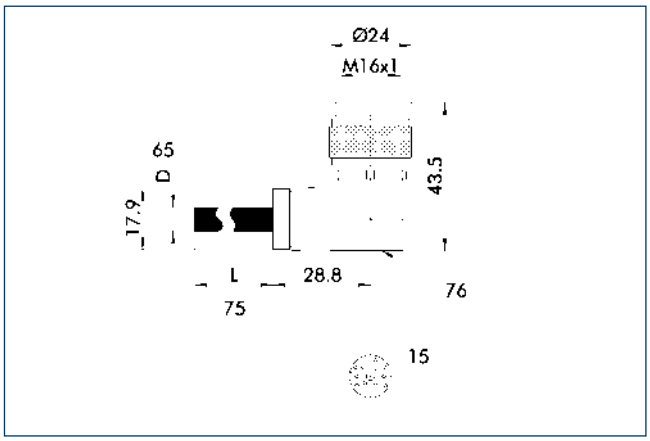
Socket			
Description		KA BW16-L 12P-0500	KA BG16-L 12P-1000
ID		0323005	0301801
Connection electric cabinet sided		open wires	open wires
Angle electric cabinet sided	[°]	0	0
Cable length	[m]	5	10
Number of wires		12	12
Wire cross section	[mm²]	0.14	0.14
Mass	[kg]	0.34	0.68
max. current per wire	[A]	0.5	0.5
max. total current	[A]	0.5	0.5
Connector			
Description		KA SW16-L 12P-0500	
ID		0323006	
Connection electric cabinet sided		open wires	
Angle electric cabinet sided	[°]	0	
Cable length	[m]	5	
Number of wires		12	
Wire cross section	[mm²]	0.14	
max. current per wire	[A]	0.5	
max. total current	[A]	0.5	

KA SW 16-L main view



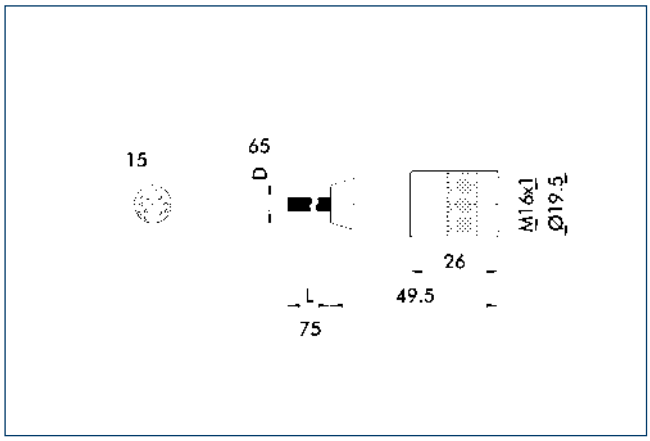
(14) Connector
(65) Cable diameter
(75) Cable length
(76) LED

KA BW16-L main view



(15) Socket
(65) Cable diameter
(75) Cable length
(76) LED

KA BG16-L main view



(15) Socket
(65) Cable diameter
(75) Cable length

Easy. Robust. Compact.

KBU / KST Cable Connector

The KST (cable connector) and KBU (cable bushing) are used for preparing lines for sensors and actuators.

Field of Application

The SCHUNK KBU / KST are used together with sensors, actuators, distributors, and cables. Wherever customer-specific cable lengths are required.

Advantages – Your benefit

Easy assembly

The KBU / KST can be quickly and easily connected to cables, and therefore reduces the complete installation time.

Industrial standard plug connector

Options and special Information

Can easily be combined with SCHUNK sensors, actuators, and sensor distributors for simple and flexible handling

Application Example

① **KST Cable Connector**

② **Cable Extensions**

③ **Sensor Distributor**

④ **MMS Magnetic Switch**

⑤ **DDF 2 Rotary feed-through**

⑥ **PGN-plus Universal Gripper**

SCHUNK offers more ...

The following components make the KBU / KST even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Sensor Cables

Inductive Proximity Sensor

SST Sensor Tester

Sensor Distributor

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com.
Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

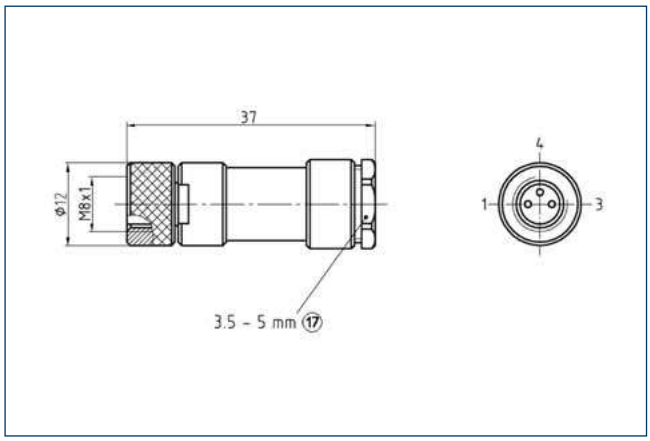
CAD data, operating manuals and other current product documents are available at **www.schunk.com**

KBU / KST M8

Technical data

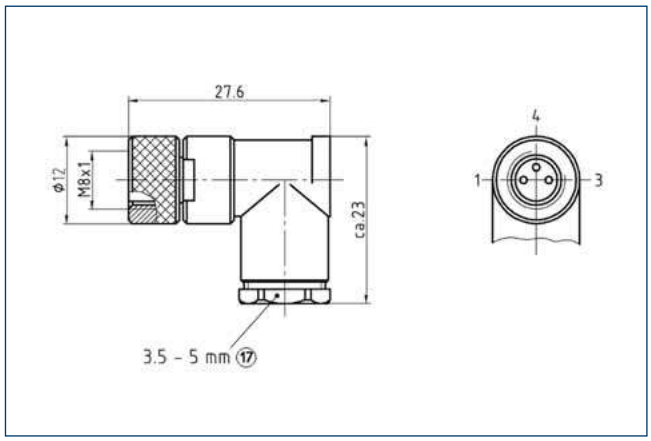
Cable socket			
Description		KBU-M8-G 3P	KBU-M8-W 3P
ID		0300052	0300053
Connection electric cabinet sided		open wires	open wires
Angle electric cabinet sided	[°]	0	0
Number of wires		3	3
Wire cross section	[mm²]	0.25	0.25
max. current per wire	[A]	0.5	0.5
max. total current	[A]	0.5	0.5
Cable connector			
Description		KST-M8-G 3P	KST-M8-W 3P
ID		0300050	0300051
Connection electric cabinet sided		open wires	open wires
Angle electric cabinet sided	[°]	0	0
Number of wires		3	3
Wire cross section	[mm²]	0.25	0.25
max. current per wire	[A]	0.5	0.5
max. total current	[A]	0.5	0.5

