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Find the *PHD CRS3U25x 1 1/2-BB-M-T44-V1-Z1* at our website: *Click HERE*

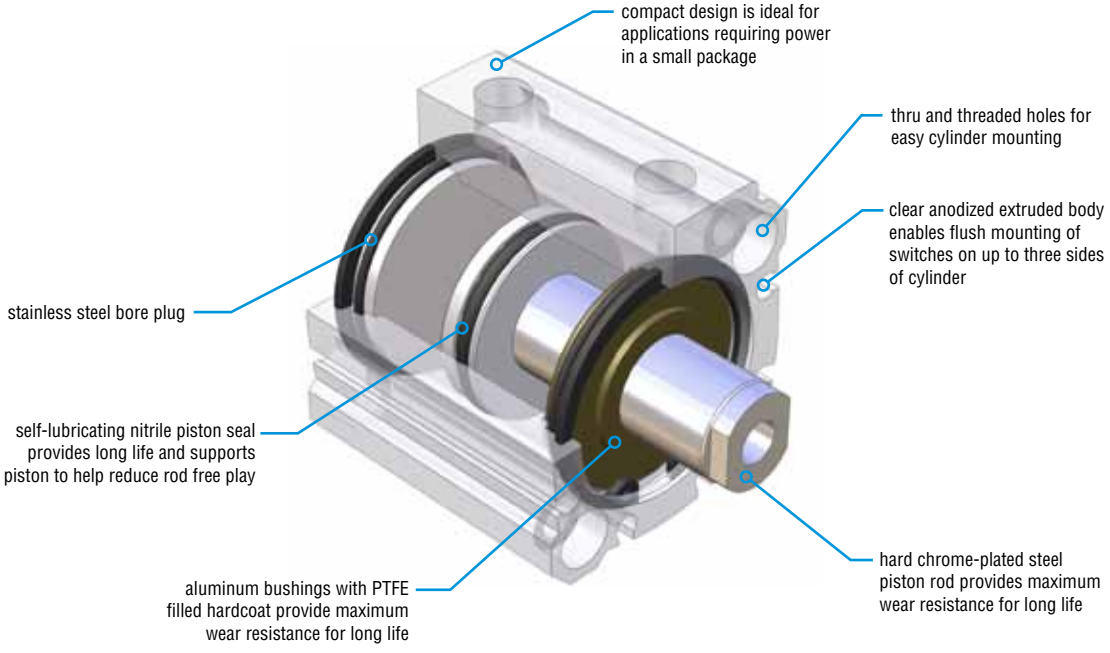
CRS

PNEUMATIC COMPACT CYLINDER



Major Benefits

- Compact design for applications where space is limited
- Up to six switch slots for flush switch mounting
- Self-lubricating nitrile piston seal for long cylinder life
- Multiple mounting options

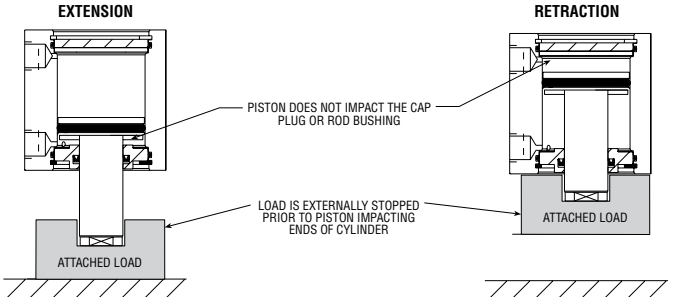


BEST PRACTICES FOR MAXIMUM CYLINDER LIFE

Shown below are the best ways to apply PHD Series CRS Cylinders. The key to proper application and long cylinder life is using the cylinder to provide power and motion while externally stopping any attached loads.

APPLICATION #1 - ATTACHED LOAD

Loads connected to the cylinder rod must always be stopped externally. Strokes, rod lengths, and attached loads should be designed so that the piston never impacts the head or cap. For vertical applications only.



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ORDERING DATA: SERIES CRS COMPACT CYLINDERS

TO ORDER SPECIFY:
Product, Series, Type, Design No., Mounting Style, Bore Size, Stroke, and Options.

PRODUCT
C - Cylinder

TYPE
S - Single Rod, Double Acting (Standard)
D - Double Rod, Double Acting (See note 4.)

MOUNTING STYLE
All units have 4 thru holes
U - Universal (Standard) Thread and C'bore 8 Places, 4 Each End

IMPERIAL STROKE (CRx3)
STANDARD STROKE LENGTHS
1/4" = Minimum stroke in 1/8" increments (See Note 5)

BORE mm	MAXIMUM STROKE (in)
12	3.25
16	3.25
20	4.00
25	4.00
32	4.50
40	4.50
50	5.00
63	7.00

METRIC STROKE (CRx6)
STANDARD STROKE LENGTHS
5 mm = Minimum stroke in 5 mm increments (See Note 5)

BORE mm	MAXIMUM STROKE [mm]
12	80
16	80
20	100
25	100
32	115
40	115
50	125
63	175

C R S 3 U 32 x 1/2 - M-T22

SERIES
R - Compact Round Bore

DESIGN NO.
3 - Imperial
6 - Metric

BORE SIZE

BORE mm	BORE in	AREA mm²	AREA in²
12	.47	113	.175
16	.63	201	.312
20	.79	314	.486
25	.98	490	.760
32	1.26	804	1.247
40	1.57	1256	1.948
50	1.97	1963	3.045
63	2.48	3117	4.831

IMPERIAL OPTIONS (CRx3)
BB - Shock Pads in both directions (No additional cylinder length)
M - Magnet for use with PHD 6790 & JC1 Switches. See Notes 1 and 7.
- Wide piston for extra rod support
WP (Standard with -M). See Note 1.
F11 - Extended length wrench flats
K_ - Extra Rod Extension in 1/8" increments. Length code example: K1 = 1/8", K3 = 3/8", etc.
T11 - Male Rod End, fine thread
T22 - Male Rod End, coarse thread
T44 - Female Rod End, coarse thread (Available on 20 mm through 63 mm sizes only)
T55 - Plain Rod End with wrench flats
T88 - Extended Male Rod End, fine thread
T99 - Extended Male Rod End, coarse thread
V1 - Fluoro-Elastomer Seals. See Note 2.
Z1 - Corrosion resistant, stainless steel rod and electroless nickel plated retaining rings. See Note 3.

METRIC OPTIONS (CRx6)
BB - Shock Pads in both directions (No additional cylinder length)
M - Magnet for use with PHD Series 6790 & JC1 Switches. See Notes 1, 7 and 8.
WP Wide piston for extra rod support (Standard with -M). See Note 1.
F11 - Extended length wrench flats
K_ - Extra Rod Extension in 5 mm increments. Length code example: K5 = 5 mm, K15 = 15 mm, etc.
T22 - Male Rod End
T55 - Plain Rod End with wrench flats
T99 - Extended Male Rod End
V1 - Fluoro-Elastomer Seals. See Note 2.
Z1 - Corrosion resistant, stainless steel rod and electroless nickel plated retaining rings. See Note 3.

NOTES:
1) Options -M and -WP add 1/4" [6.38 mm] to the overall length.
2) Option -V1 may reduce cylinder lifespan due to fluorocarbon seal material.
3) Option -Z1 may reduce cylinder lifespan due to stainless steel rod in place of chrome plated steel.
4) Double rod units' rear rod will receive same rod option as single rod.
5) For longer stroke lengths available, consult PHD.
6) See pages 1-9 through 1-11 for accessories.
7) PHD recommends the use of stainless steel or de-magnetized fasteners on units with the -M option.
8) See options pages for switch ordering information.

