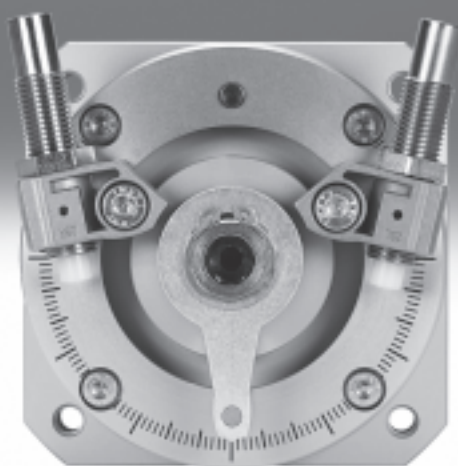


Swivel modules DSM-B

FESTO



Swivel modules DSM-B

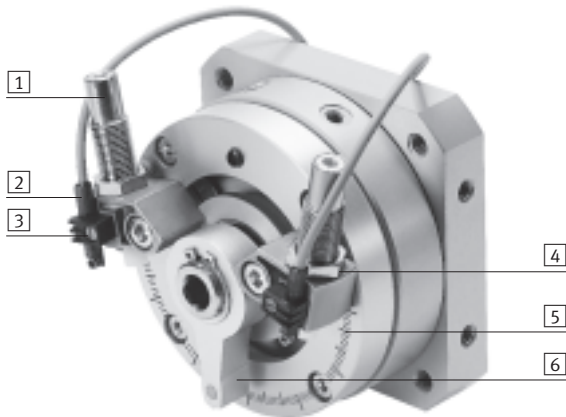
Key features

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Key features at a glance

- The swivel module DSM is a double-acting semi-rotary drive with rotary vane
- The swivel angle is infinitely adjustable over the entire swivel range
- High precision thanks to metal fixed stops
- Easy precision adjustment of the end positions using the cushioning components
- Indentations between the stop element and swivel module prevents movement of the stop system under load

The technology in detail



1 Cushioning

2 Position sensing

3 Sensor retainer



- Choice of two types of cushioning, each with metal fixed stop:
 - Flexible cushioning components (P)
 - Hydraulic shock absorbers (CC)

- Space-saving sensing of the swivel position using proximity sensors SME-/SMT-10F

- The proximity sensors are mounted directly on the stop system. The sensor retainer can be ordered as an accessory

4 Precision end-position adjustment

5 Angle scale

6 Stop lever



- After the lock nut is loosened, precision adjustment of the end positions is possible using an Allen key

- The required angle can easily be preset using the scale

- The magnet in the stop lever allows the swivel angle to be sensed

Note

If the semi-rotary drives DSM-...-B are used without a stop system or the maximum permissible mass moment of inertia is exceeded, external stops

must be attached. The rotary vane is not suitable for use in defining end positions.

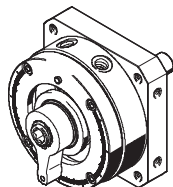
Swivel modules DSM-B

Key features

Wide choice of variants

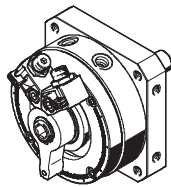
Without stop system

DSM-...-A-B



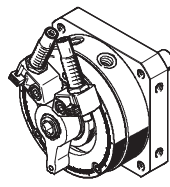
With flexible cushioning components (P)

DSM-...-P-A-B



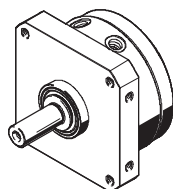
With shock absorbers (CC)

