PGN-plus

Pneumatic • 2-Finger Parallel Gripper • Universal Gripper

Sizes
40 ... 380

Weight
0.08 kg ... 39.5 kg

Gripping force
123 N ... 21150 N

Stroke per finger
2 mm ... 45 mm

Workpiece weight
0.62 kg ... 80.5 kg

Application example

Pick-and-place unit for light to medium-weight components

1. 2-Finger Parallel Gripper PGN-plus
2. Linear module LM
3. Linear module LM

Universal Gripper

Universal 2-finger parallel gripper with large gripping force and high maximum moments thanks to multi-tooth guidance.

Field of application

Ideal standard solution for numerous fields of application. For universal use in clean to slightly dirty environments. Special versions available for dirty environments.

Your advantages and benefits

Robust multi-tooth guidance
for precise handling

High maximum moments possible
suitable for using long gripper fingers

Drive concept oval piston
for maximum gripping forces

Mounting from two sides in three screw directions possible
for universal and flexible gripper assembly

Air supply via hose-free direct connection or screw connections
for universal and flexible gripper assembly

Comprehensive sensor accessory program
for versatile interrogation possibilities and control of stroke position

Compact dimensions
for minimal interfering contours in handling

Manifold options
for perfect adaption to your case of application (dust protection, high temperature, anti-corrosion and many more)

General note to the series

Principle of function
Wedge-hook kinematics

Housing material
Aluminum

Base jaw material
Steel

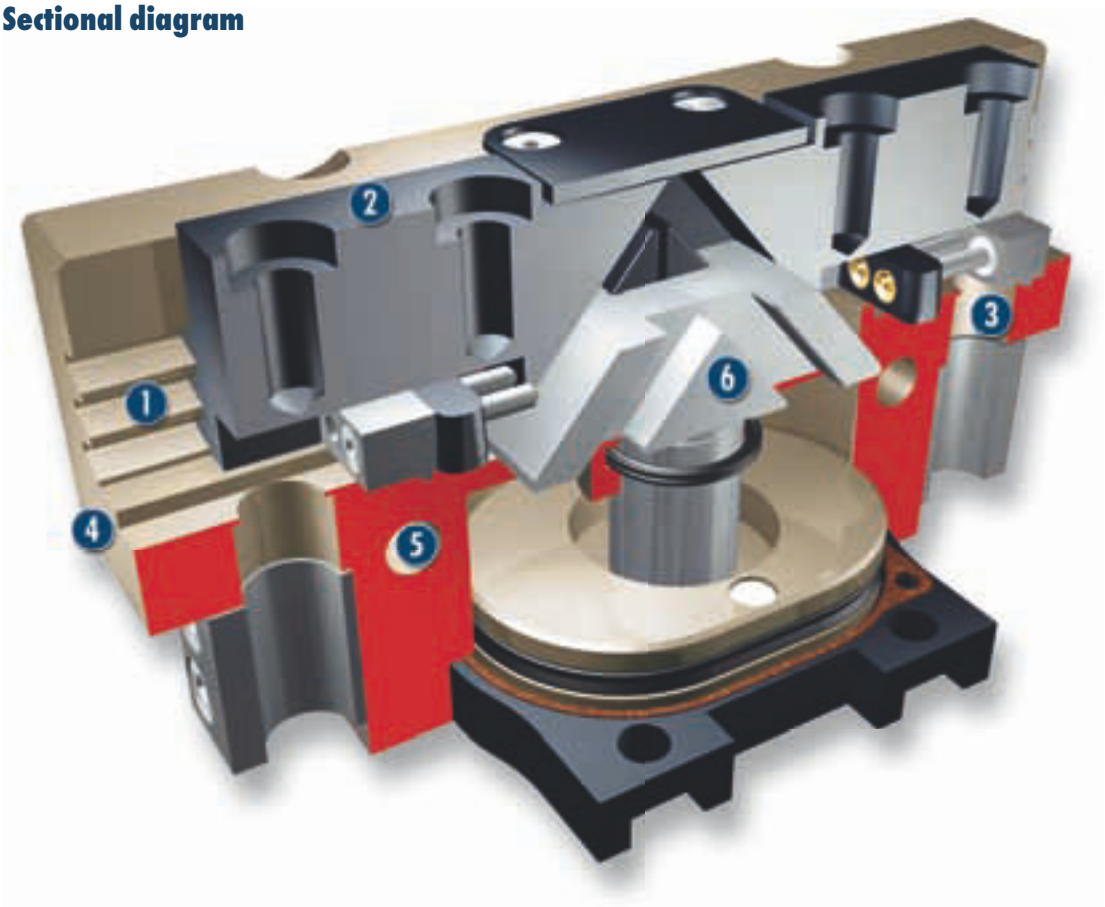
Actuation
pneumatic, with filtered compressed air (10 microns): dry, lubricated or non-lubricated
Pressure medium: Required quality class of compressed air according to DIN ISO 8573-1: 6 4 4

Warranty
36 months (details, general terms and conditions and operation manuals can be downloaded under www.schunk.com)

Scope of delivery
Brackets for proximity switches, centering sleeves, O-rings for direct connection, assembly and operating manual with manufacturer's declaration

Gripping force maintenance device
with either mechanical gripping force maintenance or SDV-P pressure maintenance valve

Sectional diagram



1 Multiple-tooth guidance
high-loadable base jaw guidance with minimum play for long fingers

2 Base jaw
for the connection of workpiece-specific gripper fingers

3 Sensor system
Brackets for proximity switches and adjustable control cams in the housing

4 Housing
weight-optimized through application of hard-anodized, high-strength aluminum alloy

5 Centering and mounting possibilities
for universal assembly of the gripper

6 Wedge-hook design
for high power transmission and centric gripping

Functional description

The oval piston is moved up or down by means of compressed air.
Through its angled active surfaces, the wedge hook transforms this movement into the lateral, synchronous gripping movement of both base jaws.

