Linear drive units DGO

Linear drive units DGO

Features

General information

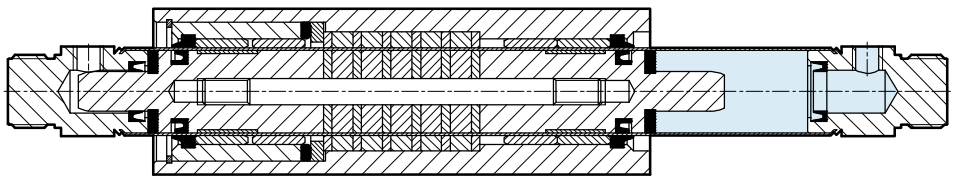
- Double-acting
- Magnetically coupled without mechanical connections
- Piston chamber and slide are pressure tight
- Pressure tight and leak-free system
- Dirt and dust cannot enter
- Space-saving installation with long strokes
- For contactless position sensing
- With adjustable end-position cushioning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

The technology in detail

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

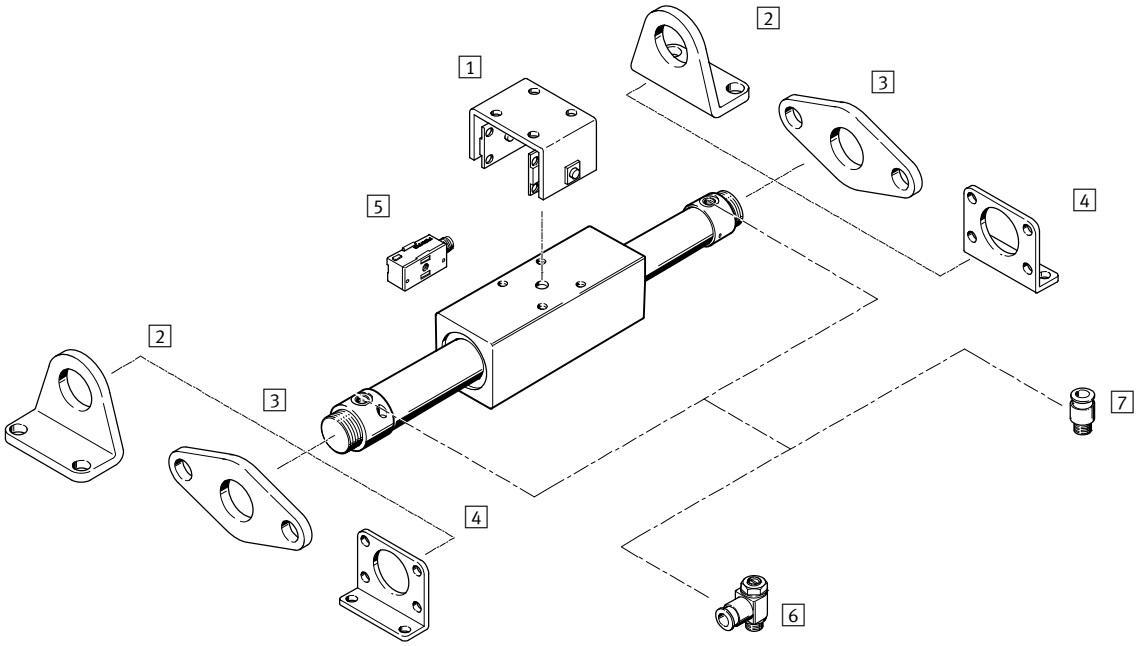
This means that there is no advancing piston rod; the installation space required is less than for conventional pneumatic cylinders.

