

Linear actuators DFPC

FESTO



Characteristics

Function

The linear actuators DFPC are double-acting pneumatic actuators that are optimised for the requirements of process automation. The product variants with a mounting interface based on ISO 5210 or ISO 15552 and extended tie rods are designed for actuating process valves such as gate valves and knife-gate valves, pinch valves or process valves without housing. The sturdy, corrosion-resistant design is suitable for applications in different segments of process automation, such as water treatment, mining, the paper and pulp industry or the chemical

industry. The modular product system with its custom configuration options offers great flexibility.

A number of standard variants can be supplied quickly from stock.

Innovative

- Sturdy, corrosion-resistant tie rod design, ideal for use in harsh ambient conditions
- Elastic cushioning rings for reducing the impact forces of the piston hitting the end positions of the actuator

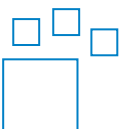
Flexible

- Variants can be configured according to individual needs using a modular product system
- Standard variants available quickly from stock
- Additional contactless end-position sensing possible with proximity switches

Design

- Sturdy tie rod design
- Double-acting
- Diameter sizes $\varnothing 80 \dots \varnothing 200$
- Stroke lengths 10 ... 1600 mm
- Mounting interface based on ISO 5210 or ISO 15552, with extended tie rods
- Operating pressure 0.06 ... 0.8 MPa, 8.7 ... 116 psi, 0.6 ... 8 bar
- Ambient temperature $-20 \dots +80^{\circ}\text{C}$
- ATEX II 2GD

Ordering data – Product options



Configurable product
This product and all its product options can be ordered using the configurator.

The configurator can be found under Products on the DVD or at
→ www.festo.com/catalogue/...

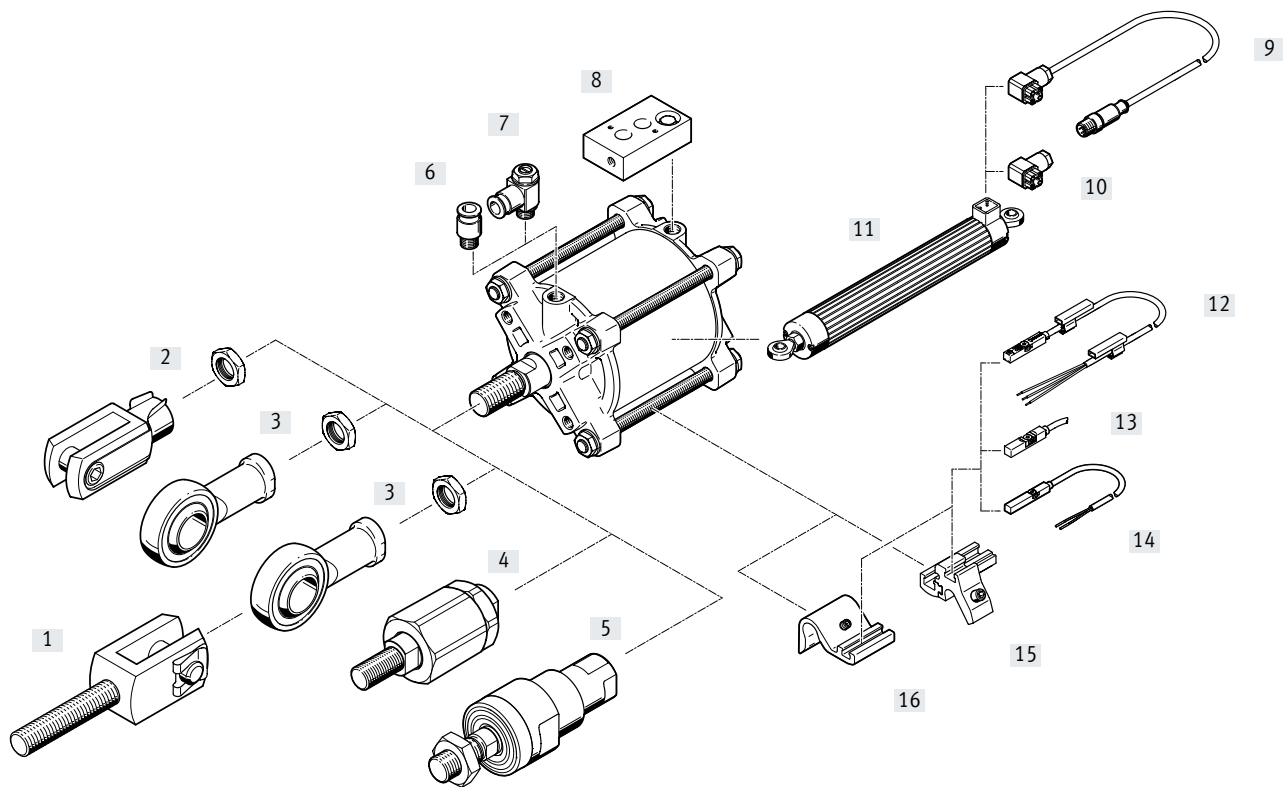
Part No.	Type
8110796	DFPC-80
8110785	DFPC-100
8110797	DFPC-125
8133065	DFPC-160
8133072	DFPC-200

