



- Compact swivel actuators with minimum space requirement
- Adjustable swivel angle

Specified types in accordance with ATEX directive for potentially explosive atmospheres
➔ www.festo.com/en/ex



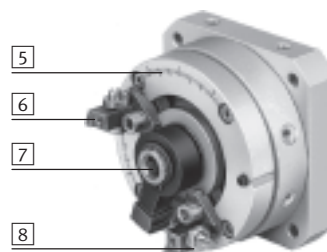
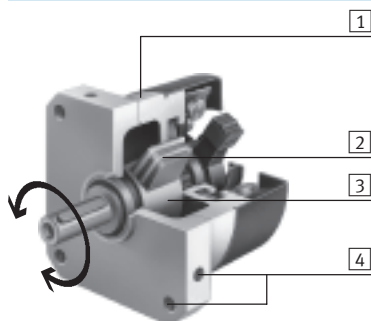
Swivel modules DSM

Key features

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At a glance

The technology in detail



- 1 Smooth operation thanks to machined surfaces
- 2 Polyurethane assures long service life for rotary vane and sealing system

- 3 Torques of up to 20 Nm with rotary vane in combination with spline shaft
- 4 Versatile, integrated mounting facilities

- 5 Swivel angle can be set anywhere within the swivel range
- 6 Mounting facility for inductive proximity sensors using sensor bracket, for contactless position sensing

- 7 Manual operation via internal hexagon socket in the drive shaft. A female thread is included for attachment of an additional drive shaft by the user
- 8 Fixed stop with fine adjustment of the swivel angle

DSM-6 ... 10

Swivel modules DSM-6 through 10 are vane driven double-acting semi-rotary actuators. The swivel angle is infinitely adjustable. End-position cushioning is accomplished with flexible cushioning plates on the rotary vane. The swivel modules are splash-water and dust proof.

DSM-12 ... 40

Swivel modules DSM-12 through 40 are vane driven double-acting actuators with infinitely adjustable swivel angle over the entire range. End positions can be adjusted by means of stop screws and lock nuts. Impact energy from the stop lever is absorbed by flexible cushioning plates on the basic versions.

End position cushioning is accomplished by means of YSR shock absorbers with CL/CR/CC variants. The rotary vane itself is not suitable for use in defining end positions, i.e. the stop lever and the stops may not be removed. The swivel modules are splash-water and dust proof.

Wide choice of variants

DSM with spigot shaft



DSM with spigot shaft and freewheel unit FLSM (accessories)



DSM with flanged shaft FW



DSM with fixed stop



DSM-12 ... 40 with shock absorber on left CL



DSM-12 ... 40 with shock absorber on right CR



DSM-12 ... 40 with shock absorber on both sides CC



Swivel modules DSM

Key features

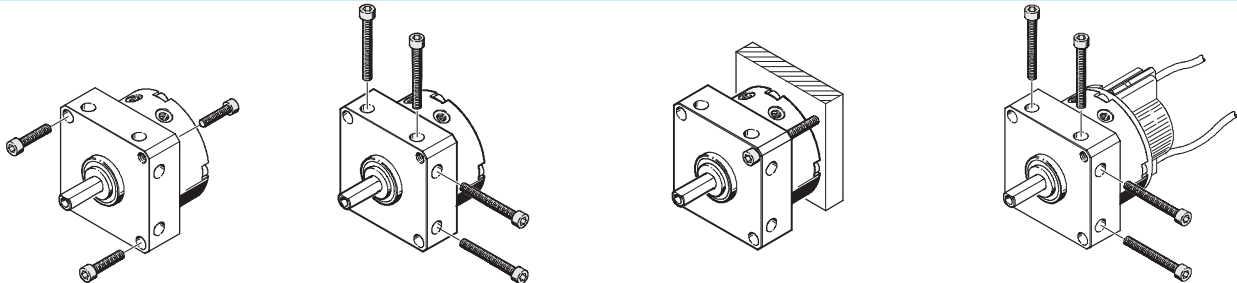
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Swivel drives
Semi-rotary vane drives

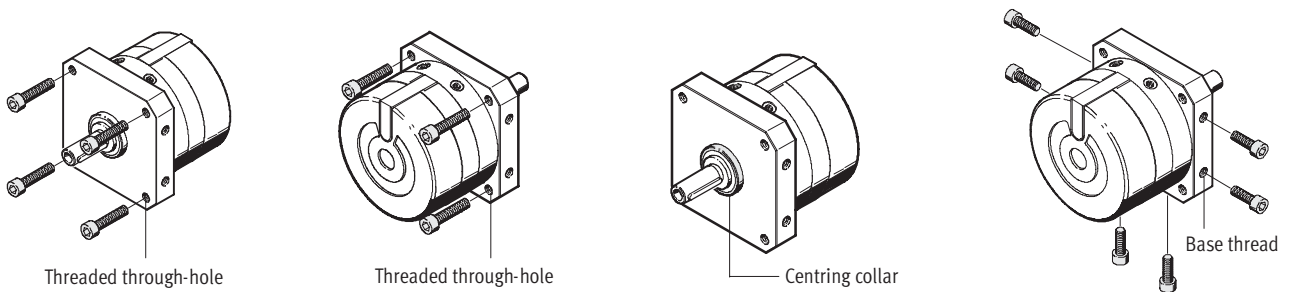
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Mounting options

DSM-6 ... 10

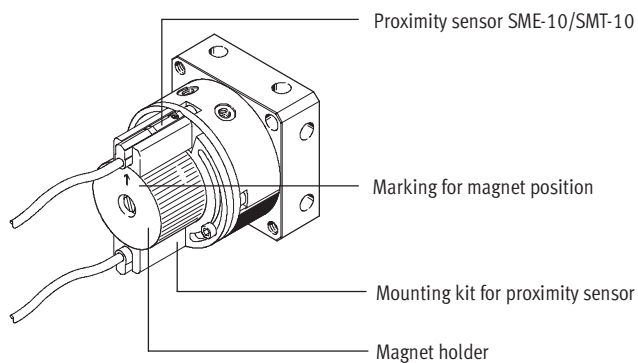


DSM-12 ... 40

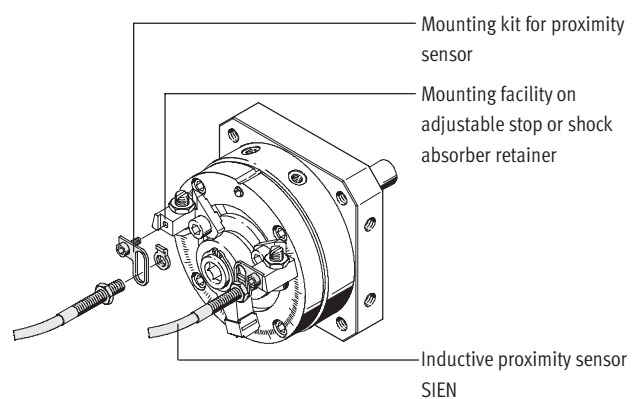


Position sensing

DSM-6 ... 10



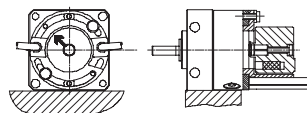
DSM-12 ... 40



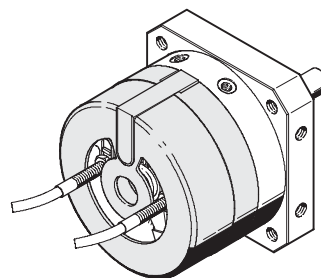
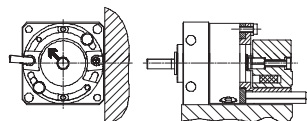
Note

If a swivel module with position sensing is to be attached to a ferritic component, the diagram opposite should be observed in order to assure reliable switching of the proximity sensor.

Recommended:



Not recommended:



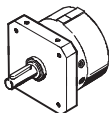
Swivel modules DSM

Product range overview



Swivel drives
Semi-rotary vane drives

4.1

Function	Version	Type	Size [mm]	Max. swivel angle [°]	Position sensing	Spigot shaft	Flanged shaft FW
Double-acting	with fixed swivel angle						
		DSM-6 ... 10	6, 8	90, 180	■	■	■
			10	90, 180, 240			
	with adjustable swivel angle						
		DSM-6 ... 10	6, 8	180	■	■	■
			10	200			
		DSM-12 ... 40	12, 16, 25, 32, 40	270	■	■	■

Swivel modules DSM

Product range overview

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Type	Fixed stop	Shock absorber			→ Page
		Left CL	Right CR	At both ends CC	
with fixed swivel angle					
DSM-6 ... 10		–	–	–	1 / 4.1-8
with adjustable swivel angle					
DSM-6 ... 10		–	–	–	1 / 4.1-8
DSM-12 ... 40					1 / 4.1-20

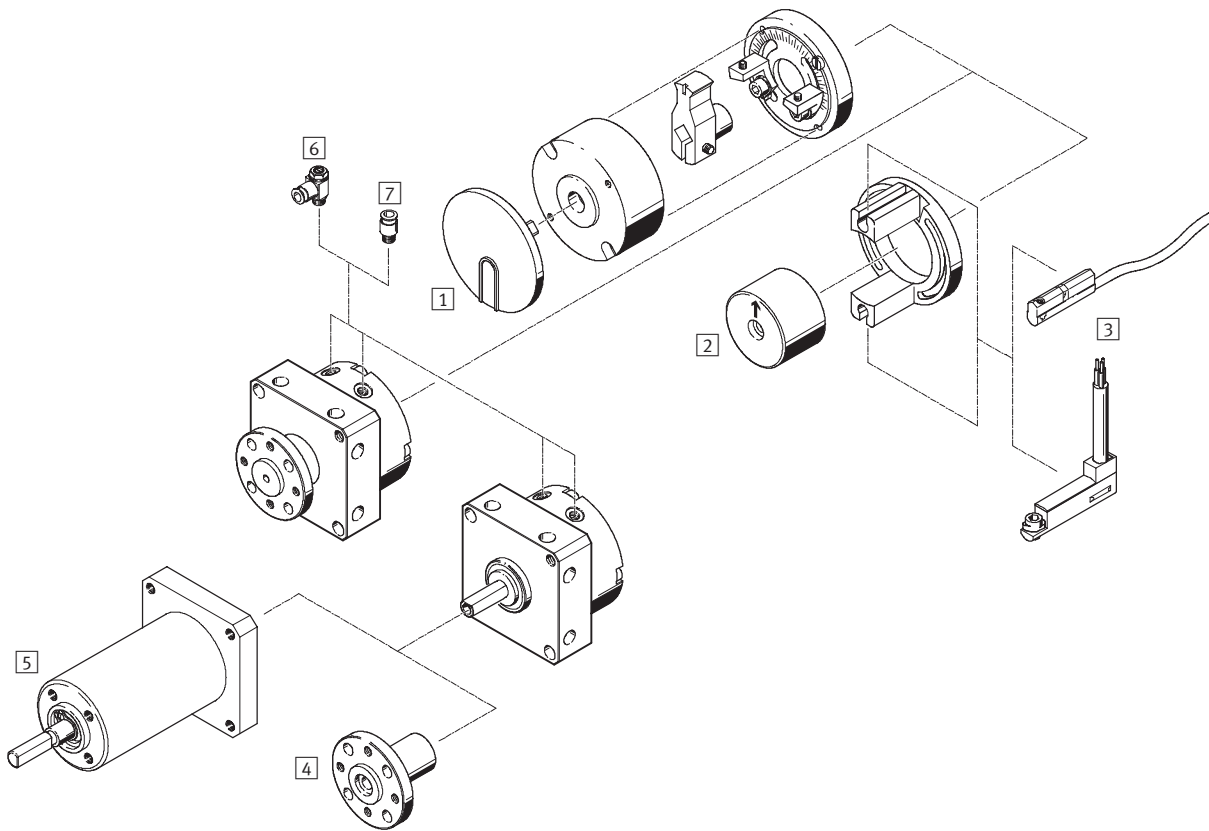
Swivel drives
Semi-rotary vane drives

4.1

Swivel modules DSM

Peripherals overview DSM-6 ... 10

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Accessories		
	Brief description	→ Page
1 End stop kit KSM	For swivel angle adjustment; expandable for swivel module DSM-...-P(-A)/DSM-...-P(-A)-FW an adapter and socket head screws must also be ordered for installation of the stop kit → 1 / 4.1-33	1 / 4.1-33
2 Mounting kit WSM-...-SME-10	For sensing the swivel angle; for mounting proximity sensors SME-/SMT-10; expandable for swivel module DSM-...-P(-FF)/DSM-...-P(-FF)-FW an adapter and socket head screws must also be ordered for installation of the mounting kit → 1 / 4.1-33	1 / 4.1-33
3 Proximity sensor SME/SMT-10	Proximity sensor for end position sensing	1 / 4.1-33
4 Push-on flange FWSR	Accessory for swivel module DSM with spigot shaft	1 / 4.1-32
5 Freewheel unit FLSM	Only in conjunction with swivel module DSM with spigot shaft	1 / 4.1-28
6 One-way flow control valve GRLA	To regulate speed	1 / 4.1-34
7 Push-in fitting QS	For connecting compressed air tubing with standard external diameters	Volume 3