Socket straight M8



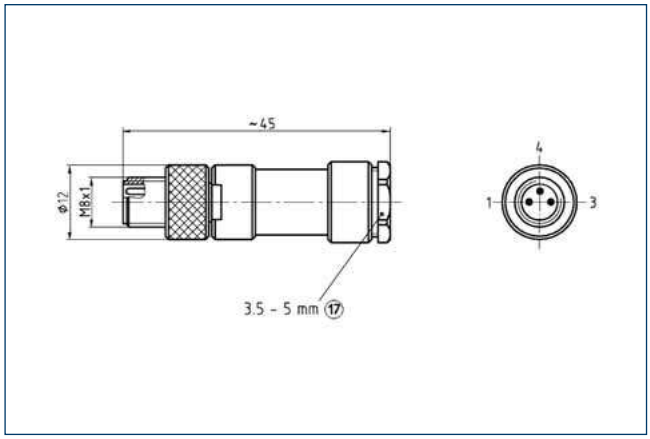
⑰ Cable outlet

Socket angled M8



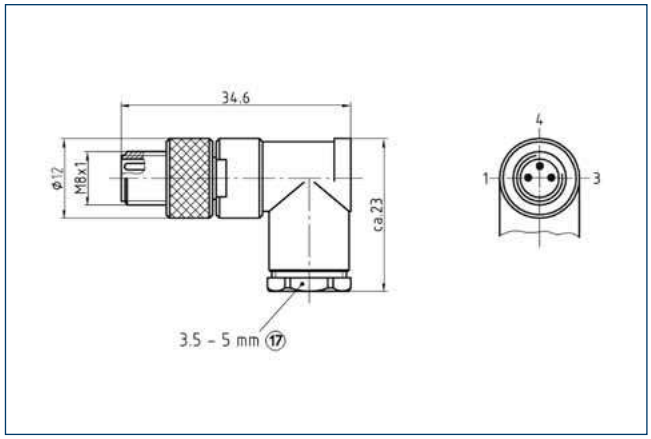
⑰ Cable outlet

Connector straight M8



⑰ Cable outlet

Connector angled M8



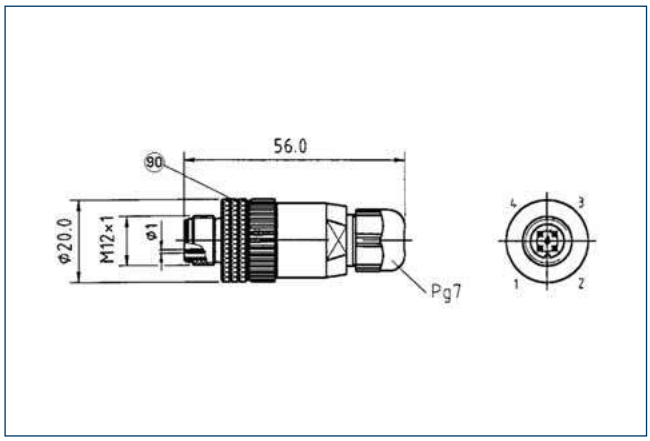
⑰ Cable outlet

KBU / KST M12

Technical data

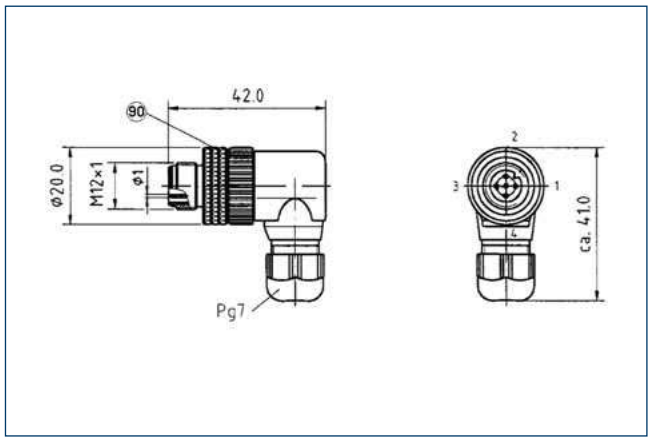
Cable socket			
Description		KBU-M12-G	KBU-M12-W
ID		0300062	0300063
Connection electric cabinet sided		open wires	open wires
Angle electric cabinet sided	[°]	0	0
Number of wires		3	3
Wire cross section	[mm²]	0.75	0.75
max. current per wire	[A]	0.5	0.5
max. total current	[A]	0.5	0.5
Cable connector			
Description		KST-M12-G	KST-M12-W
ID		0300060	0300061
Connection electric cabinet sided		open wires	open wires
Angle electric cabinet sided	[°]	0	0
Number of wires		3	3
Wire cross section	[mm²]	0.75	0.75
max. current per wire	[A]	0.5	0.5
max. total current	[A]	0.5	0.5