Options may affect unit length. See dimensional pages and option information details.

Refer to this product's online catalog in the product section for complete information including related dimensions and additional specifications. See link at bottom of this page.

SERIES 6790 & JC1 SWITCHES

PART NO.	DESCRIPTION
67902-1-05	PNP (Source) or NPN (Sink) Reed, 4.5-30 VDC, 5 m cable
JC1SDN-5	NPN (Sink) Solid State, 10-30 VDC, 5 m cable
JC1SDP-5	PNP (Source) Solid State, 10-30 VDC, 5 m cable
67922-1	PNP (Source) or NPN (Sink) Reed, 4.5-30 VDC, Quick Connect
JC1SDN-K	NPN (Sink) Solid State, 10-30 VDC, Quick Connect
JC1SDP-K	PNP (Source) Solid State, 10-30 VDC, Quick Connect
67929-2	PNP (Source) or NPN (Sink) Reed, 65-120 VAC, Quick Connect

NOTE: See Switches and Sensors section for additional switch information and complete specification. Switches must be ordered separately.

SERIES 6790 & JC1SDx CORDSET CHART

PART NO.	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 m cable
63549-05	M8, 3 pin, Straight Female Connector, 5 m cable

NOTE: Cordsets must be ordered separately.

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SPECIFICATIONS	SERIES CRS
OPERATING PRESSURE	10 psi min to 150 psi max at zero load [0.7 bar min to 10 bar max] air
STROKE TOLERANCE	± 0.031 inch [± 0.8 mm] (See Shock Pad Usage)
TEMPERATURE LIMITS	-20° to +180°F [-28° to +82°C]
VELOCITY	20 in/sec [.5 m/sec] typical min, zero load at 100 psi [7 bar]
LIFE EXPECTANCY	70 million linear inches [1.77 million linear meters] minimum at operating temperatures under 120°F [49°C] (-V1 & -Z1 options may reduce life)
LUBRICATION	Pre-lubricated for use with non-lubricated or lubricated air
MAINTENANCE	Field repairable

CYLINDER FORCE AND WEIGHT TABLE

BORE		ROD DIA.		ROD DIRECTION	EFFECTIVE AREA		BASE WEIGHT		ADDER PER 1" [25 mm] OF STROKE	
mm	in	in	mm		in²	mm²	lb	kg	lb	kg
12	.472	.250	6.35	EXTEND	.175	113	.11	.05	.085	.04
				RETRACT	.126	81				
16	.630	.250	6.35	EXTEND	.312	201	.17	.08	.10	.05
				RETRACT	.263	169				
20	.787	.375	9.53	EXTEND	.487	314	.25	.11	.15	.07
				RETRACT	.376	242				
25	.984	.375	9.53	EXTEND	.761	490	.26	.12	.16	.07
				RETRACT	.650	419				
32	1.260	.625	15.88	EXTEND	1.247	804	.48	.22	.26	.12
				RETRACT	.940	606				
40	1.575	.625	15.88	EXTEND	1.948	1256	.60	.27	.30	.14
				RETRACT	1.641	1058				
50	1.969	.750	19.05	EXTEND	3.043	1963	.78	.35	.40	.18
				RETRACT	2.602	1678				
63	2.480	.750	19.05	EXTEND	4.832	3117	.95	.43	.48	.22
				RETRACT	4.390	2832				

NOTE: Use retract figures for calculating double rod end cylinder forces in both directions.

CYLINDER FORCE CALCULATIONS

		IMPERIAL F = P x A	METRIC F = 0.1 x P x A
F	= Cylinder Force	lbs	N
P	= Operating Pressure	psi	bar
A	= Effective Area (Extend or Retract)	in²	mm²

APPLICATION

The PHD Series CRS Cylinders are designed for use as a source of power and motion. As with typical compact cylinders, the Series CRS Cylinder is not intended for applications where side loads or impact with attached loads are present. PHD recommends the use of external stops to ensure maximum cylinder life. See best application practices on page 1-3.

SHOCK PAD USAGE

Optional shock pads are recommended for applications where the piston travels the full stroke length and contacts the bushing and plug (with no attached loads). The use of shock pads reduces noise and provides maximum cylinder life in these applications. Stroke tolerance changes to ±.050 [±1.3 mm] with -BB option.1



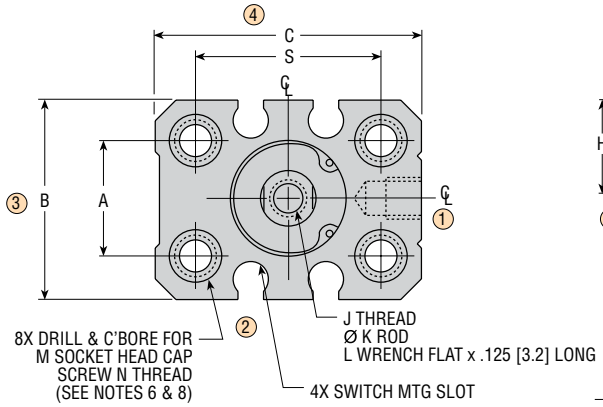
Sizing & Application Assistance

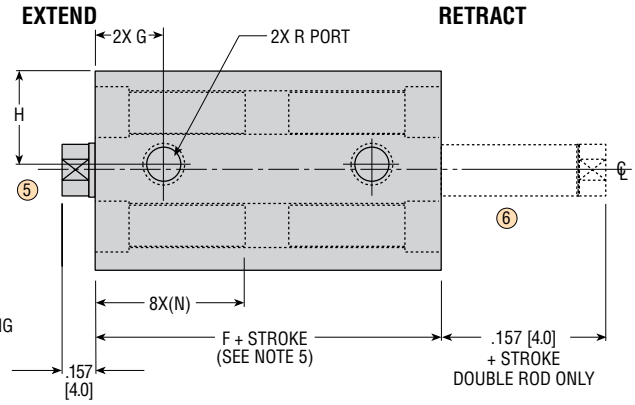
Use PHD's free online Product Sizing Application or view the Product Sizing Catalog at: www.phdinc.com/apps/sizing

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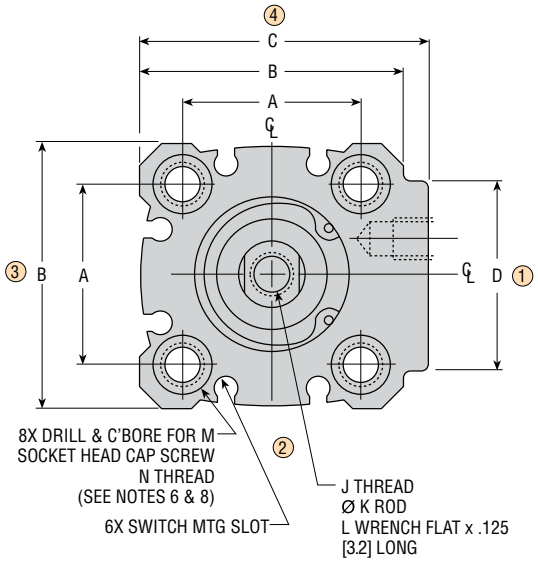
DIMENSIONS: SERIES CRS COMPACT CYLINDERS

