

Cylinders with displacement encoder

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Cylinders with displacement encoder

Product range overview

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Function	Type	Brief description
Drives	Rodless	
	DGCI	 • With guide • With contactless displacement measuring encoder • Based on linear drive DGC • Supply ports optionally on end face or front • Wide range of options for mounting on drives • System product for handling and assembly technology
	DGPI/DGPIL	 • With or without guide • With contactless displacement measuring encoder, integrated • Wide range of options for mounting on drives • System product for handling and assembly technology
	DGP/DGPL	 • With or without guide • With potentiometer or contactless displacement measuring encoder, attached • With clamping unit • Wide range of options for mounting on drives • System product for handling and assembly technology
	With piston rod	
	DNCI	 • With contactless displacement measuring encoder • Various piston rod variants • Standards-based cylinder to ISO 15552   
Semi-rotary drive	DNCM	 • With attached potentiometer • Various piston rod variants • Standards-based cylinder to ISO 15552   
	Swivel module	
Semi-rotary drive	DSMI	 • Based on swivel module DSM • Rotary encoder integrated • Compact design • Wide choice of mounting options

Cylinders with displacement encoder

Product range overview

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Piston Ø	Stroke/swivel angle	Suitable			→ Page/Internet
		For positioning with SPC200	For end-position controller SPC11	As a measuring cylinder	
[mm]	[mm/°]				
Rodless					
18, 25, 32, 40, 63	100; 160; 225; 300; 360; 450; 500; 600; 750; 850; 1,000; 1,250; 1,500; 1,750; 2,000	■	■	–	38
25, 32, 40, 50, 63	225; 300; 360; 450; 500; 600; 750; 1,000; 1,250; 1,500; 1,750; 2,000	■	■	–	84
25, 32, 40, 50, 63	225; 300; 360; 450; 500; 600; 750; 1,000; 1,250; 1,500; 1,750; 2,000	■	■	■	Drive: 66 Displacement encoder: → Internet: displacement encoder
With piston rod					
32, 40, 50, 63	10 ... 2,000	■	■	■	4
32, 50	100, 160, 200, 250, 320, 400, 500	■	■	■	22
Swivel module					
25, 40	270	■	■	■	120

Standard cylinders DNCI, with integrated displacement encoder

Key features

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Components for positioning and measuring using the standard cylinder DNCI



Positioning
with end-position controller SPC11 or axis controller SPC200

Proportional directional
control valve
MPYE-...
→ Internet: mpye



Soft Stop
→ Internet: soft stop

Closed loop end-position
controller
SPC11-INC



Positioning technology
→ Internet: spc

Axis interface
SPC-AIF-INC



Axis controller
SPC200

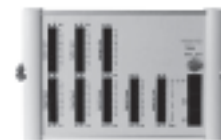


Measuring
with measuring transducer DADE

Measuring transducer
DADE-...
→ 16



PLC controller
e.g. FEC-...
→ Internet: fec



Display and control
unit
e.g. FED-...
→ Internet: fed



Standard cylinders DNCI, with integrated displacement encoder

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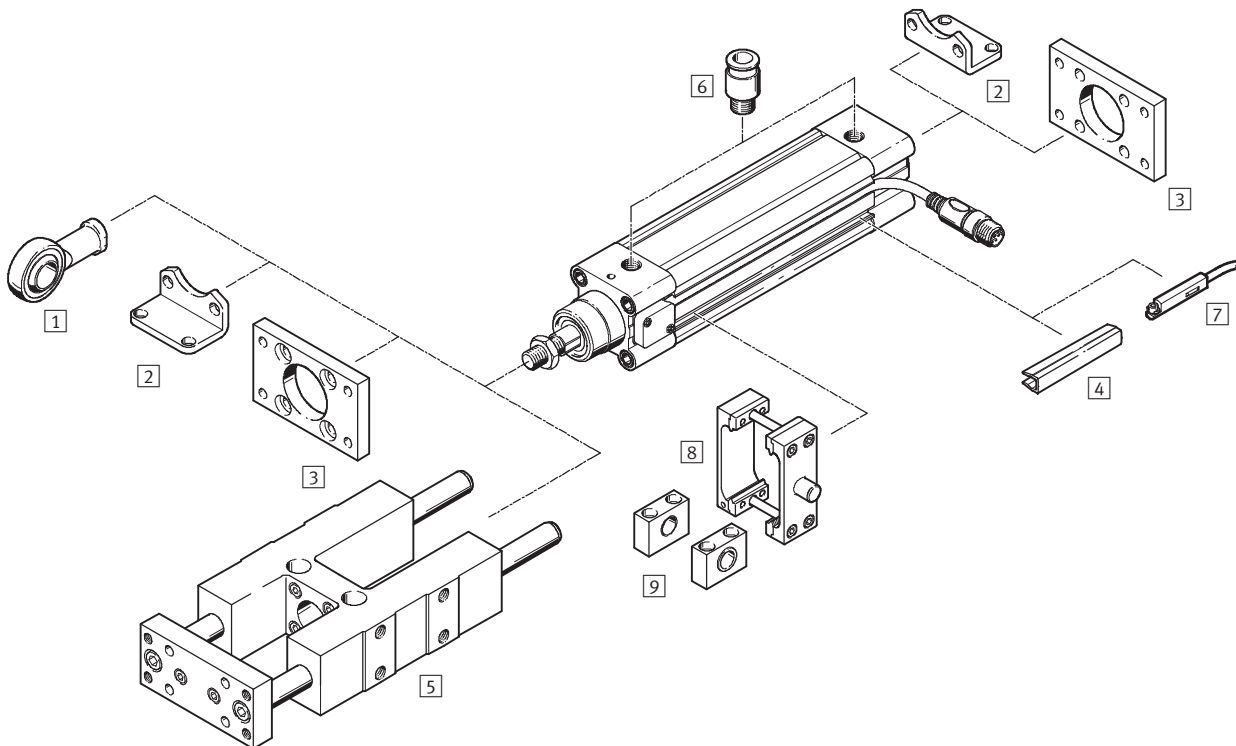
Type code

		DNCI	-		-		-		-		-		-		-		-		-	
Type																				
DNCI	Standard cylinders																			
Piston Ø [mm]																				
Stroke [mm]																				
Cushioning																				
P	Flexible cushioning rings/pads at both ends																			
Position sensing																				
A	For proximity sensing																			
Type of piston rod																				
S2	Through piston rod																			
Type of piston rod																				
K8	Extended piston rod																			
Clamping cartridge																				
KP	Clamping cartridge																			
Guide																				
FENG	Guide unit with ball bearing guide																			
No measuring head																				
MS	Drive without measuring head																			

Standard cylinders DNCI, with integrated displacement encoder

Peripherals overview

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-  - Note

If the drive DNCI is used without an end position controller SPC11 or an axis controller SPC200, e.g. as a measuring cylinder, then the standard accessories of the drive DNC can be used.

Standard cylinders DNCI, with integrated displacement encoder

Peripherals overview

Accessories		
Type	Brief description	→ Page/Internet
1 Rod eye SGS	With spherical bearing	19
2 Foot mounting HNC	For mounting the drive on the bearing and end cap	18
3 Flange mounting FNC	For mounting the drive on the bearing and end cap	19
4 Slot cover ABP-5-S	For protecting against ingress of dirt	21
5 Guide unit ¹⁾ FENG-KF	For protecting against torsion at high torque loads	feng
6 Push-in fitting QS	For connecting compressed air tubing with standard external diameters	21
7 Proximity sensor SME/SMT-8	For additional sensing of the piston position, can be ordered optionally, only in conjunction with the order code A in the drive's modular product section	proximity sensor
8 Trunnion mounting kit ZNCM	For swivelling movements of the drive	20
9 Trunnion support LNZG	For securing the trunnion mounting kit ZNCM	20

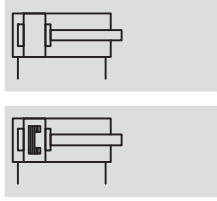
1) Guide unit FENG-KF must be attached to the piston rod such that backlash is eliminated

Standard cylinders DNCI, with integrated displacement encoder

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Technical data

Function



-  - Diameter
32 ... 63 mm
-  - Stroke length
10 ... 2,000 mm



General technical data				
Piston Ø	32	40	50	63
Constructional design	Piston Piston rod Profile barrel			
Mode of operation	Double-acting			
Cushioning	Flexible cushioning rings/pads at both ends			
Position sensing	Integrated displacement encoder For proximity sensing ¹⁾			
Measuring principle (displacement encoder)	Digital			
Type of mounting	Foot mounting			
Stroke ²⁾⁴⁾	[mm] 10 ... 2,000			
Torsion protection/Guide ³⁾	Guide rod with yoke, with ball bearing guide			
Stroke	[mm] 100 ... 500			
Piston rod extension	[mm] 1 ... 500			
Pneumatic connection	G1/8	G1/4	G1/4	G3/8
Electrical connection	Cable with 8-pin plug, round type M12			
Cable length	[m] 1.5			

- 1) Not included in the scope of delivery, can be ordered as an option
- 2) Note stroke reduction in conjunction with SPC200
- 3) Guide unit FENG-KF must be ordered as an option and will be supplied attached, the max. stroke is reduced
- 4) Can only be used as a positioning drive without reservation in the range from 100 ... 500 mm

Forces [N] and impact energy [Nm]				
Piston Ø	32	40	50	63
Theoretical force at 6 bar	483	754	1,178	1,870
advancing S2	415	633	990	1,682
Theoretical force at 6 bar	415	633	990	1,682
retracting S2	415	633	990	1,682
Impact energy at end positions	0.1	0.2	0.2	0.5

Permissible impact velocity:

$$v_{perm.} = \sqrt{\frac{2 \times E_{perm.}}{m_{dead} + m_{load}}}$$

$v_{perm.}$ Permissible impact velocity
 $E_{perm.}$ Max. impact energy
 m_{dead} Moving load (drive)
 m_{load} Moving work load

Maximum permissible load:

$$m_{load} = \frac{2 \times E_{perm.}}{v^2} - m_{dead}$$



Note

These specifications represent the maximum values which can be reached. Note the maximum permitted impact energy.

Standard cylinders DNCI, with integrated displacement encoder

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Technical data

Operating and environmental conditions		
Operating pressure ¹⁾	[bar]	4 ... 8
Operating medium ²⁾		Compressed air, filtered and unlubricated, filter unit 5 µm
Ambient temperature ³⁾	[°C]	-20 ... +80
Vibration resistance		To DIN/IEC 68 Parts 2 – 6, severity level 2
Continuous shock resistance		To DIN/IEC 68 Parts 2 – 82, severity level 2
CE symbol (declaration of conformance)		In accordance with EU EMC Directive
Protection class (displacement encoder)		IP65 to IEC 60 529
Corrosion resistance class CRC ⁴⁾		1

1) Only applies for applications with the Soft Stop end position controller SPC11 and axis controller SPC200

2) The proportional directional control valve MPYE used requires the characteristic values

3) Note operating range of proximity sensors

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

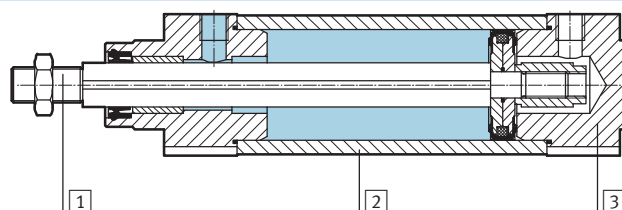
Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

Weights [g] with displacement encoder				
Piston Ø	32	40	50	63
Basic drive DNCI-...				
Product weight with 0 mm stroke	521	853	1,319	1,914
Additional weight per 10 mm stroke	30	44	62	71
Moving load with 0 mm stroke	95	175	316	383
Additional weight per 10 mm stroke	8	14	23	23
Drive with through piston rod DNCI-...-S2				
Product weight with 0 mm stroke	586	981	1,553	2,165
Additional weight per 10 mm stroke	39	60	87	96
Moving load with 0 mm stroke	155	164	297	364
Additional weight per 10 mm stroke	17	30	48	48
Additional weight with extended piston rod K8				
Additional weight per 10 mm stroke	8	14	23	23
Additional weight with clamping cartridge KP				
Product weight	234	394	700	1,147
Additional weight with guide unit FENG-...				
Product weight with 0 mm stroke	1,530	2,370	4,030	5,410
Additional weight per 10 mm stroke	18	32	50	62

Materials

Sectional view

Standard cylinders	
1) Piston rod	High-alloy steel
2) Cylinder barrel	Anodised aluminium
3) Bearing/end caps	Die-cast aluminium
– Dynamic seals	Polyurethane TPE-U
– Static seals	Nitrile rubber
– Lubricant	Klüberplex BE31-102
Displacement encoder	
– Sensor housing	Polyacetate
– Cable sheath	Polyurethane
– Plug housing	Polybuteneterephthalate
– Wall mounting plate	Polyacetate
– Screws for mounting plate	Steel



Standard cylinders DNCI, with integrated displacement encoder

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Technical data

Positioning characteristics with axis controller SPC200						
Piston Ø			32	40	50	63
Repetition accuracy	horizontal	[mm]	< ±0.5			
	vertical	[mm]	< ±0.5			
Assembly position			Any			
Minimum load, horizontal		[kg]	3	5	8	12
Maximum load, horizontal		[kg]	45	75	120	180
Minimum load, vertical ¹⁾		[kg]	3	5	8	12
Maximum load, vertical ¹⁾		[kg]	15	25	40	60
Min. travel speed		[m/s]	0.05			
Max. speed of travel		[m/s]	1.5			
Typ. positioning time, long stroke ³⁾		[s]	0.45/0.70	0.50/0.75	0.65/0.80	0.55/0.75
Typ. positioning time, short stroke ⁴⁾		[s]	0.35/0.55	0.40/0.55	0.45/0.60	0.40/0.55
Minimum positioning stroke ²⁾		[%]	< 3			
Stroke reduction ⁵⁾		[mm]	10			15
Recommended proportional directional control valve			➔ 21			

- 1) Only in conjunction with an external guide
2) In relation to the maximum stroke of the drive, but never more than 20 mm
3) At 6 bar, horizontal mounting position, DNCI-XX-500, 400 mm positioning travel at min./max. load
4) At 6 bar, horizontal mounting position, DNCI-XX-500, 100 mm positioning travel at min./max. load
5) The stroke reduction is to be maintained on every side of the drive, the max. positionable stroke is therefore: stroke – 2x stroke reduction

Positioning characteristics with end position controller SPC11				
Piston Ø	32	40	50	63
Repetition accuracy of a mid-position ¹⁾	[mm]	±2		
Assembly position	Horizontal			
Minimum load, horizontal ²⁾	[kg]	3	5	8
Maximum load, horizontal ²⁾	[kg]	45	75	120
Travel time	➔ Sizing software “SmartS oft Stop”: ➔ www.festo.com			
Recommended proportional directional control valve	➔ 21			

- 1) In the stroke range from 100 ... 500 mm
2) Load = effective load + mass of all moving parts on the drive

Electrical data, displacement encoder		
Linearity error ¹⁾	[mm]	±(0.07±0.02xL)
Max. speed of travel	[m/s]	1.5
Ambient temperature	[°C]	-20 ... +80
Max. temperature coefficient	[ppm/°K]	30
Protection class	IP65	
CE symbol (declaration of conformance)	In accordance with EU EMC Directive	
Max. permitted magnetic disruption field at 100 mm interval from the sensor ²⁾	[kA/m]	10
Electrical connection	Cable with 8-pin plug, round type M12	
Cable length	[m]	1.5

- 1) Maximum deviation of the output signal from "best fit" line (characteristic curve with nominal gradient).
L = Length of measuring system in meters
2) See also mounting conditions

Standard cylinders DNCI, with integrated displacement encoder

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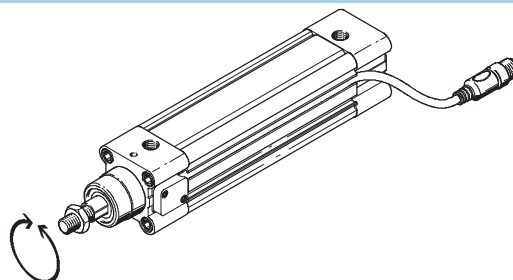
Technical data

Torques and lateral forces

The piston rod must not absorb any torque. We therefore recommend that an external guide FENG-KF be used with the drive DNCI. The guide unit is delivered installed.

The permissible static and dynamic characteristic load values with and without attached guide as well as with regard to the technical data of the variants (S2, S8, S9)

→ Internet: dnc



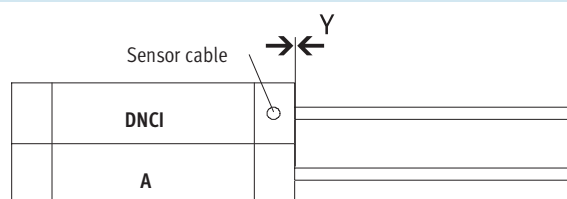
Mounting conditions

When mounting a drive A with magnet (for position sensing), in addition to a standard cylinder DNCI, the following conditions must be observed:

- X Minimum distance between the drives
- Y Offset between the drives on the bearing cap

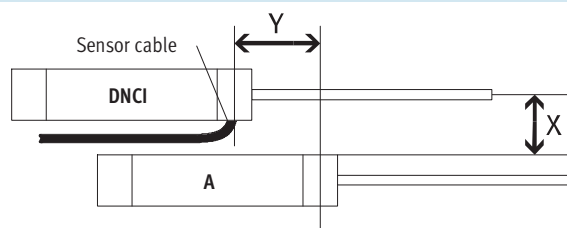
Parallel assembly

If the offset $Y = 0$ mm, the drives can be assembled directly next to one another.



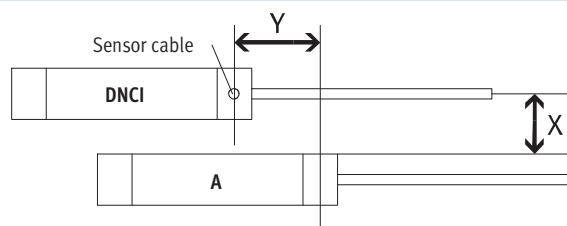
Offset assembly, cable outlet between the drives

If the offset $Y > 0$ mm and the cable outlet is between the drives, the distance from $X > 70$ mm must be observed.



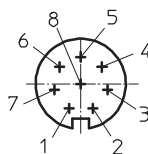
Offset assembly, cable outlet upwards or downwards

If the offset $Y > 0$ mm and the cable outlet is up or down, the distance from $X > 60$ mm must be observed.



Pin assignment of plug, view of plug

Pin	Function	Colour
1	5 V	black
2	GND	brown
3	sin+	red
4	sin-	orange
5	cos-	green
6	cos+	yellow
7	Screening	Screening
8	-	-



Standard cylinders DNCI, with integrated displacement encoder

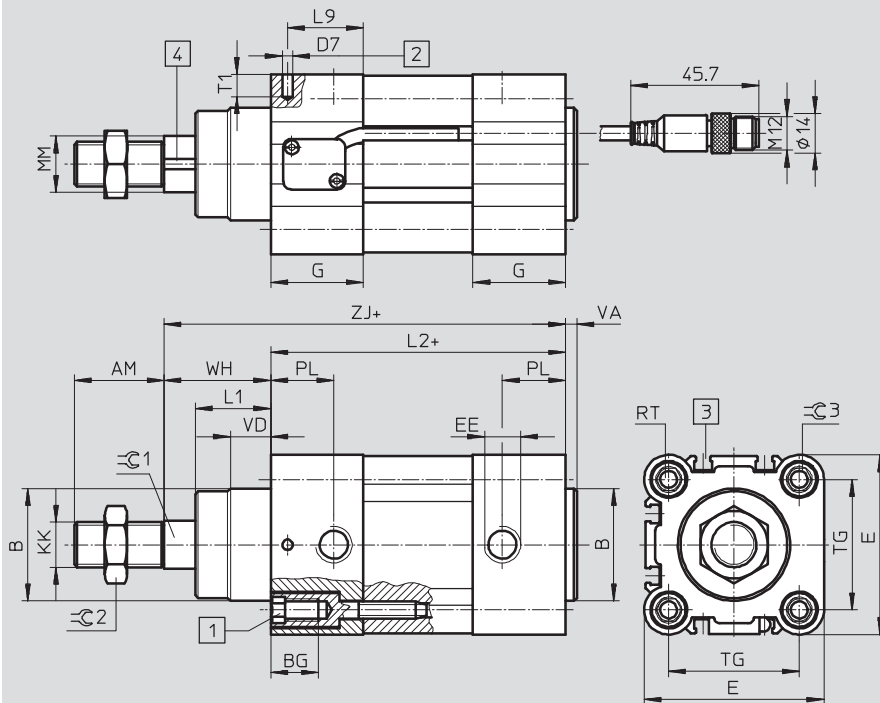
Technical data

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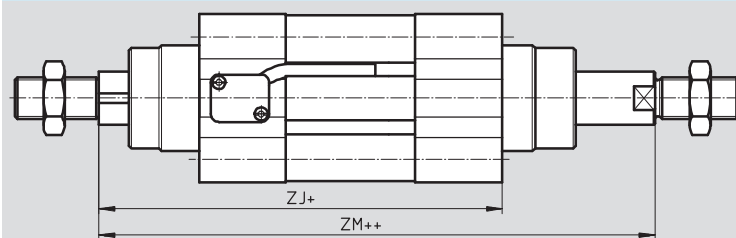
Dimensions

Download CAD data → www.festo.com

Basic version

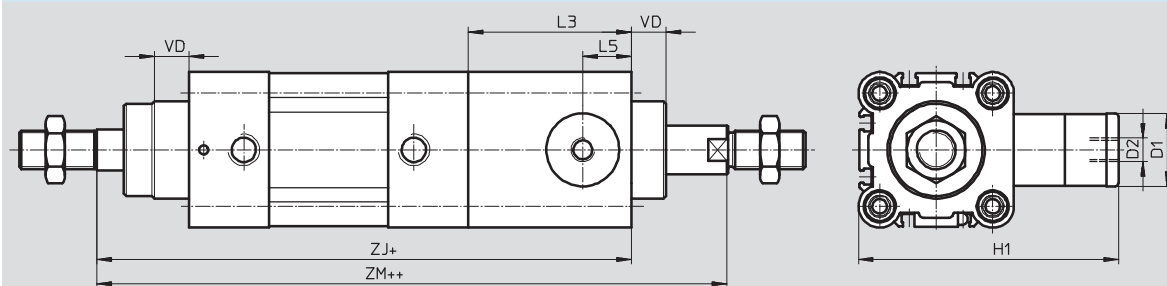


S2 – Through piston rod

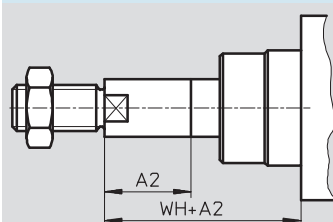


+ = plus stroke length
++ = plus 2x stroke length

S2 / KP – Through piston rod with clamping cartridge



K8 – Extended piston rod



Standard cylinders DNCI, with integrated displacement encoder

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Technical data

Ø [mm]	AM	A2 max.	B Ø d11	BG	D1 Ø f9	D2	D7 Ø	E	EE	G	H1
32	22	500	30	16	20	M5	3.7	45	G $\frac{1}{8}$	28	67
40	24	500	35	16	24	G $\frac{1}{8}$	3.7	54	G $\frac{1}{4}$	33	88
50	32	500	40	17	30	G $\frac{1}{8}$	3.7	64	G $\frac{1}{4}$	33	107
63	32	500	45	17	38	G $\frac{1}{8}$	3.7	75	G $\frac{3}{8}$	40.5	123

Ø [mm]	KK	L1	L2	L3	L5	L9	MM Ø f8	PL	RT	T1	TG
32	M10x1.25	18	94	45	14	22.5	12	15.6	M6	8	32.5
40	M12x1.25	21.3	105	53	16	27	16	14	M6	8	38
50	M16x1.5	26.8	106	67	20	27	20	14	M8	8	46.5
63	M16x1.5	27	121	76	24	33	20	17	M8	8	56.5

Ø [mm]	PI	VD	WH	ZJ		ZM		=C1	=C2	=C3
					KP		KP			
32	4	10	26	120	165	148	193	10	16	6
40	4	10.8	30	135	188	167	220	13	18	6
50	4	14.3	37	143	210	183	250	17	24	8
63	4	14.5	37	158	234	199	275	17	24	8

Standard cylinders DNCI, with integrated displacement encoder

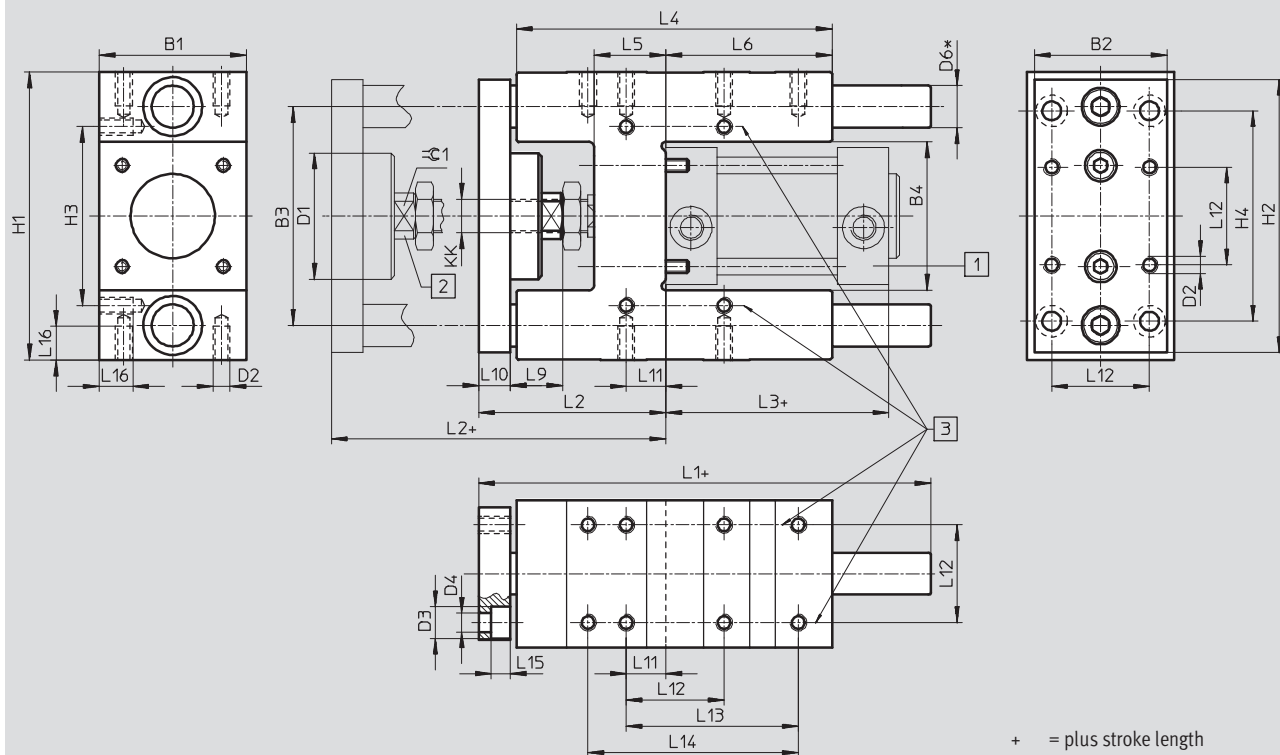
Technical data

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Dimensions

Download CAD data → www.festo.com

Guide unit FENG-KF



Standard cylinders DNCI, with integrated displacement encoder

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Technical data

For Ø [mm]	B1 -0.3	B2	B3 ±0.2	B4 ±0.3	D1 Ø	D2	D3 Ø	D4 Ø	D6 Ø h6	H1
32	50	45	74	50.5	44	M6	11	6.6	12	97 _{-0.4}
40	58	54	87	58.5	44	M6	11	6.6	16	115 _{-0.4}
50	70	63	104	70.5	60	M8	15	9	20	137 _{-0.5}
63	85	80	119	85.5	60	M8	15	9	20	152 _{-0.5}

For Ø [mm]	H2	H3 ±0.2	H4 ±0.2	KK	L1	L2	L3	L4	L5	L6
32	90	61	78	M10x1.25	155	67 ₊₅	94	125	24	76
40	110	69	84	M12x1.25	170	75 ₊₅	105	140	28	81
50	130	85	100	M16x1	188	89 ₊₁₀	106	150	34	79
63	145	100	105	M16x1	220	89 ₊₁₀	121	182	34	111

For Ø [mm]	L9	L10	L11	L12 ±0.2	L13 ±0.2	L14 ±0.2	L15	L16	≈C1
32	20	12	4.3	32.5	70.3	78	6.5	12	15
40	22	12	11	38	84	–	6.5	14	15
50	25	15	18.8	46.5	81.8	100	9	16	19
63	25	15	15.3	56.5	105	–	9	16	19

Standard cylinders DNCI, with integrated displacement encoder

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Ordering data – Modular products

M Mandatory data →					
Module No.	Function	Piston Ø	Stroke	Cushioning	Position sensing
535 411	DNCI	32	10 ... 2,000	P	A
535 412		40			
535 413		50			
535 414		63			
Order example					
535 411	DNCI	- 32	- 100	- P	- A

Ordering table							
Piston Ø	32	40	50	63	Condi- tions	Code	Enter code
M Module No.	535 411	535 412	535 413	535 414			
Function	Standard cylinder with integrated displacement encoder, non-rotating piston rod					DNCI	DNCI
Piston Ø [mm]	32	40	50	63		-...	
Stroke [mm]	10 ... 2,000				1	-...	
Cushioning	Flexible cushioning rings/pads at both ends					-P	-P
Position sensing	For proximity sensing					-A	-A

1 Stroke Can only be used as a positioning drive without reservation in the range from 100 ... 500 mm

Transfer order code

	DNCI	-		-		-	P	-	A	-
--	------	---	--	---	--	---	---	---	---	---

Standard cylinders DNCI, with integrated displacement encoder

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Ordering data – Modular products

0 Options				
Type of piston rod	Piston rod extended at front	Clamping unit	Guide	Measuring head
S2	...K8	KP	FENG	MS
-	-	-	-	-

Ordering table							
Piston Ø	32	40	50	63	Condi- tions	Code	Enter code
0 Type of piston rod	Through piston rod					-S2	
Piston rod extended [mm]	1 ... 500				2	-...K8	
Clamping unit	Clamping cartridge				3	-KP	
Guide	Guide unit with ball bearing guide on the sensor head side				4	-FENG	
Measuring head	No measuring head					-MS	

2 K8

In combination with piston rod type S2, the piston rod is only extended at the front (the side facing the measuring head)

3 K9

Only with piston rod type S2

4 FENG

Maximum stroke length 500 mm

Transfer order code

- - - - - -

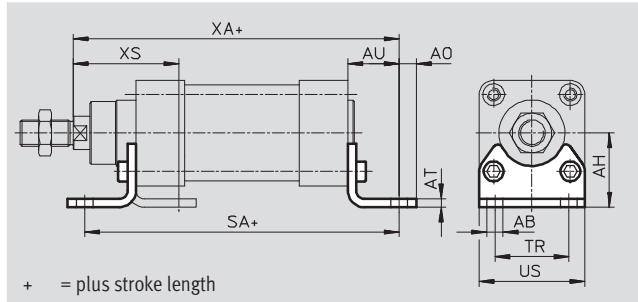
Standard cylinders DNCI, with integrated displacement encoder

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Accessories

Foot mounting HNC

Material:
galvanised steel
Free of copper, PTFE and silicone



Dimensions and ordering data							
For Ø	AB Ø	AH	AO	AT	AU	SA	
[mm]						Basic cylinder	KP
32	7	32	6.5	4	24	142	187
40	10	36	9	4	28	161	214
50	10	45	9.5	5	32	170	237
63	10	50	12.5	5	32	185	261

For Ø	TR	US	XA		XS	CRC ¹⁾	Weights	Part No.	Type
[mm]			Basic cylinder	KP			[g]		
32	32	45	144	189	45	2	135	174 369	HNC-32
40	36	54	163	216	53	2	180	174 370	HNC-40
50	45	64	175	242	62	2	325	174 371	HNC-50
63	50	75	190	266	63	2	405	174 372	HNC-63

- 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 normal industrial environment or media such as coolants or lubricating agents

Standard cylinders DNCl, with integrated displacement encoder

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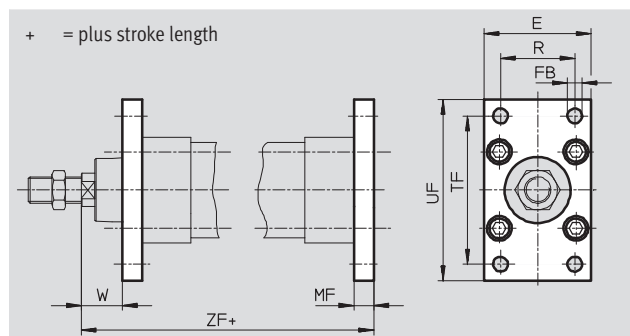
Accessories

Flange mounting FNC

Material:

FNC: galvanised steel

Free of copper, PTFE and silicone



Dimensions and ordering data												
For Ø	E	TC Ø H13	MF	R	TF	UF	W	ZF		CRC ¹⁾	Weights	Part No. Type
[mm]								Basic cylinder	KP		[g]	
32	45	7	10	32	64	80	16	130	175	2	240	174 376 FNC-32
40	54	9	10	36	72	90	20	145	198	2	280	174 377 FNC-40
50	65	9	12	45	90	110	25	155	222	2	520	174 378 FNC-50
63	75	9	12	50	100	120	25	170	246	2	690	174 379 FNC-63

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 normal industrial environment or media such as coolants or lubricating agents

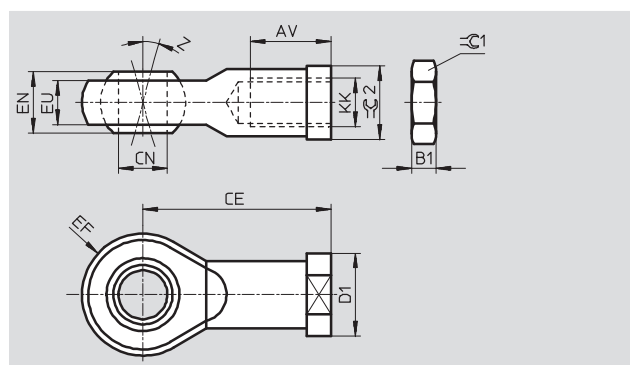
Rod eye SGS

Scope of delivery:

1 rod eye, 1 hex nut to DIN 439

Material:

galvanised steel



Dimensions and ordering data														
For Ø	AV	B1	CE	CN Ø	D1 Ø	EF ±0.5	EN	Z	≈C1	≈C2	CRC ¹⁾	Weights	Part No.	Type
[mm]				H7				[°]				[g]		
M10x1.25	20 -2	5	43	10	19	14	14	13	17	17	2	70	9 261	SGS-M10x1,25
M12x1.25	22 -2	6	50	12	22	16	16	13	19	19	2	105	9 262	SGS-M12x1,25
M16x1.5	28 -2	8	64	16	27	21	21	15	24	22	2	210	9 263	SGS-M16x1,5

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 normal industrial environment or media such as coolants or lubricating agents

Standard cylinders DNCI, with integrated displacement encoder

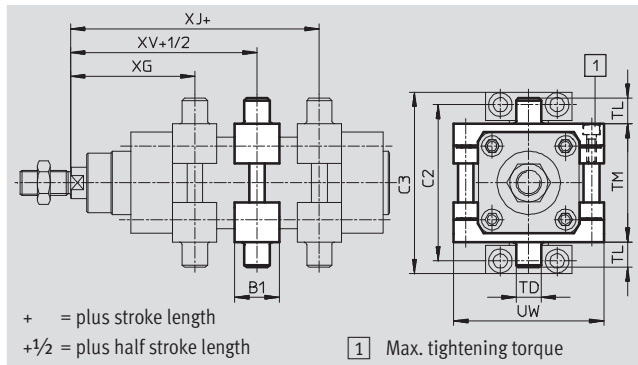
FESTO

Accessories

Trunnion mounting kit ZNCM

The mounting kit can be attached at any position along the profile barrel of a cylinder.

Material:
tempered steel



Dimensions and ordering data									
For Ø	B1	C2	C3	TD Ø e9	TL	TM	UW	XG	
[mm]								Basic cylinder	KP
32	30	71	86	12	12	50	65	66.1	111.1
40	32	87	105	16	16	63	75	75.6	128.6
50	34	99	117	16	16	75	95	83.6	150.6
63	41	116	136	20	20	90	105	93.1	169.1

For Ø [mm]	XJ		XV		Max. tightening torque [Nm]	CRC ¹⁾	Weights [g]	Part No.	Type
	Basic cylinder	KP	Basic cylinder	KP					
32	79.9	124.9	73	118	4+1	2	210	163 525	ZNCM-32
40	89.4	142.4	82.5	135.5	8+1	2	385	163 526	ZNCM-40
50	96.4	163.4	90	157	8+2	2	595	163 527	ZNCM-50
63	101.9	177.9	97.5	173.5	18+2	2	890	163 528	ZNCM-63

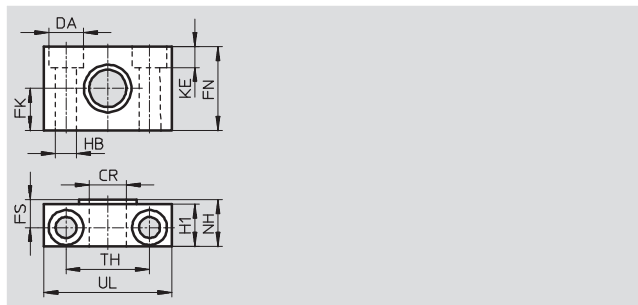
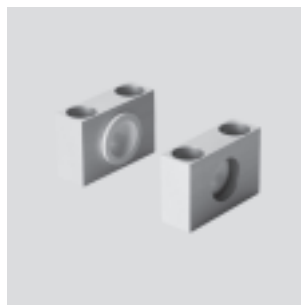
1) Corrosion resistance class 2 according to Festo standard 940 070

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

Trunnion supports LN2G

Material:
Trunnion support:
Anodised aluminium
Plain bearing: Plastic

Free of copper, PTFE and silicone



Dimensions and ordering data															
For Ø	CR	DA	FK	FN	FS	H1	HB	KE	NH	TH	UL	CRC ¹⁾	Weights	Part No.	Type
[mm]	Ø	Ø	Ø				Ø						[g]		
	D11	H13	±0.1				H13			±0.2					
32	12	11	15	30	10.5	15	6.6	6.8	18	32	46	2	125	32 959	LNZG-32
40, 50	16	15	18	36	12	18	9	9	21	36	55	2	400	32 960	LNZG-40/50
63	20	18	20	40	13	20	11	11	23	42	65	2	480	32 961	LNZG-63/80

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 normal industrial environment or media such as coolants or lubricating agents

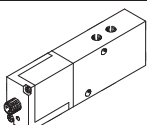
Standard cylinders DNCl, with integrated displacement encoder

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Accessories

Ordering data				
	For Ø	Remarks	Part No. Type	PU ¹⁾
Push-in fitting			Technical data → Internet: quick star	
	32	–	186 098 QS-G ¹ / ₈ -8	10
	40		186 099 QS-G ¹ / ₄ -8	10
	50		186 101 QS-G ¹ / ₄ -10	10
	63		186 100 QS-G ³ / ₈ -8	10
			186 102 QS-G ³ / ₈ -10	10
Slot cover			Technical data → Internet: abp	
	32, 40, 50, 63	every 0.5 m	151 680 ABP-5-S	2

1) Packaging unit quantity

Ordering data – Proportional directional control valves			Technical data → Internet: mpye	
	For Ø [mm]	Stroke [mm]	Part No.	Type
	For applications with axis controller SPC200			
	32	50 ... 150	154 200	MPYE-5-M5-010-B
		150 ... 400	151 692	MPYE-5-1/8-LF-010-B
		> 400	151 693	MPYE-5-1/8-HF-010-B
	40	50 ... 300	151 692	MPYE-5-1/8-LF-010-B
		> 300	151 693	MPYE-5-1/8-HF-010-B
	50	50 ... 200	151 692	MPYE-5-1/8-LF-010-B
		200 ... 900	151 693	MPYE-5-1/8-HF-010-B
		> 900	151 694	MPYE-5-1/4-010-B
	63	50 ... 300	151 693	MPYE-5-1/8-HF-010-B
		300 ... 1,000	151 694	MPYE-5-1/4-010-B
		> 1,000	151 695	MPYE-5-3/8-010-B
	For applications with Soft Stop end position controller SPC11			
	32	100 ... 500	151 692	MPYE-5-1/8-LF-010-B
		> 500	151 693	MPYE-5-1/8-HF-010-B
	40	100 ... 320	151 692	MPYE-5-1/8-LF-010-B
		320 ... 500	151 693	MPYE-5-1/8-HF-010-B
		> 500	151 694	MPYE-5-1/4-010-B
	50	100 ... 250	151 692	MPYE-5-1/8-LF-010-B
		250 ... 400	151 693	MPYE-5-1/8-HF-010-B
		> 500	151 694	MPYE-5-1/4-010-B
	63	100 ... 200	151 692	MPYE-5-1/8-LF-010-B
		200 ... 400	151 693	MPYE-5-1/8-HF-010-B
		400 ... 650	151 694	MPYE-5-1/4-010-B
		> 650	151 695	MPYE-5-3/8-010-B

 Note
Recommended proximity sensor
→ Internet: dnc

Standard cylinders DNCM, external displacement encoder

Key features

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Individual positioning components with standard cylinder DNCM ...



