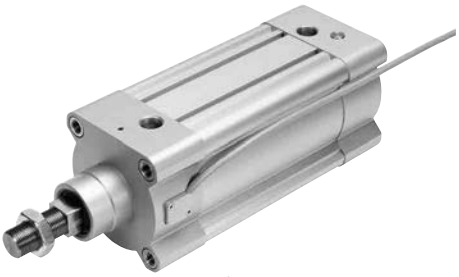
Standards-based cylinders DDPC, with measured-value transducer DADE

FESTO

Key features

Components for positioning and measuring using the standards-based cylinder DDPC



Measuring
With measured-value transducer DADE

Measured-value transducer
DADE

Controller
e.g. CECC

Operator unit
e.g. CDPX

Positioning
With end-position controller SPC11 or controller module CPX-CMAX/-CMPX

Proportional directional control valve
MPYE

End-position controller
SPC11-INC

Proportional directional control
valve VPWP

Sensor interface
CASM

Controller module
CPX-CMAX, CPX-CMPX

Type codes

001	Series	
DDPC	Standards-based cylinder, integrated displacement encoder	

002	Protection against rotation	
D	With guide unit	
Q	With protection against rotation	

003	Piston diameter	
80	80	
100	100	

004	Stroke	
...	10 ... 2000	

005	Clamping unit	
	None	
C	Attached	

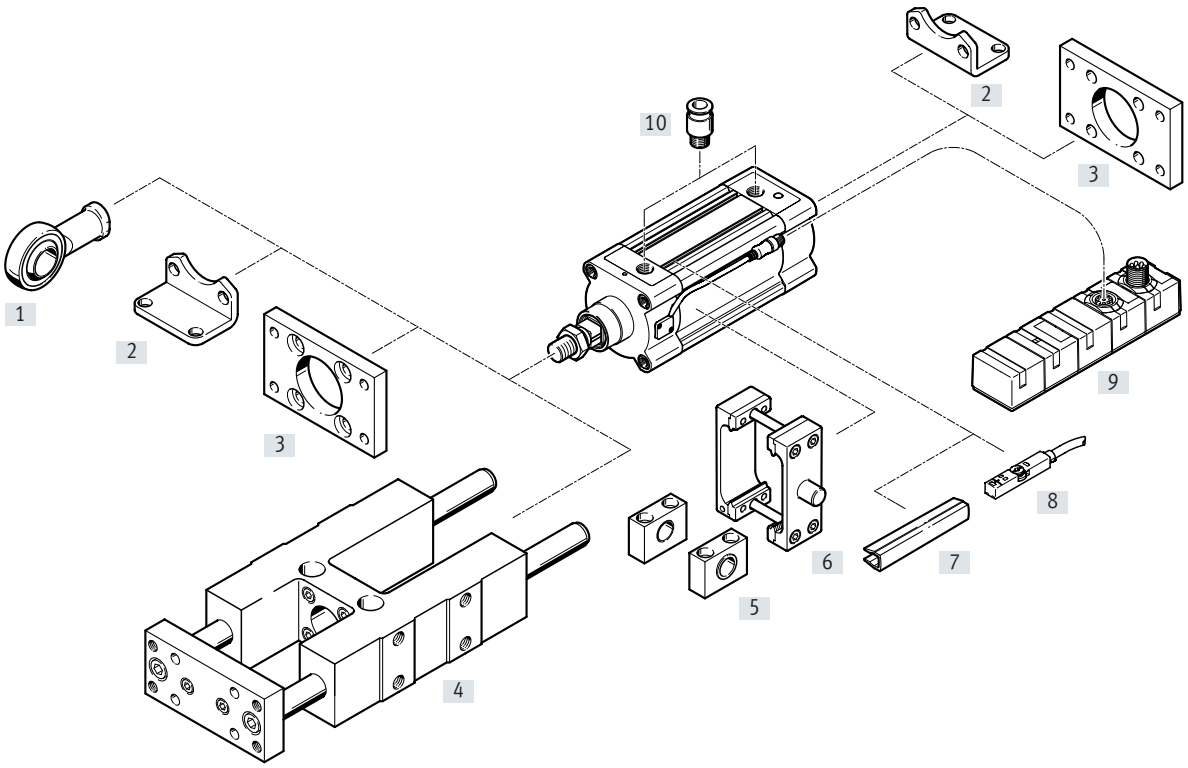
006	Piston rod type	
	At one end	
T	Through piston rod	