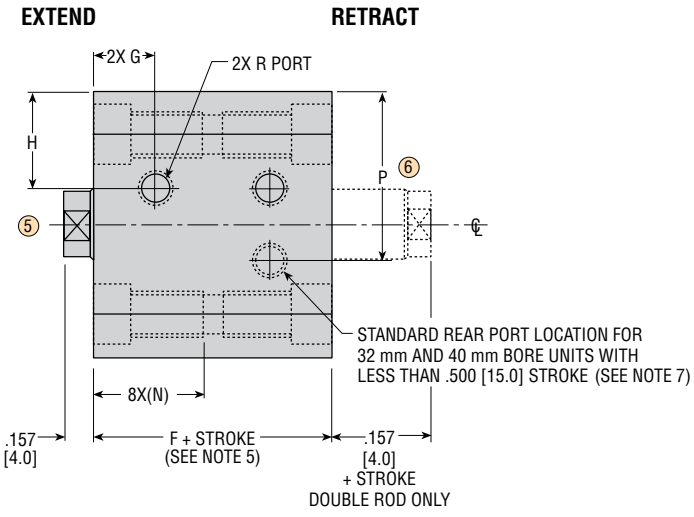
12 mm and 16 mm BORE





20 mm through 63 mm BORE





NOTES:

1) DIMENSIONS SHOWN IN [ ] ARE IN mm FOR METRIC UNITS [CRx6]
2) DESIGNATED CENTERLINE IS CENTERLINE OF CYLINDER BORE
3) UNLESS OTHERWISE DIMENSIONED, MOUNTING HOLE PATTERNS AND OTHER FEATURES ARE CENTERED ON DESIGNATED CYLINDER CENTERLINE
4) 1/4" [5 mm] MINIMUM STROKE REQUIRED
5) SEE DIMENSION CHART ON NEXT PAGE. DIMENSION F IS DIFFERENT FOR "PLAIN" UNIT AND WITH OPTIONS -M AND -WP.
6) C'BORE DEPTH OF MOUNTING HOLES MUST BE CONSIDERED TO DETERMINE PROPER MOUNTING FASTENER LENGTH
7) FOR 32 mm AND 40 mm BORE UNITS WITH STROKES LESS THAN .500 in [15 mm], PHD RECOMMENDS THE USE OF FITTINGS WITH A HEX NO LARGER THAN 7/16 [13 mm] AND NOTE REAR PORT LOCATION CHANGE
8) PHD RECOMMENDS THE USE OF STAINLESS STEEL OR DE-MAGNETIZED FASTENERS ON UNITS WITH THE -M OPTION.

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CAD & Sizing Assistance

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All dimensions are reference only unless specifically toleranced.

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BORE	LETTER DIMENSION								
	A	B	C	D	F PLAIN	F W/ OPTIONS -M, -WP	G	H	J THREAD
.472	.550	.944	1.260	—	.904	1.154	.325	.472	8-32 x .250
[12]	[13.97]	[24.0]	[32.0]		[23.0]	[29.4]	[8.26]	[12.0]	[M4 x .7 x 6]
.630	.710	1.104	1.340	—	.904	1.154	.325	.454	8-32 x .250
[16]	[18.03]	[28.0]	[34.0]		[23.0]	[29.4]	[8.26]	[11.5]	[M4 x .7 x 6]
.787	1.000	1.476	1.576	.788	.920	1.170	.350	.531	1/4-28 x .375
[20]	[25.4]	[37.5]	[40.0]	[20.0]	[23.4]	[29.7]	[8.89]	[13.5]	[M6 x 1.0 x 9]
.984	1.100	1.576	1.746	1.000	.920	1.170	.350	.552	1/4-28 x .375
[25]	[28.0]	[40.0]	[44.4]	[25.4]	[23.4]	[29.7]	[8.89]	[14.0]	[M6 x 1.0 x 9]
1.260	1.339	1.870	2.037	1.340	1.022	1.272	.375	.610	5/16-24 x .470
[32]	[34.0]	[47.5]	[52.0]	[34.0]	[26.0]	[32.3]	[9.53]	[15.5]	[M8 x 1.25 x 11]
1.575	1.575	2.205	2.363	1.420	1.022	1.272	.360	.738	5/16-24 x .470
[40]	[40.0]	[56.0]	[60.0]	[36.0]	[26.0]	[32.3]	[9.14]	[18.8]	[M8 x 1.25 x 11]
1.969	1.969	2.598	2.795	1.600	1.300	1.550	.472	.823	3/8-24 x .563
[50]	[50.0]	[66.0]	[71.0]	[40.6]	[33.0]	[39.4]	[12.00]	[21.0]	[M10 x 1.5 x 13]
2.480	2.362	3.070	3.266	2.094	1.420	1.670	.512	.865	3/8-24 x .563
[63]	[60.0]	[78.0]	[83.0]	[53.2]	[36.0]	[42.4]	[13.00]	[22.0]	[M10 x 1.5 x 13]

BORE	LETTER DIMENSION						
	K	L	M	N THREAD	P	R	S
.472	.250	.219	#6	10-24 x .550	—	10-32 x .15	.866
[12]	[6.35]	[5.6]	[M4]	[M5 x .8 x 14.5]		[M5 x .8 x 4]	[22.0]
.630	.250	.219	#6	10-24 x .550	—	10-32 x .15	.946
[16]	[6.35]	[5.6]	[M4]	[M5 x .8 x 14.5]		[M5 x .8 x 4]	[24.0]
.787	.375	.312	#10	1/4-20 x .875	—	10-32 x .15	—
[20]	[9.53]	[7.9]	[M5]	[M6 x 1.0 x 22.5]		[M5 x .8 x 4]	
.984	.375	.312	#10	1/4-20 x .875	—	10-32 x .15	—
[25]	[9.53]	[7.9]	[M5]	[M6 x 1.0 x 22.5]		[M5 x .8 x 4]	
1.260	.625	.500	#10	1/4-20 x .875	.900	1/8 NPT	—
[32]	[15.88]	[12.7]	[M5]	[M6 x 1.0 x 22.5]	[22.9]	[1/8 BSP]	
1.575	.625	.500	#10	1/4-20 x .875	1.072	1/8 NPT	—
[40]	[15.88]	[12.7]	[M5]	[M6 x 1.0 x 22.5]	[27.2]	[1/8 BSP]	
1.969	.750	.625	1/4	5/16-18 x .900	—	1/8 NPT	—
[50]	[19.05]	[15.9]	[M6]	[M8 x 1.25 x 22.5]		[1/8 BSP]	
2.480	.750	.625	1/4	5/16-18 x .900	—	1/4 NPT	—
[63]	[19.05]	[15.9]	[M6]	[M8 x 1.25 x 22.5]		[1/4 BSP]	

Numbers in [ ] are in mm for metric units [CRx6] .

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BB SHOCK PADS ON EXTENSION AND RETRACTION

Shock pads eliminate metal-to-metal contact and minimize piston impact. Shock pads are recommended for applications where the piston travels the full stroke length and contacts the head and/or cap (with no attached loads). The use of shock pads reduces noise and provides maximum cylinder life in these applications.

F11 EXTENDED LENGTH WRENCH FLATS

The design of a compact cylinder requires the length to be as short as possible. The standard wrench flat length is .125" [3 mm]. The option -F11 provides wrench flats which allow standard wrench access.

M MAGNET FOR PHD SERIES 6790 & JC1 SWITCHES

This option equips the cylinder with a magnetic band on the piston for use with PHD Series 6790 and JC1 Switches. These switches mount easily into the integral slots in the body. PHD recommends the use of stainless steel or de-magnetized fasteners on units with this option.

NOTE: Option -M adds 1/4" [6.38 mm] to the overall length of the cylinder of a plain unit.

