Superior Clamping and Gripping

SCHUNK®

Product Information

Miniature swivel vane SFL

Flexible. Freely Adjustable Swivel Angle.

SFL vane swivel unit

Rotary actuator with a high torque for easy rotation tasks up to 180°

Field of application

Optimum solution when using for easy rotation tasks.

Advantages – Your benefits

Compact design due to the almost cube shaped design several modules can be mounted in parallel

Versatile setting of the rotating angle from 0 –180° this results in a versatile range of applications

Fine adjustment of the angle of rotation For sensitive adjustment of end positions

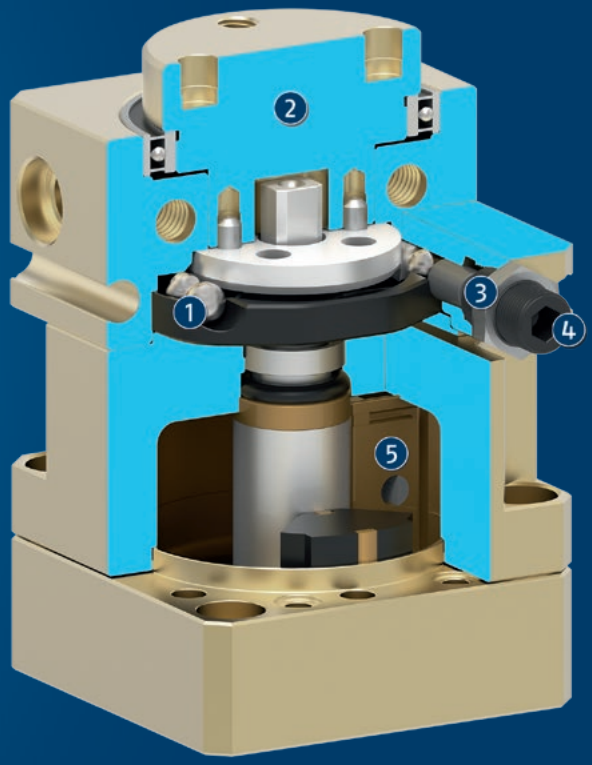
Powerful for even greater masses and inertias due to the variant with hydraulic shock absorbers

High life time and excellent synchronization due to machining of the running surfaces

Sizes	Weight	Torque	Repeat accuracy	Angle of rotation
Quantity: 3	0.09 .. 0.71 kg	0.1 .. 3.6 Nm	0.05°	90 .. 180°

Functional description

The drive is pneumatic and based on the rotor principle. The complete module can be supplied via a central, base-side connection using the direct connection.



① **Pre-adjustment of rotating angle**
using steel balls for any desired angle of rotation

② **Rotary table**
for mounting the attachment

③ **Fine adjustment of the angle of rotation**
For sensitive adjustment of end positions

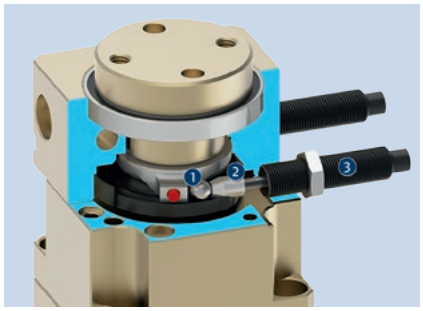
④ **End position damping**
via elastomer or hydraulic shock absorbers

⑤ **Vane swivel unit**
as a compact, powerful drive

CAD data, operating manuals and other current product documents can be found online.

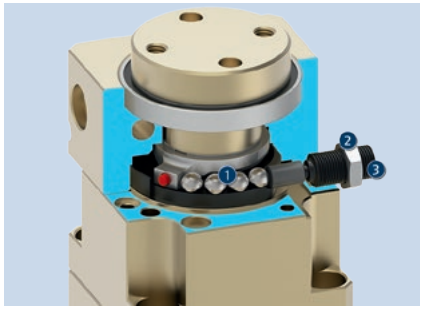
Detailed functional description

Adjustment for a large swivel angle for units with hydraulic shock absorbers



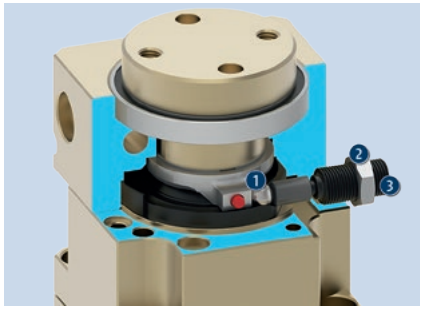
1. End position coarse adjustment via number of balls
2. End position fine adjustment via threads of the shock absorber
3. Damping via hydraulic shock absorbers

Adjustment for a small swivel angle for units with elastomer damping



1. End position coarse adjustment via number of balls
2. End position fine adjustment via threads of the stop
3. Damping via elastomer

Adjustment for a large swivel angle for units with elastomer damping



1. End position coarse adjustment via number of balls
2. End position fine adjustment via threads of the stop
3. Damping via elastomer

General notes about the series

Swivel vane material: Steel

Housing material: Aluminum alloy, anodized

Actuation: pneumatic, with filtered compressed air as per ISO 8573-1:2010 [7:4:4].