Type codes

001	Series	
DFPC	Linear drive	
002	Piston diameter	
80	80	
100	100	
125	125	
160	160	
200	200	
003	Stroke	
50	50	
65	65	
80	80	
100	100	
125	125	
150	150	
200	200	
250	250	
300	300	
350	350	
400	400	
...	10 ... 1600	
004	Function	
D	Double-acting	
005	Piston rod thread type	
	Male thread	
006	Housing surface treatment	
	None	

007	EU certification	
	None	
EX4	II 2GD	
008	Piston rod extension	
	None	
...E	1 ... 500 mm	
009	Piston rod thread extension	
	None	
...L	0 ... 70 mm	
010	Piston rod thread shortening	
...S	1 ... 30 mm	
011	Piston rod thread	
	Standard	
M16	M16	
M16P	M16x1.5	
M20	M20	
M20P	M20x1.5	
M24	M24	
M24P	M24x2	
M27	M27	
M27P	M27x2	
M30	M30	
M30P	M30x2	
M36	M36	
M36P	M36x2	
012	Thread length of spacer bolts on bearing cap	
	None	
...LB2	10 ... 120 mm	

Peripherals overview

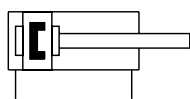





Mounting attachments and accessories		Description	→ Page/Internet
[1]	Rod clevis SGA	With male thread	12
[2]	Rod clevis SG/CRSG	Permits a swivelling movement of the cylinder in one plane	12
[3]	Rod eye SGS/CRSGS	With spherical bearing	12
[4]	Self-aligning rod coupler FK	To compensate for radial and angular deviations	12
[5]	Self-aligning rod coupler CRFK	To compensate for radial and angular deviations, corrosion-resistant	12
[6]	Push-in fitting QS	For connecting compressed air tubing with standard O.D.	qs
[7]	One-way flow control valve GRIA, GRLZ	Exhaust air and supply air flow control with one-way function	13
[8]	Control plate DADG	Control plate for mounting a valve to VDI/VDE 3845 (NAMUR) on the actuators of the DFPC series in sizes G1/8 and G1/4 using a hollow bolt	13
[9]	Connecting cable NEBC	M12, 5-pin connecting cable between the sensor interface and displacement encoder	14
[10]	Plug socket SD	For displacement encoder connection	14
[11]	Displacement encoder MLO-POT	Connecting rod potentiometer ¹⁾ , absolute measurement with high resolution	12
[12]	Proximity switch CRSMT-8	Magneto-resistive, corrosion-resistant, to EU Explosion Protection Directive (ATEX)	13
[13]	Proximity switch SDBT	Magneto-resistive, NAMUR, to EU Explosion Protection Directive (ATEX)	13
[14]	Proximity switch SMT-8M-A	Magneto-resistive, 5 ... 30 V DC, to EU Explosion Protection Directive (ATEX)	13
[15]	Mounting kit SMBZ-8- ...	For proximity switch SME/SMT-8M, for piston diameter 100	14
[16]	Sensor bracket DASP-F10- ...	For proximity switch SME/SMT-8M, for piston diameter 125 and piston diameter 160	14

1) The mounting on the linear actuator DFPC must be individually manufactured.