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



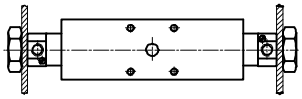
Linear drive units DGO

Peripherals overview



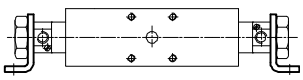
Mounting options

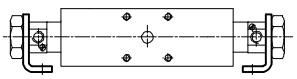
With hexagonal nuts (included in scope of delivery)



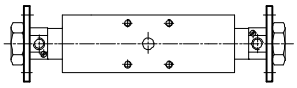
With mounting attachments

Foot mounting HBN





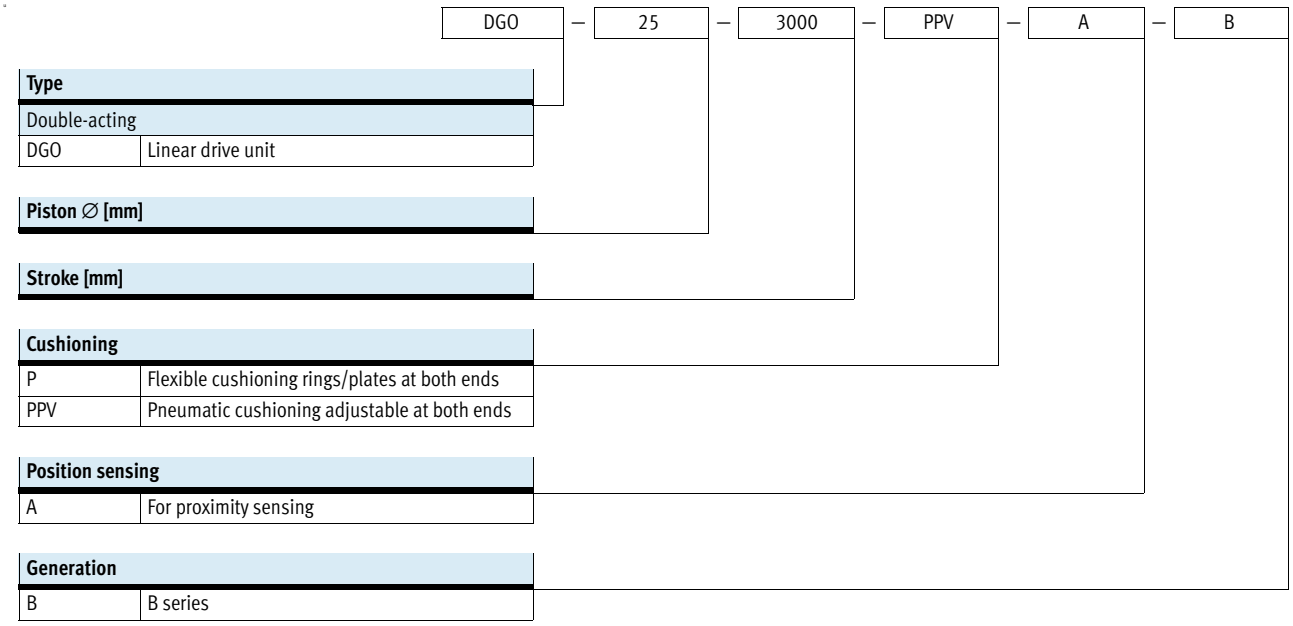
Flange mounting
FBN



Mounting attachments and accessories		
Type/Order code	**Description**	**➔ Page/Internet**
1 Moment compensator FKG	To compensate misalignments and eliminate tilting moments	10
2 Foot mounting HBN	On end caps for piston ∅ 12 … 25 mm	10
3 Flange mounting FBN	On end caps for piston ∅ 12 … 25 mm	11
4 Flange mounting FBN	On end caps for piston ∅ 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	qs

Linear drive units DGO

Type codes



Type	
Double-acting	
DGO	Linear drive unit

Piston ∅ [mm]

Stroke [mm]

Cushioning	
P	Flexible cushioning rings/plates at both ends
PPV	Pneumatic cushioning adjustable at both ends

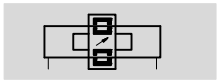
Position sensing	
A	For proximity sensing

