

## Position transmitters SMAT-8E, for slot type 8

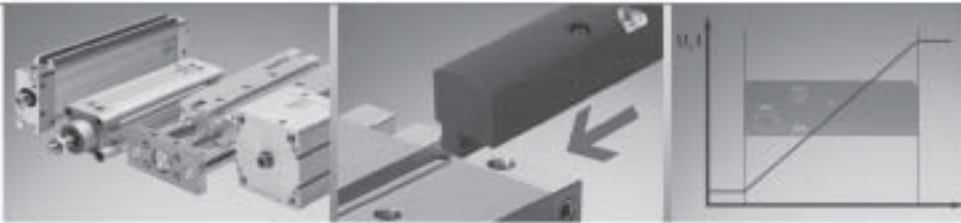


- Position measuring range  
50 mm
- Analogue output 0 ... 10 V and  
0 ... 20 mA
- Integrated out-of-range sensor
- Typical repetition  
accuracy 0.1 mm
- Direct mounting in slot type 8  
(T-slot)



## Leading the way – the new SMAT

It continuously detects the position of the cylinder piston within a range of 50 mm. Its analogue output delivers an output signal in proportion to the piston position.

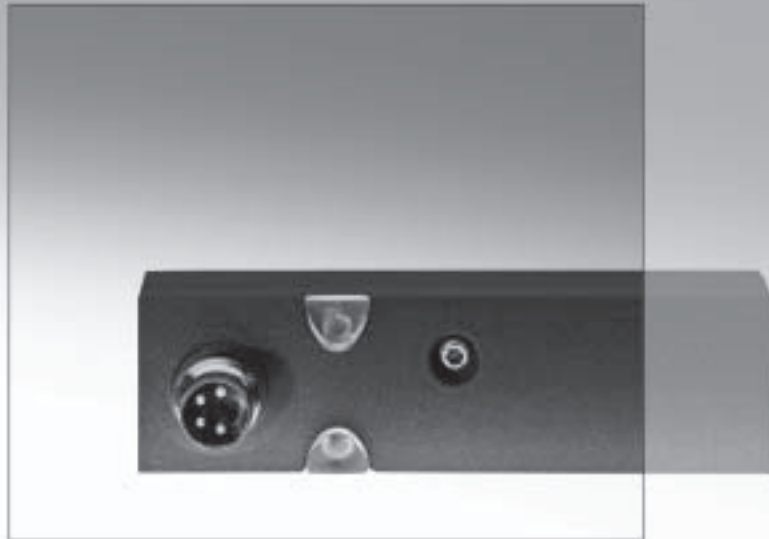


Wide range of use

Easy installation

Position is known to 100%

- **Sturdy:** thanks to the contactless measuring principle with wear-free sensing
- **Quicker to install:** simply push into the slot and secure with Allen key
- **Reliable:** the measuring range is always 50 mm, independent of cylinder; reproducibility is 0.1 mm
- **Flexible:** the installation direction of the SMAT in the slot is freely selectable
- **Multi-purpose:** fits on virtually all Festo cylinders with T-slot
- **Secure:** operating- and out-of-range display via 2 LEDs on the device
- **Standardised:** 0 ... 10 V, 0 ... 20 mA analogue output
- **Compact:** direct mounting in T-slot does not require any additional accessories



**Advantages for designers**

- Minimal design costs, no need for accessories
- Suitable for use in confined spaces thanks to the compact design
- Freely selectable drive unit means greater flexibility
- The measuring system opens up a whole host of different applications

**Advantages for end users**

- Excellent reliability and precision thanks to the wear-free measuring system
- Minimum warehousing: only 1 type for a wide range of applications and drive units
- Less expensive than comparable potentiometer solutions

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Key features

## Construction

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

regardless of the drive unit used. The transmitter can thus be connected directly to the analogue input of a programmable logic controller. The piston position of the pneumatic

cylinder can be recorded by means of contactless sensing and the travel distance can be measured between any set switching points with typical reproducibility of 0.1 mm.

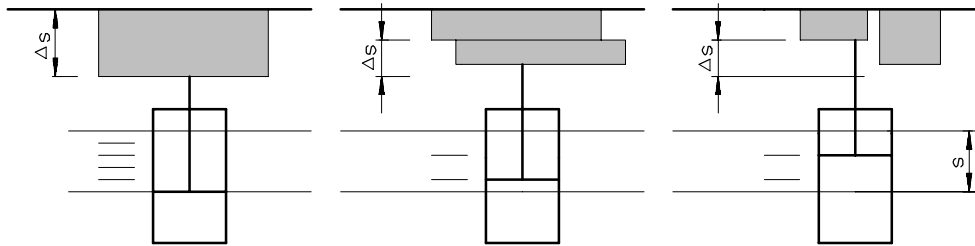
## Typical applications

### Object registering

Press-fitting, clamping, position sensing, quality sorting of parts, workpiece replacement.