Operating principle: Vane swivel unit

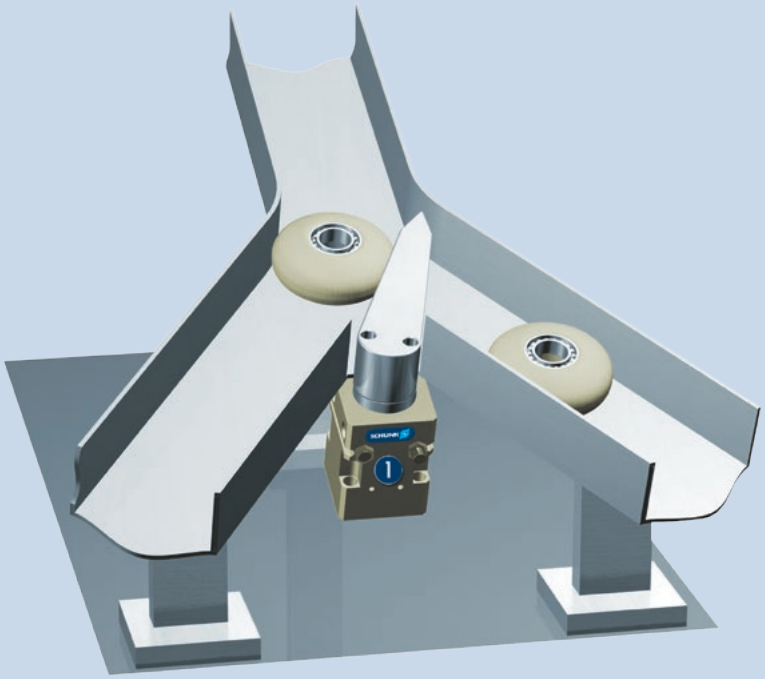
Scope of delivery: Centering sleeves, centering pins, O-rings for direct connection, assembly and operating manual with manufacturer's declaration

Warranty: 24 months

Repeat accuracy: is defined as a distribution of the end position for 100 consecutive cycles.

Flange position: is always drawn in the left end position. It rotates from here to the right in clockwise direction. The arrow points out the direction of rotation.

Cycle time: is the rotation time of pinion / flange around the nominal rotation angle. Valve switching times, hose filling times, or PLC reaction times are not a part of this and are to be considered when cycle times are calculated.



Application example

Sorting unit with SFLvane swivel unit as separator switch drive

1 SFL vane swivel unit

SCHUNK offers more ...

The following components make the product SFL even more productive – the suitable addition for the highest functionality, flexibility, reliability, and controlled production.

Centering sleeves

Fittings

Sensor cables

Pressure maintenance valve

MPZ 3-finger centric gripper

Pneumatic Small Parts Gripper MPG-plus

Sensor distributor

ⓘ Additional 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

Options and special information

The end positions of the SFL vane swivel unit can be set to anywhere between 0° and 180° due to the innovative back stop concept.

Sample Order

SFL 25 – E – 090

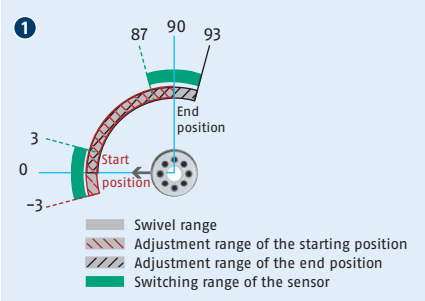
Designation
SFL

Size
25 / 40 / 64

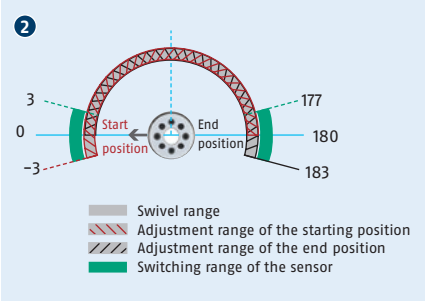
Damping method
E = Elastomer
S = Shock absorber

Angle of rotation
90° / 180°

End Position Adjustment Range and Switching Range of Sensor



1 End position adjustment range and switching area of the sensor for 90° units

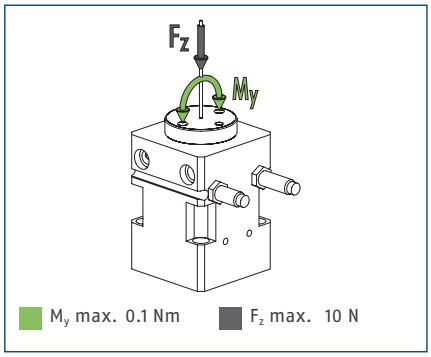


2 End position adjustment range and switching area of the sensor for 180° units

SFL 25

Miniature swivel vane

Flange load



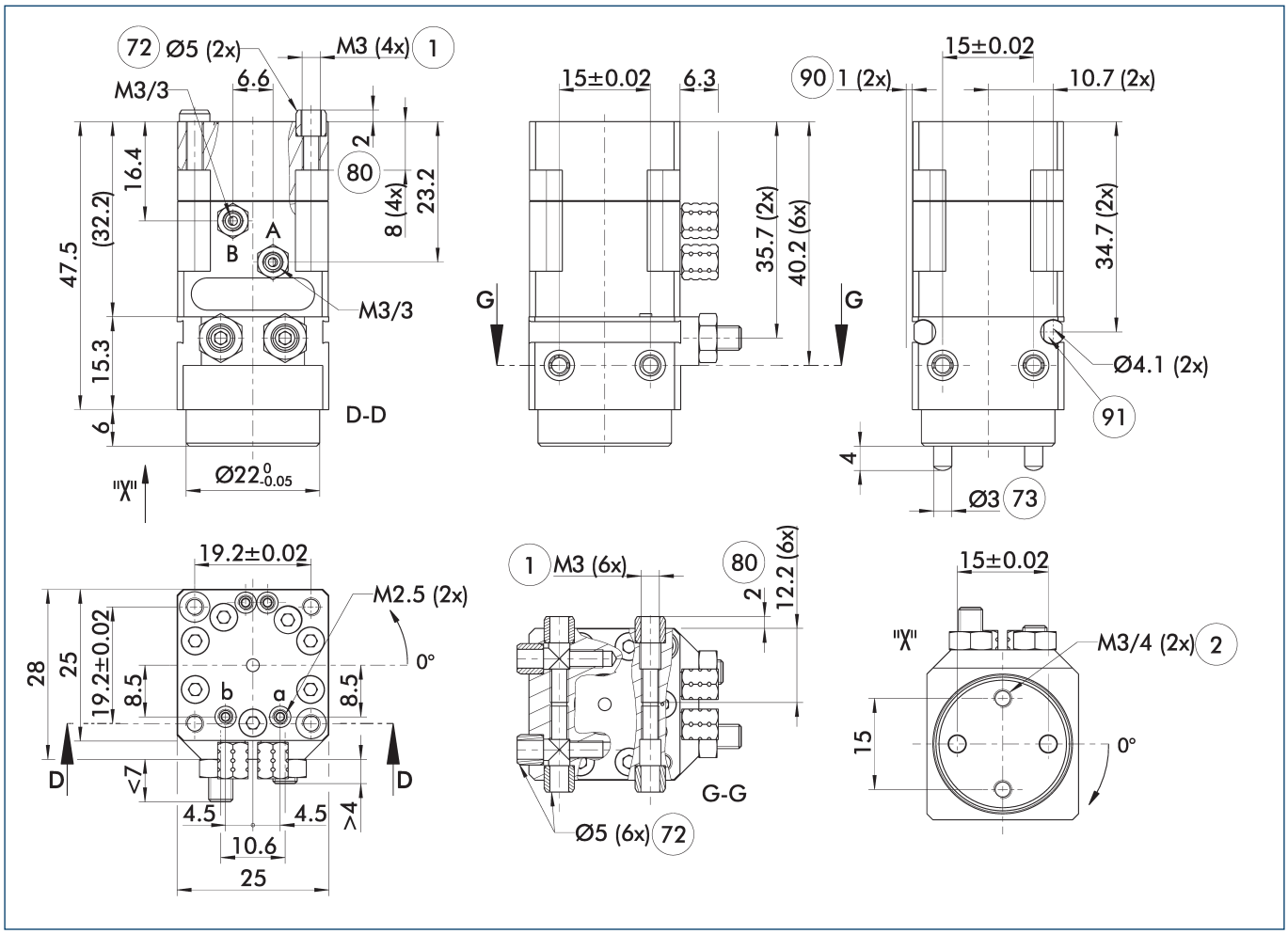
ⓘ The indicated moments and forces are statical values and should not appear simultaneously Throttling has to be done for ensuring that the rotary motion takes place without impact or bouncing. otherwise the service life reduces.

