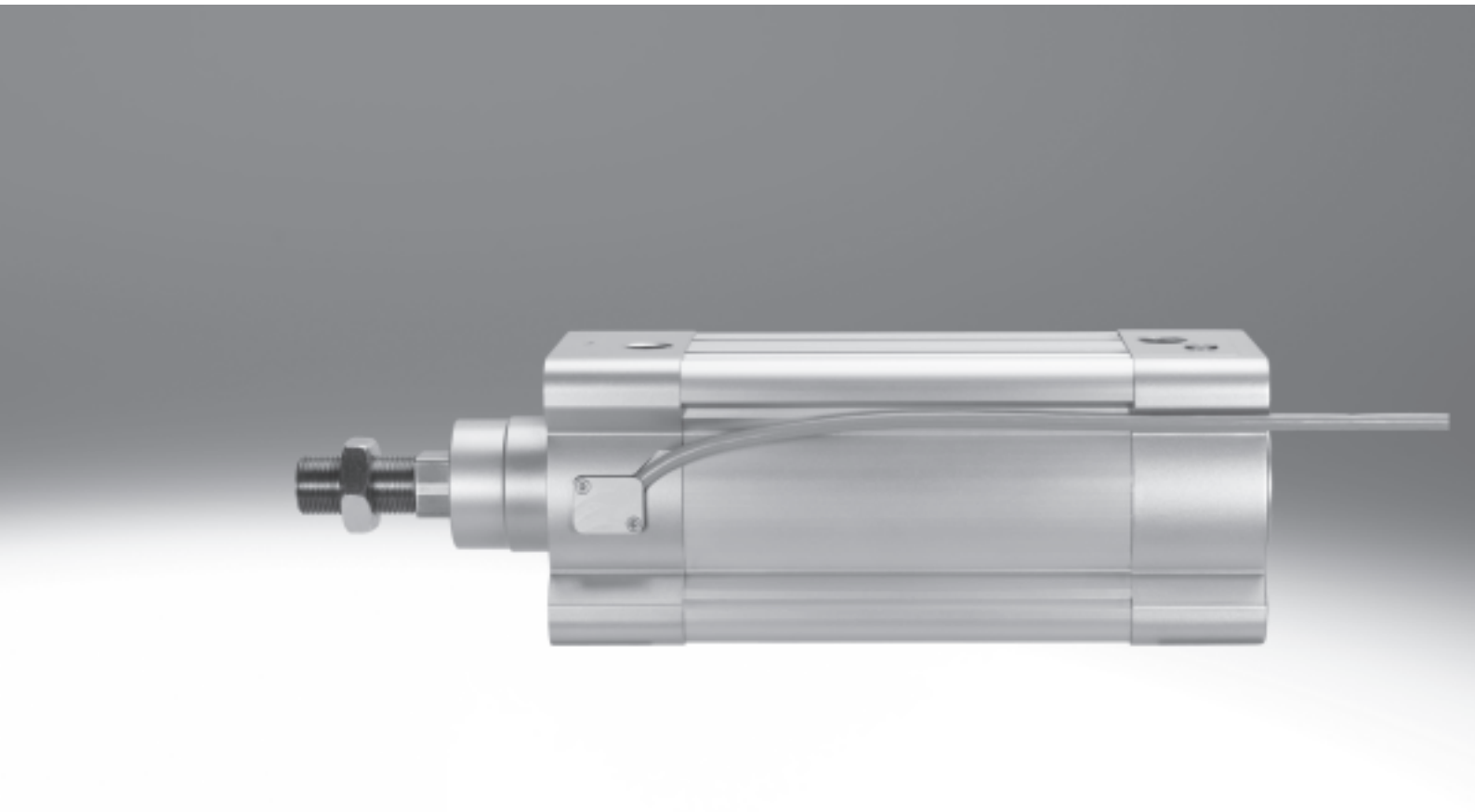
Standard cylinders DDPC, integrated displacement encoder

FESTO



Cylinders with displacement encoder

Product range overview

Function	Type	Brief description
Drives	**Rodless**	
	DDLI 	• Without guide • With contactless measuring displacement encoder • Based on linear drive DGC-K • Supply ports on end face • System product for handling and assembly technology
	DGCI 	• With guide • With contactless measuring 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 measuring 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 measuring displacement encoder, attached • With clamping unit • Wide range of options for mounting on drives
	With piston rod	
	DNCI 	• With contactless measuring displacement encoder • Various piston rod variants • Standards-based cylinder to ISO 15552 ISO DIN VDMA
	DDPC 	• With contactless measuring displacement encoder • Various piston rod variants • Standards-based cylinder to ISO 15552 ISO DIN VDMA
	DNC/DSBC 	• With attached potentiometer MLO-LWG • Various piston rod variants • Standards-based cylinder to ISO 15552 ISO DIN VDMA
Swivel modules	**Swivel modules**	
	DSMI 	• Based on swivel modules DSM • Integrated rotary potentiometer • Compact design • Wide range of mounting options

Cylinders with displacement encoder

Product range overview

FESTO

Piston ∅	Stroke/swivel angle [mm/°]	Suitable for positioning with CPX-CMAX	Suitable for positioning with SPC200	Suitable for end-position controller CPX-CMPX	Suitable for end-position controller SPC11	Suitable for use as a measuring cylinder
Rodless						
25, 32, 40	100, 160, 225, 300, 360, 450, 500, 600, 750, 850, 1000, 1250, 1500, 1750, 2000	■	■	■	■	■
18, 25, 32, 40, 63	100, 160, 225, 300, 360, 450, 500, 600, 750, 850, 1000, 1250, 1500, 1750, 2000	■	■	■	■	■
25, 32, 40, 50, 63	225, 300, 360, 450, 500, 600, 750, 1000, 1250, 1500, 1750, 2000	■	■	■	■	■
25, 32, 40, 50, 63	225, 300, 360, 450, 500, 600, 750, 1000, 1250, 1500, 1750, 2000	–	■	–	■	■
With piston rod						
32, 40, 50, 63	10 ... 2000	–	–	–	–	■
	100 ... 750	■	■	■	■	–
80, 100	10 ... 2000	–	–	–	–	■
	100 ... 750	■	■	■	■	–
32, 40, 50, 63, 80	100, 150, 225, 300, 360, 450, 600, 750	■	■	■	■	■
Swivel modules						
25, 40, 63	270	■	■	■	■	■

Cylinders with displacement encoder

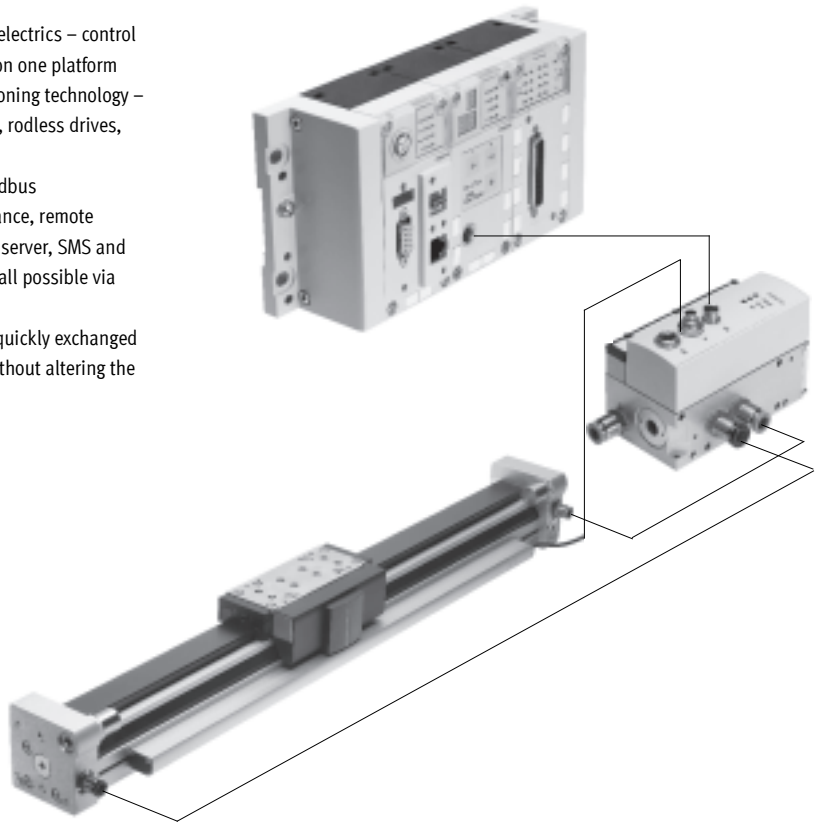
Features

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 alerts are all possible via TCP/IP
- Modules can be quickly exchanged and expanded without altering the wiring



Axis controller CPX-CMAX

Technical data ➔ Internet: 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 with the axis controller CPX-CMAX.
All stations are recognised as: the auto-identification function identifies each participant 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.