### Process monitoring

Quality inspection, wear monitoring, thickness measuring.



s Position measuring range

### Note

Sensors that detect magnetic fields, such as proximity sensors SMT/SME/SMPO/SMH and position transmitters SMAT, must not be secured onto the drive using mountings made from ferritic materials, as this can lead to malfunction.

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Selection aid



Drive	Piston Ø	Suitability	Drive	Piston Ø	Suitability
<b>Cylinders to standards</b>			<b>Drives with linear guide</b>		
Standard cylinders DSNU, ESNU		o	Mini slides SLS, SLF, SLT		-
Standard cylinders DSN, ESN		o	Twin cylinders SPZ	Ø 10, 25	o
Standard cylinders DNCB		++		Ø 16	++
Standard cylinders DNC		++		Ø 32	-
Standard cylinders DNG		-	Slide units SLZ		-
Standard cylinders CDN-...-R with sensor strip		-	Guided cylinders DFP	Ø 6 ... 16	-
Standard cylinders DNU		-		Ø 25 ... 80	o
Standard cylinders ADN		++	Mini guided drives DFC		-
<b>Cylinders with piston rod</b>			Guided drives DFM	Ø 12, 25, 50	++
Compact cylinders ADVU, AEUU		++		Ø 16, 20	+
Short-stroke cylinders ADVC, AEVC	Ø 6 ... 25	-		Ø 32, 40, 63, 80, 100	-
	Ø 32 ... 100	++	Guided drives DFM-B	Ø 12, 16, 32, 63	-
Flat cylinders EZH-10/40-40-A-B		+		Ø 20	+
Flat cylinders DZF	Ø 12, 25, 32, 40, 63	+		Ø 40, 50	++
	Ø 18, 50	++	Linear units SLE	Ø 10 ... 25	-
Flat cylinders DZH	Ø 16 ... 25	+		Ø 32 ... 50	++
	Ø 32 ... 63	-	Twin cylinders DPZC		-
Round cylinders DSNU, ESNU		o	Twin cylinders DPZ		++
Round cylinders DSW, ESW		o	<b>Handling units</b>		
Round cylinders DSEU, ESEU		o	Linear modules HMP		-
Multimount cylinders DMM, EMM		+	Linear modules HMPL		-
Round cylinders CRDG		o	Handling modules HSP		-
Round cylinders CRDSW		o	Feed separators HPV		-
Standard cylinders CRHD		o	Three-point grippers HGD		-
Standard cylinders CRDSNU		o	Parallel grippers HGP		-
Standard cylinders CRDNG		-	Precision parallel grippers HGPP		-
Standard cylinders CRDNCS		-	T-slot grippers HGPT		-
<b>Rodless cylinders</b>			Angle grippers HGW		-
Linear drives DGC		-	Radial grippers HGR		-
Linear drives DGP, DGPL		-	<b>Cushioning components</b>		
Linear drives SLG		-	Stop elements YSRWJ		-
Linear drives DGO		-	<b>Electrical positioning systems</b>		
Linear drives SLM	Ø 12, 40	++	Toothed belt axes DGE-ZR		-
	Ø 16 ... 32	o	Spindle axes DGE-SP		-
<b>Semi-rotary drives</b>			<b>System components</b>		
Swivel modules DSM	Ø 6 ... 10	-	Heavy-duty guides HD		-
Semi-rotary drives DRQ		-	<b>Process valve actuators</b>		
Semi-rotary drives DRQD	Ø 6, 8, 12, 40, 50	-	Copac linear actuators DLP-A		-
	Ø 16 ... 32	++	<b>Function-oriented drives</b>		
Stopper cylinders STA, STAF		-	Linear/swivel clamps CLR		o
Linear/swivel clamps CLR		o	Swivel/linear units DSL		-
Swivel/linear units DSL		-			

- ++ Unlimited use
- + Sensor function without restriction guarantees that the installation direction and clamping are not drive-specific
- o Upon request
- Unsuitable