Options and special information

Dust-protection version
Absolutely sealed, increased degree of protection against the ingress of materials, for use in dusty environments

Anti-corrosion version
for use in corrosion-inducing atmospheres

High-temperature version
for use in hot environments

Force intensified version
if higher gripping forces are required

Precision version
for a higher accuracy

Accessories

Accessories from SCHUNK – the suitable supplement for maximum functionality, reliability and performance of all automation modules.

Sensor system

Fittings

Universal intermediate jaw

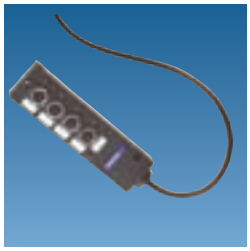
Compensation unit

Protection cover

Sensor cables

Quick-change Jaw System

Sensor Distributor



Pressure maintenance valve

Finger blanks

Force measuring jaws

Analog position sensor

Flexible Position Sensor

ⓘ For the exact size of the required accessories, availability of this size and the designation and ID, please refer to the additional views at the end of the size in question. You will find more detailed information on our accessory range in the “Accessories” catalog section.

General note to the series

Gripping force
is the arithmetic total of the gripping force applied to each finger at distance P (see illustration) measured from the upper edge of the gripper.

Finger length
The finger length is measured from the upper edge of the gripper housing in the direction of the main axis.

Repeat accuracy
is defined as the spread of the limit position after 100 consecutive strokes.

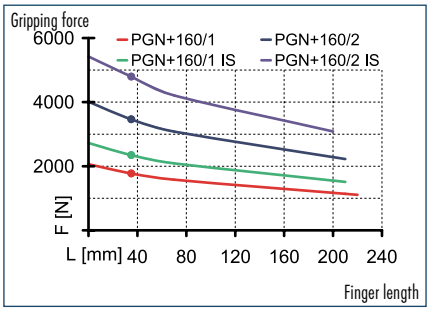
Workpiece weight
The recommended workpiece weight is calculated for a force-type connection with a coefficient of friction of 0.1 and a safety factor of 2 against slippage of the workpiece on acceleration due to gravity g. Considerably heavier workpiece weights are permitted with form-fit gripping.

Closing and opening times
Closing and opening times are purely the times that the base jaws or fingers are in motion. Valve switching times, hose filling times or PLC reaction times are not included in the above times and must be taken into consideration when determining cycle times.

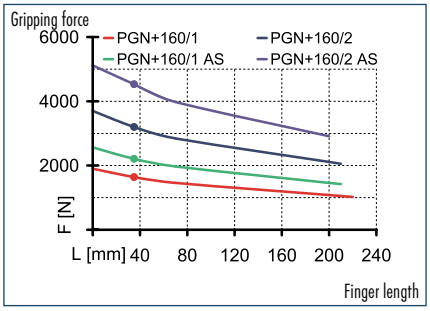
PGN-plus 160

Pneumatic • 2-Finger Parallel Gripper • Universal Gripper

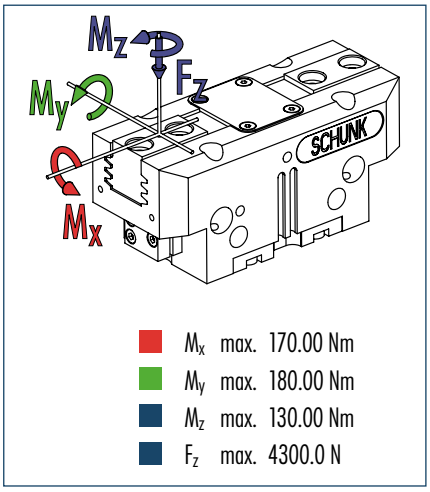
Gripping force, I.D. gripping



Gripping force, O.D. gripping



Finger load



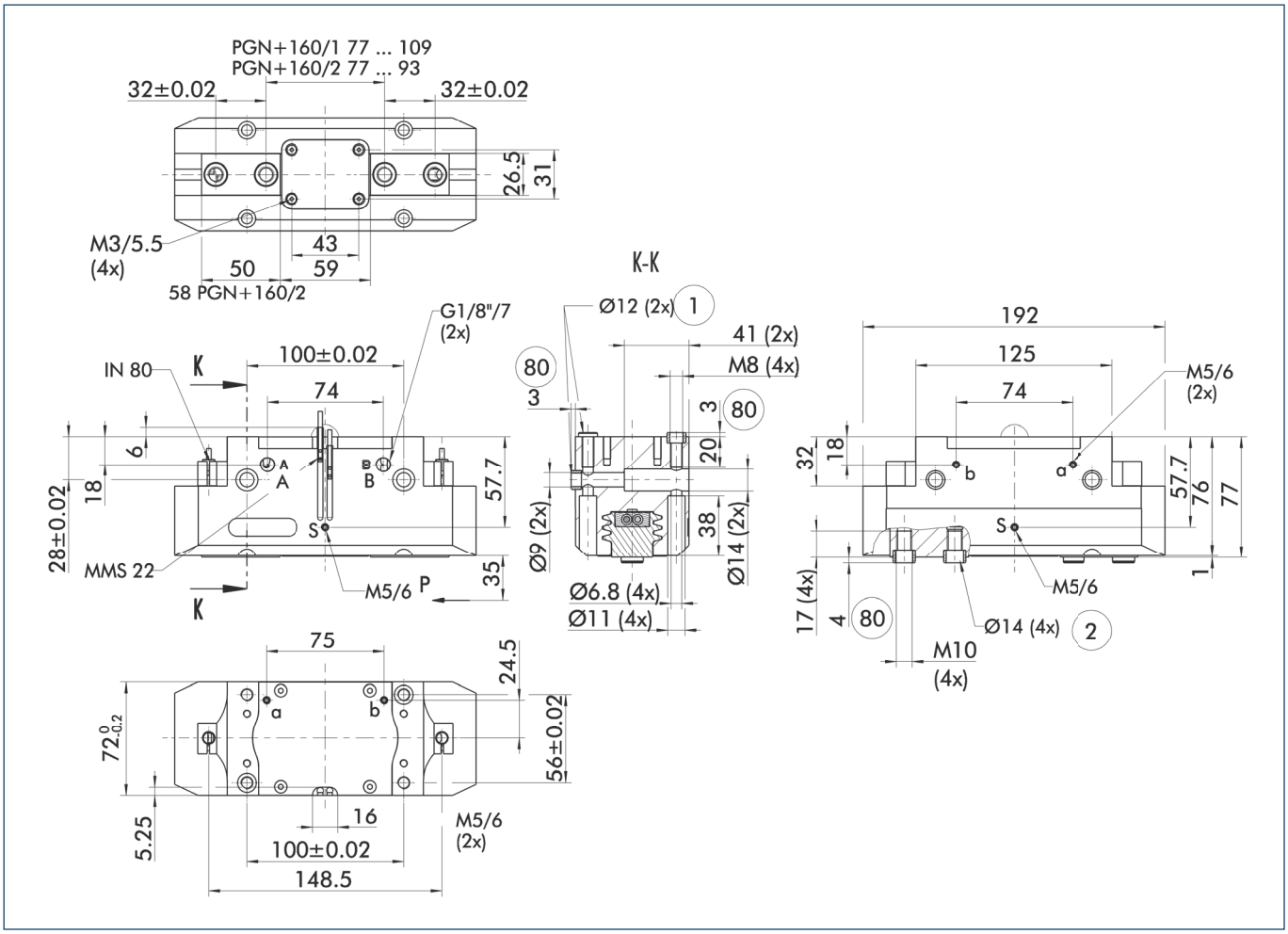
- M_x max. 170.00 Nm
- M_y max. 180.00 Nm
- M_z max. 130.00 Nm
- F_z max. 4300.0 N

