

Linear actuators DFPC

FESTO



Key features

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 offers great flexibility owing to the custom configuration options.

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

Innovative

- Sturdy and 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

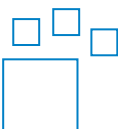
Versatile

- 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 sensors

Design

- Sturdy tie rod design
- Double-acting
- Sizes Ø80, Ø100 and Ø125
- Stroke lengths 10 ... 1600 mm
- Mounting interface based on ISO 5210 or ISO 15552, with extended tie rods
- Operating pressure 0.6 ... 8 bar
- Ambient temperature -20 ... +80°C

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

Type codes

001	Series	
DFPC	Linear drive	

002	Piston diameter	
80	80	
100	100	
125	125	

003	Stroke	
50	50	
65	65	
80	80	
100	100	
125	125	
150	150	
...	10 ... 1600	

004	Function	
D	Double-acting	

005	Piston rod thread type	
	Male thread	

006	Housing surface treatment	
	None	

007	EU certification	
	None	

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

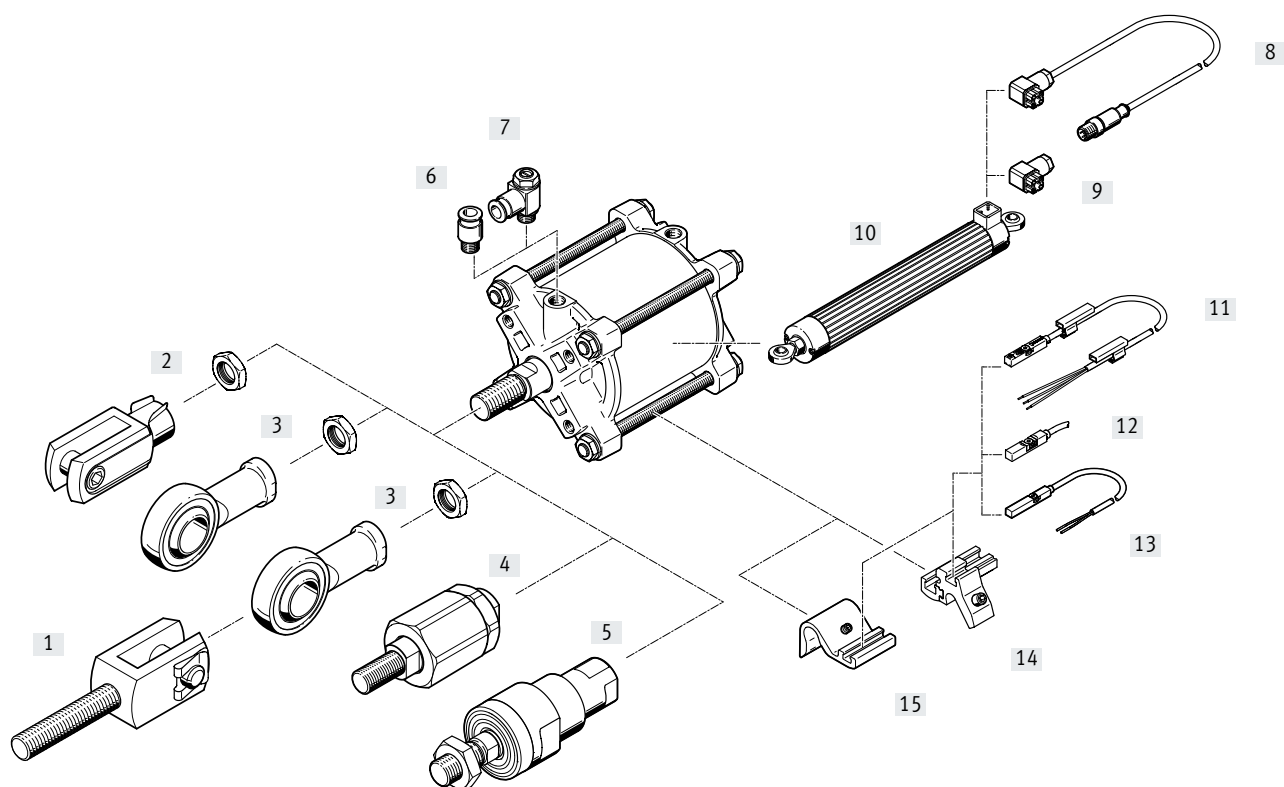
009	Piston rod thread extension	
	None	
...L	0 ... 70 mm	