Technical data

Function



-  - Piston diameter
80 ... 200 mm
-  - Stroke
10 ... 1600 mm
-  - Force
2827 ... 18850 N



General technical data					
Size of valve actuator	80	100	125	160	200
Piston diameter	80 mm	100 mm	125 mm	160 mm	200 mm
Stroke	10 ... 1600 mm				
Design	Piston, piston rod, tie rod, cylinder barrel				
Mode of operation	Double-acting				
Pneumatic connection	G1/8			G1/4	
Cushioning	Elastic cushioning rings/pads at both ends				
Process valve connection to standard	ISO 5210				
Type of mounting ¹⁾	Optionally: on flange to ISO 5210, with spacer bolts				
Flange hole pattern	F07		F10		
Mounting position	Any				
Position sensing	Via proximity switch				

1) Spacer bolts suitable for DFPC...LB2, based on ISO 15552

Operating and environmental conditions					
Size of valve actuator	80	100	125	160	200
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]				
Note on the operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)				
Operating pressure	0.06 ... 0.8 MPa				
Operating pressure	8.7 ... 116 psi				
Operating pressure	0.6 ... 8 bar				
Nominal operating pressure	0.6 MPa				
Nominal operating pressure	87 psi				
Nominal operating pressure	6 bar				
Ambient temperature	-20 ... +80°C				
Shock resistance ¹⁾	Shock test with severity level 1 to FN 942017-5 and EN 60068-2-27				
Vibration resistance ¹⁾	Transport application test with severity level 1 to FN 942017-4 and EN 60068-2-6				

1) Effective up to a stroke of 400 mm

Technical data

ATEX ¹⁾					
Size of valve actuator	80	100	125	160	200
ATEX category for gas	II 2G				
Type of ignition protection for gas	Ex h IIC T4 Gb				
ATEX category for dust	II 2D				
Type of ignition protection for dust	Ex h IIIC T120°C Db				
Explosion-proof ambient temperature	-20°C ≤ Ta ≤ +80°C				
CE marking (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)				

1) Selected types, additional information at www.festo.com/catalogue/...

Forces and impact energy					
Size of valve actuator	80	100	125	160	200
Theoretical force at 6 bar, advancing	3016 N	4712 N	7363 N	12064 N	18850 N
Theoretical force at 6 bar, retracting	2827 N	4524 N	7069 N	11581 N	18096 N
Impact energy in the end positions	1.4 J	0.94 J	1.1 J	3.3 J	4.8 J

Permissible impact velocity:

Maximum permissible mass:

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

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

v Impact velocity [m/s]
 E Kinetic impact energy [Nm]
 m₁ Moving dead weight [kg]
 m₂ Moving applied load [kg]

Air consumption ¹⁾					
Size of valve actuator	80	100	125	160	200
Air consumption, advancing, per 10 mm stroke	0.352 l	0.55 l	0.859 l	1.407 l	2.199 l
Air consumption, retracting, per 10 mm stroke	0.33 l	0.528 l	0.825 l	1.351 l	2.111 l

1) At 6 bar

Weights					
Size of valve actuator	80	100	125	160	200
Basic weight with 0 mm stroke	1230.3 g	1666.6 g	2968.9 g	5948.7 g	10258.2 g
Additional weight per 10 mm stroke	61.8 g	71.4 g	107.4 g	148.61 g	255.79 g
Moving mass with 0 mm stroke	451 g	617.1 g	1059.6 g	2102 g	3575.4 g
Additional moving mass per 10 mm stroke	24.8 g		38.9 g	64.34 g	105.31 g

Technical data

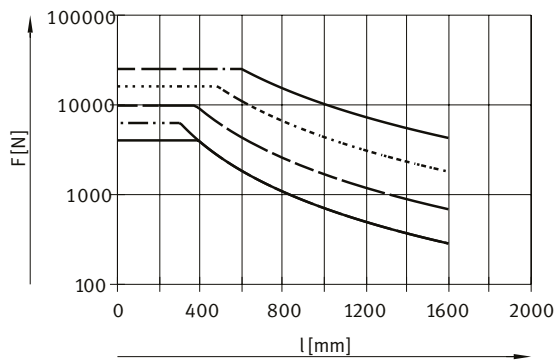
Materials	
Size of valve actuator	80 100 125 160 200
Cover material	Gravity die-cast aluminium
Piston rod material	High-alloy stainless steel
Piston rod wiper seal material	TPE-U(PU)
Nut material	High-alloy stainless steel
Static seal material	NBR
Tie rod material	High-alloy stainless steel
Cylinder barrel material	Smooth-anodised wrought aluminium alloy
Note on materials	Contains paint-wetting impairment substances, RoHS-compliant

Permissible axial force without buckling of the piston rod

The length "l" is made up of:

- The stroke of the actuator
- The extended piston rod
- The extended piston rod thread

The dimension "WH" and the thread length have already been taken into account.

