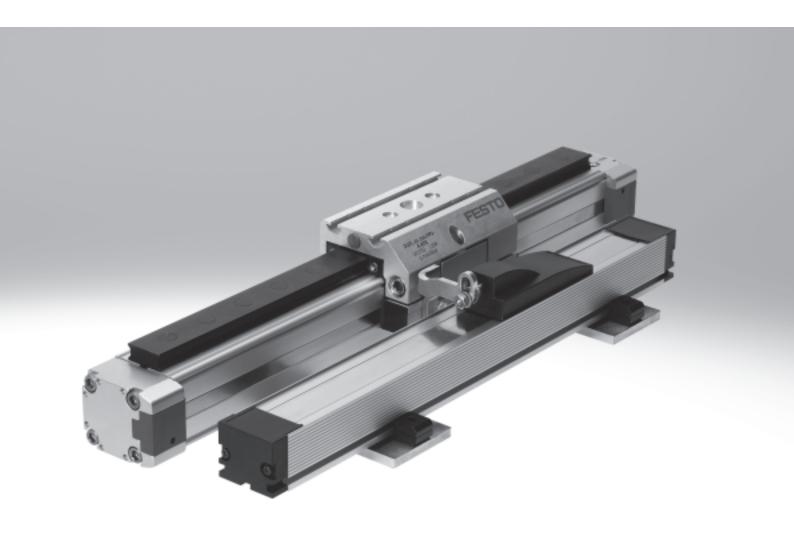
## Linear drives DGPL, with external displacement encoder



# Cylinders with displacement encoder Product range overview



Function	Туре	Brief description
Drives	Rodless	
	DGCI	With guide With contactless displacement encoder Based on linear drive DGC Supply ports optionally on end face or front System product for handling and assembly technology
	DGPI/DGPIL	Do not use for new projects!  With or without guide  With contactless displacement encoder, integrated  Wide range of options for mounting on drives  System product for handling and assembly technology
	DGP/DGPL	Do not use for new projects!  With or without guide With potentiometer or contactless displacement encoder, attached With clamping unit Wide range of options for mounting on drives
	With piston rod DNCI	With contactless displacement encoder
	200	<ul> <li>Various piston rod variants</li> <li>Standards-based cylinder to ISO 15552</li> </ul>
	DDPC	With contactless displacement encoder Various piston rod variants Standards-based cylinder to ISO 15552  DIN  DIN  DIN  DIN  DIN  DIN  DIN  DI
	DNC/DSBC	With attached potentiometer MLO-LWG     Various piston rod variants     Standards-based cylinder to ISO 15552  DIN  VDMA
Swivel	Swivel module	
module	DSMI	<ul> <li>Based on swivel module DSM</li> <li>Integrated rotary encoder</li> <li>Compact design</li> <li>Wide range of mounting options</li> </ul>

## **Cylinders with displacement encoder**Product range overview



Piston $\varnothing$	Stroke/swivel angle	Suitable									
		For positioning v	with	For end-position	controller	For use as a measuring					
	[mm/°]	CPX-CMAX	SPC200	CPX-CMPX	SPC11	cylinder					
Rodless	•		•	•							
18, 25, 32,	100; 160; 225; 300; 360;										
40,63	450; 500; 600; 750; 850;										
	1,000; 1,250; 1,500;		_	_	_	_					
	1,750; 2,000	_	•	•	•	•					
25, 32, 40,	225; 300; 360; 450; 500;										
50,63	600; 750; 1,000; 1,250;										
	1,500; 1,750; 2,000	-			-	-					
25, 32, 40,	225; 300; 360; 450; 500;										
50,63	600; 750; 1,000; 1,250;										
	1,500; 1,750; 2,000	-	•	-							
With piston r		1									
32, 40, 50,	10 2,000										
63		-		-	_	•					
	100 750										
	100 750	_	_	_							
		•	•	•	•	_					
80, 100	10 2,000										
00,100	10 2,000	_	_	_	_	_					
	100 750										
						_					
32, 40, 50,	100, 150, 225, 300, 360,										
63,80	450, 600, 750										
		_	_	_		_					
		-	•	•	•	•					
				·		·					
Swivel modu		<u> </u>									
25, 40, 63	270										
		_	_	_	_	_					
		•	•	•	•	•					

Key features

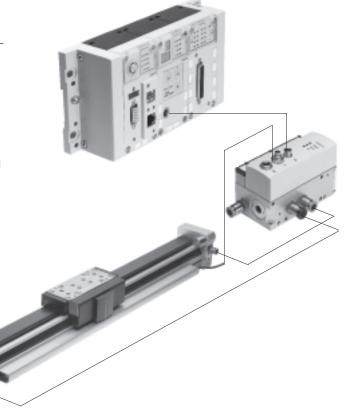
#### Servopneumatic drive technology

Positioning and Soft Stop applications as an integral component of the valve terminal CPX – the modular peripheral system for decentralised automation tasks.

The modular design means that valves, digital inputs and outputs, positioning modules and end-position controllers, as appropriate to the application, can be combined in almost any way on the CPX terminal.

#### Advantages:

- Pneumatics and electrics control and positioning on one platform
- Innovative positioning technology piston rod drives, rodless drives, rotary drives
- Actuation via fieldbus
- Remote maintenance, remote diagnostics, web server, SMS and e-mail alert are all possible via TCP/IP
- Modules can be quickly exchanged and expanded without altering the wiring



#### Axis controller CPX-CMAX



#### Free choice:

Position and force control, directly actuated or selected from one of 64 configurable position sets. If you are looking for something more: the configurable function for switching to the next set enables simple functional sequences to be realised in the axis controller CPX-CMAX.

All stations are recognised as the auto-identification function identifies each station with its device data on the controller CPX-CMAX.

#### Also included:

The functional scope of the controller CPX-CMAX includes actuation of a brake or clamping unit via the proportional directional control valve VPWP.

Up to 8 modules (max. 8 axes) can be operated in parallel and independently of each other. Commissioning via FCT (Festo configuration software) or via fieldbus: no programming, only configuration.

#### Technical data → Internet: cpx-cmax

- · Greater flexibility
- OEM friendly commissioning also via fieldbus
- Easy installation and fast commissioning
- Cost-effective
- You program the system in your PLC environment

#### **FESTO**

#### End-position controller CPX-CMPX



Fast travel between the mechanical end stops of the cylinder, stopping gently and without impact in the end position.

Fast commissioning via control panel, fieldbus or handheld unit. Improved downtime control. Actuation of a brake or clamping unit via the proportional directional control valve VPWP is an integral part of the controller CMPX.

Depending on the fieldbus chosen, up to 9 end-position controllers can be actuated on the CPX terminal. All system data can be read and written via the fieldbus, including, for example, the mid positions.

