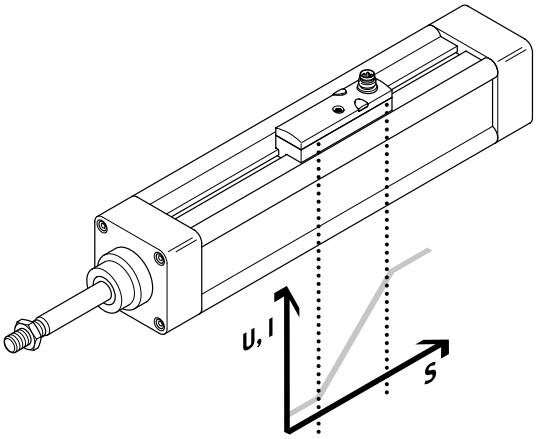
Position transmitters SMAT-8E, for T-slot

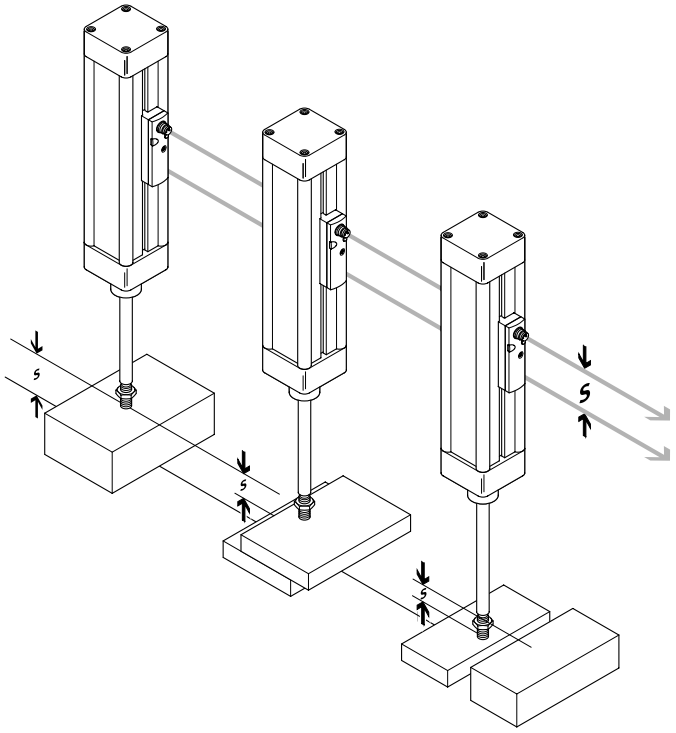
Key features

Design

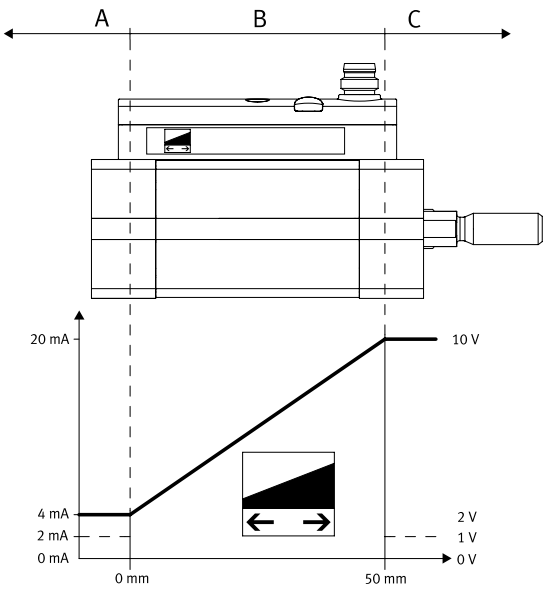
The SMAT-8E is a sturdy magnetic measuring system with a sensing range of 50 mm. It provides a standardised analogue current and voltage signal via an M8x1 plug connection, regardless of the drive used.

This enables the transmitter to be connected directly to the analogue input of a programmable logic controller. The piston position of the pneumatic cylinder is detected by contactless sensing and the travel distance can be measured between any set switching points with typical reproducibility of 0.1 mm.





Analogue output as a function of piston position



Analogue output		Description	Area
[V]	[mA]		
0	0	No valid signal, e.g. no operating voltage	–
1	2	Piston outside of the measuring range after the operating voltage is switched on	A, C
2	4	Piston has left the measuring range in the negative direction	A
10	20	Piston has left the measuring range in the positive direction	C
2 ... 10	4 ... 20	Piston within the measuring range at the relevant position	B

Note

Sensors that detect magnetic fields, such as the position transmitter SMAT, must not be secured onto the drive using mountings made from ferritic materials, as this can lead to malfunction.

