

Features



General information

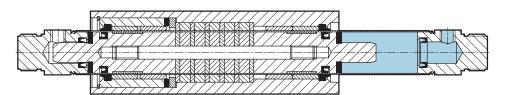
- Double-acting
- Magnetically coupled without mechanical connections
- Piston chamber and slide are pressure tight
- Pressure tight and leak-free system
- Dirt and dust cannot enter
- Space-saving installation with long strokes
- For contactless position sensing
- With adjustable end-position cushioning at both ends (not for piston Ø of 12 mm)

The technology in detail

Motion is transmitted via the force locking of the magnetic coupling on the moveable outer slide.

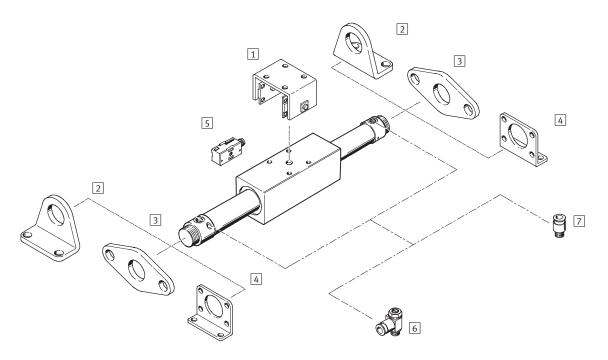
This means that there is no advancing piston rod; the installation space required is less than for conventional pneumatic cylinders.

The cylinder chamber is hermetically sealed against the outer slide as there is no mechanical connection. This prevents any leakage loss.



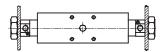






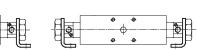
Mounting options

With hexagonal nuts (included in scope of delivery)

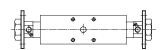


With mounting attachments

Foot mounting HBN

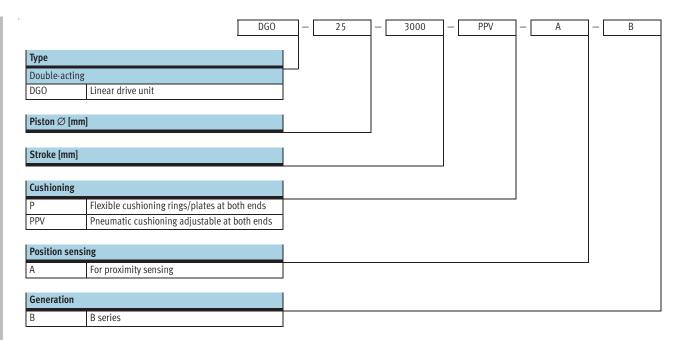


Flange mounting FBN



Mou	inting attachments and accesso	ries	
		Brief description	→ Page/Internet
1	Moment compensator FKG	To compensate misalignments and eliminate tilting moments	10
2	Foot mounting HBN	On end caps for piston Ø 12 25 mm	10
3	Flange mounting FBN	On end caps for piston Ø 12 25 mm	11
4	Flange mounting FBN	On end caps for piston Ø 32 40 mm	11
5	Proximity sensors SMEO-/SMTO-/SMPO-1	For contactless position sensing, mountable externally via a mounting kit	12
6	One-way flow control valve GRLA	To regulate speed	12
7	Push-in fitting QS	For connecting compressed air tubing with standard external diameters	quick star

3.2



Linear drive units DGO Technical data



Function





- **D** - Diameter 12 ... 40 mm



- Stroke length 10 ... 4,000 mm



General technical data										
Piston \varnothing		12	16	20	25	32	40			
Stroke	[mm]	10 1,200	10 2,500	10 3,000	10 3,500		10 4,000			
Pneumatic connection		M5 G ¹ / ₈ G ¹ / ₄								
Operating medium		Filtered compressed air, lubricated or unlubricated, other media upon request.								
Design		Rodless								
Driver principle		Force-locking (magnetic)								
Cushioning		Flexible cushion-	Pneumatic cushion	ing adjustable at bot	th ends					
		ing rings/plates at	ngs/plates at							
		both ends								
Cushioning length	[mm]	-	14	17	19	20	23			
Position sensing		For proximity sensing								
Type of mounting		With hexagonal nuts								
		With accessories								
Fitting position		Any								

