

Position transmitters SMAT-8M, for T-slot

FESTO



Key features

Design

General

The SMAT-8M is a position transmitter for the contactless sensing of the piston position of drives that can be detected magnetically.

It supplies a displacement-proportional analogue output signal in the position measuring range. It is connected directly to analogue PLC inputs without any accessories.

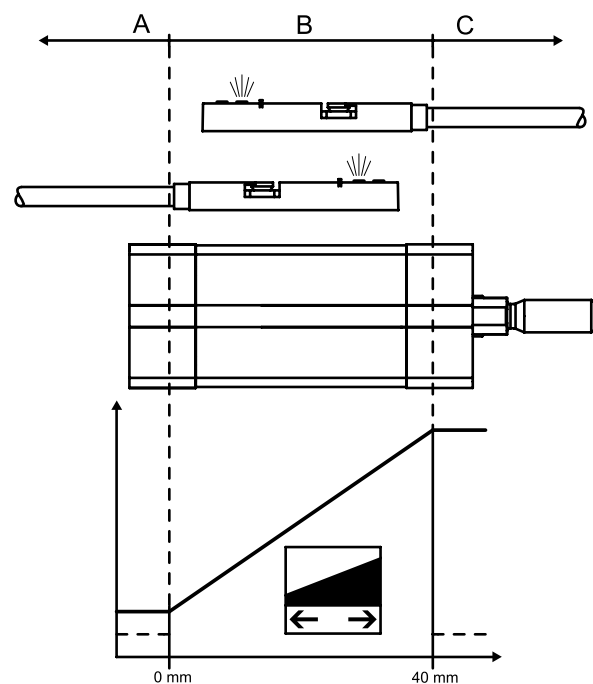
With its extremely compact design, the SMAT-8M is the ideal solution for grippers, short-stroke cylinders and all applications in which installation space is restricted.

Note
It can be used with Festo drives with T-slot (profile slot 8) as well as round cylinders and tie-rod cylinders with mounting kits. A selection aid with suitable drives can be found below.

Position measuring range

The SMAT-8M supplies a displacement-proportional analogue output signal of 0 ... 10 V in a position measuring range of up to 40 mm (depending on the drive used). This means the voltage at the output increases when the piston moves in the direction of the piston rod. When the piston retracts, the output voltage drops. The installation direction of the SMAT-8M is irrelevant in this case. To achieve the best possible function on the drive in question, the position measuring range must be initialised on the drive during installation.

As a visual aid, the green LED lights up within the position measuring range (B) and the red LED lights up outside of the measuring range (A)/(C) in normal operation.

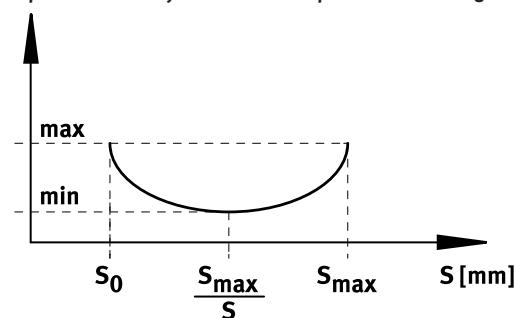


Repetition accuracy

The repetition accuracy is ± 0.025 mm on grippers and ± 0.1 mm on standard drives.

With standard drives, the repetition accuracy in the centre of the measuring range is lower than at the edge. For example, at a distance of ± 5 mm from the centre point, it is ± 0.06 mm. For critical applications, it is recommended that the SMAT-8M be mounted so that the relevant measuring points are close to 5.5 V.