Selection aid

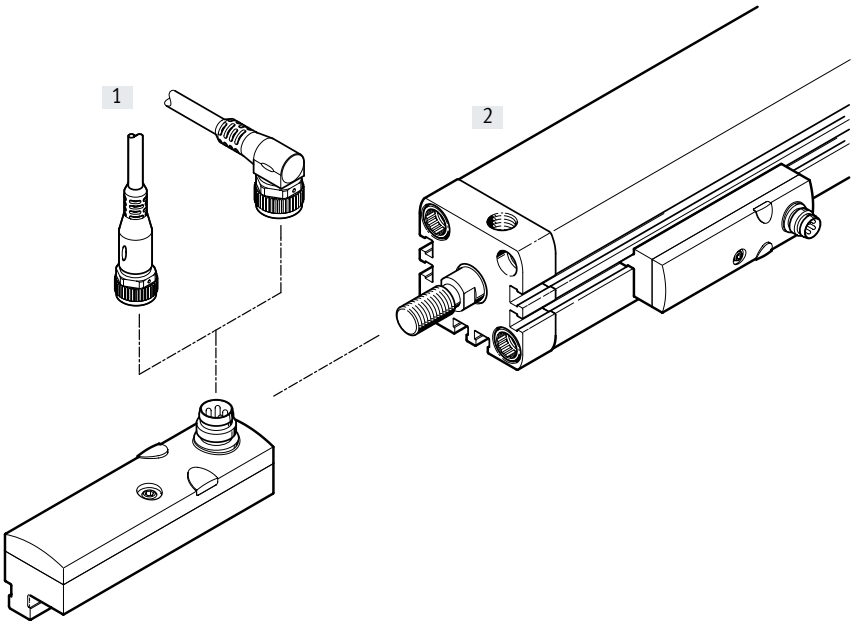
Drive	Piston ⌀	Suitability
Standards-based cylinders		
Standards-based cylinder DSBC	⌀ 32, 40, 50, 63, 80	++[1)]
	⌀ 100, 125	++[1)]
Standards-based cylinder DSBG	⌀ 125	++
	⌀ 160, 200	–
Standards-based cylinder DSNU/ ESNU		o
Standards-based cylinder DSN/ESN		–
Standards-based cylinder DNCB		++
Standards-based cylinder DNC		++
Standards-based cylinder CDN-...-R with sensor rail		–
Standards-based cylinder DNU		–
Compact cylinder ADN		++
Piston rod cylinders		
Compact cylinder ADVU/AEVU		++
Short-stroke cylinder ADVC/AEVC	⌀ 6 ... 25	–
	⌀ 32 ... 100	++
Flat cylinder EZH-10/40-40-A-B		+
Flat cylinder DZF	⌀ 12, 25, 32, 40, 63	+
	⌀ 18, 50	++
Flat cylinder DZH	⌀ 16 ... 25	+
	⌀ 32 ... 63	–
Round cylinder DSNU/ESNU		o
Round cylinder DSEU/ESEU		o
Compact cylinder DMM/EMM		+
Standards-based cylinder CRHD		o
Standards-based cylinder CRDSNU		o
Standards-based cylinder CRDNG		–
Standards-based cylinder CRDNGS		–
Rodless cylinders		
Linear drives DGC		–
Linear drives DGP/DGPL		–
Linear drives SLG		–
Linear drives DGO		–
Linear drives SLM	⌀ 12, 40	++
	⌀ 16 ... 32	o
Semi-rotary drives		
Semi-rotary drives DSM	⌀ 6 ... 10	–
Semi-rotary drives DRQ		–
Semi-rotary drives DRQD	⌀ 6, 8, 12, 40, 50	–
	⌀ 16 ... 32	++
Function-oriented drives		
Stopper cylinder STA/STAF		–
Linear/swivel clamp CLR		o
Swivel/linear units DSL		–

Drive	Piston ⌀	Suitability
Drives with linear guide		
Mini slides SLS/SLF/SLT		–
Slide units SPZ	⌀ 10, 25	o
	⌀ 16	++
	⌀ 32	–
Guided drive DFP	⌀ 10 ... 16	–
	⌀ 25 ... 80	o
Guided drive DFC		–
Guided drive DFM	⌀ 25	++
	⌀ 16, 40, 63, 80	+
	⌀ 12, 20, 32, 50, 100	–
Guided drive DFM-B	⌀ 12, 16, 25, 32	–
	⌀ 20	+
	⌀ 40, 50	++
	⌀ 63	–
Linear drive units SLE		–
Twin cylinder DPZ		++
Handling modules		
Linear modules HMP		–
Handling modules HSP		–
Feed separator HPV		–
Three-point gripper DHDS		–
Three-point gripper HGDD		–
Parallel gripper DHPS		–
Parallel gripper HGPD		–
Parallel gripper HGPT		–
Angle gripper DHWS		–
Radial gripper DHRS		–
Radial gripper HGRT		–
Cushioning components		
Stop elements YSRWJ		–
Electric positioning systems		
Toothed belt axes DGE-ZR		–
Spindle axes DGE-SP		–
System components		
Heavy-duty guides HD		–
Valve actuators		
Linear drives, Copac DLP-A		–