Advantages:

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

Cylinders with displacement encoder

Features

End-position controller CPX-CMPX

Technical data ➔ Internet: 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 control of downtime.
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.

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 noise level
- The extended diagnostics help to reduce the service time of the machine

Proportional directional control valve VPWP

Technical data ➔ Internet: 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.
In sizes 4, 6, 8 and 10.
Flow rate of 350, 700, 1400 and 2000 l/min.

With switching output for actuating a brake.
Coloured supply ports.
Pre-assembled cables guarantee faultless and fast connection with the controllers CPX-CMPX and CPX-CMAX.

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

Technical data ➔ Internet: cpx-cmix

Fully digital data acquisition and transmission means that 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.

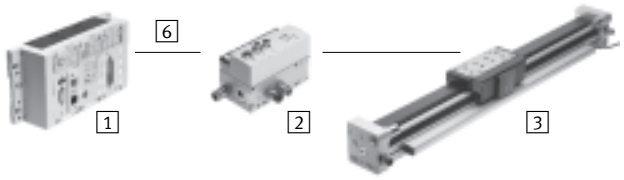
Advantages:
- All process steps can be documented, which improves quality
- An adjustable contact force (via pressure regulator) increases the precision of the "displacement sensor"
- With displacement encoders for measuring absolute values, the actual position is immediately available after the system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

Cylinders with displacement encoder

Drive options

System with linear drive DDLI, DGCI

Technical data ➔ Internet: ddli or dgci



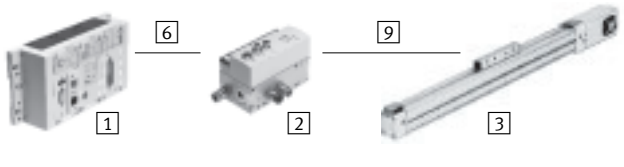
1 Controller module CPX-CMPX or CPX-CMAX
2 Proportional directional control valve VPWP
3 Linear drive DDLI, DGCI with displacement encoder
6 Connecting cable KVI-CP-3-...

- Pneumatic rodless linear drive with displacement encoder, with or without recirculating ball bearing guide
- Displacement encoder with absolute and contactless measurement
- Diameters:
  - DGCI: 18 ... 63 mm
  - DDLI: 25 ... 40 mm
- Stroke: 100 ... 2000 mm in fixed lengths
- Range of applications: Soft Stop and pneumatic positioning
- Loads from 1 ... 180 kg
- No sensor interface required

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

Technical data ➔ Internet: dgpi



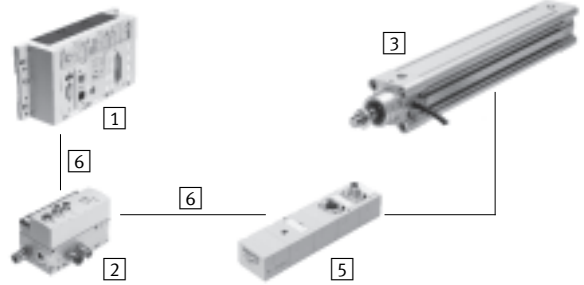
1 Controller module CPX-CMPX or CPX-CMAX
2 Proportional directional control valve VPWP
3 Linear drive DGPI, DGPIL with displacement encoder
6 Connecting cable KVI-CP-3-...
9 NEBP-M16W6-K-2-M9W5

- Pneumatic rodless linear drive with displacement encoder, with or without recirculating ball bearing guide
- Displacement encoder with absolute and contactless measurement
- Diameter: 25 ... 63 mm
- Stroke: 225 ... 2000 mm in fixed lengths
- Range of applications: Soft Stop and pneumatic positioning
- Loads from 2 ... 180 kg
- No sensor interface required

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

Technical data ➔ Internet: dnci



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

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

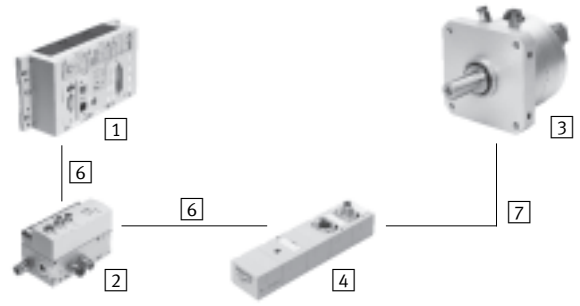
Cylinders with displacement encoder

Drive options

FESTO

System with swivel module DSMI

Technical data ➔ Internet: 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

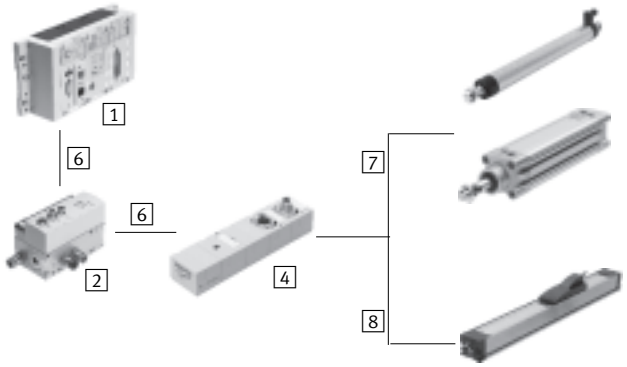
- Swivel module DSMI with integrated displacement encoder
- Identical design to pneumatic swivel module DSM
- Absolute displacement encoder based on a potentiometer
- Swivel range of 0 ... 270°
- Size: 25, 40, 63
- Max. torque: 5 ... 40 Nm
- Range of applications: Soft Stop and pneumatic positioning
- Mass moments of inertia from 15 ... 6000 kgcm^2 and a matching sensor interface CASM-S-D2-R3
- Pre-assembled cables guarantee faultless and fast connection with the proportional directional control valve VPWP

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

Technical data ➔ Internet: casm



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 ... 2000 mm
- Pre-assembled cables guarantee faultless and fast connection with the sensor interface CASM
- Range of applications: Soft Stop and pneumatic positioning with cylinder ∅ 25 ... 80 mm, e.g. DNC or DSBC
- Loads from 1 ... 300 kg

Advantages:

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

Cylinders with displacement encoder

Drive options

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

System components for pneumatic positioning systems with axis controller CPX-CMAX							
	Linear drive		Standard cylinder	Swivel module	Displacement encoder		→ Page/ Internet
	DDLI/DGCI	DGPI	DNCI, DDPC	DSMI	MLO-LWG/-TLF	MME-MTS	
Axis controller CPX-CMAX	■	■	■	■	■	■	cmax
Prop. directional control valve VPWP	■	■	■	■	■	■	vpwp
Sensor interface CASM-S-D2-R3	–	–	–	■	■	–	casm
Sensor interface CASM-S-D3-R7	–	–	■	–	–	–	casm
Connecting cable KVI-CP-3-...	■	■	■	■	■	■	kvi
Connecting cable NEBC-P1W4-...	–	–	–	■	■ / –	–	nebc
Connecting cable NEBC-A1W3-...	–	–	–	–	– / ■	–	nebc
Connecting cable NEBP-M16W6-...	–	■	–	–	–	■	nebp