Proportional directional control valve
MPYE-...
→ Internet: mpye



Soft Stop → Internet: soft stop

End position controller
SPC11-POT-TLF



Positioning technology → Internet: spc

Axis interface
SPC-AIF-POT



Axis positioning controller
SPC200



Standard cylinders DNCM, external displacement encoder

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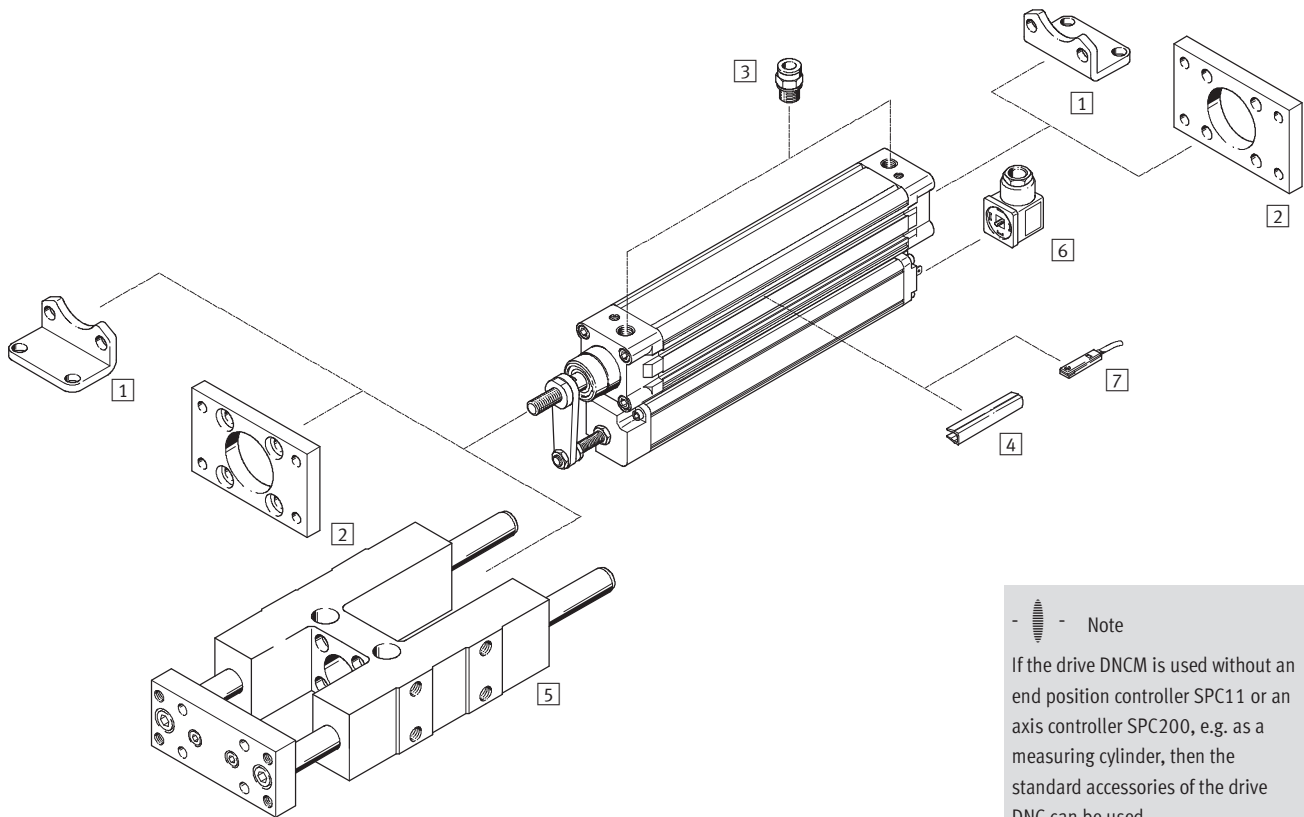
Type code

		DNCM	-	32	-	400	-	P	-	POT2	-		-	FENG	-	
Type																
DNCM	Standard cylinder															
Piston Ø [mm]																
Stroke [mm]																
Cushioning																
P	Flexible cushioning rings/pads at both ends															
Encoder attachment position																
POT1	bottom															
POT2	at rear															
POT3	top															
Piston rod type																
S2	Through															
S20	Through, hollow															
Guide																
FENG	Guide unit with ball bearing guide															
Position sensing																
A	For proximity sensing															

Standard cylinders DNCM, external displacement encoder

Peripherals overview

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Standard cylinders DNCM, external displacement encoder

Peripherals overview

Accessories		
Type	Brief description	→ Page/Internet
1 Foot mounting HNC	to mount the drive on the bearing and end cap	36
2 Flange mounting FNC	to mount the drive on the bearing and end cap	36
3 Push-in fitting QS	for connecting compressed air tubing with standard O.D.	37
4 Slot cover ABP-5-S	to protect against the ingress of dirt	36
5 Guide unit ¹⁾ FENG-KF	to protect against torsion at high torque loads	feng
6 Plug socket MSSD-C-4P	to connect the displacement encoder, is part of the end position controller SPC11 and the axis controller SPC200	37
7 Proximity sensors SME-/SMT-8	for additional sensing of the piston position, can be ordered optionally, only in conjunction with the order code A in the drive's modular product section.	proximity sensor

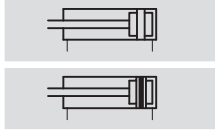
1) FENG-KF must be attached to the piston rod such that backlash is excluded.

Standard cylinders DNCM, external displacement encoder

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Technical data

Function



- $\varnothing$ - Diameter
32 mm and 50 mm
- | - Stroke length
100 ... 500 mm



General technical data		
Piston $\varnothing$	32	50
Design	Piston	
	Piston rod	
	Profile barrel	
Mode of operation	Double-acting	
Operating medium ¹⁾	Compressed air, filtered and unlubricated, filter unit 5 μ m	
Cushioning	Flexible cushioning rings/pads at both ends	
Position sensing	Displacement encoder, attached externally	
	Proximity sensor ²⁾	
Measuring principle (displacement encoder)	Analogue with encoder, contacting and absolute measurement	
Type of mounting	Foot mounting	
Stroke ³⁾	[mm]	100, 160, 200, 250, 320, 400, 500
Torsion protection/Guide ⁴⁾	Guide rod with yoke, with ball bearing guide	
Stroke	[mm]	100, 160, 200, 250
Pneumatic connection	G1/8	G1/4
Electrical connection	4-pin plug, type A DIN 43 650	

- 1) The proportional directional control valve MPYE used requires the characteristic values.
- 2) Not included in the scope of delivery, can be ordered as an option.
- 3) Note stroke reduction in conjunction with SPC200.
- 4) FENG-KF guide must be ordered as an option and will be supplied attached, the max. stroke is reduced.

Forces [N] and impact energy [Nm]		
Piston $\varnothing$	32	50
Theoretical force at 6 bar advancing	483	1,178
Theoretical force at 6 bar retracting	415	990
Max. impact energy at end positions	0.1	0.2

Permissible impact velocity:

$$v_{perm.} = \sqrt{\frac{2 \times E_{perm.}}{m_{dead} + m_{load}}}$$

Maximum permissible load:

$$m_{load} = \frac{2 \times E_{perm.}}{v^2} - m_{dead}$$

$v_{perm.}$ Permissible impact velocity
 $E_{perm.}$ Max. impact energy
 m_{dead} Moving load (drive)
 m_{load} Moving work load

Note
 These specifications represent the maximum values which can be reached. Note the maximum permitted impact energy.

Standard cylinders DNCM, external displacement encoder

Technical data

Positioning characteristics with axis controller SPC200				
Piston Ø		32		50
Repetition accuracy	horizontal	[mm]	±0.2	
	vertical	[mm]	±0.2 (for stroke 0 ... 200 mm)	
		[mm]	±0.4 (for stroke 200 ... 500 mm)	
Mounting position			Any	
Minimum load, horizontal ¹⁾		[kg]	3	8
Maximum load, horizontal ¹⁾⁶⁾		[kg]	45	120
Minimum load, vertical ¹⁾		[kg]	3	8
Maximum load, vertical ¹⁾⁶⁾		[kg]	15	40
Min. speed of travel		[m/s]	0.05	0.05
Max. speed of travel		[m/s]	2.2	1.7
Typ. positioning time, long stroke ²⁾		[s]	0.45/0.75	0.65/0.85
Typ. positioning time, short stroke ³⁾		[s]	0.35/0.55	0.45/0.60
Minimum positioning stroke ⁴⁾		[mm]	3	3
Stroke reduction ⁵⁾		[mm]	≥ 10	≥ 15
Recommended proportional directional control valve			→ 37	

1) Load = effective load + mass of all moving parts on the drive

2) At 6 bar, horizontal mounting position, DNCM-XX-500, 400 mm positioning travel at min./max. load

3) At 6 bar, horizontal mounting position, DNCM-XX-500, 100 mm positioning travel at min./max. load

4) In relation to the maximum stroke of the drive, but never more than 20 mm.

5) The stroke reserve is to be maintained on every side of the drive, the max. positionable stroke is therefore: Stroke – 2x stroke reserve

6) With external guide

Positioning characteristics with Soft Stop end position controller SPC11				
Piston Ø		32		50
Repetition accuracy of a mid-position ¹⁾		[mm]	±2	
Mounting position			horizontal	
Minimum load, horizontal ²⁾		[kg]	3	8
Maximum load, horizontal ²⁾		[kg]	45	120
Travel time			→ Sizing software "Smart Soft Stop": → www.festo.com	
Recommended proportional directional control valve			→ 37	

1) In the stroke range from 100 ... 500 mm

2) Load = effective load + mass of all moving parts on the drive

Operating and environmental conditions				
Piston Ø		32		50
Operating pressure ¹⁾		[bar]	4 ... 8	
Ambient temperature ²⁾		[°C]	-10 ... +80	
Vibration resistance			To DIN/IEC 68 Parts 2 -6, severity level 2	
Continuous shock resistance			To DIN/IEC 68 Parts 2 -27, severity level 2	
CE marking symbol (see conformity declaration)			As per EU EMC directive	
Protection class (displacement encoder)			IP54 to IEC 60 529	
Corrosion resistance class CRC ³⁾			1	

1) Only applies for applications with the Soft Stop end position controller SPC11 and axis controller SPC200.

2) Note operating range of proximity sensors

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

Components requiring low corrosion resistance. Transport and storage protection.

Weights [g] with displacement encoder								
Piston Ø		Stroke						
		100	160	200	250	320	400	500
32	Product weight	1,160	1,406	1,640	1,990	2,312	2,640	3,190
	Moving load	310	375	430	490	565	660	760
50	Product weight	2,270	2,684	3,030	3,520	4,038	4,590	5,420
	Moving load	850	1,010	1,125	1,265	1,455	1,675	1,935

Standard cylinders DNCM, external displacement encoder

FESTO

Technical data

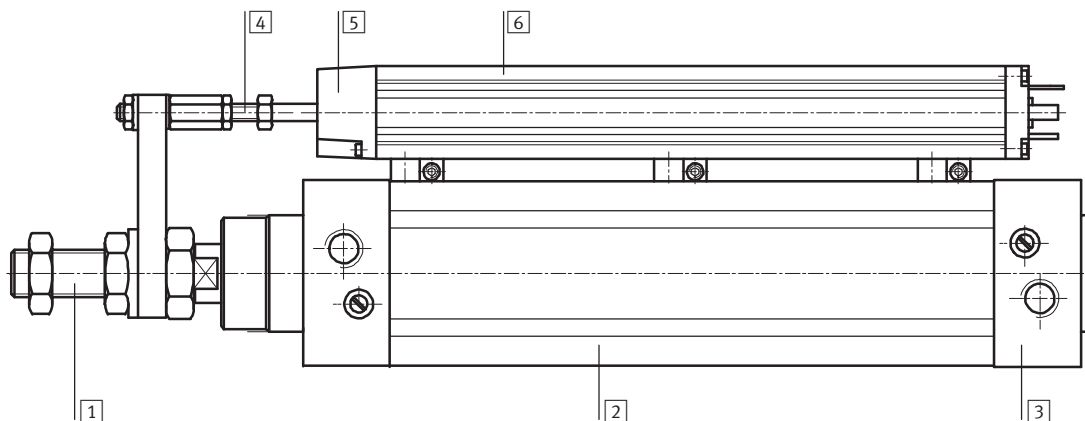
Electrical data, displacement encoder									
Stroke			100	160	200	250	320	400	500
Power supply ¹⁾	[V DC]	10							
Max. current consumption	[mA]	4							
Wiper current	recommended	[μA]	< 1						
	maximum ²⁾	[mA]	10						
Connection resistance	[kΩ]	3	5						
Connection resistance tolerance	[%]	±20							
Resolution	[mm]	≤ 0.01							
Independent linearity	maximum	[%]	0.09	0.08	0.07	0.06	0.05	0.05	0.05
Temperature coefficient	[ppm/°K]	≤ 5							
Interface	Analogue								

1) Stabilised power supply is recommended, max. 42 V DC permissible.

2) Only permissible in the short-term in the event of a fault.

Materials

Sectional view



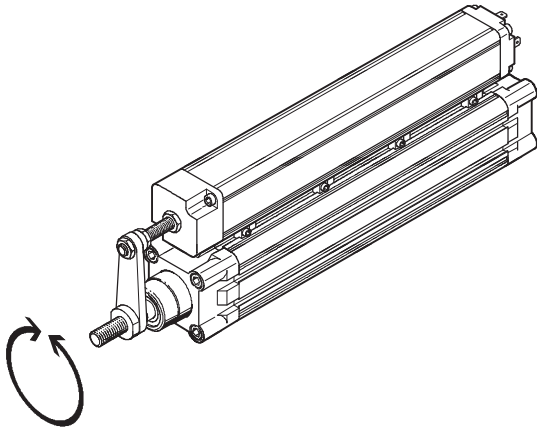
Drive		
1	Piston rod	High-alloy steel
2	Cylinder barrel	Anodised aluminium
3	Bearing/end caps	Die-cast aluminium
-	Dynamic seals	Polyurethane TPE-U
-	Static seals	Nitrile rubber
-	Lubricant	Klüberplex BE31-102
Displacement encoder		
4	Connecting rod	High-alloy steel
5	Bearing cap	Reinforced polyester
6	Profile	Anodised aluminium
-	Resistor element	Conductive plastic
-	Wiper	Contact: Precious metal
		Silencer: Elastomer
-	Cover seal	Nitrile rubber
-	Rod seal	Tetrafluoroethylene
-	Lubricant	ISOFLEX Topas MB52

Standard cylinders DNCM, external displacement encoder

Technical data

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Torques and lateral forces



- Note

Torques or lateral forces can result in inaccurate measurement results. We therefore recommend that an external guide be used with the drive DNCM.

This must be attached to the piston rod such that backlash is excluded.

Use of the DNCM with the FENG-KF is recommended. The drive is delivered with the guide attached.

The permissible static and dynamic characteristic load values with and without attached guide

➔ Internet: dnc

Technical data for the S2 and S20 designs of the piston rod

➔ Internet: dnc

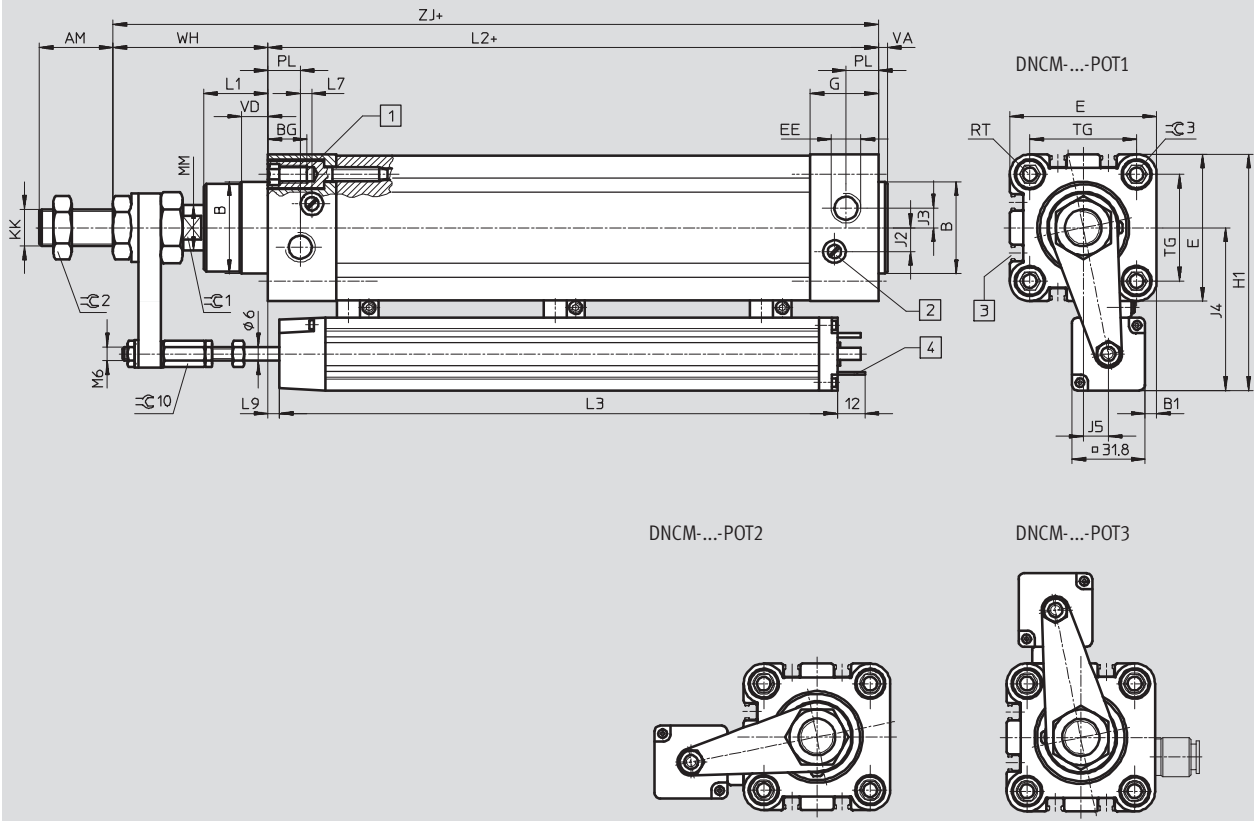
Standard cylinders DNCM, external displacement encoder

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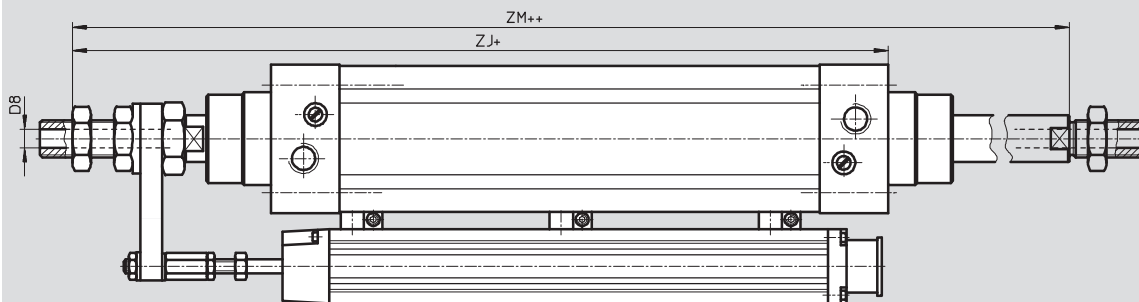
Technical data

Dimensions

Download CAD data → www.festo.com



DNCM-...-S2/DNCM-...-S20



- 1 Socket head screw with female thread for mounting attachments
- 2 Regulating screw for adjustable end-position cushioning

- 3 Sensor slot for proximity sensor SME/SMT-8
- 4 Plug connector to DIN 43 650-A

+ = plus stroke length
++ = plus 2x stroke length

Standard cylinders DNCM, external displacement encoder

FESTO

Technical data

∅ [mm]	AM	B ∅ d11	BG	B1 ±0.8	D8 ∅	E	EE	G	H1 ±1.5
32	22	30	16	0.24	4.5	45	G $\frac{1}{8}$	25.1	84.4
50	32	40	17	5.6	8	64	G $\frac{1}{4}$	29.6	103.4

∅ [mm]	J2	J3	J4 ±1	J5 ±1	KK	L1	L2
32	6	5.2	45.8	6.3	M10x1.25	18	94
50	10.4	8.5	55.3	10.6	M16x1.5	28	106

∅ [mm]	Stroke [mm]	L3	L7	L9	MM ∅ f8	PL	RT	TG	VA	VD
32	100	201	3.3	6.5 ±2	12	15.6	M6	32.5	4	10
	160	248		1 +2/-1						
	200	298		5 ±2						
	250	349		5.5 ±2						
	320	436		13 ±2						
	400	502		6 ±2						
	500	629		20 ±2						
50	100	201	5.1	6.5 ±2	20	14	M8	46.5	4	11.5
	160	248		1 +2/-1						
	200	298		5 ±2						
	250	349		5.5 ±2						
	320	436		13 ±2						
	400	502		6 ±2						
	500	629		0 ±2						

∅ [mm]	WH	ZJ	ZM	≈C1	≈C2	≈C3
32	44.4	138.4	166.4	10	16	6
50	67.4	173.4	213.4	17	24	8

Standard cylinders DNCM, external displacement encoder

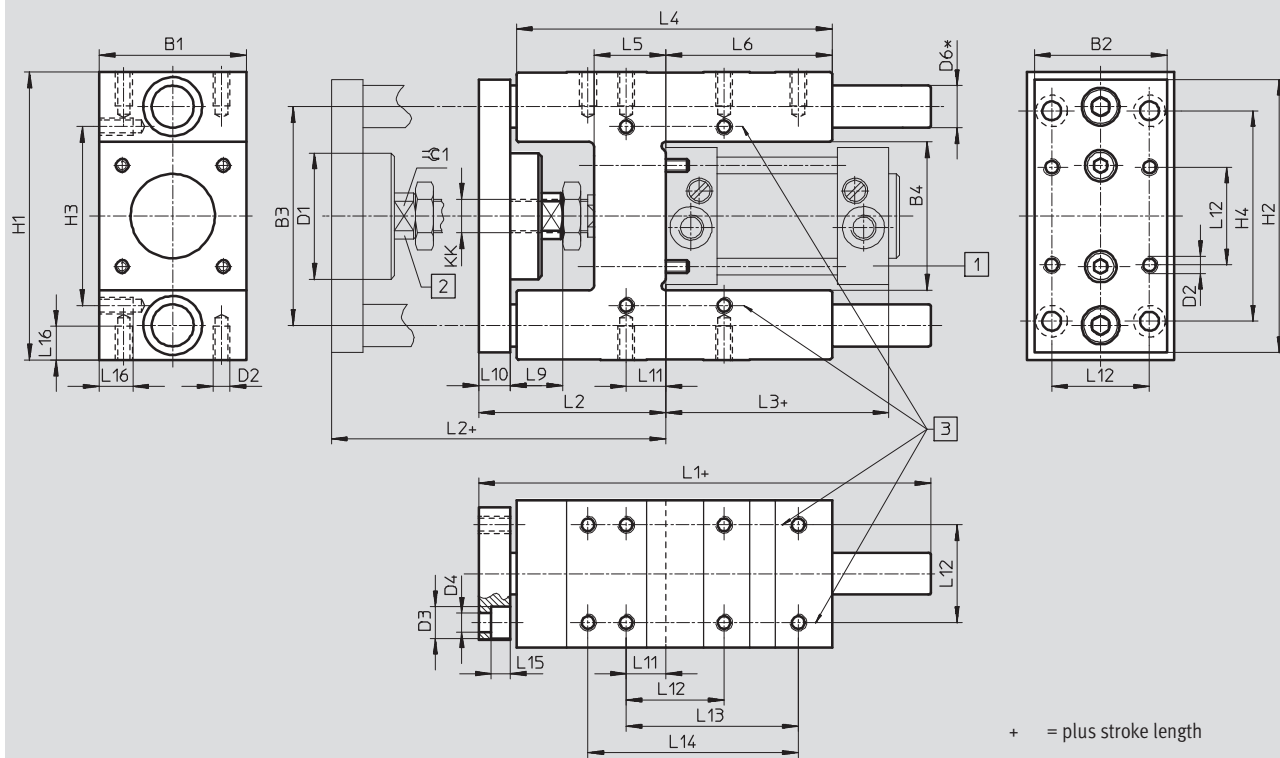
Technical data

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Dimensions

Download CAD data → www.festo.com

Guide unit FENG-KF



Standard cylinders DNCM, external displacement encoder

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Technical data

for Ø [mm]	B1 -0.3	B2	B3 ±0.2	B4 ±0.3	D1 Ø	D2	D3 Ø	D4 Ø
32	50	45	74	50.5	44	M6	11	6.6
50	70	63	104	70.5	60	M8	15	9

for Ø [mm]	D6 Ø h6	H1	H2	H3 ±0.2	H4 ±0.2	KK	L1	L2
32	12	97 _{-0.4}	90	61	78	M10x1.25	155	67 ₊₅
50	20	137 _{-0.5}	130	85	100	M16x1.5	188	89 ₊₁₀

for Ø [mm]	L3	L4	L5	L6	L9	L10	L11	L12 ±0.2
32	94	125	24	76	20	12	4.3	32.5
50	106	150	34	79	25	15	18.8	46.5

for Ø [mm]	L13 ±0.2	L14 ±0.2	L15	L16	≈G1	Stroke [mm]	Weight per 10 mm stroke [g]	Weight [g]
32	70.3	78	6.5	12	15	10 ... 500	18	1 530
50	81.8	100	9	16	19	10 ... 500	50	4 030

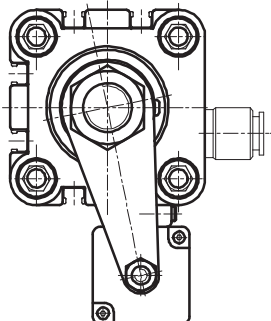
Standard cylinders DNCM, external displacement encoder

Ordering data – Modular product system

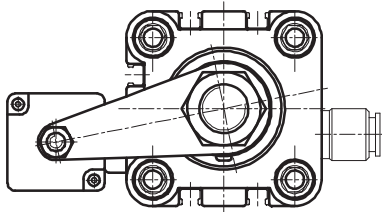
FESTO

Arrangement of the displacement encoder

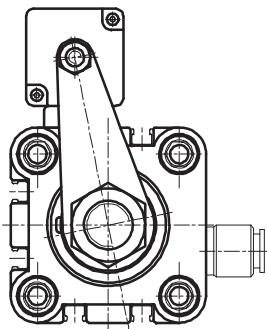
DNCM-...-POT1 (encoder underneath)



DNCM-...-POT2 (encoder at rear)



DNCM-...-POT3 (encoder on top)



Standard cylinders DNCM, external displacement encoder

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Ordering data – Modular product system

M Mandatory data						O Options		
Module No.	Basic function	Size	Stroke	Cushioning	Encoder attachment position	Piston rod type	Guide	Position sensing
528 940 528 941	DNCM	32 50	100 160 200 250 320 400 500	P	POT1 POT2 POT3	S2 S20	FENG	A
Ordering example								
528 941	DNCM	- 50	- 500	- P	- POT3	- S20	-	- A

Ordering table							
Size		32	50	Conditions	Code	Enter code	
M	Module No.	528 940	528 941				
	Basic function	Standard cylinder with displacement encoder			DNCM		DNCM
	Size [mm]	32	50		-...		
	Stroke [mm]	100			-100		
		160			-160		
		200			-200		
		250			-250		
		320		1	-320		
		400		1	-400		
		500		1	-500		
	Cushioning	Flexible cushioning rings/plates at both ends			-P		-P
	Encoder attachment position	Encoder underneath			-POT1		
		Encoder at rear			-POT2		
		Encoder on top			-POT3		
O	Piston rod type	Through piston rod		1	-S2		
		Through, hollow piston rod		1	-S20		
	Guide	Guide unit with ball bearing guide KF		2	-FENG		
	Position sensing	For proximity sensing			-A		

1 320, 400, 500, S2, S20

Not with guide FENG.

2 FENG

Only with POT2 encoder. FENG is mounted without backlash.

Transfer order code

	DNCM	-		-		-	P	-		-		-	
--	------	---	--	---	--	---	---	---	--	---	--	---	--

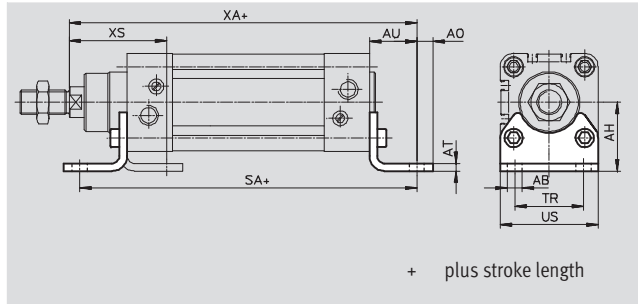
Standard cylinders DNCM, external displacement encoder

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Accessories

Foot mounting HNC

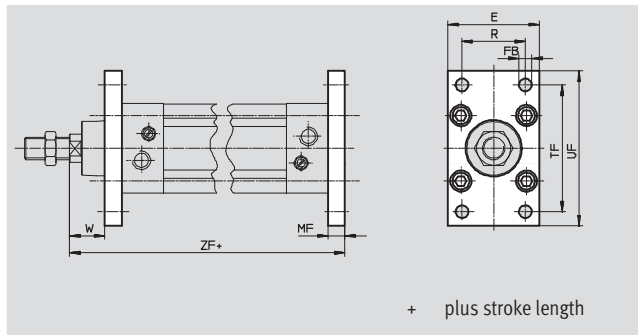
Material:
Galvanised steel
Free of copper, PTFE and silicone



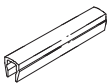
Dimensions and ordering data													
for Ø	AB	AH	AO	AT	AU	SA	TR	US	XA	XS	Weight	Part No.	Type
[mm]	Ø										[g]		
32	7	32	6.5	4	24	142	32	45	144	45	135	174 369	HNC-32
50	10	45	9.5	5	31	170	45	64	175	62	325	174 371	HNC-50

Flange mounting FNC

Material:
Galvanised steel
Free of copper, PTFE and silicone



Dimensions and ordering data										Part No.	Type
for Ø	E	FB	MF	R	TF	UF	W	ZF	Weight		
[mm]		Ø H13							[g]		
32	45	7	10	32	64	80	16	130	240	174 376	FNC-32
50	65	9	12	45	90	110	25	155	520	174 378	FNC-50

Ordering data – Slot cover			Technical data → Internet: abp		
	for Ø	Remarks	Part No.	Type	PU ¹⁾
	[mm]				
Slot cover ABP-S					
	32, 50	0.5 m each	151 680	ABP-5-S	2

1) Packaging unit quantity

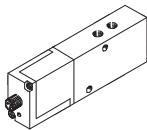
Standard cylinders DNCM, external displacement encoder

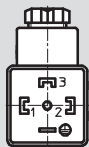
Accessories

FESTO

Ordering data – Push-in/threaded fittings			Technical data → Internet: quick star		
	for Ø [mm]	Remarks	Part No.	Type	PU ¹⁾
	32	for connecting compressed air tubing with standard O.D.	186 098	QS-G¹/₈-8	10
	50		186 099	QS-G¹/₄-8	

1) Packaging unit quantity

Ordering data – Proportional directional control valves			Technical data → Internet: mpye		
	for Ø [mm]	Stroke [mm]	Part No.	Type	
	for applications with axis controller SPC200				
	32	100/160/200/250/320	151 692	MPYE-5-¹/₈-LF-010-B	
		400/500	151 693	MPYE-5-¹/₈-HF-010-B	
	50	100/160/200/250/320/400/500	151 693	MPYE-5-¹/₈-HF-010-B	
	for applications with Soft Stop end position controller SPC11				
	32	100/160/200/250/320/400	151 692	MPYE-5-¹/₈-LF-010-B	
		500	151 693	MPYE-5-¹/₈-HF-010-B	
	50	100/160/200/250	151 692	MPYE-5-¹/₈-LF-010-B	
		320/400	151 693	MPYE-5-¹/₈-HF-010-B	
		500	151 694	MPYE-5-¹/₄-010-B	

Ordering data – Plug socket					
	PIN	Pin allocations	Designation	Part No.	Type
	1	Power supply	Plug socket	171 157	MSSD-C-4P
	2	Signal			
	3	0 V			
	PE	PE (yellow), screen			

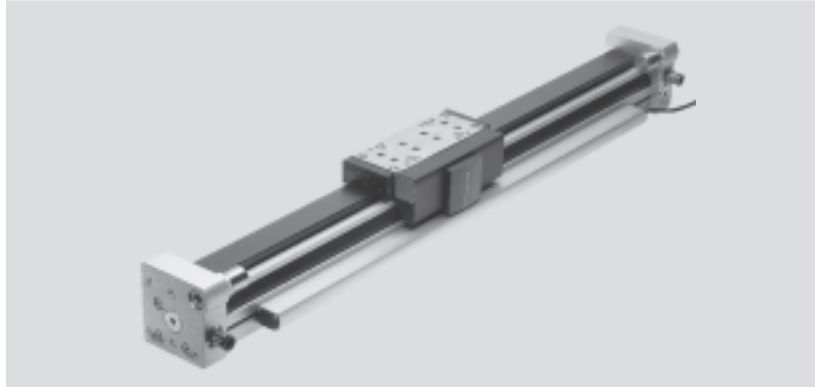
-  - Note
Recommended proximity sensor
→ Internet: dnc

Linear drives DGCI, with displacement encoder

Key features

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Individual positioning components with linear drive DGCI



Proportional directional control valve
MPYE-...
→ Internet: mpye



Soft Stop → Internet: spc11

End position controller
SPC11-MTS-AIF-2



Positioning technology → Internet: spc

Axis interface
SPC-AIF-MTS-2



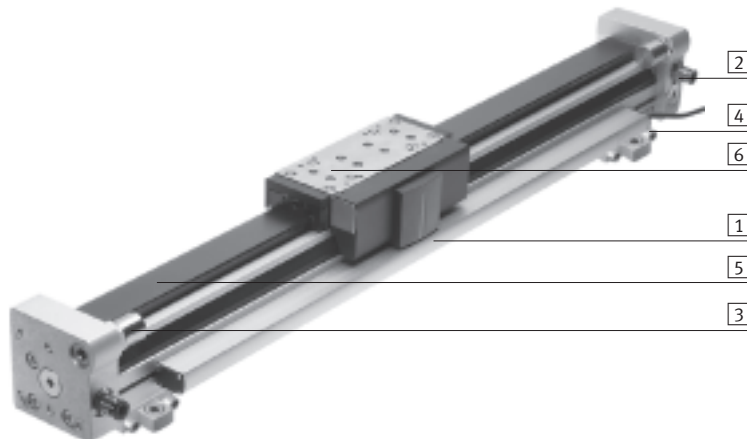
Axis controller
SPC200



Linear drives DGCI, with displacement encoder

Key features

At a glance



1 Displacement encoder → 46 • High degree of protection IP67 • Non-contacting • Measures absolute values	2 Supply ports → 54 • Optionally on two sides (on the end face or on the front) • Optionally with different coloured push-in fittings for simple and error-free tubing connections
3 End stops → 48 • Metal fixed stop • Shock absorber, precisely adjustable	4 Profile mounting → 47 • Profile mountings remain on the base plate after the drive is dismantled. This saves time during assembly and removal
5 Recirculating ball bearing guide → 44 • Piston Ø 18 ... 63 mm • Stroke lengths 100 ... 2,000 mm • Guide backlash = 0 mm • For medium and large loads • Precision mounting interface with stainless steel slide • Operating behaviour with torque load = very good	6 Recirculating ball bearing guide with protected guide → 44 • Piston Ø 18 ... 40 mm • Stroke lengths 100 ... 2,000 mm • Guide backlash = 0 mm • The protected guide cleans the guide rail and protects the recirculating ball bearing guide by means of an additional wiper seal and lubrication unit
– Passive guide axis DGC-FA → 7 • No drive • Piston Ø 8 ... 63 mm • Stroke lengths 1 ... 5,000 mm • Guide backlash = 0 mm • Precision guide, suitable for DGCI. Can be used as a machine component or as a twin guide with DGCI	– Passive guide axis with protected guide DGC-FA-GP → 7 • No drive • Piston Ø 18 ... 63 mm • Stroke lengths 1 ... 5,000 mm • Guide backlash = 0 mm • The protected guide cleans the guide rail and protects the recirculating ball bearing guide by means of an additional wiper seal and lubrication unit

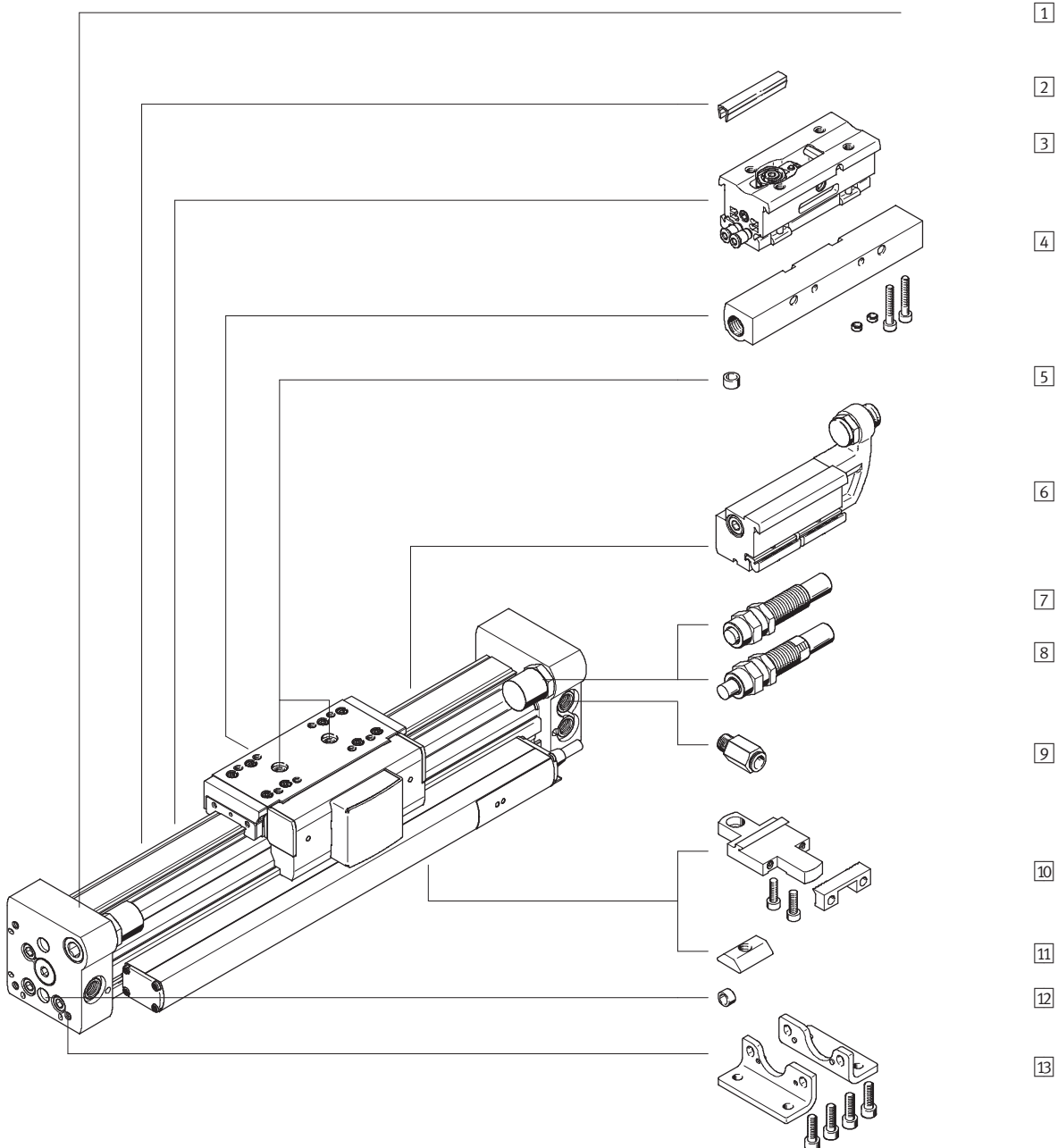
Linear drives DGCI, with displacement encoder

Peripherals overview

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 Note

Drive must not be operated without end stops or shock absorbers.