Swivel modules DSM

Type codes DSM-6 ... 10

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		DSM	—	8	—	180	—	P	—	A	—	FF	—	FW
Type														
Double-acting														
DSM	Swivel module													
Size [mm]														
Max. swivel angle [°]														
Cushioning														
P	Non-adjustable at either end													
Position sensing														
	No position sensing													
A	For proximity sensing													
Adjustable swivel angle														
	Fixed swivel angle													
FF	Adjustable swivel angle													
Shaft														
	Spigot shaft													
FW	Flanged shaft													

Swivel modules DSM

Technical data DSM-6 ... 10

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Function



Size
6 ... 10 mm



General technical data				
Size		6	8	10
Pneumatic connection		M3		
Design		Rotary vane		
Cushioning		Flexible cushioning rings/plates at both ends		
Type of mounting		Via female thread		
Assembly position		Any		
Max. swivel angle	Fixed	[°]	90 or 180	90 or 180
	Adjustable	[°]	0 ... 180	90, 180 or 240
Permissible frequency at 6 bar		[Hz]	3	0 ... 200
Max. cushioning angle		[°]	0.5	3 (with 240°: 2 Hz)
Air consumption at max. swivel angle and 6 bar ¹⁾	90°	[cm ³]	0.6	0.7
	180°	[cm ³]	1.2	1.4
	240°	[cm ³]	–	5.5

1) Theoretical values

Operating and environmental conditions				
Size		6	8	10
Operating medium		Filtered compressed air, lubricated or unlubricated		
Operating pressure	[bar]	3.5 ... 8	3.5 ... 8	2.5 ... 8
Temperature range ¹⁾	[°C]	0 ... +60		
CE symbol		Atex		

1) Note operating range of proximity sensors

Forces and torques				
Size		6	8	10
Torque at 6 bar	[Nm]	0.15	0.35	0.85
Max. perm. radial load on drive shaft	[N]	15	20	30
Max. perm. axial load on drive shaft	[N]	10		
Max. perm. mass moment of inertia on the drive shaft ¹⁾	[kgm ²]	0.05 x 10 ⁻⁴	0.1 x 10 ⁻⁴	0.2 x 10 ⁻⁴

1) Unthrottled, please see diagrams starting on ➔ 1 / 4.1-10

Swivel modules DSM

Technical data DSM-6 ... 10

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Weights [g]				
Size		6	8	10
Spigot shaft				
• Fixed stop	90°	45	78	140
	180°	78	140	140
	240°	–	–	140
• Fixed stop • Position sensing	90°	50	85	149
	180°	50	85	149
	240°	–	–	149
• Fixed stop • Adjustable swivel angle	180°	70	140	–
	200°	–	–	240
• Fixed stop • Position sensing • Adjustable swivel angle	180°	85	155	–
	200°	–	–	255
Flanged shaft				
• Fixed stop	90°	51	85	150
	180°	51	85	150
	240°	–	–	150
• Fixed stop • Position sensing	90°	56	92	159
	180°	56	92	159
	240°	–	–	159
• Fixed stop • Adjustable swivel angle	180°	76	147	–
	200°	–	–	250
• Fixed stop • Position sensing • Adjustable swivel angle	180°	91	162	–
	200°	–	–	265

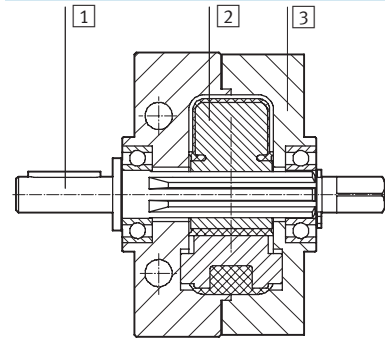
Swivel modules DSM

Technical data DSM-6 ... 10

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Materials

Sectional view



Swivel module

1	Shaft	Stainless steel
2	Rotary vane	Plastic, glass fibre reinforced
3	Housing	Anodised aluminium
-	Screws	Galvanised steel
-	Seals	Polyurethane
-	Note on materials	Free of copper and PTFE

Max. permissible mass moment of inertia

Example illustrating the use of the diagrams

A DSM-25-270-P swivel module is to be used to rotate a gripper with load through 180° in 0.4 s. The mass moment of inertia of the gripper and mass is $4.5 \times 10^{-4} \text{ kgm}^2$.

Question:

Is the value for the mass moment of inertia still permissible?

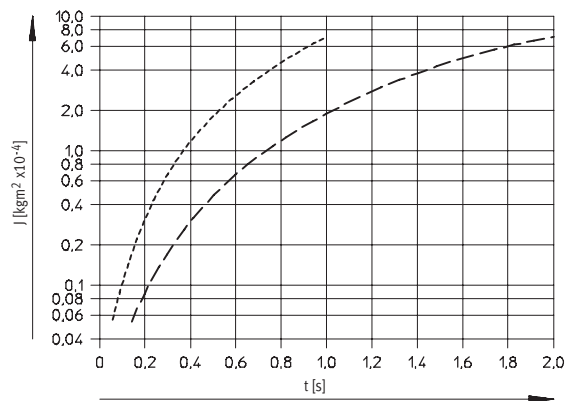
Answer:

The graph on page 1 / 4.1-23 indicates that the permissible mass moment of inertia is $6.5 \times 10^{-4} \text{ kgm}^2$ for a 180° angle of rotation. This means that the swivel actuator can be used without flow control valves!

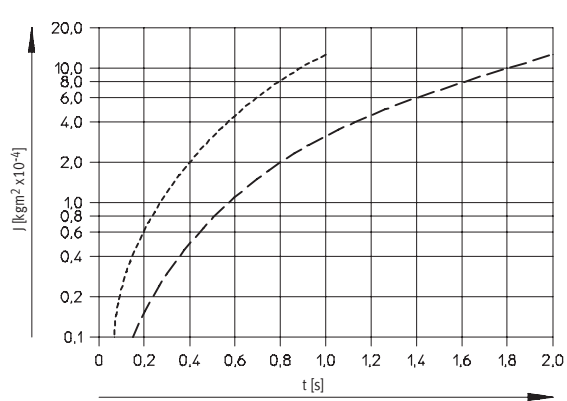
If the permissible mass moment of inertia had been exceeded in this example, it would be necessary to reduce the angular velocity by means of flow control valves, or to equip the DSM-25 with shock absorbers.

Mass moment of inertia J as a function of swivel time t

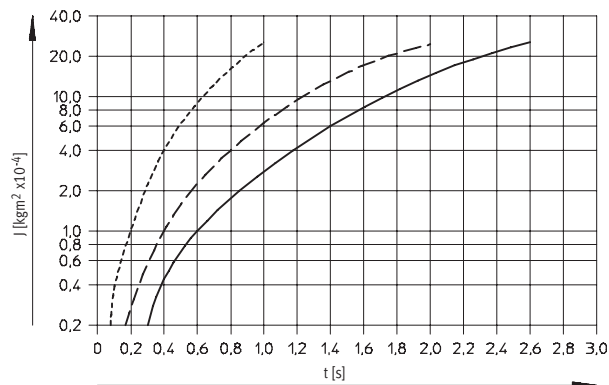
DSM-6



DSM-8



DSM-10



--- 90°
- - - 180°
— 240°

Swivel modules DSM

Technical data DSM-6 ... 10

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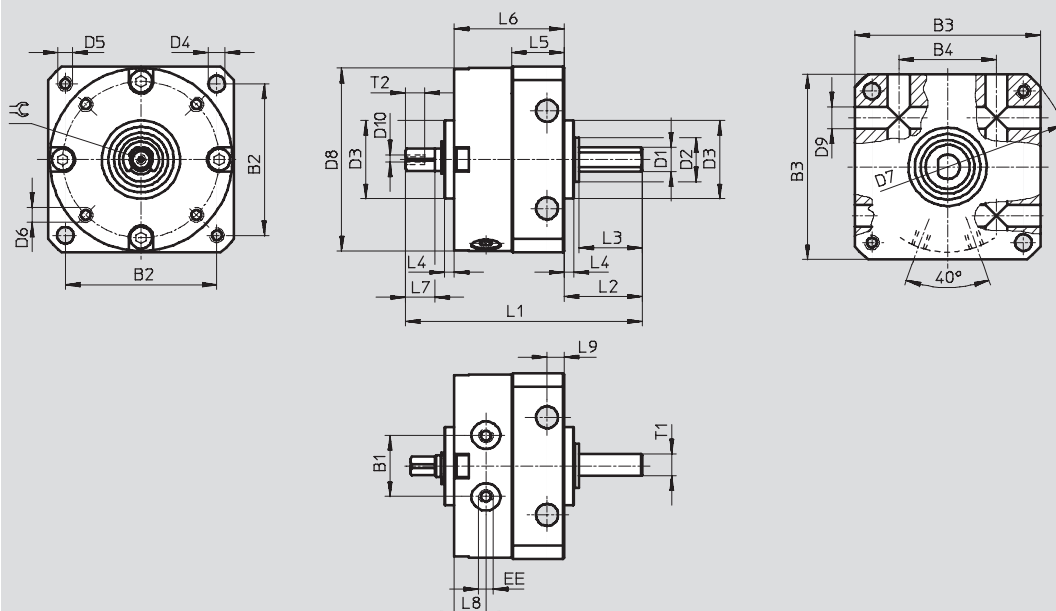
Swivel drives
Semi-rotary vane drives

4.1

Dimensions

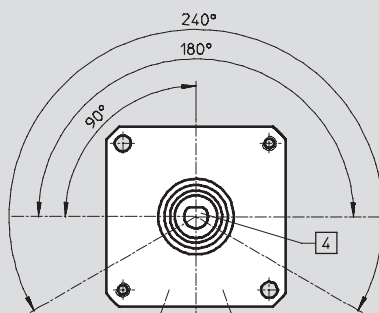
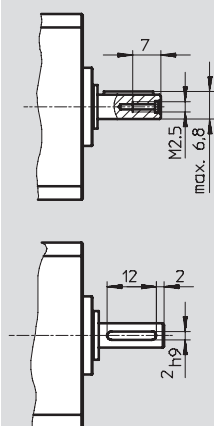
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With spigot shaft and fixed stop



Spigot design for swivel module
DSM-10

Shaft position



- Note

For swivel angle tolerance, → table below. Compressed air connections are shown at the bottom in the drawing.