With switching output for actuating

#### Technical data → Internet: cpx-cmpx

#### Advantages:

- · Greater flexibility
- OEM friendly commissioning also via fieldbus
- Easy installation and fast commissioning
- · Cost-effective
  - Up to 30% faster cycle rates
- Significantly reduced system vibration
- Improved work ergonomics thanks to significantly reduced
- The extended diagnostics help to reduce the service time for the machine

#### Proportional directional control valve VPWP



The 5/3-way proportional directional control valve for applications with Soft Stop and pneumatic positioning. Fully digitalised – with integrated pressure sensors, with new diagnostic functions.

2,000 l/min.

a brake. Coloured supply ports. Pre-assembled cables guarantee faultless and fast connection with the controllers CPX-CMPX and CPX-CMAX. In sizes 4, 6, 8 and 10. Flow rate of 350, 700, 1,400 and

#### Technical data → Internet: vpwp

#### Advantages:

- Easy installation and fast commissioning
- Reduction of system downtimes thanks to the new diagnostic options
- · With switching output for actuating a brake/clamping unit

#### Measuring module CPX-CMIX



Fully digital data acquisition and transmission means pneumatic cylinders can be used as sensors. With very high repetition accuracy and incorporating both analogue and digital measuring sensors.

Suitable for the linear drive DGCI with displacement encoder for measuring absolute values, for the piston rod drive DNCI/DDPC with incremental displacement encoder or even for a potentiometer of the type MLO.

#### Technical data → Internet: cpx-cmix

- All process steps can be documented, which improves quality
- An adjustable contact force (via pressure regulator) increases the precision of the "displacement sensor"
- With displacement encoders for measuring absolute values, the actual position is immediately available after the system is switched on

Drive options

#### **FESTO**

#### System with linear drive DDLI, DGCI



- 1 Controller module CPX-CMPX or CPX-CMAX
- 2 Proportional directional control valve VPWP
- 3 Linear drive DDLI, DGCI with displacement encoder
- 6 Connecting cable KVI-CP-3-...

- Pneumatic rodless linear drive with displacement encoder, with or without recirculating ball bearing guide
- Displacement encoder with absolute and contactless measuring
- Identical design to pneumatic linear drive DGC
- Diameter: 18 ... 40 and 63 mm
- Stroke: 100 ... 2,000 mm in fixed lengths
- Range of applications: Soft Stop and pneumatic positioning
- Loads from 1 ... 180 kg
- No sensor interface required

#### Technical data → Internet: dgci

#### Advantages:

- Complete drive unit
- DDLI for easy connection to customer's guide system
- Excellent running characteristics
- For fast and accurate positioning down to ±0.2 mm (only with axis controller CPX-CMAX)

#### System with linear drive DGPI, DGPIL or displacement encoder MME-MTS



- 1 Controller module CPX-CMPX or CPX-CMAX
- 2 Proportional directional control valve VPWP
- 3 Linear drive DGPI, DGPIL with displacement encoder
- 6 Connecting cable KVI-CP-3-...
- 9 NEBP-M16W6-K-2-M9W5

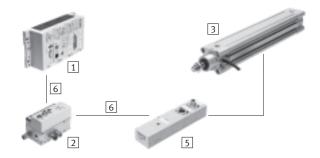
- Pneumatic rodless linear drive with displacement encoder, with or without recirculating ball bearing guide
- Displacement encoder with absolute and contactless measuring
- Diameter: 25 ... 63 mm
- Stroke: 225 ... 2,000 mm in fixed lengths
- Range of applications: Soft Stop and pneumatic positioning
- Loads from 2 ... 180 kg
- No sensor interface required

#### Technical data → Internet: dgpi

#### Advantages:

- Complete drive unit
- DGPI for easy connection to customer's guide system
- Excellent running characteristics
- For fast and accurate positioning down to ±0.2 mm (only with axis controller CPX-CMAX)

#### System with standard cylinder DNCI, DDPC



- 1 Controller module CPX-CMPX or CPX-CMAX
- 2 Proportional directional control valve VPWP
- 3 Standard cylinder DNCI, DDPC with displacement encoder
- 5 Sensor interface CASM-S-D3-R7
- 6 Connecting cable KVI-CP-3-...

- Standard cylinder with integrated displacement encoder, conforms to DIN ISO 6432, VDMA 24 562, NF E 49 003.1 and Uni 10 290
- Displacement encoder with contactless and incremental measuring
- Diameter: 32 ... 100 mm
- Stroke: 100 ... 750 mm
- Range of applications: Soft Stop and pneumatic positioning
- Loads from 3 ... 450 kg and a matching sensor interface CASM-S-D3-R7
- Pre-assembled cables guarantee faultless and fast electrical connection

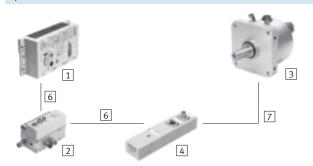
#### Technical data → Internet: dnci

- Compact drive unit
- Can be used universally
- Also with guide unit
- For fast and accurate positioning down to ±0.5 mm (only with axis controller CPX-CMAX)

Drive options



#### System with swivel module DSMI



- 1 Controller module CPX-CMPX or CPX-CMAX
- 2 Proportional directional control valve VPWP
- 3 Swivel module DSMI with displacement encoder
- 4 Sensor interface CASM-S-D2-R3
- 6 Connecting cable KVI-CP-3-...
- 7 Connecting cable NEBC-P1W4-K-0,3-N-M12G5

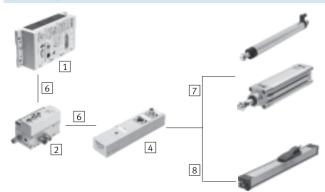
- Swivel module DSMI with integrated displacement encoder
- Identical design to pneumatic swivel module DSM
- Absolute displacement encoder on basis of potentiometer
- Swivel range from 0 ... 270°
- Size: 25, 40, 63
- Max. torque: 5 ... 40 Nm
- Range of applications: Soft Stop and pneumatic positioning
- Mass moments of inertia from 15 ... 6,000 kgcm<sup>2</sup> and a matching sensor interface CASM-S-D2-R3
- Pre-assembled cables guarantee faultless and fast connection with the proportional directional control valve VPWP

#### Technical data → Internet: dsmi

#### Advantages:

- Complete drive unit, compact, can be used immediately
- High angular acceleration
- With adjustable fixed stops
- For fast and accurate positioning down to ±0.2° (only with axis controller CPX-CMAX)

#### System with potentiometer



- 1 Controller module CPX-CMPX or CPX-CMAX
- 2 Proportional directional control valve VPWP
- 4 Sensor interface CASM-S-D2-R3
- 6 Connecting cable KVI-CP-3-...
- 7 Connecting cable NEBC-P1W4-K-0,3-N-M12G5
- 8 Connecting cable NEBC-A1W3-K-0,4-N-M12G5