DSM-...-CC-...-A-B



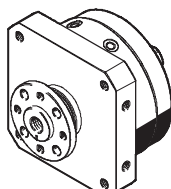
With spigot shaft

DSM-...-A-B



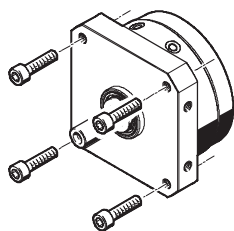
With flanged shaft

DSM-...FW-A-B

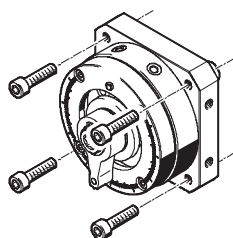


Mounting options

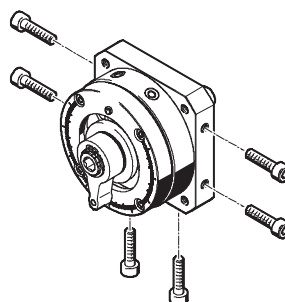
Via threaded through-hole from front



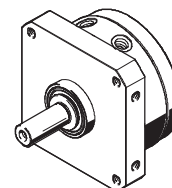
Via threaded through-hole from rear



Via threaded flange from three sides

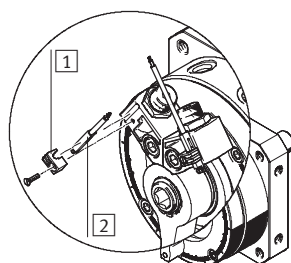


Centring via centring collar

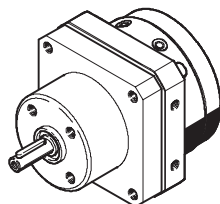


Accessories

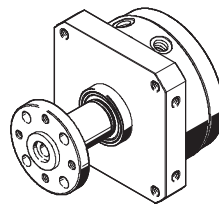
Position sensing



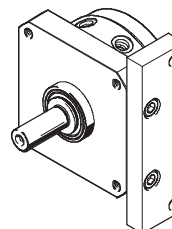
Freewheel unit FLSM



Push-on flange HSR-FW



Mounting plate HSM

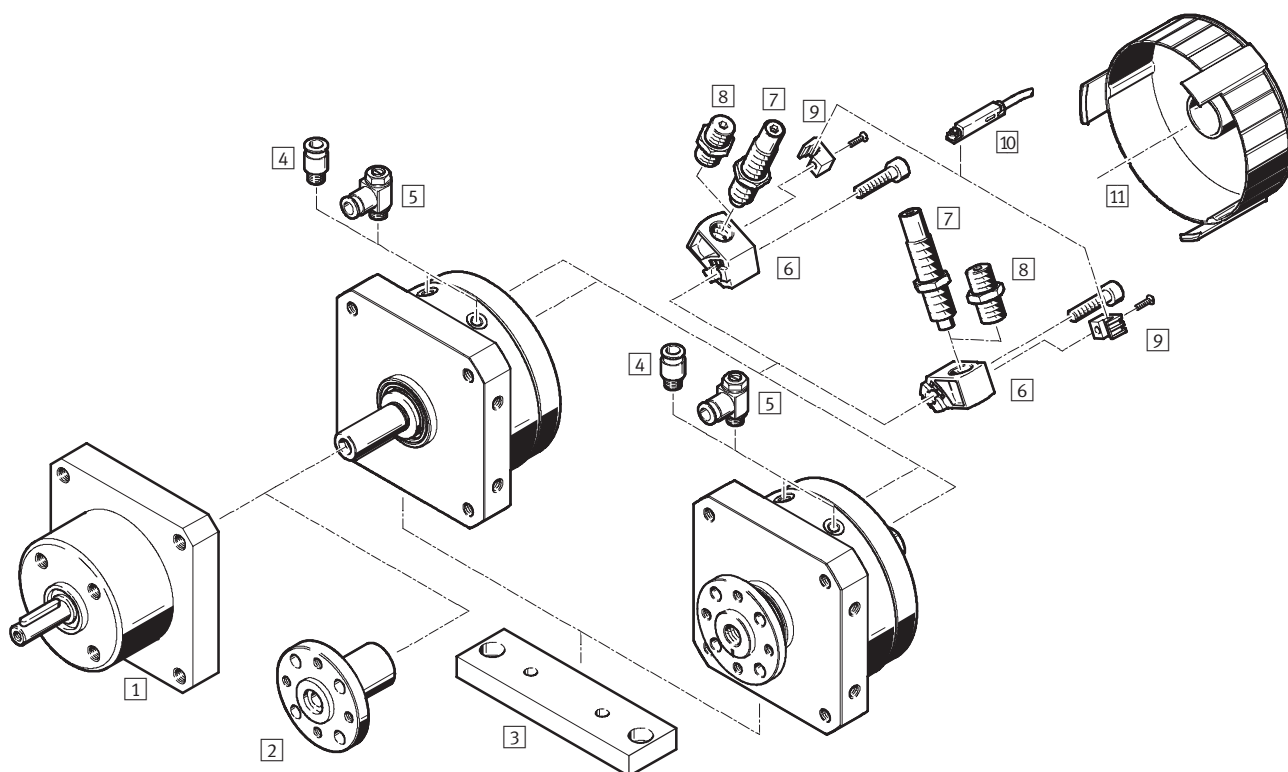


- 1 Sensor retainer
- 2 Proximity sensor SME/SMT-10F with cable outlet, in-line

Swivel modules DSM-B

Peripherals overview

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Accessories			
	Brief description	➔ Page/Internet	
1	Freewheel unit FLSM	• For synchronous rotation in one direction • Only in conjunction with swivel module DSM with spigot shaft	15
2	Push-on flange FWSR	Accessory for swivel module DSM with spigot shaft	16
3	Mounting plate HSM	For foot or flange mounting	16
4	Push-in fitting QS	For connecting compressed air tubing with standard external diameters	quick star
5	One-way flow control valve GRLA	For regulating speed	18
6	Shock absorber retainer DSM-B	• For flexible cushioning components • For shock absorber	18
7	Shock absorber DYSC	Self-adjusting shock absorbers with fixed stop	18
8	Cushioning stop DSM-...-P-B	Flexible cushioning components with fixed stop	18
9	Sensor retainer SL-DSM-B	For mounting proximity sensors SME/SMT-10	17
10	Proximity sensor SME/SMT-10F	For sensing the end positions	17
11	Cover cap AKM	Reduces the risk of injury in the swivel range of the stop lever	17

Swivel modules DSM-B

Type codes

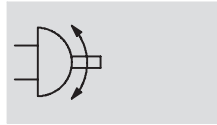
		DSM	–	16	–	270	–	P	–	FW	–	A	–	B
Type														
Double-acting														
DSM	Swivel module													
Size [mm]														
Max. swivel angle [°], adjustable														
Cushioning														
P	Flexible cushioning components at both ends													
CC	Shock absorber at both ends													
Shaft														
	Shaft with woodruff key													
FW	Flanged shaft													
Position sensing														
A	For proximity sensor													
Variant														
B	B series													

Swivel modules DSM-B

Technical data

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Function



 Size
12 ... 40 mm



General technical data							
Size			12	16	25	32	40
Pneumatic connection			M5			G1/8	
Design			Semi-rotary actuator with rotary vane				
Cushioning	With cushioning components (P)		Flexible cushioning pads at both ends				
	With shock absorbers (CC)		Self-adjusting at both ends				
Type of mounting			With female thread				
Mounting position			Any				
Swivel angle	With cushioning components (P)	[°]	270				
Swivel angle adjustment		[°]	−6				
Swivel angle	With shock absorbers (CC)	[°]	246			240	
Swivel angle adjustment		[°]	−3				
Swivel frequency	With cushioning components (P)	[Hz]	2				
(at max. swivel angle)	With shock absorbers (CC)	[Hz]	1.5	1		0.7	
Swivel frequency (at smaller swivel angle)	With shock absorbers (CC)	[Hz]	2	1.5			
Cushioning angle	With shock absorbers (CC)	[°]	15	12	10	12	16
Repetition accuracy	With cushioning components (P)	[°]	1				
	With shock absorbers (CC)	[°]	0.1				