Generation	
B	B series

Linear drive units DGO

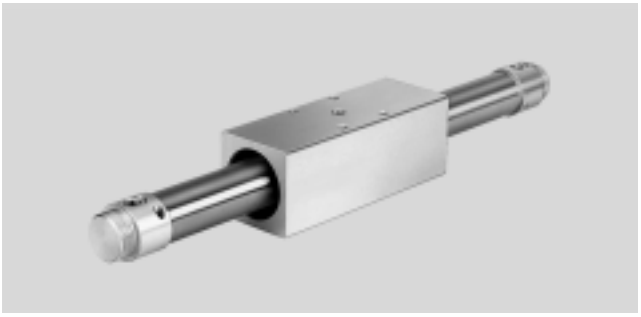
Technical data

Function



- Ø - Diameter
  12 … 40 mm

- I - Stroke length
  10 … 4,000 mm



General technical data							
Piston ∅		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 in accordance with ISO 8573-1:2010 [7:–:–]					
Note on operating/pilot medium		Operation with lubricated medium possible (in which case lubricated operation will always be required)					
Design		Rodless					
Driver principle		Force-locking (magnetic)					
Cushioning		Flexible cushioning rings/plates at both ends	Pneumatic cushioning adjustable 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 … +60					

1) Note operating range of proximity sensors

Forces [N]						
Piston ∅	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

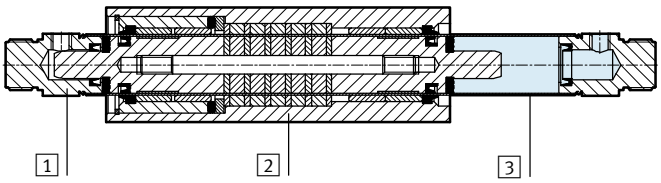
Weights [g]						
Piston ∅	12	16	20	25	32	40
Product weight with 0 mm stroke	320	620	1000	1340	2400	3920
Additional weight per 10 mm stroke	2	3	4	4.8	6	8

Linear drive units DGO

Technical data

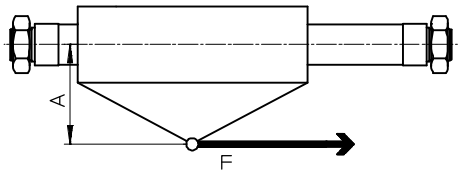
Materials

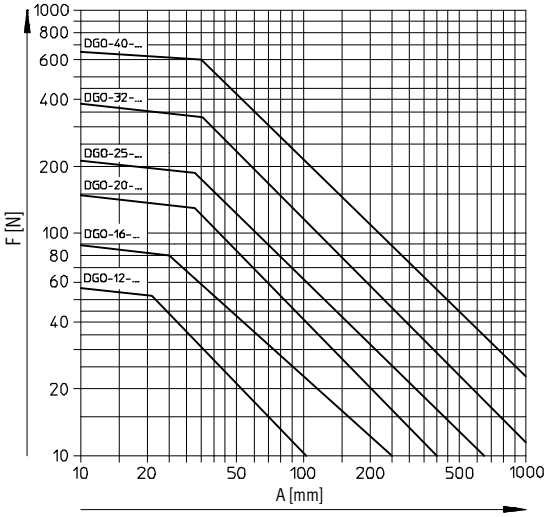
Sectional view



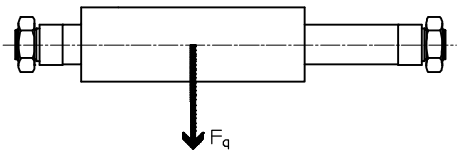
Linear drive unit		
1	End cap	Anodised aluminium
2	Outer slide	Anodised aluminium
3	Cylinder barrel	High-alloy steel
–	Seals	Nitrile rubber, polyurethane

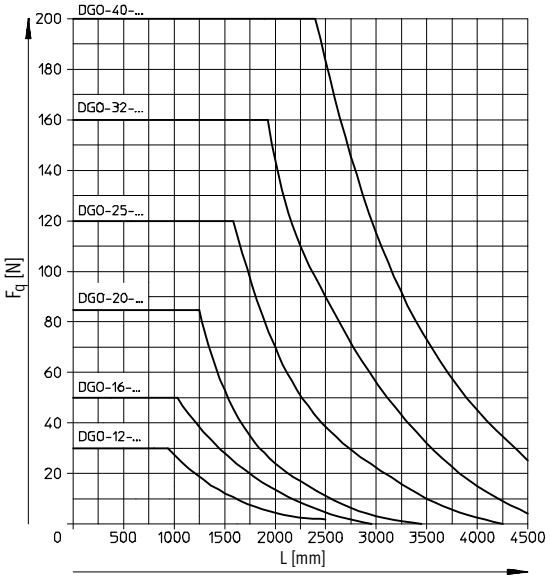
Permissible axial force F dependent on lever arm A