1) Only with feature D3, with slot that can be accessed from the side

++ Unrestricted use
+ Sensor function guaranteed without restriction; installation direction and clamping dependent on drive
o On request
– Not suitable

Peripherals overview



Accessories		→ Page/Internet
[1]	Connecting cable NEBU-M8	9
[2]	Standards-based cylinder DSBC	dsbc
	Standards-based cylinder DNC	dnc
	Compact cylinder ADN	adn
	Compact cylinder ADVU/AEVU	advu
	Short-stroke cylinder ADVC/AEVC	advc
	Flat cylinder EZH	ezh
	Flat cylinder DZF	dzf

Accessories		→ Page/Internet
[2]	Flat cylinder DZH	dzh
	Compact cylinder DMM/EMM	dmm
	Linear drives SLM	slm
	Semi-rotary drives DRQD	drqd
	Slide units SPZ	spz
	Guided drive DFM/DFM-B	dfm
	Twin cylinder DPZ	dpz

Type codes

001	Series	
SMAT	Position transmitter, magnetic	

002	Design type	
8	For T-slot	

003	Sensor version	
E	Mounting with accessories	

004	Measuring range	
S50	48 ... 52 mm	

005	Analogue output	
IU	0 ... 10 V, 0 ... 20 mA	

006	Cable characteristic	
	None	
E	Suitable for energy chains/robot applications	

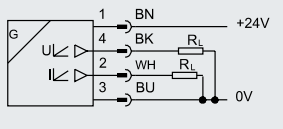
007	Cable length [m]	
	None	
0,3	0.3 m	

008	Electrical connection	
M8	Plug M8, 4-pin, fixed	
M8D	Plug M8, 4-pin, rotatable thread	

Data sheet

Function

Normal operation



SMAT-8E-...-M8 SMAT-8E-...-M8D

General technical data			
Type		SMAT-8E-...-M8	SMAT-8E-...-E-0.3-M8D
Design		For T-slot	
Certification		RCM	
		c UL us listed (OL)	
KC mark		KC EMC	
CE marking (see declaration of conformity)		To EU EMC Directive	
Note on materials		Free of copper and PTFE	
		RoHS-compliant	
		Halogen-free	

Input signal/measuring element			
Measured variable		Position	
Measuring principle		Magnetic	
Position measuring range	[mm]	48 ... 52	
Ambient temperature	[°C]	–20 ... +50	
Ambient temperature with flexible cable installation		–	–20 ... +50

Signal processing		
Typical sampling interval	[ms]	2.85
Max. speed of travel	[m/s]	3

Output, general		
Path resolution	[mm]	0.064

Analogue output		
Analogue output	[V]	0 ... 10
	[mA]	4 ... 20
Sensitivity	[V/mm]	0.152
	[mA/mm]	0.305
Typical linearity error	[mm]	±0.25
Repetition accuracy of analogue value[1)]	[mm]	0.128
Min. load resistance of voltage output	[kΩ]	2
Max. load resistance of current output	[Ω]	500

1) Use of a non-rotating piston rod or a mechanical structure which provides protection against rotation is recommended.

Data sheet

Output, additional data		
Short circuit current rating		Yes
Overload protection		Provided

Electronics		
Operating voltage range	[V DC]	15 ... 30
No-load supply current	[mA]	32
Reverse polarity protection		For all electrical connections

Electromechanics			
Electrical connection		SMAT-8E-...-M8	SMAT-8E-...-E-0.3-M8D
Connection type		Plug	Cable with plug
Connection technology		M8x1, A-coded to EN 61076-2-104	M8x1, A-coded to EN 61076-2-104
Number of pins/wires		4	4
Type of mounting		Screw-type lock	Screw-type lock
Outlet direction of connection		–	In-line
Cable characteristic		–	Suitable for energy chains and robot applications

Mechanics			
Type		SMAT-8E-...-M8	SMAT-8E-...-E-0.3-M8D
Mounting position		Any	
Product weight	[g]	15	21.4
Information on materials: Housing		Reinforced PA, PC	
Information on materials: Cable sheath		TPE-U (PUR)	

