



## **Position Transmitters SMAT-8E, for T-slot**



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

Product overview

**FESTO**



- Position measuring range 50 mm
- Analogue output 0 ... 10 V and 0 ... 20 mA
- Integrated out-of-range detection
- Repeat accuracy  $\pm 0,064$  mm
- Direct mounting in T-slot

Detailed product information

➔ [www.festo.com/catalogue/smat](http://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

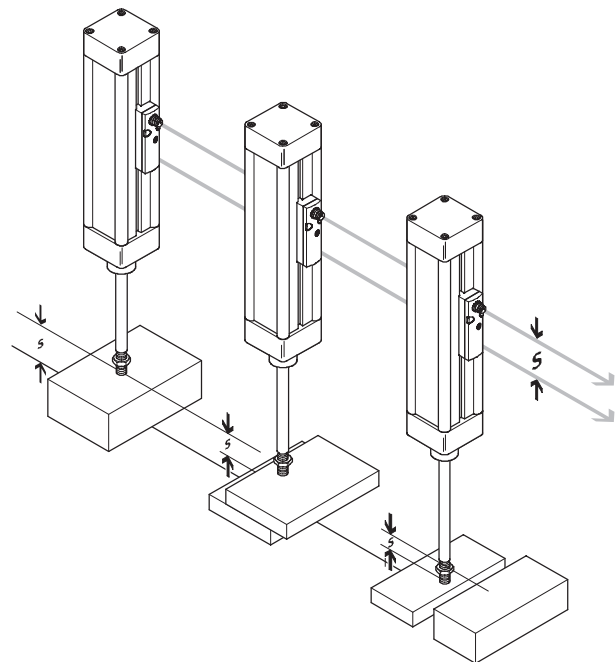
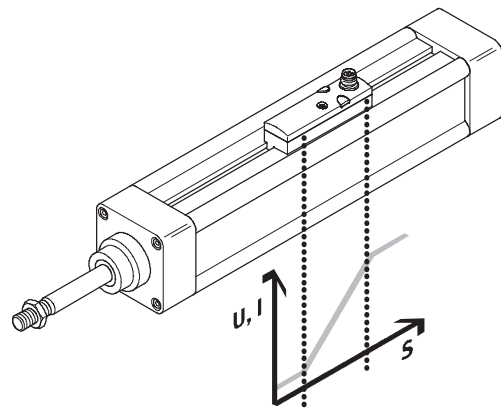
## Design

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

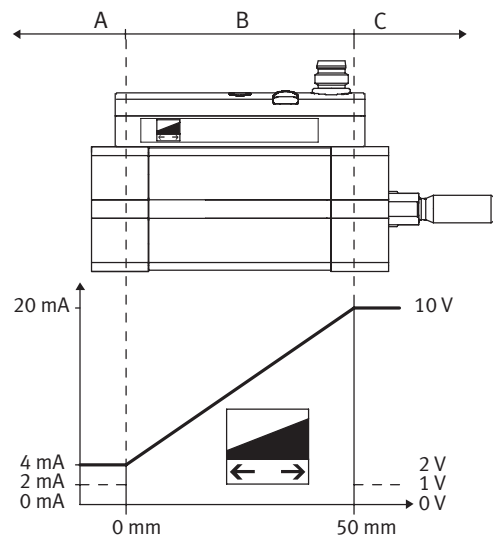
analogue current and voltage signal via an M8x1 plug connection. The transmitter can thus be connected directly to the analogue input of a pro-

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.