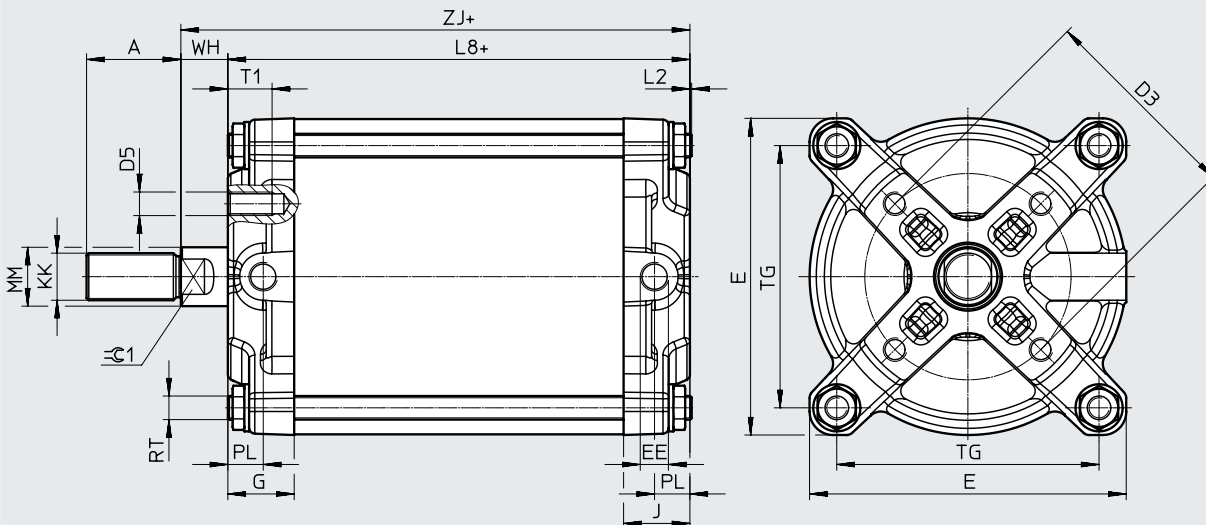


- Diameter 80
- Diameter 100
- - - Diameter 125
- · - · - Diameter 160
- · - · - · Diameter 200

Technical data

Dimensions

Download CAD data → www.festo.com



+ = plus stroke length

Piston diameter	A	D3 ∅	D5	E	EE	G	J	L2
[mm]	-0.5							max.
DFPC-80-...-D	32	70	M8	90	G1/8	22.7	22.7	2.4
DFPC-100-...-D	32	70	M8	107.5	G1/8	22.5	22.5	2.2
DFPC-125-...-D	40	102	M10	136	G1/8	24.5	24.5	1.6
DFPC-160-...-D	54	102	M10	170	G1/4	25.3	25.3	0.7
DFPC-200-...-D	72	102	M10	211	G1/4	29.9	29.9	1

Piston diameter	L8	MM ∅	PL	RT	T1	TG	WH	ZJ	⊖G1
[mm]									
DFPC-80-...-D	75.2	20	15.2	M8	15	72	16 +0.6/-1.6	91.2	16
DFPC-100-...-D	76.8	20	12	M8	15	89	16 +0.7/-1.2	92.8	16
DFPC-125-...-D	91	25	14	M10	18	110	20 +0.9/-1	111	21
DFPC-160-...-D	127	32	14.3	M12	18	140	24 +1.1/-1.1	150.9	27
DFPC-200-...-D	144.2	40	18.9	M16	20	175	30 +1.2/-1.2	173.8	36

