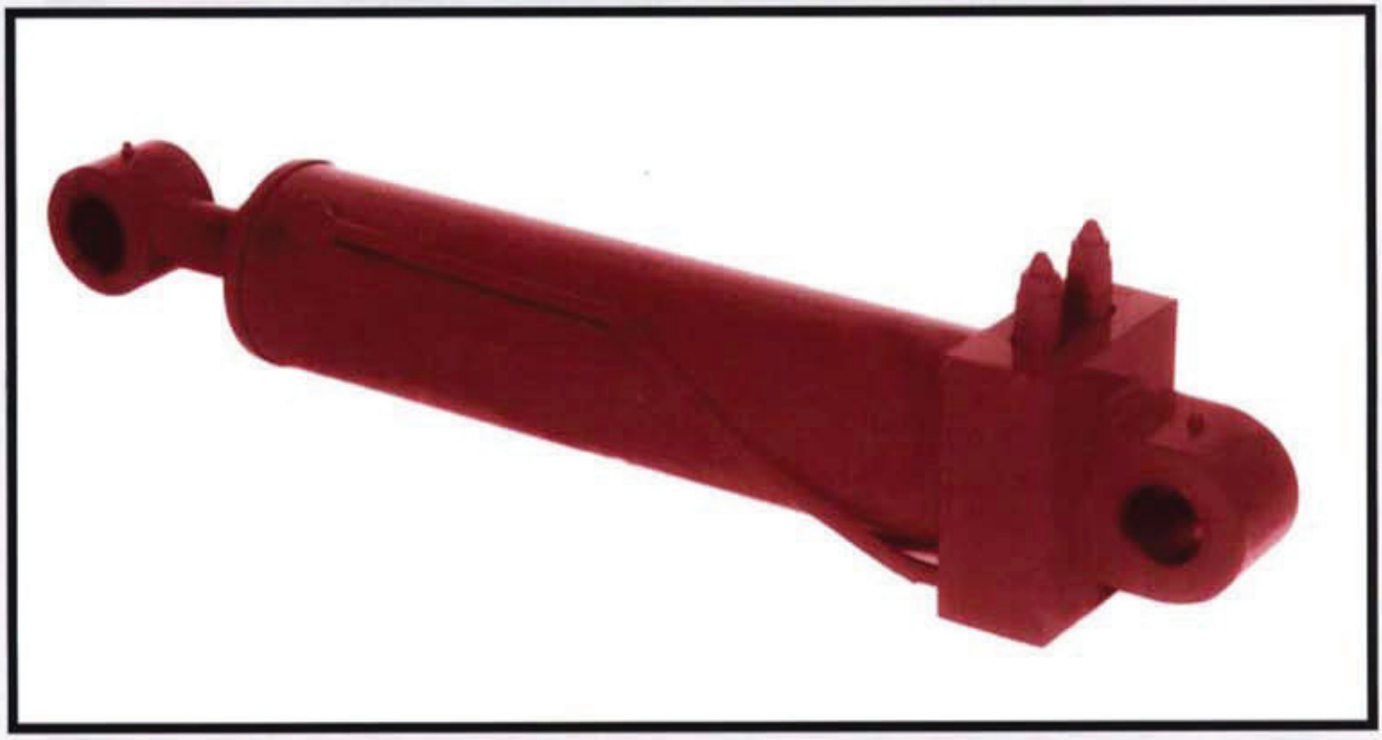
ENERGY®

Manufacturing Company, Inc.