Linear drives DGCI, with displacement encoder

Peripherals overview

Variants and accessories			
Type	For piston Ø	Brief description	→ Page/Internet
1 Linear drive DGCI-KF	18 ... 63	Linear drive without accessories, with recirculating ball bearing guide.	44
2 Slot cover L	18 ... 63	For protecting against ingress of dirt and securing proximity sensor cables.	64
3 Intermediate position module DADM-DGC	25, 32	Facilitates intermediate positions with metal fixed stop. The module can be attached.	62
4 Shock absorber retainer DADP-DGC	18 ... 63	For variable end position adjustment in combination with the stop KYC.	60
5 Centring pin/sleeve ¹⁾ ZBS/ZBH	18 ... 63	For centring loads and attachments on the slide.	64
6 Stop KYC	18 ... 63	For variable end position adjustment in combination with the shock absorber retainer DADP-DGC.	60
7 Shock absorber YSR	18 ... 63	Self-adjusting hydraulic shock absorber with spring return and linear cushioning characteristic.	56
8 Shock absorber YSRW	18 ... 63	Self-adjusting hydraulic shock absorber with spring return and progressive cushioning characteristic.	56
9 Push-in fitting QS	18 ... 63	For connecting compressed air tubing with standard outer diameter.	54
10 Profile mounting M	18 ... 63	Simple and precise mounting option via dovetail connection.	59
11 Slot nut B	25 ... 63	For mounting attachments.	64
12 Centring pin/sleeve ¹⁾ ZBS/ZBH	18 ... 63	For centring the drive without foot mountings (user-specific).	64
13 Foot mounting F	18 ... 63	For mounting on the end cap.	58
– Proportional directional control valve MPYE	18 ... 63	Regulates the compressed air and therefore the position of the slide.	65

1) Included in the scope of delivery of the drive



Note

Assignment table of drives and associated proportional directional control valves → 65

Linear drives DGCI, with displacement encoder

Type codes

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		DGCI	-	25	-	1000	-	KF	-		-		-		-	
Type																
DGCI	Linear drive with displacement encoder															
Piston Ø [mm]																
Stroke [mm]																
Guide																
KF	Recirculating ball bearing guide															
Alternative supply port																
-	Push-in fitting at both ends, front															
QD	Push-in fitting at both ends, end face															
QR	Push-in fitting at one end, end face, right side															
Q	Threaded connection, end face open, front sealed															
Slide																
GP	Protected recirculating ball bearing guide															
Additional slide																
KL	Additional slide at left															
KR	Additional slide at right															
Cushioning																
-	Adjustable mechanical stop without cushioning															
YSR	Shock absorber, self-adjusting															
YSRW	Shock absorber, self-adjusting, progressive															

Linear drives DGCI, with displacement encoder

Type codes



		ZUB	F		2B	
Accessories						
ZUB	Accessories supplied separately					
Type of mounting						
F	Foot mounting					
M	Profile mounting					
Slot cover						
...L	For sensor slot					
Slot nut						
...B	For mounting slot					
Operating instructions						
0	Express waiver – no operating instructions to be included					

Linear drives DGCI, with displacement encoder

Technical data

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Function



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- Ø - Diameter
18 ... 63 mm
- I - Stroke length
100 ... 2,000 mm

General technical data					
Piston Ø	18	25	32	40	63
Constructional design	Rodless linear drive with displacement encoder				
Mode of operation	Double-acting				
Driver principle	Slotted cylinder, mechanically coupled				
Guide	External recirculating ball bearing guide				
Mounting position	Any				
Type of mounting	Profile mounting				
	Foot mounting				
	Direct mounting				
Pneumatic connection	M5	G1/8		G1/4	G3/8
Cushioning	- Via metal fixed stop - Optionally via shock absorber, self-adjusting at both ends				
→ 47					
Position sensing	Via displacement encoder				
Measuring principle (displacement encoder)	Digital, magnetostrictive, non-contacting and absolute measurement				
Stroke ¹⁾	[mm] 100, 160, 225, 300, 360, 450, 500, 600, 750, 850, 1000, 1250, 1750, 2000				
Protected version	Optional				–
Max. speed ²⁾	[m/s] 5				
Stroke tolerance	[mm] 0 ... 2.5				

1) Note: Stroke reduction in combination with SPC200

2) Only applies to positioning using axis controller SPC200 and end position controller SPC11. Otherwise a maximum speed of 3 m/s is permitted.

Operating and environmental conditions					
Piston Ø	18	25	32	40	63
Operating pressure [bar]	2 ... 8			1.5 ... 8	
Operating medium	Filtered and unlubricated compressed air, grade of filtration 5 µm				
Ambient temperature [°C]	-10 ... +60				
Vibration resistance to DIN/IEC 68 Parts 2-6	At 10 ...58 Hz: 0.15 mm				
	At 58 ...150 Hz: 2G				
Continuous shock resistance to DIN/IEC 68 Parts 2-27	Half sine 15g, 11 ms				
CE mark (see declaration of conformity)	In accordance with EU EMC directive				
Certification	C tick				
Protection class (displacement encoder)	IP67				
Corrosion resistance class CRC ¹⁾	1				

1) Corrosion resistance class 1 as per Festo standard 940 070

Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

Forces [N] and impact energy [Nm]					
Piston Ø	18	25	32	40	63
Theoretical force at 6 bar	153	295	483	754	1,870
Impact energy at the end positions	with fixed stop	0.4	0.5	0.7	0.7
	with shock absorber	→ 47			
	YSR/YSRW				

Linear drives DGCI, with displacement encoder

Technical data

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Positioning characteristics with axis controller SPC200					
Piston Ø	18	25	32	40	63
Repetition accuracy [mm]	→ 46				
Mounting position	Any				
Minimum load, horizontal ¹⁾ [kg]	1	2	3	5	12
Maximum load, horizontal ¹⁾ [kg]	15	30	50	75	180
Minimum load, vertical ¹⁾ [kg]	1	2	3	5	12
Maximum load, vertical ¹⁾ [kg]	5	10	15	25	60
Minimum travel speed [m/s]	0.05				
Maximum travel speed [m/s]	5				
Typ. positioning time, long stroke ²⁾ [s]	0.75/1.15	0.65/1.00	0.65/1.05	0.70/1.05	1.05/1.20
Typ. positioning time, short stroke ³⁾ [s]	0.38/0.65	0.38/0.60	0.38/0.60	0.38/0.60	0.65/0.65
Minimum positioning stroke ⁴⁾ [%]	3				
Stroke reduction ⁵⁾ [mm]	20	25	25	35	35
Recommended proportional directional control valve	→ 65				

1) Load = effective load + mass of all moving parts on the drive

2) At 6 bar, horizontal mounting position, DGCI-XX-1000, 800 mm positioning travel at min./max. load

3) At 6 bar, horizontal mounting position, DGCI-XX-1000, 100 mm positioning travel at min./max. load

4) Referred to the maximum stroke of the drive, but never more than 20 mm

5) The stroke reduction is to be maintained on every side of the drive, the max. positionable stroke is therefore: stroke – 2x stroke reduction

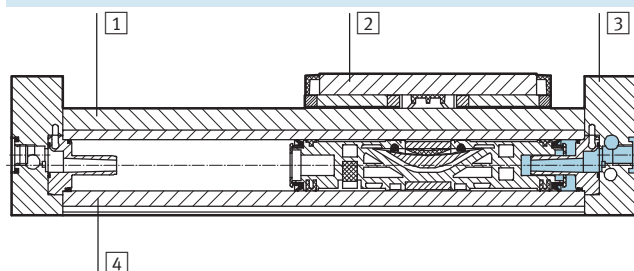
Positioning characteristics with end position controller SPC11					
Piston Ø	18	25	32	40	63
Repetition accuracy of an intermediate position [mm]	±2				
Mounting position	Any				
Minimum load, horizontal ¹⁾ [kg]	1	2	3	5	12
Maximum load, horizontal ¹⁾ [kg]	15	30	50	75	180
Minimum load, vertical ¹⁾ [kg]	1	2	3	5	12
Maximum load, vertical ¹⁾ [kg]	5	10	15	25	60
Travel time [s]	→ "SoftStop" software tool: www.festo.com				
Recommended proportional directional control valve	→ 65				

1) Load = effective load + mass of all moving parts on the drive

Weight [g]					
Piston Ø	18	25	32	40	63
Basic weight with 0 mm stroke	1,200	2,400	3,100	7,300	22,500
Additional weight per 10 mm stroke	38	56	81	124	243
Moving load	360	770	1,170	2,360	8,200
Moving load on additional slide	300	650	950	2,000	5,600

Materials

Sectional view



Linear drives		
1	Guide rail	High-alloy steel
2	Slide	High-alloy steel
3	End cap	Anodised aluminium
4	Cylinder profile, housing	Anodised aluminium
–	Seals, sealing band	Polyurethane
–	Guide band, dirt wiper, reversing roller	Polyacetal
–	Cover	Polyacetal, polyamide, powder-coated aluminium
–	Displacement encoder	Anodised aluminium, glass-fibre reinforced polyphthalamide
–	Cable	Polyurethane
–	Note on materials	Free of copper, PTFE and silicone

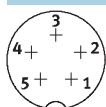
Linear drives DGCI, with displacement encoder

Technical data

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Electrical data for displacement encoder		
Linearity	[%]	±0.02 FS (min. ±50 µm)
Resolution	[mm]	≤0.01
Interface		CAN to ISO/DIS 11898
Power supply	[V DC]	24 (±25%)
Current consumption	[mA]	Typically 100
Max. temperature coefficient	[ppm/°K]	15
Electrical connection		Cable with 5-pin plug, round type M9
Cable length	[m]	1.5
Cable quality		Suitable for energy chains

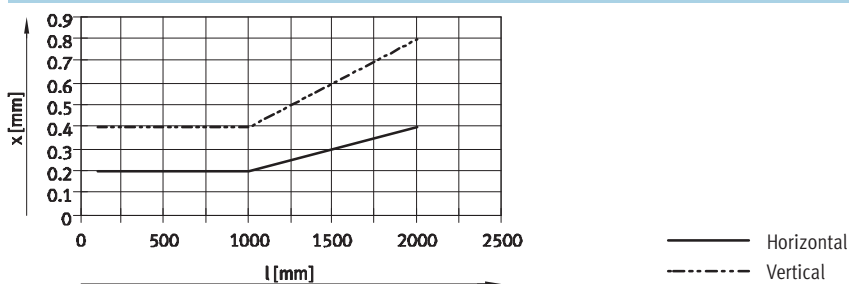
Pin allocation of plug for displacement encoder



Pin	Function
1	24 V
2	–
3	0 V

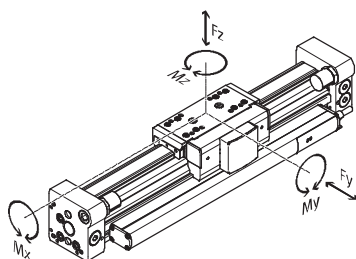
Pin	Function
4	CAN_H
5	CAN_L
–	Screen

Repetition accuracy x as a function of the stroke l

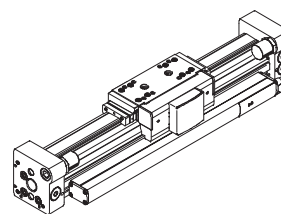


Characteristic load values for linear drive with recirculating ball bearing guide and guide

The indicated forces and torques refer to the slide surface and the centre of the slide. They must not be exceeded during dynamic operation. Special attention must be paid to the cushioning phase.



GP – Protected guide



If the drive is simultaneously subjected to several of the forces and torques listed below, the following equation must be satisfied in addition to the indicated maximum loads:

$$\frac{F_y}{F_{y_{\max}}} + \frac{F_z}{F_{z_{\max}}} + \frac{M_x}{M_{x_{\max}}} + \frac{M_y}{M_{y_{\max}}} + \frac{M_z}{M_{z_{\max}}} \leq 1$$

Note

To avoid distortion in the slide, the bearing surfaces of the attachments must maintain a flatness of 0.01 mm.

Permissible forces and torques						
Piston Ø		18	25	32	40	63
F _y _{max.}	[N]	1,850	3,050	3,310	6,890	15,200
F _z _{max.}	[N]	1,850	3,050	3,310	6,890	15,200
M _x _{max.}	[Nm]	16	36	54	144	529
M _y _{max.}	[Nm]	51	97	150	380	1,157
M _z _{max.}	[Nm]	51	97	150	380	1,157

Linear drives DGCI, with displacement encoder

Technical data

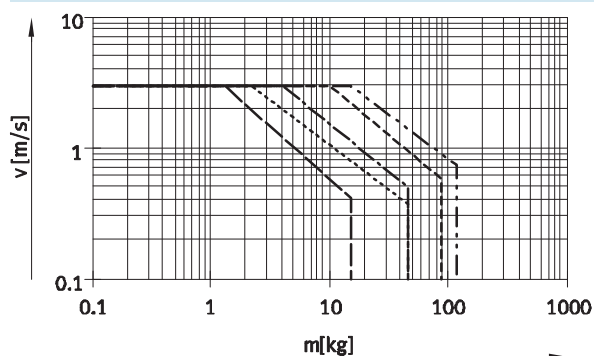
Number of profile mountings MUC as a function of overall length

Excessive distances between the profile mountings can reduce the positioning accuracy. The following table shows the required minimum number of profile and foot mountings.

Stroke [mm]	Number of mounting attachments		
	Order code M		Order code F
	Profile mounting	Foot mounting + profile mounting	
			
100 ... 400	2	2	0
401 ... 600	2	2	1
601 ... 1,200	3	2	1
1,201 ... 1,400	3	2	2
1,401 ... 2,000	4	2	2

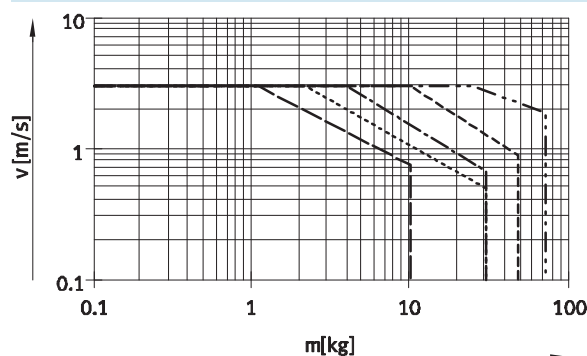
Maximum permissible piston speed with shock absorber v as a function of effective load m

Piston Ø 18 ... 63 with YSR cushioning



— Ø 18 - - - - - Ø 40
 - · - · - Ø 25 - · - · - Ø 63
 - · - - - Ø 32

Piston Ø 18 ... 63 with YSRW cushioning



Note

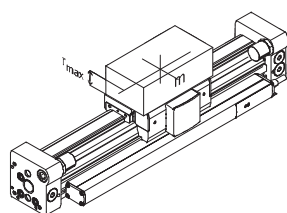
This data represents the maximum values that can be achieved.

In practice, values fluctuate relative to the size of the effective load.

Operating range of cushioning

The end position cushioning must be adjusted to ensure jerk-free operation. If the operating conditions are outside the permissible range, the

load to be moved must be cushioned using suitable equipment (shock absorbers, stops, etc.), preferably at the centre of gravity of the mass.



The data applies to a horizontal mounting position:

Piston Ø	18	25	32	40	63
Distance $r_{\max}$ [mm]	35	50	50	50	50

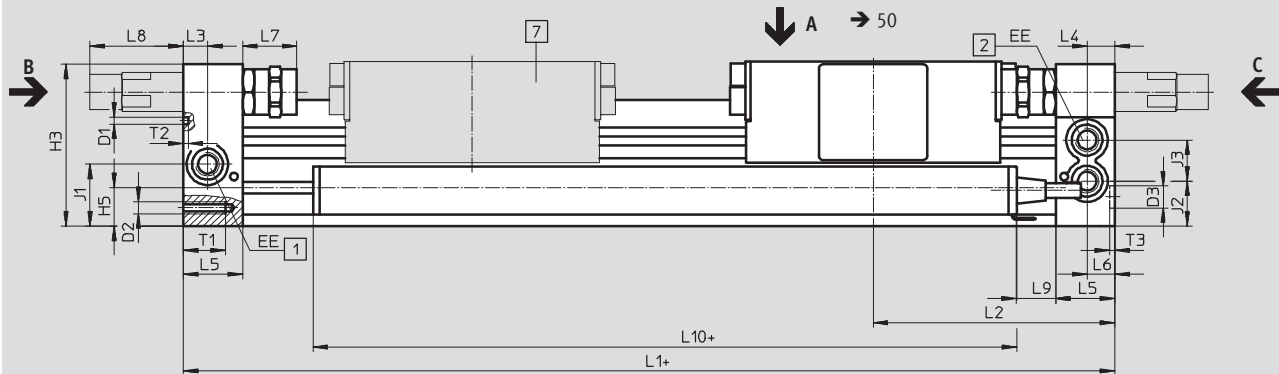
Linear drives DGCI, with displacement encoder

Technical data

Dimensions

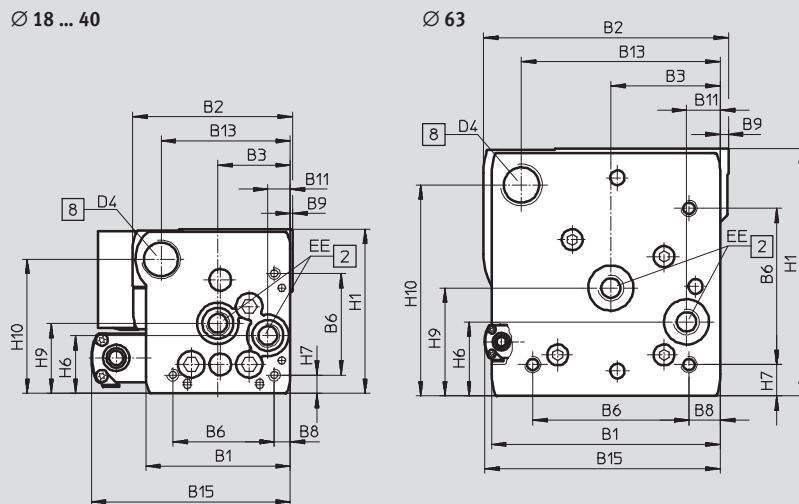
Download CAD data → www.festo.com

Ø 18 ... 63



View C

Ø 18 .. 40



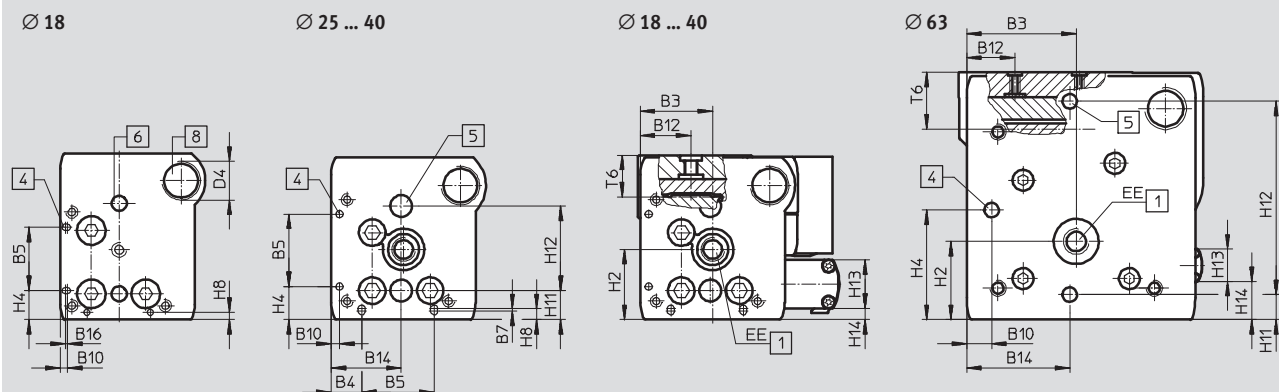
View B

Ø 18

Ø 25 ... 40

Ø 18 ... 40

Ø 63



- | | | | |
|---|--|--|---------------------------------------|
| + plus stroke length | 2 Option of supply port at both ends, for supplying from one end (on the end face, right-hand side) | 4 Mounting hole for foot mounting HPC | 6 Hole for centring sleeve ZBH |
| 1 Option of supply port at both ends (on the end face or on the front) | | 5 Hole for centring pin ZBS | 7 Additional slide |
| | | | 8 Thread for end stop |

Linear drives DGCI, with displacement encoder

Technical data

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Ø [mm]	B1	B2	B3	B4 ±0.1	B5 ±0.05	B6	B7	B8 ±0.1	B9	B10	B11	B12
18	44.5	49.9	19.5	8.8	21	31	–	3.8	1	2.4	5.5	15.5
25	59.8	66	30	12.65	30	42	1	6.65	1	3.5	9.3	21
32	73	79	38.5	5.7	63.1	57.5	–	8.5	1.5	14	14.9	18
40	91	98.5	45	17.2	55	65	–	12.2	2	8	16.5	24.8
63	142	149	68	–	–	97	–	19.5	5	15.5	21	30

Ø [mm]	B13	B14 ±0.05	B15	B16	D1 Ø	D2	D3 Ø H7	D4	EE	H1	H2	H3
18	39	19.5	68.3	0.8	2±0.05	M4	5	M12x1	M5	56.3	23.1	55
25	53	29	82.4	–	3±0.05	M5	9	M16x1	G $\frac{1}{8}$	68	29	67
32	65	38.5	97.8	–	3±0.05	M6	9	M16x1	G $\frac{1}{8}$	78.5	30	77
40	80.5	45	110.3	–	4±0.05	M6	9	M22x1.5	G $\frac{1}{4}$	99.5	41.5	97.5
63	123.5	68	146.3	–	9 ^{H7}	M10	9	M26x1.5	G $\frac{3}{8}$	153.5	48.5	151

Ø [mm]	H4 ±0.1	H5	H6	H7	H8	H9	H10	H11	H12 ±0.05	H13	H14	J1	J2
18	9.6	13.4	20	4.6	2.4	25.2	46	8.5±0.15	30	20	2.3	20	16.5
25	13.65	15.8	24	7.65	4.5	29	55.5	12±0.15	35	20	4.7	26.1	18.6
32	5.7	17	27.7	8.5	14	35.2	63.8	11.45±0.15	50	20	5.9	30	22
40	17.2	25	36.5	12.2	8	44	81.5	15±0.15	60	20	13.9	35	26
63	68	34.8	46	19.5	–	67	131	15.5±0.2	120	20	23.7	41.5	39.5

Ø [mm]	J3	L1		L2		L3	L4	L5	L6	L7		
		KF +0.9/–0.2	KF-GP +0.9/–0.2	KF	KF-GP					KF	KF-GP	KF-YSR(W)
18	11	150	157	74.5	78	5.7	5.8	15	5.5	14.5 ... 16.5	18 ... 20	14.5 ... 34.5
25	17	200	205	100	102.5	10.5	10.6	24.5	10.6	22.5 ... 26.5	25 ... 29	22.5 ... 47.5
32	18.5	250	250	124.8	124.8	14.5	14.5	30.5	14.5	27.3 ... 32.3	27.3 ... 32.3	27.3 ... 52.3
40	26	300	312	150	156	14.6	14.6	33.5	14.6	31 ... 36	37 ... 42	31 ... 56
63	31.5	400	–	200	–	20	20	44	20	41 ... 46	–	41 ... 76

Ø [mm]	L8		L9		L10 max.	T1	T2	T3 +0.2	T6	Stroke tolerance
	YSR	YSRW	KF ±0.2	KF-GP ±0.2						
18	29.9	32.6	–	3.5	119	9	2	3.1	15	0 ... 2.5
25	35.6	38.6	16.3	18.8	119	17.5	2	2.1	17.3	
32	19.5	28	35.3	35.3	119	15	2	2.1	20	
40	38.5	43.5	57.5	63.5	119	20	2	2.1	25.7	
63	38.3	48.3	97	–	119	27.5	2.1 ^{+0.2}	2.1	36.1	

 Note

For reasons of functional safety of the displacement encoder and stability of the linear drive DGCI, the distance L7 must not fall below the values in the table.

Linear drives DGCI, with displacement encoder

Technical data

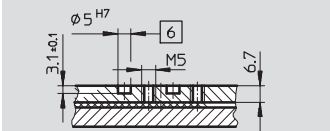
FESTO

Dimensions

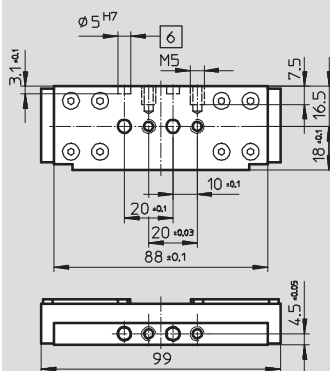
Download CAD data → www.festo.com

Slide

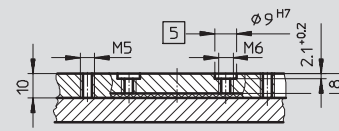
Ø 18



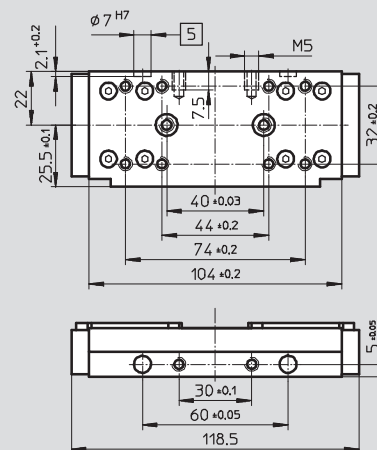
View A



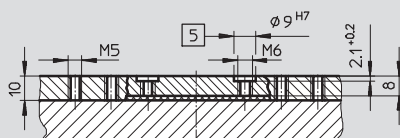
Ø 25



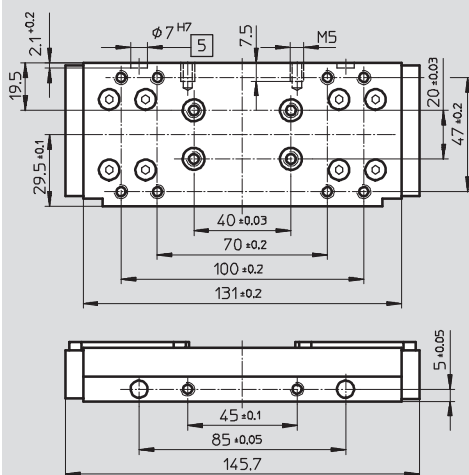
View A



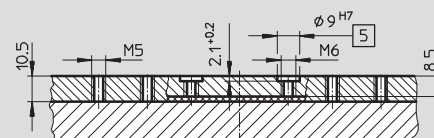
Ø 32



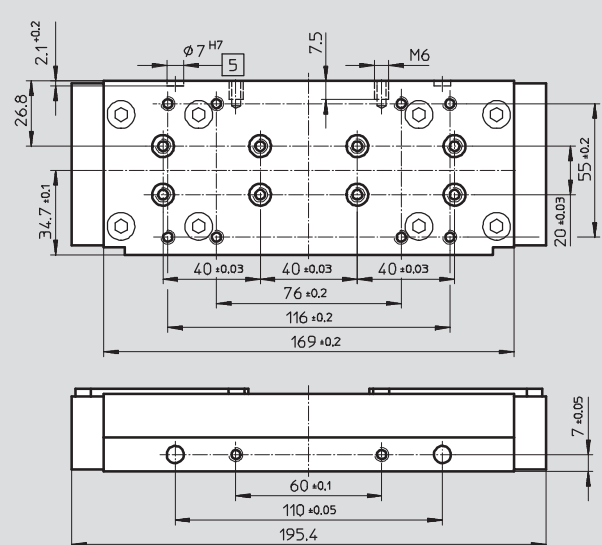
View A



Ø 40



View A



- 5 Hole for centring sleeve ZBH
- 6 Hole for centring pin ZBS

Linear drives DGCI, with displacement encoder

Technical data

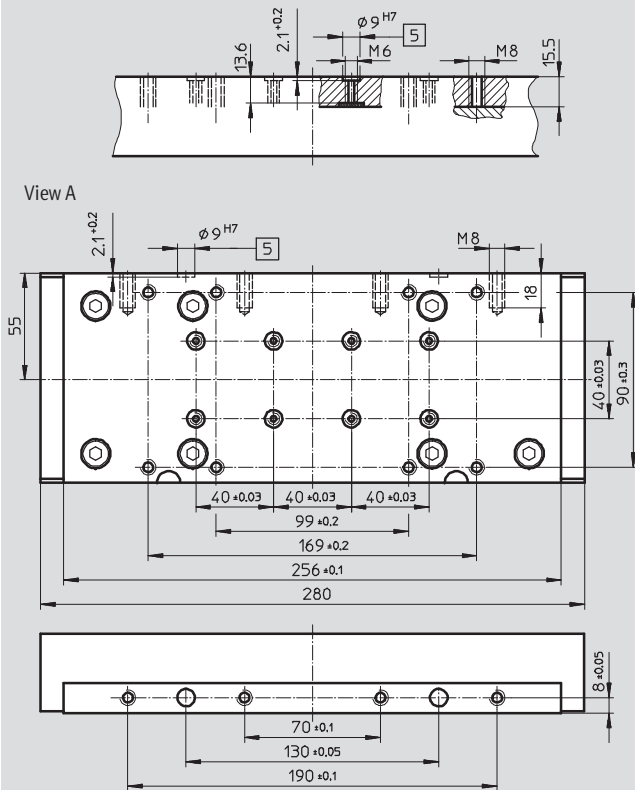
FESTO

Dimensions

Download CAD data → www.festo.com

Slide

Ø 63



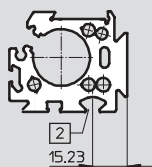
- [5] Hole for centring sleeve ZBH
- [6] Hole for centring pin ZBS

Profile barrel

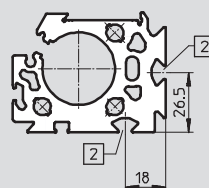
Ø 18



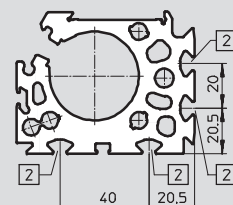
Ø 25



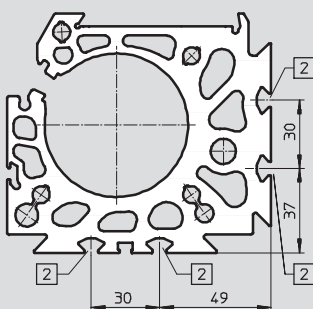
Ø 32



Ø 40



Ø 63



- [2] Mounting slot for slot nut

Linear drives DGCI, with displacement encoder

Technical data

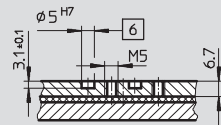
FESTO

Dimensions

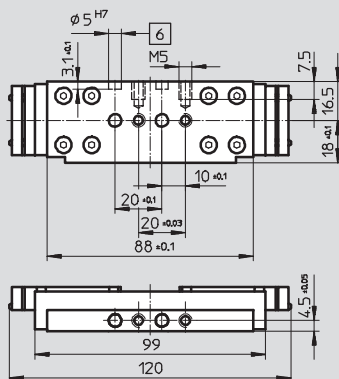
Download CAD data → www.festo.com

Slide, variant GP – Protected recirculating ball bearing guide

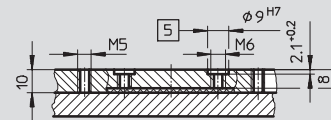
Ø 18



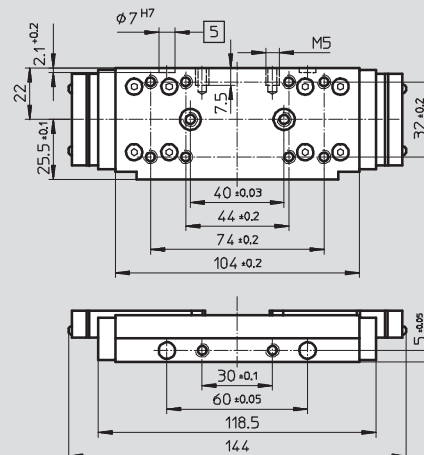
View A



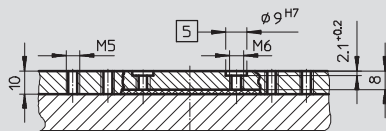
Ø 25



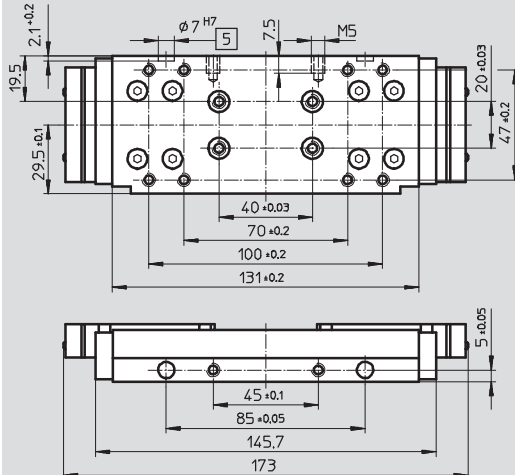
View A



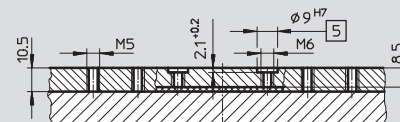
Ø 32



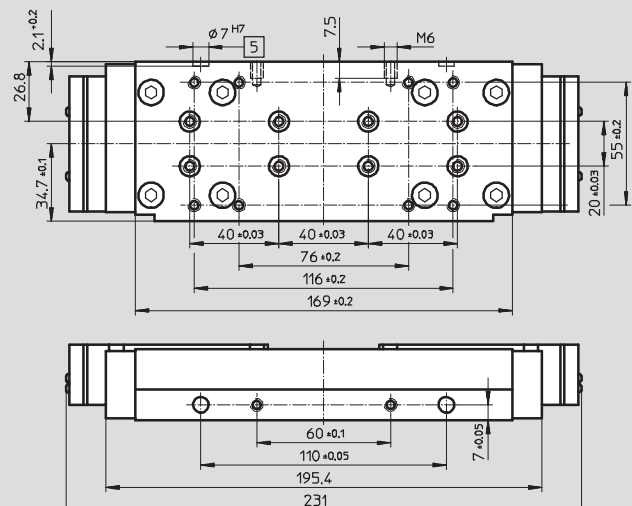
View A



Ø 40



View A



5 Hole for centring sleeve ZBH

6 Hole for centring pin ZBS

Linear drives DGCI, with displacement encoder

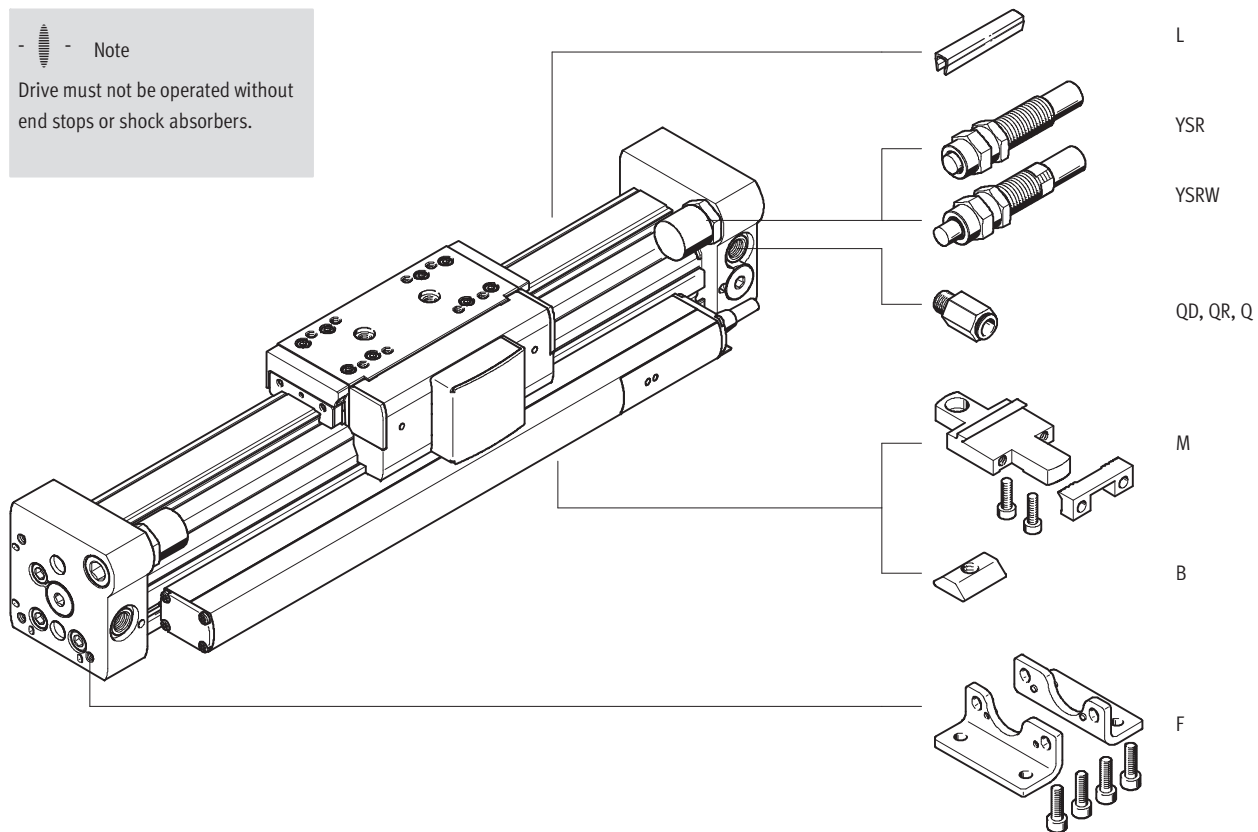
Ordering data – Modular products

Order code

Mandatory data/options

 **Note**

Drive must not be operated without end stops or shock absorbers.