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

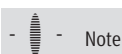
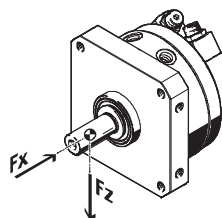
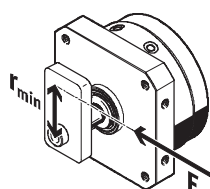
Operating and environmental conditions					
Size	12	16	25	32	40
Operating medium	Filtered compressed air, lubricated or unlubricated				
Operating pressure	[bar]	2 ... 10		1.5 ... 10	
Ambient temperature	[°C]	−10 ... +60			
Storage temperature	[°C]	20			

Weights [g]					
Size	12	16	25	32	40
Swivel module without cushioning					
DSM-...-B	240	410	625	1,270	2,470
DSM-...-FW-B	260	450	650	1,350	2,600
Swivel module with flexible cushioning elements					
DSM-...-P-A-B	275	470	700	1,425	2,700
DSM-...-P-FW-A-B	293	510	725	1,500	2,835
Swivel module with shock absorbers					
DSM-...-CC-A-B	285	480	710	1,460	2,800
DSM-...-CC-FW-A-B	300	520	735	1,550	2,935

Swivel modules DSM-B

Technical data

Forces and torques					
Size	12	16	25	32	40
Min. permissible stop radius r [mm]	15	17	21	28	40
Max. permissible stop force F [N]	90	160	320	480	650
Max. permissible radial load F_Z [N] on drive shaft	45	75	120	200	350
Max. permissible axial load F_X [N] on drive shaft	18	30	50	75	120
Torque at 6 bar [Nm]	1.25	2.5	5	10	20
Torque per bar [Nm]	0.2	0.41	0.83	1.66	3.33
Max. permissible mass moment of inertia	→ 8				



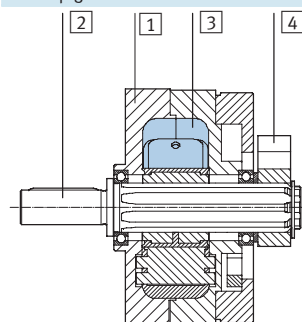
If the semi-rotary drives DSM-...-A-B are used without a stop system or the maximum mass moment of inertia is exceeded, external stops must be

attached. A minimum radius to the drive shaft (r_{min}) must be observed. The stop force must not exceed the maximum force.

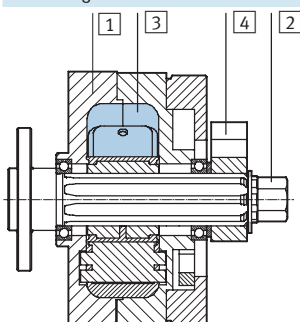
Materials

Sectional view

With spigot shaft



With flanged shaft



Swivel module

1	Housing, flange	Anodised aluminium
2	Shaft	Steel, nickel-plated
3	Rotary vane	Fibreglass reinforced plastic
4	Stop lever	Anodised aluminium
-	Fixed stops/screws	Galvanised steel
-	Stop screws	Stainless steel
-	Cap	Fibreglass reinforced plastic
-	Seals	Polyurethane
-	Note on materials	Free of copper and PTFE

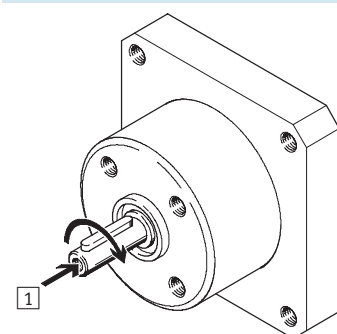
Direction of rotation in combination with freewheel unit FLSM

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

Dimensions and ordering data

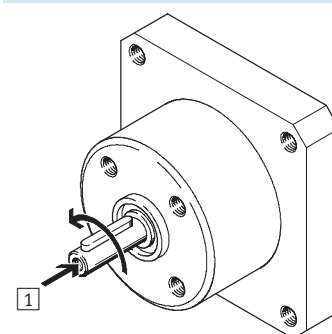
→ 15

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



1 Viewed towards drive shaft

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



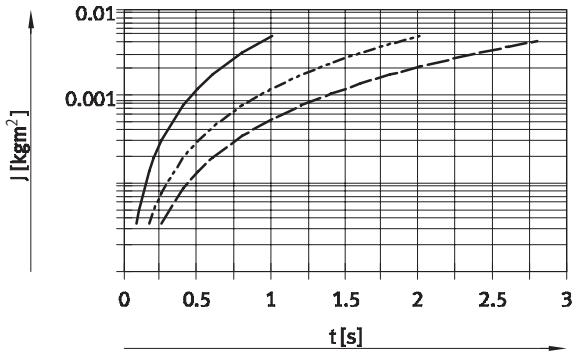
Swivel modules DSM-B

Technical data

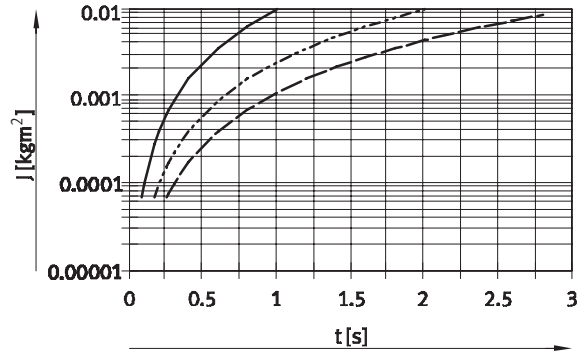
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Mass moment of inertia J as a function of swivel time t
With flexible cushioning components