CHD SERIES HEAVY DUTY CUSTOM WELDED HYDRAULIC CYLINDERS

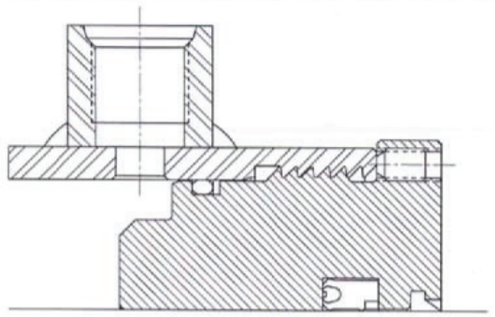
1.0 Inch (2.54 cm) to 10.0 Inch (25.4 cm) Bores; Up to 15.0 Foot (4.57 m) Stroke Lengths



FOR WORKING PRESSURES TO 5,000 PSIG (345 BAR)

CHD CYLINDER DESIGN

THREADED-IN ROD GUIDE



FEATURES

- A variety of seal packages to fit most applications
- St 52.3 DOM steel tubing skive-burnished to 4 – 10 micro-inches, RMS (.1 to .25 microns, RMS)
- Standard rod seal is an energized twin-lip u-cup with backup ring
- Ground and polished 1045 steel rod hard chrome plated to a minimum of .0005” (12.5 microns)
- Ductile iron or steel piston and guide
- Glass-filled nylon wear rings available as needed

CHD CYLINDER DIMENSIONS

Bore Diameter	Available Rod Diameters
1” (2.54 cm)	.5” (1.27 cm), .625” (1.59 cm), .75” (1.91 cm)
1.5” (3.81 cm)	.75” (1.91 cm), 1” (2.54 cm), 1.125” (2.86 cm)
1.75” (4.45 cm)	1” (2.54 cm), 1.125” (2.86 cm)
2” (5.08 cm)	1” (2.54 cm), 1.25” (3.18 cm), 1.375” (3.49 cm), 1.5” (3.81 cm)
2.25” (5.72 cm)	1.125” (2.86 cm), 1.75” (4.45 cm)
2.5” (6.35 cm)	1.125” (2.86 cm), 1.25” (3.18 cm), 1.375” (3.49 cm), 1.5” (3.81 cm), 1.625” (4.13 cm), 1.75” (4.45 cm), 2” (5.08 cm)
2.75” (6.99 cm)	1.125” (2.86 cm), 1.5” (3.81 cm), 1.75” (4.45 cm), 2” (5.08 cm)
3” (7.62 cm)	1.25” (3.18 cm), 1.5” (3.81 cm), 1.625” (4.13 cm), 1.75” (4.45 cm), 2” (5.08 cm), 2.25” (5.72 cm), 2.75” (6.99 cm)
3.25” (8.26 cm)	1.625” (4.13 cm)
3.5” (8.89 cm)	1.25” (3.18 cm), 1.5” (3.81 cm), 1.75” (4.45 cm), 2” (5.08 cm), 2.25” (5.72 cm), 2.5” (6.35 cm), 2.75” (6.99 cm), 3” (7.62 cm)
3.75” (9.53 cm)	1.5” (3.81 cm)
4” (10.16 cm)	1.25” (3.18 cm), 1.5” (3.81 cm), 1.75” (4.45 cm), 2” (5.08 cm), 2.25” (5.72 cm), 2.5” (6.35 cm), 3” (7.62 cm)
4.25” (10.8 cm)	1.75” (4.45 cm), 2” (5.08 cm)
4.5” (11.43 cm)	1.5” (3.81), 1.75” (4.45 cm), 2” (5.08 cm), 2.25” (5.72 cm), 2.5” (6.35 cm), 2.75” (6.99 cm), 3” (7.62 cm), 3.5” (8.89 cm)
4.75” (12.07 cm)	2.375” (6.03 cm)
5” (12.7 cm)	2” (5.08 cm), 2.25” (5.72 cm), 2.5” (6.35 cm), 2.75” (6.99 cm), 3” (7.62 cm), 3.5” (8.89 cm), 3.75” (9.53 cm), 4” (10.16 cm)
5.25” (13.34 cm)	2.5” (6.35 cm), 4.5” (11.43 cm)
5.5” (13.97 cm)	2.25” (5.72 cm), 2.75” (6.99 cm), 3.5” (8.89 cm), 4.5” (11.43 cm)
5.75” (14.61 cm)	3.25” (8.26 cm)
6” (15.24 cm)	2.375” (5.94 cm), 2.5” (6.35 cm), 3” (7.62 cm), 3.5” (8.89 cm), 4” (10.16 cm), 4.5” (11.43 cm)
6.5” (16.51 cm)	4.5” (11.43 cm), 5” (12.7 cm)
7” (17.78 cm)	2.5” (6.35 cm), 3” (7.62 cm), 4” (10.16 cm), 5” (12.7 cm)
7.5” (19.05 cm)	4” (10.16 cm)
8” (20.32 cm)	2.5” (6.35 cm), 6” (15.24 cm)
9” (22.86 cm)	6” (15.24 cm)
10” (25.4 cm)	Please consult factory