Operating and environmental conditions											
Piston ∅		12	16	20	25	32	40				
Operating pressure	[bar]	2 7	1.7 7	1.6 7	1.5 7	1.4 7	1.3 7				
Temperature range ¹⁾ [°C] $-20 \dots +60$											

¹⁾ Note operating range of proximity sensors

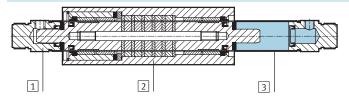
Forces [N]											
Piston Ø	12	16	20	25	32	40					
Theoretical force at 6 bar	68	121	188	295	483	754					
Breakaway force of the magnetic	100	160	270	400	680	1,050					
coupling											

Weights [g]											
Piston Ø 12 16 20 25 32 40											
Product weight with 0 mm stroke	320	620	1,000	1,340	2,400	3,920					
Additional weight per 10 mm stroke	2	3	4	4.8	6	8					

Technical data

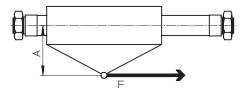
Materials

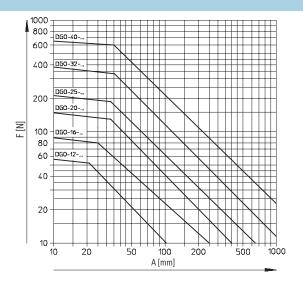
Sectional view



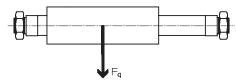
Line	ar drive unit	
1	End cap	Anodised aluminium
2	Outer slide	Anodised aluminium
3	Cylinder barrel	High-alloy steel
-	Seals	Nitrile rubber, polyurethane

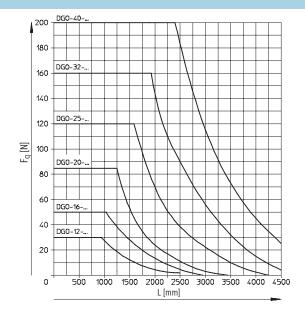
Permissible axial force F dependent on lever arm A





Permissible lateral force F_q dependent on stroke length L



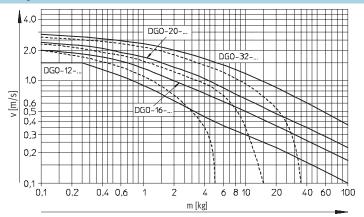


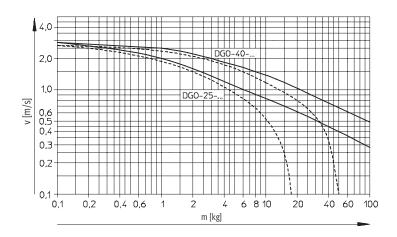
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Technical data

Max. piston speed v dependent on the moving mass m

If the operating conditions are outside the permissible range, the moving mass must be externally cushioned using suitable equipment (shock absorbers or stops).



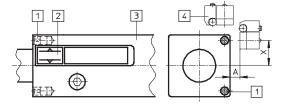


———Horizontal mounting position ————Vertical mounting position

Contactless position sensing

Mounting the proximity sensors SMEO-/SMTO-/SMPO-1

The proximity sensors are fitted by the user near the linear drive unit (e.g. on a \varnothing 6 mm rod). Contactless position sensing is only possible in the area shown. Too small a distance A can cause multiple switching.

