

escapements

**FE** Series  
Feed Escapement



**numatics**

# Table of Contents

**NUMATICS®**

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<b>FE Series</b> .....	3-6
Features and Benefits .....	3
How To Order .....	4
Dimensions and Technical Specifications .....	4
Switch Information .....	5-6

Air-Oil Systems, Inc. [www.airoil.com](http://www.airoil.com)



The FE-Series design uses two double acting cylinders that are cross-ported and internally sequenced for smooth functioning parts regulation. Internal back pressure cross-port design allows both rods to be retracted with the air off to easily clear jammed parts. A four way two position valve is required for operation.

### A. Body

High strength hardcoat aluminum.

### B. Rods

Ground aluminum, hardcoat anodized, Teflon impregnated non-rotating.

### C. Retract Stop Adjustments

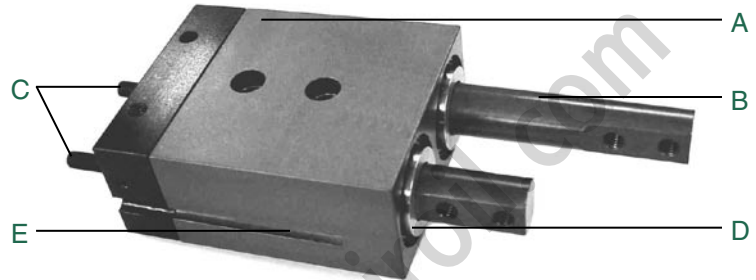
Two adjustment screws allow flexibility to adjust the retract stroke on both rods independently.

### D. Bronze Bushings

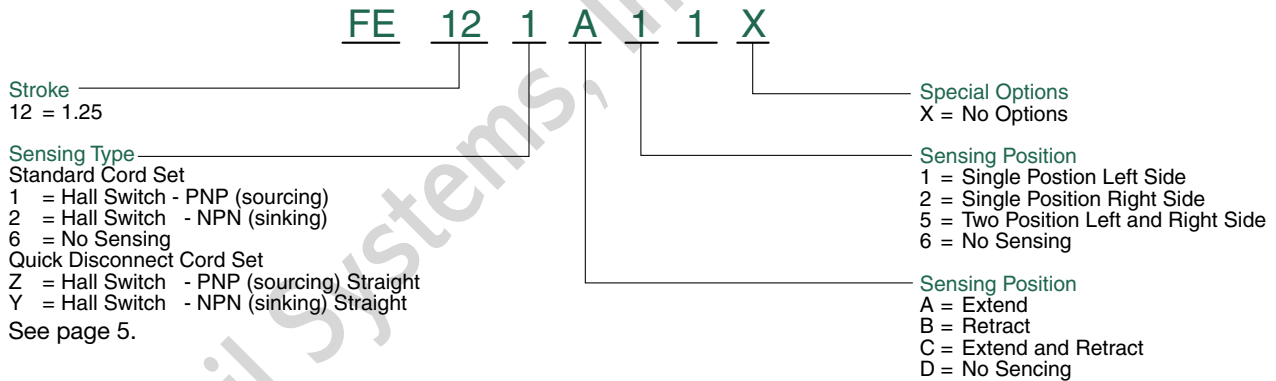
High side load capabilities, self lubricating, long life.

### E. Sensing

Hall effect sensors available to sense extend & retract positions.