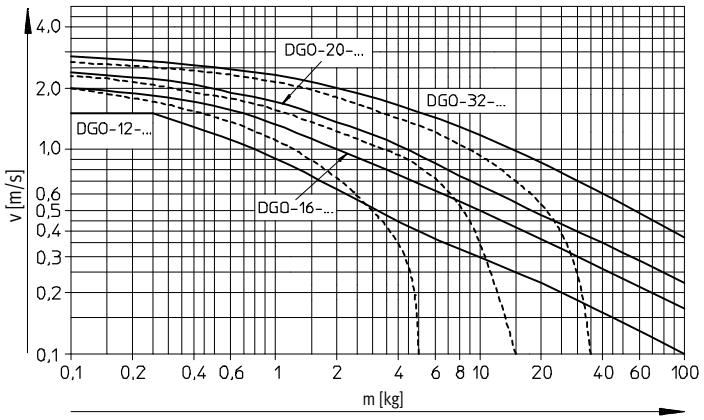
Permissible lateral force F_q dependent on stroke length L

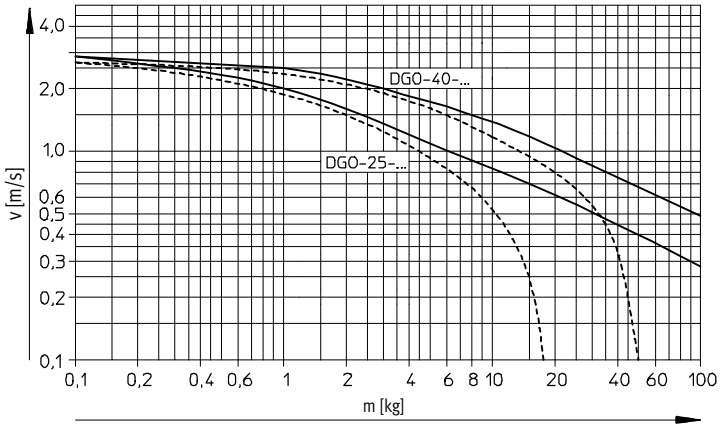




Max. piston speed v dependent on the moving mass m

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





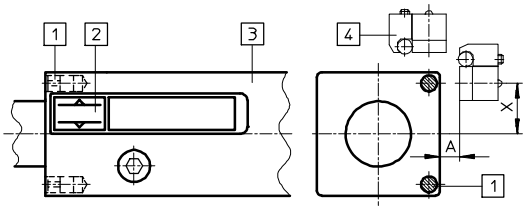
——— Horizontal mounting position

- - - - - - - 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 ∅ 6 mm rod). Contactless position sensing is only possible in the area shown. Too small a distance A can cause multiple switching.



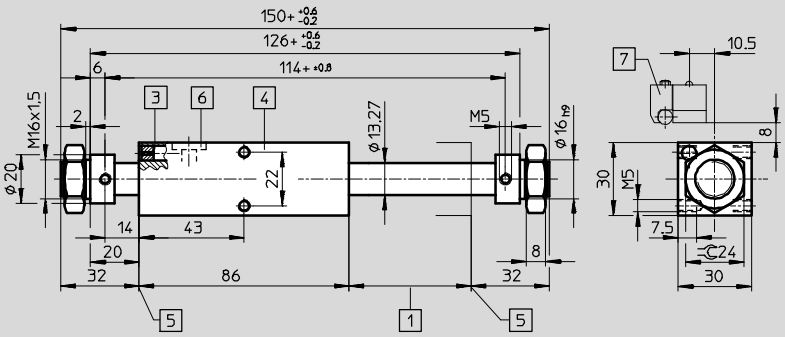
1 Switching magnet for proximity sensor
2 Switching range
3 Outer slide 360° rotatable
4 Proximity sensor with mounting kit SMB-1

Switching distances, switching travel and hysteresis [mm]

Proximity sensors	A	X						Switching travel	Hysteresis
		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