007	Cushioning	
P	Elastic cushioning rings/plates on both sides	

008	Position sensing	
A	For proximity sensor	

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

Peripherals overview



Note

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

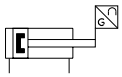
Peripherals overview

Accessories

	Type	Description	→ Page/Internet
[1]	Rod eye SGS	With spherical bearing	ddpc
[2]	Foot mounting HNC	For mounting the drive on the bearing and end caps	ddpc
[3]	Flange mounting FNC	For mounting the drive on the bearing and end caps	ddpc
[4]	Guide unit[1)] FENG-KF	For protecting against rotation at high torque loads	12
[5]	Trunnion support LNZG	For mounting the trunnion flange kit DAMT	ddpc
[6]	Trunnion flange kit DAMT	For swivelling movements of the drive	ddpc
[7]	Slot cover ABP-5-S	For protection against contamination	ddpc
[8]	Proximity switch SME/SMT-8	For additional sensing of the piston position, can be ordered optionally, only in conjunction with the order code A in the drive's modular product system	ddpc
[9]	Measured-value transducer DADE	Converts the sensor signal of the cylinder to a voltage signal of 0 ... 10 V and/or a current signal of 4 ... 20 mA	14
[10]	Push-in fitting QS	For connecting tubing with standard O.D.	qs

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

Data sheet



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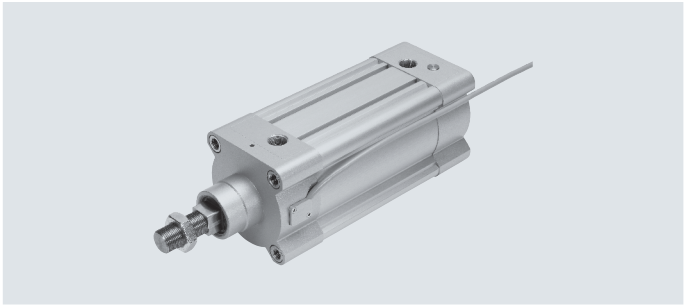
- Ø - Diameter
  80 and 100 mm
- I - Stroke length
  10 ... 1250 mm



General technical data			
Piston ø		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 switch[2]	
Measuring principle (displacement encoder)		Encoder, contactless and relative measurement	
Pneumatic connection		G3/8	G1/2
Stroke			
DDPC-...	[mm]	10 ... 1250	
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

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 the operating/pilot medium		Lubricated operation 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 marking (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
2) The proportional directional control valve VPWP, MPYE used requires these characteristic values
3) Note operating range of proximity switches
4) For information about the area of use, see the EC declaration of conformity: www.festo.com/sp → Certificates.
   If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.
5) Corrosion resistance class CRC 1 to Festo standard FN 940070
   Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Data sheet

Forces [N] and impact energy [Nm]		
Piston ø	80	100
Theoretical force at 6 bar, advancing	3016	4712
Theoretical force at 6 bar, retracting	2721	4418
Impact energy at the end positions	1.8	2.5

Permissible impact velocity:

$$v = \sqrt{\frac{2 \cdot E}{m_1 + m_2}}$$

Maximum permissible mass:

$$m_2 = \frac{2 \cdot E}{v^2} - m_1$$

v	Permissible impact velocity
E	Max. impact energy
m_1	Moving mass (drive)
m_2	Moving payload

Note

These specifications represent the maximum values that can be achieved. The maximum permissible impact energy must be observed.