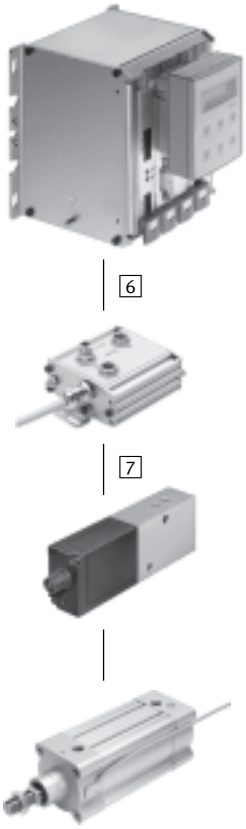
System components for measuring cylinders with measuring module CPX-CMIX							
	Linear drive		Standard cylinder	Swivel module	Displacement encoder		→ Page/ Internet
	DDLI/DGCI	DGPI	DNCI, DDPC	DSMI	MLO-LWG/-TLF	MME-MTS	
Measuring module CPX-CMIX-M1-1	■	■	■	■	■	■	cmix
Sensor interface CASM-S-D2-R3	–	–	–	■	■	–	casm
Sensor interface CASM-S-D3-R7	–	–	■	–	–	–	casm
Connecting cable KVI-CP-3-...	(■)[1]	(■)[1]	■	■	■	(■)	kvi
Connecting cable NEBC-P1W4-...	–	–	–	■	■ / –	–	nebc
Connecting cable NEBC-A1W3-...	–	–	–	–	– / ■	–	nebc
Connecting cable NEBP-M16W6-...	–	■	–	–	–	■	nebp

1) As an extension

Cylinders with displacement encoder

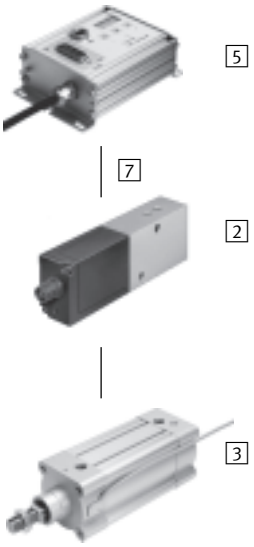
Overview

Individual components for positioning
With axis controller SPC200
➔ Internet: spc200



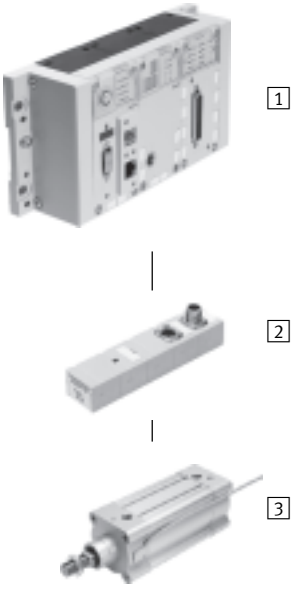
1 Axis controller SPC200
2 Proportional directional control valve MPYE
3 Standard cylinder DNCI, DDPC
4 Axis interface SPC-AIF-INC
6 Connecting cable KSPC-AIF-...
7 Connecting cable KMPYE-AIF-...

With end-position controller SPC11
➔ Internet: spc11



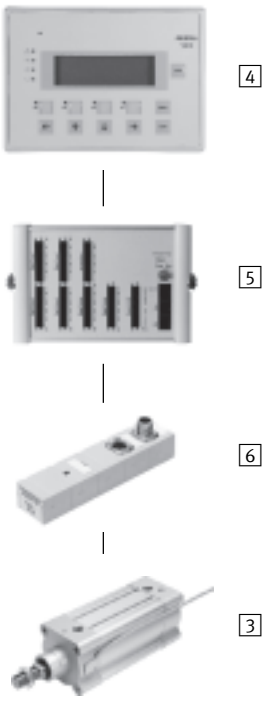
2 Proportional directional control valve MPYE
3 Standard cylinder DNCI, DDPC
5 End-position controller SPC11-INC
7 Connecting cable KMPYE-AIF-...

Individual components for use as a measuring cylinder
With measuring module CPX-CMIX
➔ Internet: cmix



1 Measuring module CPX-CMIX
2 Sensor interface CASM-S-D3-R7
3 Standard cylinder DNCI, DDPC

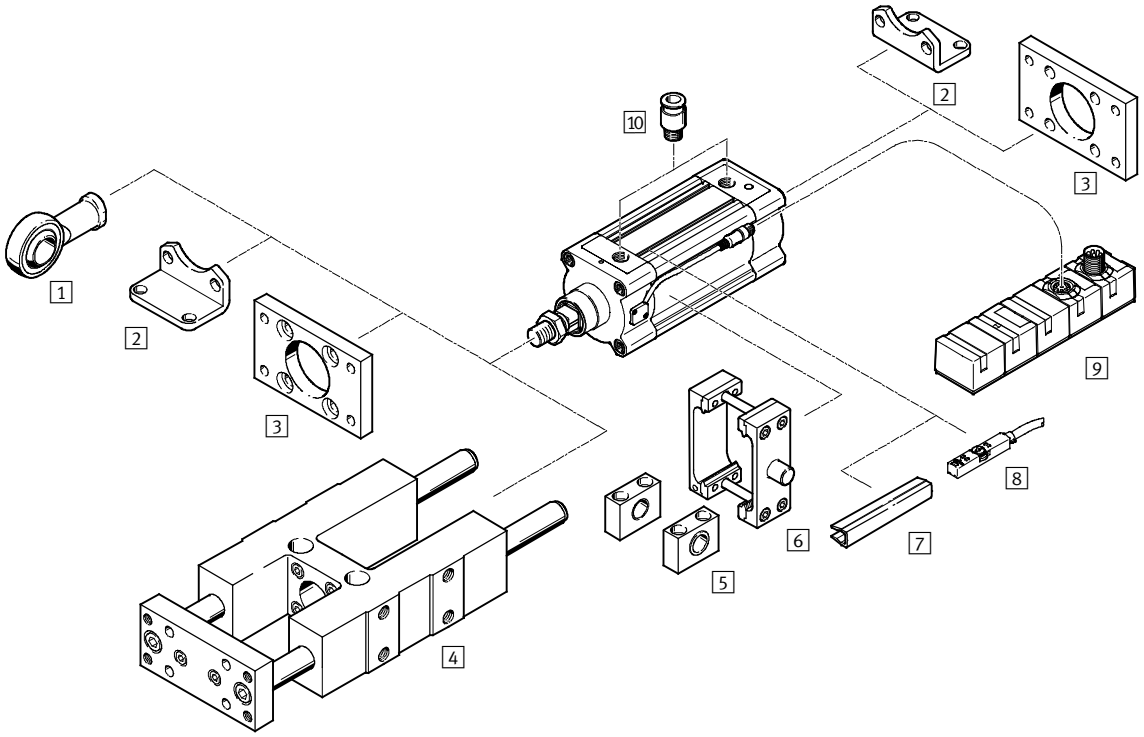
With measured-value transducer DADE
➔ Internet: dade



3 Standard cylinder DNCI, DDPC
4 Operator unit FED
5 PLC controller FEC
6 Measured-value transducer DADE

Standard cylinders DDPC, integrated displacement encoder

Peripherals overview



Note

If the drive DDPC is used without an end-position controller CPX-CMPX, SPC11 or axis controller CPX-CMAX, SPC200, e.g. as a measuring cylinder, then the standard accessories for the drive DNC can be used.

