

Position transmitters SMAT-8E, for T-slot

Product overview



- Position measuring range 50 mm
- Analogue output 0 ... 10 V and 0 ... 20 mA
- Integrated out-of-range detection
- Typical repeat accuracy 0.1 mm
- Direct mounting in T-slot

Detailed product information
➔ www.festo.com/catalogue/smat

Product overview							
Design	Type of mounting	Measuring principle	Operating voltage range	Analogue output	Switch output	Switching element function	➔ Page
Position transmitter SMAT-8E							
For T-slot	Insertable in slot lengthwise	Magnetic	15 ... 30 V DC	0 ... 10 V 0 ... 20 mA	–	–	43

Position transmitters SMAT-8E, for T-slot

Key features

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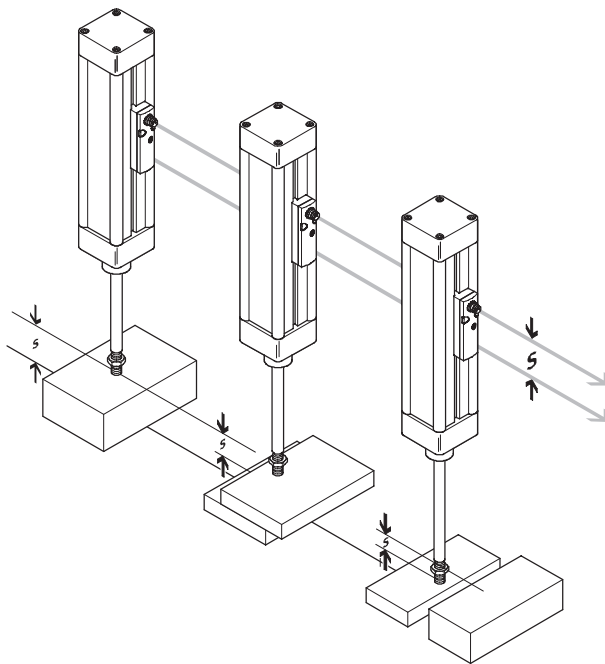
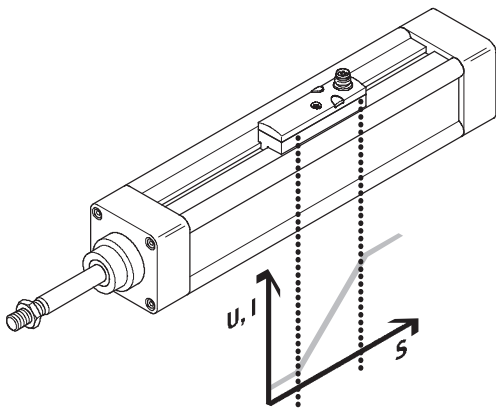
Design

The SMAT-8E is a sturdy magnetic measuring system with a 50 mm working range, regardless of the drive unit used. It provides a standardised

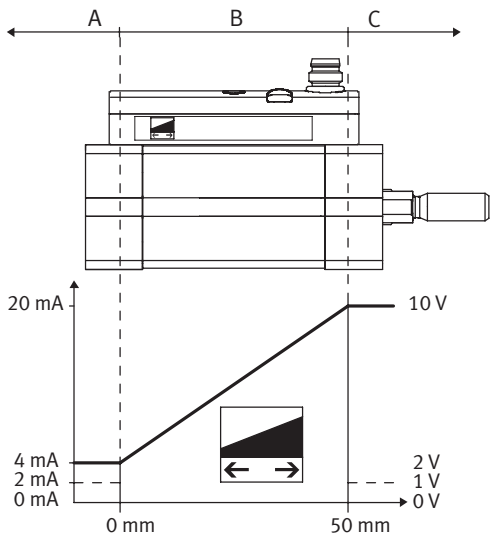
analogue current and voltage signal via an M8x1 plug connection. The transmitter can thus be connected directly to the analogue input of a pro-

grammable 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 repeatability of 0.1 mm.



Analogue output as a function of the piston position



Analogue output		Description	Area
[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

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.