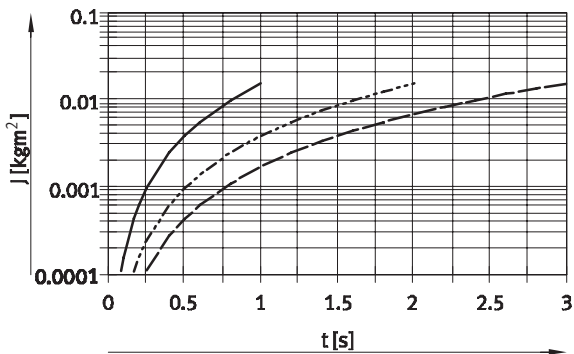
DSM-12-270-P-A-B



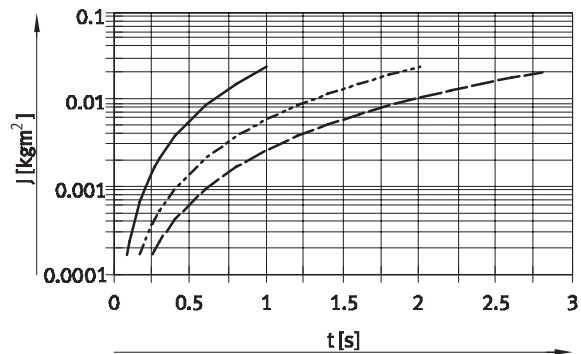
DSM-16-270-P-A-B



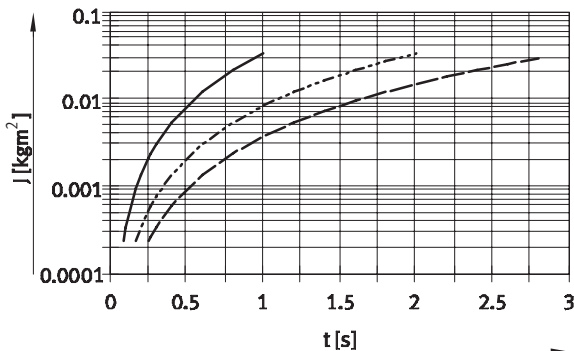
DSM-25-270-P-A-B



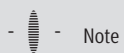
DSM-32-270-P-A-B



DSM-40-270-P-A-B



— 90°
- - - 180°
- · - 270°



Note

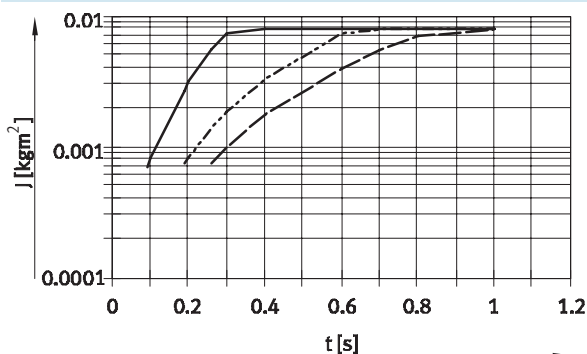
Sizing software
Calculating the mass moment
of inertia → www.festo.com

Swivel modules DSM-B

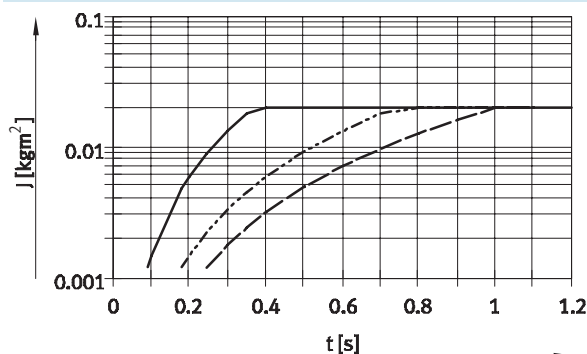
Technical data

Mass moment of inertia J as a function of swivel time t
With shock absorber

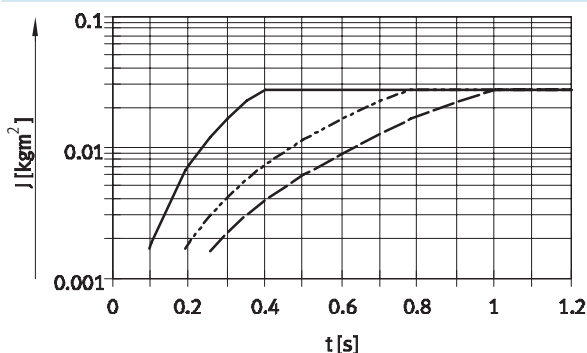
DSM-12-270-CC-A-B



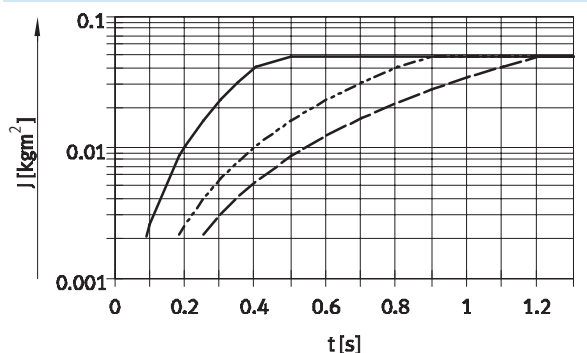
DSM-16-270-CC-A-B



DSM-25-270-CC-A-B

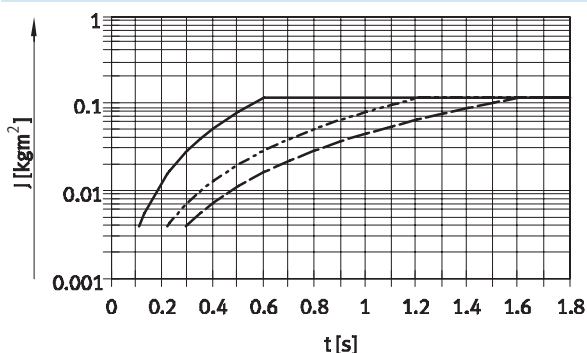


DSM-32-270-CC-A-B



— 90°
- - - 180°
- · - 246°

DSM-40-270-CC-A-B



— 90°
- - - 180°
- · - 240°

In the diagrams DSM-...-CC the swivel time is represented up till the moment when the stop lever strikes the shock absorber. In order to retain the complete swivel time, the cushioning time of the shock absorber must also be taken into account.

