E326

ENERPAC

Powerful Solutions.
Global Force.

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Table of Contents

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

Cover bridge photo courtesy of Kiewit.

Model Number Index

Section Index

The World

A complete range of quality high force tools for all industrial applications, with local availability and after sale service anywhere in the world…. this is what has made Enerpac the undisputed global market leader in high pressure hydraulics.

Across every continent, Enerpac's network of authorized distributors and service centers can reach even the most remote locations, supplying and servicing products that are designed to enhance productivity and performance, while making the workplace safer.

With over 150 sales specialists and a network of service and engineering support in 17 countries across the globe, Enerpac has become the product of choice in industries such as manufacturing, construction, energy, oil & gas, shipbuilding, railroads, mining, and metals transformation.

Always at the leading edge of technology, Enerpac has continued to develop its range of time and cost-savings tools, utilizing modern engineered materials to improve productivity and minimize operator fatigue.

Enerpac's commitment to the continued development of quality high force tools ensures that the products you purchase are the best tools in the industry. We will continue to lead the way in the development of quality high force tools for all industrial applications.

Class Brand

10 Reasons to Work with Enerpac

- Expert Design
- Highly Reliable
- Service Excellence
- Worldwide Experience
- Application Support
- Availability
- Quality
- Value
- Innovative Products
- Systems Solutions

Total Quality

Our products are tested to the most exacting standards. These high standards guarantee the quality, price and performance requirements of the markets we serve around the globe.

Global Network

Enerpac has an extensive network of authorized distributors and service centers located in more than 90 countries worldwide. You can rely on Enerpac for the products and technical support you need to get your job done, anywhere in the world.

Logistics Excellence

Enerpac's mission is to maintain service excellence in the ever-changing world of modern distribution. Providing our extensive range of products to our thousands of distributors worldwide demands a logistic expertise only a market leader can provide.

A Tradition of Innovation

Enerpac has a long history of finding new solutions to better meet the challenges of the industries we serve. We were the first to develop a composite hand pump and the first to offer a computerized lifting system. Our latest innovations include a full range of aluminum cylinders… cylinders with the strength of steel and the advantages of aluminum and the Z-Class series of power pumps… pumps that were designed to run cooler, use less electricity and are easy to service.

ENERPAC®

POWERFUL SOLUTIONS. GLOBAL FORCE.

ENERPAC hydraulic cylinders are available in hundreds of different configurations. Whatever the industrial application... lifting, pushing, pulling, bending, holding... whatever the force capacity, stroke length, or size restrictions... single- or double-acting, solid or hollow plunger, you can be sure that Enerpac has the cylinder to suit your high force application. Enerpac jacking cylinders fully comply to ASME B30.1 (except RD-Series).

Golden Ring Design

The exclusive Golden Ring Design is a unique bearing design which absorbs eccentric load stresses to protect your cylinder against abrasion, over-extending or plunger blow-outs and jamming or top-end mushrooming. As a result, Golden Ring cylinders provide long, trouble-free operation.

Hardened Saddle
prevents plunger from mushrooming and jamming in the top bearing. Snap-in design.

Plunger Wiper
reduces contamination, extending cylinder life.

Stop Ring
absorbs eccentric loading and prevents plunger over-extension

Plated Plunger
resists wear and rust.

Golden Ring
absorbs eccentric loading without galling cylinder parts.

Plunger Return Spring
enables fast plunger retraction on single-acting cylinders.

Note: The cut-away drawing is representative of typical cylinder construction and may not represent all cylinders in this section.

Cylinder & Lifting Section Overview

* Capacity (tons)	Stroke Range (in)	Cylinder Type and Functions	Series		Page
5-100	.63-14.25	General Purpose Cylinders, Single-acting Cylinder Accessories	RC		6 ▶ 10 ▶
20-150	1.97-7.87	Aluminum Cylinders Single-Acting Solid, Lock Nut and Hollow	RAC RACL RACH		12 ▶ 14 ▶ 16 ▶
50-150	1.97-7.87	Aluminum Cylinders Double-Acting Solid	RAR		18 ▶
5-500	.25-2.44	Pancake and Low Height Cylinders, Single-Acting	CLP RSM RCS		20 ▶ 22 ▶ 23 ▶
2.5-60	5.00-6.00	Pull Cylinders, Single-Acting	BRC BRP		24 ▶
12-150	.31-10.13	Hollow Plunger Cylinders Single- and Double-Acting	RCH RRH		26 ▶ 28 ▶
4-25	1.13-10.25	Precision Production Cylinders, Double-Acting	RD		30 ▶
10-500	2.25-48.00	Long Stroke Cylinders, Double-Acting	RR		32 ▶
50-1000	1.97-11.81	High Tonnage Cylinders Single-Acting (S/A), S/A with Mechanical Locknut, Double-Acting	CLSG CLRG CLL		36 ▶ 40 ▶ 44 ▶
3-74	–	Lifting Bags	LB		48 ▶
30-100	–	Plastic Cribbing Blocks	LPC		50 ▶
1.5-150	3.00-20.00	Aluminum and Steel Jacks Industrial Bottle Jacks	JHA/JH EBJ		52 ▶ 53 ▶
60-200	14.0-27.0	POW'R RISER® Lifting Jack	PR		54 ▶
10-25	2.0-6.0	Extreme Environment Products (Valves, cylinders, hand pumps)	RC P V		56 ▶
5-100	1.50-14.25	Cylinder - Pump Sets (Single-Acting)	SC		58 ▶

* All cylinder capacities are nominal values, unless otherwise stated. [Maximum] capacities are theoretical and may vary, depending on cylinder condition and application.

▼ Shown from left to right: **RC-506, RC-50, RC-2510, RC-154, RC-10010, RC-55, RC-1010**

The Industry Standard General Purpose Cylinder

- **The Golden Ring absorbs eccentric loading without galling cylinder parts**
- **Collar threads, plunger threads and base mounting holes enable easy fixturing (on most models)**
- **Designed for use in all positions**
- **High strength alloy steel for durability**
- **Nickel plating available on most models (contact Enerpac for details)**
- **Heavy-duty return springs**
- **Baked enamel finish for increased corrosion resistance**
- **CR-400 coupler and dust cap included on all models**
- **Plunger wiper reduces contamination, extending cylinder life**

Saddles

All RC cylinders are equipped with hardened removable grooved saddles. For tilt and flat saddles, see the RC-Series accessory page.

Page: **10**

Base Plates

To ensure the stability of cylinders for lifting applications, base plates are available for 10, 25 and 50 ton RC cylinders.

Page: **10**

Specialty Attachments

For solving all kinds of application problems, specialty attachments are available for 5, 10 and 25 ton RC cylinders.

Page: **168**

▼ *Stage lifting set up in Greece, where assembled pipes, 82 feet in length, were stage lifted with six RC-2514 cylinders.*

▼ *RC cylinder mounting attachments greatly extend the application possibilities (available for 5, 10,15 and 25 ton cylinders).*

Single-Acting, General Purpose Cylinders

Golden Ring Design

The exclusive Golden Ring Design is a unique bearing design which absorbs eccentric load stresses to protect your cylinder against abrasion, over-extending or plunger blow-outs and jamming or top-end mushrooming. As a result, Golden Ring cylinders provide long, trouble-free operation.

RC Series

Capacity:
5-100 tons

Stroke:
.63-14.25 inches

Maximum Operating Pressure:
10,000 psi

▼ **QUICK SELECTION CHART**
For complete technical information see next page.

Cylinder Capacity tons (maximum)	Stroke (in)	Model Number	Cylinder Effective Area (in^2)	Oil Capacity (in^3)	Collapsed Height (in)	Weight (lbs)
5 (4.9)	.63	**RC-50****	.99	.62	1.63	2.2
	1.00	**RC-51**	.99	.99	4.34	2.3
	3.00	**RC-53**	.99	2.98	6.50	3.3
	5.00	**RC-55***	.99	4.97	8.50	4.1
	7.00	**RC-57**	.99	6.96	10.75	5.3
	9.13	**RC-59**	.99	9.07	12.75	6.1
10 (11.2)	1.00	**RC-101**	2.24	2.24	3.53	4.0
	2.13	**RC-102***	2.24	4.75	4.78	5.1
	4.13	**RC-104**	2.24	9.23	6.75	7.2
	6.13	**RC-106***	2.24	13.70	9.75	9.8
	8.00	**RC-108**	2.24	17.89	11.75	12.0
	10.13	**RC-1010***	2.24	22.65	13.75	14.0
	12.00	**RC-1012**	2.24	26.84	15.75	15.0
	14.00	**RC-1014**	2.24	31.31	17.75	18.0
15 (15.7)	1.00	**RC-151**	3.14	3.14	4.88	7.2
	2.00	**RC-152**	3.14	6.28	5.88	9.0
	4.00	**RC-154***	3.14	12.57	7.88	11.0
	6.00	**RC-156***	3.14	18.85	10.69	15.0
	8.00	**RC-158**	3.14	25.13	12.69	18.0
	10.00	**RC-1510**	3.14	31.42	14.69	21.0
	12.00	**RC-1512**	3.14	37.70	16.69	24.0
	14.00	**RC-1514**	3.14	43.98	18.69	26.0
25 (25.8)	1.00	**RC-251**	5.16	5.16	5.50	13.0
	2.00	**RC-252***	5.16	10.31	6.50	14.0
	4.00	**RC-254***	5.16	20.63	8.50	18.0
	6.25	**RC-256***	5.16	32.23	10.75	22.0
	8.25	**RC-258**	5.16	42.55	12.75	27.0
	10.25	**RC-2510**	5.16	52.86	14.75	31.0
	12.25	**RC-2512**	5.16	63.18	16.75	36.0
	14.25	**RC-2514***	5.16	73.49	18.75	39.0
30 (32.4)	8.25	**RC-308**	6.49	53.56	15.25	40.0
50 (55.2)	2.00	**RC-502**	11.04	22.09	6.94	33.0
	4.00	**RC-504**	11.04	44.18	8.94	42.0
	6.25	**RC-506***	11.04	69.03	11.13	51.0
	13.25	**RC-5013**	11.04	146.34	18.13	83.0
75 (79.5)	6.13	**RC-756**	15.90	97.41	11.25	65.0
	13.13	**RC-7513**	15.90	208.74	19.38	130.0
100 (103.1)	6.63	**RC-1006**	20.63	136.67	14.06	130.0
	10.25	**RC-10010**	20.63	211.45	17.69	160.0

* Available as a set. See note on this page.
** RC-50 cylinder has non-removable grooved saddle and no collar thread.

Think Safety

Manufacturer's rating of load and stroke are maximum safe limits.

Good practice encourages using only 80% of these ratings!

Page: 240

RAC-Series, Single-Acting Cylinders

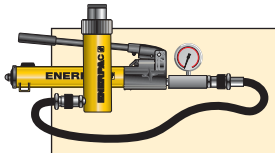
The lightweight general purpose spring return aluminum cylinders.

Page: 12

Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

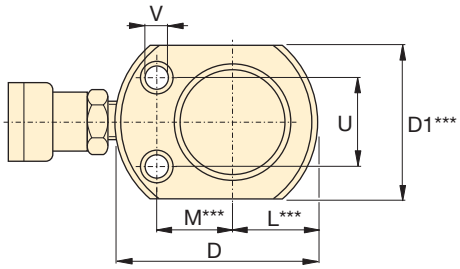
Page: 117

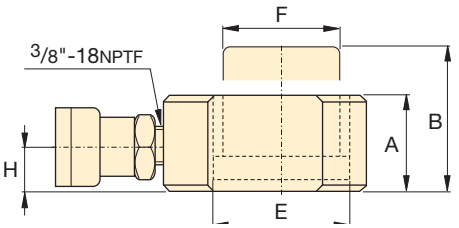


Pump and Cylinder Sets

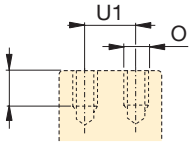
All cylinders marked with an * are available as **sets** (cylinder, gauge, couplers, hose and pump) for your ordering convenience.

Page: 58

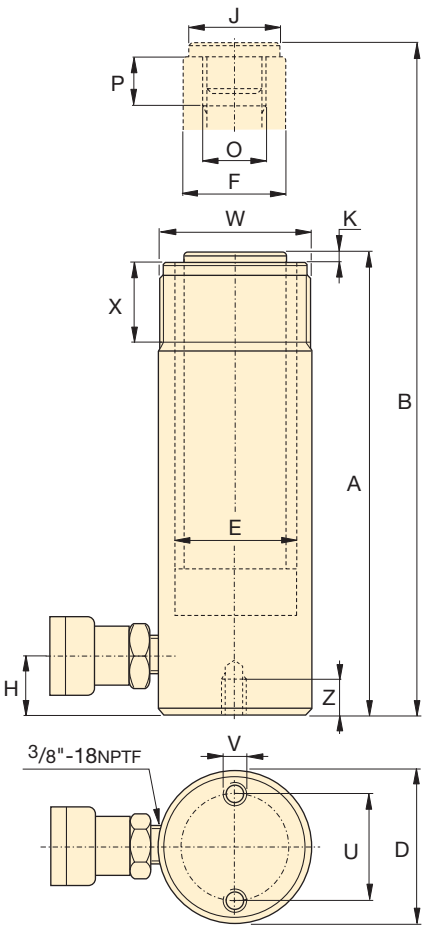




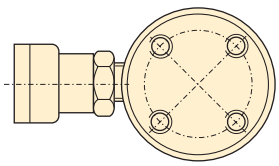
RC-50



RC-101 only
(U1 = .75 inch)



RC-51 to RC-5013 models



RC-1006 and RC-10010 models

Speed Chart

See the Enerpac Cylinder Speed Chart in our "Yellow Pages" to determine your approximate cylinder speed.

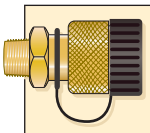
Page: **251**

◄ For full features see page 6.

Cylinder Capacity tons (maximum)	Stroke (in)	Model Number	Cylinder Effective Area (in^2)	Oil Capacity (in^3)	Collapsed Height A (in)	Extended Height B (in)	Outside Diameter D (in)
5 (4.9)	.63	**RC-50****	.99	.62	1.63	2.25	2.31
	1.00	**RC-51**	.99	.99	4.34	5.34	1.50
	3.00	**RC-53**	.99	2.98	6.50	9.50	1.50
	5.00	**RC-55***	.99	4.97	8.50	13.50	1.50
	7.00	**RC-57**	.99	6.96	10.75	17.75	1.50
	9.13	**RC-59**	.99	9.07	12.75	21.88	1.50
10 (11.2)	1.00	**RC-101**	2.24	2.24	3.53	4.53	2.25
	2.13	**RC-102***	2.24	4.75	4.78	6.91	2.25
	4.13	**RC-104**	2.24	9.23	6.75	10.88	2.25
	6.13	**RC-106***	2.24	13.70	9.75	15.88	2.25
	8.00	**RC-108**	2.24	17.89	11.75	19.75	2.25
	10.13	**RC-1010***	2.24	22.65	13.75	23.88	2.25
	12.00	**RC-1012**	2.24	26.84	15.75	27.75	2.25
	14.00	**RC-1014**	2.24	31.31	17.75	31.75	2.25
15 (15.7)	1.00	**RC-151**	3.14	3.14	4.88	5.88	2.75
	2.00	**RC-152**	3.14	6.28	5.88	7.88	2.75
	4.00	**RC-154***	3.14	12.57	7.88	11.88	2.75
	6.00	**RC-156***	3.14	18.85	10.69	16.69	2.75
	8.00	**RC-158**	3.14	25.13	12.69	20.69	2.75
	10.00	**RC-1510**	3.14	31.42	14.69	24.69	2.75
	12.00	**RC-1512**	3.14	37.70	16.69	28.69	2.75
	14.00	**RC-1514**	3.14	43.98	18.69	32.69	2.75
25 (25.8)	1.00	**RC-251**	5.16	5.16	5.50	6.50	3.38
	2.00	**RC-252***	5.16	10.31	6.50	8.50	3.38
	4.00	**RC-254***	5.16	20.63	8.50	12.50	3.38
	6.25	**RC-256***	5.16	32.23	10.75	17.00	3.38
	8.25	**RC-258**	5.16	42.55	12.75	21.00	3.38
	10.25	**RC-2510**	5.16	52.86	14.75	25.00	3.38
	12.25	**RC-2512**	5.16	63.18	16.75	29.00	3.38
	14.25	**RC-2514***	5.16	73.49	18.75	33.00	3.38
30 (32.4)	8.25	**RC-308**	6.49	53.56	15.25	23.50	4.00
50 (55.2)	2.00	**RC-502**	11.04	22.09	6.94	8.94	5.00
	4.00	**RC-504**	11.04	44.18	8.94	12.94	5.00
	6.25	**RC-506***	11.04	69.03	11.13	17.38	5.00
	13.25	**RC-5013**	11.04	146.34	18.13	31.38	5.00
75 (79.5)	6.13	**RC-756**	15.90	97.41	11.25	17.38	5.75
	13.13	**RC-7513**	15.90	208.74	19.38	32.50	5.75
100 (103.1)	6.63	**RC-1006**	20.63	136.67	14.06	20.69	7.00
	10.25	**RC-10010**	20.63	211.45	17.69	27.94	7.00

* Available as a set. See page 58.
** RC-50 cylinder has non-removable grooved saddle and no collar thread.
*** D1 = 1.63 inch, L = .81 inch, M = 1.00 inch.

Single-Acting, General Purpose Cylinders



Couplers Included!
CR-400 couplers included on all models. Fits all HC-Series hoses.

Capacity:
5-100 tons

Stroke:
.63-14.25 inches

Maximum Operating Pressure:
10,000 psi

RC Series

Cylinder Bore Diam. E (in)	Plunger Diam. F (in)	Base to Adv. Port H (in)	Saddle Diam. J (in)	Saddle Protrusion from Plngr. K (in)	Plunger Internal Thread O (in)	Plunger Thread Length P (in)	Base Mounting Holes Bolt Circle U (in)	Base Mounting Holes Thread V (in)	Base Mounting Holes Thrd. Depth Z (in)	Collar Thread W (in)	Collar Thread Length X (in)	Weight (lbs)	Model Number
1.13	1.00	.75	**	**	**	**	1.13	.22	—	—	—	2.2	**RC-50****
1.13	1.00	.75	1.00	.25	¾"-16	.56	1.00	¼"-20UN	.56	1½"-16	1.13	2.3	**RC-51**
1.13	1.00	.75	1.00	.25	¾"-16	.56	1.00	¼"-20UN	.56	1½"-16	1.13	3.3	**RC-53**
1.13	1.00	.75	1.00	.25	¾"-16	.56	1.00	¼"-20UN	.56	1½"-16	1.13	4.1	**RC-55***
1.13	1.00	.75	1.00	.25	¾"-16	.63	1.00	¼"-20UN	.56	1½"-16	1.13	5.3	**RC-57**
1.13	1.00	.75	1.00	.25	¾"-16	.63	1.00	¼"-20UN	.56	1½"-16	1.13	6.1	**RC-59**
1.69	1.50	.75	–	–	#10-24UN	.25	1.56	5⁄16"-18UN	.50	2¼"-14	1.06	4.0	**RC-101**
1.69	1.50	.75	1.38	.25	1"- 8	.75	1.56	5⁄16"-18UN	.50	2¼"-14	1.13	5.1	**RC-102***
1.69	1.50	.75	1.38	.25	1"- 8	.75	1.56	5⁄16"-18UN	.50	2¼"-14	1.06	7.2	**RC-104**
1.69	1.50	.75	1.38	.25	1"- 8	.75	1.56	5⁄16"-18UN	.50	2¼"-14	1.13	9.8	**RC-106***
1.69	1.50	.75	1.38	.25	1"- 8	.75	1.56	5⁄16"-18UN	.50	2¼"-14	1.06	12	**RC-108**
1.69	1.50	.75	1.38	.25	1"- 8	.75	1.56	5⁄16"-18UN	.50	2¼"-14	1.13	14	**RC-1010***
1.69	1.50	.75	1.38	.25	1"- 8	.75	1.56	5⁄16"-18UN	.50	2¼"-14	1.06	15	**RC-1012**
1.69	1.50	.75	1.38	.25	1"- 8	.75	1.56	5⁄16"-18UN	.50	2¼"-14	1.06	18	**RC-1014**
2.00	1.63	.75	1.50	.38	1"- 8	1.00	1.88	⅜"-16UN	.50	2¾"-16	1.19	7.2	**RC-151**
2.00	1.63	.75	1.50	.38	1"- 8	1.00	1.88	⅜"-16UN	.50	2¾"-16	1.19	9	**RC-152**
2.00	1.63	.75	1.50	.38	1"- 8	1.00	1.88	⅜"-16UN	.50	2¾"-16	1.19	11	**RC-154***
2.00	1.63	1.00	1.50	.38	1"- 8	1.00	1.88	⅜"-16UN	.50	2¾"-16	1.19	15	**RC-156***
2.00	1.63	1.00	1.50	.38	1"- 8	1.00	1.88	⅜"-16UN	.50	2¾"-16	1.19	18	**RC-158**
2.00	1.63	1.00	1.50	.38	1"- 8	1.00	1.88	⅜"-16UN	.50	2¾"-16	1.19	21	**RC-1510**
2.00	1.63	1.00	1.50	.38	1"- 8	1.00	1.88	⅜"-16UN	.50	2¾"-16	1.19	24	**RC-1512**
2.00	1.63	1.00	1.50	.38	1"- 8	1.00	1.88	⅜"-16UN	.50	2¾"-16	1.19	26	**RC-1514**
2.56	2.25	1.00	2.00	.41	1½"-16	1.00	2.31	½"-13UN	.75	3⅝"-12	1.94	13	**RC-251**
2.56	2.25	1.00	2.00	.41	1½"- 16	1.00	2.31	½"-13UN	.75	3⅝"-12	1.94	14	**RC-252***
2.56	2.25	1.00	2.00	.41	1½"- 16	1.00	2.31	½"-13UN	.75	3⅝"-12	1.94	18	**RC-254***
2.56	2.25	1.00	2.00	.41	1½"- 16	1.00	2.31	½"-13UN	.75	3⅝"-12	1.94	22	**RC-256***
2.56	2.25	1.00	2.00	.41	1½"- 16	1.00	2.31	½"-13UN	.75	3⅝"-12	1.94	27	**RC-258**
2.56	2.25	1.00	2.00	.41	1½"- 16	1.00	2.31	½"-13UN	.75	3⅝"-12	1.94	31	**RC-2510**
2.56	2.25	1.00	2.00	.41	1½"- 16	1.00	2.31	½"-13UN	.75	3⅝"-12	1.94	36	**RC-2512**
2.56	2.25	1.00	2.00	.41	1½"- 16	1.00	2.31	½"-13UN	.75	3⅝"-12	1.94	39	**RC-2514***
2.88	2.25	2.25	2.00	.41	1½"- 16	1.00	—	—	—	3⅝"-12	1.94	40	**RC-308**
3.75	3.13	1.31	2.81	.11	—	—	3.75	½"-13UN	.75	5"-12	2.19	33	**RC-502**
3.75	3.13	1.31	2.81	.11	—	—	3.75	½"-13UN	.75	5"-12	2.19	42	**RC-504**
3.75	3.13	1.38	2.81	.11	—	—	3.75	½"-13UN	.75	5"-12	2.19	51	**RC-506***
3.75	3.13	1.38	2.81	.11	—	—	3.75	½"-13UN	.75	5"-12	2.19	83	**RC-5013**
4.50	3.75	1.19	2.81	.23	—	—	—	—	—	5¾"-12	1.75	65	**RC-756**
4.50	3.75	1.19	2.81	.23	—	—	—	—	—	5¾"-12	1.75	130	**RC-7513**
5.13	4.13	1.63	2.81	.11	—	—	5.50	¾"-10UN	1.00	6⅞"-12	1.75	130	**RC-1006**
5.13	4.13	1.63	2.81	.11	—	—	5.50	¾"-10UN	1.00	6⅞"-12	1.75	160	**RC-10010**

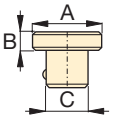
▼ SELECTION CHART

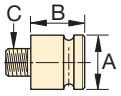
For Use with Cylinder Capacity (tons)	Saddles: Flat/Threaded	Saddles: Grooved[1]	Saddles: Tilt	Base Plate	Mounting Block	Clevis Eyes: Base[4]	Clevis Eyes: Plunger
							
5	A-53F[2]	A-53G[2]	–	–	RB-5[2], AW-51[2], AW-53[2]	REB-5[2]	REP-5[2]
10	A-12[3], A-102F[3]	A-102G[3]	CAT-10[3]	JBI-10	RB-10, AW-102	REB-10	REP-10[3]
15	–	A-152G	CAT-10	–	RB-15	REB-15	REP-10
25	A-29	A-252G	CAT-50	JBI-25	RB-25	REB-25	REP-25
30	A-29	A-252G	CAT-50	–	RB-25	–	REP-25
50	–	–	CAT-100	JBI-50	–	–	–
75	–	–	CAT-100	–	–	–	–
100	–	–	CAT-100	–	–	–	–

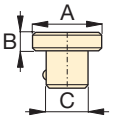
[1] Standard on 5-30 ton RC-cylinders [2] Except RC-50 [3] Except RC-101 [4] Mounting screws are included.

▼ DIMENSION CHARTS

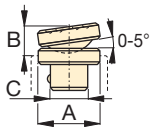
Model Number	Saddle Dimensions (in) A	B	C
	Flat		
A-53F	1.00	.25	.68
A-102F	1.38	.24	.88
A-12	2.00	1.88	1"-8UNC
A-29	2.00	1.88	1½"-16UN
	Grooved		
A-53G	1.00	.25	.68
A-102G	1.38	.24	.88
A-152G	1.50	.37	.88
A-252G	1.97	.37	1.40

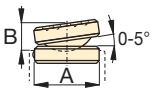




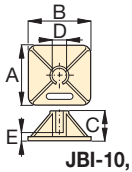


Model Number	Tilt Saddle Dimensions (in) A	B	C
	Tilt		
CAT-10	1.38	.79	.88
CAT-50	1.97	.83	1.40
	Tilt		
CAT-100	2.80	.98	–

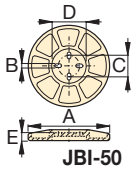




Model Number	Base Plate Dimensions (in) A	B	C	D	E
JBI-10	9.00	9.00	5.34	2.29	.81
JBI-25	11.00	11.00	5.53	3.41	1.03
JBI-50	12.00	.60	3.75	5.19	1.25

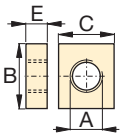


JBI-10, -25

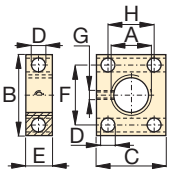


JBI-50

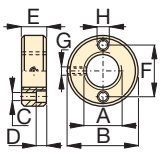
Model Number	Mounting Block Dimensions (in) A	B	C	D	E	F	G	H
RB-5	1½"-16	3.50	3.00	–	1.00	–	–	–
AW-51	1½"-16	2.76	2.36	.43	.98	2.13	¼"-20	1.62
AW-53	1½"-16	2.87	.28	.31	.75	2.25	¼"-20	.41
RB-10	2¼"-14	4.50	3.50	–	1.00	–	–	–
AW-102	2¼"-14	3.94	3.25	.63	1.18	3.00	7/16"-20	2.31
RB-15	2¾"-16	4.00	4.50	–	1.50	–	–	–
RB-25	3 5/16"-12	5.00	6.50	–	2.00	–	–	–



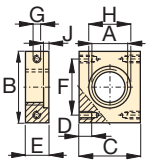
RB-5, -10
RB-15, -25



AW-51

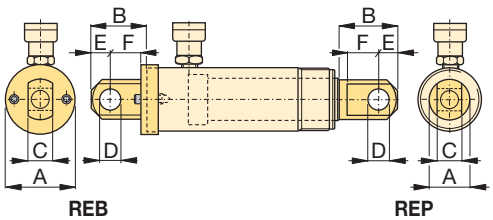


AW-53



AW-102 (J=.19)

Type	Model Number	Clevis Eye Dimensions (in) A	B	C	D	E	F	Pin to Pin* (in)
Base[4]	**REB-5**	1.75	1.88	.56	.63	.63	1.00	2.37
	REB-10	2.50	2.63	1.00	.88	1.00	1.38	3.07
	REB-15	3.00	2.63	1.00	.88	1.00	1.38	3.07
	REB-25	3.75	3.13	1.50	1.25	1.25	1.63	3.45
Plunger	**REP-5**	1.13	1.62	.56	.63	.63	.75	—
	REP-10	1.69	2.43	1.00	.88	1.00	1.13	—
	REP-25	2.25	2.93	1.50	1.25	1.25	1.38	—



REB **REP**

* Pin to Pin– REB and REP Clevises fitted. Add cylinder stroke length.
[4] Mounting screws are included.

The Enerpac Lightweight Aluminum Cylinders

▼ Shown: **RAC, RACL, RACH, and RAR**

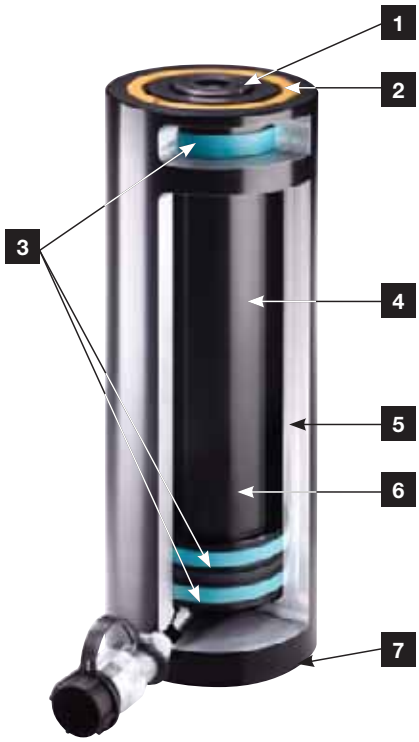
RA Series

Capacity:
20-150 tons

Stroke:
1.97-7.87 inches

Maximum Operating Pressure:
10,000 psi

- **Lightweight, easy to carry and position to allow a higher cylinder capacity-to-weight-ratio**
- **Non-corrosive by design, aluminum has always been a good material for use in many caustic environments**
- **Composite bearings on all moving surfaces guarantee NO metal-to-metal contact, to resist side loads and increase cylinder life**



1. **Removable Hardened Saddle** protects plunger from being damaged by abrasive surface contact.
2. **Stop Ring** on all models absorbs eccentric loading and prevents plunger over-extension.
3. **Composite Bearing** material to prevent metal-to-metal contact, reducing side-load issues and increasing life.
4. **Hard-coated Plunger and Base** resist wear and prevent galling.
5. **7075-T6 Aluminum Alloy Components** for maximum strength and minimum weight.
6. **Plunger Return Spring** on all single-acting models for prompt cylinder return.
7. **Standard Steel Baseplate** protects cylinder base from abrasive surfaces.

Think Safety

Manufacturer's rating of load and stroke are maximum safe limits.

Good practice encourages using only 80% of these ratings!

Page: 242

RAC-Series, Single-Acting Cylinders

The lightweight general purpose spring return aluminum cylinders.

Page: 12

RACL-Series, Lock Nut Cylinders

The lightweight spring return aluminum cylinders for mechanical load holding.

Page: 14

RACH-Series, Hollow Plunger Cylinders

For both push and pull forces with a single-acting cylinders.

Page: 16

RAR-Series, Double-Acting Cylinders

The lightweight aluminum cylinders for lifting and lowering.

Page: 18

▼ Shown from left to right: **RAC-508, RAC-1506, RAC-304, and RAC-206**

Lightweight for Maximum Portability

- **Composite bearings prevent metal-to-metal contact, increasing cylinder life and resistance to side-loads of up to 10%**
- **Hard coat finish on all surfaces resists damage and extends cylinder life**
- **Handles included on all models**
- **Steel baseplate and saddle for protection against load-induced damage**
- **Integral stop ring prevents plunger over-travel and is capable of withstanding the full cylinder capacity**
- **High-strength return spring for rapid cylinder retraction**
- **CR-400 coupler and dustcap included on all models**
- **All cylinders meet ASME B-30.1 and ISO 10100 standards**

Saddles

All RAC cylinders are equipped with bolt-on removable saddles of hardened steel.

Lightweight Hand Pumps

Enerpac hand pumps **P-392** or **P-802** make the optimal lightweight set.

Page: 62

Aluminum Lock Nut Cylinders

When positive mechanical load holding is required, the lightweight RACL-Series Aluminum Lock Nut cylinders are the ideal choice.

Page: 14

Cylinder Capacity (tons) [maximum]	Stroke (in)	Model Number	Cylinder Effective Area (in²)
20 [24.1]	1.97	**RAC-202**	4.83
	3.94	**RAC-204**	4.83
	5.91	**RAC-206**	4.83
30 [34.2]	1.97	**RAC-302**	6.85
	3.94	**RAC-304**	6.85
	5.91	**RAC-306**	6.85
50 [54.9]	1.97	**RAC-502**	10.99
	3.94	**RAC-504**	10.99
	5.91	**RAC-506**	10.99
100 [110.9]	3.94	**RAC-1004**	22.19
	5.91	**RAC-1006**	22.19
	7.87	**RAC-1008**	22.19
150 [175.9]	5.91	**RAC-1506**	35.18

◀ *Enerpac lightweight aluminum RAC-506 cylinders are ideal for wet environments such as this tunnel under the river (Holland High-Speed Train Line).*

Aluminum vs. Steel

Aluminum cylinders, while offering the most lightweight solution for many lifting, stressing and lowering applications, also have some unique limitations due to material properties.

Aluminum differs from steel in that it has a lower finite fatigue life. This means aluminum cylinders should NOT be used in high-cycle applications such as production.

The Enerpac line of aluminum cylinders are designed to provide 5,000 cycles at their recommended pressure. **This limit should not be exceeded.** In normal lifting and many maintenance applications, this should provide a lifetime of use.

RAC Series

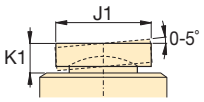
Capacity:
20-150 tons

Stroke:
1.97-7.87 inches

Maximum Operating Pressure:
10,000 psi

Optional Bolt Tilt Saddle Dimensions (in)

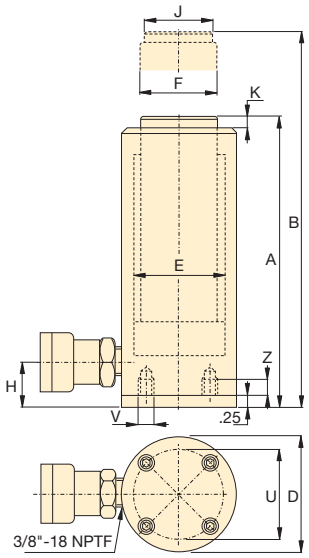
Cylinder Model / Capacity (ton)	Model Number	Saddle Diameter J1	Saddle Protrusion from Base K1
RAC-50	CATG-50	1.97	1.02
RAC-100	CATG-100	3.59	1.30
RAC-150	CATG-150	4.65	1.46



Steel Base Plate Mounting Holes

Cylinder Model / Capacity (ton)	Bolt Circle U (in)	Thread V (mm)	Thread Depth [1] Z (in)
RAC-20	2.76	M6	.47
RAC-30	3.15	M6	.47
RAC-50	4.33	M6	.47
RAC-100	6.30	M6	.47
RAC-150	7.87	M6	.47

[1] Including Base Plate Height of .25 inches.
Four (4) baseplate bolts: M6



Steel Base Plate

The steel base plate protects the cylinder base from damage, it should not be removed.

The base holes in these aluminum cylinders are designed for securing the steel base plate. **They will not withstand the capacity of the cylinder.**

Do not use the base holes in these aluminum cylinders to attach any device to the cylinder.

Oil Capacity (in³)	Collapsed Height A (in)	Extended Height B (in)	Outside Diameter D (in)	Cylinder Bore Diameter E (in)	Plunger Diameter F (in)	Base to Advance Port H (in)	Saddle Diameter J (in)	Saddle Protrusion from Plunger K (in)	Weight (lbs)	Model Number
9.51	6.85	8.82	3.35	2.48	1.97	1.07	1.57	.12	7.9	RAC-202
19.02	8.82	12.76	3.35	2.48	1.97	1.07	1.57	.12	9.0	RAC-204
28.52	10.79	16.69	3.35	2.48	1.97	1.07	1.57	.12	10.1	RAC-206
13.48	7.13	9.09	3.94	2.95	2.36	1.31	1.57	.12	9.9	RAC-302
26.97	9.09	13.03	3.94	2.95	2.36	1.31	1.57	.12	11.5	RAC-304
40.45	11.06	16.97	3.94	2.95	2.36	1.31	1.57	.12	13.0	RAC-306
21.63	7.32	9.29	5.12	3.74	3.15	1.19	1.97	.12	18.7	RAC-502
43.27	9.29	13.23	5.12	3.74	3.15	1.19	1.97	.12	21.6	RAC-504
64.90	11.26	17.17	5.12	3.74	3.15	1.19	1.97	.12	24.5	RAC-506
87.36	10.67	14.61	7.09	5.31	4.33	1.82	3.70	.12	43.2	RAC-1004
131.04	12.64	18.54	7.09	5.31	4.33	1.82	3.70	.12	48.3	RAC-1006
174.72	14.61	22.48	7.09	5.31	4.33	1.82	3.70	.12	53.4	RAC-1008
207.76	13.49	19.40	9.06	6.69	5.51	2.02	4.45	.12	73.4	RAC-1506

▼ Shown from left to right: **RACL-1006, RACL-504 and RACL-506**

- **Aluminum Lock Nut provides mechanical load holding for extended periods**
- **Hardened steel stop ring increases cylinder life and resistance to side-loads of up to 5%**
- **Hard coat finish on all surfaces resists damage and extends cylinder life**
- **Composite bearings increase cylinder life and side load resistance**
- **Handles included on all models**
- **Steel baseplate and saddle for protection against load-induced damage**
- **Integral stop ring prevents plunger over-travel and is capable of withstanding the full cylinder capacity**
- **High-strength return spring for rapid cylinder retraction**
- **CR-400 coupler and dustcap included on all models**
- **All cylinders meet ASME B-30.1 and ISO 10100 standards**

◀ *The portable Lock Nut cylinder RACL-1506 used for extended load support during epoxy injection for bridge reinforcement.*

To Secure Loads Mechanically

Saddles

All RACL cylinders are equipped with bolt-on removable saddles of hardened steel. For tilt saddles see next page.

Page: **15**

Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

Page: **118**

Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

Page: **117**

Cylinder Capacity ton (maximum)	Stroke (in)	Model Number	Cylinder Effective Area (in^2)
30 (34.2)	1.97	**RACL-302**	6.85
	3.94	**RACL-304**	6.85
	5.91	**RACL-306**	6.85
50 (54.9)	1.97	**RACL-502**	10.99
	3.94	**RACL-504**	10.99
	5.91	**RACL-506**	10.99
100 (110.9)	1.97	**RACL-1002**	22.19
	3.94	**RACL-1004**	22.19
	5.91	**RACL-1006**	22.19
150 (175.9)	1.97	**RACL-1502**	35.18
	3.94	**RACL-1504**	35.18
	5.91	**RACL-1506**	35.18

Single-Acting, Spring Return, Lock Nut Cylinders

Aluminum vs. Steel

Aluminum cylinders, while offering the most lightweight solution for many lifting, stressing and lowering applications, also have some unique limitations due to material properties.

Aluminum differs from steel in that it has a lower finite fatigue life. This means aluminum cylinders should NOT be used in high-cycle applications such as production.

The Enerpac line of aluminum cylinders are designed to provide 5,000 cycles at their recommended pressure. **This limit should not be exceeded.** In normal lifting and many maintenance applications, this should provide a lifetime of use.

RACL Series

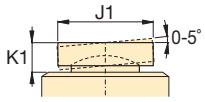
Capacity:
30-150 tons

Stroke:
1.97-5.91 inches

Maximum Operating Pressure:
10,000 psi

Optional Bolt On Tilt Saddle Dimensions (in)

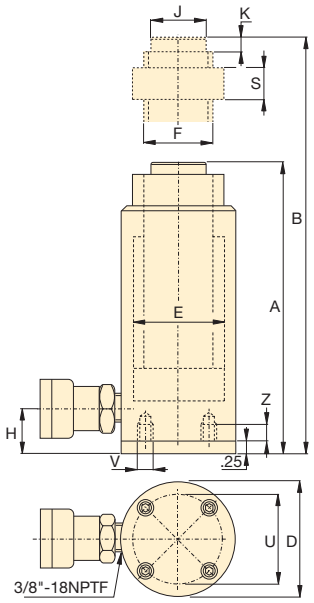
Cylinder Model / Capacity (ton)	Model Number	Saddle Diameter J1	Saddle Protrusion from Base K1
RACL-50	CATG-50	1.97	1.02
RACL-100	CATG-100	3.59	1.30
RACL-150	CATG-150	4.65	1.46



Steel Base Plate Mounting Holes

Cylinder Model / Capacity (ton)	Bolt Circle U (in)	Thread V (mm)	Thread Depth [1] Z (in)
RACL-30	3.15	M6	.24
RACL-50	4.33	M6	.47
RACL-100	6.30	M6	.47
RACL-150	7.87	M6	.47

[1] Including Base Plate Height of .25 inches.
Four (4) baseplate bolts: M6



Steel Base Plate

The steel base plate protects the cylinder base from damage, it should not be removed.

The base holes in these aluminum cylinders are designed for securing the steel base plate. **They will not withstand the capacity of the cylinder.**

Do not use the base holes in these aluminum cylinders to attach any device to the cylinder.

Lifting an Unbalanced Load

When lifting an unbalanced load Enerpac Synchronous Lift Systems can be the solution with multiple lift point capabilities from 4 to 64 points.

Page: 228

Oil Capacity (in³)	Collapsed Height A (in)	Extended Height B (in)	Outside Diameter D (in)	Cylinder Bore Diameter E (in)	Plunger Diameter (Threaded) F (in)	Base to Advance Port H (in)	Saddle Diameter J (in)	Saddle Protrusion from Plunger K (in)	Lock Nut Height S (in)	Weight (lbs)	Model Number
13.48	9.10	11.07	3.94	2.95	2.36	1.31	1.58	.12	1.97	11.9	RACL-302
26.97	11.07	15.01	3.94	2.95	2.36	1.31	1.58	.12	1.97	13.4	RACL-304
40.45	13.04	18.95	3.94	2.95	2.36	1.31	1.58	.12	1.97	14.9	RACL-306
21.63	9.29	11.26	5.12	3.74	3.15	1.19	1.97	.12	1.97	20.5	RACL-502
43.27	11.26	15.20	5.12	3.74	3.15	1.19	1.97	.12	1.97	23.4	RACL-504
64.90	13.23	19.13	5.12	3.74	3.15	1.19	1.97	.12	1.97	26.2	RACL-506
43.68	11.65	13.62	7.09	5.31	4.33	1.82	3.70	.12	2.95	48.2	RACL-1002
87.36	13.62	17.56	7.09	5.31	4.33	1.82	3.70	.12	2.95	53.3	RACL-1004
131.14	15.59	21.50	7.09	5.31	4.33	1.82	3.70	.12	2.95	58.4	RACL-1006
69.25	12.72	14.69	9.06	6.69	5.51	2.02	4.45	.12	3.15	71.0	RACL-1502
138.61	14.69	18.62	9.06	6.69	5.51	2.02	4.45	.12	3.15	79.8	RACL-1504
207.91	16.65	22.56	9.06	6.69	5.51	2.02	4.45	.12	3.15	88.6	RACL-1506

▼ Shown from left to right: **RACH-15010, RACH-304 and RACH-208**

The Lightweight Solution for Tensioning and Testing

- **Hollow plunger design allows for both pull and push forces**
- **Composite bearings increase cylinder life and side load resistance**
- **Hard coat finish on all surfaces resists damage and extends cylinder life**
- **Handles included on all models**
- **Floating center tube increases seal life**
- **Steel baseplate and saddle for protection against load-induced damage**
- **Integral stop ring prevents plunger over-travel and is capable of withstanding the full cylinder capacity**
- **High-strength return spring for rapid cylinder retraction**

Saddles

All RACH-cylinders are equipped with bolt-on removable hardened steel hollow saddles.

