

Linear drives DGO

FESTO



Key features

At a glance

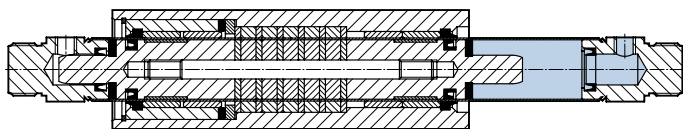
- Double-acting
- Magnetically coupled without mechanical connections
- Piston chamber and slide are hermetically sealed
- Pressure-tight and leak-free system
- Dirt-proof and dust-proof
- Space-saving installation with long strokes
- For contactless position sensing
- With adjustable end-position cushioning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

The technology in detail

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

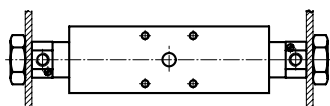
This means that there is no advancing piston rod and the installation space required is less than for conventional pneumatic drives.

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

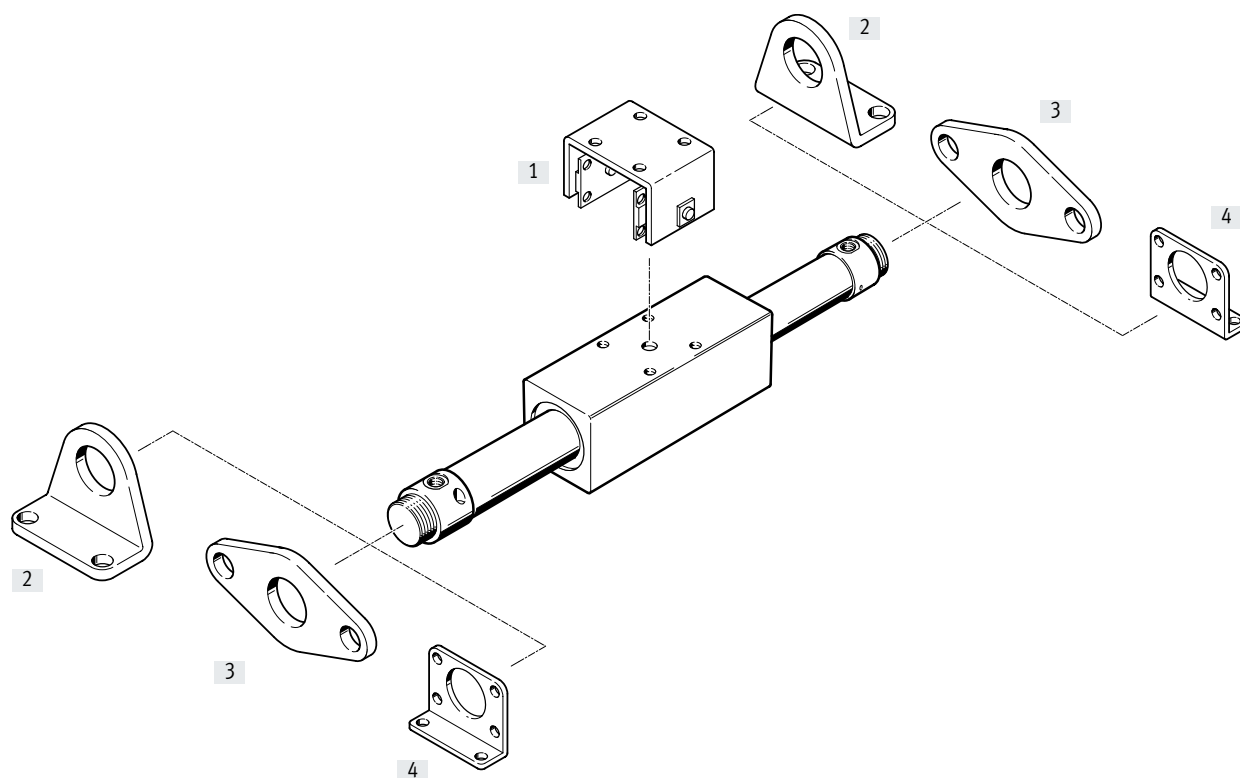


Mounting option

With hex nuts (included in scope of delivery)