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

Selection aid

FESTO

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

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


Type codes, technical data

FESTO

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

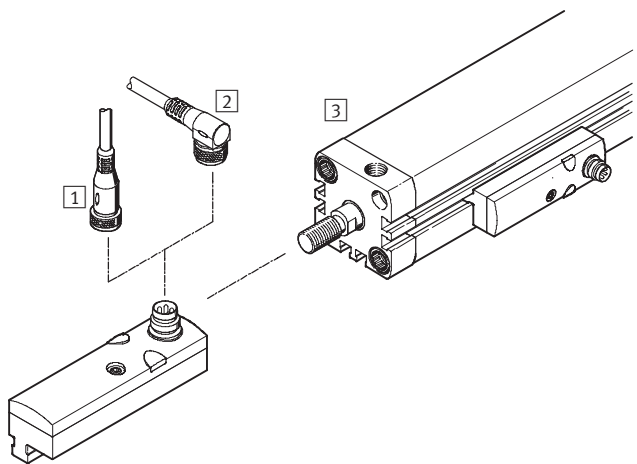
Technical data		
Design		
Design		For T-slot
Type of mounting		Clamped, insertable in slot lengthwise
Status display		Red LED = outside measuring range
Electrical data		
Analogue output	[V]	0 ... 10
	[mA]	0 ... 20
Typical scanning interval	[ms]	2.85
Displacement resolution	[mm]	0.064
Electrical connection		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
Typical linearity error	[mm]	0.25
Max. speed of travel	[m/s]	3
Protection class		IP65, IP67
Operating and environmental conditions		
Ambient temperature	[°C]	–20 ... +50 <sup>1)</sup>
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

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

Peripherals overview



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 → 261	
	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	

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

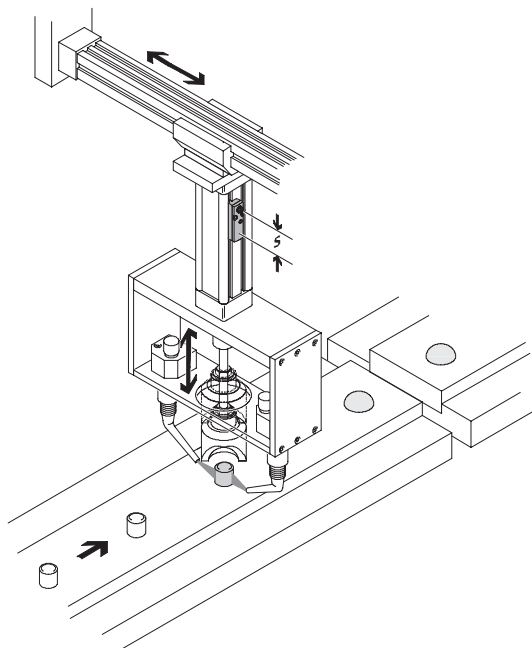
Application examples

## Application examples

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

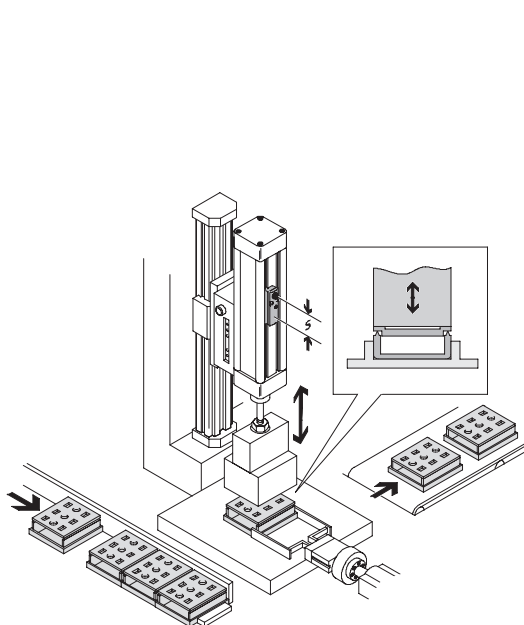
- Joining procedures
- Clamping
- Position sensing
- Detection of good/reject parts
- Workpiece placement
- Quality inspection
- Wear monitoring
- Thickness measuring

### 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.

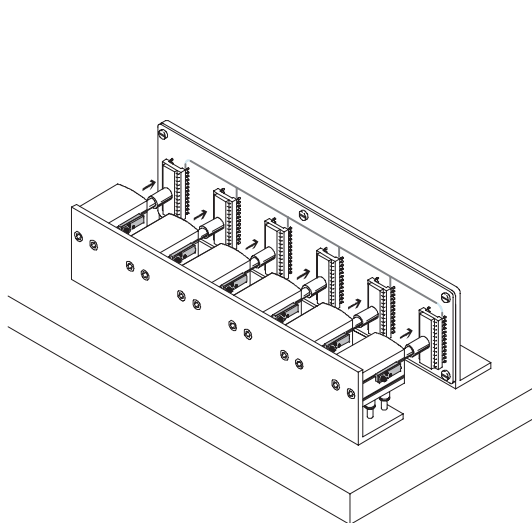
### Ultrasonic welding



- The joining of sections of material using ultrasonics must be defined. The position transmitter is used for