Size [mm]	B1	B2	B3	B4	D1 Ø g7	D2 Ø	D3 Ø	D4 Ø H12	D5	D6	D7 Ø H12	D8 Ø	D9 Ø H12	D10	EE
6	10	25	30	17	4	8	14	3.2	M3	M2	40	29.4	3.5	M2	M3
8	12.8	31	38	20	5	9	16	3.2	M3	M2.5	50	37.4	3.5	M2	M3
10	15.9	38	47	26	6	12	19	4.3	M4	M3	62	46.4	4.5	M2.5	M3

Size [mm]	L1	L2	L3	L4	L5	L6	L7	L8	L9	T1	T2 h12	≈C	Swivel angle tolerance
6	43	13	10	2	9.8	21	5	6	3	3.5	4	3	0/+5°
8	50	16	13	2	11.3	23	6	6.5	3	4.5	4.3	3.5	0/+5°
10	61	19.6	16	2	14.3	28.4	8	7.5	4	–	5	4.5	0/+5°

Swivel modules DSM

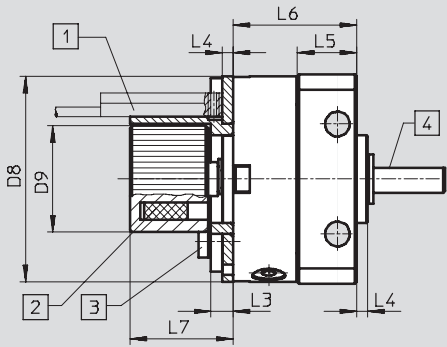
Technical data DSM-6 ... 10

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Dimensions

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With spigot shaft, fixed stop and position sensing



- 1 Proximity sensors not included in scope of delivery. Observe fitting space for proximity sensors and cable.
- 2 Magnet position
- 3 Max. tightening torque for sensor bracket screws → Table below
- 4 The flat or the woodruff key on the shaft indicates the position of the rotary vane

Size	D8 Ø	D9 Ø	L3	L4	L5	L6	L7	Tightening torque
[mm]								[Nm]
6	29.4	17.3	4	2	9.8	21	19.5	0.19
8	37.4	19.3	4	2	11.3	23	19.5	0.32
10	46.4	22.3	4	2	14.3	28	19.5	0.44

Swivel modules DSM

Technical data DSM-6 ... 10

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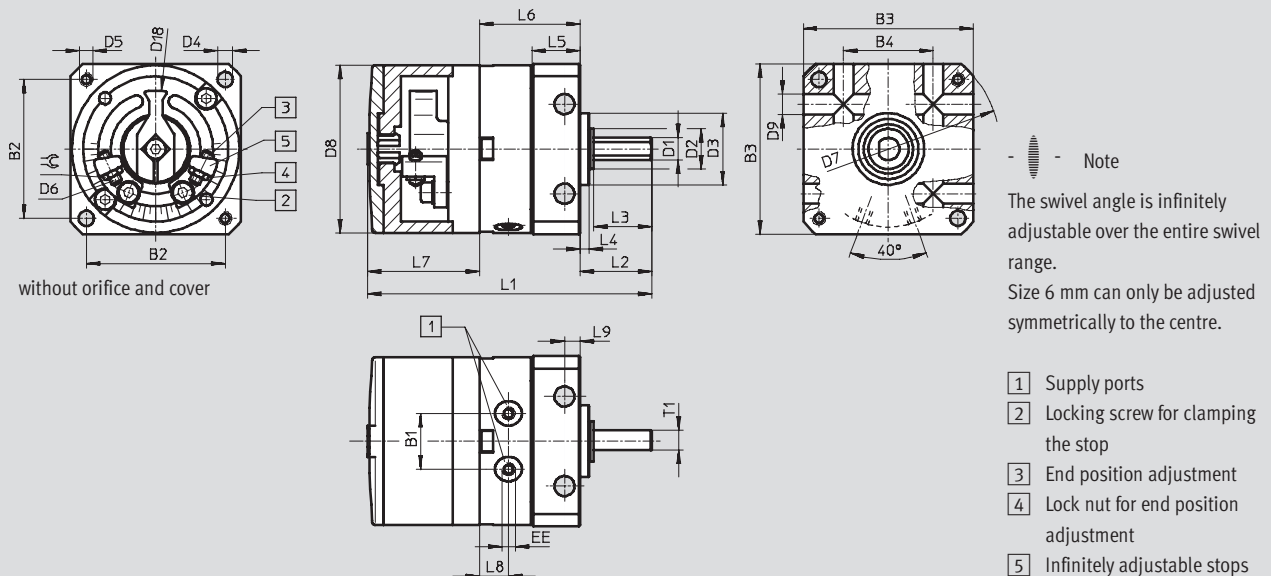
Swivel drives
Semi-rotary vane drives

4.1

Dimensions

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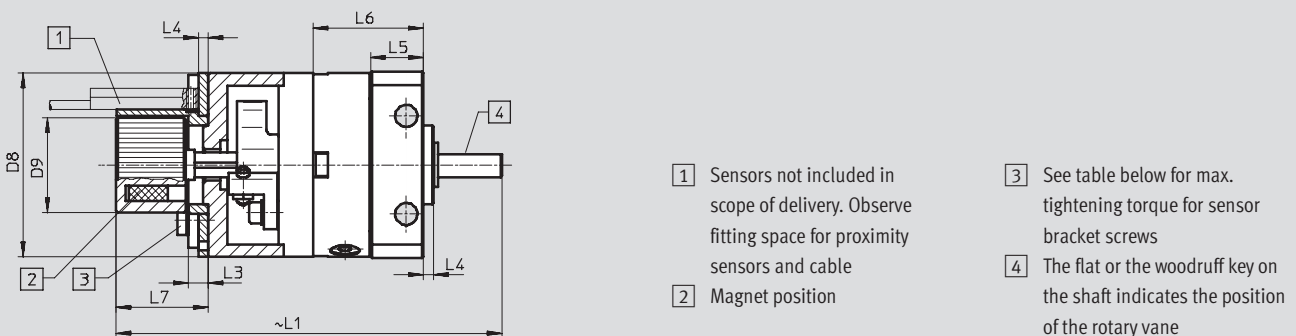
With spigot shaft, fixed stop and adjustable swivel angle



Size	B1	B2	B3	B4	D1 Ø g7	D2 Ø	D3 Ø	D4 Ø H12	D5	D6	D7 Ø H12	D8 Ø	D9 Ø H12	D18 Ø	EE
[mm]															
6	10	25	30	17	4	8	14	3.2	M3	M2	40	29.4	3.5	22	M3
8	12.8	31	38	20	5	9	16	3.2	M3	M2.5	50	37.4	3.5	26	M3
10	15.9	38	47	26	6	12	19	4.3	M4	M3	62	46.4	4.5	35.8	M3

Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	T1	⌀	Max. swivel angle	Precision adjustment both ends
[mm]													
6	52	13	10	2	9.8	21	17.8	6	3	3.5	4	180°+5°	+1°/-5°
8	64	16	13	2	11.3	23	24.9	6.5	3	4.5	5	180°+5°	+1°/-5°
10	76	19.6	16	2	14.3	28.4	28.2	7.5	4	—	5.5	200°+5°	+1°/-5°

With spigot shaft, fixed stop, adjustable swivel angle and position sensing



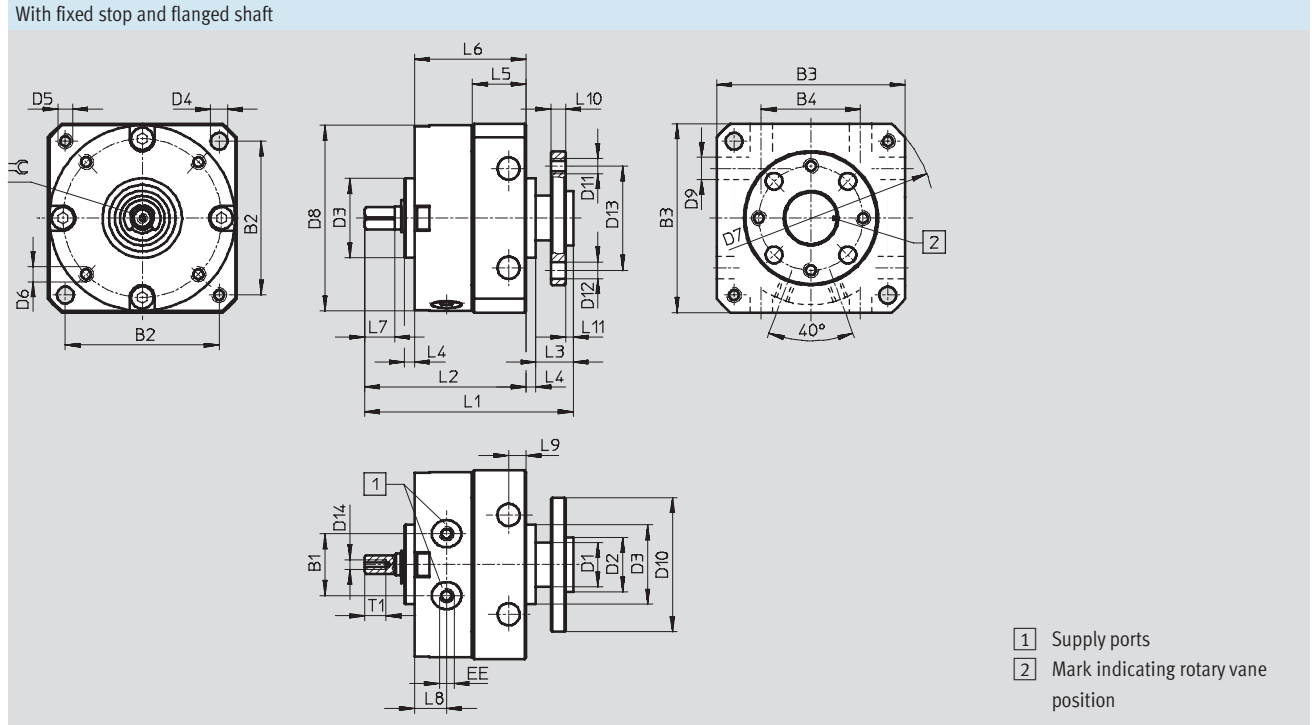
Size	D8 Ø	D9	L1	L3	L4	L5	L6	L7	Tightening torque
[mm]									[Nm]
6	29.4	17.3	68.5	4	2	9.8	21	19.5	0.19
8	37.4	19.3	80	4	2	11.3	23	19.5	0.32
10	46.4	22.3	91.5	4	2	14.3	28.4	19.5	0.44

Swivel modules DSM

Technical data DSM-6 ... 10

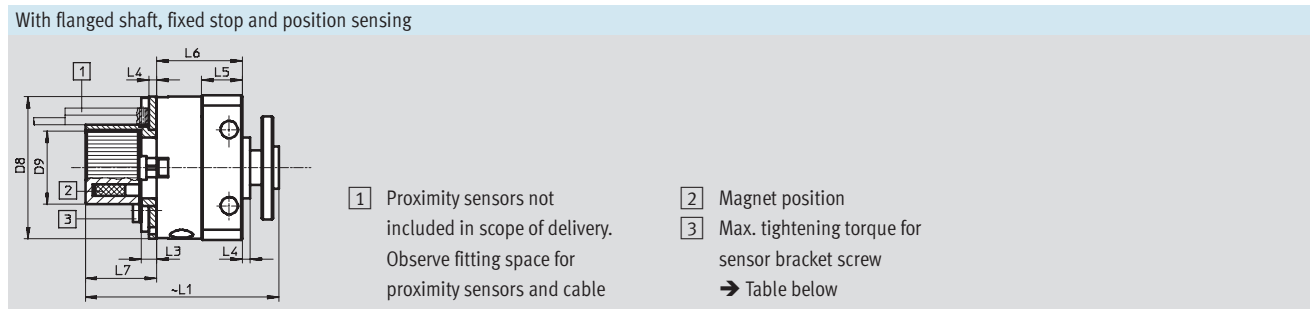
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Size	B1	B2	B3	B4	D1 Ø	D2 Ø g7	D3 Ø f8	D4 Ø	D5	D6	D7 Ø H12	D8 Ø	D9 Ø H12	D10 Ø	D11	D12 Ø H13	D13 Ø
[mm]																	
6	10	25	30	17	8	8	14	3.2	M3	M2	40	29.4	3.5	23	M3	3.4	16
8	12.8	31	38	20	9	11	16	3.2	M3	M2.5	50	37.4	3.5	27	M3	3.4	21
10	15.9	38	47	26	10	11	19	4.3	M4	M3	62	46.4	4.5	30	M3	3.4	21

Size	D14	EE	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	T1	⌀	Swivel angle tolerance
[mm]																
6	M2	M3	39.5	30	7.5	2	9.8	21	5	6	3	3	1.5	4	3	0/+5°
8	M2	M3	43.5	34	7.5	2	11.3	23	6	6.5	3	3	1.5	4.3	3.5	0/+5°
10	M2.5	M3	53	41.4	9.6	2	14.3	28.4	8	7.5	4	3	1.6	5	4.5	0/+5°



Size	D8	D9	L1	L3	L4	L5	L6	L7	Tightening torque
[mm]	Ø	Ø							[Nm]
6	29.4	17.3	50	4	2	9.8	21	19.5	0.19
8	37.4	19.3	52	4	2	11.3	23	19.5	0.32
10	46.4	22.3	59.5	4	2	14.3	28.4	19.5	0.44

Swivel modules DSM

Technical data DSM-6 ... 10

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Dimensions

With flanged shaft, fixed stop and adjustable swivel angle

Download CAD data → www.festo.com/en/engineering

without orifice and cover

Note
The swivel angle is infinitely adjustable over the entire swivel range.
Size 6 mm can only be adjusted symmetrically to the centre.