Lightweight Hand Pumps

Enerpac hand pumps **P-392** or **P-802** make the optimal lightweight set.

Page: **62**

Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment.

Refer to the System Components section for a full range of gauges.

Page: **117**

Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

Page: **118**

◀ *An RACH-306, powered by a P-392 hand pump, is used to extract corroded carriage pins from refuse collection vehicles.*

Cylinder Capacity ton [maximum]	Stroke (in)	Model Number	Cylinder Effective Area (in^2)
20 [25.3]	1.97	**RACH-202**	5.07
	5.91	**RACH-206**	5.07
30 [39.6]	1.97	**RACH-302**	7.92
	5.91	**RACH-306**	7.92
60 [65.6]	3.94	**RACH-604**	13.13
	5.91	**RACH-606**	13.13
100 [127.5]	5.91	**RACH-1006**	25.51

Single-Acting, Spring Return, Hollow Plunger Cylinders

Aluminum vs. Steel

Aluminum cylinders, while offering the most lightweight solution also have some unique limitations due to material properties. It differs from steel in that it has a lower finite fatigue life. Aluminum cylinders should NOT be used in high-cycle applications such as production.

These cylinders are designed to provide 5000 cycles at their recommended pressure. **This limit should not be exceeded**. In normal lifting and many maintenance applications, this should provide a lifetime of use.

RACH Series

Capacity:
20-100 tons

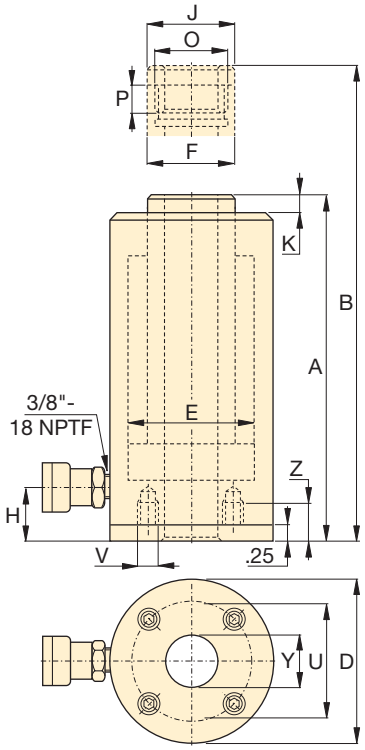
Stroke:
1.97-5.91 inches

Center Hole Diameter:
1.06-3.11 inches

Maximum Operating Pressure:
10,000 psi

Steel Base Plate Mounting Holes			
Cylinder Model / Capacity (ton)	Bolt Circle U (in)	Thread V (mm)	Thread Depth [1] Z (in)
RACH-20	3.15	M6	.47
RACH-30	4.33	M6	.47
RACH-60	6.29	M6	.47
RACH-100	9.05	M6	.47

[1] Including Base Plate Height of .25 inches. Four (4) baseplate bolts: M6



Steel Base Plate

The steel base plate protects the cylinder base from damage, it should not be removed.

The base holes in these aluminum cylinders are designed for securing the steel base plate. **They will not withstand the capacity of the cylinder.**

Do not use the base holes in these aluminum cylinders to attach any device to the cylinder.

Standard Features

- CR-400 coupler and dust cap
- All cylinders meet ASME B-30.1 and ISO 10100 standards.

Oil Capacity (in³)	Collapsed Height A (in)	Extended Height B (in)	Outside Diameter D (in)	Cylinder Bore Diameter E (in)	Plunger Diameter F (in)	Base to Advance Port H (in)	Saddle Diameter J (in)	Saddle Protrusion from Plunger K (in)	Center Hole Diameter Y (in)	Weight (lbs)	Model Number
9.98	7.41	9.37	3.94	2.95	2.17	1.14	2.17	.39	1.06	11.5	**RACH-202**
29.94	12.41	18.32	3.94	2.95	2.17	1.14	2.17	.39	1.06	15.7	**RACH-206**
15.59	8.20	10.17	5.12	3.74	2.76	1.14	2.76	.39	1.34	17.6	**RACH-302**
46.77	13.12	19.02	5.12	3.74	2.76	1.14	2.76	.39	1.34	24.7	**RACH-306**
51.69	12.41	16.34	7.09	5.12	3.94	2.41	3.94	.47	2.13	43.0	**RACH-604**
77.53	14.97	20.87	7.09	5.12	3.94	2.41	39.4	.47	2.13	50.3	**RACH-606**
150.64	15.39	21.31	9.84	7.28	5.71	2.41	5.71	.55	3.11	101.9	**RACH-1006**

▼ Shown from left to right: **RAR-1008, RAR-506, RAR-502**

The Lightweight Solution for Double-Acting Applications

- **Double-acting for rapid retraction, regardless of hose lengths and system losses**
- **Composite bearings increase cylinder life and side load resistance**
- **Hard coat finish on all surfaces resists damage and extends cylinder life**
- **Handles included on all models**
- **Steel baseplate and saddle for protection against load-induced damage**
- **Integral stop ring prevents plunger over-travel and is capable of withstanding the full cylinder capacity**
- **Built-in safety valve prevents accidental over-pressurization**

Saddles

All RAR-cylinders are equipped with bolt-on removable hardened steel saddles. For tilt saddles see next page.

Page: 19

Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

Page: 118

Optimum Performance

Enerpac's range of ZU4 electric pumps, fitted with manual or solenoid operated 4-way valves, offer optimum combinations with RAR cylinders.

Page: 80

▼ *An RAR-506 was easy to position under a bulldozer for repair of frame member.*

Cylinder Capacity (ton)	Stroke (in)	Model Number	Maximum Cylinder Capacity (ton)		Cylinder Effective Area (in^2)		Oil Capacity (in^3)	
			Push	Pull	Push	Pull	Push	Pull
50	1.97	RAR-502	55	21	10.99	4.14	21.63	8.15
	3.94	RAR-504	55	21	10.99	4.14	43.25	16.30
	5.91	RAR-506	55	21	10.99	4.14	64.88	24.44
100	3.94	RAR-1004	111	62	22.19	12.33	87.35	48.53
	5.91	RAR-1006	111	62	22.19	12.33	131.02	72.79
	7.87	RAR-1008	111	62	22.19	12.33	174.70	97.05
150	5.91	RAR-1506	176	102	35.18	20.45	207.77	120.78

Aluminum vs. Steel

Aluminum cylinders, while offering the most lightweight solution also have some unique limitations due to material properties.
It differs from steel in that it has a lower finite fatigue life. Aluminum cylinders should NOT be used in high-cycle applications such as production.

These cylinders are designed to provide 5000 cycles at their recommended pressure. **This limit should not be exceeded**. In normal lifting and many maintenance applications, this should provide a lifetime of use.

RAR Series

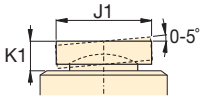
Capacity:
50-150 tons

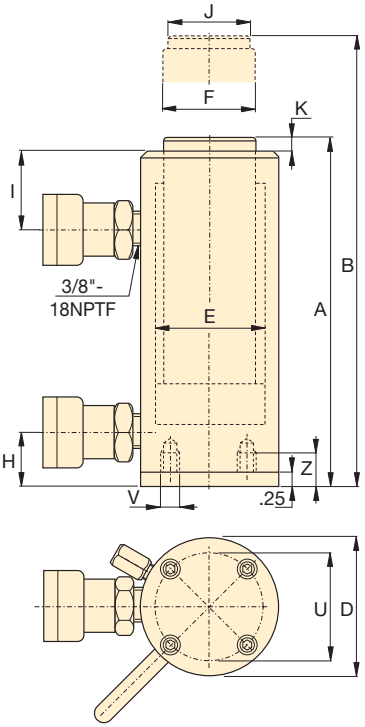
Stroke:
1.97-7.87 inches

Maximum Operating Pressure:
10,000 psi

Optional Bolt On Tilt Saddle Dimensions (in)

Cylinder Model / Capacity (ton)	Model Number	Saddle Diameter J1	Saddle Protrusion from Base K1
RAR-50	CATG-50	1.97	1.02
RAR-100	CATG-100	2.88	1.22
RAR-150	CATG-150	3.59	1.30





Steel Base Plate Mounting Holes

Cylinder Model / Capacity (ton)	Bolt Circle U (in)	Thread V (mm)	Thread Depth [1] Z (in)
RAR-50	4.33	M6	.47
RAR-100	6.50	M6	.47
RAR-150	7.87	M6	.47

[1] Including Base Plate Height of .25 inch.
Four (4) baseplate bolts: M6

Steel Base Plate

The steel base plate protects the cylinder base from damage, it should not be removed.

The base holes in these aluminum cylinders are designed for securing the steel base plate. **They will not withstand the capacity of the cylinder.**

Do not use the base holes in these aluminum cylinders to attach any device to the cylinder.

Standard Features

- CR-400 coupler and dust cap
- All cylinders meet ASME B-30.1 and ISO 10100 standards.

Collapsed Height A (in)	Extended Height B (in)	Outside Diameter D (in)	Cylinder Bore Diameter E (in)	Plunger Diameter F (in)	Base to Advance Port H (in)	Top to Retract Port I (in)	Saddle Diameter J (in)	Saddle Protrusion from Plunger K (in)	Weight (lbs)	Model Number
7.91	9.88	5.71	3.74	2.95	1.19	2.20	1.97	.12	24.5	RAR-502
9.88	13.82	5.71	3.74	2.95	1.19	2.20	1.97	.12	28.0	RAR-504
11.85	17.76	5.71	3.74	2.95	1.19	2.20	1.97	.12	31.5	RAR-506
11.85	15.79	7.28	5.31	3.54	1.70	3.15	2.95	.12	42.6	RAR-1004
13.82	19.72	7.28	5.31	3.54	1.70	3.15	2.95	.12	48.9	RAR-1006
15.79	23.66	7.28	5.31	3.54	1.70	3.15	2.95	.12	55.3	RAR-1008
13.71	19.60	9.06	6.69	4.33	1.50	2.95	3.70	.12	73.2	RAR-1506

▼ Shown from left to right: **CLP-2002, CLP-5002**

The Shortest Power Lifter

- **Flat design for use in confined areas**
- **Safety lock nut for mechanical load holding**
- **Single-acting load return**
- **Special bearing design resists sideload forces**
- **Overflow port functions as a stroke limiter**
- **CR-400 coupler and dust cap included on all models**

Saddles

All CLP-Series cylinders include integral tilt saddles with maximum tilt angles up to 5°.

Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

Page: **117**

Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

Page: **118**

▼ *Only the extreme low height CLP-cylinder fits in this confined area to lift the construction.The V-82 needle valve is used to control cylinder speed during lifting and lowering.*

Cylinder Capacity (ton) [maximum]	Stroke (in)	Model Number	Cylinder Effective Area (in^2)	Oil Capacity (in^3)
60 [67.1]	1.97	**CLP-602**	13.42	26.42
100 [113.7]	1.97	**CLP-1002**	22.75	44.78
160 [179.2]	1.77	**CLP-1602**	35.85	63.51
200 [221.3]	1.77	**CLP-2002**	44.27	78.43
250 [284.2]	1.77	**CLP-2502**	56.85	100.72
400 [433.6]	1.77	**CLP-4002**	86.72	153.64
500 [566.2]	1.77	**CLP-5002**	113.25	200.63

Speed Chart

See the Enerpac Cylinder Speed Chart in our "Yellow Pages" to determine your approximate cylinder speed.

Page: 249

Longer Stroke Lock Nut Cylinders

For lock nut applications that require longer stroke lengths, see **CLL-Series** heavy-duty cylinders.

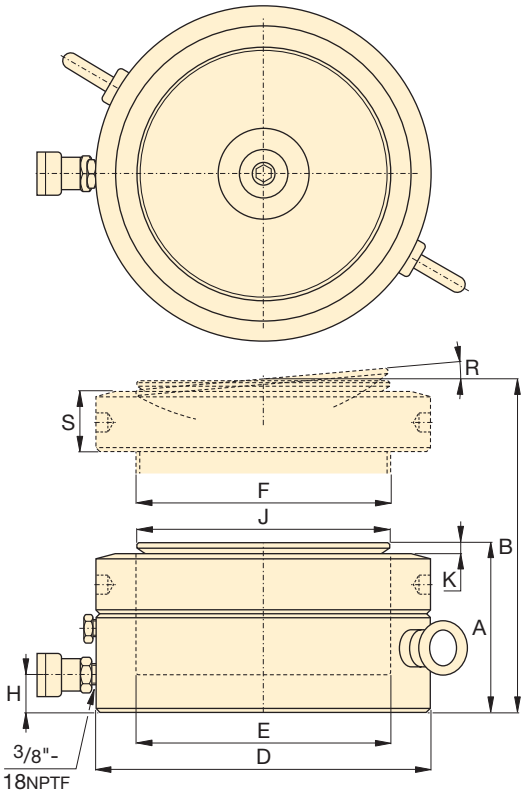
Page: 44

CLP Series

Capacity:
60-500 tons

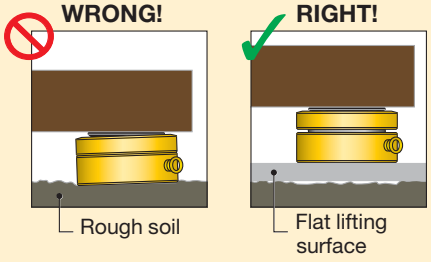
Stroke:
1.77-1.97 inches

Maximum Operating Pressure:
10,000 psi



All CLP-series cylinders require a solid lifting surface for correct support.

Use of pancake cylinders on surfaces such as sand, mud or dirt may result in cylinder damage!



For more safety instructions see our "Yellow Pages".

Page: 239

	Collapsed Height A (in)	Extended Height B (in)	Outside Diameter D (in)	Cyl. Bore Diameter E (in)	Plunger Diameter F (mm)	Base to Advance Port H (in)	Saddle Diameter J (in)	Saddle Protrusion from Plngr. K (in)	Saddle Max. Tilt Angle R	Lock Nut Height S (in)	Weight (lbs)	Model Number
	4.92	6.89	5.51	4.13	Tr 104 x 4	.75	3.78	.24	5°	1.10	33	**CLP-602**
	5.39	7.36	6.89	5.38	Tr 136 x 6	.83	4.96	.31	5°	1.22	57	**CLP-1002**
	5.83	7.60	8.66	6.76	Tr 171 x 6	1.06	6.30	.35	5°	1.57	97	**CLP-1602**
	6.10	7.87	9.65	7.51	Tr 190 x 6	1.18	7.09	.39	5°	1.69	125	**CLP-2002**
	6.26	8.03	10.83	8.51	Tr 216 x 6	1.26	7.87	.43	5°	1.73	163	**CLP-2502**
	7.01	8.78	13.78	10.51	Tr 266 x 6	1.54	9.84	.43	4°	2.17	295	**CLP-4002**
	7.56	9.33	15.75	12.01	Tr 305 x 6	1.89	11.42	.39	3°	2.44	416	**CLP-5002**

▼ Shown from left to right: **RSM-1000, RSM-300, RSM-50, RCS-1002, RCS-302**

Maximum Power to Height Ratio

Saddles

All RCS-Series cylinders have plunger mounting holes for installation of tilt saddles. See table for selection and dimensional information.

Page: 23

Low Clearance Lifting

The **LW-16** Lifting Wedge and **SOH-Series** Machine Lifts are the perfect choices for lifting loads that have low clearance.

Page: 165

RSM-Series, Flat-Jac® Cylinders

- **Compact, flat design for use where other cylinders will not fit**
- **RSM-750, 1000 and 1500 have handles for easy carrying**
- **Mounting holes permit easy fixturing**
- **Baked enamel finish for increased corrosion resistance**
- **CR-400 coupler and dust cap included on all models***
- **Hard chrome plated high-quality steel plungers**
- **Grooved plunger ends require no saddle**
- **Single-acting spring return**

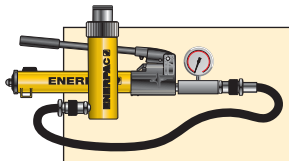
RCS-Series, Low Height Cylinders

- **Lightweight, low profile design for use in confined spaces**
- **Baked enamel finish for increased corrosion resistance**
- **Plunger wiper reduces contamination, extending cylinder life**
- **CR-400 coupler and dust cap included on all models**
- **Grooved plunger end with threaded holes for mounting tilt saddles**
- **Integral handle on RCS-1002 for easy carrying**
- **Plated steel plungers**
- **Single-acting spring return**

▼ *Only a couple of inches are needed for an RSM-cylinder to lift this large steel construction.*

Cylinder Capacity (tons) [max.]	Stroke (in)	Model Number	Cyl. Effect. Area (in^2)	Oil Cap. (in^3)
5 [4.9]	.25	**RSM-50***	.99	.25
10 [11.2]	.44	**RSM-100**	2.24	.98
20 [22.1]	.44	**RSM-200**	4.43	1.94
30 [32.4]	.50	**RSM-300**	6.49	3.25
50 [48.1]	.63	**RSM-500**	9.62	6.01
75 [79.5]	.63	**RSM-750**	15.90	9.94
100 [98.1]	.63	**RSM-1000**	19.63	12.27
150 [153.4]	.63	**RSM-1500**	30.68	19.17
10 [11.2]	1.50	**RCS-101****	2.24	3.35
20 [22.1]	1.75	**RCS-201****	4.43	7.75
30 [32.4]	2.44	**RCS-302****	6.49	15.82
50 [48.1]	2.38	**RCS-502****	9.62	22.85
100 [98.1]	2.25	**RCS-1002****	19.63	44.18

* RSM-50 is fitted with an AR-400 coupler.
** Available as a set. See note on next page.



Pump and Cylinder Sets

All cylinders marked with an ** are available as **sets** (cylinder, gauge, couplers, hose and pump) for your ordering convenience.

Page: 58

RSM RCS Series

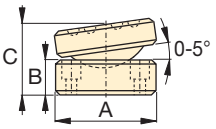
Capacity:
5-150 tons

Stroke:
.25-2.44 inches

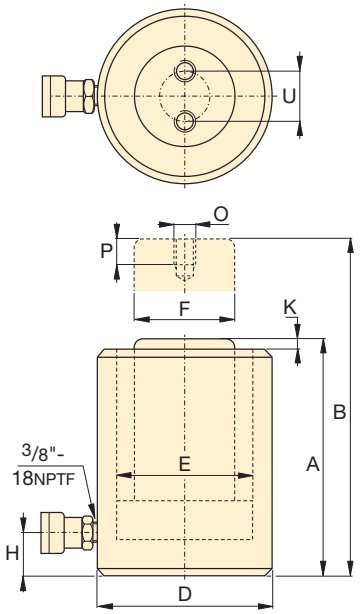
Maximum Operating Pressure:
10,000 psi

Optional Bolt On Tilt Saddle Dimensions (in)

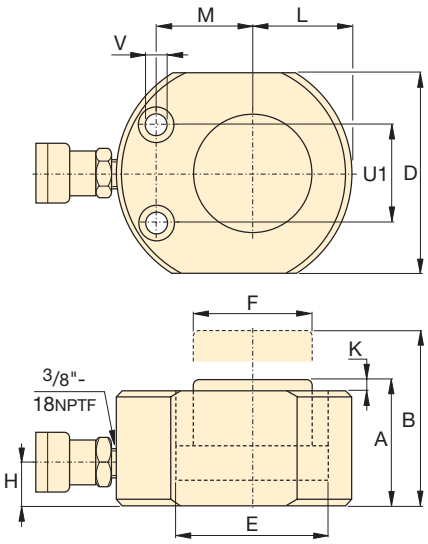
For cylinder model:	Model Number	A	B	C*
RCS-101	CAT-11	1.38	.43	.83
RCS-201, -302, -502	CAT-51	1.97	.59	1.14
RCS-1002	CAT-101	2.80	.67	1.39



* "C" dimension equals saddle protrusion from plunger. Mounting screws are included.



RCS-Series



RSM-Series

* 5° angle position of coupler on RCS-101, 201, 302.

RSM Cylinder Mounting Hole Dimensions (in)

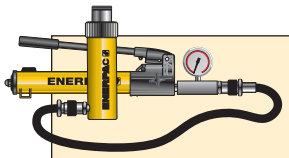
Model Number	Hole Pitch U1	Hole Diam. V	Counter Bore Diam.	Counter Bore Depth
RSM-50	1.12	.20	.312	.17
RSM-100	1.44	.28	.422	.31
RSM-200	1.94	.40	.594	.39
RSM-300	2.06	.40	.625	.44
RSM-500	2.62	.47	.750	.50
RSM-750	3.00	.53	.812	.56
RSM-1000	3.00	.53	.812	.56
RSM-1500	4.62	.53	.812	.56

Collapsed Height A (in)	Extended Height B (in)	Outside Diameter D (in)	Cylinder Bore Diameter E (in)	Plunger Diameter F (in)	Base to Advance Port H (in)	Plunger Protrusion from Base K (in)	Plunger to Base L (in)	Plunger to Mtg. Hole M (in)	Thread O (mm)	Thread Depth P (in)	Bolt Circle U (in)	Weight (lbs)	Model Number
1.28	1.53	2.31 x 1.63	1.13	1.00	.63	.04	.81	.88	–	–	–	2.3	RSM-50*
1.69	2.13	3.25 x 2.19	1.69	1.50	.75	.04	1.09	1.34	–	–	–	3.1	RSM-100
2.03	2.47	4.00 x 3.00	2.38	2.00	.75	.04	1.56	1.56	–	–	–	6.8	RSM-200
2.31	2.81	4.63 x 3.75	2.88	2.50	.75	.08	1.88	1.75	–	–	–	10	RSM-300
2.63	3.25	5.50 x 4.50	3.50	2.75	.75	.08	2.25	2.13	–	–	–	15	RSM-500
3.13	3.75	6.50 x 5.50	4.50	3.25	.75	.08	2.75	2.63	–	–	–	25	RSM-750
3.38	4.00	7.00 x 6.00	5.00	3.63	.75	.08	3.00	2.94	–	–	–	32	RSM-1000
3.94	4.56	8.50 x 7.50	6.25	4.50	.94	.08	3.75	3.25	–	–	–	58	RSM-1500
3.47	4.97	2.75	1.69	1.50	.69	.20	–	–	M4	.32	1.03	9	RCS-101**
3.88	5.63	3.63	2.38	2.00	.69	.13	–	–	M5	.32	1.57	11	RCS-201**
4.63	7.06	4.00	2.88	2.62	.75	.13	–	–	M5	.32	1.57	15	RCS-302**
4.81	7.19	4.88	3.50	2.75	.94	.08	–	–	M5	.32	1.57	24	RCS-502**
5.56	7.81	6.50	5.00	3.63	1.25	.06	–	–	M8	.40	2.17	50	RCS-1002**

▼ Shown from left to right: **BRC-25, BRC-46, BRP-306, BRP-606, BRP-106C**

The Ultimate in Pulling Power

- **High strength alloy steel construction**
- **Plunger blow-out protection to prevent over-extension**
- **Hard chrome-plated plunger for long life**
- **Baked enamel finish for increased corrosion resistance**
- **CR-400 coupler and dust cap included on all models**
- **Plunger wiper reduces contamination, extending cylinder life**
- **Single-acting spring-return**
- **Replaceable links on BRP-models**



Pump and Cylinder Sets

All cylinders marked with an * are available as **sets** (cylinder, gauge, couplers, hose and pump) for your ordering convenience.

Page: **58**

Gauges

Minimize the risk of over-loading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

Page: **117**

Attachments and Accessories

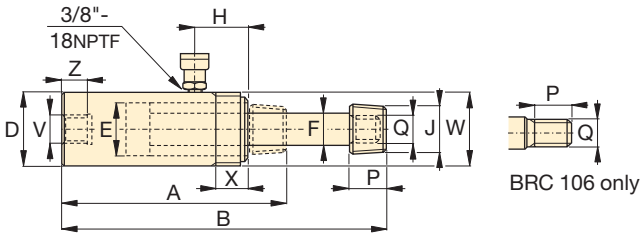
The BRC-25 and BRC-46 units have base, collar and plunger threads to affix a range of optional attachments and accessories, such as chains, saddles and extension tubes.

Page: **166**

▼ *Ship building, welding and Enerpac pull cylinders go hand in hand.*

▼ *To lift a load bearing mast into place, BRP cylinders were used to tension the supporting cables.*

BRC Cylinder Mounting Dimensions (in)				
Model Number	Base Mounting Hole V	Collar Thread W	Collar Thread Length X	Mtg. Thread Length Z
BRC-25	¾"-14 NPT	1½"-16 UN	.98	.67
BRC-46	1¼"-11½" NPT	2¼"-14 UN	1.06	.98
BRC-106	M30 x 2	M85 x 2	1.02	.98



BRC-25 to BRC-106

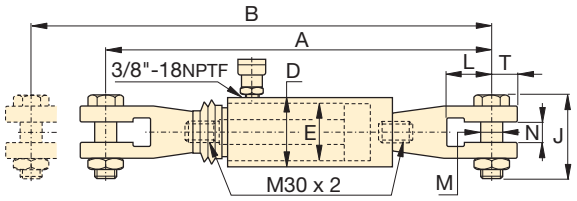
BRC BRP Series

Capacity:
2.5-60 tons

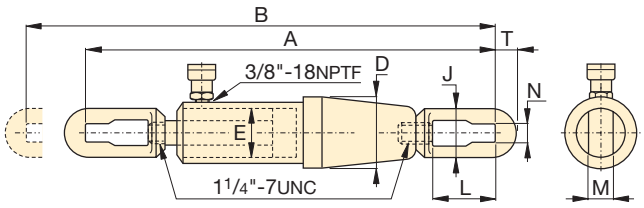
Stroke:
5.00-6.00 inches

Maximum Operating Pressure:
10,000 psi

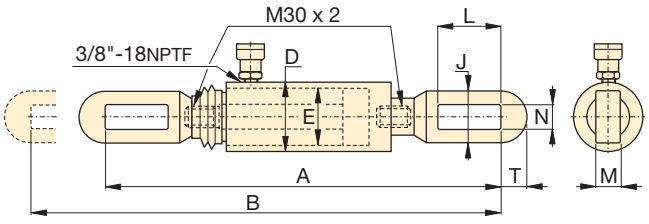
Cylinder Capacity (tons) [maximum]	Stroke (in)	Model Number	Cyl. Effect. Area (in^2)	Oil Cap. (in^3)	Collap. Height A (in)	Ext. Height B (in)	Outside Diam. D (in)	Cyl. Bore Diam. E (in)	Plgr. Diam. F (in)	Top to Inlet Port H (in)	Saddle Diameter J (in)	Plunger Thread Length P (in)	Plunger Outside Thread Q	Weight (lbs)
2.5 [2.7]	5.00	**BRC-25**	.55	2.76	10.44	15.44	1.89	1.13	.75	1.77	¾"-14 NPT	1.13	11/16"-24	4
5 [5.6]	5.50	**BRC-46**	1.13	6.21	11.88	17.38	2.25	1.69	1.19	1.69	1¼"-11½" NPT	1.25	1 3/16"-16	10
10 [11.6]	5.95	**BRC-106**	2.32	13.80	11.38	17.33	3.35	2.13	1.25	1.57	–	1.02	M30x2	21



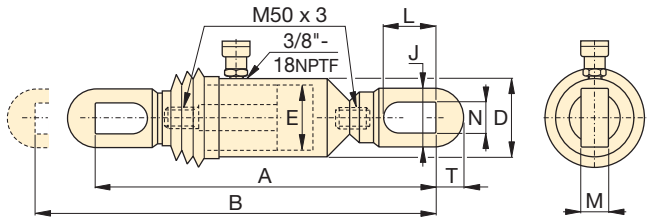
BRP-106C



BRP-306



BRP-106L



BRP-606

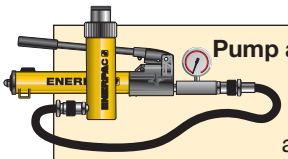
Cylinder Capacity (tons) [maximum]	Stroke (in)	Model Number	Cyl. Effect. Area (in^2)	Oil Capacity (in^3)	Collap. Height A (in)	Ext. Height B (in)	Outside Diam. D (in)	Cyl. Bore Diam. E (in)	Link Height J (in)	Link Opening L (in)	Link Thickness M (in)	Link Width N (in)	Slot to Link End T (in)	Weight (lbs)
10 [11.6]	6.00	**BRP-106C***	2.32	13.80	23.11	29.06	3.35	2.13	4.72	2.44	1.19	1.38	1.26	35
	6.00	**BRP-106L***	2.32	13.80	22.24	28.19	3.35	2.13	2.64	4.53	0.88	1.19	1.26	24
30 [36.1]	6.00	**BRP-306***	7.22	43.27	42.72	48.82	5.39	3.50	4.49	5.71	1.38	1.57	1.97	106
60 [58.8]	6.00	**BRP-606***	11.78	70.43	28.34	34.32	5.51	4.33	5.13	5.90	1.57	1.97	2.76	118

Note: BRP-106C, BRP-106L and BRP-606 are fitted with rubber bellows for rod protection.
*Available as a set. See note on previous page. Please refer to drawings above for BRP-106C and BRP-106L.

▼ Shown from left to right: **RCH-306, RCH-120, RCH-1003**

- **Hollow plunger design allows for both pull and push forces**
- **Single-acting spring return**
- **Nickel-plated, floating center tube on models over 20 tons increases product life**
- **Baked enamel finish for increased corrosion resistance**
- **Collar threads for easy fixturing**
- **RCH-120 includes AR-630 coupler and has 1/4 NPTF port**
- **RCH-121 and RCH-1211 have FZ-1630 reducer and AR-630 coupler, all other models feature CR-400 coupler**

Versatility in Testing, Maintenance and Tensioning Applications



Pump and Cylinder Sets

All cylinders marked with an * are available as **sets** (cylinder, gauge, couplers, hose and pump) for your ordering convenience.

Page: 58

Lightweight Aluminum Hollow Plunger Cylinders

If you need a higher cylinder capacity-to-weight ratio the lightweight **RACH-Series** Aluminum Hollow Plunger Cylinders are the perfect choice.

Page: 16

Saddles

Most RCH-Series cylinders are equipped with smooth saddles. See table at next page for optional threaded saddles and all dimensional information.

Page: 27

▼ *Hollow plunger cylinder RCH-1003 used in an application for intermediate boom suspension on a dragline.*

Cylinder Capacity (tons) [maximum]	Stroke (in)	Model Number	Cyl. Effect. Area (in^2)	Oil Cap. (in^3)
12 [13.8]	0.31	RCH-120	2.76	0.86
	1.63	RCH-121*	2.76	4.49
	1.63	RCH-1211	2.76	4.49
	3.00	RCH-123	2.76	8.29
20 [23.6]	2.00	RCH-202*	4.73	9.46
	6.10	RCH-206	4.73	28.67
30 [36.1]	2.50	RCH-302*	7.22	18.05
	6.13	RCH-306	7.22	44.23
60 [63.6]	3.00	RCH-603*	12.73	38.20
	6.00	RCH-606	12.73	76.41
100 [103.1]	3.00	RCH-1003*	20.63	61.88

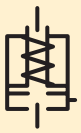
* Available as a set. See note on this page.

Hoses

Enerpac offers a complete line of high quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

Page: 118

RCH Series



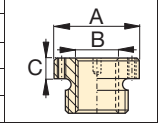
Capacity:
12-100 tons

Stroke:
.31-6.13 inches

Center Hole Diameter:
.77-3.11 inches

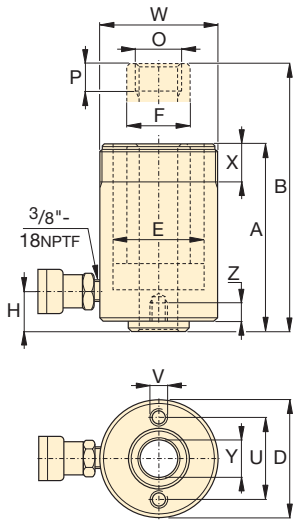
Maximum Operating Pressure:
10,000 psi

Optional Heat Treated Hollow Saddles						
Saddle Type	Cylinder Model No.	Saddle Model No.	Saddle Dimensions (in) A	B	C	
Threaded Hollow	RCH-202, 206	HP-2015	2.11	1"-8	.38	
	RCH-302, 306	HP-3015	2.49	1¼"-7	.38	
	RCH-603, 606	HP-5016	3.61	1⅝"-5½"	.50	
	RCH-1003	HP-10016	4.97	2½"-8	.51	

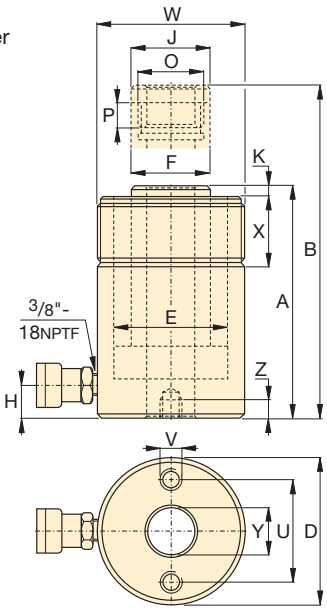


Smooth hollow saddles are standard on all RCH-models (12-ton models are not equipped with saddles).

RCH-121 and RCH-1211 have a 1.88" diameter boss that protrudes 0.25" from base.



RCH-120 to RCH-123 models



RCH-202 to RCH-1003 models

Base Mounting Hole Dimensions (in)			
Model Number	Bolt Circle U	Thread V	Thread Depth Z
RCH-120	2.00	5/16"-18 UNC	.35
RCH-121	–	–	–
RCH-1211	–	–	–
RCH-123	2.00	5/16"-18 UNC	.50
RCH-202	3.25	3/8"-16 UNC	.37
RCH-206	3.25	3/8"-16 UNC	.37
RCH-302	3.63	3/8"-16 UNC	.55
RCH-306	3.63	3/8"-16 UNC	.55
RCH-603	5.13	½"-13 UNC	.55
RCH-606	5.13	½"-13 UNC	.55
RCH-1003	7.00	5/8"-11 UNC	.75

* 1/4" NPT for RCH-120 only

Collap. Height A (in)	Ext. Height B (in)	Outside Diam. D (in)	Cyl. Bore Diam. E (in)	Plngr. Diam. F (in)	Cyl. Base to Advance Port H (in)	Saddle Diameter J (in)	Saddle Protrusion from Plngr. K (in)	Plunger Internal Thread O (in)	Plunger Thread Length P (in)	Collar Thread W (in)	Collar Thread Length X (in)	Center Hole Diam. Y (in)	Weight (lbs)	Model Number
2.19	2.50	2.75	2.13	1.38	.38	–	–	¾"-16 UN	.63	2¾"-16	1.19	.77	3.2	RCH-120
4.75	6.38	2.75	2.13	1.38	.75	–	–	–	–	2¾"-16	1.19	.77	6.2	RCH-121*
4.75	6.38	2.75	2.13	1.38	.75	–	–	¾"-16 UN	.63	2¾"-16	1.19	.77	6.2	RCH-1211
7.25	10.25	2.75	2.13	1.38	.75	–	–	–	–	2¾"-16	1.19	.77	9.8	RCH-123
6.38	8.38	3.88	2.88	2.13	.75	2.13	.27	1 9/16"-16 UN	.75	3⅞"-12	1.50	1.06	17	RCH-202*
12.05	18.11	3.88	2.88	2.13	.75	2.13	.27	1 9/16"-16 UN	.75	3⅞"-12	1.50	1.06	31	RCH-206
7.03	9.53	4.50	3.50	2.50	.85	2.50	.38	1 13/16"-16 UN	.88	4½"-12	1.66	1.31	24	RCH-302*
13.00	19.13	4.50	3.50	2.50	1.00	2.50	.38	1 13/16"-16 UN	.88	4½"-12	1.66	1.31	48	RCH-306
9.75	12.75	6.25	4.88	3.63	1.25	3.61	.50	2¾"-16 UN	.75	6¼"-12	1.91	2.12	62	RCH-603*
12.75	18.75	6.25	4.88	3.63	1.25	3.61	.50	2¾"-16 UN	.75	6¼"-12	1.91	2.12	78	RCH-606
10.00	13.00	8.38	6.50	5.00	1.50	4.97	.50	4"-16 UN	1.00	8⅜"-12	2.38	3.11	132	RCH-1003*

▼ Shown from left to right: **RRH-3010, RRH-1001, RRH-6010**

Versatility in Testing, Maintenance and Tensioning Applications

- **Relief valves prevent damage in case of over-pressurization**
- **Baked enamel finish for increased corrosion resistance**
- **Collar threads enable easy fixturing (except RRH-1001 and RRH-1508)**
- **Double-acting operation for fast retraction**
- **Nickel-plated, floating center tube increases product life**
- **Hollow plunger allows for both pull and push forces**
- **CR-400 couplers and dust caps included on all models**
- **Plunger wiper reduces contamination, extending cylinder life**

Pump Selection

A double-acting cylinder must be powered by a pump with a 4-way valve.

Page: 61

Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

Page: 117

Saddles

All RRH-Series cylinders are equipped with smooth saddles. See table on next page for optional threaded saddles and all dimensional information.

Page: 29

▼ *Double-acting hollow plunger cylinders are applied for bridge launching systems.*

Cylinder Capacity (ton)	Stroke (in)	Model Number	Max. Cylinder Capacity (ton)		Cylinder Effective Area (in^2)		Oil Capacity (in^3)	
			Advance	Retract	Advance	Retract	Advance	Retract
30	7.00	RRH-307	36	24	7.22	4.71	50.55	32.99
	10.13	RRH-3010	36	24	7.22	4.71	73.12	47.71
60	3.50	RRH-603	64	42	12.73	8.37	44.57	29.21
	6.50	RRH-606	64	42	12.73	8.37	82.77	54.24
	10.12	RRH-6010	64	42	12.73	8.37	128.94	84.49
100	1.50	RRH-1001	103	68	20.63	13.54	30.94	20.32
	3.00	RRH-1003	103	68	20.63	13.54	61.88	40.64
	6.00	RRH-1006	103	68	20.63	13.54	123.76	81.29
	10.13	RRH-10010	103	68	20.63	13.54	208.84	137.17
150	8.00	RRH-1508	158	80	31.62	15.91	252.97	127.23

Double-Acting, Hollow Plunger Cylinders

Hoses

Enerpac offers a complete line of high quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

Page: 118

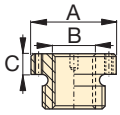
RRH Series

Capacity:
30-150 tons

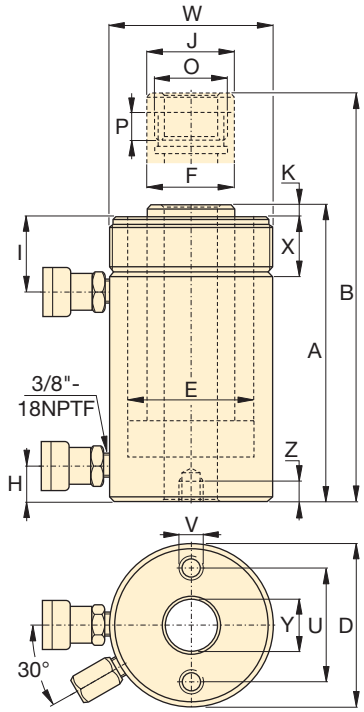
Stroke:
1.50-10.13 inches

Center Hole Diameter:
1.31-3.13 inches

Maximum Operating Pressure:
10,000 psi

Optional Heat Treated Saddles						
Saddle Type	Cylinder Model Number	Saddle Model No.	Saddle Dimensions (in) A	B	C	
Threaded Hollow	RRH-307, 3010	HP-3015	2.49	1¼"-7	.38	
	RRH-603, 606, 6010	HP-5016	3.61	1⅝"-5½	.50	
	RRH-1001, 1003, RRH-1006, 10010	HP-10016	4.97	2½"-8	.51	

Smooth hollow saddles are standard on all RRH-models.



Base Mounting Hole Dimensions (in)			
Model Number	Bolt Circle U	Thread V	Thread Depth Z
RRH-307	3.63	⅜"- 16	.62
RRH-3010	3.63	⅜"- 16	.62
RRH-603	5.12	½"- 13	.55
RRH-606	5.12	½"- 13	.55
RRH-6010	5.12	½"- 13	.55
RRH-1001	7.00	⅝"- 11	.75
RRH-1003	7.00	⅝"- 11	.75
RRH-1006	7.00	⅝"- 11	.75
RRH-10010	7.00	⅝"- 11	.75
RRH-1508	–	–	–

	Collap. Height A (in)	Ext. Height B (in)	Out. Diam. D (in)	Cyl. Bore Diam. E (in)	Plngr. Diam. F (in)	Cyl. Base to Adv. Port H (in)	Cyl. Top to Return Port I (in)	Saddle Diam. J (in)	Saddle Protrusion from Plngr. K (in)	Thread O (in)	Plunger Thread Length P (in)	Collar Thread W (in)	Collar Thread Length X (in)	Center Hole Diam. Y (in)	Wt. (lbs)	Model Number
	13.00	20.00	4.50	3.50	2.50	1.00	2.38	2.50	.38	1 13/16"-16	.88	4½"-12	1.66	1.31	48	RRH-307
	17.00	27.13	4.50	3.50	2.50	1.00	2.38	2.50	.38	1 13/16"-16	.88	4½"-12	1.66	1.31	60	RRH-3010
	9.75	13.25	6.25	4.88	3.63	1.25	2.63	3.61	.50	2¾"-16	.75	6¼"-12	1.91	2.13	62	RRH-603
	12.75	19.25	6.25	4.88	3.63	1.25	2.63	3.61	.50	2¾"-16	.75	6¼"-12	1.91	2.13	78	RRH-606
	17.25	27.38	6.25	4.88	3.63	1.25	2.63	3.61	.50	2¾"-16	.75	6¼"-12	1.91	2.13	101	RRH-6010
	6.50	8.00	8.38	6.50	5.00	1.50	1.75	4.97	.50	4"-16	1.00	–	–	3.13	85	RRH-1001
	10.00	13.00	8.38	6.50	5.00	1.50	3.38	4.97	.50	4"-16	1.00	8⅜"-12	2.38	3.13	135	RRH-1003
	13.50	19.50	8.38	6.50	5.00	1.50	3.38	4.97	.50	4"-16	1.00	8⅜"-12	2.38	3.13	175	RRH-1006
	18.13	28.25	8.38	6.50	5.00	1.50	3.38	4.97	.50	4"-16	1.00	8⅜"-12	2.38	3.13	235	RRH-10010
	13.75	21.75	9.75	7.50	6.00	1.50	2.38	5.00	.19	4¼"-12	1.00	–	–	3.13	245	RRH-1508

▼ Shown from left to right: **RD-2510, RD-96, RD-256, RD-41, RD-166**

High Precision and High Cycle Performance

Speed Chart

See the Enerpac Cylinder Speed Chart in our 'Yellow Pages' to determine your approximate cylinder speed.

Page: 249

Golden Ring Design

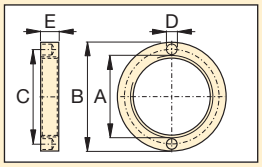
Enerpac RD cylinders are provided with the Golden Ring Design, for long, trouble-free performance.