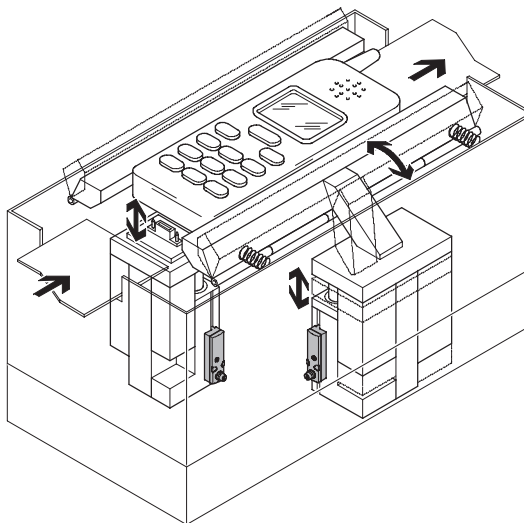
contactless and wear-free detection of the feed motion of the sonotrode.

### 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.



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

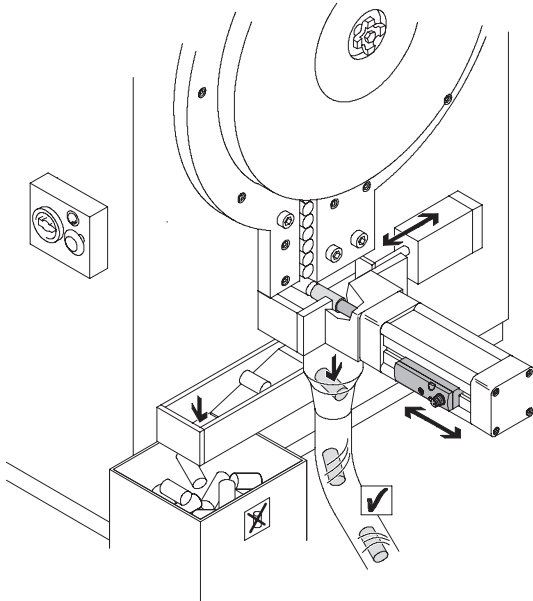
Application examples

FESTO

Sensors  
Sensors for drive units

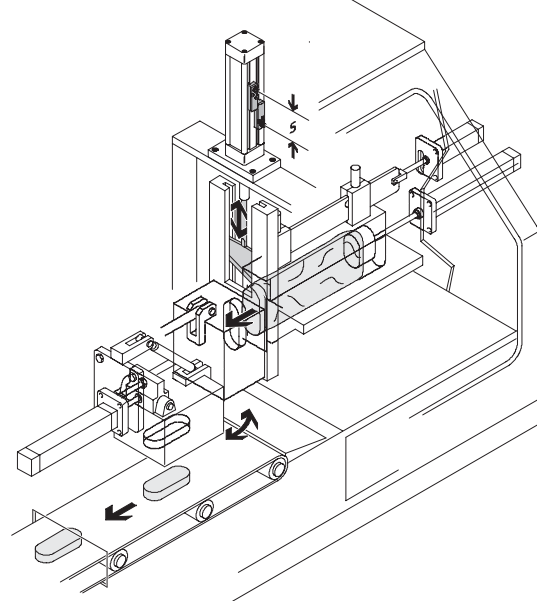
1.1

## Detection of good/reject parts



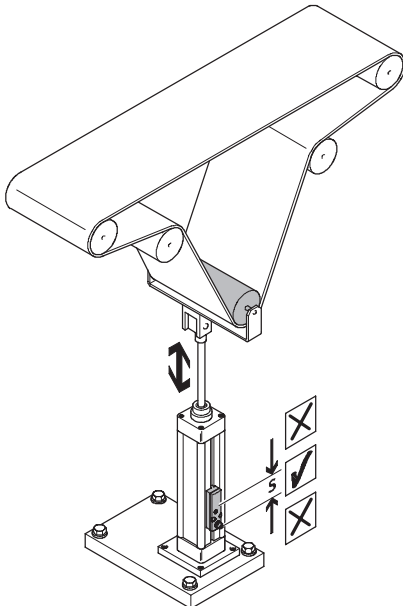
- The length or thickness of components is detected using the position transmitter and sorted into good and reject parts according to the result.