ⓘ The indicated moments and forces are static values, apply per base jaw and may occur simultaneously. M_y may arise in addition to the moment generated by the gripping force itself. If the max. permitted finger weight is exceeded, it is imperative to throttle the air pressure so that the jaw movement occurs without any hitting or bouncing. Service life may be reduced.

Technical data

Description		PGN-plus 160-1	PGN-plus 160-2	PGN-plus 160-1-AS	PGN-plus 160-2-AS	PGN-plus 160-1-IS	PGN-plus 160-2-IS
ID		**0371104**	**0371154**	**0371404**	**0371454**	**0371464**	**0371474**
Stroke per finger	[mm]	16	8	16	8	16	8
Closing force	[N]	1640	3200	2210	4420		
Opening force	[N]	1770	3460			2340	
Min. spring force	[N]			570	1220	570	1220
Weight	[kg]	2.6	2.6	3.3	3.3	3.3	3.3
Recommended workpiece weight	[kg]	8.2	16	8.2	16	8.2	16
Air consumption per double stroke	[cm³]	157	157	265	265	265	265
Min./max. operating pressure	[bar]	2.5/8	2.5/8	4/6.5	4/6.5	4/6.5	4/6.5
Nominal operating pressure	[bar]	6	6	6	6	6	6
Closing/opening time	[s]	0.15/0.15	0.15/0.15	0.12/0.25	0.12/0.25	0.25/0.12	0.25/0.12
Max. permitted finger length	[mm]	220	210	210	200	210	200
Max. permitted weight per finger	[kg]	3.5	3.5	3.5	3.5	3.5	3.5
IP class		40	40	40	40	40	40
Min./max. ambient temperature	[°C]	-10/90	-10/90	-10/90	-10/90	-10/90	-10/90
Repeat accuracy	[mm]	0.01	0.01	0.01	0.01	0.01	0.01
Cleanroom class ISO-classification 14644-1		5	5	5	5	5	5
OPTIONS and their characteristics							
Dust-protection version		**37371104**	**37371154**	**37371404**	**37371454**	**37371464**	**37371474**
IP class		64	64	64	64	64	64
Weight	[kg]	3	3	3.7	3.7	3.7	3.7
Anti-corrosion version		**38371104**	**38371154**	**38371404**	**38371454**	**38371464**	**38371474**
High-temperature version		**39371104**	**39371154**	**39371404**	**39371454**	**39371464**	**39371474**
Min./max. ambient temperature	[°C]	-10/130	-10/130	-10/130	-10/130	-10/130	-10/130
Force intensified version		PGN-plus 160-1-KVZ	PGN-plus 160-2-KVZ	PGN-plus 160-1-AS-KVZ		PGN-plus 160-1-IS-KVZ	
ID		**0372104**	**0372154**	**0372404**		**0372464**	
Closing force	[N]	2950	5760	3520			
Opening force	[N]	3185	6230			3755	
Weight	[kg]	3.4	3.4	4.4		4.4	
Maximum pressure	[bar]	6	6	6		6	
Max. permitted finger length	[mm]	160	125	125		125	
Precision version		**0371126**	**0371176**	**0371426**	**0371441**		

Main view

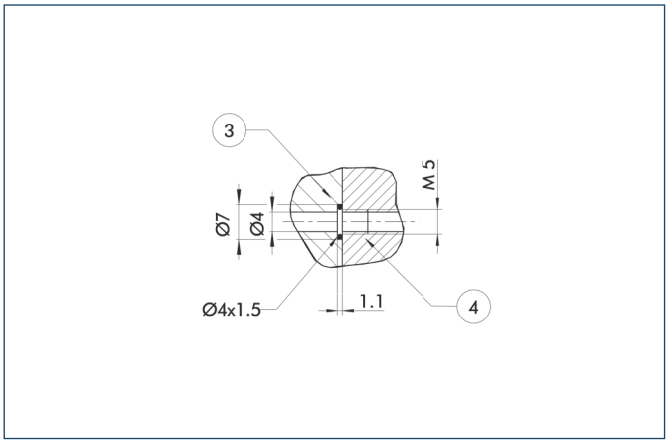


The drawing shows the gripper in the basic version with closed jaws, the dimensions do not include the options described below.