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	

012	Thread length of spacer bolts on bearing cap	
	None	
...LB2	10 ... 120 mm	

Peripherals overview

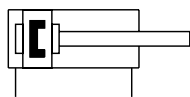


Mounting attachments and accessories

		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	For compensating radial and angular deviations	12
[5]	Self-aligning rod coupler CRFK	For compensating 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 GRLA, GRLZ	Exhaust air flow control valves and supply air flow control valves with non-return function	12
[8]	Connecting cable NEBC	Connecting cable, M12, 5-pin between sensor interface and displacement encoder	13
[9]	Plug socket SD	For displacement encoder connection	13
[10]	Displacement encoder MLO-POT	Connecting rod potentiometer, absolute measurement with high resolution	12
[11]	Proximity sensor CRSMT-8	Magnetoresistive, corrosion-resistant, to EU Explosion Protection Directive (ATEX)	13
[12]	Proximity sensor SDBT	Magnetoresistive, NAMUR, to EU Explosion Protection Directive (ATEX)	13
[13]	Proximity sensor SMT-8M-A	Magneto-resistive, 5 ... 30 V DC, to EU Explosion Protection Directive (ATEX)	13
[14]	Mounting kit SMBZ-8- ...	For proximity sensor SME/SMT-8M, for piston diameter 100	13
[15]	Sensor bracket DASP-M4- ...	For proximity sensor SME/SMT-8M, for piston diameter 125, 160, 200, 250, 320	13

Data sheet

Function



-  - Piston diameter
80 ... 125 mm
-  - Stroke
10 ... 1600 mm
-  - Force
2827 ... 7363 N



General technical data

General technical data				
Piston diameter	[mm]	80	100	125
Size of valve actuator		80	100	125
Design	Piston			
	Piston rod			
	Tie rod			
	Cylinder barrel			
Mode of operation		Double-acting		
Pneumatic connection		G1/8		
Stroke	[mm]	10 ... 1600		
Cushioning		Elastic cushioning rings/pads at both ends		
Process valve connection to standard		ISO 5210		
Type of mounting		Optionally: on flange to ISO 5210 with spacer bolts (for DFPC-...-L2B)		
Flange hole pattern		F07	F07	F10
Mounting position		Any (an external guide is required if lateral forces occur)		
Position sensing		Via proximity sensor		

Operating and environmental conditions

Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium	Lubricated operation possible (in which case lubricated operation will always be required)		
Operating pressure	[bar]	0.6 ... 8	
Nominal operating pressure	[bar]	6	
Ambient temperature	[°C]	-20 ... +80	
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 class 1 in accordance with FN 942017-4 and EN 60068-2-6		

1) Valid up to a stroke of 400 mm

Data sheet

Forces [N] and impact energy [J]			
Piston diameter	80	100	125
Theoretical force at 6 bar, advancing	3016	4712	7363
Theoretical force at 6 bar, retracting	2827	4524	7069
Impact energy in the end positions	1.4	0.94	1.1

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]

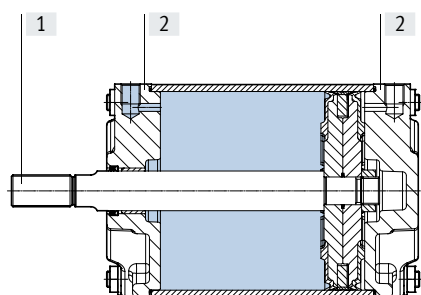
Air consumption [l]			
Piston diameter	80	100	125
Air consumption, advancing, per 10 mm stroke	0.352	0.55	0.859
Air consumption, retracting, per 10 mm stroke	0.33	0.528	0.825