Technical data

Description		SFL-25-E-090	SFL-25-E-180
ID		0304560	0304060
Angle of rotation	[°]	90.0	180.0
End position adjustability	[°]	90.0	180.0
End position damping		Elastomer	Elastomer
Torque	[Nm]	0.1	0.1
Protection class IP		52	52
Weight	[kg]	0.09	0.09
Cycle Time (1x rotation angle) without attached load	[s]	0.06	0.10
Fluid consumption (2 x nominal angle)	[cm³]	2.0	3.0
Nominal operating pressure	[bar]	6.0	6.0
min./max. operating pressure	[bar]	4/6.5	4/6.5
Diameter of connecting hose		3 x 1.8 x 0.6	3 x 1.8 x 0.6
min./max. ambient temperature	[°C]	5/90	5/90
max. mass moment of inertia*	[kgmm²]	50	50
Repeat accuracy	[°]	0.05	0.05
Cleanroom class ISO 14644-1		5	5

ⓘ max. admissible mass moment of inertia of the payload

Main view



The drawing shows the basic design of the vane swivel unit with elastomer damping.

ⓘ The SDV-P pressure maintenance valve can be used to maintain the position in the case of a loss of pressure (see "Accessories" catalog section).

A, a Main / direct connection, swivel unit clockwise turning

B, b Main / direct connection, swivel unit counterclockwise turning

(1) Connection swivel unit

(2) Attachment connection

(72) Fit for centering sleeves

(73) Fit for centering pins

(80) Depth of the centering sleeve hole in the counter part

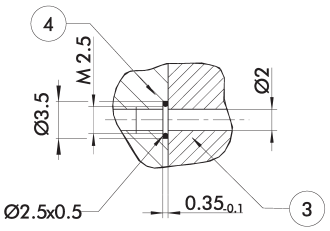
(90) Sensor projection beyond housing

(91) Sensor MMS 22..

SFL 25

Miniature swivel vane

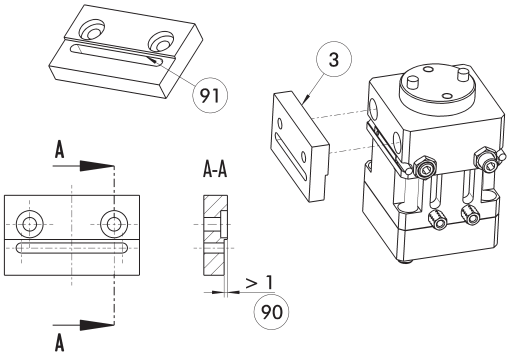
Hose-free direct connection M2.5



(3) Adapter
(4) Rotary unit

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

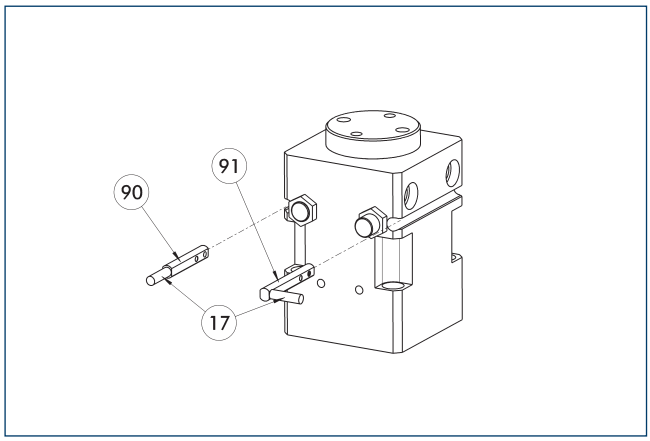
Adapter plate design



(3) Adapter
(91) Recess as mounting aid
(90) Step

Suggested here is an adapter plate design which allows for access to the sensors as easily as possible.