Cushioning time of the shock absorber

Size	12/16/25	32	40
Cushioning time [s]	0.1	0.25	0.3

Swivel modules DSM-B

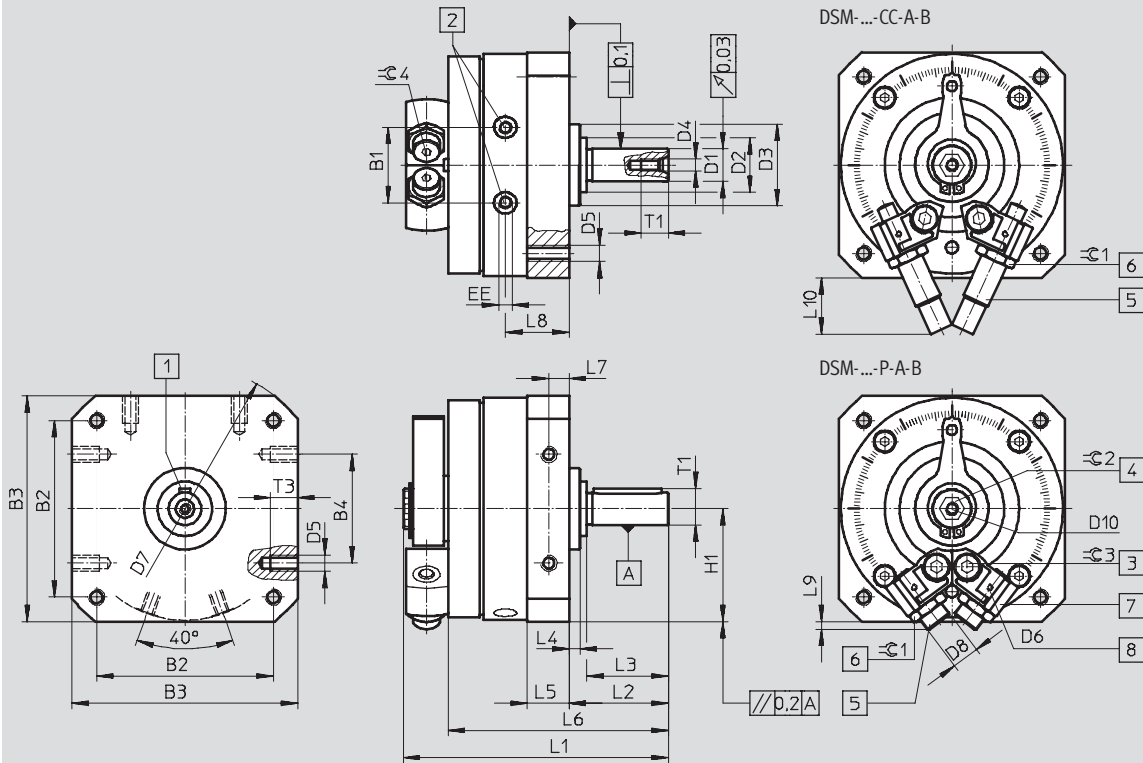
Technical data

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Dimensions

With spigot shaft

Download CAD data → www.festo.com



- | | | | |
|-------------------------------|---------------------------------------|--|---------------------------------------|
| 1 Woodruff key position at 0° | 3 Locking screw for clamping the stop | 5 End-position adjustment | 7 Infinitely adjustable stops |
| 2 Compressed air connections | 4 Manual override (internal hex) | 6 Lock nut for end-position adjustment | 8 Mounting thread for sensor retainer |

Swivel modules DSM-B

Technical data

FESTO

Size [mm]	B1 ±0.5	B2 ±0.3	B3	B4	D1 Ø g7	D2 Ø	D3 Ø f8	D4	D5	D6	D7 Ø
12	19.8	48	59±0.3	30±0.2	8	15±0.2	24	M3	M4	M2	78±0.3
16	23.5	57	70±0.3	40±0.2	10	18 _{0.3}	28	M3	M5	M2	91±0.3
25	28	65	83±0.3	40±0.2	12	20 _{0.3}	30	M4	M6	M2	106±0.3
32	35.5	85	105±0.3	60±0.3	16	27 _{0.4}	42	M5	M8	M2	135±0.3
40	43.8	105	130±0.5	80±0.3	20	36 _{0.4}	52	M6	M10	M2	168±0.5

Size [mm]	D8 Ø	D10	EE	H1 ±0.2	L1	L2 +0.6 -0.7	L3 ±0.2	L4 ±0.4	L5 +0.2 -0.4	L6	L7
12	M8x1	M4	M5	29.5	68.3±0.3	24.5	20	3	10.3	55.5±0.8	5±0.1
16	M10x1	M5	M5	35	82.7±1	28	23	2.6	13	67.1±0.9	6.5±0.2
25	M10x1	M5	M5	41.5	97.5±0.5	36.5	30	4	15.2	81±1	7.5±0.2
32	M12x1	M5	G1/8	52.5	127.1±0.5	51	40	8	19.2	107±1.1	9.5±0.2
40	M16x1	M6	G1/8	65	155.5±0.6	62	50	8	23.7	131±1.2	12±0.2

Size [mm]	L8	L9	L10	T1 max.	T2 +2	T3 +0.2	≈C 1	≈C 2	≈C 3	≈C 4	Woodruff key to DIN 6885 ¹⁾
12	16.5	3	22.7	8.8	9	8	10	6	2.5	2.5	A2x2x16
16	20.2	7.2	26.1	11.2	9	8	13	8	3	3	A3x3x18
25	23.5	2.9	20.7	13.5	10	10	13	8	4	3	A4x4x25
32	30.5	3.8	29.1	18	12.5	12	15	10	5	4	A5x5x36
40	36	3.4	43.5	22.5	16	15	19	10	8	5	A6x6x45

