

TABLE OF CONTENTS

54

TS SERIES Pneumatic Cylinders



54	Features	60	32mm	Bore
56	How to Order	61	40mm	Bore
57	Engineering Data	62	50mm	Bore
58	20mm Bore	63	63mm	Bore
59	25mm Bore	64	76mm	Bore

87

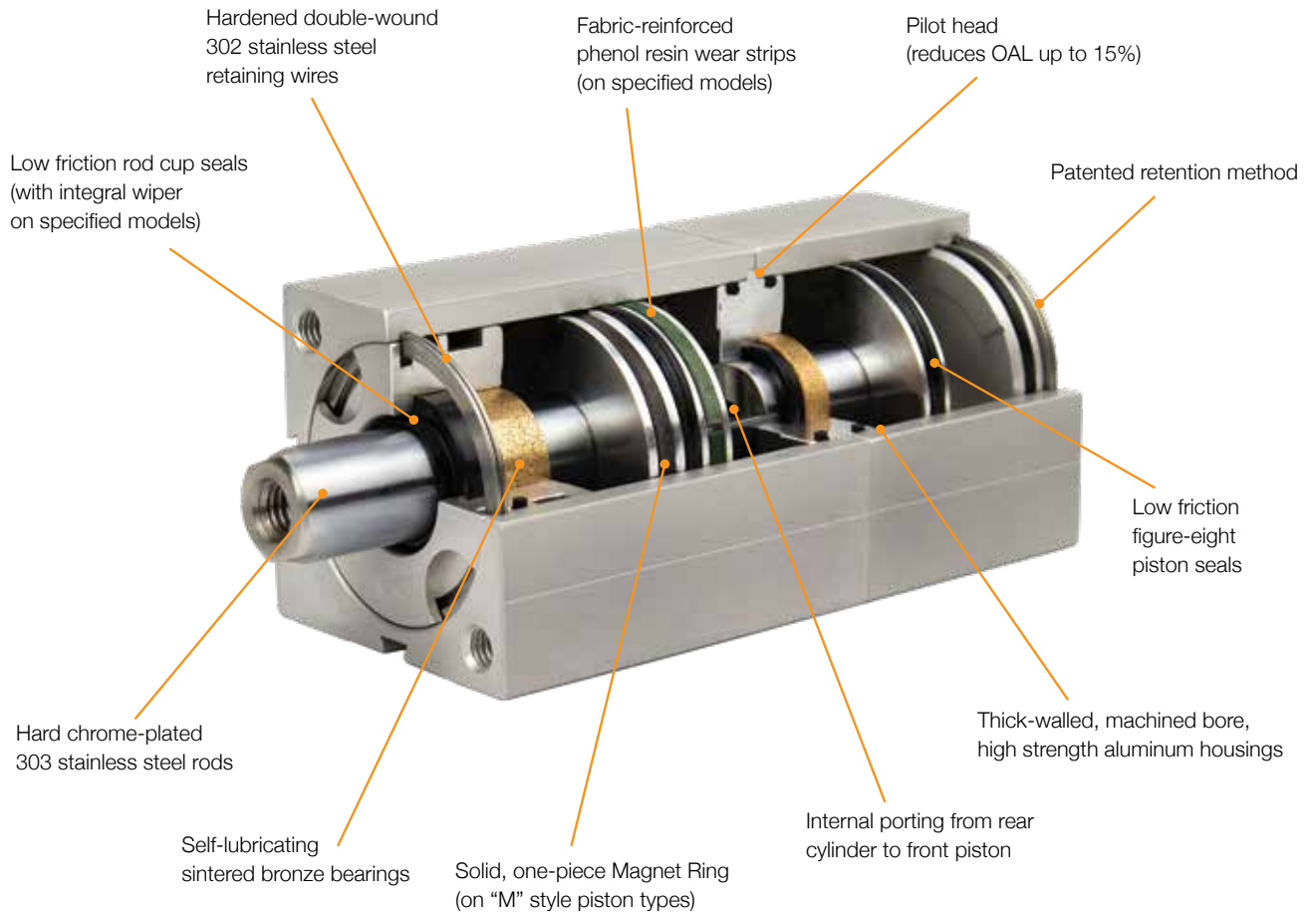
ACCESSORIES



88	Solid State Limit Sensors	94	Pivot Mountings
89	Sensor Low Profile	95	Hollow Rod
90	Sensor Receptacles	96	Rod End Options
91	Alignment Couplers	97	Urethane Shock Pads
92	Flange Mountings		

TS SERIES

PNEUMATIC CYLINDERS

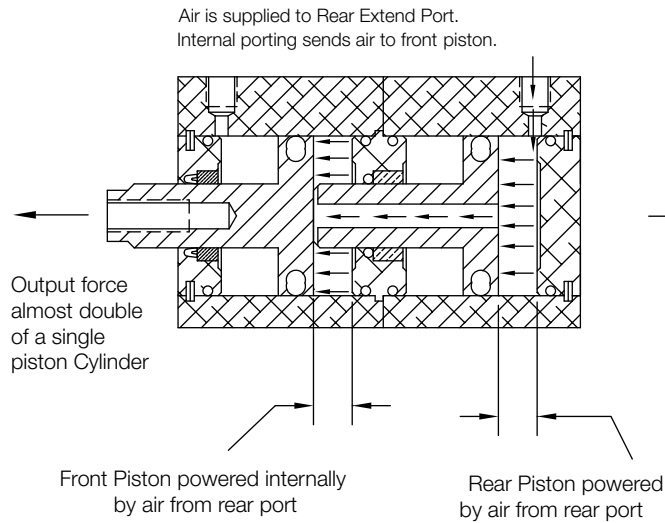


Tandem 2 Piston Pneumatic Cylinders

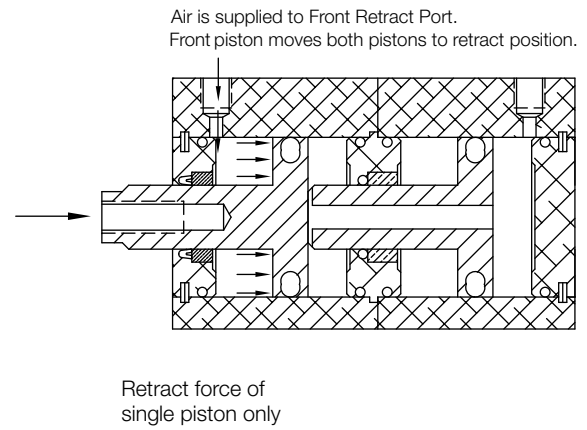
The T series cylinder line is based on the same rugged, proven designs of Nason's L series cylinders. Thick-walled, custom aluminum extrusions are precision bored and honed. High strength aluminum internal components are machined to exacting tolerances to control seal squeezes and stroke tolerances. Chrome-plated 303 stainless steel rods are precision ground for long life. The dual piloted head design aligns bores and rods and helps reduce overall length up to 15% compared to two standard units bolted together. Internal porting from the rear cylinder piston to the front cylinder piston simplifies plumbing.

Tandem Piston Cylinder

EXTENDING TANDEM 2 PISTON CYLINDER



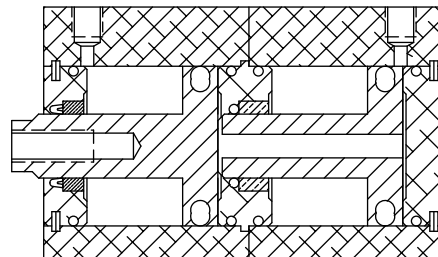
RETRACTING TANDEM 2 PISTON CYLINDER



Individual Features

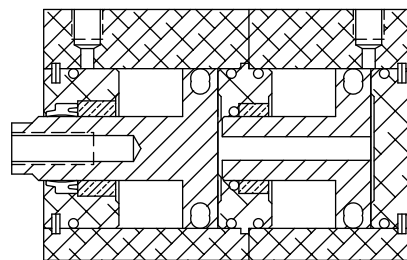
Model - TS

- Most compact of 3 models



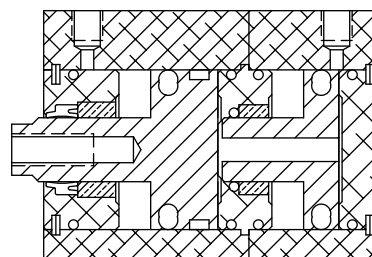
Model - TE

- Extended internal front rod bearing for additional load support
- Integral seal and rod wiper



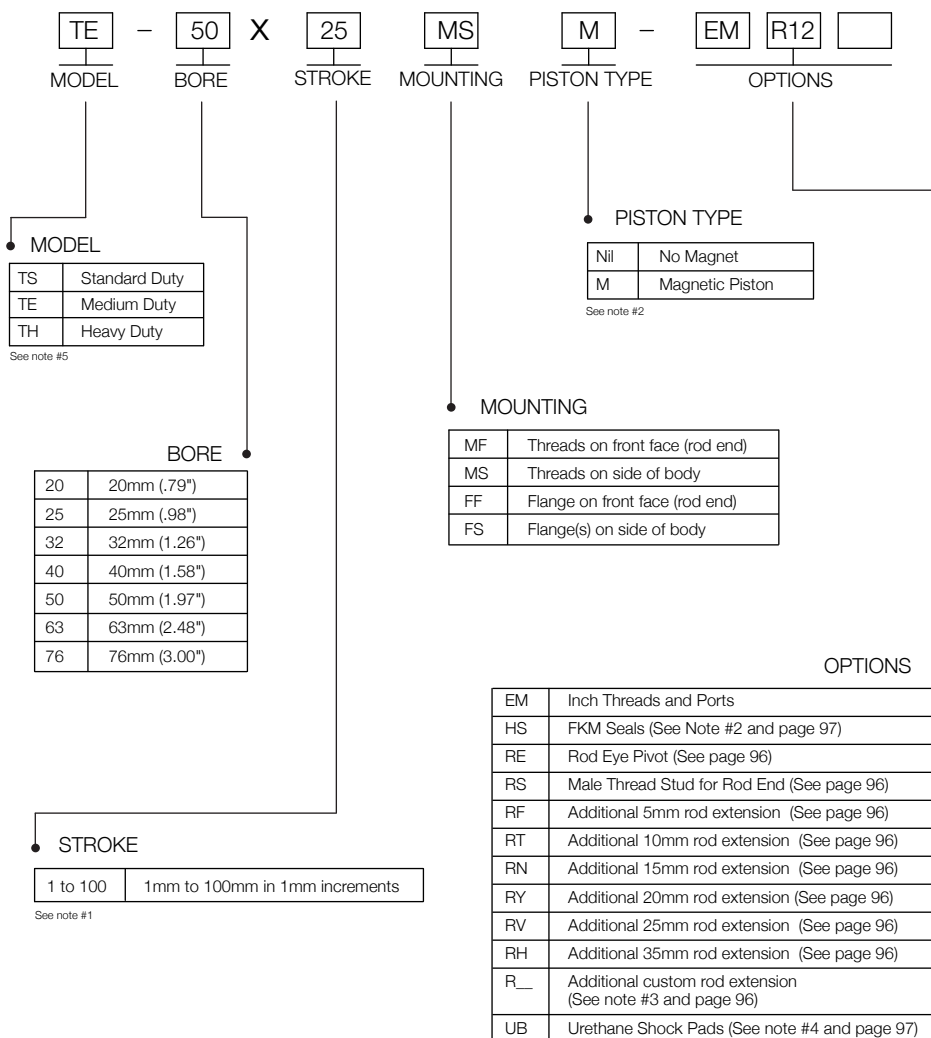
Model - TH

- Extended internal front rod bearing for additional load support
- Integral seal and rod wiper
- Wear band added to front piston for additional load support



How To Order

Example: Medium Duty, 50mm Bore, 25mm stroke, Tapped Side Mounting, Magnetic Piston, Inch threads, 17mm Total Rod Extension



Note 1 - All models use a 5mm stroke body length for Rear Cylinder Stroke of 5mm or less. Rear Cylinder Strokes over 5mm use body length of the actual stroke + adder. Model TS with a Nonmagnetic Piston uses a 9mm stroke body length for Front Cylinder Stroke of 9mm or less. Front Cylinder Strokes over 9mm use body length of the actual stroke + adder. Model TS with Code "M" Magnetic Piston uses a 4mm stroke body length for Front Cylinder Stroke of 4mm or less. Front Cylinder Strokes over 4mm use body length of the actual stroke + adder. Model TE 20, 25, & 32mm Bore with a Nonmagnetic Piston uses a 4mm stroke body length for Front Cylinder Stroke of 4mm or less. Front Cylinder Strokes over length of the actual stroke + adder. All other TE and TH bores and piston combinations use body length of the actual stroke + adder for Front Cylinder. Examples: TS-20X4FF-EM would have a Total Length of 5+9+Dim"A" and a Rear Cylinder Stroke body Length of 5+16.36(Rear Cylinder Length Adder). See Product Page. TS-20X10MS-RE would have a Total Length of (10x2)+Dim"A" and a Rear Cylinder Stroke body length of 10+16.36(Rear Cylinder Length Adder). See Product Page.