- 1 Supply ports
- 2 Locking screw for clamping the stop
- 3 End position adjustment
- 4 Lock nut for end position adjustment
- 5 Infinitely adjustable stops

Size	B1	B2	B3	B4	D1 Ø	D2 Ø g7	D3 Ø f8	D4 Ø H12	D5	D6	D7 Ø H12	D8 Ø
[mm]												
6	10	25	30	17	8	8	14	3.2	M3	M2	40	29.4
8	12.8	31	38	20	9	11	16	3.2	M3	M2.5	50	37.4
10	15.9	38	47	26	10	11	19	4.3	M4	M3	62	46.4

Size	D9 Ø H12	D10 Ø	D11	D12 Ø H13	D13 Ø	D18 Ø	EE	L1	L2	L3	L4
[mm]											
6	3.5	23	M3	3.4	16	22	M3	48	9.5	8	2
8	3.5	27	M3	3.4	21	26	M3	58	9.5	8	2
10	4.5	30	M3	3.4	21	35.8	M3	68	11.6	10	2

Size	L5	L6	L7	L8	L9	L10	L11	≈	Max. swivel angle	Precision adjustment both ends
[mm]										
6	9.8	21	17.8	6	3	3	1.5	4	180° +5°	+1°/-5°
8	11.3	23	24.9	6.5	3	3	1.5	5	180° +5°	+1°/-5°
10	14.3	28.4	28.2	7.5	4	3	1.6	5.5	200° +5°	+1°/-5°

Swivel modules DSM

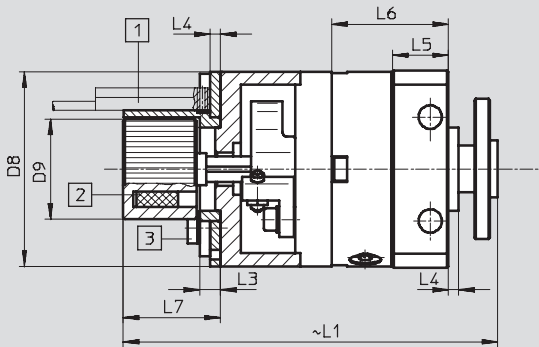
Technical data DSM-6 ... 10

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Dimensions

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With flanged shaft, fixed stop, adjustable swivel angle and position sensing



- 1 Proximity sensors not included in scope of delivery. Observe fitting space for proximity sensors and cable.
- 2 Magnet position

- 3 Max. tightening torque for sensor bracket screws → Table below

-  - Note

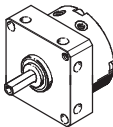
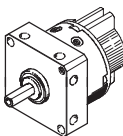
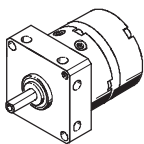
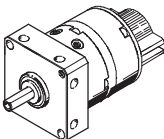
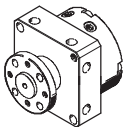
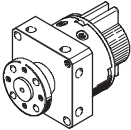
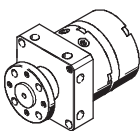
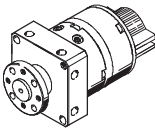
The swivel angle is infinitely adjustable over the entire swivel range.
Size 6 mm can only be adjusted symmetrically to the centre.

Size [mm]	D8 Ø	D9 Ø	L1	L3	L4	L5	L6	L7	Tightening torque [Nm]
6	29.4	17.3	65	4	2	9.8	21	19.5	0.19
8	37.4	19.3	73.5	4	2	11.3	23	19.5	0.32
10	46.4	22.3	83	4	2	14.3	28.4	19.5	0.44

Swivel modules DSM

Technical data DSM-6 ... 10

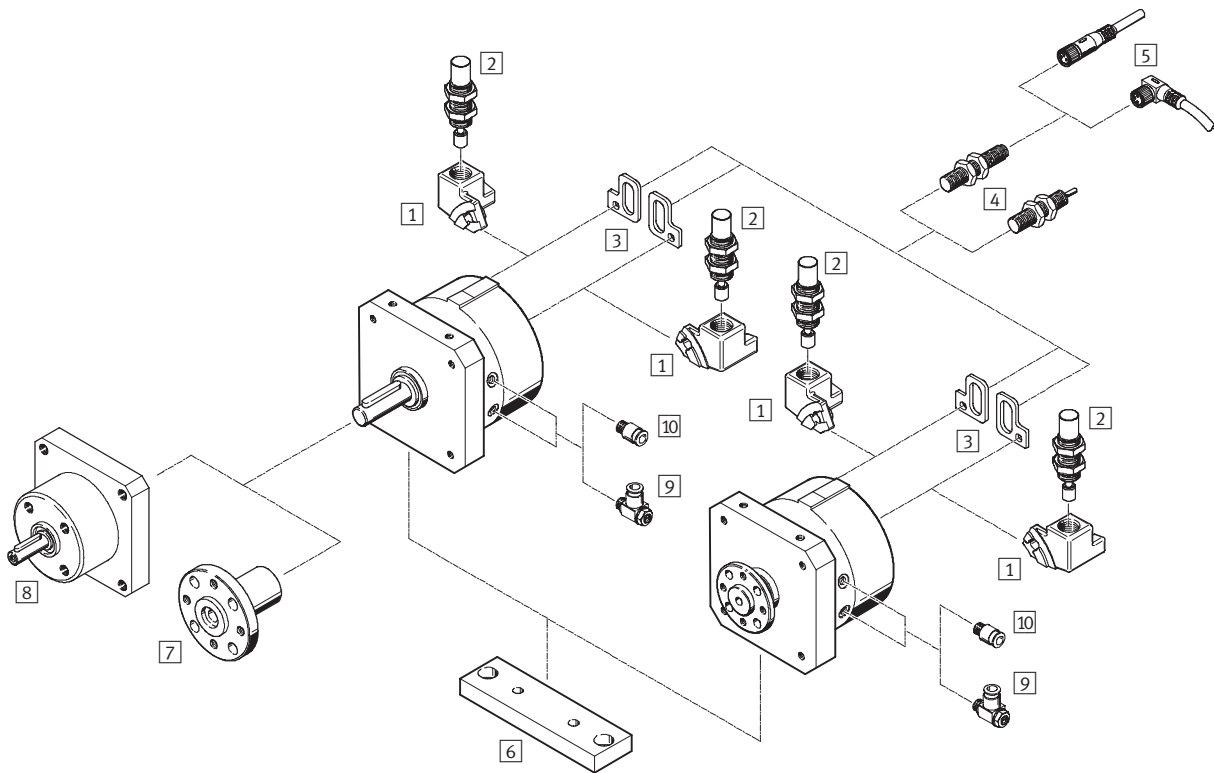
FESTO

Ordering data							
Swivel module	Key features	Max. swivel angle	Size [mm]	Part No.	Type		
Spigot shaft							
	• Fixed stop	90°	6	173 188	DSM-6-90-P		
			8	173 190	DSM-8-90-P		
			10	173 192	DSM-10-90-P		
		180°	6	173 189	DSM-6-180-P		
			8	173 191	DSM-8-180-P		
			10	173 193	DSM-10-180-P		
		240°	10	173 194	DSM-10-240-P		
			• Fixed stop • Position sensing	90°	6	173 195	DSM-6-90-P-A
					8	173 197	DSM-8-90-P-A
10	173 199				DSM-10-90-P-A		
180°	6			173 196	DSM-6-180-P-A		
	8			173 198	DSM-8-180-P-A		
	10			173 200	DSM-10-180-P-A		
240°	10			173 201	DSM-10-240-P-A		
	• Fixed stop • Adjustable swivel angle			180°	6	175 827	DSM-6-180-P-FF
					8	175 828	DSM-8-180-P-FF
		200°	10	175 829	DSM-10-240-P-FF		
				• Fixed stop • Position sensing • Adjustable swivel angle	180°	6	175 830
		8				175 831	DSM-8-180-P-A-FF
		200°			10	175 832	DSM-10-240-P-A-FF
Flanged shaft							
	• Fixed stop	90°	6	185 928	DSM-6-90-P-FW		
			8	185 934	DSM-8-90-P-FW		
			10	185 940	DSM-10-90-P-FW		
		180°	6	185 929	DSM-6-180-P-FW		
			8	185 935	DSM-8-180-P-FW		
			10	185 941	DSM-10-180-P-FW		
		240°	10	185 942	DSM-10-240-P-FW		
			• Fixed stop • Position sensing	90°	6	185 930	DSM-6-90-P-A-FW
					8	185 936	DSM-8-90-P-A-FW
10	185 943				DSM-10-90-P-A-FW		
180°	6			185 931	DSM-6-180-P-A-FW		
	8			185 937	DSM-8-180-P-A-FW		
	10			185 944	DSM-10-180-P-A-FW		
240°	10			185 945	DSM-10-240-P-A-FW		
	• Fixed stop • Adjustable swivel angle			180°	6	185 932	DSM-6-180-P-FF-FW
					8	185 938	DSM-8-180-P-FF-FW
		200°	10	185 946	DSM-10-240-P-FF-FW		
				• Fixed stop • Position sensing • Adjustable swivel angle	180°	6	185 933
		8				185 939	DSM-8-180-P-A-FF-FW
		200°			10	185 947	DSM-10-240-P-A-FF-FW

Swivel modules DSM

Peripherals overview DSM-12 ... 40

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Accessories		
	Brief description	→ Page
1	Shock absorber retainer DSM-...-CL/CR For end position adjustable at left, right or both ends Expandable for swivel module DSM-...-P/DSM-...-P-FW, replaces the fixed stop	1 / 4.1-30
2	Shock absorber YSR Self-adjusting shock absorbers in the end positions	1 / 4.1-34
3	Mounting kit WSM-...-J-M... For mounting inductive proximity sensors SIEN	1 / 4.1-34
4	Proximity sensor, inductive SIEN For end position sensing, available with plug or cable	1 / 4.1-34
5	Connecting cable NEBU For inductive proximity sensors with plug	1 / 4.1-34
6	Mounting plate HSM For foot or flange mounting	1 / 4.1-31
7	Push-on flange FWSR Accessory for swivel module DSM with spigot shaft	1 / 4.1-32
8	Freewheel unit FLSM Only in conjunction with swivel module DSM with spigot shaft	1 / 4.1-28
9	One-way flow control valve GRLA To regulate speed	1 / 4.1-34
10	Push-in fitting QS For connecting compressed air tubing with standard external diameters	Volume 3

Swivel modules DSM

Type codes DSM-12 ... 40

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		DSM	–	25	–	270	–	P	–	FW	–	CL
Type												
Double-acting												
DSM	Swivel module											
Size [mm]												
Max. swivel angle [°], adjustable												
Cushioning												
P	Non-adjustable at either end											
Shaft												
	Spigot shaft											
FW	Flanged shaft											
Fixed stop/shock absorber												
	Fixed stop											
CL	Shock absorber on left											
CR	Shock absorber on right											
CC	Shock absorbers at both ends											

Swivel modules DSM

Technical data DSM-12 ... 40

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Function



- Ø - Size
12 ... 40 mm

- T - [www.festo.com/en/
Spare_parts_service](http://www.festo.com/en/Spare_parts_service)