- **Designed for long life, the best choice for production applications**
- **Unique mounting configurations simplify fixturing**
- **Baked enamel finish for increased corrosion resistance**
- **Double-acting operation develops force in both directions, providing maximum versatility**
- **Plunger wiper reduces contamination, extending cylinder life**

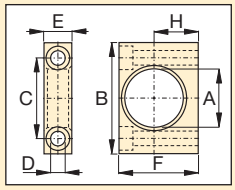
▼ *Clamping application using Enerpac RD cylinders (with clevis eye attachments on both ends) for their high-pressure capability and mounting flexibility.*

Cylinder Capacity (tons)	Stroke (in)	Model Number	Max. Cylinder Capacity (tons)		Cylinder Effective Area (in^2)		Oil Capacity (in^3)		Collap. Height A (in)	Ext. Height B (in)	Body Length C (in)	Outside Diam. D (in)	Cylinder Bore Diam. E (in)	Plunger Diam. F (in)
			Advance	Retract	Advance	Retract	Advance	Retract						
4	1.13	RD-41	4	2	.79	.34	.88	.39	7.31	8.44	6.38	2.00	1.00	.75
	3.13	RD-43	4	2	.79	.34	2.45	1.07	9.31	12.44	8.38	2.00	1.00	.75
	6.13	RD-46	4	2	.79	.34	4.81	2.10	12.31	18.44	11.38	2.00	1.00	.75
9	1.13	RD-91	9	5	1.77	.98	1.99	1.10	8.75	9.88	7.80	2.50	1.50	1.00
	3.13	RD-93	9	5	1.77	.98	5.52	3.07	10.78	13.91	9.80	2.50	1.50	1.00
	6.13	RD-96	9	5	1.77	.98	10.82	6.01	13.78	19.91	12.80	2.50	1.50	1.00
	10.13	RD-910	9	5	1.77	.98	17.89	9.94	17.78	27.91	16.81	2.50	1.50	1.00
16	6.25	RD-166	16	8	3.14	1.66	19.63	10.35	15.31	21.56	14.13	3.00	2.00	1.38
	10.25	RD-1610	16	8	3.14	1.66	32.20	16.98	19.31	29.56	18.11	3.00	2.00	1.38
25	6.25	RD-256	25	11	4.91	2.15	30.68	13.42	16.69	22.94	15.63	3.63	2.50	1.88
	10.25	RD-2510	25	11	4.91	2.15	50.31	22.01	20.69	30.94	19.61	3.63	2.50	1.88

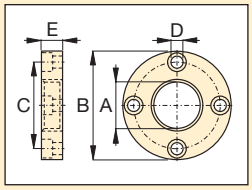
▼ RD CYLINDER ATTACHMENTS



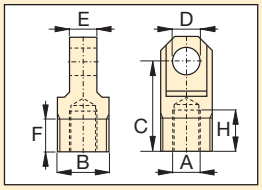
Retainer Nut
For locking foot or flange mountings. Tightens onto cylinder collar threads (included with foot and flange mounting kits)



Foot Mounting
Mounts onto cylinder collar



Flange Mounting
Mounts onto cylinder collar



Clevis Eye
Threads onto plunger or into cylinder base

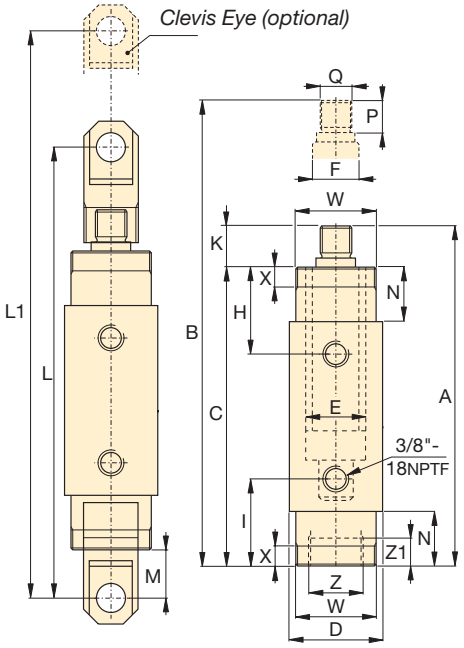
Model Number	RD-Cyl: (tons)	Dimensions (in) A	B	C	D	E	F	H
Foot Mounting with Retainer Nut								
AD-141	**4**	1.38	3.00	2.00	.41	.76	2.25	1.25
AD-171	**9**	2.00	4.00	2.88	.53	1.00	3.25	1.75
AD-181	**16**	2.63	5.00	3.76	.78	1.38	4.00	2.06
AD-191	**25**	3.25	6.26	4.62	1.03	1.76	4.88	2.50
Flange Mounting with Retainer Nut								
AD-142	**4**	1.38	3.88	3.09	.41	.75	–	–
AD-172	**9**	2.00	4.75	3.88	.41	1.00	–	–
AD-182	**16**	2.63	5.63	4.56	.53	1.38	–	–
AD-192	**25**	3.25	6.50	5.34	.66	1.75	–	–
Retainer Nut								
AD-143	**4**	1⅜"-12 UNF	2.25	1.81	.25	.38	–	–
AD-173	**9**	2"- 12	3.00	2.50	.27	.50	–	–
AD-183	**16**	2⅝"- 16	3.63	3.12	.27	.75	–	–
AD-193	**25**	3¼"- 16	4.25	3.75	.27	1.00	–	–
Clevis Eye								
AD-150	**4**	½"- 20	1⅛"- 20	1.12	.63	.63	.75	.94
AD-151	**9**	¾"- 16	1 1/16"- 18	1.31	.75	1.00	1.00	.94
AD-152	**16**	1⅛"- 12	2 3/16"- 16	1.88	1.00	1.25	1.00	1.19
AD-153	**25**	1½"- 12	2¾"- 16	2.00	1.25	1.50	1.00	1.06

RD Series

Capacity:
4-25 tons

Stroke:
1.13-10.25 inches

Maximum Operating Pressure:
10,000 psi



Top to Ret. Port H (in)	Bottom to Adv. Port I (in)	Plunger Protrusion K (in)	Clevis Eye Mounting Dimensions L (in)	L1 (in)	M (in)	Neck Length N (in)	Plunger Thread Length P (in)	Plunger External Thread Q (in)	Cylinder Mounting Dimensions (in) Collar Thread W	Collar Thread Length X	Int. Base Thread Z	Int. Base Thread Length Z1	Wt. (lbs)	Model Number
1.88	1.88	.94	10.12	11.25	1.61	1.13	.75	½"-20	1⅜"-12	.44	1⅛"-20	.35	4.8	**RD-41**
1.88	1.88	.94	12.12	15.25	1.61	1.13	.75	½"-20	1⅜"-12	.44	1⅛"-20	.35	6.4	**RD-43**
1.88	1.88	.94	15.12	21.25	1.61	1.13	.75	½"-20	1⅜"-12	.44	1⅛"-20	.35	9.0	**RD-46**
2.27	2.27	.98	11.61	12.76	1.50	1.50	.75	¾"-16	2"-12	.56	1 1/16"-18	.55	9.0	**RD-91**
2.27	2.27	.98	13.66	16.79	1.50	1.50	.75	¾"-16	2"-12	.56	1 1/16"-18	.55	11.0	**RD-93**
2.27	2.27	.98	16.66	22.79	1.50	1.50	.75	¾"-16	2"-12	.56	1 1/16"-18	.55	14.0	**RD-96**
2.27	2.27	.98	20.66	30.79	1.50	1.50	.75	¾"-16	2"-12	.56	1 1/16"-18	.55	19.0	**RD-910**
2.90	2.90	1.19	19.32	25.57	2.05	2.13	1.00	1⅛"-12	2⅝"-16	.88	2 3/16"-16	.94	22.0	**RD-166**
2.90	2.90	1.19	23.32	33.57	2.05	2.13	1.00	1⅛"-12	2⅝"-16	.88	2 3/16"-16	.94	29.0	**RD-1610**
3.50	3.50	1.06	20.86	27.11	2.09	2.75	1.00	1½"-12	3⅝"-16	1.13	2¾"-16	1.02	36.0	**RD-256**
3.50	3.50	1.08	24.86	35.11	2.09	2.75	1.00	1½"-12	3¼"-16	1.13	2¾"-16	1.02	46.0	**RD-2510**

▼ Shown from left to right: **RR-10013, RR-1502, RR-20013, RR-1010, RR-7513**

Most Versatile Performers

Rugged enough for the toughest job site uses and precision designed for high-cycle industrial uses.

- **Collar threads, plunger threads and base mounting holes for easy fixturing (on most models)**
- **Baked enamel finish for increased corrosion resistance**
- **Removable hardened saddles protect plunger during lifting and pressing**
- **Built-in safety valve prevents accidental over-pressurization**
- **CR-400 couplers included on all models**
- **Plunger wiper reduces contamination, extending cylinder life**

Pump Selection
A double-acting cylinder must be powered by a pump with a 4-way valve.
Page: 61

Saddles
RR-Series cylinders up to 75-ton have plunger thread for installation of CAT-Series tilt saddles.
Page: 33

Optimum Performance
Enerpac's range of ZU4 electric pumps, fitted with manual or solenoid operated 4-way valves, offer optimum combinations with RR cylinders.
Page: 82

▼ *These long stroke RR-cylinders are attached to a sliding and guiding system pulling the arched roof assembly of Athen's Olympic Stadium step by step into the final position.*

▼ *RR-cylinders provide power and precision in a special hydraulic press.*

RR Series

Capacity:
10-500 tons

Stroke:
2.25-48.00 inches

Maximum Operating Pressure:
10,000 psi

▼ QUICK SELECTION CHART

For complete technical information see next page.

Cylinder Capacity (tons)	Stroke (in)	Model Number	Cylinder Effective Area (in²) Push	Cylinder Effective Area (in²) Pull	Oil Capacity (in³) Push	Oil Capacity (in³) Pull	Collap. Height (in)
10	10.00	RR-1010*	2.23	.80	22.33	8.00	16.13
	12.00	RR-1012*	2.23	.80	26.80	9.00	18.00
30	8.25	RR-308*	6.51	3.00	53.67	25.00	15.25
	14.50	RR-3014*	6.51	3.00	92.70	43.00	21.63
50	6.13	RR-506	11.06	3.40	67.77	21.00	13.06
	13.13	RR-5013	11.06	3.40	145.17	44.00	20.06
	20.13	RR-5020	11.06	3.40	222.56	68.00	28.88
75	6.13	RR-756	15.92	4.90	97.58	29.00	13.69
	13.13	RR-7513	15.92	4.90	209.00	64.00	20.69
100	6.63	RR-1006	20.65	9.60	136.93	63.00	14.06
	13.13	RR-10013	20.65	9.60	271.17	126.00	20.63
	18.13	RR-10018	20.65	9.60	374.44	174.00	27.06
150	2.25	RR-1502	30.71	14.80	69.11	33.00	7.72
	6.13	RR-1506	30.71	14.80	188.28	91.00	15.19
	13.13	RR-15013	30.71	14.80	403.27	194.00	22.20
	32.13	RR-15032	30.71	14.80	986.84	475.00	43.94
200	6.00	RR-2006	44.21	22.50	265.28	135.00	16.94
	13.00	RR-20013	44.21	22.50	574.78	293.00	23.94
	18.00	RR-20018	44.21	22.50	795.85	396.00	30.13
	24.00	RR-20024	44.21	22.50	1,061	528.00	36.13
	36.00	RR-20036	44.21	22.50	1,592	792.00	48.13
	48.00	RR-20048	44.21	22.50	2,122	1,056	60.13
300	6.00	RR-3006	70.93	38.00	425.56	228.00	19.13
	12.00	RR-30012	70.93	38.00	851.12	456.00	25.13
	18.00	RR-30018	70.93	38.00	1,277	684.00	31.13
	24.00	RR-30024	70.93	38.00	1,702	912.00	37.13
	36.00	RR-30036	70.93	38.00	2,553	1,368	49.13
	48.00	RR-30048	70.93	38.00	3,405	1,824	61.13
400	6.00	RR-4006	95.09	51.00	570.51	306.00	21.19
	12.00	RR-40012	95.09	51.00	1,141	612.00	27.19
	18.00	RR-40018	95.09	51.00	1,712	918.00	33.19
	24.00	RR-40024	95.09	51.00	2,282	1,224	39.19
	36.00	RR-40036	95.09	51.00	3,423	1,836	51.19
	48.00	RR-40048	95.09	51.00	4,564	2,448	63.19
500	6.00	RR-5006	113.15	63.00	678	378.00	22.75
	12.00	RR-50012	113.15	63.00	1,358	756.00	28.75
	18.00	RR-50018	113.15	63.00	2,037	1,134	34.75
	24.00	RR-50024	113.15	63.00	2,716	1,512	40.75
	36.00	RR-50036	113.15	63.00	4,074	2,264	52.75
	48.00	RR-50048	113.15	63.00	5,431	3,024	64.75

* For RR-1010 and RR-1012: N = 1.26 inch; for RR-308 and RR-3014: N = 2.20 inch.

Enerpac CLRG-Series

If you do not not have a high cycle application, Enerpac CLRG-Series cylinders may be the right alternative.

Page: 40

Speed Chart

See the Enerpac Cylinder Speed Chart in our "Yellow Pages" to determine your approximate cylinder speed.

Page: 249

Optional Snap-in Saddles

Optional snap-in saddles for RR-Series double-acting cylinders:

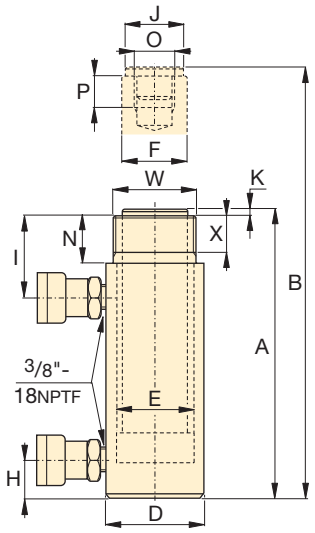
Saddle Type	Cylinder Model Number	Saddle Model Number
Flat	RR-1010, 1012	A-102F
Tilt	RR-1010, 1012	CAT-10
	RR-308, 3014	CAT-50
	RR-506, 5013	CAT-100
	RR-5020, 756	
	RR-7513	

Standard Saddles

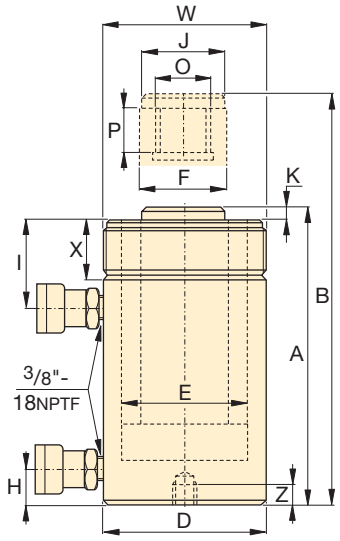
Grooved	RR-1010, 1012	A-102G
	RR-308, 3014	A-252G

For additional information on saddles:

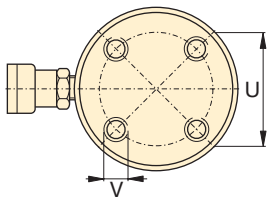
Page: 10



RR-1010 to RR-3014 models



RR-506 to RR-50048 models



RR-1006 to RR-30048

No mounting holes:
RR-506, 5013
RR-756, 7513
RR-1502, 15032

Cylinder retract capacity for certain RR cylinders may be less than theoretical values, as a result of reduced relief valve pressure settings:

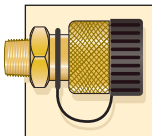
RR-308/3014:	4000 psi
RR-506/5013/5020:	6950 psi
RR-756/7513:	7200 psi

◀ For full features see page 32.

Cylinder Capacity (ton)	Stroke (in)	Model Number	Max. Cylinder Capacity (tons) Push	Max. Cylinder Capacity (tons) Pull	Cylinder Effective Area (in^2) Push	Cylinder Effective Area (in^2) Pull	Oil Capacity (in^3) Push	Oil Capacity (in^3) Pull	Collap. Height A (in)	Ext. Height B (in)	Outside Diam. D (in)
10	10.00	RR-1010*	11.1	4.0	2.23	.80	22.33	8.00	16.13	26.13	2.88
	12.00	RR-1012*	11.1	4.0	2.23	.80	26.80	9.00	18.00	30.00	2.88
30	8.25	RR-308*	32.5	6.0	6.51	3.00	53.67	25.00	15.25	23.50	4.00
	14.50	RR-3014*	32.5	6.0	6.51	3.00	92.70	43.00	21.63	36.13	4.00
50	6.13	RR-506	55.3	11.8	11.06	3.40	67.77	21.00	13.06	19.19	5.00
	13.13	RR-5013	55.3	11.8	11.06	3.40	145.17	44.00	20.06	33.19	5.00
	20.13	RR-5020	55.3	11.8	11.06	3.40	222.56	68.00	28.88	49.00	5.00
75	6.13	RR-756	79.6	17.6	15.92	4.90	97.58	29.00	13.69	19.81	5.75
	13.13	RR-7513	79.6	17.6	15.92	4.90	209.00	64.00	20.69	33.81	5.75
100	6.63	RR-1006	103.2	48.0	20.65	9.60	136.93	63.00	14.06	20.69	7.00
	13.13	RR-10013	103.2	48.0	20.65	9.60	271.17	126.00	20.63	33.75	7.00
	18.13	RR-10018	103.2	48.0	20.65	9.60	374.44	174.00	27.06	45.19	7.00
150	2.25	RR-1502	153.5	30.0	30.71	14.80	69.11	33.00	7.19	9.44	8.00
	6.13	RR-1506	153.5	74.0	30.71	14.80	188.28	91.00	15.19	21.31	8.00
	13.13	RR-15013	153.5	74.0	30.71	14.80	403.27	194.00	22.20	35.31	8.00
	32.13	RR-15032	153.5	74.0	30.71	14.80	986.84	475.00	43.94	76.06	8.00
200	6.00	RR-2006	221.0	112.5	44.21	22.50	265.28	135.00	16.94	22.94	9.75
	13.00	RR-20013	221.0	112.5	44.21	22.50	574.78	293.00	23.94	36.94	9.75
	18.00	RR-20018	221.0	112.5	44.21	22.50	795.85	396.00	30.13	48.13	9.75
	24.00	RR-20024	221.0	112.5	44.21	22.50	1,061	528.00	36.13	60.13	9.75
	36.00	RR-20036	221.0	112.5	44.21	22.50	1,592	792.00	48.13	84.13	9.75
	48.00	RR-20048	221.0	112.5	44.21	22.50	2,122	1,056	60.13	108.13	9.75
300	6.00	RR-3006	354.6	190.0	70.93	38.00	425.56	228.00	19.13	25.13	12.25
	12.00	RR-30012	354.6	190.0	70.93	38.00	851.12	456.00	25.13	37.13	12.25
	18.00	RR-30018	354.6	190.0	70.93	38.00	1,277	684.00	31.13	49.13	12.25
	24.00	RR-30024	354.6	190.0	70.93	38.00	1,702	912.00	37.13	61.13	12.25
	36.00	RR-30036	354.6	190.0	70.93	38.00	2,553	1368	49.13	85.13	12.25
	48.00	RR-30048	354.6	190.0	70.93	38.00	3,405	1824	61.13	109.13	12.25
400	6.00	RR-4006	475.4	255.0	95.09	51.00	570.51	306.00	21.19	27.19	14.13
	12.00	RR-40012	475.4	255.0	95.09	51.00	1,141	612.00	27.19	39.19	14.13
	18.00	RR-40018	475.4	255.0	95.09	51.00	1,712	918.00	33.19	51.19	14.13
	24.00	RR-40024	475.4	255.0	95.09	51.00	2,282	1224	39.19	63.19	14.13
	36.00	RR-40036	475.4	255.0	95.09	51.00	3,423	1836	51.19	87.19	14.13
	48.00	RR-40048	475.4	255.0	95.09	51.00	4,564	2448	63.19	111.19	14.13
500	6.00	RR-5006	565.7	315.0	113.15	63.00	678.92	378.00	22.75	28.75	15.63
	12.00	RR-50012	565.7	315.0	113.15	63.00	1,358	756.00	28.75	40.75	15.63
	18.00	RR-50018	565.7	315.0	113.15	63.00	2,037	1134	34.75	52.75	15.63
	24.00	RR-50024	565.7	315.0	113.15	63.00	2,716	1512	40.75	64.75	15.63
	36.00	RR-50036	565.7	315.0	113.15	63.00	4,074	2268	52.75	88.75	15.63
	48.00	RR-50048	565.7	315.0	113.15	63.00	5,431	3024	64.75	112.75	15.63

* For RR-1010 and RR-1012: N = 1.26 inch; for RR-308 and RR-3014: N = 2.20 inch.

Double-Acting Long Stroke Cylinders



Couplers Included!
CR-400 couplers included on all models. Fits all HC-Series hoses.

Capacity:
10-500 tons

Stroke:
2.25-48.00 inches

Maximum Operating Pressure:
10,000 psi

RR Series

Cylinder Bore Diameter E (in)	Plunger Diameter F (in)	Base to Adv. Port H (in)	Top to Return Port I (in)	Saddle Diameter J (in)	Saddle Protrusion from Plngr. K (in)	Plunger Internal Thread O (in)	Plunger Thread Length P (in)	Base Mounting Holes: Bolt Cir. Diam. U (in)	Base Mounting Holes: Thread V (in)	Base Mounting Holes: Thread Depth Z (in)	Collar Thread W (in)	Collar Thread Length X (in)	Weight (lbs)	Model Number
1.69	1.38	1.44	2.25	1.38	.24	1-8	1.00	–	–	–	2¼-14	1.06	28	**RR-1010***
1.69	1.38	1.44	2.25	1.38	.24	1-8	1.00	–	–	–	2¼-14	1.06	31	**RR-1012***
2.88	2.13	1.44	3.19	2.00	.41	1½-16	1.00	–	–	–	3⁵⁄₁₆-12	1.94	40	**RR-308***
2.88	2.13	1.56	3.19	2.00	.41	1½-16	1.00	–	–	–	3⁵⁄₁₆-12	1.94	64	**RR-3014***
3.75	3.13	1.13	3.00	2.81	.11	1-12	1.00	–	–	–	5-12	2.00	67	**RR-506**
3.75	3.13	1.13	3.00	2.81	.11	1-12	1.00	–	–	–	5-12	2.00	115	**RR-5013**
3.75	3.13	2.25	3.00	2.81	.11	1-12	1.00	3.00	–	–	5-12	2.00	150	**RR-5020**
4.50	3.75	1.19	3.00	2.81	.25	1-12	1.50	–	–	–	5¾-12	1.50	92	**RR-756**
4.50	3.75	1.19	3.19	2.81	.25	1-12	1.50	–	–	–	5¾-12	1.50	150	**RR-7513**
5.13	3.75	1.50	2.81	3.00	.13	1¾-12	1.38	5.50	¾-10	1.00	6⅞-12	2.00	135	**RR-1006**
5.13	3.75	1.50	2.81	3.00	.13	1¾-12	1.38	5.50	¾-10	1.00	6⅞-12	2.00	205	**RR-10013**
5.13	3.75	1.63	3.63	3.00	.13	1¾-12	1.38	5.50	¾-10	1.00	6⅞-12	2.00	260	**RR-10018**
6.25	4.50	.88	2.63	3.67	.06	–	–	–	–	–	–	–	110	**RR-1502**
6.25	4.50	1.94	3.31	4.49	.75	3⅜-16	1.38	6.25	¾-16	1.00	8-12	2.36	205	**RR-1506**
6.25	4.50	1.94	3.31	4.49	.75	3⅜-16	1.38	6.25	¾-16	1.00	8-12	2.36	275	**RR-15013**
6.25	4.50	3.31	3.31	4.49	.75	3⅜-16	1.38	–	–	–	8-12	2.36	525	**RR-15032**
7.50	5.25	2.25	3.81	5.25	.88	–	–	5.00	1-8	1.00	–	–	325	**RR-2006**
7.50	5.25	2.25	3.81	5.25	.88	2½-12	2.50	5.00	1-8	1.00	9¾-12	2.13	440	**RR-20013**
7.50	5.25	3.38	4.00	5.25	.88	2½-12	2.50	5.00	1-8	1.00	9¾ -12	2.13	450	**RR-20018**
7.50	5.25	3.38	4.00	5.25	.88	2½-12	2.50	5.00	1-8	1.00	9¾ -12	2.13	616	**RR-20024**
7.50	5.25	3.38	4.00	5.25	.88	2½ -12	2.50	5.00	1-8	1.00	9¾ -12	2.13	845	**RR-20036**
7.50	5.25	3.38	4.00	5.25	.88	2½-12	2.50	5.00	1-8	1.00	9¾ - 12	2.13	1065	**RR-20048**
9.50	6.50	3.50	4.50	6.50	1.13	2½-12	3.25	6.25	1¼-7	1.75	12¼-12	2.31	441	**RR-3006**
9.50	6.50	3.50	4.50	6.50	1.13	2½-12	3.25	6.25	1¼-7	1.75	12¼-12	2.31	608	**RR-30012**
9.50	6.50	3.50	4.50	6.50	1.13	2½-12	3.25	6.25	1¼-7	1.75	12¼-12	2.31	776	**RR-30018**
9.50	6.50	3.50	4.50	6.50	1.13	2½-12	3.25	6.25	1¼-7	1.75	12¼-12	2.31	1034	**RR-30024**
9.50	6.50	3.50	4.50	6.50	1.13	2½-12	3.25	6.25	1¼-7	1.75	12¼-12	2.31	1385	**RR-30036**
9.50	6.50	3.50	4.50	6.50	1.13	2½-12	3.25	6.25	1¼-7	1.75	12¼-12	2.31	1720	**RR-30048**
11.00	7.50	4.25	5.25	7.50	1.13	3-12	3.75	8.00	1½-6	2.00	14⅛-8	2.56	670	**RR-4006**
11.00	7.50	4.25	5.25	7.50	1.13	3-12	3.75	8.00	1½-6	2.00	14⅛-8	2.56	880	**RR-40012**
11.00	7.50	4.25	5.25	7.50	1.13	3-12	3.75	8.00	1½-6	2.00	14⅛-8	2.56	1000	**RR-40018**
11.00	7.50	4.25	5.25	7.50	1.13	3-12	3.75	8.00	1½-6	2.00	14⅛-8	2.56	1317	**RR-40024**
11.00	7.50	4.25	5.25	7.50	1.13	3-12	3.75	8.00	1½-6	2.00	14⅛-8	2.56	1746	**RR-40036**
11.00	7.50	4.25	5.25	7.50	1.13	3-12	3.75	8.00	1½-6	2.00	14⅛-8	2.56	2162	**RR-40048**
12.00	8.00	4.75	6.00	8.00	1.13	3¼-12	4.25	8.00	1¾-5	2.12	15⅝-8	3.13	953	**RR-5006**
12.00	8.00	4.75	6.00	8.00	1.13	3¼-12	4.25	8.00	1¾-5	2.12	15⅝-8	3.13	1300	**RR-50012**
12.00	8.00	4.75	6.00	8.00	1.13	3¼-12	4.25	8.00	1¾-5	2.12	15⅝-8	3.13	1500	**RR-50018**
12.00	8.00	4.75	6.00	8.00	1.13	3¼-12	4.25	8.00	1¾-5	2.12	15⅝-8	3.13	1800	**RR-50024**
12.00	8.00	4.75	6.00	8.00	1.13	3¼-12	4.25	8.00	1¾-5	2.12	15⅝-8	3.13	2210	**RR-50036**
12.00	8.00	4.75	6.00	8.00	1.13	3¼-12	4.25	8.00	1¾-5	2.12	15⅝-8	3.13	2700	**RR-50048**

▼ Shown from left to right: **CLSG-1506, CLSG-2006, CLSG-506**

The Single-Acting Heavy Lifting Solution with Integral Stop Ring

- **Integral stop ring provides piston blow-out protection**
- **Baked enamel outside finish and plated pistons provide superior corrosion protection**
- **Base mounting holes standard on all models**
- **Plunger wiper reduces contamination, extending cylinder life**
- **Single-acting load return**

▼ *Eight CLSG-2506 cylinders equipped with tilting saddles lifted the planking of the bridge as the pier heads were being rebuilt.*

Saddles

All CLSG-Series cylinders are equipped with bolt-on removable grooved saddles. For information on optional tilt saddles, see selection chart.

Page: 39

Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

Page: 117

Optimum Performance

Enerpac's range of *Z-Class* electric pumps, fitted with manual or solenoid operated 3-way valves, offer optimum combinations with CLSG cylinders.

Page: 80

Low Height - High Tonnage

When low height with high force is required, CLP-Series Pancake Cylinders with lock nut offer the solution to lift the first few inches.

Page: 20

CLSG Series

Capacity:
50-1,000 tons

Stroke:
1.97-11.81 inches

Maximum Operating Pressure:
10,000 psi

▼ QUICK SELECTION CHART

For complete technical information see next page.

Cylinder Capacity (ton) [maximum]	Stroke (in)	Model Number	Cylinder Effective Area (in^2)	Oil Capacity (in^3)	Collapsed Height (in)	Weight (lbs)
50 [59.1]	1.97	CLSG-502	11.81	23.25	6.38	37
	3.94	CLSG-504	11.81	46.50	8.35	44
	5.91	CLSG-506	11.81	69.75	10.31	51
	7.87	CLSG-508	11.81	93.00	12.28	60
	9.84	CLSG-5010	11.81	116.25	14.25	68
	11.81	CLSG-5012	11.81	139.50	16.22	75
100 [102.9]	1.97	CLSG-1002	20.57	40.50	7.16	42
	3.94	CLSG-1004	20.57	81.00	9.13	64
	5.91	CLSG-1006	20.57	121.50	11.09	88
	7.87	CLSG-1008	20.57	162.00	13.06	110
	9.84	CLSG-10010	20.57	202.50	15.03	134
	11.81	CLSG-10012	20.57	242.99	17.00	157
150 [153.9]	1.97	CLSG-1502	30.78	60.58	7.72	86
	3.94	CLSG-1504	30.78	121.17	9.69	115
	5.91	CLSG-1506	30.78	181.75	11.65	143
	7.87	CLSG-1508	30.78	242.33	13.62	172
	9.84	CLSG-15010	30.78	302.92	15.59	203
	11.81	CLSG-15012	30.78	363.50	17.56	231
200 [206.1]	1.97	CLSG-2002	41.22	81.13	8.50	121
	5.91	CLSG-2006	41.22	243.40	12.44	201
	11.81	CLSG-20012	41.22	486.79	18.35	322
250 [284.0]	1.97	CLSG-2502	56.80	111.81	9.25	196
	5.91	CLSG-2506	56.80	335.42	13.19	300
	11.81	CLSG-25012	56.80	670.84	19.09	456
300 [353.6]	1.97	CLSG-3002	70.71	139.19	12.28	406
	5.91	CLSG-3006	70.71	417.56	16.22	511
	11.81	CLSG-30012	70.71	835.11	22.13	668
400 [433.9]	1.97	CLSG-4002	86.78	170.84	14.74	595
	5.91	CLSG-4006	86.78	512.51	18.68	728
	11.81	CLSG-40012	86.78	1025.02	24.59	928
500 [566.3]	1.97	CLSG-5002	113.25	222.92	16.50	884
	5.91	CLSG-5006	113.25	668.77	20.43	1058
	11.81	CLSG-50012	113.25	1337.55	26.34	1321
600 [662.9]	1.97	CLSG-6002	132.57	260.97	16.89	1045
	5.91	CLSG-6006	132.57	782.90	20.83	1246
	11.81	CLSG-60012	132.57	1565.81	26.73	1545
800 [911.6]	1.97	CLSG-8002	182.32	358.91	18.66	1634
	5.91	CLSG-8006	182.32	10776.72	22.60	1941
	11.81	CLSG-80012	182.32	2153.44	28.50	2332
1000 [1136]	1.97	CLSG-10002	227.19	447.23	22.20	2341
	5.91	CLSG-10006	227.19	1341.68	26.14	2674
	11.81	CLSG-100012	227.19	2683.35	32.05	3172

Standard Features

- Interchangeable, hardened grooved saddles
- CR-400 Coupler and dust cap
- Top and side mount lifting eye capability
- All cylinders meet ASME B-30.1 and ISO 10100 Standards

Additional Stroke Lengths

Models above 150 tons are also available with standard stroke lengths of 4, 8 and 10 inches. Please contact Enerpac for ordering information and dimensional details.

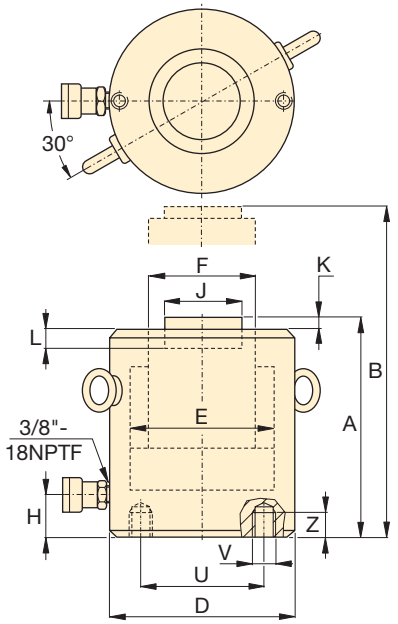
Lifting an Unbalanced Load

When lifting an unbalanced load **Enerpac Synchronous Lift Systems** can be the solution with multiple lift point capabilities from 4 to 64 points. See our “Yellow Pages” for multi-cylinder set-ups.

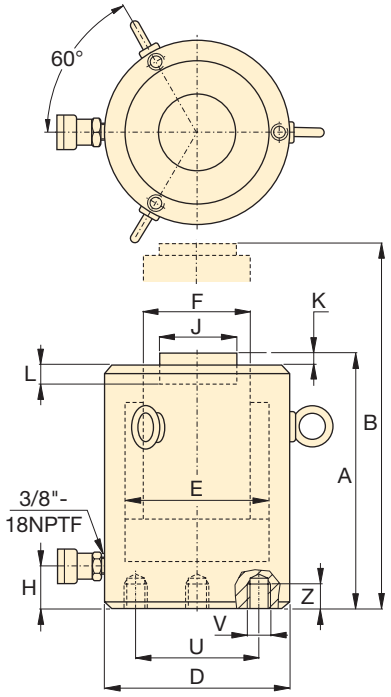
Page: 226

Mounting Hole Orientation

Top mounting hole orientation is maintained to port location. Base mounting hole orientation is not maintained to port location.



CLSG-50 to CLSG-150 models



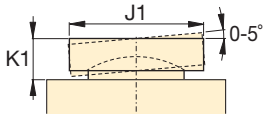
CLSG-200 to CLSG-1000 models

◀ For full features see page 36.

Cylinder Capacity (ton) [maximum]	Stroke (in)	Model Number	Cylinder Effective Area (in^2)	Oil Capacity (in^3)	Collapsed Height A (in)	Extended Height B (in)	Outside Diam. D (in)
50 [59.1]	1.97	CLSG-502	11.81	23.25	6.38	8.35	5.12
	3.94	CLSG-504	11.81	46.50	8.35	12.28	5.12
	5.91	CLSG-506	11.81	69.75	10.31	16.22	5.12
	7.87	CLSG-508	11.81	93.00	12.28	20.16	5.12
	9.84	CLSG-5010	11.81	116.25	14.25	24.09	5.12
	11.81	CLSG-5012	11.81	139.50	16.22	28.03	5.12
100 [102.9]	1.97	CLSG-1002	20.57	40.50	7.16	9.13	6.50
	3.94	CLSG-1004	20.57	81.00	9.13	13.06	6.50
	5.91	CLSG-1006	20.57	121.50	11.09	17.00	6.50
	7.87	CLSG-1008	20.57	162.00	13.06	20.94	6.50
	9.84	CLSG-10010	20.57	202.50	15.03	24.87	6.50
	11.81	CLSG-10012	20.57	242.99	17.00	28.81	6.50
150 [153.9]	1.97	CLSG-1502	30.78	60.58	7.72	9.69	8.07
	3.94	CLSG-1504	30.78	121.17	9.69	13.62	8.07
	5.91	CLSG-1506	30.78	181.75	11.65	17.56	8.07
	7.87	CLSG-1508	30.78	242.33	13.62	21.50	8.07
	9.84	CLSG-15010	30.78	302.92	15.59	25.43	8.07
	11.81	CLSG-15012	30.78	363.50	17.56	29.37	8.07
200 [206.1]	1.97	CLSG-2002	41.22	81.13	8.50	10.47	9.25
	5.91	CLSG-2006	41.22	243.40	12.44	18.35	9.25
	11.81	CLSG-20012	41.22	486.79	18.35	30.16	9.25
250 [284.0]	1.97	CLSG-2502	56.80	111.81	9.25	11.22	10.83
	5.91	CLSG-2506	56.80	335.42	13.19	19.09	10.83
	11.81	CLSG-25012	56.80	670.84	19.09	30.91	10.83
300 [353.6]	1.97	CLSG-3002	70.71	139.19	12.28	14.25	12.20
	5.91	CLSG-3006	70.71	417.56	16.22	22.13	12.20
	11.81	CLSG-30012	70.71	835.11	22.13	33.94	12.20
400 [433.9]	1.97	CLSG-4002	86.78	170.84	14.74	16.71	13.78
	5.91	CLSG-4006	86.78	512.51	18.68	24.59	13.78
	11.81	CLSG-40012	86.78	1025.02	24.59	36.40	13.78
500 [566.3]	1.97	CLSG-5002	113.25	222.92	16.50	18.46	15.75
	5.91	CLSG-5006	113.25	668.77	20.43	26.34	15.75
	11.81	CLSG-50012	113.25	1337.55	26.34	38.15	15.75
600 [662.9]	1.97	CLSG-6002	132.57	260.97	16.89	18.86	16.93
	5.91	CLSG-6006	132.57	782.90	20.83	26.73	16.93
	11.81	CLSG-60012	132.57	1565.81	26.73	38.54	16.93
800 [911.6]	1.97	CLSG-8002	182.32	358.91	18.66	20.63	19.88
	5.91	CLSG-8006	182.32	1076.72	22.60	28.50	19.88
	11.81	CLSG-80012	182.32	2153.44	28.50	40.31	19.88
1000 [1136]	1.97	CLSG-10002	227.19	447.23	22.20	24.17	22.05
	5.91	CLSG-10006	227.19	1341.68	26.14	32.05	22.05
	11.81	CLSG-100012	227.19	2683.35	32.05	43.86	22.05

Single-Acting, High Tonnage Cylinders

Optional Tilt Saddle *



Capacity:
50-1,000 tons

Stroke:
1.97-11.81 inches

Maximum Operating Pressure:
10,000 psi

CLSG Series

	Cylinder Bore Diam. E (in)	Plunger Diam. F (in)	Base to Advance Port H (in)	Standard Saddle Diam. J (in)	Saddle Protrusion from Plngr. K (in)	Depth of Plunger Hole L (in)	Base Mounting Holes			Weight (lbs)	Model Number	* Optional Tilt Saddle		
							Bolt Cir. Diam. U (in)	Thread V (mm)	Thread Depth Z (in)			Diam. J1 (in)	Height K1 (in)	Model Number
	3.88	2.76	2.05	1.97	.04	.75	2.56	M12	.87	37	CLSG-502	1.95	.94	CATG-50
	3.88	2.76	2.05	1.97	.04	.75	2.56	M12	.87	44	CLSG-504	1.95	.94	CATG-50
	3.88	2.76	2.05	1.97	.04	.75	2.56	M12	.87	51	CLSG-506	1.95	.94	CATG-50
	3.88	2.76	2.05	1.97	.04	.75	2.56	M12	.87	60	CLSG-508	1.95	.94	CATG-50
	3.88	2.76	2.05	1.97	.04	.75	2.56	M12	.87	68	CLSG-5010	1.95	.94	CATG-50
	3.88	2.76	2.05	1.97	.04	.75	2.56	M12	.87	75	CLSG-5012	1.95	.94	CATG-50
	5.12	3.74	2.13	2.95	.04	.75	3.74	M12	.87	42	CLSG-1002	2.86	1.14	CATG-100
	5.12	3.74	2.13	2.95	.04	.75	3.74	M12	.87	64	CLSG-1004	2.86	1.14	CATG-100
	5.12	3.74	2.13	2.95	.04	.75	3.74	M12	.87	88	CLSG-1006	2.86	1.14	CATG-100
	5.12	3.74	2.13	2.95	.04	.75	3.74	M12	.87	110	CLSG-1008	2.86	1.14	CATG-100
	5.12	3.74	2.13	2.95	.04	.75	3.74	M12	.87	134	CLSG-10010	2.86	1.14	CATG-100
	5.12	3.74	2.13	2.95	.04	.75	3.74	M12	.87	157	CLSG-10012	2.86	1.14	CATG-100
	6.26	4.49	2.40	3.70	.04	.75	5.12	M12	.87	86	CLSG-1502	3.56	1.21	CATG-150
	6.26	4.49	2.40	3.70	.04	.75	5.12	M12	.87	115	CLSG-1504	3.56	1.21	CATG-150
	6.26	4.49	2.40	3.70	.04	.75	5.12	M12	.87	143	CLSG-1506	3.56	1.21	CATG-150
	6.26	4.49	2.40	3.70	.04	.75	5.12	M12	.87	172	CLSG-1508	3.56	1.21	CATG-150
	6.26	4.49	2.40	3.70	.04	.75	5.12	M12	.87	203	CLSG-15010	3.56	1.21	CATG-150
	6.26	4.49	2.40	3.70	.04	.75	5.12	M12	.87	231	CLSG-15012	3.56	1.21	CATG-150
	7.24	5.24	2.62	4.45	.04	.94	6.50	M12	.87	121	CLSG-2002	4.64	1.37	CATG-200
	7.24	5.24	2.62	4.45	.04	.94	6.50	M12	.87	201	CLSG-2006	4.64	1.37	CATG-200
	7.24	5.24	2.62	4.45	.04	.94	6.50	M12	.87	322	CLSG-20012	4.64	1.37	CATG-200
	8.50	6.50	2.87	5.71	.04	.94	7.48	M12	.87	196	CLSG-2502	5.60	1.81	CATG-250
	8.50	6.50	2.87	5.71	.04	.94	7.48	M12	.87	300	CLSG-2506	5.60	1.81	CATG-250
	8.50	6.50	2.87	5.71	.04	.94	7.48	M12	.87	456	CLSG-25012	5.60	1.81	CATG-250
	9.49	7.76	3.98	6.97	.04	.75	7.09	M16	1.42	406	CLSG-3002	6.30	2.42	CATG-300
	9.49	7.76	3.98	6.97	.04	.75	7.09	M16	1.42	511	CLSG-3006	6.30	2.42	CATG-300
	9.49	7.76	3.98	6.97	.04	.75	7.09	M16	1.42	668	CLSG-30012	6.30	2.42	CATG-300
	10.51	8.50	4.49	7.72	.12	1.06	8.07	M16	1.42	595	CLSG-4002	7.59	2.00	CATG-400
	10.51	8.50	4.49	7.72	.12	1.06	8.07	M16	1.42	728	CLSG-4006	7.59	2.00	CATG-400
	10.51	8.50	4.49	7.72	.12	1.06	8.07	M16	1.42	928	CLSG-40012	7.59	2.00	CATG-400
	12.01	9.76	4.49	8.98	.12	1.06	9.84	M24	1.50	884	CLSG-5002	8.98	2.48	CATG-500
	12.01	9.76	4.49	8.98	.12	1.06	9.84	M24	1.50	1058	CLSG-5006	8.98	2.48	CATG-500
	12.01	9.76	4.49	8.98	.12	1.06	9.84	M24	1.50	1321	CLSG-50012	8.98	2.48	CATG-500
	12.99	10.51	4.49	9.72	.12	1.06	10.83	M24	1.50	1045	CLSG-6002	9.47	2.99	CATG-600
	12.99	10.51	4.49	9.72	.12	1.06	10.83	M24	1.50	1246	CLSG-6006	9.47	2.99	CATG-600
	12.99	10.51	4.49	9.72	.12	1.06	10.83	M24	1.50	1545	CLSG-60012	9.47	2.99	CATG-600
	15.24	12.48	5.87	11.69	.12	1.06	12.99	M24	1.50	1634	CLSG-8002	11.28	2.94	CATG-800
	15.24	12.48	5.87	11.69	.12	1.06	12.99	M24	1.50	1914	CLSG-8006	11.28	2.94	CATG-800
	15.24	12.48	5.87	11.69	.12	1.06	12.99	M24	1.50	2332	CLSG-80012	11.28	2.94	CATG-800
	17.01	13.50	6.85	12.72	.12	1.06	14.76	M24	1.50	2341	CLSG-10002	12.35	3.65	CATG-1000
	17.01	13.50	6.85	12.72	.12	1.06	14.76	M24	1.50	2674	CLSG-10006	12.35	3.65	CATG-1000
	17.01	13.50	6.85	12.72	.12	1.06	14.76	M24	1.50	3172	CLSG-100012	12.35	3.65	CATG-1000

▼ Shown from left to right: **CLRG-506, CLRG-2006, CLRG-1506**

Double-Acting Power Lifters

- **Integral stop ring provides piston blow-out protection**
- **Double-acting for positive retraction**
- **Baked enamel outside finish and plated pistons provide superior corrosion resistance**
- **Safety valve in retract side of cylinder helps to prevent damage in case of accidental over-pressurization**
- **Interchangeable, hardened grooved saddles are standard**
- **Plunger wiper reduces contamination, extending cylinder life**

Saddles

All CLRG cylinders are equipped with bolt-on removable grooved saddles. For information on optional tilt saddles, see selection chart.