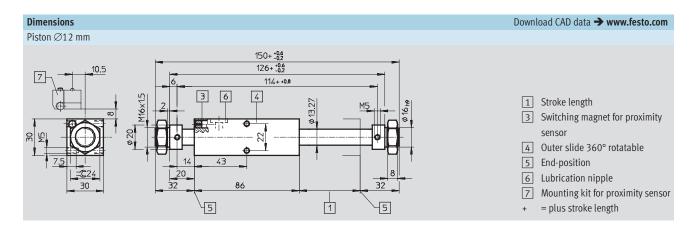


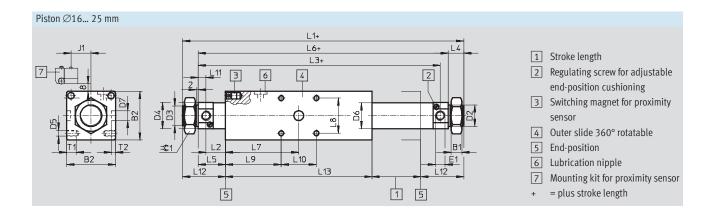
- Switching magnet for proximity sensor
- 2 Switching range
- 3 Outer slide 360° rotatable
- 4 Proximity sensor with mounting kit SMB-1

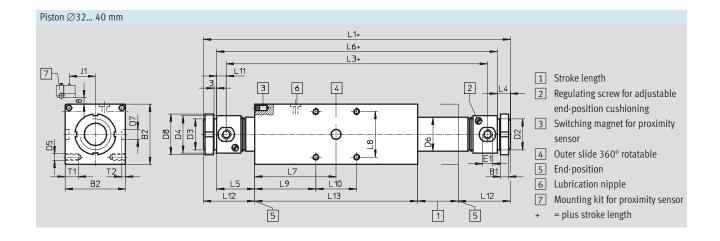
Switching distances, switch	Switching distances, switching travel and hysteresis [mm]												
Proximity sensors	А	X	X										
		DGO-12	DGO-18	DGO-20	DGO-25	DGO-32	DGO-40						
SMEO-1, SMTO-1	6.0 8.0	10 11	13 14	16 17	20 21	25 26	32 33	7.5 13	1.0 4.5				
SMPO-1-H-B	5.0 6.0							7.0 15	0.4 2.5				

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Technical data







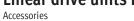
Linear drive units DGO Technical data



Dimensio	ons								
Ø	B1	B2	D2	D3	D4	D5	D6	D7	D8
			Ø		Ø		Ø	Ø	Ø
[mm]			h9					h8	
16	8	36	16	M16x1.5	20	M5	17.5	8	-
20	11	42	22	M22x1.5	27	M5	21.3	8	-
25	11	50	22	M22x1.5	27	M6	26.5	10	-
32	8	60	30	M30x1.5	38	M6	33.6	10	42
40	10	74	38	M38x1.5	46	M8	42.6	12	50
Ø	E1	J1	L1	L2	L3	L4	L5	L6	L7
[mm]									
16	M5	13.5	205 +1/-0.5	12	149 +1/-0.5	12	28	181 ± 0.6	62.5
20	G1/8	16.5	217 +0.8/-0.6	16.5	169 +1/-0.8	16	24.5	185 +0.8/-0.6	67.5
25	G ¹ /8 ¹⁾	20.5	238 +1.3/-0.7	20	190 +1.5/-0.9	16	28	206 +1.3/-0.7	75
32	G ¹ /8	25.5	270 +0.8/-0.6	23.6	218 +0.8/-0.6	16	33.6	238 +0.8/-0.6	85
40	G ¹ / ₄	32	327 +1.3/-0.7	35	271 +1.5/-0.9	16	47	295 +1.3/-0.7	100
Ø	L8	L9	L10	L11	L12	L13	T1	T2	= ©1
[mm]									
16	26	49.5	26	16	40	125	8	4	24
20	32	51.5	32	8	40.5	135	10	3	32
25	36	57	36	8	44	150	10	4	32
32	48	61	48	10	49.5	170	12.5	4	-
40	56	75	50	12	63	200	16	4.5	-