Note 2 - Magnetic Piston "M" limits temperature range to -10°C to 82°C (14°F to 180°F). This temperature rating overrides ALL OTHER TEMPERATURE ratings (Standard Seals, HS Seals, etc.). Magnetic Piston and Sensor mounting tracks are provided on Front Stroke Cylinder only.

Note 3 - "R_" Enter desired additional Custom Length Rod extension in mm after "R". Example TE-32X40MSM-EMR20.4 would have a TOTAL ROD EXTENSION of 25.4mm (20.4mm+Standard 5mm extension)

Note 4 - "UB" Urethane Shock Pads limit temperature range to -10°C to 82°C (14°F to 180°F). This temperature rating overrides ALL OTHER TEMPERATURE ratings (Standard Seals, HS Seals, etc.). Pads are mechanically retained at the four Cap faces. "UB" OPTION CHANGES STROKE TOLERANCES TO +/-2mm.

Note 5 - While all Models are offered in all strokes, it is recommended that strokes over 50mm use TE or TH Models for added bearing support.

Engineering Data

Bore	Piston Area Extend	Piston Area Retract	Min. Operating Pressure	Max. Operating Pressure
20	5,78 cm ² (.88 in ²)	2,64 cm ² (.40 in ²)	0.10 MPa (15 PSI)	1.4 MPa (200 PSI)
25	9,03 cm ² (1.40 in ²)	4,12 cm ² (.64 in ²)	0.10 MPa (15 PSI)	1.4 MPa (200 PSI)
32	14,95 cm ² (2.32 in ²)	6,91 cm ² (1.07 in ²)	0.08 MPa (12 PSI)	1.4 MPa (200 PSI)
40	23,11 cm ² (3.59 in ²)	10,55 cm ² (1.64 in ²)	0.08 MPa (12 PSI)	1.4 MPa (200 PSI)
50	37,25 cm ² (5.77 in ²)	17,62 cm ² (2.73 in ²)	0.07 MPa (10 PSI)	1.4 MPa (200 PSI)
63	59,20 cm ² (9.17 in ²)	28,03 cm ² (4.34 in ²)	0.07 MPa (10 PSI)	1.4 MPa (200 PSI)
76	88,06 cm ² (13.66 in ²)	42,46 cm ² (6.59 in ²)	0.07 MPa (10 PSI)	1.4 MPa (200 PSI)

Specifications

Action	Double Acting, 2 Piston Push
Media	Air - Clean, Dry Or Lubricated
Pre-Lubricated at Factory	Non-soap elastomer/PTFE thickener
Temp. Range (Std.)	-10°C to 93°C (14°F to 200°F)
Temp. Range (Mag. Piston)	-10°C to 82°C (14°F to 180°F) See Note 2 & 3
Temp. Range (UB Option)	-10°C to 82°C (14°F to 180°F) See Note 2 & 3
Temp. Range (HS Option)	-10°C to 150°C (14°F to 302°F) See Note 2 & 3
Stroke Tolerance (Std)	+1,0mm/-0 (+0.04"/-0)
Stroke Tolerance (UB)	+/-2mm (+/--.08")

Available Strokes

1 to 100	1mm to 100mm in 1mm increments
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Note 1 - All models use a 5mm stroke body length for Rear Cylinder Stroke of 5mm or less. Rear Cylinder Strokes over 5mm use body length of the actual stroke + adder. Model TS with a Nonmagnetic Piston uses a 9mm stroke body length for Front Cylinder Stroke of 9mm or less. Front Cylinder Strokes over 9mm use body length of the actual stroke + adder.

Model TS with Code "M" Magnetic Piston uses a 4mm stroke body length for Front Cylinder Stroke of 4mm or less. Front Cylinder Strokes over 4mm use body length of the actual stroke + adder.

Model TE 20, 25, & 32mm Bore with a Nonmagnetic Piston uses a 4mm stroke body length for Front Cylinder Stroke of 4mm or less. Front Cylinder Strokes over 4mm use body length of the actual stroke + adder.

All other TE and TH bores and piston combinations use body length of the actual stroke + adder for Front Cylinder.

Examples: TS-20X4FF-EM would have a Total Length of 5+9+Dim"A" and a Rear Cylinder Stroke body Length of 5+16.36(Rear Cylinder Length Adder). See Product Page.

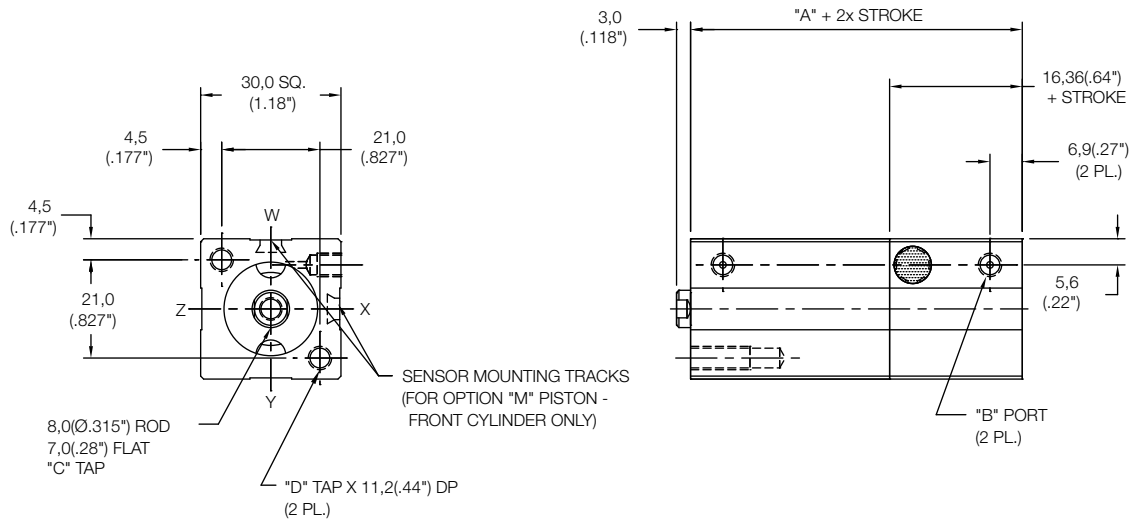
TS-20X10MS-RE would have a Total Length of (10x2)+Dim"A" and a Rear Cylinder Stroke body length of 10+16.36(Rear Cylinder Length Adder). See Product Page.

Note 2 - Magnetic Piston "M" limits temperature range to -10°C to 82°C (14°F to 180°F). This temperature rating overrides ALL OTHER TEMPERATURE ratings (Standard Seals, HS Seals, etc.). Magnetic Piston and Sensor mounting tracks are provided on Front Stroke Cylinder only.

Note 3 - "UB" Urethane Shock Pads limit temperature range to -10°C to 82°C (14°F to 180°F). This temperature rating overrides ALL OTHER TEMPERATURE ratings (Standard Seals, HS Seals, etc.). Pads are mechanically retained at the four Cap faces. "UB" OPTION CHANGES STROKE TOLERANCES TO +/-2mm.

Note 4 - While all Models are offered in all strokes, it is recommended that strokes over 50mm use TE or TH Models for added bearing support.

Tandem Piston Cylinder Front Mount Cylinder "MF"

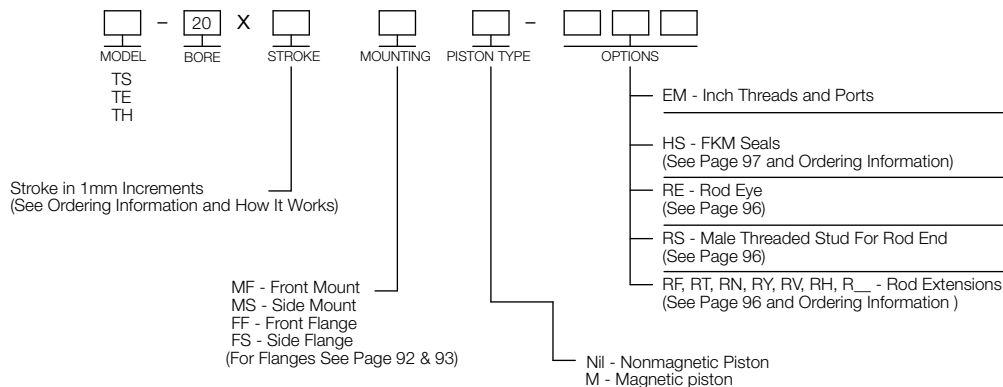
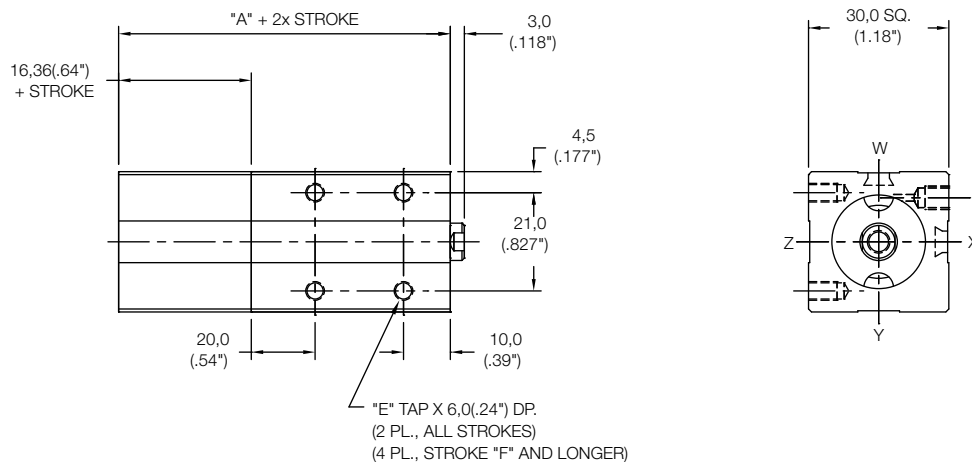


MODEL	PISTON	"A"	"F"	PISTON	"A"	"F"
TS	Non-Mag	34,0(1.34")	40,0mm(1.58")	Mag	39,0(1.54")	35,0mm(1.38")
TE	Non-Mag	39,0(1.54")	35,0mm(1.38")	Mag	44,0(1.73")	30,0mm(1.18")
TH	Non-Mag	44,0(1.73")	30,0mm(1.18")	Mag	49,0(1.93")	25,0mm(.98")

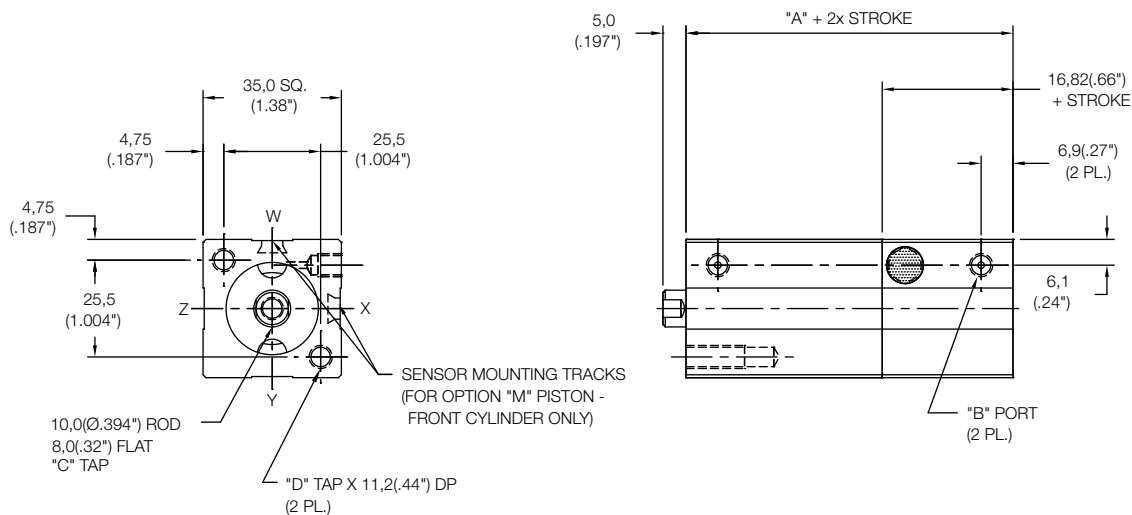
	Standard Threads	"EM" Option
"B"	M5X0,8	#10-32
"C"	M5X0,8	#10-32
"D"	M5X0,8	#10-32
"E"	M4X0,7	#8-32