T11 MALE ROD END, FINE THREAD (NOT AVAILABLE ON CRx6 UNITS)

T22 MALE ROD END, COARSE THREAD

These options provide a studded male rod end in place of the standard female threaded rod end. The metric CRS is available with coarse threads only.

T44 FEMALE ROD END, COARSE THREAD (CRx3 20-63 UNITS ONLY)

This option provides a female coarse thread rod end. This option can be applied to imperial 20 mm through 63 mm bore units. The imperial 12 mm and 16 mm bore units have an 8-32 coarse thread as standard. The metric 12 mm through 63 mm bore units have coarse threads as standard.

T55 PLAIN ROD END

This option provides a plain rod end with wrench flats. Standard PHD Compact Cylinders are supplied with a female rod end.

NOTE: On double rod units, rear rod receives same rod end as single rod.

K_ EXTRA ROD EXTENSION

Extra rod extension can be achieved by specifying the option -K followed by the length code.

Length code example (for imperial CRx3 units)
K1 = 1/8" of extra rod extension
K3 = 3/8", etc.

Length code example (for metric CRx6 units)
K5 = 5 mm of extra rod extension
K15 = 15 mm, etc.

.157" [4 mm] of rod extension is standard. Available in 1/8" [5 mm] increments only.

WP WIDE PISTON FOR EXTRA ROD END SUPPORT

This option provides additional rod end stability. All units with magnetic pistons will automatically receive a wide piston to accommodate the magnet.

NOTE: Option -WP, adds 1/4" [6.38 mm] to the overall length of the cylinder of a plain unit.

V1 FLUORO-ELASTOMER SEALS

Fluoro-Elastomer seals are compatible with certain fluids which degrade standard Nitrile seals. Seal compatibility should be checked with the fluid manufacturer for correct application. Consult PHD for high temperature use.

Z1 CORROSION RESISTANT

Electroless nickel plating is applied to the retaining rings and a stainless steel piston rod is supplied. Male rod ends are not plated when this option is specified. This option may reduce seal life.

T88 EXTENDED MALE ROD END, FINE THREAD (NOT AVAILABLE ON CRx6 UNITS)

T99 EXTENDED MALE ROD END, COARSE THREAD

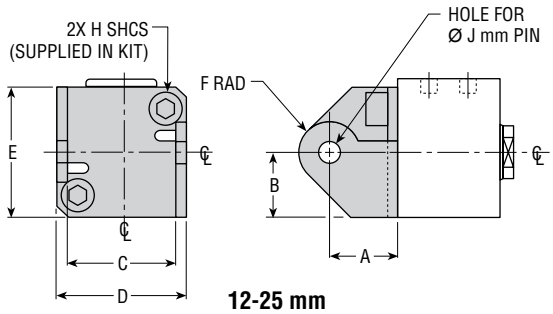
These options provide a studded male rod end with extended length threads. Metric CRS units are available with coarse threads only.

Options may affect unit length. See dimensional pages and option information details.

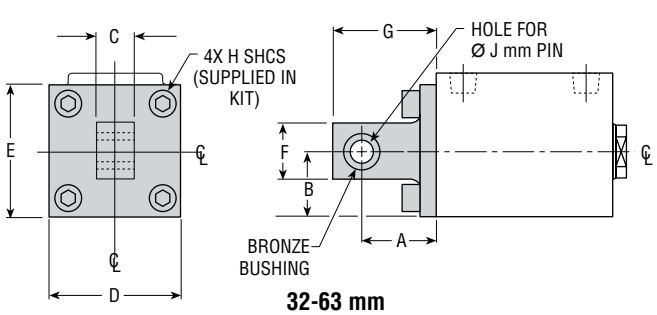
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CYLINDER PIVOT KIT



12-25 mm



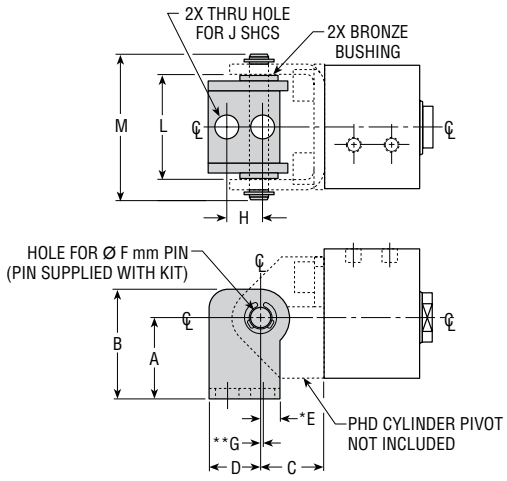
32-63 mm

BORE [mm]	DIMENSIONS A	B	C	D	E	F	G	H	J	KIT NO. IMPERIAL CRx3	KIT NO. METRIC CRx6
12	.650 [16.5]	.638 [16.2]	.905 [23.00]	1.064 [27.0]	1.276 [32.4]	.281 [7.1]	— —	10-24 [M5 x .8]	.197 [5.0]	60278-1	60286-1
16	.650 [16.5]	.678 [17.2]	.905 [23.00]	1.064 [27.0]	1.356 [34.4]	.281 [7.1]	— —	10-24 [M5 x .8]	.197 [5.0]	60279-1	60287-1
20	.790 [20.1]	.750 [19.0]	1.250 [31.75]	1.500 [38.1]	1.500 [38.1]	.355 [9.0]	— —	1/4-20 [M6 x 1.0]	.236 [6.0]	60280-1	60288-1
25	.790 [20.1]	.800 [20.3]	1.250 [31.75]	1.500 [38.1]	1.600 [40.6]	.355 [9.0]	— —	1/4-20 [M6 x 1.0]	.236 [6.0]	60281-1	60289-1
32	1.065 [27.0]	.935 [23.8]	.490 [12.45]	1.870 [47.5]	1.870 [47.5]	.820 [21.0]	1.475 [37.5]	1/4-20 [M6 x 1.0]	.394 [10.0]	60282-1	60290-1
40	1.065 [27.0]	1.105 [28.1]	.490 [12.45]	2.210 [56.1]	2.210 [56.1]	.820 [21.0]	1.475 [37.5]	1/4-20 [M6 x 1.0]	.394 [10.0]	60283-1	60291-1
50	1.460 [37.1]	1.300 [33.0]	.600 [15.24]	2.600 [66.0]	2.600 [66.0]	1.000 [25.4]	1.970 [50.0]	5/16-18 [M8 x 1.25]	.472 [12.0]	60284-1	60292-1
63	1.460 [37.1]	1.500 [38.1]	.600 [15.24]	3.000 [76.2]	3.000 [76.2]	1.000 [25.4]	1.970 [50.0]	5/16-18 [M8 x 1.25]	.472 [12.0]	60285-1	60293-1

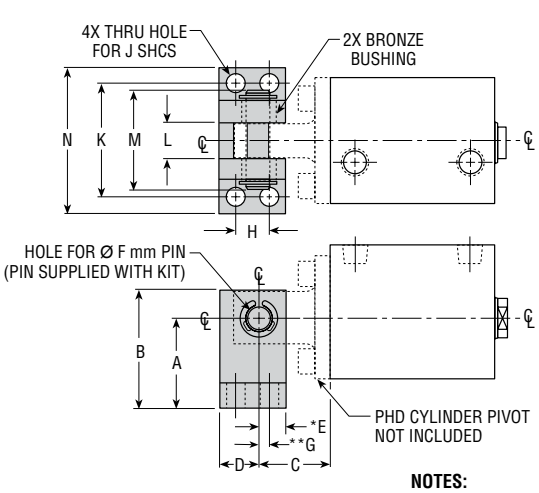
Numbers in [ ] are in mm for metric units [CRx6].