Weight [g]			
Piston diameter	80	100	125
Basic weight with 0 mm stroke	1230.3	1666.6	2968.9
Additional weight per 10 mm stroke	61.8	71.4	107.4
Moving load with 0 mm stroke	451	617.1	1059.6
Additional moving mass per 10 mm stroke	24.8	24.8	38.9

Data sheet

Materials

Sectional view



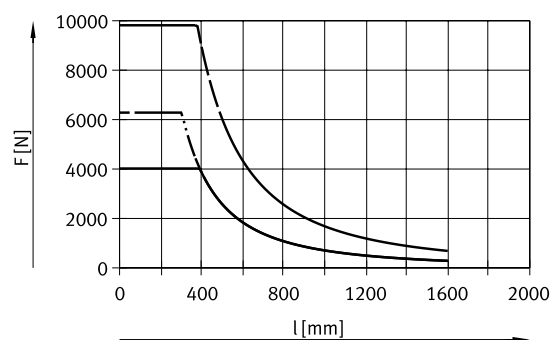
	Piston diameter	
[1] Cylinder barrel	80 ... 125	Smooth-anodised wrought aluminium alloy
[2] Cover		Gravity die-cast aluminium
- Tie rod		High-alloy stainless steel
- Nut		High-alloy stainless steel
- Piston rod		High-alloy stainless steel
- Piston rod wiper seal		TPE-U(PU)
- Static seals		NBR
- Note on materials		RoHS-compliant
		Contains paint-wetting impairment substances

Permissible axial force without buckling of the piston rod

The length "l" is made up of:

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

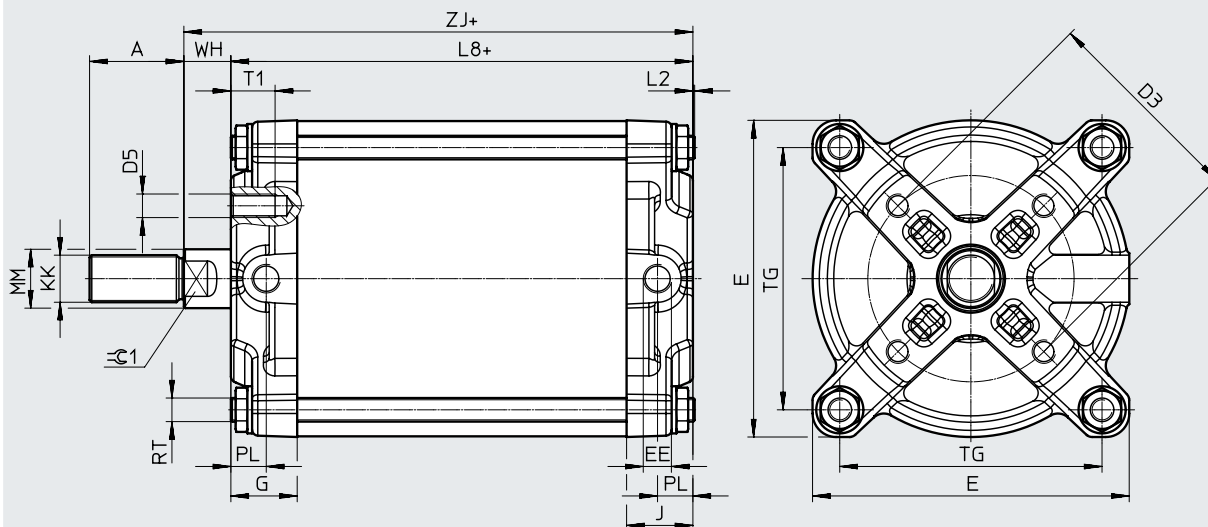
The dimension "WH" and the thread length have already been taken into account.