Peripherals overview



Mounting components and accessories		Brief description	→ Page/Internet
[1]	Moment compensator FKG	To compensate for misalignments and eliminate tilting moments	10
[2]	Foot mounting HBN	For bearing or end cap with piston diameter of 12 ... 25 mm	10
[3]	Flange mounting FBN	For bearing or end cap with piston diameter of 12 ... 25 mm	11
[4]	Flange mounting FBN	For bearing or end cap with piston diameter of 32 ... 40 mm	11
[5]	Proximity switch SMEO-/SMTO-/SMPO-1	For contactless position sensing, mounted externally via a mounting kit	12
[6]	One-way flow control valve GRLA	For speed regulation	12
[7]	Push-in fitting QS	For connecting compressed air tubing with standard O.D.	qs

Type codes

001	Series
DGO	Linear drive, double-acting

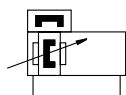
002	Piston diameter
12	12
16	16
20	20
25	25
32	32
40	40

003	Stroke
10	10
1200	1200
2500	2500
3000	3000
3500	3500
4000	4000

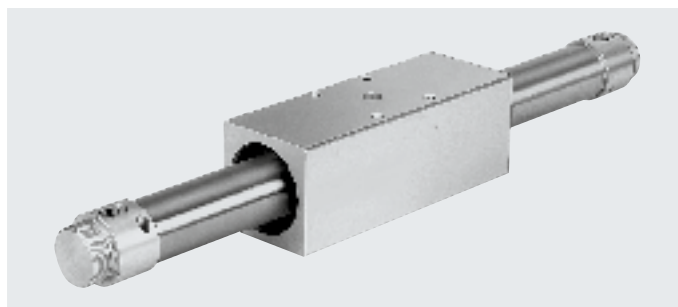
004	Cushioning
P	Elastic cushioning rings/plates on both sides
PPV	Pneumatic cushioning, adjustable at both ends

005	Position sensing
A	For proximity sensor

Data sheet



- Ø - Diameter
12 ... 40 mm
- l - Stroke length
10 ... 4000 mm



General technical data						
Piston diameter	12	16	20	25	32	40
Stroke [mm]	10 ... 1200	10 ... 2500	10 ... 3000	10 ... 3500		10 ... 4000
Pneumatic connection	M5		G1/8			G1/4
Operating medium	Compressed air to ISO 8573-1:2010 [7:-:-]					
Note on operating/ pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)					
Design	Rodless					
Moment compensator principle	Magnetically coupled					
Cushioning	Elastic cushioning rings/pads at both ends	Pneumatic cushioning, adjustable at both ends				
Cushioning length [mm]	–	14	17	19	20	23
Position sensing	Via proximity switch					
Type of mounting	With hex nuts					
	With accessories					
Mounting position	Any					

Operating and environmental conditions						
Piston diameter	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 ... +60					

1) Note operating range of proximity switches

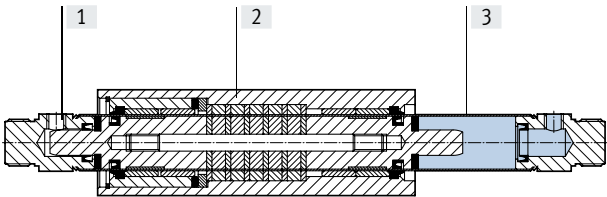
Forces [N]						
Piston diameter	12	16	20	25	32	40
Theoretical force at 6 bar	68	121	188	295	483	754
Breakaway force of the magnetic coupling	100	160	270	400	680	1050

Weights [g]						
Piston diameter	12	16	20	25	32	40
Product weight with 0 mm stroke	320	620	1000	1340	2400	3920
Additional weight per 10 mm stroke	2	3	4	4.8	6	8