NOTES:
1) 12-25 mm IS BRITE ZINC PLATED STEEL
2) 32-63 mm IS ANODIZED ALUMINUM WITH LUBRICATED BRONZE BUSHINGS
3) FULCRUM PIN NOT INCLUDED (SEE "FULCRUM PIN KITS" TO PURCHASE)
4) DESIGNATED CENTERLINE ℄ IS CENTERLINE OF CYLINDER.
5) UNLESS OTHERWISE DIMENSIONED, FEATURES ARE CENTERED ON CYLINDER CENTERLINE.

BASE PIVOT KIT



12-25 mm



32-63 mm

BORE [mm]	DIMENSIONS A	B	C	D	E	ØF	G	H	J	K	L	M	N	KIT: CRx3x, CRx6x IMPERIAL/METRIC
12/16	.865 [22.0]	1.145 [29.0]	.650 [16.5]	.490 [12.5]	.220 [5.6]	.197 [5.0]	.060 [1.5]	.375 [9.5]	#10 [M5]	N/A	.877 [22.3]	1.300 [33.0]	N/A	60294-1
20/25	1.000 [25.4]	1.355 [34.4]	.790 [20.1]	.630 [16.0]	.260 [6.5]	.237 [6.0]	.040 [1.0]	.435 [11.0]	1/4 [M6]	N/A	1.221 [31.0]	1.730 [44.0]	N/A	60295-1
32/40	1.375 [34.9]	1.800 [45.7]	1.065 [27.0]	.600 [15.2]	.400 [10.2]	.394 [10.0]	.156 [4.0]	.510 [13.0]	1/4 [M6]	1.695 [43.0]	.540 [13.7]	1.490 [38.0]	2.165 [55.0]	60296-1
50/63	1.890 [48.0]	2.365 [60.0]	1.460 [37.1]	.755 [19.2]	.508 [12.9]	.472 [12.0]	.236 [6.0]	.709 [18.0]	5/16 [M8]	2.265 [57.5]	.659 [16.7]	1.970 [50.0]	2.835 [72.0]	60297-1

Numbers in [ ] are in mm for metric units [CRx6].

NOTES:
1) 12-25 mm IS BRITE ZINC PLATED STEEL WITH LUBRICATED BRONZE BUSHINGS
2) 32-63 mm IS ANODIZED ALUMINUM WITH LUBRICATED BRONZE BUSHINGS
3) FULCRUM PIN INCLUDED. DOES NOT INCLUDE CYLINDER PIVOT.
4) *E IS TO CENTER OF PIVOT PIN
5) **G IS FROM CENTER OF PIVOT PIN TO CENTER OF FIRST MOUNTING HOLE]
6) DESIGNATED CENTERLINE ℄ IS CENTERLINE OF CYLINDER.

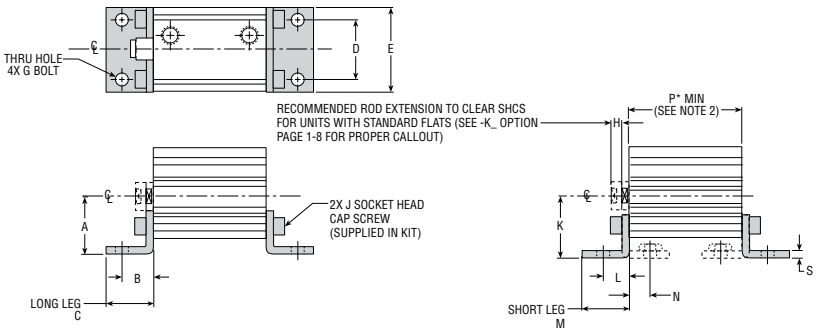
All dimensions are reference only unless specifically toleranced.

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F MOUNT KIT (Must be ordered separately)

Plated steel for use where front or rear mounting is not feasible. Brackets are narrow allowing units to be used where space to the side of the cylinder is limited.

NOTE: Brackets may be mounted in different configurations. Each kit includes 1 bracket and cylinder mounting hardware. Two kits recommended per unit!



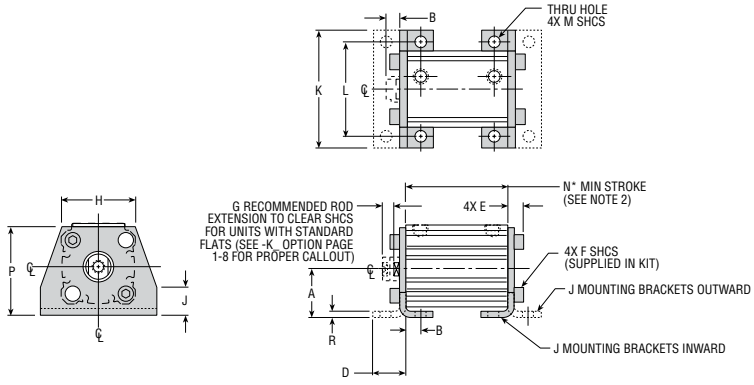
BORE [mm]	DIMENSIONS														KIT NO. IMPERIAL CRx3	KIT NO. METRIC CRx6
	A	B	C	D	E	G	H	J	K	L	M	N	P* MIN	S		
12	.874 [22.2]	.553 [14.0]	.770 [19.6]	.550 [14.0]	.950 [24.13]	#10 [M5]	.250 [5.0]	10-24 [M5 x .8]	.986 [25.0]	.441 [11.2]	.660 [17.0]	.336 [8.5]	3/8 [10.0]	.105 [2.67]	58904-1	60302-1
16	.945 [24.0]	. 589 [15.0]	.850 [21.6]	.710 [18.0]	1.110 [28.19]	#10 [M5]	.250 [10.0]	10-24 [M5 x .8]	1.062 [27.0]	.475 [12.1]	.730 [18.5]	.355 [9.0]	3/8 [10.0]	.120 [3.05]	58905-1	60303-1
20	1.000 [25.4]	.680 [17.3]	.940 [23.9]	1.000 [25.4]	1.560 [39.62]	1/4 [M6]	.375 [10.0]	1/4-20 [M6 x 1.0]	1.180 [30.0]	.500 [12.7]	.760 [19.3]	.380 [9.7]	1/2 [15.0]	.120 [3.05]	58906-1	60304-1
25	1.100 [27.9]	.690 [17.5]	.950 [24.1]	1.100 [27.9]	1.610 [40.90]	1/4 [M6]	.375 [10.0]	1/4-20 [M6 x 1.0]	1.240 [31.5]	.550 [14.0]	.825 [21.0]	.415 [10.5]	1/2 [15.0]	.135 [3.43]	58907-1	60305-1
32	1.280 [32.5]	.730 [18.5]	1.035 [26.3]	1.340 [34.0]	1.890 [48.00]	1/4 [M6]	.375 [10.0]	1/4-20 [M6 x 1.0]	1.400 [35.5]	.610 [15.5]	.915 [23.2]	.446 [11.3]	5/8 [20.0]	.164 [4.17]	58908-1	60306-1
40	1.412 [35.9]	.807 [20.5]	1.180 [30.00]	1.575 [40.0]	2.205 [56.00]	1/4 [M6]	.375 [10.0]	1/4-20 [M6 x 1.0]	1.595 [40.5]	.625 [15.9]	.975 [24.8]	.446 [11.3]	5/8 [20.0]	.179 [4.55]	58909-1	60307-1
50	1.750 [44.5]	.905 [23.0]	1.420 [36.1]	1.970 [50.0]	2.600 [66.00]	5/16 [M8]	.500 [15.0]	5/16-18 [M8 x 1.25]	1.889 [48.0]	.765 [19.4]	1.250 [31.8]	.556 [14.1]	7/8 [25.0]	.209 [5.31]	58910-1	60308-1
63	2.011 [51.1]	.985 [25.0]	1.520 [38.6]	2.360 [60.0]	3.070 [78.00]	5/16 [M8]	.500 [15.0]	5/16-18 [M8 x 1.25]	2.166 [55.0]	.830 [21.0]	1.325 [33.7]	.580 [14.7]	7/8 [25.0]	.250 [6.35]	58911-1	60309-1

NOTES:
1) NUMBERS IN [ ] ARE IN mm FOR METRIC UNITS [CRx5].
2) *MINIMUM STROKE REQUIRED FOR LEGS OF BOTH BRACKETS TO BE UNDER UNIT (SUBTRACT .250 [5.0] FROM P FOR MAGNETIC UNITS)
3) DESIGNATED CENTERLINE ℄ IS CENTERLINE OF CYLINDER.