Side Mount Cylinder "MS"

(All dimensions not shown same as "MF")



Tandem Piston Cylinder Front Mount Cylinder "MF"

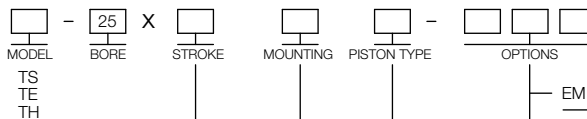
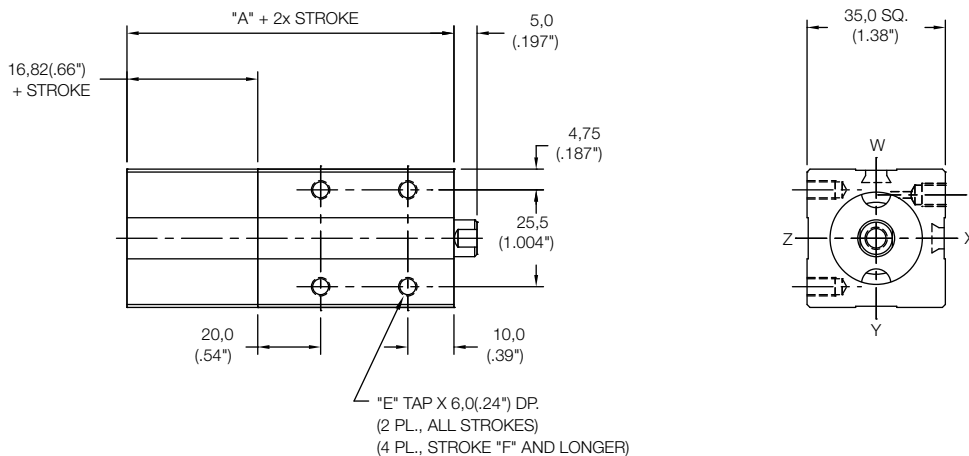


MODEL	PISTON	"A"	"F"	PISTON	"A"	"F"
TS	Non-Mag	35,0(1.38")	40,0mm(1.58")	Mag	40,0(1.58")	35,0mm(1.38")
TE	Non-Mag	40,0(1.58")	35,0mm(1.38")	Mag	45,0(1.77")	30,0mm(1.18")
TH	Non-Mag	45,0(1.77")	30,0mm(1.18")	Mag	50,0(1.97")	25,0mm(.98")

	Standard Threads	"EM" Option
"B"	M5X0,8	#10-32
"C"	M5X0,8	#10-32
"D"	M5X0,8	#10-32
"E"	M5X0,8	#10-32

Side Mount Cylinder "MS"

(All dimensions not shown same as "MF")



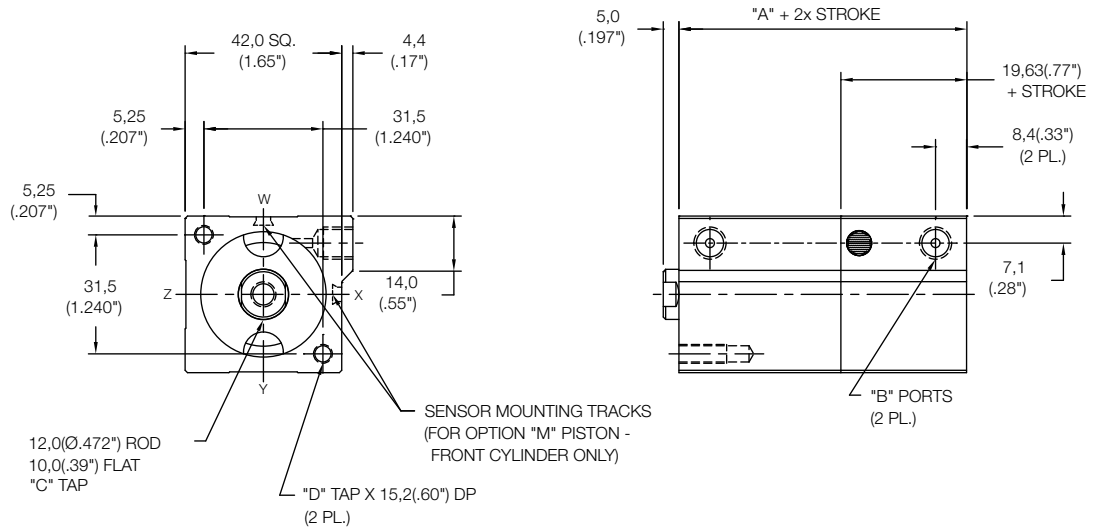
Stroke in 1mm Increments
(See Ordering Information and How It Works)

MF - Front Mount
MS - Side Mount
FF - Front Flange
FS - Side Flange
(For Flanges See Page 92 & 93)

- EM - Inch Threads and Ports
- HS - FKM Seals
(See Page 97 and Ordering Information)
- RE - Rod Eye
(See Page 96)
- RS - Male Threaded Stud For Rod End
(See Page 96)
- RF, RT, RN, RY, RV, RH, R_L - Rod Extensions
(See Page 96 and Ordering Information)

Nil - Nonmagnetic Piston
M - Magnetic piston

**Tandem Piston Cylinder
Front Mount Cylinder "MF"**

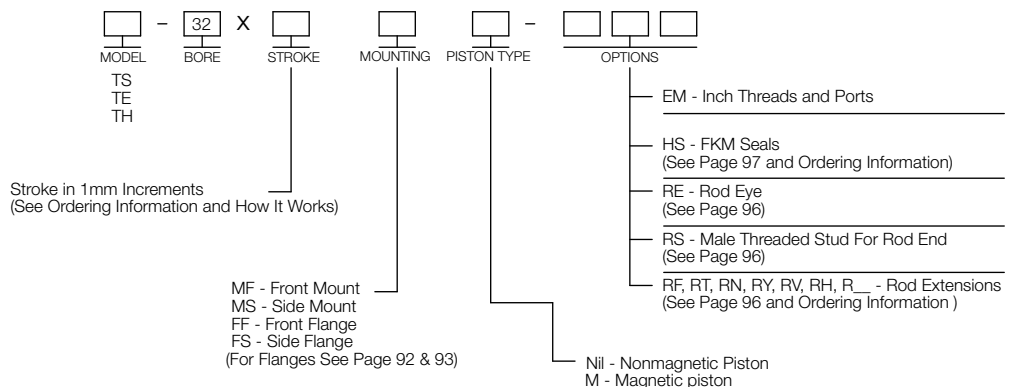
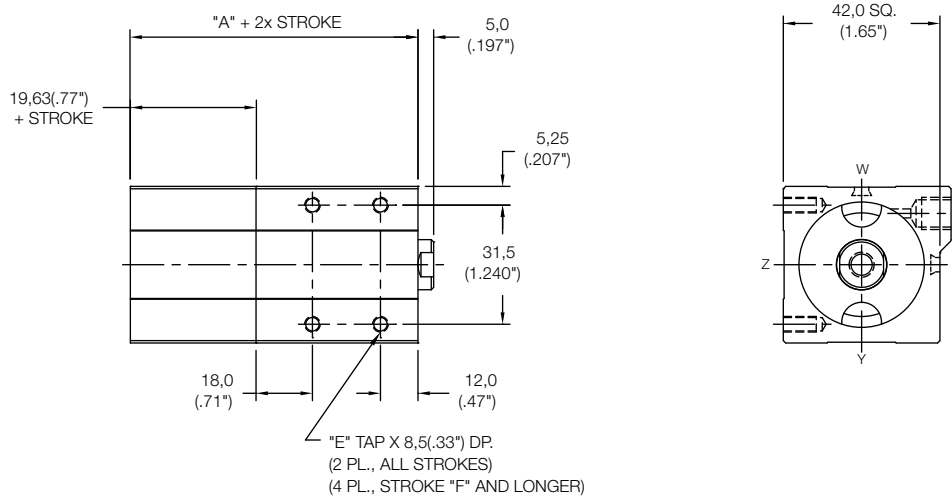


MODEL	PISTON	"A"	"F"	PISTON	"A"	"F"
TS	Non-Mag	41,0(1.61")	40,0mm(1.58")	Mag	46,0(1.81")	35,0mm(1.38")
TE	Non-Mag	46,0(1.81")	35,0mm(1.38")	Mag	51,0(2.01")	30,0mm(1.18")
TH	Non-Mag	51,0(2.01")	30,0mm(1.18")	Mag	56,0(2.21")	25,0mm(.98")

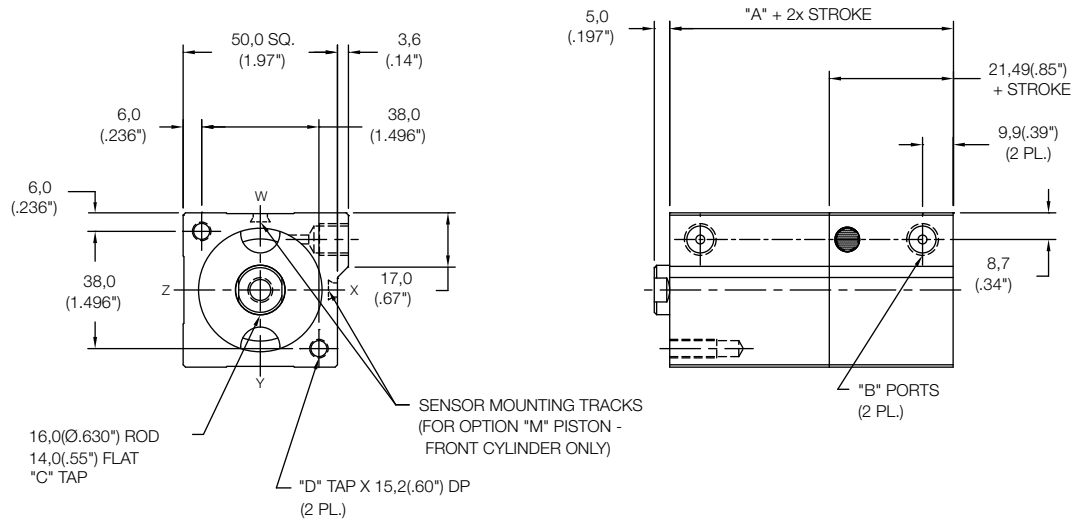
	Standard Threads	"EM" Option
"B"	G1/8 PORT	1/8-27
"C"	M6X1,0	1/4-20
"D"	M6X1,0	1/4-20
"E"	M5X0,8	10-32

Side Mount Cylinder "MS"

(All dimensions not shown same as "MF")



Tandem Piston Cylinder Front Mount Cylinder "MF"

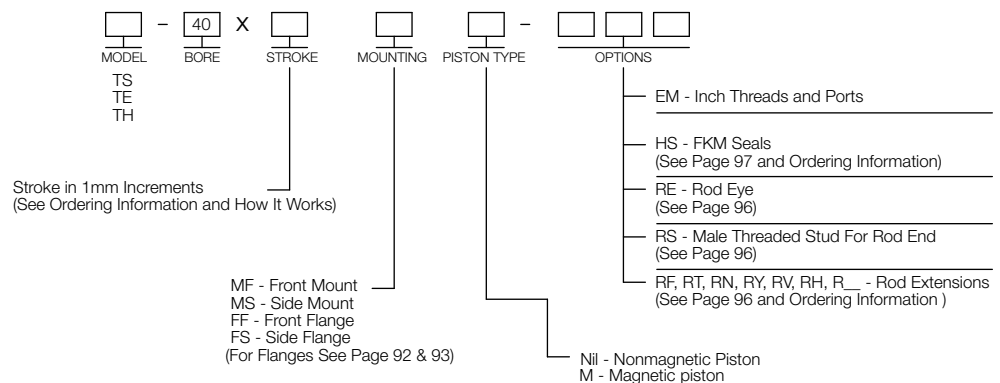
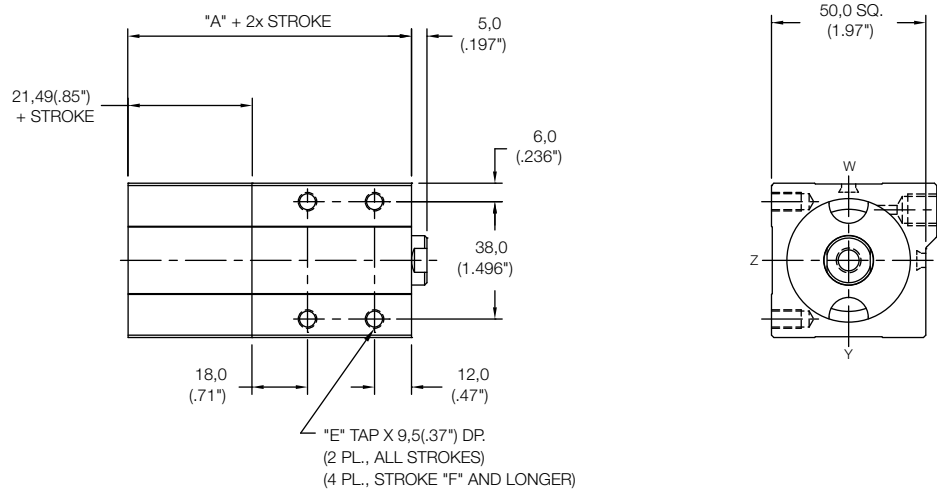


