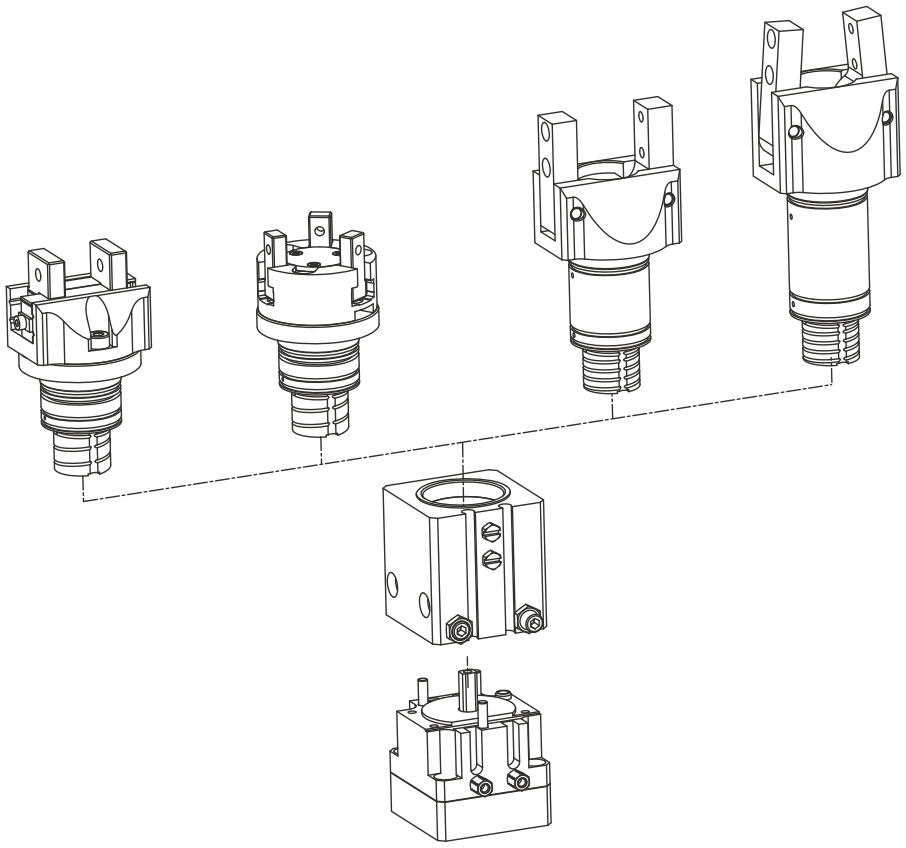
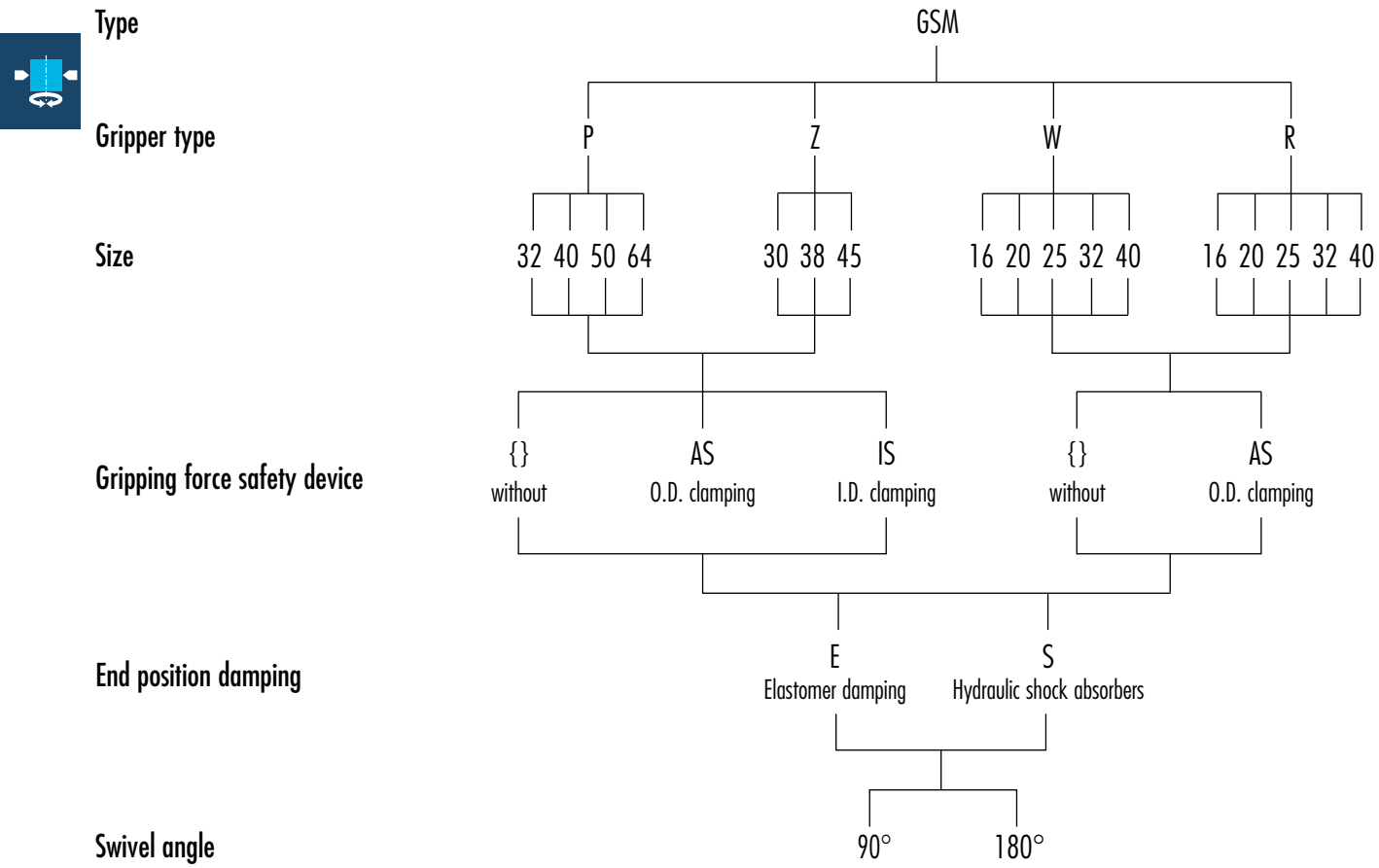
Modular Design