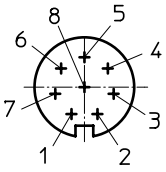
Electrical data – Displacement encoder		
Output signal		Analogue
Linearity error		
Strokes up to 500 mm	[mm]	< ±0.08
Strokes up to 1000 mm	[mm]	< ±0.09
Strokes over 1000 mm	[mm]	< ±0.11
Resolution[1]	[%]	≤ 0.025
Repetition accuracy		
≤ 400	[mm]	±0.1
≤ 500	[mm]	±0.13
≤ 750	[mm]	±0.19
≤ 1200	[mm]	±0.3
≤ 1250	[mm]	±0.4
Max. speed of travel	[m/s]	1.5
Degree of protection		IP65
CE marking (see declaration of conformity)[2]		To EU EMC Directive
Max. permitted magnetic interference field[3]	[kA/m]	10
Electrical connection		Cable with 8-pin plug, round design, M12
Cable length	[m]	1.5

1) Always refers to max. stroke

2) For information about the area of use, see the EC declaration of conformity: www.festo.com/sp → Certificates.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

3) At a distance of 100 mm

Pin allocation for the plug



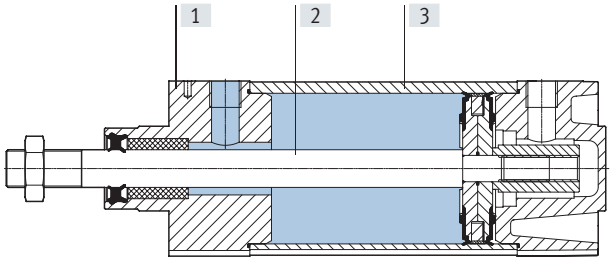
Pin	Function	Colour
1	5 V	Black
2	GND	Brown
3	sin+	Red
4	sin–	Orange
5	cos–	Green
6	cos+	Yellow
7	Shielding	Shielding
8	n.c.	–

Data sheet

Weight [g]		
Piston ø	80	100
DDPC-...		
Basic weight with 0 mm stroke	3053	4330
Additional weight per 10 mm stroke	87	95
Moving mass 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	3537	5019
Additional weight per 10 mm stroke	127	134
Moving mass with 0 mm stroke	1247	1467
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	2046	2829
DDPC-...-D – Additional weight with guide unit		
Basic weight with 0 mm stroke	10430	12990
Additional weight per 10 mm stroke	80	80

Materials

Sectional view



Standards-based cylinder

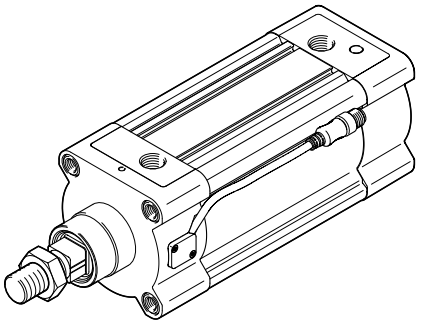
[1]	Cover	Wrought aluminium alloy
[2]	Piston rod	High-alloy steel
[3]	Cylinder barrel	Wrought aluminium alloy
–	Seals	NBR, polyurethane
	Note on materials	Free of copper and PTFE
		RoHS-compliant

Data sheet

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



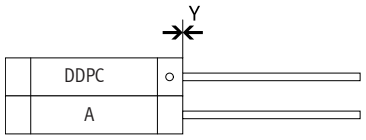
Mounting conditions

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

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

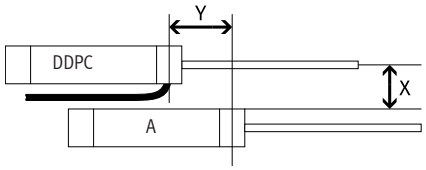
Parallel assembly

The drives can be mounted directly next to one another if the offset Y = 0 mm.



