

# NUMATICS®

## FE Series

Feed Escapement



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## FE Series

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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, PTFE impregnated non-rotating.

### C. Retract Stop Adjustments

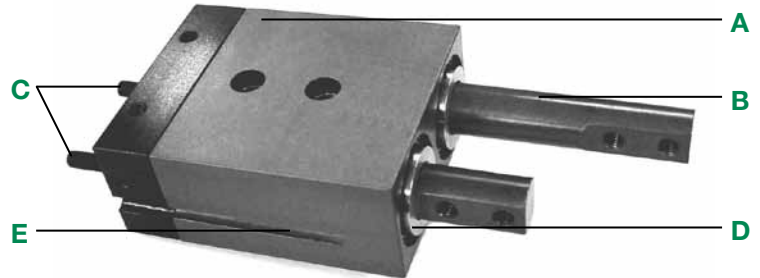
Two adjustment screws allow flexibility to adjust the retract stroke on both rods independently.

### D. Bronze Bushings

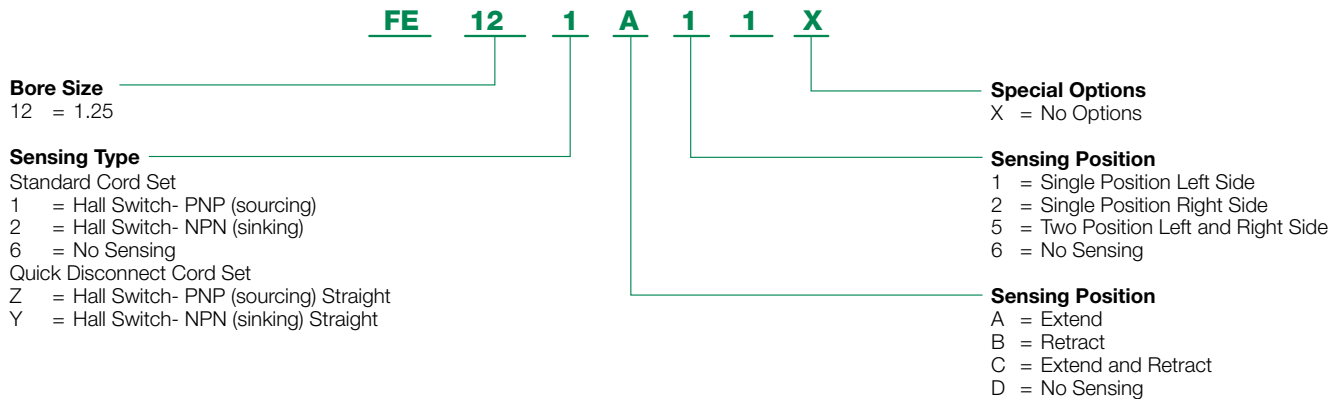
High side load capabilities, self lubricating, long life.

### E. Sensing

Hall effect sensors available to sense extend and retract positions.