## How to Order

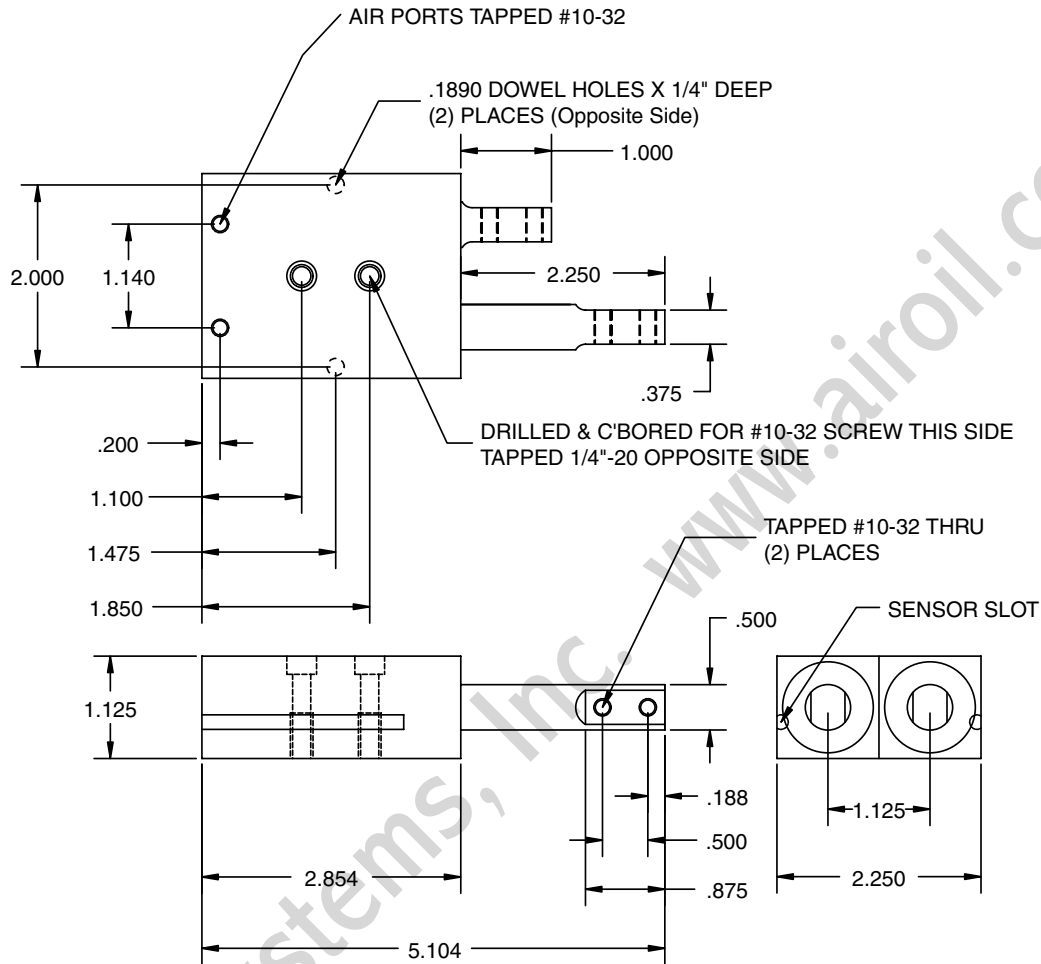


### When ordering additional switches:

SWITCH DESCRIPTION	STANDARD PART NO.	QUICK DISCONNECT PART NO.
Hall Effect-PNP (Sourcing)	CS-20TP	CS-20TP-QD
Hall Effect-NPN (Sinking)	CS-20TN	CS-20TN-QD
Reed Switch	CS-20TR	CS-20TR-QD



### FE Series Dimensions and Technical Specifications

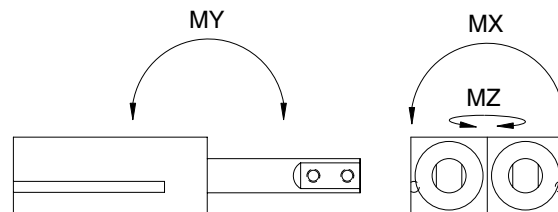


### Specifications

#### FE-12

Stroke	1.25 in.
Force Extend @ 100 psi	43.0 lbs.
Force Retract @ 100 psi	41.0 lbs.
Time	0.35 Sec.
Pressure Range	40-120 psi
Side Play	+/- 0.001 in.
Displacement	0.48 cu. in.
Weight	12.0 oz.

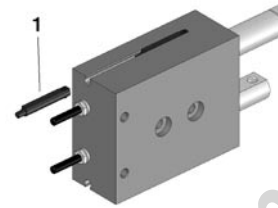
LOAD CAPACITY	STATIC	DYNAMIC
Mx	150	13 in.-lbs.
My	150	13 in.-lbs.
Mz	150	13 in.-lbs.



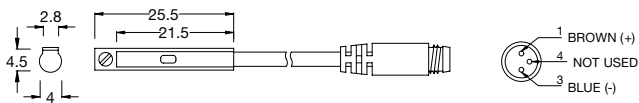


### FE Series Switch Information

	SWITCH OR BRACKET DESCRIPTION	STANDARD PART NO.	QUICK DISCONNECT PART NO.
1	Hall Effect PNP (Sourcing) 4mm	CS-20TP	CS-20TP-QD
1	Hall Effect NPN (Sinking) 4mm	CS-20TN	CS-20TN-QD
1	Reed Switch 4mm	CS-20TR	CS-20TR-QD

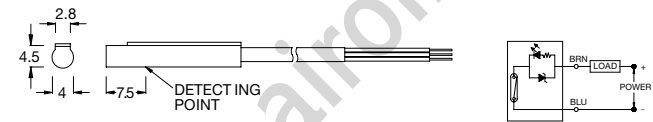


### Reed Switch (AC/DC NO) 8 mm Connector - CS-20TR-QD



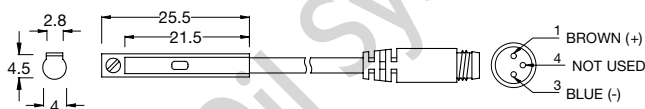
Sensor Type	Reed Switch
Switching Logic	SPST Normally Open
Output	-
Operating Voltage	5-120V DC/AC 50/60 Hz
Switching Current	50mA max. (Resistive)
Power Rating*	6 Watts
Voltage Drop	2.5V
Current Consumption	-
Leakage Current	-
LED Indicator	Red
Operating Frequency	200 Hz
Temperature Range	-
Shock / Vibration	30G/9G
Protection Circuit	None
Set Screw Max. Torque	-