Socket straight M12



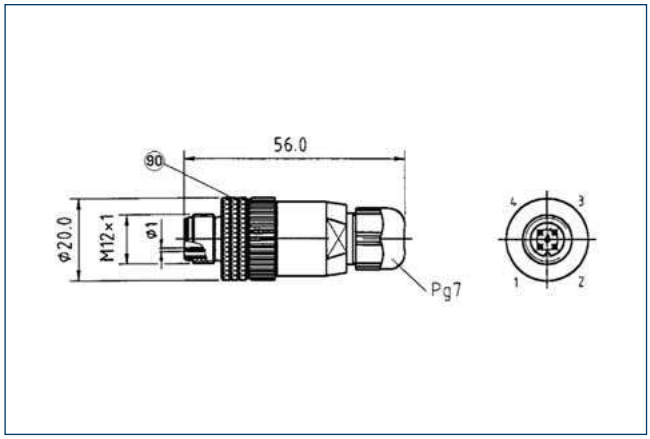
(90) Locking ring

Socket angled M12



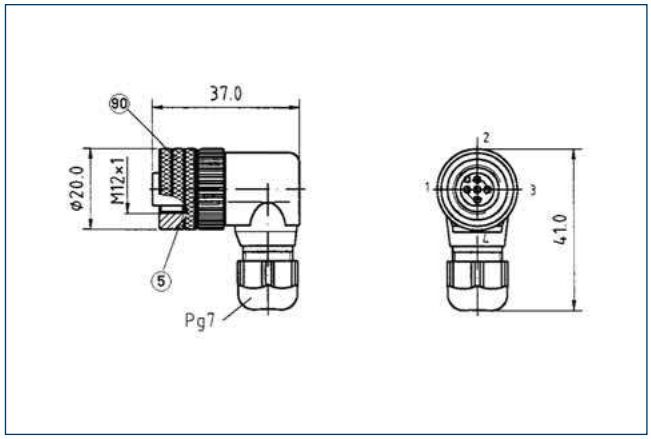
(90) Locking ring

Connector straight M12



(90) Locking ring

Connector angled M12



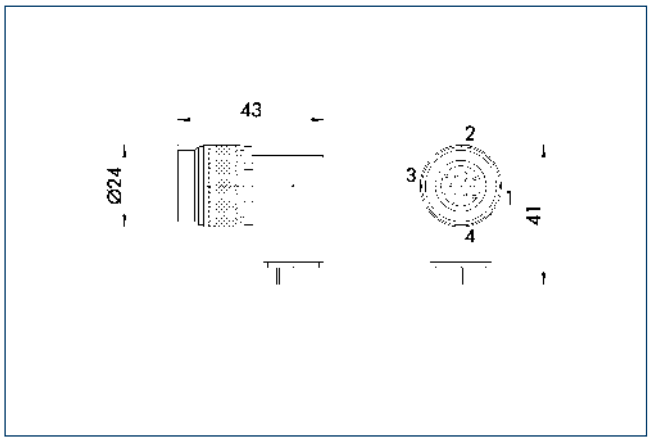
(5) O-ring (90) Locking ring

KBU / KST M16

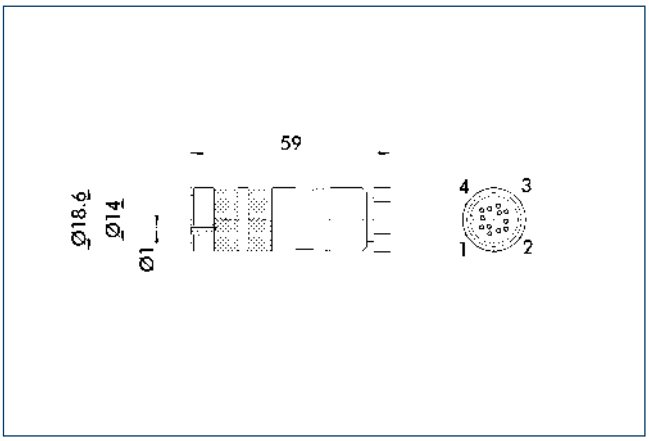
Technical data

Cable socket		
Description		KBU-M16 12P
ID		9941732
Connection electric cabinet sided		open wires
Angle electric cabinet sided	[°]	0
Number of wires		12
Wire cross section	[mm²]	0
max. current per wire	[A]	0.5
max. total current	[A]	0.5
Cable connector		
Description		KST-M16 12P
ID		9940790
Connection electric cabinet sided		open wires
Angle electric cabinet sided	[°]	0
Number of wires		12
Wire cross section	[mm²]	0
max. current per wire	[A]	0.5
max. total current	[A]	0.5

Socket angular M16



Socket straight M16



Reliable. Compact. Flexible.

KV Cable Extensions

The SCHUNK KV cable extensions are ideal for supplying SCHUNK components, and for leading signals.

Field of Application

Cable extensions are used where electric connections between two components should be done without cable assembly

Advantages – Your benefit

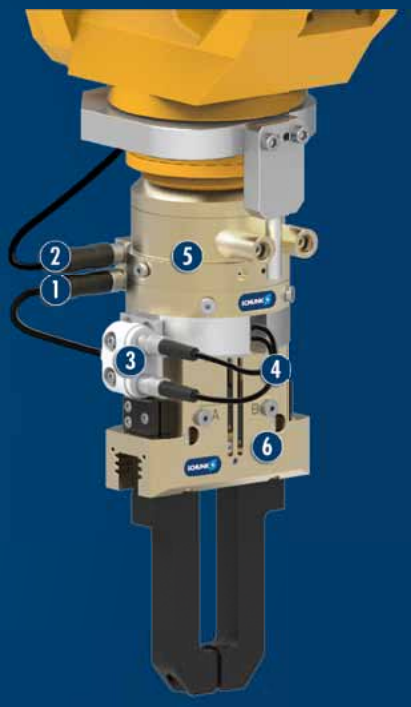
Pre-assembled cable easy and fast wiring, without the need for tools

Standard plug connector for universal application

Options and special Information

Compatibility: can easily be combined with SCHUNK sensors, actuators, and sensor distributors.

Application Example



① **KST Cable Connector**

② **Cable Extensions**

③ **Sensor Distributor**

④ **MMS Magnetic Switch**

⑤ **DDF 2 Rotary feed-through**

⑥ **PGN-plus Universal Gripper**

SCHUNK offers more ...

The following components make the KV even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

Sensor Distributor

EGP Electric Parallel Gripper

CLI Connector Clip

MMS 22 Sensor

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com.
Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

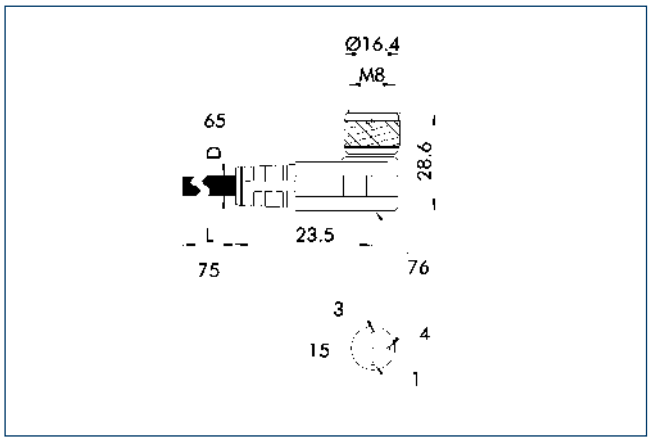
CAD data, operating manuals and other current product documents are available at **www.schunk.com**

KV M8

Technical data

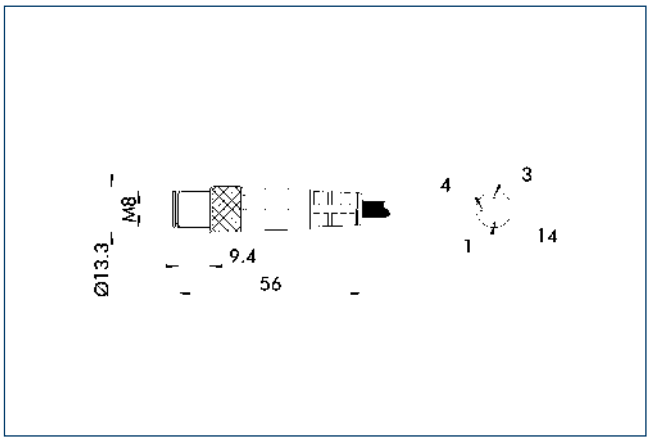
Description		KV BG08-SG08 3P-0050	KV BG08-SG08 3P-0100	KV BW08-SG08 3P-0030-PNP	KV BW08-SG08 3P-0100-PNP	KV BW08-SG08 3P-0200-PNP
ID		0301598	0301599	0301495	0301496	0301497
Connection sensor side		Connector	Connector	Connector	Connector	Connector
Thread sensor sided		M8	M8	M8	M8	M8
Angled connector, sensor side	[°]	0	0	90	90	90
Connection electric cabinet sided		Connector	Connector	Connector	Connector	Connector
Thread electric cabinet sided		M8	M8	M8	M8	M8
Angle electric cabinet sided	[°]	0	0	0	0	0
Cable length	[m]	0.5	1	0.3	1	2
Number of wires		3	3	3	3	3
Wire cross section	[mm²]	0.14	0.14	0.14	0.14	0.14
Mass	[kg]	0.04	0.05	0.02	0.04	0.06
max. current per wire	[A]	0.5	0.5	0.5	0.5	0.5
max. total current	[A]	0.5	0.5	0.5	0.5	0.5