Versions of the series



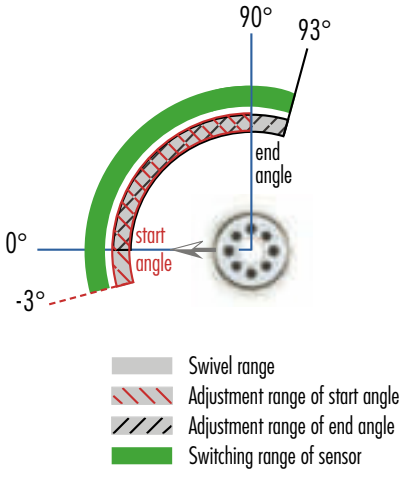
How to order

GSM – P | 20 – AS – E – 090

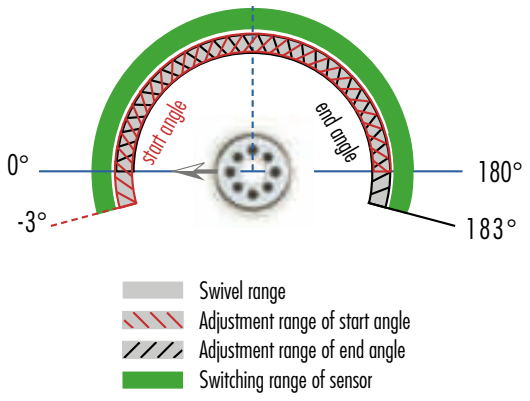
- 090: 90° / 180° — Swivel angle
- E: E = with Elastomer damping; S = with Hydraulic shock absorbers — End position damping
- AS: without / O.D. clamping / I.D. clamping — Gripping force safety device
- 20: 16 / 20 / 25 / 30 / 32 / 38 /40 / 45 / 50 / 64 — Size
- P: P = Parallel gripper; Z = Centric gripper; W = Angular gripper; R = Radial gripper — Gripper type
- GSM: Rotary Gripper Module — Type