Repetition accuracy as a function of position measuring range S



Selection aid

Drive/gripper	Usability on drive	Position measuring range approx.		Drive/gripper	Usability on drive	Position measuring range approx.		
		With init. [mm]	Without init. ²⁾ [mm]			With init. [mm]	Without init. ²⁾ [mm]	
Standards-based cylinders				Standards-based cylinders				
Standards-based cylinder DSBC-32	+	26	26	Compact cylinder ADN/AEN-12	+	22	22	
Standards-based cylinder DSBC-40	+	26	26	Compact cylinder ADN/AEN-16	+	26	26	
Standards-based cylinder DSBC-50	+	30	27	Compact cylinder ADN/AEN-20	+	30	28	
Standards-based cylinder DSBC-63	+	33	33	Compact cylinder ADN/AEN-25	+	27	24	
Standards-based cylinder DSBC-80	+	37	37	Compact cylinder ADN/AEN-32	+	31	31	
Standards-based cylinder DSBC-100	+	33	31	Compact cylinder ADN/AEN-40	+	28	20	
Standards-based cylinder DSBC-125	+	35	34	Compact cylinder ADN/AEN-50	+	25	21	
Standards-based cylinder DSBG-32	+	19	17	Compact cylinder ADN/AEN-63	+	31	29	
Standards-based cylinder DSBG-40	+	24	23	Compact cylinder ADN/AEN-80	o ¹⁾	–	–	
Standards-based cylinder DSBG-50	+	27	26	Compact cylinder ADN/AEN-100	+	28	24	
Standards-based cylinder DSBG-63	+	27	27	Compact cylinder ADN/AEN-125	+	37	33	
Standards-based cylinder DSBG-80	+	30	33	Piston rod cylinders				
Standards-based cylinder DSBG-100	+	29	27	Short-stroke cylinder ADVC/AEVC-32	+	Stroke < position measuring range SMAT-8M	Stroke < position measuring range SMAT-8M	
Standards-based cylinder DSBG-125	+	27	24	Short-stroke cylinder ADVC/AEVC-40	+			24
Standards-based cylinder DSBG-160	+	33	23	Short-stroke cylinder ADVC/AEVC-50	+			Stroke < position measuring range SMAT-8M
Standards-based cylinder DSBG-200	+	29	24	Short-stroke cylinder ADVC/AEVC-63	+			
Standards-based cylinder DSBG-250	+	19	19	Short-stroke cylinder ADVC/AEVC-80	+			
Standards-based cylinder DSBG-320	+	18	17	Short-stroke cylinder ADVC/AEVC-100	+	24		
Standards-based cylinder DSNU/ESNU-8	+	19	17	Compact cylinder ADVU/AEUV-12	+	23	20	
Standards-based cylinder DSNU/ESNU-10	+	22	19	Compact cylinder ADVU/AEUV-16	+	20	17	
Standards-based cylinder DSNU/ESNU-12	+	21	19	Compact cylinder ADVU/AEUV-20	+	29	28	
Standards-based cylinder DSNU/ESNU-16	+	21	19	Compact cylinder ADVU/AEUV-25	+	25	21	
Standards-based cylinder DSNU/ESNU-20	+	20	18	Compact cylinder ADVU/AEUV-32	+	27	23	
Standards-based cylinder DSNU/ESNU-25	+	28	22	Compact cylinder ADVU/AEUV-40	+	24	21	
Round cylinder DSNU/ESNU-32	+	25	23	Compact cylinder ADVU/AEUV-50	+	22	18	
Round cylinder DSNU/ESNU-40	+	29	30	Compact cylinder ADVU/AEUV-63	+	32	27	
Round cylinder DSNU/ESNU-50	+	31	29	Compact cylinder ADVU/AEUV-80	+	35	28	
Round cylinder DSNU/ESNU-63	+	36	33	Compact cylinder ADVU/AEUV-100	+	33	26	
Standards-based cylinder DNCB-32	+	25	23	Compact cylinder ADVU/AEUV-125	+	35	31	
Standards-based cylinder DNCB-40	+	28	19	Compact cylinder DPDM-25	+	–	32	
Standards-based cylinder DNCB-50	+	30	26	Compact cylinder DPDM-32	+	–	15	
Standards-based cylinder DNCB-63	+	32	27	Flat cylinder DZF-12	+	29	26	
Standards-based cylinder DNCB-80	+	35	32	Flat cylinder DZF-18	+	26	24	
Standards-based cylinder DNCB-100	+	29	26	Flat cylinder DZF-25	+	28	23	
Standards-based cylinder DNC-32	+	29	32	Flat cylinder DZF-32	+	26	17	
Standards-based cylinder DNC-40	o ¹⁾	–	–	Flat cylinder DZF-40	o ¹⁾	–	–	
Standards-based cylinder DNC-50	o ¹⁾	–	–	Flat cylinder DZF-50	o ¹⁾	–	–	
Standards-based cylinder DNC-63	+	34	28	Flat cylinder DZF-63	o ¹⁾	–	–	
Standards-based cylinder DNC-80	+	35	29					
Standards-based cylinder DNC-100	+	37	33					
Standards-based cylinder DNC-125	+	38	32					
Standards-based cylinder DNG-32	+	28	19					
Standards-based cylinder DNG-40	+	34	30					
Standards-based cylinder DNG-50	o ¹⁾	–	–					
Standards-based cylinder DNG-63	+	32	25					
Standards-based cylinder DNG-80	+	32	25					
Standards-based cylinder DNG-100	+	32	27					