Piston diameter [mm]	KK	
	DFPC-...	-M-... ¹⁾
80	M16x1.5	M16/M20 ²⁾ /M20x1.5 ²⁾
100	M16x1.5	M16/M20 ²⁾ /M20x1.5 ²⁾
125	M20x1.5	M16/M16x1.5/M20/M24 ²⁾ /M24x1.5 ²⁾
160	M27x2	M16/M16x1.5/M20/M20x1.5/M24/M24x1.5/M27
200	M36x2	M16/M16x1.5/M20/M20x1.5/M24/M24x1.5/M27/M27x2/M30/M30x2/M36

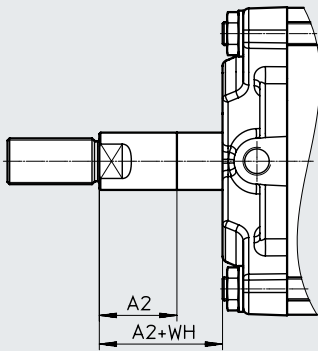
1) Regular threads or threads with smaller nominal diameter than in the basic version cannot withstand such high loads. This requires modifying the screw connection.
 2) Additional lock nut for piston rod attachments (see page → 12) required for mounting.

Technical data

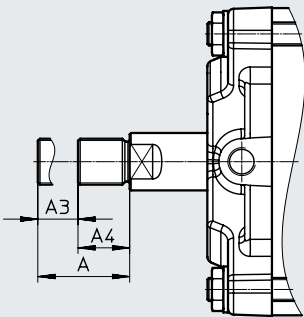
Dimensions – Variants

Download CAD data → www.festo.com

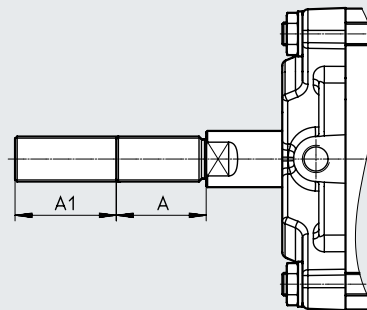
[E] Extended piston rod



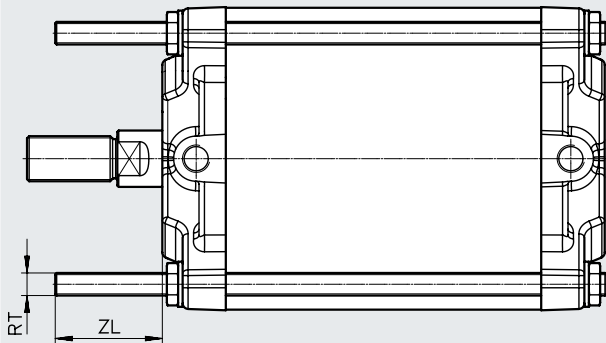
[S] Shortened piston rod thread



[L] Extended piston rod thread

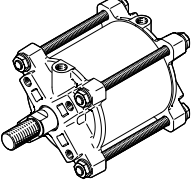



[LB2] Spacer bolts on the bearing cap



Piston diameter [mm]	A -0.5	A1		A2		A3		A4	RT	WH	ZL	
		min.	max.	min.	max.	min.	max.				min. ±0.5	max. ±0.5
DFPC-80-...-D	32	1	70	1	500	1	22	A – A3	M8	16 +0.6/-1.6	10	120
DFPC-100-...-D	32	1	70	1	500	1	22	A – A3	M8	16 +0.7/-1.2	10	120
DFPC-125-...-D	40	1	70	1	500	1	30	A – A3	M10	20 +0.9/-1	10	120
DFPC-160-...-D	54	1	70	1	500	1	44	A – A3	M12	24 +1.1/-1.1	10	120
DFPC-200-...-D	72	1	70	1	500	1	62	A – A3	M16	30 +1.2/-1.2	10	120

Technical data

Ordering data		Piston diameter [mm]	Stroke [mm]	Weight [g]	Part No.	Type
	Double-acting linear actuator with cushioning at both ends	80	50	1540	8110815	DFPC-80-50-D
			65	1720	8110817	DFPC-80-65-D
			80	1630	8110816	DFPC-80-80-D
		100	80	2240	8110777	DFPC-100-80-D
			100	2380	8110776	DFPC-100-100-D
			125	2560	8110775	DFPC-100-125-D
		125	100	4040	8110773	DFPC-125-100-D
			125	4310	8110774	DFPC-125-125-D
			150	4580	8110772	DFPC-125-150-D
		160	150	8180	8133079	DFPC-160-150-D
			200	8920	8133080	DFPC-160-200-D
			250	9660	8133081	DFPC-160-250-D
			300	10410	8133082	DFPC-160-300-D
		200	300	17930	8133104	DFPC-200-300-D
			350	19210	8133105	DFPC-200-350-D
400	20490		8133106	DFPC-200-400-D		