Standard cylinders DDPC, integrated displacement encoder

Peripherals overview

Accessories			
	Type	Brief description	➔ Page/Internet
1	Rod eye SGS	With spherical bearing	22
2	Foot mounting HNC	For mounting the drive on the bearing and end cap	22
3	Flange mounting FNC	For mounting the drive on the bearing and end cap	22
4	Guide unit[1)] FENG-KF	For protecting against rotation at high torque loads	20
5	Trunnion support LNZG	For securing the trunnion mounting kit DAMT	24
6	Trunnion mounting kit DAMT	For swivelling movements of the drive	23
7	Slot cover ABP-5-S	For protecting against the ingress of dirt	24
8	Proximity sensor SME/SMT-8	For additional sensing of the piston position, can be ordered optionally, only in combination with the order code A in the modular products section for the drive	sm
9	Sensor interface CASM	Used to connect pneumatic drives with analogue/incremental displacement encoder to a position controller CPX-CMAX or CPX-CMPX	casm
10	Push-in fitting QS	For connecting compressed air tubing with standard O.D.	24

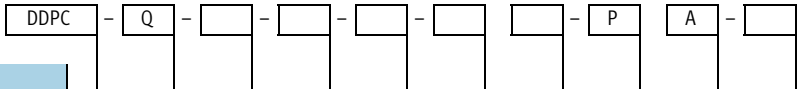
1) Guide unit FENG-KF must be attached to the piston rod in a way that eliminates backlash

Note

Allocation table of drives and associated proportional directional control valves ➔ 25

Standard cylinders DDPC, integrated displacement encoder

Type codes



Type	
DDPC	Standard cylinder

Protection against rotation	
Q	With protection against rotation

Piston ∅ [mm]

Stroke [mm]

Guide unit	
–	None
D	Attached

Clamping unit	
–	None
C	Attached

Piston rod type	
–	At one end
T	Through piston rod

Cushioning	
P	Elastic cushioning rings/pads at both ends

Position sensing	
A	Via proximity sensor

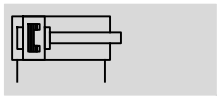
Piston rod extension	
–	None
...E	1 ... 500 mm

Standard cylinders DDPC, integrated displacement encoder

Technical data

FESTO

Function



- Diameter
  80 and 100 mm
- Stroke length
  10 ... 2,000 mm

General technical data			
Piston ∅		80	100
Based on standard		ISO 15552	
Design		Piston	
		Piston rod	
		Profile barrel	
Mode of operation		Double-acting	
Guide[1]		Guide rod with yoke, with ball bearing guide	
Protection against rotation		Square piston rod	
Mounting position		Any	
Type of mounting		Via accessories	
Cushioning		Elastic cushioning rings/pads at both ends	
Position sensing		Integrated displacement encoder	
		Via proximity sensor[2]	
Measuring principle (displacement encoder)		Encoder, non-contacting and relative measurement	
Pneumatic connection		G3⁄8	G1⁄2
Stroke			
DDPC-...[3]	[mm]	10 ... 2,000	
DDPC-...-D	[mm]	100 ... 500	
Extended piston rod	[mm]	1 ... 500	

1) Guide unit FENG-KF can be ordered via the modular product system (feature D) and is supplied attached. The maximum stroke is restricted.
2) Not included in the scope of delivery, can be ordered as an option
3) Can only be used without restriction as a positioning drive in the range from 100 ... 750 mm.
Note stroke reduction in combination with CPX-CMAX, SPC200

Operating and environmental conditions		
Operating pressure	[bar]	4 ... 12
Operating pressure[1]	[bar]	4 ... 8
Operating medium[2]		Compressed air to ISO 8573-1:2010 [6:4:4]
Note on operating/pilot medium		Operation with lubricated medium not possible
		Pressure dew point 10 °C below ambient/medium temperature
Ambient temperature[3]	[°C]	–20 ... +80
Vibration resistance to DIN/IEC 68 Part 2-6		Severity level 2
Continuous shock resistance to DIN/IEC 68 Part 2-82		Severity level 2
CE mark (see declaration of conformity)[4]		To EU EMC Directive
Corrosion resistance class CRC[5]		1

1) Only applies to applications with end-position controller CPX-CMPX, SPC11 and axis controller CPX-CMAX, SPC200
2) Characteristic values contingent on the proportional directional control valve VPWP, MPYE
3) Note operating range of proximity sensors
4) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com → Support → User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.
5) Corrosion resistance class 1 according to Festo standard 940 070
Components subject to low corrosion stress. 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.

Standard cylinders DDPC, integrated displacement encoder

FESTO

Technical data

Forces [N] and impact energy [Nm]		
Piston ∅	80	100
Theoretical force at 6 bar, advancing	3,016	4,712
Theoretical force at 6 bar, retracting	2,721	4,418
Impact energy at the end positions	1.8	2.5

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 effective load

Note

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

Positioning characteristics with axis controller CPX-CMAX, SPC200			
Piston ∅		80	100
Stroke	[mm]	100 ... 750	
Mounting position		Any	
Resolution	[mm]	0.01	
Repetition accuracy	[mm]	≤ ±0.5	
Min. load, horizontal	[kg]	20	32
Max. load, horizontal	[kg]	300	450
Min. load, vertical[1]	[kg]	20	32
Max. load, vertical[1]	[kg]	100	150
Min. travel speed	[m/s]	0.05	
Max. travel speed	[m/s]	1	0.7
Typical positioning time, long stroke[2]	[s]	0.88/1.02	0.95/1.10
Typical positioning time, short stroke[3]	[s]	0.77/0.95	0.80/1.32
Min. positioning stroke[4]	[%]	≤ 3	
Stroke reduction[5]	[mm]	15	
Recommended proportional directional control valve			
For CPX-CMAX		➔ 25	
For SPC200		➔ 26	

1) Only in combination with external guide
2) At 6 bar, horizontal mounting position, DDPC-XX-500, 400 mm positioning travel at min./max. load
3) At 6 bar, horizontal mounting position, DDPC-XX-500, 200 mm positioning travel at min./max. load
4) Refers to the cylinder stroke, but not more than 10 mm
5) The stroke reduction must be maintained on each side of the drive, the max. positionable stroke is therefore: stroke – 2x stroke reduction

Force control characteristics with axis controller CPX-CMAX			
Piston ∅		80	100
Stroke	[mm]	100 ... 750	
Mounting position		Any	
Max. controllable force[1]	[N]	2,710/2,440	4,240/3,975
Typical friction forces[2]	[N]	140	160
Repetition accuracy pressure regulation[3][4]	[%]	< ±2	

1) Advancing/retracting at 6 bar
2) These values can fluctuate greatly from cylinder to cylinder and are not guaranteed.
These friction forces must also be taken into consideration when using an external guide or when the cylinder is moving other components subject to friction
3) This value defines the repetition accuracy with which the internal differential pressure in the cylinder is controlled and refers to the maximum controllable force (the internal differential pressure corresponds to the prescribed force setpoint value)
4) The effective force at the workpiece and its accuracy depends largely on the friction in the system as well as the repetition accuracy of the internal control system. Note that friction forces always work against the direction of movement of the piston. The following formula can be used as a rule of thumb for the force F at the workpiece:
$F = F_{setpoint} \pm F_{friction\ forces} \pm$ internal repetition accuracy