1) Included in the scope of delivery

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

Swivel modules DSM-B

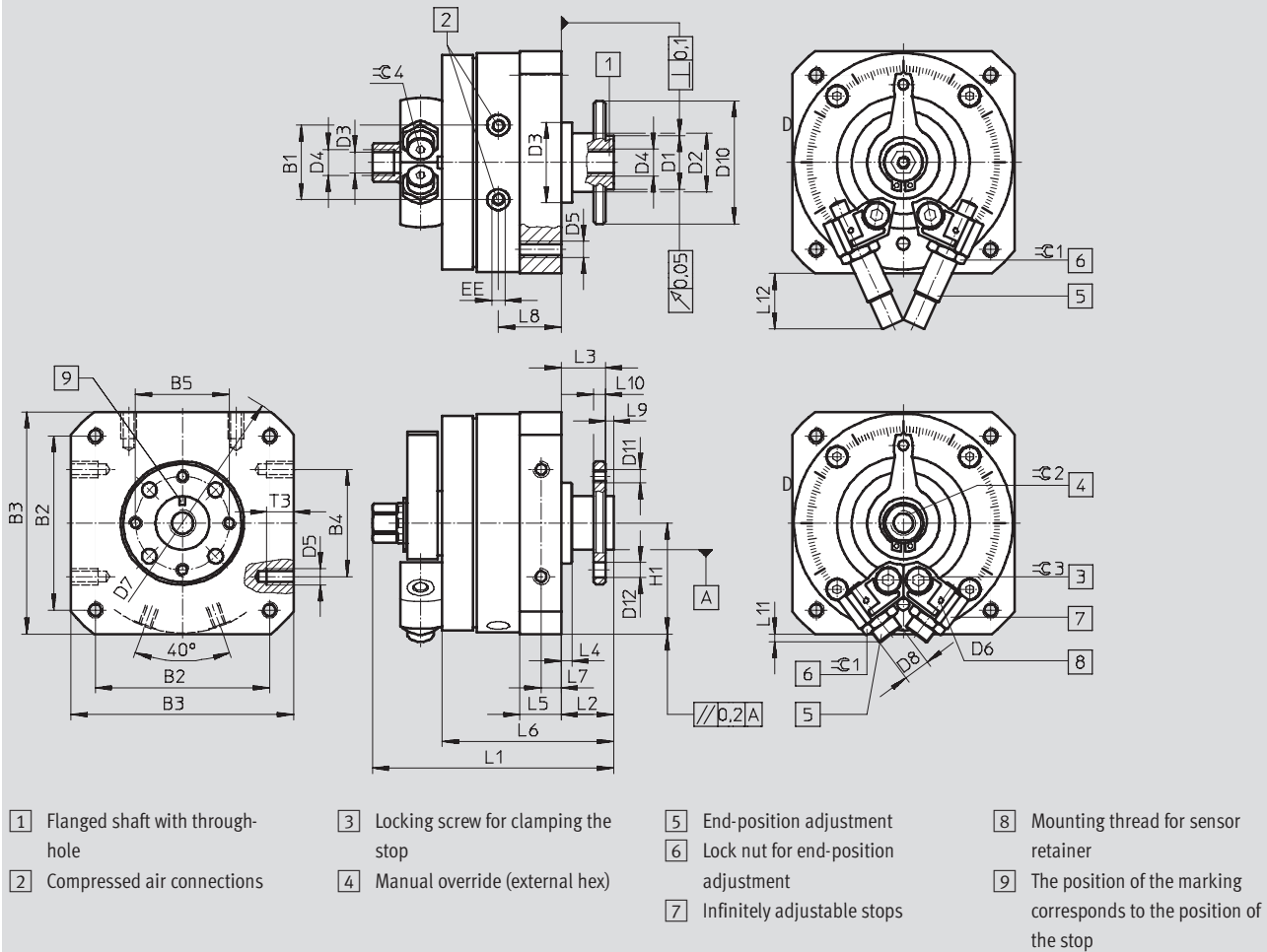
Technical data

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Dimensions

Download CAD data → www.festo.com

With flanged shaft



Swivel modules DSM-B

Technical data

FESTO

Size [mm]	B1 ±0.5	B2 ±0.3	B3	B4	B5	D1 Ø f8	D2 Ø	D3 Ø	D4	D5	D6	D7 Ø
12	19.8	48	59±0.3	30±0.2	25	14	15±0.2	4.2	M5	M4	M2	78±0.3
16	23.5	57	70±0.3	40±0.2	28	16	18 _{0.3}	4.2	M5	M5	M2	91±0.3
25	28	65	83±0.3	40±0.2	35	20	20 _{0.3}	8.6	G1/8	M6	M2	106±0.3
32	35.5	85	105±0.3	60±0.3	45	28	27 _{0.4}	8.6	G1/8	M8	M2	135±0.3
40	43.8	105	130±0.5	80±0.3	54	36	36 _{0.4}	11.5	G1/4	M10	M2	168±0.5

Size [mm]	D8	D10 Ø	D11	D12 H13	EE	H1 ±0.2	L1 +0.4	L2 +0.5 -0.85	L3 +0.5 -0.62	L4 ±0.4	L5 +0.2 -0.4	L6 ±1
12	M8x1	33	M3	3.4	M5	29.5	67.3 _{0.65}	13	11	3	10.3	44
16	M10x1	38	M4	4.5	M5	35	79 _{0.65}	15	13	2.6	13	54.1
25	M10x1	46	M5	5.5	M5	41.5	90 _{0.65}	19.5	16.5	4	15.2	64
32	M12x1	60	M6	6.5	G1/8	52.5	115.8 _{0.65}	27	23	8	19.2	83
40	M16x1	70	M8	9	G1/8	65	143.8 _{0.7}	33	28	8	23.7	102

