

**Series CHD Cylinder Features**

**Primary Seal** – polyurethane rod seal with multiple sealing edges is self-compensating and self relieving to withstand pressure variations and conform to mechanical deflection that may occur.

**Piston Rod** – Medium carbon steel, hard chrome plated and polished.

**Ports** – SAE O-ring ports are standard.

**OPTIONAL PORTS**  
 NPTF and BSPP ports are also available. Manifold ports are available on mounting styles C & CN.

**Secondary Seal – Rod Wiper** – wipes clean any oil film adhering to the rod on the extend stroke and cleans the rod on the return stroke.

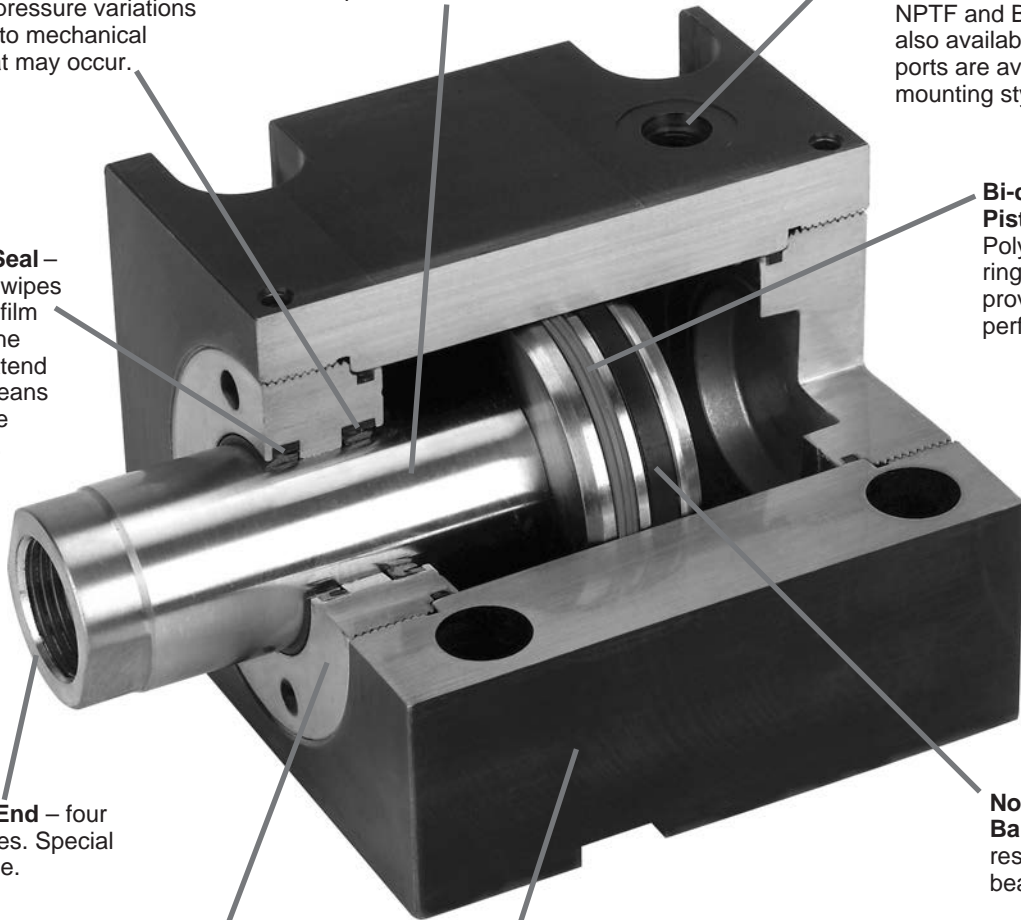
**Bi-directional Piston Seal** – Polyurethane seal ring with energizer provides leak-free performance.

**Piston Rod End** – four standard styles. Special ends available.

**Non-Metallic Wear Band** – improves resistance to bearing loads.

**Rod Gland** – nodular iron bearing with RoHS compliant zinc plating for corrosion resistance. Optional pilot gland available at no additional cost.