- Attachable potentiometers with absolute measurement, with high degree of protection
- With connecting rod or moment compensator
- Measuring range: 100 ... 2,000 mm
- Pre-assembled cables guarantee faultless and fast connection with the sensor interface CASM
- Range of applications: Soft Stop and pneumatic positioning with cylinder Ø 25 ... 80 mm,
   e.g. DNC or DSBC
- Loads from 1 ... 300 kg

#### Technical data → Internet: casm

- Easy installation and fast commissioning
- Cost-effective
- Can also be used in harsh environmental conditions
- Variety of drives: CPX-CMPX and CPX-CMAX also support cylinders with external displacement encoder

# **Cylinders with displacement encoder**Drive options



Syste	System components for Soft Stop systems with end-position controller CPX-CMPX									
3		Linear drive		Standard cylinder	Swivel module	Displacement encoder		→ Page/		
		DDLI/DGCI	DGPI	DNCI, DDPC	DSMI	MLO-LWG/-TLF	MME-MTS	Internet		
1	End-position controller CPX-CMPX	•	•	-	-	-	-	cmpx		
2	Prop. directional control valve VPWP	•	•	•	•	•	-	vpwp		
4	Sensor interface CASM-S-D2-R3	-	_	-	•	•	-	casm		
5	Sensor interface CASM-S-D3-R7	-	_	•	-	-	-	casm		
6	Connecting cable KVI-CP-3			•	•	•	•	kvi		
7	Connecting cable NEBC-P1W4	-	-	-	•	■ / -	-	nebc		
8	Connecting cable NEBC-A1W3	-	-	-	-	<b>-/■</b>	_	nebc		
9	Connecting cable NEBP-M16W6	-	•	-	-	_	-	nebp		

Syste	m components for pneumatic pos	sitioning system	s with axis contro	ller CPX-CMAX				
3		Linear drive	inear drive		Standard cylinder   Swivel module		Displacement encoder	
		DDLI/DGCI	DGPI	DNCI, DDPC	DSMI	MLO-LWG/-TLF	MME-MTS	Internet
1	Axis controller CPX-CMAX	•	-	-	-	-	-	cmax
2	Prop. directional control valve VPWP	•	•	•	•	•	-	vpwp
4	Sensor interface CASM-S-D2-R3	-	-	-	•	-	_	casm
5	Sensor interface CASM-S-D3-R7	-	-	•	-	_	-	casm
6	Connecting cable KVI-CP-3	•	•	•	•	•	-	kvi
7	Connecting cable NEBC-P1W4	-	-	-	•	■ / -	-	nebc
8	Connecting cable NEBC-A1W3	-	-	-	-	- / <b>■</b>	_	nebc
9	Connecting cable NEBP-M16W6	-	•	-	-	_	-	nebp

System components for measur		asuring infodute C		1			→ Page/
	Linear drive		Standard cylinder	Standard cylinder   Swivel module		Displacement encoder	
	DDLI/DGCI	DGPI	DNCI, DDPC	DSMI	MLO-LWG/-TLF	MME-MTS	Internet
Measuring module		_	_	_	_		amais:
CPX-CMIX-M1-1	-	-	_	-	-	_	cmix
Sensor interface				_	_		casm
CASM-S-D2-R3	_	_	_	_	_	_	Casiii
Sensor interface	_					_	casm
CASM-S-D3-R7	_	_	_	_	_	_	Casiii
Connecting cable	(■)	(■)	_			(■)	kvi
KVI-CP-3	(-)	(-)	_	_	_	(-)	KVI
Connecting cable					■ / -		nebc
NEBC-P1W4	_	_	_	_	<b>-</b> / -	_	певс
Connecting cable					-/ <b>=</b>		nebc
NEBC-A1W3		_	_	_	- / <b>-</b>	_	lienc
Connecting cable	_		_	_	_		nebp
NEBP-M16W6	_	_	_	_	_	_	Henh

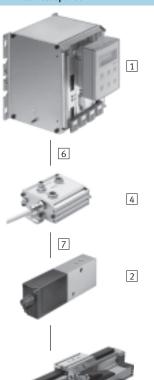
Overview



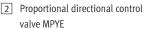
## Individual components for positioning With axis controller SPC200

→ Internet: spc200

## With end-position controller SPC11 → Internet: spc11







- 3 Linear drive DGPL
- 4 Axis interface SPC-AIF-POT
- 6 Connecting cable KSPC-AIF-...
- 7 Connecting cable KMPYE-AIF-...



- 2 Proportional directional control valve MPYE
- 3 Linear drive DGPL
- 5 End-position controller SPC11-POT-TLF
- 7 Connecting cable KMPYE-AIF-...



3

- $\bullet~$  Piston Ø 25 ... 63 mm
- Stroke 225 ... 2,000 mm
- Standard slide or extended slide
- High characteristic load values
- Supply ports on both sides



#### DGPL, with recirculating ball bearing guide and clamping unit

- Piston Ø 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
- Supply ports on both sides