+ Unrestricted use

o On request

1) Different from technical data. Usability on request

2) Position measuring range without initialisation (delivery status)

Selection aid

Drive/gripper	Usability on drive	Position measuring range approx.	
		With init. [mm]	Without init. ²⁾ [mm]

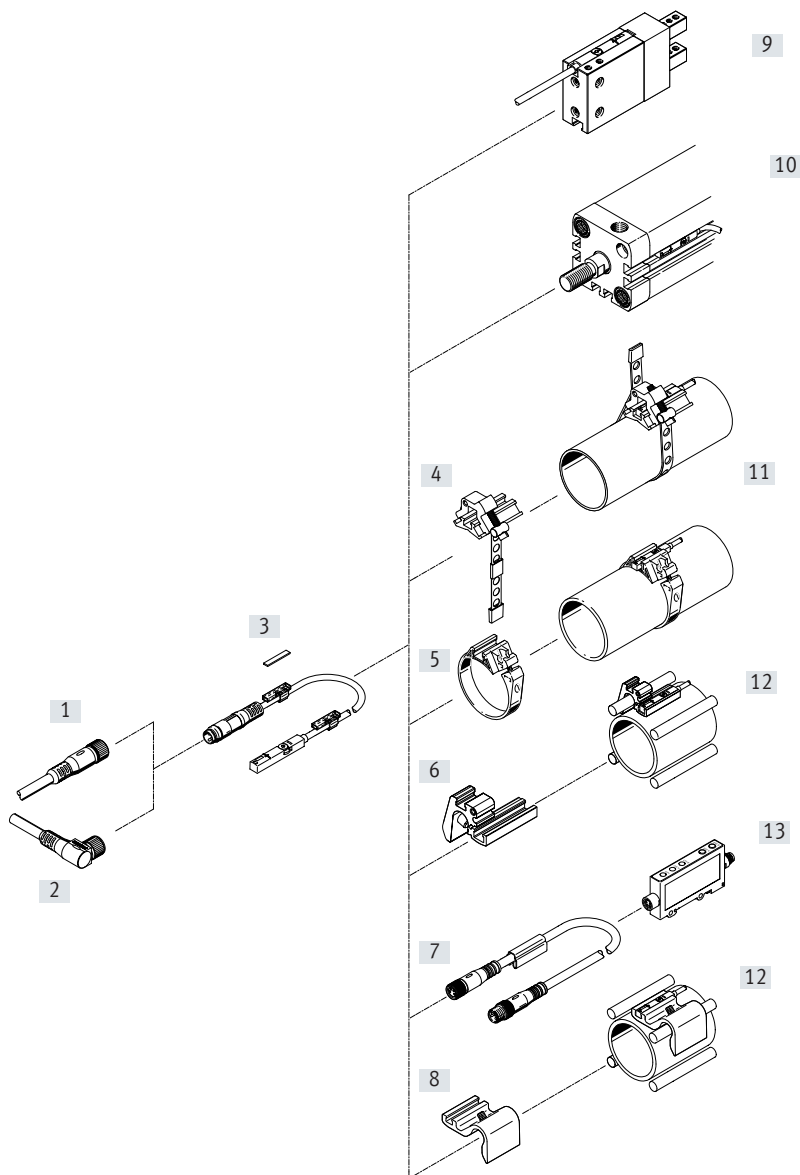
Rodless cylinders			
Linear drive DGC-18	+	30	26
Linear drive DGC-25	o ¹⁾	–	–
Linear drive DGC-32	o ¹⁾	–	–
Linear drive DGC-40	o ¹⁾	–	–
Function-oriented drives			
Linear/swivel clamp CLR-12	+	22	22
Linear/swivel clamp CLR-16	+	26	26
Linear/swivel clamp CLR-20	+	30	28
Linear/swivel clamp CLR-25	+	27	24
Linear/swivel clamp CLR-32	+	31	31
Linear/swivel clamp CLR-40	+	28	20
Linear/swivel clamp CLR-50	+	25	21
Linear/swivel clamp CLR-63	+	31	29
Drives with linear guides			
Guided drive DFM-12	+	17	14
Guided drive DFM-16	+	21	21
Guided drive DFM-20	+	22	14
Guided drive DFM-25	+	19	15
Guided drive DFM-32	+	17	12
Guided drive DFM-40	+	21	16
Guided drive DFM-50	+	25	19
Guided drive DFM-63	+	31	27
Guided drive DFM-80	+	30	30
Guided drive DFM-100	+	25	24
Guided drive DFM-12-B	+	16	22
Guided drive DFM-16-B	+	20	21
Guided drive DFM-20-B	+	26	27
Guided drive DFM-25-B	+	24	22
Guided drive DFM-32-B	+	29	28
Guided drive DFM-40-B	+	30	29
Guided drive DFM-50-B	+	31	31
Guided drive DFM-63-B	+	33	32
Mini slide DGST-16	+	18	17
Mini slide DGST-20	+	20	18
Mini slide DGST-25	+	19	15
Linear drive unit SLE-10	+	22	22
Linear drive unit SLE-16	+	21	21
Linear drive unit SLE-20	+	20	20
Linear drive unit SLE-25	+	28	28
Linear drive unit SLE-32	+	25	25
Linear drive unit SLE-40	+	29	29
Linear drive unit SLE-50	+	31	31