Standard cylinders DDPC, integrated displacement encoder

Technical data

Positioning characteristics with Soft Stop end-position controller CPX-CMPX, SPC11			
Piston ∅		80	100
Stroke	[mm]	100 ... 750	
Mounting position		Any	
Repetition accuracy	[mm]	±2	
Min. load, horizontal	[kg]	20	32
Max. load, horizontal	[kg]	300	450
Min. load, vertical[1)]	[kg]	20	32
Max. load, vertical[1)]	[kg]	100	150
Travel time	[s]	➔ Soft Stop sizing software: ➔ www.festo.com	
Recommended proportional directional control valve			
For CPX-CMPX		➔ 25	
For SPC11		➔ 26	

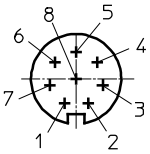
1) Only in combination with external guide

Electrical data – Displacement encoder		
Output signal		Analogue
Independent linearity		
Strokes up to 500 mm	[mm]	< ±0.08
Strokes up to 1,000 mm	[mm]	< ±0.09
Strokes above 1,000 mm	[mm]	< ±0.11
Max. travel speed	[m/s]	1.5
Protection class		IP65
CE marking (see declaration of conformity)		In accordance with EU EMC Directive[1)]
Max. permitted magnetic disruption field[2)]	[kA/m]	10
Electrical connection		Cable with 8-pin plug, round type M12
Cable length	[m]	1.5

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com ➔ Support ➔ User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

2) At 100 mm interval

Pin assignment 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	Screened
8	n.c.	–

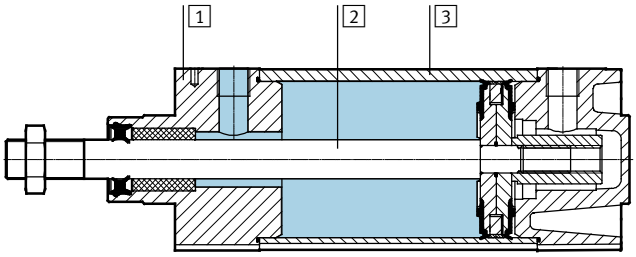
Standard cylinders DDPC, integrated displacement encoder

Technical data

Weight [g]		
Piston ∅	80	100
DDPC-...		
Basic weight with 0 mm stroke	3,053	4,330
Additional weight per 10 mm stroke	87	95
Moving load with 0 mm stroke	804	994
Additional weight per 10 mm stroke	31	31
DDPC-...-T – Through piston rod		
Basic weight with 0 mm stroke	3,537	5,019
Additional weight per 10 mm stroke	127	134
Moving load with 0 mm stroke	1,247	1,467
Additional weight per 10 mm stroke	70	70
DDPC-...-...E – Additional weight with piston rod extension		
Additional weight per 10 mm extension	31	31
DDPC-...-C – Additional weight with clamping unit		
Additional weight	2,046	2,829
DDPC-...-D – Additional weight with guide unit		
Basic weight with 0 mm stroke	10,430	12,990
Additional weight per 10 mm stroke	80	80

Materials

Sectional view



Standard cylinder		
1	End cap	Wrought aluminium alloy
2	Piston rod	High-alloy steel
3	Cylinder barrel	Wrought aluminium alloy
–	Seals	Nitrile rubber, polyurethane
	Note on materials	Free of copper and PTFE
		RoHS-compliant

Standard cylinders DDPC, integrated displacement encoder

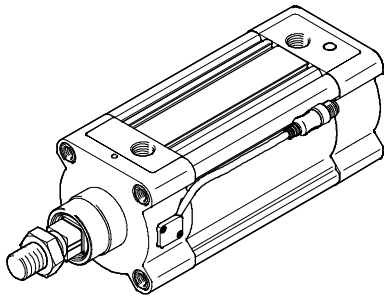
Technical data

FESTO

Torques and lateral forces

Max. torque for protection against rotation
Dynamic ≤ 3 Nm
Static ≤ 5 Nm
An external guide unit FENG-KF is recommended with higher torque loads. The guide unit is supplied attached.

The permissible static and dynamic characteristic load values with and without attached guide
➔ Internet: feng



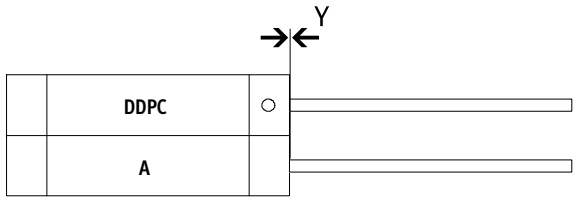
Mounting conditions

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

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

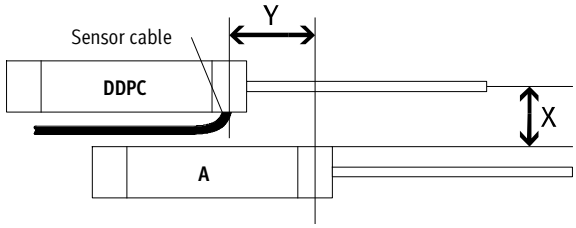
Parallel assembly

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



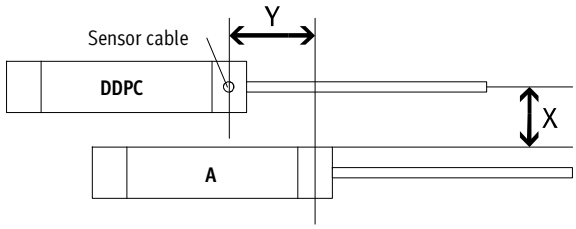
Offset assembly, cable outlet between the drives

If the offset is Y › 0 mm and the cable outlet is between the drives, a distance of X › 70 mm must be observed.



Offset assembly, cable outlet upwards or downwards

If the offset is Y › 0 mm and the cable outlet is up or down, a distance of X › 60 mm must be observed.



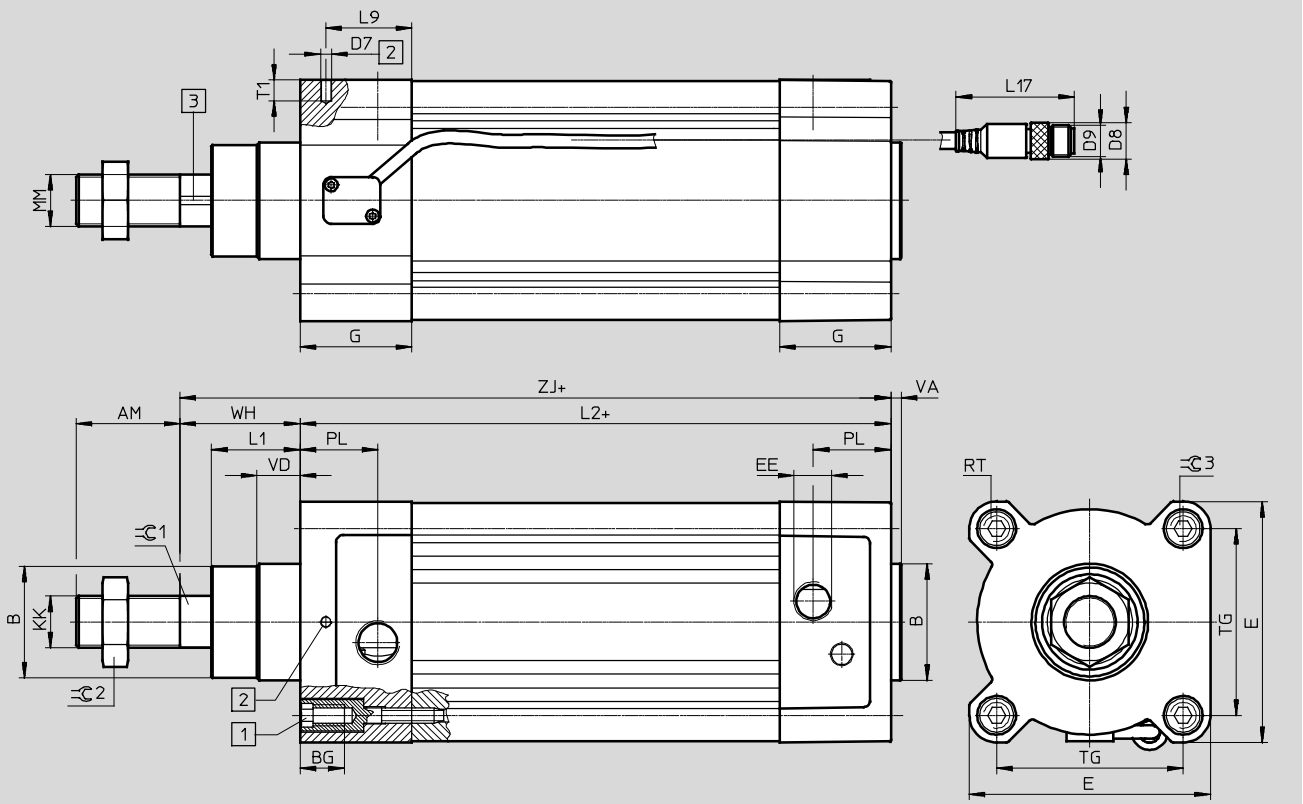
Standard cylinders DDPC, integrated displacement encoder