J MOUNT KIT (Must be ordered separately)

Plated steel for use where height is critical, but room is available to sides of unit.

NOTE: Brackets may be mounted in different configurations. Kit includes 2 brackets and cylinder mounting hardware.



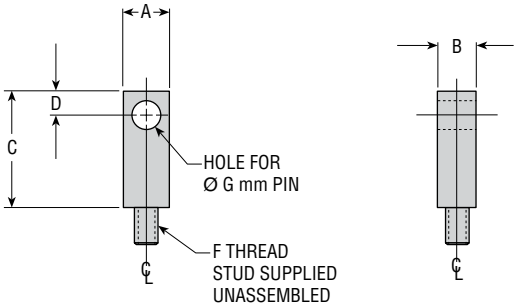
BORE [mm]	DIMENSIONS														KIT NO. IMPERIAL CRx3	KIT NO. METRIC CRx6
	A	B	D	E	F	G	H	J	K	L	M	N* MIN	P	R		
12	.830 [21.1]	.275 [7.0]	.600 [15.3]	.295 [7.5]	10-24 [M5 x .8]	.250 [5.0]	.945 [24.0]	.390 [10.0]	1.810 [46.0]	1.380 [35.1]	#10 [M5]	.250 [5.0]	1.510 [38.4]	.105 [2.67]	60310-1	60318-1
16	.870 [22.0]	.275 [7.0]	.610 [15.5]	.310 [7.9]	10-24 [M5 x .8]	.250 [10.0]	1.122 [28.5]	.450 [11.5]	1.970 [50.0]	1.535 [39.0]	#10 [M5]	.250 [5.0]	1.620 [41.2]	.120 [3.05]	60311-1	60319-1
20	.945 [24.0]	.315 [8.0]	.710 [18.0]	.370 [9.4]	1/4-20 [M6 x 1.0]	.375 [10.0]	1.470 [37.4]	.450 [11.5]	2.520 [64.0]	1.969 [50.0]	1/4 [M6]	.375 [10.0]	1.750 [44.5]	.120 [3.05]	60312-1	60320-1
25	1.005 [25.5]	.315 [8.0]	.725 [18.5]	.390 [9.9]	1/4-20 [M6 x 1.0]	.375 [10.0]	1.581 [40.2]	.490 [12.5]	2.600 [66.0]	2.047 [52.0]	1/4 [M6]	.375 [10.0]	1.890 [48.0]	.135 [3.43]	60313-1	60321-1
32	1.218 [31.0]	.355 [9.0]	.834 [21.2]	.414 [10.5]	1/4-20 [M6 x 1.0]	.375 [10.0]	1.873 [47.6]	.630 [16.0]	2.950 [75.0]	2.362 [60.0]	1/4 [M6]	.375 [10.0]	2.240 [57.0]	.164 [4.17]	60314-1	60322-1
40	1.400 [35.6]	.355 [9.0]	.885 [22.5]	.429 [10.9]	1/4-20 [M6 x 1.0]	.375 [10.0]	2.190 [55.7]	.670 [17.0]	3.310 [84.1]	2.677 [68.0]	1/4 [M6]	.500 [10.0]	2.560 [65.0]	.179 [4.55]	60315-1	60323-1
50	1.730 [44.0]	.492 [12.5]	1.110 [28.2]	.531 [13.5]	5/16-18 [M8 x 1.25]	.500 [15.0]	2.577 [65.5]	.850 [21.5]	3.940 [100.1]	3.189 [81.0]	5/16 [M8]	.625 [15.0]	3.150 [80.0]	.209 [5.31]	60316-1	60324-1
63	2.010 [51.1]	.512 [13.0]	1.250 [31.8]	.570 [14.5]	5/16-18 [M8 x 1.25]	.500 [15.0]	3.055 [77.6]	1.000 [25.5]	4.530 [115.1]	3.661 [93.0]	5/16 [M8]	.750 [20.0]	3.660 [93.0]	.250 [6.35]	60317-1	60325-1

NOTES:
1) NUMBERS IN [ ] ARE IN mm FOR METRIC UNITS [CRx6].
2) *MINIMUM STROKE REQUIRED FOR LEGS OF BOTH BRACKETS TO BE UNDER UNIT (SUBTRACT .250 [5.0] FROM P FOR MAGNETIC UNITS)
3) DESIGNATED CENTERLINE ℄ IS CENTERLINE OF CYLINDER.

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ROD EYE KIT

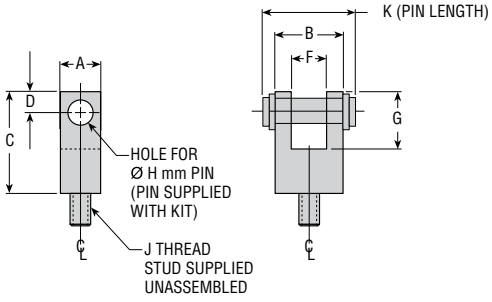
BORE [mm]	DIMENSIONS A	B	C	D	F	G	KIT: CRx3x IMPERIAL	KIT: CRx6x METRIC
12/16	.438 [11.0]	.250 [6.5]	.885 [22.5]	.215 [5.5]	8-32 [M4 x .7]	.197 [5.0]	59069-1	60234-1
20/25	.500 [12.7]	.375 [9.5]	1.065 [27.0]	.255 [6.5]	1/4-28 [M6 x 1.0]	.236 [6.0]	59070-1	60235-1
32/40	.625 [16.0]	.500 [12.5]	1.495 [38.0]	.355 [9.0]	5/16-24 [M8 x 1.25]	.394 [10.0]	59071-1	60236-1
50/63	.875 [22.2]	.625 [16.0]	1.610 [41.0]	.430 [11.0]	3/8-24 [M10 x 1.5]	.472 [12.0]	59072-1	60237-1



NOTES:
1) UNIT **MUST** BE ORDERED WITH STANDARD FEMALE THREADS
2) DESIGNATED CENTERLINE ℄ IS CENTERLINE OF PART. ALL FEATURES CENTERED ON ℄ UNLESS OTHERWISE NOTED.
3) STANDARD PLATING IS BRITE ZINC
4) NUMBERS IN [ ] ARE IN mm FOR METRIC UNITS [CRx6]