ⓘ The SDV-P pressure maintenance valve can also be used for I.D. or O.D. gripping alternatively or in addition to the spring-loaded, mechanical gripping force maintenance device (see "Accessories" catalog section).

A, a Main/direct connection, gripper opening
B, b Main/direct connection, gripper closing
S Air purge connection
① Gripper connection
② Finger connection
80 Depth of the centering sleeve hole in the matching part

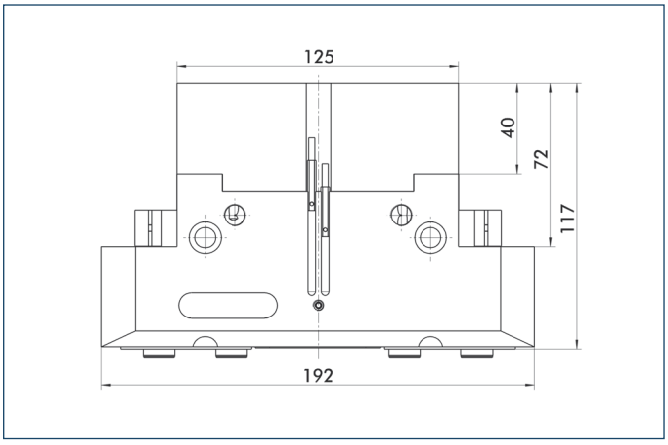
Hose-free direct connection



③ Adapter
④ Gripper

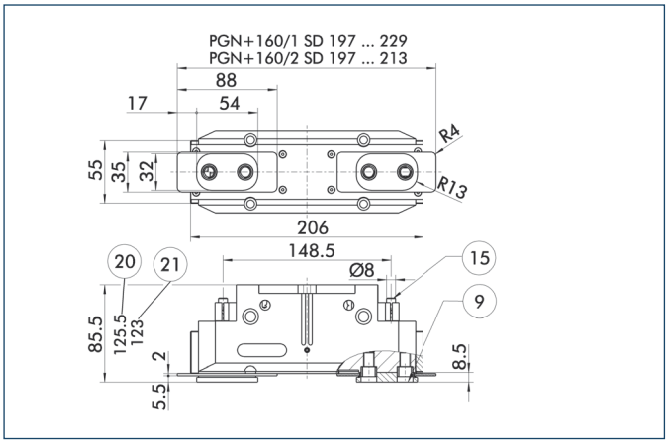
The direct connection is used for supplying compressed air without hoses. Instead, the pressure medium is fed through bore-holes in the mounting plate.

AS/IS gripping force maintenance device



The mechanical gripping force maintenance device ensures a minimum gripping force even in case of pressure drop. This acts as closing force in the AS version, and as opening force in the IS version. In addition, the gripping force maintenance device can also be used for increasing the gripping force or for single-acting gripping.

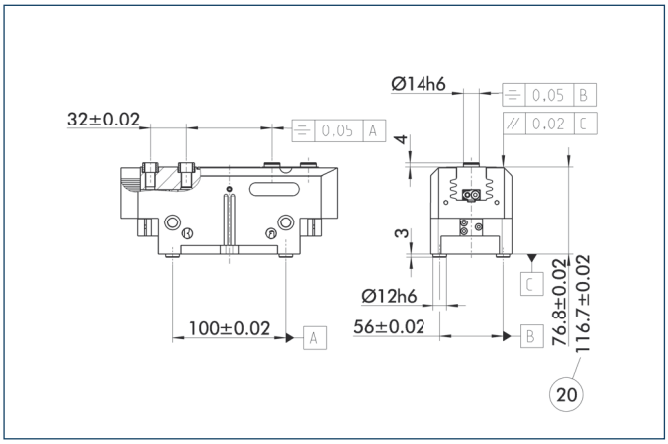
Dust-protection version



⑨ For mounting screw connection diagram, see basic version
⑮ Sealing bolt
⑳ For AS / IS version
㉑ Applies for KVZ version

The "dust-protection" option increases the degree of protection against penetrating substances. The screw connection diagram shifts by the height of the intermediate jaw. The finger length is still measured from the upper edge of the gripper housing.

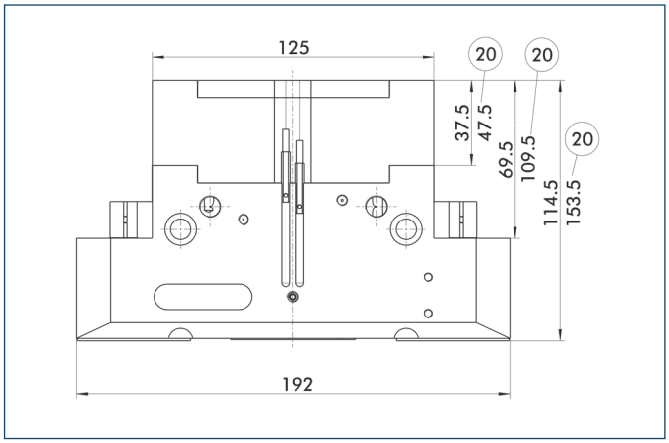
Precision version



⑳ For AS / IS version

The indicated tolerances just refer to the types of precision versions shown in the chart of technical specifications. All other types of precision versions are available on request.