End stop adjustability and switching angle of sensor

- in the case of 90° units



- in the case of 180° units



GSM-Z

Sizes
30 ... 45

Weight
0.35 kg ... 1.32 kg

Gripping force
55 N ... 310 N

Stroke per finger
3 mm ... 5 mm

Torque
0.3 Nm ... 2.7 Nm

Application example

Compact, economical linear rotary gripper unit for mounting a suspension device

1. GSM-Z Gripper Swivel Module
2. Linear Module KLM
3. Linear Module KLM

Concentric Gripper Swivel Module

compact rotary gripping combination, consisting of a powerful rotor drive, an end-position and damping device and a 3-finger concentric gripper

Field of application

gripping and rotating combined in a single compact module, for automated assembly in places with a restricted amount of available space

Your advantages and benefits

Space-saving
as the rotary drive, end-position damping unit and gripper are merged in one compact module

Economical
since adapter plates are not needed, there will be costs for project planning and engineering design

T-slot guidance
for precise gripping at high moment loads

Flexible
through several mounting options, infinitely adjustable rotating angle and numerous product versions

Process reliability
as moving cables and hoses are replaced by integrated feed-throughs

Mounting from three sides in three screw directions possible
for universal and flexible assembly of the rotary gripper module

Air supply via hose-free direct connection or screw connections
for the connection of exactly the right rotary gripper module in all automation solutions

Comprehensive accessories
through the use of existing gripper components

General note to the series

Principle of function
Combined rotor and piston drive

Housing material
Aluminum alloy, hard-anodized

Base jaw material
Steel

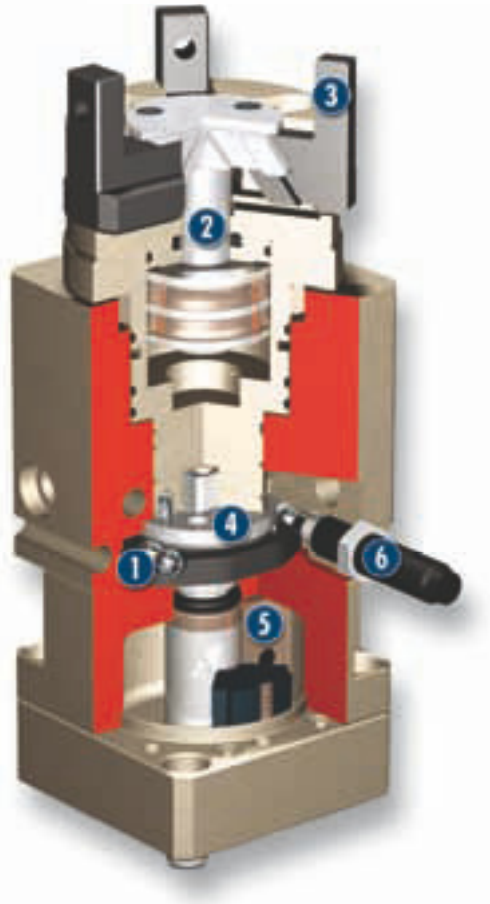
Actuation
pneumatic, with filtered compressed air (10 microns): dry, lubricated or non-lubricated
Pressure medium: Required quality class of compressed air according to DIN ISO 8573-1: 6 4 4

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

Scope of delivery
Centering sleeves, O-rings for direct connection, screws for lateral fastening, steel balls for adjustment of the swiveling angle, assembly and operation manual with declaration of incorporation

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

Sectional diagram



1 **Preset of rotating angle**
using steel balls for any desired angle of rotation

2 **Gripper drive**
double-acting piston drive system with wedge hook

3 **Base jaw**
for mounting the top fingers

4 **End-position damping assembly**
for end-position adjustment and damping

5 **Rotor**
as a compact, powerful drive

6 **Hydraulic shock absorber**
to increase the damping performance

Functional description

As its rotor is actuated with pressure, the drive rotates the integrated gripping module. The module itself is driven by its own piston. The piston motion is subsequently transformed into a synchronized gripping motion.