MODEL	PISTON	"A"	"F"	PISTON	"A"	"F"
TS	Non-Mag	45,0(1.77")	40,0mm(1.58")	Mag	50,0(1.97")	35,0mm(1.38")
TE	Non-Mag	55,0(2.17")	30,0mm(1.18")	Mag	60,0(2.36")	25,0mm(.98")
TH	Non-Mag	60,0(2.36")	25,0mm(.98")	Mag	65,0(2.56")	20,0mm(.79")

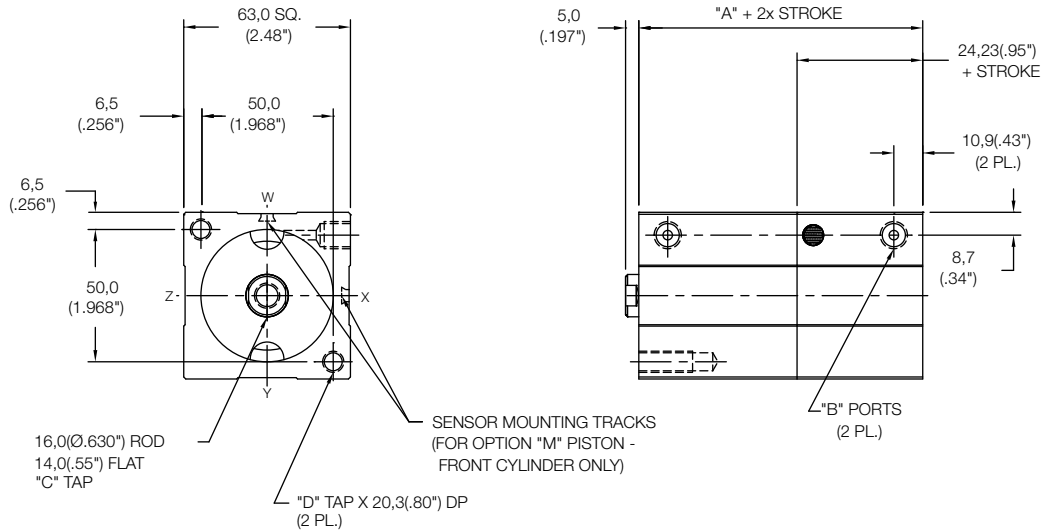
	Standard Threads	"EM" Option
"B"	G1/8 PORT	1/8-27
"C"	M8X1,25	5/16-18
"D"	M6X1,0	1/4-20
"E"	M6X1,0	1/4-20

Side Mount Cylinder "MS"

(All dimensions not shown same as "MF")



Tandem Piston Cylinder Front Mount Cylinder "MF"

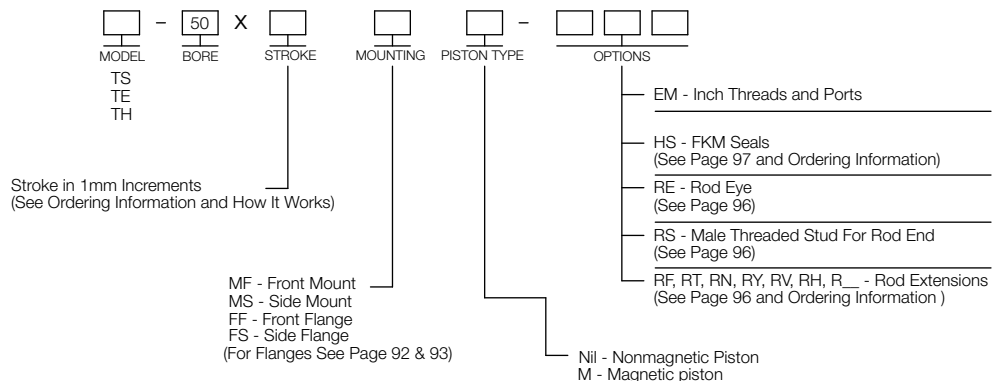
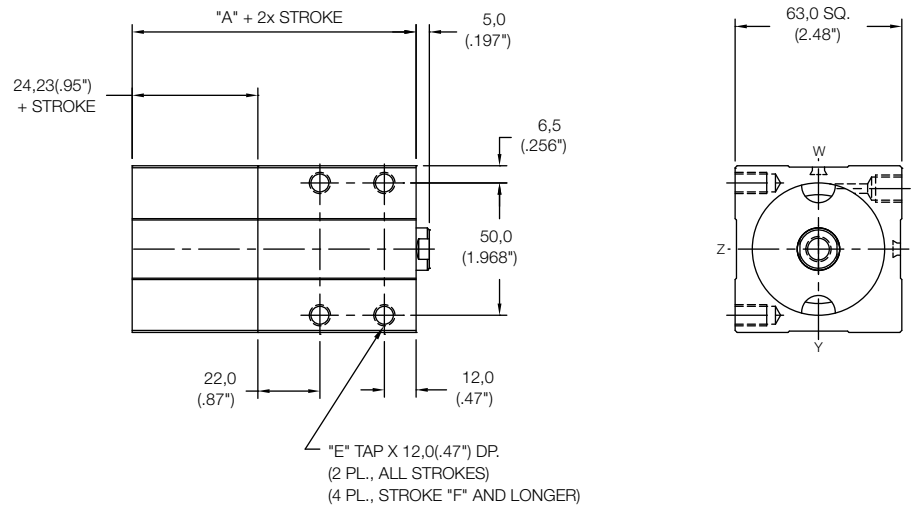


MODEL	PISTON	"A"	"F"	PISTON	"A"	"F"
TS	Non-Mag	51,0(2.01")	40,0mm(1.58")	Mag	56,0(2.20")	35,0mm(1.38")
TE	Non-Mag	61,0(2.40")	30,0mm(1.18")	Mag	66,0(2.60")	25,0mm(.98")
TH	Non-Mag	66,0(2.60")	25,0mm(.98")	Mag	71,0(2.80")	20,0mm(.79")

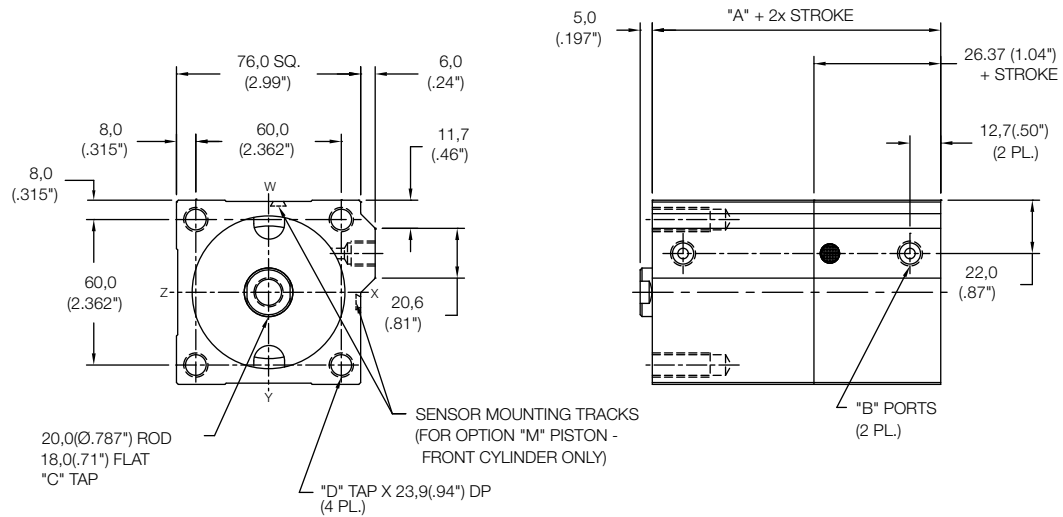
	Standard Threads	"EM" Option
"B"	G1/8 PORT	1/8-27
"C"	M10X1,5	3/8-24
"D"	M8X1,25	5/16-18
"E"	M8X1,25	5/16-18

Side Mount Cylinder "MS"

(All dimensions not shown same as "MF")



Tandem Piston Cylinder Front Mount Cylinder "MF"

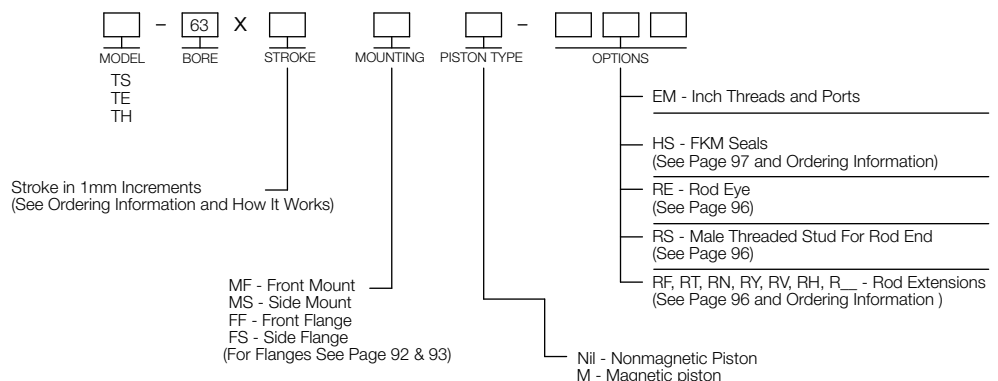
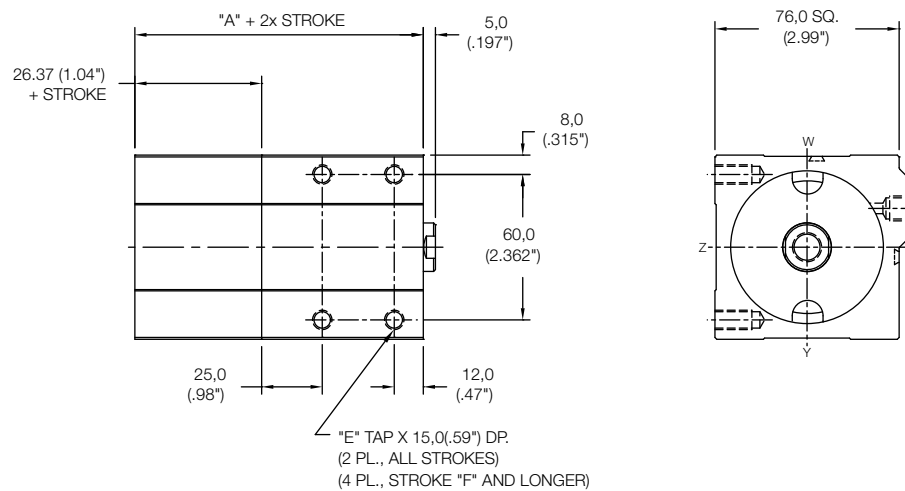


MODEL	PISTON	"A"	"F"	PISTON	"A"	"F"
TS	Non-Mag	56,0(2.20")	45,0mm(1.77")	Mag	61,0(2.40")	40,0mm(1.58")
TE	Non-Mag	66,0(2.60")	35,0mm(1.38")	Mag	71,0(2.80")	30,0mm(1.18")
TH	Non-Mag	76,0(2.99")	25,0mm(.98")	Mag	81,0(3.19")	20,0mm(.79")