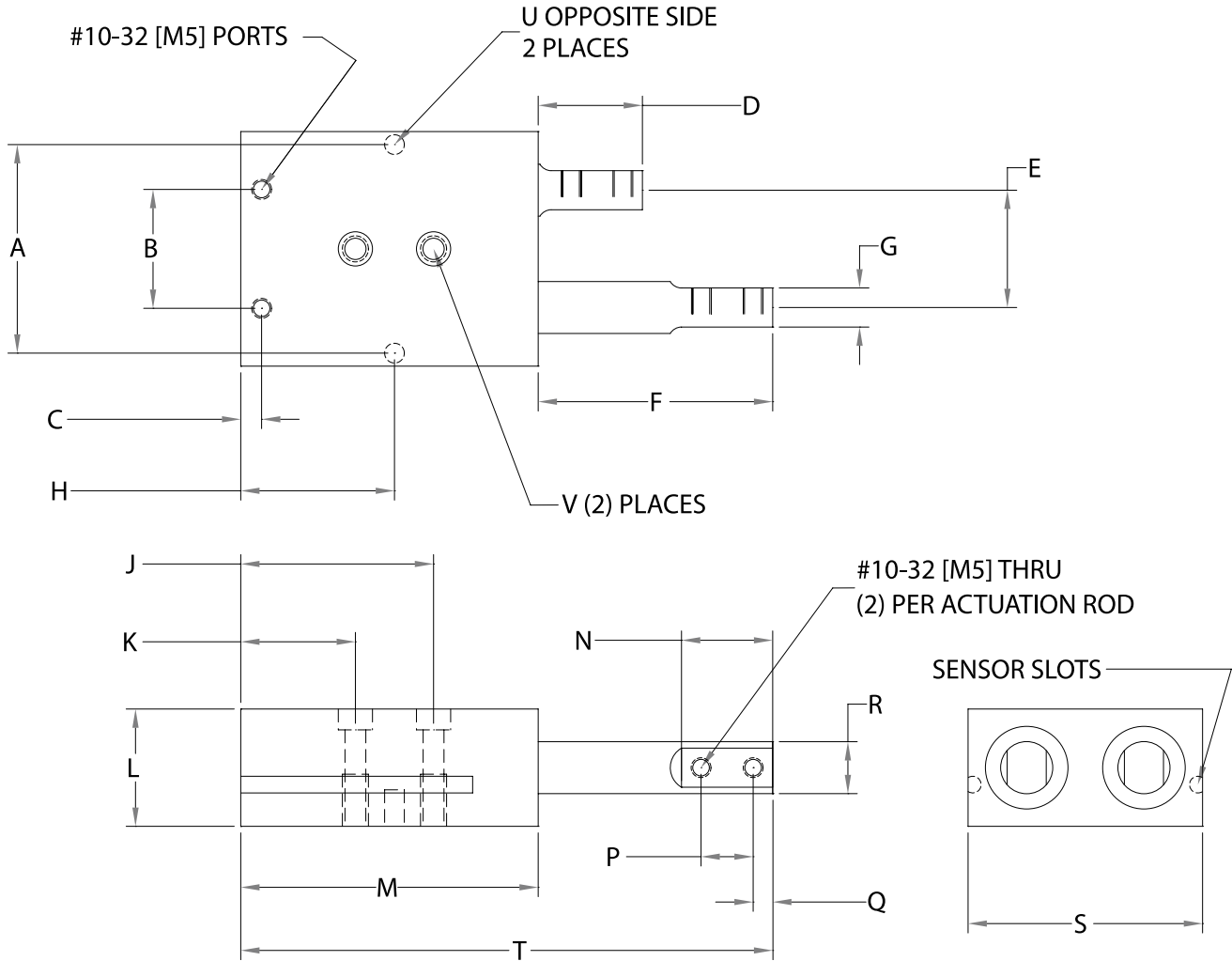
## How to Order



### When ordering additional switches:

Switch Description	Part No.	Quick Disconnect Part No.
Hall Effect PNP (Sourcing)	CS-20TP	CS-18P-QD
Hall Effect NPN (Sinking)	CS-20TN	CS-20TN-QD

**FE Series Dimensions**



## Dimensions: Inches

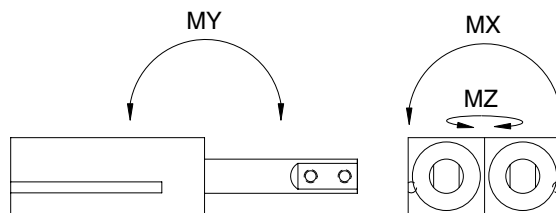
	FE11	FE12	FE13
A	1.6875	2.0000	2.5000
B	0.936	1.140	1.374
C	0.156	0.200	0.200
D	0.875	1.000	1.000
E	0.937	1.125	1.375
F	1.875	2.250	2.562
G	0.250	0.375	0.373
H	1.063	1.475	1.500
J	1.313	1.850	1.875
K	0.813	1.100	1.125
L	1.000	1.125	1.375
M	2.313	2.854	3.062
N	0.750	0.875	0.875
P	0.375	0.500	0.500
Q	0.188	0.188	0.188
R	0.375	0.500	0.562
S	1.875	2.250	2.750
T	4.188	5.104	5.625
U	1/8" S.F. .250 DEEP [3MM S.F. X 6MM DEEP]	3/16" S.F. .250 DEEP [5MM S.F. X 6MM DEEP]	3/16" S.F. .250 DEEP [5MM S.F. X 6MM DEEP]
V	C'B For #8-32 [M4] SHCS Tapped #10-32 [M5] Opp. Side	C'B For #10-32 [M5] SHCS Tapped # 1/4-20 [M6] Opp. Side	C'B For # 1/4-20 [M6] SHCS Tapped # 5/16-18 [M8] Opp. Side

## Specifications

	FE11	FE12	FE13
Stroke	1.0 in	1.25 in	1.56 in
Force Extend @ 100 psi	22.5 lbs.	43.7 lbs.	75 lbs.
Force retract @ 100 psi	12.5 lbs.	41.2 lbs.	65 lbs.
Time	.35 Sec	.35 Sec	.35 Sec
Pressure Range	20-120 psi	20-120 psi	20-120 psi
Side Play	+/- .002 in	+/- .002 in	+/- .002 in
Weight	8 oz	12 oz	1 lb

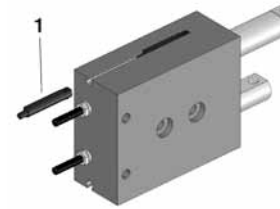
## Load Capacity (Dynamic)

	FE11	FE12	FE13
Mx	5 in-lbs	13 in-lbs	24 in-lbs
My	5 in-lbs	13 in-lbs	24 in-lbs
Mz	5 in-lbs	13 in-lbs	24 in-lbs