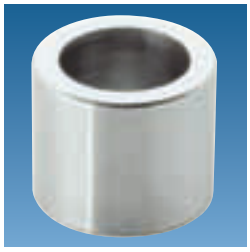
Options and special information

Despite the many options and versions already available as standard, SCHUNK also designs and produces customized versions on request.

Accessories

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

Centering sleeves

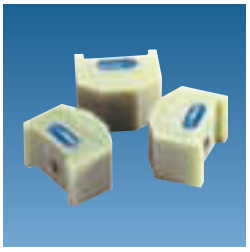


Fittings

Programmable magnetic switch

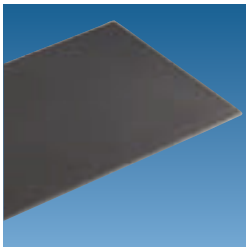
Inductive proximity switches

Plastic inserts



Sensor cables

Gripper pads



Sensor Distributor

Pressure maintenance valve

Finger blanks

ⓘ 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.

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.

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

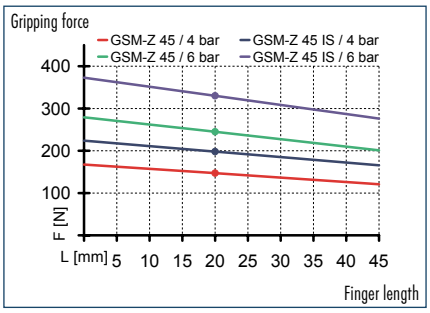
Closing and opening times, cycle times
Closing and opening times are purely the times that the base jaws or fingers are in motion. Cycle times are purely the times that the rotating part (mostly the pinion) is in motion. Valve switching times, hose filling times or PLC reaction times are not included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

Middle attached load
The middle attached load should constitute a typical load. It is defined as the half of the max. possible mass moment of inertia that can be swiveled without restriction, bouncing or hitting, with a centric load and a vertical rotating axis.

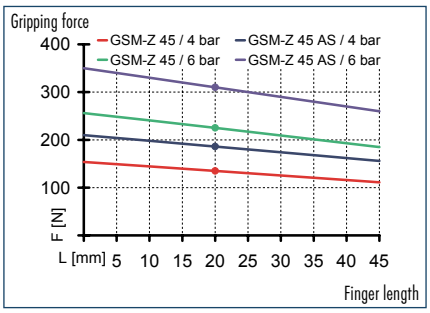
GSM-Z 45

Pneumatic • Gripper-Swivel System • Concentric Gripper Swivel Module

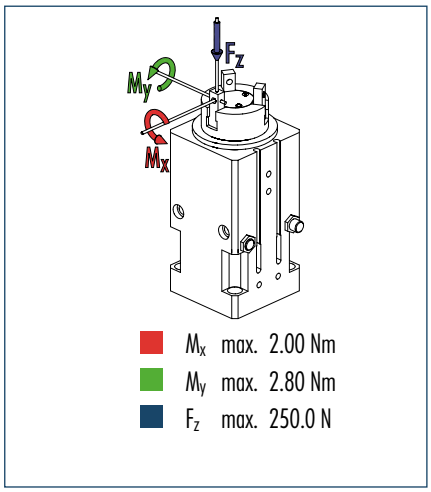
Gripping force, I.D. gripping



Gripping force, O.D. gripping



Finger load



ⓘ 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.