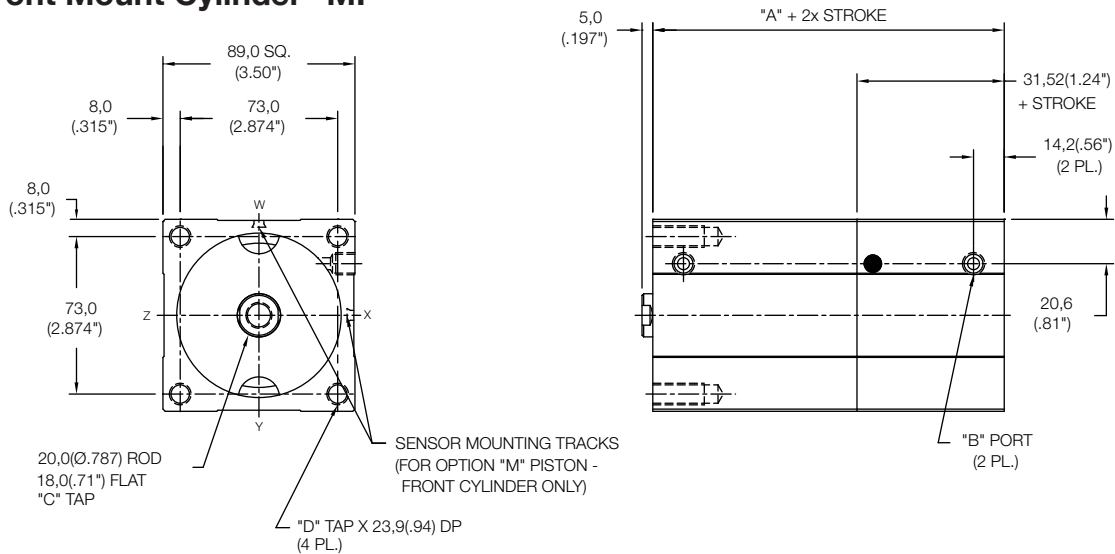
	Standard Threads	"EM" Option
"B"	G1/8 PORT	1/8-27
"C"	M12X1,75	1/2-13
"D"	M10X1,5	3/8-24
"E"	M8X1.25	5/16-18

Side Mount Cylinder "MS"

(All dimensions not shown same as "MF")



**Tandem Piston Cylinder
Front Mount Cylinder "MF"**

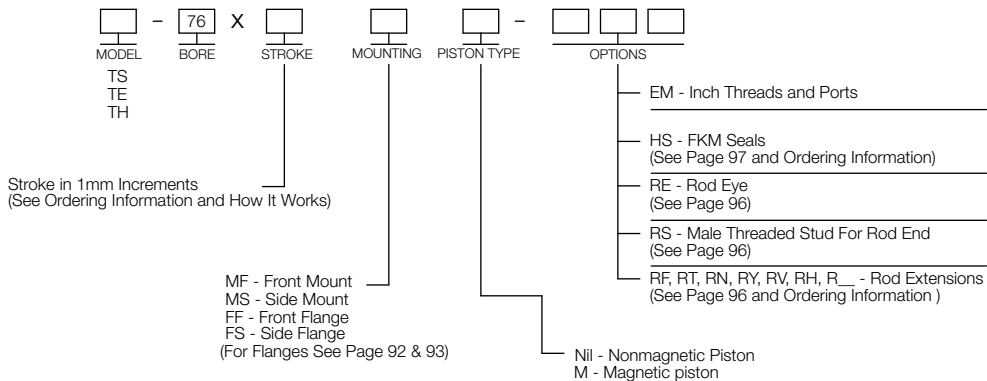
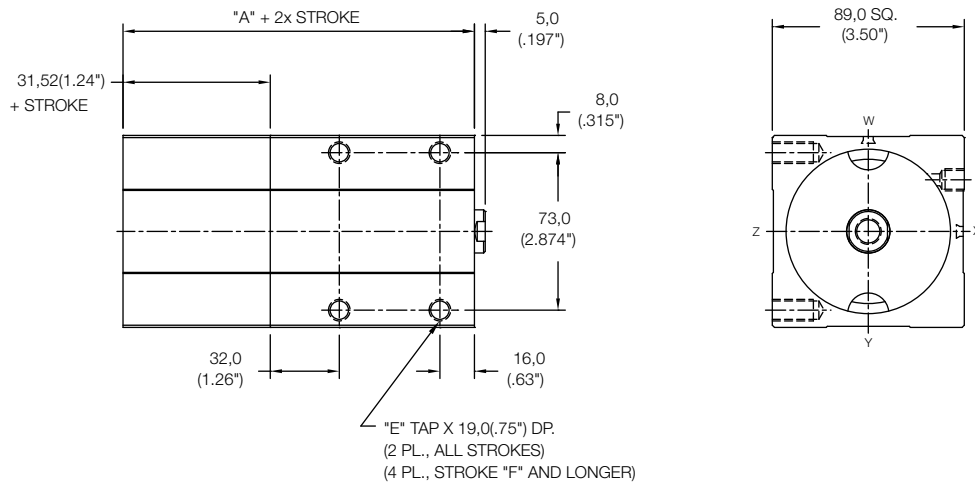


MODEL	PISTON	"A"	"F"	PISTON	"A"	"F"
TS	Non-Mag	67,0(2.64")	45,0mm(1.77")	Mag	72,0(2.83")	40,0mm(1.58")
TE	Non-Mag	77,0(3.03")	35,0mm(1.38")	Mag	82,0(3.23")	30,0mm(1.18")
TH	Non-Mag	87,0(3.43")	25,0mm(.98")	Mag	92,0(3.62")	20,0mm(.79")

	Standard Threads	"EM" Option
"B"	G1/8 PORT	1/8-27
"C"	M12X1,75	1/2-13
"D"	M10X1,5	3/8-24
"E"	M10X1,5	3/8-24

Side Mount Cylinder "MS"

(All dimensions not shown same as "MF")



ACCESSORIES

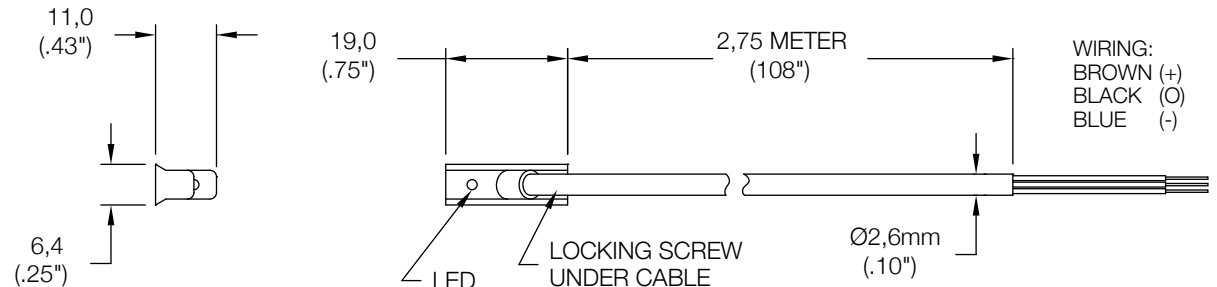


Solid State Limit Sensors

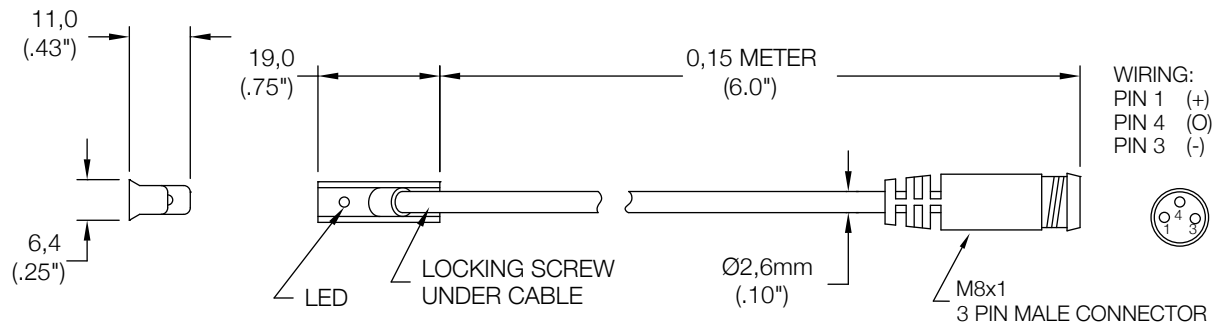
Nason limit sensors are magnetically activated digital output devices. They are on/off devices used to sense piston location on Nason "L" series cylinders. A magnet is added to the piston of the cylinder and a 60° dovetail is machined into the cylinder body to allow the sensors to be added. Magneto-resistive technology (similar to Hall Effect) is used to produce the sensors. This results in greater sensitivity and reduced dead-band compared to Hall devices.

Specifications		
Part Number	SKS, SKP	SCS, SCP
Switch Logic	Solid State Output, Normally Open	Solid State Output, Normally Open
Sensor Type	NPN, Current Sinking	PNP, Current Sourcing
Operating Voltage	5-28 VDC	
Switching Current	200mA max.	
Voltage Drop	1.0 V max	
Switching Power	4.8 Watts max.	
LED Indicator: Switch Active	Red	
Operating Temperature	-20°C to 80°C (-4°F to 176°F)	
Switching Speed	4 uS operate, 4 uS release	
Enclosure Classification	IP67, NEMA 6	
Cable	2.6 dia, 3C, 26 AWG, Black PVC	
Housing	Glass-filled Polypropylene	
Shock	50 G max	
Vibration	9 G max	

Flying Lead Sensors - Part #: SKS, SCS



Quick Disconnect Sensors - Part #: SKP, SCP



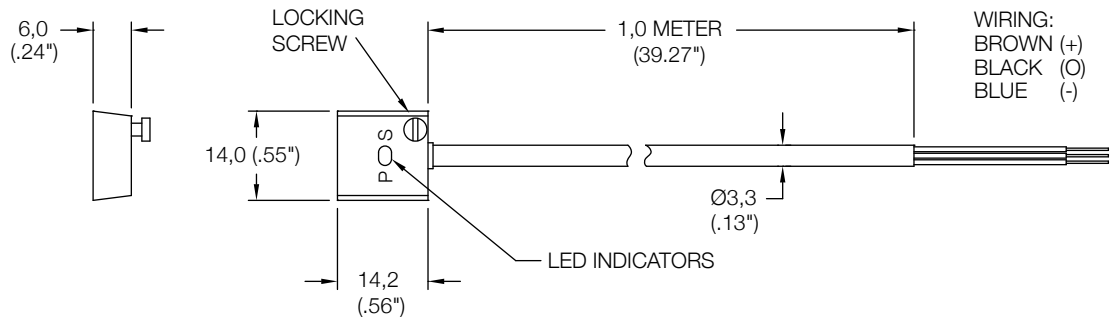
Mates with Part Number "SR" sensor receptacle. See page 90.

Low Profile Solid State Limit Sensors

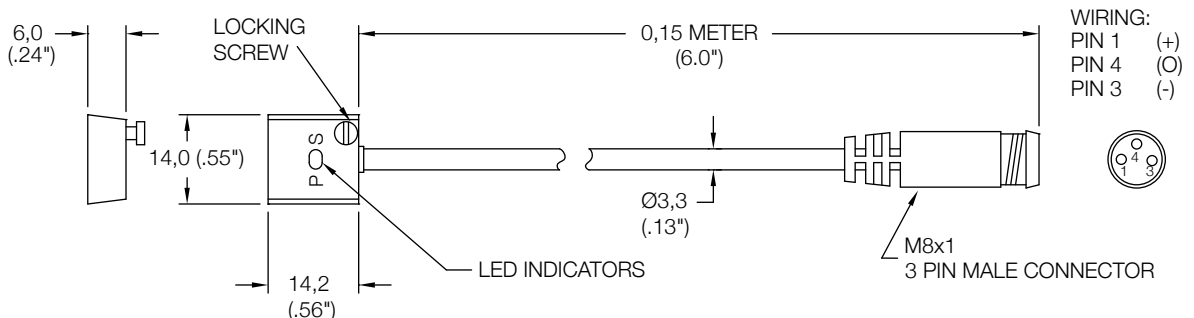
Nason limit sensors are magnetically activated digital output devices. They are on/off devices used to sense piston location on Nason "C" series cylinders. A magnet is added to the piston of the cylinder and a dovetail is machined into the cylinder body to allow the sensors to be added. Magneto-resistive technology (similar to Hall Effect) is used to produce the sensors. This results in greater sensitivity and reduced dead-band compared to Hall devices.