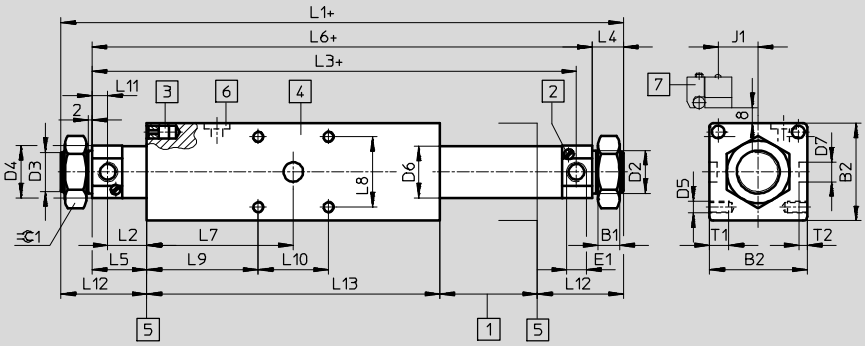
Dimensions Download CAD data ➔ **www.festo.com**

Piston ∅12 mm



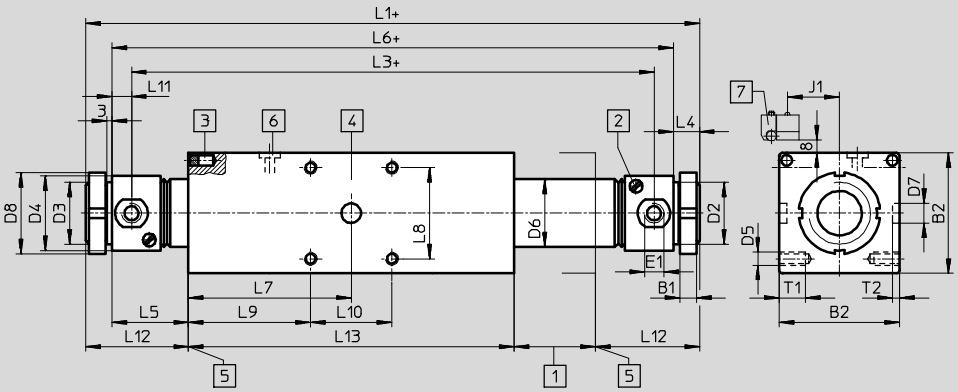
1 Stroke length
3 Switching magnet for proximity sensor
4 Outer slide 360° rotatable
5 End-position
6 Lubrication nipple
7 Mounting kit for proximity sensor
\+ = plus stroke length

Piston ∅16... 25 mm



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

Piston ∅32... 40 mm



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

Linear drive units DGO

Technical data

Dimensions

∅ [mm]	B1	B2	D2 ∅ h9	D3	D4 ∅	D5	D6 ∅	D7 ∅ h8	D8 ∅
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

∅ [mm]	E1	J1	L1	L2	L3	L4	L5	L6	L7
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	G1/8[1)]	20.5	238 +1.3/-0.7	20	190 +1.5/-0.9	16	28	206 +1.3/-0.7	75
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
40	G1/4	32	327 +1.3/-0.7	35	271 +1.5/-0.9	16	47	295 +1.3/-0.7	100

∅ [mm]	L8	L9	L10	L11	L12	L13	T1	T2	⌭1
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

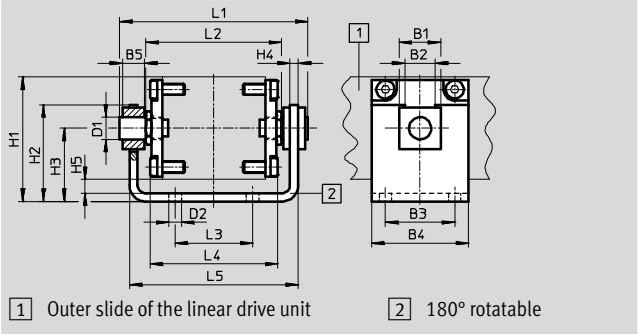
Ordering data

∅ [mm]	Stroke [mm]	Part No.	Type
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**