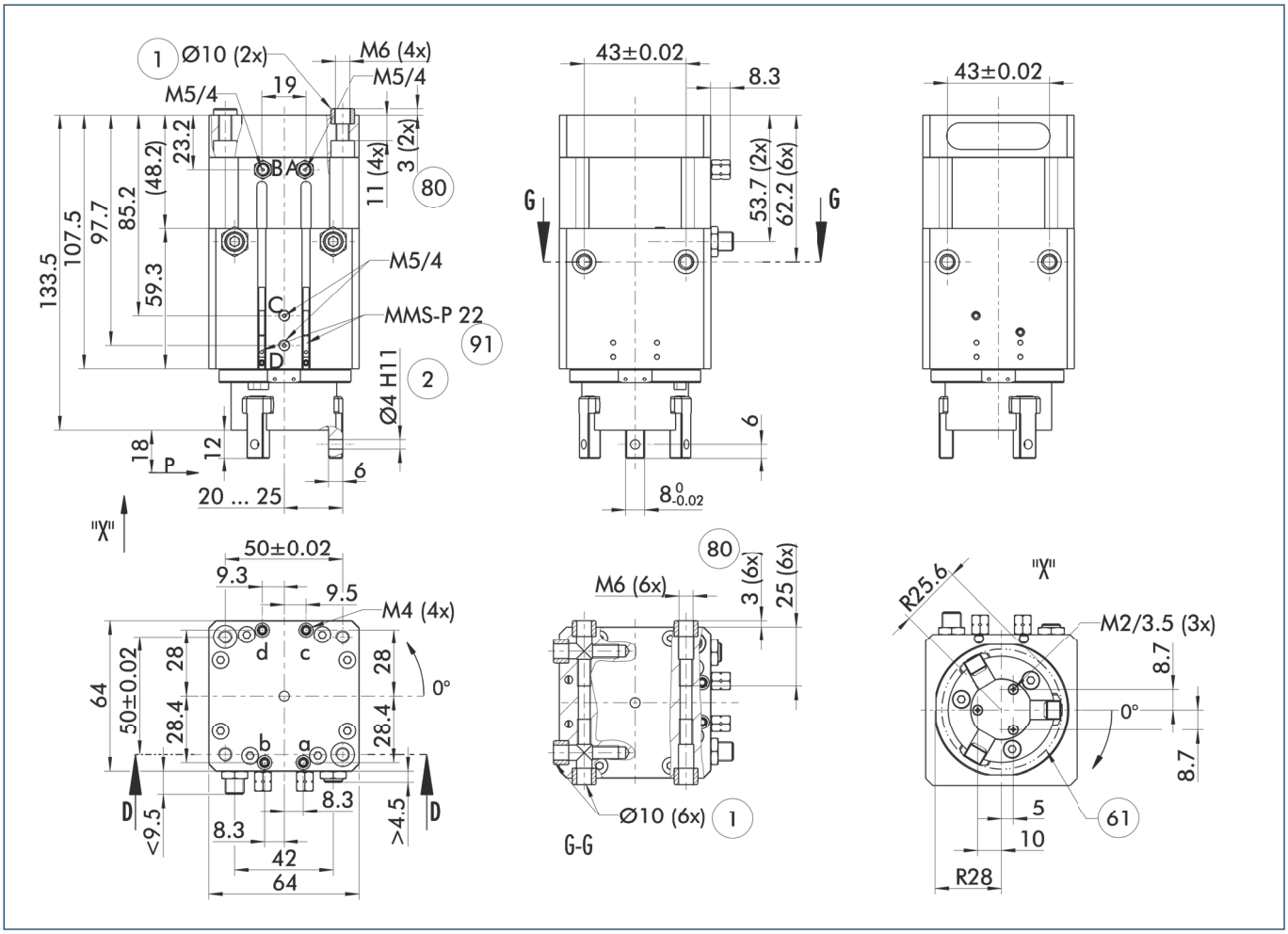
Technical data

Description		GSM-Z 45-E-090	GSM-Z 45-S-090	GSM-Z 45-AS-E-090	GSM-Z 45-AS-S-090	GSM-Z 45-IS-E-090	GSM-Z 45-IS-S-090
ID		**0304663**	**0304763**	**0304664**	**0304764**	**0304665**	**0304765**
End position adjustability	[°]	90	90	90	90	90	90
Stroke per finger	[mm]	5	5	5	5	5	5
Closing/Opening force	[N]	225/245	225/245	310/-	310/-	-/310	-/310
Min. spring force	[N]			85	85	95	95
Torque	[Nm]	2.7	2.7	2.7	2.7	2.7	2.7
Damping for rotation		Elastomer damping	hydr. shock absorbers	Elastomer damping	hydr. shock absorbers	Elastomer damping	hydr. shock absorbers
Recommended workpiece weight	[kg]	1.1	1.1	1.1	1.1	1.1	1.1
Air consumption for gripping	[cm³]	13.85	13.85	13.85	13.85	13.85	13.85
Air consumption for swiveling	[cm³]	51	51	51	51	51	51
Weight	[kg]	1.2	1.2	1.32	1.32	1.32	1.32
Nominal operating pressure	[bar]	6	6	6	6	6	6
Max. operating pressure	[bar]	6.5	6.5	6.5	6.5	6.5	6.5
Minimum operating pressure for gripping	[bar]	2	2	4	4	4	4
Minimum operating pressure for swiveling	[bar]	3	3	3	3	3	3
Closing/opening time	[s]	0.05/0.05	0.05/0.05	0.04/0.05	0.04/0.05	0.05/0.04	0.05/0.04
Swiveling time with middle attached load	[s]	0.14	0.14	0.14	0.14	0.14	0.14
Max. permitted finger length	[mm]	45	45	45	45	45	45