## Cutting



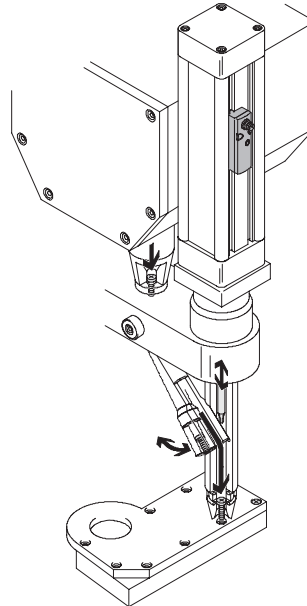
- The cutting depth of the blade is monitored and the blade is retracted when the required depth is reached.

## 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



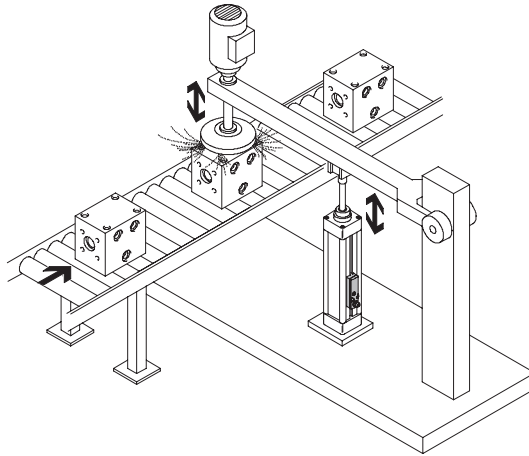
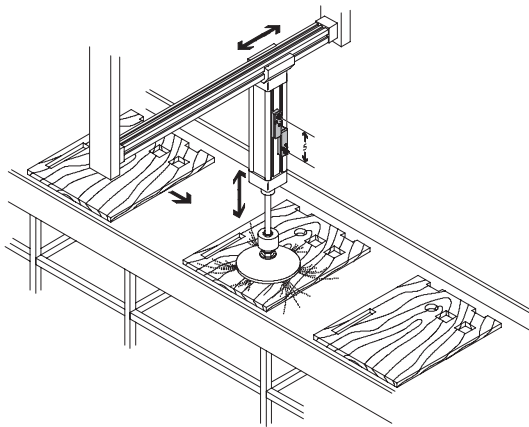
- The feed motion of the power screwdriver and, consequently, the screw-in depth is detected using the position transmitter and the screwdriver is switched off or reversed depending on the depth.

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

Application examples

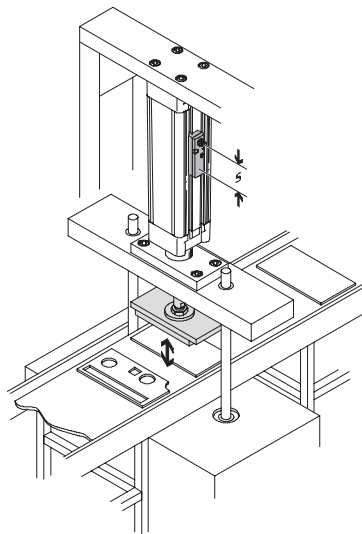
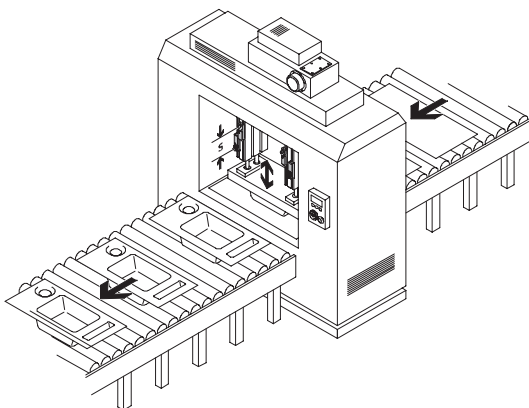
FESTO

### 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.

# Product Range and Company Overview

## A Complete Suite of Automation Services

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.