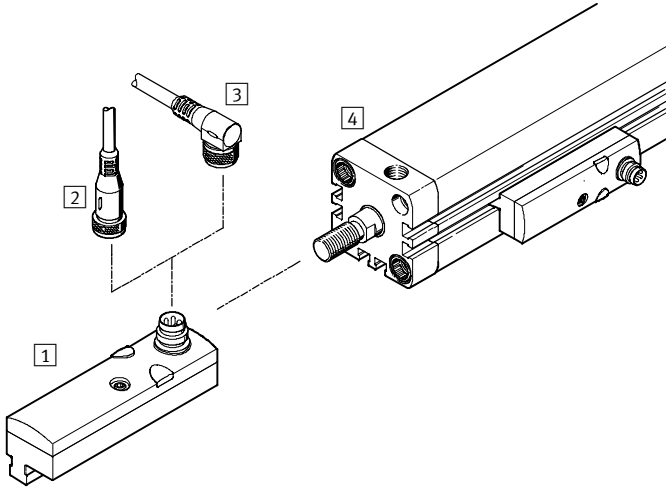
Drive accessories  
Cylinder sensors

**10.2**

# Position transmitters SMAT-8E, for slot type 8

Peripherals overview and type codes

## Peripherals overview



	Brief description	→ Page
<b>Proximity sensors</b>		
1	SMAT-8E Magnetic, with plug M8x1	1 / 10.2-115
<b>Accessories</b>		
2	Plug socket with cable SIM-M8-4GD-... Straight socket, M8x1, 4-pin	1 / 10.2-117
3	Plug socket with cable SIM-M8-4WD-... Angled socket, M8x1, 4-pin	
<b>Drives</b>		
4	Drives with slot type 8 (T-slot) Drives combinable with SMAT-8E → Table 1 / 10.2-113	-

## Type codes

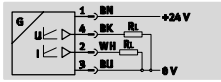
		SMAT	8E	S50	IU	M8
<b>Type</b>	SMAT	Position transmitter, magnetic				
<b>Construction</b>	8E	For T-slot, insertable				
<b>Position measuring range</b>	S50	50 mm				
<b>Analogue output</b>	IU	0 ... 10 V, 0 ... 20 mA				
<b>Electrical connection</b>	M8	Plug M8x1				

# Position transmitters SMAT-8E, for slot type 8

Technical data

Function

Position transmitter



- Position measuring range 50 mm
- Analogue output 0 ... 10 V and 0 ... 20 mA
- Integrated out-of-range sensor
- Magnetic measuring principle
- Insertable in T-slot



General technical data	
Switching element function	Namur
Electrical data	
Analogue output	0 ... 10 V 0 ... 20 mA
Sensitivity	0.152 V/mm 0.305 mA/mm
Typical scanning interval [ms]	2.85
Displacement resolution [mm]	0.064
Electrical connection	Plug M8x1, 4-pin
Operating voltage range [V DC]	15 ... 30
Max. switching capacity [W]	–
Min. load resistance of voltage output [Ω]	2 000
Max. load resistance of current output [Ω]	500
Idle current [mA]	32
Protection against short circuit	Yes
Protection against overloading	Available
Protection against polarity reversal	For all electrical connections
Protection class to EN 60 529	IP65/IP67
CE symbol	89/336/EEC (EMC)
Approval	c UL us - Listed (OL)
Construction	
Design	For T-slot
Type of mounting	Clamped in T-slot, insertable
Measuring principle	Magnetic
Measured variable	Position
Position measuring range [mm]	50
Position measuring range tolerance [mm]	±2
Reproducibility, analogue value [mm]	±0.064
Max. speed of travel [m/s]	3
Ready status display	Green LED
Status display	Red LED = outside measuring range
Assembly position	Any
Materials Housing	Polyamide, reinforced Polycarbonate
Note on materials	Free of copper, PTFE and silicone
Product weight [g]	15

Operating and environmental conditions	
Ambient temperature [°C]	–20 ... +50 <sup>1)</sup>
Corrosion resistance class CRC <sup>2)</sup>	2

1) Extended ambient temperature range on request

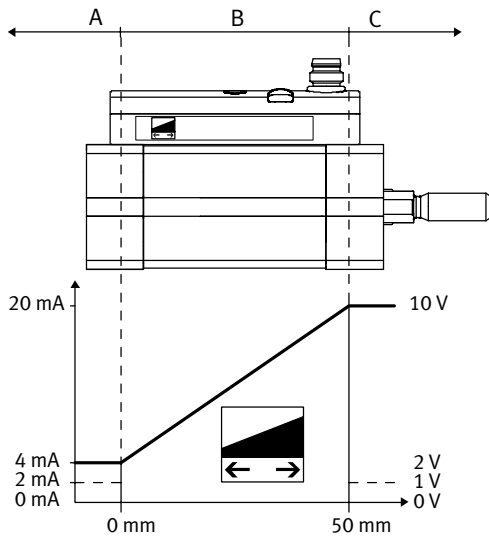
2) Corrosion resistance class 2 according to Festo standard 940 070