Max. permitted weight per finger	[kg]	0.08	0.08	0.08	0.08	0.08	0.08
IP class		40	40	40	40	40	40
Min./max. ambient temperature	[°C]	-10/90	5/60	-10/90	5/60	-10/90	5/60
Repeat accuracy for gripping	[mm]	0.01	0.01	0.01	0.01	0.01	0.01
Repeat accuracy for swiveling	[°]	0.1	0.1	0.1	0.1	0.1	0.1

OPTIONS and their characteristics

Description		GSM-Z 45-E-180	GSM-Z 45-S-180	GSM-Z 45-AS-E-180	GSM-Z 45-AS-S-180	GSM-Z 45-IS-E-180	GSM-Z 45-IS-S-180
ID		**0303863**	**0303963**	**0303864**	**0303964**	**0303865**	**0303965**
End position adjustability	[°]	180	180	180	180	180	180
Air consumption for swiveling	[cm³]	85	85	85	85	85	85
Swiveling time with middle attached load	[s]	0.24	0.24	0.24	0.24	0.24	0.24

Main view



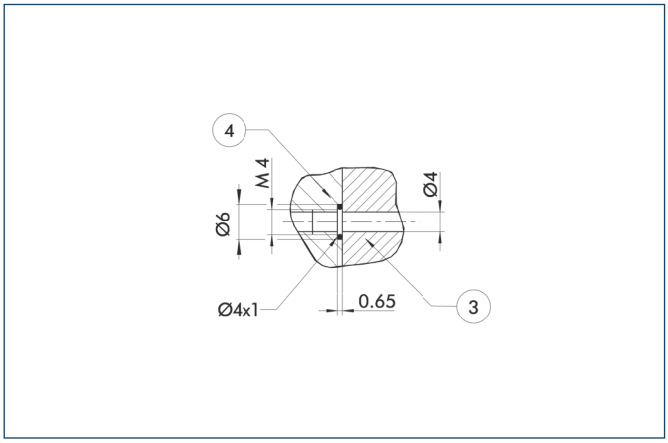
The drawing shows the gripper in the basic version with opened jaws without considering the dimensions of the described options below.

ⓘ 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, rotary actuator clockwise turning
B, b Main/direct connection, rotary actuator anti-clockwise turning
C, c Main/direct connection, gripper opening
D, d Main/direct connection, gripper closing

① Rotary actuator connection
② Finger connection
⑥① Interfering contour during swiveling
⑧⓪ Depth of the centering sleeve hole in the matching part
⑨① Monitoring of gripping and swiveling