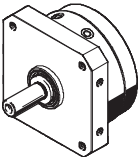
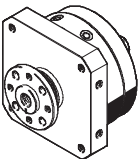
Size [mm]	L7	L8	L9 -0.2	L10 ±0.1	L11	L12	T2 +2	T3 +0.2	≈C 1	≈C 2	≈C 3	≈C 4
12	5±0.1	16.5	2	3	3	22.7	9	8	10	8	2.5	2.5
16	6.5±0.2	20.2	2	4	7.2	26.1	9	8	13	11	3	3
25	7.5±0.2	23.5	3	4.5	2.9	20.7	10	10	13	13	4	3
32	9.5±0.2	30.5	4	6	3.8	29.1	12.5	12	15	13	5	4
40	12±0.2	36	5	7.5	3.4	43.5	16	15	19	19	8	5

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

Swivel modules DSM-B

Technical data

FESTO

Ordering data					
Swivel module	Key features	Swivel angle	Ø [mm]	Part No.	Type
With spigot shaft					
	• Without stop system	270°	12	547 591	DSM-12-270-A-B
			16	547 592	DSM-16-270-A-B
			25	547 593	DSM-25-270-A-B
			32	547 594	DSM-32-270-A-B
			40	547 595	DSM-40-270-A-B
	• With flexible cushioning components • Adjustable swivel angle	270°	12	547 570	DSM-12-270-P-A-B
			16	547 574	DSM-16-270-P-A-B
			25	547 578	DSM-25-270-P-A-B
			32	547 582	DSM-32-270-P-A-B
			40	547 586	DSM-40-270-P-A-B
	• Shock absorber at both ends • Adjustable swivel angle	246°	12	547 572	DSM-12-270-CC-A-B
			16	547 576	DSM-16-270-CC-A-B
			25	547 580	DSM-25-270-CC-A-B
			32	547 584	DSM-32-270-CC-A-B
		240°	40	547 588	DSM-40-270-CC-A-B
With flanged shaft					
	• Without stop system	270°	12	547 596	DSM-12-270-FW-A-B
			16	547 597	DSM-16-270-FW-A-B
			25	547 598	DSM-25-270-FW-A-B
			32	547 599	DSM-32-270-FW-A-B
			40	547 560	DSM-40-270-FW-A-B
	• With flexible cushioning components • Adjustable swivel angle	270°	12	547 571	DSM-12-270-P-FW-A-B
			16	547 575	DSM-16-270-P-FW-A-B
			25	547 579	DSM-25-270-P-FW-A-B
			32	547 583	DSM-32-270-P-FW-A-B
			40	547 587	DSM-40-270-P-FW-A-B
	• Shock absorber at both ends • Adjustable swivel angle	246°	12	547 573	DSM-12-270-CC-FW-A-B
			16	547 577	DSM-16-270-CC-FW-A-B
			25	547 581	DSM-25-270-CC-FW-A-B
			32	547 585	DSM-32-270-CC-FW-A-B
		240°	40	547 589	DSM-40-270-CC-FW-A-B

Swivel modules DSM-B

Accessories

FESTO

Freewheel unit FLSM

Material:

Housing: Anodised aluminium

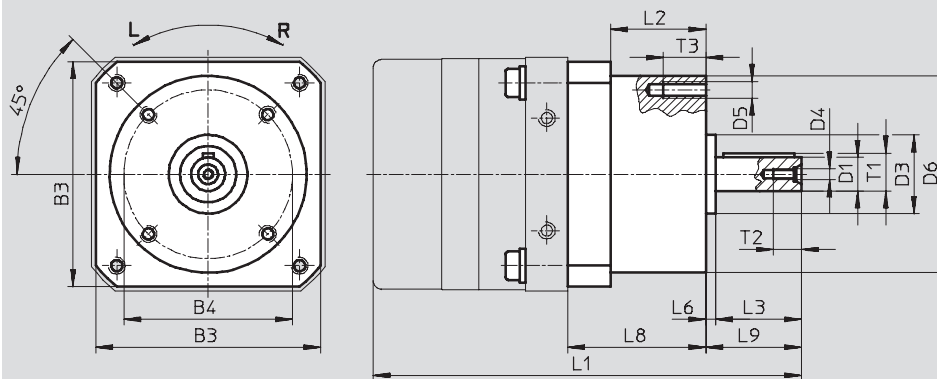
Shaft, sleeve: Hardened steel



Note

The minimum possible swivel angle is 3°. Switching accuracy is, however, dependent on speed and load.

Dimensions and ordering data



For size	B3	B4	D1	D3	D4	D5	D6	L1	L2	L3	L6	L8
[mm]		±0.15	Ø g7	Ø h8			Ø ±0.3				+0.2	±0.1
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	Woodruff key to DIN 6885	CRC ¹⁾	Weight	Direction of rotation	Part No.	Type
[mm]							[g]			
12	24.5	8.8	9	8	A2x2x16	2	300	Anti-clockwise rotation	164 229	FLSM-12-L
								Clockwise rotation	164 234	FLSM-12-R
16	27.4	11.2	9	10	A3x3x18	2	450	Anti-clockwise rotation	164 230	FLSM-16-L
								Clockwise rotation	164 235	FLSM-16-R
25	34	13.5	10	15	A4x4x25	2	650	Anti-clockwise rotation	164 231	FLSM-25-L
								Clockwise rotation	164 236	FLSM-25-R
32	48.5	18	12.5	15	A5x5x36	2	1 500	Anti-clockwise rotation	164 232	FLSM-32-L
								Clockwise rotation	164 237	FLSM-32-R
40	58	22.5	16	15	A6x6x45	2	2 350	Anti-clockwise rotation	164 233	FLSM-40-L
								Clockwise rotation	164 238	FLSM-40-R