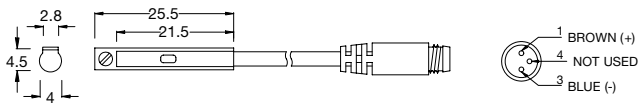


**FE Series Switch Information**

	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

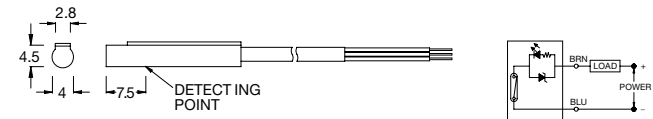


**Reed Switch (AC/DC NO)  
8 mm Connector - CS-20TR-QD**



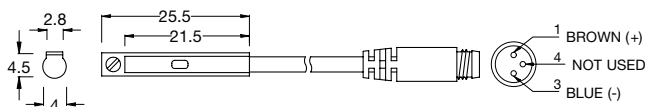
Sensor Type	Reed Switch
Switching Logic	SPST Normally Open
Output	-
Operating Voltage	5-120V DC/AC 50/60 Hz
Switching Current	50mA max. (Resistive)
Power Rating*	6 Watts
Voltage Drop	2.5V
Current Consumption	-
Leakage Current	-
LED Indicator	Red
Operating Frequency	200 Hz
Temperature Range	-
Shock /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

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



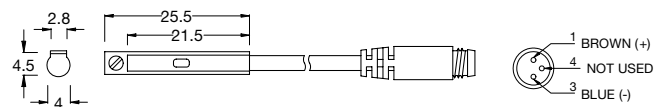
Sensor Type	Reed Switch
Switching Logic	SPST Normally Open
Output	-
Operating Voltage	5-120V DC/AC 50/60 Hz
Switching Current	50mA max. (Resistive)
Power Rating*	6 Watts
Voltage Drop	2.5 max.
Current Consumption	-
Leakage Current	-
LED Indicator	Red
Operating Frequency	200 Hz
Temperature Range	-
Shock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

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



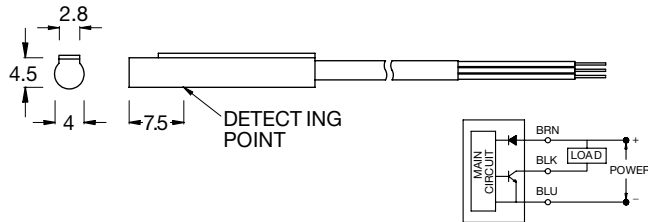
Sensor Type	Solid State Output
Switching Logic	Normally Open
Output	PNP Current Sourcing
Operating Voltage	5-30 VDC
Switching Current	50mA max.
Power Rating*	1.5 Watts
Voltage Drop	1.5 V @ 25 mA max.
Current Consumption	15 mA @ 24 VDC max.
Leakage Current	0.01 mA max.
LED Indicator	Green
Cable	-
Operating 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**



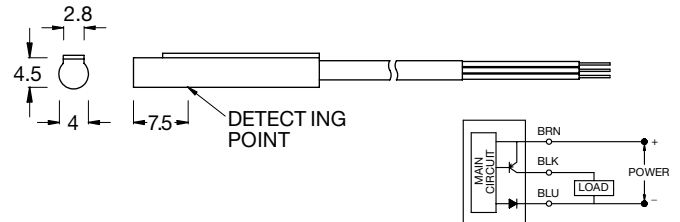
Sensor Type	Solid State Output
Switching Logic	Normally Open
Output	NPN Current Sinking
Operating Voltage	5-30 VDC
Switching Current	50mA max.
Power Rating*	1.5 Watts
Voltage Drop	0.5 V @ 25 mA max.
Current Consumption	12 mA @ 24 VDC max.
Leakage Current	0.01 mA max.
LED Indicator	Red
Cable	-
Operating 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 (NPN NO) Flying Lead - CS-20TN



Sensor Type	Solid State Output
Switching Logic	Normally Open
Output	NPN Current Sinking
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)

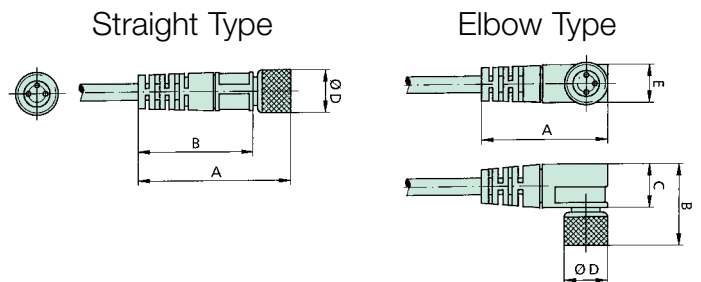
## Electro Switch (PNP NO) Flying Lead - CS-20TP



Sensor Type	Solid State Output
Switching Logic	Normally Open
Output	PNP Current Sourcing
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

Type	Order Code
Straight, 5 m Cable	PXCST
Elbow, 5 m Cable	PXC90





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