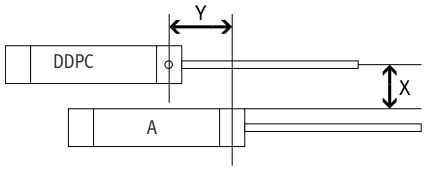
Offset mounting, cable outlet between the drives

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



Offset mounting, cable outlet upwards or downwards

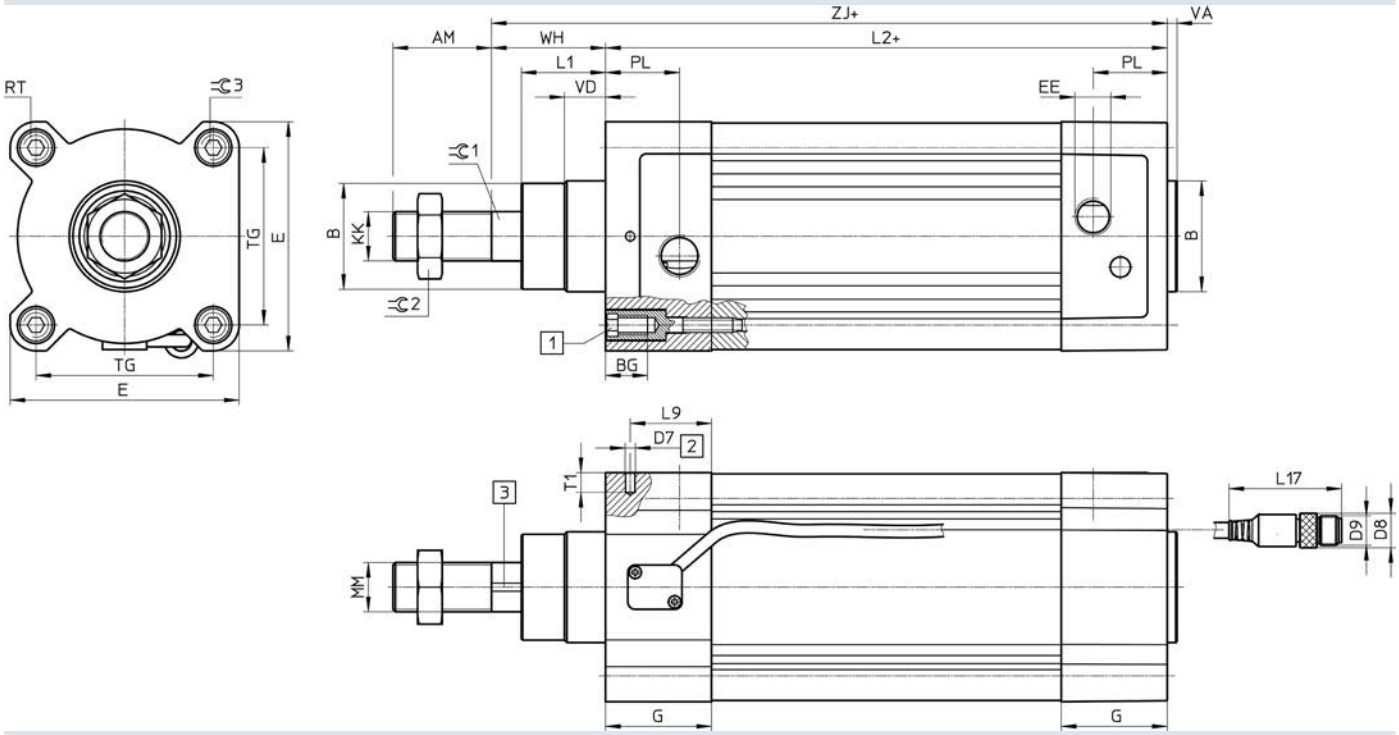
If the offset is Y > 0 mm and the cable outlet is up or down, a distance of X > 60 mm must be observed.



Data sheet

Dimensions Download CAD data ➔ www.festo.com

DDPC-...