KV M8 socket angular



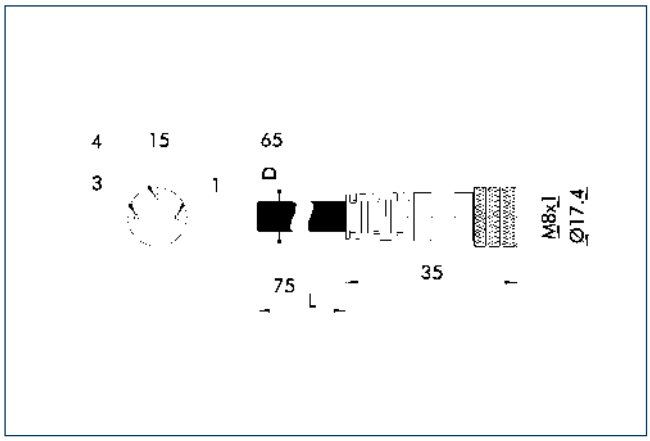
(15) Socket
(65) Cable diameter
(75) Cable length
(76) LED

KC M8 plug straight



(14) Connector

KA BG08-L 3P main view



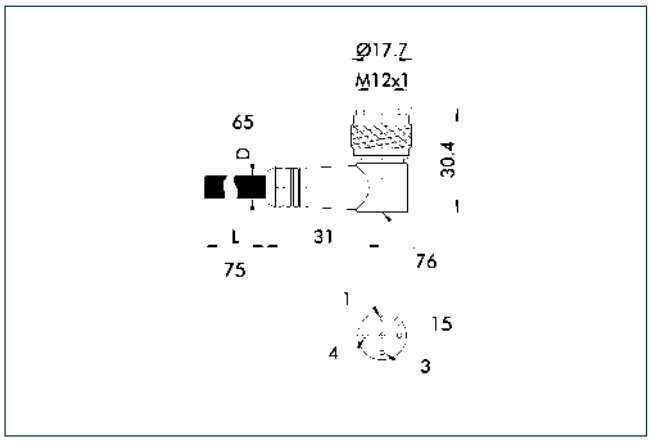
(15) Socket
(65) Cable diameter
(75) Cable length

KV M12

Technical data

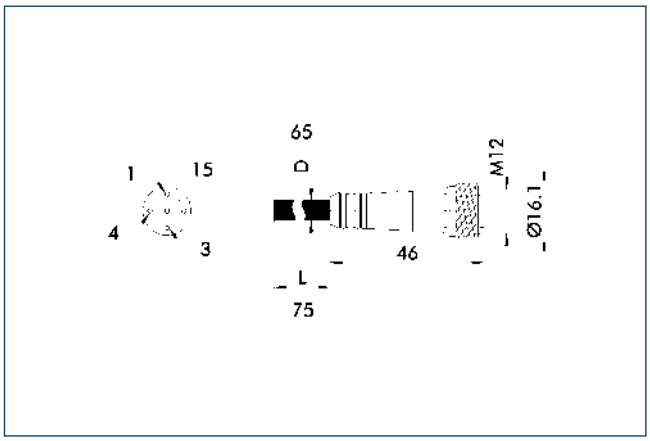
Description		KV BG12-SG12 3P-0030-PNP	KV BG12-SG12 3P-0060-PNP	KV BW12-SG12 3P-0030-PNP	KV BW12-SG12 3P-0100-PNP	KV BW12-SG12 3P-0200-PNP
ID		0301999	0301998	0301595	0301596	0301597
Connection sensor side		Socket	Socket	Socket	Socket	Socket
Thread sensor sided		M12	M12	M12	M12	M12
Angled connector, sensor side	[°]	0	0	90	90	90
Connection electric cabinet sided		Connector	Connector	Connector	Connector	Connector
Thread electric cabinet sided		M12	M12	M12	M12	M12
Angle electric cabinet sided	[°]	0	0	0	0	0
Cable length	[m]	0.3	0.6	0.3	1	2
Number of wires		3	3	3	3	3
Wire cross section	[mm²]	0.14	0.14	0.14	0.14	0.14
Mass	[kg]	0.04	0.05	0.05	0.08	0.13
max. current per wire	[A]	0.5	0.5	0.5	0.5	0.5
max. total current	[A]	0.5	0.5	0.5	0.5	0.5

KV M12 socket angular



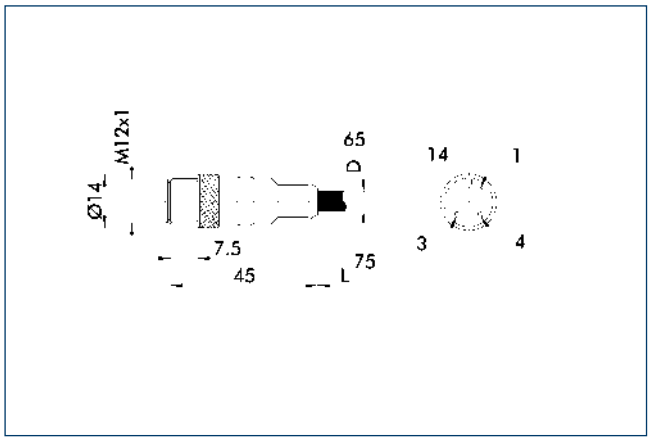
(15) Socket
(65) Cable diameter
(75) Cable length
(76) LED

KV M12 socket straight



(15) Socket
(65) Cable diameter
(75) Cable length

KV M12 plug straight



(14) Connector
(65) Cable diameter
(75) Cable length

Easy. Flexible. Compact.

V Sensor Distributor

For connecting all SCHUNK sensors and sensor systems (IN / INK / MMS / APS-M1, etc.). In the versions 2 (V2), 4 (V4) and 8 (V8).

Field of Application

Sensor distributors from SCHUNK are all-rounders, not sensitive to vibrations, dust, and humidity. They are suitable for applications in clean and dirty environments.

Advantages – Your benefit

Operating display and shift indicator by LED for direct control of the switching status

A feed line therefore it is ideal for signal feed through

Robust PA housing for a long service lifetime and resistance against many chemicals

Options and special Information

Protection class as per DIN 40050 IP67 in plugged position for use in clean or dusty environments or if in contact with water. Functionability in case of contact with other mediums (coolant, acids, bases, etc.) is often given, however cannot be guaranteed by SCHUNK.