- Ø 80
- Ø 100
- - - Ø 125

Data sheet

Dimensions

Download CAD data → www.festo.com

+ = plus stroke length

Piston diameter	A	D3 ø	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

Piston diameter	L8	MM ø	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

Piston diameter	KK	
[mm]	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⁾

1) Regular threads or threads with smaller nominal diameter than in the basic version can generally not withstand such high loads. This requires modifying the screw connection.

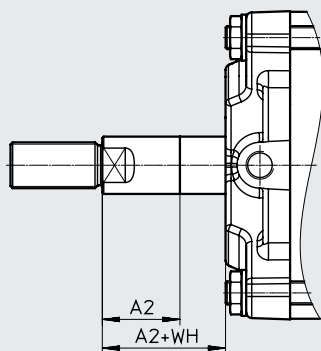
2) Additional lock nut for piston rod attachments (see page → 12) required for mounting

Data sheet

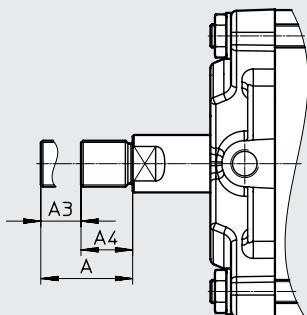
Dimensions – Variants

Download CAD data → www.festo.com

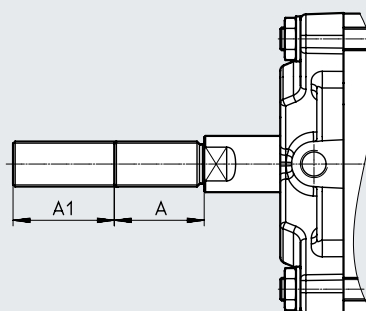
[E] Extended piston rod



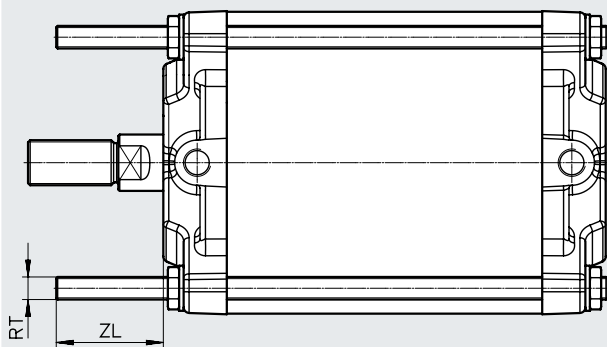
[S] Shortened piston rod thread



[L] Extended piston rod thread

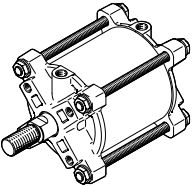


[LB2] Spacer bolts on the bearing cap



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

Data sheet

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

**Note**

Other stroke variants in the modular product system see page → 11

Ordering data – Modular product system

Ordering table						
Piston diameter	80	100	125	Conditions	Code	Enter code
Module no.	8110796	8110785	8110797			
Product type	DFPC				DFPC	DFPC
Piston diameter [mm]	80	–			–80	
	–	100	–		–100	
	–		125		–125	
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]	None					
	1 ... 500			[4]	–...E	
Piston rod thread extension [mm]	None					
	1 ... 70			[1]	–...L	
Piston rod thread shortening [mm]	None					
	1 ... 22 1 ... 30			[2]	...S	
Piston rod thread	Standard (page → 8)					
	M16		M16x1.5		–M16	
	–				–M16P	
	M20				–M20	
	M20x1.5		–		–M20P	
	–		M24	[3]	–M24	
	–		M24x1.5	[3]	–M24P	
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 piston rod extension is < 1600 mm

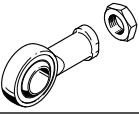
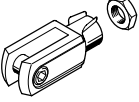