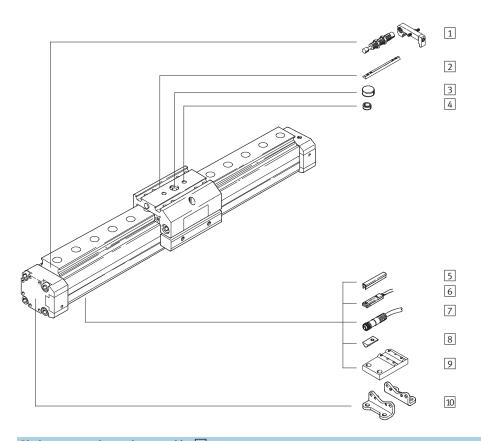


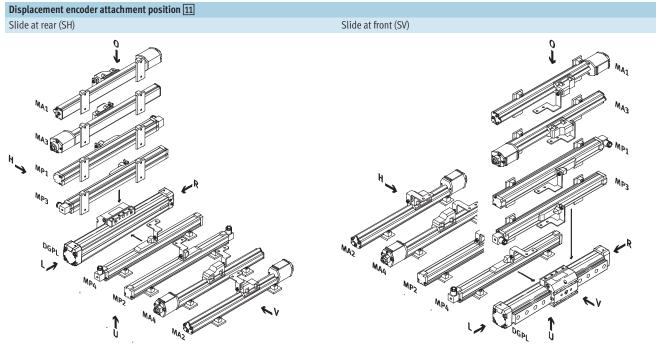
## - Type discontinued

## Linear drives DGPL, external displacement encoder

**FESTO** 

Peripherals overview





# Do not use for new designs! - Type discontinued

# Linear drives DGPL, external displacement encoder Peripherals overview

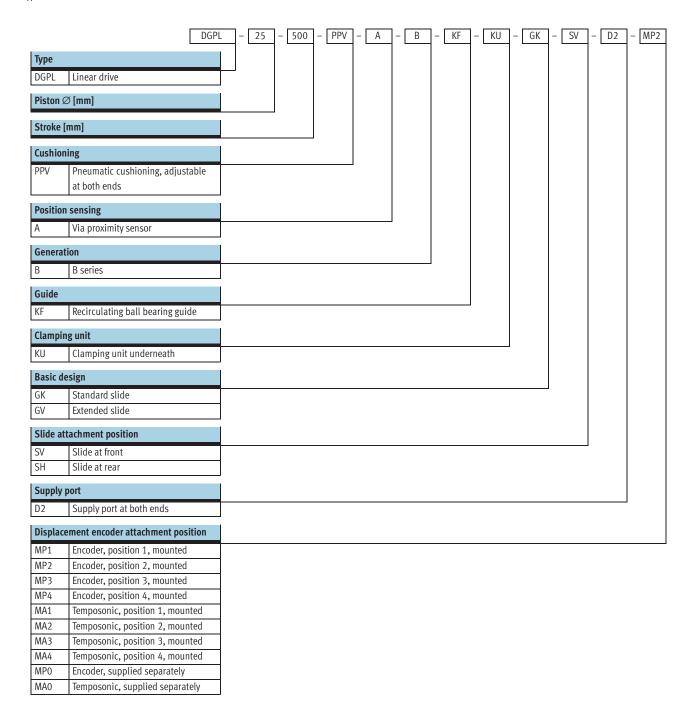
Variar	nts and accessories		
	Туре	Brief description	→ Page/Internet
1	Shock absorber kit	For avoiding damage at the end stop in the event of malfunction	28
	C		
2	Slot nut for slide	For mounting loads and attachments on the slide	29
	X		
3	Central mounting	For centring loads and attachments on the slide	29
	Q		
4	Centring sleeves	For centring loads and attachments on the slide	29
	Z		
5	Slot cover	For protecting against the ingress of dirt	29
	B/S		
6	Proximity sensor	For additional sensing of the piston position, can be ordered optionally, only in combina-	31
	G/H/I/J/N	tion with the order code A in the modular products section for the drive	
7	Connecting cable	For proximity sensor	31
	V		
8	Slot nut for mounting slot	For mounting attachments	29
	Υ		
9	Central support	For mounting the axis	26
	M		
10	Foot mounting	For mounting the axis	26
	F		
11	Displacement encoder attachment	For drive position measurement	22
	position		
	MA1 MA4/MP1 MP4		

## - Type discontinued

### Linear drives DGPL, external displacement encoder

**FESTO** 

Type codes

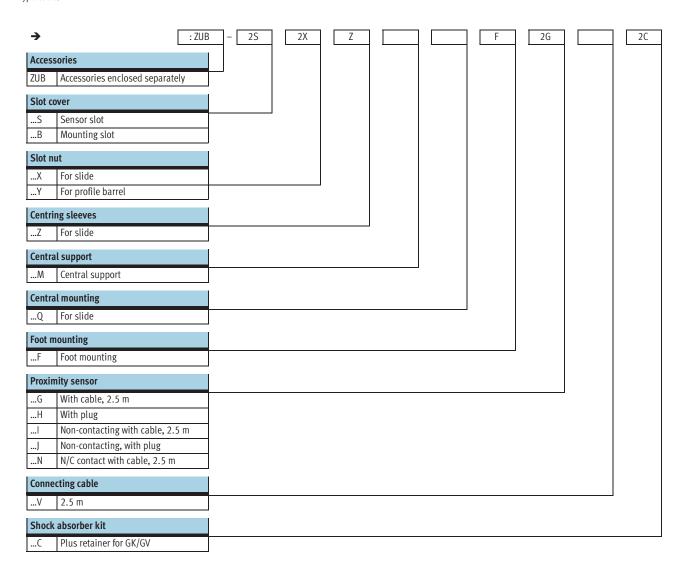


## - Type discontinued

## Linear drives DGPL, external displacement encoder

**FESTO** 

Type codes



## - Type discontinued

## Linear drives DGPL, external displacement encoder

**FESTO** 

Technical data

#### Function



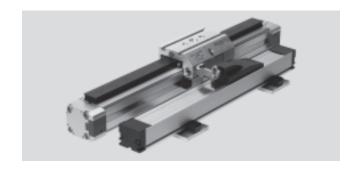




25 ... 63 mm



225 ... 2,000 mm



General technical data								
Piston ∅		25	32	40	50	63		
Design		Piston						
		Moment compensati	tor					
		Profile barrel						
Mode of operation		Double-acting						
Operating medium <sup>1)</sup>		Compressed air acc	cording to ISO 8573	-1:2010 [6:4:4]				
Note about the operating/pilot medium		Lubricated operation	on not possible					
		Pressure dew point	10 °C below ambie	nt temperature/temp	perature of medium			
Cushioning	Adjustable at both ends							
Cushioning length	[mm]	18	20	30				
Position sensing		Displacement encoder, attached externally						
		Proximity sensor						
Measuring principle (displacement encoder)		→ Internet: displacement encoder						
Type of mounting		Foot mounting						
Stroke <sup>2)3)</sup>	[mm]	225; 300; 360; 45	0; 500; 600; 750; 1	,000; 1,250; 1,500	); 1,750; 2,000			
Protection against rotation/guide		Guide rail with slide	e					
		Recirculating ball bearing						
Clamping unit	Clamping unit → Internet: dgpl							
Pneumatic connection		G½ G¾ G3/8						
Electrical connection		→ Internet: displa	cement encoder					

<sup>1)</sup> The proportional directional control valve MPYE used requires the characteristic values.

<sup>3)</sup> 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 in the end positions <sup>1)</sup>	0.1	0.2	0.4	0.8	0.8			

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

Permissible impact velocity:  $v_{perm.} \; = \; \sqrt{\frac{2 \, x \, E_{perm.}}{m_{dead} \; + \; m_{lo}}}$ 

 $\begin{array}{ll} v_{perm.} & \text{Permissible impact velocity} \\ E_{perm.} & \text{Max. impact energy} \\ m_{dead} & \text{Moving load (drive)} \\ m_{load} & \text{Moving effective load} \end{array}$ 

Note These specifications represent the maximum values that can be achieved. Note the maximum permissible impact energy.

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

Note stroke reduction in combination with SPC200.