Linear drives DGCI, with displacement encoder

Ordering data – Modular products

FESTO

Order code – Alternative supply port

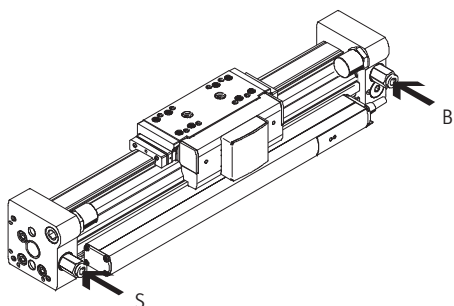
Four different supply port options (see below) can be selected when ordering the linear drive.

To facilitate commissioning, the linear drive is supplied with different

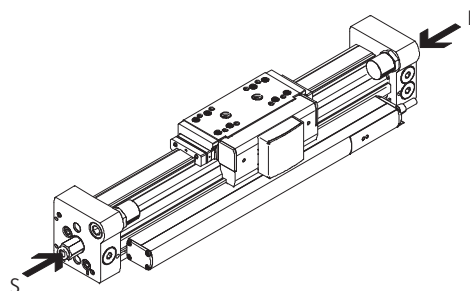
coloured push-in fittings (black or blue release ring) and without push-in

fittings in the case of the variant DGCI-...Q.

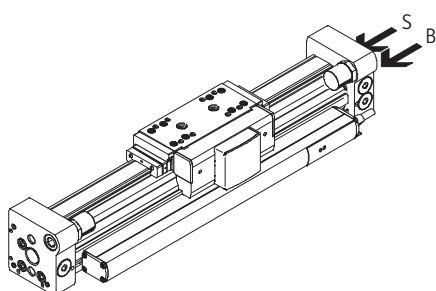
Push-in fitting at both ends, front face (standard)
DGCI-...



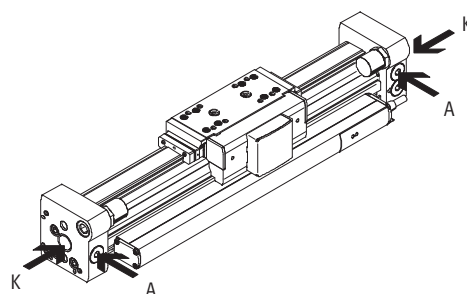
Push-in fitting at both ends, end face
DGCI-...-QD



Push-in fitting at one end, end face
DGCI-...-QR



No push-in fitting, end face open
DGCI-...Q



 Note

Compressed air supply at one end is only recommended for strokes up to 600 mm.

Direction of movement of the slide:

S To the right:

Fitting with black release ring

B To the left:

Fitting with blue release ring

Alternative port option

K Supply ports open

A Supply ports sealed

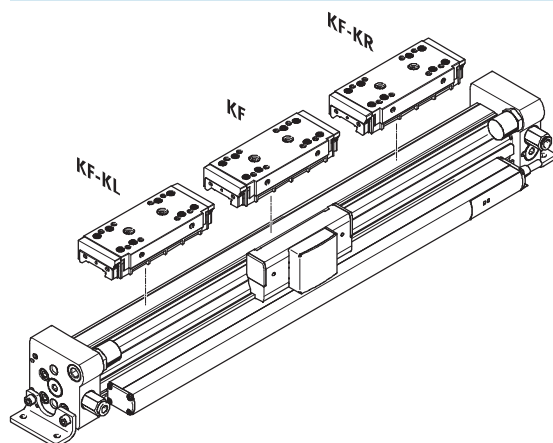
Linear drives DGCI, with displacement encoder

Ordering data – Modular products

Order code

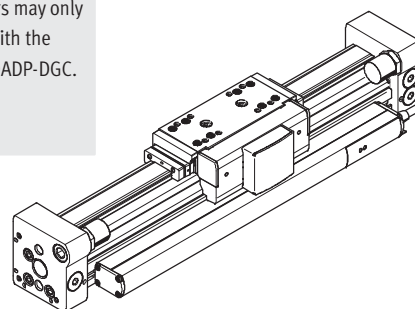
KL/KR – With additional slide

GP – With protected recirculating ball bearing guide



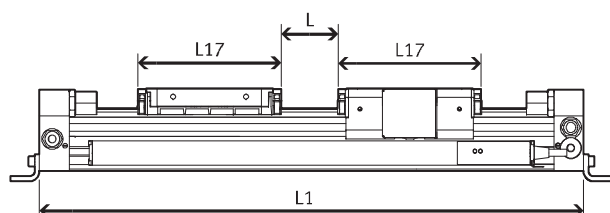
 Note

In the case of the variant with GP, only fixed stops may be used in the end caps. Shock absorbers may only be used in combination with the shock absorber retainer DADP-DGC.



Effective stroke reduction when ordering an additional slide KL or KR

For a linear drive DGCI with additional slide and the distance between the two slides, the effective stroke is reduced by the length of the additional slide.



Ø [mm]	L17	
	DGCI-...-KF	DGCI-...-KF-...-GP
18	99	120
25	118.5	144
32	145.7	173
40	195.4	231
63	280	–

Given:

DGCI-18-500-...

L = 20 mm

L17 = 99 mm

The effective stroke is reduced to

381 mm = 500 mm – 20 mm – 99 mm

Linear drives DGCI, with displacement encoder

Ordering data – Modular products

FESTO

M Mandatory data					O Options →
Module No.	Function	Piston Ø	Stroke	Guide	Alternative supply port
544 425 544 426 544 427 544 428 544 429	DGCI	18 25 32 40 63	100, 160, 225, 300, 360, 450, 500, 600, 750, 850, 1000, 1250, 1500, 1750, 2000	KF	– QD QR Q
Order example	DGCI	–	–	KF	–

Ordering table								
Size	18	25	32	40	63	Condi- tions	Code	Enter code
M Module No.	544 425	544 426	544 427	544 428	544 429			
Function	Linear drive with displacement encoder						DGCI	DGCI
Piston Ø [mm]	18	25	32	40	63		-...	
Stroke [mm]	100, 160, 225, 300, 360, 450, 500, 600, 750, 850, 1000, 1250, 1500, 1750, 2000						-...	
Guide	Recirculating ball bearing guide						-KF	-KF
O Alternative supply port	Push-in fitting at both ends, front face (standard)							
	Push-in fitting at both ends, end face						-QD	
	Push-in fitting at one end, end face, right side					1	-QR	
	Threaded connection (end face open, front face sealed)						-Q	
	M5	G1/8	G1/8	G1/4	G3/8			

1 QR

Only for strokes 100 ... 600 mm

Transfer order code

	DGCI	–		–		–	KF	–	
--	------	---	--	---	--	---	----	---	--

Linear drives DGCI, with displacement encoder

Ordering data – Modular products

FESTO

→ 0 Options								
Slide	Additional slide at left	Additional slide at right	Cushioning	Accessories	Type of mounting	Slot cover for sensor slot	Slot nut for mounting slot	User documentation
GP	KL	KR	– YSR YSRW	ZUB	F M	...L	...B	0
–	–	–	–	ZUB	–	–	–	–

Ordering table									
Size	18	25	32	40	63	Condi- tions	Code		Enter code
↓ Slide	Protected recirculating ball bearing guide					2	-GP		
0 Additional slide at left	Additional slide, standard, at left					3	-KL		
Additional slide at right	Additional slide, standard, at right					3	-KR		
Cushioning	Adjustable mechanical stop without cushioning (standard)								
	Shock absorber, self-adjusting						-YSR		
	Shock absorber, self-adjusting, progressive						-YSRW		
Accessories							ZUB-	ZUB-	
Type of mounting	Foot mounting (includes 0 ... 2 profile mountings depending on the stroke)					4	F		
	Profile mounting (2 ... 4 depending on the stroke)					4	M		
Slot cover for sensor slot	1 ... 9						...L		
Slot nut for mounting slot	– 1 ... 9						...B		
User documentation	Express waiver - no user documentation to be included (already available) (operating instructions in pdf format are available free of charge via the Internet www.festo.com)						0		

- 2 **GP** Not in combination with YSR and YSRW
 3 **KL, KR** For a linear drive DGCI with additional slide (KL, KR), the effective stroke per additional slide is reduced by the dimension in the table → 55 plus the distance between the slides
 4 **F, M** Assignment table → 47

Transfer order code

– – – – – ZUB – – – –

Linear drives DGCI, with displacement encoder

Accessories

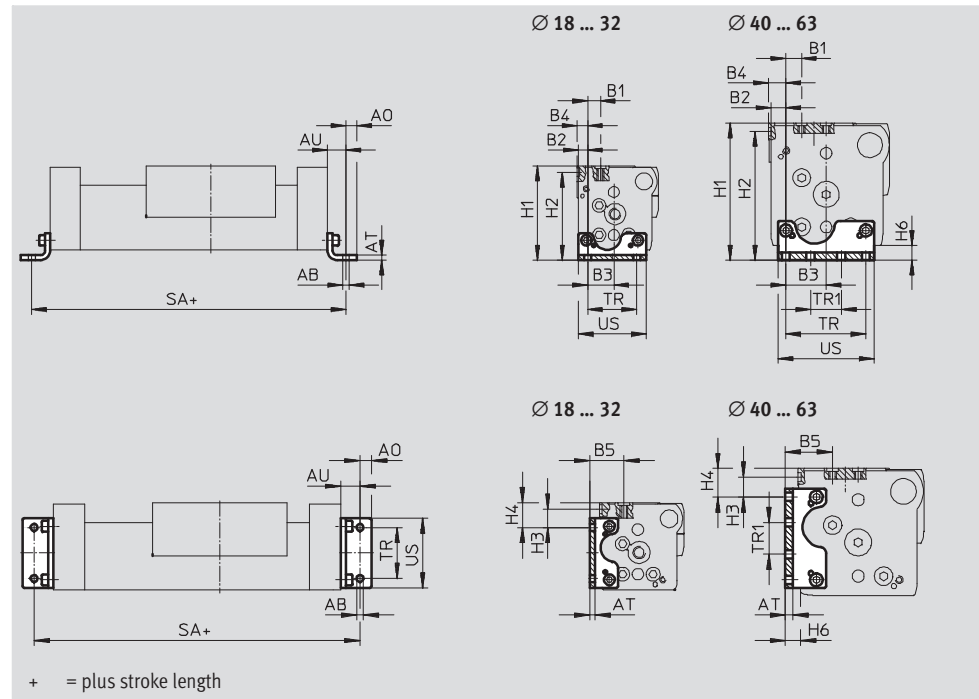
FESTO

Foot mounting HPC
(order code: F)

Material:
Galvanised steel



Note
Additional profile mountings MUC
are required for strokes above
400 mm → 47.



Dimensions and ordering data

For Ø	AB	A0	AT	AU	B1	B2	B3
[mm]	Ø						
18	5.5	6.75	3	13.25	11.2	4.3	15.2
25	5.5	9	4	15	13.35	7.65	22.35
32	6.6	10	5	19	9	9	29.5
40	6.6	10	6	20	12.6	12.2	32.8
63	11	13.5	8	28	17.5	12.5	55.5

For Ø	B4	B5	H1	H2	H3	H4
[mm]						
18	5.3	23.2	64	59.5	16	21.5
25	8.65	29.5	76.5	71.5	14.35	19.35
32	10.5	27	87.5	82.5	8	13
40	14.2	36.8	111.5	104.5	15.3	22.3
63	17.5	49	172.5	164.5	22	30

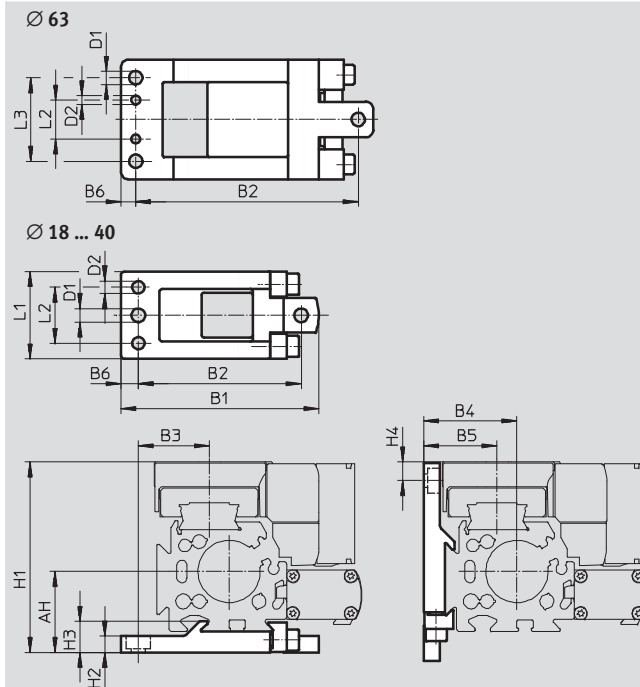
For Ø	H6	SA	TR	TR1	US	Weight	Part No.	Type
[mm]		+0.9/-0.2	±0.1	±0.1		[g]		
18	7.7	176.5	30	–	38.6	58	533 667	HPC-18
25	8.5	230	40	–	55	131	533 668	HPC-25
32	9	288	56.5	19.5	68	239	533 669	HPC-32
40	12	340	65	25	78	348	533 670	HPC-40
63	19	456	111	39	133	1,245	545 237	HPC-63

Linear drives DGCI, with displacement encoder

Accessories

Profile mounting MUC (order code: M)

Material:
High-alloy steel



Range of applications
→ 47

Dimensions and ordering data

For Ø	AH	B1	B2	B3	B4	B5	B6	D1 Ø H13	D2 Ø H7
[mm]			±0.2						
18	27.2	67.8±0.2	56±0.15	28.7	27.2	23.2	5.7	5.5	5
25	32.5	79.5±0.2	65.5±0.15	28.5	37.5	29.5	7	5.5	5
32	37.5	94±0.2	80±0.15	35	47.5	37	7	5.5	5
40	47	110.5±0.2	96±0.15	43	57	46.8	7	6.5	6
63	75	169±0.5	149±0.2	72.5	87	69	10	9	6

For Ø	H1	H2	H3	H4	L1	L2	L3	Weight	Part No.	Type
[mm]						±0.05	±0.2	[g]		
18	64	5.7-0.2	9.9±0.1	6.4	33±0.1	20.5	—	78	531 752	MUC-18
25	76.5	6.5-0.2	12.5±0.1	7.43	35±0.1	22.5	—	113	531 753	MUC-25
32	87.5	6.5-0.2	13±0.1	4	45±0.1	30	—	174	531 754	MUC-32
40	111.5	8.5-0.2	16±0.1	11.3	60±0.1	44	—	346	531 755	MUC-40
63	172.5	11	25.5	15	80±0.4	26	56	1,080	531 757	MUC-63

Linear drives DGCI, with displacement encoder

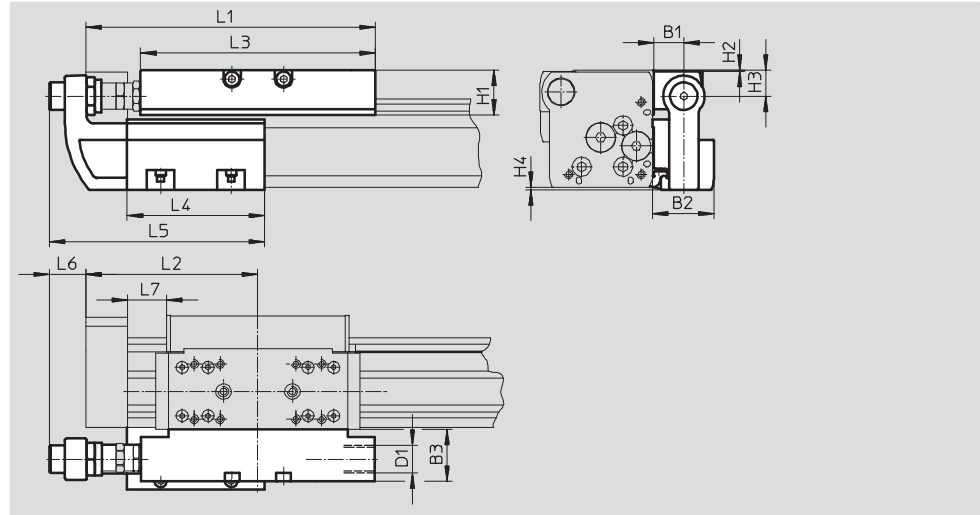
Accessories

FESTO

Shock absorber retainer DADP-DGC Stop KYC

Materials: Stop
Housing: Anodised aluminium
Stop bracket: Stainless steel casting
Clamp: High-alloy steel
Free of copper and PTFE

Materials: Shock absorber retainer
Housing: Anodised aluminium
Free of copper and PTFE



 **Note**
Shock absorber not included in the scope of delivery.
Existing stop elements can be removed from the end caps of the linear drive and installed in the shock absorber retainer.

Dimensions									
For Ø	B1	B2	B3	D1	H1	H2	H3	H4	L1
[mm]									
18	16	34.5	29	M12x1	20.7	0.2	12.5	0.7	128
25	16.5	35	30	M16x1	25.5	0.5	15	1.4	168
32	16.5	35	30	M16x1	25.5	0.5	15	1.7	206.8
40	16	35.7	35	M22x1.5	37	0.5	21.5	2	255
63	25	50	40	M26x1.5	51.5	1.5	33	0	328

For Ø [mm]	L2	L3	L4	L5	L6	L7		
						KF	KF-GP	KF-YSR(W)
18	74.5	107	80	118.5	23.5	≥14.5	≥18	≥14.5
25	100	136	80	125	20.5	≥22.5	≥25	≥22.5
32	124.8	164	120	165	14.5	≥27.3	≥27.3	≥27.3
40	150	210	156	220.5	31	≥31	≥37	≥31
63	200	256	200	268	24	≥41	–	≥41

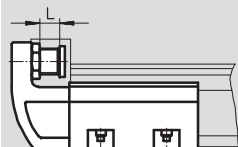
 **Note**
For reasons of functional safety of the displacement encoder and stability of the linear drive DGCI, the distance L7 must not fall below the values in the table.

Linear drives DGCI, with displacement encoder

Accessories

Technical data and ordering data

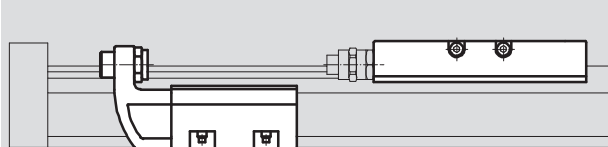
Precision adjustment



Note

The stop KYC can be used in both directions.

Installation example



Note

- The stop KYC can be mounted at any position within the stroke.
- Note dimension L7 → 60

For Ø [mm]	Max. impact force [N]	Ambient temperature [°C]	CRC ¹⁾	Weight [g]	Part No.	Type
Shock absorber retainer DADP-DGC						
18	1,100	-10 ... +80	2	130	541 729	DADP-DGC-18-KF
25	1,400			180	541 730	DADP-DGC-25-KF
32	1,700			215	541 731	DADP-DGC-32-KF
40	3,500			460	541 732	DADP-DGC-40-KF
63	4,300			1,080	545 245	DADP-DGC-63

1) Corrosion resistance class 2 as per 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.

For Ø [mm]	Precision adjustment L [mm]	Ambient temperature [°C]	CRC ¹⁾	Weight [g]	Part No.	Type
Stop KYC						
18	10	-10 ... +80	2	400	541 691	KYC-18
25	10			560	541 692	KYC-25
32	10			790	541 693	KYC-32
40	15			1,525	541 694	KYC-40
63	15			2,950	545 243	KYC-63

1) Corrosion resistance class 2 as per 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.



Note

Permissible impact energy

→ 44

Linear drives DGCI, with displacement encoder

Accessories

FESTO

Intermediate position module DADM-DGC

Materials:

Housing: Anodised aluminium

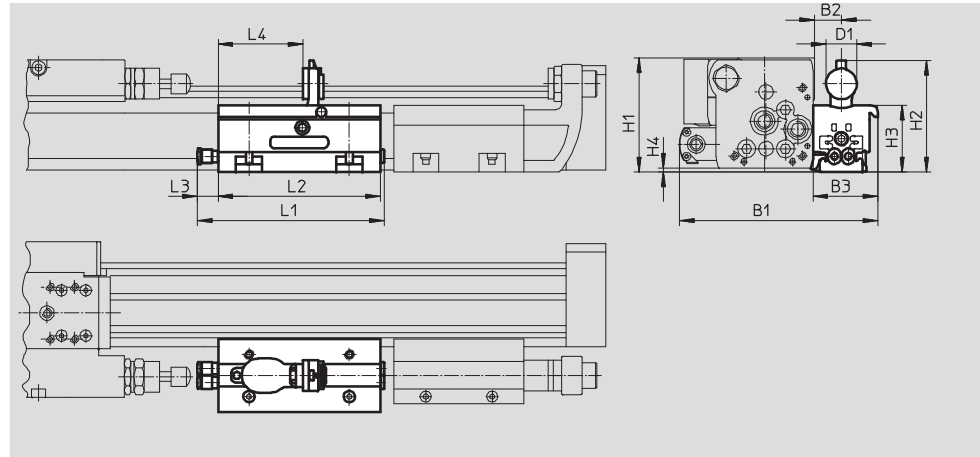
Stop screw, nut:

Galvanised steel

Clamp, lever:

High-alloy steel

Free of copper and PTFE



Note

- Shock absorber not included in the scope of delivery. Existing shock absorbers can be removed from the end caps of the linear drive and installed in the shock absorber retainer. Under no circumstances may the

linear drive and the intermediate position module be operated without a shock absorber.

- A shock absorber retainer DADP-DGC and a stop KYC are additionally needed when using an intermediate position module.

- The projection (dimension H4) must be observed when using the drive in combination with the intermediate position module DADM-DGC. Mounting via foot mountings HPC or profile mountings MUC is recommended in this case.

Dimensions						
For Ø [mm]	B1	B2	B3	D1	H1	H2
25	122.5	16.5	40	19	69.4	68.6
32	138	16.5	40	19	80.2	79.7

For Ø [mm]	H3	H4	L1	L2	L3	L4
25	41	1.4	116	100	13.4	52.2
32	52	1.7	116	100	13.4	52.2

Note

Permissible impact energy

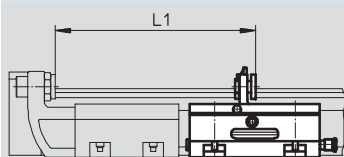
→ 44

Linear drives DGCI, with displacement encoder

Accessories

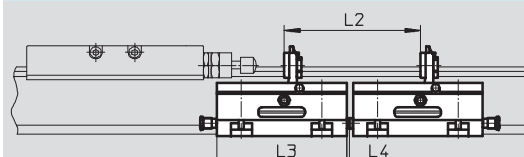
Minimum distance

Between end stop and intermediate position



Ø	L1
25	145.3
32	185.3

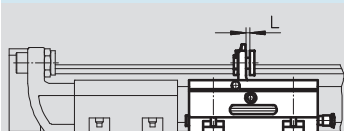
Between two intermediate positions



Ø	L2	L3	L4
25	105	100	2.5
32	105	100	2.5

Technical data and ordering data

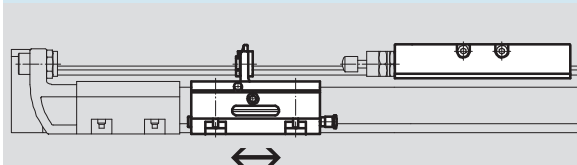
Precision adjustment L



 **Note**

The intermediate position module DADM-DGC can be used in both directions. A shock absorber retainer DADP-DGC and a stop KYC are additionally needed when using an intermediate position module.

Installation example



 **Note**

The intermediate position module DADM-DGC can be mounted at any position within the stroke.

For Ø	Operating pressure	Impact velocity	Swivel time	Repetition accuracy	Pneumatic connection	Precision adjustment L
[mm]	[bar]	[m/s]	[ms]	[mm]		[mm]
25	2.5 ... 8	→ 47	<100	0.02	QS-4	2
32						

For Ø	Ambient temperature	CRC ¹⁾	Mounting position	Position sensing	Weight	Part No.	Type
[mm]	[°C]				[g]		
25	-10 ... +60	2	Any	Via proximity sensor SME/SMT-10	430	541 700	DADM-DGC-25-A
32					530	541 701	DADM-DGC-32-A

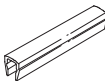
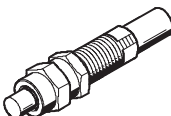
1) Corrosion resistance class 2 as per Festo standard 940 070

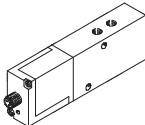
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Linear drives DGCI, with displacement encoder

Accessories

FESTO

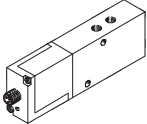
Ordering data						
	For Ø	Comment	Order code	Part No.	Type	PU ¹⁾
Slot nut HMBN Technical data → Internet: hmbn						
	25 ... 40	For mounting slot	B	547 264	HMBN-5-1M5	10
	50, 63			186 566	HMBN-5-2M5	
Centring pin/sleeve ZBS, ZBH Technical data → Internet: zbs, zbh						
	18	For slide	–	150 928	ZBS-5	10
	25 ... 63			150 927	ZBH-9	
	18	For end cap	–	150 928	ZBS-5	
	25 ... 63			150 927	ZBH-9	
Slot cover ABP-S Technical data → Internet: abp						
	18 ... 63	For sensor slot 0.5 m each	L	151 680	ABP-5-S	2
Shock absorber YSRW Technical data → Internet: ysrw						
	18		YSRW	540 347	YSRW-DGC-18-KF	1
	25			540 349	YSRW-DGC-25-KF	
	32			540 351	YSRW-DGC-32-KF	
	40			540 353	YSRW-DGC-40/50	
	63			543 069	YSRW-DGC-63	

Ordering data – Proportional directional control valves and push-in fittings						
	For Ø [mm]	Stroke [mm]	Proportional directional control valve		Push-in fitting for DGCI	
			Technical data → Internet: mpye		Technical data → Internet: quick star	
			Part No.	Type	Part No.	Type
	For applications with axis controller SPC200					
	18	100 ... 300	154 200	MPYE-5-M5-010-B	153 306	QSM-M5-6
		360 ... 2,000	151 692	MPYE-5-1/8-LF-010-B	153 306	QSM-M5-6
	25	100 ... 160	154 200	MPYE-5-M5-010-B	153 002	QS-1/8-6
		225 ... 750	151 692	MPYE-5-1/8-LF-010-B	153 004	QS-1/8-8
		850 ... 2,000	151 693	MPYE-5-1/8-HF-010-B	153 004	QS-1/8-8
	32	100	154 200	MPYE-5-M5-010-B	153 002	QS-1/8-6
		160 ... 360	151 692	MPYE-5-1/8-LF-010-B	153 004	QS-1/8-8
		450 ... 2,000	151 693	MPYE-5-1/8-HF-010-B	153 004	QS-1/8-8
	40	100 ... 300	151 692	MPYE-5-1/8-LF-010-B	153 005	QS-1/4-8
		360 ... 750	151 693	MPYE-5-1/8-HF-010-B	153 005	QS-1/4-8
		850 ... 2,000	151 694	MPYE-5-1/4-010-B	153 007	QS-1/4-10
	63	100 ... 160	151 692	MPYE-5-1/8-LF-010-B	153 006	QS-3/8-8
		225 ... 300	151 693	MPYE-5-1/8-HF-010-B	153 006	QS-3/8-8
		360 ... 450	151 694	MPYE-5-1/4-010-B	153 008	QS-3/8-10
		500 ... 2,000	151 695	MPYE-5-3/8-010-B	153 009	QS-3/8-12

Linear drives DGCI, with displacement encoder

Accessories

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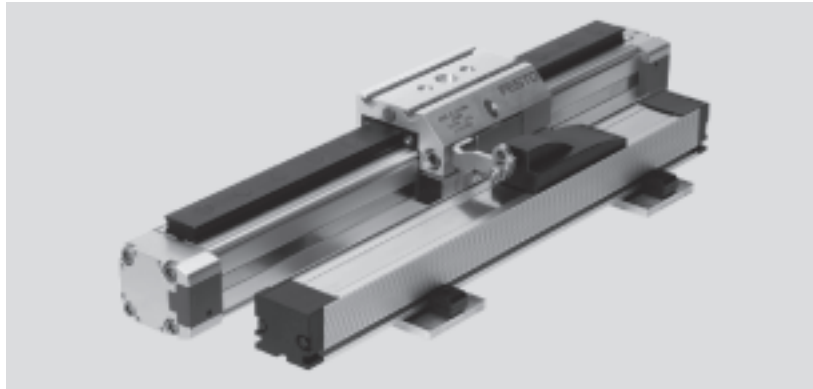
Ordering data – Proportional directional control valves and push-in fittings					
	For Ø [mm]	Stroke [mm]	Proportional directional control valve		Push-in fitting for DGCI
			Technical data → Internet: mpye		Technical data → Internet: quick star
			Part No.	Type	Part No. Type
	For applications with Soft Stop end position controller SPC11-MTS-AIF-2, horizontal				
	18	100 ... 300	154 200	MPYE-5-M5-010-B	153 306 QSM-M5-6
		360 ... 1,750	151 692	MPYE-5-1/8-LF-010-B	153 306 QSM-M5-6
		2,000	151 693	MPYE-5-1/8-HF-010-B	153 306 QSM-M5-6
	25	100 ... 160	151 692	MPYE-5-1/8-LF-010-B	153 002 QS-1/8-6
		225 ... 300	151 692	MPYE-5-1/8-LF-010-B	153 004 QS-1/8-8
		360 ... 2,000	151 693	MPYE-5-1/8-HF-010-B	153 004 QS-1/8-8
	32	100	151 692	MPYE-5-1/8-LF-010-B	153 002 QS-1/8-6
		160 ... 1,000	151 693	MPYE-5-1/8-HF-010-B	153 004 QS-1/8-8
		1,250 ... 2,000	151 694	MPYE-5-1/4-010-B	153 004 QS-1/8-8
	40	100 ... 500	151 693	MPYE-5-1/8-HF-010-B	153 005 QS-1/4-8
		600 ... 750	151 694	MPYE-5-1/4-010-B	153 005 QS-1/4-8
		850 ... 2,000	151 694	MPYE-5-1/4-010-B	153 007 QS-1/4-10
	63	100 ... 160	151 692	MPYE-5-1/8-LF-010-B	153 006 QS-3/8-8
		225 ... 300	151 693	MPYE-5-1/8-HF-010-B	153 006 QS-3/8-8
		360 ... 450	151 694	MPYE-5-1/4-010-B	153 008 QS-3/8-10
		500 ... 2,000	151 695	MPYE-5-3/8-010-B	153 009 QS-3/8-12
	For applications with Soft Stop end position controller SPC11-MTS-AIF-2, vertical				
	18	100 ... 300	154 200	MPYE-5-M5-010-B	153 306 QSM-M5-6
		360 ... 1,750	151 692	MPYE-5-1/8-LF-010-B	153 306 QSM-M5-6
		2,000	151 693	MPYE-5-1/8-HF-010-B	153 306 QSM-M5-6
	25	100 ... 160	151 692	MPYE-5-1/8-LF-010-B	153 002 QS-1/8-6
		225 ... 750	151 692	MPYE-5-1/8-LF-010-B	153 004 QS-1/8-8
		850 ... 2,000	151 693	MPYE-5-1/8-HF-010-B	153 004 QS-1/8-8
	32	100	151 692	MPYE-5-1/8-LF-010-B	153 002 QS-1/8-6
		160 ... 300	151 692	MPYE-5-1/8-LF-010-B	153 004 QS-1/8-8
		360 ... 1,750	151 693	MPYE-5-1/8-HF-010-B	153 004 QS-1/8-8
		2,000	151 694	MPYE-5-1/4-010-B	153 004 QS-1/8-8
	40	100 ... 225	151 692	MPYE-5-1/8-LF-010-B	153 005 QS-1/4-8
		300 ... 750	151 693	MPYE-5-1/8-HF-010-B	153 005 QS-1/4-8
		850 ... 1,000	151 693	MPYE-5-1/8-HF-010-B	153 007 QS-1/4-10
		1250 ... 2,000	151 694	MPYE-5-1/4-010-B	153 007 QS-1/4-10
	63	100 ... 160	151 692	MPYE-5-1/8-LF-010-B	153 006 QS-3/8-8
		225 ... 300	151 693	MPYE-5-1/8-HF-010-B	153 006 QS-3/8-8
		360 ... 450	151 694	MPYE-5-1/4-010-B	153 008 QS-3/8-10
		500 ... 2,000	151 695	MPYE-5-3/8-010-B	153 009 QS-3/8-12

Linear drives DGPL, external displacement encoder

Features

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Individual positioning components with linear drive DGPL ...



Proportional directional control valve
MPYE-...
→ Internet: mpye



Soft Stop → Internet: soft stop

End position controller
SPC11-POT-TLF



Positioning technology → Internet: spc

Axis interface
SPC-AIF-POT



Axis positioning controller
SPC200



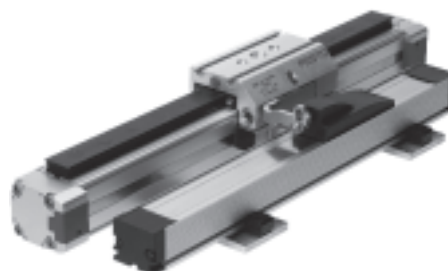
Linear drives DGPL, external displacement encoder

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Features

DGPL, with recirculating ball bearing guide

- Piston $\varnothing$ 25 ... 63 mm
- Stroke 225 ... 2,000 mm
- Standard slide or extended slide
- High characteristic load values
- Air connections on both sides



DGPL, with recirculating ball bearing guide and clamping unit

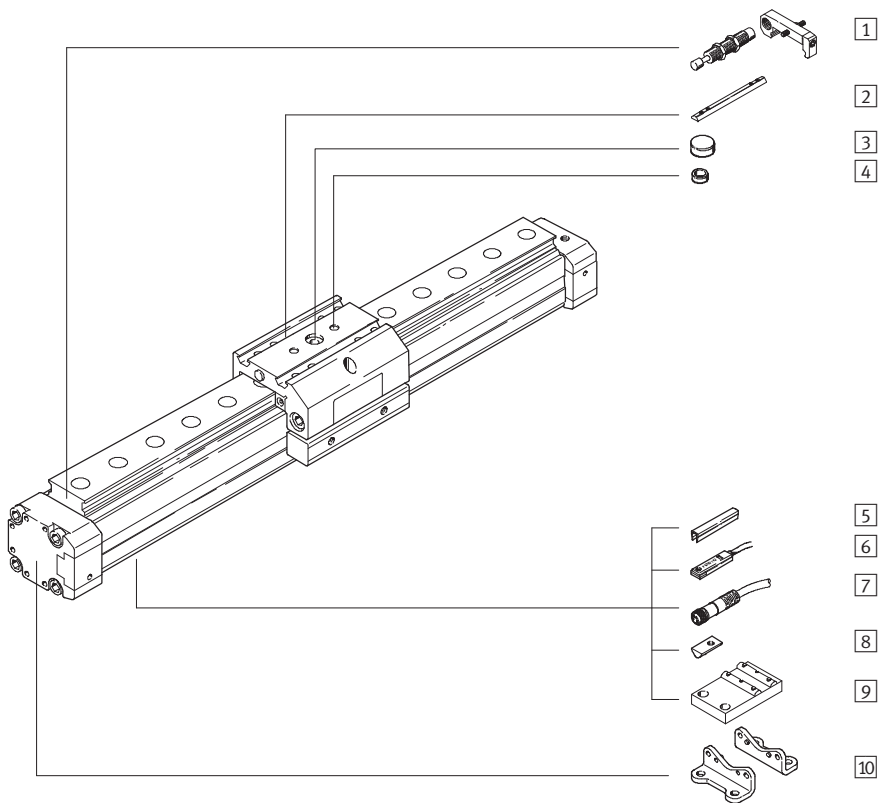
- Piston $\varnothing$ 25...40 mm
- Stroke 225 ... 2,000 mm
- Standard slide or extended slide
- In the event of a loss of pressure, the slide can be fixed in vertical operation using the clamping unit.
- High characteristic load values
- Air connections on both sides



Linear drives DGPL, external displacement encoder

Peripherals overview

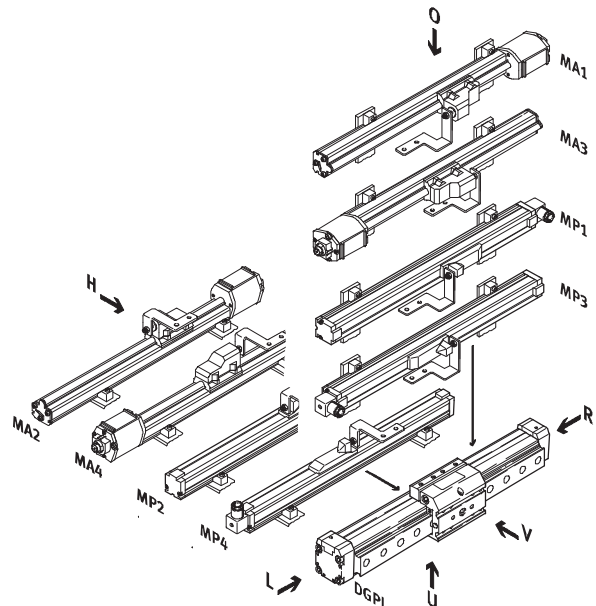
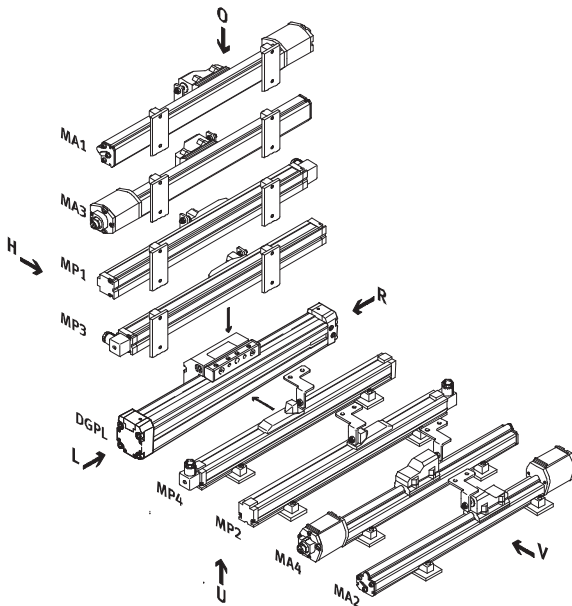
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Displacement encoder attachment position 11

Slide at rear (SH)

Slide at front (SV)



Linear drives DGPL, external displacement encoder

Peripherals overview

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Variants and accessories		
Type	Brief description	→ Page/Internet
1 Shock absorber kits C	to avoid damage at the end stop, in the event of malfunctions	116
2 Slot nut for slide X	for mounting loads and attachments on the slide	117
3 Central mounting Q	for centring loads and attachments on the slide	117
4 Centring sleeves Z	for centring loads and attachments on the slide	117
5 Slot cover B/S	to protect against the ingress of dirt	117
6 Proximity sensors G/H/I/J/N	for additional sensing of the piston position, can be ordered optionally, only in conjunction with the order code A in the drive's modular product section.	119
7 Cable with socket V	for proximity sensor	119
8 Slot nut for mounting slot Y	for mounting attachments	117
9 Central support M	to mount the axis	114
10 Foot mounting F	to mount the axis	114
11 Displacement encoder attachment position MA1 ... MA4/MP1 ... MP4	for drive position measurement	80

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		DGPL	-	25	-	500	-	PPV	-	A	-	B	-	KF	-	KU	-	GK	-	SV	-	D2	-	MP2
Type																								
DGPL	Linear drive unit																							
Piston Ø [mm]																								
Stroke [mm]																								
Cushioning																								
PPV	Pneumatic cushioning adjustable at both ends																							
Position sensing																								
A	For proximity sensing																							
Generation																								
B	B series																							
Guide																								
KF	Recirculating ball bearing guide																							
Clamping unit																								
KU	Clamping unit underneath																							
Basic variant																								
GK	Standard slide																							
GV	Extended slide																							
Slide attachment position																								
SV	Slide at front																							
SH	Slide at rear																							
Supply port																								
D2	Connection at both ends																							
Displacement encoder attachment position																								
MP1	Encoder, position 1, mounted																							
MP2	Encoder, position 2, mounted																							
MP3	Encoder, position 3, mounted																							
MP4	Encoder, position 4, mounted																							
MA1	Temposonic, position 1, mounted																							
MA2	Temposonic, position 2, mounted																							
MA3	Temposonic, position 3, mounted																							
MA4	Temposonic, position 4, mounted																							
MP0	Encoder, supplied separately																							
MA0	Temposonic, supplied separately																							

Linear drives DGPL, external displacement encoder

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Type codes

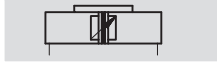
		: ZUB	-	2S	2X	Z			F	2G		2C
Accessories												
ZUB	Accessories supplied loose											
Slot cover												
...S	Sensor slot											
...B	Mounting slot											
Slot nut												
...X	For slide											
...Y	For profile barrel											
Centring sleeves												
...Z	For slide											
Central support												
...M	Central support											
Central mounting												
...Q	For slide											
Foot mounting												
...F	Foot mounting											
Proximity sensors												
...G	With cable 2.5 m											
...H	With plug											
...I	Contactless, with cable 2.5 m											
...J	Contactless, with plug											
...N	NC contact, with cable 2.5 m											
Cable with socket												
...V	2.5 m											
Shock absorber kit												
...C	And retainer for GK/GV											

Linear drives DGPL, external displacement encoder

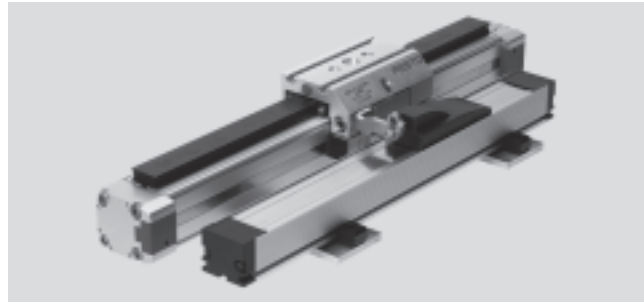
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Technical data

Function



- Ø - Diameter
25 ... 63 mm
- I - Stroke length
225 ... 2,000 mm



General technical data					
Piston Ø	25	32	40	50	63
Design	Piston				
	Driver				
	Profile barrel				
Mode of operation	Double-acting				
Operating medium ¹⁾	Compressed air, filtered and unlubricated, filter unit 5 µm				
Cushioning	Pneumatic cushioning adjustable at both ends				
Cushioning length	[mm]	18	20	30	
Position sensing	Displacement encoder, attached externally				
	For proximity sensing				
Measuring principle (displacement encoder)	➔ Internet: displacement encoders				
Type of mounting	Foot mounting				
Stroke ²⁾³⁾	[mm]	225, 300, 360, 450, 500, 600, 750, 1,000, 1,250, 1,500, 1,750, 2,000			
Protection against torsion/guide	Guide rail with slide				
	Recirculating ball bearing				
Clamping unit	➔ Internet: dgpl				
Pneumatic connection	G1/8		G1/4		G3/8
Electrical connection	➔ Internet: displacement encoders				

- 1) The proportional directional control valve MPYE used requires the characteristic values.
- 2) Note stroke reduction in conjunction with SPC200.
- 3) Supply of compressed air to each end of the cylinder (feature D2) is absolutely essential for Soft Stop SPC11 and axis controller SPC200 as of a length of 500 mm.