Page: 43

Safety Device

A pilot-operated check valve **(V-42)** can be inserted between cylinder ports. This valve provides a safety lock on the cylinder under load at any position and remote control for unlocking.

Page: 132

Optimum Performance

Enerpac's range of Z-Class electric pumps, fitted with manual or solenoid operated 4-way valves, offer optimum combinations with CLRG cylinders.

Page: 80

▼ *CLRG-Series cylinders supported and positioned these automobile deck elements.*

▼ *Replacing adjustment rolls under a fly-over with CLRG cylinders, for controlled lifting and lowering.*

CLRG Series

Capacity:
50-1,000 tons

Stroke:
1.97-11.81 inches

Maximum Operating Pressure:
10,000 psi

▼ QUICK SELECTION CHART

For complete technical information see next page.

Cylinder Capacity (ton)	Stroke (in)	Model Number	Cylinder Effective Area (in²) Push	Cylinder Effective Area (in²) Pull	Oil Capacity (in³) Push	Oil Capacity (in³) Pull	Collapsed Height (in)
50	1.97	CLRG-502	11.81	5.85	23.25	11.51	6.38
	3.94	CLRG-504	11.81	5.85	46.50	23.02	8.35
	5.91	CLRG-506	11.81	5.85	69.75	34.52	10.31
	7.87	CLRG-508	11.81	5.85	93.00	46.03	12.28
	9.84	CLRG-5010	11.81	5.85	116.25	57.54	14.25
	11.81	CLRG-5012	11.81	5.85	139.50	69.05	16.22
100	1.97	CLRG-1002	20.57	9.59	40.50	18.87	7.16
	3.94	CLRG-1004	20.57	9.59	81.00	37.74	9.13
	5.91	CLRG-1006	20.57	9.59	121.50	56.61	11.09
	7.87	CLRG-1008	20.57	9.59	162.00	75.49	13.06
	9.84	CLRG-10010	20.57	9.59	202.50	94.36	15.03
	11.81	CLRG-10012	20.57	9.59	242.99	113.23	17.00
150	1.97	CLRG-1502	30.78	14.96	60.58	29.44	7.72
	3.94	CLRG-1504	30.78	14.96	121.17	58.88	9.69
	5.91	CLRG-1506	30.78	14.96	181.75	88.32	11.65
	7.87	CLRG-1508	30.78	14.96	242.33	117.76	13.62
	9.84	CLRG-15010	30.78	14.96	302.92	147.20	15.59
	11.81	CLRG-15012	30.78	14.96	363.50	176.64	17.56
200	1.97	CLRG-2002	41.22	19.68	81.13	38.74	8.50
	5.91	CLRG-2006	41.22	19.68	243.40	116.23	12.44
	11.81	CLRG-20012	41.22	19.68	486.79	232.46	18.35
250	1.97	CLRG-2502	56.80	23.65	111.81	46.56	9.25
	5.91	CLRG-2506	56.80	23.65	335.42	139.69	13.19
	11.81	CLRG-25012	56.80	23.65	670.84	279.39	19.09
300	1.97	CLRG-3002	70.71	23.46	139.19	46.18	12.28
	5.91	CLRG-3006	70.71	23.46	417.56	138.55	16.22
	11.81	CLRG-30012	70.71	23.46	835.11	277.10	22.13
400	1.97	CLRG-4002	86.79	29.99	170.84	59.03	14.74
	5.91	CLRG-4006	86.79	29.99	512.51	177.09	18.68
	11.81	CLRG-40012	86.79	29.99	1,025	354.18	24.59
500	1.97	CLRG-5002	113.25	38.37	222.92	75.54	16.50
	5.91	CLRG-5006	113.25	38.37	668.77	226.61	20.43
	11.81	CLRG-50012	113.25	38.37	1,338	453.22	26.34
600	1.97	CLRG-6002	132.57	45.79	260.97	90.13	16.89
	5.91	CLRG-6006	132.57	45.79	782.90	270.39	20.83
	11.81	CLRG-60012	132.57	45.79	1,566	540.79	26.73
800	1.97	CLRG-8002	182.32	59.99	358.91	118.09	18.66
	5.91	CLRG-8006	182.32	59.99	1,077	354.28	22.60
	11.81	CLRG-80012	182.32	59.99	2,153	708.57	28.50
1000	1.97	CLRG-10002	227.19	83.97	447.23	165.29	22.20
	5.91	CLRG-10006	227.19	83.97	1,342	495.87	26.14
	11.81	CLRG-100012	227.19	83.97	2,683	991.75	32.05

Standard Features

- Interchangeable, hardened grooved saddles
- CR-400 Coupler and dust cap
- Top and side mount lifting eye capability
- All cylinders meet ASME B-30.1 and ISO 10100 Standards

Pump Selection

A double-acting cylinder must be powered by a pump with a 4-way valve.

Page: 61

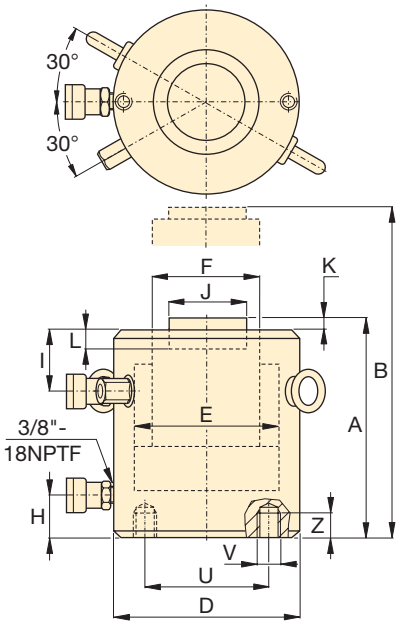
RR-Series

For higher cycle applications, Enerpac RR cylinders are a good alternative.

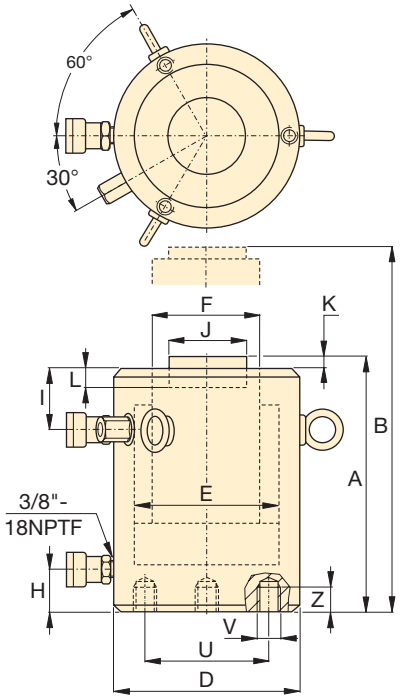
Page: 32

Additional Stroke Lengths

Models above 150 tons are also available with standard stroke lengths of 4, 8 and 10 inches. Please contact Enerpac for ordering information.



CLRG-50 to CLRG-150 models



CLRG-200 to CLRG-1000 models

Base Mounting Hole Dimensions (in)			
Model / Capacity ton	Bolt Circle U	Thread Size V (mm)	Minimum Thread Depth Z
CLRG-50	2.56	M12	.87
CLRG-100	3.74	M12	.87
CLRG-150	5.12	M12	.87
CLRG-200	6.50	M12	.87
CLRG-250	7.48	M12	.87
CLRG-300	7.09	M16	1.42
CLRG-400	8.07	M16	1.42
CLRG-500	9.84	M24	1.50
CLRG-600	10.83	M24	1.50
CLRG-800	12.99	M24	1.50
CLRG-1000	14.76	M24	1.50

Mounting Hole Orientation

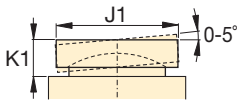
Top mounting hole orientation is maintained to port location. Base mounting hole orientation is not maintained to port location.

◀ For full features see page 40.

Cylinder Capacity (ton)	Stroke (in)	Model Number	Maximum Cylinder Capacity (ton)		Cylinder Effective Area (in^2)		Oil Capacity (in^3)	
			Push	Pull	Push	Pull	Push	Pull
50	1.97	CLRG-502	59.1	29	11.81	5.85	23.25	11.51
	3.94	CLRG-504	59.1	29	11.81	5.85	46.50	23.02
	5.91	CLRG-506	59.1	29	11.81	5.85	69.75	34.52
	7.87	CLRG-508	59.1	29	11.81	5.85	93.00	46.03
	9.84	CLRG-5010	59.1	29	11.81	5.85	116.25	57.54
	11.81	CLRG-5012	59.1	29	11.81	5.85	139.50	69.05
100	1.97	CLRG-1002	102.9	48	20.57	9.59	40.50	18.87
	3.94	CLRG-1004	102.9	48	20.57	9.59	81.00	37.74
	5.91	CLRG-1006	102.9	48	20.57	9.59	121.50	56.61
	7.87	CLRG-1008	102.9	48	20.57	9.59	162.00	75.49
	9.84	CLRG-10010	102.9	48	20.57	9.59	202.50	94.36
	11.81	CLRG-10012	102.9	48	20.57	9.59	242.99	113.23
150	1.97	CLRG-1502	153.9	75	30.78	14.96	60.58	29.44
	3.94	CLRG-1504	153.9	75	30.78	14.96	121.17	58.88
	5.91	CLRG-1506	153.9	75	30.78	14.96	181.75	88.32
	7.87	CLRG-1508	153.9	75	30.78	14.96	242.33	117.76
	9.84	CLRG-15010	153.9	75	30.78	14.96	302.92	147.20
	11.81	CLRG-15012	153.9	75	30.78	14.96	363.50	176.64
200	1.97	CLRG-2002	206.1	98	41.22	19.68	81.13	38.74
	5.91	CLRG-2006	206.1	98	41.22	19.68	243.40	116.23
	11.81	CLRG-20012	206.1	98	41.22	19.68	486.79	232.46
250	1.97	CLRG-2502	284.0	118	56.80	23.65	111.81	46.56
	5.91	CLRG-2506	284.0	118	56.80	23.65	335.42	139.69
	11.81	CLRG-25012	284.0	118	56.80	23.65	670.84	279.39
300	1.97	CLRG-3002	353.6	117	70.71	23.46	139.19	46.18
	5.91	CLRG-3006	353.6	117	70.71	23.46	417.56	138.55
	11.81	CLRG-30012	353.6	117	70.71	23.46	835.11	277.10
400	1.97	CLRG-4002	433.9	150	86.79	29.99	170.84	59.03
	5.91	CLRG-4006	433.9	150	86.79	29.99	512.51	177.09
	11.81	CLRG-40012	433.9	150	86.79	29.99	1,025	354.18
500	1.97	CLRG-5002	566.3	192	113.25	38.37	222.92	75.54
	5.91	CLRG-5006	566.3	192	113.25	38.37	668.77	226.61
	11.81	CLRG-50012	566.3	192	113.25	38.37	1,338	453.22
600	1.97	CLRG-6002	662.9	229	132.57	45.79	260.97	90.13
	5.91	CLRG-6006	662.9	229	132.57	45.79	782.90	270.39
	11.81	CLRG-60012	662.9	229	132.57	45.79	1,566	540.79
800	1.97	CLRG-8002	911.6	300	182.32	59.99	358.91	118.09
	5.91	CLRG-8006	911.6	300	182.32	59.99	1,077	354.28
	11.81	CLRG-80012	911.6	300	182.32	59.99	2,153	708.57
1000	1.97	CLRG-10002	1136	420	227.19	83.97	447.23	165.29
	5.91	CLRG-10006	1136	420	227.19	83.97	1,342	495.87
	11.81	CLRG-100012	1136	420	227.19	83.97	2,683	991.75

Double-Acting, High Tonnage Cylinders

*** Optional Tilt Saddle**



Capacity:
50-1,000 tons

Stroke:
1.97-11.81 inches

Maximum Operating Pressure:
10,000 psi

CLRG Series

Collap. Height A (in)	Ext. Height B (in)	Outside Diam. D (in)	Cyl. Bore Diam. E (in)	Plunger Diam. F (in)	Base to Advance Port H (in)	Top to Retract Port I (in)	Standard Saddle Diam. J (in)	Saddle Protrusion from Plngr. K (in)	Depth of Plunger Hole L (in)	Weight (lbs)	Model Number	*Optional Tilt Saddle Diam. J1 (in)	*Optional Tilt Saddle Height K1 (in)	*Optional Tilt Saddle Model Number
6.38	8.35	5.12	3.88	2.76	1.65	1.29	1.97	.04	.75	37	CLRG-502	1.95	.94	CATG-50
8.35	12.28	5.12	3.88	2.76	1.65	1.29	1.97	.04	.75	44	CLRG-504	1.95	.94	CATG-50
10.31	16.22	5.12	3.88	2.76	1.65	1.29	1.97	.04	.75	51	CLRG-506	1.95	.94	CATG-50
12.28	20.16	5.12	3.88	2.76	1.65	1.29	1.97	.04	.75	60	CLRG-508	1.95	.94	CATG-50
14.25	24.09	5.12	3.88	2.76	1.65	1.29	1.97	.04	.75	68	CLRG-5010	1.95	.94	CATG-50
16.22	28.03	5.12	3.88	2.76	1.65	1.29	1.97	.04	.75	75	CLRG-5012	1.95	.94	CATG-50
7.16	9.13	6.50	5.12	3.74	2.13	1.89	2.95	.04	.75	42	CLRG-1002	2.86	1.14	CATG-100
9.13	13.06	6.50	5.12	3.74	2.13	1.89	2.95	.04	.75	64	CLRG-1004	2.86	1.14	CATG-100
11.09	17.00	6.50	5.12	3.74	2.13	1.89	2.95	.04	.75	88	CLRG-1006	2.86	1.14	CATG-100
13.06	20.94	6.50	5.12	3.74	2.13	1.89	2.95	.04	.75	110	CLRG-1008	2.86	1.14	CATG-100
15.03	24.87	6.50	5.12	3.74	2.13	1.89	2.95	.04	.75	134	CLRG-10010	2.86	1.14	CATG-100
17.00	28.81	6.50	5.12	3.74	2.13	1.89	2.95	.04	.75	157	CLRG-10012	2.86	1.14	CATG-100
7.72	9.69	8.07	6.26	4.49	2.40	2.22	3.70	.04	.75	86	CLRG-1502	3.56	1.21	CATG-150
9.69	13.62	8.07	6.26	4.49	2.40	2.22	3.70	.04	.75	115	CLRG-1504	3.56	1.21	CATG-150
11.65	17.56	8.07	6.26	4.49	2.40	2.22	3.70	.04	.75	143	CLRG-1506	3.56	1.21	CATG-150
13.62	21.50	8.07	6.26	4.49	2.40	2.22	3.70	.04	.75	172	CLRG-1508	3.56	1.21	CATG-150
15.59	25.43	8.07	6.26	4.49	2.40	2.22	3.70	.04	.75	203	CLRG-15010	3.56	1.21	CATG-150
17.56	29.37	8.07	6.26	4.49	2.40	2.22	3.70	.04	.75	231	CLRG-15012	3.56	1.21	CATG-150
8.50	10.47	9.25	7.24	5.24	2.62	2.22	4.45	.04	.94	121	CLRG-2002	4.64	1.37	CATG-200
12.44	18.35	9.25	7.24	5.24	2.62	2.22	4.45	.04	.94	201	CLRG-2006	4.64	1.37	CATG-200
18.35	30.16	9.25	7.24	5.24	2.62	2.22	4.45	.04	.94	322	CLRG-20012	4.64	1.37	CATG-200
9.25	11.22	10.83	8.50	6.50	2.87	3.07	5.71	.04	.94	196	CLRG-2502	5.60	1.81	CATG-250
13.19	19.09	10.83	8.50	6.50	2.87	3.07	5.71	.04	.94	300	CLRG-2506	5.60	1.81	CATG-250
19.09	30.91	10.83	8.50	6.50	2.87	3.07	5.71	.04	.94	456	CLRG-25012	5.60	1.81	CATG-250
12.28	14.25	12.20	9.49	7.76	3.98	2.95	6.97	.04	.75	406	CLRG-3002	6.30	2.42	CATG-300
16.22	22.13	12.20	9.49	7.76	3.98	2.95	6.97	.04	.75	511	CLRG-3006	6.30	2.42	CATG-300
22.13	33.94	12.20	9.49	7.76	3.98	2.95	6.97	.04	.75	668	CLRG-30012	6.30	2.42	CATG-300
14.74	16.71	13.78	10.51	8.50	4.49	4.13	7.72	.12	1.06	595	CLRG-4002	7.59	2.00	CATG-400
18.68	24.59	13.78	10.51	8.50	4.49	4.13	7.72	.12	1.06	728	CLRG-4006	7.59	2.00	CATG-400
24.59	36.40	13.78	10.51	8.50	4.49	4.13	7.72	.12	1.06	928	CLRG-40012	7.59	2.00	CATG-400
16.50	18.46	15.75	12.01	9.76	4.49	5.31	8.98	.12	1.06	884	CLRG-5002	8.98	2.48	CATG-500
20.43	26.34	15.75	12.01	9.76	4.49	5.31	8.98	.12	1.06	1058	CLRG-5006	8.98	2.48	CATG-500
26.34	38.15	15.75	12.01	9.76	4.49	5.31	8.98	.12	1.06	1321	CLRG-50012	8.98	2.48	CATG-500
16.89	18.86	16.93	12.99	10.51	4.49	5.31	9.72	.12	1.06	1045	CLRG-6002	9.47	2.99	CATG-600
20.83	26.73	16.93	12.99	10.51	4.49	5.31	9.72	.12	1.06	1246	CLRG-6006	9.47	2.99	CATG-600
26.73	38.54	16.93	12.99	10.51	4.49	5.31	9.72	.12	1.06	1545	CLRG-60012	9.47	2.99	CATG-600
18.66	20.63	19.88	15.24	12.48	5.87	5.31	11.69	.12	1.06	1634	CLRG-8002	11.28	2.94	CATG-800
22.60	28.50	19.88	15.24	12.48	5.87	5.31	11.69	.12	1.06	1914	CLRG-8006	11.28	2.94	CATG-800
28.50	40.31	19.88	15.24	12.48	5.87	5.31	11.69	.12	1.06	2332	CLRG-80012	11.28	2.94	CATG-800
22.20	24.17	22.05	17.01	13.50	6.85	6.69	12.72	.12	1.06	2341	CLRG-10002	12.35	3.65	CATG-1000
26.14	32.05	22.05	17.01	13.50	6.85	6.69	12.72	.12	1.06	2674	CLRG-10006	12.35	3.65	CATG-1000
32.05	43.86	22.05	17.01	13.50	6.85	6.69	12.72	.12	1.06	3172	CLRG-100012	12.35	3.65	CATG-1000

▼ Shown from left to right: **CLL-1006, CLL-2506, CLL-1506, CLL-506**

- **Safety Lock Nut for mechanical load holding**
- **Baked enamel outside finish and plated pistons provide superior corrosion resistance**
- **Overflow port functions as a stroke limiter**
- **Interchangeable, hardened grooved saddles are standard**
- **CR-400 coupler and dust cap included on all models**
- **Single-acting load return**

To Secure Loads Mechanically

Saddles

All CLL cylinders are equipped with bolt-on removable grooved saddles. For information on optional tilt saddles, see the selection chart.

Page: 47

Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

Page: 117

Low Height - High Tonnage

When low height with high force is required, pancake cylinders with lock nut offer the solution to lift the first few inches.

Page: 20

▼ *For this curved bridge, CLL-Series cylinders were used to support the concrete beams to level the pierhead and to place 4000 ton slide bearings between pier and pierhead.*

▼ *CLL cylinder, mechanically locked, after positioning the curved bridge.*

CLL Series

Capacity:
50-1,000 tons

Stroke:
1.97-11.81 inches

Maximum Operating Pressure:
10,000 psi

▼ QUICK SELECTION CHART

For complete technical information see next page.

Cylinder Capacity (ton) [maximum]	Stroke (in)	Model Number	Cylinder Effective Area (in^2)	Oil Capacity (in^3)	Collapsed Height (in)	Weight (lbs)
50 [59.1]	1.97	CLL-502	10.99	21.63	6.46	35
	3.94	CLL-504	10.99	43.25	8.43	46
	5.91	CLL-506	10.99	64.88	10.39	57
	7.87	CLL-508	10.99	86.51	12.36	68
	9.84	CLL-5010	10.99	108.14	14.33	79
	11.81	CLL-5012	10.99	129.76	16.30	90
100 [102.9]	1.97	CLL-1002	20.57	40.50	7.36	68
	3.94	CLL-1004	20.57	81.00	9.33	87
	5.91	CLL-1006	20.57	121.50	11.30	106
	7.87	CLL-1008	20.57	162.00	13.27	125
	9.84	CLL-10010	20.57	202.50	15.24	143
	11.81	CLL-10012	20.57	242.99	17.20	162
150 [153.9]	1.97	CLL-1502	30.78	60.58	8.23	117
	3.94	CLL-1504	30.78	121.17	10.20	146
	5.91	CLL-1506	30.78	181.75	12.17	174
	7.87	CLL-1508	30.78	242.33	14.13	203
	9.84	CLL-15010	30.78	302.92	16.10	231
	11.81	CLL-15012	30.78	363.50	18.07	260
200 [206.1]	1.97	CLL-2002	41.17	81.04	9.57	183
	5.91	CLL-2006	41.17	243.13	13.50	260
	11.81	CLL-20012	41.17	486.27	19.41	376
250 [284.0]	1.97	CLL-2502	56.75	111.70	9.80	256
	5.91	CLL-2506	56.75	335.11	13.74	359
	11.81	CLL-25012	56.75	670.22	19.65	515
300 [353.6]	1.97	CLL-3002	70.71	139.19	11.61	382
	5.91	CLL-3006	70.71	417.56	15.55	514
	11.81	CLL-30012	70.71	835.11	21.46	712
400 [433.9]	1.97	CLL-4002	86.79	170.84	13.19	553
	5.91	CLL-4006	86.79	512.51	17.13	721
	11.81	CLL-40012	86.79	1025.02	23.03	972
500 [566.3]	1.97	CLL-5002	113.25	222.99	14.76	809
	5.91	CLL-5006	113.25	668.77	18.70	1029
	11.81	CLL-50012	113.25	1337.55	24.61	1360
600 [662.9]	1.97	CLL-6002	132.57	260.97	15.55	985
	5.91	CLL-6006	132.57	782.90	19.49	1241
	11.81	CLL-60012	132.57	1565.81	25.39	1625
800 [911.6]	1.97	CLL-8002	182.42	359.09	17.91	1565
	5.91	CLL-8006	182.42	1077.27	21.85	1918
	11.81	CLL-80012	182.42	2154.55	27.76	2446
1000 [1136]	1.97	CLL-10002	227.30	447.43	19.49	2094
	5.91	CLL-10006	227.30	1342.30	23.43	2517
	11.81	CLL-100012	227.30	2684.59	29.33	3151

Additional Stroke Lengths

Models above 150 tons are also available with standard stroke lengths of 4, 8 and 10 inches. Please contact Enerpac for ordering information and dimensional details.

Lifting an Unbalanced Load?

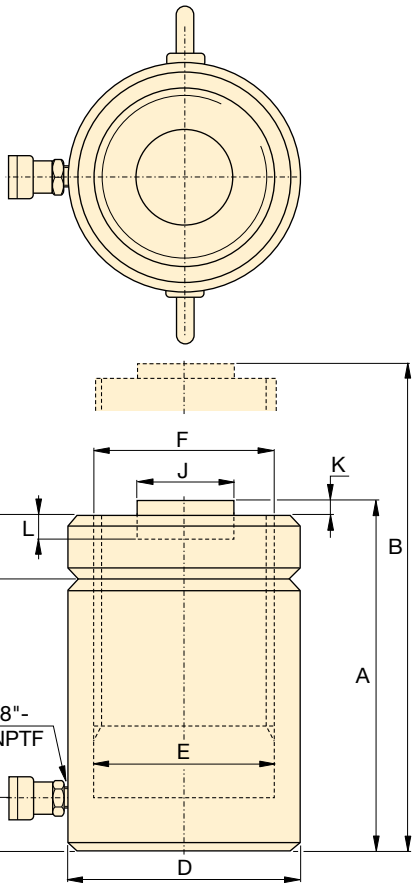
See our "Yellow Pages" for multi-cylinder set ups.

Page: 244

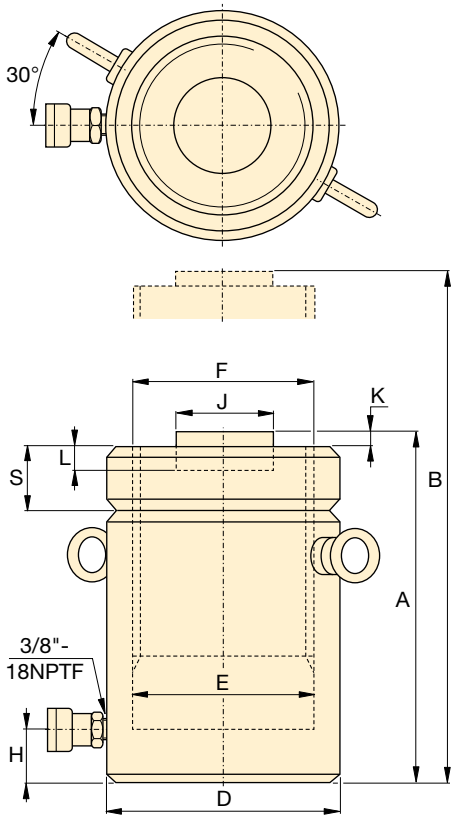
Speed Chart

See the Enerpac Cylinder Speed Chart in our "Yellow Pages" section.

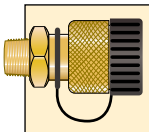
Page: 249



CLL-50 to CLL-250 models



CLL-300 to CLL-1000 models



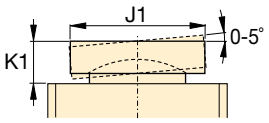
Coupler Included!
CR-400 coupler included on all models.
Fits all HC-Series hoses.

◀ For full features see page 44.

Cylinder Capacity (ton) [maximum]	Stroke (in)	Model Number	Cylinder Effective Area (in^2)	Oil Capacity (in^3)
50 [59.1]	1.97	**CLL-502**	10.99	21.63
	3.94	**CLL-504**	10.99	43.25
	5.91	**CLL-506**	10.99	64.88
	7.87	**CLL-508**	10.99	86.51
	9.84	**CLL-5010**	10.99	108.14
	11.81	**CLL-5012**	10.99	129.76
100 [102.9]	1.97	**CLL-1002**	20.57	40.50
	3.94	**CLL-1004**	20.57	81.00
	5.91	**CLL-1006**	20.57	121.50
	7.87	**CLL-1008**	20.57	162.00
	9.84	**CLL-10010**	20.57	202.50
	11.81	**CLL-10012**	20.57	242.99
150 [153.9]	1.97	**CLL-1502**	30.78	60.58
	3.94	**CLL-1504**	30.78	121.17
	5.91	**CLL-1506**	30.78	181.75
	7.87	**CLL-1508**	30.78	242.33
	9.84	**CLL-15010**	30.78	302.92
	11.81	**CLL-15012**	30.78	363.50
200 [206.1]	1.97	**CLL-2002**	41.17	81.04
	5.91	**CLL-2006**	41.17	243.13
	11.81	**CLL-20012**	41.17	486.27
250 [284.0]	1.97	**CLL-2502**	56.75	111.70
	5.91	**CLL-2506**	56.75	335.11
	11.81	**CLL-25012**	56.75	670.22
300 [353.6]	1.97	**CLL-3002**	70.71	139.19
	5.91	**CLL-3006**	70.71	417.56
	11.81	**CLL-30012**	70.71	835.11
400 [433.9]	1.97	**CLL-4002**	86.79	170.84
	5.91	**CLL-4006**	86.79	512.51
	11.81	**CLL-40012**	86.79	1025.02
500 [566.3]	1.97	**CLL-5002**	113.25	222.99
	5.91	**CLL-5006**	113.25	668.77
	11.81	**CLL-50012**	113.25	1337.55
600 [662.9]	1.97	**CLL-6002**	132.57	260.97
	5.91	**CLL-6006**	132.57	782.90
	11.81	**CLL-60012**	132.57	1565.81
800 [911.6]	1.97	**CLL-8002**	182.42	359.09
	5.91	**CLL-8006**	182.42	1077.27
	11.81	**CLL-80012**	182.42	2154.55
1000 [1136]	1.97	**CLL-10002**	227.30	447.43
	5.91	**CLL-10006**	227.30	1342.30
	11.81	**CLL-100012**	227.30	2684.59

Single-Acting, Lock Nut Cylinders

***Optional Tilt Saddle**



Capacity:
50-1,000 tons

Stroke:
1.97-11.81 inches

Maximum Operating Pressure:
10,000 psi

CLL Series

	Collap. Height A (in)	Ext. Height B (in)	Outside Diam. D (in)	Cyl. Bore Diam. E (in)	Plunger Diameter (threaded) F (mm)	Base to Advance Port H (in)	Stand. Saddle Diam. J (in)	Saddle Protrusion from Plgr. K (in)	Depth of Plunger Hole L (in)	Lock Nut Height S (in)	Weight (lbs)	Model Number	* Optional Tilt Saddle		
													Diam. J1 (in)	Height K1 (in)	Model Number
	6.46	8.43	4.92	3.74	Tr 95 x 4	1.18	2.80	.08	.51	1.42	35	**CLL-502**	2.80	.94	**CAT-100**
	8.43	12.36	4.92	3.74	Tr 95 x 4	1.18	2.80	.08	.51	1.42	46	**CLL-504**	2.80	.94	**CAT-100**
	10.39	16.30	4.92	3.74	Tr 95 x 4	1.18	2.80	.08	.51	1.42	57	**CLL-506**	2.80	.94	**CAT-100**
	12.36	20.24	4.92	3.74	Tr 95 x 4	1.18	2.80	.08	.51	1.42	68	**CLL-508**	2.80	.94	**CAT-100**
	14.33	24.17	4.92	3.74	Tr 95 x 4	1.18	2.80	.08	.51	1.42	79	**CLL-5010**	2.80	.94	**CAT-100**
	16.30	28.11	4.92	3.74	Tr 95 x 4	1.18	2.80	.08	.51	1.42	90	**CLL-5012**	2.80	.94	**CAT-100**
	7.36	9.33	6.50	5.12	Tr 130 x 6	1.18	2.80	.08	.51	1.73	68	**CLL-1002**	2.80	.94	**CAT-100**
	9.33	13.27	6.50	5.12	Tr 130 x 6	1.18	2.80	.08	.51	1.73	87	**CLL-1004**	2.80	.94	**CAT-100**
	11.30	17.20	6.50	5.12	Tr 130 x 6	1.18	2.80	.08	.51	1.73	106	**CLL-1006**	2.80	.94	**CAT-100**
	13.27	21.14	6.50	5.12	Tr 130 x 6	1.18	2.80	.08	.51	1.73	125	**CLL-1008**	2.80	.94	**CAT-100**
	15.24	25.08	6.50	5.12	Tr 130 x 6	1.18	2.80	.08	.51	1.73	143	**CLL-10010**	2.80	.94	**CAT-100**
	17.20	29.02	6.50	5.12	Tr 130 x 6	1.18	2.80	.08	.51	1.73	162	**CLL-10012**	2.80	.94	**CAT-100**
	8.23	10.20	8.07	6.26	Tr 159 x 6	1.54	5.12	.08	.98	1.73	117	**CLL-1502**	5.12	.79	**CAT-200**
	10.20	14.13	8.07	6.26	Tr 159 x 6	1.54	5.12	.08	.98	1.73	146	**CLL-1504**	5.12	.79	**CAT-200**
	12.17	18.07	8.07	6.26	Tr 159 x 6	1.54	5.12	.08	.98	1.73	174	**CLL-1506**	5.12	.79	**CAT-200**
	14.13	22.01	8.07	6.26	Tr 159 x 6	1.54	5.12	.08	.98	1.73	203	**CLL-1508**	5.12	.79	**CAT-200**
	16.10	25.94	8.07	6.26	Tr 159 x 6	1.54	5.12	.08	.98	1.73	231	**CLL-15010**	5.12	.79	**CAT-200**
	18.07	29.88	8.07	6.26	Tr 159 x 6	1.54	5.12	.08	.98	1.73	260	**CLL-15012**	5.12	.79	**CAT-200**
	9.57	11.54	9.25	7.24	Tr 184 x 6	1.97	5.12	.08	.98	1.97	183	**CLL-2002**	5.12	.79	**CAT-200**
	13.50	19.41	9.25	7.24	Tr 184 x 6	1.97	5.12	.08	.98	1.97	260	**CLL-2006**	5.12	.79	**CAT-200**
	19.41	31.22	9.25	7.24	Tr 184 x 6	1.97	5.12	.08	.98	1.97	376	**CLL-20012**	5.12	.79	**CAT-200**
	9.80	11.77	10.83	8.50	Tr 216 x 6	1.97	5.91	.08	.98	2.20	256	**CLL-2502**	5.91	.83	**CAT-250**
	13.74	19.65	10.83	8.50	Tr 216 x 6	1.97	5.91	.08	.98	2.20	359	**CLL-2506**	5.91	.83	**CAT-250**
	19.65	31.46	10.83	8.50	Tr 216 x 6	1.97	5.91	.08	.98	2.20	515	**CLL-25012**	5.91	.83	**CAT-250**
	11.61	13.58	12.20	9.49	Tr 241 x 6	2.32	5.47	.20	.98	2.36	382	**CLL-3002**	7.68	2.95	**CAT-300**
	15.55	21.46	12.20	9.49	Tr 241 x 6	2.32	5.47	.20	.98	2.36	514	**CLL-3006**	7.68	2.95	**CAT-300**
	21.46	33.27	12.20	9.49	Tr 241 x 6	2.32	5.47	.20	.98	2.36	712	**CLL-30012**	7.68	2.95	**CAT-300**
	13.19	15.16	13.78	10.51	Tr 266 x 6	2.76	6.26	.20	.98	2.76	553	**CLL-4002**	8.86	3.35	**CAT-400**
	17.13	23.03	13.78	10.51	Tr 266 x 6	2.76	6.26	.20	.98	2.76	721	**CLL-4006**	8.86	3.35	**CAT-400**
	23.03	34.84	13.78	10.51	Tr 266 x 6	2.76	6.26	.20	.98	2.76	972	**CLL-40012**	8.86	3.35	**CAT-400**
	14.76	16.73	15.75	12.01	Tr 305 x 6	3.15	7.05	.20	.98	3.15	809	**CLL-5002**	9.84	3.58	**CAT-500**
	18.70	24.61	15.75	12.01	Tr 305 x 6	3.15	7.05	.20	.98	3.15	1029	**CLL-5006**	9.84	3.58	**CAT-500**
	24.61	36.42	15.75	12.01	Tr 305 x 6	3.15	7.05	.20	.98	3.15	1360	**CLL-50012**	9.84	3.58	**CAT-500**
	15.55	17.52	16.93	12.99	Tr 330 x 6	3.35	7.64	.20	.98	3.35	985	**CLL-6002**	10.83	3.78	**CAT-600**
	19.49	25.39	16.93	12.99	Tr 330 x 6	3.35	7.64	.20	.98	3.35	1241	**CLL-6006**	10.83	3.78	**CAT-600**
	25.39	37.20	16.93	12.99	Tr 330 x 6	3.35	7.64	.20	.98	3.35	1625	**CLL-60012**	10.83	3.78	**CAT-600**
	17.91	19.88	19.88	15.24	Tr 387 x 6	3.94	8.82	.20	.98	3.94	1565	**CLL-8002**	12.60	4.84	**CAT-800**
	21.85	27.76	19.88	15.24	Tr 387 x 6	3.94	8.82	.20	.98	3.94	1918	**CLL-8006**	12.60	4.84	**CAT-800**
	27.76	39.57	19.88	15.24	Tr 387 x 6	3.94	8.82	.20	.98	3.94	2446	**CLL-80012**	12.60	4.84	**CAT-800**
	19.49	21.46	22.05	17.01	Tr 432 x 6	4.33	9.80	.20	.98	4.33	2094	**CLL-10002**	14.17	5.35	**CAT-1000**
	23.43	29.33	22.05	17.01	Tr 432 x 6	4.33	9.80	.20	.98	4.33	2517	**CLL-10006**	14.17	5.35	**CAT-1000**
	29.33	41.14	22.05	17.01	Tr 432 x 6	4.33	9.80	.20	.98	4.33	3151	**CLL-100012**	14.17	5.35	**CAT-1000**

▼ Shown: **LB-28**

Low Clearance Lifting Using Compressed Air or Water

- **Nine sizes with capacities from 3 to 74 tons; Kevlar® reinforced and "center target" marked to assure safety in use**
- **Aggressive high-friction surface to prevent bags from slipping**
- **Non-conducting rubber, resists oil and most chemicals; operating temperature range is -40° F to 200° F**
- **Larger sizes provided with Nylon® straps and heavy-duty reinforced lugs**
- **Industrial interchange air supply to deadman controller; safety coupler inflation hoses protect against accidental disconnections**
- **Inflatable using shop air or water**

LPC-2421

Use a 24" x 24" lifting bag base under lifting bag to provide a flat surface and protect the lifting bag from debris damage.

Plastic Cribbing

Safely support lifted loads using Enerpac Plastic Cribbing. Available in three sizes and as wedges to help stabilize stacks.

Page: 50

Ultra-low Clearance Loads

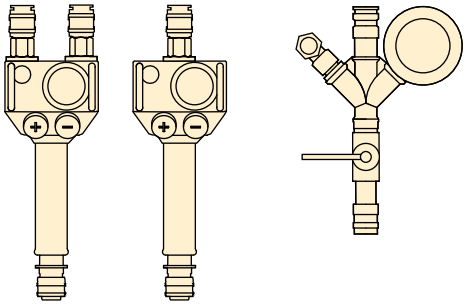
Lift up to 16 tons with minimal clearance gap of only .38 inche with **LW-16** Lifting Wedge.

Page: 174

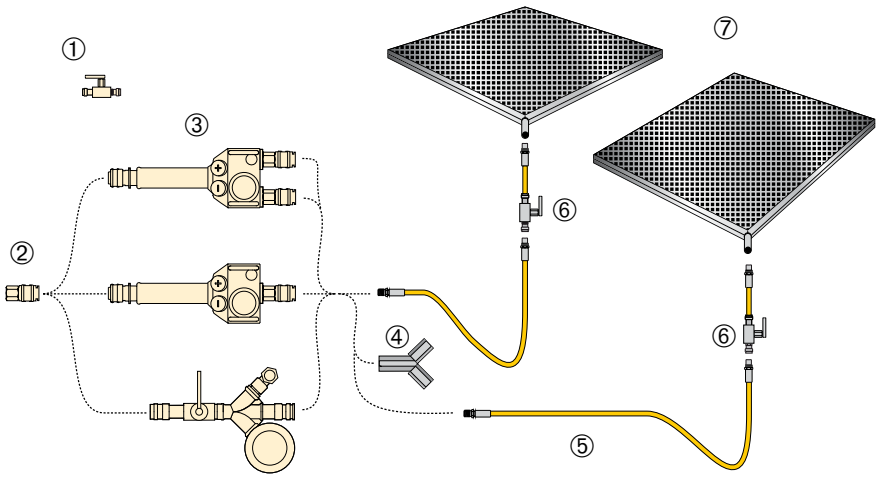
◀ *An Enerpac LB-6 lifting bag preparing to lift a CNC machining center.*

Controller Types

Pneumatic Deadman | **Pneumatic or Water Ball Valve**



CACG2 **CACG1** **CACW1**



LB Series

Lifting Bag Capacity:
3-74 tons

Collapsed Height:
1.1-1.2 inches

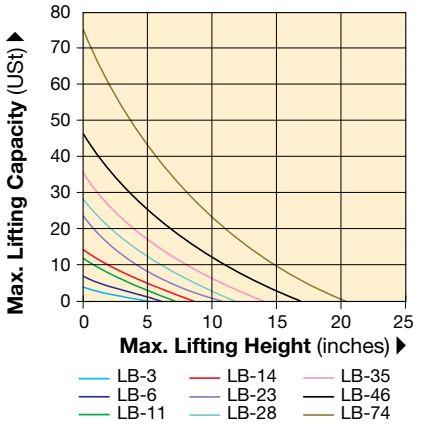
Maximum Inflated Height:
5.1-20.0 inches

Maximum Operating Pressure:
116 psi

▼ **SELECTION CHART**

Item No.	Model No. Usage With Air	Model No. Usage With Water	Description
①	**CAPA1**	-	Portable Compressor Adaptor
②	**CACA1**	-	Construction Compressor Adaptor
③	**CACG1**	-	Single Deadman Controller
	CACG2	-	Double Deadman Controller
	CACW1	**CACW1**	Single Ball Valve Controller
④	**CAYC**	**CAYC**	"Y" Connnector for Twin application
⑤	**A0820**	-	Yellow inflation Hose 20 ft.
	-	**W0801**	Blue inflation Hose 1 ft.
	-	**WP801**	Blue inflation Hose 1 ft. (garden)
	-	**W0820**	Blue inflation Hose 20 ft
⑥	**A0801**	-	Yellow hose 1 ft with Pressure Relief Valve and Ball Valve
⑦	**LB3.....LB74**	**LB3.....LB74**	Lifting Bags (see below)

LIFTING HEIGHT vs. LOAD CHART



*Lifting Bag Capacity (ton)	Collapsed Height (in)	Maximum Lifting Height (in)	Maximum Inflated Height (in)	Model Number	*Capacity @ 50% Extended Height (cu ft)	Length X Width (in)	Nylon Straps and Lugs Included	Weight (lbs)
3	1.1	5.1	6.2	**LB-3**	0.70	9 x 9	-	2.8
6	1.1	5.9	7.0	**LB-6**	1.80	12 x 12	-	5.3
11	1.1	7.1	8.2	**LB-11**	4.00	15 x 15	-	8.8
14	1.1	8.7	9.8	**LB-14**	4.30	18 x 18	-	11.7
23	1.1	10.6	11.7	**LB-23**	7.20	22 x 22	-	17.9
28	1.2	11.8	13.0	**LB-28**	8.50	24 x 24	●	24.7
35	1.2	14.2	15.4	**LB-35**	9.80	27 x 27	●	29.3
46	1.2	16.5	17.7	**LB-46**	12.80	30 x 30	●	40.1
74	1.2	20.0	21.3	**LB-74**	21.00	36 x 36	●	55.8

* Lifting capacity reduces as lifting bag height increases.