## - Type discontinued

## Linear drives DGPL, external displacement encoder

Positioning characteristics with axis contro	oller SPC200					
Piston Ø		25	32	40	50	63
Repetition accuracy	[mm]	<b>→</b> 16				
Mounting position		Any				
Minimum load, horizontal <sup>1)</sup>	[kg]	2	3	5	8	12
Maximum load, horizontal <sup>1)</sup>	[kg]	30	45	75	120	180
Minimum load, vertical <sup>1)</sup>	[kg]	2	3	5	8	12
Maximum load, vertical <sup>1)</sup>	[kg]	10	15	25	40	60
Minimum travel speed	[m/s]	0.05				
Maximum travel speed	[m/s]	3				
Typical positioning time, long stroke <sup>2)</sup>	[s]	0.80/1.20	0.90/1.25	0.80/1.20	1.00/1.25	0.95/1.25
Typical positioning time, short stroke <sup>3)</sup>	[s]	0.50/0.70	0.50/0.65	0.45/0.65	0.55/0.65	0.55/0.65
Minimum positioning stroke <sup>4)</sup>	[%]	3			•	
Stroke reduction <sup>5)</sup>	[mm]	25		35		
Recommended proportional directional con	trol valve	<b>→</b> 30		•		

- 1) Load = effective load + mass of all moving parts on the drive
- 2) At 6 bar, horizontal mounting position, DGPL-XX-1250, 1,000 mm travel at min./max. load
  3) At 6 bar, horizontal mounting position, DNCM-XX-1250, 100 mm travel at min./max. load
  4) In relation to the maximum stroke of the drive, but never more than 20 mm
- 5) The stroke reduction must be maintained on each side of the drive, the max. positionable stroke is therefore: stroke 2x stroke reduction

Positioning characteristics with end-positi	ion controller S	PC11				
Piston ∅		25	32	40	50	63
Repetition accuracy of a mid-position 1)	[mm]	±2			·	·
Mounting position		Any				
Minimum load, horizontal <sup>2)</sup>	[kg]	2	3	5	8	12
Maximum load, horizontal <sup>2)</sup>	[kg]	30	45	75	120	180
Minimum load, vertical <sup>2)</sup>	[kg]	2	3	5	8	12
Maximum load, vertical <sup>2)</sup>	[kg]	10	15	25	40	60
Travel time	[s]	→ SoftStop	sizing software: 🛨	www.festo.com	•	•
Recommended proportional directional con	→ 30	<b>→</b> 30				

- 1) In the stroke range from 225  $\dots$  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 <sup>1)</sup> [bar] 4 8									
Ambient temperature <sup>2)</sup>	[°C]	-10 +60	-10 +60						
Vibration resistance		To DIN/IEC 6	To DIN/IEC 68 Parts 2 – 6, severity level 2						
Continuous shock resistance		To DIN/IEC 6	To DIN/IEC 68 Parts 2 – 27, severity level 2						
CE mark (see declaration of conformity)	To EU EMC D	To EU EMC Directive							
Protection class (displacement encoder)	→ Internet	→ Internet: displacement encoder							

- 1) Only applies to applications with Soft Stop SPC11 and axis controller SPC200
- 2) Note operating range of proximity sensors

## - Type discontinued

## Linear drives DGPL, external displacement encoder

**FESTO** 

Technical data

Weights [g] without displacement encoder								
Piston ∅		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 o	clamping unit per 10 mm stroke	27	34	42	-	-		
Moving load	Standard slide GK	605	895	1,700	3,000	4,990		
	Extended slide GV	950	1,375	2,603	4,700	7,860		
	Clamping unit	185	250	461	-	-		

**-**

Note

Electrical data, displacement encoder:

Analogue displacement encoder (order code MP)

→Internet: displacement encoder

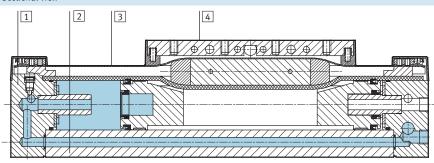
Digital displacement encoder

(order code MA)

→ Internet: displacement encoder

#### Materials

#### Sectional view



Displacement encoder materials

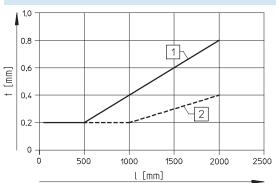
→Internet: displacement encoder

Drive	e	
1	End cap	Anodised aluminium
2	Profile	Anodised aluminium
3	Cover strip	Corrosion-resistant steel
4	Moment compensator	Anodised aluminium
-	Slide	Anodised aluminium
-	Guide rail	Corrosion-resistant steel
-	Seals	Nitrile rubber, polyurethane

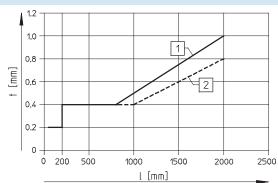
#### Repetition accuracy

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

Horizontal



Vertical



- 1 With analogue displacement encoder
- 2 With digital displacement encoder

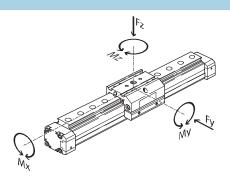
### Linear drives DGPL, external displacement encoder

**FESTO** 

Technical data

#### Characteristic load values

The indicated forces and torques refer to the centre line of the internal diameter of the profile barrel. These values must not be exceeded during dynamic operation. Special attention must be paid to the deceleration phase.



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

$$0,4 \times \frac{Fz}{Fz_{max.}} + \frac{Mx}{Mx_{max.}} + \frac{My}{My_{max.}} + 0,2 \times \frac{Mz}{Mz_{max.}} \le 1$$

$$\frac{Fz}{Fz_{max.}} \leq 1 \qquad \frac{Mz}{Mz_{max.}} \leq 1$$

Permissible forces and torques														
Piston Ø		25		32		40		50		63				
Variant		GK	GV	GK	GV	GK	GV	GK	GV	GK	GV			
Fy <sub>max</sub> .	[N]	3,080	3,080	3,080	3,080	7,300	7,300	7,300	7,300	14,050	14,050			
Fz <sub>max</sub> .	[N]	3,080	3,080	3,080	3,080	7,300	7,300	7,300	7,300	14,050	14,050			
Mx <sub>max</sub> .	[Nm]	45	45	63	63	170	170	240	240	580	580			
My <sub>max</sub> .	[Nm]	85	170	127	250	330	660	460	920	910	1,820			
Mz <sub>max</sub> .	[Nm]	85	170	127	250	330	660	460	920	910	1,820			

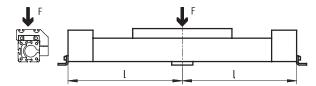
#### Maximum permissible support span l as a function of force F

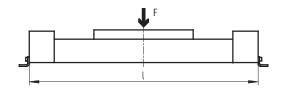
The axis may need to be supported with central supports MUP in order to

limit deflection in the case of large strokes. The following graphs can be used to determine the maximum permissible support span l as a function

of force F acting on the axis.