Data sheet

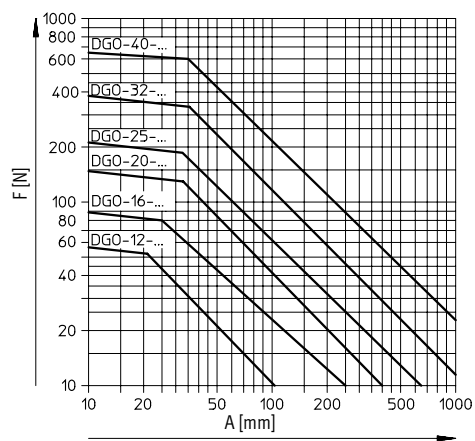
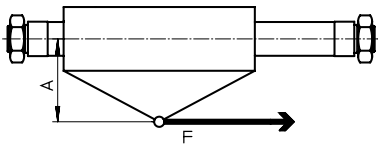
Materials

Sectional view

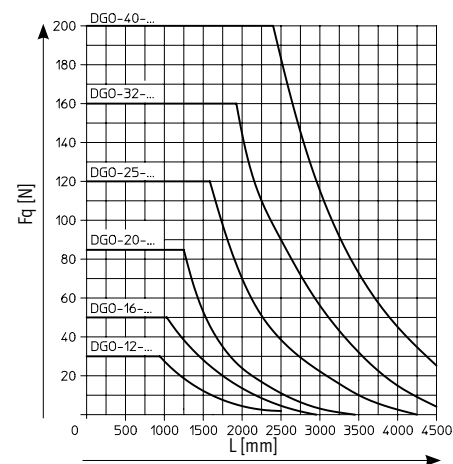
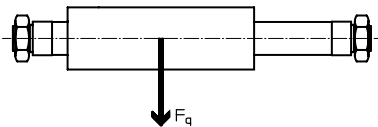


Linear drive	
[1] End cap	Anodised aluminium
[2] Outer slide	Anodised aluminium
[3] Cylinder barrel	High-alloy steel
- Seals	NBR, polyurethane

Permissible axial force F as a function of lever arm A



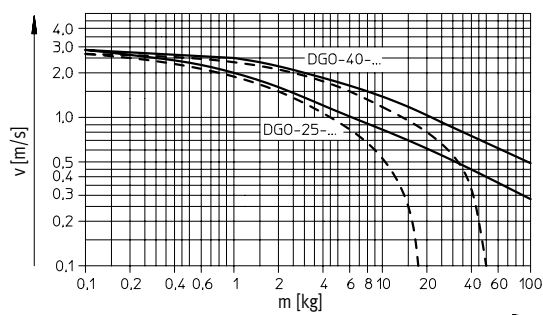
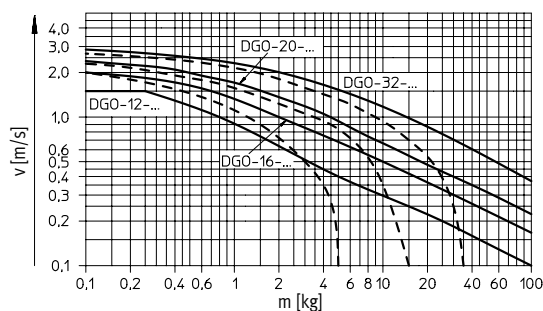
Permissible transverse load F_q as a function of stroke length L



Data sheet

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).

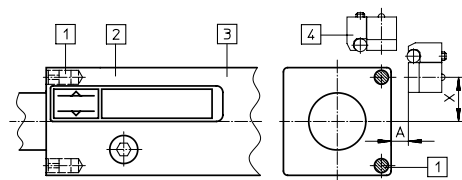


— Horizontal mounting position
 - - - - - Vertical mounting position

Contactless position sensing

Mounting the proximity switches SMEO-/SMT0-/SMPO-1

The proximity switches are mounted by the customer near the linear drive (e.g. on a round rod with a 6 mm diameter). Contactless position sensing is only possible in the area shown. Too small a distance A can cause multiple switching.