+ Unrestricted use
o On request
1) Different from technical data. Usability on request
2) Position measuring range without initialisation (delivery status)
3) Repetition accuracy corresponds to 1°

Drive/gripper	Usability on drive	Position measuring range approx.	
		With init. [mm]	Without init. ²⁾ [mm]

Handling modules					
Three-point gripper DHDS-32 (HGD)	+	Stroke < position measuring range SMAT-8M	Stroke < position measuring range SMAT-8M		
Three-point gripper DHDS-50 (HGD)	+				
Parallel gripper DHPS-10 (HGP)	+				
Parallel gripper DHPS-16 (HGP)	+				
Parallel gripper DHPS-20 (HGP)	+				
Parallel gripper DHPS-25 (HGP)	+	Stroke < position measuring range SMAT-8M	Stroke < position measuring range SMAT-8M		
Parallel gripper DHPS-35 (HGP)	+				
Parallel gripper HGPL-63	o ¹⁾				
Parallel gripper HGPL-14- ... -B	+			9	8
Parallel gripper HGPL-25- ... -B	+			18	14
Parallel gripper HGPL-40- ... -B	+			19	15
Parallel gripper HGPL-63- ... -B	+			23	19
Parallel gripper HGPT-40-B	+			Stroke < position measuring range SMAT-8M	Stroke < position measuring range SMAT-8M
Parallel gripper HGPT-50-B	+				
Parallel gripper HGPT-63-B	+			16	15
Parallel gripper HGPT-80-B	+	16	12		
Angle gripper DHWS-16 (HGW)	+	Stroke < position measuring range SMAT-8M	Stroke < position measuring range SMAT-8M		
Angle gripper DHWS-25 (HGW)	+				
Angle gripper DHWS-32 (HGW)	+				
Angle gripper DHWS-40 (HGW)	+				
Radial gripper DHRS-16 (HGR)	+				
Radial gripper DHRS-25 (HGR)	+				
Radial gripper DHRS-32 (HGR)	+				
Radial gripper DHRS-40 (HGR)	+				
Radial gripper HGRT-40-A-G2	+				
Radial gripper HGRT-50-A-G2	o ¹⁾				
Semi-rotary drives with rack and pinion					
Semi-rotary drive DRRD-16	+ ³⁾	17	19		
Semi-rotary drive DRRD-20	+ ³⁾	13	13		
Semi-rotary drive DRRD-25	+ ³⁾	28	28		
Semi-rotary drive DRRD-32	+ ³⁾	29	29		
Semi-rotary drive DRRD-35	+ ³⁾	34	33		
Semi-rotary drive DRRD-40	+ ³⁾	32	32		
Semi-rotary drive DRRD-50	+ ³⁾	32	32		
Semi-rotary drive DRRD-63	o ¹⁾	–	–		