Electronic magnetic switches MMS



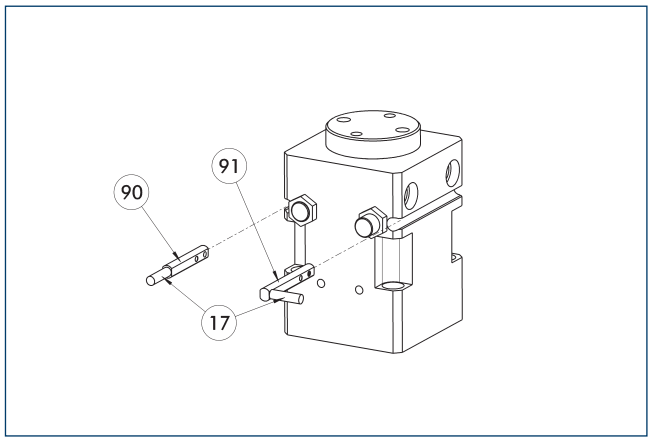
(17) Cable outlet
(91) Sensor MMS 22...-SA
(90) Sensor MMS 22..

End position monitoring for mounting in the C-slot.

Description	ID	Often combined
Electronic magnetic switches MMS		
MMS 22-S-M8-PNP	0301032	●
MMSK 22-S-PNP	0301034	
MMS electronic magnetic switches with lateral outlet		
MMS 22-S-M8-PNP-SA	0301042	●
MMSK 22-S-PNP-SA	0301044	
Cable extension		
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
clip for plug/socket		
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/S) are required for each unit and extension cables are available as an option. For sensor cables, note the minimum permissible bending radii. These are generally 35 mm.

Programmable magnetic switches MMS PI1



(17) Cable outlet
(91) Sensor MMS 22 ..-PI1-...-SA
(90) Sensor MMS 22 PI1-...

Position monitoring with one programmable position per sensor and electronics integrated in the sensor. Can be programmed using MT magnetic teaching tool (included in scope of delivery) or ST plug teaching tool (optional). End position monitoring is mounted in the C-slot. If the ST plug teaching tools are listed in the table provided, teaching is only possible with the ST teaching tools.

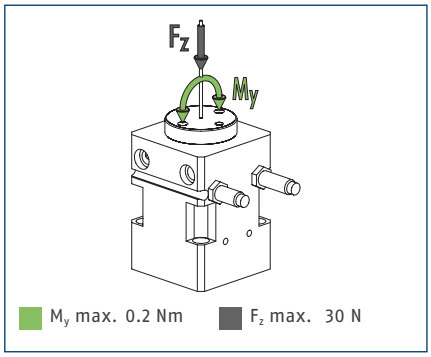
Description	ID	Often combined
Programmable magnetic switches MMS PI1		
MMS 22-PI1-S-M8-PNP	0301160	●
MMSK 22-PI1-S-PNP	0301162	
Programmable magnetic switches MMS PI1 with lateral cable outlet		
MMS 22-PI1-S-M8-PNP-SA	0301166	●
MMSK 22-PI1-S-PNP-SA	0301168	
Programmable magnetic switches MMS PI1 with stainless steel housing		
MMS 22-PI1-S-M8-PNP-HD	0301110	●
MMSK 22-PI1-S-PNP-HD	0301112	

ⓘ Two sensors (closer/S) are required for each unit and extension cables are available as an option. For sensor cables, note the minimum permissible bending radii. These are generally 35 mm.

SFL 40

Miniature swivel vane

Flange load



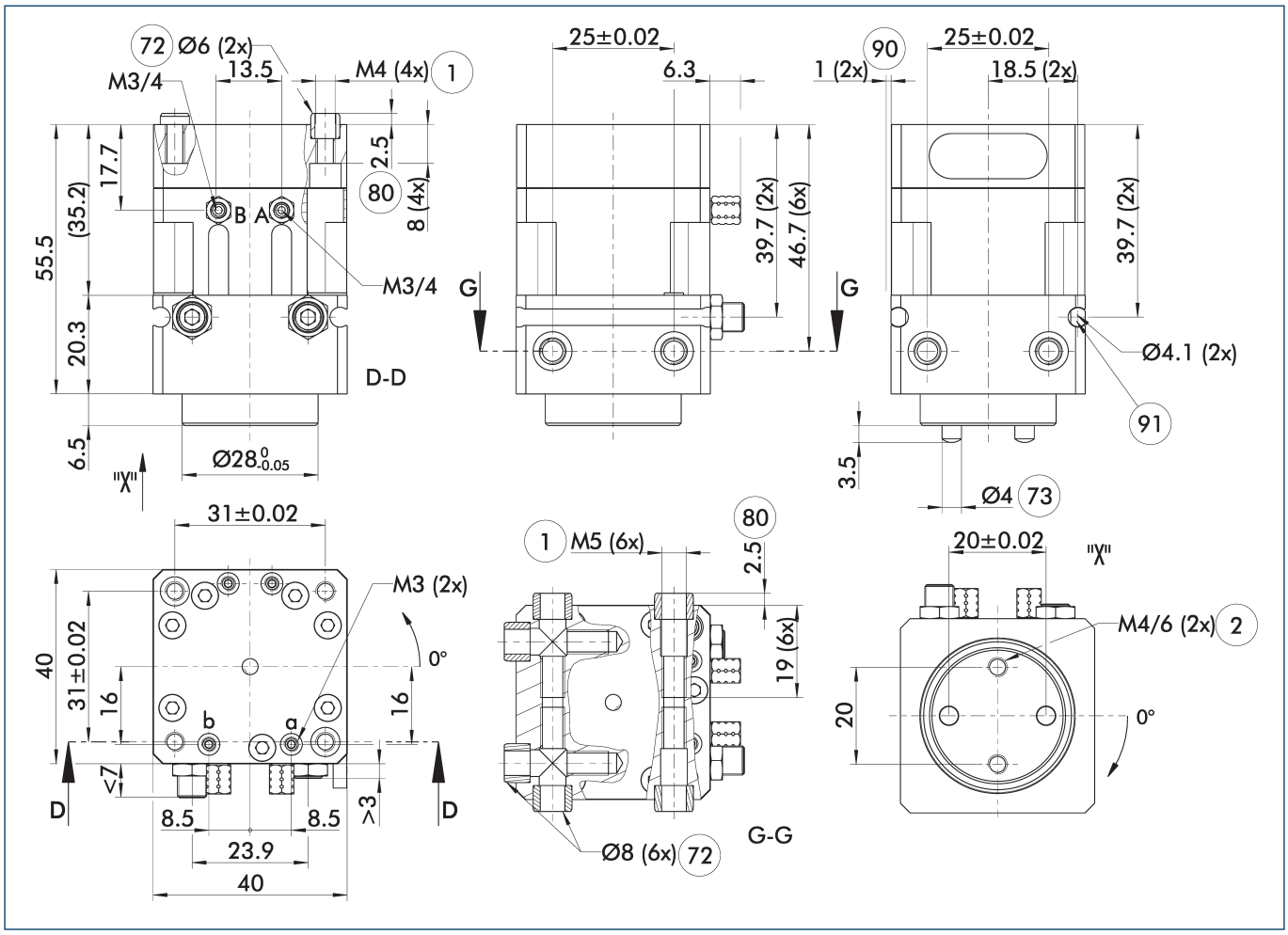
ⓘ The indicated moments and forces are statical values and should not appear simultaneously Throttling has to be done for ensuring that the rotary motion takes place without impact or bouncing. otherwise the service life reduces.