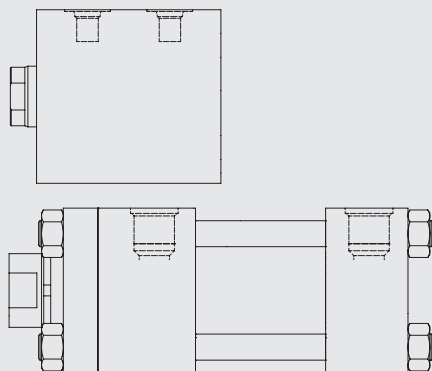
**Cylinder Body** – steel with black paint exterior surface treatment.



**CHD Compact Hydraulic Cylinders...** require less mounting space than conventional tie rod cylinders.

**Optional Pilot Gland...** offers added bearing area to increase service life and also improves alignment of cylinder and load.

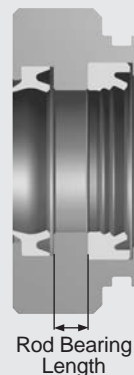
**Shorter overall length for the same bore and stroke**



50mm bore by 25mm stroke shown

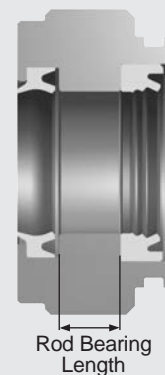
**Standard Gland**

**Pilot Gland**



Rod Bearing Length

Average 63% more bearing area with Pilot Gland



Rod Bearing Length

(18mm rod glands depicted)

**Use pilot cap to improve alignment for rear mount applications**

**Theoretical Push and Pull Forces**

The cylinder output forces are derived from the formula:

$$F = \frac{P \times A}{10000}$$

Where F = Force in kN.

P = Pressure at the cylinder in bar.

A = Effective area of cylinder piston in square mm.

To determine the bore size for the application take the following steps.

1. Select the Operating Pressure column closest to that desired.

2. In the same column, identify the force required to move the load (always rounding up). If the piston rod is in compression use the 'Push' row and if the piston rod is in tension use the 'Pull' row.

3. In the row to the left is the bore required.

If the cylinder envelope dimensions are too large for the application, increase the operating pressure to the maximum pressure in the table below, if possible, and repeat steps 1 - 3.

**Push and Pull Force in kN**

Bore Ø	Rod Ø	Operating Direction	Piston Area (mm²)	Operating Pressure (Bar)						
				50	75	100	125	150	175	207
20	12	Push	314	1.57	2.36	3.14	3.93	4.71	5.50	6.50
		Pull	201	1.01	1.51	2.01	2.51	3.02	3.52	4.16
25	14	Push	491	2.45	3.68	4.91	6.14	7.36	8.59	10.2
		Pull	337	1.68	2.53	3.37	4.21	5.05	5.90	6.97
32	18	Push	804	4.02	6.03	8.04	10.1	12.1	14.1	16.6
		Pull	550	2.75	4.12	5.50	6.87	8.25	9.62	11.4
40	22	Push	1,257	6.28	9.42	12.6	15.7	18.8	22.0	26.0
		Pull	877	4.38	6.57	8.8	11.0	13.1	15.3	18.1
50	28	Push	1,963	9.82	14.7	19.6	24.5	29.5	34.4	40.6
		Pull	1,348	6.74	10.1	13.5	16.8	20.2	23.6	27.9
63	36	Push	3,117	15.6	23.4	31.2	39.0	46.8	54.6	64.5
		Pull	2,099	10.5	15.7	21.0	26.2	31.5	36.7	43.5
80	45	Push	5,027	25.1	37.7	50.3	62.8	75.4	88.0	104
		Pull	3,436	17.2	25.8	34.4	43.0	51.5	60.1	71.1

**Series CHD  
Pressure Rating**

Bore Ø	Maximum Working Pressure in bar
20	207
25	207
32	207
40	207
50	207
63	207
80	207

**Equivalents**

- 1 kN = 224.81 pounds force
- 1 bar = 14.50 psi
- 1 mm = .03937 inch
- 1 mm² = .00155 inch²

**Cylinder Weights**

To determine the weight of a Series CHD cylinder, first select the proper basic zero stroke weight for the mounting required, and then calculate the weight of the

cylinder stroke and add the result to the basic weight. For extra rod extension, use piston rod weights per mm in Table C.