Technical data

FESTO

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

DDPC-...



1 Socket head screw with female thread for mounting attachments

2 Hole for securing the earthing for self-tapping M4 screw according to DIN 7500

3 Magnetic measuring band

\+ = plus stroke length

++ = plus 2x stroke length

∅ [mm]	AM	B ∅ d11	BG	D7 ∅	D8 ∅	D9	E	EE	G
80	40	45	17	3.7	14	M12	93	G3/8	43
100	40	55	17	3.7	14	M12	110	G1/2	48

∅ [mm]	KK	L1	L2	L9	L17	MM ∅	PL	RT	T1
80	M20x1.5	34.2	128	20	45.7	20	30	M10	8
100	M20x1.5	38	138	21.5	45.7	20	31.5	M10	8

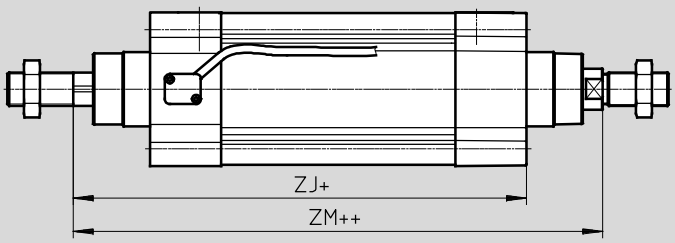
∅ [mm]	TG	VA	VD	WH	ZJ	⌀1	⌀2	⌀3
80	72	4	16.7	46	174	22	30	6
100	89	4	20.5	51	189	22	30	6

Standard cylinders DDPC, integrated displacement encoder

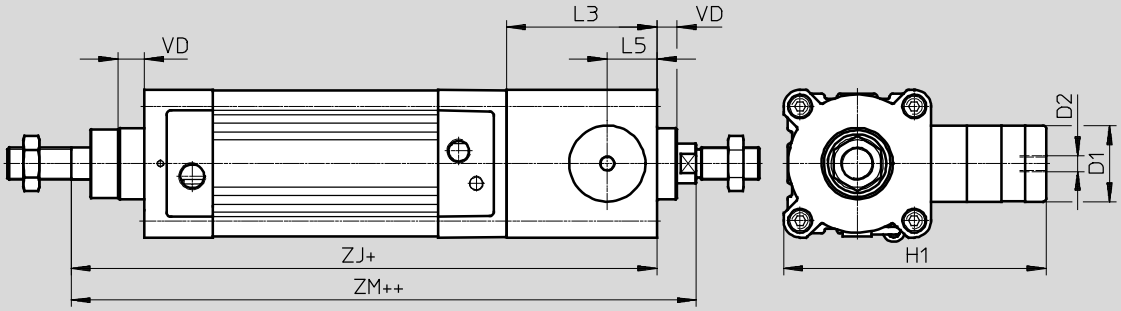
Technical data

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

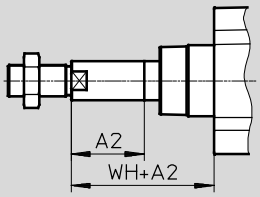
DDPC-...-T – Through piston rod



DDPC-...-CT – Through piston rod with clamping unit



DDPC-...-...E – Extended piston rod



∅ [mm]	A2 max.	D1 ∅ f9	D2	H1	L3	L5
80	500	48	G⅛	165.5	95	31.5
100	500	48	G⅛	174	98	31

∅ [mm]	VD	WH	ZJ		ZM	
			DDPC-...-T	DDPC-...-CT	DDPC-...-T	DDPC-...-CT
80	16.7	46	174	269	222	317
100	20.5	51	189	287	240	338

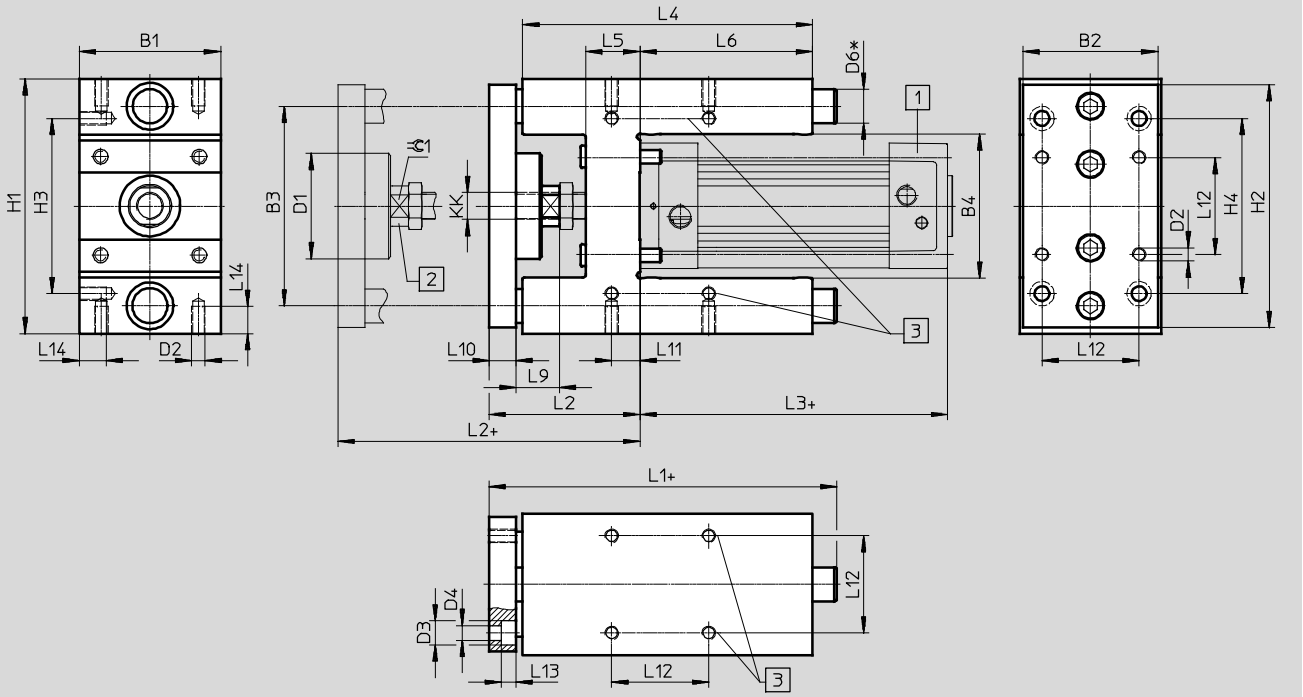
Standard cylinders DDPC, integrated displacement encoder