ROD CLEVIS KIT

BORE [mm]	DIMENSIONS A	B	C	D	F	G	H	J	K	KIT: CRx3x IMPERIAL	KIT: CRx6x METRIC
12/16	.438 [11.1]	.625 [15.9]	1.000 [25.4]	.215 [5.5]	.266 [6.8]	.610 [15.5]	.197 [5.0]	8-32 [M4 x .7]	.845 [21.5]	59073-1	60238-1
20/25	.500 [12.7]	.750 [19.0]	1.255 [32.0]	.255 [6.5]	.391 [9.9]	.738 [18.8]	.236 [6.0]	1/4-28 [M6 x 1.0]	.965 [24.5]	59074-1	60239-1
32/40	.625 [15.9]	1.000 [25.4]	1.615 [41.0]	.315 [8.0]	.518 [13.2]	.925 [23.5]	.394 [10.0]	5/16-24 [M8 x 1.25]	1.300 [33.0]	59075-1	60240-1
50/63	.875 [22.2]	1.250 [31.8]	1.815 [46.1]	.435 [11.0]	.645 [16.4]	1.165 [29.6]	.472 [12.0]	3/8-24 [M10 x 1.5]	1.575 [40.0]	59076-1	60241-1



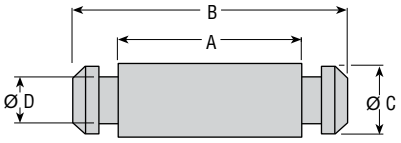
NOTES:
1) UNIT **MUST** BE ORDERED WITH STANDARD FEMALE THREADS
2) DESIGNATED CENTERLINE ℄ IS CENTERLINE OF PART. ALL FEATURES CENTERED ON ℄ UNLESS OTHERWISE NOTED.
3) STANDARD PLATING IS BRITE ZINC (PIN & CLEVIS)
4) NUMBERS IN [ ] ARE IN mm FOR METRIC UNITS [CRx6]

ROD FULCRUM PIN KIT

Replacement for Rod Clevis pin or for use with PHD Rod Eye. Pin is Brite Zinc plated. Retaining rings are supplied.

BORE [mm]	DIMENSIONS A	B	ØC	ØD	KIT: CRx2x, CRx5x IMPERIAL/METRIC
12/16	.665 [16.9]	.845 [21.5]	.197 [5.0]	.125 [3.2]	60326-1
20/25	.785 [19.9]	.965 [24.5]	.236 [6.0]	.156 [4.0]	60327-1
32/40	1.045 [26.5]	1.300 [33.0]	.394 [10.0]	.274 [7.0]	60328-1
50/63	1.295 [32.9]	1.575 [40.0]	.472 [12.0]	.353 [9.0]	60329-1

Numbers in [ ] are in mm for metric units [CRx6].



CYLINDER FULCRUM PIN KIT

Replacement for base pivot pin or for use with PHD Cylinder Pivot. Pin is Brite Zinc plated. Retaining rings are supplied.

BORE [mm]	DIMENSIONS A	B	ØC	ØD	KIT: CRx2x, CRx5x IMPERIAL/METRIC
12/16	1.120 [28.5]	1.300 [33.0]	.197 [5.0]	.125 [3.1]	60330-1
20/25	1.550 [39.4]	1.730 [44.0]	.236 [6.0]	.156 [4.0]	60331-1
32/40	1.240 [31.5]	1.490 [37.9]	.394 [10.0]	.274 [7.0]	60332-1
50/63	1.690 [42.9]	1.970 [50.0]	.472 [12.0]	.353 [9.0]	60333-1

Numbers in [ ] are in mm for metric units [CRx6].

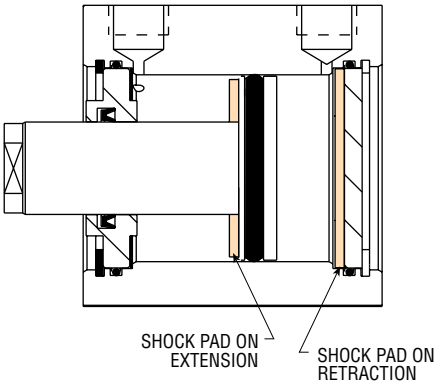


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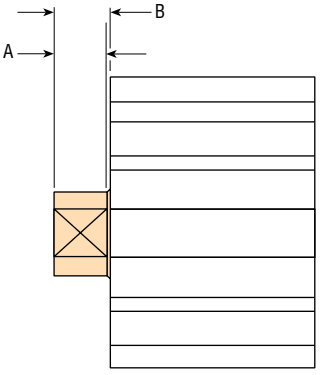
BB SHOCK PADS ON EXTENSION AND RETRACTION

Shock pads eliminate metal-to-metal contact and minimize piston impact. Shock pads are recommended for applications where the piston travels the full stroke length and contacts the head and/or cap (with no attached loads). The use of shock pads reduces noise and provides maximum cylinder life in these applications.



F11 EXTENDED LENGTH WRENCH FLATS

The design of a compact cylinder requires the length to be as short as possible. The standard wrench flat length is .125" [3 mm]. The option -F11 provides wrench flats which allow standard wrench access.



BORE [mm]	A EXTENDED WRENCH FLATS		B ROD EXTENSION	
12/16	.200	[5.08]	.250	[6.5]
20/25	.200	[5.08]	.250	[6.5]
32/40	.290	[8.00]	.344	[9.0]
50/63	.290	[8.00]	.344	[9.0]

Numbers in [ ] are in mm for metric units [CRx6].

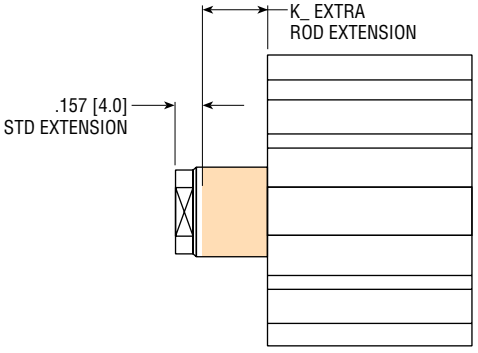
K_ EXTRA ROD EXTENSION

Extra rod extension can be achieved by specifying the option -K followed by the length code.

Length code example (for imperial CRx3 units)
K1 = 1/8" of extra rod extension
K3 = 3/8", etc.

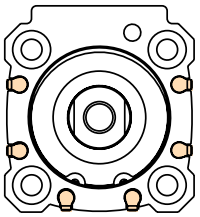
Length code example (for metric CRx6 units)
K5 = 5 mm of extra rod extension
K15 = 15 mm, etc.

.157" [4 mm] of rod extension is standard. Available in 1/8" [5 mm] increments only.



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M MAGNET FOR PHD SERIES 6790 & JC1 SWITCHES



This option equips the cylinder with a magnetic band on the piston for use with PHD Series 6790 and JC1 Switches. These switches mount easily into the integral slots in the body. PHD recommends the use of stainless steel or de-magnetized fasteners on units with this option.

NOTE: Option -M adds 1/4" [6.38 mm] to the overall length of the cylinder of a plain unit.

SERIES 6790 & JC1 SWITCHES

PART NO.	DESCRIPTION
67902-1-05	PNP (Source) or NPN (Sink) Reed, 4.5-30 VDC, 5 m cable
JC1SDN-5	NPN (Sink) Solid State, 10-30 VDC, 5 m cable
JC1SDP-5	PNP (Source) Solid State, 10-30 VDC, 5 m cable
67922-1	PNP (Source) or NPN (Sink) Reed, 4.5-30 VDC, Quick Connect
JC1SDN-K	NPN (Sink) Solid State, 10-30 VDC, Quick Connect
JC1SDP-K	PNP (Source) Solid State, 10-30 VDC, Quick Connect
67929-2	PNP (Source) or NPN (Sink) Reed, 65-120 VAC, Quick Connect

NOTE: See Switches and Sensors section for additional switch information and complete specification.