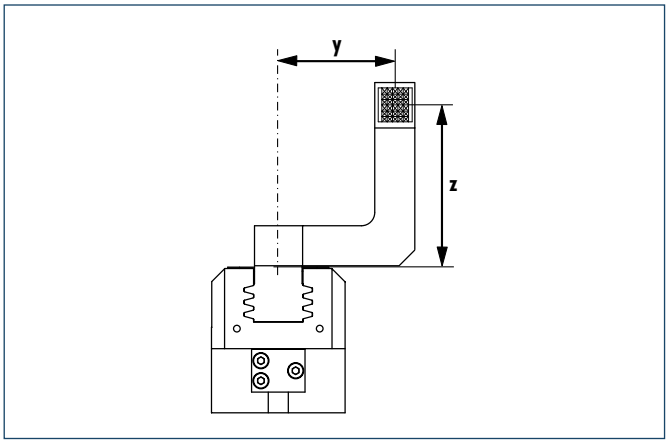
Force intensified version

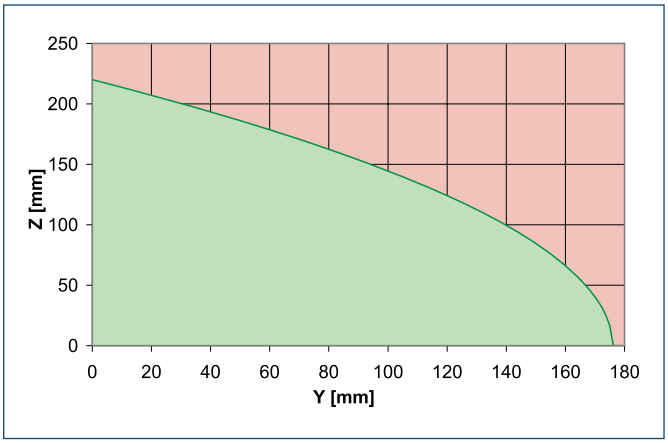


⑳ For AS / IS version

The KVZ cylinder increases the gripping forces during opening and closing. A second, in series-connected piston also increases the force on the wedge hook. The full gripping force shown in the data table is sometimes only reached after a few hundred gripping cycles. Please consider that grippers which are equipped with a gripping force maintenance device (AS / IS) are higher.

Maximum permitted finger projection

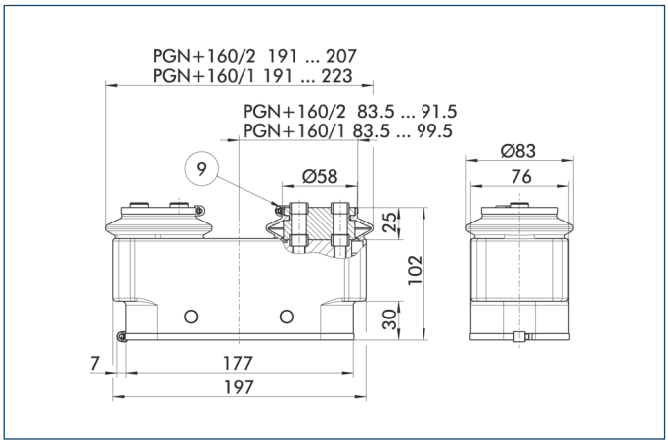




Permitted range
Inadmissible range

The curve applies to the basic version (stroke -1). For other versions, the curve will be parallel but offset in line with the max. permitted finger length.

Protection cover

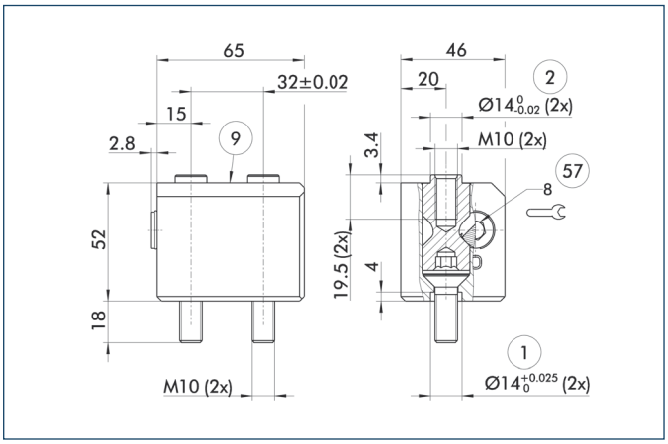


⑨ For mounting screw connection diagram, see basic version

The HUE protective cover completely protects the gripper against external influences up to IP65 if an additional sealing of the cover bottom is provided as part of the application. The mounting diagram shifts by the height of the intermediate jaw.

Description	ID	Cleanroom class ISO-classification 14644-1
Protection cover		
HUE PGN-plus 160	**0371484**	2

Quick-change Jaw System



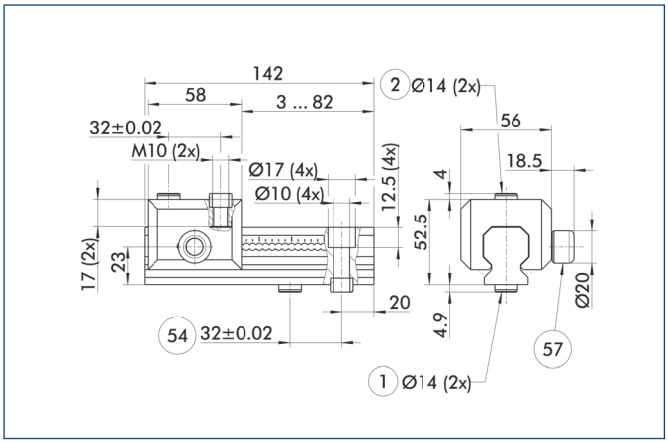
① Gripper connection
② Finger connection
⑨ For mounting screw connection diagram, see basic version
57 Locking

The BSWS quick-change jaw system enables top jaws to be changed on the gripper manually and rapidly. An adapter (BSWS-A) and a base (BSWS-B) are required for each gripper jaw.
For a reverse assembly without height set-up, one adapter (BSWS-A) and a kit (BSWS-U) per gripper jaw are required. Another effect of the BSWS-U is, that there are no disturbing fastening bores in the finger contour.