Specifications		
Part Number	NPL, NPP	PNL, PNP
Switch Logic	Solid State Output, Normally Open	Solid State Output, Normally Open
Sensor Type	NPN, Current Sinking	PNP, Current Sourcing
Operating Voltage	5-28 VDC	
Current Consumption:	On	16mA @ 24 VDC
	Off	7mA @ 24 VDC
Switching Current	100mA @ 24 VDC, 30mA @ 5 VDC	
Voltage Drop	1.5 V max @ 100mA	
Response Frequency	1 KHz max	
LED Indicators:	Power On	Green
	Switch Active	Red
Operating Temperature	-10°C to 70°C (14°F to 158°F)	
Circuit Protection	Reverse Polarity, Surge Suppression	
Enclosure Classification	IEC 529 IP67, NEMA 6P	
Cable	3.3 dia, 3C, 24 AWG, Black PVC	
Housing	Zinc Diecast - Black	Zinc Diecast - Silver
Shock	50 G max	
Vibration	9 G max	

Flying Lead Sensors - Part #: NPL, PNL



Quick Disconnect Sensors - Part #: NPP, PNP

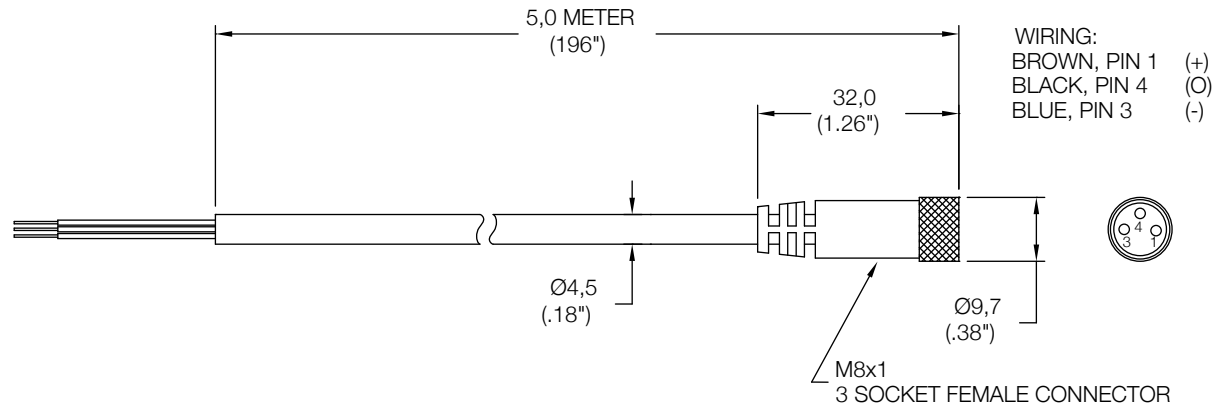


Mates with Part Number "SR" sensor receptacle. See page 90.

Sensor Receptacle

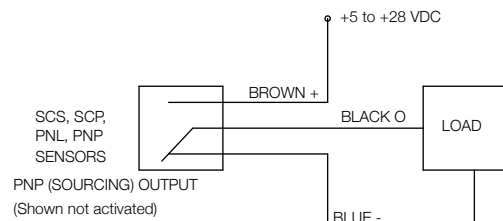
8mm female molded locking connector
 Mates with SCP, SKP, NPP, PNP Sensors

Part #: SR

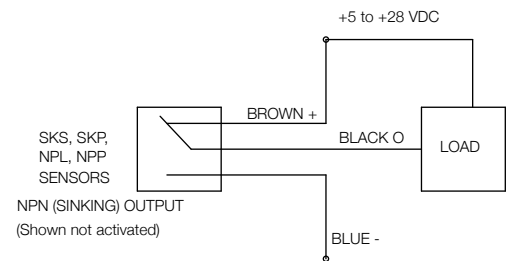


Sensor Schematics

PNP (Sourcing) output sensors complete a circuit by connecting the load to the supply current. These sensors are typically used on controllers with a single power supply. All sensors will utilize the same supply voltage.



NPN (Sinking) output sensors complete a circuit by connecting the load to ground. These sensors are typically used on controllers with multiple power supplies. All sensors can utilize different supply voltages. The ground is their common factor.

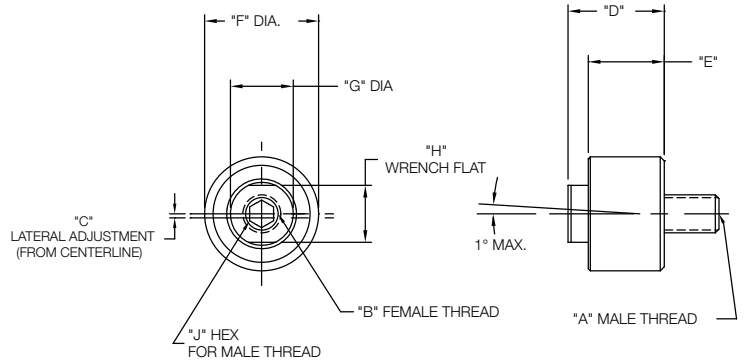


Important Notes

- All Nason sensors are magnetically activated devices. Cylinders should be ordered with option "M" for a magnetic piston.
- Presence of electromagnetic fields, external magnets, welding fields, etc. may effect operation of Nason sensors.
- Temperature ratings for sensors should be observed and will override seal option temperature ratings of the cylinder.

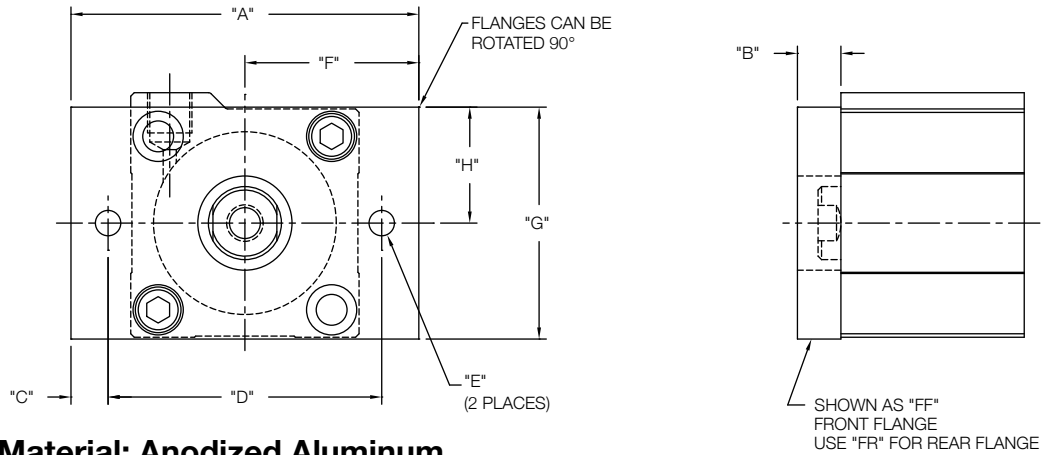
Features

- Hardened Steel Components with Black Oxide Finish
- 0,15mm (.006") Max. Axial Play
- Temperature rating -10°C to 204°C (0°F to 400°F)



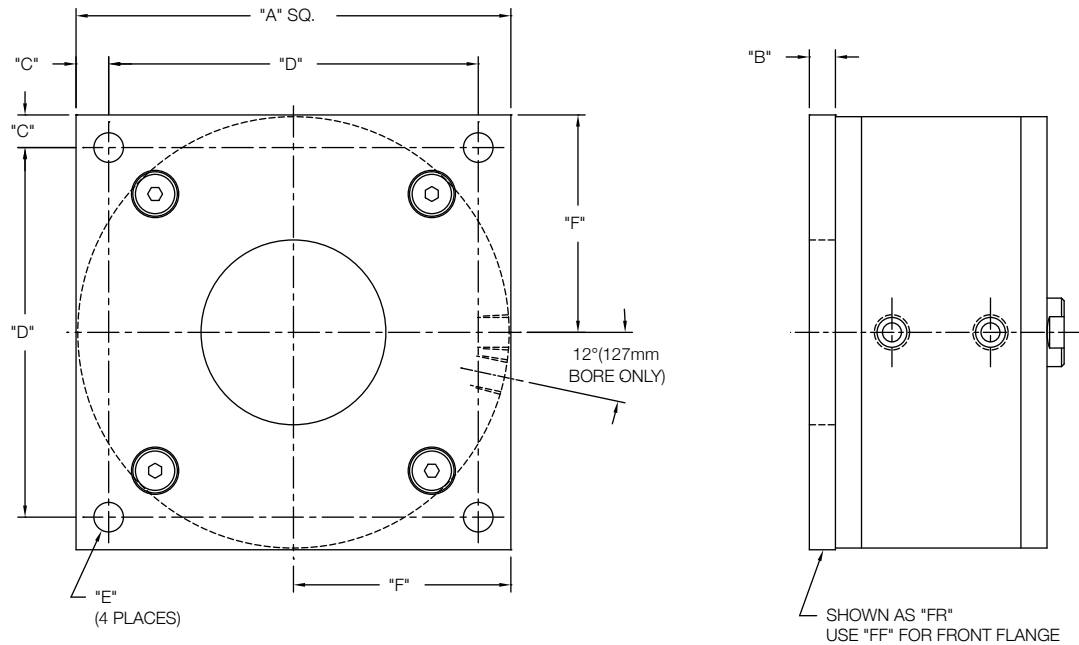
Bore Part Number	A Male Thread	B Female Thread	C	D	E	F	G	H	J	Load Rating
										Max Pull 5 X S.F.
AC-M4	M4x0,7 X 6,3mm	M4x0,7 X 5,5mm	0,5 (.02")	10,3 (.40")	8,7 (.34")	14,0 (.55")	6,0 (.24")	5,0 (.20")	2,5	.67 kN (150 lbs.)
AC-M4-C8	M4x0,7 X 6,3mm	#8-32 X .22"								
AC-C8	#8-32 X .31"	#8-32 X .22"								
AC-C8-M4	#8-32 X .31"	M4x0,7 X 5,5mm	0,8 (.03")	14,3 (.56")	10,3 (.41")	19,0 (.75")	8,0 (.31")	7,0 (.28")	5/64	1.11 kN (250 lbs.)
AC-M5	M5x0,8 X 8,4mm	M5x0,8 X 8,0mm								
AC-M5-F10	M5x0,8 X 8,4mm	#10-32 X .31"								
AC-M5-C10	M5x0,8 X 8,4mm	#10-24 X .31"								
AC-F10	#10-32 X .31"	#10-32 X .31"								
AC-F10-M5	#10-32 X .31"	M5x0,8 X 8,0mm								
AC-F10-C10	#10-32 X .31"	#10-24 X .31"								
AC-C10	#10-24 X .31"	#10-24 X .31"								
AC-C10-M5	#10-24 X .31"	M5x0,8 X 8,0mm								
AC-C10-F10	#10-24 X .31"	#10-32 X .31"								
AC-M6	M6x1,0 X 9,5mm	M6x1,0 X 11,0mm	0,8 (.03")	19,3 (.76")	14,3 (.56")	28,5 (1.13")	12,7 (.50")	11,0 (.43")	4	3.55 kN (800 lbs.)
AC-M6-C14	M6x1,0 X 9,5mm	1/4-20 X .44"								
AC-M6-F14	M6x1,0 X 9,5mm	1/4-28 X .44"								
AC-C14	1/4-20 X .41"	1/4-20 X .44"								
AC-C14-M6	1/4-20 X .41"	M6x1,0 X 11,0mm								
AC-C14-F14	1/4-20 X .41"	1/4-28 X .44"								
AC-F14	1/4-28 X .41"	1/4-28 X .44"								
AC-F14-M6	1/4-28 X .41"	M6x1,0 X 11,0mm								
AC-F14-C14	1/4-28 X .41"	1/4-20 X .44"								
AC-M8	M8x1,25 X 13,7mm	M8x1,25 X 12,0mm							0,8 (.03")	
AC-M8-C516	M8x1,25 X 13,7mm	5/16-18 X .50"								
AC-M8-F516	M8x1,25 X 13,7mm	5/16-24 X .50"								
AC-C516	5/16-18 X .54"	5/16-18 X .50"								
AC-C516-M8	5/16-18 X .54"	M8x1,25 X 12,0mm								
AC-C516-F516	5/16-18 X .54"	5/16-24 X .50"								
AC-F516	5/16-24 X .54"	5/16-24 X .50"								
AC-F516-M8	5/16-24 X .54"	M8x1,25 X 12,0mm								
AC-F516-C516	5/16-24 X .54"	5/16-18 X .50"								
AC-M10	M10x1,5 X 13,7mm	M10x1,5 X 14,0mm	0,8 (.03")	24,0 (.95")	19,0 (.75")	28,5 (1.13")	16,0 (.63")	14,0 (.55")		6
AC-M10-F38	M10x1,5 X 13,7mm	3/8-24 X .56"								
AC-M10-C38	M10x1,5 X 13,7mm	3/8-16 X .56"								
AC-F38	3/8-24 X .54"	3/8-24 X .56"								
AC-F38-M10	3/8-24 X .54"	M10x1,5 X 14,0mm								
AC-F38-C38	3/8-24 X .54"	3/8-16 X .56"								
AC-C38	3/8-16 X .54"	3/8-16 X .56"								
AC-C38-M10	3/8-16 X .54"	M10x1,5 X 14,0mm								
AC-C38-F38	3/8-16 X .54"	3/8-24 X .56"								
AC-M12	M12x1,75 X 21,8mm	M12x1,75 X 22,0mm							1,5 (.06")	35,0 (1.38")
AC-M12-C12	M12x1,75 X 21,8mm	1/2-13 X .88"								
AC-M12-F12	M12x1,75 X 21,8mm	1/2-20 X .88"								
AC-C12	1/2-13 X .88"	1/2-13 X .88"								
AC-C12-M12	1/2-13 X .88"	M12x1,75 X 22,0mm								
AC-C12-F12	1/2-13 X .88"	1/2-20 X .88"								
AC-F12	1/2-20 X .88"	1/2-20 X .88"								
AC-F12-M12	1/2-20 X .88"	M12x1,75 X 22,0mm								
AC-F12-C12	1/2-20 X .88"	1/2-13 X .88"								