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

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Technical data

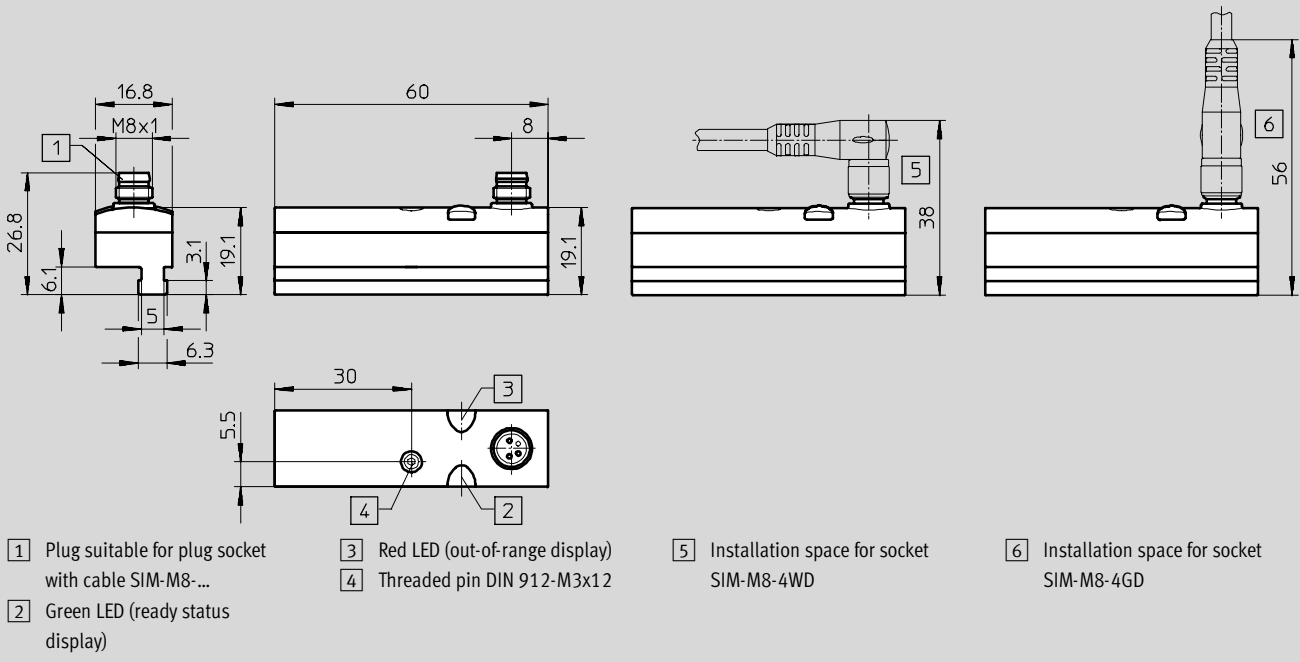
## Analogue output as a function of the piston position



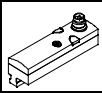
Analogue output		Description	Range
[V]	[mA]		
0	0	No valid signal, e.g. no operating voltage	–
1	2	Piston outside of measuring range after operating voltage is switched on	A, C
2	4	Piston has left the measuring range in the negative direction	A
10	20	Piston has left the measuring range in the positive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

## Dimensions

Download CAD data → [www.festo.com/en/engineering](http://www.festo.com/en/engineering)



## Ordering data

	Analogue output	Electrical connection	Part No.	Type
	0 ... 10 V 0 ... 20 mA	Plug M8x1, 4-pin	<b>540 191</b>	<b>SMAT-8E-S50-IU-M8</b>

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Accessories

## Plug socket with cable M8

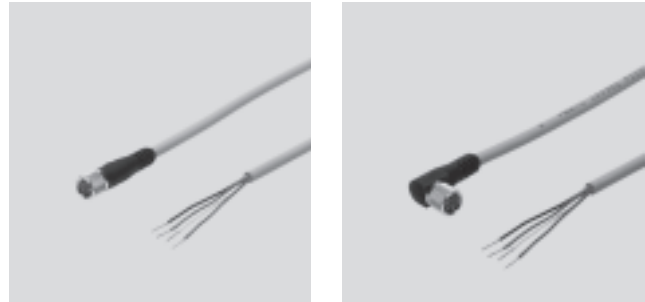
**SIM-M8-4GD-...**

**SIM-M8-4WD-...**

Material:

Housing: Polyurethane

Cable sheath: Polyurethane



Ordering data						
Switching output		Switching status display with LED	Cable length [m]	Weight [g]	Part No.	Type
PNP	NPN					
Straight socket						
■	■	-	2.5		158 960	SIM-M8-4GD-2,5-PU
■	■	-	5		158 961	SIM-M8-4GD-5-PU
Angled socket						
■	■	-	2.5		158 962	SIM-M8-4WD-2,5-PU
■	■	-	5		158 963	SIM-M8-4WD-5-PU