Application Example

① **V8 Sensor Distributor**

② **SRU-plus Universal Rotary Actuator**

③ **PHE Stroke Module**

④ **PGN-plus Universal Gripper with workpiece-specific Gripper Fingers**

SCHUNK offers more ...

The following components make the Sensor-Verteiler even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

KBU / KST Cable Connector

MMS 22 Sensor

Sensor Cables

EGP Electric Parallel Gripper

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

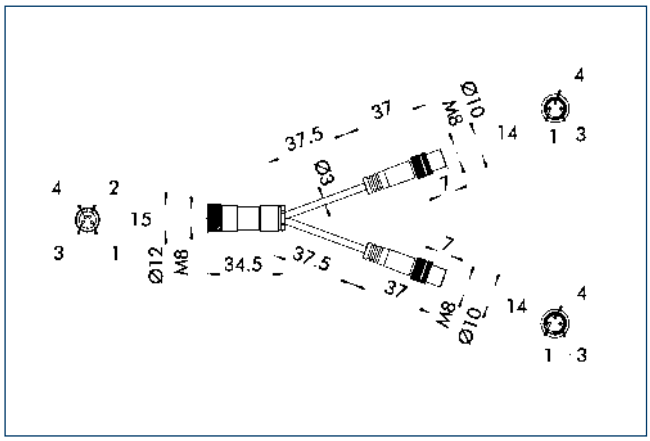
CAD data, operating manuals and other current product documents are available at **www.schunk.com**

Y Sensor Distributor

Technical data

Description		V2-M8-4P-2XM8-3P
ID		0301380
Connection socket		M8
Cable length	[mm]	37
Nominal voltage	[V]	30
max. total current	[A]	4
min. / max. ambient temperature	[°C]	-25/80

V2-M8-4-2xM8-3 main view



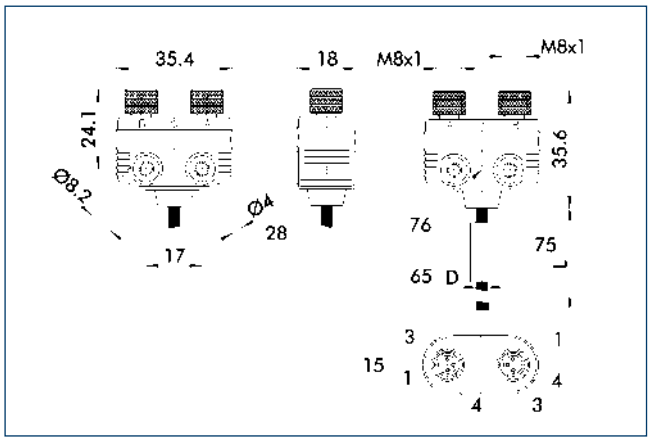
(14) Connector (15) Socket

V2 Sensor Distributor

Technical data

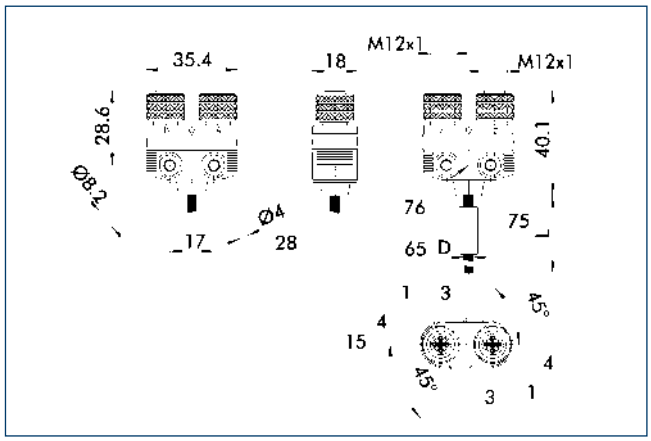
Description		V2-M8	V2-M12
ID		0301775	0301776
Connection socket		M8	M12
Cable length	[m]	3	3
Cable diameter	[mm]	4.5	4.5
Nominal voltage	[V]	24	24
min. voltage	[V]	10	10
max. voltage	[V]	30	30
max. current per wire	[A]	2	2
max. total current	[A]	2	2
min. / max. ambient temperature	[°C]	-5/70	-5/70

V2-M8 main view



(15) Socket
(28) Through-hole
(65) Cable diameter
(75) Cable length
(76) LED

V2-M12 main view



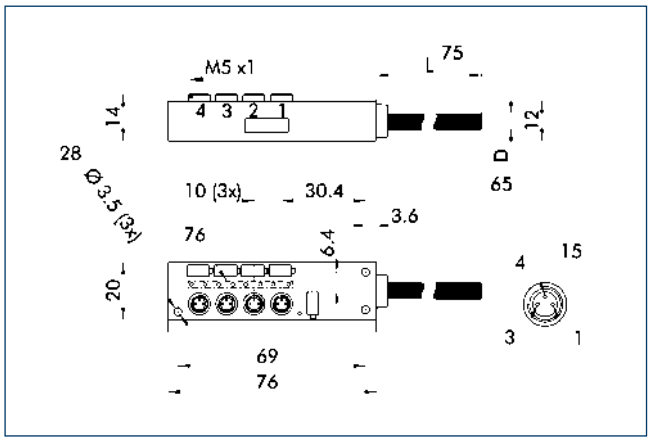
(15) Socket
(28) Through-hole
(65) Cable diameter
(75) Cable length
(76) LED

V4 Sensor Distributor

Technical data

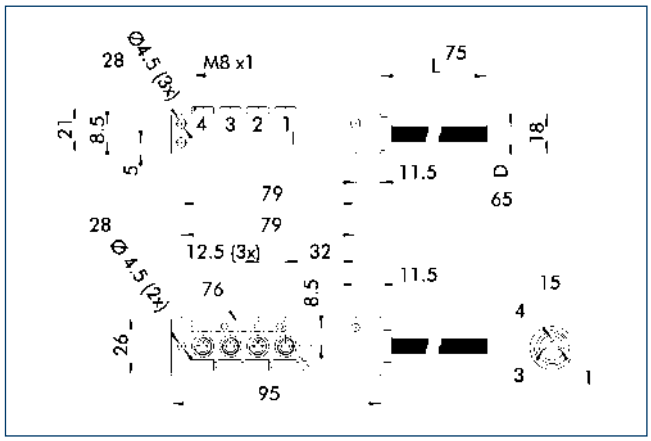
Description		V4-M5	V4-M8	V4-M8-M12 PRH	V4-M12
ID		0301661	0301746	0301755	0301747
Connection socket		M5	M8	M8	M12
Cable length	[m]	5	5	5	5
Cable diameter	[mm]	5	7	7	8.4
Nominal voltage	[V]	24	24	24	24
min. voltage	[V]	30	30	30	30
max. voltage	[V]	10	10	10	10
max. current per wire	[A]	2	2	2	2
max. total current	[A]	2	2	2	2