 **Note**

For other stroke variants in the modular product system, see page → 11

Ordering data – Modular product system

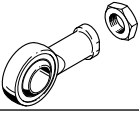
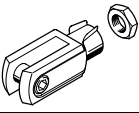
Ordering table											
Piston diameter	80	100	125	160	200	Conditions	Code	Enter code			
Module no.	8110796	8110785	8110797	8133065	8133072						
Product type	DFPC						DFPC	DFPC			
Piston diameter [mm]	80	-					-80				
	-	100	-				-100				
	-		125	-			-125				
	-			160	-		-160				
	-				200		-200				
Stroke [mm]	10 ... 1600										
Function	Double-acting						-D				
Piston rod thread type	Male thread										
Housing surface treatment	None										
EU certification	None										
Extended piston rod [mm]	II 2GD						-EX4				
	None										
Extended piston rod thread [mm]	1 ... 500					[4]	-...E				
	None										
Shortened piston rod thread [mm]	1 ... 70					[1]	-...L				
	None										
Piston rod thread	1 ... 22					1 ... 22	1 ... 30	1 ... 44	1 ... 62	[2]	...S
	Standard (→ 8)										
	M16										-M16
	-					M16x1.5					-M16P
	M20										-M20
	M20x1.5					-	M20x1.5				-M20P
	-					M24		[3]			-M24
	-					M24x1.5		[3]			-M24P
	-					M27					-M27
	-						M27x2				-M27P
	-					M30					-M30
	-					M30x2					-M30P
	-						M36				-M36
-										-M36P	
Thread length of spacer bolts on the bearing cap [mm]	Without spacer bolts										
	10 ... 120										...LB2

- 1) ...L Not in combination with shortened piston rod thread (...S)
- 2) ...S Not in combination with extended piston rod thread (...L)
- 3) M24, M24P Not in combination with piston diameter 80 and 100
- 4) ...E Upper limit for selected stroke and extended piston rod is < 1600 mm

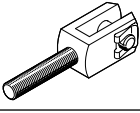
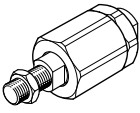
 **Note**
 For other fixed-stroke variants,
 see page → 10

Accessories

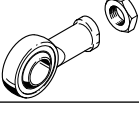
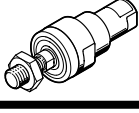
Ordering data – Piston rod attachments

Designation	For diam.	Part No.	Type
Rod eye SGS			
	80, 100	9263	SGS-M16x1.5
	125	9264	SGS-M20x1.5
	160, 200	10775	SGS-M36X2
Rod clevis SG1¹⁾			
	80, 100	6146	SG-M16x1.5
	125	6147	SG-M20x1.5
	160, 200	9581	SG-M36X2

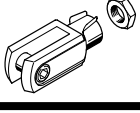
Datasheets → Internet: piston rod attachment

Designation	For diam.	Part No.	Type
Rod clevis SGA1¹⁾			
	80, 100	10768	SGA-M16x1.5
	125	10769	SGA-M20x1.5
	160, 200	10771	SGA-M36X2
Self-aligning rod coupler FK1¹⁾			
	80, 100	6142	FK-M16x1.5
	125	6143	FK-M20x1.5
	160, 200	10746	FK-M36X2

Ordering data – Piston rod attachments, corrosion-resistant

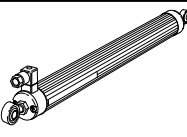
Designation	For diam.	Part No.	Type
Rod eye CRSGS			
	80, 100	195584	CRSGS-M16x1.5
	125	195585	CRSGS-M20x1.5
	160	195586	CRSGS-M27X2
Self-aligning rod coupler CRFK			
	80, 100	2490673	CRFK-M16x1.5
	125	2545677	CRFK-M20x1.5

Datasheets → Internet: piston rod attachment

Designation	For diam.	Part No.	Type
Rod clevis CRSG1¹⁾			
	80, 100	13571	CRSG-M16x1.5
	125	13572	CRSG-M20x1.5
	160	185361	CRSG-M27X2