Technical data

Description		SFL-40-E-090	SFL-40-S-090	SFL-40-E-180	SFL-40-S-180
ID		0304564	0304565	0304064	0304065
Angle of rotation	[°]	90.0	90.0	180.0	180.0
End position adjustability	[°]	90.0	90.0	180.0	180.0
End position damping		Elastomer	Hydr. damper	Elastomer	Hydr. damper
Torque	[Nm]	0.5	0.5	0.5	0.5
Protection class IP		52	52	52	52
Weight	[kg]	0.24	0.24	0.24	0.24
Cycle Time (1x rotation angle) without attached load	[s]	0.07	0.07	0.12	0.12
Fluid consumption (2 x nominal angle)	[cm³]	9.0	9.0	15.0	15.0
Nominal operating pressure	[bar]	6.0	6.0	6.0	6.0
min./max. operating pressure	[bar]	2.5/6.5	3/6.5	2.5/6.5	3/6.5
Diameter of connecting hose		3 x 1.8 x 0.6	3 x 1.8 x 0.6	3 x 1.8 x 0.6	3 x 1.8 x 0.6
min./max. ambient temperature	[°C]	-10/90	5/60	-10/90	5/60
max. mass moment of inertia*	[kgmm²]	75	150	75	150
Repeat accuracy	[°]	0.05	0.05	0.05	0.05
Cleanroom class ISO 14644-1		5	5	5	5

ⓘ max. admissible mass moment of inertia of the payload

Main view



The drawing shows the basic design of the vane swivel unit with elastomer damping.

ⓘ The SDV-P pressure maintenance valve can be used to maintain the position in the case of a loss of pressure (see "Accessories" catalog section).

A, a Main / direct connection, swivel unit clockwise turning

B, b Main / direct connection, swivel unit counterclockwise turning

(1) Connection swivel unit

(2) Attachment connection

(72) Fit for centering sleeves

(73) Fit for centering pins

(80) Depth of the centering sleeve hole in the counter part

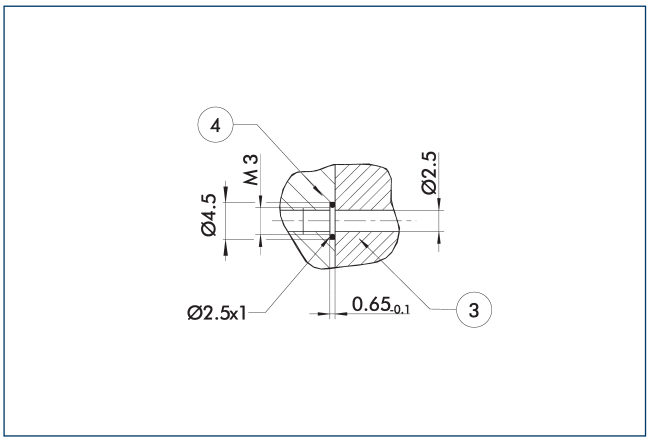
(90) Sensor projection beyond housing

(91) Sensor MMS 22..

SFL 40

Miniature swivel vane

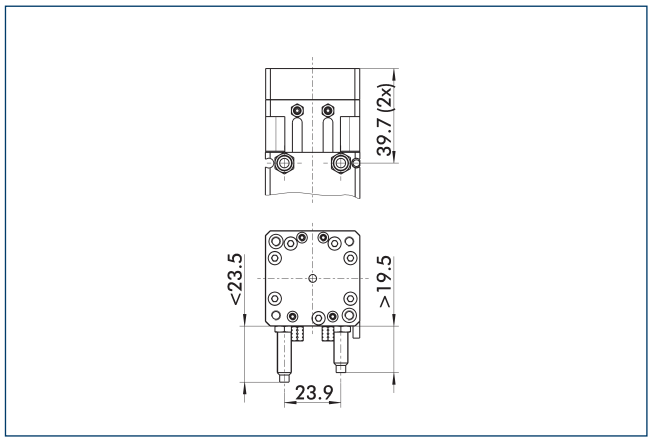
Hose-free direct connection M3



(3) Adapter
(4) Rotary unit

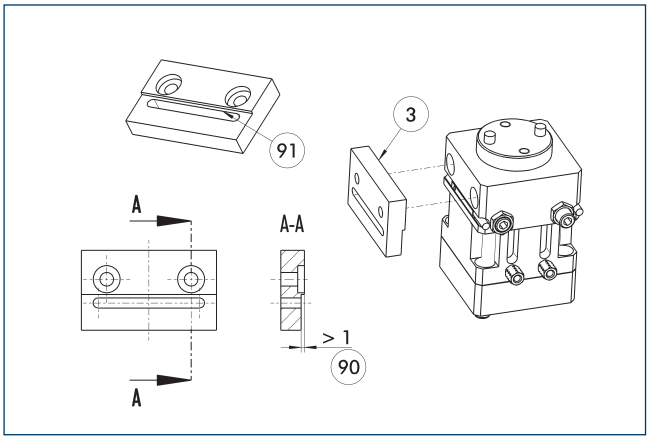
The direct connection is used for supplying compressed air without hoses. Instead, the pressure medium is fed through bore-holes in the mounting plate.