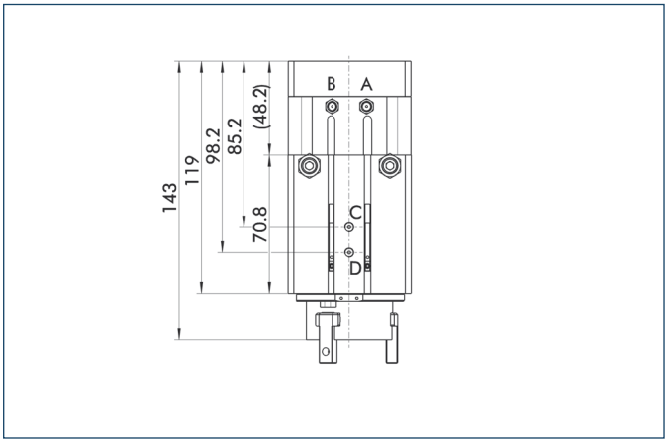
Hose-free direct connection



③ Adapter
④ Gripper swivel module

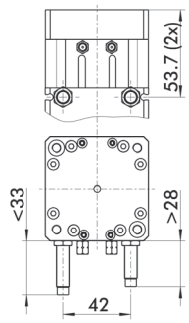
The direct connection is used for supplying compressed air without hoses. Instead, the pressure medium is fed through bore-holes in the mounting plate.

AS/IS gripping force maintenance device



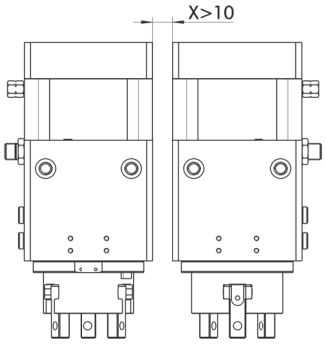
The mechanical gripping force maintenance device ensures a minimum gripping force even in case of pressure drop. This acts as closing force in the AS version, and as opening force in the IS version. In addition, the gripping force maintenance device can also be used for increasing the gripping force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

Version with shock absorbers



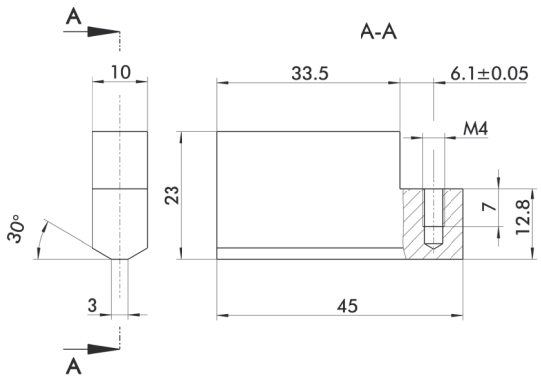
The drawing shows changes in dimensions of the shock absorber versions, compared to the elastomer versions shown on the main view.

Stacked arrangement



CAUTION: Monitoring is carried out by magnetic switches, and in case of side-by-side assembly of several units, a minimum distance of X mm between the units must be maintained.

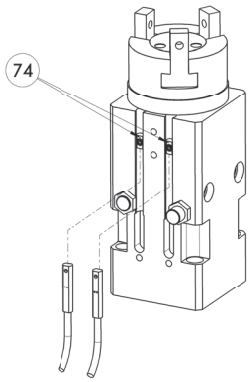
Finger blanks



Finger blanks for customized subsequent machining

Description	ID	Material	Scope of delivery
Finger blanks			
ABR 45	**0340539**	Aluminum	3

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.

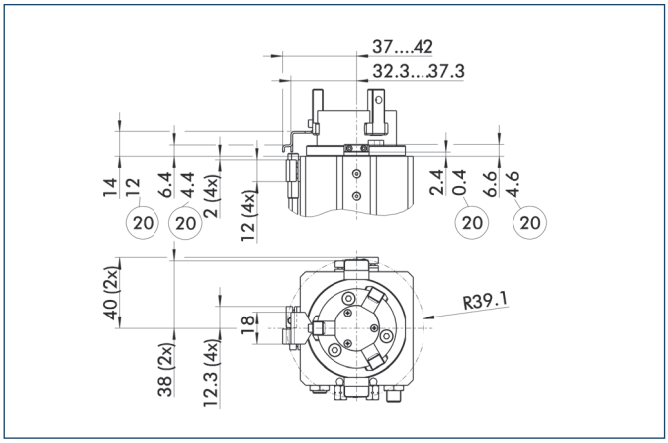
Description	ID	Recommended product
Programmable magnetic switch		
MMS-P 22-S-M8-PNP	**0301370**	•
MMSK-P 22-S-PNP	**0301371**	
Connection cables		
KA BG08-L 4P-0500	**0307767**	
KA BG08-L 4P-1000	**0307768**	
KA BW08-L 4P-0500	**0307765**	
KA BW08-L 4P-1000	**0307766**	
Sensor Distributor		
V2-M8-4P-2XM8-3P	**0301380**	

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

ⓘ Per each GSM two sensors MMS-P are required. If standard extension cables (M8-3P) are used, the sensor distributor can be applied.