Moment compensator FKG
for piston ∅ 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



1 Outer slide of the linear drive unit 2 180° rotatable

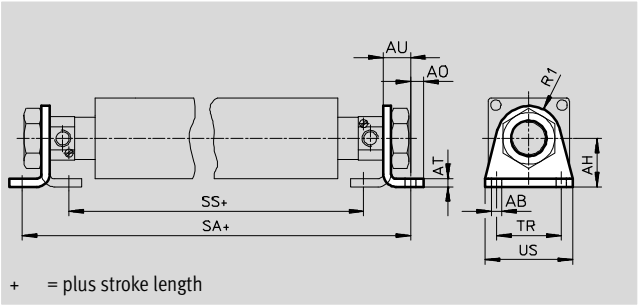
Dimensions and ordering data

For ∅	B1	B2	B3	B4	B5	D1 ∅	D2 ∅	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	**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	1277	**15 235**	**FKG-40-B**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Foot mounting HBN
for piston ∅ 12 ... 25 mm

Material:
Galvanised steel
Free of copper and PTFE



\+ = plus stroke length

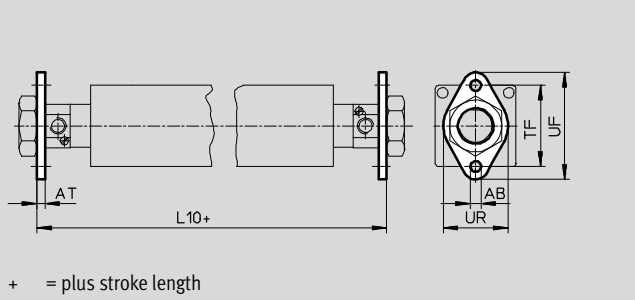
Dimensions and ordering data

For ∅	AB ∅	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. For dry indoor applications 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 ∅ 12 ... 25 mm

Material:
Galvanised steel
Free of copper and PTFE



\+ = plus stroke length

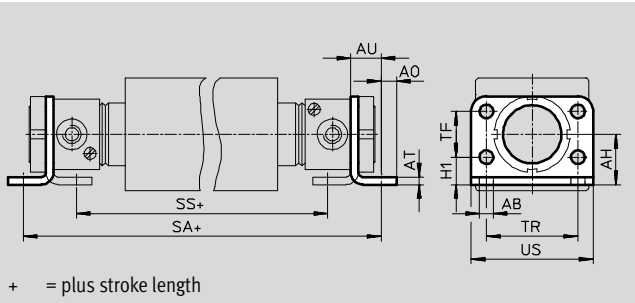
Dimensions and ordering data

For ∅	AB ∅	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. For dry indoor applications 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 ∅ 32 ... 40 mm

Material:
Galvanised steel
Free of copper and PTFE



\+ = plus stroke length

Dimensions and ordering data

For ∅	AB ∅	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. For dry indoor applications 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).

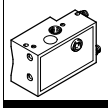
Ordering data – Rectangular proximity sensors, magneto-resistive — Technical data ➔ Internet: smto

	Mounting	Switch output	Electrical connection		Cable length [m]	Part No.	Type
			Cable	M8 plug			
NO 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**

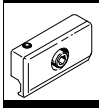
Ordering data – Rectangular proximity sensors, magnetic reed — Technical data ➔ Internet: smeo

	Mounting	Electrical connection		Cable length [m]	Part No.	Type
		Cable	M8 plug			
NO 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 – Rectangular proximity sensors, pneumatic — Technical data ➔ Internet: smpo

	Mounting	Pneumatic connection	Part No.	Type
3/2-way valve, normally closed				
	With accessories	Barbed fitting for 3 mm tubing ID	**31008**	**SMPO-1-H-B**

Ordering data – Mounting kit — Technical data ➔ Internet: smb

	Mounting	Part No.	Type
	For cylinder with tie rod ∅ 6 mm or DUO rail mounting profile	**11886**	**SMB-1**

Ordering data – Connecting cables — Technical data ➔ 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 — Technical data ➔ Internet: grla

	Connection		Material	Part No.	Type
	Thread	For tubing OD			
	M5	3	Metal design	**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**