▼ Shown: LPC6701-B, LPC4401-Y, LPC2401-B, LPC3W-B

Durable Crib Blocks Safely Support and Stabilize Lifted Loads

Lifting Bags

Safely lift loads using Enerpac Lifting Bags. Inflatable using compressed air or water.

Page: 48

Properties

Enerpac plastic cribbing blocks can be nailed, screwed or sawn like wood. Piloted ignition is similar to wood.

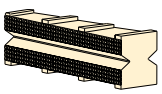
- **Multiple sizes, shapes fit most applications**
- **Interlocking or aggressive non-slip surface**
- ***Non-conducting plastic resists oil and most chemicals**
- **Does not splinter, like wood**
- **Does not snap and fail, like wood**
- **Operating temperature range is -40° F to 176° F (-40° C to +80° C)**
- **Carrying lanyards provided on all 6" x 7" and on yellow 4" x 4" crib blocks**
- **Made from 100% recycled plastics**

Crib Block Capacity

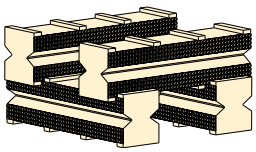
Crib stack may compress up to 2 inches at 70° F with no cracked blocks. Ratings are based on a full press load in which the load is evenly distributed across the crib stack using a 1-inch steel plate to spread the load. Do not load any localized area of a crib or cribbing block at more than 1600 psi.

▼ *Enerpac cribbing blocks build a stable, interlocked platform for lifting a ship.*

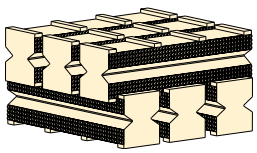
Single Crib



2 Box Interlocked Crib



3 Box Interlocked Crib



Nominal Block Dimensions (in)	Single Crib Block Capacity (ton)	2 Box Crib Stack		3 Box Crib Stack	
		Max. Stack Height (in)	Max. Capacity (ton)	Max. Stack Height (in)	Max. Capacity (ton)
2 x 4 x 18	40	36	30	40	70
4 x 4 x 18	40	45	30	48	70
6 x 7 x 24	60	57	60	64	100

* Reference a plastic compatibility source for HDPE/PP chemical resistance.

Plastic Cribbing Blocks

Enerpac Cribbing Blocks – for Superior Crib Stability

Enerpac plastic cribbing blocks are designed to provide superior crib stability compared to standard hardwood and softwood products. Enerpac plastic cribbing blocks won't fail catastrophically like wooden cribbing; instead of snapping or cracking and collapsing, it gradually deforms providing a visual warning of overload.

In addition, unlike wood products, Enerpac plastic cribbing blocks do not splinter or absorb most fluids. Convenient sizes help to quickly and safely build stable cribs to support loads.

Enerpac cribbing blocks have two distinct surfaces: interlocking and pyramid. The interlocking surface ensures block alignment at a 90° angle; the pyramid surface can be utilized to build crib stacks at odd angles, less than 90°.

LPC Series

Minimum Clearance:
2.1 inches

Maximum Crib Height:
64 inches

**Maximum Capacity:
30-100 tons

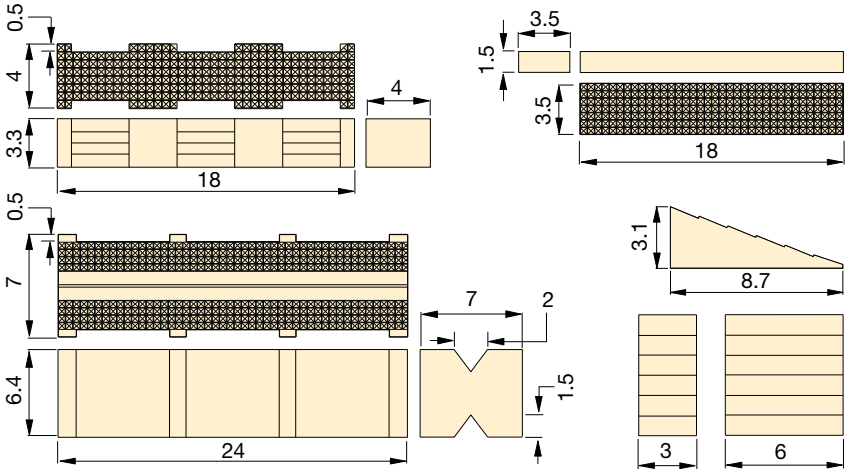
Temperature Operating Range:
-40 °F to 176 °F

Think Safety!

Do not mix different materials in crib stacks. Stable crib stacks require blocks with similar friction, compression and deflection rates.

Use wedges to stabilize crib stacks when necessary.

Reference dimensions are in inches.



	Model Number	Kit Piece Count						Volume	Weight
		*2 x 4 x 18" Black	*4 x 4 x 18" Black / Yellow	*6 x 7 x 24" Black / Yellow	3" Wedge Black	6" Wedge Black	Nylon Carrying Tote	(cu ft)	(lbs)
Single Blocks	LPC2401-B	1	-	-	-	-	-	0.08	3.00
	LPC4401-B	-	1	-	-	-	-	0.17	5.25
	LPC4401-Y	-	1	-	-	-	-	0.17	5.25
	LPC6701-B	-	-	1	-	-	-	0.56	25.00
	LPC6701-Y	-	-	1	-	-	-	0.56	25.00
	LPC3W-B	-	-	-	1	-	-	0.02	1.50
	LPC6W-B	-	-	-	-	1	-	0.09	2.50
2 x 4 Kits	LPC2418	18	-	-	3	-	1	1.63	62.50
	LPC2436	36	-	-	6	-	2	3.18	116.00
	LPC2472	72	-	-	9	-	4	6.38	233.50
4 x 4 Kits	LPC4409	-	5 / 4	-	2	-	1	1.58	49.75
	LPC4418	-	10 / 8	-	3	-	2	3.19	101.00
	LPC4436	-	20 / 16	-	8	-	4	6.43	205.00
	LPC4472	-	40 / 32	-	9	-	8	12.70	399.50
6 x 7 Kits	LPC6704	-	-	2 / 2	-	1	-	2.34	102.50
	LPC6708	-	-	4 / 4	-	3	-	4.77	207.50
	LPC6720	-	-	11 / 9	-	7	-	11.87	517.50
	LPC6750	-	-	28 / 22	-	8	-	29.45	2787.50

* **NOTE:** Cribbing block dimensions are nominal. Refer to reference dimension drawing

** **NOTE:** Distribute load over largest possible crib stack surface area. Do not load any localized area of a crib or cribbing block at more than 1600 psi.

▼ Shown from left to right: **JHA-356, JHA-156**

JH, JHA
Series

Capacity:
7-150 tons

Stroke:
3.00-6.13 inches

Maximum Operating Pressure:
10,000 psi

- **All-directional operation on 7, 15 and 35 ton models**
- **Internal relief valve to prevent overloading**
- **Machined flat front and bottom surfaces permit flush alignment in tight corners**
- **All models include pumping handle**
- **Chrome plated plungers**

Lifting Wedge and Machine Lifts

Ideal to lift the load the first few inches. The **LW-16** Lifting Wedge requires a very small access gap of only .39 in.

Page: **165**

Load Skates

For moving heavy loads easily and safely.

Page: **176**

Plastic Cribbing

Safely support lifted loads using Enerpac Plastic Cribbing. Available in three sizes and as wedges to help stabilize stacks.

Page: **50**

Style	Jack Capacity (ton)	Stroke (in)	Model Number	Jack Effective Area (in^2)	Collapsed Height (in)	Extended Height (in)	Bottom Plate Dimensions (W x L) (in)	Plunger Diameter (in)	Pump Speed	Weight (lbs)
Aluminum Jack	**7**	3.00	**JHA-73**	1.49	5.25	8.25	2.88 x 6.25	1.19	Single	11
	15	6.06	**JHA-156**	3.14	9.75	15.81	3.63 x 9.38	1.63	Single	29
	35	6.13	**JHA-356**	7.07	10.13	16.25	4.63 x 10.00	2.13	Single	40
	75	6.06	**JHA-756**	15.90	11.25	17.31	6.88 x 12.81	4.50	Single	94
	150	6.13	**JHA-1506**	30.68	12.88	19.00	9.50 x 16.06	6.25	2-Speed	210
Steel Jack	**30**	6.13	**JH-306**	5.94	10.00	16.13	3.75 x 9.56	2.75	Single	59
	50	6.09	**JH-506**	9.62	10.25	16.34	5.00 x 10.19	3.50	2-Speed	90
	100	6.06	**JH-1006**	20.63	11.31	17.37	7.13 x 12.94	5.12	2-Speed	184

▼ Shown: **EBJ-4GC, EBJ-50GC, EBJL-15GC, EBJ-12GC**

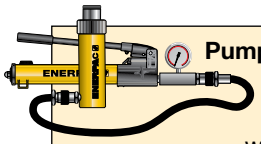
EBJ
Series

Capacity:
1.5-100 tons

Stroke:
3.03-20.00 inches

- **Lower handle effort reduces operator fatigue**
- **Fully serviceable**
- **Cast beam and forged pump linkage**
- **Pumping handle included on all models**
- **Safety relief valve to prevent overload**
- **Automatic by-pass port to prevent over-extension**
- **Wiper seal for extended life**
- **Chrome plating on pump and ram plungers**

Screw Feature
Heat treated, adjustable extension screw with cleated saddle on selected EBJ models helps adjusting and prevents slipping.



Pump and Cylinder Sets
As an alternative to Industrial Bottle Jacks where the operator is required to stand remote from the jacking point, see the range of pump and cylinder sets.

Page: 58

Jack Capacity (ton)	Stroke (in)	Model Number	Screw Extension (in)	Minimum Height (in)	Maximum Height (in)	Plunger Diameter (in)	Saddle Diameter (in)	Base Dimensions L x W (in)	Weight (lbs)
1.5	18.00	✦ **EBJL-15GC**	–	21.72	39.72	.88	.75	3.63 x 5.00	12.8
2	3.74	**EBJ-2GC**	2.76	6.89	13.39	.87	.83	4.02 x 3.78	6.6
3	20.00	✦ **EBJL-3GC**	–	26.31	46.31	1.12	1.12	4.25 x 5.50	22.0
4	4.72	**EBJ-4GC**	2.76	7.68	15.16	1.11	1.03	4.41 x 4.13	9.3
6	5.12	**EBJ-6GC**	3.15	8.27	16.54	1.34	1.19	4.72 x 4.49	12.1
8	5.51	**EBJ-8GC**	3.15	8.66	17.32	1.50	1.34	4.92 x 4.69	13.7
12	6.10	**EBJ-12GC**	3.15	9.45	18.70	1.70	1.58	5.31 x 5.12	17.6
12	3.03	* **EBJS-12GC**	1.69	6.10	10.83	1.70	1.58	5.31 x 5.12	14.6
15	5.91	**EBJ-15GC**	3.15	9.45	18.50	1.89	1.70	5.71 x 5.43	20.7
20	6.10	**EBJ-20GC**	3.15	9.84	19.09	2.09	1.82	6.10 x 5.71	25.1
20	3.11	* **EBJS-20GC**	1.61	6.50	11.22	2.09	1.82	6.10 x 5.71	19.8
30	6.89	✦ **EBJ-30GC**	–	11.22	18.11	2.80	2.72	7.48 x 5.91	56.9
50	4.33	✦ **EBJ-50GC**	–	9.25	13.58	3.35	3.15	10.04 x 7.48	92.6
100	5.32	✦ **EBJ-100GC**	–	12.20	17.52	4.89	3.94	11.81 x 9.45	198.9

⋆ Short bottle jack ✦ Without extension screw
All EBJ Jacks meet or exceed: ANSI, PALD, CE

▼ Shown: **PRASA10027L**

Safe, Efficient, Mobile Load Lifting

- **60, 100, 150 and 200-ton capacities with pneumatic or electric pumps for the toughest jobs**
- **4" ground clearance for transport over rail and rough terrain**
- **Three position handle provides easy tilt back and transport**
- **Complies with ASME/ANSI B30.1 specifications**
- **Easy to change external filter minimizes down time**
- **Rugged, fully enclosed 24" wide frame with no exposed fittings or hoses**
- **SUP-R-STACK™ Extension System allows lifting at all heights without blocking.**

Standard 12' pendant cord for air driven units with pneumatic valves and 20' pendant cord for electric driven units keeps operator away from the load.

▼ *Versatility for rail maintenance. One jack for all cars from Intermodal to High Hopper with 28 heights in between.*

Capacity (ton)	Stroke (in)	Electric Pump Model Number (115 VAC)	Weight (lbs)
60	14	**PREMB06014L**	390
	27	**PREMB06027L**	600
100	16	**PREMB10016L**	510
	27	**PREMB10027L**	600
	16	-	-
	27	-	-
150	15.5	-	-
	26.5	-	-
	15.5	**PREMB15016L**	570
	26.5	**PREMB15027L**	708
200	15.5	-	-
	26.5	-	-

(PR-Series not available in Canada. Contact Enerpac.)

SUP-R-STACK™ Extensions

Increase useful height from 5" to 18".

Model No.	Size (in)	Model No.	Size (in)
PRE5	5	PRE11	11
PRE7	7	PRE14	14
PRE9	9	PRE18	18
PRES6024	Extension set includes **PRE5, PRE7, PRE11** and **PRE18**		

Spacers

Fine tune your Extension stack height.

Model No.	Size (in)	Model No.	Size (in)
PRS1	1	PRS3	3
PRS2	2	–	–
PRS4	Set includes (2) **PRS1,** (1) **PRS2** and (1) **PRS3**		

PR Series

Rated Lifting Capacity:
60-200 tons

Stroke:
14-27 inches

Maximum Operating Pressure:
10,000 psi

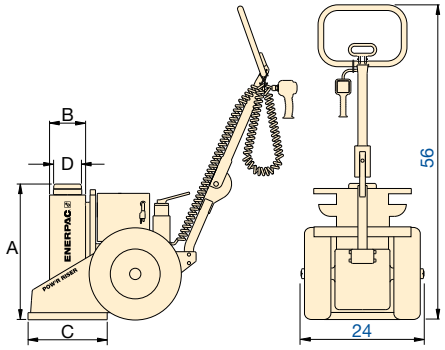
Cap. (ton)	Swivel Load Cap	Locking U-Rings 1 in.	3 in.	4½ in.	5½ in.	10 in.	Set Model Number	Locking U-Ring Sets Include
60	PRTS60	PRU11	PRU13	PRU14	–	PRU110	[1]PRUS126	(2) PRU11, (1) PRU13, (2) PRU14
							[2]PRUS137	(2) PRU11, (1) PRU13, (2) PRU14 (1) PRU110
100	PRTS60	PRU11	PRU13	PRU14	–	PRU110	[1]PRUS126	(2) PRU11, (1) PRU13, (2) PRU14
							[2]PRUS137	(2) PRU11, (1) PRU13, (2) PRU14 (1) PRU110
150	PRTS150	PRU151	PRU153	–	PRU155	PRU1510	[3]PRUS1526	(2) PRU151, (1) PRU153, (2) PRU155
							[2]PRUS1537	(2) PRU151, (1) PRU1510, (2) PRU155
200	PRTS200	PRU201	PRU203	–	PRU205	PRU2010	[3]PRUS2026	(2) PRU201, (1) PRU203, (2) PRU205
							[2]PRUS2037	(2) PRU201, (1) PRU2010, (2) PRU205

[1] For 14 and 16" stroke models
[2] For 27" stroke models
[3] For 15.5" stroke models

WARNING!

Extensions: Any two Extensions may be stacked for loads up to 60 tons. For loads over 60 tons or strokes over 14" only one Extension and one Spacer can be used.

Spacers: Never exceed 3" in total Spacer height.



Dimensions shown in inches.

	Air Pump	Weight (lbs)	A	B	C	D	Max. Additional Stack Height Using Optional Ext. System (in)	Valve Type
	PRAMA06014L	390	24	6.4	14	4	32*	Manual
	PRAMA06027L	600	37	6.4	14	4	11	
	PRAMA10016L	510	26	7.0	18	4	21**	
	PRAMA10027L	600	37	7.0	18	4	11	
	PRASA10016L	510	26	7.0	18	4	21**	Pneumatic
	PRASA10027L	600	37	7.0	18	4	11	
	PRASA15016L	570	26	8.0	18	5	21**	
	PRASA15027L	708	37	8.0	18	5	11	
	-	-	26	8.0	18	5	21**	Manual
	-	-	37	8.0	18	5	11	
	PRASA20016L	640	26	9.5	18	6	21**	Pneumatic
	PRASA20027L	825	37	9.5	18	6	11	

* Based on one 18" and one 11" Extension and one 3" Spacer.
** Based on one 18" Extension and one 3" Spacer.

For power source, the following characters should be inserted in the 5th space of the model number.

Ordering Example:
Model No. PREMI06014L is a 14" stroke, 60 ton model, with a manual valve and a 208-240 VAC, 1-ph electric motor.

A	Air Pump, 50 scfm, 80 psi
B	115 VAC, 1ph., 50-60 Hz, 20 A
E	208-240 VAC, 1-ph., 50-60 Hz, Euro Plug, 10 A
I	208-240 VAC, 1-ph., 50-60 Hz, USA Plug, 10 A
G	[1]208-240 VAC, 3-ph., 50-60 Hz
W	[1]380-415 VAC, 3-ph., 50-60 Hz
J	[1]440-480 VAC, 3-ph., 50-60 Hz
R	[1]575 VAC, 3-ph., 50-60 Hz

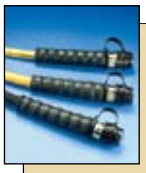
[1] Not available for 60-ton capacity

▼ Shown from left to right: **P-142ALSS, P-392ALSS, V-152NV, V-66NV, RC256NV, RC-106NV, RC-53NV**

Maximum Corrosion Resistance

- **Corrosion resistant, nickel-plated valves and cylinders**
- **Stainless steel pump inserts will not corrode**
- **Viton® Seals provide heat and chemical resistance**
- **Anodized aluminum pump reservoirs and plastic encapsulated pump bodies resist wet environments**
- **Two-speed operation reduces pump handle strokes 78% compared to single-speed pumps**
- **Pump handles lock for easy carrying**

Use Enerpac **Extreme Environment Products** in wet environments such as food processing, pulp and paper, mining, construction and applications in high temperature or in welding areas.



700, 900 Series Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

Page: **118**

▼ CYLINDER CHART

Cylinder Capacity (ton)	Stroke (in)	Model Number	Oil Capacity (in^3)	Pressure Rating (psi)	Port Dimension (in)	Collapsed Height A (in)	Extended Height B (in)	Outside Diameter D (in)
5	3.0	**RC-53NV**	2.98	10,000	3/8"-18 NPTF	6.50	9.50	1.50
10	2.0	**RC-102NV**	4.75	10,000	3/8"-18 NPTF	4.78	6.91	2.25
10	6.0	**RC-106NV**	13.70	10,000	3/8"-18 NPTF	9.75	15.88	2.25
25	6.0	**RC-256NV**	32.23	10,000	3/8"-18 NPTF	10.75	17.00	3.38

▼ HAND PUMP CHART

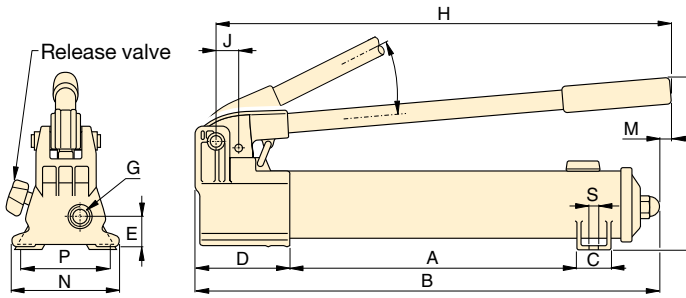
Pump Type	Oil Capacity (in^3)	Model Number	Pressure Rating (psi)	Oil Displacement per Stroke (in^3)	Port Dimension (in)	Piston Stroke (in)
Two Speed	20	**P-142ALSS**	200/10,000	0.221/0.055	1/4"-18 NPTF	.50
	55	**P-392ALSS**	200/10,000	0.687/0.151	3/8"-18 NPTF	1.00

▼ VALVE CHART*

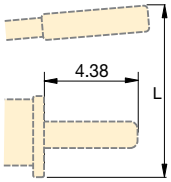
Valve Type	Model Number	Pressure Function	Pressure Rating (psi)
Manual Check Valve	**V-66NV**	Check	10,000
Pressure Relief Valve	**V-152NV**	+3% Repeatability	800/10,000

* See page 132 for valve function information of standard model products.

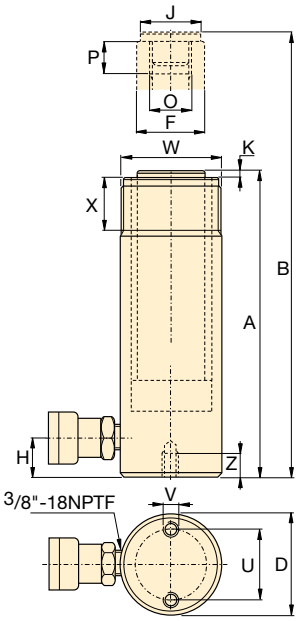
P-392ALSS



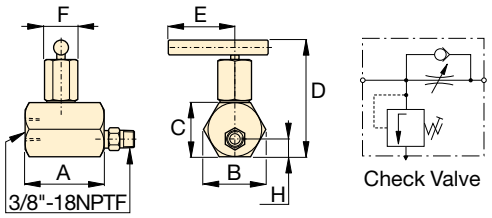
P-142ALSS



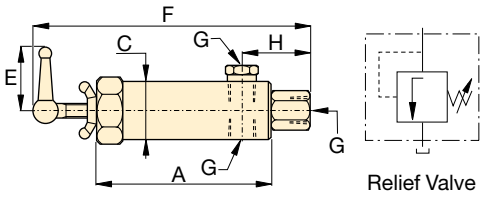
RC-102NV, RC-106NV, RC-256NV



V-66NV



V-152NV



RC P V Series

Cylinder Capacity:
5-25 tons

Stroke:
2-6 inches

Maximum Operating Pressure:
10,000 psi

Multifluid Hand Pumps

MP-Series corrosion resistant hand pumps for low pressure filling and high pressure testing applications, suitable for a wide range of fluids.

Page: 69

Plunger Diam. F (in)	Base to Adv. Port H (in)	Saddle Diam. J (in)	Saddle Protrusion from Plngr. K (in)	Plunger Internal Thread O (in)	Plunger Thread Length P (in)	Base Mounting Holes: Bolt Circle U (in)	Base Mounting Holes: Thread V (in)	Base Mounting Holes: Thrd. Depth Z (in)	Collar Thread W (in)	Collar Thread Length X (in)	Weight (lbs)	Model Number
1.00	.75	1.00	.25	¾"-16	.56	1.00	¼"-20UN	.56	1½"-16	1.13	3.3	**RC-53NV**
1.50	.75	1.38	.25	1"- 8	.75	1.56	5⁄16"-18UN	.50	2¼"-14	1.13	5.1	**RC-102NV**
1.50	.75	1.38	.25	1"- 8	.75	1.56	5⁄16"-18UN	.50	2¼"-14	1.13	9.8	**RC-106NV**
2.25	1.00	2.00	.41	1½"-16	1.00	2.31	½"-13UN	.75	3 5⁄16"-12	1.94	22.0	**RC-256NV**

Pump Dimensions (in) A	B	C	D	E	G	H	J	L	M	N	P	S	Weight (lbs)	Model Number
7.31	13.25	1.13	3.37	1.13	¼"-18 NPTF	12.56	.75	5.63	–	3.75	3.18	.28	4.5	**P-142ALSS**
13.56	21.00	1.44	3.93	1.31	⅜"-18 NPTF	20.56	1.19	7.00	.63	4.75	–	–	9.0	**P-392ALSS**

Valve Dimensions (in) A	B	C	D	E	F	G	H	Weight (lbs)	Model Number
3.50	2.25	2.00	4.00	2.00	0.87	⅜"-18 NPTF	1.00	3.9	**V-66NV**
4.53	–	1.50	–	3.12	7.62	⅜"-18 NPTF	1.53	3.5	**V-152NV**

▼ Shown cylinder-pump set: **SCR-1010H**

The Quickest and Easiest Way to Start Working Right Away

- **Optimum match of individual components**
- **Sets include 6 foot safety hose, calibrated gauge with gauge adaptor**
- **All hand pumps are two-speed**

Speed Chart
See the Enerpac Cylinder Speed Chart in our "Yellow Pages" section.
Page: 249

1 **Cylinder Selection** (See Cylinder Section of this catalog for full product descriptions)		Nominal Set Capacity (ton)	Cylinder Model No.	Stroke (in)	Collapsed Height (in)
	**Single-acting, General Purpose Cylinders:** For maximum versatility. **RC-Series** *Page:* 6	5	RC-55	5.00	8.50
		10	RC-102	2.13	4.78
			RC-106	6.13	9.75
			RC-1010	10.13	13.75
		15	RC-154	4.00	7.88
			RC-156	6.00	10.69
		25	RC-252	2.00	6.50
			RC-254	4.00	8.50
			RC-256	6.25	10.75
			RC-2514	14.25	18.75
		50	RC-506	6.25	11.13
	**Single-acting, Low Height Cylinders:** Ideal where space is restricted. **RCS-Series** *Page:* 22	10	RCS-101	1.50	3.47
		20	RCS-201	1.75	3.88
		30	RCS-302	2.44	4.63
		50	RCS-502	2.38	4.81
		100	RCS-1002	2.25	5.56
	**Single-acting, Hollow Cylinders:** For pushing and pulling applications. **RCH-Series** *Page:* 26	12	RCH-121	1.63	4.75
		20	RCH-202	2.00	6.31
		30	RCH-302	2.50	7.03
		60	RCH-603	3.00	9.75
		100	RCH-1003	3.00	10.00
	**Pull Cylinders:** The ultimate in pulling power. **BRP-Series** *Page:* 24	10	BRP-106C	5.95	23.11
			BRP-106L	5.95	21.33
		30	BRP-306	6.10	42.72
		60	BRP-606	5.98	28.34
		–	–	–	–

Single-Acting, Cylinder Pump Sets

SET SELECTION:

1. **Select the cylinder**
2. **Select the pump**
3. **Find the set model number in the blue field of the matrix**

SELECTION EXAMPLE

Selected cylinder:
- RC-106, Single-acting cylinder with 6.13" stroke

Selected pump:
- P-392, Lightweight hand pump

Set model number:
- SCR-106H

Included:
- HC-7206 hose
- GF-10P gauge
- GA-2 adaptor

SC Series

Capacity:
5-100 tons

Stroke:
1.50-14.25 inches

Maximum Operating Pressure:
10,000 psi

2

Pump selection (See Pump Section of this catalog for full product descriptions)					Accessories Included		
Hand Pump P-142	Hand Pump P-392	Hand Pump P-80	Foot Pump P-392FP	XA-Series Air Pump XA-11	Hose Model No.	Gauge Model No.	Gauge Adaptor Model No.
							
SCR-55H	–	–	–	–	HC-7206	GP-10S	GA-4
–	SCR-102H	–	SCR-102FP	SCR-102A	HC-7206	GF-10P	GA-2
–	SCR-106H	–	SCR-106FP	SCR-106A	HC-7206	GF-10P	GA-2
–	SCR-1010H	–	SCR-1010FP	SCR-1010A	HC-7206	GF-10P	GA-2
–	SCR-154H	–	SCR-154FP	SCR-154A	HC-7206	GP-10S	GA-2
–	SCR-156H	–	SCR-156FP	SCR-156A	HC-7206	GP-10S	GA-2
–	SCR-252H	–	SCR-252FP	SCR-252A	HC-7206	GF-20P	GA-2
–	SCR-254H	–	SCR-254FP	SCR-254A	HC-7206	GF-20P	GA-2
–	SCR-256H	–	SCR-256FP	SCR-256A	HC-7206	GF-20P	GA-2
–	–	SCR-2514H	–	SCR-2514A[1)]	HC-7206	GF-20P	GA-2
–	–	SCR-506H	–	SCR-506A[1)]	HC-7206	GF-50P	GA-2
–	SCL-101H	–	SCL-101FP	SCL-101A	HC-7206	GF-10P	GA-2
–	SCL-201H	–	SCL-201FP	SCL-201A	HC-7206	GF-230P	GA-2
–	SCL-302H	–	SCL-302FP	SCL-302A	HC-7206	GF-230P	GA-2
–	SCL-502H	–	SCL-502FP	SCL-502A	HC-7206	GF-510P	GA-2
–	–	SCL-1002H	–	–	HC-7206	GF-510P	GA-2
SCH-121H	–	–	–	–	HB-7206	GF-120P	GA-4
–	SCH-202H	–	SCH-202FP	SCH-202A	HC-7206	GF-813P	GA-3
–	SCH-302H	–	SCH-302FP	SCH-302A	HC-7206	GF-813P	GA-3
–	–	SCH-603H	–	SCH-603A[1)]	HC-7206	GF-813P	GA-3
–	–	SCH-1003H	–	–	HC-7206	GP-10S	GA-2
–	SCP-106CH	–	SCP-106CFP	–	HC-7206	GP-10S	GA-2
–	SCP-106LH	–	SCP-106LFP	–	HC-7206	GP-10S	GA-2
–	–	SCP-306H	–	–	HC-7206	GP-10S	GA-2
–	–	SCP-606H	–	–	HC-7206	GP-10S	GA-2
–	–	–	–	–	–	–	–

[1)] XA-12

Enerpac Hydraulic Pumps

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

ENERPAC hydraulic pumps are available in over 1,000 different configurations. Whatever your high pressure pump needs are… speed, control, intermittent or heavy-duty performance… you can be sure that Enerpac has the pump to suit the application.

Featuring Hand, Battery, Electric, Air and Gasoline powered models, with multiple reservoir and valve configurations, Enerpac offers the most comprehensive high pressure pump line available.

Pump Selection

For help in selecting the correct pump for your application, please review our **"Yellow Pages."**
If you require further assistance, contact the Enerpac office located near you.

Page: 244

Torque Wrench Pumps

System matched air and electric pumps provide control to operate Enerpac Torque Wrenches.

Page: 204

Pumps and Directional Control Valves Section Overview

Power Source	Pump Types	Maximum Reservoir Capacity	Max. Flow at Rated Pressure (in^3/min)	Series		Page
Manual	**Lightweight Hand Pumps** Exclusively from Enerpac	155 in^3	.15 (in^3/stroke)	P		62 ▶
	Steel Hand Pumps **Low Pressure Hand Pumps**	453 in^3 200 in^3	.29 .58 (in^3/stroke)	P P		64 ▶ 66 ▶
	Foot Pump For Hands Free Operation	38 in^3	.15 (in^3/stroke)	P		68 ▶
	Multifluid Hand Pumps Pumping Fluids up to 14,500 psi	38 in^3	1.28 (in^3/stroke)	MP		69 ▶
	Ultra-High Pressure Hand Pumps Pressure up to 40,000 psi	60 in^3	.15 (in^3/stroke)	P/11		70 ▶
Electric	**Battery Powered Hydraulic Pump** Cordless Hydraulic Power	1 gal.	15	BP		72 ▶
	Economy Series Compact and Portable	1 gal.	20	PU		74 ▶
	Submerged Series Powerful and Low-Noise	1.5 gal.	20	PE		76 ▶
	***Z-Class* Pumps, ZU4 and ZE3 to ZE6-Series** Portable and Powerful	10 gal.	60 200	ZU ZE		82 ▶
	8000-Series The Maximum Flow Pump	25 gal.	462	PE		94 ▶
Air	**XA-Series** XVARI® Technology for Productivity and Ergonomics	122 in^3	15	XA		96 ▶
	Turbo II Air Hydraulic Pumps Compact Air Over Hydraulic	305 in^3	10	PA		98 ▶
	Air Hydraulic Pumps Single and Twin-Air Motor	2 gal.	9	PA PAM		100 ▶
	ZA4 Air Hydraulic Pumps The Standard for Air-Hydraulic Pumps	10 gal.	80	ZA		102 ▶
	ATP-Series Air Pump High Pressure Air Pump	1 gal.	4	ATP		104 ▶
Gasoline	**Atlas Series** Small and Lightweight	2 gal.	40	PGM		105 ▶
	ZG5/ZG6 Gasoline Hydraulic Pumps Gas Powered High Flow Pumps	10 gal.	200	ZG5/ ZG6		106 ▶
	8000-Series Gasoline Pumps For the Largest Jobs	25 gal.	1.5 (gal/min)	EGM		108 ▶
Directional Control Valves						109 ▶

▼ Pumps shown, from top to bottom: **P-802, P-842, P-202, P-142**

- **Lightweight and compact design**
- **Durable glass-filled nylon reservoir and nylon encapsulated aluminum pump base for maximum corrosion resistance**
- **Two-speed operation on most models reduces handle strokes by as much as 78% over single speed pumps**
- **Lower handle effort to minimize operator fatigue**
- **Integral 4-way valve on P-842 for operation of double-acting cylinders**
- **Handle lock and lightweight construction for easy carrying**
- **Large oil capacities to power a wide range of cylinders or tools**
- **Non-conductive fiberglass handle for operator safety**
- **Internal pressure relief valve for overload protection**

Exclusively from Enerpac

Cylinder Matching Chart

For help in selecting the correct hand pump for your application, please refer to the Cylinder Matching Chart located in the "Yellow Pages".

Page: 244

Speed Chart

To determine how a specific pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the "Yellow Pages".

Page: 251

Tank Kits

When a return-to-tank port is required, the Tank Kits provide a 7/16-20 port at the rear of the reservoir.

PC-20	Fits P-141, P-142
PC-25	Fits P-202, P-391, P-392

LX-101 Hand Pump Oil

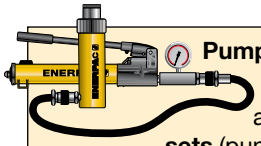
A medium viscosity oil specially formulated for hand pumps. Performs well in low temperatures and requires less pumping effort than standard Enerpac HF blue oil.

Page: 122

▼ *P-392 in action with RSM-500 cylinders.*

Pump Type	Usable Oil Capacity (in^3)	Model Number	Pressure Rating* (psi) 1st stage	Pressure Rating* (psi) 2nd stage	Oil Displacement per Stroke (in^3) 1st stage	Oil Displacement per Stroke (in^3) 2nd stage	Max. Handle Effort (lbs)
Single-speed	20	**P-141**	N/A	10,000	N/A	.055	72
	55	**P-391**	N/A	10,000	N/A	.151	85
Two-speed	20	**P-142****	200	10,000	.221	.055	78
	55	**P-202**	200	10,000	.221	.055	63
	55	**P-392****	200	10,000	.687	.151	93
	155	**P-802**	400	10,000	2.40	.151	95
	155	**P-842*****	400	10,000	2.40	.151	95

* Contact Enerpac for applications where operating pressure is less than 10% of pressure rating.
** Available as set, see note on top of next page.
*** For use with double-acting cylinders.



Pump and Cylinder Sets

Pumps marked with an ** are available as **sets** (pump, cylinder, gauge, couplers and hose) for your ordering convenience.

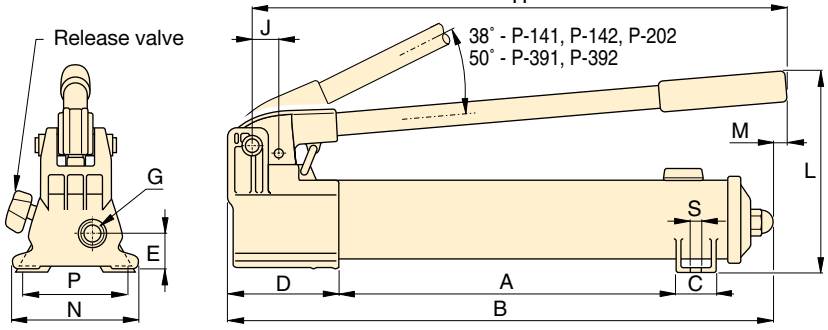
Page: 58

P Series

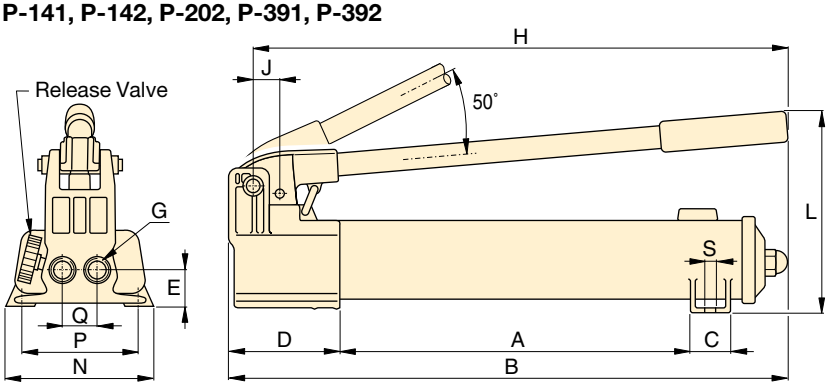
Reservoir Capacity:
20-155 in³

Flow at Rated Pressure:
.055-.15 in³/stroke

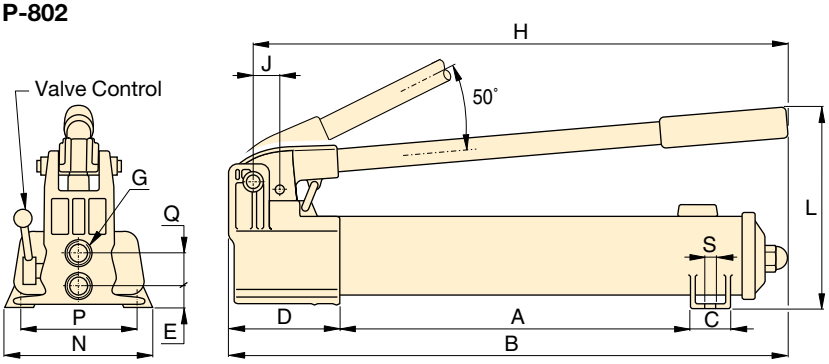
Maximum Operating Pressure:
10,000 psi



P-141, P-142, P-202, P-391, P-392



P-802



P-842

Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

Page: 118

Gauges

Minimize the risk of over-loading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

Page: 117

Aluminum Reservoir

For applications where composite reservoirs may not be suitable, the **P-392AL** utilizes an extruded aluminum reservoir. Also included is a second handle for two-hand use. Contact Enerpac for details.

Piston Stroke	Dimensions (in)														Weight	Model Number
(in)	A	B	C	D	E	G	H	J	L	M	N	P	Q	S	(lbs)	
.50	7.31	13.25	1.13	3.37	1.13	¼"-18 NPTF	12.56	.75	5.63	–	3.75	3.25	–	.28	5.3	**P-141**
1.00	13.56	21.00	1.44	3.93	1.31	⅜"-18 NPTF	20.56	1.19	7.00	.63	4.75	–	–	–	9.0	**P-391**
.50	7.31	13.25	1.13	3.37	1.13	¼"-18 NPTF	12.56	.75	5.63	–	3.75	3.25	–	.28	5.3	**P-142****
.50	13.56	20.06	1.44	3.37	1.13	¼"-18 NPTF	15.75	.75	5.69	.63	3.75	–	–	–	7.5	**P-202**
1.00	13.56	21.00	1.44	3.93	1.31	⅜"-18 NPTF	20.56	1.19	7.00	.63	4.75	4.75	–	–	9.0	**P-392****
1.00	13.30	21.75	1.78	5.25	1.39	⅜"-18 NPTF	20.75	2.19	9.00	–	7.12	4.75	1.40	.41	18.0	**P-802**
1.00	13.30	21.75	1.78	5.25	.81	⅜"-18 NPTF	20.75	2.19	9.00	–	7.12	4.75	1.44	.41	22.0	**P-842****

▼ Shown from left to right: **P-462, P-84, P-801, P-77, P-80, P-39**

The Solution for Tough Jobs

- **Two-speed operation for reduced operator fatigue (except P-39)**
- **4-way valving on the P-84 and P-464 for operation of double-acting cylinders**
- **External load release valve on remaining models for single-acting cylinder operation**
- **Internal pressure relief valve for overload protection**
- **Large oil capacity to power a wide range of cylinders or tools**

Two Speed

Recommended for applications where cylinder plunger must advance rapidly to contact load, and applications where greater oil capacities are required, such as multiple cylinder hook-ups.

Foot Pump Conversion Kits

Convert your **P-39** to foot power with the **PC-10** Kit. Includes instructions for easy conversion.

Gauges

Minimize the risk of over-loading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

Page: **117**

4-Way Control Valve

P-84 and P-464 feature a manual 4-way control valve, designed for use with one double-acting or two single-acting cylinders. For system set-up information:

Page: **247**

▼ *In the absence of a power supply, the P-80 Hand Pump offers a powerful solution.*

Pump Type	Usable Oil Capacity (in^3)	Model Number	Pressure Rating* (psi)		Oil Displacement per Stroke (in^3)		Max. Handle Effort (lbs)
			1st stage	2nd stage	1st stage	2nd stage	
Single	40	**P-39**	N/C	10,000	N/C	.16	111
Two-speed	47	**P-77**	200	10,000	.97	.15	94
	134	**P-80****	350	10,000	.99	.15	104
	249	**P-801**	350	10,000	.99	.15	104
	134	**P-84*****	350	10,000	.99	.15	104
	453	**P-462**	200	10,000	7.69	.29	110
	453	**P-464*****	200	10,000	7.69	.29	110

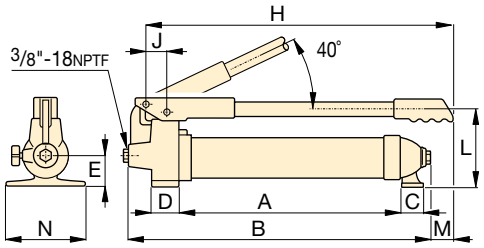
* Contact Enerpac for applications where operating pressure is less than 10% of pressure rating.
** Available as a set, see note on next page.
*** For use with double-acting cylinders.