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Selection aid

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Drive	Piston Ø	Suitability	Drive	Piston Ø	Suitability
Standards-based cylinders			Drives with linear guide		
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 10 ... 16	–
Standard cylinders DNU		–		Ø 25 ... 80	o
Standard cylinders ADN		++	Mini guided drives DFC		–
Cylinders with piston rod			Guided drives DFM	Ø 12, 25, 50	++
Compact cylinders ADVU, AEVU		++		Ø 16, 20, 32, 40, 63, 80	+
Short-stroke cylinders ADVC, AEVC	Ø 6 ... 25	–		Ø 100	–
	Ø 32 ... 100	++	Guided drives DFM-B	Ø 12, 16, 25, 32	–
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	++		Ø 63	–
Flat cylinders DZH	Ø 16 ... 25	+	Linear units SLE		–
	Ø 32 ... 63	–	Twin cylinders DPZC		–
Round cylinders DSNU, ESNU		o	Twin cylinders DPZ		–
Round cylinders DSW, ESW		o	Handling units		
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		–	Parallel grippers HGPP		–
Standard cylinders CRDNCS		–	Parallel grippers HGPT		–
Rodless cylinders			Angle grippers HGW		–
Linear drives DGC		–	Radial grippers HGR		–
Linear drives DGP, DGPL		–	Cushioning components		
Linear drives SLG		–	Hydraulic stop elements YSRWJ		–
Linear drives DGO		–	Electrical positioning systems		
Linear drives SLM	Ø 12, 40	++	Toothed belt axes DGE-ZR		–
	Ø 16 ... 32	o	Spindle axes DGE-SP		–
Semi-rotary drives			System components		
Swivel modules DSM	Ø 6 ... 10	–	Heavy-duty guides HD		–
Semi-rotary drives DRQ		–	Valve actuators		
Semi-rotary drives DRQD	Ø 6, 8, 12, 40, 50	–	Copac linear actuators DLP-A		–
	Ø 16 ... 32	++			
Function-oriented drives					
Stopper cylinders STA, STAF		–			
Linear/swivel clamps CLR		o			
Swivel/linear units DSL		–			

- ++ Unrestricted use
- + Sensor function guaranteed without restriction; installation direction and clamping are drive-specific
- o Upon request
- Not suitable

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
Type codes, technical data

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		SMAT	–	8E	–	S50	–	IU	–	M8
Type										
SMAT	Position transmitter, magnetic									
Design										
8E	For T-slot, insertable from end									
Position measuring range										
S50	48 ... 52 mm									
Analogue output										
IU	0 ... 10 V, 0 ... 20 mA									
Electrical connection										
M8	Plug M8x1									

Technical data		
Design		
Design		For T-slot
Type of mounting		Clamped, insertable in slot lengthwise
Status display		Red LED = outside measuring range
Electrical data		
Analogue output	[V]	0 ... 10
	[mA]	0 ... 20
Typical scanning interval	[ms]	2.85
Displacement resolution	[mm]	0.064
Electrical connection		Plug, M8x1, 4-pin
Operating voltage range	[V DC]	15 ... 30
Protection against short circuit		Yes
Protection against overloading		Yes
Protection against polarity reversal		For all electrical connections
Measuring principle		Magnetic
Position measuring range	[mm]	48 ... 52
Repetition accuracy, analogue value	[mm]	±0.064
Linearity error	[mm]	Typically 0.25
Max. speed of travel	[m/s]	3
Protection class		IP65, IP67
Operating and environmental conditions		
Ambient temperature	[°C]	−20 ... +50 ¹⁾
CE mark (see declaration of conformity)		In accordance with EU EMC directive
Certification		c UL us - Listed (OL)
		C-Tick
Materials		
Housing		Reinforced polyamide
		Polycarbonate

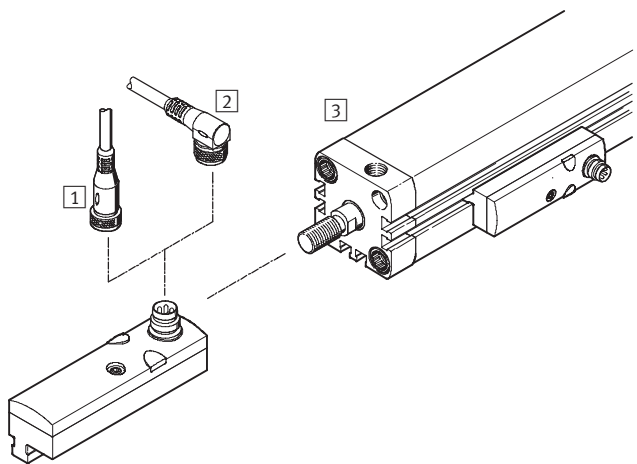
1) Extended ambient temperature range on request