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

Mounting kit for proximity switches – angle of rotation 90°



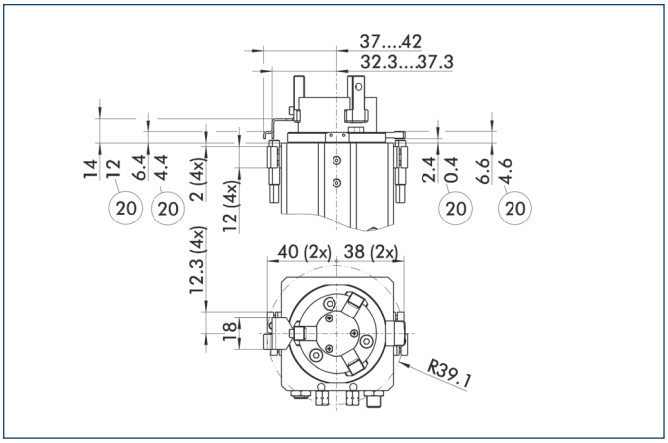
⑳ For AS / IS version

The mounting kits for the 90° and 180° GSM versions are identical, only the mounting is different. The mounting kit consists of two switch cams, two operating cams and small components. The proximity switches must be ordered separately.

Description	ID
Mounting kit for proximity switch	
AS-GSM-Z 45	**0304946**

ⓘ This mounting kit needs to be ordered optionally as an accessory.

Mounting kit for proximity switches – angle of rotation 180°



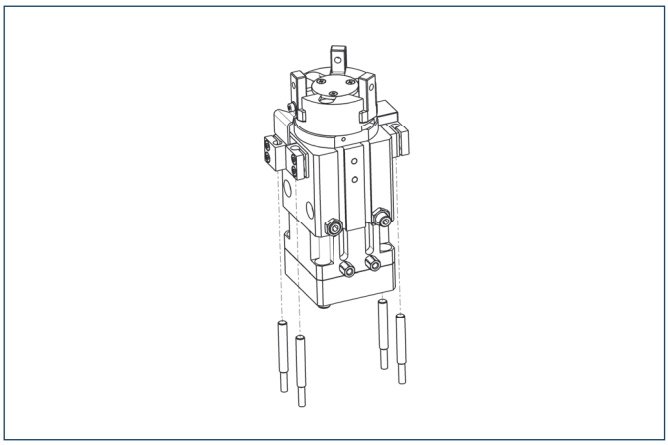
⑳ For AS / IS version

The mounting kits for the 90° and 180° GSM versions are identical, only the mounting is different. The mounting kit consists of two switch cams, two operating cams (only one needs to be fitted, see operating manual), four sensor brackets and small components. The proximity switches must be ordered separately.

Description	ID
Mounting kit for proximity switch	
AS-GSM-Z 45	**0304946**

ⓘ This mounting kit needs to be ordered optionally as an accessory.

Inductive proximity switches



End position monitoring mounted with mounting kit

Description	ID	Recommended product
Mounting kit for proximity switch		
AS-GSM-Z 45	**0304946**	
Inductive proximity switches		
IN 40-S-M8	**0301474**	•
IN 40-S-M12	**0301574**	
INK 40-S	**0301555**	

ⓘ Per each GSM four sensors (closer/NO) are required, optionally also an extension cable. The conditions of the swivelling or gripping processes are evaluated of the control unit by logic evaluation of the four sensor signals. If inductive proximity switches should be used, please take care that the switching positions cannot be adjusted.

ⓘ 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.