Peripherals overview



Accessories		→ Page/ Internet	Accessories		→ Page/ Internet
[1]	Connecting cable NEBU-M8G4	10	[10]	Standards-based cylinder DSBC	dsbc
[2]	Connecting cable NEBU-M8W4	10		Standards-based cylinder DNC	dnc
[3]	Inscription label ASLR	10		Compact cylinder ADN	adn
[4]	Mounting kit SMBR-8-8/100-S6, heat resistant	10		Short-stroke cylinder ADVC/AEVC	advc
[5]	Mounting kit SMBR	10		Compact cylinder ADVU/AEUV	advu
[6]	Mounting SMBZ-8	10		Flat cylinder DZF	dzf
[7]	Connecting cable NEBU-M8G4	10		Linear drive DGC	dgc
[8]	Sensor bracket DASP-M4-...	10		Linear/swivel clamp CLR	clr
[9]	Three-point gripper DHDS	dhds		Guided drive DFM	dfm
	Three-point gripper HGDD	hgdd	[11]	Standards-based/round cylinder DSNU	dsnu
	Parallel gripper DHPS	dhps		Linear drive unit SLE	sle
	Parallel gripper HGPD	hgpd	[12]	Standards-based cylinder DSBG	dsbg
	Parallel gripper HGPT	hgpt	[13]	Signal converter SVE4	sve4
	Angle gripper DHWS	dhws			
	Radial gripper DHRS	dhrs			
	Radial gripper HGRT	hgtr			

Type codes

001	Series
SMAT	Position transmitter, magnetic

002	Design type
8	For T-slot

003	Sensor version
M	Inserted in the slot from above

004	Analogue output
U	0 ... 10 V

005	Cable characteristic
E	Suitable for energy chains/robot applications

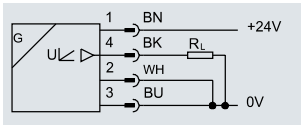
006	Cable length [m]
0,3	0,3 m

007	Electrical connection
M8D	Plug M8, 4-pin, rotatable thread

Data sheet

Function

Normal operation



General technical data	
Design	For T-slot
Mounting position	Any
Certification	c UL us listed (OL) RCM
CE marking (see declaration of conformity)	To EU EMC Directive ¹⁾ To EU RoHS Directive
UKCA marking (see declaration of conformity)	To UK instructions for EMC To UK RoHS instructions
KC mark	KC EMC
Certificate issuing authority	UL E232949
Application information	Support / Overview of actuator sensors „The right sensor for the actuator“
Note on materials	RoHS-compliant Halogen-free
PWIS conformity	VDMA24364-B2-L

- 1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/SMAT-8M → Support/Downloads.
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.

Input signal/measuring element	
Measured variable	Position
Measuring principle	Magnetic
Position measuring range [mm]	≤ 40 ²⁾

- 2) Dependent on drive/gripper used.

Signal processing	
Max. speed of travel [m/s]	3

Output, general	
Path resolution [mm]	≤ 0.05 ²⁾
Repetition accuracy [mm]	0.2
[°]	1 on semi-rotary drive DRRD

Analogue output	
Typical linearity error [mm]	±1 on cylinders ²⁾ ±0.2 on grippers ²⁾

- 2) Dependent on drive/gripper used.

Electrical outputs	
Analogue output [V]	0 ... 10
Short circuit current rating	Yes
Overload protection	Available
Output signal	Analogue

Data sheet

Electronics		
Operating voltage range	[V DC]	15 ... 30
No-load supply current	[mA]	< 12
Sensing range	[mm]	≤ 52
Resolution of travel	[mm]	≤ 0.02
Typical linearity error	[mm]	± 1
Typical sampling interval	[ms]	2
Residual ripple	[%]	10
Reverse polarity protection		For all electrical connections

Electromechanics	
Electrical connection	SMAT-8M-U-E-0,3-M8D
Connection direction	In-line
Connection type	Cable with plug
Connection technology	M8x1, A-coded to EN 61076-2-104
Number of pins/wires	4
Type of mounting	Screw-type lock
Cable length	[m] 0.3
Cable characteristic	Suitable for energy chains + robot applications
Cable test conditions	Energy chain: 5 million cycles, bending radius 28 mm
	Torsional resistance: > 300,000 cycles, ±270°/0.1 m
	Resistance to bending: to Festo standard; test conditions on request
Housing material	High-alloy stainless steel, PA reinforced
Union nut material	Nickel-plated brass
Cable sheath material	TPE-U (PUR)
Material of pin contacts	Gold-plated copper alloy
Cable sheath colour	Grey

Mechanics	
Type of mounting	Screw-clamped, inserted in the slot from above
Product weight	[g] 9.5

Display/operation	
Status indication	Red, green LED

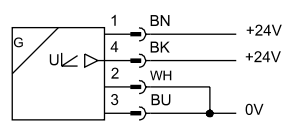
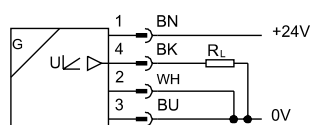
Immission/emission		
Ambient temperature	[°C]	-40 ... +80
Ambient temperature with flexible cable installation	[°C]	-20 ... +70
Degree of protection		IP65, IP68
Corrosion resistance class CRC ¹⁾		2