Description	ID
Quick-change Jaw System adapter	
BSWS-A 160	**0303030**
Quick-change Jaw System base	
BSWS-B 160	**0303031**
Quick-change Jaw System reversed	
BSWS-U 160	**0303045**

You can find more detailed information and individual parts of the above-mentioned accessories in the “Accessories” catalog section.

Universal intermediate jaw



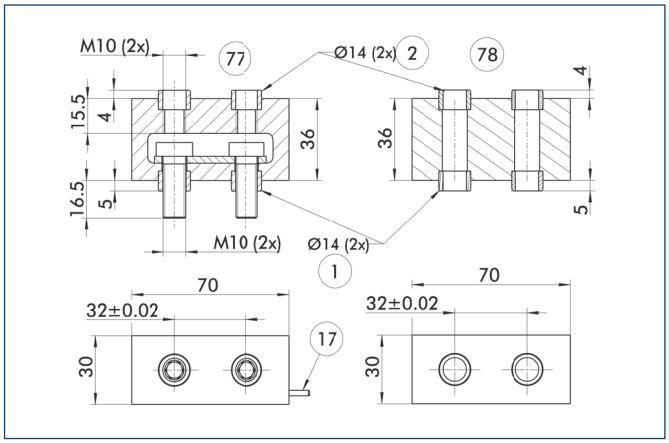
① Gripper connection
② Finger connection
54 Optional right or left connection
57 Locking

The universal intermediate jaw allows fast tool-free and reliable plugging and shifting of top jaws at the gripper.

Description	ID	Grid dimension
Universal intermediate jaw		
UZB 160	**0300046**	4 mm
UZB-S 160	**5518274**	4 mm

ⓘ The slide UZB-S can be removed completely and has to be ordered separately. Moreover, it allows a fast jaw change.

Force measuring jaws

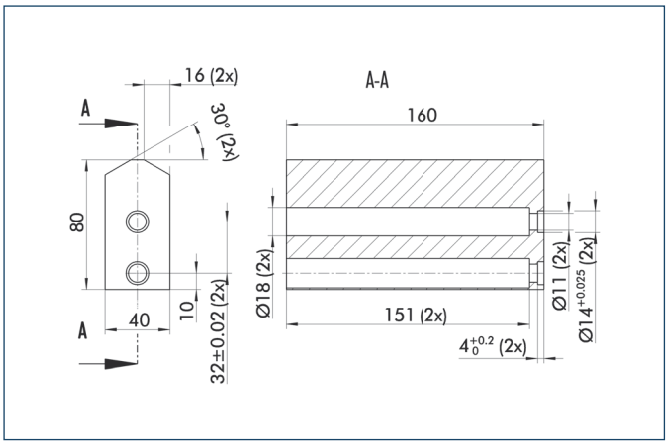


① Gripper connection
② Finger connection
17 Cable outlet
77 Active intermediate jaws
78 Passive intermediate jaws

Force measuring jaws measure gripping forces, but can also determine workpiece weights or dimensional deviations. There are active and passive intermediate jaws (FMS-ZBA or FMS-ZBP). At least one active force measuring jaw is required per gripper, the rest can be passive. For each active jaw, a FMS-A1 control unit and a FMS-A connection cable are required.

Description	ID
Active intermediate jaws	
FMS-ZBA 160	**0301840**
Passive intermediate jaws	
FMS-ZBP 160	**0301841**
Electronic Processor	
FMS-A2	**0301811**
Connection cables	
FMS-AK0200	**0301820**
FMS-AK0500	**0301821**
FMS-AK1000	**0301822**
FMS-AK2000	**0301823**

Finger blanks

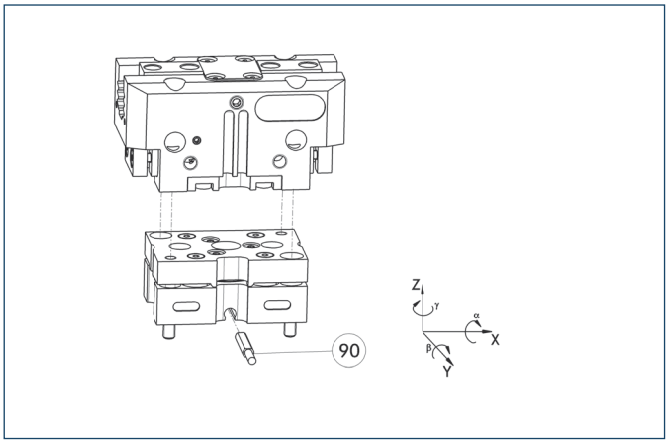


Finger blanks for customized subsequent machining

Description	ID	Material	Scope of delivery
Finger blanks			
ABR-plus 160	**0300014**	Aluminum	1
SBR-plus 160	**0300024**	16 MnCr 5	1

You can find more detailed information and individual parts of the above-mentioned accessories in the “Accessories” catalog section.

Tolerance compensation unit

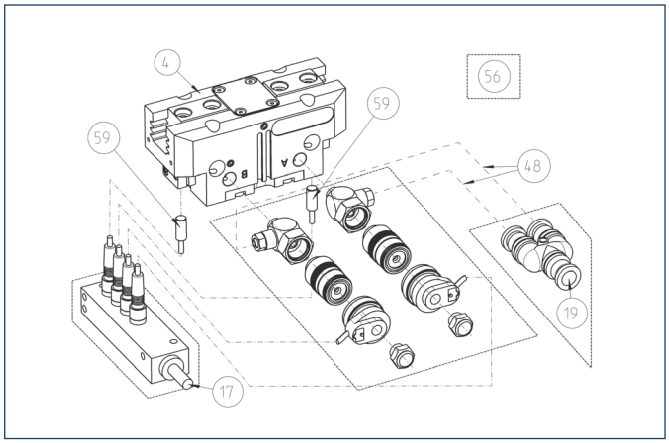


(90) Monitoring of locking

Grippers can be directly mounted without an adapter plate. Tolerance compensation unit and gripper have an identical screw connection diagram. Therefore the tolerance compensation units can be assembled later. Please consider the additional assembly height of the tolerance compensation unit. For details see catalog “Robot Accessories”.