Please consult factory if the bore / rod combination you desire is not shown above

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CHD DESIGN OPTIONS & SPECIAL PORT BLOCKS

SPECIAL VALVE BLOCK (BOLTED ON)

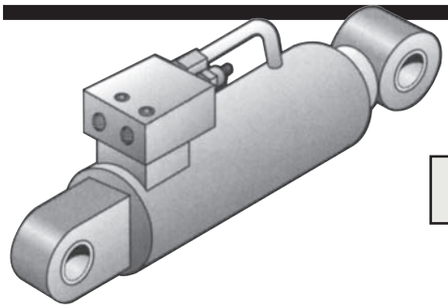
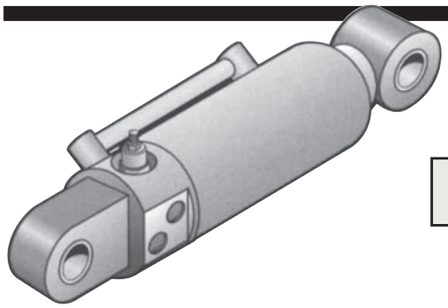


Illustration is one typical example. For other options consult factory.

SPECIAL VALVE BLOCK IN BASE END



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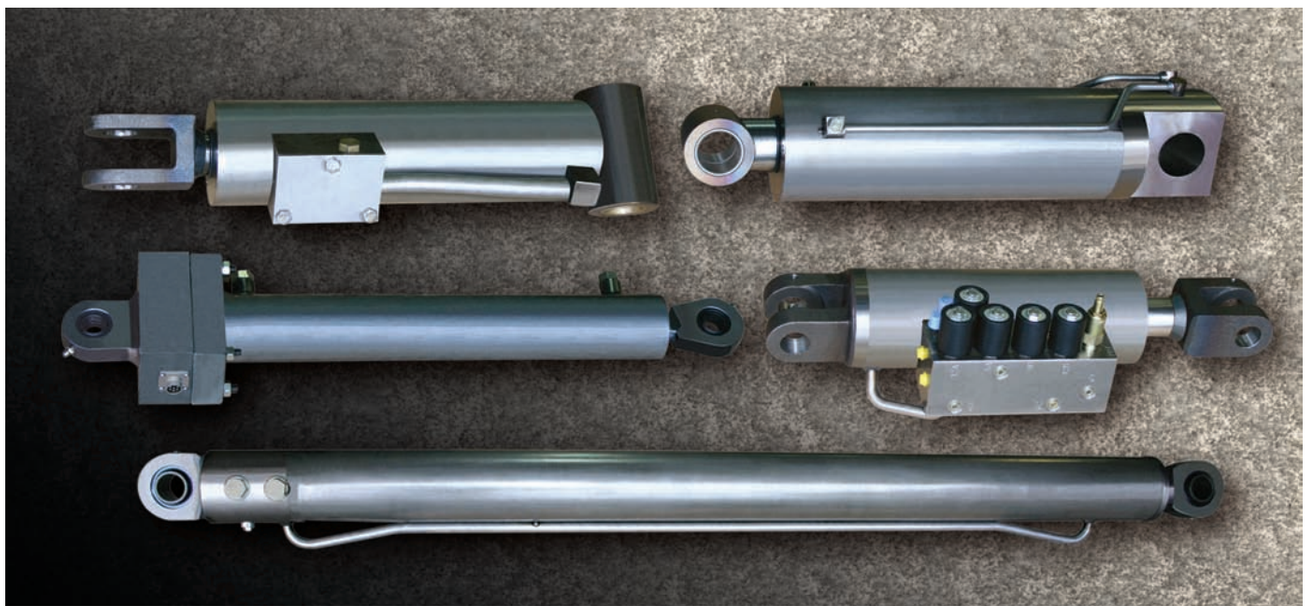
PORT OPTIONS AVAILABLE