[1] Socket head screw with female thread for mounting components

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

[3] Magnetic measuring band

\+ = plus stroke length

ø [mm]	AM	B ø d11	BG	D7 ø	D8 ø	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

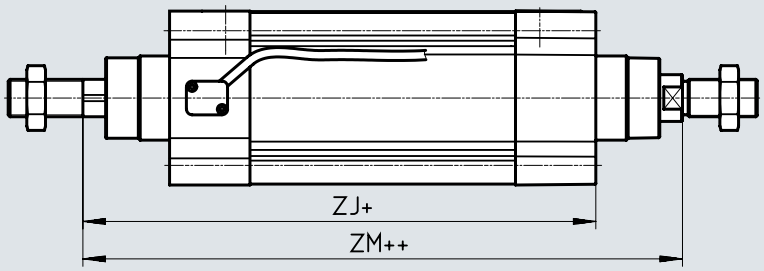
ø [mm]	KK	L1	L2	L9	L17	MM ø	PL	RT	T1
80	M20x1.5	34.2	128	20	45.7	20	30	M10	8
100	M20x1.5	38	138	21.5	45.7	20	31.5	M10	8

ø [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

Data sheet

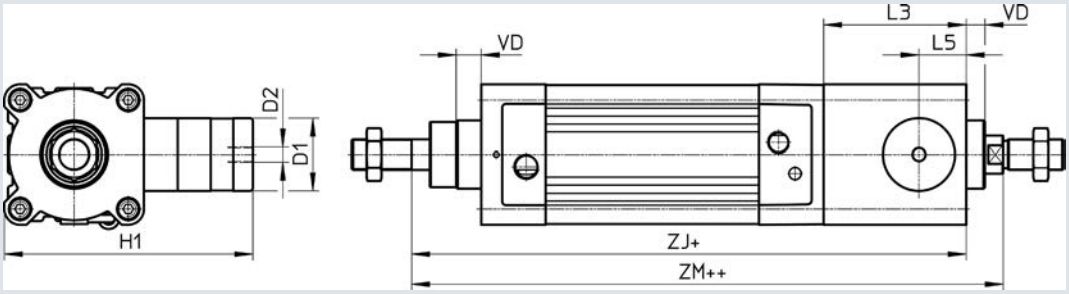
Dimensions Download CAD data ➔ www.festo.com

DDPC-...-T – Through piston rod



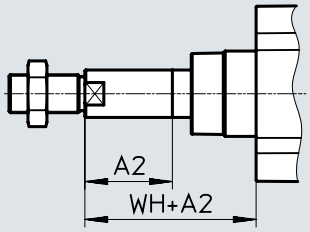
\+ = plus stroke length
++ = plus 2x stroke length