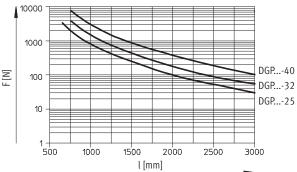
#### Force on the surface of the slide



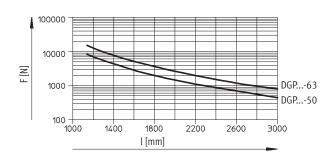


#### Maximum support span I (without central support) as a function of force F

Piston  $\varnothing$  25 ... 40



Piston Ø 50/63

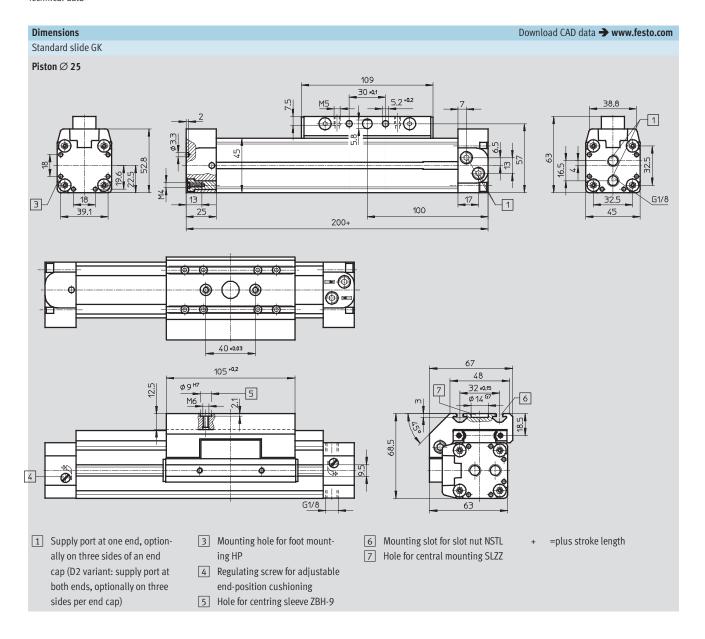


## - Type discontinued

## Linear drives DGPL, external displacement encoder

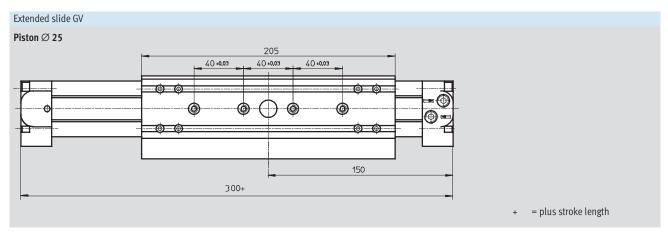
**FESTO** 

Technical data



## - Type discontinued

## **Linear drives DGPL, external displacement encoder** Technical data



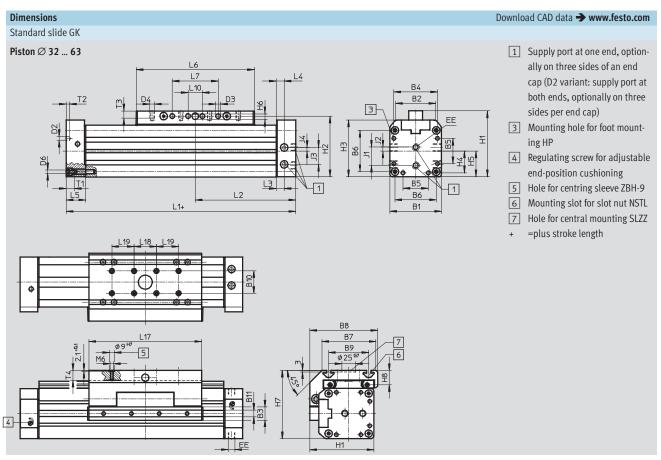


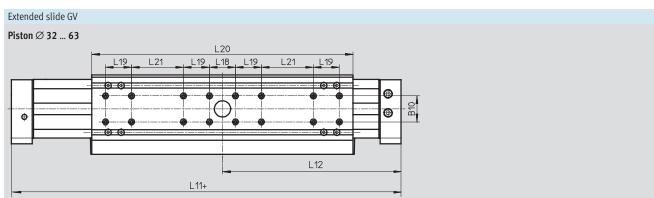
## - Type discontinued

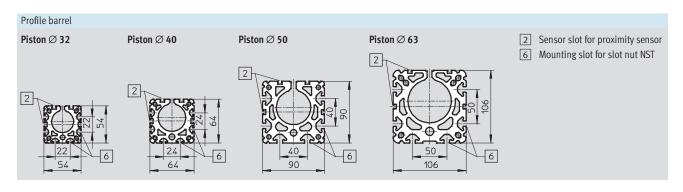
## Linear drives DGPL, external displacement encoder

**FESTO** 

Technical data







## - Type discontinued

# Linear drives DGPL, external displacement encoder Technical data

Ø	B1	B2	В3	B4	B5	В6	В7	B8	В9	B10	B11	D2 Ø
[mm]			+0.2							±0.03		
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	D3	D4	D6	EE	H1	H2	Н3	H4	H5	H6	H7	H8
	Ø											
[mm]	+0.2											
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	J1	J2	J3	J4	L1	L2	L3	L4	L5	L6	L7	L10
[mm]												±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	L11	L12	L17	L18	L19	L20	L21	T1	T2	T3	T	4
[mm]	+0.9/-0.2	+0.3/-0.6		±0.03	±0.03		±0.1				ma	ax.
32	380	190	131 +0.2	40	-	261	40	13.2	3	7.5	12	2.5
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	3.5
63	650	325	230 +0.2			480	120	21.2	1		20	).5



## - Type discontinued

## Linear drives DGPL, external displacement encoder

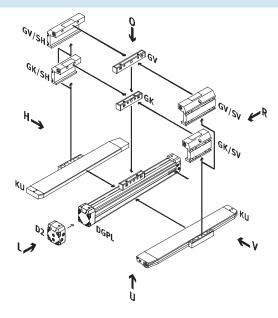
**FESTO** 

Ordering data – Modular products

#### Order code

#### Mandatory data/options

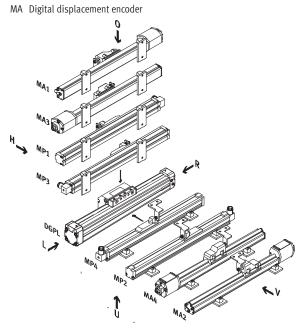
- KU Clamping unit underneath
- GK Standard slide
- GV Extended slide
- SV Slide at front
- SH Slide at rear
- D2 Supply port at both ends

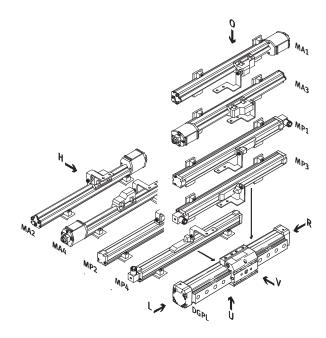


#### Attachment position for slide at rear (SH)

Attachment position for slide at front (SV)