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



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Peripherals overview

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Accessories		→ Page
1	Connecting cable NEBU-M8G4	45
2	Connecting cable NEBU-M8W4	45
3	Fitted to drive with T-slot	43

Ordering data – Connecting cables			Technical data → 169	
	Number of wires	Cable length [m]	Part No.	Type
Straight plug socket				
	4	2.5	541 342	NEBU-M8G4-K-2.5-LE4
		5	541 343	NEBU-M8G4-K-5-LE4
Angled plug socket				
	4	2.5	541 344	NEBU-M8W4-K-2.5-LE4
		5	541 345	NEBU-M8W4-K-5-LE4

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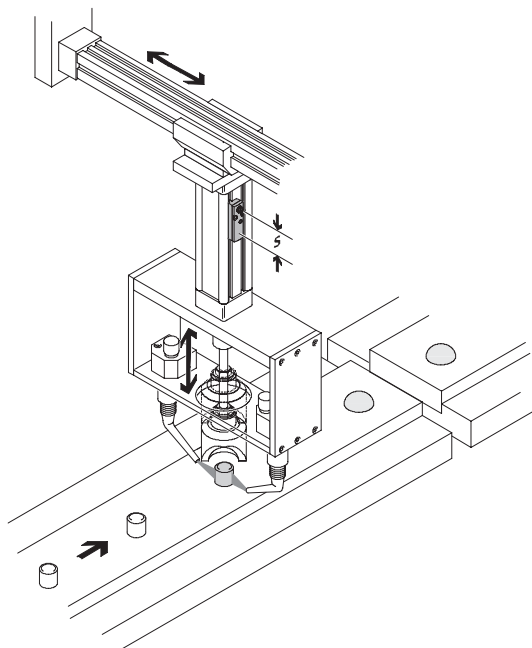
Application examples

Application examples

Many typical applications can be found in the areas of object detection and process monitoring:

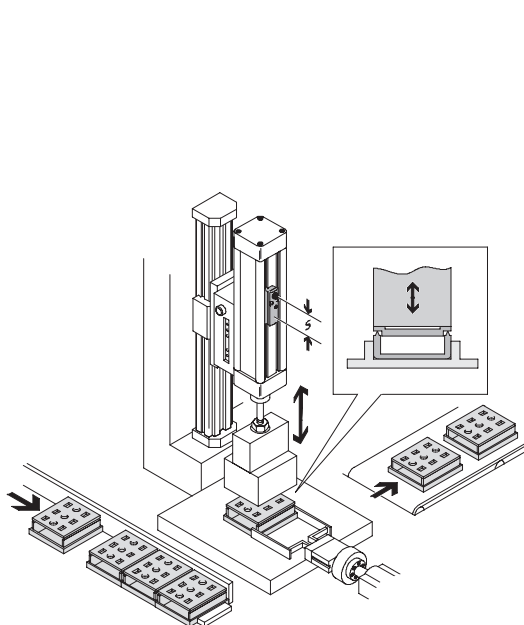
- Joining procedures
- Clamping
- Position sensing
- Detection of good/reject parts
- Workpiece placement
- Quality inspection
- Wear monitoring
- Thickness measuring

Hot air riveting



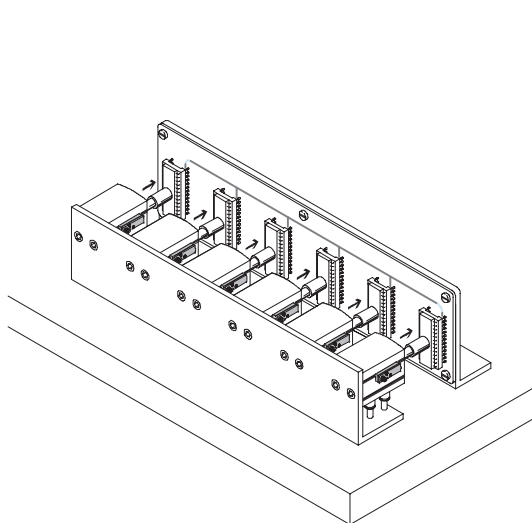
- After the rivet has been heated using hot air, the rivet head is formed by compressing it with the die.
- The feed motion of the riveting die is controlled using the position transmitter.