Version with shock absorbers



Changed dimensions for the shock absorber variant

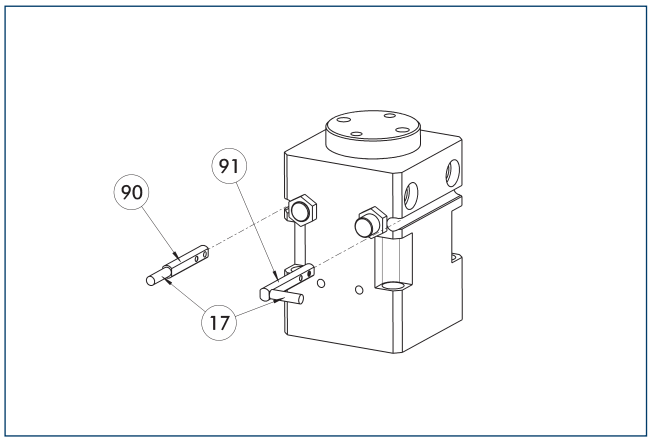
Adapter plate design



(3) Adapter
(91) Recess as mounting aid
(90) Step

Suggested here is an adapter plate design which allows for access to the sensors as easily as possible.

Electronic magnetic switches MMS



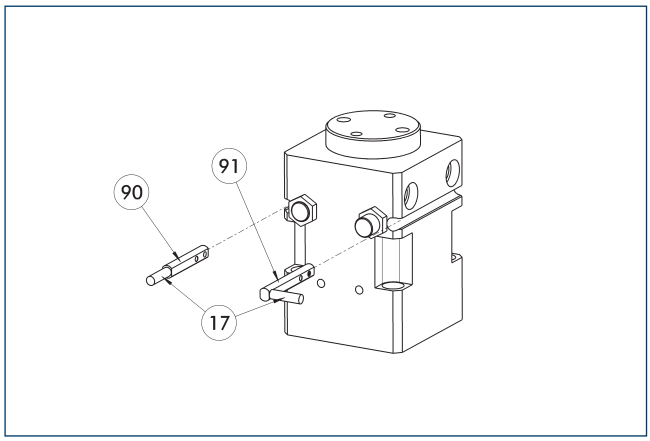
17 Cable outlet
91 Sensor MMS 22...-SA
90 Sensor MMS 22..

End position monitoring for mounting in the C-slot.

Description	ID	Often combined
Electronic magnetic switches MMS		
MMS 22-S-M8-PNP	0301032	●
MMSK 22-S-PNP	0301034	
MMS electronic magnetic switches with lateral outlet		
MMS 22-S-M8-PNP-SA	0301042	●
MMSK 22-S-PNP-SA	0301044	
Cable extension		
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
clip for plug/socket		
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/S) are required for each unit and extension cables are available as an option. For sensor cables, note the minimum permissible bending radii. These are generally 35 mm.

Programmable magnetic switches MMS PI1



(17) Cable outlet
(91) Sensor MMS 22 ..-PI1-...-SA
(90) Sensor MMS 22 PI1-...

Position monitoring with one programmable position per sensor and electronics integrated in the sensor. Can be programmed using MT magnetic teaching tool (included in scope of delivery) or ST plug teaching tool (optional). End position monitoring is mounted in the C-slot. If the ST plug teaching tools are listed in the table provided, teaching is only possible with the ST teaching tools.

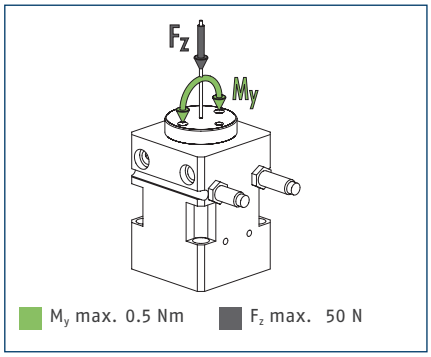
Description	ID	Often combined
Programmable magnetic switches MMS PI1		
MMS 22-PI1-S-M8-PNP	0301160	●
MMSK 22-PI1-S-PNP	0301162	
Programmable magnetic switches MMS PI1 with lateral cable outlet		
MMS 22-PI1-S-M8-PNP-SA	0301166	●
MMSK 22-PI1-S-PNP-SA	0301168	
Programmable magnetic switches MMS PI1 with stainless steel housing		
MMS 22-PI1-S-M8-PNP-HD	0301110	●
MMSK 22-PI1-S-PNP-HD	0301112	

ⓘ Two sensors (closer/S) are required for each unit and extension cables are available as an option. For sensor cables, note the minimum permissible bending radii. These are generally 35 mm.