General technical data						
Size		12	16	25	32	40
Pneumatic connection		M5			G1/8	
Design		Rotary vane				
Cushioning		Flexible cushioning rings/plates at both ends; self-adjustable at one end; self-adjustable at both ends				
Type of mounting		Via female thread				
Assembly position		Any				
Max. swivel angle	without shock absorber	[°]	0 ... 270	0 ... 270	0 ... 270	0 ... 270
	with shock absorber (CR/CL)	[°]	0 ... 254	0 ... 254	0 ... 258	0 ... 258
	with two shock absorbers (CC)	[°]	0 ... 238	0 ... 238	0 ... 246	0 ... 246
Max. permissible frequency (with max. swivel angle)	without shock absorber	[Hz]	2			
	with shock absorber	[Hz]	1.5	1	0.7	
Swivel angle adjustment		Without shock absorber –5 ... +1°; with shock absorber ➔ 1 / 4.1-30				
Cushioning angle	without shock absorber	[°]	1.8 ... 2.1	1.3 ... 2.1	1.1 ... 1.9	0.9 ... 1.7
	with shock absorber	[°]	13	12	10	12.5
Air consumption at max. swivel angle and 6 bar ¹⁾		[cm³]	82	163	288	632
						1,168

1) Theoretical values

- Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Operating and environmental conditions					
Size	12	16	25	32	40
Operating medium	Filtered compressed air, lubricated or unlubricated				
Operating pressure	[bar]	2 ... 10		1.5 ... 10	
Temperature range ¹⁾	[°C]	– 10 ... +60			
CE symbol	Atex				

1) Note operating range of proximity sensors

Forces and torques						
Size		12	16	25	32	40
Torque at 6 bar		[Nm]	1.25	2.5	5	10
Max. perm. radial load on drive shaft		[N]	45	75	120	200
Max. perm. axial load on drive shaft		[N]	18	30	50	75
Max. perm. mass moment of inertia on the drive shaft ¹⁾	without shock absorber	[kgm ²]	0.35 x 10 ⁻⁴	0.7 x 10 ⁻⁴	1.1 x 10 ⁻⁴	1.1 x 10 ⁻⁴
	with shock absorber	[kgm ²]	7 x 10 ⁻⁴	12 x 10 ⁻⁴	16 x 10 ⁻⁴	21 x 10 ⁻⁴
						40 x 10 ⁻⁴

1) Unthrottled, please see diagrams starting on → 1 / 4.1-23

Swivel modules DSM

Technical data DSM-12 ... 40

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Weights [g]					
Size	12	16	25	32	40
Spigot shaft					
• Fixed stop	250	450	690	1,380	2,600
• Adjustable swivel angle					
• Shock absorber on left	300	510	730	1,480	2,830
• Adjustable swivel angle					
• Shock absorber on right	300	510	730	1,480	2,830
• Adjustable swivel angle					
• Shock absorbers on both sides	300	510	730	1,480	2,830
• Adjustable swivel angle					
Flanged shaft					
• Fixed stop	250	450	690	1,380	2,600
• Adjustable swivel angle					
• Shock absorber on left	300	510	730	1,480	2,830
• Adjustable swivel angle					
• Shock absorber on right	510	510	730	1,480	2,830
• Adjustable swivel angle					
• Shock absorbers on both sides	300	510	730	1,480	2,830
• Adjustable swivel angle					

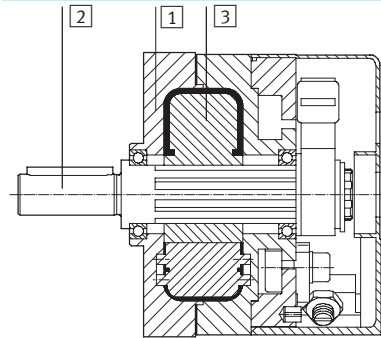
Swivel modules DSM

Technical data DSM-12 ... 40

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Materials

Sectional view

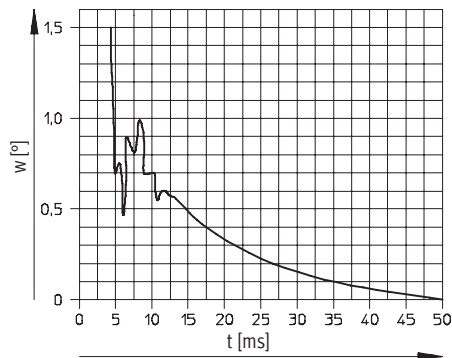


Swivel module

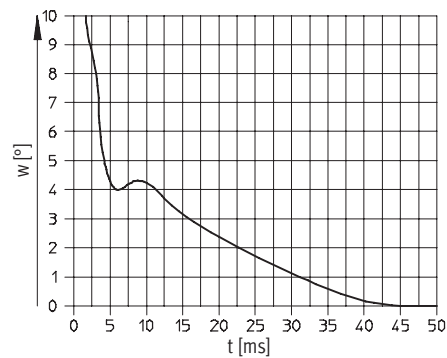
1	Housing, stop lever	Anodised aluminium
2	Shaft	Nickel-plated steel
3	Rotary vane	Plastic, glass fibre reinforced
-	Fixed stops / screws	Galvanised steel
-	Stop screws	Stainless steel
-	Cap	Plastic, glass fibre reinforced
-	Seals	Polyurethane
-	Note on materials	Free of copper and PTFE

Cushioning (cushioning angle w as a function of swivel time t)

Fixed stop



Integrated shock absorber



Max. permissible mass moment of inertia

Example illustrating the use of the diagrams

A DSM-25-270-P swivel module is to be used to rotate a gripper with load through 180° in 0.4 s. The mass moment of inertia of the gripper and mass is $4.5 \times 10^{-4} \text{ kgm}^2$.

Question:

Is the value for the mass moment of inertia still permissible?

Answer:

The graph on page 1 / 4.1-23 indicates that the permissible mass moment of inertia is $6.5 \times 10^{-4} \text{ kgm}^2$ for a 180° angle of rotation. This means that the swivel actuator can be used without flow control valves!

If the permissible mass moment of inertia had been exceeded in this example, it would be necessary to reduce the angular velocity by means of flow control valves, or to equip the DSM-25 with shock absorbers.



Note

In the diagrams, swivelling time is specified for CL/CR/CC variants up to the point when the stop lever meets the shock absorber. The specified cushioning time of the shock absorber must be added in order to obtain total swivelling time.

Swivel modules DSM

Technical data DSM-12 ... 40

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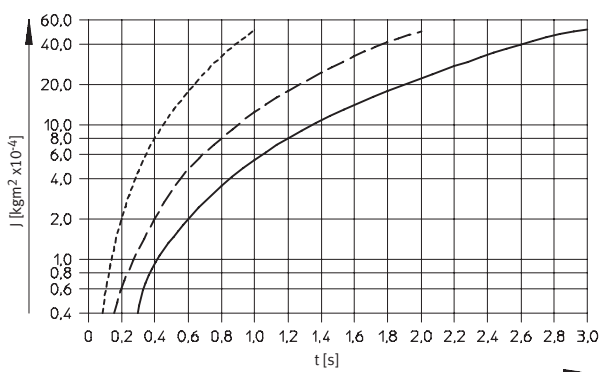
Swivel drives
Semi-rotary vane drives