Description	ID	Locking	Deflection
Compensation unit			
TCU-160-3-MV-P	**0324846**	Yes	±2°/±1°/±1.5°
TCU-160-3-OV-P	**0324847**	No	±2°/±1°/±1.5°

Attachment valves



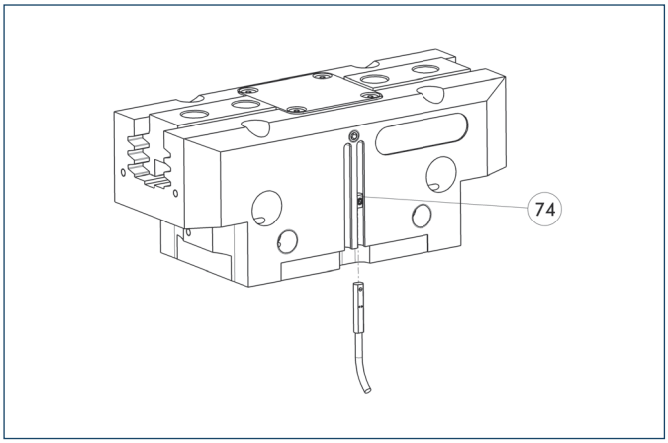
(4) Gripper
(17) Cable outlet
(19) Air connection
(48) Hose
(56) Included in delivery
(59) Monitoring “gripping”

For each gripper one attachment valve ABV is required, optional with distributor for sensors and valves. Attachment valves increase the efficiency, reduce the installation work and air consumption and simplify air supply. For details please refer to the “Accessories” catalog section.

Description	ID
Attachment valves	
ABV-MV30-G1/8	**0303328**
ABV-MV30-G1/8-V2-M8	**0303396**
ABV-MV30-G1/8-V4-M8	**0303366**
ABV-MV30-G1/8-V8-M8	**0303367**

You can find more detailed information and individual parts of the above-mentioned accessories in the “Accessories” catalog section.

Programmable magnetic switch



74 Stop for MMS-P

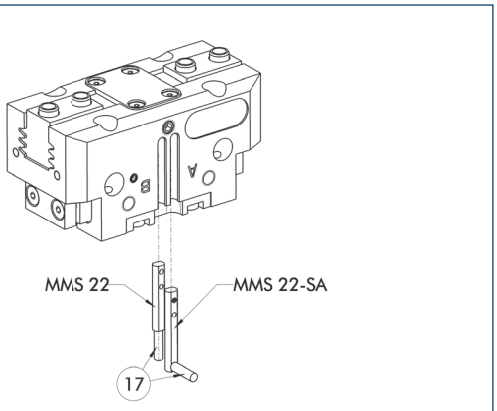
Position monitoring with two programmable positions per sensor. The end position monitoring is mounted in the C-slot.

Description	ID	Recommended product
Programmable magnetic switch		
MMS-P 22-S-M8-PNP	**0301370**	•
MMSK-P 22-S-PNP	**0301371**	
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**	

ⓘ Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

ⓘ Per gripper one sensor (closer/NO) is required, optionally a cable extension.

Electronic magnetic switches



17 Cable outlet

End position monitoring for mounting in the C-slot

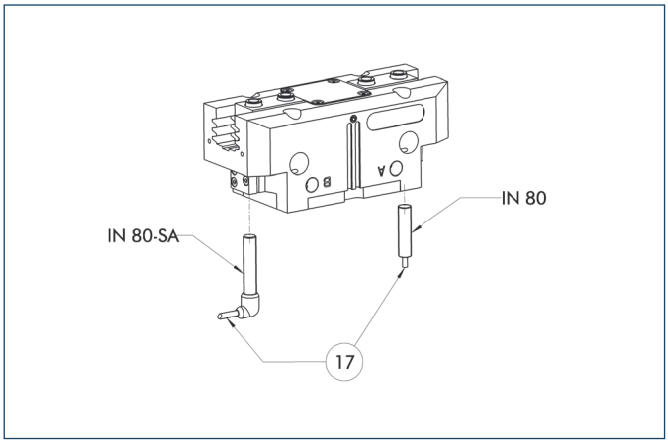
Description	ID	Recommended product
Electronic magnetic switches		
MMS 22-S-M5-PNP	**0301438**	
MMS 22-S-M5-NPN	**0301439**	
MMS 22-S-M8-PNP	**0301432**	•
MMS 22-S-M8-NPN	**0301433**	
MMSK 22-S-PNP	**0301434**	
MMSK 22-S-NPN	**0301435**	
Electronic magnetic switches with lateral cable outlet		
MMS 22-S-M5-PNP-SA	**0301448**	
MMS 22-S-M5-NPN-SA	**0301449**	
MMS 22-S-M8-PNP-SA	**0301442**	•
MMS 22-S-M8-NPN-SA	**0301443**	
MMSK 22-S-PNP-SA	**0301444**	
MMSK 22-S-NPN-SA	**0301445**	
Reed Switches		
RMS 22-S-M8	**0377720**	•
Connection cables		
KA BG05-L 3P-0300	**0301652**	
KA BG08-L 3P-0300-PNP	**0301622**	
KA BG08-L 3P-0500-PNP	**0301623**	
KA BW05-L 3P-0300	**0301650**	
KA BW08-L 3P-0300-NPN	**0301602**	
KA BW08-L 3P-0300-PNP	**0301594**	
KA BW08-L 3P-0500-NPN	**9641116**	
KA BW08-L 3P-0500-PNP	**0301502**	
Cable extensions		
KV BW08-SG08 3P-0030-PNP	**0301495**	
KV BW08-SG08 3P-0100-PNP	**0301496**	
KV BW08-SG08 3P-0200-PNP	**0301497**	

ⓘ Two sensors (closer/NO) are required for each gripper, plus extension cables as an option.