**Custom Automation Components**  
Complete custom engineered solutions



**Custom Control Cabinets**  
Comprehensive engineering support  
and on-site services



**Complete Systems**  
Shipment, stocking and storage services

## The Broadest Range of Automation Components

With a comprehensive line of more than 30,000 automation components, Festo is capable of solving the most complex automation requirements.



**Electromechanical**  
Electromechanical actuators, motors,  
controllers & drives



**Pneumatics**  
Pneumatic linear and rotary actuators,  
valves, and air supply



**PLCs and I/O Devices**  
PLC's, operator interfaces, sensors  
and I/O devices

## Supporting Advanced Automation... As No One Else Can!

Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 12,000 employees in 56 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

## Quality Assurance, ISO 9001 and ISO 14001 Certifications

Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.



© Copyright 2008, Festo Corporation. While every effort is made to ensure that all dimensions and specifications are correct, Festo cannot guarantee that publications are completely free of any error, in particular typing or printing errors. Accordingly, Festo cannot be held responsible for the same. For Liability and Warranty conditions, refer to our "Terms and Conditions of Sale", available from your local Festo office. All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior written permission of Festo. All technical data subject to change according to technical update.



Printed on recycled paper at New Horizon Graphic, Inc., FSC certified as an environmentally friendly printing plant.

# Festo North America

## United States

### Customer Resource Center

502 Earth City Expy., Suite 125  
Earth City, MO 63045

For ordering assistance, or to find  
your nearest Festo Distributor,

**Call:** 1.800.99.FESTO

**Fax:** 1.800.96.FESTO

**Email:** customer.service@us.festo.com

For technical support,

**Call:** 1.866.GO.FESTO

**Fax:** 1.800.96.FESTO

**Email:** product.support@us.festo.com

### Headquarters

Festo Corporation  
395 Moreland Road  
P.O. Box 18023  
Hauppauge, NY 11788  
[www.festo.com/us](http://www.festo.com/us)

---

## Sales Offices

### Appleton

N. 922 Tower View Drive, Suite N  
Greenville, WI 54942

### Boston

120 Presidential Way, Suite 330  
Woburn, MA 01801

### Chicago

1441 East Business Center Drive  
Mt. Prospect, IL 60056

### Dallas

1825 Lakeway Drive, Suite 600  
Lewisville, TX 75057

### Detroit - Automotive Engineering Center

2601 Cambridge Court, Suite 320  
Auburn Hills, MI 48326

### New York

395 Moreland Road  
Hauppauge, NY 11788

### Silicon Valley

4935 Southfront Road, Suite F  
Livermore, CA 94550

## Design and Manufacturing Operations



**East:** 395 Moreland Road, Hauppauge, NY 11788



**Central:** 1441 East Business Center Drive, Mt. Prospect, IL 60056



**West:** 4935 Southfront Road, Suite F, Livermore, CA 94550

---

## Mexico

### Headquarters

Festo Pneumatic, S.A.  
Av. Ceylán 3, Col. Tequesquahuac  
54020 Tlalnepantla, Edo. de México  
Call: 011 52 [55] 53 21 66 00  
Fax: 011 52 [55] 53 21 66 65  
Email: festo.mexico@mx.festo.com  
[www.festo.com/mx](http://www.festo.com/mx)



## Canada

### Headquarters

Festo Inc.  
5300 Explorer Drive  
Mississauga, Ontario L4W 5G4  
Call: 1.905.624.9000  
Fax: 1.905.624.9001  
Email: info.ca@ca.festo.com  
[www.festo.com/ca](http://www.festo.com/ca)



---

## Festo Worldwide

Argentina Australia Austria Belarus Belgium Brazil Bulgaria Canada Chile China Colombia Croatia Czech Republic Denmark  
Estonia Finland France Germany Great Britain Greece Hong Kong Hungary India Indonesia Iran Ireland Israel Italy Japan  
Latvia Lithuania Malaysia Mexico Netherlands New Zealand Norway Peru Philippines Poland Romania Russia Serbia Singapore  
Slovakia Slovenia South Africa South Korea Spain Sweden Switzerland Taiwan Thailand Turkey Ukraine United States Venezuela

[www.festo.com](http://www.festo.com)