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



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

DDPC-...-...E – Extended piston rod



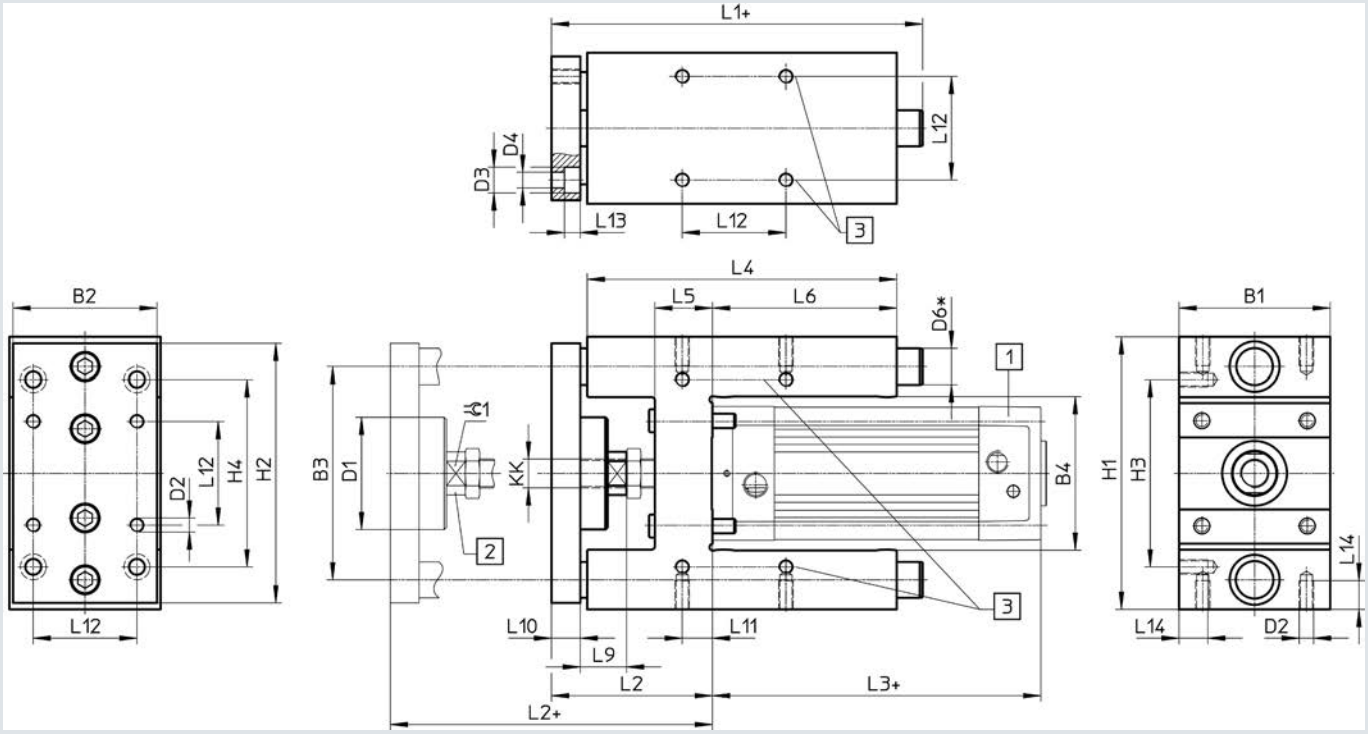
ø [mm]	A2 max.	D1 ø f9	D2	H1	L3	L5
80	500	48	G1/8	165.5	95	31.5
100	500	48	G1/8	174	98	31

ø [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

Data sheet

Dimensions Download CAD data ➔ www.festo.com

DDPC-...-D



[1] Standards-based cylinder DDPC
[2] Compensating coupling
[3] Customers can drill additional mounting holes here as required
+ = plus stroke length

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

ø [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

ø [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

Ordering data – Modular product system

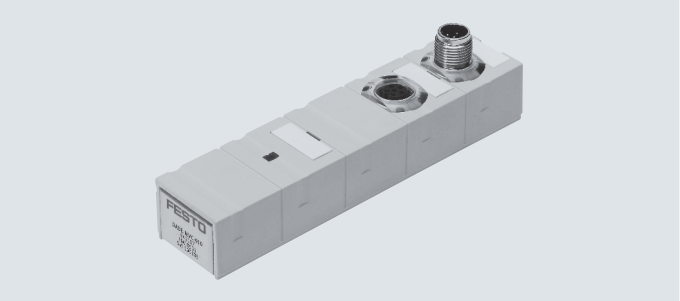
Ordering table							
Piston ø		80	100	Conditions	Code		Enter code
Module no.		**1677705**	**1691433**				
Function		Standards-based cylinder with integrated displacement encoder			**DDPC**		DDPC
Protection against rotation		With protection against rotation			**-Q**		-Q
Piston ø	[mm]	80	100		**-...**		
Stroke	[mm]	10 ... 1250			**-...**		
Guide unit		None					
		Attached			**-D**		
Clamping unit		None					
		Attached		[1]	**-C**		
Piston rod		At one end					
		Through piston rod			**T**		
Cushioning		Elastic cushioning rings/pads at both ends			**-P**		-P
Position sensing		Via proximity switch			**A**		A
Piston rod extension		None					
	[mm]	1 ... 500			**-...E**		

[1] C Only available with T

Data sheet

Measured-value transducer
DADE-MVC-010
DADE-MVC-420

The measured-value transducer converts sensor signals of the standards-based cylinder DDPC into a voltage signal of 0 ... 10 V and/or a current signal of 4 ... 20 mA. These signals can be evaluated by a PLC with an appropriate signal input.