Face Flange Mounting - "FF" & "FR"
12mm Thru 76mm Bores



Material: Anodized Aluminum

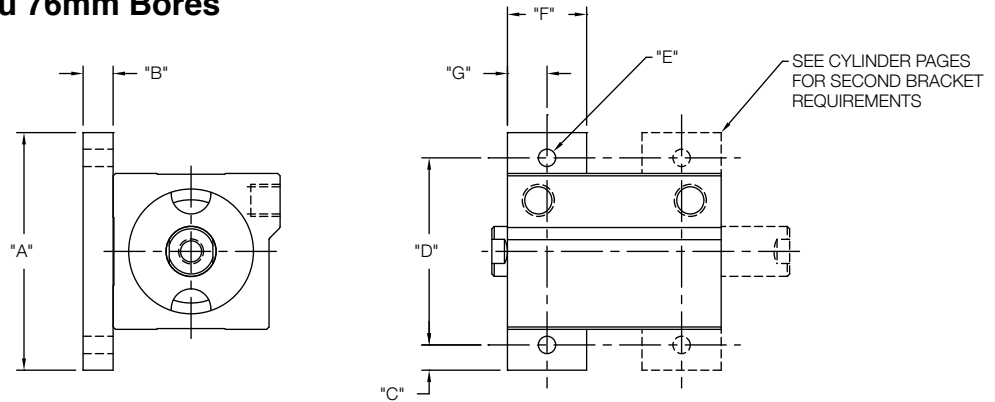
Face Flange Mounting - "FF" & "FR"
101mm Thru 152mm Bores



Material:
101mm Bore - Anodized Aluminum
127mm & 152mm Bore - Zinc Plated Steel

BORE	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"
12	50,8 (2.0")	6,4 (.25")	5,4 (.21")	40,0 (1.58")	4,5 (.18")	25,4 (1.0")	22,2 (0.88")	11,1 (.44")
20		9,5 (.38")	3,9 (.15")	43,0 (1.69")			31,8 (1.25")	15,9 (.63")
25		6,4 (.25")	6,4 (.25")	50,8 (2.00")			38,1 (1.50")	19,05 (.75")
28,5	63,5 (2.5")	9,5 (.38")	5,75 (.23")	52,0 (2.05")	5,5 (.22")	31,8 (1.25")	44,5 (1.75")	22,25 (.88")
32	8,1 (.32")		60,0 (2.36")	38,1 (1.50")			50,8 (2.00")	25,4 (1.00")
40	76,2 (3.0")		7,5 (.30")	78,0 (3.07")			46,5 (1.83")	63,5 (2.50")
50	93,0 (3.66")	12,7 (.50")	9,0 (.35")	102,0 (4.02")	10,5 (.41")	59,9 (2.36")	76,2 (3.00")	38,1 (1.50")
63	120,0 (4.72")	19,05 (.75")	115,1 (4.53")	66,5 (2.62")			88,9 (3.50")	44,45 (1.75")
76	133,1 (5.24")	9,5 (.38")	108,0 (4.25")	8,64 (.34")			63,5 (2.50")	N/A
101	127,0 (5.0")	9,5 (.38")	12,7 (.50")	152,4 (6.00")	10,5 (.41")	88,9 (3.50")	N/A	N/A
127	177,8 (7.0")		N/A	N/A				
152	N/A		N/A	N/A				

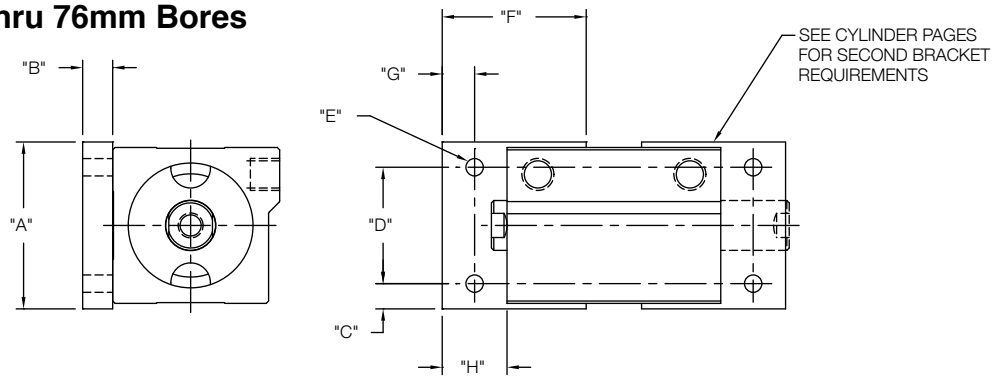
Side Flange Mounting - "FS"
12mm Thru 76mm Bores



Material: Anodized Aluminum

Bore	"A"	"B"	"C"	"D"	"E"	"F"	"G"
12	44,5 (1.75")	6,35 (.25")	4,8 (.19")	35 (1.38")	4,5 (.18")	16 (.63")	7,9 (.31")
20	50,8 (2.0")	9,5 (.38")	5,4 (.21")	40 (1.58")		19 (.75")	9,5 (.38")
25			3,9 (.15")	43 (1.69")			
28,5	63,5 (2.5")	4,8 (.19")	6,35 (.25")	50,8 (2.0")	5,5 (.22")	25,4 (1.00")	12,7 (.50")
32			9,5 (.38")	5,75 (.23")	52 (2.05")		
40	8,1 (.32")	60 (2.36")					
50	93 (3.66")	12,7 (.50")	7,5 (.30")	78 (3.07")	8,5 (.33")		
63	120 (4.72")	19 (.75")	9,0 (.35")	102 (4.02")	10,5 (.41")		
76	133 (5.24")			115 (4.53")			

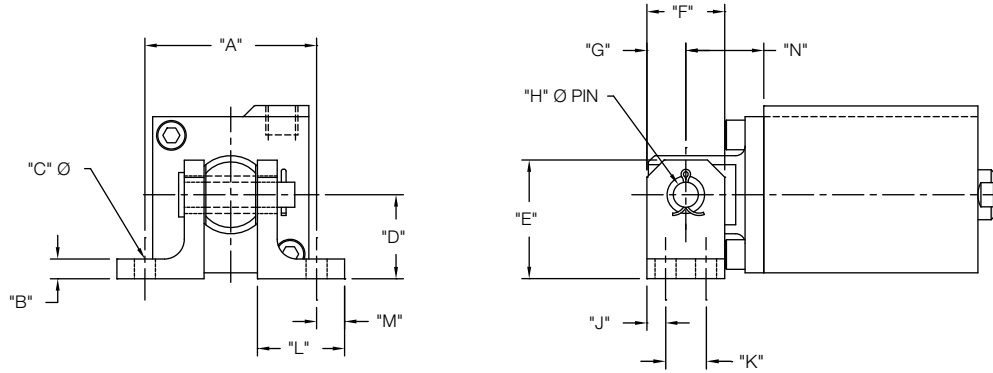
End Flange Mounting - "FE"
12mm Thru 76mm Bores



Material: Anodized Aluminum

Bore	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"
12	25,4 (1.00")	6,35 (.25")	4,2 (.17")	17,0 (.67")	4,5 (.18")	24,0 (.95")	4,0 (.16")	8,0 (.32")
20	31,8 (1.25")	9,5 (.38")	4,4 (.17")	23,0 (.91")		27,0 (1.06")		
25	38,1 (1.50")		4,05 (.16")	30,0 (1.18")				
28,5	38,1 (1.50")	4,8 (.19")	4,8 (.19")	28,6 (1.13")	5,6 (.22")	28,6 (1.13")	4,8 (.19")	9,7 (.38")
32	44,5 (1.75")	9,5 (.38")	5,0 (.20")	34,5 (1.36")	5,5 (.22")	35,4 (1.39")	5,0 (.20")	10,0 (.39")
40	50,8 (2.00")		4,9 (.19")	41,0 (1.61")				
50	63,5 (2.50")	12,7 (.50")	8,0 (.32")	47,5 (1.87")	8,5 (.33")	41,4 (1.63")	8,0 (.32")	16,0 (.63")
63	76,2 (3.00")	19 (.75")	10,1 (.40")	56,0 (2.20")	10,5 (.41")	45,4 (1.79")	10,0 (.39")	20,0 (.79")
76	88,9 (3.50")		9,95 (.39")	69,0 (2.72")				

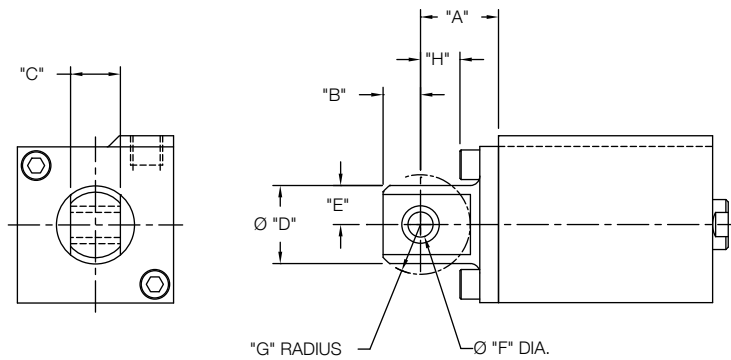
Long Pivot Mounting Style - "PL"



Bore	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"	"L"	"M"	"N"
20	48,8 (1.92")	6,35 (.25")	5,4 (.21")	20 (.79")	31,8 (1.25")	25 (.98")	12,5 (.49")	8,0 (.32")	6,0 (.24")	13 (.51")	25,0 (.98")	7,0 (.28")	23,0 (.91")
25	52,8 (2.08")												
28.5	48,3 (1.90")												
32	54,9 (2.16")	9,53 (.38")	6,8 (.27")	22 (.87")	31,8 (1.25")	25 (.98")	12,5 (.49")	8,0 (.32")	6,0 (.24")	13 (.51")	28,0 (1.10")	9,0 (.35")	25,0 (.98")
40	58,7 (2.31")										27 (1.06")		
50	65,8 (2.59")		34 (1.34")	50,8 (2.00")	35 (1.38")	17,5 (.69")	8,0 (.32")	19 (.75")	36,0 (1.42")	13,0 (.51")			
63	67,8 (2.67")												
76	73,7 (2.90")		8,7 (.34")	46 (1.81")	63,5 (2.50")	40 (1.58")	20,0 (.79")	10,0 (.39")	10,0 (.39")	20 (.79")	40,0 (1.58")	16,0 (.63")	40,0 (1.58")

- LONG PIVOTS ALLOW FOR A MINIMUM 180° OF MOVEMENT
- LONG PIVOTS ARE ANODIZED ALUMINUM WITH SINTERED BRONZE BEARINGS
- PIVOT PINS ARE STEEL WITH STEEL COTTER PIN, INCLUDED

Pivot on Rear Face Mounting Style - "PR"