SERIES 6790 & JC1SDx CORDSET CHART

PART NO.	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 m cable
63549-05	M8, 3 pin, Straight Female Connector, 5 m cable

TORQUE CHART

SWITCH	TORQUE
6790	16 in-oz
JC1SDx	Hand tighten clockwise until switch is securely retained. Do not overtighten.

WP WIDE PISTON FOR EXTRA ROD END SUPPORT

This option provides additional rod end stability. All units with magnetic pistons will automatically receive a wide piston to accommodate the magnet.

NOTE: Option -WP, adds 1/4" [6.38 mm] to the overall length of the cylinder of a plain unit.

V1 FLUORO-ELASTOMER SEALS

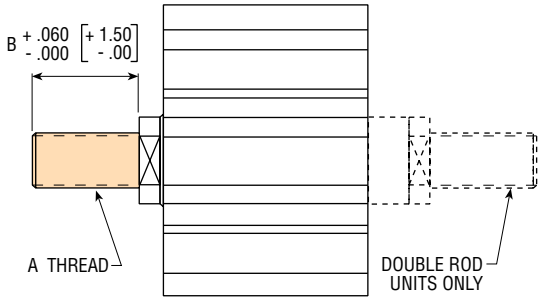
Fluoro-Elastomer seals are compatible with certain fluids which degrade standard Nitrile seals. Seal compatibility should be checked with the fluid manufacturer for correct application. Consult PHD for high temperature use.

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T11 MALE ROD END, FINE THREAD
(NOT AVAILABLE ON CRx6 UNITS)

T22 MALE ROD END, COARSE THREAD

These options provide a studded male rod end in place of the standard female threaded rod end. The metric CRS is available with coarse threads only. See pages 1-6 and 1-7 for specifications of standard rod ends.

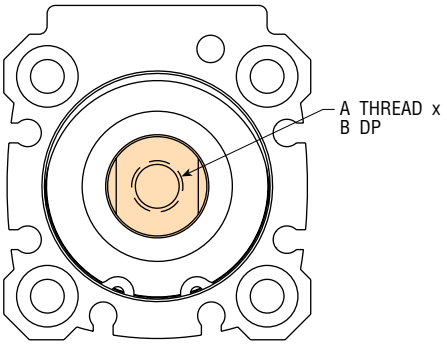


BORE [mm]	-T11 FINE A THREAD	-T22 COARSE A THREAD		B	
12/16	N/A	8-32	[M4 x .7]	.325	[8.5]
20/25	1/4-28	1/4-20	[M6 x 1.0]	.580	[14.9]
32/40	5/16-24	5/16-18	[M8 x 1.25]	.625	[17.5]
50/63	3/8-24	3/8-16	[M10 x 1.5]	.810	[20.5]

NOTES: 1) Numbers in [ ] are in mm for metric units [CRx6].
2) On double rod units, rear rod receives same rod end as single rod.

T44 FEMALE ROD END, COARSE THREAD (CRx3 20-63 UNITS ONLY)

This option provides a female coarse thread rod end. This option can be applied to imperial 20 mm through 63 mm bore units. The imperial 12 mm and 16 mm bore units have an 8-32 coarse thread as standard. See pages 1-6 and 1-7 for standard thread sizes. The metric 12 mm through 63 mm bore units have coarse threads as standard.



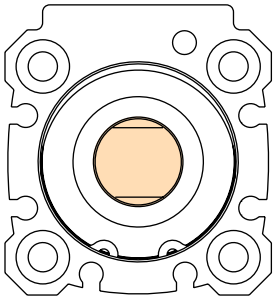
BORE [mm]	-T44 COARSE A THREAD		B	
12/16	(STD)	(STD)	(STD)	(STD)
20/25	1/4-20	(STD)	.375	(STD)
32/40	5/16-18	(STD)	.470	(STD)
50/63	3/8-16	(STD)	.562	(STD)

NOTE: On double rod units, rear rod receives same rod end as single rod.

T55 PLAIN ROD END

This option provides a plain rod end with wrench flats. Standard PHD Compact Cylinders are supplied with a female rod end.

NOTE: On double rod units, rear rod receives same rod end as single rod.



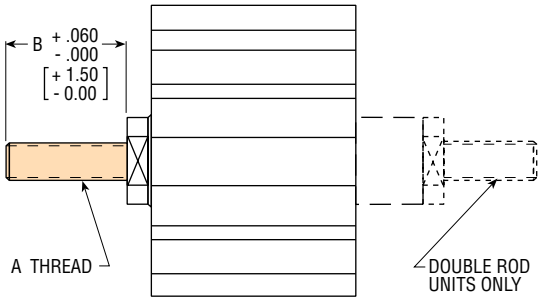
All dimensions are reference only unless specifically toleranced.

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T88 EXTENDED MALE ROD END, FINE THREAD
(NOT AVAILABLE ON CRx6 UNITS)

T99 EXTENDED MALE ROD END, COARSE THREAD

These options provide a studded male rod end with extended length threads. Metric CRS units are available with coarse threads only. See page 1-12-3 for standard length male rod end options.



BORE [mm]	-T88 FINE	-T99 COARSE A THREAD		B
12/16	N/A	8-32	[M4 x .7]	.700 [17.5]
20/25	1/4-28	1/4-20	[M6 x 1.0]	1.200 [29.5]
32/40	5/16-24	5/16-18	[M8 x 1.25]	1.250 [32.5]
50/63	3/8-24	3/8-16	[M10 x 1.5]	1.690 [35.5]

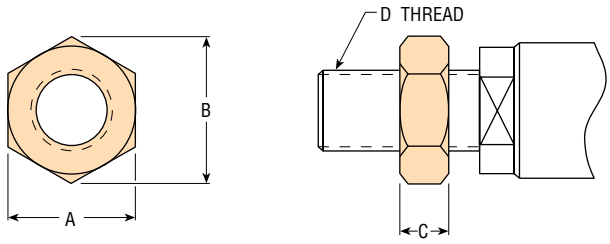
NOTES: 1) Numbers in [ ] are in mm for metric units [CRx6].
2) On double rod units, rear rod receives same rod end as single rod.

Z1 CORROSION RESISTANT

Electroless nickel plating is applied to the retaining rings and a stainless steel piston rod is supplied. Male rod ends are not plated when this option is specified. This option may reduce seal life.

HEXAGONAL NUT KIT

Nut kits include a hexagonal nut for use with male studded rod ends. All male rod end options are shipped without hexagonal nuts.



BORE [mm]	DIMENSIONS A	B	C	D THREAD FINE	KIT NO.	D THREAD COARSE	KIT NO. COARSE
12/16	.335 [7.0]	.385 [7.7]	.125 [2.2]	N/A [N/A]	N/A [N/A]	8-32 [M4 x .7]	1972-039 [3204-035]
20/25	.432 [10.0]	.487 [11.0]	.157 [3.2]	1/4-28 [N/A]	1972-015 [N/A]	1/4-20 [M6 x 1.0]	1972-014 [3204-001]
32/40	.500 [13.0]	.577 [14.4]	.187 [4.0]	5/16-24 [N/A]	1972-017 [N/A]	5/16-18 [M8 x 1.25]	1972-016 [3204-002]
50/63	.562 [17.0]	.650 [18.9]	.215 [5.0]	3/8-24 [N/A]	1972-019 [N/A]	3/8-16 [M10 x 1.5]	1972-018 [3204-025]

Numbers in [ ] are in mm for metric units [CRx6].

All dimensions are reference only unless specifically toleranced.

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