Forces [N] and impact energy [Nm]					
Piston Ø	25	32	40	50	63
Theoretical force at 6 bar	295	483	754	1,178	1,870
Max. impact energy at the end positions ¹⁾	0.1	0.2	0.4	0.8	0.8

- 1) Cushioning PPV must be completely open for applications with Soft Stop SPC11 and axis controller SPC200.

Permissible impact velocity:

$$v_{perm.} = \sqrt{\frac{2 \times E_{perm.}}{m_{dead} + m_{load}}}$$

Maximum permissible load:

$$m_{load} = \frac{2 \times E_{perm.}}{v^2} - m_{dead}$$

$v_{perm.}$ Permissible impact velocity
 $E_{perm.}$ Max. impact energy
 m_{dead} Moving load (drive)
 m_{load} Moving work load

 Note

These specifications represent the maximum values which can be reached. Note the maximum permitted impact energy.

Linear drives DGPL, external displacement encoder

FESTO

Technical data

Positioning characteristics with axis controller SPC200					
Piston Ø	25	32	40	50	63
Repetition accuracy [mm]	➔ 74				
Mounting position	Any				
Minimum load, horizontal ¹⁾ [kg]	2	3	5	8	12
Maximum load, horizontal ¹⁾ [kg]	30	45	75	120	180
Minimum load, vertical ¹⁾ [kg]	2	3	5	8	12
Maximum load, vertical ¹⁾ [kg]	10	15	25	40	60
Min. speed of travel [m/s]	0.05				
Max. speed of travel [m/s]	3				
Typ. positioning time, long stroke ²⁾ [s]	0.80/1.20	0.90/1.25	0.80/1.20	1.00/1.25	0.95/1.25
Typ. positioning time, short stroke ³⁾ [s]	0.50/0.70	0.50/0.65	0.45/0.65	0.55/0.65	0.55/0.65
Minimum positioning stroke ⁴⁾ [%]	3				
Stroke reduction ⁵⁾ [mm]	25		35		
Recommended proportional directional control valve	➔ 118				

1) Load = effective load + mass of all moving parts on the drive

2) At 6 bar, horizontal mounting position, DGPL-XX-1250, 1000 mm positioning travel at min./max. load

3) At 6 bar, horizontal mounting position, DNCM-XX-1250, 100 mm positioning travel at min./max. load

4) In relation to the maximum stroke of the drive, but never more than 20 mm.

5) The stroke reserve is to be maintained on every side of the drive, the max. positionable stroke is therefore: Stroke – 2x stroke reserve

Positioning characteristics with end position controller SPC11					
Piston Ø	25	32	40	50	63
Repetition accuracy of a mid-position ¹⁾ [mm]	±2				
Mounting position	Any				
Minimum load, horizontal ²⁾ [kg]	2	3	5	8	12
Maximum load, horizontal ²⁾ [kg]	30	45	75	120	180
Minimum load, vertical ²⁾ [kg]	2	3	5	8	12
Maximum load, vertical ²⁾ [kg]	10	15	25	40	60
Travel time [s]	→ Sizing software "Smartb Soft Stop": → www.festo.com				
Recommended proportional directional control valve	→ 118				

1) In the stroke range from 225 ... 2,000 mm

2) Load = effective load + mass of all moving parts on the drive

Operating and environmental conditions					
Piston Ø	25	32	40	50	63
Operating pressure ¹⁾ [bar]	4 ... 8				
Ambient temperature ²⁾ [°C]	-10 ... +60				
Vibration resistance	To DIN/IEC 68 Parts 2 -6, severity level 2				
Continuous shock resistance	To DIN/IEC 68 Parts 2 -27, severity level 2				
CE symbol	To 89/336/EEC (EMC regulation)				
Protection class (displacement encoder)	→ Internet: displacement encoder				

1) Only applies for applications with Soft Stop SPC11 and axis controller SPC200.

2) Note operating range of proximity sensors.

Linear drives DGPL, external displacement encoder

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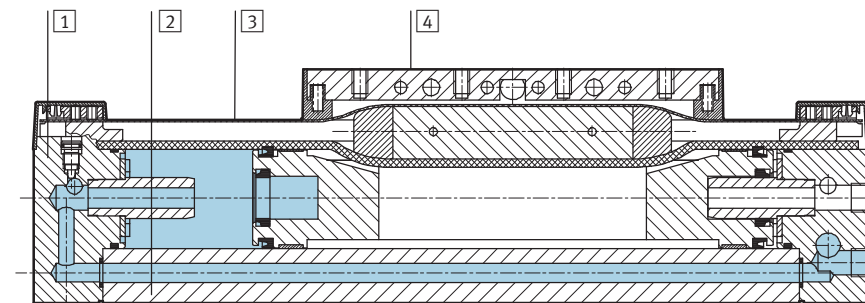
Technical data

Weights [g] without displacement encoder					
Piston Ø	25	32	40	50	63
Basic weight	1,520	2,720	4,480	9,600	15,370
Additional weight per 10 mm stroke	53	69	97	167	236
Clamping unit	714	1,100	1,694	–	–
Additional weight of clamping unit per 10 mm stroke	27	34	42	–	–
Moving load	Standard slide GK	605	895	1,700	3,000
	Extended slide GV	950	1,375	2,603	4,700
	Clamping unit	185	250	461	–

 Note		
Electrical data, displacement encoder:	Analogue displacement encoder (Order code: MP) → Internet: displacement encoder	Digital displacement encoder (Order code: MA) → Internet: displacement encoder

Materials

Sectional view



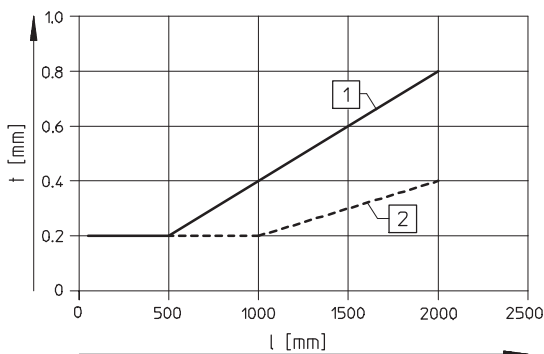
Displacement encoder materials
→ Internet: displacement encoder

Drive	
1 End cap	Anodised aluminium
2 Profile	Anodised aluminium
3 Cover strip	Steel, corrosion resistant
4 Driver	Anodised aluminium
– Slide	Anodised aluminium
– Guide rail	Corrosion resistant steel
– Seals	Nitrile rubber, polyurethane

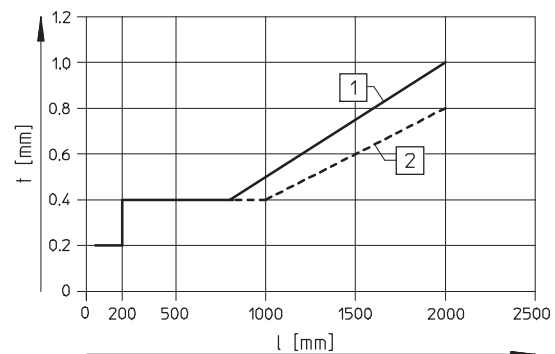
Repetition accuracy

Tolerance t [mm] as a function of the stroke l [mm]

horizontal



vertical



- 1 with analogue displacement encoder
- 2 with digital displacement encoder

Linear drives DGPL, external displacement encoder

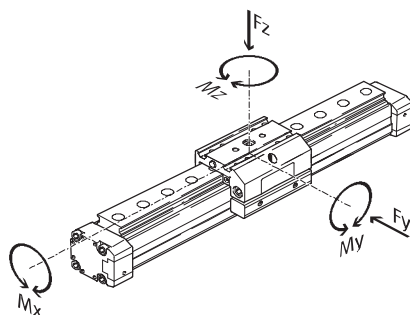
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Technical data

Characteristic load values

The forces and torques specified refer to the centre line of the profile barrel internal diameter.

They must not be exceeded during dynamic operation. Special attention must be paid to the cushioning phase.



If the drive is subjected to more than two of the indicated forces and torques simultaneously, the following equations must be satisfied in addition to the indicated maximum loads.

$$0,4 \times \frac{F_z}{F_{z_{\max}}} + \frac{M_x}{M_{x_{\max}}} + \frac{M_y}{M_{y_{\max}}} + 0,2 \times \frac{M_z}{M_{z_{\max}}} \leq 1$$

$$\frac{F_z}{F_{z_{\max}}} \leq 1 \quad \frac{M_z}{M_{z_{\max}}} \leq 1$$

Permissible forces and torques

Piston Ø Variant		25		32		40		50		63	
		GK	GV	GK	GV	GK	GV	GK	GV	GK	GV
Fy _{max.}	[N]	3,080	3,080	3,080	3,080	7,300	7,300	7,300	7,300	14,050	14,050
Fz _{max.}	[N]	3,080	3,080	3,080	3,080	7,300	7,300	7,300	7,300	14,050	14,050
Mx _{max.}	[Nm]	45	45	63	63	170	170	240	240	580	580
My _{max.}	[Nm]	85	170	127	250	330	660	460	920	910	1,820
Mz _{max.}	[Nm]	85	170	127	250	330	660	460	920	910	1,820

Maximum permissible support span l as a function of the force F

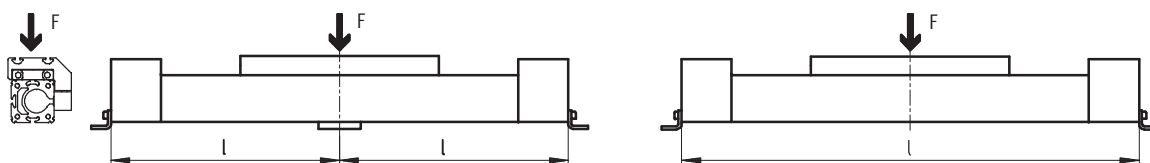
The axis may need to be supported with central supports MUP in order to

limit deflection in the case of large strokes. The following diagrams serve

to determine the maximum permissible support span l as a

function of the force F.

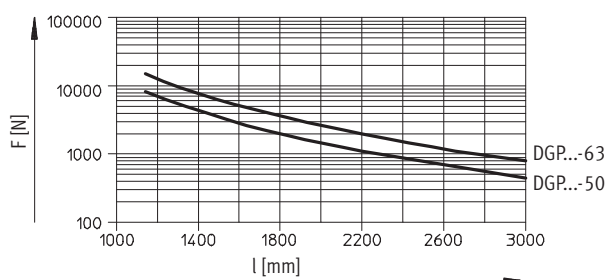
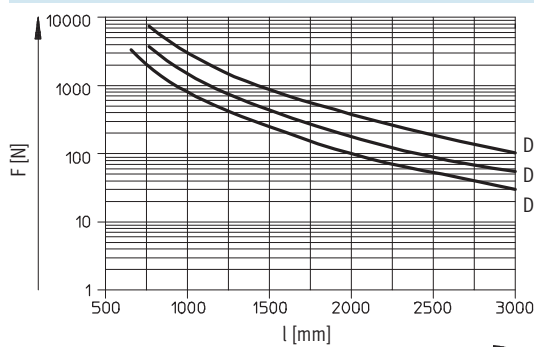
Force on the surface of the slide



Maximum support span l (without central support) as a function of the force F

Piston Ø 25 ... 40

Piston Ø 50/63



Linear drives DGPL, external displacement encoder

Technical data

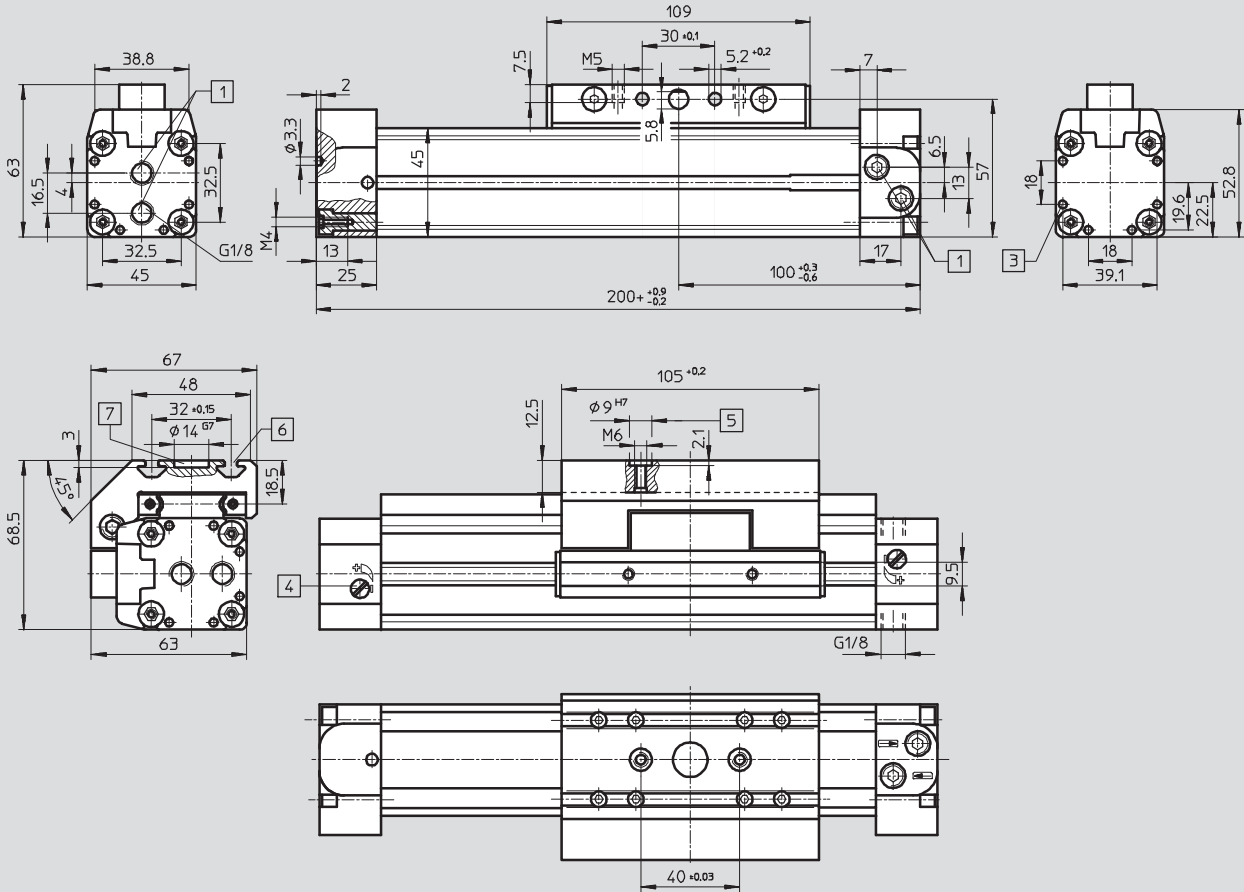
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Dimensions

Download CAD data → www.festo.com

Standard slide GK

Piston Ø 25



1 Supply ports at one end, option of three sides of an end cap (D2 variant: supply port at both ends, option of three sides per end cap)

3 Mounting hole for foot mounting HP
4 Regulating screw for adjustable end-position cushioning
5 Hole for centring sleeve ZBH-9

6 Mounting slot for slot nut NSTL
7 Drilled hole for central mounting SLZZ

+ = plus stroke length

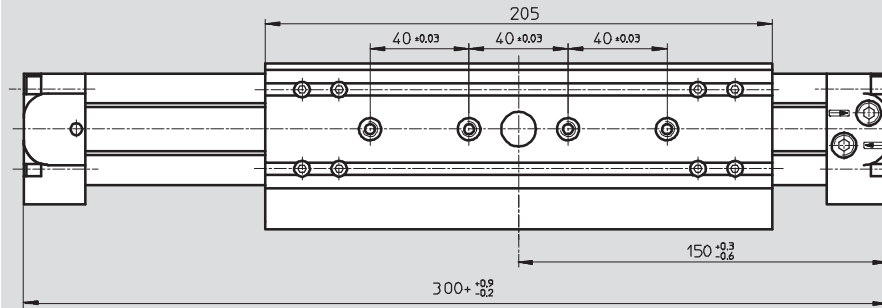
Linear drives DGPL, external displacement encoder

Technical data

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Extended slide GV

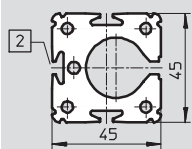
Piston Ø 25



+ = plus stroke length

Profile barrel

Piston Ø 25



2 Sensor slot for proximity sensor

Linear drives DGPL, external displacement encoder

Technical data

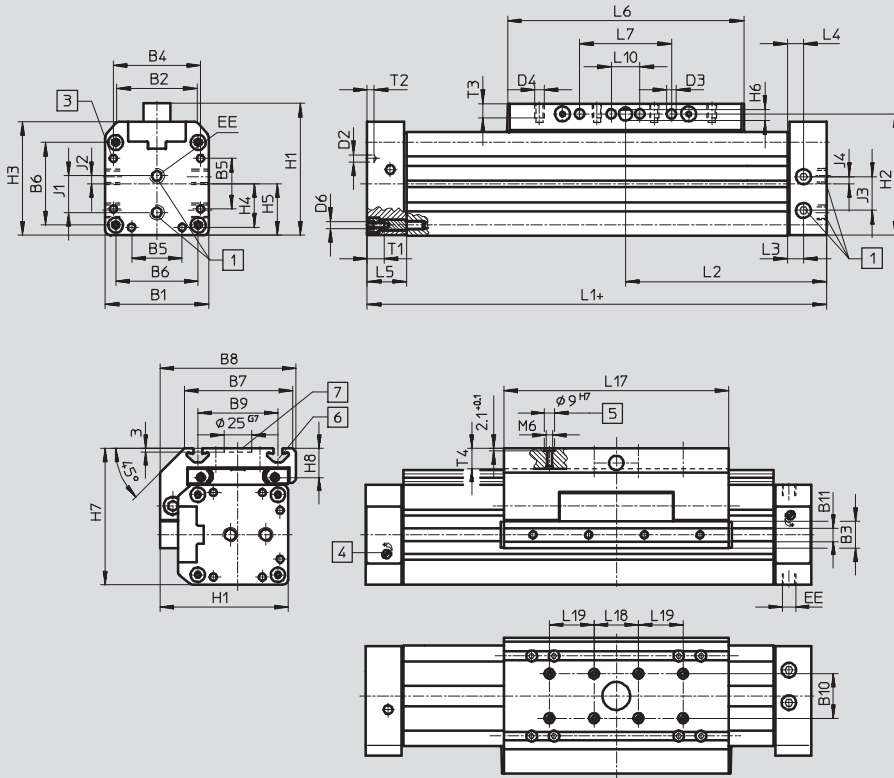
FESTO

Dimensions

Standard slide GK

Download CAD data → www.festo.com

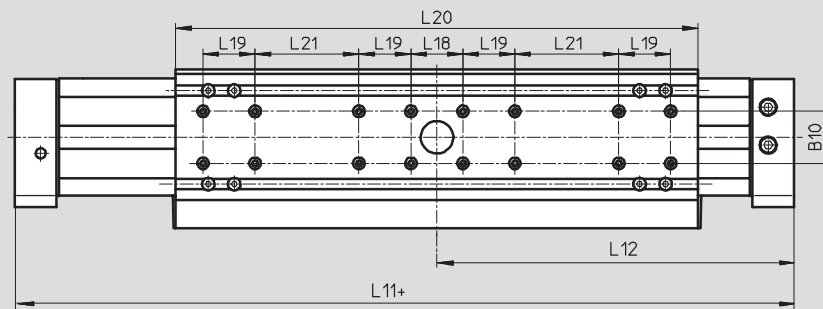
Piston Ø 32 ... 63



- 1 Supply ports at one end, option of three sides of an end cap (D2 variant: supply port at both ends, option of three sides per end cap)
 - 3 Mounting hole for foot mounting HP
 - 4 Regulating screw for adjustable end-position cushioning
 - 5 Hole for centring sleeve ZBH-9
 - 6 Mounting slot for slot nut NSTL
 - 7 Drilled hole for central mounting SLZZ
- + = plus stroke length

Extended slide GV

Piston Ø 32 ... 63



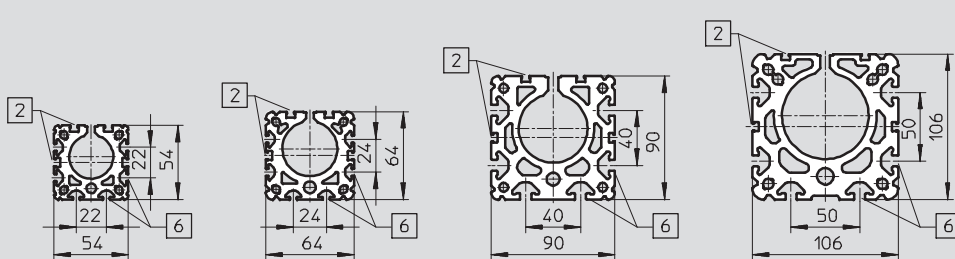
Profile barrel

Piston Ø 32

Piston Ø 40

Piston Ø 50

Piston Ø 63



- 2 Sensor slot for proximity sensor
- 6 Mounting slot for slot nut NST

Linear drives DGPL, external displacement encoder

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Technical data

Ø [mm]	B1	B2	B3 +0.2	B4	B5	B6	B7	B8	B9	B10 ±0.03	B11	D2 Ø
32	54	35.8	19	46	21	40	63	79	47 ±0.15	20	9.5	4.3
40	64	45.7	21	53	28	49	78.5	96.5	55 ±0.2			
50	90	69.2	24	76	44	72	97	122	72 ±0.2	40	12	6.3
63	106	84.8		89		83	121	142	90 ±0.25			

Ø [mm]	D3 Ø +0.2	D4	D6	EE	H1	H2	H3	H4	H5	H6	H7	H8
32	5.2	M5	M5	G1/8	72	66	62	23	27	5.8	77.5	18.5
40	6.5	M6		G1/4	86	78	71.8	26.5	32	7.7	90.5	20
50	8.5	M8	M6		115	106	99	36	45	9.7	122.5	26
63			M8	G3/8	131	122	115	44.5	53		144.5	30

Ø [mm]	J1	J2	J3	J4	L1 +0.9/-0.2	L2 +0.3/-0.6	L3	L4	L5	L6	L7	L10 ±0.15
32	19	4.2	14	4.7	250	125	17	8.5	31	135	50 ±0.1	–
40	22	5	21	9.1	300	150	11.5	11.5		171	70 ±0.1	
50	31.8	6.8	29.3	6	350	175	14	14	34	206	80 ±0.1	
63	36	8	31	14	400	200				234	110 ±0.1	

Ø [mm]	L11 +0.9/-0.2	L12 +0.3/-0.6	L17	L18 ±0.03	L19 ±0.03	L20	L21 ±0.1	T1	T2	T3	T4 max.
32	380	190	131 ±0.2	40	–	261	40	13.2	3	7.5	12.5
40	470	235	167 ±0.2		40	337			4	10.5	
50	550	275	202 ±0.2			402	80	15.2	6	12.5	18.5
63	650	325	230 ±0.2			480	120	21.2			20.5

 Note
 Accessories → 114

Linear drives DGPL, external displacement encoder

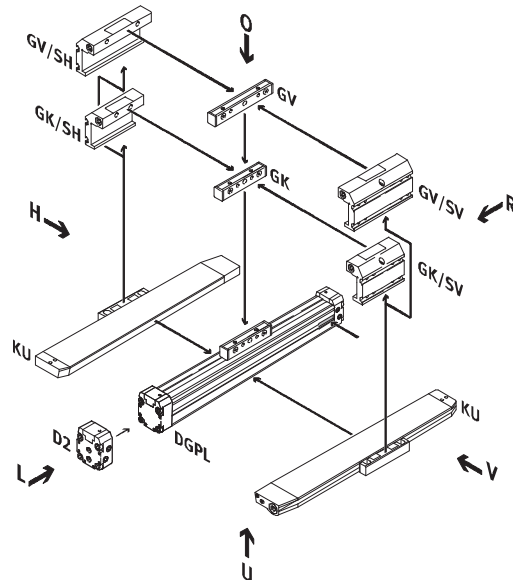
FESTO

Ordering data – Modular product system

Order code

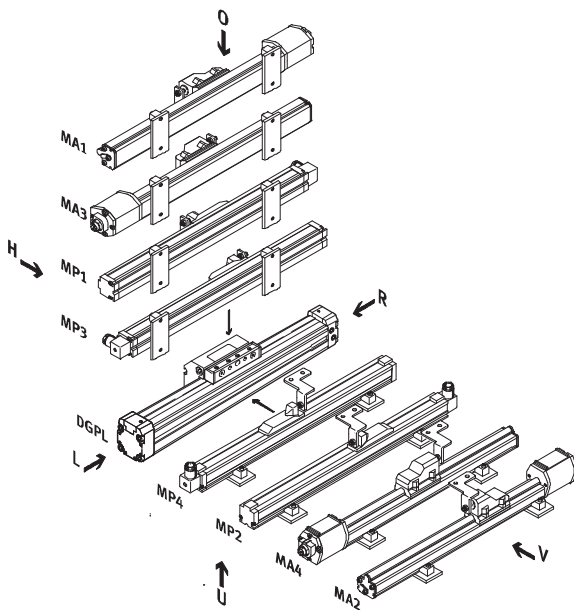
Mandatory data/Options

- KU Clamping unit underneath
- GK Standard slide
- GV Extended slide
- SV Slide at rear
- SH Slide at front
- D2 Air connection at both ends

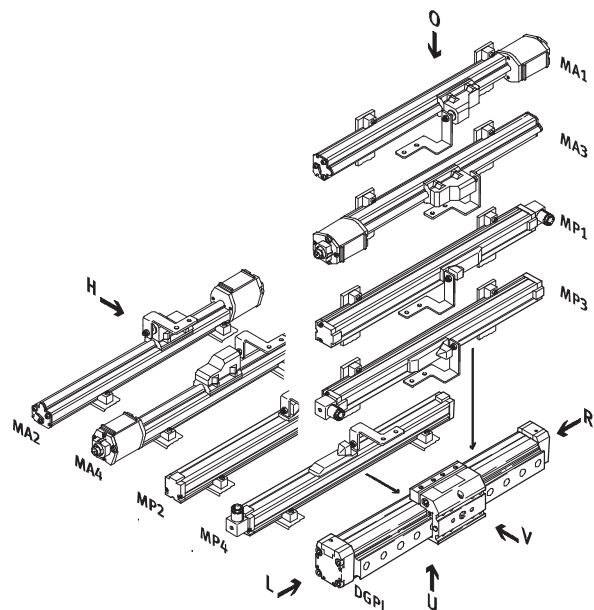


Attachment position for slides at rear (SH)

- MP Analogue displacement encoder
- MA Digital displacement encoder



Attachment position for slides at front (SV)



-  - Note

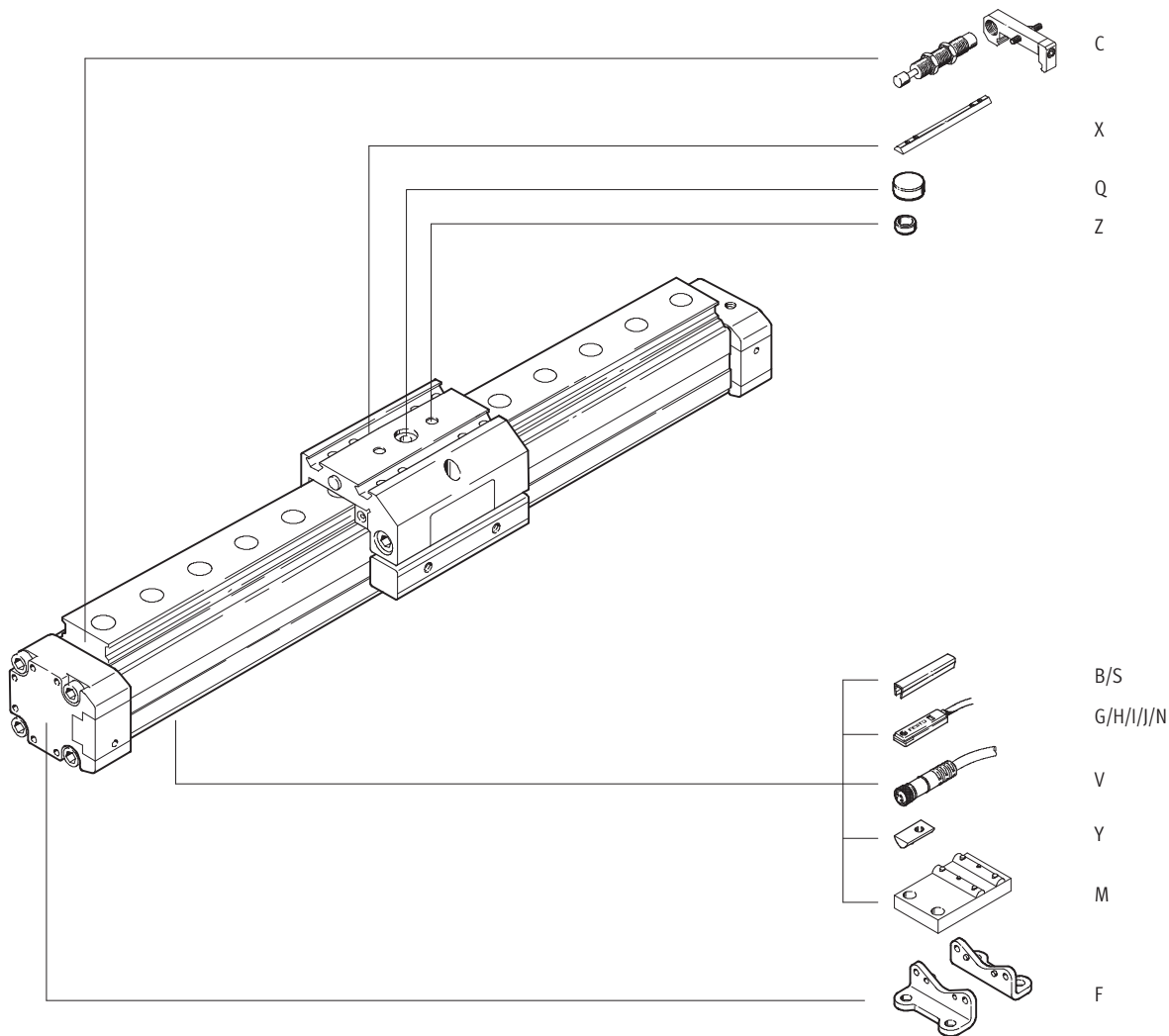
- O top
- U underneath
- R right
- L left
- V front
- H rear

Linear drives DGPL, external displacement encoder

Ordering data – Modular product system



Order code
Options



Linear drives DGPL, external displacement encoder

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Ordering data – Modular product system

M Mandatory data								O Options					➔
Module No.	Drive function	Size	Stroke	Cushioning	Position sensing	Generation	Guide	Clamping unit	Basic variant	Slide attachment position	Supply port	Displacement encoder	
175 134	DGPL	25	225 ... 2 000	PPV	A	B	KF	KU	GK GV	SV SH	D2	MP1	
175 135		32										MP2	
175 136		40										MP3	
175 137		50										MP4	
175 138		63										MA1	
Ordering example												MA2	
												MA3	
												MA4	
												MP0	
												MA0	
175 136	DGPL	- 40	- 750	- PPV	- A	- B	- KF	-	- GV	- SH	- D2	- MA2	

Ordering table								
Size	25	32	40	50	63	Condi- tions	Code	Enter code
M	Module No.	175 134	175 135	175 136	175 137	175 138		
	Drive function	Pneumatic linear drive with slide					DGPL	DGPL
	Size	25	32	40	50	63	-...	
	Stroke [mm]	225, 300, 360, 450, 500, 600, 750, 1 000, 1 250, 1 500, 1 750, 2 000					-...	
	Cushioning	Pneumatic cushioning adjustable at both ends					-PPV	-PPV
	Position sensing	For proximity sensing					-A	-A
	Generation	B series					-B	-B
	Guide	Recirculating ball bearing guide					-KF	-KF
O	Clamping unit	Underneath			–	–	-KU	
	Basic variant	Standard piston/slide				1	-GK	
		Extended piston/slide					-GV	
	Slide attachment position	Slide at front				2	-SV	
		Slide at rear					-SH	
	Supply port	at both ends					-D2	
	Displacement encoder	Encoder, position 1, mounted					-MP1	
		Encoder, position 2, mounted				3	-MP2	
		Encoder, position 3, mounted					-MP3	
		Encoder, position 4, mounted				3	-MP4	
		Temposonic with CAN axis interface, position 1, mounted					-MA1	
		Temposonic with CAN axis interface, position 2, mounted				3	-MA2	
		Temposonic with CAN axis interface, position 3, mounted					-MA3	
		Temposonic with CAN axis interface, position 4, mounted				3	-MA4	
		Encoder, supplied separately					-MP0	
		Temposonic with CAN axis interface, supplied separately					-MA0	

- 1 GK or GV Must be selected
 2 SV or SH Must be selected
 3 MP2, MP4, MA2, MA4 Not with clamping unit KU

Transfer order code

[] DGPL - [] - [] - PPV - A - B - KF - [] - [] - [] - [] - []

Linear drives DGPL, external displacement encoder

Ordering data – Modular product system

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Options

Accessories	Slot cover	Slot nut	Centring sleeve	Central support	Central mounting	Foot mounting	Proximity sensor, magnetic	Plug socket	Shock absorber kit
ZUB	...S ...B	...X ...Y	...Z	...M	...Q	...F	...G ...H ...I ...J ...N	...V	...C
: ZUB	- 2S2B	2XY	Z		Q	F			2C

Ordering table

Size		25	32	40	50	63	Condi- tions	Code	Enter code
↓	Accessories	Supplied separately						:ZUB-	:ZUB-
0	Slot cover, x2, 0.5 m	Sensor slot	1 ... 10					...S	
		Mounting slot	—	1 ... 10				...B	
	Slot nut	Slide	1 ... 10					...X	
		Mounting slot	—	1 ... 10				...Y	
	Centring sleeve (pack of 10)		10, 20, 30, 40, 50, 60, 70, 80, 90					...Z	
	Central support		1 ... 10					...M	
	Central mounting		1 ... 10					...Q	
	Foot mounting		1 ... 10					...F	
	Magnetic proximity sensor	With cable 2.5 m	1 ... 10					...G	
		With plug	1 ... 10					...H	
	Magnetic proximity sensor, contactless	With cable 2.5 m	1 ... 10					...I	
		With plug	1 ... 10					...J	
Magnetic proximity sensor	NC contact, with cable 2.5 m	1 ... 10					...N		
Cable with socket, 2.5 m		1 ... 10					...V		
Shock absorber kit		1 ... 10					...C		

Transfer order code

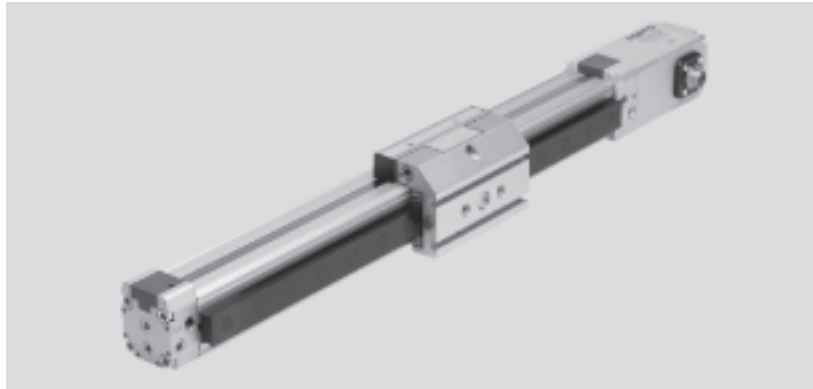
: ZUB -

Linear drives DGPI/DGPIL, integrated displacement encoder

Features

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Individual positioning components with linear drive DGPI/DGPIL ...