Note

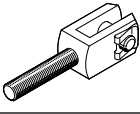
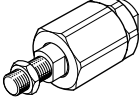
Other fixed-stroke variants see page → 10

Accessories

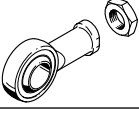
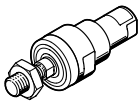
Ordering data – Piston rod attachments

Designation	For diam.	Part no.	Type
Rod eye SGS			
	80, 100	9263	SGS-M16x1.5
	125	9264	SGS-M20x1.5
Rod clevis SG ¹⁾			
	80, 100	6146	SG-M16x1.5
	125	6147	SG-M20x1.5

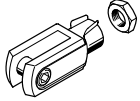
Data sheets → Internet: piston rod attachment

Designation	For diam.	Part no.	Type
Rod clevis SGA ¹⁾			
	80, 100	10768	SGA-M16x1.5
	125	10769	SGA-M20x1.5
Self-aligning rod coupler FK ¹⁾			
	80, 100	6142	FK-M16x1.5
	125	6143	FK-M20x1.5

Ordering data – Piston rod attachments, corrosion-resistant

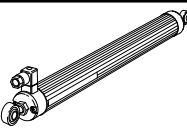
Designation	For diam.	Part no.	Type
Rod eye CRS GS			
	80, 100	195584	CRSGS-M16x1.5
	125	195585	CRSGS-M20x1.5
Self-aligning rod coupler CRFK			
	80, 100	2490673	CRFK-M16x1.5
	125	2545677	CRFK-M20x1.5

Data sheets → Internet: piston rod attachment

Designation	For diam.	Part no.	Type
Rod clevis CRSG ¹⁾			
	80, 100	13571	CRSG-M16x1.5
	125	13572	CRSG-M20x1.5

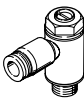
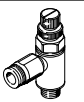
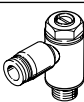
1) Suitable for ATEX

Ordering data – Displacement encoders

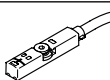
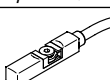
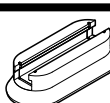
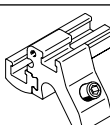
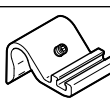
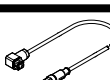
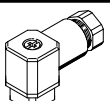
		Stroke [mm]	Part no.	Type
	Connecting rod potentiometer			
			100	192213
			150	192214
			225	152645
			300	152646
			360	152647
			450	152648
			600	152650
			750	152651

Data sheets → Internet: mlo-pot

Ordering data – One-way flow control valves

		Connection	Part no.	Type
		Thread		
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

Accessories

Ordering data – Proximity sensor for T-slot, magneto-resistive						Data sheets → Internet: smt-8	
	Switching output	Electrical connection	Plug M8x1	Cable length [m]	Part no.	Type	
		Cable					
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 sensor for T-slot, corrosion-resistant							Data sheets → Internet: crsmt
	Switching output	Electrical connection		Cable length [m]	Part no.	Type	
N/O contact							
	PNP	Cable, 3-wire		5	574380	CRSMT-8M-PS-24V-K-5.0-OE	
Ordering data – Proximity sensor for T-slot, NAMUR							Data sheets → Internet: sdbt
	Switching output	Electrical connection		Cable length [m]	Part no.	Type	
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	
Ordering data – Mounting kits for proximity sensors							Data sheets → Internet: crsmb, smbz, dasp
	For diam.	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	Rail: Anodised wrought aluminium alloy Screws: High-alloy stainless steel Free of copper and PTFE			8127664	DASP-F10-125-A	
Ordering data – Connecting cables							Data sheets → Internet: nebc
	Description				Part no.	Type	
	Between sensor interface and displacement encoder				549293	NEBC-P1W4-K-0.3-N-M12G5	
Ordering data – Plug sockets							Data sheets → Internet: sd
	Description				Part no.	Type	
	For displacement encoder connection				194332	SD-4-WD-7	