P Series

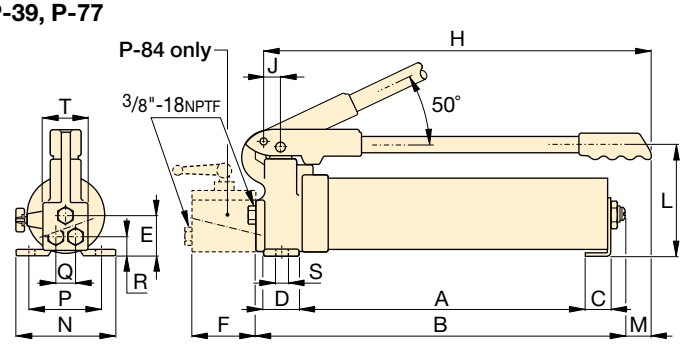
Reservoir Capacity:
40-453 in³

Flow at Rated Pressure:
.15-.29 in³/stroke

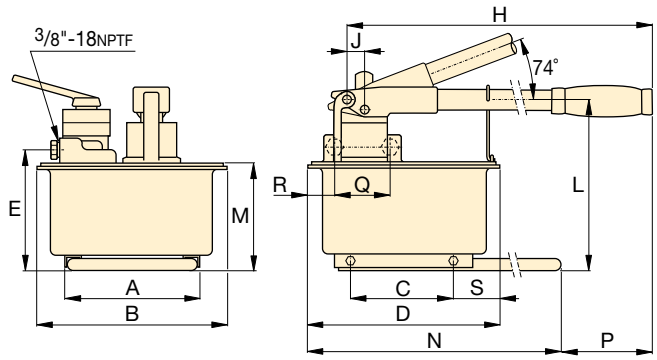
Maximum Operating Pressure:
10,000 psi



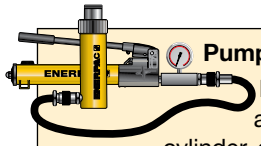
P-39, P-77



P-80, P-801, P-84



P-462, P-464



Pump and Cylinder Sets

P-80 is also available as a **set** (pump, cylinder, gauge, couplers and hose) for your ordering convenience.

Page: 58

Speed Chart

To determine how a specific pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the "Yellow Pages".

Page: 251

Cylinder Matching Chart

For help in selecting the correct hand pump for your application, please refer to the Cylinder Matching Chart located in the "Yellow Pages."

Page: 244

Piston Stroke	Dimensions (in)																Weight	Model Number
(in)	A	B	C	D	E	F	H	J	L	M	N	P	Q	R	S	T	(lbs)	
.81	15.50	20.47	1.28	1.50	1.25	–	18.25	1.18	4.69	2.56	5.25	–	–	–	–	–	13	**P-39**
1.00	16.46	20.67	1.30	1.57	2.04	–	22.04	1.34	4.57	1.97	4.72	–	–	–	–	–	15	**P-77**
1.00	16.75	21.22	1.00	1.75	2.13	–	20.75	1.14	6.88	.75	5.75	4.76	–	.83	.31	–	24	**P-80****
1.00	25.94	30.78	1.00	1.75	2.13	–	30.43	1.14	6.88	–	5.75	4.76	–	.83	.31	–	31	**P-801**
1.00	16.75	21.22	1.00	1.75	–	2.52	20.75	1.14	6.88	.75	5.75	4.76	1.50	1.69	.31	2.64	29	**P-84*****
1.50	8.25	12.13	6.42	12.63	7.68	–	26.44	.98	10.63	6.89	25.6	3.63	–	–	3.13	–	61	**P-462**
1.50	8.35	12.13	6.42	12.63	7.68	–	26.44	.98	10.63	6.89	25.6	3.63	3.50	2.68	3.13	–	61	**P-464*****

▼ Shown from left to right: **P-25, P-51, P-18**

When Less Than 10,000 psi is All You Need

- **P-25 and P-50 pump oil in both forward and reverse handle movement improving overall efficiency, ideal when mounting space is restricted**
- **External load-release valve**
- **Internal pressure-relief valve for overload protection**
- **P-51 can be operated in horizontal and vertical position with pump head and oil outlet facing downwards**

LX-101 Hand Pump Oil

A medium viscosity oil specially formulated for hand pumps. Performs well in low temperatures and requires less pumping effort than standard Enerpac HF blue oil.

Page: **122**

Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

Page: **117**

▼ *P-18 hand pump used for locking the rotating table for marble polishing.*

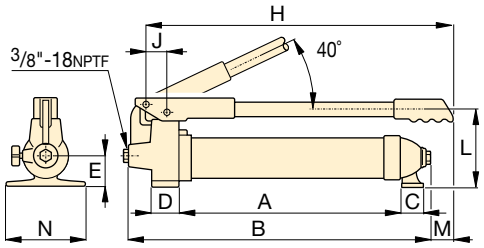
Pump Type	Usable Oil Capacity (in^3)	Model Number	Pressure Rating (psi)	Oil Displacement per Stroke (in^3)	Max. Handle Effort (lbs)
Single-speed	18	**P-18**	2,850	0.16	57
	200	**P-25**	2,500	0.58	60
	200	**P-50**	5,000	0.29	60
	50	**P-51**	3,000	0.25	61

P Series

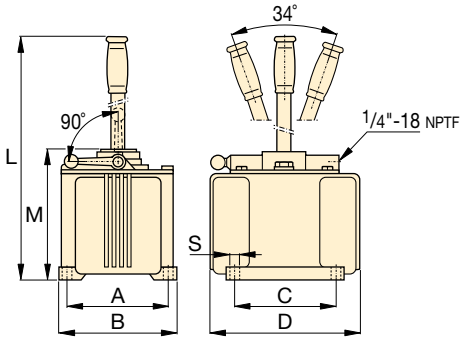
Reservoir Capacity:
18-200 in³

Flow at Rated Pressure:
.16-.58 in³/stroke

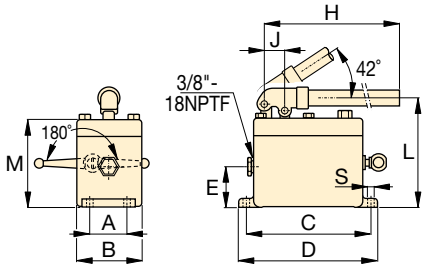
Maximum Operating Pressure:
2,500-5,000 psi



P-18



P-25, P-50



P-51

Hoses

Enerpac offers a complete line of high quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

Page: 118

P-51 hand pumps used with RC-series cylinders to keep wooden layers under pressure during lamination of plates. ▶

Piston Stroke	Dimensions (in)																Weight	Model Number
(in)	A	B	C	D	E	F	H	J	L	M	N	P	Q	R	S	T	(lbs)	
.81	8.25	12.88	1.28	1.50	1.88	–	8.50	1.18	4.38	.51	5.25	–	–	–	–	–	11	**P-18**
1.50	6.00	6.82	6.00	9.43	–	–	–	–	26.94	7.88	–	–	–	–	.40	–	36	**P-25**
1.50	6.00	6.82	6.00	9.43	–	–	–	–	26.94	7.88	–	–	–	–	.40	–	37	**P-50**
1.00	2.06	3.63	7.12	7.88	2.25	–	24.00	1.16	6.31	5.06	–	–	–	–	.34	–	12	**P-51**

Lightweight Hydraulic Foot Pump

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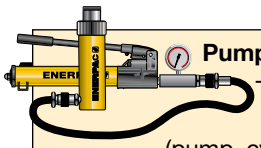
▼ Shown: **P-392FP**

P
Series

Flow at Rated Pressure:
.15 in³/stroke

Reservoir Capacity:
38 in³

Maximum Operating Pressure:
10,000 psi



Pump and Cylinder sets

The P-392FP is available as **sets** (pump, cylinder, gauge, couplers and hose) for your ordering convenience.

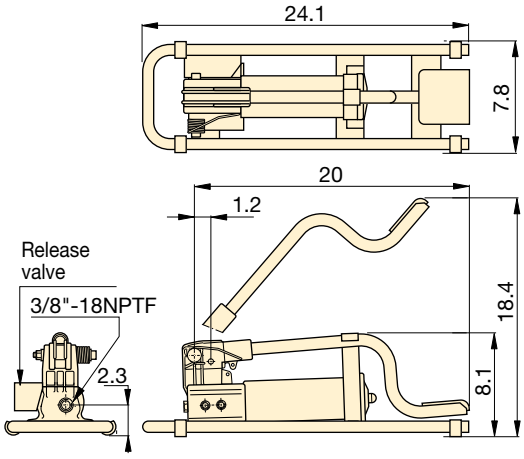
Page: 58

Hoses

Enerpac offers a complete line of high quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

Page: 118

- **Robust, durable and compact**
  - **Steel frame for maximum stability**
  - **Steel pumping handle**
  - **Aluminium reservoir**
- **Foot pedal lock and lightweight construction for portability**
- **Two-speed operation reduces foot pedal strokes**
- **Large foot-pad release valve for controlling load descent**
- **Internal pressure relief valve for overload protection**



▼ *P-392FP offers the advantage of hands free operation to handle and control the tool or cylinder.*

Usable Oil Capacity (in³)	Model Number	Pressure Rating (psi) 1st stage	Pressure Rating (psi) 2nd stage	Oil Displacement per Stroke (in³) 1st stage	Oil Displacement per Stroke (in³) 2nd stage	Max. Handle Effort (lbs)	Piston Stroke (in)	Weight (lbs)
38	**P-392FP** *	200	10,000	.687	.151	125	1	16

* Available as set, see note on this page.

▼ Shown: **MP-110**

MP
Series

Reservoir Capacity:
2 gal. (optional)

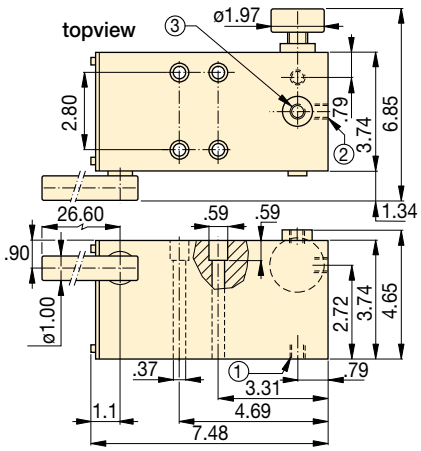
Flow at Rated Pressure:
.12-1.28 in³/stroke

Maximum Operating Pressure:
1,500-14,500 psi

Optional Reservoir Kit

The 2 gallon reservoir kit **MP-10T** includes tank with skid frame, top plate with reservoir seal, suction pipe and mounting bolts. Useable oil capacity is 1.5 gal.

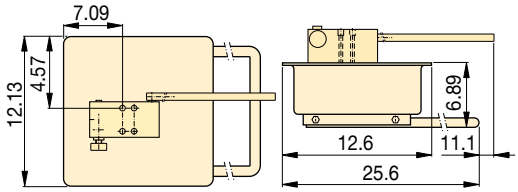
- **Superior corrosion resistance**
- **Impregnated aluminium anodized pump housing with stainless steel internal pumping components**
- **Standard Nitrile seals – excellent for demineralized water, oil/water emulsions, water glycols, mineral oils, hydraulic fluids**
- **Custom EPDM seals available for use with Skydrol® or brake fluids**
- **Two speed pumps up to 14,500 psi pressure**
- **Externally adjustable pressure relief valve**
- **1/4" NPTF gauge port**



MP-110, 350, 700, 1000

① Suction / Tank return port 3/8"-18 NPTF
② Pressure port 3/8"-18 NPTF
③ Gauge port 1/4"-18 NPTF

▼ *MP-Series pumps are ideal for testing and filling applications.*



MP-10T

Pump Type	Usable Oil Capacity (in³)	Model Number	Pressure Rating (psi) 1st stage	Pressure Rating (psi) 2nd stage	Oil Displacement per Stroke (in³) 1st stage	Oil Displacement per Stroke (in³) 2nd stage	Max. Handle Effort (lbs)	Piston Stroke (in)	Weight (lbs)
Two Speed	*	**MP-110**	500	1500	3.2	1.28	99	1.04	14.5
	*	**MP-350**	500	5000	3.2	.43	99	1.04	14.5
	*	**MP-700**	500	10,000	3.2	.18	99	1.04	14.5
	*	**MP-1000**	500	14,500	3.2	.12	99	1.04	14.5

Note: MP-Pump includes .060 in. thick gasket for reservoir mounting.
* MP-Series pumps require the use of an external reservoir.

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▼ Shown from left to right: **11-100, P-2282**

Ultra-High Pressure up to 40,000 psi

2-Way Shut-Off Valve 72-750

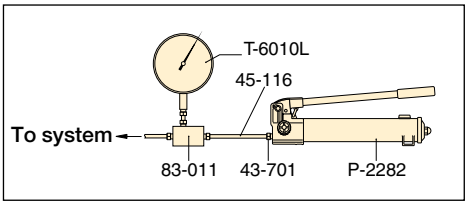
For 40,000 psi applications requiring a shut-off valve or gauge snubber. Made of 318 Stainless Steel and utilizing .38 inch cone fittings, it is the perfect selection for use with your Ultra-High Pressure Hand Pump.

Test System Gauges

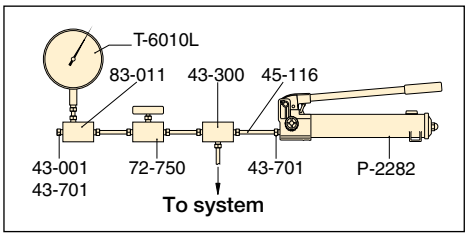
Ideal for monitoring pressure in your hydraulic circuit, Test System Gauges, such as the **T-6010L**, are available with cone threads or NPTF threads and in a variety of pressure ranges.

Page: 128

- **Two-speed operation on the P-2282 allows for faster fill, reducing cycle times for many testing applications**
- **303 Stainless steel construction on the 11-100 and 11-400 models enable use with many different fluids, such as distilled water, alcohol, diesters, silicones, soluble oils and petroleum**
- **Large release knob for improved control of pressure release**
- **Outlet ports are 3/4"-16 cone for 40,000 psi rating**



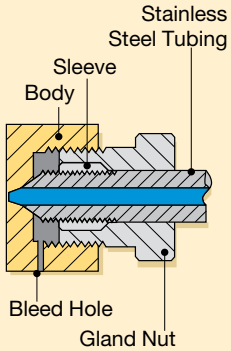
▲ *Typical Test System*



▲ *Test System with Gauge and Snubber*

Cone Seal

Stainless Steel High Pressure fittings seal on a "cone" surface and do not require pipe sealer. The Gland Nut holds the sleeve and tubing tight against the cone surface to provide a 40,000 psi seal.



Pump Type	Usable Oil Capacity (in^3)	Model Number	Pressure Rating* (psi) 1st stage	Pressure Rating* (psi) 2nd stage	Oil Displacement per Stroke (in^3) 1st stage	Oil Displacement per Stroke (in^3) 2nd stage	Max. Handle Effort (lbs)
Two-speed	60	**P-2282**	200	40,000	.99	.037	106
Single-speed	45	**11-100**	N/C	10,000	N/C	.152	120
	45	**11-400**	N/C	40,000	N/C	.038	120

* Contact Enerpac for applications where operating pressure is less than 10% of pressure rating.

▼ Optional Ultra-High Pressure Fittings and Tubing

Description		Connection	Model No.
		40,000 psi	
Gland Nut Plug		.38" cone	43-001
Elbow		.38" cone	43-200
Tee		.38" cone	43-300
Gauge Tee		.38" cone side/ .25" cone gauge port	43-301
Gauge Adaptor		.38" cone side/ .25" cone gauge port	83-011
Coupling		.38" cone	43-400
Cross		.38" cone	43-600
Gland Nut with Sleeve		.38" cone	43-701
Gauge Connector		.25" cone	43-704
Tubing		4" tube, O.D. .38" *	45-116
		8" tube, O.D. .38" *	45-126
		12" tube, O.D. .38" *	45-136
		10,000 psi only	
Adaptor		.38" F cone to ¼" M NPTF	41-146
		.38" F cone to ⅜" M NPTF	41-166
Adaptor		.38" F cone to ¼" F NPTF	41-246
		.38" F cone to ⅜" F NPTF	41-266
Adaptor		.38" M cone to ⅜" F NPTF	41-366

Note: .25" cone fittings use 9⁄16"-18 threads, ⅜" cone fittings use ¾"-16 threads.

* Actual tubing lengths are .75" less than nominal size shown. These dimensions make distance between centers of valves and fittings multiples of 4" spaces.

P/11 Series

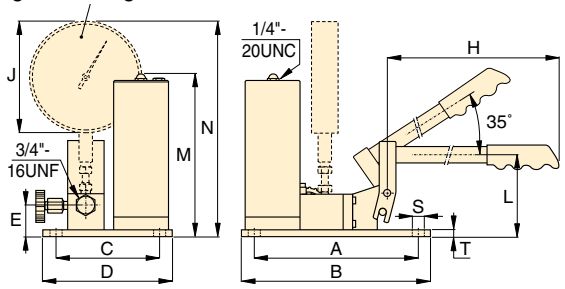
Reservoir Capacity:
45-60 in³

Flow at Rated Pressure:
.037-.152 in³/stroke

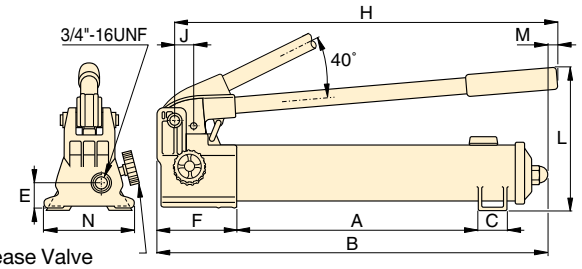
Maximum Operating Pressure:
10,000-40,000 psi

Stainless Steel Construction
Ultra-high Pressure Fittings feature all stainless steel construction except adaptor **41-366**, which features nickel plated carbon steel construction.

Optional T-Series gauge and fitting



11-100, 11-400



Release Valve
P-2282

	Piston Stroke	Dimensions (in)													Weight	Model Number
	(in)	A	B	C	D	E	F	H	J	L	M	N	S	T	(lbs)	
	1.00	13.56	22.00	1.40	–	1.24	5.25	20.75	1.16	9.00	.28	4.74	–	–	14	P-2282
	.78	9.45	10.50	5.98	7.00	1.77	–	25.00	6.41	4.50	9.33	12.38	.31	.37	22	11-100
	.78	9.45	10.50	5.98	7.00	1.77	–	25.00	6.41	4.50	9.33	12.38	.31	.37	22	11-400

▼ Shown: **BP-122**

Cordless Hydraulic Power

- **Lightweight, compact design with integrated handle for maximum portability**
- **Dual power selection and variable speed for preferred flow and precise control**
- **Heavy-duty 28 volt Lithium-Ion battery pack delivers constant fade-free power**
- **Immediate charging after use — a quick one hour charge**
- **Pump model includes two 3.0 amp-hour battery packs and quick charger**

28-Volt Lithium-Ion Battery

Heavy-duty construction with easy to operate latches. Fuel gauge LEDs show remaining charge.

Number of illuminated LEDs	Charge Remaining
4 ■■■■	100%-78%
3 ■■■	77%-56%
2 ■■	55%-34%
1 ■	33%-10%
Flashing	less than 10%

G2535L Gauge

Minimize the risk of overloading and ensure long dependable service from your cordless pump.

Page: 127

Battery packs contain no cadmium, so they are environmentally friendly. Enerpac encourages recycling.

◀ *Take the battery pump anywhere without any power cords or air hoses.*

Battery Powered Hydraulic Pump

Battery Powered Pump

The BP cordless pump is best suited for small to medium size cylinders or hydraulic tools, or wherever portable cordless hydraulic power is needed.

Powerful for everyday use, its lightweight and ergonomic design is ideal for both remote job sites or wherever a cord gets in the way.

The Lithium-Ion battery operates at peak performance under extreme conditions to get more work completed. The battery pack provides the power to run the cordless pump at maximum pressure for over six minutes. Numerous applications are easily and safely performed using the cordless pump powered by the Lithium-Ion battery pack.*

- 130 cuts of 3/8-inch reinforcing bar using the WHC750 Cutter
- 75 lifts with a WR5 Spreader
- Safely remove thirty 1-inch nuts using the NC3241 Nut Splitter
- Lift loads multiple times using 5–100 ton jacks

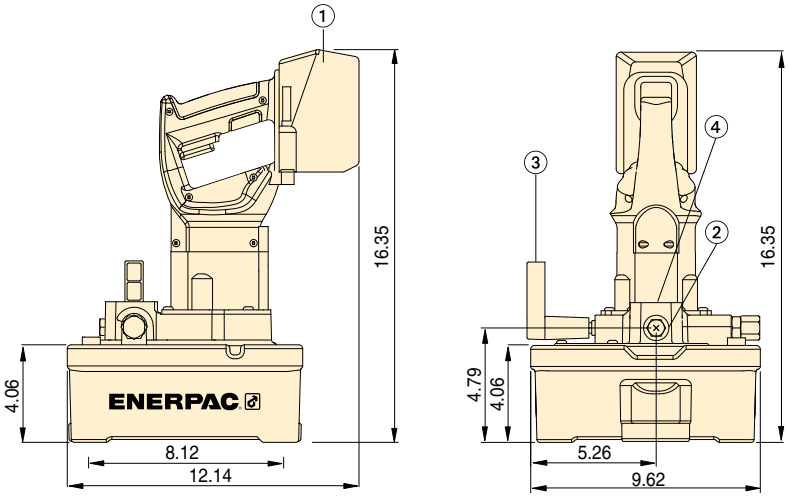
*Actual number of cycles will depend on condition of tool, battery, and ambient conditions.

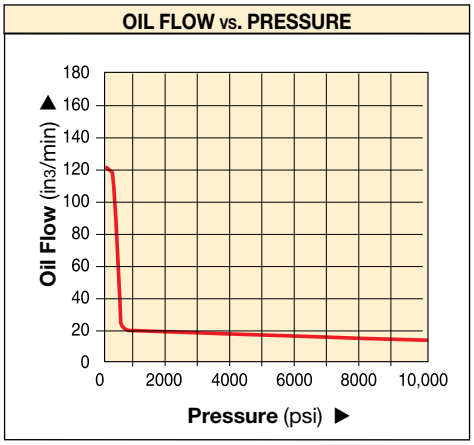
BP Series

Reservoir Capacity:
.5-1.0 gal.

Flow at Rated Pressure:
15 in³/min.

Maximum Operating Pressure:
10,000 psi





① 28-Volt Lithium-Ion battery

② ⅜"-18 NPTF oil outlet

③ 3-way, 2-position valve

④ ¼"-18 NPTF gauge port

▼ *Power and simplicity for the toughest jobs.*

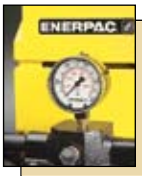
▼ SELECTION CHART

Usable Oil Capacity (gal)	Model Number	Output Flow Rate (in³/min) 200 psi	Output Flow Rate (in³/min) 10,000 psi	Valve Function	Charger Voltage (VAC)	Weight (lbs)
0.5	**BP-122**	120	15	3-way, 2-pos.	115	21.2
1.0	**BP-124**	120	15	3-way, 2-pos.	115	24.0
0.5	**BP-122E**	120	15	3-way, 2-pos.	230	21.2
1.0	**BP-124E**	120	15	3-way, 2-pos.	230	24.0

▼ Shown: **PUJ-1200B**

Heavy on Performance, Light on Weight

- **Lightweight and compact design, 22 to 41 lbs**
- **Large easy-carry handle for maximum portability**
- **Two-speed operation reduces cycle times for improved productivity**
- **115 VAC 50/60-cycle universal motor will operate on voltages as low as 60 volts**
- **24 VAC remote motor control, 10-ft length for operator safety**
- **Starts under full load**
- **High strength molded shroud with integral handle, protects motor from contamination and damage**
- **Designed for intermittent duty cycle**



Gauges

Minimize the risk of over-loading and ensure long, dependable service from your equipment. For use with the Economy pump the G-2535L gauge and GA-3 gauge adaptor are suggested.

For a full range of gauges, please refer to the System Components section.

Page: 117

Speed Chart

To determine how the 0.5 hp Economy pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the "Yellow Pages".

Page: 251

▼ *An Economy pump PUJ-1200B is used with an RC-2514 to reposition a stamping die to simplify maintenance.*

Used with Cylinder	Usable Oil Capacity (gal)	Model Number*	Pressure Rating (psi)	
			1st stage	2nd stage
Single-acting	.50	**PUD-1100B**	200	10,000
	1.00	**PUD-1101B**	200	10,000
	.50	**PUD-1300B**	200	10,000
	1.00	**PUD-1301B**	200	10,000
	.50	**PUJ-1200B**	200	10,000
	1.00	**PUJ-1201B**	200	10,000
Double-acting	.50	**PUJ-1400B**	200	10,000
	1.00	**PUJ-1401B**	200	10,000

About the Economy Pump

The Economy pump is best suited to power small to medium size cylinders or hydraulic tools. Its lightweight and compact design makes it ideal for applications which require easy transport of the pump.
The Universal motor works well on long extension cords or generator-driven electrical power supplies.

For further application assistance refer to the "Yellow Pages".

PUD-1100 Series
- Provides advance/auto-retract of single-acting cylinders
- Ideal for punching applications
- For applications not requiring load holding
- 10-ft pendant controls motor and valve operation

PUD-1300 Series
- Provides advance/hold/retract of single-acting cylinders
- 10-foot pendant controls motor and valve operation
- Ideal for applications requiring remote valve operation.

PUJ-Series
- Available with 3- and 4-way valves for single- or double-acting cylinders
- 10-ft pendant controls the motor operation
- Manual valves provide advance/retract tool control

Page: 244

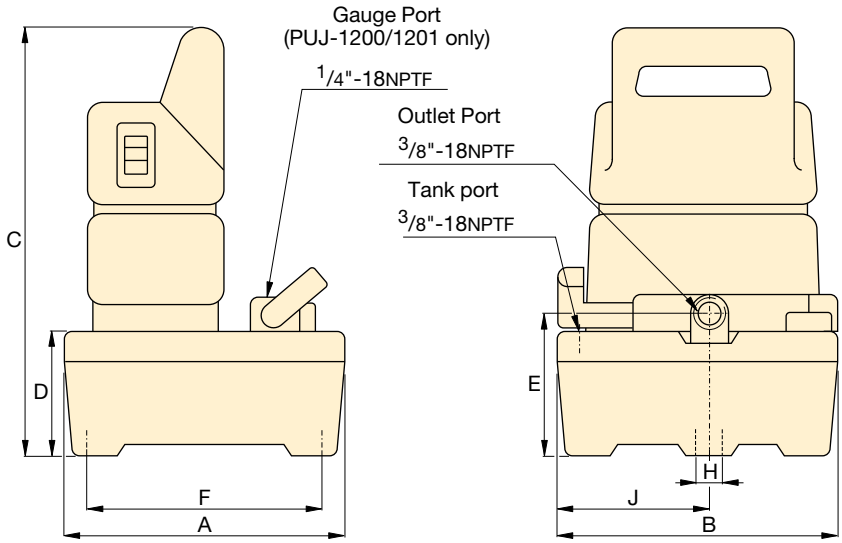
PU Series

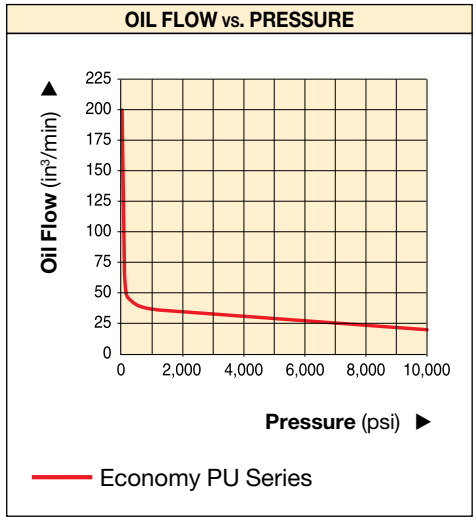
Reservoir Capacity:
0.5-1.0 gal.

Flow at Rated Pressure:
20 in³/min.

Motor Size:
.5 hp

Maximum Operating Pressure:
10,000 psi





Output Flow Rate (in³/min) 1st stage	Output Flow Rate (in³/min) 2nd stage	Valve Type	Current Draw (Amps)	Motor Voltage (VAC)	Sound Level (dBA)	Dimensions (in) A	B	C	D	E	F	H	J	Weight (lbs)	Model Number*
200	20	Dump **	9.5	115	85	9.62	9.62	14.25	4.00	4.72	8.00	.40	5.25	26	PUD-1100B
200	20		9.5	115	85	14.50	12.18	14.72	4.15	5.12	12.74	.40	5.62	35	PUD-1101B
200	20	Dump and Hold	9.5	115	85	9.62	9.62	14.25	4.00	4.72	8.00	.40	5.25	26	PUD-1300B
200	20		9.5	115	85	14.50	12.18	14.72	4.15	5.12	12.74	.40	5.62	35	PUD-1301B
200	20	3-way, 2-pos.	9.5	115	85	9.62	9.62	14.25	4.00	4.72	8.00	.40	5.25	24	PUJ-1200B
200	20		9.5	115	85	14.50	12.18	14.72	4.15	5.12	12.74	.40	5.62	31	PUJ-1201B
200	20	4-way, 3-pos.	9.5	115	85	9.62	9.62	14.25	4.00	4.72	8.00	.40	5.25	29	PUJ-1400B
200	20		9.5	115	85	14.50	12.18	14.72	4.15	5.12	12.74	.40	5.62	36	PUJ-1401B

* For 230 volt applications replace "B" suffix with "E".
** Electric dump valve for auto-retract of cylinders.

▼ Shown: **PEJ-1401B**

Best Performance for Mid-Range Cylinders and Tools

- **Two-speed operation reduces cycle times for improved productivity**
- **Powerful .5 hp induction motor is submerged in the oil reservoir to run cooler, protect the motor, simplify the pump interface, save space and reduce noise**
- **Large 1.5 gallon reservoir allows operation of a wide range of cylinders**
- **24 VDC remote pendant control on certain models for safer operation**
- **Externally adjustable relief valve allows control of operating pressure without opening the pump**
- **40-micron internal return line filter keeps oil clean, promoting longer pump life**
- **Full length side tube for easy monitoring of oil level**

◀ *The Remote Jog model of the Submerged Pump simplifies repair on this construction crane.*

▼ **SELECTION CHART**
For more technical information see next page.

5 BASIC PUMP TYPES Select the model that suits your application. For special requirements see **page 77** or contact your Enerpac office.	
PED-Series: with Dump Valve • Ideal for punching, crimping and cutting • For use when load holding is not required • Control pendant with 10 ft. cord controls valve and motor	
PEM-Series: with Manual Valve • Ideal choice for most applications • Manual valve control, for both single-acting and double-acting applications • Manual motor control	
PER-Series: with Solenoid Valve • Ideal for production and lifting • All valves are 3-position for Advance/Hold/Retract • Control pendant with 10 ft. cord for remote valve operation	
PEJ-Series: with Remote Jog • For light production and lifting applications • Manual valve control for single-acting or double-acting cylinders • Control pendant with 10 ft. cord for remote motor operation	
PES-Series: with Pressure Switch • Designed for maintaining pressure applications, such as clamping, workholding and testing • All versions include manual valves for directional control	

* Contact Enerpac for details on VM style valves.

Submerged Electric Pumps

Submerged Pump Application

The Submerged pump is best suited to power small to medium size cylinders or hydraulic tools, or whenever a quiet, intermittent duty cycle is needed. With its low sound level and the addition of the optional oil cooler, the Submerged pump is suited to light production work as well.

Its lightweight and compact design also make it ideal for applications which require some transport of the pump.

For further application assistance see the “Yellow Pages” or contact your local Enerpac office.

Page: 244

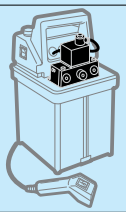
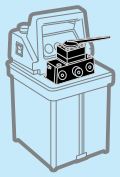
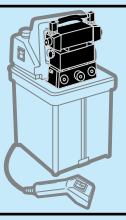
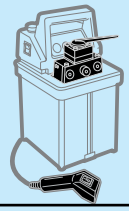
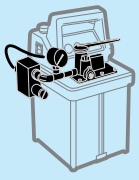
PE Series

Reservoir Capacity:
1.5 gal.

Flow at Rated Pressure:
20 in^3/min.

Motor Size:
.5 hp

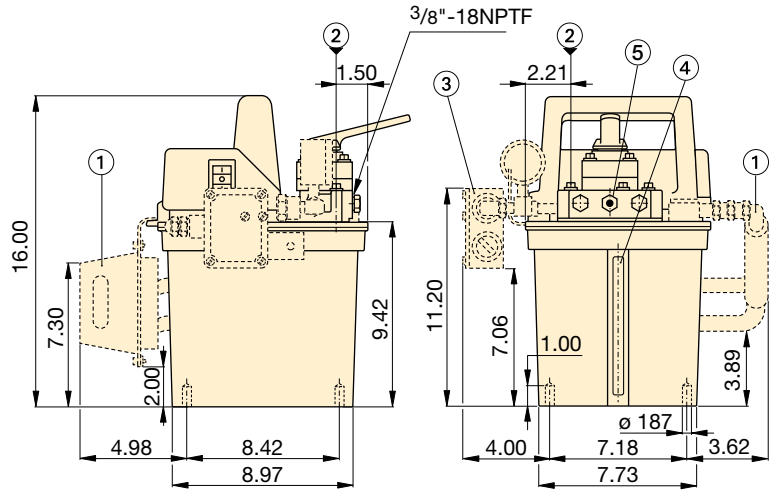
Maximum Operating Pressure:
10,000 psi

	Pump Type	Used with Cylinder	Valve Function	Valve Type*	Usable Oil Capacity (gal)	Model Number 115 VAC, 1 ph	Weight (lbs)
		Single-acting	Advance/Retract	Dump	1.5	**PED-1101B**	55
		Single-acting	Advance/Retract	Manual VMP 10000D	1.5	**PEM-1201B**	53
		Single-acting	Advance/Hold/Retract	Manual VMF 10000D	1.5	**PEM-1301B**	53
		Double-acting	Advance/Hold/Retract	Manual VMC 10000D	1.5	**PEM-1401B**	53
		Single-acting	Advance/Hold/Retract	Solenoid (VEF-15500D)	1.5	**PER-1301B**	65
		Double-acting	Advance/Hold/Retract	Solenoid (VEC-15600D)	1.5	**PER-1401B**	65
		Single-acting	Advance/Retract	Manual VMP 10000D	1.5	**PEJ-1201B**	55
		Single-acting	Advance/Hold/Retract	Manual VMF 10000D	1.5	**PEJ-1301B**	55
		Double-acting	Advance/Hold/Retract	Manual VMC 10000D	1.5	**PEJ-1401B**	55
		Single-acting	Advance/Retract	Manual VMP 10000D	1.5	**PES-1201B**	62
		Double-acting	Advance/Hold/Retract	Manual VMC 10000D	1.5	**PES-1401B**	62

◀ For full features see page 76.

Submerged Pump Performance							
Motor Size	Pressure Rating (psi)		Output Flow Rate** (in^3/min)		Motor Electrical Specifications*	Sound Level	Relief Valve Adjustment Range
(hp)	1st stage	2nd stage	1st stage	2nd stage	(Amps @ Volts-Ph-Hz)	(dBA)	(psi)
0.5	1,000	10,000	150	20	13 @ 115-1-50/60 6.75 @ 230-1-50/60	62-70	1,000-10,000

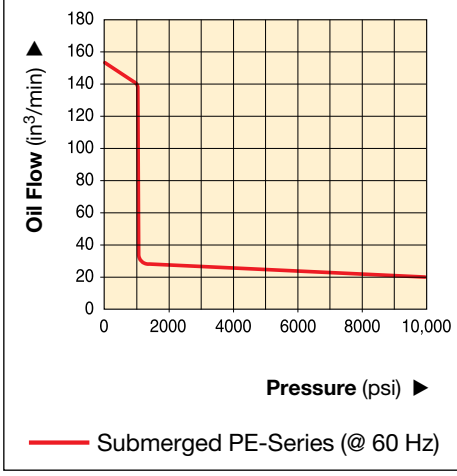
* At bypass and maximum pressure. See matrix footnotes on next page for Hz limitations.
** All flow data at 60 Hz, 50 Hz data will be 5/6 th this number.



Dimensions shown in inches.

① Heat Exchanger (optional for all models)
② Fill Port
③ Pressure Switch (PES-Series, optional for other models)
④ Oil Level Indicator
⑤ Adjustable Relief Valve

OIL FLOW vs. PRESSURE



Speed Chart

To determine how a submerged pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the "Yellow Pages".

Page: **251**

◀ *This PED-1001B Submerged pump quickly and quietly powers a hydraulic nut cutter in this bucket maintenance application.*

Submerged Electric Pumps Ordering Matrix

CUSTOM BUILD YOUR SUBMERGED PUMP
If the Submerged Pump that would best fit your application cannot be found in the chart on page 76, you can easily build your custom submerged pump here.

▼ This is how a Submerged Pump Model Number is built up:

P	E	M	-	1	3	01	B
1 Product Type	2 Motor Type	3 Pump Type		4 Pump Series	5 Valve Type	6 Reservoir Size	7 Motor Voltage

1 Product Type
P = Pump

2 Motor Type
E = Electric motor

3 Pump Type
D = Dump
J = Jog
M = Manual
R = Remote (Solenoid)[1) 2)]
S = Pressure switch

4 Pump Series
1 = .5 hp, 10,000 psi

5 Valve Type
0 = No valve (PER only)
1 = Dump
2 = 3-way, 2-position, normally open
3 = 3-way, 3-position, tandem center
4 = 4-way, 3-position, tandem center
5 = Modular valve (PER only)

6 Reservoir Size
01 = 1.5 gallon

7 Motor Voltage and Heat Exchanger
B = 115 V, 1 Ph, 60 Hz [1)]
D = 115 V, 1 Ph, 60 Hz [1)] with heat exchanger
E = 230 V, 1 Ph, 50 Hz [2)]
F = 230 V, 1 Ph, 50 Hz [2)] with heat exchanger
I = 230 V, 1 Ph, 60 Hz

[1)] Can also run at 50 Hz with manual valve
[2)] Can also run at 60 Hz with manual valve

Ordering Example

Model Number: PER-1301B

The PER-1301B is a .5 hp, 10,000 psi, submerged electric pump, with 1.5 gallon usable oil capacity, a 3-way, 3-position modular, remote solenoid valve and a 115 V, 1 Phase, 60 Hz motor.

PE Series

Reservoir Capacity:
1.5 gal.

Flow at Rated Pressure:
20 in³/min.

Motor Size:
.5 hp

Maximum Operating Pressure:
10,000 psi

Hoses
Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.
Page: 118

Gauges
Minimize the risk of over-loading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.
Page: 117

The **PER-1301B, PER-1401B, PER-1301D** and **PER-1401D** include a Modular (solenoid) Valve and pilot operating check.
Page: 114

Introducing the *Z-Class* power pumps from Enerpac—pumps that run cooler, use less electricity and are easy to service.

Enerpac has used the latest metallurgical, bearing and seal technologies to produce a pump whose features and benefits far surpass the electric pumps that are available today. By reducing the number of moving parts, improving flow dynamics and decreasing friction, *Z-Class* pumps will stay on the job longer, require less energy to operate and when needed, have lower service costs.

Z-Class electric pumps from Enerpac—simply the best pump you will ever use.

Z Tough.
Dependable.
Innovative.
CLASS

Z-Class Pumping Element — The Heart of Your Hydraulic System

Highly efficient design provides increased flow rates, reduced heat generation and a decrease in power consumption. This means improved tool speed and increased service life—which results in higher productivity and lower operating costs.

Heavy-duty bearings extend pump life by reducing friction, reducing surface-loading and lowering bearing stresses.

Pump cavity oil bath extends pump life by reducing heat, improving lubrication and reducing wear.

Self-priming, high-flow 1st stage pump increases pump performance by super-charging the 2nd stage piston pump—improving oil flow in both hot and cold weather operation.

Balanced rotating components reduce vibration creating a smoother running pump—reducing wear, friction and sound levels.

Replaceable piston check-valves increase service life of major pump components.

Ergonomic low-voltage pendant features sealed switches and operates at 15 VCD for improved operator safety.

Back-lit LCD on select *Z-Class* pumps

- pump usage information, hour and cycle counts
- low-voltage warning and recording
- offers self-test and diagnostic capabilities
- information displayed in 6 languages
- pressure read-out (when used with the optional pressure transducer)
- adjustable trigger pressure setting (when used with the optional pressure transducer)

ZU4 Series Pump Applications

- **Mobile:** when frequent pump transport is required and/or on remote locations
- **Universal motor:** 1-phase, runs well under poor voltage supply, using generator power supply or using long extension cord
- **Duty-cycle:** for intermittent applications
- **Cylinders and tools:** for medium to large size single- and double-acting applications and high speed.

ZE Series Pump Applications

- **Stationary:** when pump remains in one location
- **Induction motor:** 1 and 3-phase for high cycle usage
- **Duty-cycle:** for heavy-duty, extended cycle application
- **Cylinders and tools:** for medium to large size single- and double-acting applications and high speed

***Z-Class* factory installed options & accessories**

Extensive list of accessories including heat exchanger, roll-bars, skid bar, pressure transducer, return line filter and level and temperature switches, allow complete pump control over a wide range of industrial applications.

***Z-Class* electric pumps for your application**

Available in one flow range for universal motor and 4 flow ranges for induction motor. Choose from single or two-stage models to provide the optimum cylinder and tool performance for almost any industrial application.

Pump Series	Motor Size	Flow @ 10,000 psi
ZU4	1.7 hp	60 in^3/min
ZE3	1.0 hp	40 in^3/min
ZE4	1.5 hp	60 in^3/min
ZE5	3.0 hp	120 in^3/min
ZE6	7.5 hp	200 in^3/min

▼ Shown from left to right: **ZU4304MB, ZU4420SB-H, ZU4304PB-K**

Z Tough. Dependable. Innovative. CLASS

- **Features *Z-Class* high-efficiency pump design; higher oil flow and bypass pressure, cooler running and requires 18% less current draw than comparable pumps**
- **Powerful 1.7 hp universal electric motor provides high power-to-weight ratio and excellent low-voltage operating characteristics**
- **High-strength, molded composite shroud protects motor and electronics, while providing an ergonomic, non-conductive handle for easy transport**
- **Low-voltage pendant provides additional safety for the operator (remote control units)**

Pro Series pump only

- **LCD readout provides pressure and torque display and a number of diagnostic and readout capabilities never before offered on a portable electric pump**
- **AutoCycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed (pump can be used with or without auto cycle feature)**

◀ *Designed to be tough, the ZU4-Series with steel reservoirs will take the abuse of today's construction sites.The ZU4908JE is the ideal pump for post tensioning applications.*
For post tensioning tools *see page 184.*

▼ **COMMON PUMP MODELS**
For technical information and other options see next page.

BASIC PUMP TYPES Select the model that suits your application. For special requirements contact your Enerpac office.	
Manual Valve • Ideal choice for most applications • Manual valve control, for single-acting or double-acting applications • Motor control on shroud	
Manual Valve with Pendant • For light production and lifting applications • Manual valve control for single-acting or double-acting cylinders • Low-voltage control pendant with 10-ft. cord for remote motor operation	
Dump Valve • Ideal for punching, crimping and cutting • For use when load-holding is not required • Low-voltage control pendant with 10-ft. cord controls valve and motor	
Solenoid Valve • Ideal for lifting applications and where remote control is required • Motor runs continuously on pumps with VE33 and VE43 valves. With VE32 valve, motor only runs during the advance function, while holding and retracting, the motor is off • Low-voltage control pendant with 10 ft. cord for remote motor and valve operation	

***Z-Class* – A Pump For Every Application**

Patented *Z-Class* pump technology provides high by-pass pressures for increased productivity—important in applications using long hose runs and high pressure-drop circuits, like heavy lifting or certain double-acting tools.

Enerpac ZU4 Hydraulic Pumps are built to power small to large-sized cylinders or hydraulic tools, or wherever high-speed, intermittent duty, remote hydraulic power is needed.

Pro Electric Pump

- Digital (LCD) display features a built-in hour meter and shows self-diagnostic, cycle-count and low voltage warning information.