Proportional directional control valve
MPYE-...
→ Internet: mpye



Soft Stop → Internet: soft stop

End position controller
SPC11-MTS-AIF



Positioning technology → Internet: spc

Axis interface
SPC-AIF-MTS



Axis positioning controller
SPC200



Linear drives DGPI/DGPIL, integrated displacement encoder

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Features

DGPI, without guide

86

- Piston Ø 25 ... 63 mm
- Stroke 225 ... 2,000 mm
- Standard driver
- Low characteristic load values
- Air connections on both sides



DGPIL, with recirculating ball bearing guide

100

- Piston Ø 25 ... 63 mm
- Stroke 225 ... 2,000 mm
- Standard slide
- High characteristic load values
- Air connections on both sides



DGPIL, with recirculating ball bearing guide and protected version

100

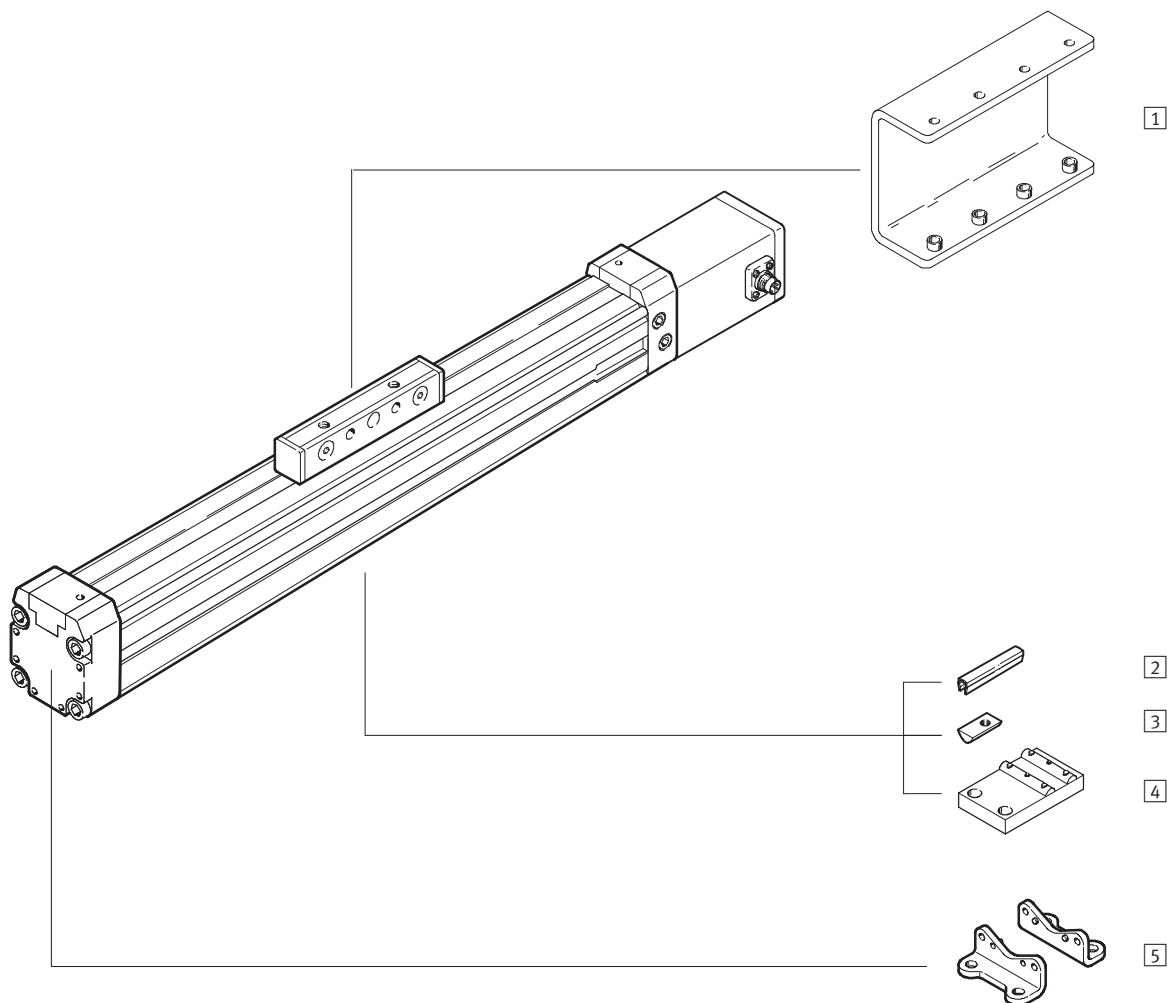
- Piston Ø 25...40 mm
- Stroke 225 ... 2,000 mm
- Protected from above and the sides against the ingress of particles
- High characteristic load values
- Air connections on both sides



Linear drives DGPI, integrated displacement encoder

Peripherals overview

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Variants and accessories		
Type	Brief description	→ Page/Internet
1 Load inverter AK	to secure the load from beneath, is supplied attached	115
2 Slot cover B/S	to protect against the ingress of dirt	117
3 Slot nut Y	for mounting attachments	117
4 Central support M	to mount the axis	114
5 Foot mounting F	to mount the axis	114

Linear drives DGPI, integrated displacement encoder

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Type codes

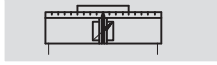
		DGPI	-	25	-	500	-	PPV	-	AIF	-	GK	-	AV	-	AK	-	D2	-	4BYF
Type																				
DGPI	Linear drive unit																			
Piston Ø [mm]																				
Stroke [mm]																				
Cushioning																				
PPV	Pneumatic cushioning adjustable at both ends																			
Displacement encoder																				
AIF	Temposonic with CAN axis interface																			
Basic variant																				
GK	Standard slide																			
Connection position for displacement encoder and compressed air																				
AH	Connections at rear																			
AU	Connections underneath																			
AV	Connections at front																			
Driver																				
AK	Load inverter																			
Air supply port																				
D2	Connection at both ends																			
Accessories supplied loose																				
...S	Slot cover for sensor slot																			
...B	Slot cover for mounting slot																			
...Y	Slot nut for mounting slot																			
...M	Central support																			
...F	Foot mounting																			

Linear drives DGPI, integrated displacement encoder

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Technical data

Function



- $\varnothing$ - Diameter
25 ... 63 mm
- I - Stroke length
225 ... 2,000 mm



General technical data					
Piston Ø	25	32	40	50	63
Design	Piston				
	Driver				
	Profile barrel				
Mode of operation	Double-acting				
Operating medium ¹⁾	Compressed air, filtered and unlubricated, filter unit 5 µm				
Cushioning	Pneumatic cushioning adjustable at both ends				
Cushioning length [mm]	18	20	30		
Position sensing	Integrated displacement encoder				
Measuring principle	Digital, magnetostrictive, non-contacting, absolute measurement				
Type of mounting	Foot mounting				
Stroke ²⁾³⁾ [mm]	225, 300, 360, 450, 500, 600, 750, 1,000, 1,250, 1,500, 1,750, 2,000				
Pneumatic connection	G1/8		G1/4		G3/8
Electrical connection	6-pin round plug to DIN 45 322				

1) The proportional directional control valve MPYE used requires the characteristic values.

2) Note stroke reduction in conjunction with SPC200.

3) Supply of compressed air to each end of the cylinder (feature D2) is absolutely essential for Soft Stop SPC11 and axis controller SPC200 as of a length of 500 mm.

Forces [N] and impact energy [Nm]					
Piston $\varnothing$	25	32	40	50	63
Theoretical force at 6 bar	295	483	754	1,178	1,870
Max. impact energy at the end positions ¹⁾	0.1	0.2	0.4	0.8	0.8

1) Cushioning PPV must be completely open for applications with Soft Stop SPC11 and axis controller SPC200.

Permissible impact velocity:

$$v_{\text{perm.}} = \sqrt{\frac{2 \times E_{\text{perm.}}}{m_{\text{dead}} + m_{\text{load}}}}$$

Maximum permissible load:

$$m_{\text{load}} = \frac{2 \times E_{\text{perm.}}}{v^2} - m_{\text{dead}}$$

$v_{\text{perm.}}$ Permissible impact velocity
 $E_{\text{perm.}}$ Max. impact energy
 m_{dead} Moving load (drive)
 m_{load} Moving work load

-  - Note

These specifications represent the maximum values which can be reached. Note the maximum permitted impact energy.

Linear drives DGPI, integrated displacement encoder

FESTO

Technical data

Positioning characteristics with axis controller SPC200					
Piston Ø	25	32	40	50	63
Repetition accuracy [mm]	➔ 74				
Mounting position	Any				
Minimum load, horizontal ¹⁾ [kg]	2	3	5	8	12
Maximum load, horizontal ¹⁾ [kg]	30	45	75	120	180
Minimum load, vertical ¹⁾ [kg]	2	3	5	8	12
Maximum load, vertical ¹⁾ [kg]	10	15	25	40	60
Min. speed of travel [m/s]	0.05				
Max. speed of travel [m/s]	3				
Typ. positioning time, long stroke ²⁾ [s]	0.75/1.20	0.85/1.20	0.75/1.20	0.95/1.25	0.90/1.20
Typ. positioning time, short stroke ³⁾ [s]	0.40/0.60	0.45/0.60	0.40/0.60	0.50/0.65	0.50/0.65
Minimum positioning stroke ⁴⁾ [%]	3				
Stroke reduction ⁵⁾ [mm]	25		35		
Recommended proportional directional control valve	➔ 118				

1) Load = effective load + mass of all moving parts on the drive

2) At 6 bar, horizontal mounting position, DGPI-XX-1250, 1000 mm positioning travel at min./max. load

3) At 6 bar, horizontal mounting position, DNCM-XX-1250, 100 mm positioning travel at min./max. load

4) In relation to the maximum stroke of the drive, but never more than 20 mm.

5) The stroke reserve is to be maintained on every side of the drive, the max. positionable stroke is therefore: Stroke – 2x stroke reserve

Positioning characteristics with end position controller SPC11					
Piston Ø	25	32	40	50	63
Repetition accuracy of a mid-position ¹⁾ [mm]	±2				
Mounting position	Any				
Minimum load, horizontal ²⁾ [kg]	2	3	5	8	12
Maximum load, horizontal ²⁾ [kg]	30	45	75	120	180
Minimum load, vertical ²⁾ [kg]	2	3	5	8	12
Maximum load, vertical ²⁾ [kg]	10	15	25	40	60
Travel time [s]	→ Sizing software "Smart Soft Stop": → www.festo.com				
Recommended proportional directional control valve	→ 118				

1) In the stroke range from 225 ... 2,000 mm

2) Load = effective load + mass of all moving parts on the drive

Operating and environmental conditions					
Piston Ø	25	32	40	50	63
Operating pressure ¹⁾ [bar]	4 ... 8				
Ambient temperature [°C]	-10 ... +60				
Vibration resistance	To DIN/IEC 68 Parts 2 -6, severity level 1				
Continuous shock resistance	To DIN/IEC 68 Parts 2 -27, severity level 1				
CE marking symbol (see conformity declaration)	As per EU EMC directive				
Protection class (displacement encoder)	IP65 to IEC 60 529				
Corrosion resistance class CRC ²⁾	1				

1) Only applies for applications with Soft Stop SPC11 and axis controller SPC200.

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

Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

Weights [g]					
Piston Ø	25	32	40	50	63
Basic weight	1,540	2,150	3,500	6,980	10,600
Additional weight per 10 mm stroke	38	43	59	130	168
Moving load	180	314	551	1,045	1,775

Linear drives DGPI, integrated displacement encoder

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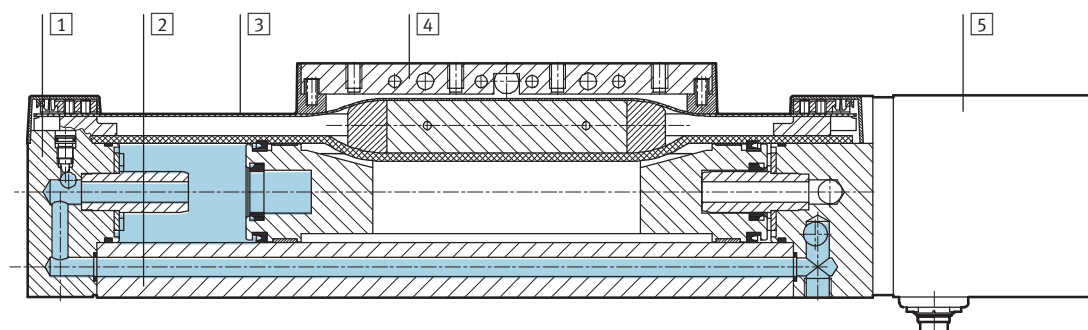
Technical data

Electrical data, displacement encoder		
Power supply	[V DC]	24 (-15/+25%)
Max. current consumption	[mA]	90
Resolution	[mm]	≤ 0.01
Independent linearity ¹⁾	maximum [%]	0.02
Temperature coefficient	[ppm/°K]	≤ 15
Interface	Digital, CAN with protocol: SPC-AIF	

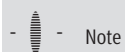
1) Minimum ±50 µm

Materials

Sectional view



Drive		
1	End cap	Anodised aluminium
2	Profile	Anodised aluminium
3	Cover strip	Steel, corrosion resistant
4	Driver	Anodised aluminium
5	Displacement encoder housing	Anodised aluminium
-	Seals	Nitrile rubber, polyurethane



Note

Further technical data

→ Internet: dgpl

Linear drives DGPI, integrated displacement encoder

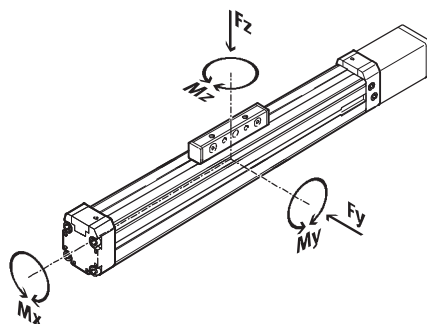
FESTO

Technical data

Characteristic load values

The forces and torques specified refer to the centre line of the profile barrel internal diameter.

They must not be exceeded during dynamic operation. Special attention must be paid to the cushioning phase.



If the drive is subjected to more than two of the indicated forces and torques simultaneously, the following equations must be satisfied in addition to the indicated maximum loads.

$$0,4 \times \frac{F_z}{F_{z_{\max}}} + \frac{M_x}{M_{x_{\max}}} + \frac{M_y}{M_{y_{\max}}} + 0,2 \times \frac{M_z}{M_{z_{\max}}} \leq 1$$

$$\frac{F_z}{F_{z_{\max}}} \leq 1 \quad \frac{M_z}{M_{z_{\max}}} \leq 1$$

Permissible forces and torques

Piston Ø	25	32	40	50	63
Fy _{max.} [N]	–	–	–	–	–
Fz _{max.} [N]	330	480	800	1,200	1,600
Mx _{max.} [Nm]	1	2	4	7	8
My _{max.} [Nm]	20	40	60	120	120
Mz _{max.} [Nm]	3	5	8	15	24

Maximum permissible support span l as a function of the force F

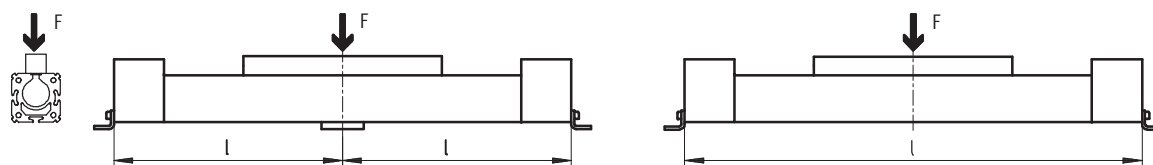
The axis may need to be supported with central supports MUP in order to

limit deflection in the case of large strokes. The following diagrams serve

to determine the maximum permissible support span l as a

function of the force F.

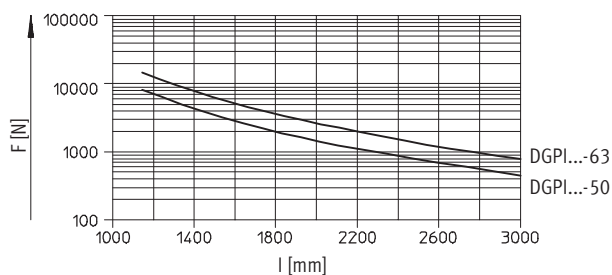
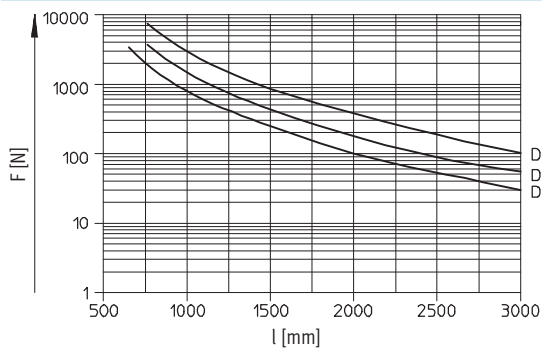
Force on the surface of the slide



Maximum support span l (without central support) as a function of the force F

Piston Ø 25 ... 40

Piston Ø 50/63



Linear drives DGPI, integrated displacement encoder

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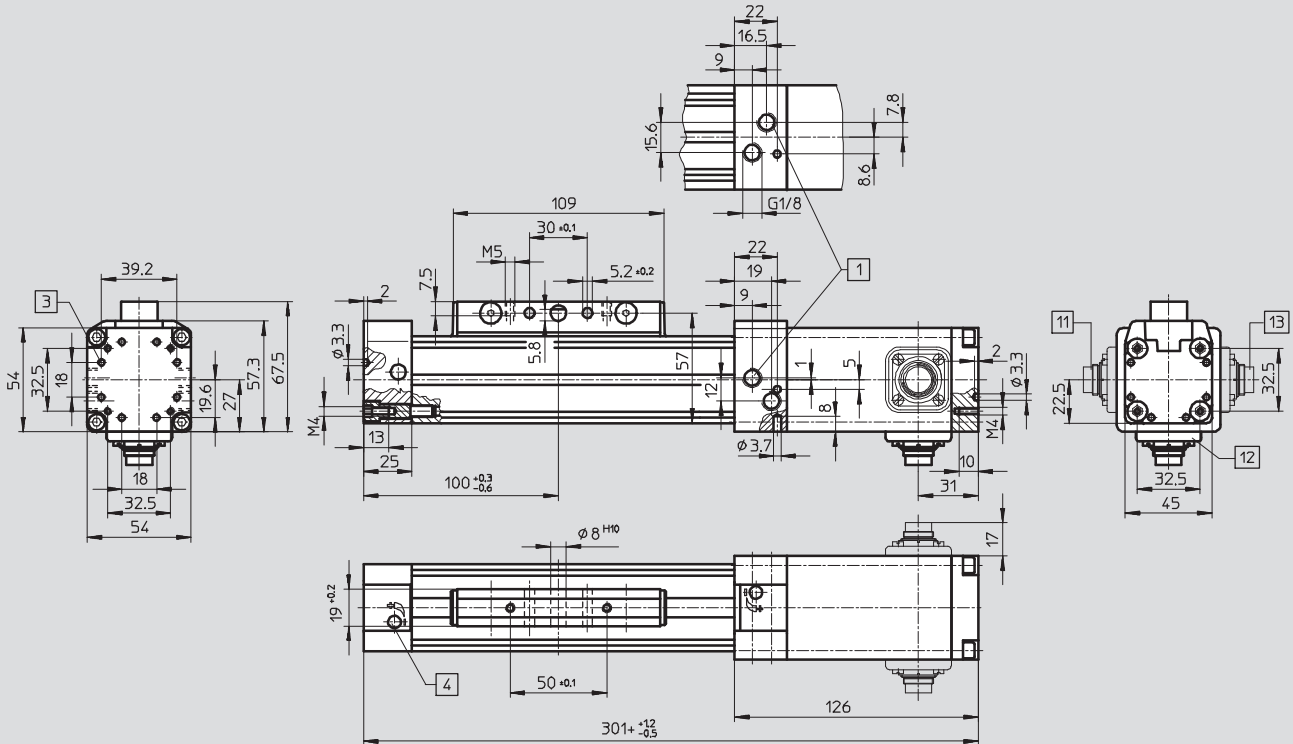
Technical data

Dimensions

Download CAD data → www.festo.com

Standard driver GK

Piston Ø 25



- 1 Both compressed air connections can be optionally connected to three sides of the right-hand end cap
- 2 Mounting holes for foot mounting HP
- 3 Regulating screw for adjustable end-position cushioning
- 4 Encoder connection at rear
- 5 Encoder connection underneath
- 6 Encoder connection at front
- 7 + = plus stroke length

Linear drives DGPI, integrated displacement encoder

Technical data

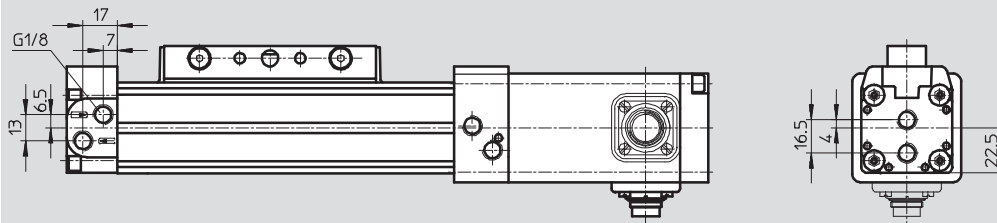
FESTO

Dimensions

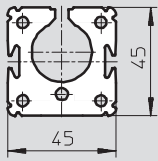
Download CAD data → www.festo.com

Supply port D2 at both sides

Piston Ø 25



Profile barrel



Linear drives DGPI, integrated displacement encoder

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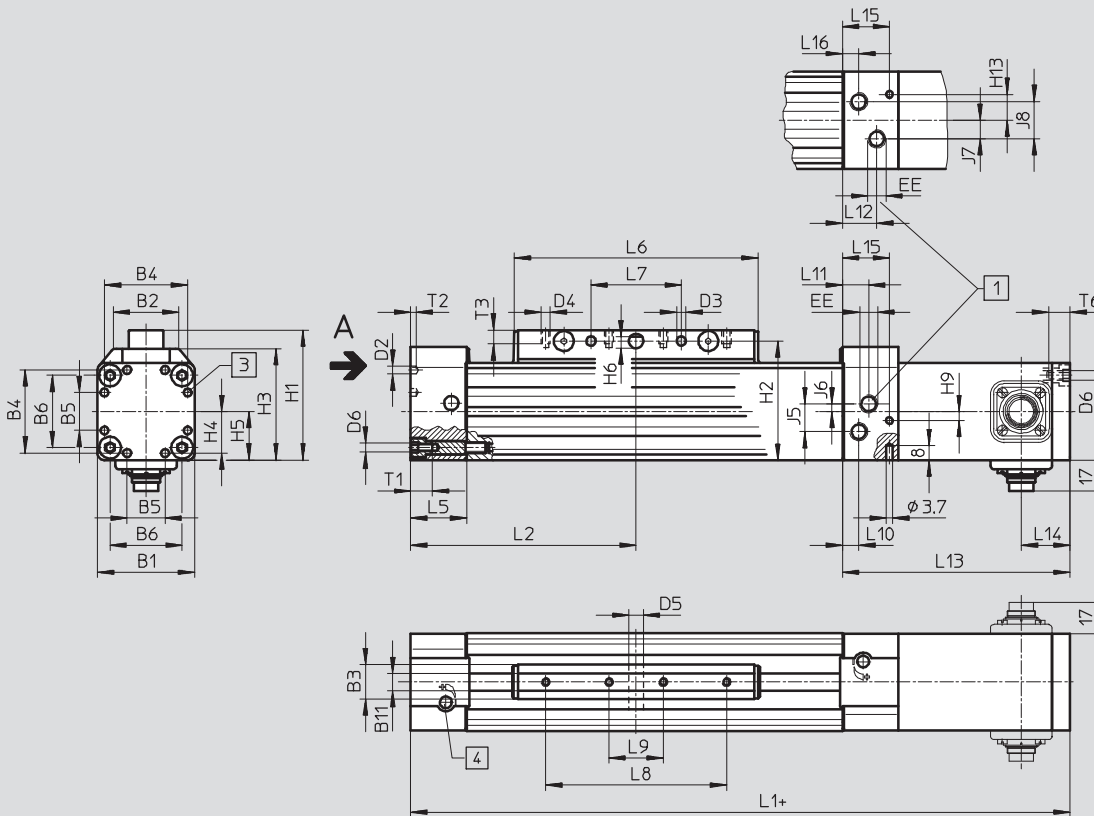
Technical data

Dimensions

Download CAD data → www.festo.com

Standard driver GK

Piston Ø 32 ... 63



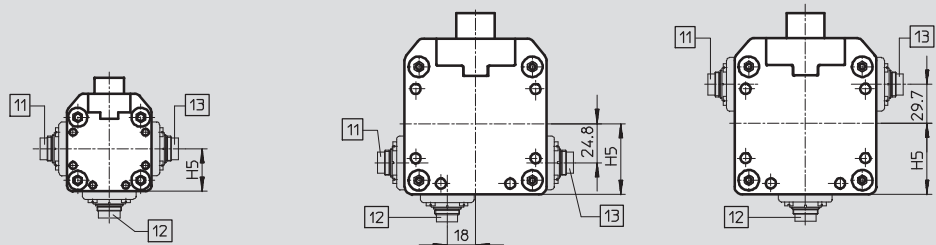
- 1 Both compressed air connections can be optionally connected to three sides of the right-hand end cap
- 2 Mounting holes for foot mounting HP
- 3 Regulating screw for adjustable end-position cushioning
- 4 Encoder connection at rear
- 5 Encoder connection underneath
- 6 Encoder connection at front
- + = plus stroke length

View A

Piston Ø 32/40

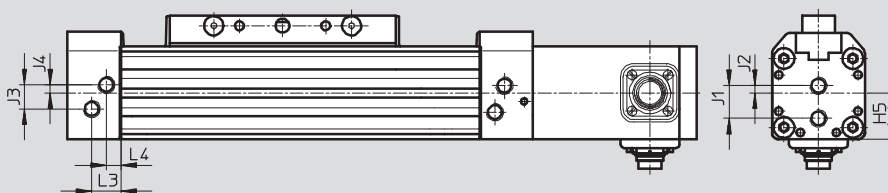
Piston Ø 50

Piston Ø 63



Supply port D2 at both sides

Piston Ø 32 ... 63



Linear drives DGPI, integrated displacement encoder

Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

Profile barrel

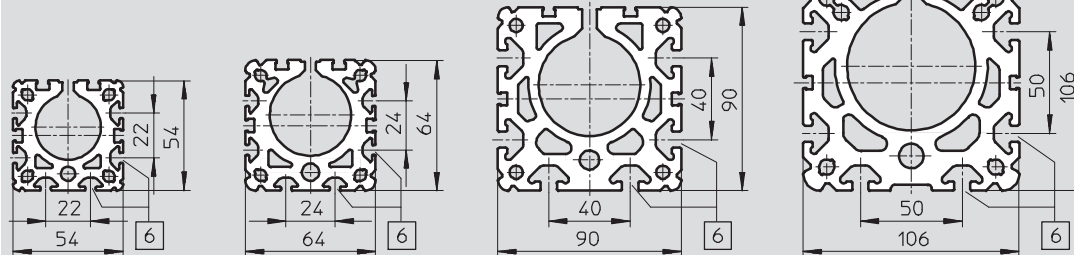
Piston Ø 32

Piston Ø 40

Piston Ø 50

Piston Ø 63

6 Mounting slot for slot nuts NST



Ø	B1	B2	B3	B4	B5	B6	B11	D2 Ø	D3 Ø	D4	D5 Ø	D6
[mm]			+0.2						+0.2		H10	
32	54	35.8	19	46	21	40	9.5	4.3	5.2	M5	8	M5
40	64	45.7	21	53	28	49	9.5	4.3	6.5	M6	10	M5
50	90	69.2	24	76	44	72	12	6.3	8.5	M8	12	M6
63	106	84.8	24	89	44	83	12	6.3	8.5	M8	12	M8

Ø	EE	H1	H2	H3	H4	H5	H6	H9	H13	J1	J2	J3
[mm]												
32	G1/8	72	66	62	23	27	5.8	5	10.3	19	4.2	14
40	G1/4	86	78	71.8	26.5	32	7.7	5	12.75	22	5	21
50	G1/4	115	106	99	36	45	9.7	21.8	16.6	31.8	6.8	29.3
63	G3/8	131	122	115	44.5	53	9.7	-28	30	36	8	31

Ø	J4	J5	J6	J7	J8	L1	L2	L3	L4	L5	L6	L7
[mm]						+1.2/-0.5	+0.3/-0.6					±0.1
32	4.7	15.4	4.2	10.3	20.6	345	125	17	8.5	31	135	50
40	9.1	23	9.1	12.75	25.5	397	150	11.5	11.5	31	171	70
50	6	20.6	6.8	21	21	465	175	14	14	34	206	80
63	14	27	8	25	25	513	200	14	14	34	234	110

Ø	L8	L9	L10	L11	L12	L13	L14	L15	L16	T1	T2	T3	T6
[mm]	±0.1	±0.1											
32	100	30	17	8.5	19	126	27	26	9	13.2	3	7.5	12
40	130	40	10.8	16.5	21	128	29	26	10.8	13.2	4	10.5	12
50	150	50	10.8	18	22.8	149	80	25.2	12	15.2	6	12.5	15
63	190	70	14	24.5	31	147.5	68	16.5	16.5	21.2	6	12.5	20

Linear drives DGPI, integrated displacement encoder

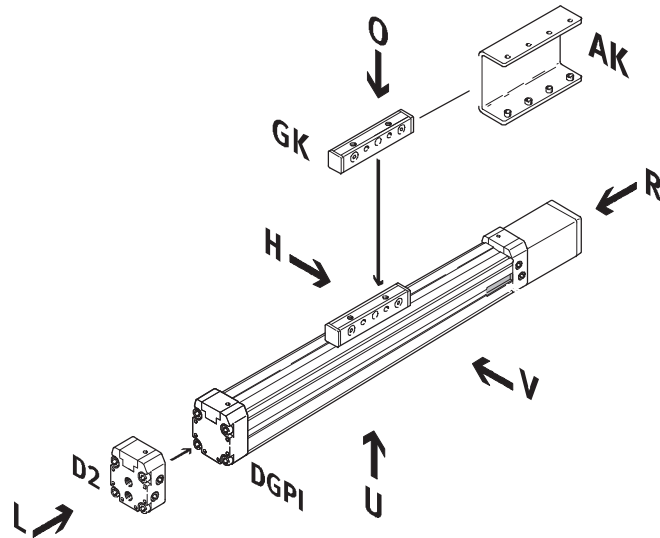
Ordering data – Modular product system

FESTO

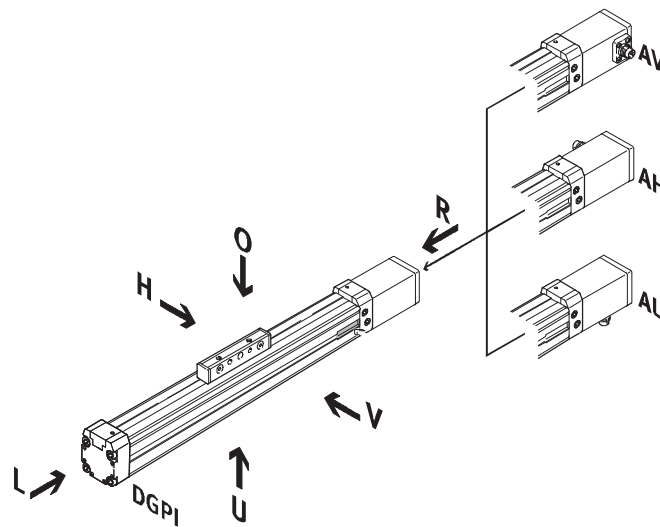
Order code

Mandatory data/Options

- AK Load inverter
- D2 Air connection at both ends
- GK Standard slide



- AV Displacement encoder connection to front
- AH Displacement encoder connection to rear
- AU Displacement encoder connection underneath



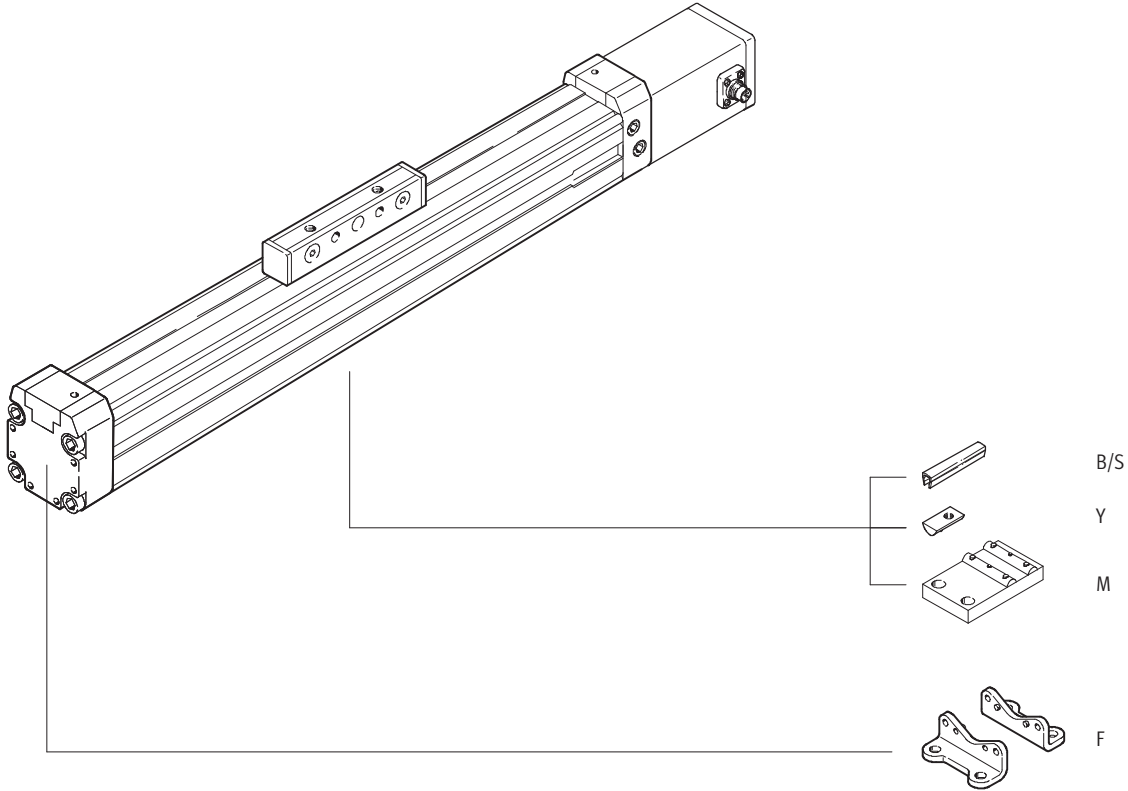
Linear drives DGPI, integrated displacement encoder

Ordering data – Modular product system

FESTO

Order code

Options



Linear drives DGPI, integrated displacement encoder

Ordering data – Modular product system

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Mandatory data →

Module No.	Drive function	Size	Stroke	Cushioning	Displacement encoder	Basic variant	Connection position for displacement encoder
175 134	DGPI	25	225 ... 2 000	PPV	AIF	GK	AH
175 135		32					AU
175 136		40					AV
175 137		50					
175 138		63					
Ordering example							
175 138	DGPI	63	750	PPV	AIF	GK	AV

Ordering table									
Size	25	32	40	50	63	Condi- tions	Code	Enter code	
M Module No.	175 134	175 135	175 136	175 137	175 138				
Drive function	Pneumatic linear drive with integrated displacement encoder						DGPI		DGPI
Size	25	32	40	50	63		-...		
Stroke [mm]	225, 300, 360, 450, 500, 600, 750, 1 000, 1 250, 1 500, 1 750, 2 000						-...		
Cushioning	Pneumatic cushioning adjustable at both ends						-PPV		-PPV
Displacement encoder	Temposonic with CAN axis interface						-AIF		-AIF
Basic variant	Standard piston/slide						-GK		-GK
Connection position for displacement encoder AIF and compressed air	Connection position for displacement encoder and air supply port, rear						-AH		
	Connection position for displacement encoder and air supply port, underneath						-AU		
	Connection position for displacement encoder and air supply port, front						-AV		

Transfer order code

	DGPI	-		-		-	PPV	-	AIF	-	GK	-	
--	------	---	--	---	--	---	-----	---	-----	---	----	---	--

Linear drives DGPI, integrated displacement encoder

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Ordering data – Modular product system

Options					
Driver/Air supply port	Accessories	Slot cover	Slot nut	Central support	Foot mounting
AK D2	ZUB	...S ...B	...Y	...M	...F
- AK	: ZUB	- 2B2S	10Y		F

Ordering table									
Size	25	32	40	50	63	Condi- tions	Code		Enter code
↓ Driver	Load inverter						-AK		
0 Air supply port	at both ends						-D2		
Accessories	Supplied separately						:ZUB-		:ZUB-
Slot cover, Sensor slot x2, 0.5 m	1 ... 10						...S		
Mounting slot	- 1 ... 10						...B		
Slot nut Mounting slot	- 1 ... 10						...Y		
Central support	1 ... 10						...M		
Foot mounting	1 ... 10						...F		

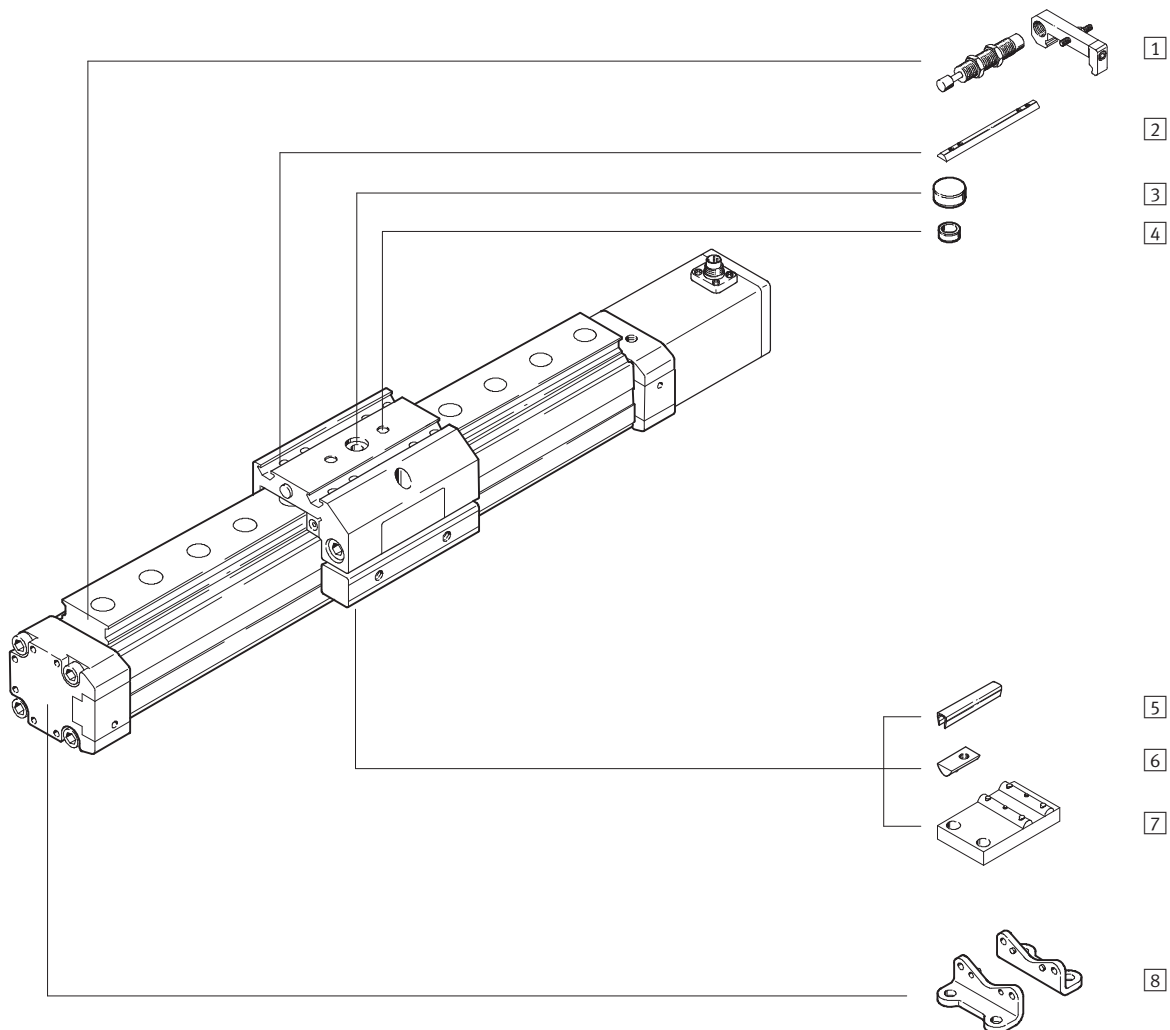
Transfer order code

- : ZUB -

Linear drives DGPIIL, integrated displacement encoder

Peripherals overview

FESTO



Linear drives DGPII, integrated displacement encoder

Peripherals overview

Variants and accessories		
Type	Brief description	→ Page/Internet
1 Shock absorber kit C/E	to avoid damage at the end stop, in the event of malfunctions	116
2 Slot nut for slide X	for mounting loads and attachments on the slide	117
3 Central mounting Q	for centring loads and attachments on the slide	117
4 Centring sleeves Z	for centring loads and attachments on the slide	117
5 Slot cover B/S	to protect against the ingress of dirt	117
6 Slot nut for mounting slot Y	for mounting attachments	117
7 Central support M	to mount the axis	114
8 Foot mounting F	to mount the axis	114