¹⁾ Max. screw-in depth 7 mm. Use screws supplied by Festo: → www.festo.com

Ordering of	lata		
Ø	Stroke	Part No.	Туре
[mm]	[mm]		
12	10 1,200	15 221	DGO-12P-A-B
16	10 2,500	15 222	DGO-16PPV-A-B
20	10 3,000	15 223	DGO-20PPV-A-B
25	10 3,500	15 224	DGO-25PPV-A-B
32	10 3,500	15 225	DGO-32PPV-A-B
40	10 4,000	15 226	DGO-40PPV-A-B



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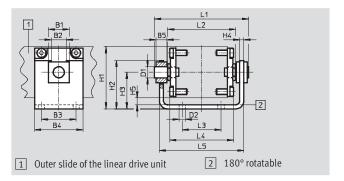
Moment compensator FKG

for piston \varnothing 16 ... 40 mm Maximum permissible misalignment of parallel guide in longitudinal axis of cylinder = 1 mm.

Scope of delivery: 1 moment compensator and 8 mounting screws

Material: Galvanised steel





Dimension	Dimensions and ordering data																				
For Ø	B1	B2	В3	B4	B5	D1 Ø	D2 Ø	H1	H2	Н3	H4	H5	L1	L2	L3	L4	L5		Weight [g]	Part No.	Туре
16	18	14	26	40	8	10	5.5	47	40	29	4	7	74	54	26	49	68	2	257	15 233	FKG-16-B
20	18	14	32	42	8	10	5.5	53	43	32	4	7	82	62	32	57	76	2	302	33 339	FKG-20-B
25	22	16	36	50	12	12	6.6	63	50	38	5	8	98	70	36	64	89	2	511	15 234	FKG-25-B
32	22	16	48	60	12	12	6.6	73	55	43	5	8	108	80	48	74	99	2	677	33 340	FKG-32-B
40	30	22	50	70	16	16	9	90	70	53	6	10	134	98	56	92	122	2	1,277	15 235	FKG-40-B

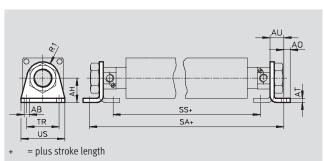
¹⁾ Corrosion resistance class 2 according to Festo standard 940 070 Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Foot mounting HBN

for piston \varnothing 12 ... 25 mm

Material: Galvanised steel Free of copper, PTFE and silicone





Dimension	Dimensions and ordering data													
For Ø	AB	AH	AO	AT	AU	R1	SA	SS	TR	US	CRC ¹⁾	Weight	Part No.	Туре
	Ø											[g]		
12	5.5	20	6	4	14	13	153	105	32	42	2	40	5 125	HBN-12/16x1
16	5.5	27	6	4	14	13	209	161	32	42	2	50	6 062	HBN-12/16x1-A
20	6.6	30	8	5	17	20	219	161	40	54	2	100	6 064	HBN-20/25x1-A
25	6.6	30	8	5	17	20	240	182	40	54	2	100	6 064	HBN-20/25x1-A

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.



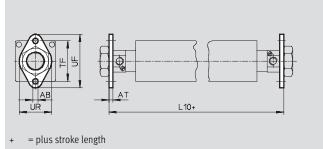
Accessories

Flange mounting FBN

for piston \varnothing 12 ... 25 mm

Material: Galvanised steel Free of copper, PTFE and silicone





Dimension	Dimensions and ordering data												
For Ø	AB	AT	L10	TF	UF	UR	US	CRC ¹⁾	Weight	Part No.	Туре		
	Ø								[g]				
12	5.5	4	133	40	53	30	42	2	25	5 130	FBN-12/16		
16	5.5	4	189	40	53	30	42	2	25	5 130	FBN-12/16		
20	6.6	5	189	50	66	40	54	2	45	5 131	FBN-20/25		
25	6.6	5	216	50	66	40	54	2	45	5 131	FBN-20/25		