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

Switching distances, switching travel and hysteresis [mm]

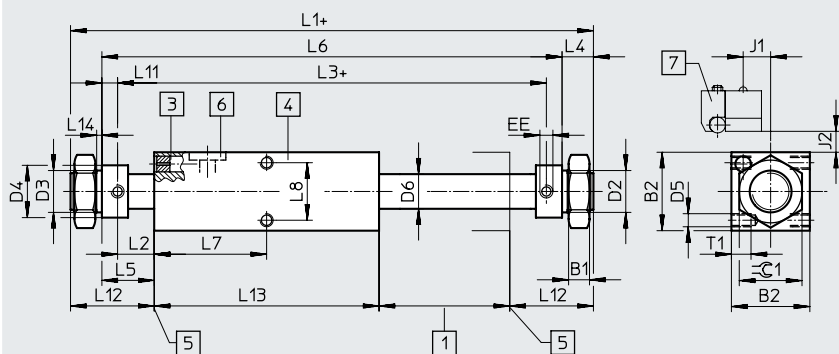
Proximity switch	A	X						Switching travel	Hysteresis
		DGO-12-...	DGO-16-...	DGO-20-...	DGO-25-...	DGO-32-...	DGO-40-...		
SMEO-1, SMT0-1	6.0 ... 8.0	10 ... 11	13 ... 14	16 ... 17	20 ... 21	25 ... 26	32 ... 33	7.5 ... 13	1.0 ... 4.5
SMPO-1-H-B	5.0 ... 6.0							7.0 ... 15	0.4 ... 2.5