4.1

Mass moment of inertia J as a function of swivel time t

Without shock absorber

DSM-12-270-P

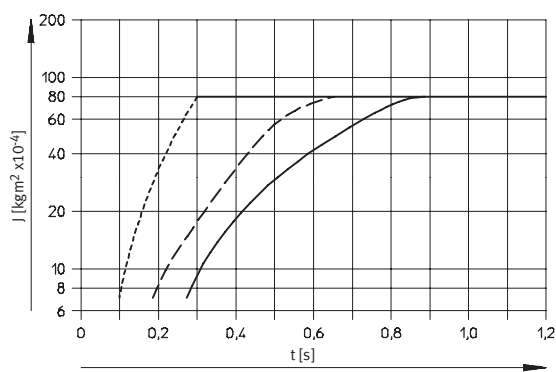


With shock absorber

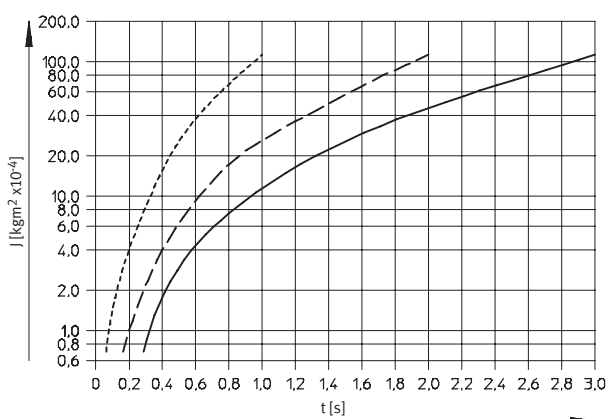
DSM-12-270-P-CL/CR/CC

Max. permissible mass moment of inertia: $80 \times 10^{-4} \text{ kgm}^2$

Cushioning time, shock absorbers YSR-5-5-C: approx. 0.1 s



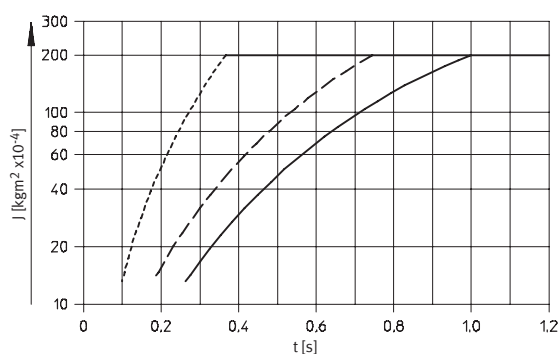
DSM-16-270-P



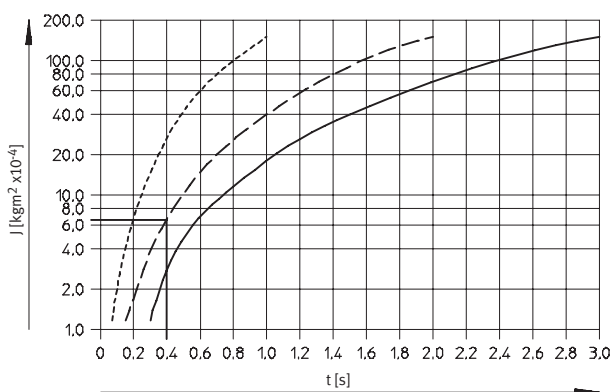
DSM-16-270-P-CL/CR/CC

Max. permissible mass moment of inertia: $200 \times 10^{-4} \text{ kgm}^2$

Cushioning time, shock absorbers YSR-7-5-C: approx. 0.1 s



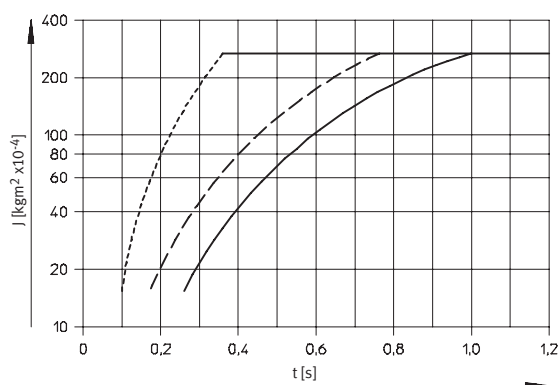
DSM-25-270-P



DSM-25-270-P-CL/CR/CC

Max. permissible mass moment of inertia: $280 \times 10^{-4} \text{ kgm}^2$

Cushioning time, shock absorbers YSR-7-5-C: approx. 0.1 s



--- 90°
- - - 180°
— 270°

Swivel modules DSM

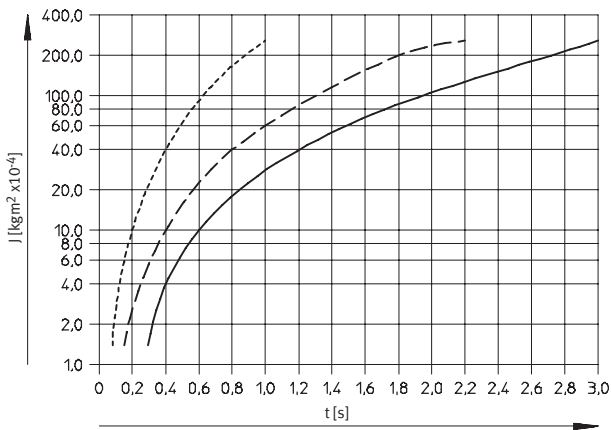
Technical data DSM-12 ... 40

FESTO

Mass moment of inertia J as a function of swivel time t

Without shock absorber

DSM-32-270-P

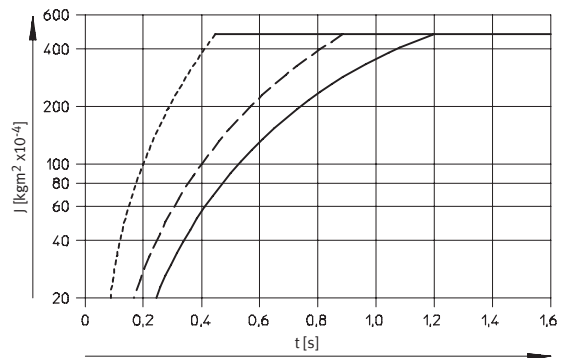


With shock absorber

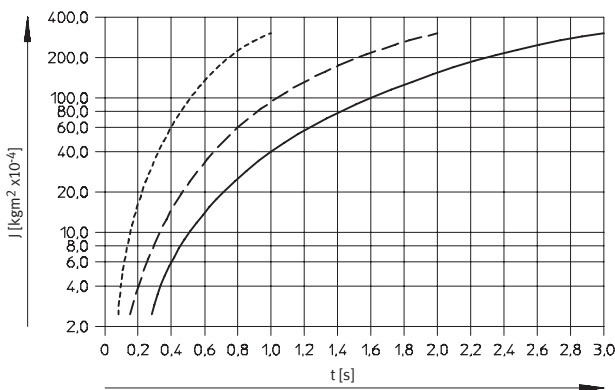
DSM-32-270-P-CL/CR/CC

Max. permissible mass moment of inertia: $500 \times 10^{-4} \text{ kgm}^2$

Cushioning time, shock absorbers YSR-8-8-C: approx. 0.25 s



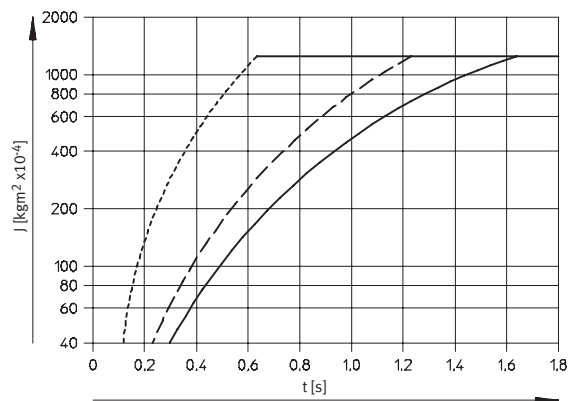
DSM-40-270-P



DSM-40-270-P-CL/CR/CC

Max. permissible mass moment of inertia: $1200 \times 10^{-4} \text{ kgm}^2$

Cushioning time, shock absorbers YSR-12-12-C: approx. 0.3 s



--- 90°
- - - 180°
— 270°

Swivel modules DSM

Technical data DSM-12 ... 40

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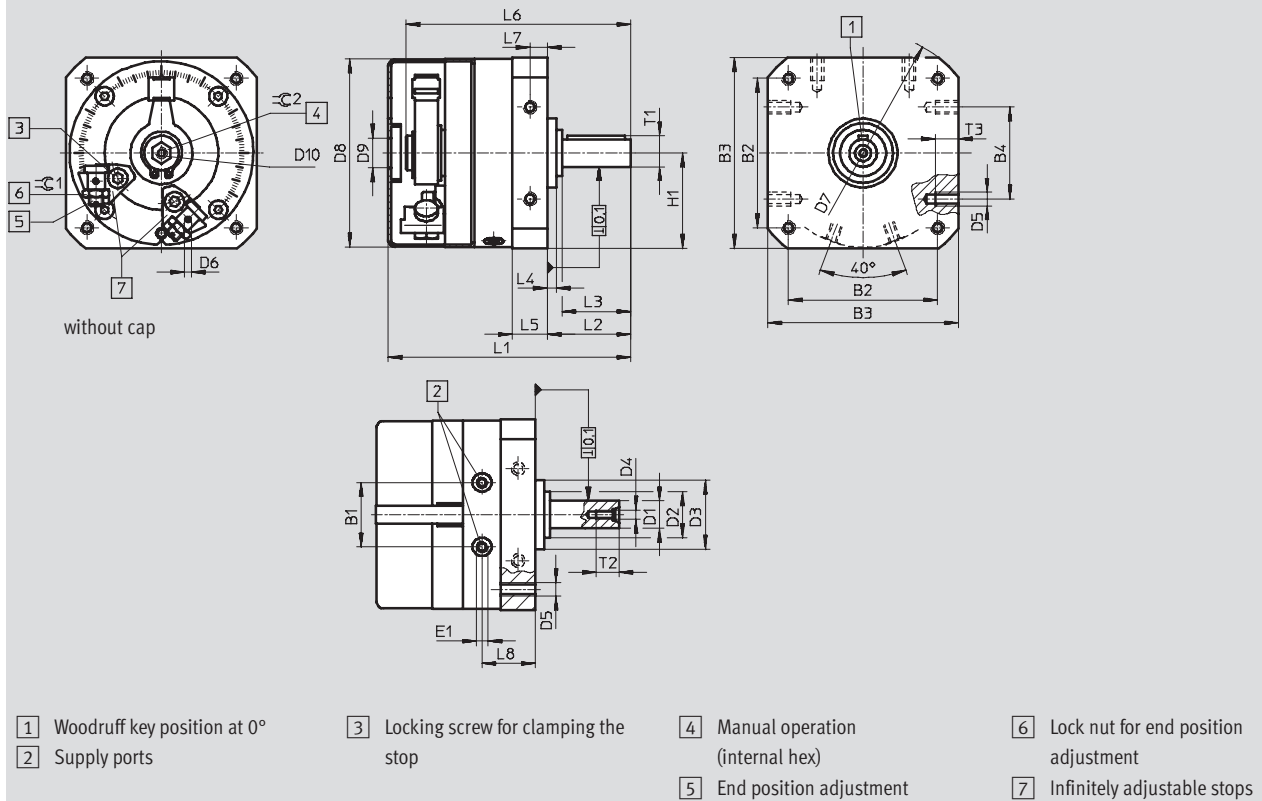
Swivel drives
Semi-rotary vane drives

4.1

Dimensions

Download CAD data → www.festo.com/en/engineering

With spigot shaft and fixed stop



Size	B1	B2	B3	B4	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	E1	H1
[mm]					Ø g7	Ø	Ø f8				Ø	Ø	Ø			
12	19.8	48	59	30	8	15	24	M3	M4	M3	78	58	9	M4	M5	29.5
16	23.5	57	70	40	10	18	28	M3	M5	M3	91	69	12.5	M5	M5	35
25	28	65	83	40	12	20	30	M4	M6	M3	106	82	13	M5	M5	41.5
32	35.5	85	105	60	16	27	42	M5	M8	M3	135	104	16.5	M5	G $\frac{1}{8}$	52.5
40	43.8	105	130	80	20	36	52	M6	M10	M3	168	128	23.5	M6	G $\frac{1}{8}$	65

Size	L1	L2	L3	L4	L5	L6	L7	L8	T1	T2	T3	≤C1	≤C2	Woodruff key to DIN 6885 ¹⁾
[mm]									max.					
12	77.5	24.5	20	3	10.3	68.3	5	16.5	8.8	9	8	7	6	A2x2x16
16	90.8	28	23	2.6	13	81.2	6.5	20.2	11.2	9	8	8	8	A3x3x18
25	105.5	36.5	30	4	15.2	97.5	7.5	23.5	13.5	10	10	10	8	A4x4x25
32	139.5	51	40	8	19.2	127.1	9.5	30.5	18	12.5	12	13	10	A5x5x36
40	171.5	62	50	8	23.7	155.5	12	36	22.5	16	15	17	10	A6x6x45

1) included in scope of delivery

· Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Swivel modules DSM

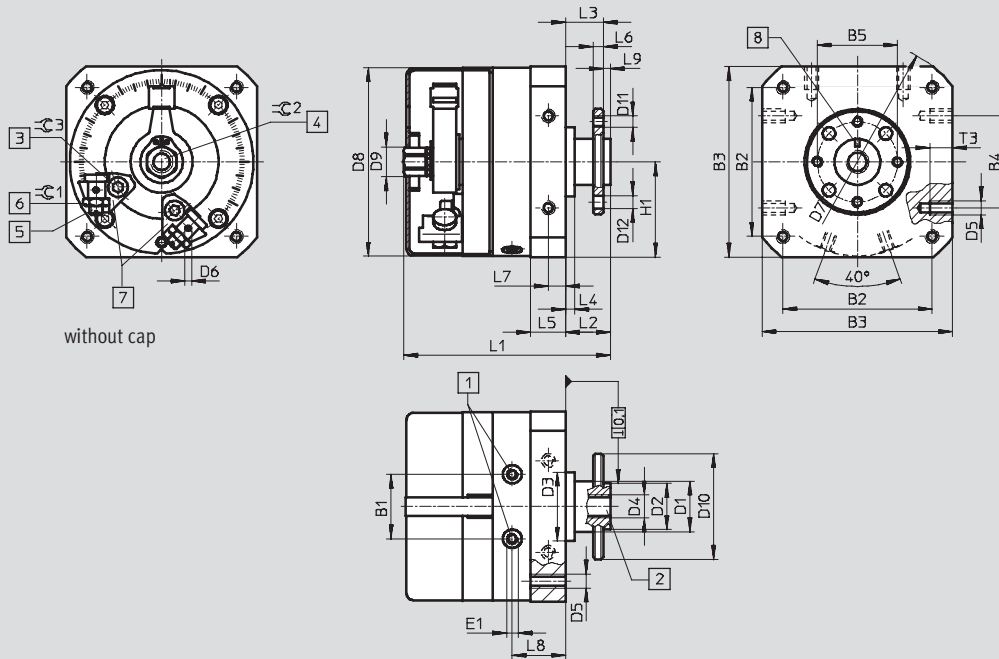
Technical data DSM-12 ... 40

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Dimensions

Download CAD data → www.festo.com/en/engineering

With fixed stop and flanged shaft



- | | | | |
|-----------------------------------|---------------------------------------|--|--|
| 1 Supply ports | 3 Locking screw for clamping the stop | 5 End position adjustment | 7 Infinitely adjustable stops |
| 2 Flanged shaft with through-hole | 4 Manual operation (external hex) | 6 Lock nut for end position adjustment | 8 The position of the marking corresponds to the position of the stop. |

Size	B1	B2	B3	B4	B5	D1	D2	D3	D4	D5	D6	Ø	D8	D9	Ø	D11
[mm]						Ø	Ø f8	Ø f8					Ø	Ø		
12	19.8	48	59	30	25	15	14	24	M5	M4	M3	78	58	9	33	M3
16	23.5	57	70	40	28	18	16	28	M5	M5	M3	91	69	12.5	38	M4
25	28	65	83	40	35	20	20	30	G1/8	M6	M3	106	82	13	46	M5
32	35.5	85	105	60	45	27	28	42	G1/8	M8	M3	135	104	16.5	60	M6
40	43.8	105	130	80	54	36	36	52	G1/4	M10	M3	168	128	23.5	70	M8

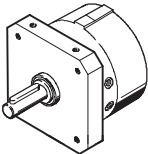
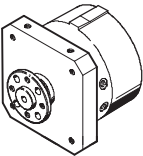
Size	D12	E1	H1	L1	L2	L3	L4	L5	L6	L7	L8	L9	T3	≈C 1	≈C 2	≈C 3
[mm]	Ø															
12	3.4	M5	29.5	67.3	13	11	3	10.3	3	5	16.5	2	8	7	8	2.5
16	4.5	M5	35	79	15	13	2.6	13	4	6.5	20.2	2	8	8	11	3
25	5.5	M5	41.5	90	19.5	16.5	4	15.2	4.5	7.5	23.5	3	10	10	13	4
32	6.6	G1/8	52.5	115.8	27	23	8	19.2	6	9.5	30.5	4	12	13	13	5
40	9	G1/8	65	143.8	33	28	8	23.7	7.5	12	36	5	15	17	19	8

- Note: This product conforms with the ISO 1179-1 standard and the ISO 228-1 standard.