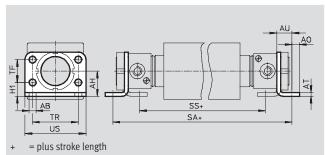
1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Flange mounting FBN

for piston Ø 32 ... 40 mm

Material: Galvanised steel Free of copper, PTFE and silicone





Dimension	Dimensions and ordering data														
For Ø	AB ∅	АН	AO	AT	AU	H1	SA	SS	TF	TR	US	CRC ¹⁾	Weight [g]	Part No.	Туре
32	7	28	7	4	14	14	266	218	28	52	66	2	102	195 855	FBN-32
40	9	33	10	5	19	18	335	265	30	60	80	2	190	195 856	FBN-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.

Accessories

Ordering data	Ordering data − Rectangular proximity sensors, magneto-resistive Technical data → Internet: smto								
	Mounting	Switch	Electrical connection		Cable length	Part No.	Туре		
		output	Cable	M8 plug	[m]				
NO contact	NO contact								
	With accessories	PNP	3-wire	-	2.5	151 683	SMTO-1-PS-K-LED-24-C		
			-	3-pin	-	151 685	SMTO-1-PS-S-LED-24-C		
		NPN	3-wire	-	2.5	151 684	SMTO-1-NS-K-LED-24-C		
			-	3-pin	-	151 686	SMTO-1-NS-S-LED-24-C		

Ordering data	Ordering data − Rectangular proximity sensors, magnetic reed Technical data → Internet: smeo							
	Mounting	Electrical connection	Cable length	Part No.	Туре			
		Cable	M8 plug	[m]				
NO contact								
	With accessories	3-wire	-	2.5	30 459	SMEO-1-LED-24-B		
		3-wire	-	5.0	151 672	SMEO-1-LED-24-K5-B		
		-	3-pin	-	150 848	SMEO-1-S-LED-24-B		

Ordering data	Technical data → Internet: smpo						
	Mounting	Pneumatic connection	Part No.	Туре			
3/2-way valve,	3/2-way valve, normally closed						
0000	With accessories	Barbed fitting for 3 mm tubing ID	31 008	SMPO-1-H-B			

Ordering data	– Mounting kit		Technical data → Internet: smb
	Mounting	Part No.	Туре
	For cylinder with tie rod \varnothing 6 mm or DUO rail mounting profile	11 886	SMB-1

Ordering data	- Connecting cables		Technical data → Internet: nebu		
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Туре
	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 → Internet: grla			
	Connection		Material	Part No.	Туре
	Thread	For tubing OD			
	M5	3	Metal design	193 137	GRLA-M5-QS-3-D
		4		193 138	GRLA-M5-QS-4-D
	G1/8	4		193 143	GRLA-1/8-QS-4-D
		6		193 144	GRLA-1/8-QS-6-D
	G1/4	6		193 146	GRLA-1/4-QS-6-D
		8		193 147	GRLA-1/4-QS-8-D

Product Range and Company Overview

A Complete Suite of Automation Services

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.



Custom Automation ComponentsComplete custom engineered solutions



Custom Control CabinetsComprehensive engineering support and on-site services



Complete SystemsShipment, stocking and storage services

The Broadest Range of Automation Components

With a comprehensive line of more than 30,000 automation components, Festo is capable of solving the most complex automation requirements.



ElectromechanicalElectromechanical actuators, motors, controllers & drives



PneumaticsPneumatic linear and rotary actuators, valves, and air supply



PLC's and I/O Devices
PLC's, operator interfaces, sensors
and I/O devices

Supporting Advanced Automation... As No One Else Can!

Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 12,000 employees in 56 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

Quality Assurance, ISO 9001 and ISO 14001 Certifications

Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.



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