**Table A** Single Rod End CHD Cylinder Weights in kg.

Bore Ø	Rod Ø	Single Rod Cylinders									
		Basic Weight at Zero Stroke				Per mm Stroke	Basic Weight at Zero Stroke	Per mm Stroke	Basic Weight at Zero Stroke		Per mm Stroke
		T	TN, TR	A, M	AN, AR, MN, MR				C	CN	
20	12	0.57	0.58	0.61	0.62	0.013	0.84	0.013	-	-	-
25	14	0.80	0.81	0.84	0.85	0.016	1.17	0.017	0.71	0.73	0.015
32	18	1.39	1.42	1.45	1.48	0.024	1.92	0.025	1.41	1.43	0.026
40	22	1.87	1.90	1.97	2.01	0.029	2.81	0.031	1.93	1.96	0.033
50	28	2.61	2.67	2.79	2.85	0.036	4.20	0.038	2.82	2.88	0.044
63	36	4.11	4.20	4.34	4.42	0.047	6.11	0.051	4.69	4.78	0.063
80	45	7.19	7.33	7.49	7.62	0.067	10.7	0.072	-	-	-

**Table C** Piston rod weights in kg.

Rod Ø	Piston Rod Weight per mm
12	0.001
14	0.001
18	0.002
22	0.003
28	0.005
36	0.008
45	0.012

**Table B** Double Rod End CHD Cylinder Weights in kg.

Bore Ø	Rod Ø	Double Rod Cylinders									
		Basic Weight at Zero Stroke				Per mm Stroke	Basic Weight at Zero Stroke	Per mm Stroke	Basic Weight at Zero Stroke		Per mm Stroke
		T	TN	A, M	AN, MN				J	C	
20	12	0.60	0.61	0.64	0.65	0.013	0.87	0.014	-	-	-
25	14	0.83	0.85	0.87	0.89	0.017	1.21	0.018	0.75	0.77	0.016
32	18	1.46	1.48	1.52	1.54	0.026	1.98	0.027	1.47	1.50	0.028
40	22	1.97	2.01	2.08	2.11	0.032	2.92	0.034	2.03	2.07	0.036
50	28	2.81	2.87	2.99	3.05	0.041	4.40	0.043	3.02	3.08	0.049
63	36	4.52	4.61	4.75	4.83	0.055	6.53	0.059	5.10	5.19	0.071
80	45	7.99	8.12	8.28	8.42	0.080	11.5	0.085	-	-	-