Swivel modules DSM

Technical data DSM-12 ... 40

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Ordering data					
Swivel module	Key features	Max. swivel angle	Size [mm]	Part No.	Type
Spigot shaft					
	• Fixed stop • Adjustable swivel angle	270°	12	159 540	DSM-12-270-P
			16	159 541	DSM-16-270-P
			25	158 959	DSM-25-270-P
			32	152 593	DSM-32-270-P
			40	152 594	DSM-40-270-P
	• Shock absorber on left • Adjustable swivel angle	254° 254° 258° 258° 255°	12	164 321	DSM-12-270-P-CL
			16	163 000	DSM-16-270-P-CL
			25	163 002	DSM-25-270-P-CL
			32	163 004	DSM-32-270-P-CL
			40	163 006	DSM-40-270-P-CL
	• Shock absorber on right • Adjustable swivel angle	254° 254° 258° 258° 255°	12	164 322	DSM-12-270-P-CR
			16	163 001	DSM-16-270-P-CR
			25	163 003	DSM-25-270-P-CR
			32	163 005	DSM-32-270-P-CR
			40	163 007	DSM-40-270-P-CR
	• Shock absorbers on both sides • Adjustable swivel angle	238° 238° 246° 246° 240°	12	164 323	DSM-12-270-P-CC
			16	161 746	DSM-16-270-P-CC
			25	161 747	DSM-25-270-P-CC
			32	161 748	DSM-32-270-P-CC
			40	161 749	DSM-40-270-P-CC
Flanged shaft					
	• Fixed stop • Adjustable swivel angle	270°	12	157 657	DSM-12-270-P-FW
			16	157 658	DSM-16-270-P-FW
			25	157 659	DSM-25-270-P-FW
			32	157 660	DSM-32-270-P-FW
			40	157 661	DSM-40-270-P-FW
	• Shock absorber on left • Adjustable swivel angle	254° 254° 258° 258° 255°	12	170 080	DSM-12-270-P-FW-CL
			16	170 083	DSM-16-270-P-FW-CL
			25	170 086	DSM-25-270-P-FW-CL
			32	170 089	DSM-32-270-P-FW-CL
			40	170 092	DSM-40-270-P-FW-CL
	• Shock absorber on right • Adjustable swivel angle	254° 254° 258° 258° 255°	12	170 081	DSM-12-270-P-FW-CR
			16	170 084	DSM-16-270-P-FW-CR
			25	170 087	DSM-25-270-P-FW-CR
			32	170 090	DSM-32-270-P-FW-CR
			40	170 093	DSM-40-270-P-FW-CR
	• Shock absorbers at both ends • Adjustable swivel angle	238° 238° 246° 246° 240°	12	170 079	DSM-12-270-P-FW-CC
			16	170 082	DSM-16-270-P-FW-CC
			25	170 085	DSM-25-270-P-FW-CC
			32	170 088	DSM-32-270-P-FW-CC
			40	170 091	DSM-40-270-P-FW-CC

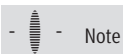
Swivel modules DSM

Accessories

Free wheel unit FLSM

Material:

Housing: Anodised aluminium

Shaft: $\varnothing 6, 8$ steel $\varnothing 10 \dots 40$ hardened steelSleeve: $\varnothing 6, 8$ steel $\varnothing 10 \dots 40$ hardened steel

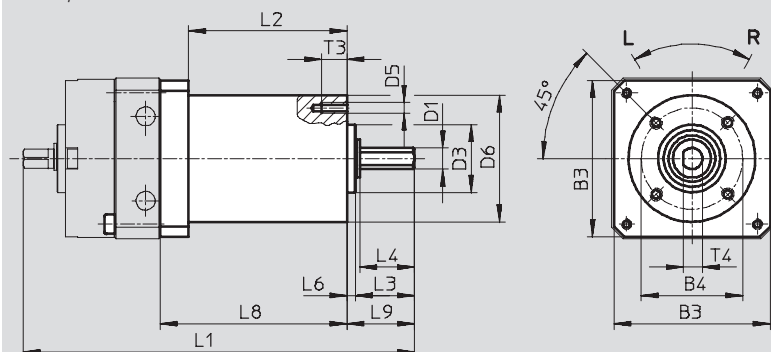
Note

The minimum possible rotation angle is 3° .

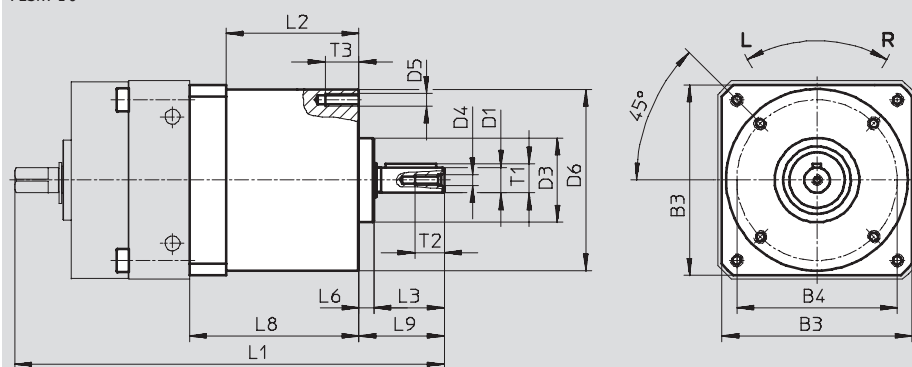
Switching accuracy is, however, dependent on speed and load.

Dimensions

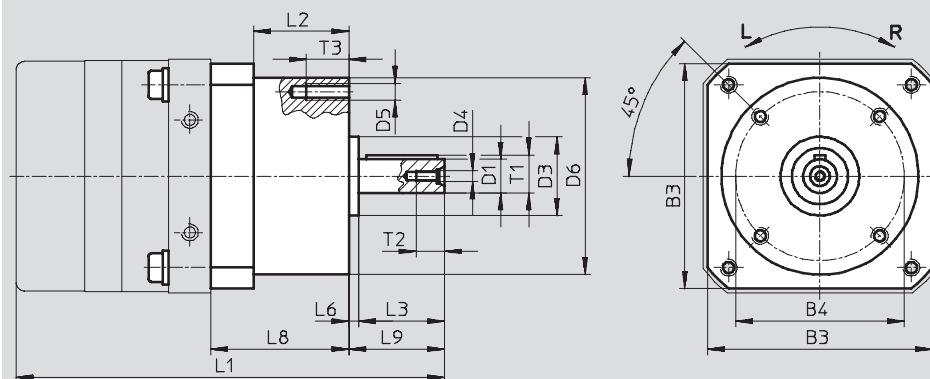
FLSM-6/8



FLSM-10



FLSM-12 ... 40



Swivel modules DSM

Accessories

FESTO

Dimensions and ordering data													
For size	B3	B4	D1	D3	D4	D5	D6	L1	L2	L3	L4	L6	L8
[mm]		±0.15	∅ g7	∅ h8			∅ ±0.3					+0.2	±0.1
6	29.5	23	4	14	–	M3	28	85.8	36 ±0.1	10.8	10	2	43
8	37	24	5	16	–	M3	30	94.5	37.5 ±0.1	14	13	2	44.5
10	45	38	6	20	M2.5	M3	43	101	30 ±0.1	16.7	–	3.5	40
12	55	42	8	25	M3	M3	48.5	125	37 ±0.4	20	–	3.5	47.3
16	65	50	10	24	M3	M4	60	137	34 ±0.4	23	–	3.5	47
25	80	60	12	28	M4	M6	70	152	34 ±0.4	30	–	3.5	49
32	100	83	16	42	M5	M6	95	197.8	42.8 ±0.4	40	–	7.2	60.8
40	120	96	20	52	M6	M8	110	244.5	54 ±0.4	50	–	6	77

For size	L9	T1	T2	T3	T4	Woodruff key to DIN 6885	CRC ¹⁾	Weight	Direction of rotation	Part No.	Type
[mm]								[g]			
6	12.8	–	–	5	3.5	–	2	100	left-hand	188 523	FLSM-6-L
									right-hand	188 522	FLSM-6-R
8	16	–	–	6	4.5	–	2	125	left-hand	188 525	FLSM-8-L
									right-hand	188 524	FLSM-8-R
10	20.2	6.8	7	8	–	A2x2x12	2	160	left-hand	188 527	FLSM-10-L
									right-hand	188 526	FLSM-10-R
12	24.5	8.8	9	8	–	A2x2x16	2	300	left-hand	164 229	FLSM-12-L
									right-hand	164 234	FLSM-12-R
16	27.4	11.2	9	10	–	A3x3x18	2	450	left-hand	164 230	FLSM-16-L
									right-hand	164 235	FLSM-16-R
25	34	13.5	10	15	–	A4x4x25	2	650	left-hand	164 231	FLSM-25-L
									right-hand	164 236	FLSM-25-R
32	48.5	18	12.5	15	–	A5x5x36	2	1 500	left-hand	164 232	FLSM-32-L
									right-hand	164 237	FLSM-32-R
40	58	22.5	16	15	–	A6x6x45	2	2 350	left-hand	164 233	FLSM-40-L
									right-hand	164 238	FLSM-40-R

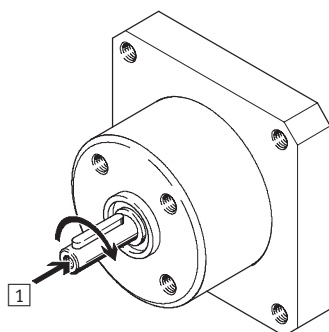
1) Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents

Direction of rotation

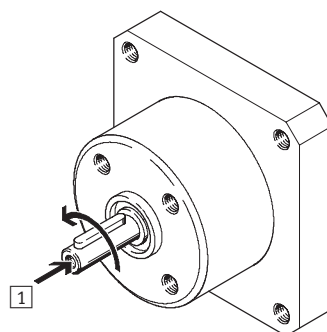
The freewheel unit blocks one of the two possible swivel directions of the DSM swivel module.