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Terminal allocation

Normal operation Initialisation Plug



- 1 Operating voltage
- 2 Analogue output 0 V
- 3 0 V
- 4 Analogue output 0 ... 10 V

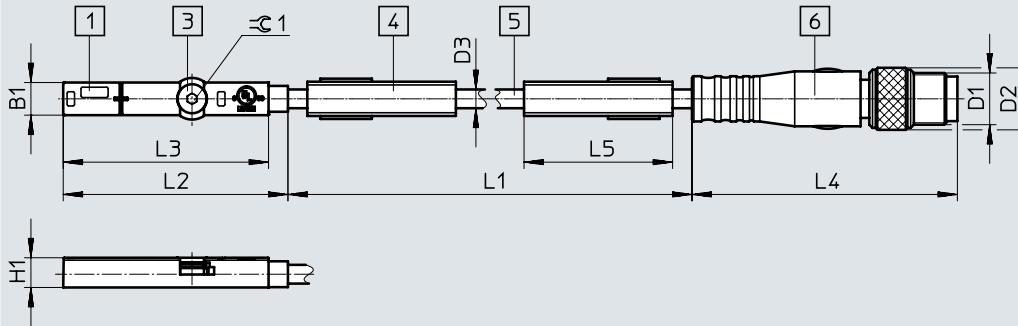
Wire colours

BN = Brown BU = Blue
 BK = Black WH = White

Data sheet

Dimensions

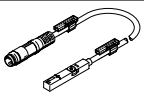
Download CAD data → www.festo.com



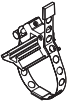



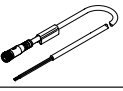
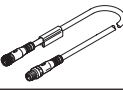


- [1] Light emitting diode
- [3] Clamping element
- [4] Inscription label holder
- [5] Connecting cable
- [6] Plug M8, 4-pin, rotatable thread

B1	D1	D2 ∅	D3 ∅	H1	L1	L2	L3	L4	L5	☉
5	M8x1	9.6	2.9	4.6	300	34.8	31.8	41.1	23	1.5

Ordering data

Size	Analogue output [V]	Electrical connection	Cable length [m]	Part no.	Type
	0 ... 10	Plug M8, 4-pin, rotatable thread	0.3	553744	SMAT-8M-U-E-0.3-M8D

Accessories

Ordering data – Mounting components				Part no.	Type	
For piston \varnothing						
Mounting kit SMBR-8-8/100-S6, heat-resistant						
	8 ... 100			538937	SMBR-8-8/100-S6	
Mounting kit SMBR						
	8			175091	SMBR-8-8	
	10			175092	SMBR-8-10	
	12			175093	SMBR-8-12	
	16			175094	SMBR-8-16	
	20			175095	SMBR-8-20	
	25			175096	SMBR-8-25	
	32			175097	SMBR-8-32	
	40			175098	SMBR-8-40	
	50			175099	SMBR-8-50	
	63			175100	SMBR-8-63	
Mounting SMBZ						
	32 ... 100			537806	SMBZ-8-32/100	
	125 ... 320			537808	SMBZ-8-125/320	
Sensor bracket DASP-M4-...						
	For DSBG-125			1451483	DASP-M4-125-A	
	For DSBG-250			1456781	DASP-M4-250-A	
	For DSBG-320			3015256	DASP-M4-320-A	
Ordering data – Connecting cable NEBU-M8				Data sheets → Internet: nebu		
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type	
	Straight socket, M8x1, 4-pin	Cable, open end, 4-wire	2.5	541342	NEBU-M8G4-K-2.5-LE4	
			5	541343	NEBU-M8G4-K-5-LE4	
	Straight socket, M8x1, 4-pin	Straight socket, M8x1, 4-pin	2.5	554035	NEBU-M8G4-K-2.5-M8G4	
	Angled socket, M8x1, 4-pin	Cable, open end, 4-wire	2.5	541344	NEBU-M8W4-K-2.5-LE4	
			5	541345	NEBU-M8W4-K-5-LE4	
Ordering data – Inscription label ASLR				Part no.	Type	PU ¹⁾
	Size			541598	ASLR-L-423	34

1) Packaging unit per frame

Festo - Your Partner in Automation



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