Ultrasonic welding



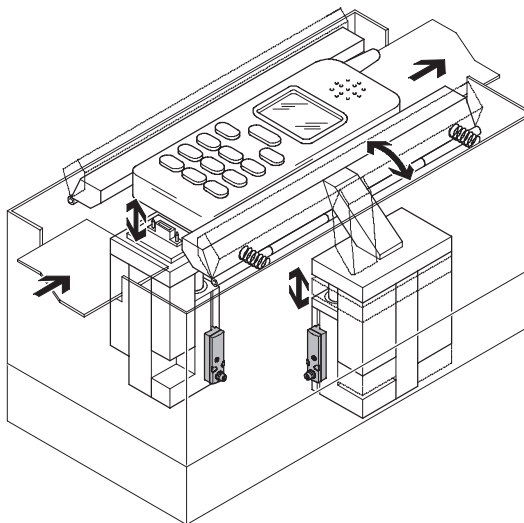
- The joining of sections of material using ultrasonics must be defined. The position transmitter is used for contactless and wear-free detection of the feed motion of the sonotrode.

Pressing



- Feed or press-in depth is monitored using the position transmitter.

Clamping



- The position and movement of the clamping jaws is fed back via the position transmitter for process monitoring/quality inspection.

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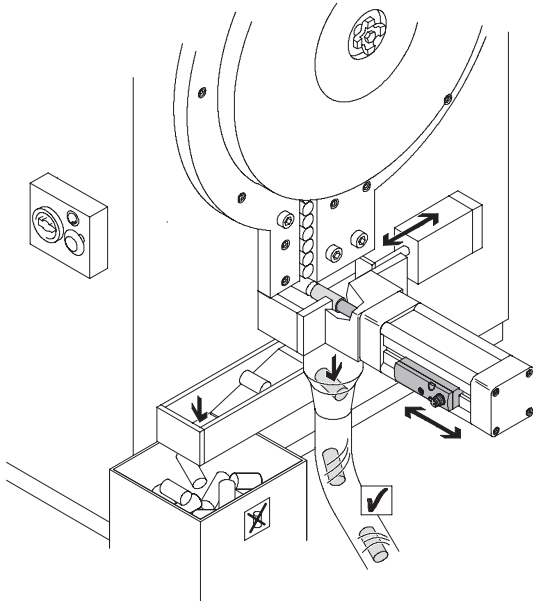
Application examples

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Sensors
Sensors for drive units

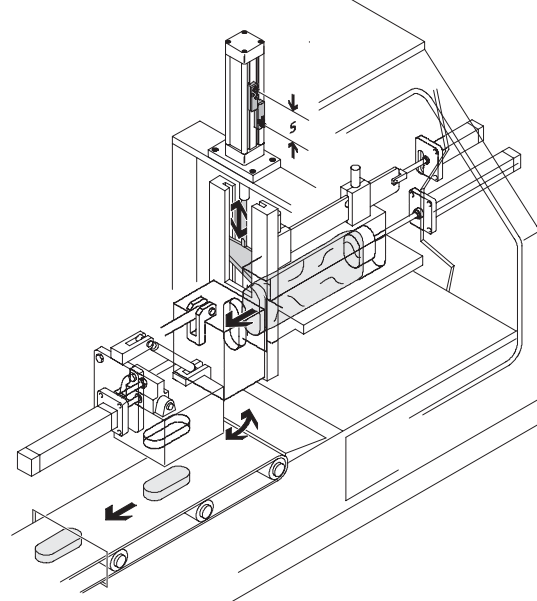
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Detection of good/reject parts



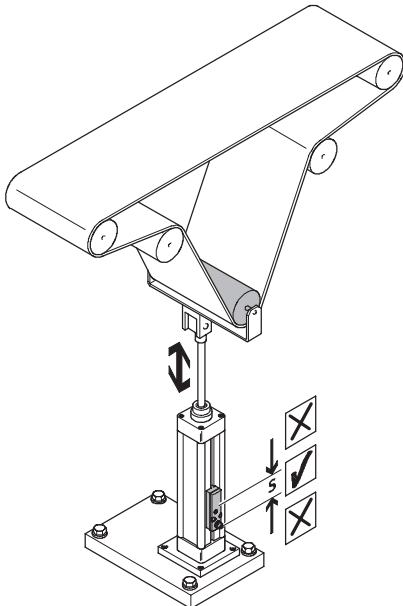
- The length or thickness of components is detected using the position transmitter and sorted into good and reject parts according to the result.