Pressure can also be displayed when the pump is equipped with an optional pressure transducer.

Standard Electric Pump

- For applications that do not require digital display features of the Premium Pump. Available in all manual or jog versions.

Classic Electric Pump

- The *Classic* has traditional electro-mechanical components (transformers, relays and switches) in place of solid-state electronics. The Classic delivers durable, safe and efficient hydraulic power for demanding markets like construction, post-tensioning and foundation repair.

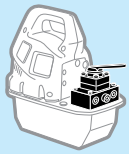
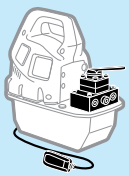
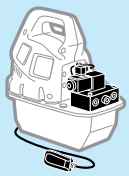
ZU Series

Reservoir Capacity:
1.0-10.0 gal.

Flow at Rated Pressure:
60 in³/min.

Motor Size:
1.7 hp

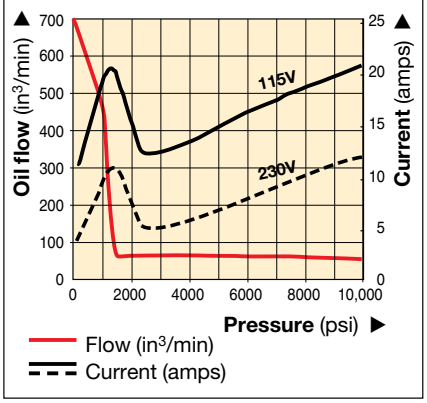
Maximum Operating Pressure:
10,000 psi

Pump Type	Used with Cylinder		Valve Function			Valve Type[2]	Pump Control	Usable Oil Capacity (gal)	Model Number 115 VAC[3] 1 Phase			Pro Product Weight w/oil[4] (lbs)
									Classic	STD Electric	Pro Electric	
	●		●		●	VM32	Manual	1.0	**ZU4204RB**	**ZU4204MB**	**ZU4204LB**	59
	●		●		●	VM32	Manual	2.0	**ZU4208RB**	**ZU4208MB**	**ZU4208LB**	69
	●		●	●	●	VM33	Manual	2.0	**ZU4308RB**	**ZU4308MB**	**ZU4308LB**	70
	●		●	●	●	VM33	Manual	5.0	**ZU4320RB**	**ZU4320MB**	**ZU4320LB**	109
		●	●	●	●	VM43	Manual	2.0	**ZU4408RB**	**ZU4408MB**	**ZU4408LB**	70
		●	●	●	●	VM43	Manual	5.0	**ZU4420RB**	**ZU4420MB**	**ZU4420LB**	109
	●		●		●	VM32	Remote (Man.)	1.0	**ZU4204PB**	**ZU4204JB**	**ZU4204KB**	60
	●		●		●	VM32	Remote (Man.)	2.0	**ZU4208PB**	**ZU4208JB**	**ZU4208KB**	70
	●		●		●	VM32	Remote (Man.)	5.0	**ZU4220PB**	**ZU4220JB**	**ZU4220KB**	109
	●		●	●	●	VM33	Remote (Man.)	2.0	**ZU4308PB**	**ZU4308JB**	**ZU4308KB**	71
		●	●	●	●	VM43	Remote (Man.)	2.0	**ZU4408PB**	**ZU4408JB**	**ZU4408KB**	71
		●	●	●	●	VM43	Remote (Man.)	5.0	**ZU4420PB**	**ZU4420JB**	**ZU4420KB**	110
	●		●		●	VE32D	Remote	1.0	**N/A**	**N/A**	**ZU4104DB**	63
	●		●		●	VE32D	Remote	2.0	**N/A**	**N/A**	**ZU4108DB**	73
	●		●		●	VE32D	Remote	5.0	**N/A**	**N/A**	**ZU4120DB**	112
						–	–	–	–	–	–	–
						–	–	–	–	–	–	–
						–	–	–	–	–	–	–
	●		●		●	VE32	Remote	1.0	**N/A**	**N/A**	**ZU4204SB**	63
	●		●		●	VE32	Remote	2.0	**N/A**	**N/A**	**ZU4208SB**	73
	●		●	●	●	VE33	Remote	2.0	**N/A**	**N/A**	**ZU4308SB**	85
		●	●	●	●	VE43	Remote	2.0	**N/A**	**N/A**	**ZU4408SB**	85
		●	●	●	●	VE43	Remote	5.0	**N/A**	**N/A**	**ZU4420SB**	124
						–	–	–	–	–	–	–
						–	–	–	–	–	–	–
						–	–	–	–	–	–	–
						–	–	–	–	–	–	–

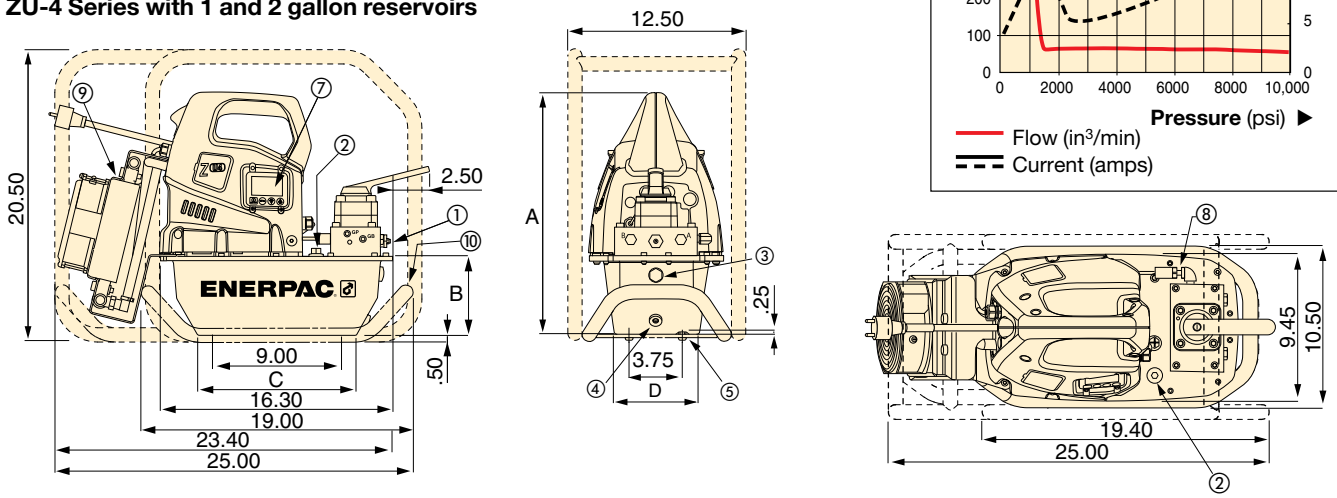
1) All models meet CE safety requirements. "E" voltage versions also meet all requirements of the European EMC-Directive.
2) See valves section for technical information on valve types.
3) See custom order matrix for other voltage options.
4) Subtract 3 lbs. for STD Electric models.

ZU4 Performance							
Motor Size	Output Flow Rate (in^3/min)				Motor Electrical Specification	Sound Level	Relief Valve Adjustment Range
(hp)	100 psi	700 psi	5000 psi	10,000 psi	(volts-ph-Hz)	(dBA)	(psi)
1.7	700	535	76	60	115-1-50/60 230-1-50/60	85-90	2,000-10,000

Oil Flow and Current vs. Pressure

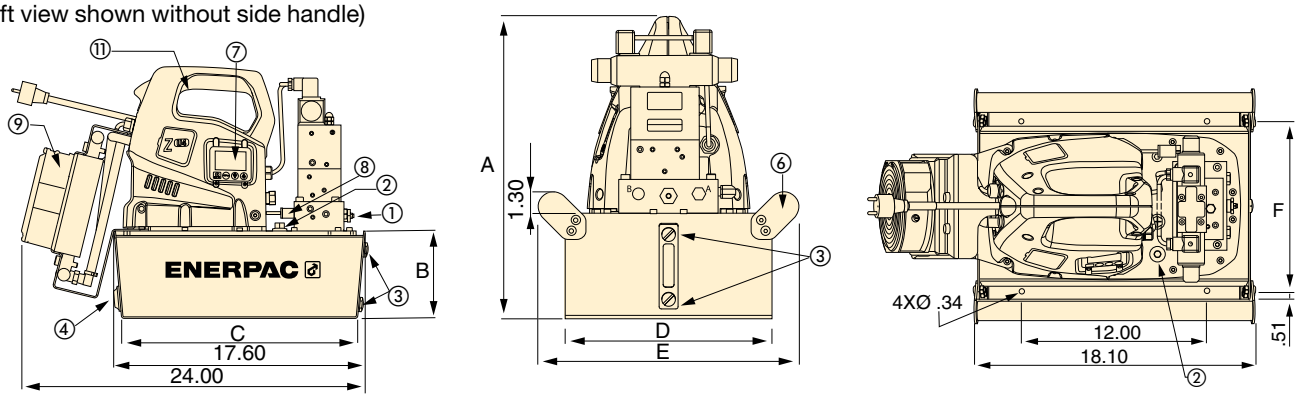


ZU-4 Series with 1 and 2 gallon reservoirs



ZU-4 Series with 2.5, 5.0 and 10.0 gallon reservoirs

(Left view shown without side handle)



① User adjustable relief valve
② Oil fill port, SAE#10
③ Oil level sight gauge
④ Oil Drain, 1/2" NPTF
⑤ M8 x 1.25
⑥ Handles on all 2.5, 5.0, and 10.0 gallon reservoirs

Factory installed features and options

⑦ Back-lit LCD Electric
⑧ Pressure transducer
⑨ Heat exchanger
⑩ Skid bar
⑪ Handle guard installed on all 2.5, 5, and 10 gal reservoirs
⑫ Reservoir handles included on all 2.5, 5 and 10 gallon pumps

◀ *Increased output flow and extended brush life increase productivity for post-tensioning applications.*

Pump Dimensions						
Usable Reservoir Capacity (gal)	A (in)	B (in)	C (in)	D (in)	E (in)	F (in)
1.0	16.7	5.6	11.0	6.0	-	-
2.0	16.7	5.6	11.0	8.1	-	-
2.5	17.3	6.2	16.5	12.0	15.1	11.0
5.0	18.3	7.1	16.5	16.6	19.7	15.6
10.0	21.7	10.6	15.7	19.9	22.7	18.9

CUSTOM BUILD YOUR ZU4 SERIES PUMP
If the ZU4 Series pump that would best fit your application cannot be found in the chart on page 82, you can easily build your custom ZU4 Series pump here.

▼ This is how a ZU-Series pump model number is built up:

Z	U	4	4	08	L	B	-	H	K	T	
1 Product Type	2 Motor Type	3 Flow Group	4 Valve Type	5 Reservoir Size	6 Valve Operation	7 Voltage		8 Options	8 Options	8 Options	8 Options

1 Product Type
Z = Pump Series

2 Motor Type
U = Universal electric motor

3 Flow Group
4 = 60 in^3/min @ 10,000 psi

4 Valve Type (see page 110 for more details)
1 Dump (VE32D)
2 3 way/2 position manual or electric (VM32 or VE32)
3 3 way/3 position manual or electric (VM33 or VE33)
4 4 way/3 position manual or electric (VM43 or VE43)
6 3 way/3 position locking manual w/po check (VM33-L)
7 3 way/2 position manual or electric (VM22)
8 4 way/3 position locking manual w/po check (VM43-L)
9 4 way/3 position manual w/power seating (VM43-LPS)

5 Reservoir Size (useable capacity)
04 = 1.0 gallon
08 = 2.0 gallon
10 = 2.5 gallon (includes side handles)
20 = 5.0 gallon (includes side handles)
40 = 10.0 gallon (includes side handles)

6 Valve Operation
D = Dump (solenoid valve w/pendant and LCD Electric)
J = Jog (manual valve w/pendant and Standard Electric (i.e. w/o LCD)
K = Jog (manual valve w/pendant and LCD Electric)
L = Manual valve w/LCD Electric (w/o pendant)
P = Manual valve w/pendant and classic electric (i.e.w/o LCD)
R = Manual valve w/Classic electric (i.e. w/o LCD) [w/o pendant]
M = Manual valve w/Standard Electric (i.e. w/o LCD) [w/o pendant]
S = Solenoid valve w/pendant and LCD Electric

7 Voltage
B = 115V, 1 ph, 50/60Hz
E = 208-240V, 1 ph, 50/60 Hz (w/European plug and CE EMC compliant)
I = 208-240V, 1 ph, 50/60 Hz (w/NEMA 6-15 plug)

8 Options
F = Filter
G = 0-15,000 psi gauge (2 1/2") [1]
H = Heat exchanger
K = Skidbar (1 and 2 gallon reservoirs only)
L = Level/temp switch [2] [3]
N = No reservoir handles (includes lifting eyes)
R = Roll bar
T = Pressure transducer [2]
U = Foot switch

[1] Pressure gauge not available on pump models with pressure transducer
[2] These options require LCD electric
[3] Not available on 1 and 2 gallon reservoirs

ZU Series

Reservoir Capacity:
1.0-10.0 gal.

Flow at Rated Pressure:
60 in^3/min.

Motor Size:
1.7 hp

Maximum Operating Pressure:
10,000 psi

Speed Chart
To determine how a submerged pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the "Yellow Pages".
Page: 251

Ordering Example
Model Number:
ZU4408LB-HKT
ZU4408LB-HKT is a 60 in^3/min at 10,000 psi pump with a 4-way, 3-position manual valve, a 2 gal. (8-liter) reservoir, operates on 115V, 1ph, 50/60 Hz and is specified with optional LCD electrical panel, heat exchanger, pressure transducer and skidbar.

Torque Wrench Pumps
System matched air and electric pumps provide control to operate Enerpac Torque Wrenches.
Page: 204

Pressure Transducer*

- **More durable than analog gauges (against mechanical and hydraulic shock)**
- **More accurate than analog gauges (0.5% full scale of pump)**
- **Calibration can be fine tuned for certification**
- **"Set pressure" feature turns off motor at user defined pressure (or shifts valve to neutral on models with VE33/ VE43 valves)**
- **Display pressure in psi, bar, or MPa**

* Requires LCD Electric

Accessory Kit Model Number	Adjustable Pressure Range (psi)	Switch-point repeatability	Dead-band (psi)
ZPT-U4 *	50-10,000	± 0,5%	50

***** Add suffix **T** for factory installation.

Level/Temperature Switch

- **Ensures feedback on pump oil level and temperature**
- **Drop-in design allows for easy installation to pump reservoir**
- **Plugs directly into pump electrical enclosure**
- **Built-in thermal sensing shuts off pump when unsafe operating temperature is reached**
- **Oil level switch shuts down pump before oil reaches an unsafe operating level**

Model Number	Operating Temperature (° F)	Maximum Pressure (psi)	Weight (lbs)
ZLS-U5	40-230	150	.11

***** Add suffix **L** for factory installation.

Foot Switch

- **Hands-free remote control on solenoid dump and 3-position valves**
- **With 10 foot cord**

Accessory Kit No.	Can be used on ZU4 Pumps with
ZCF-2 *	Solenoid VE-Series valves

***** Add suffix **U** for factory installation.

Roll Cage

- **Protects pump**
- **Provides greater pump stability**

Accessory Kit Number	Fits on Reservoir
ZRC-04 *	1 and 2 gallon[1)]
ZRC-04H *	1 and 2 gallon[2)]
ZRB-10 *	2.5 gallon
ZRB-20 *	5 gallon
ZRB-40 *	10 gallon

***** Add suffix **R** for factory installation.
[1)] Without heat exchanger [2)] With heat exchanger

Ordering Example:
Model No. ZU4208BB-QR

Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

Page: 118

Gauges

Minimize the risk of overloading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

Page: 117

ZU-Series Factory Installed Options and Accessories

Heat Exchanger*

- **Removes heat from the bypass oil to provide cooler operation**
- **Stabilizes oil viscosity, increasing oil life and reduces wear of pump and other hydraulic components**

* Requires LCD Electric

Heat Exchanger

Can be factory installed on ZU4-Series LCD Electric pumps.

- Extends system life
- Stabilizes oil temperature at a maximum of 130° F at 70° F ambient temperature.

Do not exceed maximum oil flow and pressure ratings. Heat exchanger is not suitable for water-glycol or high water based fluids.

ZU Series

Reservoir Capacity:
1.0-10.0 gal.

Flow at Rated Pressure:
60 in³/min.

Motor Size:
1.7 hp

Maximum Operating Pressure:
10,000 psi

Accessory Kit No. *	Can be used on
ZHE-U115	115V pumps
ZHE-U230	230V pumps

Return Line Filter

- **25 micron nominal filter removes contaminants from return oil flow before allowing it back into tank**
- **Internal by-pass valve prevents damage if filter is dirty**
- **With maintenance indicator**
- **Replaceable filter element PF25**

Skidbar*

- **Provides easy two-hand lift**
- **Provides greater pump stability on soft or uneven surfaces**
- **Also available as an add-on kit (model number SBZ-4)**

* 1 and 2 gallon reservoirs only

Accessory Kit Model Number	Maximum Pressure (psi)	Maximum Oil Flow (GPM)	By-pass Setting (psi)
ZPF *	200	12.0	25

* Add suffix **F** for factory installation.

Accessory Kit No.	For ZU-Series Pumps with Reservoir	Weight (lbs)
SBZ-4 *	1-2 gal. w/o heat exchanger	4.9
SBZ-4L *	1-2 gal. with heat exchanger	5.5

* Add suffix **K** for factory installation.

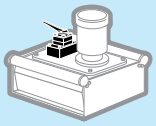
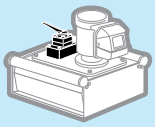
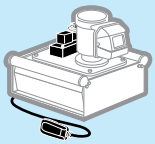
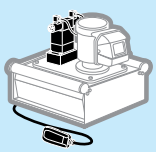
▼ Shown from left to right: **ZE3304MB-K, ZE4110DB-FHR**

The New Standard for Industrial Applications, *Z-Class*

Oil Level Indicators

All ZE pumps feature an oil level indicator—sight glasses on the 1 and 2 gallon reservoirs and oil level gauges on the 2.5, 5 and 10 gallon reservoirs.

▼ SELECTION CHART *

	BASIC PUMP CONFIGURATIONS Select your ZE pump model here for most applications. For special requirements, see the ZE Pump ordering matrix. 91	Pump Type	Used with Cylinder		Valve Function			Valve** Model Number	Useable Oil Capacity (gal)
MANUAL VALVE CONTROL	**Manual Valve without electric box or LCD** • Ideal choice for most applications • Manual valve control, for both single-acting or double-acting applications • Manual motor control • On/off switch on 1-phase electric motor		●		●		●	VM32	2.0
			●		●	●	●	VM33	2.0
			●		●	●	●	VM33	5.0
			●		●	●	●	VM33	10.0
				●	●	●	●	VM43	2.0
				●	●	●	●	VM43	5.0
				●	●	●	●	VM43	10.0
	Manual Valve with electric box and LCD • Ideal choice for most applications • Manual valve control, for both single-acting or double-acting applications • Manual motor control		●		●		●	VM32	2.0
			●		●		●	VM32	2.5
			●		●	●	●	VM33	5.0
			●		●	●	●	VM33	10.0
				●	●	●	●	VM43	5.0
				●	●	●	●	VM43	10.0
REMOTE VALVE CONTROL	**Solenoid Dump Valve with electric box and LCD** • Ideal for punching, crimping and cutting • For use when load holding is not required • Push-button control pendant with 10 ft. cord controls the valve and motor		●		●		●	VE32D	1.0
			●		●		●	VE32D	2.0
			●		●		●	VE32D	2.5
			●		●		●	VE32D	5.0
	Solenoid 3-position Valve with Electric Box and LCD • Ideal for production and lifting applications • All valves are 3-position for Advance-Hold-Retract • Push-button control pendant with 10 ft. cord controls the valve and motor		●		●	●	●	VE33	2.0
			●		●	●	●	VE33	2.5
			●		●	●	●	VE33	5.0
				●	●	●	●	VE43	2.0
				●	●	●	●	VE43	2.5
				●	●	●	●	VE43	5.0
				●	●	●	●	VE43	10.0

* Models in this chart are 115 VAC, 1-phase at 50/60 Hz for ZE3-4 or 220 VAC, 3 phase at 50/60 Hz for ZE5-6. For other options, please refer to the ZE Pump ordering matrix. **See Valve Section for technical information.

ZE-Series Electric Pumps

- **Features *Z-Class* high-efficiency pump design; higher oil flow and by-pass pressure, cooler running and requires 18% less current draw than comparable pumps**
- **Totally enclosed, fan-cooled industrial electric motors supply extended life and stand up to harsh industrial environments**
- **Low-voltage pendant, on certain models, provides additional safety for the operator**
- **Multiple valve and reservoir configurations provide application specific models to match the most demanding industrial applications**
- **High-strength, molded electrical enclosure protects electronics, power supplies and LCD readout from harsh industrial environments**
- **LCD readout provides a number of diagnostic and readout capabilities never before offered on an industrial pump (included with electric valve models, optional on other models)**

ZE Series

Reservoir Capacity:
1.0-10.0 gal.

Flow at Rated Pressure:
40-200 in³/min

Motor Size:
1.0-7.5 hp

Maximum Operating Pressure:
10,000 psi

ZE3 Series (1.0 hp) Output Flow Rate at 10,000 psi: 40 in³/min		ZE4 Series (1.5 hp) Output Flow Rate at 10,000 psi: 60 in³/min		ZE5 Series (3.0 hp) Output Flow Rate at 10,000 psi: 120 in³/min		ZE6 Series (7.5 hp) Output Flow Rate at 10,000 psi: 200 in³/min	
Model Number	Weight (lbs)	**Model Number**	Weight (lbs)	**Model Number**	Weight (lbs)	**Model Number**	Weight (lbs)
ZE3208MB	91	**ZE4208MB**	100	–	–	–	–
ZE3308MB	92	**ZE4308MB**	101	–	–	–	–
ZE3320MB	132	**ZE4320MB**	141	**ZE5320MG**	152	**ZE6320MG**	191
ZE3340MB	183	**ZE4340MB**	192	**ZE5340MG**	203	**ZE6340MG**	242
ZE3408MB	92	**ZE4408MB**	101	–	–	–	–
ZE3420MB	132	**ZE4420MB**	141	**ZE5420MG**	152	**ZE6420MG**	191
ZE3440MB	183	**ZE4440MB**	192	**ZE5440MG**	203	**ZE6440MG**	242
ZE3208LB	96	**ZE4208LB**	105	–	–	–	–
ZE3210LB	109	**ZE4210LB**	112	**ZE5210LG**	132	**ZE6210LG**	171
ZE3320LB	138	**ZE4320LB**	146	**ZE5320LG**	160	**ZE6320LG**	199
ZE3340LB	188	**ZE4340LB**	197	**ZE5340LG**	210	**ZE6340LG**	249
ZE3420LB	138	**ZE4420LB**	145	**ZE5420LG**	160	**ZE6420LG**	199
ZE3440LB	189	**ZE4440LB**	197	**ZE5440LG**	210	**ZE6440LG**	250
ZE3104DB	94	**ZE4104DB**	103	–	–	–	–
ZE3108DB	105	**ZE4108DB**	109	–	–	–	–
ZE3110DB	114	**ZE4110DB**	122	**ZE5110DG**	136	**ZE6110DG**	175
ZE3120DB	141	**ZE4120DB**	149	**ZE5120DG**	163	**ZE6120DG**	202
ZE3140DB	190	–		–		–	
ZE3308SB	112	**ZE4308SB**	121	–	–	–	–
ZE3310SB	125	**ZE4310SB**	134	**ZE5310SG**	147	**ZE6310SG**	187
ZE3320SB	152	**ZE4320SB**	161	**ZE5320SG**	174	**ZE6320SG**	213
ZE3408SB	112	**ZE4408SB**	121	–	–	–	–
ZE3410SB	125	**ZE4410SB**	134	**ZE5410SG**	147	**ZE6410SG**	187
ZE3420SB	152	**ZE4420SB**	161	**ZE5420SG**	174	**ZE6420SG**	213
ZE3440SB	203	**ZE4440SB**	212	**ZE5440SG**	225	**ZE6440SG**	264

* All models in this chart are 115 VAC, 1-phase at 50/60 Hz. For other options please refer to the ZE Pump ordering matrix.

User Adjustable Relief Valve

All VM and VE-Series have a user adjustable relief valve to allow the operator to easily set the optimum working pressure.

Locking Valves

For applications requiring positive load holding, VM-Series valves (except VM32) are available with a pilot-operated check valve. This provides hydraulic locking of the load until the valve is shifted into the retract position. To order this feature on your ZE-series pump see the valve type in the order matrix.

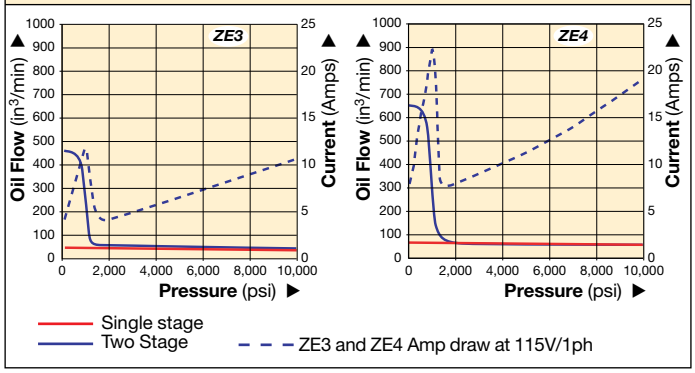
Page: 110

Single-Stage or Two-Stage

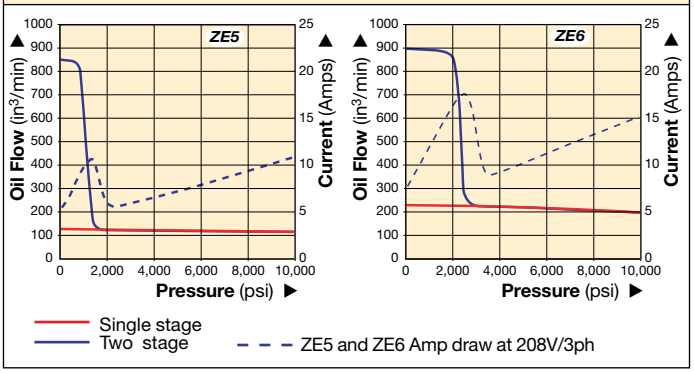
Choose single-stage pumps for applications that require constant flow regardless of pressure, such as testing or clamping. Two-stage pumps have an increased output flow at low pressure to allow fast movement towards the load, for reduced cycle times and increased productivity. To specify a single-stage pump, place the letter "S" at the end of the model number.

For example: **ZE5320LG-S**

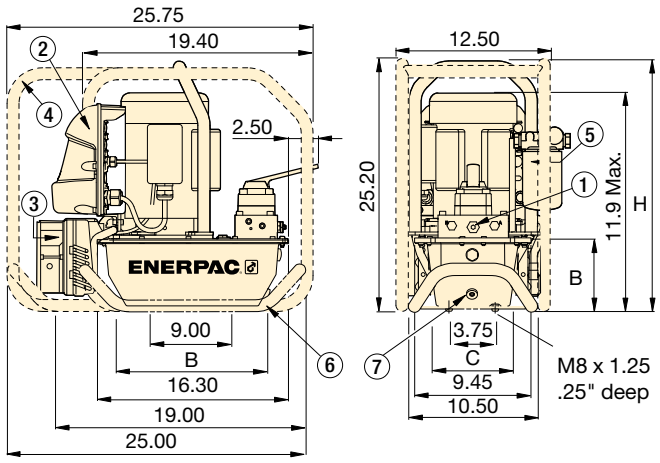
ZE3 and ZE4 Oil Flow and Current vs. Pessure



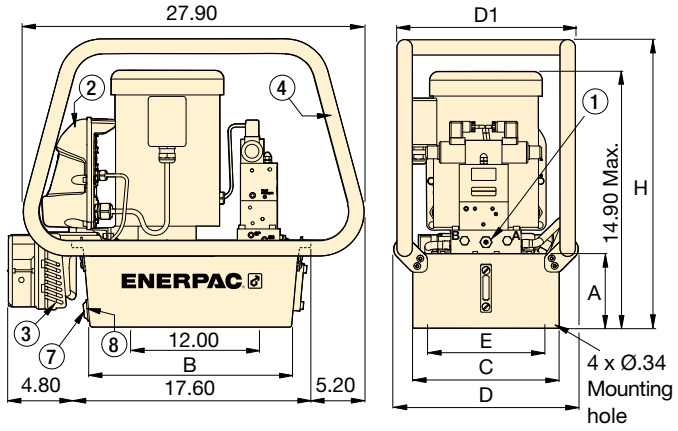
ZE5 and ZE6 Oil Flow and Current vs. Pessure



ZE-Series Pumps with 1 and 2 gallon reservoir



ZE-Series Pumps with 2.5, 5, 10 gallon reservoir



Reservoir Size (useable oil) (gal)	ZE-Series Pump Dimensions (in)						
	A	B	C	D	D1	E	H
1.0	5.6	11.0	6.0	–	–	–	20.2
2.0	5.6	11.0	8.1	–	–	–	22.6
2.5	6.2	16.5	12.0	15.1	14.6	11.0	23.6
5.0	7.1	16.5	16.6	19.7	19.2	15.6	24.6
10.0	10.6	15.7	19.9	22.7	22.5	18.9	28.1

① User adjustable relief valve on all manual and solenoid valves:
3/8" NPTF on A and B ports
1/4" NPTF on auxiliary ports
② Electric Box (Optional w/manual valve)
③ Heat Exchanger (Optional)
④ Roll Bar (Optional)
⑤ Return Line Filter (Optional)
⑥ Skid Bar (Optional)
⑦ Oil Drain
⑧ Oil Level/Temperature Switch (Optional)

▼ PERFORMANCE CHART

Pump Series	Operation	Output Flow Rate (in³/min) 100 psi	700 psi	5,000 psi	10,000 psi	Available Reservoir Sizes (useable oil) (gal)	Motor Size hp	RPM	Relief Valve Adjustment Range (psi)	Sound Level (dBA)
ZE3	Single-stage	43	43	42	40	1, 2, 2.5, 5, 10	1.0	1750	1000 - 10,000	75
	Two-stage	450	385	42	40					
ZE4	Single-stage	64	64	62	60	1, 2, 2.5, 5, 10	1.5	1750	1000 - 10,000	75
	Two-stage	650	600	62	60					
ZE5	Single-stage	128	126	123	120	2.5, 5, 10	3.0	1750	1000 - 10,000	75
	Two-stage	850	825	123	120					
ZE6	Single-stage	220	215	210	200	2.5, 5, 10	7.5	3450	1000 - 10,000	80
	Two-stage	900	890	210	200					

Output flow rate is listed at 60 Hz.
Flow rate will be approximately 5/6 of these values at 50 Hz.

ZE Electric Pump Ordering Matrix

CUSTOM BUILD YOUR ZE SERIES PUMP
If the ZE Series pump that would best fit your application cannot be found in the chart on page 88, you can easily build your custom ZE Series pump here.

▼ This is how a ZE Series Pump model is built up:

Z	E	4	4	20	L	B	-	F	H	L	T
1 Product Type	2 Motor Type	3 Flow Group	4 Valve Type	5 Useable Oil Capacity	6 Valve Operation	7 Voltage		8 Options	8 Options	8 Options	8 Options

1 Product Type
Z = Pump Class

2 Prime movers
E = Induction Electric Motor

3 Flow Group
3 = 40 in³/min @ 10,000 psi
4 = 60 in³/min @ 10,000 psi
5 = 120 in³/min @ 10,000 psi[1)]
6 = 200 in³/min @ 10,000 psi[1)]

4 Valve Types
0 = No valve w/coverplate
1 = Dump (VE32D)
2 = 3 way/2 position manual (VM32)
3 = 3 way/3 position manual or electric (VM33 or VE33)
4 = 4 way/3 position manual or electric (VM43 or VE43)
6 = 3 way/3 position locking manual w/po check (VM33L)
7 = 3 way/2 position manual (VM22)
8 = 4 way/3 position locking manual w/po check (VM43L)

5 Useable Oil Capacity
04 = 1.0 gallon[2)]
08 = 1.75 gallon[2)]
10 = 2.5 gallon
20 = 5.0 gallon
40 = 10.0 gallon

6 Valve Operation
D = Dump valve (w/ pendant and LCD)
L = Manual valve (w/o pendant, w/ LCD)
M = Manual valve [6)] (w/o pendant or LCD)
N = No valve [6)] (no electrical box)
S = Solenoid valve (w/ pendant and LCD)
W = No valve (w/o pendant and LCD)

7 Voltages
Single Phase
B = 115V 1 ph 50-60Hz [3)]
E = 208-240V 1 ph 50-60 Hz European Plug
I = 208-240V 1 ph 50-60 Hz USA Plug
Three Phase [6)]
M = 190-200V 3ph 50-60Hz
G = 208-240V 3ph 50-60Hz
W = 380-415V 3ph 50-60Hz
K = 440V 3ph 50-60Hz
J = 460-480V 3ph 50-60Hz
R = 575V 3ph 60Hz

8 Options (specify in alphabetical order)
F = Filter
G = 0-15,000 psi gauge (2 1/2") [7)]
H = Heat exchanger [4)]
K = Skidbar (1 and 2 gal. reservoirs only)
L = Level/temp switch [4) 5)]
N = No reservoir handles (includes lifting eyes)
P = Pressure switch [4)]
R = Roll bar
S = Single stage
T = Pressure transducer [4) 7)]
U = Foot switch [4)]

1) ZE5 and ZE6 series pumps only available with 3-phase motors.
2) 1 and 2 gallon reservoirs only available on ZE3 and ZE4 series pumps.
3) 115 volt pumps are supplied with 15 amp plug for intermittent use. 20 amp circuit recommended for frequent full pressure use.
4) These options require LCD electrical package. Pressure switch option only available on manual valves without locking valve. The LCD electrical package can accept either a pressure switch or pressure transducer, but not both.
5) Not available with 1 and 2 gallon reservoirs.
6) Standard Electric models with 3-phase motors are shipped without cord, motor starter or overload protection.
7) Pressure gauge not available on pump models with pressure transducer. Pressure transducer provides digital pressure readout on LCD display.

ZE Series

Reservoir Capacity:
1.0-10.0 gal.

Flow at Rated Pressure:
40-200 in³/min.

Motor Size:
1.0-7.5 hp

Maximum Operating Pressure:
10,000 psi

Ordering Example 1
Model Number: ZE4420MB
ZE4420MB is a 60 in³/min, 10,000 psi pump with a 4 way, 3-position manual valve, a 5 gallon reservoir, operates on a 115 VAC 1 ph 50/60 Hz motor and includes standard electrical package.

Ordering Example 2
Model Number: ZE6440SG-HNU
ZE6440SG-HNU is a 200 in³/min, 10,000 psi pump with a 4 way, 3-position electric valve, a 10 gallon reservoir, operates on a 230 VAC 3 ph 50/60 Hz motor. It includes LCD electrical package and foot switch on 10 ft cord, no reservoir handles and the optional heat exchanger.

Single-Stage or Two-Stage
Choose single-stage pumps for applications that require constant flow regardless of pressure, such as testing or clamping.

Two-stage pumps have an increased output flow at low pressure to allow fast movement towards the load, for reduced cycle times and increased productivity.

Electric Box [1)]

- **Back-lit LCD**
- **Pump usage information, hour and cycle counts**
- **Low-voltage warning and recording**
- **Self-test and diagnostic capabilities**
- **Pressure read-out [2)]**
- **Auto-mode pressure setting [2)]**
- **Information can be displayed in six languages [3)]**

[1)] Included on pumps with solenoid valves. Can be factory installed on pumps with manual valve

[2)] When used with optional pressure transducer

[3)] English, French, German, Italian, Spanish and Portuguese

Level/Temperature Switch [4)]

- **Shuts down pump before oil level reaches an unsafe level, avoiding damage due to cavitation**
- **Shuts down pump when unsafe oil temperature is reached**
- **Ideal if pump is used in remote area without visual access to oil level**

[4)] 24 V, requires Electric Box. Available for 2.5, 5 and 10 gallon reservoirs

Accessory Kit Model Number	Fixed Temperature Signal (°F)	Operating Temperature (°F)	Max. Pressure (psi)
ZLS-U4 *	75	40 - 230	150

* Add suffix **L** for factory installation, see ordering matrix.

Return Line Filter

- **25 micron nominal filter removes contaminants from return oil flow before allowing it back into tank**
- **Internal by-pass valve prevents damage if filter is dirty**
- **With maintenance indicator**
- **Replaceable filter element PF25**

Accessory Kit Model Number	Maximum Pressure (psi)	Maximum Oil Flow (GPM)	By-pass Setting (psi)
ZPF *	200	12.0	25

* Add suffix **F** for factory installation, see ordering matrix.

Roll Cage

- **For easy portability and hoisting**
- **Protects pump and electric box**
- **Available for all reservoir sizes**

Accessory Kit Number	Fits on Reservoir
ZRC-04 *	1 and 2 gallon[1)]
ZRC-04H *	1 and 2 gallon[2)]
ZRB-10 *	2.5 gallon
ZRB-20 *	5 gallon
ZRB-40 *	10 gallon

* Add suffix **R** for factory installation, see ordering matrix.
[1)] Without heat exchanger [2)] With heat exchanger

Skid Bar

- **Provides easy two-hand lift**
- **Provides greater pump stability on soft or uneven surfaces**

Accessory Kit Number	For ZE-Series Pumps with Reservoir	Weight (lbs)
SBZ-4 *	1-2 gal. w/o heat exchanger	4.9
SBZ-4L *	1-2 gal. with heat exchanger	5.5

* 1 and 2 gallon reservoirs only. Add suffix **K** for factory installation, see ordering matrix.

Foot Switch [5)]

- **Hands-free remote control on solenoid dump and 3-position valves**
- **With 10 foot cord**

[5)] 15 V, requires Electric Box

Accessory Kit Number	Can be used on ZE-Series Pumps with
ZCF-2 *	Solenoid VE-Series valves

* Add suffix **U** for factory installation, see ordering matrix.

ZE-Series, Factory Installed Options & Accessories

Pressure Transducer [1)]

- **Displays pressure on LCD in bar, MPa or psi**
- **More accurate than analog gauge**
- **Calibration can be fine-tuned for certification**
- **Easy-viewing variable rate display**
- **"Set pressure" feature turns off motor at user defined pressure (or shifts valve to neutral on models with VE33/ VE43 valves)**

1) 24 V, requires Electric Box

Accessory Kit Model number	Adjustable Pressure Range (psi)	Switch-point Repeat-ability	Dead-band (psi)
ZPT-U4 *	50-10,000	± 0,5%	50

* Add suffix **T** for factory installation, see ordering matrix.

Pressure Switch [2)]

- **Controls pump, monitors system**
- **Adjustable pressure 500-10,000 psi**
- **Includes glycerine filled 15,000 psi pressure gauge G2536L**
- **Accuracy ± 1,5% of full scale**

2) 24 V, requires Electric Box. Not available in combination with pressure transducer.

Accessory Kit Model number	Switch-point Repea-tability	Deadband (psi)	Oil Ports (NPT)
ZPS-E3 *	± 2%	115-550	3/8"

* Add suffix **P** for factory installation, see ordering matrix.

Pendants [3)]

- **For pump types with valve operation "W" (No Valve, with Electric Box, without pendant)**

3) When ordering Enerpac VE-Series solenoid valve the pendant must be ordered separately. Pendant connection to be plugged into electric box

Pendant Model Number	To be used with Solenoid Valve:
ZCP-1	VE32D
ZCP-3	VE32, VE33, VE43

Heat Exchanger [4)]

- **Removes heat from bypass oil to provide cooler operation**
- **Stabilizes oil viscosity, increasing oil life and reduces wear of pump and other hydraulic components.**

4) 24 VDC, requires electric box

Accessory Kit Model number	Fits on Reservoir	Weight (lbs)
ZHE-E04 *	1 and 2 gallon	9.0
ZHE-E10 *	2.5, 5, and 10 gallon	9.0

* Add suffix **H** for factory installation, see ordering matrix.

ZE Series

Reservoir Capacity:
1.0-10.0 gal.

Flow at Rated Pressure:
40-200 in³/min.

Motor Size:
1.0-7.5 hp

Maximum Operating Pressure:
10,000 psi

ZHE-Series Heat Exchangers

Heat exchanger stabilizes oil temperature at 130° F at 70° F ambient temperature. Thermal transfer at 5 GPM and 70° F ambient temperature: 900 Btu/hour.

Do not exceed maximum oil flow of 7.0 GPM and maximum pressure of 300 psi. Not suitable for water-glycol or high water based fluids.

▼ Shown: **PEM-8418**

The Largest Pump for the Largest Jobs

- **Panel-mounted pressure gauge and adjustable relief valve for system pressure control**
- **Two-speed pump design, with high by-pass pressure, for rapid cylinder advance**
- **Dual voltage motor (230/460 VAC, 3 phase, 60 Hz)**
- **Full length reservoir sight tube with integral thermometer for ease in monitoring oil level and temperature**

Locking Valves

Pumps with VM-4 manual valves are available with VM-4L manual valves for positive load holding. Add suffix **"L"** to pump model number.

Page: **110**

FS-34 Foot Control Switch

This 3-position switch allows hands-free control of the solenoid valve on the pump. Operates 24V and 115V valves that use the square electrical connector.

Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

Page: **118**

◀ *With similar specifications, a gasoline powered EGM-8000 Series is shown here performing a synchronized lift.*

About the 8000 Series

The 8000 Series is the largest pump in the Enerpac line and the best choice to power most large size cylinders, multiple cylinder circuits, and applications where the need for high speed requires high flow rates.

The 8000 Series, with its large reservoir capacity, is best suited for large jobs and may be the only solution because of the required oil capacity.

For further application assistance see our "Yellow Pages", or consult your local Enerpac office.

Page: 241

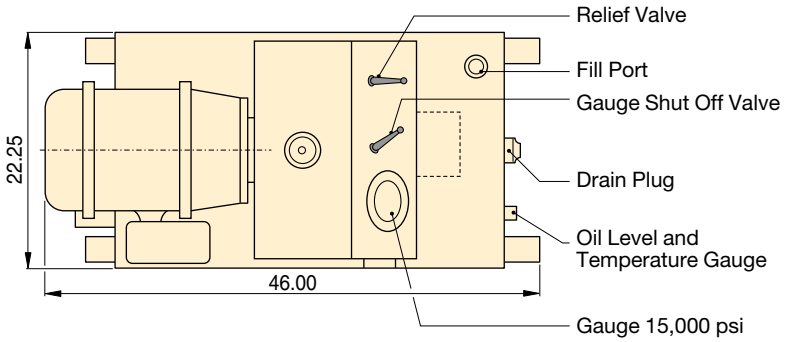
PE Series

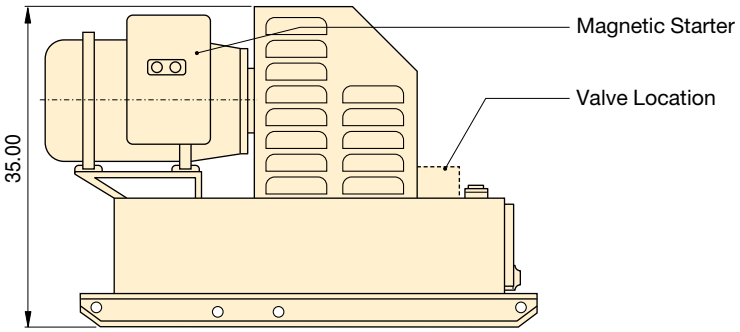
Reservoir Capacity:
25 gal.