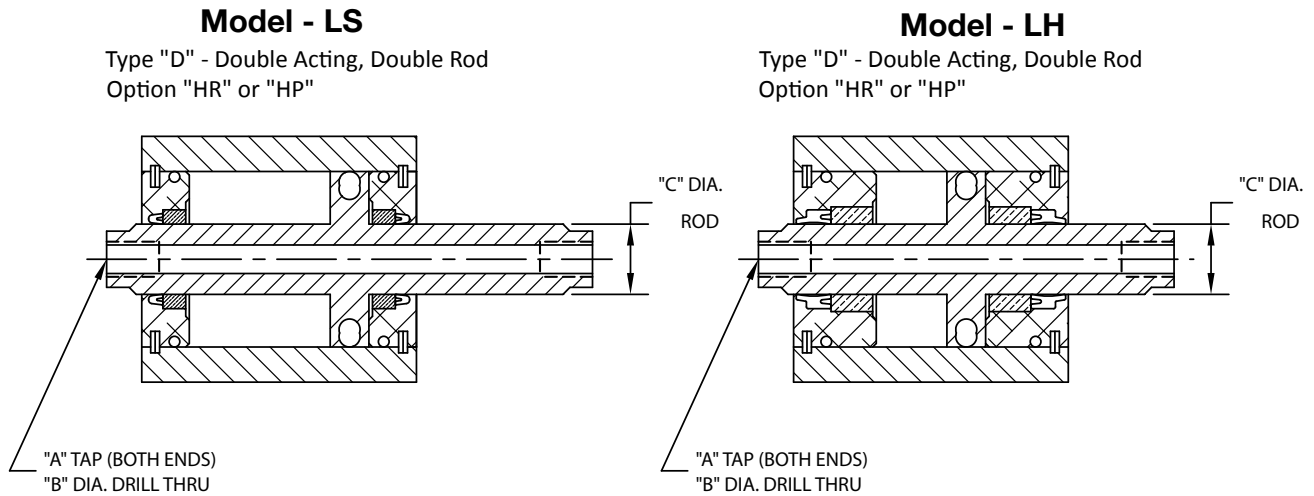
Bore	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"
12	20 (.79")	5,9 (.23")	6 (.24")	12 (.47")	6 (.24")	5 (.20")	13,9 (.55")	10,9 (.43")
20	23 (.91")	12 (.47")	22 (.87")	11 (.43")	8 (.32")	14 (.55")	12,5 (.49")	
25								15,5 (.61")
28.5	25 (.98")	16 (.63")	25 (.98")	12,5 (.49")	7,9 (.31")	16 (.63")	12 (.47")	
32								
40								
50	40 (1.58")	14 (.55")	19 (.75")	35 (1.38")	17,5 (.69")	10 (.39")	25 (.98")	23 (.91")
63								21 (.83")
76			25 (.98")	40 (1.58")	20 (.79")			

- REAR PIVOT CAN BE ROTATED 90°
- REAR PIVOT OPTION IS ONLY AVAILABLE ON SINGLE END MODELS ONLY
- REAR PIVOTS ARE ANODIZED ALUMINUM WITH A SINTERED BRONZE BEARING

Hollow Rod

Hollow Rod - Options "HR" and "HP"
 Thru hole for type "D" in Models "LS" and "LH"

"HR" - Hollow rod with standard taps
 "HP" - Hollow rod with taps for fittings

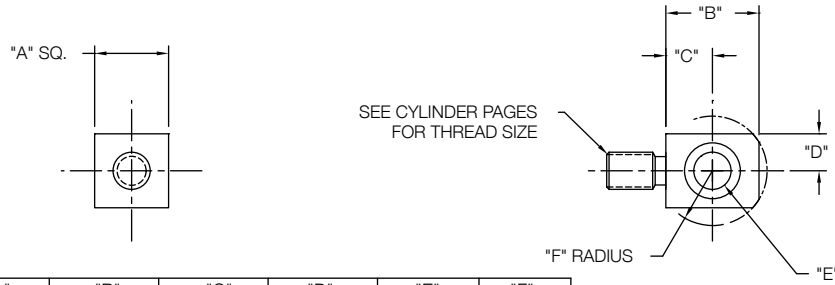


Bore	"C" Dia. Rod	HR Standard		HR "EM" Option		HP Standard		HP "EM" Option	
		"A" Tap	"B" Dia Thru	"A" Tap	"B" Dia Thru	"A" Tap	"B" Dia Thru	"A" Tap	"B" Dia Thru
20	8,0 (.315")	NA	NA	NA	NA	M5x0,8	1,2mm(.05")	#10-32	1,2mm(.05")
25	10,0 (.394")	NA	NA	NA	NA	M5x0,8	1,2mm(.06")	#10-32	1,2mm(.06")
28.5	12,0(.472")	5/16-18	6,9mm(.26")	NA	NA	M5x0,8	1,2mm(.16")	#10-32	1,2mm(.16")
32	12,0(.472")	M6X1,0	5,1mm(.20")	1/4-20	5,1mm(.20")	M5x0,8	1,2mm(.16")	#10-32	1,2mm(.16")
40	16,0(.630")	M8X1,25	6,6mm(.26")	5/16-18	6,6mm(.26")	G1/8	8,7mm(.34")	1/8-27 NPTF	8,7mm(.34")
50	16,0(.630")	M10X1,5	8,5mm(.33")	3/8-24	8,5mm(.33")	G1/8	8,7mm(.34")	1/8-27 NPTF	8,7mm(.34")
63	20,0(.787")	M12X1,75	10,2mm (.40")	1/2-13	10,5mm(.42")	G1/4	11,0mm(.43")	1/4-18 NPTF	11,4mm(.45")
76	20,0(.787")	M12X1,75	10,2mm (.40")	1/2-13	10,5mm(.42")	G1/4	11,0mm(.43")	1/4-18 NPTF	11,4mm(.45")
101	20,0(.787")	M12X1,75	10,2mm (.40")	1/2-13	10,5mm(.42")	G1/4	11,0mm(.43")	1/4-18 NPTF	11,4mm(.45")
127	20,0(.787")	M12X1,75	10,2mm (.40")	1/2-13	10,5mm(.42")	G1/4	11,0mm(.43")	1/4-18 NPTF	11,4mm(.45")
152	25,0(.984")	M16X2,0	14,0mm(.55")	5/8-18	14,5mm (.57")	G1/4	11,0mm(.43")	1/4-18 NPTF	11,4mm(.45")

Notes:

1. Maximum Operating Pressure of Cylinder with "HR" or "HP" option is 150 PSI Pneumatic Service Only. Not available with "SH" (Hydraulic Seals) Option.
2. Pressure Rating for ID of hollow rod is 28inHg (Vacuum) to 150 PSI.
3. For oversized rod diameters, undersize rod diameters, large thru holes, and custom threads contact Nason for a Custom Part Number

Rod Eye Option - "RE"

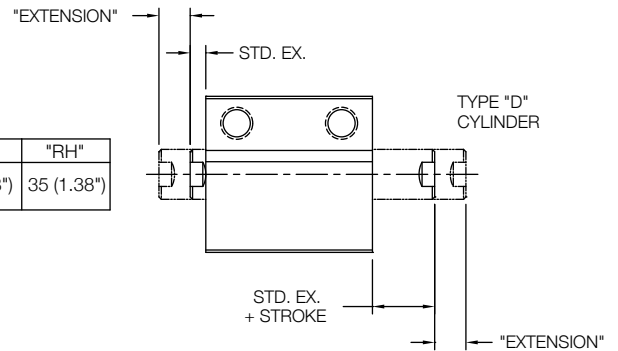


Bore	"A"	"B"	"C"	"D"	"E"	"F"
12	7,9(.31")	8,0(.32")	4,0(.16")	3,96(.156")	3,0(.119")	5,0(.20")
20	12,7 (.50")	12 (.47")	6 (.24")	6,35 (.25")	5 (.20")	8 (.32")
25		12,7(.50")	6,35(.25")		6,35(.25")	7,6(.30")
28,5	16 (.63")	20 (.79")	10 (.39")	8 (.32")	8 (.32")	12 (.47")
32		20 (.79")	10 (.39")	8 (.32")	8 (.32")	12 (.47")
40	19 (.75")	25 (.98")	12,5 (.49")	9,5 (.38")	10 (.39")	14 (.55")
50		25 (.98")	12,5 (.49")	9,5 (.38")		
63	25,4 (1.00")			12,7 (.50")		
76	25,4 (1.00")			12,7 (.50")		

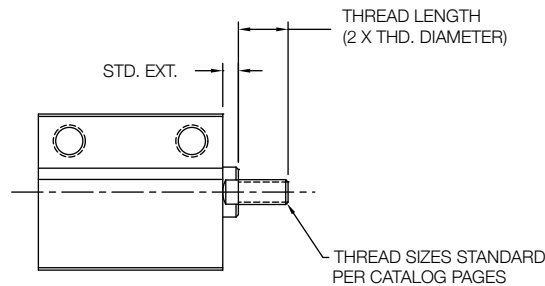
Rod Extensions Option - See Chart Below

Extension	"RF"	"RT"	"RN"	"RY"	"RV"	"RH"
Length	5 (.20")	10 (.39")	15 (.59")	20 (.79")	25 (.98")	35 (1.38")

For standard extension, see catalog pages.
If cylinder is double ended, extension will be on both ends.
Consult factory for single ended extension on a double ended cylinder.

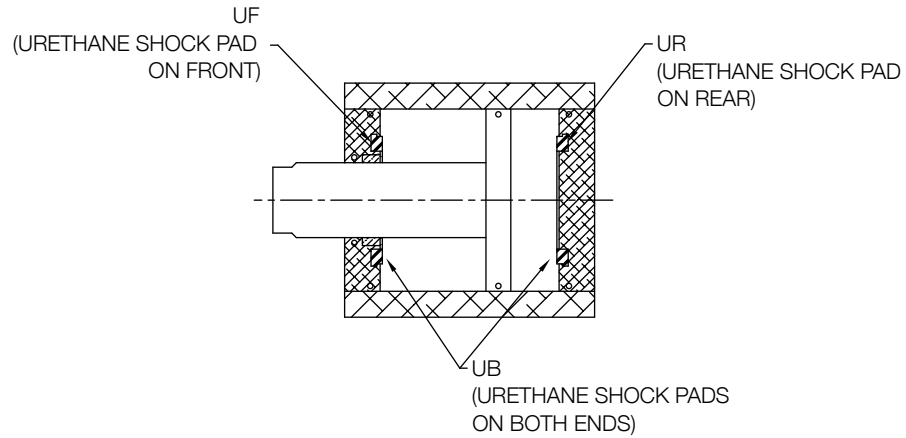


Rod Stud Option - "RS"



Bore	Std. Ext.	Thread Length
12	3 (.12")	8 (.32")
20	3 (.12")	10 (.39")
25	5 (.20")	10 (.39")
28,5	3,2(.13")	16(.63")
32	5 (.20")	12 (.47")
40	5 (.20")	16 (.63")
50	5 (.20")	20 (.79")
63	5 (.20")	24 (.95")
76	5 (.20")	24 (.95")

**Urethane Shock Pads
Option - "UF", "UR", "UB"**



- Urethane shock pads available on 20mm thru 76mm Bores in models LS, LE, LH, and LC.
- Pneumatic service only.
- Temperature rating: -18°C to 82°C (0°F -180°F).
- Use for increased noise reduction, minor piston impact, or high cycle rates.
- Does not increase cylinder length.
- Shock pads mechanically retained in cap and head.
- Shock pads are replaceable.
- Shock pads are NOT suitable replacements in applications requiring shock absorbers.

Seal Options

OPTION	MATERIAL	MODEL	BORE SIZE	PRESSURE RATING	TEMPERATURE RATING	MEDIA
BLANK (NO CODE)	NITRILE	LS, LE, LH	12mm 20mm thru 76mm 101mm thru 152mm	10 BAR (150 PSI) 17 BAR (250 PSI) 14 BAR (200 PSI)	-18°C to 95°C (0°F to 200°F)	Air (Clean, Dry or Lubricated)
HS	FLUOROCARBON	LE, LH	12mm 20mm thru 76mm 101mm thru 152mm	10 BAR (150 PSI) 17 BAR (250 PSI) 14 BAR (200 PSI)	-18°C to 150°C (0°F to 302°F)	Air (Clean, Dry or Lubricated)
SH	NITRILE	LS, LE, LH	20mm thru 76mm	35 BAR (500 PSI)	-10°C to 70°C (14°F to 158°F)	Hydraulic Fluid (Mineral Oil, Water Polyglycol Solutions Water-in-Oil Emulsions)

- Temperature and pressure ratings are based on a combination of seal materials, lubrication, and cylinder design.
- For higher or lower temperature and/or pressure ratings, consult Nason for a custom solution. Nason has successfully designed cylinders to operate at temperature extremes of -40°F and +500°F respectively, as well pressures as low as 5PSI and as high as 3000 PSI.