### Reed Switch (AC/DC NO) Flying Lead - CS-20TR



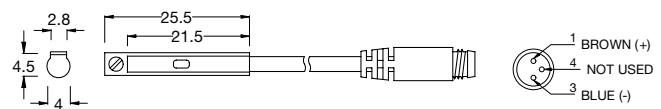
Sensor Type	Reed Switch
Switching Logic	SPST Normally Open
Output	-
Operating Voltage	5-120V DC/AC 50/60 Hz
Switching Current	50mA max. (Resistive)
Power Rating*	6 Watts
Voltage Drop	2.5 max.
Current Consumption	-
Leakage Current	-
LED Indicator	Red
Operating Frequency	200 Hz
Temperature Range	-
Shock / Vibration	30G/9G
Protection Circuit	None
Set Screw Max. Torque	-

### Electro Switch (PNP NO) 8 mm Connector - CS-20TP-QD



Sensor Type	Solid State Output
Switching Logic	Normally Open
Output	PNP Current Spurcing
Operating Voltage	5-30 VDC
Switching Current	50mA max.
Power Rating*	1.5 Watts
Voltage Drop	1.5 V @ 25 mA max.
Current Consumption	15 mA @ 24 VDC max.
Leakage Current	0.01 mA max.
LED Indicator	Green
Cable	-
Operating Frequency	1000 Hz
Magnetic Requirement	40 Gauss parallel
Temperature Range	14 to 158°F (-10 to 70°C)
Shock / Vibration	50G/9G
Enclosure Classification	IEC 529 IP67 (NEMA 6)
Protection Circuit	Reverse Polarity, Surge Suppression
Set Screw Max. Torque	1.77 in-lbs (0.2 N-m)

### Electro Switch (NPN NO) 8 mm Connector - CS-20TN-QD

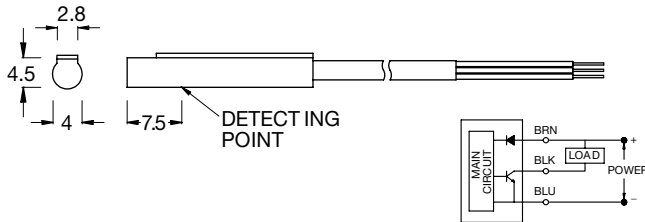


Sensor Type	Solid State Output
Switching Logic	Normally Open
Output	NPN Current Spurcing
Operating Voltage	5-30 VDC
Switching Current	50mA max.
Power Rating*	1.5 Watts
Voltage Drop	0.5 V @ 25 mA max.
Current Consumption	12 mA @ 24 VDC max.
Leakage Current	0.01 mA max.
LED Indicator	Red
Cable	-
Operating Frequency	1000 Hz
Magnetic Requirement	40 Gauss parallel
Temperature Range	14 to 158°F (-10 to 70°C)
Shock / Vibration	50G/9G
Enclosure Classification	IEC 529 IP67 (NEMA 6)
Protection Circuit	Reverse Polarity, Surge Suppression
Set Screw Max. Torque	1.77 in-lbs (0.2 N-m)



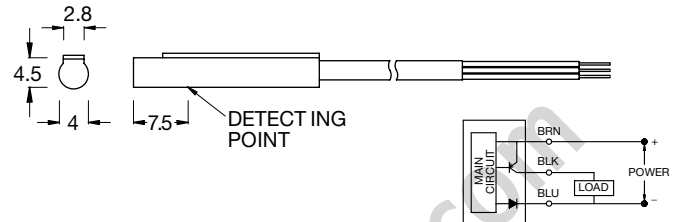
## FE Series

### Electro Switch (NPN NO) Flying Lead - CS-20TN



Sensor Type	Solid State Output
Switching Logic	Normally Open
Output	NPN Current Spurcing
Operating Voltage	5-30 VDC
Switching Current	50mA max.
Power Rating*	1.5 Watts
Voltage Drop	0.5 V @ 25 mA max.
Current Consumption	12 mA @ 24 VDC max.
Leakage Current	0.01 mA max.
LED Indicator	Red
Cable	-
Operating Frequency	1000 Hz
Magnetic Requirement	40 Gauss parallel
Temperature Range	14 to 158°F (-10 to 70°C)
Shock / Vibration	50G/9G
Enclosure Classification	IEC 529 IP67 (NEMA 6)
Protection Circuit	Reverse Polarity, Surge Suppression
Set Screw Max. Torque	1.77 in-lbs (0.2 N-m)