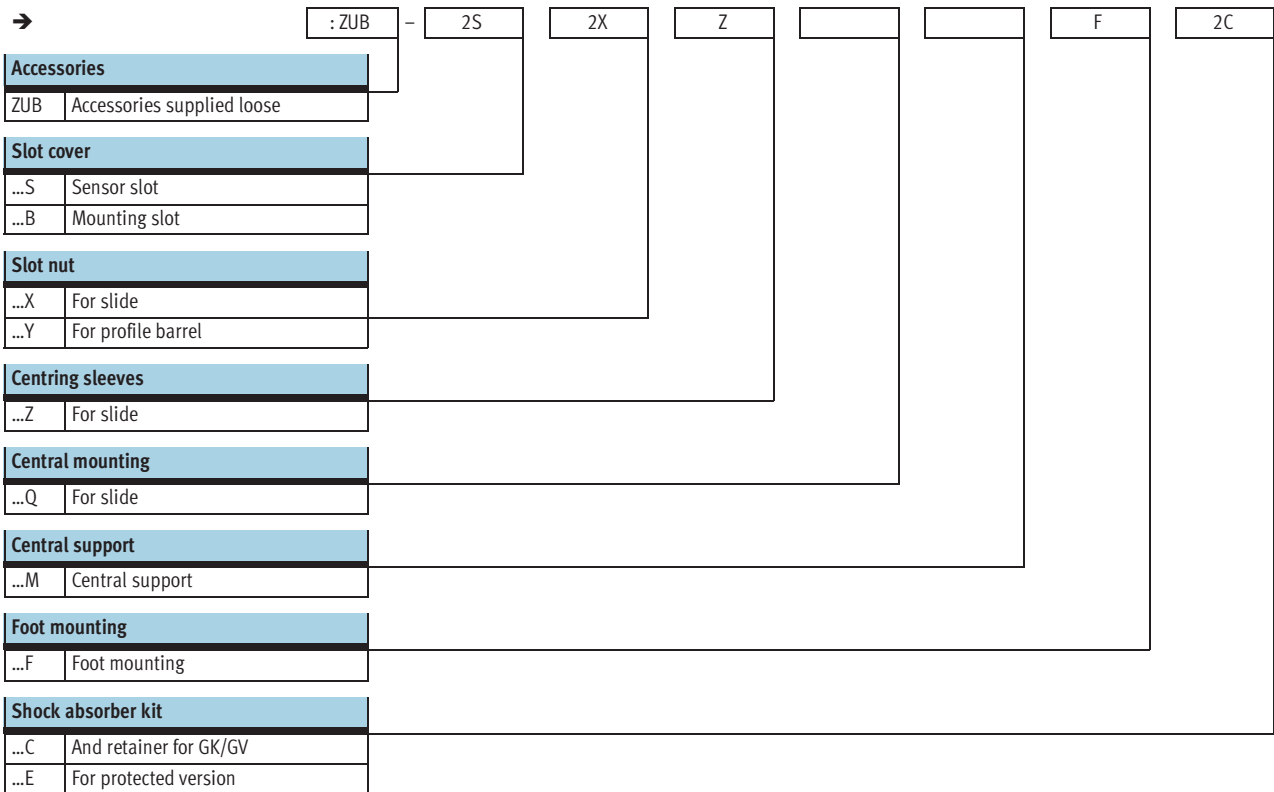
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		DGPIL	-	25	-	500	-	PPV	-	B	-	KF	-	AIF	-	GK	-	AV	-	SV	-	D2	-	
Type																								
DGPIL	Linear drive unit																							
Piston Ø [mm]																								
Stroke [mm]																								
Cushioning																								
PPV	Pneumatic cushioning adjustable at both ends																							
Generation																								
B	B series																							
Guide																								
KF	Recirculating ball bearing guide																							
Displacement encoder																								
AIF	Temposonic with CAN axis interface																							
Basic variant																								
GK	Standard slide																							
Connection position for displacement encoder and compressed air																								
AH	Connections at rear																							
AU	Connections underneath																							
AV	Connections at front																							
Slide attachment position																								
SH	Slide at rear																							
SV	Slide at front																							
Air supply port																								
D2	Connection at both ends																							
Protected version																								
GA	Protected version																							

Linear drives DGPII, integrated displacement encoder

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Type codes

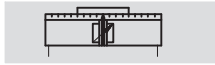


Linear drives DGPII, integrated displacement encoder

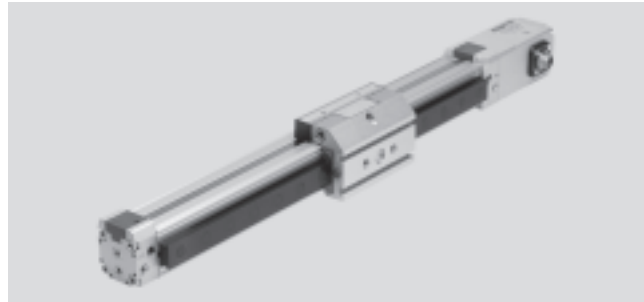
FESTO

Technical data

Function



- Ø - Diameter
25 ... 63 mm
- I - Stroke length
225 ... 2,000 mm



General technical data					
Piston Ø	25	32	40	50	63
Design	Piston				
	Driver				
	Profile barrel				
Mode of operation	Double-acting				
Operating medium ¹⁾	Compressed air, filtered and unlubricated, filter unit 5 µm				
Cushioning	Pneumatic cushioning adjustable at both ends				
Cushioning length [mm]	18	20	30		
Position sensing	Integrated displacement encoder				
Measuring principle	Digital, magnetostrictive, non-contacting, absolute measurement				
Type of mounting	Foot mounting				
Stroke ²⁾³⁾ [mm]	225, 300, 360, 450, 500, 600, 750, 1,000, 1,250, 1,500, 1,750, 2,000				
Protection against torsion/guide	Guide rail with slide				
	Recirculating ball bearing				
Protected version ⁴⁾	Optional				
Pneumatic connection	G1/8		G1/4		G3/8
Electrical connection	6-pin round plug to DIN 45 322				

1) The proportional directional control valve MPYE used requires the characteristic values.

2) Note stroke reduction in conjunction with SPC200.

3) Supply of compressed air to each end of the cylinder (feature D2) is absolutely essential for Soft Stop SPC11 and axis controller SPC200 as of a length of 500 mm.

4) Protected from above and the sides against the ingress of particles

Forces [N] and impact energy [Nm]					
Piston Ø	25	32	40	50	63
Theoretical force at 6 bar	295	483	754	1,178	1,870
Max. impact energy at the end positions ¹⁾	0.1	0.2	0.4	0.8	0.8

1) Cushioning PPV must be completely open for applications with Soft Stop SPC11 and axis controller SPC200.

Permissible impact velocity:

$$v_{perm.} = \sqrt{\frac{2 \times E_{perm.}}{m_{dead} + m_{load}}}$$

$v_{perm.}$ Permissible impact velocity
 $E_{perm.}$ Max. impact energy
 m_{dead} Moving load (drive)
 m_{load} Moving work load

Maximum permissible load:

$$m_{load} = \frac{2 \times E_{perm.}}{v^2} - m_{dead}$$

- - Note

These specifications represent the maximum values which can be reached. Note the maximum permitted impact energy.

Linear drives DGPII, integrated displacement encoder

FESTO

Technical data

Positioning characteristics with axis controller SPC200					
Piston Ø	25	32	40	50	63
Repetition accuracy [mm]	➔ 74				
Mounting position	Any				
Minimum load, horizontal ¹⁾ [kg]	2	3	5	8	12
Maximum load, horizontal ¹⁾ [kg]	30	45	75	120	180
Minimum load, vertical ¹⁾ [kg]	2	3	5	8	12
Maximum load, vertical ¹⁾ [kg]	10	15	25	40	60
Min. speed of travel [m/s]	0.05				
Max. speed of travel [m/s]	3				
Typ. positioning time, long stroke ²⁾ [s]	0.75/1.20	0.85/1.20	0.75/1.20	0.95/1.25	0.90/1.20
Typ. positioning time, short stroke ³⁾ [s]	0.40/0.60	0.45/0.60	0.40/0.60	0.50/0.65	0.50/0.65
Minimum positioning stroke ⁴⁾ [%]	3				
Stroke reduction ⁵⁾ [mm]	25		35		
Recommended proportional directional control valve	➔ 118				

1) Load = effective load + mass of all moving parts on the drive

2) At 6 bar, horizontal mounting position, DGPII-XX-1250, 1000 mm positioning travel at min./max. load

3) At 6 bar, horizontal mounting position, DNCM-XX-1250, 100 mm positioning travel at min./max. load

4) In relation to the maximum stroke of the drive, but never more than 20 mm.

5) The stroke reserve is to be maintained on every side of the drive, the max. positionable stroke is therefore: Stroke – 2x stroke reserve

Positioning characteristics with end position controller SPC11					
Piston Ø	25	32	40	50	63
Repetition accuracy of a mid-position ¹⁾ [mm]	±2				
Mounting position	Any				
Minimum load, horizontal ²⁾ [kg]	2	3	5	8	12
Maximum load, horizontal ²⁾ [kg]	30	45	75	120	180
Minimum load, vertical ²⁾ [kg]	2	3	5	8	12
Maximum load, vertical ²⁾ [kg]	10	15	25	40	60
Travel time [s]	→ Sizing software "Smart Soft Stop": → www.festo.com				
Recommended proportional directional control valve	→ 118				

1) In the stroke range from 225 ... 2,000 mm

2) Load = effective load + mass of all moving parts on the drive

Operating and environmental conditions					
Piston Ø	25	32	40	50	63
Operating pressure ¹⁾ [bar]	4 ... 8				
Ambient temperature [°C]	-10 ... +60				
Vibration resistance	To DIN/IEC 68 Parts 2 -6, severity level 1				
Continuous shock resistance	To DIN/IEC 68 Parts 2 -27, severity level 1				
CE marking symbol (see conformity declaration)	As per EU EMC directive				
Protection class (displacement encoder)	IP65 to IEC 60 529				

1) Only applies for applications with Soft Stop SPC11 and axis controller SPC200.

Linear drives DGPII, integrated displacement encoder

FESTO

Technical data

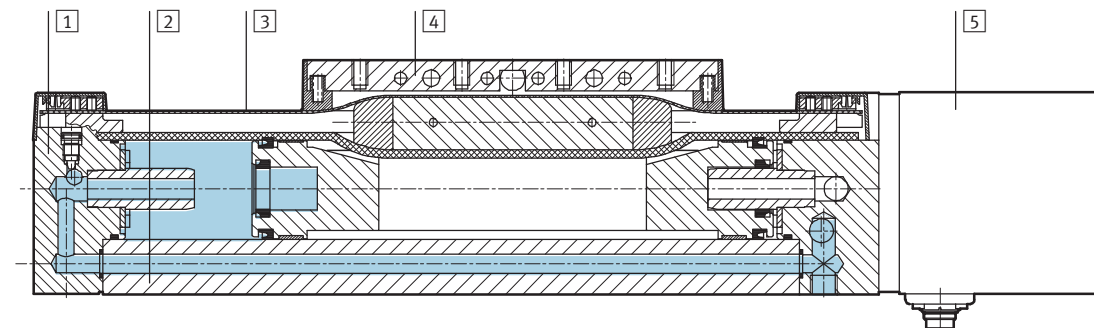
Weights [g]					
Piston Ø	25	32	40	50	63
Standard slide GK					
Basic weight	2,220	3,320	5,330	10,700	16,870
Additional weight per 10 mm stroke	55	71	99	186	256
Moving load	605	895	1,700	3,000	4,990
Additional weights for protected version GA					
Dirt protection cover	1,690	2,500	4,000	–	–
Additional weight per 10 mm stroke	26	42	65	–	–
Moving load	907	1,350	2,550	–	–

Electrical data, displacement encoder		
Power supply	[V DC]	24 (–15/+25%)
Max. current consumption	[mA]	90
Resolution	[mm]	≤ 0.01
Independent linearity ¹⁾	maximum [%]	0.02
Temperature coefficient	[ppm/°K]	≤ 15
Interface	Digital, CAN with protocol: SPC-AIF	

1) Minimum ±50 µm

Materials

Sectional view



Drive	
1 End cap	Anodised aluminium
2 Profile	Anodised aluminium
3 Cover strip	Steel, corrosion resistant
4 Driver	Anodised aluminium
5 Displacement encoder housing	Anodised aluminium
– Slide	Anodised aluminium
– Guide rail	Corrosion resistant steel
– Seals	Nitrile rubber, polyurethane

 Note
 Further technical data
 → Internet: dgpl

Linear drives DGPI, integrated displacement encoder

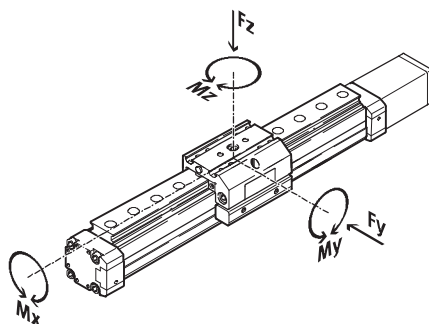
FESTO

Technical data

Characteristic load values

The forces and torques specified refer to the centre line of the profile barrel internal diameter.

They must not be exceeded during dynamic operation. Special attention must be paid to the cushioning phase.



If the drive is subjected to more than two of the indicated forces and torques simultaneously, the following equations must be satisfied in addition to the indicated maximum loads.

$$\frac{F_y}{F_{y_{\max}}} + \frac{F_z}{F_{z_{\max}}} + \frac{M_x}{M_{x_{\max}}} + \frac{M_y}{M_{y_{\max}}} + \frac{M_z}{M_{z_{\max}}} \leq 1$$

Permissible forces and torques

Piston Ø	25	32	40	50	63
F _y _{max.} [N]	3,080	3,080	7,300	7,300	14,050
F _z _{max.} [N]	3,080	3,080	7,300	7,300	14,050
M _x _{max.} [Nm]	45	63	170	240	580
M _y _{max.} [Nm]	85	127	330	460	910
M _z _{max.} [Nm]	85	127	330	460	910

Maximum permissible support span l as a function of the force F

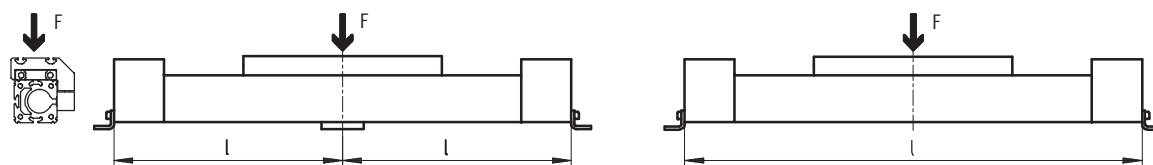
The axis may need to be supported with central supports MUP in order to

limit deflection in the case of large strokes. The following diagrams serve

to determine the maximum permissible support span l as a

function of the force F.

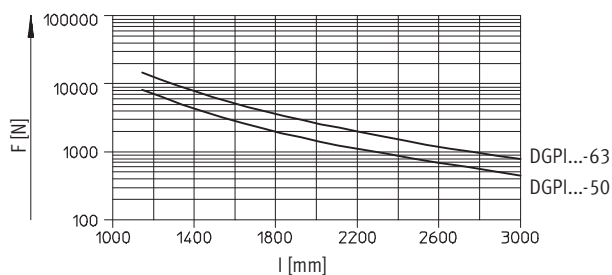
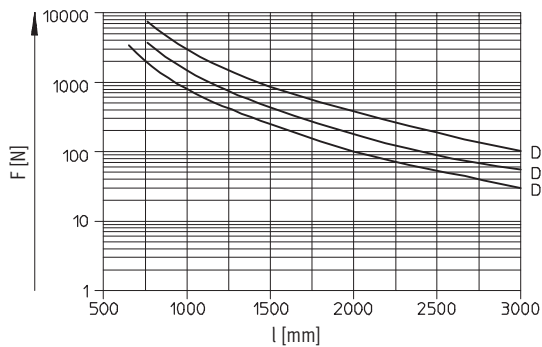
Force on the surface of the slide



Maximum support span l (without central support) as a function of the force F

Piston Ø 25 ... 40

Piston Ø 50/63



Linear drives DGPII, integrated displacement encoder

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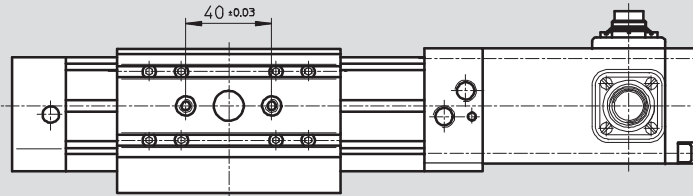
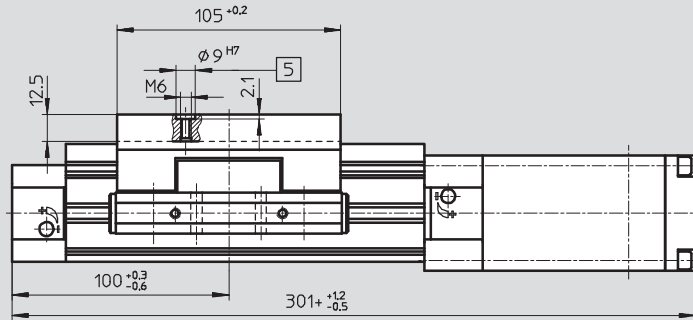
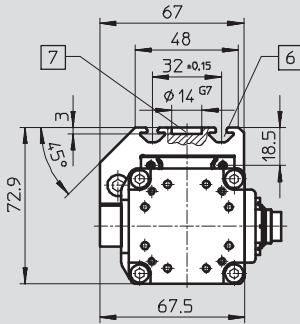
Technical data

Dimensions

Download CAD data → www.festo.com

Standard slide GK

Piston Ø 25



- 5 Hole for centring sleeve ZBH-9
- 6 Mounting slot for slot nut NSTL

- 7 Drilled hole for central mounting SLZZ

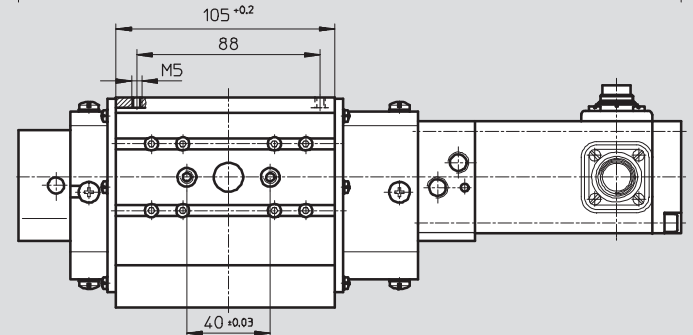
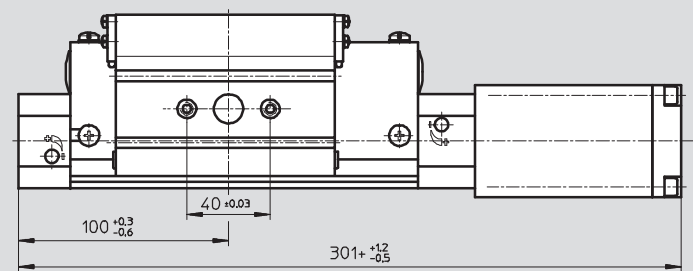
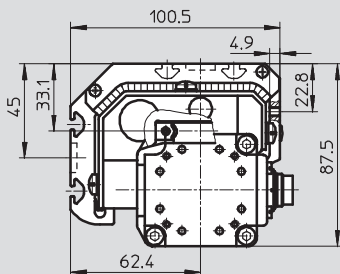
+ = plus stroke length

Basic dimensions

→ 92

Protected version GA

Piston Ø 25



+ = plus stroke length

Basic dimensions

→ 92

Linear drives DGPII, integrated displacement encoder

Technical data

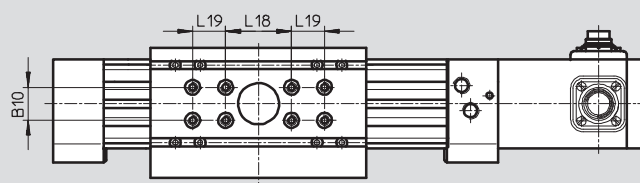
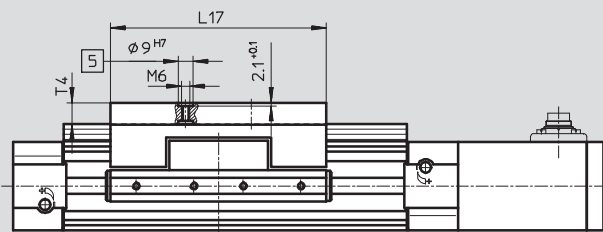
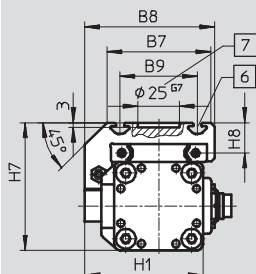
FESTO

Dimensions

Download CAD data → www.festo.com

Standard slide GK

Piston Ø 32 ... 63



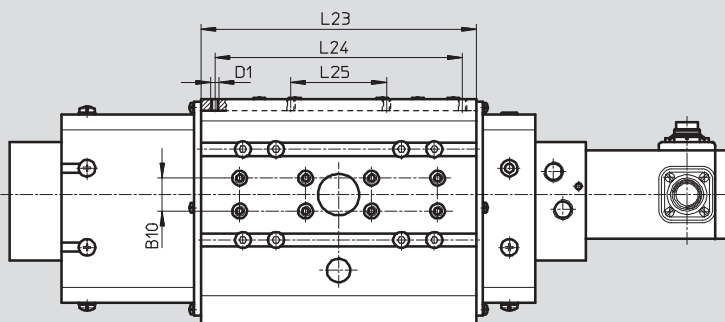
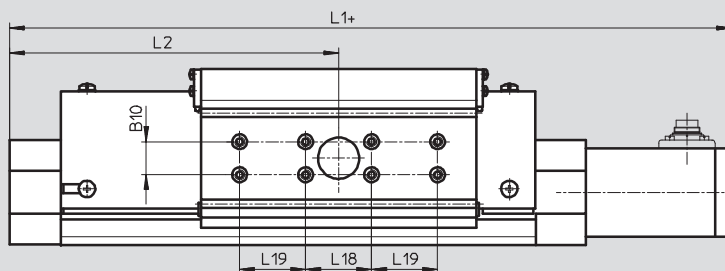
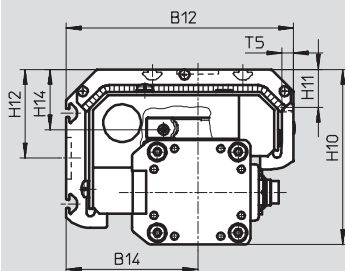
- 5 Hole for centring sleeve ZBH-9
- 6 Mounting slot for slot nut NSTL
- 7 Drilled hole for central mounting SLZZ
- + = plus stroke length

Basic dimensions

→ 94

Protected version GA

Piston Ø 32/40



+ = plus stroke length

Basic dimensions

→ 94

Ø [mm]	B7	B8	B9	B10 ±0.03	B12	B14	D1	H1	H7	H8	H10
32	63	79	47 ±0.15	20	112.1	67.6	–	72	77.5	18.5	93.1
40	78.5	96.5	55 ±0.2	20	137.6	79.6	M5	86	90.5	20	106.6
50	97	122	72 ±0.2	40	–	–	–	115	122.5	26	–
63	121	142	90 ±0.25	40	–	–	–	131	144.5	30	–

Ø [mm]	H11	H12	H14	L1 +1.2/–0.5	L2 +0.3/–0.6	L17 +0.2	L18 ±0.03	L19 ±0.03	L23	L24	L25	T4 max.	T5
32	–	49.5	34.1	345	125	131	40	–	131	–	–	12.5	–
40	23.1	54	36.1	397	150	167	40	40	167	150	58	12.5	7
50	–	–	–	465	175	202	40	40	–	–	–	18.5	–
63	–	–	–	513	200	230	40	40	–	–	–	20.5	–

Linear drives DGPIIL, integrated displacement encoder

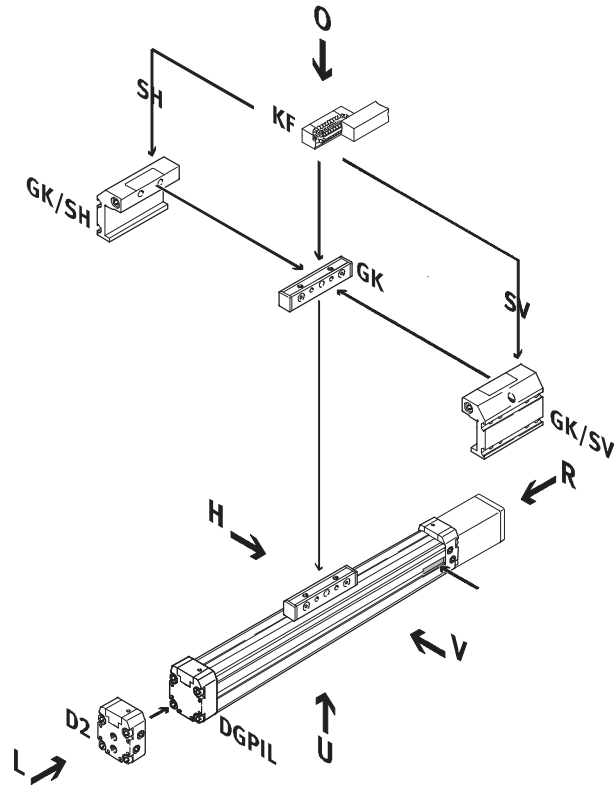
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Ordering data – Modular product system

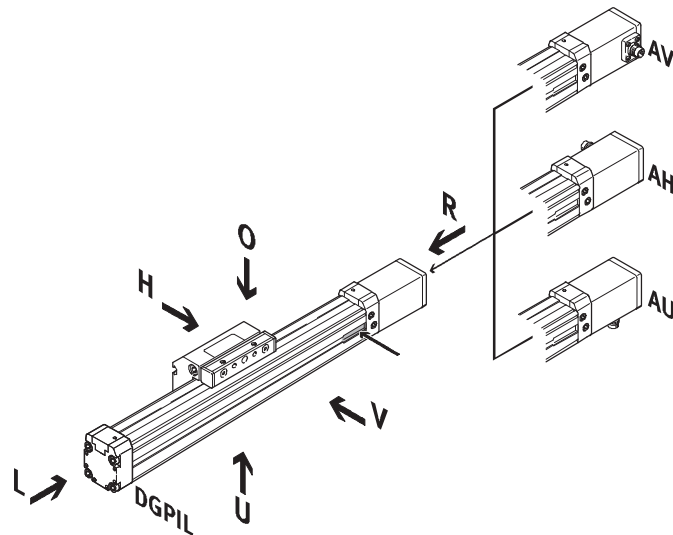
Order code

Mandatory data

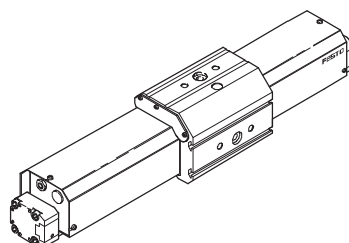
- KF Recirculating ball bearing guide
- SH Slide at rear
- SV Slide at front
- D2 Air connection at both ends
- GK Standard slide



- AV Displacement encoder connection to front
- AH Displacement encoder connection to rear
- AU Displacement encoder connection underneath



- GA Protected version



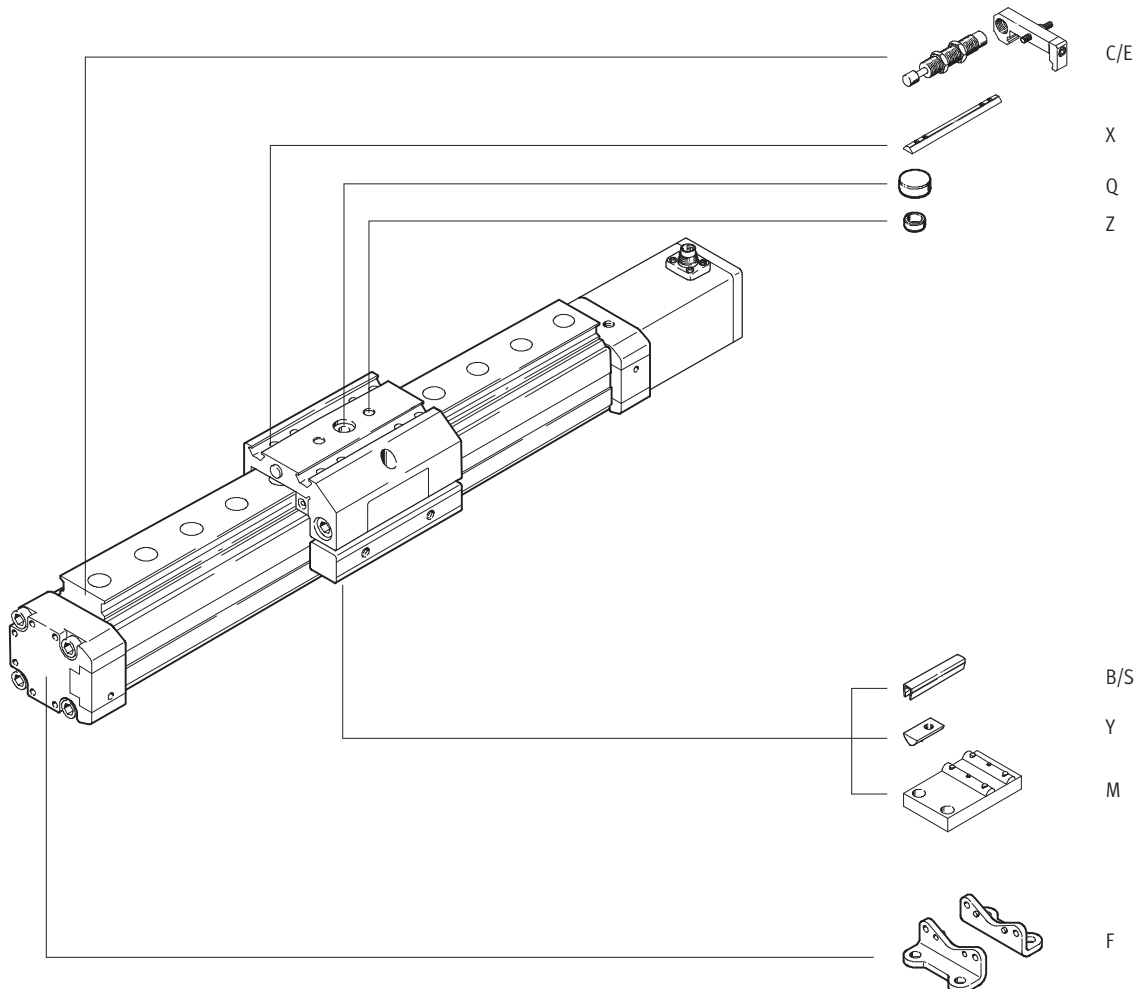
Linear drives DGPIIL, integrated displacement encoder

Ordering data – Modular product system

FESTO

Order code

Options



Linear drives DGPIL, integrated displacement encoder

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Ordering data – Modular product system

Mandatory data →										
Module No.	Drive function	Size	Stroke	Cushioning	Generation	Guide	Displacement encoder	Basic variant	Connection position for displacement encoder	Slide attachment position
175 134	DGPIL	25	225 ...	PPV	B	KF	AIF	GK	AH	SH
175 135		32	2 000						AU	SV
175 136		40							AV	
175 137		50								
175 138		63								
Ordering example										
175 134	DGPIL	25	450	PPV	B	KF	AIF	GK	AU	SH

Ordering table										
Size	25	32	40	50	63	Condi- tions	Code	Enter code		
M Module No.	175 134	175 135	175 136	175 137	175 138					
Drive function	Pneumatic linear drive with integrated displacement encoder and slide						DGPIL	DGPIL		
Size	25	32	40	50	63		~...			
Stroke [mm]	225, 300, 360, 450, 500, 600, 750, 1 000, 1 250, 1 500, 1 750, 2 000						~...			
Cushioning	Pneumatic cushioning adjustable at both ends						-PPV	-PPV		
Generation	B series						-B	-B		
Guide	Recirculating ball bearing guide						-KF	-KF		
Displacement encoder	Temposonic with CAN axis interface						-AIF	-AIF		
Basic variant	Standard piston/slide						-GK	-GK		
Connection position for displacement encoder AIF and compressed air	Connection position for displacement encoder and air supply port, rear						-AH			
	Connection position for displacement encoder and air supply port, underneath						-AU			
	Connection position for displacement encoder and air supply port, front						-AV			
Slide attachment position	Slide at rear						-SH			
	Slide at front						-SV			

Transfer order code

DGPIL - - - PPV - B - KF - AIF - GK - -

Linear drives DGPII, integrated displacement encoder

FESTO

Ordering data – Modular product system

Options

Air supply port	Protected version	Accessories	Slot cover	Slot nut	Centring sleeve	Central support	Central mounting	Foot mounting	Shock absorber
D2	GA	ZUB	...S ...B	...X ...Y	...Z	...M	...Q	...F	...C ...E
- D2	-	: ZUB	- 2S2B	2X				F	2C

Ordering table

Size	25	32	40	50	63	Condi- tions	Code	Enter code
↓ Air supply port	at both ends						-D2	
0 Protected version	Protected roller bearing design for harsh environment						-GA	
Accessories	Supplied separately						:ZUB-	:ZUB-
Slot cover, x2, 0.5 m	Sensor slot	1 ... 10					...S	
	Mounting slot	1 ... 10					...B	
Slot nut	Slide	1 ... 10					...X	
	Mounting slot	1 ... 10					...Y	
Centring sleeve (pack of 10)	10, 20, 30, 40, 50, 60, 70, 80, 90						...Z	
Central support	1 ... 10						...M	
Central mounting	1 ... 10						...Q	
Foot mounting	1 ... 10						...F	
Shock absorber kit	with retainer, 1-off	1 ... 10					1 ...C	
		1 ... 10					2 ...E	

1 C Not with protected version GA.

2 E Only with protected version GA.

Transfer order code

- [] - [] : ZUB - [] [] [] [] [] [] [] []

Linear drives DGPL/DGPI/DGPIL

Accessories

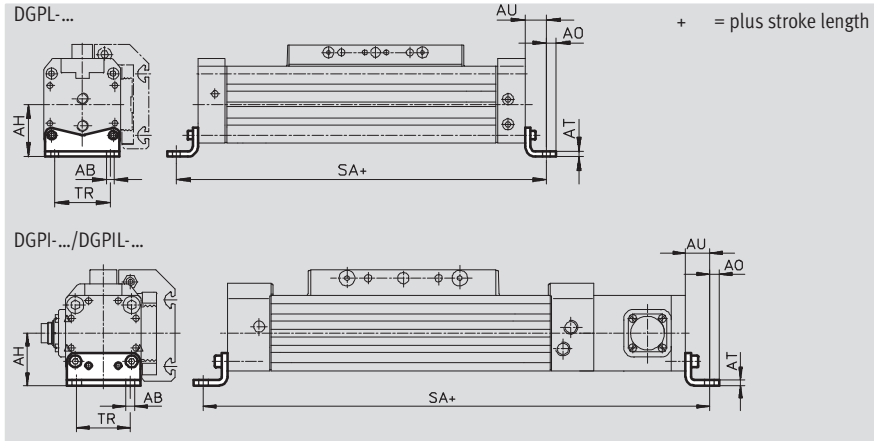
FESTO

Foot mounting HP (Order code: F)



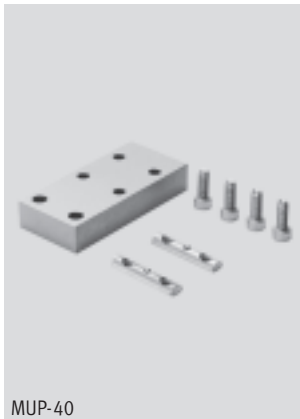
Material:
Galvanised steel

Free of copper, PTFE and silicone



Dimensions and ordering data											
for Ø	AB	AH	AO	AT	AU	SA		TR	Weight	Part No.	Type
[mm]	Ø					DGPL	DGPI(L)		[g]		
25	5.5	29.5	6	3	13	226	327	32.5	61	150 731	HP-25
32	6.6	37	7	4	17	284	379	38	117	150 732	HP-32
40	6.6	46	8.5	5	17.5	335	432	45	188	150 733	HP-40
50	9	61	11	6	25	400	515	65	243	150 734	HP-50
63	11	69	13.5	6	28	456	569	75	305	150 735	HP-63

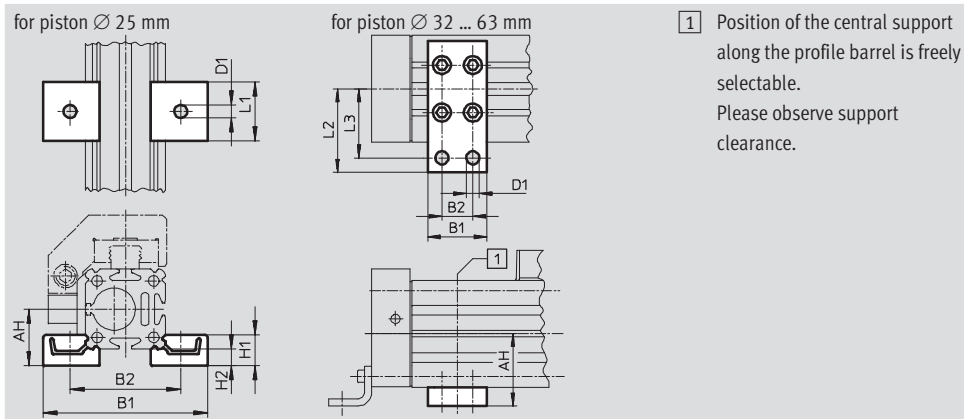
Central support MUP (Order code: M)



MUP-40

Material:
Galvanised steel

Free of copper, PTFE and silicone



Dimensions and ordering data												
for Ø	AH	B1	B2	D1 Ø	H1	H2	L1	L2	L3	Weight	Part No.	Type
[mm]										[g]		
25	29.5	81	58	5.5	13	7	25	–	–	33	150 736	MUP-18/25
32	37	35	22	6.6	–	–	–	41.5	35	89	150 737	MUP-32
40	46	35	22	6.6	–	–	–	47	40	126	150 738	MUP-40
50	61	50	26	11	–	–	–	70	58	241	150 739	MUP-50
63	69	50	26	11	–	–	–	77	65	340	150 800	MUP-63

Linear drives DGPL/DGPI/DGPIL

Accessories

FESTO

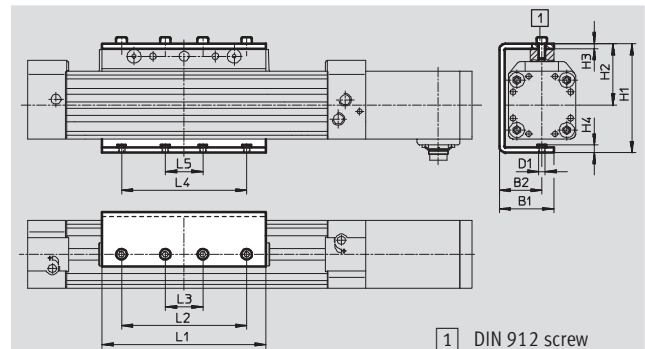
Load inverter AK

for DGPI

(Order code: AK)

Material:

Galvanised steel



Dimensions and ordering data									
for Ø	B1	B2	D1	H1	H2	H3	H4	L1	L2
[mm]									
25	39	29.5	M5	76.1	43.5	3	5	105	–
32	43.5	34	M5	87	49	4	6	131	100
40	50.5	40	M6	104	58	4	8.1	167	130
50	67	55	M8	138.5	75	5	10.5	202	150
63	77	65	M8	156.5	84	6	11.5	230	190

for Ø	L3	L4	L5	1	CRC ¹⁾	Weight	Part No.	Type
[mm]						[g]		
25	50	50	20	M5x10	2	380	196 106	AK-25
32	30	100	30	M5x12		690	196 107	AK-32
40	40	130	40	M6x14		1,050	196 108	AK-40
50	50	150	50	M8x16		2,080	196 109	AK-50
63	70	190	70	M8x18		2,820	196 110	AK-63

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.