FLSM-...-R, right-hand (clockwise) rotation



1 Viewed towards drive shaft

FLSM-...-L, left-hand (counter-clockwise) rotation

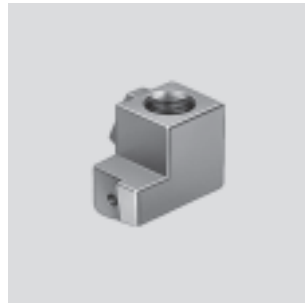


Swivel modules DSM

Accessories

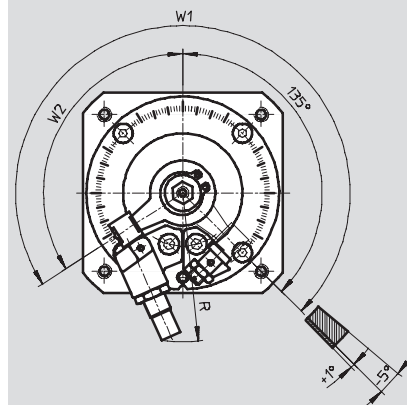
Shock absorber retainer DSM-...-CL/CR

Material:
Galvanised steel
Free of copper, PTFE and silicone

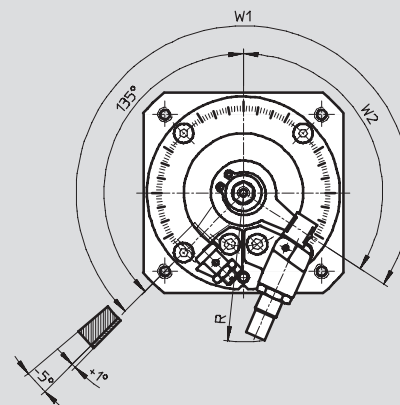


Dimensions

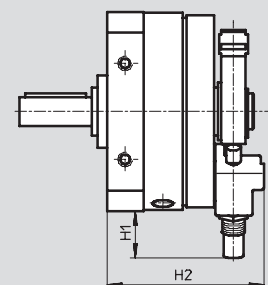
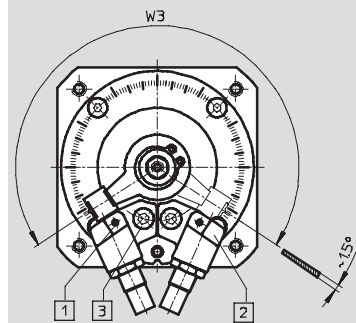
CL variants



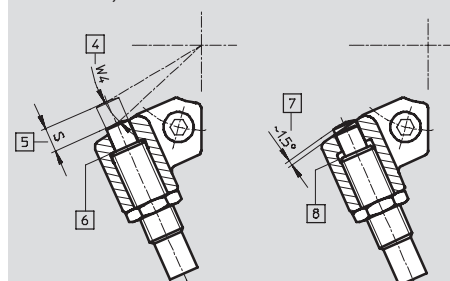
CR variants



CC variants



Precision adjustment



- | | | | |
|--|--|---|--|
| 1 Mounting thread for end position sensing | 3 Locking screw for tightening the shock absorber retainer | 5 Cushioning length | 7 Precision adjustment (not with DSM-12) |
| 2 Infinitely adjustable shock absorber retainer for adjustment of swivel angle | 4 Cushioning angle | 6 Shock absorber at internal stop in retainer | 8 Shock absorber unscrewed |

Swivel modules DSM

Accessories

FESTO

Swivel drives
Semi-rotary vane drives

4.1

Dimensions and ordering data							
For size	H1	H2	R	S	T1	W1	W2
[mm]	max.		max.		max.	max.	max.
12	18	48	48	4.5	8.8	254°	119°
16	22	60.8	58	5	11.2	254°	119°
25	19	68.3	61	5	13.5	258°	123°
32	27	82	81	8	18	258°	123°
40	41	101.5	108	12	22.5	255°	120°

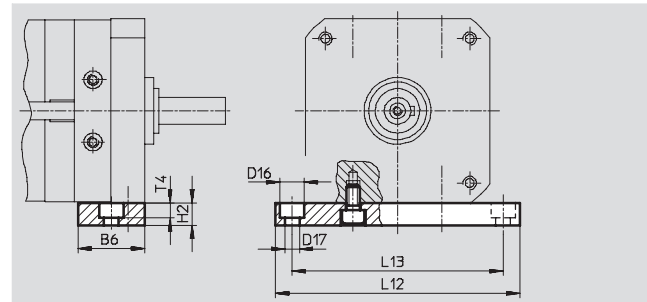
For size	W3	W4	Woodruff key to DIN 6885	CRC ¹⁾	Weight	For shock absorbers	Part No.	Type
[mm]	max.				[g]			
12	238°	13°	A2x2x16	2	30	Left	164 324	DSM-12-CL
						Right	164 325	DSM-12-CR
16	238°	12°	A3x3x18	2	50	Left	161 184	DSM-16-CL
						Right	161 185	DSM-16-CR
25	246°	10°	A4x4x25	2	51	Left	161 186	DSM-25-CL
						Right	161 187	DSM-25-CR
32	246°	12.5°	A5x5x36	2	95	Left	161 188	DSM-32-CL
						Right	161 189	DSM-32-CR
40	240°	15°	A6x6x45	2	175	Left	161 190	DSM-40-CL
						Right	161 191	DSM-40-CR

1) Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents

Mounting plate HSM

Material:
Aluminium



Dimensions and ordering data										
For size	B6	D16	D17	H2	L12	L13	T4	CRC ¹⁾	Weight	Part No. Type
[mm]		Ø	Ø						[g]	
12	20	8	4.5	10	84	72	4.6	2	48	165 571 HSM-12
16	28	10	5.5	10	98	84	5.7	2	80	165 572 HSM-16
25	30	11	6.6	10	110	95	6.8	2	94	165 573 HSM-25
32	40	15	9	15	145	125	9	2	246	165 574 HSM-32
40	45	18	11	20	180	155	11	2	459	165 575 HSM-40

1) Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents

Swivel modules DSM

Accessories

FESTO

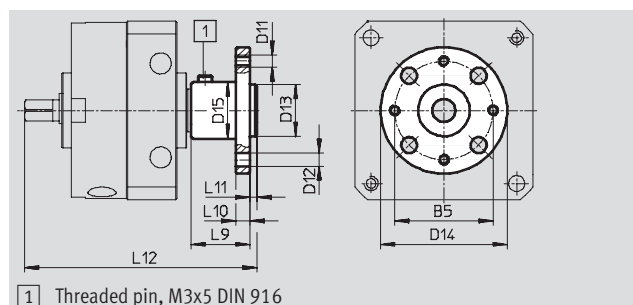
Push-on flange FWSR

for size 6/8

Material:

Wrought aluminium alloy, anodised

Free of copper, PTFE and silicone



Dimensions and ordering data

For size [mm]	B5	D11	D12 Ø H13	D13 Ø g7	D14 Ø	D15 Ø	L9	L10	L11	L12	CRC ¹⁾	Weight [g]	Part No.	Type
6	16	M3	3.4	8	23	10	10.5	3	1.5	45	2	6	185 948	FWSR-6
8	21	M3	3.4	11	27	12	12.5	3	1.5	51	2	8	185 949	FWSR-8

1) Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents

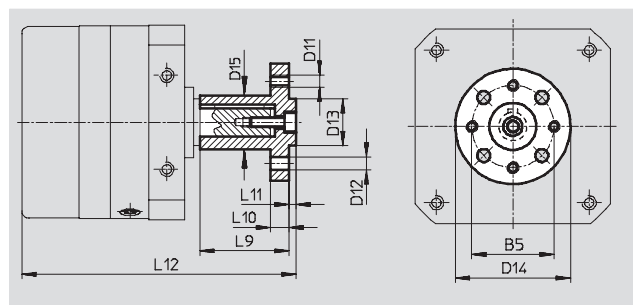
Push-on flange FWSR

for size 10 ... 40

Material:

Wrought aluminium alloy, anodised

Free of copper, PTFE and silicone



- - Note

The swivel module shown in the dimensional drawing corresponds to variants with size 12 to 40 mm.

Dimensions and ordering data

For size [mm]	B5	D11	D12 Ø H13	D13 Ø g7	D14 Ø	D15 Ø	L9	L10	L11	L12	CRC ¹⁾	Weight [g]	Part No.	Type
10	21	M3	3.4	11	30	12	22	3	1.6	68.6	2	14	32 798	FWSR-10
12	25	M3	3.4	14	35	15	25	3	3	85.5	2	32	14 659	FWSR-12
16	28	M4	4.5	16	40	17	28	5	3	98.8	2	51	13 239	FWSR-16
25	35	M5	5.5	20	50	23	38	8	3	116.5	2	68	13 240	FWSR-25
32	45	M6	6.5	28	60	28	48	10	4	151.5	2	180	13 241	FWSR-32
40	54	M8	9	36	70	38	60	11	5	186.5	2	300	14 656	FWSR-40

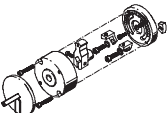
1) Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents

Swivel modules DSM

Accessories

FESTO

Ordering data – Kits				
	For size	Remarks	Part No.	Type
Mounting kit				
	6	For proximity sensor SME/SMT-10	173 205	WSM-6-SME-10
	8		173 206	WSM-8-SME-10
	10		173 207	WSM-10-SME-10
End stop kit				
	6	For swivel angle adjustment, max. 180°	175 833	KSM-6
	8		175 834	KSM-8
	10	For swivel angle adjustment, max. 200°	175 835	KSM-10

Ordering data – Kit accessories				
For size	Remarks	Part No.	Type	
6	Adapter for attachment of stop kit KSM or mounting kit WSM-...-SME-10	375 098	DSM-6-180-P-A-FF	
8		375 099	DSM-8-180-P-A-FF	
10		375 100	DSM-10-240-P-A-FF	
6	Socket head screw for attachment of stop kit KSM or mounting kit WSM-...-SME-10	258 568	DIN 84-M2x25-4.8	
8		385 259	DIN 84-M2x30-4.8	
10		365 902	M2.5x32 ¹⁾	

1) Screw similar to DIN 84

Ordering data – Proximity sensors for C-slot, magneto-resistive					Technical data → www.festo.com/catalogue/sm	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire, in-line	2.5	525 915	SMT-10F-PS-24V-K2,5L-OE
			Plug M8x1, 3-pin, in-line	0.3	525 916	SMT-10F-PS-24V-K0,3L-M8D
			Plug M8x1, 3-pin, lateral	0.3	526 675	SMT-10F-PS-24V-K0,3Q-M8D
	Insertable in the slot lengthwise	PNP	Plug M8x1, 3-pin, in-line	0.3	173 220	SMT-10-PS-SL-LED-24
			Cable, 3-wire, in-line	2.5	173 218	SMT-10-PS-KL-LED-24

Ordering data – Proximity sensors for C-slot, magnetic reed					Technical data → www.festo.com/catalogue/sm	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	Contacting	Plug M8x1, 3-pin, in-line	0.3	525 914	SME-10F-DS-24V-K0,3L-M8D
			Cable, 3-wire, in-line	2.5	525 913	SME-10F-DS-24V-K2,5L-OE
			Cable, 2-wire, in-line	2.5	526 672	SME-10F-ZS-24V-K2,5L-OE
	Insertable in the slot lengthwise	Contacting	Cable, 3-wire, in-line	2.5	173 210	SME-10-KL-LED-24
			Cable, 3-wire, lateral	2.5	173 211	SME-10-KQ-LED-24
			Plug M8x1, 3-pin, in-line	0.3	173 212	SME-10-SL-LED-24
			Plug M8x1, 3-pin, lateral	0.3	173 213	SME-10-SQ-LED-24

Swivel modules DSM

Accessories

FESTO

Ordering data – Shock absorbers			Technical data → 1 / 9.0-2	
	For size	Remarks	Part No.	Type
	12	For shock absorber retainer DSM-...-CL/CR	158 981	YSR-5-5-C
	16, 25		160 272	YSR-7-5-C
	32		34 571	YSR-8-8-C
	40		34 572	YSR-12-12-C

Ordering data – Mounting kits				
	For size	Remarks	Part No.	Type
	12	For inductive proximity sensors SIEN-M5	161 041	WSM-12-J-M5
	16		161 042	WSM-16-J-M5
	25		161 043	WSM-25-J-M5
	32	For inductive proximity sensors SIEN-M8	161 044	WSM-32-J-M8
	40		161 045	WSM-40-J-M8

Ordering data – Proximity sensors, inductive			Technical data → Volume 4	
	For size	Remarks	Connection	Part No. Type
	12, 16, 25	For mounting kit WSM-...-J-M5	Cable	150 370 SIEN-M5B-PS-K-L
			Plug	150 371 SIEN-M5B-PS-S-L
	32, 40	For mounting kit WSM-...-J-M8	Cable	150 386 SIEN-M8B-PS-K-L
			Plug	150 387 SIEN-M8B-PS-S-L

Ordering data – Connecting cables			Technical data → www.festo.com/catalogue/nebu	
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No. Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 333 NEBU-M8G3-K-2.5-LE3
			5	541 334 NEBU-M8G3-K-5-LE3
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 338 NEBU-M8W3-K-2.5-LE3
			5	541 341 NEBU-M8W3-K-5-LE3

Ordering data – One-way flow control valves			Technical data → Volume 2	
	Connection	Material	Part No.	Type
	Thread	For tubing O.D.		
For exhaust air				
	M3	3	Metal design	175 041 GRLA-M3-QS-3
		4		193 137 GRLA-M5-QS-3-D
	M5	3		193 138 GRLA-M5-QS-4-D
		4		193 139 GRLA-M5-QS-6-D
	G1/8	3		193 142 GRLA-1/8-QS-3-D
		4		193 143 GRLA-1/8-QS-4-D
		6		193 144 GRLA-1/8-QS-6-D
		8		193 145 GRLA-1/8-QS-8-D