MP Analogue displacement encoder





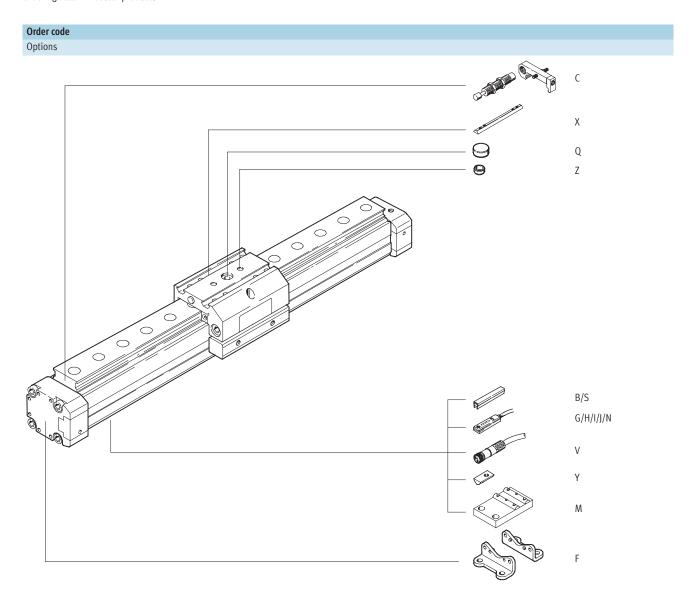


Note

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

## - Type discontinued

## **Linear drives DGPL, external displacement encoder** Ordering data – Modular products



## - Type discontinued

## **Linear drives DGPL, external displacement encoder** Ordering data – Modular products

**FESTO** 

1	Mandatory	data							O Opti	ons			<b>→</b>
1 1 1 1	75 134 75 135 75 136 75 137 75 138	Func- tion  DGPL	25 32 40 50 63	225 2,000	ioning . PPV	Position sensing	Generation	<b>Guide</b> KF	Clamping unit	GK GV	Slide attach- ment posi- tion SV SH	Supply port  D2	Dis- place- ment encoder  MP1 MP2 MP3 MP4 MA1 MA2 MA3 MA4
e 1	Order example .75 136	DGPL -	- 40	<b>-</b> 750	– PPV	_ A .	- В	- KF		- <b>GV</b> -	- SH -	D2	MPO MAO
Siz	<b>dering table</b> e		25		32	40		50	6	3	Condi-	Code	Enter
M	Module No.		175 134	4	175 135	175 130	5	175 137	1	75 138	tions		code
	Function				drive with slid			-11,7-101				DGPL	DGPL
	Size		25		32	40		50	6	3			
	Stroke	[mn				; 750; 1,000; 1,		0; 1,750; 2	2,000				
	Cushioning Position sensit	n ~		tic cushio imity sens		ole at both ends						-PPV -A	-PPV
	Generation	iig	B series	illilly sens	501							-A -B	-A -B
	Guide			ating ball	bearing guide	<u> </u>						-KF	-KF
0	Clamping unit		Underne	eath				-	-			-KU	
	Basic design			d piston/s								-GK	
				d piston/s	lide							-GV	
	Slide attachme	ent position	Slide at									-SV -SH	
	Supply port		At both									-D2	
	Displacement (	encoder			1, mounted							-MP1	
					2, mounted						2	-MP2	
				•	3, mounted							-MP3	
				•	4, mounted						2	-MP4	
						face, position 1,						-MA1	
						face, position 2,					2	-MA2	
				Temposonic with CAN axis interface, position 3, mounted Temposonic with CAN axis interface, position 4, mounted									
					separately	ace, position 4,	mounted				2	-MA4 -MP0	
				,	- spanatory								

_		
1	SV or SH	Must be selected

2 MP2, MP4, MA2, MA4 Not with clamping unit KU.

Transfer order																									
	DG	GPL	-		-		-[	PPV	_	Α	]-	В	В	_	KF	]-		_		_		-		-[	

Subject to change – 2013/05

## - Type discontinued

## **Linear drives DGPL, external displacement encoder** Ordering data – Modular products

O Opt	ions															
Acces- sories	Slot	cover	Slot nut	Cent		Centra		Central mounting	3	Foot mounting	s	Proximity ensor, nagnetic	Connec cable	ting	Sho	ck orber kit
ZUB	S B		X Y	Z		M		Q		F		G H I J N	V		C	
: ZUB	- 2S2B	i	2XY	Z				Q		F					2C	
<b>Ordering ta</b> Size	ble		25		32		40		50		63		Condi- tions	Code		Enter code
Accesso			Fu alasad san											ZUD	+	ZUD
			Enclosed sep	aratety	/									:ZUB-	4	:ZUB-
O Slot cov		Sensor slo	t 1 10											S		
2 pcs., (	0.5 m															
		Mounting slot	-		1 10									В		
Slot nut	t	Slide	1 10											X	1	
		Mounting slot	-		1 10									Ү		
Contrino	م داممیره	(pack of 10)	10, 20, 30, 4	0.50	60 70 8	0 90								Z	-	
				10, 50,	00, 70, 8	0, 30								M	-	
	support		1 10												4	
	mountin	g	1 10											Q	_	
Foot mo			1 10											F		
Proximi	ty	With	1 10											G		
sensor,		cable,														
magneti	ic	2.5 m														
		With plug	1 10											Н		
Proximi	tv	With	1 10										+	l	1	
sensor,	•	cable,	1 10													
	ic, non-														4	
contacti	ing	With plug	1 10											J		
Proximi	ty	N/C con-	1 10											N		
sensor,	•	tact with														
magneti		cable,														
magneti	IL															
		2.5 m														
Connect	ting	2.5 m	1 10											V		
cable																
Classia	bsorber	kit	1 10											C		

			der code				
:[	ZUB	]-]					

## Linear drives DGPL/DGPI/DGPIL Accessories

**FESTO** 

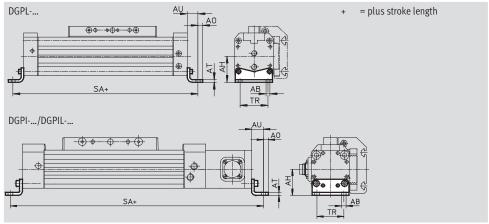
#### Foot mounting HP

(order code: F)



Free of copper, PTFE and silicone





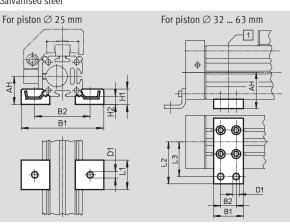
Dimensions a	imensions and ordering data														
For Ø	AB	AH	AO	AT	AU	9	Ä	TR	Weight	Part No.	Туре				
	Ø					DGPL	DGPI(L)								
[mm]									[g]						
25	5.5	29.5	6	3	13	226	327	32.5	61	150 731	HP-25				
32	6.6	37	7	4	17	284	379	38	117	150 732	HP-32				
40	6.6	46	8.5	5	17.5	335	432	45	188	150 733	HP-40				
F.O.	0	61	11	6	25	400	515	65	243	150 734	HP-50				
50	,	01	11	U	23	400	717	0,5	277	230734	111 50				

#### Central support MUP

(order code: M)

Material: Galvanised steel Free of copper, PTFE and silicone





1 Position of the central support along the profile barrel is freely selectable.

Please note span.