### Electro Switch (PNP NO) Flying Lead - CS-20TP



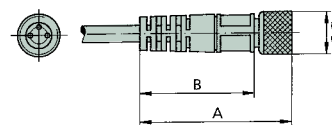
Sensor Type	Solid State Output
Switching Logic	Normally Open
Output	PNP Current Spurcing
Operating Voltage	5-30 VDC
Switching Current	50mA max.
Power Rating*	1.5 Watts
Voltage Drop	1.5 V @ 25 mA max.
Current Consumption	12 mA @ 24 VDC max.
Leakage Current	0.01 mA max.
LED Indicator	Green
Cable	Abrasion resistant polyurethane
	(PUR) jacket, PVC insulation
Operating Frequency	1000 Hz
Magnetic Requirement	40 Gauss parallel
Temperature Range	14 to 158°F (-10 to 70°C)
Shock / Vibration	50G/9G
Enclosure Classification	IEC 529 IP67 (NEMA 6)
Protection Circuit	Reverse Polarity, Surge Suppression
Set Screw Max. Torque	1.77 in-lbs (0.2 N-m)

## Female Connectors for Reed Switches and Hall Effect Sensors

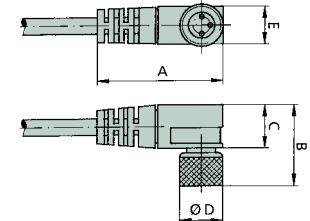
Dimensions (mm)

TYPE	ORDER CODE
Straight, 5 m Cable	PXCST
Elbow, 5 m Calbe	PXC90

### Straight Type



### Elbow Type



# NUMATICS®

World Class Supplier  
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## World Headquarters

### Numatics Incorporated

Phone: 248-887-4111  
Fax: 248-887-9190

## UNITED STATES

### Numatics – Air Preparation

Phone: 810-667-3900  
Fax: 810-667-3902

### Numatics – Valves

Phone: 248-887-4111  
Fax: 248-887-9190

### Numatics – Miniature Valves

Phone: 248-960-1400  
Fax: 248-960-2160

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Fax: 615-771-1201

### Numatics – Rodless Cylinders

Phone: 519-452-1777  
Fax: 519-452-3995

### Numatics – Automation

Phone: 440-934-3200  
Fax: 440-934-2288

## CANADA

### Ontario

Numatics, Ltd.  
Phone: 519-452-1777  
Fax: 519-452-3995

### Quebec

Numatics, Ltd.  
Phone: 514-332-6444  
Fax: 514-332-9273

### British Columbia

Numatics, Ltd.  
Phone: 604-574-0401  
Fax: 604-574-3713

## EUROPE

### Germany – European Headquarters

Numatics GmbH  
Phone: 011-49-22 41-31 60-0  
Fax: 011-49-22 41-31 60 40

### Hungary

Numatics Kft.  
Phone: 011-36-13 82 21 35  
Fax: 011-36-12 04 39 47

## EUROPE

### England

Numatics Limited  
Phone: 011-44-1525-37 07 35  
Fax: 011-44-1525-38 25 67

### France

Numatics s.a.r.l.  
Phone: 011-33-1 41 21 48 88  
Fax: 011-33-1 41 21 48 89

### Italy

Numatics srl  
Phone: 011-39-030-373 19 99  
Fax: 011-39-030-373 19 81

### Netherlands

Numatics B.V.  
Phone: 011-31-418-65 29 50  
Fax: 011-31-418-65 29 43

### Spain

Numatics Spain S.L.  
Phone: 011-34-93-221 21 96  
Fax: 011-34-93-221 35 14

## AFRICA

### South Africa

Numatics SA (Pty) Ltd.  
Phone: 011-27-11-8 65 44 52  
Fax: 011-27-11-8 65 42 90

## LATIN & SOUTH AMERICA

### Mexico

Numatics de Mexico S.A. de C.V.  
Phone: 011-52-222-284 6176  
Fax: 011-52-222-284 6179

### Brazil

Valvair Comercial Ltda.  
Phone: 011-55-12-351 2874  
Fax: 011-55-12-351 1958

## ASIA & PACIFIC

### Australia

Numatics Australia Pty. Ltd.  
Phone: 011-61-3-95 63 86 00  
Fax: 011-61-3-95 63 85 11

### Taiwan – Asian Headquarters

Numatics Co, Ltd. Asia  
Phone: 011-886-2-29 15 16 05  
Fax: 011-886-2-29 14 18 97

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