V4-M5 main view



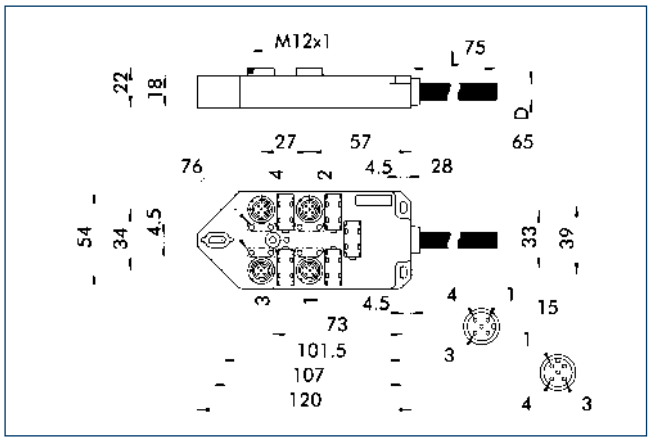
(15) Socket
(28) Through-hole
(65) Cable diameter
(75) Cable length
(76) LED

V4-M8 main view



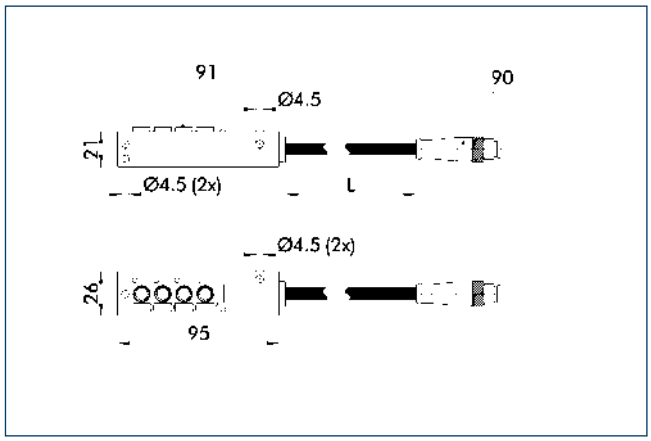
(15) Socket
(28) Through-hole
(65) Cable diameter
(75) Cable length
(76) LED

V 4-M12 main view



(15) Socket
(28) Through-hole
(65) Cable diameter
(75) Cable length
(76) LED

V4-M8 PRH main view



(90) Sensor connection
(91) Sensor connection

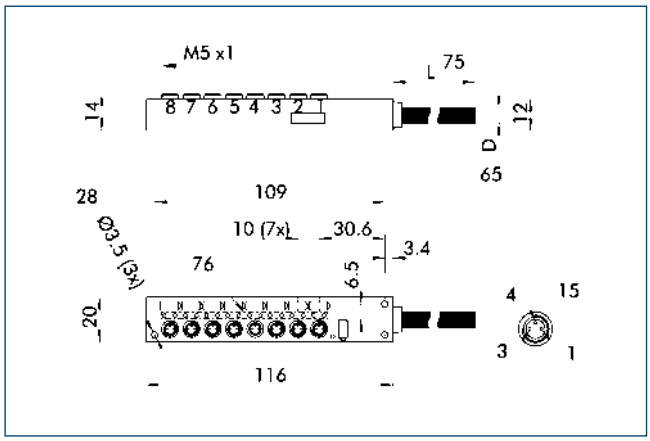
The PRH junction box can be directly connected to PRH. Four sensors with 3 pins / M8 plug can be connected.

V8 Sensor Distributor

Technical data

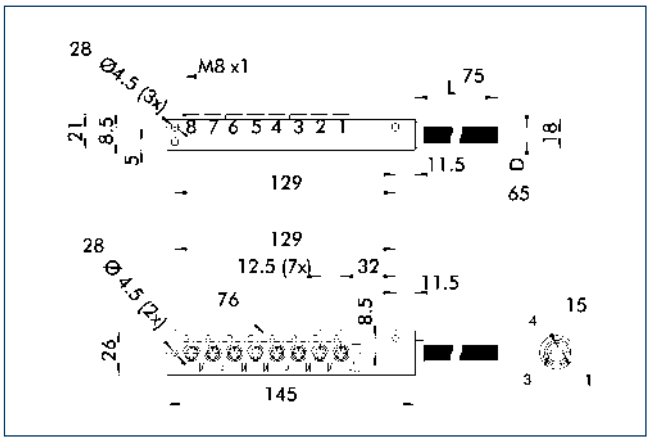
Description		V8-M5	V8-M8	V8-M12
ID		0301662	0301751	0301752
Connection socket		M5	M8	M12
Cable length	[m]	5	5	5
Cable diameter	[mm]	6.5	9.5	9.5
Nominal voltage	[V]	24	24	24
min. voltage	[V]	10	10	10
max. voltage	[V]	30	30	30
max. current per wire	[A]	2	2	2
max. total current	[A]	2	2	2

V8-M5 main view



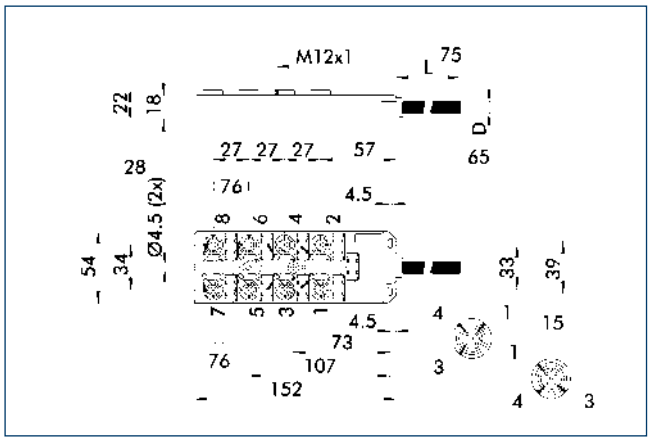
(15) Socket
(28) Through-hole
(65) Cable diameter
(75) Cable length
(76) LED

V8-M8 main view



(15) Socket
(28) Through-hole
(65) Cable diameter
(75) Cable length
(76) LED

V8-M12 main view



(15) Socket
(28) Through-hole
(65) Cable diameter
(75) Cable length
(76) LED

Precise. Compact. Easy Assembly.

ZHU / ZH Centering Elements

Centering sleeves are used for centering between two elements. With SCHUNK grippers, this frequently occurs between the mounting plate and gripper and between the gripper and gripper fingers.

Field of Application

Variable centering tasks for gripper and rotary modules, as well as linear modules.