Cutting



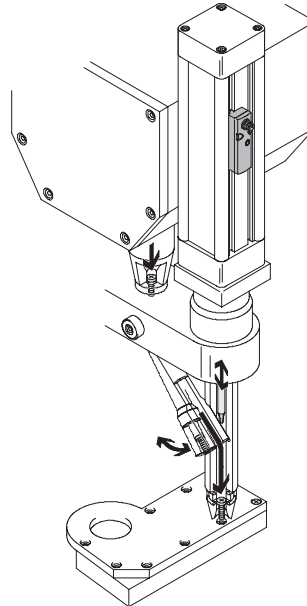
- The cutting depth of the blade is monitored and the blade is retracted when the required depth is reached.

Position monitoring



- The desired belt tension is preset using the piston position of the cylinder. The position transmitter is used to monitor an area for the preset piston position. Ageing and stretching of the belt can be detected at an early stage by means of the resulting change in the piston position.

Automatic screwdriver application



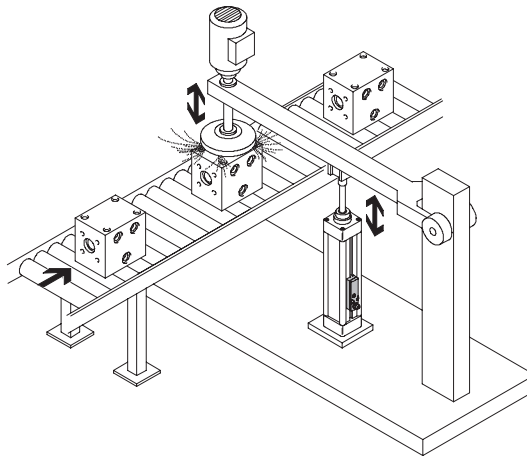
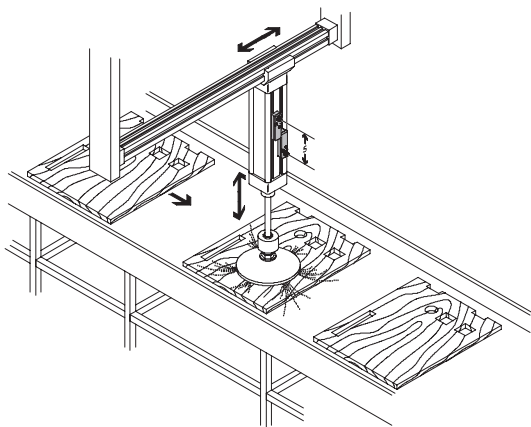
- The feed motion of the power screwdriver and, consequently, the screw-in depth is detected using the position transmitter and the screwdriver is switched off or reversed depending on the depth.

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Application examples

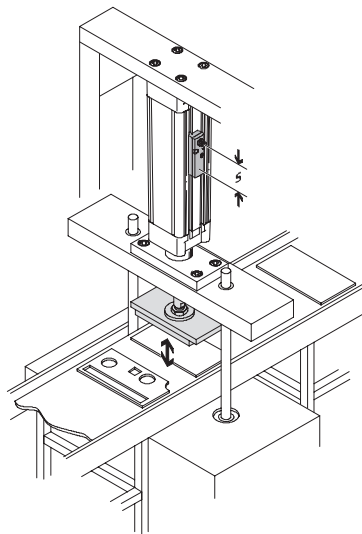
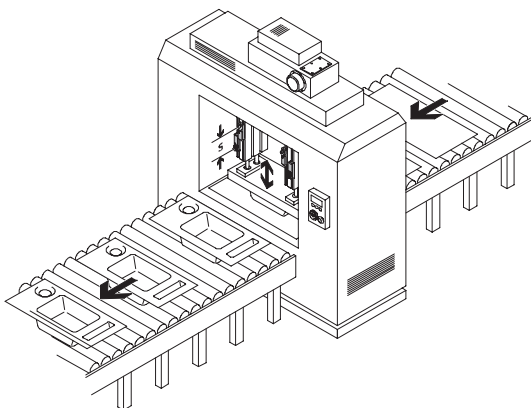
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Grinding



- The feed motion of the grinding disc is monitored using the position transmitter.

Punching



- The feed motion of the punching device is monitored using the position transmitter.