Data sheet

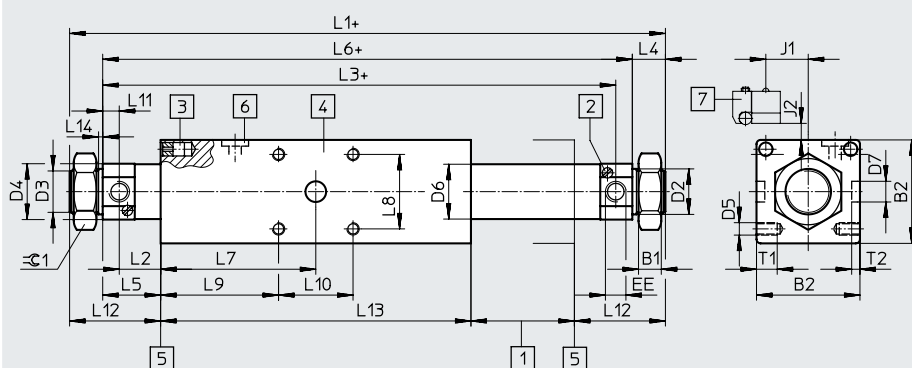
Dimensions

Download CAD data → www.festo.com

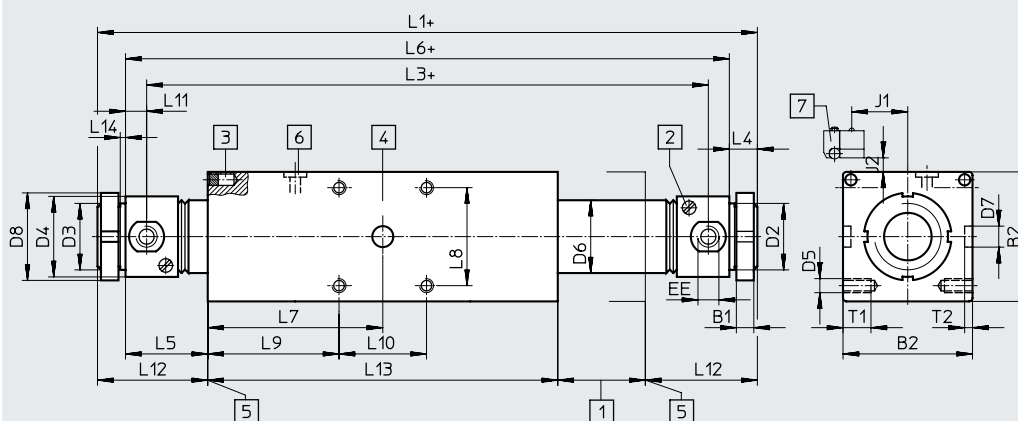
Piston diameter 12 mm



Piston diameter 16 ... 25 mm



Piston diameter 32 ... 40 mm



- [1] Stroke length
 - [2] Adjusting screw for adjustable end-position cushioning
 - [3] Switching magnet for proximity switch
 - [4] Outer slide 360° rotatable
 - [5] End position
 - [6] Lubrication nipple
 - [7] Mounting kit for proximity sensor
- + = plus stroke length

Data sheet

Dimensions									
Ø	B1	B2	D2 Ø	D3	D4 Ø	D5	D6 Ø	D7 Ø	D8 Ø
[mm]			h9					h8	
12	8	30	16	M16x1.5	20	M5	13.27	–	–
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	EE	J1	L1	L2	L3	L4	L5	L6	L7	L8
[mm]										
12	M5	10.5	150 +0.6/-0.2	14	114 ±0.8	14	20	126 +0.6/-0.2	43	22
16	M5	13.5	205 +1/-0.5	12	149 +1/-0.5	12	28	181 ±0.6	62.5	26
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	32
25	G1/8 ¹⁾	20.5	238 +1.3/-0.7	20	190 +1.5/-0.9	16	28	206 +1.3/-0.7	75	36
32	G1/8	25.5	270 +0.8/-0.6	23.6	218 +0.8/-0.6	16	33.6	238 +0.8/-0.6	85	48
40	G1/4	32	327 +1.3/-0.7	35	271 +1.5/-0.9	16	47	295 +1.3/-0.7	100	56

Ø	L9	L10	L11	L12	L13	L14	T1	T2	≈G1	Stroke tolerance
[mm]										
12	–	–	6	32	86	2	7.5	–	24	+2
16	49.5	26	16	40	125	–	8	4	24	+2
20	51.5	32	8	40.5	135	–	10	3	32	+2.7
25	57	36	8	44	150	–	10	4	32	+2.5
32	61	48	10	49.5	170	–	12.5	4	–	+2.5
40	75	50	12	63	200	–	16	4.5	–	+3.15

1) Max. screw-in depth 7 mm. Use fittings from Festo: → Internet: qs

Ordering data			
Ø	Stroke	Part no.	Type
[mm]	[mm]		
12	10 ... 1200	15221	DGO-12-...-P-A-B
16	10 ... 2500	15222	DGO-16-...-PPV-A-B
20	10 ... 3000	15223	DGO-20-...-PPV-A-B
25	10 ... 3500	15224	DGO-25-...-PPV-A-B
32	10 ... 3500	15225	DGO-32-...-PPV-A-B
40	10 ... 4000	15226	DGO-40-...-PPV-A-B

Accessories

Moment compensator FKG

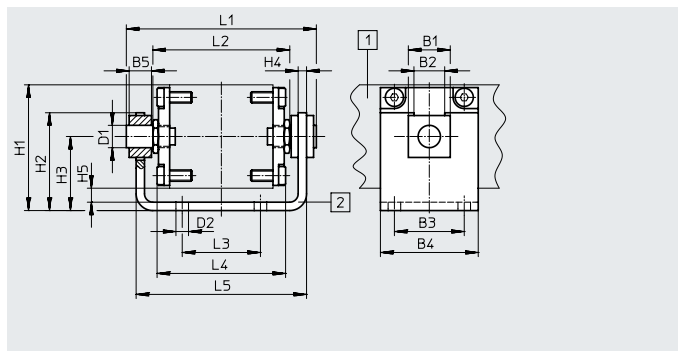
For piston diameter 16 ... 40 mm

Maximum permissible misalignment of a parallel guide along the longitudinal axis of the cylinder = 1 mm