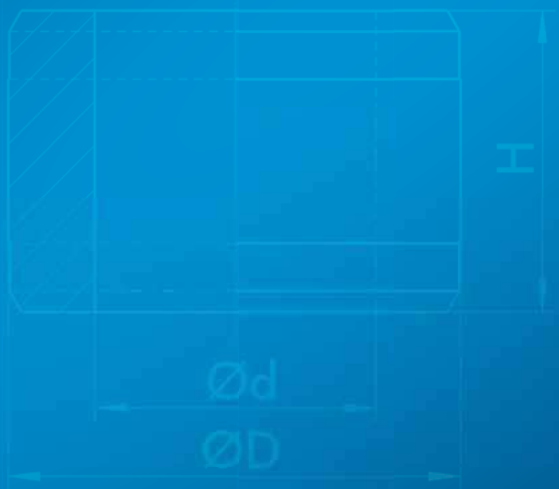
Advantages – Your benefit

Space-saving for small, compact grippers

Precise for high repeat accuracy

Economical for low costs

Easy to install for fast assembly



Applications

① **ZHU Centering Sleeves**

② **PGN-plus Universal Gripper**

SCHUNK offers more ...

The following components make the Zentrierelemente even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

PGN-plus Universal Gripper

SRU-plus Flat Swivel Unit

Adapter Plate

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

ZHU Centering Elements

Accessories | Fastening Elements | Centering Elements

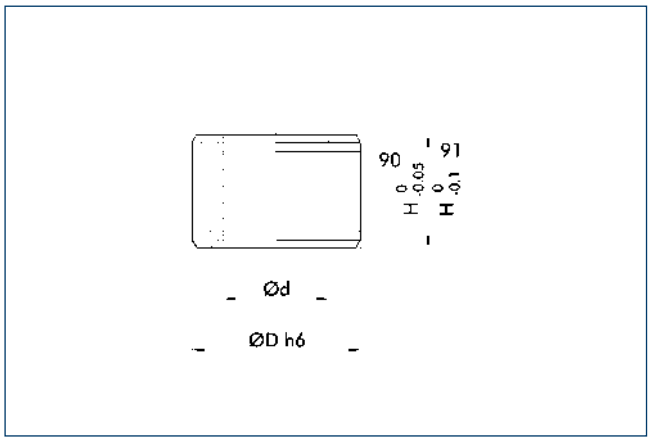
Technical data

Description		ZH 500	ZH 600	ZH 700	ZHU 2	ZHU 2,5	ZHU 3
ID		0313399	0313367	0313368	9941547	9941628	9941629
Ø D	[mm]	5	6	7	2	2.5	3
Ø d	[mm]	3.2	4.4	5.4	1.3	1.7	2.1
H	[mm]	2.5	2.5	2.5	1.95	1.95	1.95

Description		ZHU 3,5	ZHU 4	ZHU 5	ZHU 6	ZHU 8	ZHU 10
ID		9939947	9939376	9939377	9939384	9939378	9939379
Ø D	[mm]	3.5	4	5	6	8	10
Ø d	[mm]	2.1	2.6	3.1	4.1	5.1	6.2
H	[mm]	2.95	3.95	4.35	5.35	5.35	6.65

Description		ZHU 12	ZHU 14	ZHU 16	ZHU 22	ZHU 28
ID		9939380	9939381	9939382	9939383	9941220
Ø D	[mm]	12	14	16	22	28
Ø d	[mm]	8.2	10.2	12.2	16.2	21
H	[mm]	6.65	8.6	8.6	13.6	17.6

ZHU main view



(90) Ød1,3 – Ød8,2 (91) Ød10,2 – Ød21

The variable dimensions are shown in the technical data table.

Strong. Easy. Robust.

WV Elbow Fittings

Version as plug-in connection for fast and easy connection to the pneumatic energy supplies.

Field of Application

For secure hose connections in automation solutions

Advantages – Your benefit

Suitable for all SCHUNK gripper, rotary, and linear modules, in addition to robot accessories

Flexible utilization for use on pneumatic hoses from various manufacturers

Fittings as plug-in connections for fast hose attachment

Application Example

① **Elbow Fitting**

② **PGN-plus Universal Gripper**

③ **SRU-plus Universal Rotary Actuator**

SCHUNK offers more ...

The following components make the WV even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

PGN-plus Universal Gripper

SRU-plus Flat Swivel Unit

Banjo Fittings with One-way low DRV Control Valves

Adapter Plate

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

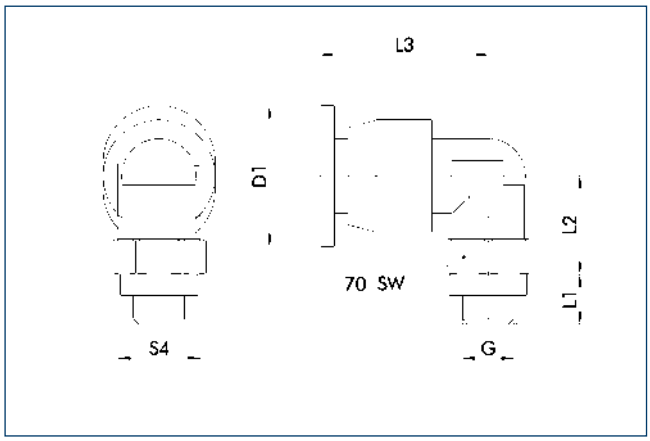
WV

Accessories | Valves and Screw Connection | Elbow Fitting

Technical data

Description		WV-G1/8-6	WV-G1/8-8	WV-G1/4-6
ID		9937129	9936730	9937170
Thread		G1/8“	G1/8“	G1/4“
max. operating pressure	[bar]	20	20	20
min. / max. ambient temperature	[°C]	-10/60	-10/60	-10/60

WV main view



70 Wrench size

Description	G	L1	L2	L3	D1	SW	S4
WV-G1/8-6	G1/8"	5	13.5	22	12	13	10
WV-G1/8-8	G1/8"	5	16	25.5	14	13	12
WV-G1/4-6	G1/4"	7	15.5	23.5	12	17	10

Flexible. Robust. Easy.

SWV Swivel Fittings

Version as plug-in connection for fast and easy connection to the pneumatic energy supplies.

Field of Application

For secure hose connections in automation solutions

Advantages – Your benefit

Suitable for all SCHUNK gripper, rotary, and linear modules, in addition to robot accessories

Flexible utilization for use on pneumatic hoses from various manufacturers

Fittings as plug-in connections for fast hose attachment

Application Example

① **Swivel Fitting**

② **Flow Control Valves**

③ **SRH-plus Swivel Master**

④ **PZN-plus 3-Finger Universal Gripper**

SCHUNK offers more ...