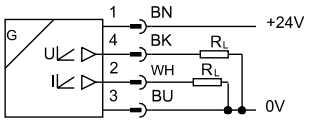
Display/operation	
Ready status indication	Green LED
Status indication	Red LED = outside measuring range

Immission/emission		
Type	SMAT-8E-...-M8	SMAT-8E-...-E-0.3-M8D
Degree of protection	IP65, IP67	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



Plug

1 Operating voltage
2 Analogue output 0 ... 20 mA
3 0 V
4 Analogue output 0 ... 10 V

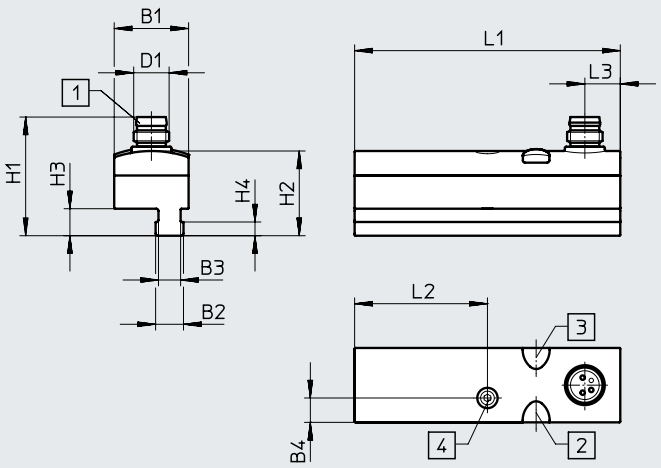
Wire colours

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

Data sheet

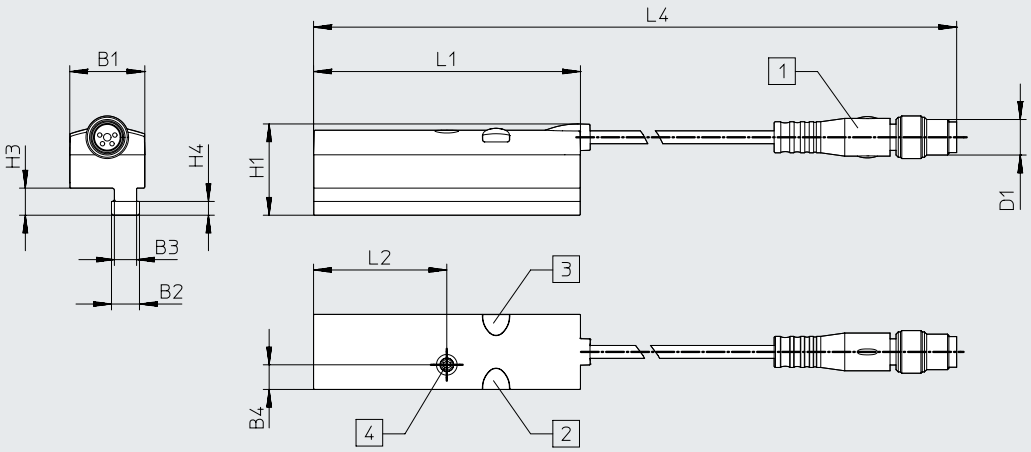
Dimensions Download CAD data ➔ www.festo.com

SMAT-8E-...-M8



[1] Plug to fit connecting cable NEBU-M8
[2] Green light emitting diode
[3] Red light emitting diode
[4] Threaded pin

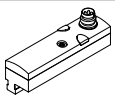
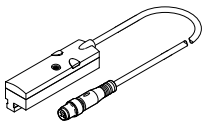
SMAT-8E-...-M8D



[1] Plug to fit connecting cable NEBU-M8
[2] Green light emitting diode
[3] Red light emitting diode
[4] Threaded pin

Type	B1	B2	B3	B4	D1	H1	H2	H3	H4	L1	L2	L3	L4	L5
SMAT-8E-...-M8	16.8	6.3	5	5.5	M8x1	26.8	19.1	6.1	3.1	60	30	8	–	–
SMAT-8E-...-M8D	16.9			5.6		20.5	–			60.1		–	420	62.3

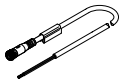
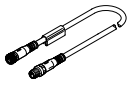
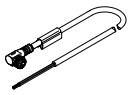
Ordering data

	Electrical connection	Cable length [m]	Part no.	Type
	Plug M8x1, 4-pin, fixed	–	**540191**	**SMAT-8E-S50-IU-M8**
	Cable with plug M8x1, 4-pin, rotatable thread	0.3	**570134**	**SMAT-8E-S50-IU-E-0.3-M8D**

Accessories

Ordering data – Connecting cables 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**