Scope of delivery: 1 moment compensator and 8 retaining screws

Material:

Galvanised steel



Dimensions and ordering data

For diameter	B1	B2	B3	B4	B5	D1 Ø	D2 Ø	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	CRC ¹⁾	Weight [g]	Part no.	Type
16	18	14	26	40	8	10	5.5	47	40	29	4	7	74	54	26	49	68	2	257	15233	FKG-16-B
20	18	14	32	42	8	10	5.5	53	43	32	4	7	82	62	32	57	76	2	302	33339	FKG-20-B
25	22	16	36	50	12	12	6.6	63	50	38	5	8	98	70	36	64	89	2	511	15234	FKG-25-B
32	22	16	48	60	12	12	6.6	73	55	43	5	8	108	80	48	74	99	2	677	33340	FKG-32-B
40	30	22	50	70	16	16	9	90	70	53	6	10	134	98	56	92	122	2	1277	15235	FKG-40-B

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

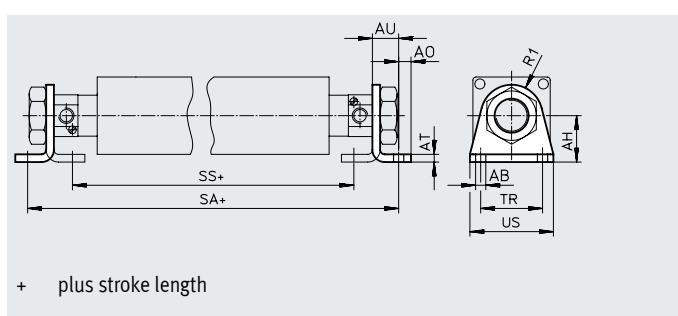
Foot mounting HBN

For piston diameter 12 ... 25 mm

Material:

Galvanised steel

Free of copper and PTFE



Dimensions and ordering data

For diameter	AB ø	AH	AO	AT	AU	R1	SA	SS	TR	US	CRC ¹⁾	Weight [g]	Part no.	Type
12	5.5	20	6	4	14	13	153	105	32	42	1	43	5125	HBN-12/16x1
16	5.5	27	6	4	14	13	209	161	32	42	1	51	6062	HBN-12/16x1-A
20	6.6	30	8	5	17	20	219	161	40	54	1	104	6064	HBN-20/25x1-A
25	6.6	30	8	5	17	20	240	182	40	54	1	104	6064	HBN-20/25x1-A

1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry internal application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Accessories

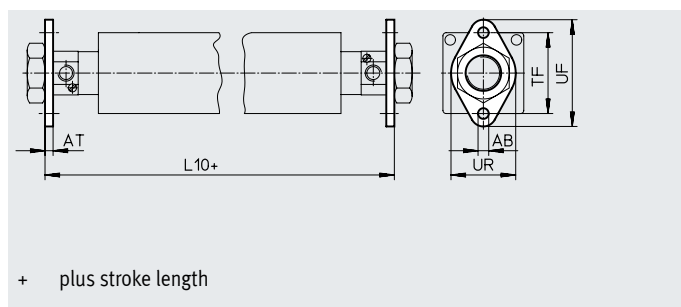
Flange mounting FBN

For piston diameter 12 ... 25 mm

Material:

Galvanised steel

Free of copper and PTFE



Dimensions and ordering data

For diameter	AB Ø	AT	L10	TF	UF	UR	US	CRC ¹⁾	Weight [g]	Part no.	Type
12	5.5	4	133	40	53	30	42	1	26	5130	FBN-12/16
16	5.5	4	189	40	53	30	42	1	26	5130	FBN-12/16
20	6.6	5	189	50	66	40	54	1	52	5131	FBN-20/25
25	6.6	5	216	50	66	40	54	1	52	5131	FBN-20/25