1) Suitable for ATEX

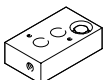
Ordering data – Displacement encoder

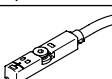
		Stroke [mm]	Part No.	Type
	Connecting rod potentiometer	100	192213	MLO-POT-100-LWG
		150	192214	MLO-POT-150-LWG
		225	152645	MLO-POT-225-LWG
		300	152646	MLO-POT-300-LWG
		360	152647	MLO-POT-360-LWG
		450	152648	MLO-POT-450-LWG
		600	152650	MLO-POT-600-LWG
		750	152651	MLO-POT-750-LWG

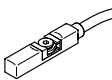
Datasheets → Internet: mlo-pot

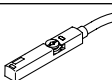
Accessories

Ordering data – One-way flow control valves				
	Connection		Part No.	Type
	Thread	For tubing O.D.		
Exhaust air flow control valve with slotted head screw				
	G1/8	4	193143	GRLA-1/8-QS-4-D
		6	193144	GRLA-1/8-QS-6-D
		8	193145	GRLA-1/8-QS-8-D
Exhaust air flow control valve with knurled screw				
	G1/8	8	534337	GRLA-1/8-QS-8-RS-D
Supply air flow control valve with slotted head screw				
	G1/8	8	193159	GRLZ-1/8-QS-8-D






Ordering data – Control plate, NAMUR				Datasheets → Internet: dadg	
	Description	Pneumatic connection	Part No.	Type	
				For mounting a valve to VDI/VDE 3845 (NAMUR) using a hollow bolt	G1/8
	G1/4	8131548	DADG-FM-VDE1G14		

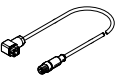
Ordering data – Proximity switch for T-slot, magneto-resistive					Datasheets → Internet: smt-8	
	Switching output	Electrical connection		Cable length [m]	Part No.	Type
		Cable	Plug M8x1			
N/O contact						
	Contactless	2-wire	–	5	574341	SMT-8M-A-ZS-24V-E-5.0-OE-EX2
	PNP	–	3-pin	0.3	574342	SMT-8M-A-PS-24V-E-0.3-M8D-EX2

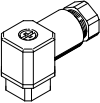
Ordering data – Proximity switch for T-slot, corrosion-resistant					Datasheets → Internet: crsmt	
	Switching output	Electrical connection		Cable length [m]	Part No.	Type
		Cable	Plug M8x1			
N/O contact						
	PNP	Cable, 3-wire	–	5	574380	CRSMT-8M-PS-24V-K-5.0-OE

Ordering data – Proximity switch for T-slot, NAMUR					Datasheets → Internet: sdbt	
	Switching output	Electrical connection		Cable length [m]	Part No.	Type
		Cable	Plug M8x1			
N/O contact						
	NAMUR	Cable, 2-wire	–	5	579071	SDBT-MS-20NL-ZN-E-5-LE-EX6
				10	579072	SDBT-MS-20NL-ZN-E-10-LE-EX6

Accessories

Ordering data – Mounting kits for proximity switches			Datasheets → Internet: crsmb, smbz, dasp	
	For piston diameter	Materials	Part No.	Type
	80, 100, 125	Housing: polyurethane Rail: hard-anodised aluminium Free of copper and PTFE	525565	CRSMB-8-32/100
	80, 100	Rail: anodised wrought aluminium alloy Screws: high-alloy stainless steel Free of copper and PTFE	537806	SMBZ-8-32/100
	125	Housing: anodised wrought aluminium alloy Screws: high-alloy stainless steel	8127664	DASP-F10-125-A
	160	Housing: anodised wrought aluminium alloy Screws: high-alloy stainless steel	8144200	DASP-F10-160-A
	200	Housing: anodised wrought aluminium alloy Screws: high-alloy stainless steel	1553813	DASP-M4-160-A

Ordering data – Connecting cables		Datasheets → Internet: nebc	
	Description	Part No.	Type
	Between sensor interface and displacement encoder	549293	NEBC-P1W4-K-0.3-N-M12G5

Ordering data – Plug sockets		Datasheets → Internet: sd	
	Description	Part No.	Type
	For displacement encoder connection	194332	SD-4-WD-7