General technical data	
Type of mounting	With through-hole
Mounting position	Any
Short circuit current rating	Yes
Reverse polarity protection	Yes
Diagnostic function	Display via LED

General electrical data		
Analogue output	[V]	0 ... 10 (as per EN 61131-2)
	[mA]	4 ... 20 (as per EN 61131-2)
Nominal operating voltage	[V DC]	24 ±25%
Residual ripple	[%]	4 (at 50 Hz)
Current consumption at nominal operating voltage	[mA]	20 ... 30
Switching logic at outputs		PNP
Switching logic at inputs		PNP
Debounce time at inputs	[ms]	3
Linearity error FS		0.2%

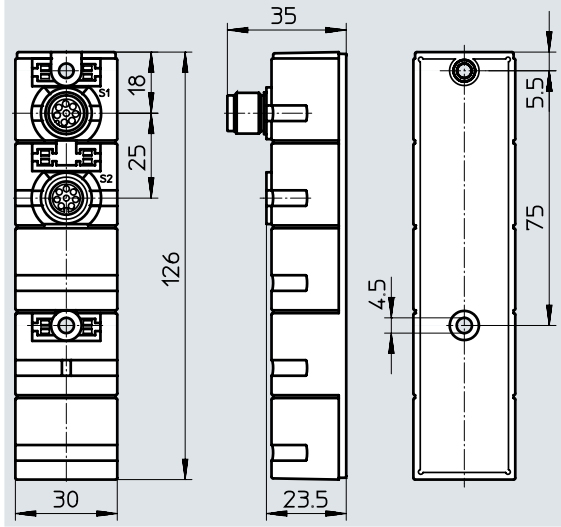
Operating and environmental conditions		
Ambient temperature	[°C]	0 ... 55
Degree of protection		IP65
Relative humidity		95% non-condensing
CE marking (see declaration of conformity)		To EU EMC Directive
		To EU RoHS Directive
KC marking		KC EMC
Corrosion resistance class CRC[1)]		1
Product weight	[g]	128
Note on materials : Housing		Polybutylene terephthalate

1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Data sheet

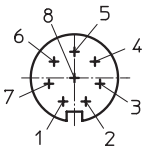
Dimensions

Download CAD data ➔ www.festo.com



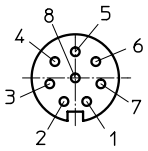
Pin allocation

PLC interface



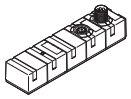
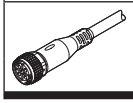
Pin	Function	Cable colour
1	24 V	White
2	Analogue measurement signal	Brown
3	Reference output	Green
4	0 V measurement signal	Yellow
5	Reference input	Grey
6	Calibration input	Pink
7	Ready output	Blue
8	0 V power supply and inputs/outputs	Red

Measuring system interface



Pin	Function
1	Ub
2	0 V
3	Signal sine +
4	Signal sine -
5	Signal cosine -
6	Signal cosine +
7	Screening / earth
8	–

Ordering data

		Description	Part no.	Type
Measured-value transducer				
	With voltage signal	0 ... 10 V	**542117**	**DADE-MVC-010**
	With current signal	4 ... 20 mA	**542118**	**DADE-MVC-420**
Accessories				Data sheets ➔ Internet: sim
	Connecting cable	PLC connecting cable (length 2 m)	**525616**	**SIM-M12-8GD-2-PU**
		PLC connecting cable (length 5 m)	**525618**	**SIM-M12-8GD-5-PU**

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