Shock absorber DG-GA

for DGPIL

Protected version GA

(Order code: E)

Material:

Housing: Galvanised steel; piston rod:
high-alloy steel

Seals: Perbunan, polyurethane

Free of copper, PTFE and silicone



Ordering data			Part No.	Type
for Ø	Weight			
[mm]	[g]			
25	70		192 875	DG-GA-25-YSR
32	110		192 876	DG-GA-32-YSR
40	140		192 877	DG-GA-40-YSR

Linear drives DGPL/DGPI/DGPIL

Accessories

FESTO

Shock absorber YSR-...-C

for DGPL/DGPIL

(Order code: C)

Material:

Housing: Galvanised steel; piston rod:
high-alloy steel,

Seals: Perbunan, polyurethane

Free of copper, PTFE and silicone



Note

Shock absorber YSRW with
progressive characteristic

→ Internet: ysrw

Ordering data		Part No.	Type
for Ø [mm]	Weight [g]		
25	70	34 572	YSR-12-12-C
32	70	34 572	YSR-12-12-C
40	140	34 573	YSR-16-20-C
50	140	34 573	YSR-16-20-C
63	240	34 574	YSR-20-25-C

Shock absorber retainer KYP

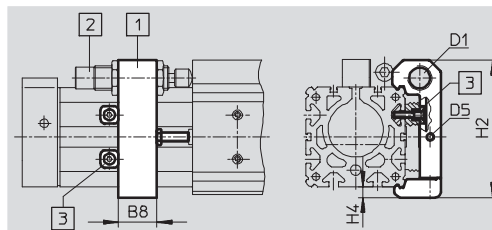
for DGPL/DGPIL

(Order code: C)

Material:

Retainer: Aluminium

Sleeve: Steel, corrosion resistant



1 Shock absorber retainer KYP
(if the retainer is in contact with
the front cap, i.e. cap serves to
secure the position, the entire
stroke length can be utilised)

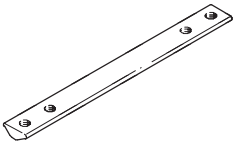
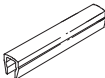
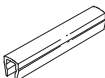
2 Shock absorber YSR-...-C
3 Position retainer
(included in scope of delivery)
either behind or underneath the
shock absorber retainer KYP

Dimensions and ordering data							Part No.	Type
for Ø [mm]	B8	D1	D5	H2	H4	Weight [g]		
25	19	M16x1	M5	69.5	6	95	158 908	KYP-25
32	25	M16x1	M5	80	8	130	158 909	KYP-32
40	32	M22x1.5	M5	102	8	209	158 910	KYP-40
50	35	M22x1.5	M8	124	10	415	158 911	KYP-50
63	44	M26x1.5	M10	152.5	11.5	609	158 912	KYP-63

Linear drives DGPI/DGPI/DGPIL

Accessories

FESTO

Ordering data						
	for Ø [mm]	Remarks	Order code	Part No.	Type	PU ¹⁾
Slot nut NST				Technical data → Internet: nst		
	25	For mounting slot	Y	526 091	NST-HMV-M4	1
	32, 40			150 914	NST-5-M5	1
	50, 63			150 915	NST-8-M6	1
Slot nut NSTL				Technical data → Internet: nstl		
	25	For slide	X	158 410	NSTL-25	1
	32			158 411	NSTL-32	1
	40			158 412	NSTL-40	1
	50			158 413	NSTL-50	1
	63			158 414	NSTL-63	1
Centring sleeve ZBH				Technical data → Internet: zbh		
	25 ... 63	For slide	Z	150 927	ZBH-9	10
Central mounting SLZZ				Technical data → Internet: slzz		
	25	For slide	Q	150 900	SLZZ-16/10	1
	32, 40			150 901	SLZZ-25/16	
	50, 63			150 904	SLZZ-50/40	1
Slot cover ABP				Technical data → Internet: abp		
	32, 40	For mounting slot 0.5 m each	B	151 681	ABP-5	2
	50, 63			151 682	ABP-8	
Slot cover ABP-S				Technical data → Internet: abp		
	25 ... 63	For sensor slot 0.5 m each	S	563 360	ABP-5-S1	2

1) Packaging unit quantity

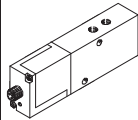
Ordering data – Push-in/threaded fittings				Technical data → Internet: quick star	
	for Ø [mm]	Remarks	Part No.	Type	PU ¹⁾
	25, 32	For connecting compressed air tubing	186 098	QS-G ¹ / ₈ -8	10
	40, 50		186 099	QS-G ¹ / ₄ -8	
	63		186 101	QS-G ¹ / ₄ -10	10
			186 100	QS-G ³ / ₈ -8	10
			186 102	QS-G ³ / ₈ -10	
			186 103	QS-G ³ / ₈ -12	

1) Packaging unit quantity

Linear drives DGPL/DGPI/DGPIL

Accessories

FESTO

Ordering data – Proportional directional control valves										Technical data ➔ Internet: mpye					
Selection aid															
Application	for Ø [mm]	Stroke [mm]													
		225	300	360	450	500	600	750	1,000	1,250	1,500	1,750	2,000		
horizontal/vertical	For applications with axis controller SPC200														
	25	1/1	1/1	1/1	1/1	1/1	1/1	1/1	2/2	2/2	2/2	2/2	2/2		
	32	1/1	1/1	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2		
	40	1/1	2/2	2/2	2/2	2/2	2/2	2/2	3/3	3/3	3/3	3/3	3/3		
	50	2/2	2/2	2/2	2/2	2/2	3/3	3/3	3/3	3/3	3/3	3/3	3/3		
	63	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	4/4	4/4	4/4	4/4		
	For applications with Soft Stop end position controller SPC11														
	25	1/1 ¹⁾	1/1	2/1	2/1	2/1	2/2	2/2	2/3	2/3	2/3	2/3	2/3		
	32	1/1 ¹⁾	2/1	2/1	2/1	2/1	2/1	3/2	3/3	3/3	3/3	3/3	3/3		
	40	2/1	2/1	2/1	2/1	2/2	3/3	3/4	3/4	3/4	3/4	3/4	3/4		
	50	1/1	2/1	2/2	3/2	3/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4		
	63	2/1	2/2	3/3	3/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4		
	Valve	Selection number								Part No.	Type				
	1								151 692	MPYE-5-1/8-LF-010-B					
	2								151 693	MPYE-5-1/8-HF-010-B					
	3								151 694	MPYE-5-1/4-010-B					
	4								151 695	MPYE-5-3/8-010-B					

1) On request



Note

The representation e.g. 2/1 in the columns means:

Selection number 2	Selection number 1
for horizontal application	for vertical application
151 693 MPYE-5-1/8-HF-010-B	151 692 MPYE-5-1/8-LF-010-B

Linear drives DGPL/DGPI/DGPIL

Accessories

FESTO

Ordering data – Proximity sensors for T-slot, magneto-resistive					Technical data → Internet: smt	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot lengthwise, flush with the cylinder profile	PNP	Plug M8x1, 3-pin	0.3	175 484	SMT-8-PS-S-LED-24-B
N/C contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	7.5	543 873	SMT-8M-PO-24V-K7,5-OE

Ordering data – Proximity sensors for T-slot, magnetic reed					Technical data → Internet: sme	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	150 855	SME-8-K-LED-24
			Plug M8x1, 3-pin	0.3	150 857	SME-8-S-LED-24
N/C contact						
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	7.5	160 251	SME-8-O-K-LED-24

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	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

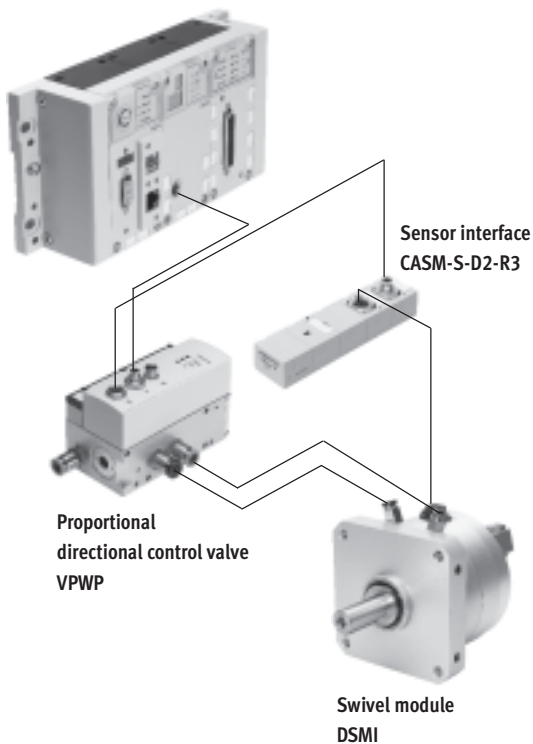
Swivel modules DSMI-B, integrated angular displacement encoder

Key features

FESTO

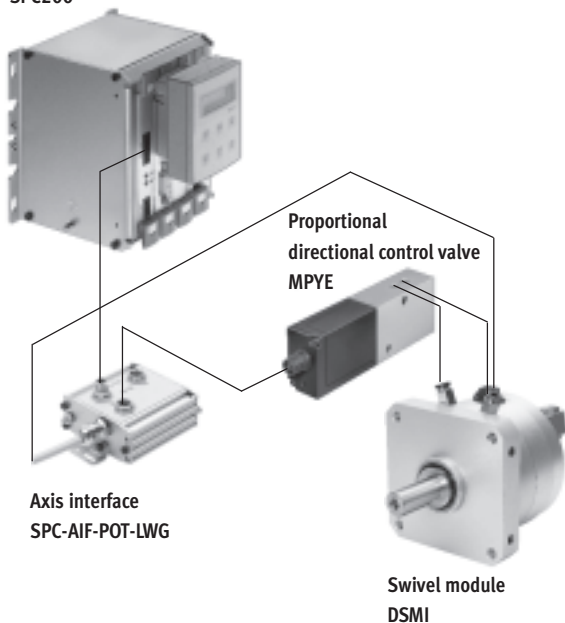
Individual components for positioning with axis controller CPX-CMAX or end-position controller CPX-CMPX

Axis controller/end-position controller
CPX-CMAX/CPX-CMPX

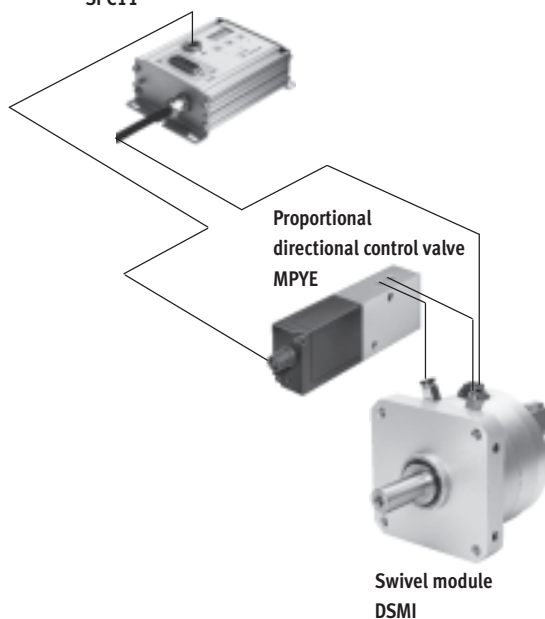


Individual components for positioning with axis controller SPC200 or end-position controller SPC11

Axis controller
SPC200



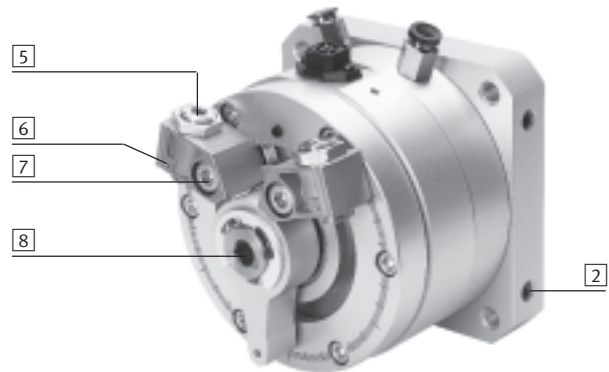
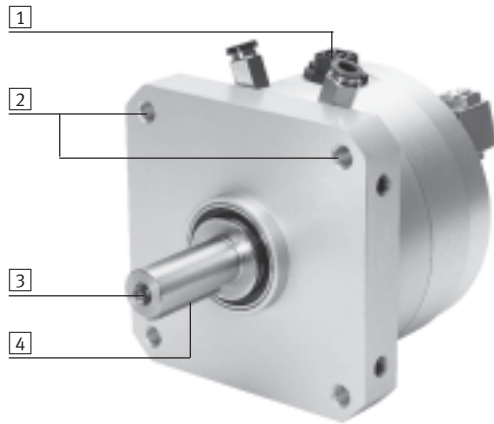
End-position controller
SPC11



Swivel modules DSMI-B, integrated angular displacement encoder

Key features

At a glance

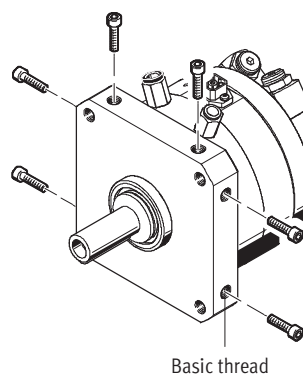
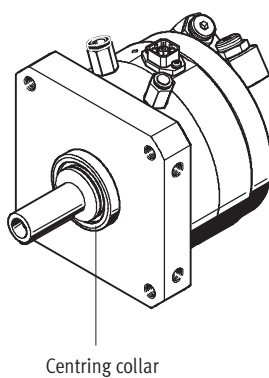
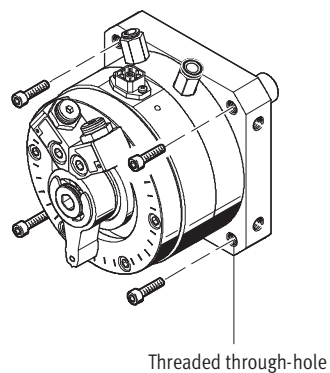
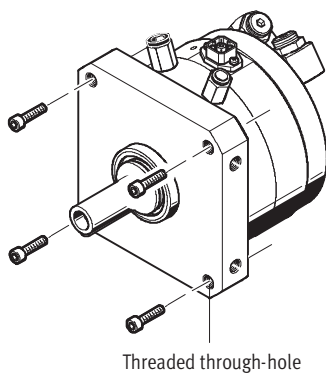


- 1 Connector plug for displacement encoder
- 2 Wide range of integrated mounting options
- 3 Option for mounting on the drive shaft by the user
- 4 Woodruff key
- 5 Fixed stop with precision adjustment of the swivel angle
- 6 Bracket for mounting proximity sensor for contactless position sensing

- 7 Fixed stop can be set at any point within the swivel angle
- 8 Manual operation via internal hexagon socket in the drive shaft

A female thread is already integrated for attachment of an additional drive shaft by the user.

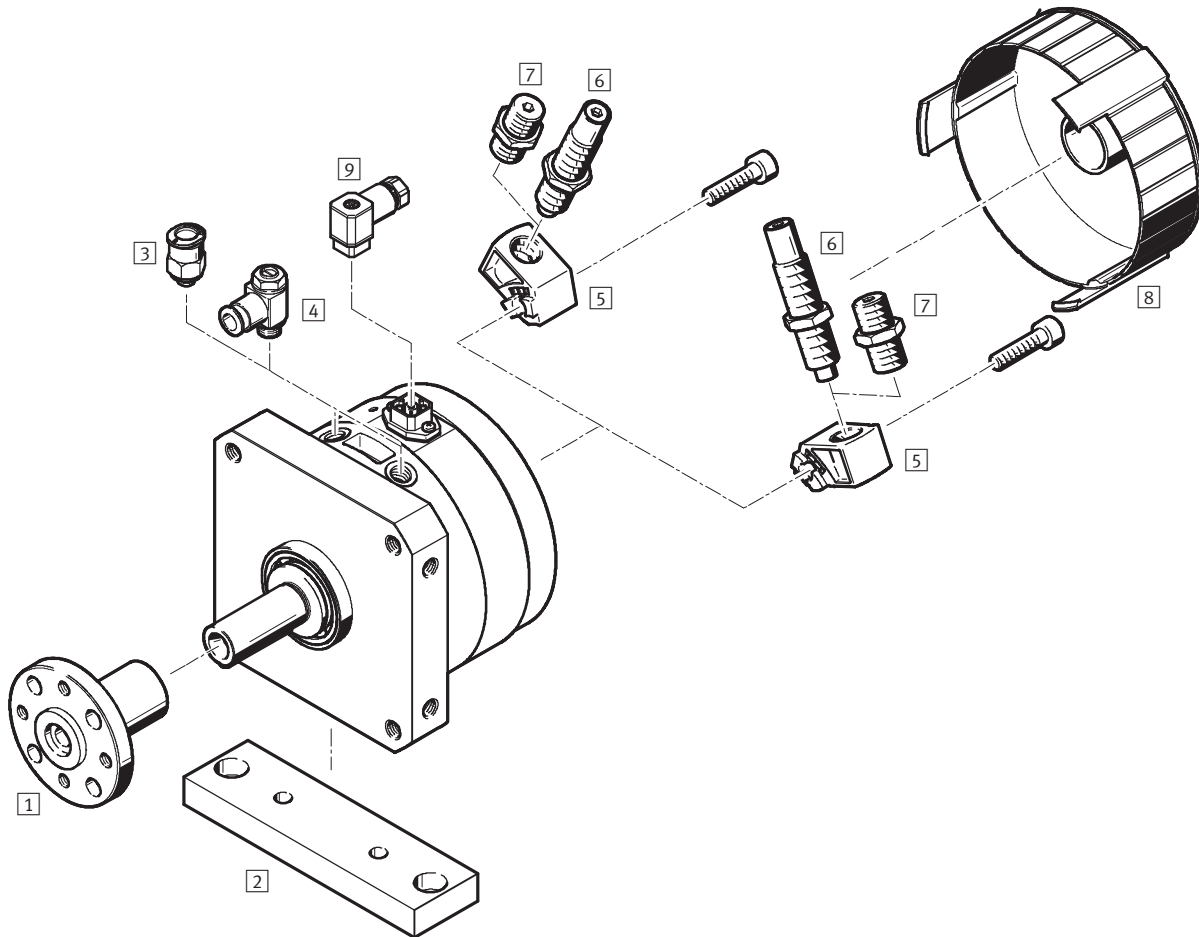
Mounting options



Swivel modules DSMI-B, integrated angular displacement encoder

Peripherals overview

FESTO



Accessories			
	For size	Brief description	→ Page/Internet
1 Push-on flange FWSR	25, 40	For mounting attachments	128
2 Mounting plate HSM	25, 40	Adapter plate for mounting the drive	128
3 Push-in fitting QS	25, 40, 63	For connecting compressed air tubing with standard O.D. (push-in fittings are included in the scope of delivery of the drive)	quick star
4 One-way flow control valve GRLA	25, 40, 63	For regulating speed (is recommended when using the DSMI as a measuring cylinder)	129
5 Cushioning mount DSM-B	25, 40, 63	- For elastic cushioning components - For shock absorbers - As a mechanical stop in Soft Stop applications	129
6 Shock absorber DYSC	25, 40, 63	Self-adjusting shock absorbers with fixed stop (is recommended when using the DSMI as a measuring cylinder)	129
7 Cushioning kit DSM-...-P-B	25, 40, 63	Elastic cushioning components with fixed stop	129
8 Cover cap AKM	25, 40	Reduces the risk of injury in the swivel range of the stop lever	129
9 Plug socket SD	25, 40, 63	For connecting the displacement encoder	129

Swivel modules DSMI-B, integrated angular displacement encoder

Type codes

		DSMI	—		—	270	—	A	—	B
Type										
Double-acting										
DSMI	Swivel module with angular displacement encoder									
Size										
Max. swivel angle [°]										
Position sensing										
A	Via proximity sensor									
Variant										
B	B series									

Swivel modules DSMI-B, integrated angular displacement encoder

FESTO

Technical data

-  Size
25 ... 63
-  Torque
5 ... 40 Nm



General technical data			
Size	25	40	63
Design	Rotary vane Drive shaft, running in ball bearings		
Mode of operation	Double-acting		
Position sensing	Via integrated angular displacement encoder Via proximity sensor ¹⁾		
Measuring principle (angular displacement encoder)	Analogue with conductive plastic potentiometer		
Type of mounting	Via female thread		
Min. travel speed [°/s]	50		
Max. travel speed [°/s]	2,000		
Max. swivel angle ²⁾ [°]	272		
Adjustment range of swivel angle [°]	0 ... 270		
Pneumatic connection	M5	G1/8	G1/4
Push-in fitting used	QSM-M5-6	QS-G1/8-8-I	QS-G1/4-10-I
Compressed air tubing O.D. [mm]	6	8	10
Electrical connection	4-pin plug, □ 16, DIN 45 322		

- 1) Can be ordered as an option
2) Note stroke reduction in combination with axis controllers CPX-CMAX, SPC200

Torque [Nm]			
Size	25	40	63
Torque ¹⁾	5	20	40

- 1) Theoretical values, calculated at 6 bar

Permissible forces on the drive shaft			
Size	25	40	63
Max. radial force [N]	120	350	500
Max. axial force [N]	50	120	500
Max. swivel frequency ¹⁾ [Hz]	2		1

- 1) At max. permissible mass moment of inertia, operating pressure of 6 bar and a swivel angle of 270°

-  Note
Further technical data
➔ Internet: dsm

Swivel modules DSMI-B, integrated angular displacement encoder

Technical data

FESTO

Positioning characteristics with axis controller CPX-CMAX, SPC200			
Size	25	40	63
Repetition accuracy [°]	±0.3		
Mounting position	Any		
Min. mass moment of inertia, horizontal ¹⁾ [kgm ²]	15 x 10 ⁻⁴	60 x 10 ⁻⁴	300 x 10 ⁻⁴
Max. mass moment of inertia, horizontal ¹⁾ [kgm ²]	300 x 10 ⁻⁴	1,200 x 10 ⁻⁴	6,000 x 10 ⁻⁴
Min. mass moment of inertia, vertical ²⁾ [kgm ²]	15 x 10 ⁻⁴	60 x 10 ⁻⁴	300 x 10 ⁻⁴
Max. mass moment of inertia, vertical ²⁾ [kgm ²]	300 x 10 ⁻⁴	1,200 x 10 ⁻⁴	6,000 x 10 ⁻⁴
Min. travel speed [°/s]	50		
Max. travel speed [°/s]	2,000		
Typ. positioning time, long stroke ³⁾ [s]	0.35/0.60	0.30/0.55	0.64/1
Typ. positioning time, short stroke ⁴⁾ [s]	0.15/0.25	0.25/0.25	0.30/0.35
Minimum positioning stroke [°]	5		
Max. swivel stroke ⁵⁾ [°]	260		
Recommended proportional directional control valve			
For CPX-CMAX	On request	VPWP-4-L-5-Q8-10-E-F	
For SPC200	MPYE-5-M5-010-B	MPYE-5-1/8-LF-010-B	

- 1) Must not change during the movement, but may be outside the centre of gravity
- 2) Must not change during the movement, must act at the centre of gravity
- 3) At 6 bar, vertical mounting position, 260° positioning angle at min./max. mass moment of inertia
- 4) At 6 bar, vertical mounting position, 15° positioning angle at min./max. mass moment of inertia
- 5) A stroke reduction of 5° on both sides must be noted

Positioning characteristics with Soft Stop end-position controller CPX-CMPX, SPC11				
Size	25	40	63	
End-position repetition accuracy ¹⁾	[°]	< 0.2		
Intermediate-position repetition accuracy	[°]	±2		
Mounting position	Horizontal			
Cushioning ²⁾	Electronically controlled			
Min. mass moment of inertia, horizontal ³⁾	[kgm ²]	15 x 10 ⁻⁴	60 x 10 ⁻⁴	300 x 10 ⁻⁴
Max. mass moment of inertia, horizontal ³⁾	[kgm ²]	300 x 10 ⁻⁴	1,200 x 10 ⁻⁴	6,000 x 10 ⁻⁴
Minimum swivel stroke	[°]	15		
Recommended proportional directional control valve				
For CPX-CMPX	On request		VPWP-4-L-5-Q8-10-E-F	
For SPC200	MPYE-5-M5-010-B		MPYE-5-1/8-LF-010-B	

- 1) When using the DSMI stops
- 2) The cushioning pad on the stop lever must be removed for applications with Soft Stop. The stop lever must not swivel to the end stop at too great a speed as this could damage the swivel module
- 3) Must not change during the movement, but may be outside the centre of gravity

Operating and environmental conditions	
Operating medium	Compressed air, filtered and unlubricated, filter unit 5 µm
Operating pressure ¹⁾ [bar]	4 ... 8
Ambient temperature ²⁾ [°C]	-10 ... +60
Vibration resistance	To DIN/IEC 68 Part 2 – 6, severity level 2
Shock resistance	To DIN/IEC 68 Part 2 – 82, severity level 2
CE mark (see declaration of conformity)	To EU EMC Directive
Protection class	IP65 to IEC 60 529
Corrosion resistance class CRC ³⁾	1

- 1) Only applies to applications with end-position controller CPX-CMPX, SPC11 and axis controller CPX-CMAX, SPC200
- 2) Note operating range of proximity sensors
- 3) Corrosion resistance class 1 to Festo standard 940 070. Components subject to low corrosion stress. Transport and storage protection

Swivel modules DSMI-B, integrated angular displacement encoder

FESTO

Technical data

Weight			
Size	25	40	63
DSMI [g]	1,080	3,950	6,900

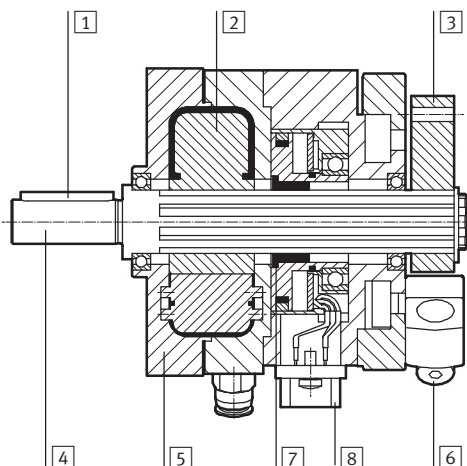
Electrical data, displacement encoder		
Power supply ¹⁾	[V DC]	10
Max. current consumption	[mA]	4
Wiper current	Recommended	[µA] < 1
	Maximum ²⁾	[mA] 10
Connection resistance	[kΩ]	5
Connection resistance tolerance	[%]	±20
Angular resolution	[°]	0.1
Independent linearity	[%]	0.25
Output signal		Analogue

1) Stabilised power supply is recommended, max. 42 V DC permissible.

2) Only permissible in the short term in the event of a fault.

Materials

Sectional view



Cylinder/displacement encoder		
Cylinder		
1	Woodruff key	Steel
2	Rotary vane	Glass fibre-reinforced plastic
3	Stop lever	Anodised wrought aluminium alloy
4	Drive shaft	Nickel-plated steel
5	Housing	Anodised wrought aluminium alloy
6	Fixed stop/screw	Steel
Note on materials		Free of copper, PTFE and silicone
Displacement encoder		
7	Coupling	Polyurethane
8	Housing	Anodised aluminium

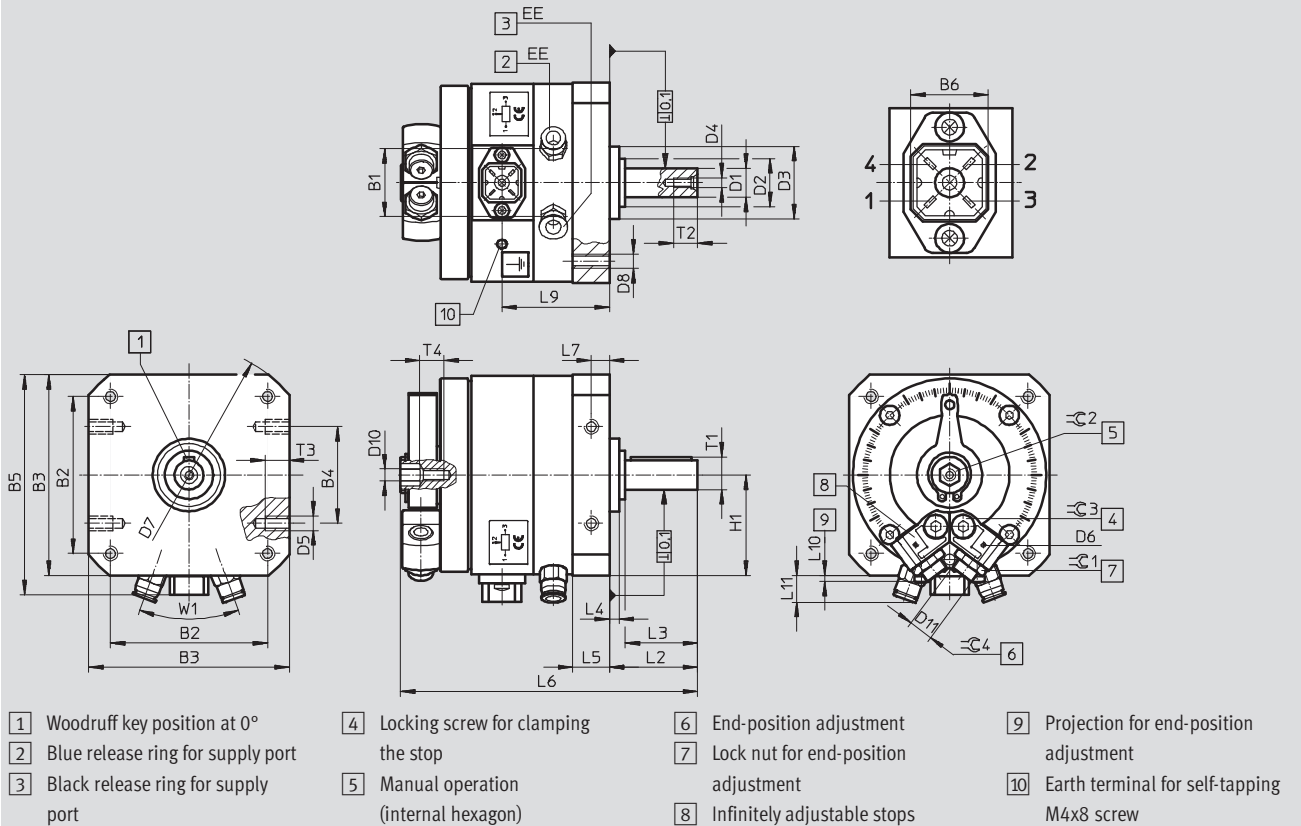
Swivel modules DSMI-B, integrated angular displacement encoder

Technical data

FESTO

Dimensions

Download CAD data → www.festo.com



Size	B1	B2	B3	B4	B5	B6	D1 g7 Ø	D2 Ø	D3 f8 Ø	D4	D5	D6	D7 Ø
[mm]	±0.5												
25	28	65±0.3	83±0.3	40±0.2	91	16	12	20-0.3	30	M4	M6	M2	106±0.3
40	43.8	105±0.3	130±0.5	80±0.3	139	16	20	36-0.4	52	M6	M10	M2	168±0.5
63	55	125±0.5	152±0.5	80±0.3	157	16	25	40±0.3	70	M10	M10	M3	200±0.5

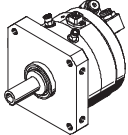
Size	D8	D10	D11	EE	H1	L2	L3	L4	L5	L6	L7	L9	L10
[mm]					±0.2	+0.6/-0.7	±0.2	±0.4	+0.2/-0.3		±0.2	±1	
25	M6	M5	M10x1	M5	41.5	36.5	30	4	15.2	123±0.5	7.5	44.5	2.9
40	M10	M6	M16x1	G1/8	65	62	50	8	23.7	184±0.6	12	64.5	3.4
63	M12	M6	M22x1.5	G1/4	76	75.5	60	10.5	28.5	235±0.6	14	80.5	6

Size	L11	T1	T2	T3	T4	W1	≈C1	≈C2	≈C3	≈C4	Woodruff key to DIN 6885
[mm]	±2	max.	+2	±0.2							
25	12	13.5	10	10	10	40°	13	8	4	3	A4x4x25
40	16	22.5	16	15	10	40°	19	10	8	5	A6x6x45
63	20	28	22	16	20	40°	27	10	8	5	A8x7x50

Swivel modules DSMI-B, integrated angular displacement encoder

Accessories

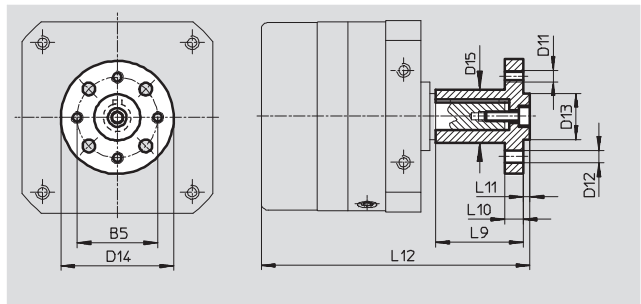
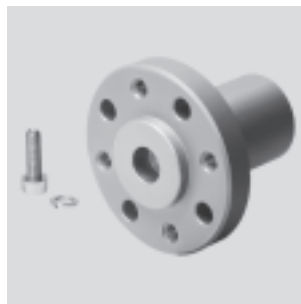
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Ordering data			
	Size	Swivel angle [°]	Part No. Type
	25	270	561690 DSMI-25-270-A-B
	40		561691 DSMI-40-270-A-B
	63		1202485 DSMI-63-270-A-B

Accessories

Push-on flange FWSR

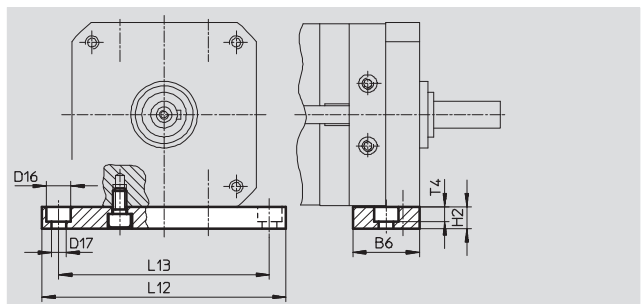
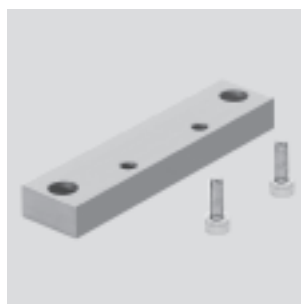
Materials:
Anodised aluminium
Free of copper, PTFE and silicone



Dimensions and ordering data												Part No.	Type
For size [mm]	B5	D11	D12 Ø H13	D13 Ø g7	D14 Ø	D15 Ø	L9	L10	L11	L12	Weight [g]		
25	35	M5	5.5	20	50	23	38	8	3	116.5	68	13240	FWSR-25
40	54	M8	9	36	70	38	60	11	5	186.5	240	14656	FWSR-40

Mounting plate HSM

Materials:
Anodised aluminium
Free of copper, PTFE and silicone



Dimensions and ordering data										
For size	B6	D16 Ø	D17 Ø	H2	L12	L13	T4	Weight	Part No.	Type
[mm]								[g]		
25	30	11	6.6	10	110	95	6.8	94	165573	HSM-25
40	45	18	11	20	180	155	11	459	165575	HSM-40

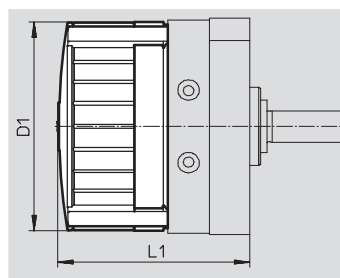
Swivel modules DSMI-B, integrated angular displacement encoder

Accessories

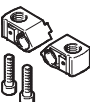
Cover cap AKM

Materials:

Polyamide



Dimensions and ordering data				
For size [mm]	D1 Ø	L1	Part No.	Type
25	83	98.5±1.2	549196	AKM-25
40	130	135.5±1.5	549198	AKM-40

Ordering data					
	For size	Brief description	Part No.	Type	PU ¹⁾
Cushioning mount					
	25	- For elastic cushioning components - For shock absorbers	547902	DSM-25-B	2
	40		547904	DSM-40-B	
	63		552085	DSM-63-B	
Cushioning kit					
	25	For cushioning mount DSML-...-B	550658	DSM-16/25-P-B	2
	40		550660	DSM-40-P-B	
	63		552086	DSM-63-P-B	
Shock absorber					
	25	For cushioning mount DSML-...-B	548012	DYSC-7-5-Y1F	1
	40		548014	DYSC-12-12-Y1F	
	63		553593	DYSC-16-18-Y1F	

1) Packaging unit

Ordering data – One-way flow control valves					Technical data → Internet: grla	
	For size	Connection		Material	Part No.	Type
		Thread	For tubing O.D.			
For exhaust air						
	25	M5	3	Metal design	193137	GRLA-M5-QS-3-D
			4		193138	GRLA-M5-QS-4-D
			6		193139	GRLA-M5-QS-6-D
	40	G1/8	3		193142	GRLA-1/8-QS-3-D
			4		193143	GRLA-1/8-QS-4-D
			6		193144	GRLA-1/8-QS-6-D
			8		193145	GRLA-1/8-QS-8-D
			10		193148	GRLA-1/4-QS-10-D
	63	G1/4	10			

Ordering data – Plug sockets				
	Pin	Pin allocation	Designation	Part No. Type
	1	Power supply	Plug socket	194332 SD-4-WD-7
	2	Signal		
	3	0 V		
	4	PE (yellow), screened		