- **Standard SAE O-Ring Ports:** Available in straight, 90º elbow, and several other configurations
- **NPTF Ports:** Available in straight, 90º elbow, and several other configurations
- **4-Bolt Flange Ports:** Please consult factory for availability

ADDITIONAL AVAILABLE FEATURES:

- Single-acting cylinders
- Ram-type cylinders
- Custom end mechanisms
- Custom fluid lines
- Hydraulic cushioning
- Integral stop tubes
- Custom valve blocks and valves
- Position sensing cylinders
- Re-phasing cylinders

ENERGY MANUFACTURING CUSTOM WELDED CYLINDER EXAMPLES



CUSTOM QUOTATION REQUEST

All Energy® welded cylinders are custom-made.
Please complete and return the following sheet so that we can provide you with the best cylinder for your application.

ENERGY® Custom Quotation Request Form

This form must be filled out in its entirety before a welded cylinder quotation can be prepared. Unless noted otherwise by the customer, Energy® Manufacturing will use the following parameters with respect to the processing of this request:

1. The oil temperature in the cylinder will be 170° Fahrenheit (77° Celsius) or less.
2. The rod speed will be 50 feet per minute (15.2 meters per minute) or less.
3. System filtration will be 20 micron or better.
4. The fluid used is SAE 20 (ISO VG68) or less-viscous petroleum-based fluid and is non-foaming type for hydraulic use.
5. Mount center-to-center and stroke dimensions are +/- 1/8" (+/-3.2 mm).
6. The cylinder is not used in a corrosive environment.

PURPOSE OF QUOTE: _____ **QUOTE DEADLINE DATE:** _____

CUSTOMER DATA

Customer name: _____
Address: _____
City, State or Province, Zip or Postal Code: _____
Telephone number: _____ Purchasing contact: _____
Fax number: _____ Engineering contact: _____
E-mail: _____

CYLINDER DATA

All welded cylinder quotation requests should be accompanied by a blueprint or sketch and the following data should be completed.
Cushioned cylinder requests must include pump flow to cylinder, weight of load, and details of the linkage between cylinder and load.

Bore size: _____
Stroke length: _____
Rod diameter: _____
Retracted pin center length: _____
Port type (pipe or SAE o-ring): _____
Port size: _____
Mounting pin diameter: _____
Test requirements: ( ) Standard 100% air test ( ) 100% Hydraulic test

Mountings:
Base: _____
Rod: _____
Finish:
Acrylic Water-Based
Primer Paint (please specify color): _____
Other Paint (please specify): _____
Clear Rust-Preventative Coating: _____
None: _____

QUOTATION DATA

Annual Usage: _____ Release Quantity: _____
Target Price: _____ Customer Part Number: _____

APPLICATION DATA

Type of machine (crane, combine, etc.): _____
_____
Will cylinder be used to lift people? _____
Type of function (hoist, swing, steering, etc.): _____
_____
Estimated cycles per year: _____
Does cylinder always reach full extend or retract position? _____
Is cylinder subjected to high overrunning loads? _____
Is cylinder subjected to side loading? _____
Is cylinder barrel braced to restrict buckling? _____

Primary cylinder effort will be to ( ) push load ( ) pull load ( ) both push and pull load
Cylinder is ( ) double acting ( ) single acting
Cylinder is mounted ( ) vertically ( ) horizontally ( ) swings through arc with mechanism

Pressure values:
Operating: _____
Peak (if known): _____
Main system relief: _____
Operating flow range: _____

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 Form CHD (Rev. 7/2011)