Technical data

FESTO

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

DDPC-...-D



1 Standard cylinder DDPC
2 Compensating coupling
3 Users can drill additional mounting holes as required
\+ = plus stroke length

∅ [mm]	B1 −0.3	B2	B3 ±0.2	B4 ±0.6	D1 ∅	D2	D3 ∅	D4 ∅	D6 ∅ h6
80	105	100	148	106	78	M10	18	11	25
100	130	120	172	131	78	M10	18	11	25

∅ [mm]	H1 −0.5	H2	H3 ±0.2	H4 ±0.2	KK	L1	L2 +10	L3	L4
80	189	180	130	130	M20x1.5	258	111	194	215
100	213	200	150	150	M20x1.5	263	116	138	220

∅ [mm]	L5	L6	L9	L10	L11	L12 ±0.2	L13	L14	⌯ 1
80	40	128	32	20	21	72	11	20	27
100	40	128	32	20	24.5	89	11	20	27

Standard cylinders DDPC, integrated displacement encoder

Ordering data – Modular products

FESTO

Ordering table								
Piston ∅			80	100	Condi-tions	Code		Enter code
M	Module No.		**1677705**	**1691433**				
	Function		Standard cylinder with integrated displacement encoder			**DDPC**		DDPC
	Protection against rotation		With protection against rotation			**-Q**		-Q
	Piston ∅	[mm]	80	100		**-...**		
	Stroke	[mm]	10 ... 2,000		1	**-...**		
O	Guide unit		None					
			Attached			**-D**		
	Clamping unit		None					
			Attached		2	**-C**		
	Piston rod type		At one end					
			Through piston rod			**T**		
M	Cushioning		Elastic cushioning rings/pads at both ends			**-P**		-P
	Position sensing		Via proximity sensor			**A**		A
O	Piston rod extension		None					
		[mm]	1 ... 500			**-...E**		

1 **–...** Can only be used without restriction as a positioning drive in the range from 100 ... 750 mm

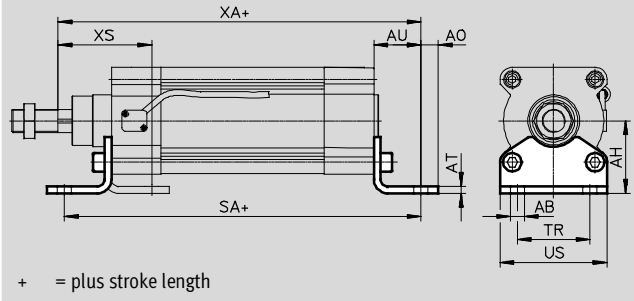
2 **C** Only available with T

Transfer order code

	DDPC	–	Q	–		–		–		–		–		–	P	A	–	

Foot mounting HNC

Materials:
Galvanised steel
Free of copper and PTFE



Dimensions and ordering data

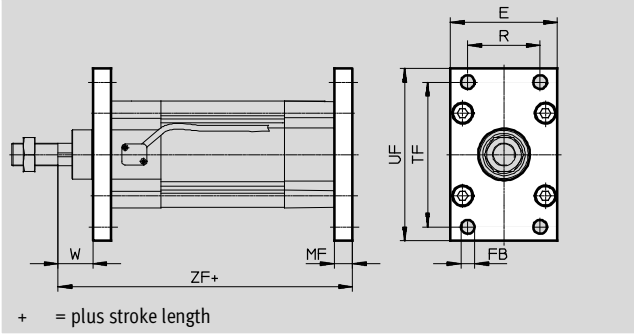
For ∅ [mm]	AB ∅	AH	AO	AT	AU	SA	
						DDPC-...	DDPC-...-C
80	12	63	15	6	41	276	371
100	14.5	71	17.5	6	41	220	318

For ∅ [mm]	TR	US	XA		XS	CRC[1]	Weight [g]	Part No.	Type
			DDPC-...	DDPC-...-C					
80	63	93	281	376	81	2	829	**174373**	**HNC-80**
100	75	110	230	328	86	2	1,009	**174374**	**HNC-100**

1) 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.

Flange mounting FNC

Materials:
FNC: Galvanised steel
Free of copper and PTFE
RoHS-compliant



Dimensions and ordering data

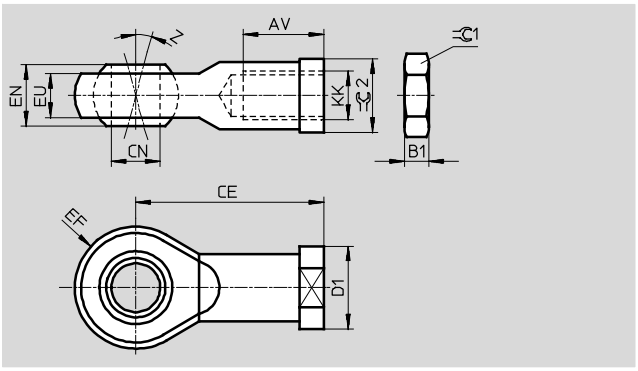
For ∅ [mm]	E	FB ∅ H13	MF	R	TF	UF	W	ZF		CRC[1]	Weight [g]	Part No.	Type
								DDPC-...	DDPC-...-C				
80	93	12	16	63	126	150	30	256	351	1	1,495	**174380**	**FNC-80**
100	110	14	16	75	150	175	35	205	303	1	2,041	**174381**	**FNC-100**

1) Corrosion resistance class 1 according to Festo standard 940 070
Components subject to low corrosion stress. 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.

Rod eye SGS

Scope of delivery:
1 rod eye, 1 hex nut to DIN 439

Materials:
Galvanised steel
RoHS-compliant



Dimensions and ordering data

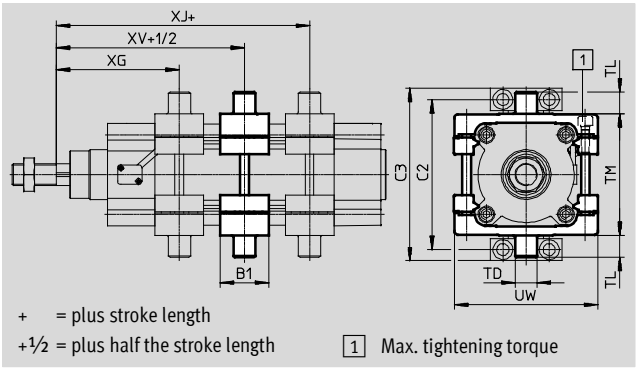
For ∅ [mm]	AV	B1	CE	CN ∅ H7	D1 ∅	EF ±0.5	EN	EU	Z [°]	⌀C1	⌀C2	CRC[1]	Weight [g]	Part No.	Type
M20x1.5	33 –2	10	77	20	34	25	25	18	15	30	30	2	464	**9264**	**SGS-M20x1,5**

1) 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.

Trunnion mounting kit DAMT

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

Materials:
Galvanised steel
Free of copper and PTFE
RoHS-compliant



Dimensions and ordering data

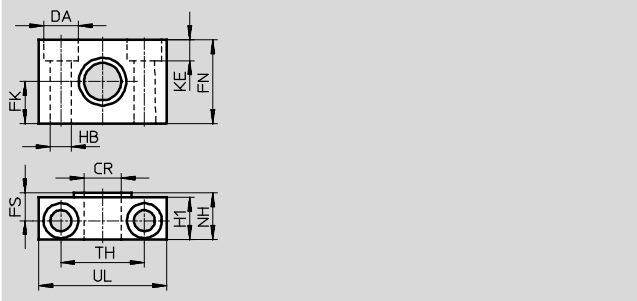
For ∅ [mm]	B1	C2	C3	TD ∅ e9	TL	TM	UW	XG DDPC-...	XG DDPC-...-C
80	44	136	156	20	20	110	130	111	206
100	48	164	189	25	25	132	145	123	221

For ∅ [mm]	XJ DDPC-...	XJ DDPC-...-C	XV DDPC-...	XV DDPC-...-C	Max. tightening torque [Nm]	CRC[1]	Weight [g]	Part No.	Type
80	175	270	143	238	28+2	1	1,494	**163529**	**DAMT-V1-80-A**
100	117	215	120	218	28+2	1	2,095	**163530**	**DAMT-V1-100-A**

1) Corrosion resistance class 1 according to Festo standard 940 070
Components subject to low corrosion stress. 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.