ⓘ Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

You can find more detailed information and individual parts of the above-mentioned accessories in the “Accessories” catalog section.

Inductive proximity switches



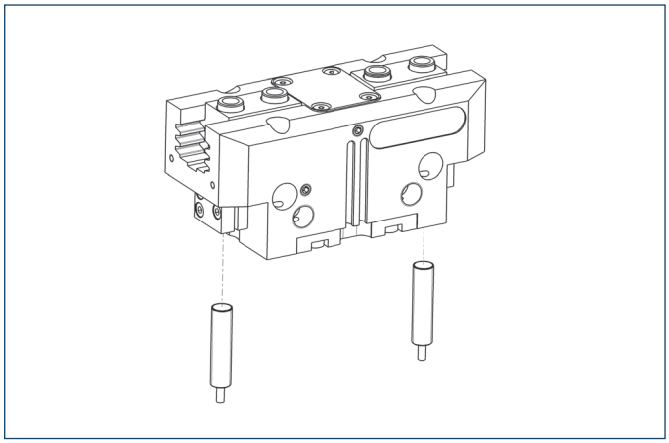
⑰ Cable outlet

End position monitoring for direct mounting

Description	ID	Recommended product
Inductive proximity switches		
IN 80-S-M8	**0301478**	•
IN 80-S-M12	**0301578**	
INK 80-S	**0301550**	
Inductive proximity switch with lateral outlet		
IN 80-S-M12-SA	**0301587**	
IN 80-S-M8-SA	**0301483**	•
INK 80-S-SA	**0301566**	
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**	
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**	

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

Cylindrical Reed Switches



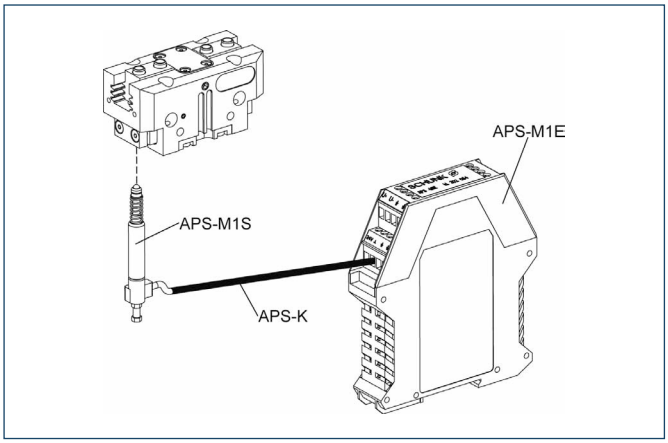
End position monitoring mounted with mounting kit

Description	ID
Mounting kit for proximity switch	
AS-RMS 80 PGN/PZN-plus 160-380	**0377727**
Reed Switches	
RMS 80-S-M8	**0377721**

ⓘ Two sensors (closer/NO) are required for each gripper, plus extension cables as an option.
ⓘ This mounting kit needs to be ordered optionally as an accessory.
ⓘ Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

You can find more detailed information and individual parts of the above-mentioned accessories in the “Accessories” catalog section.

Analog position sensor



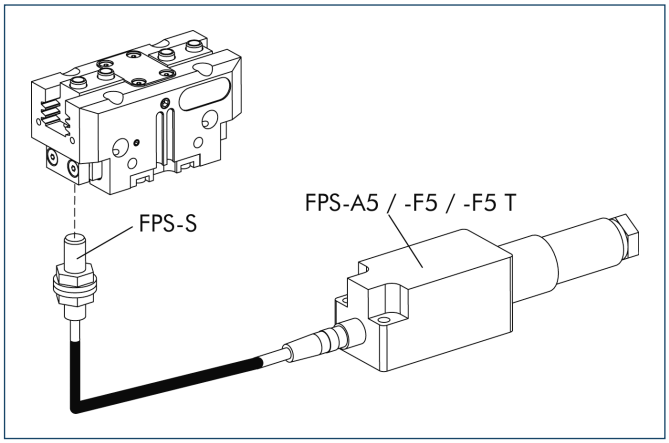
Analog multi position monitoring for any desired positions

Description	ID
Mounting kit	
AS-APS-M1-160/1 and 240/2	**0302083**
AS-APS-M1-160/2	**0302084**
Connection cables	
APS-K0200	**0302066**
APS-K0700	**0302068**
Electronic Processor	
APS-M1E	**0302064**
Sensor	
APS-M1S	**0302062**

ⓘ When using an APS system, for each gripper a mounting kit (AS-APS), an APS sensor (APS-M 1S, incl. 3 m cable) as well as an electronics (APS-M1e) are required.

ⓘ An extension cable (APS-K) can be connected between the sensor and the electronics as an option. The max. cable length between the sensor and the electronics is 10 m, between the electronics and their control unit (PLC) it is max. 1 m.

Flexible Position Sensor



Flexible position monitoring of up to five positions

Description	ID
Mounting kit for FPS	
AS-PGN/PZN-plus 160/1	**0301638**
AS-PGN/PZN-plus 160/2	**0301639**
Electronic Processor	
FPS-F5	**0301805**
FPS-F5 T	**0301807**
Sensor	
FPS-S M8	**0301704**

ⓘ When using a FPS system, a FPS sensor (FPS-S) and a control unit (FPS-F5 / F5 T or A5) are required for each gripper as well as a mounting kit (AS), if listed. Cable extensions (KV) are available as options in the "Accessories" catalog section.

You can find more detailed information and individual parts of the above-mentioned accessories in the "Accessories" catalog section.