SFL 64

Miniature swivel vane

Flange load



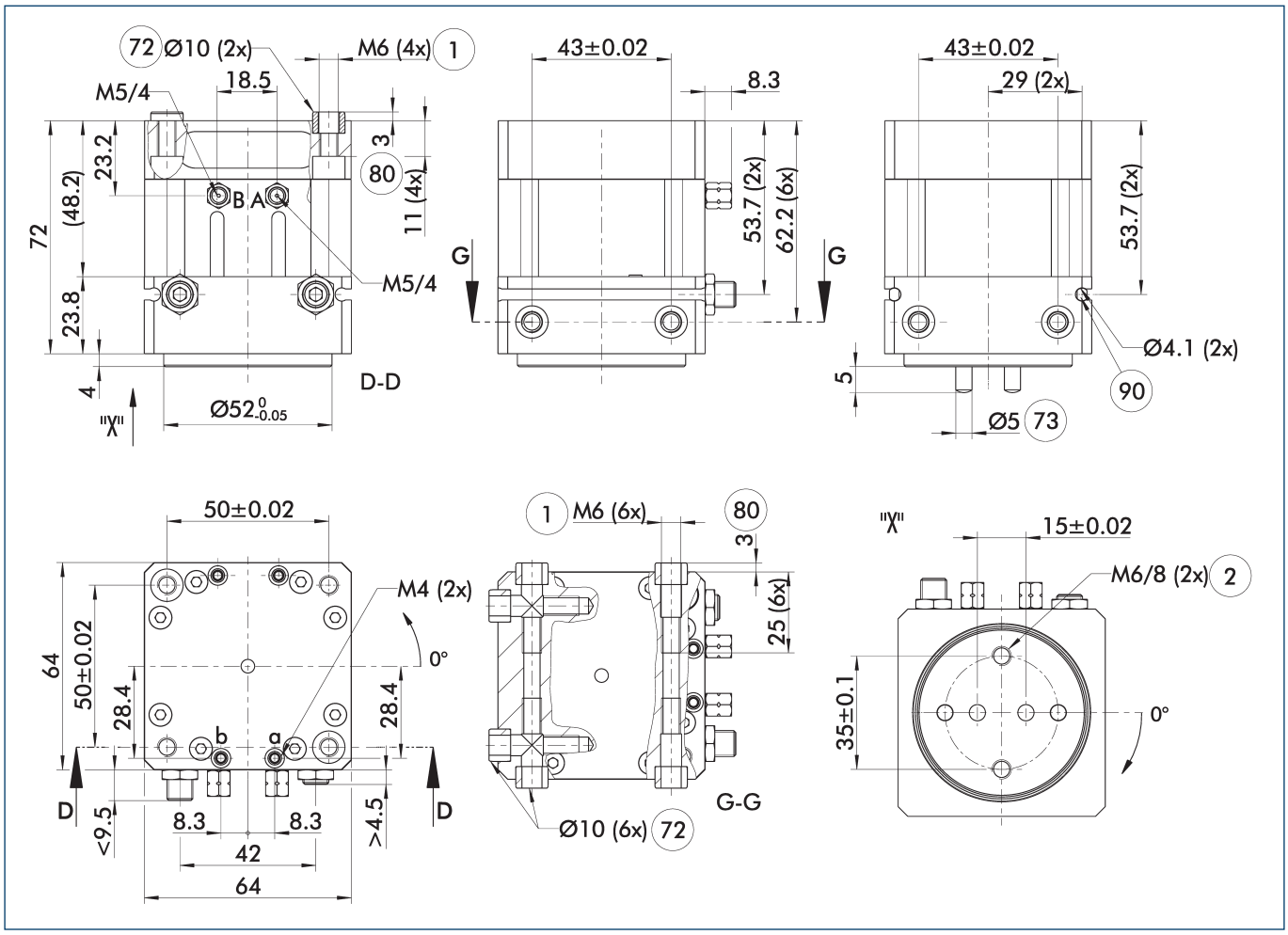
ⓘ The indicated moments and forces are statical values and should not appear simultaneously Throttling has to be done for ensuring that the rotary motion takes place without impact or bouncing. otherwise the service life reduces.

Technical data

Description		SFL-64-E-090	SFL-64-S-090	SFL-64-E-180	SFL-64-S-180
ID		0304568	0304569	0304068	0304069
Angle of rotation	[°]	90.0	90.0	180.0	180.0
End position adjustability	[°]	90.0	90.0	180.0	180.0
End position damping		Elastomer	Hydr. damper	Elastomer	Hydr. damper
Torque	[Nm]	3.6	3.6	3.6	3.6
Protection class IP		52	52	52	52
Weight	[kg]	0.71	0.71	0.71	0.71
Cycle Time (1x rotation angle) without attached load	[s]	0.11	0.11	0.18	0.18
Fluid consumption (2 x nominal angle)	[cm³]	51.0	51.0	85.0	85.0
Nominal operating pressure	[bar]	6.0	6.0	6.0	6.0
min./max. operating pressure	[bar]	2/6.5	2/6.5	2/6.5	2/6.5
Diameter of connecting hose		6 x 3.9 x 1.05	6 x 3.9 x 1.05	6 x 3.9 x 1.05	6 x 3.9 x 1.05
min./max. ambient temperature	[°C]	-10/90	5/60	-10/90	5/60
max. mass moment of inertia*	[kgmm²]	250	500	250	500
Repeat accuracy	[°]	0.05	0.05	0.05	0.05
Cleanroom class ISO 14644-1		5	5	5	5

ⓘ max. admissible mass moment of inertia of the payload

Main view



The drawing shows the basic design of the vane swivel unit with elastomer damping.

ⓘ The SDV-P pressure maintenance valve can be used to maintain the position in the case of a loss of pressure (see "Accessories" catalog section).

A, a Main / direct connection, swivel unit clockwise turning

B, b Main / direct connection, swivel unit counterclockwise turning

(1) Connection swivel unit

(2) Attachment connection

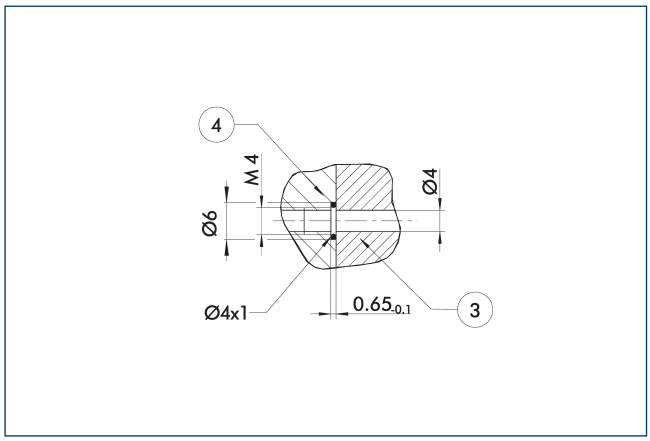
(72) Fit for centering sleeves

(73) Fit for centering pins

(80) Depth of the centering sleeve hole in the counter part

(90) Sensor MMS 22..