Dimensions a	Dimensions and ordering data														
For Ø	AH	B1	B2	D1 Ø	H1	H2	L1	L2	L3	Weight	Part No.	Туре			
[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			
				1	1	1	1	77	1	340	150 800	MUP-63			

## Linear drives DGPL/DGPI/DGPIL

Accessories

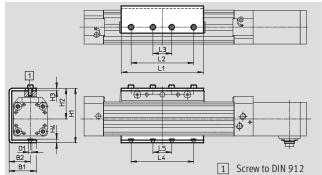
**FESTO** 

#### Load inverter bracket AK

for DGPI (order code: AK)

Material: Galvanised steel





Dimensions a	imensions and ordering data														
For Ø	B1	B2	D1	H1	H2	Н3	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 <sup>1)</sup>	Weight	Part No. Type
[mm]						[g]	
25	50	50	20	M5x10	2	380	196 106 AK-25
32	30	100	30	M5x12	1	690	196 107 AK-32
40	40	130	40	M6x14	1	1,050	196 108 AK-40
50	50	150	50	M8x16	1	2,080	196 109 AK-50
63	70	190	70	M8x18	1	2,820	196 110 AK-63

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

#### Shock absorber DG-GA

for DGPIL Protected version GA (order code: E)

Materials: Housing: Galvanised steel Piston rod: high-alloy steel Seals: NBR, PUR

Free of copper, PTFE and silicone



Ordering data	Ordering data								
For Ø	Weight	Part No.	Туре						
[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

**FESTO** 

Accessories

#### Shock absorber YSR-...-C

for DGPL/DGPIL (order code: C)

Materials:

Housing: Galvanised steel Piston rod: high-alloy steel Seals: NBR, PUR

Free of copper, PTFE and silicone



Note Shock absorber YSRW with progressive characteristics → Internet: ysrw

Ordering da	Ordering data								
For $\varnothing$	Weight	Part No.	Туре						
[mm]	[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

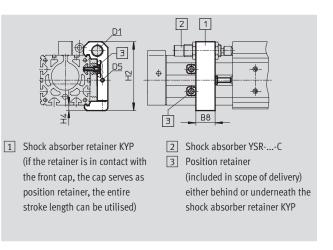
for DGPL/DGPIL (order code: C)

Materials:

Retainer: Aluminium

Sleeve: Corrosion-resistant steel





Dimensions and ordering data										
For Ø [mm]	B8	D1	D5	H2	H4	Weight [g]	Part No.	Туре		
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 DGPL/DGPI/DGPIL Accessories



Ordering data				Technical o	data 🗲 Internet: mount	ing component
	For Ø	Comment	Order code	Part No.	Туре	PU <sup>1)</sup>
	[mm]					
Slot nut NST						
<u> </u>	25	For mounting slot	Υ	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						
(a)	25	For slide	X	158 410	NSTL-25	1
<b>3</b> //	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						
	25 63	For slide	Z	150 927	ZBH-9	10
<u> </u>						
Central mounting SLZZ						
	25	For slide	Q	150 900	•	1
III P	32,40			150 901	SLZZ-25/16	
	50,63			150 904	SLZZ-50/40	1
Slot cover ABP						
	32, 40	For mounting slot	В	151 681	ABP-5	2
	50,63	Every 0.5 m		151 682	ABP-8	
						· · · · · · · · · · · · · · · · · · ·
Slot cover ABP-S						
	25 63	For sensor slot	S	563 360	ABP-5-S1	2
		Every 0.5 m				

<sup>1)</sup> Packaging unit

Ordering data - Push-in fittings				Technical data → Internet: qui	ck star
	For Ø	Comment	Part No.	Туре	PU <sup>1)</sup>
	[mm]				
	25, 32	For connecting compressed air tubing with standard	186 098	QS-G <sup>1</sup> /8-8	10
	40, 50	O.D.	186 099	QS-G <sup>1</sup> / <sub>4</sub> -8	
			186 101	QS-G <sup>1</sup> / <sub>4</sub> -10	10
	63		186 100	QS-G3%-8	10
			186 102	QS-G3/8-10	
			186 103	QS-G3/8-12	

<sup>1)</sup> Packaging unit

## Linear drives DGPL/DGPI/DGPIL Accessories



Selection aid														
Application	For Ø	Stroke	Stroke [mm]											
	[mm]	225	300	360	450	500	600	750	1,000	1,250	1,500	1,750	2,000	
orizontal/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 applicat	For applications with Soft Stop end-position controller SPC11												
	25	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)	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	
alve	Selection nu	umber							Part No	o. Type				
4	1	1							151 692 MPYE-5-1/8-LF-010-B					
0	2	2								151 693 MPYE-5-½8-HF-010-B				
	3								151 69	94 MPYI	E-5-½-010	0-B		
	4	•		_		_			151 69	5 MPYI	E-5-3/8-010	0-B		

1) On request



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

Selection number 1 for vertical applicati Selection number 2 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



Ordering dat	a – Proximity sensor for T-slot, magnetic re		Technical data → Internet: sme			
	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
No.	Insertable in the slot lengthwise, flush	Contacting	Cable, 3-wire	2.5	150 855	SME-8-K-LED-24
	with the cylinder profile		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	- Proximity sensor for T-slot, magneto-	resistive				Technical data → Internet: smt
	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part No.	Туре
N/O contact						
M. S. V.	Insertable in the slot from above, flush with the cylinder profile, short design	PNP	Cable, 3-wire	2.5	574335	SMT-8M-A-PS-24V-E-2,5-0E
N/C contact						
	Insertable in the slot from above, flush with the cylinder profile, short design	PNP	Cable, 3-wire	7.5	574340	SMT-8M-A-PO-24V-E-7,5-0E

Ordering data	- Connecting cables	Technical data → Internet: nebu			
	Electrical connection, left Electrical connection, right Cable length		Part No.	Туре	
			[m]		
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 333	NEBU-M8G3-K-2.5-LE3
OF THE PERSON NAMED IN COLUMN TO PERSON NAME			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

#### **Product Range and Company Overview**

#### **A Complete Suite of Automation Services**

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



**Custom Automation Components** Complete custom engineered solutions



**Custom Control Cabinets** Comprehensive engineering support and on-site services



**Complete Systems** Shipment, stocking and storage services

#### The Broadest Range of Automation Components

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



Electromechanical Electromechanical actuators, motors, controllers & drives



**Pneumatics** Pneumatic linear and rotary actuators, valves, and air supply



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

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

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

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



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