The following components make the SWV even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

PGN-plus Universal Gripper

SRU-plus Flat Swivel Unit

Adapter Plate

WV Elbow Fittings

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

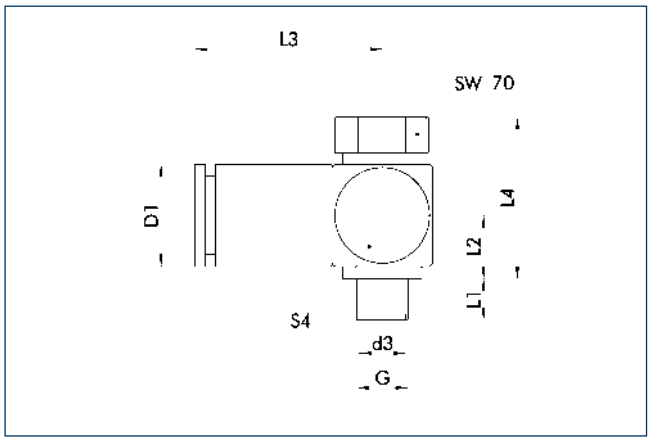
CAD data, operating manuals and other current product documents are available at **www.schunk.com**

SWV

Technical data

Description		SWV-G4-6	SWV-G4-8	SWV-G8-6	SWV-M3-4	SWV-M5-6
ID		9937128	9936728	9937152	9210505	9936171
Thread		G1/4“	G1/4“	G1/8“	M3	M5
max. operating pressure	[bar]	20	20	20	20	20
min. / max. ambient temperature	[°C]	-10/60	-10/60	-10/60	-10/60	-10/60

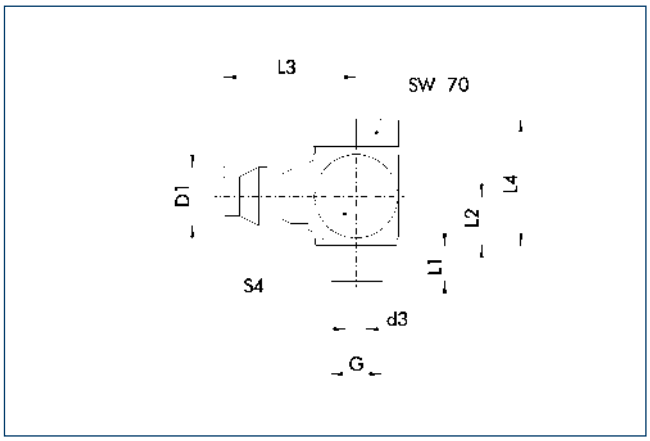
SWV main view



70 Wrench size

Description	G	D3	L1	L2	L3	L4	D1	SW
SWV-G4-6	G1/4"	7	8	8.4	24.5	21.6	12	17
SWV-G4-8	G1/4"	7	8	15.3	25	21.6	13.5	17
SWV-G8-6	G1/8"	5	6.5	8.25	22.5	20.5	12	14
SWV-M5-6	M5	2	4	6.2	18.5	15.8	10	8

SWV-M3 main view



70 Wrench size

Description	G	D3	L1	L2	L3	L4	D1	SW
SWV-M3-4	M3	1.1	2	2.5	7.3	7.3	3.4	5

Compact. Easy. Safe.

Banjo Fittings with One-way low DRV Control Valves

Version as plug-in connection for fast and easy connection to the pneumatic energy supplies.

Field of Application

For secure hose connections in automation solutions

Advantages – Your benefit

Suitable for all SCHUNK gripper, rotary, and linear modules, in addition to robot accessories

Flexible utilization for use on pneumatic hoses from various manufacturers

Fittings as plug-in connections for fast hose attachment

Application Example

① **Swivel Fitting**

② **Flow Control Valves**

③ **SRH-plus Swivel Master**

④ **PZN-plus 3-Finger Universal Gripper**

SCHUNK offers more ...

The following components make the DRV even more productive – the perfect complement for highest functionality, flexibility, and process reliability.

PGN-plus Universal Gripper

SRU-plus Flat Swivel Unit

WV Elbow Fittings

Adapter Plate

ⓘ Further information regarding the products can be found on the following product pages or at www.schunk.com. Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

CAD data, operating manuals and other current product documents are available at **www.schunk.com**

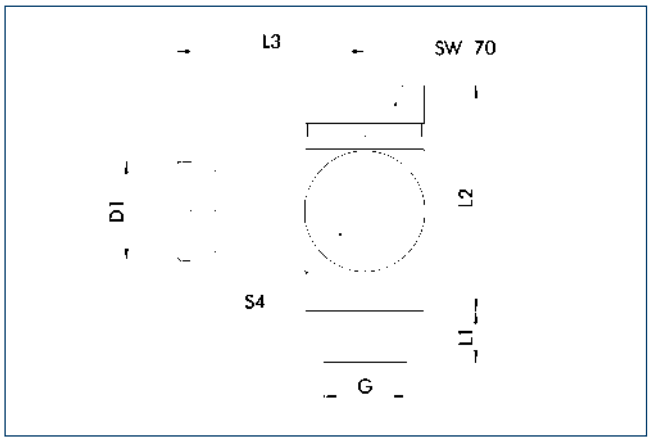
DRV

Accessories | Valves and Screw Connection | Banjo Fitting

Technical data

Description		DRV-M3-3	DRV-M5-6	DRV-G8-6	DRV-G4-6	DRV-G8-8
ID		9720005	9936160	9936159	9936161	9936162
Thread		M3	M5	G1/8“	G1/4“	G1/8“
max. operating pressure	[bar]	20	20	20	20	20
min. / max. ambient temperature	[°C]	-10/60	-10/60	-10/60	-10/60	-10/60

DRV main view



70 Wrench size

Description	G	L1	L2	L3	D1	SW
DRV-M3-3	M3	2.5	29	11	4.8	
DRV-M5-6	M5	4	21.5	21	10.4	8
DRV-G8-6	G1/8"	5	30	22.5	12	14
DRV-G4-6	G1/4"	6.5	32	24.5	12	17
DRV-G8-8	G1/8"	5	30	23	14	14

SCHUNK Service

Competent and skilled personnel ensure optimal availability of your SCHUNK products, and make sure that their value will be maintained.

Your advantage:

- Fast supply of original spare parts
- Reduction of down-times
- The complete spectrum of components from one source
- Quality and availability that can only be guaranteed by the original manufacturer
- 12-month warranty

Initial operation

- Professional assembly
- Fast and trouble-free

Inspection

- Inspection is carried out by skilled service engineers
- Avoiding unplanned failures of workholding and toolholding equipment

Maintenance

- Regular maintenance carried out by skilled service engineers
- Increasing and ensuring the availability of your workholding and tool-holding equipment

Repairs

- Short down-times due to fast intervention of the SCHUNK service engineers
- Spare parts and accessories

Training

- Fast and practical training
- Efficient use of your SCHUNK products by training of the operating personnel
- The basis for proper machining of workpieces
- Ensures longevity of your SCHUNK products

Individual service – for better results

- Hotline to our inside technical consultants weekdays from 7 a.m. to 6 p.m.
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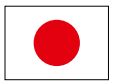

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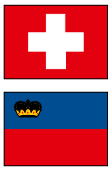

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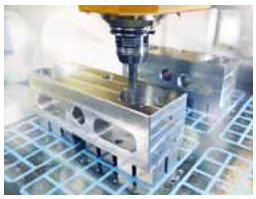

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