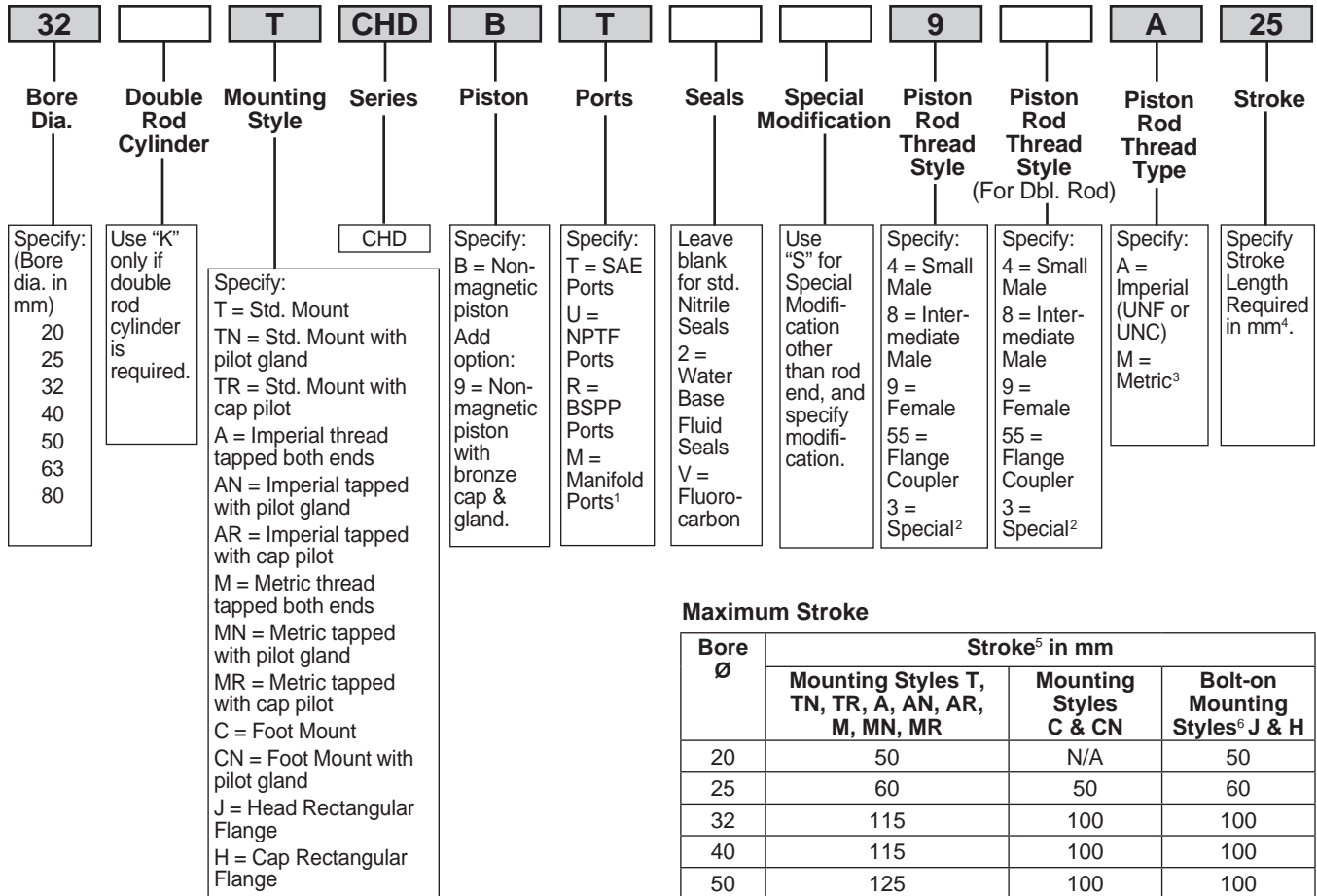
**Equivalent**

1 kg = 2.2046 pounds



Model Code & Standard Specifications

Model Ordering Code for CHD



Maximum Stroke

Bore Ø	Stroke <sup>5</sup> in mm		
	Mounting Styles T, TN, TR, A, AN, AR, M, MN, MR	Mounting Styles C & CN	Bolt-on Mounting Styles <sup>6</sup> J & H
20	50	N/A	50
25	60	50	60
32	115	100	100
40	115	100	100
50	125	100	100
63	115	100	100
80	115	N/A	100

Shaded boxes identify required model number fields.

<sup>1</sup> Manifold ports are only available on Foot Mounting Styles C & CN. See Mounting Styles C & CN Dimension Pages for minimum stroke with Manifold Ports.

<sup>2</sup> To order thread style 3, specify "3" and give the desired dimensions for KK, A, and W (or WP depending on mounting) or furnish a dimensioned sketch.

<sup>3</sup> Always use M for rod style 55.

<sup>4</sup> See Maximum Stroke Chart above.

<sup>5</sup> Intermediate strokes in 1mm increments are available.

<sup>6</sup> Longer strokes (up to maximum lengths for Mounting Styles T, TN, TR, A, AN, AR, M, MN & MR) are available at increased manufacturing lead times. Contact the factory.

Standard Specifications

- 13 Standard mounting styles
- Bore sizes – 20mm to 80mm
- Piston Rod Diameter – 12mm to 45mm
- Single and double rod construction available
- Strokes up to 100mm depending on bore size (see table above)

- Working pressure up to 207 bar
- Temperature range – -23°C to +121°C (depending on seal class)
- Reference ISO 16656: 2004

Seal Classes	Typical Fluids	Temperature Range
1 – Standard Nitrile & Polyurethane	Hydraulic Oil, MIL-H-5606 Oil	-23°C (-10°F) to +100°C (+212°F)
2 – Optional Water Base Fluid Seal	Water-in-Oil Emulsion – Houghto-Safe 271, 620, 5040. Mobil Pyrogard D. Shell Iruis 905. Ucon Hydrolube J-4	-23°C (-10°F) to +121°C (+250°F)
5 – Optional (at extra cost) Fluorocarbon Seals	High Temperature	-23°C (-10°F) to +121°C (+250°F) Class 5 seals may be operated up to +204°C (+400°F) with reduced service life

Note: Class 5 seals are not suitable for use with Skydrol fluid, but can be used with hydraulic oil if desired.