1) Corrosion resistance class 2 to Festo standard 940 070

Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents

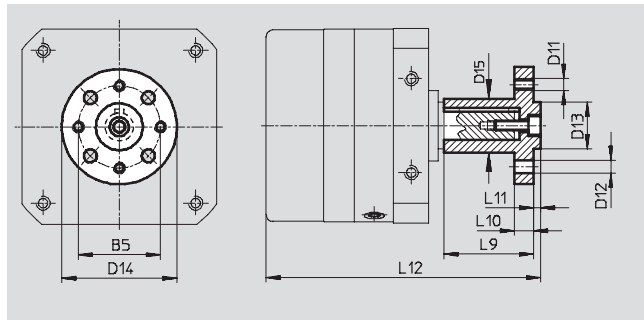
Swivel modules DSM-B

Accessories

FESTO

Push-on flange FWSR

Material:
Wrought aluminium alloy, anodised
Copper, PTFE and silicone-free

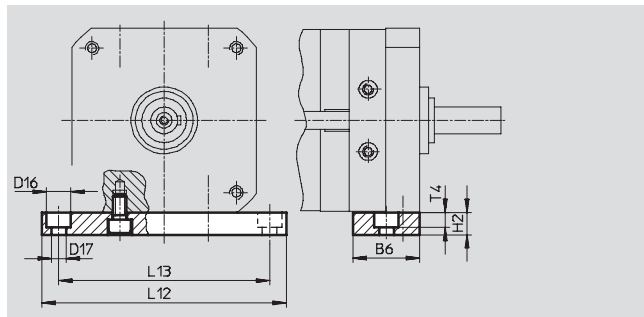
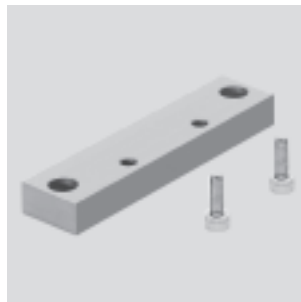


Dimensions and ordering data													
For size [mm]	B5	D11	D12 Ø H13	D13 Ø g7	D14 Ø	D15 Ø	L9	L10	L11	L12	CRC ¹⁾	Weight [g]	Part No. Type
12	25	M3	3.4	14	35	15	25	3	3	85.5	2	32	14 659 FWSR-12
16	28	M4	4.5	16	40	17	28	5	3	98.8	2	51	13 239 FWSR-16
25	35	M5	5.5	20	50	23	38	8	3	116.5	2	68	13 240 FWSR-25
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 to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents

Mounting plate HSM

Material:
Aluminium



Dimensions and ordering data									
For size [mm]	B6	D16 Ø	D17 Ø	H2	L12	L13	T4	CRC ¹⁾	Weight [g]
12	20	8	4.5	10	84	72	4.6	2	48
16	28	10	5.5	10	98	84	5.7	2	80
25	30	11	6.6	10	110	95	6.8	2	94
32	40	15	9	15	145	125	9	2	246
40	45	18	11	20	180	155	11	2	459

- 1) Corrosion resistance class 2 to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents

Swivel modules DSM-B

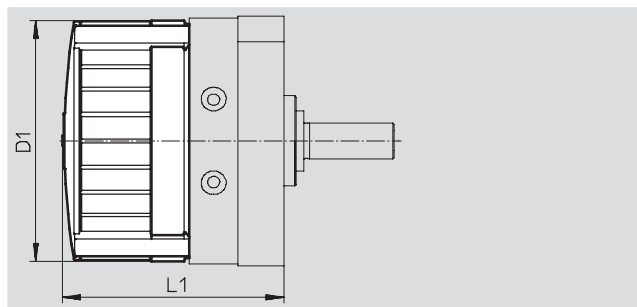
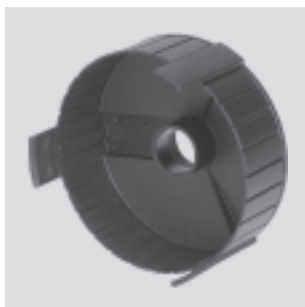
Accessories

FESTO

Cover cap AKM

Material:

Polyamide



Dimensions and ordering data				
For size [mm]	D1 Ø	L1	Part No.	Type
12	59	56.2±1.2	549 194	AKM-12
16	70	68±1.2	549 195	AKM-16
25	83	73.4±1.2	549 196	AKM-25
32	105	89.7±1.5	549 197	AKM-32
40	130	107.1±1.5	549 198	AKM-40

Ordering data – Proximity sensors for C-slot, magneto-resistive					Technical data → Internet: smt	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Clamped onto the DSM with a sensor retainer	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

Ordering data – Proximity sensors for C-slot, magnetic reed					Technical data → Internet: sme	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Clamped onto the DSM with a sensor retainer	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

Ordering data – Sensor retainer				
	For size	Remarks	Part No.	Type
	12, 16, 25, 32, 40	Can only be used in combination with proximity sensors SME-/SMT-10F	550 661	SL-DSM-B

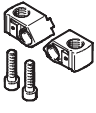
Swivel modules DSM-B

Accessories

FESTO

Ordering data – Cushioning stops				
	For size	Remarks	Part No.	Type
	12	For fitting in cushioning mount DSM-...-B	550 657	DSM-12-P-B
	16, 25		550 658	DSM-16/25-P-B
	32		550 659	DSM-32-P-B
	40		550 660	DSM-40-P-B

Ordering data – Shock absorbers			Technical data → Internet: dycs	
	For size	Remarks	Part No.	Type
	12	For fitting in cushioning mount DSM-...-B	548 011	DYSC-5-5-Y1F
	16, 25		548 012	DYSC-7-5-Y1F
	32		548 013	DYSC-8-8-Y1F
	40		548 014	DYSC-12-12-Y1F

Ordering data – Cushioning mounts				
	For size	Remarks	Part No.	Type
	12	• For flexible cushioning components	547 900	DSM-12-B
	16	• For shock absorbers	547 901	DSM-16-B
	25		547 902	DSM-25-B
	32		547 903	DSM-32-B
	40		547 904	DSM-40-B

Ordering data – One-way flow control valves				Technical data → Internet: grla	
	Connection		Material	Part No.	Type
	Thread	For tubing O.D.			
For exhaust air					
	M5	3	Metal design	193 137	GRLA-M5-QS-3-D
		4		193 138	GRLA-M5-QS-4-D
		6		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