Trunnion support LNZG

Materials:
Trunnion support: Anodised aluminium
Plain bearing: Plastic
Free of copper and PTFE
RoHS-compliant

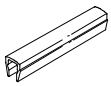


Dimensions and ordering data

For ∅ [mm]	CR ∅ D11	DA ∅ H13	FK ∅ ±0.1	FN	FS	H1	HB ∅ H13	KE	NH	TH ±0.2	UL	CRC[1]	Weight [g]	Part No.	Type
80	20	18	20	40	13	20	11	11	23	42	65	2	178	**32961**	**LNZG-63/80**
100	25	20	25	50	16	24.5	14	13	28.5	50	75	2	306	**32962**	**LNZG-100/125**

1) 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.

Ordering data

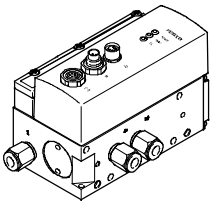
	For ∅	Comment	Part No.	Type	PU[1]
Slot cover				Technical data ➔ Internet: abp	
	80, 100	Every 0.5 m	**151680**	**ABP-5-S**	2

1) Packaging unit

Note

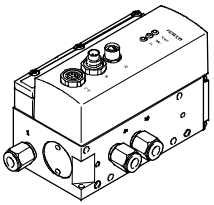
Recommended proximity sensor
➔ Internet: dsbc

Ordering data – Proportional directional control valves and push-in fittings

	For ∅	Stroke	Proportional directional control valve Technical data ➔ Internet: vpwp		Push-in fitting for DDPC Technical data ➔ Internet: quick star		
	[mm]	[mm]	Part No.	Type	Part No.	Type	PU[1]
	For applications with axis controller CPX-CMAX						
	80	100 … 200	**550171**	**VPWP-6-L-5-Q8-10-E-…**	**186100**	**QS-G⅜-8**	10
		201 … 450	**550172**	**VPWP-8-L-5-Q10-10-E-…**	**186102**	**QS-G⅜-10**	
		451 … 750	**1552544**	**VPWP-10-L-5-Q-10-E-G-EX1**	**186103**	**QS-G⅜-12**	
	100	100 … 120	**550171**	**VPWP-6-L-5-Q8-10-E-…**	**186104**	**QS-G½-12**[2]	1
		121 … 330	**550172**	**VPWP-8-L-5-Q10-10-E-…**	**186104**	**QS-G½-12**[3]	
		331 … 750	**1552544**	**VPWP-10-L-5-Q-10-E-G-EX1**	**186104**	**QS-G½-12**	

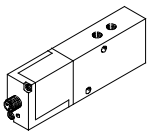
1) Packaging unit
2) With additional reduction from ∅ 12 to ∅ 8, with push-in connector QS-12H-8 (part number 130624)
3) With additional reduction from ∅ 12 to ∅ 10, with push-in connector QS-12H-10 (part number 153044)

Ordering data – Proportional directional control valves and push-in fittings

	For ∅	Stroke	Proportional directional control valve Technical data ➔ Internet: vpwp		Push-in fitting for DDPC Technical data ➔ Internet: quick star		
	[mm]	[mm]	Part No.	Type	Part No.	Type	PU[1]
	For applications with Soft Stop end-position controller CPX-CMPX						
	80	100 … 125	**550170**	**VPWP-4-L-5-Q8-10-E-…**	**186100**	**QS-G⅜-8**	10
		126 … 160	**550171**	**VPWP-6-L-5-Q8-10-E-…**	**186100**	**QS-G⅜-8**	
		161 … 400	**550172**	**VPWP-8-L-5-Q10-10-E-…**	**186102**	**QS-G⅜-10**	
		401 … 750	**1552544**	**VPWP-10-L-5-Q-10-E-G-EX1**	**186103**	**QS-G⅜-12**	
	100	100 … 150	**550171**	**VPWP-6-L-5-Q8-10-E-…**	**186104**	**QS-G½-12**[2]	1
		151 … 350	**550172**	**VPWP-8-L-5-Q10-10-E-…**	**186104**	**QS-G½-12**[3]	
		351 … 750	**1552544**	**VPWP-10-L-5-Q-10-E-G-EX1**	**186104**	**QS-G½-12**	

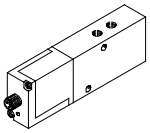
1) Packaging unit
2) With additional reduction from ∅ 12 to ∅ 8, with push-in connector QS-12H-8 (part number 130624)
3) With additional reduction from ∅ 12 to ∅ 10, with push-in connector QS-12H-10 (part number 153044)

Ordering data – Proportional directional control valves and push-in fittings

	For ∅ [mm]	Stroke [mm]	Proportional directional control valve Technical data ➔ Internet: mpye Part No.	Type	Push-in fitting for DDPC Technical data ➔ Internet: quick star Part No.	Type	PU[1]
	For applications with axis controller SPC200						
	80	100 … 200	**151693**	**MPYE-5-1/8-HF-010-B**	**186100**	**QS-G⅜-8**	10
		201 … 450	**151694**	**MPYE-5-1/4-010-B**	**186102**	**QS-G⅜-10**	
		451 … 750	**151695**	**MPYE-5-3/8-010-B**	**186103**	**QS-G⅜-12**	
	100	100 … 120	**151693**	**MPYE-5-1/8-HF-010-B**	**186104**	**QS-G½-12**[2]	1
		121 … 330	**151694**	**MPYE-5-1/4-010-B**	**186104**	**QS-G½-12**[3]	
		331 … 750	**151695**	**MPYE-5-3/8-010-B**	**186104**	**QS-G½-12**	

1) Packaging unit
2) With additional reduction from ∅ 12 to ∅ 8, with push-in connector QS-12H-8 (part number 130624)
3) With additional reduction from ∅ 12 to ∅ 10, with push-in connector QS-12H-10 (part number 153044)

Ordering data – Proportional directional control valves and push-in fittings

	For ∅ [mm]	Stroke [mm]	Proportional directional control valve Technical data ➔ Internet: mpye Part No.	Type	Push-in fitting for DDPC Technical data ➔ Internet: quick star Part No.	Type	PU[1]
	For applications with Soft Stop end-position controller SPC11						
	80	100 … 125	**151692**	**MPYE-5-1/8-LF-010-B**	**186100**	**QS-G⅜-8**	10
		126 … 160	**151693**	**MPYE-5-1/8-HF-010-B**	**186100**	**QS-G⅜-8**	
		161 … 400	**151694**	**MPYE-5-1/4-010-B**	**186102**	**QS-G⅜-10**	
		401 … 750	**151695**	**MPYE-5-3/8-010-B**	**186103**	**QS-G⅜-12**	
	100	100 … 150	**151693**	**MPYE-5-1/8-HF-010-B**	**186104**	**QS-G½-12**[2]	1
		151 … 350	**151694**	**MPYE-5-1/4-010-B**	**186104**	**QS-G½-12**[3]	
		351 … 750	**151695**	**MPYE-5-3/8-010-B**	**186104**	**QS-G½-12**	

1) Packaging unit
2) With additional reduction from ∅ 12 to ∅ 8, with push-in connector QS-12H-8 (part number 130624)
3) With additional reduction from ∅ 12 to ∅ 10, with push-in connector QS-12H-10 (part number 153044)