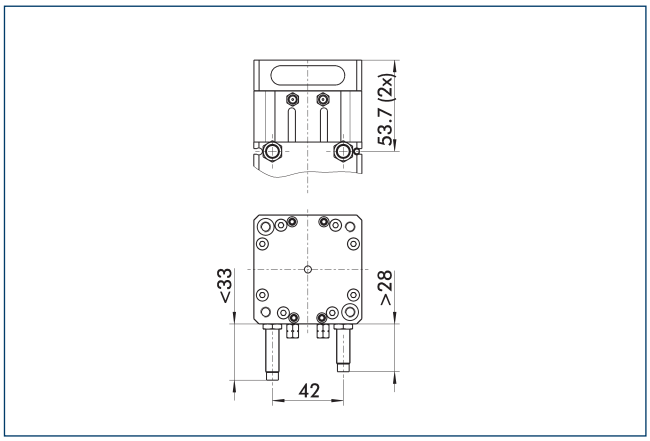
Hose-free direct connection M4



(3) Adapter (4) Rotary unit

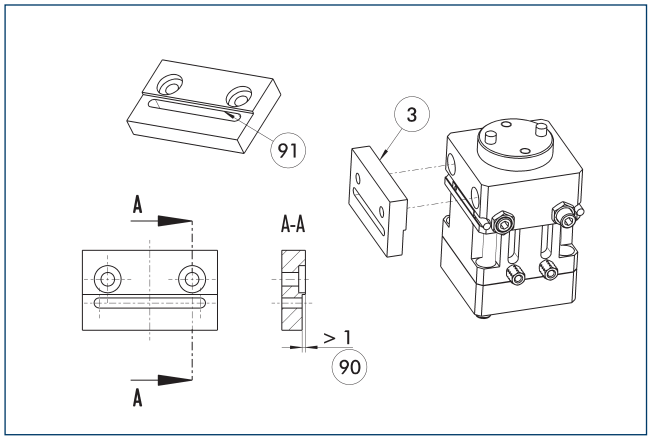
The direct connection is used for supplying compressed air without hoses. Instead, the pressure medium is fed through bore-holes in the mounting plate.

Version with shock absorbers



Changed dimensions for the shock absorber variant

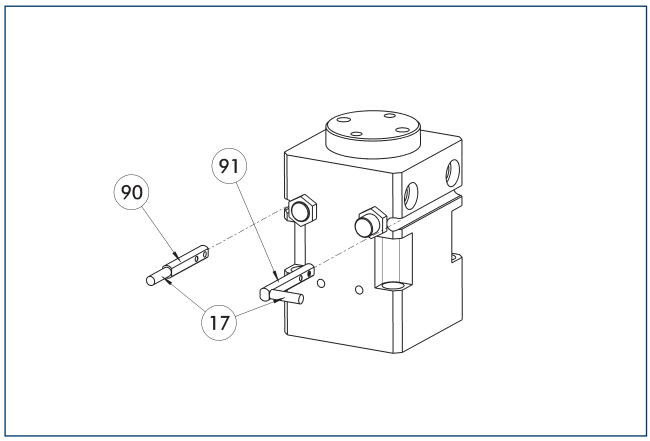
Adapter plate design



(3) Adapter (91) Recess as mounting aid
(90) Step

Suggested here is an adapter plate design which allows for access to the sensors as easily as possible.

Electronic magnetic switches MMS



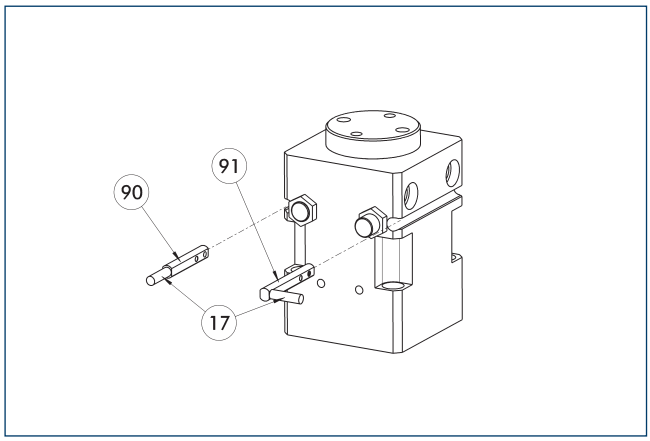
(17) Cable outlet
(91) Sensor MMS 22...-SA
(90) Sensor MMS 22..

End position monitoring for mounting in the C-slot.

Description	ID	Often combined
Electronic magnetic switches MMS		
MMS 22-S-M8-PNP	0301032	●
MMSK 22-S-PNP	0301034	
MMS electronic magnetic switches with lateral outlet		
MMS 22-S-M8-PNP-SA	0301042	●
MMSK 22-S-PNP-SA	0301044	
Cable extension		
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
clip for plug/socket		
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/S) are required for each unit and extension cables are available as an option. For sensor cables, note the minimum permissible bending radii. These are generally 35 mm.

Programmable magnetic switches MMS PI1



(17) Cable outlet
(91) Sensor MMS 22 ..-PI1-...-SA
(90) Sensor MMS 22 PI1-...

Position monitoring with one programmable position per sensor and electronics integrated in the sensor. Can be programmed using MT magnetic teaching tool (included in scope of delivery) or ST plug teaching tool (optional). End position monitoring is mounted in the C-slot. If the ST plug teaching tools are listed in the table provided, teaching is only possible with the ST teaching tools.

Description	ID	Often combined
Programmable magnetic switches MMS PI1		
MMS 22-PI1-S-M8-PNP	0301160	●
MMSK 22-PI1-S-PNP	0301162	
Programmable magnetic switches MMS PI1 with lateral cable outlet		
MMS 22-PI1-S-M8-PNP-SA	0301166	●
MMSK 22-PI1-S-PNP-SA	0301168	
Programmable magnetic switches MMS PI1 with stainless steel housing		
MMS 22-PI1-S-M8-PNP-HD	0301110	●
MMSK 22-PI1-S-PNP-HD	0301112	

ⓘ Two sensors (closer/S) are required for each unit and extension cables are available as an option. For sensor cables, note the minimum permissible bending radii. These are generally 35 mm.

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