1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry internal application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

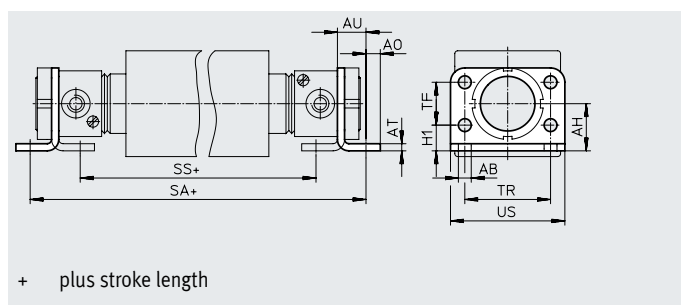
Flange mounting FBN

For piston diameter 32 ... 40 mm

Material:

Galvanised steel

Free of copper and PTFE



Dimensions and ordering data

For diameter	AB Ø	AH	AO	AT	AU	H1	SA	SS	TF	TR	US	CRC ¹⁾	Weight [g]	Part no.	Type
32	7	28	7	4	14	14	266	218	28	52	66	1	103	195855	FBN-32
40	9	33	10	5	19	18	335	265	30	60	80	1	191	195856	FBN-40

1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry internal application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Accessories

Ordering data – Proximity switch in block design, magneto-resistive						Data sheets → Internet: smto	
	Mounting	Switching output	Electrical connection		Cable length [m]	Part no.	Type
			Cable	Plug connector M8			
N/O contact							
	With accessories	PNP	3-wire	–	2.5	151683	SMTO-1-PS-K-LED-24-C
			–	3-pin	–	151685	SMTO-1-PS-S-LED-24-C
		NPN	3-wire	–	2.5	151684	SMTO-1-NS-K-LED-24-C
			–	3-pin	–	151686	SMTO-1-NS-S-LED-24-C
Ordering data – Proximity switch in block design, magnetic reed						Data sheets → Internet: smeo	
	Mounting	Electrical connection		Cable length [m]	Part no.	Type	
		Cable	Plug connector M8				
N/O contact							
	With accessories	3-wire	–	2.5	30459	SMEO-1-LED-24-B	
		3-wire	–	5.0	151672	SMEO-1-LED-24-K5-B	
		–	3-pin	–	150848	SMEO-1-S-LED-24-B	
Ordering data – Proximity switch in block design, pneumatic						Data sheets → Internet: smpo	
	Mounting	Pneumatic connection			Part no.	Type	
3/2-way valve, normally closed							
	With accessories	Barbed fitting for tubing I.D. 3 mm				31008	SMPO-1-H-B
Ordering data – Mounting kit						Data sheets → Internet: smb	
	Mounting					Part no.	Type
	For cylinder with mounting rod of 6 mm diameter or DUO rail mounting profile				11886	SMB-1	
Ordering data – Connecting cables						Data sheets → Internet: 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	541333	NEBU-M8G3-K-2.5-LE3
					5	541334	NEBU-M8G3-K-5-LE3
	Angled socket, M8x1, 3-pin		Cable, open end, 3-wire		2.5	541338	NEBU-M8W3-K-2.5-LE3
					5	541341	NEBU-M8W3-K-5-LE3
Ordering data – One-way flow control valves						Data sheets → Internet: grla	
	Connection Thread	For tubing O.D.	Material		Part no.	Type	
	M5	3	Metal version		193137	GRLA-M5-QS-3-D	
		4			193138	GRLA-M5-QS-4-D	
	G1/8	4			193143	GRLA-1/8-QS-4-D	
		6			193144	GRLA-1/8-QS-6-D	
	G1/4	6			193146	GRLA-1/4-QS-6-D	
		8			193147	GRLA-1/4-QS-8-D	
	G1/4	6					
		8					