Flow at Rated Pressure:
2.0 gal/min.

Motor Size:
12.5 hp

Maximum Operating Pressure:
10,000 psi





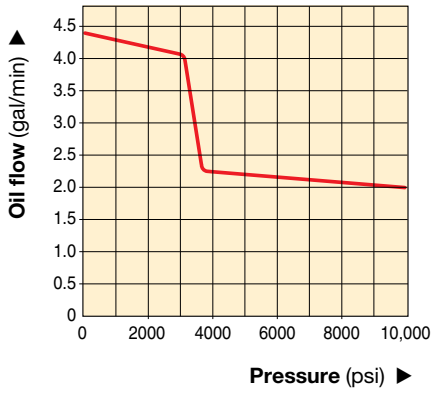
Dimensions shown in inches.

Speed Chart

To determine how an 8000 Series pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the "Yellow Pages".

Page: 251

OIL FLOW vs. PRESSURE



Used with Cylinder	Usable Oil Capacity (gal)	Model Number	Pressure Rating (psi) 1st stage	Pressure Rating (psi) 2nd stage	Output Flow Rate (gal/min) 1st stage	Output Flow Rate (gal/min) 2nd stage	Valve Type	Valve Function	Current Draw (Amps)	Motor Voltage* (VAC)	Sound Level (dBA)	Weight (lbs)
Single-acting	18	PEM-8218	3,700	10,000	4.4	2.0	Manual (VM-2)	3-way, 2-pos.	33.0	230	78-84	720
	18	PEM-8218C	3,700	10,000	4.4	2.0			16.5	460	78-84	720
Double-acting	18	PEM-8418	3,700	10,000	4.4	2.0	Manual (VM-4)	4-way, 3-pos.	33.0	230	78-84	720
	18	PEM-8418C	3,700	10,000	4.4	2.0			16.5	460	78-84	720
	18	PER-8418	3,700	10,000	4.4	2.0	Solenoid (VE43)	4-way, 3-pos.	33.0	230	78-84	765
	18	PER-8418C	3,700	10,000	4.4	2.0			16.5	460	78-84	765

* Consult Enerpac for availability of other voltages.

▼ Shown: **XA11G**

- **Ergonomic design for less operator fatigue**
- **Variable oil flow and fine metering for precise control**
- **Higher oil flow for increased productivity**
- **Closed hydraulic system prevents contamination and allows pump usage in any position**
- **Pedal lock function for retract position**
- **Ground screw for improved ATEX explosion safety**
- **External adjustable pressure setting valve**

▼ *Easily operated by foot. No need to fully lift up foot - rest body weight on heel, resulting in a hands-free and stable working position.*

XVARI® TECHNOLOGY

Productivity and Ergonomics

Optional Pressure Gauge
Integrated gauge with calibrated scale reading in psi, bar and MPa for actual pressure reading.

Optional 4-Way 3-Position Valve
For powering double-acting hydraulic cylinders and tools.

Optional 1/2 Gallon Reservoir
Double oil capacity for powering larger hydrauic cylinders and tools.

Pedal Safety Guard
Customer installed frame protects both pedals against accidental activation.

Order model number [1]	XPG1

"Joy-stick" Lever Kit
Customer installed set of handles for manual operation of both pedals.

Order model number [1]	XLK1

Hydraulic Swivel Connector
Customer installed swivel connector for optimal orientation of the hydraulic hose.

Order model number [1]	XSC1

[1] Accessories must be ordered separately.

XVARI® Technology, Air Driven Hydraulic Pumps

XVARI® TECHNOLOGY

Production Application

XA11 pump is used with a 13-ton hollow cylinder to compress and position diesel engine valve springs.

The operator benefits from the fine metering capacities of the XVARI® Technology to apply the mandatory precise stroke and force.

www.xvari.com

XA Series

Reservoir Capacity:
61-122 in³

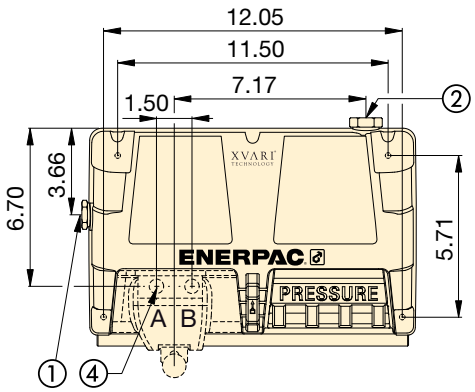
Flow at Rated Pressure:
15 in³/min.

Air Consumption:
10-35 scfm

Maximum Operating Pressure:
10,000 psi

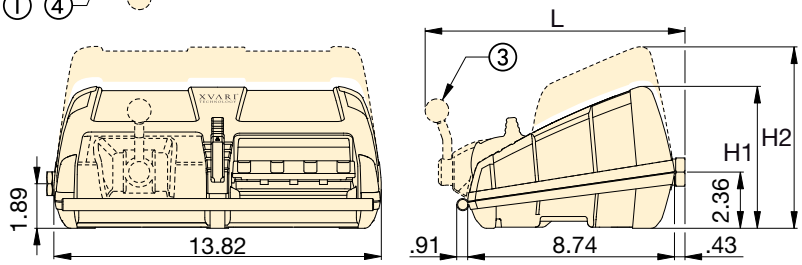
▼ XA-SERIES PERFORMANCE CHART

Maximum Pressure (psi)	Output Flow Rate (in³/min) No load	Output Flow Rate (in³/min) Load	Pump Series	Valve Function	Dynamic Air Pressure (psi)
10,000	120	15	**XA1**	Advance/Hold/Retract	30-125



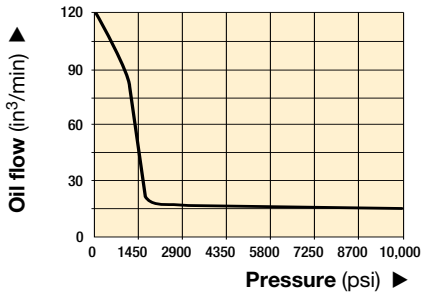
① 3/8"-18 NPTF Oil Outlet
② 1/4"-18NPTF Air Inlet
③ 4/3 Optional Control Valve
④ 3/8"-18 NPTF Oil Outlet

Dimensions shown in inches.



OIL FLOW vs. PRESSURE

at 100 psi dynamic air pressure



Regulator-Filter-Lubricator

Recommended for use with all XA-Series Air pumps. Provides clean, lubricated air and allows for air pressure adjustment.

Order model number [1]	RFL102

▼ SELECTION CHART

For Use With Cylinder Tool	Usable Oil Capacity (in³)	Model No. [1]	Pressure Gauge	3-Way, 3-Position Valve	4-Way, 3-Position Valve	Dimensions (in) H1	Dimensions (in) H2	Dimensions (in) L	Weight (lbs)
Single-acting	61	**XA11**	–	•	–	5.98	–	–	19.0
	122	**XA12**	–	•	–	–	6.69	–	22.4
Single-acting	61	**XA11G**	•	•	–	5.98	–	–	19.4
	122	**XA12G**	•	•	–	–	6.69	–	22.9
Double-acting	61	**XA11V**	–	–	•	5.98	–	10.98	22.3
	122	**XA12V**	–	–	•	–	6.69	10.98	25.7
Double-acting	61	**XA11VG**	•	–	•	5.98	–	10.98	22.7
	122	**XA12VG**	•	–	•	–	6.69	10.98	26.2

[1] High-flow coupler CR400 and accessories must be ordered separately.

▼ Shown left to right: **PAMG-1402N, PATG-1102N, PARG-1102N, PATG-1105N**

Compact Air Over Hydraulic

- **High efficiency cast aluminum air motor for increased life and reduced air consumption**
- **Fully serviceable air motor assembly**
- **Reinforced heavy-duty reservoir for applications in tough environments**
- **New generation air saver piston with rugged one-piece design reduces air consumption and operating costs**
- **Return-to-tank port for use in remote valve applications**
- **Quiet – only 76 dBA with low air consumption of 12 scfm**
- **Operating air pressure: 40-125 psi, enables pump to start at extremely low pressure**
- **Internal pressure relief valve provides overload protection**

RFL-102 Regulator-Filter-Lubricator

Recommended for use with all air pumps. Provides clean, lubricated air and allows for air pressure adjustment. Steel bowl guards are standard.

Order model number [1]	RFL102

Large Reservoir Models

The Turbo II Air Pump is also available with a larger reservoir: **PATG-1105N, PAMG-1405N,** and **PARG-1105N.**

Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

Page: 118

▼ *Easily operated by hand or by foot.*

Used with Cylinder	Usable Oil Capacity (in³)	Model Number
Single-acting	127	PATG-1102N*
	230	PATG-1105N
	127	PARG-1102N
	230	PARG-1105N
Double-acting	127	PAMG-1402N
	230	PAMG-1405N

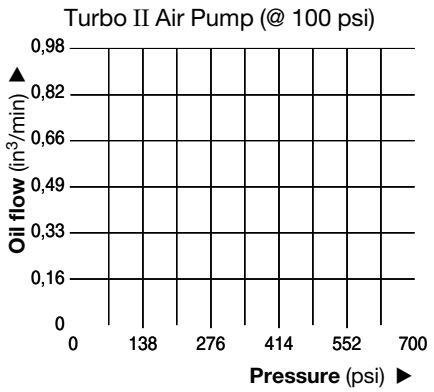
* Available as set. See note on next page.

The **PATG**-models use a foot or hand operated treadle to control air and valve functions.

The **PAMG**-models use a treadle with a locking feature and a 4-way manual valve.

The **PARG**-models use a 15 ft. pendant hose for convenient one-man operation.

OIL FLOW vs. PRESSURE



PATG and PAMG models
PARG models [2)]

PA Series

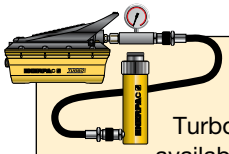
Reservoir Capacity:
150-305 in³

Flow at Rated Pressure:
10 in³/min.

Maximum Operating Pressure:
10,000 psi

Pressure Rating (psi)	Output Flow Rate (in³/min) No load	Output Flow Rate (in³/min) Load	Model Number	Valve Function	Air Pressure Range (psi)	Air Consumption (scfm)	Sound Level (dBA)
10,000	60	10	**PATG & PAMG**	Advance/ Hold/ Retract	40-125	12	76
10,000	51[1)]	6[1)]	**PARG**		40-125	12	76
10,000	48[2)]	5[2)]			40-125	8	76

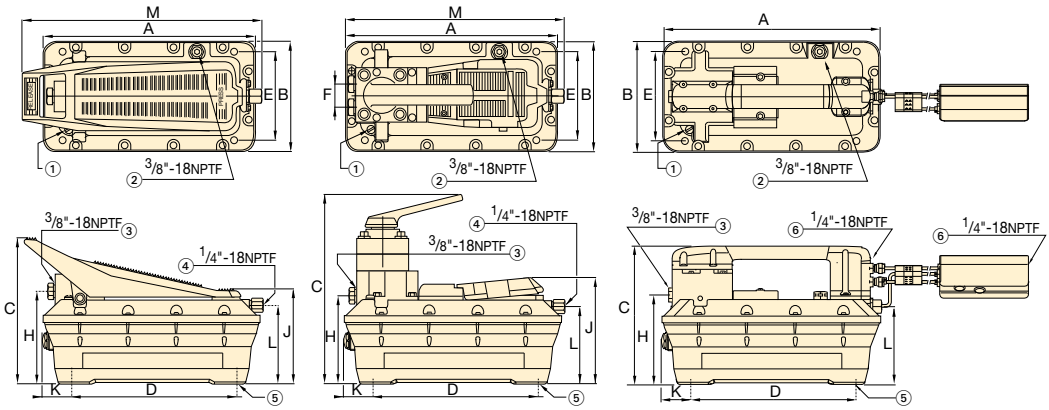
[1)] Air supply connected at pendant.
[2)] Air supply connected at pump shown on flow curve.



Pump and Cylinder Sets

Turbo II pumps are also available as sets (Turbo II pump, cylinder, gauge, couplers and hose) for your ordering convenience.

Page: **58**



PATG-1102N and PATG-1105N

PAMG-1402N and PAMG-1405N

PARG-1102N and PARG-1105N

Dimensions (in) A	B	C	D	E	F	H	J	K	L	M	Weight (lbs)	Model Number
12.33	6.49	8.29	9.04	4.00	–	5.15	5.75	1.65	4.43	13.62	18	**PATG-1102N***
15.60	7.92	8.22	9.04	4.00	–	5.08	5.75	3.28	4.41	17.20	22	**PATG-1105N**
12.33	6.49	7.88	9.04	4.00	–	5.15	–	1.65	4.43	–	22	**PARG-1102N**
15.60	7.92	7.88	9.04	4.00	–	5.08	–	3.28	4.41	–	26	**PARG-1105N**
12.33	6.49	10.50	9.04	4.00	1.42	5.23	6.00	1.65	4.43	12.60	24	**PAMG-1402N**
15.60	7.92	10.50	9.04	4.00	1.42	5.19	6.00	3.28	4.41	15.94	28	**PAMG-1405N**

▼ Shown from top to bottom: **PA-1150, PA-133**

PA
Series

Reservoir Capacity:
36-80 in³

Flow at Rated Pressure:
8 in³/min.

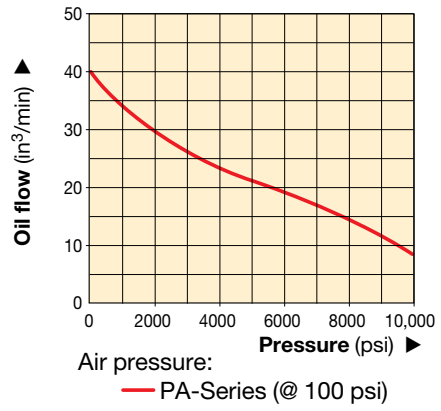
Maximum Operating Pressure:
10,000 psi

PC-66 Reservoir Conversion Kit

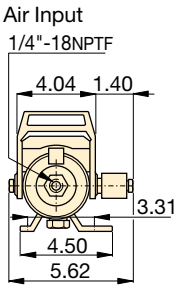
Double the reservoir capacity of your existing PA-133 with this easy to install conversion kit.

- **Rugged construction – built for long life and easy service**
- **Swivel coupling simplifies hydraulic connection and pump operation**
- **Three-position treadle provides cylinder advance, hold and retract operation**
- **PA-133 operates in all positions for increased versatility in use and mounting**
- **Base mounting slots provided on PA-133**

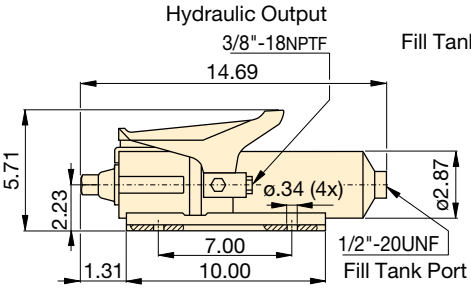
OIL FLOW vs. PRESSURE

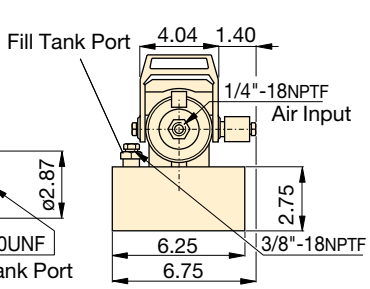


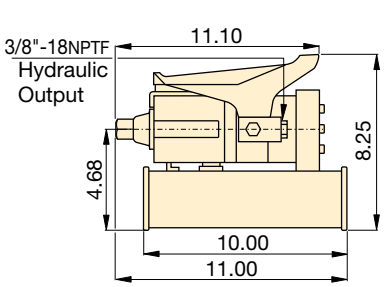
Dimensions shown in inches.



PA-133







PA-1150

Used with Cylinder	Usable Oil Capacity (in³)	Model Number	Pressure Rating (psi)	Output Flow Rate (in³/min) No load	Output Flow Rate (in³/min) Load	Valve Function	Air Pressure Range* (psi)	Air Consumption (scfm)	Sound Level (dBA)	Weight (lbs)
Single-acting	36	**PA-133**	10,000	40	8	Advance/Hold/Retract	60-120	9	85	12
	80	**PA-1150**	10,000	40	8	Advance/Hold/Retract	60-120	9	85	18

* Recommended Regulator-Filter-Lubricator: RFL-102

▼ Shown: **PAM-1041**

PAM Series

Reservoir Capacity:
1.0-2.0 gal.

Flow at Rated Pressure:
9 in³/min.

Maximum Operating Pressure:
10,000 psi

Locking Valves

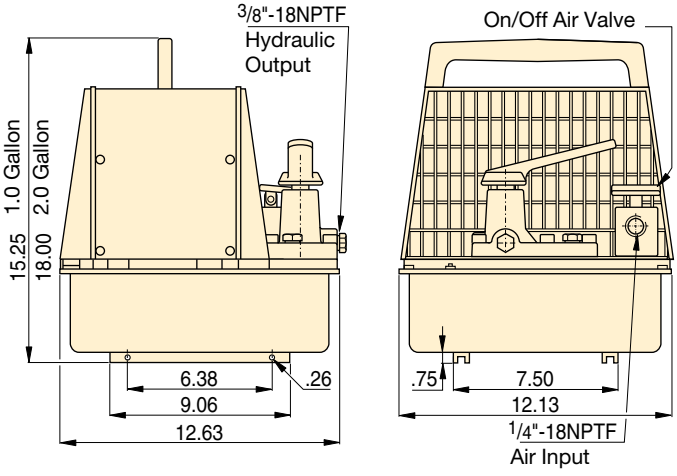
Pumps with VM-4 manual valves are available with VM-4L manual locking valves instead.
Add suffix **"L"** to pump model number.

Page: **110**

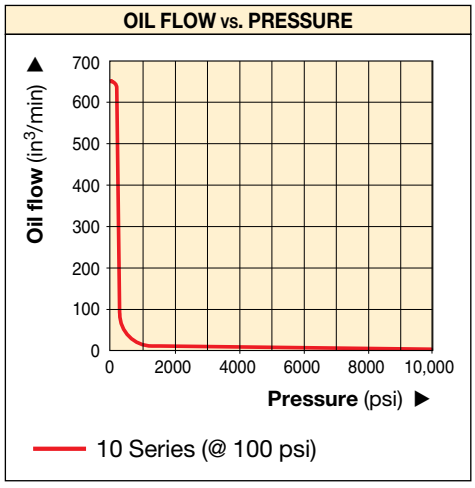
VA-2 Remote Valve

For remote operation of PAM-10 series air pumps. Permits either hand or foot operation.

- **Twin air motor configuration delivers high-flow performance in first stage, up to 200 psi, for rapid cylinder advance**
- **1 and 2 gallon reservoirs for use with a wide range of cylinders**
- **Integral shroud protects air motors and provides easy portability**



PAM-1022



Used with Cylinder	Usable Oil Capacity (gal)	Model Number (with Shroud)	Pressure Rating (psi)	Output Flow Rate (in³/min) 1st stage	Output Flow Rate (in³/min) 2nd stage	Valve Function	Valve Model	Air Pressure Range* (psi)	Air Consumption (scfm)	Sound Level (dBA)	Weight (lbs)
Single-acting	0.7	PAM-1021	10,000	650	9	Adv/Hold/Ret	VM-2	60-120	18	87	50
	2.0	PAM-1022	10,000	650	9	Adv/Hold/Ret	VM-2	60-120	18	87	60
Double-acting	0.7	PAM-1041	10,000	650	9	Adv/Hold/Ret	VM-4	60-120	18	87	50
	2.0	PAM-1042	10,000	650	9	Adv/Hold/Ret	VM-4	60-120	18	87	60

* Recommended Regulator-Filter-Lubricator: RFL-102

▼ Shown: **ZA4208MX, ZA4420MX**

Z Tough. Dependable. Innovative. CLASS

- **Features Z-Class high efficiency pump design, higher oil flow and bypass pressure**
- **Two-speed operation and high by-pass pressure reduces cycle time for improved productivity**
- **Internal relief valves. One is factory set for overload protection while the second is user adjustable for pre-setting maximum system pressure**
- **Sight gauge on 1 and 2 gallon and level gauge on 2.5, 5 and 10 gallon reservoirs allow quick and easy oil level monitoring**
- **Optional heat exchanger warms exhaust air to prevent freezing and cools the oil**

ATEX Certified

See explanation of ATEX certification in the "Yellow Pages."

II 2 GD ck T4 KEMA 0602 CE

Page: 241

Speed Chart

To determine how a ZA Series pump will operate your cylinder, see the Pump/Cylinder Speed Chart in the "Yellow Pages".

Page: 251

Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

Page: 118

ZA4 Performance		
Dynamic Air Pressure Range (psi)	Air Consumption (scfm)	Sound Level (dBA)
60-100	20-100	94-97

Used with Cylinder	Usable Oil Capacity (gal)	Valve Model Number[2]	Valve Function	Model Number	Output Flow Rate[1] (in³/min) 100 psi	700 psi	5,000 psi	10,000 psi
Single-acting	1.0	Manual VM32	Advance/ Retract	ZA4204MX	850	675	110	80
	1.75			ZA4208MX	850	675	110	80
	5.0			ZA4220MX	850	675	110	80
Double-acting	1.0	Manual VM43	Advance/ Hold/ Retract	ZA4404MX	850	675	110	80
	1.75			ZA4408MX	850	675	110	80
	2.5			ZA4410MX	850	675	110	80
	5.0			ZA4420MX	850	675	110	80
	10.0			ZA4440MX	850	675	110	80

1) Actual flow will vary with air supply
2) See valve section for hydraulic symbols and details

ZA-Series Air Hydraulic Pump Ordering Matrix

CUSTOM BUILD YOUR ZA4 AIR PUMP

▼ This is how a ZA-Series Pump model number is built up:

Z	A	4	2	08	M	X	-	F	H	K	
1 Product Type	2 Motor Type	3 Flow group	4 Valve Type	5 Usable oil capacity	6 Valve Operation	7 Voltage		8 Options	8 Options	8 Options	8 Options

1 Product Type
Z = Pump class

2 Motor Type
A = Air motor

3 Flow Group
4 = 80 in³/min@10,000 psi

4 Valve Type
0 = No valve with coverplate
2 = 3-way, 2-position (VM32)
3 = 3-way, 3-position (VM33)
4 = 4-way, 3-position (VM43)
6 = 3-way, 3-position, locking (VM33L)
7 = 3-way, 2-position (VM22)
8 = 4-way, 3-position, locking (VM43L)

5 Usable Oil Capacity
04 = 1.0 gallon
08 = 1.75 gallon
10 = 2.5 gallon
20 = 5.0 gallon
40 = 10.0 gallon

6 Valve Operation
M = Manual valve
N = No valve

7 Voltage
X = Not applicable

8 Options
(Specify in alphabetical order)
F = Filter
G = 0-15,000 psi gauge (2 1/2")
H = Heat exchanger*
K = Skidbar*
N = No reservoir handles (includes lifting eyes; 2.5, 5, 10 gallon only)
R = Roll bars

* (1 and 2 gallon reservoirs only)

Ordering Example

Model Number: ZA4208MX-FHK

ZA4208MX-FHK is an air operated pump with a 3-way, 2-position manual valve, a 2.0 gallon reservoir, filter, heat exchanger and skid bar.

ZA Series

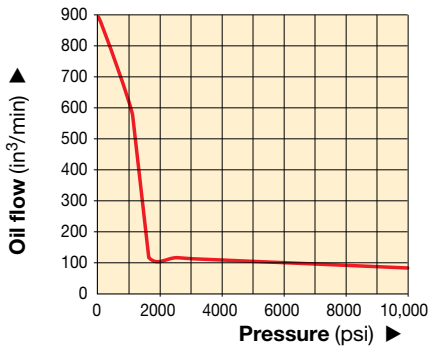
Reservoir Capacity:
1.0-10.0 gal.

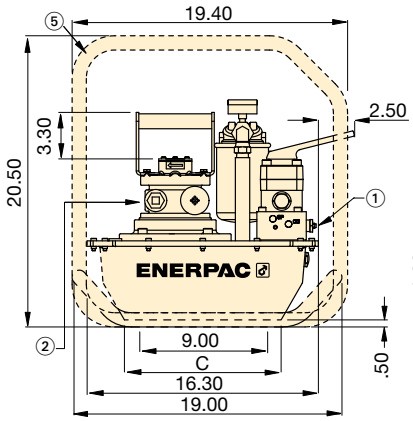
Flow at Rated Pressure:
80 in³/min.

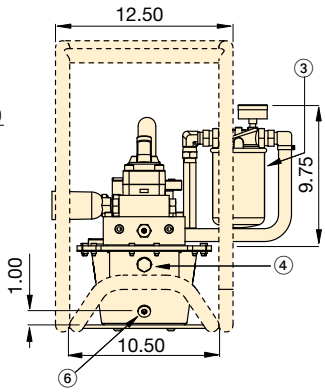
Maximum Operating Pressure:
10,000 psi

OIL FLOW vs. PRESSURE

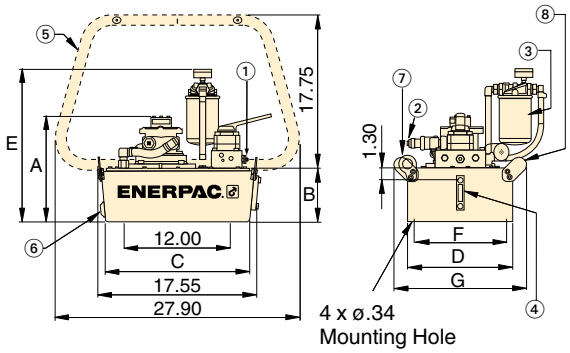
100 psi Dynamic Air Pressure at 70 scfm







1 and 1.75 gallon reservoirs



2.5, 5, 10 gallon reservoirs

	Dimensions (in)							Weight (incl. oil)
	A	B	C	D	E	F	G	(lbs)
	11.6	5.6	11.0	6.0	15.4	-	-	65.5
	11.6	5.6	11.0	8.1	15.4	-	-	75.7
	13.0	7.1	16.5	16.6	16.0	15.6	18.4	112.7
	11.6	5.6	11.0	6.0	15.4	-	-	66.7
	11.6	5.6	11.0	8.1	15.4	-	-	76.9
	12.0	6.1	16.5	12.0	16.0	11.0	15.1	87.1
	13.0	7.1	16.5	16.6	16.9	15.6	18.4	113.9
	16.5	10.6	15.7	19.9	20.4	18.9	23.0	164.6

① User adjustable relief valve on all manual valves
② Air inlet 1/2" NPTF
③ Return Line Filter (optional)
④ Oil Sight Gauge
⑤ Roll Cage (optional)
⑥ Oil Drain
⑦ Lifting eyes (4) (optional)
⑧ Handles

Skid Bar (Model No. SBZ-4) (optional)

ATP-Series Air Pump

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ Shown: **ATP-1500**

ATP Series

Reservoir Capacity:
1.0 gallon

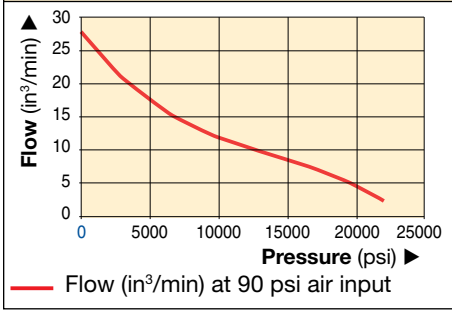
Flow at Rated Pressure:
4 in³/min.

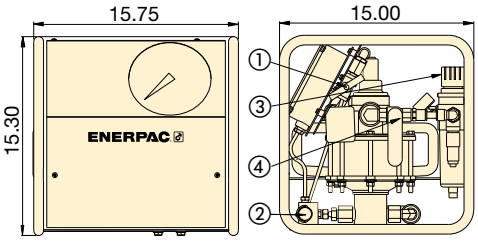
Maximum Operating Pressure:
21,750 psi

These products operate at ultra-high pressure, use only the specified fittings and hoses designed for these pressures.

- **General purpose, high pressure air driven pump unit for products requiring up to 21,750 psi hydraulic pressure**
- **Compact, lightweight, rugged steel frame for protection and easy handling**
- **Prelubricated pump element, does not require an airline lubricator**
- **Easily adjustable output pressure control**
- **Integrated and protected easy to read glycerin filled gauge**
- **Safety relief valve limits output pressure**

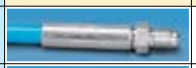
OIL FLOW vs. PRESSURE





① HPT Shut-off Valve
② HPT Out Port
③ Filter/Regulator
④ Air On/Off Valve

▼ HOSES

Model Number		End 1	End 2	Length (ft)
HT-1503		1/4 BSPM 120° Cone	1/4 BSPM 120° Cone	3.28
HT-1510		1/4 BSPM 120° Cone	1/4 BSPM 120° Cone	9.84
HT-1503HR*		BH150	BR150	3.28
HT-1510HR*		BH150	BR150	9.84

* Includes dust caps

▼ FITTINGS

Description		Complete Set	Female Half	Male Half
Quick Disconnect Coupler*		B150	BR150	BH150
Quick Disconnect Coupler and Adaptor Kit*		BW150AW	—	—
Quick Disconnect Blanking Coupler Set*		B150B	—	—

* Includes dust caps

Pump Type	Useable Oil Capacity (gal)	Model Number	Pressure Rating (psi)	Output Flow Rate at 0 psi (in³/min)	Output Flow Rate at 21,750 psi (in³/min)	Air Pressure Range (psi)	Air Consumption (sfcm)	Sound Level (dBA)	Weight (lbs)
High pressure	1.0	**ATP-1500**	21,755	26	4	80-90	70	70	70

▼ Shown from left to right: **PGM-2408R**

PGM Series

Reservoir Capacity:
1 gallon

Flow at Rated Pressure:
40 in³/min.

Motor Size:
4.2 Ft.lbs

Maximum Operating Pressure:
10,000 psi

Patented Genesis Technology
– coaxial piston design ensures high performance
– first-stage piston pump for improved efficiency

Gauges

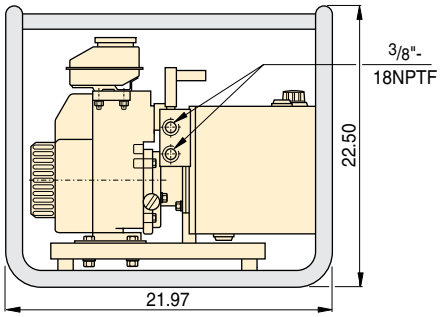
Minimize the risk of over-loading and ensure long, dependable service from your equipment. Refer to the System Components section for a full range of gauges.

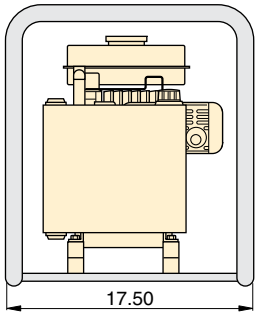
Page: 124

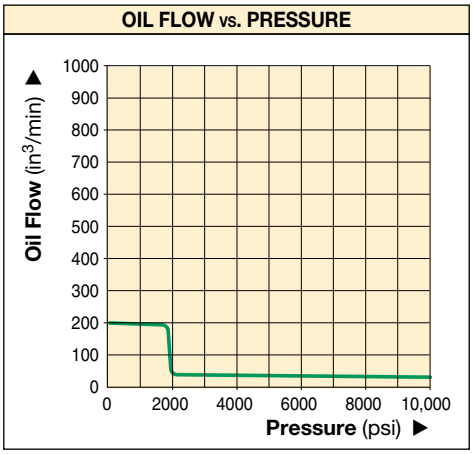
Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

Page: 118







Used with Cylinder	Usable Oil Capacity (gal)	Model Number	Output Flow Rate** (in³/min) 1st stage	Output Flow Rate** (in³/min) 2nd stage	Pressure Rating (psi)	Valve Type	Valve Function	Motor Manufacturer	Motor Size (Ft.lbs)	Weight (lbs)
Single-acting	1.0	PGM-2304R*	200	40	10,000	3-way, 3-position	Advance/ Hold/Retract	Honda	4.2 at 3600 rpm	55
	2.0	PGM-2308R*	200	40	10,000	3-way, 3-position				72
Double-acting	1.0	PGM-2404R*	200	40	10,000	4-way, 3-position				55
	2.0	PGM-2408R*	200	40	10,000	4-way, 3-position				72

* Note: PGM-20 Series are available with a carrying handle instead of a Roll Cage. For ordering omit the 'R' from the model number.
** Nominal values–may vary based on motor speed.

ZG5/ZG6 Gasoline Hydraulic Pumps

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ Shown from left to right: **ZG6440MX-BCFH, ZG5420MX-B**

Z Tough. Dependable. Innovative. CLASS

- **Features *Z-Class* high efficiency pump design, higher oil flow and bypass pressure**
- **Two-speed operation reduces cycle time for improved productivity**
- **Full sight oil level glass on all reservoirs allow quick and easy oil level monitoring**
- **Sturdy wheeled cart for ZG6 allows transport over uneven terrain and features collapsible handles for easy storage**
- **Dual forced air heat exchangers on ZG6 stabilizes hydraulic oil temperature**
- **ZG5 is available in two 4-cycle engine sizes: 7.1 ft.lbs Honda and 8.5 ft.lbs Briggs & Stratton**
- **ZG6 has Briggs & Stratton 17 ft.lbs engine with electric start, pressurized oil and 16-amp charge output for accessories**

User Adjustable Relief Valve

All VM-Series directional valves have a user adjustable relief valve to allow the operator to easily set the optimum working pressure.

High Pressure Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

Page: 118

Other Options Available

The ZG5/ZG6 pumps are available in a wide range of configurations and options. Contact Enerpac for further information.

▼ SELECTION CHART

Used with Cylinder	Usable Oil Capacity (gal)	Valve Model Number	Valve Function	Model Number	Motor Manufacturer*	Motor Size (Ft.lbs)	Weight (lbs)
Single-Acting	2.5	VM33	Advance/ Hold/ Retract	ZG5310MX-R	Honda	7.1	113.6
	5.0			ZG5320MX-R			140.9
Double-Acting	2.5	VM43		ZG5410MX-R			113.6
	5.0			ZG5420MX-R			141.0
Single-Acting	2.5	VM33		ZG5310MX-BR	Briggs & Stratton	8.5	111.0
	5.0			ZG5320MX-BR			138.3
Double-Acting	2.5	VM43		ZG5410MX-BR			111.1
	5.0			ZG5420MX-BR			138.4
	10.0	VM43		ZG6440MX-BCFH		17.0	334.0

*To order Briggs & Stratton motor, place a "B" suffix in the model number.

ZG5/ ZG6 Series

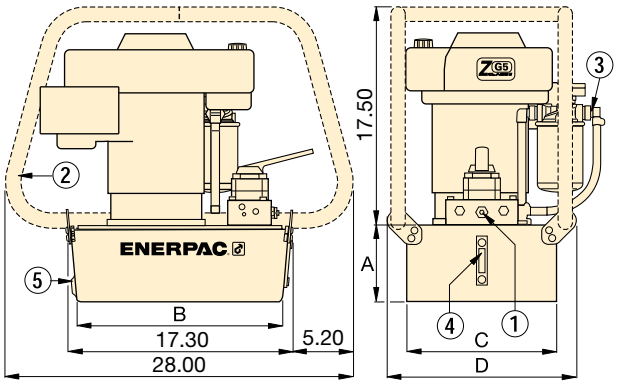
Reservoir Capacity:
2.5-10 gal.

Flow at Rated Pressure:
100-200 in³/min.

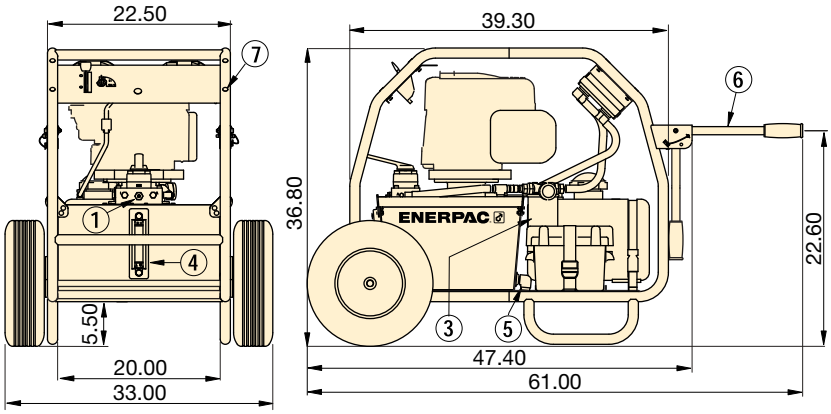
Engine Size:
7.1, 8.5 and 17.0 Ft.lbs

Maximum Operating Pressure:
10,000 psi

ZG5

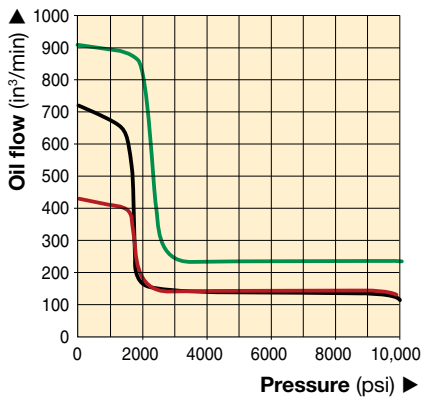


ZG6



① User adjustable relief valve on all manual valves. 3/8" NPTF on A and B ports; 1/4" NPTF on auxiliary ports.
② Roll Bar (optional)
③ Return Line Filter (optional on ZG5, Standard on ZG6)
④ Oil Level Gauge
⑤ Oil Drain
⑥ Collapsible handles (ZG6 only)
⑦ Cart (standard on ZG6 only)

OIL FLOW vs. PRESSURE



Motor Size		Output Flow Rate (in³/min)				Relief Valve Adjustment Range	Sound Level
(Ft.lbs)	RPM	100 psi	700 psi	5,000 psi	10,000 psi	(psi)	(dBA)
7.1	2500	700	650	110	100	1000 - 10,000	88 - 93
8.5	3600	400	380	110	100		91 - 95
17.0	3600	900	885	225	200		91 - 95

ZG5 Dimensions (in)				
Reservoir Size (gal)	A	B	C	D
2.5	6.1	16.5	12.0	15.1
5.0	7.1	16.3	16.6	19.7
10.0	10.6	15.7	19.9	22.7

▼ Shown: **EGM-8418**

EGM
Series

Reservoir Capacity:
25 gal.

Flow at Rated Pressure:
1.5 gal/min.

Motor Size:
18 hp

Maximum Operating Pressure:
10,000 psi

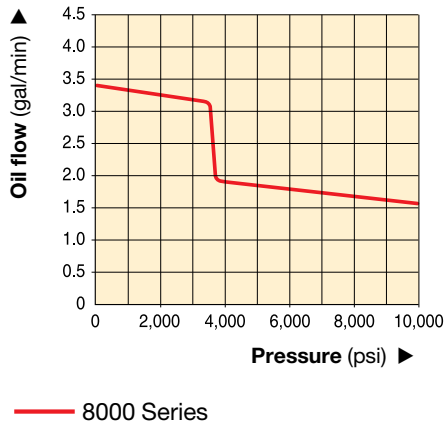
Locking Valves

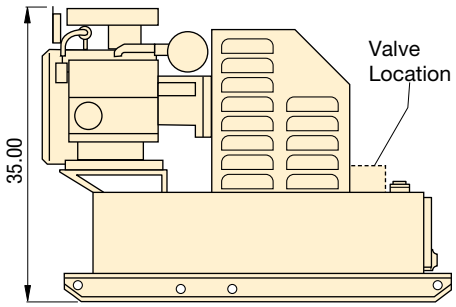
Pumps with VM-4 manual valves are available with VM-4L manual valves for positive load holding. Add suffix "L" to pump model number.

Page: 110

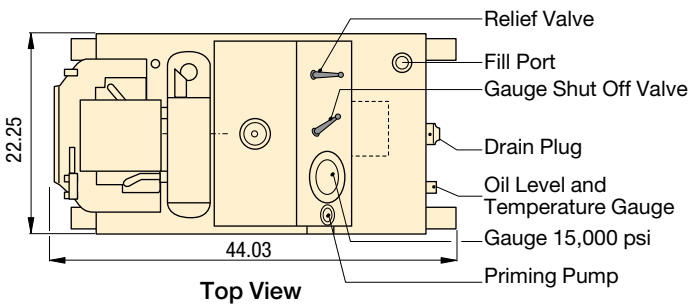
- **Industrial grade 18 hp twin-cylinder motor**
- **Panel mounted pressure gauge and adjustable relief valve for system pressure control**
- **Two-speed pump design with high by-pass pressure for rapid cylinder advance**
- **Built in oil temperature and oil level gauge**
- **External adjustable relief valve (1,200-10,000 psi) allows control of operating pressure without opening the pump**
- **Integral priming circuit guarantees quick starts after transport**

OIL FLOW vs. PRESSURE





Side View



Top View

Used with Cylinder	Usable Oil Capacity (gal)	Model Number	Pressure Rating (psi)		Output Flow Rate (gal/min)		Valve Type	Valve Function	Sound Level (dBA)	Weight (lbs)
			1st stage	2nd stage	1st stage	2nd stage				
Single-acting	18	**EGM-8218**	3,700	10,000	3.4	1.5	3-way, 2-pos.	Adv./Retr.	94	890
Double-acting	18	**EGM-8418**	3,700	10,000	3.4	1.5	4-way, 3-pos.	Adv./Hold/Retr.	94	890

Directional Control Valves Section Overview

ENERPAC hydraulic valves are available in a wide variety of models and configurations.

Whatever your requirements... directional control, flow control, or pressure control... you can be sure that Enerpac has the correct valve to match your application exactly.

Designed and manufactured for safe operation up to 10,000 psi, the range of Enerpac valves allows for direct pump mounting, remote mounting, manual or solenoid actuation, and in-line installation, giving you flexible solutions to control your hydraulic system.

Valve Type	Series		Page
Pump-Mounted Directional Control Valves	**VM, VE**		**110** ▶
Remote-Manual Directional Control Valves	**VC, VM, VE**		**112** ▶
Modular/Solenoid Operated Directional Control Valves	**VE**		**114** ▶

Valving Help

See Basic System Set-Up and Valve Information in our 'Yellow Pages'

Page: 244

▼ Shown from left to right: **VM32, VE33, VM33, VM43L, VE43-115**

- **Advance/Retract and Advance/Hold/Retract operation of single-acting and double-acting cylinders**
- **Manual or solenoid operation**
- **Pump mounting will retrofit on most Enerpac pumps**
- **Available "locking" option on VM Series valves for load-holding applications**
- **Standard "locking" feature on VE Series 3-position valves**

▼ *ZE4420SB-FH Z-Class pump is mounted next to an Enerpac H-frame press, includes VE43 electric valve to control cylinder operation.*

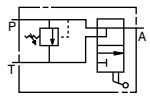
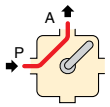
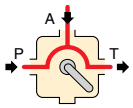
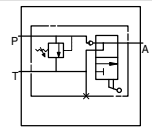
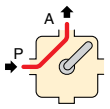
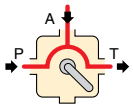
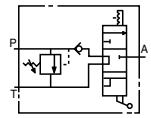
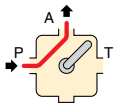
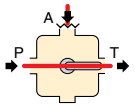
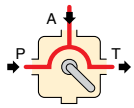
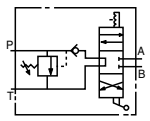
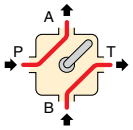
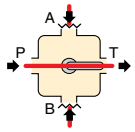
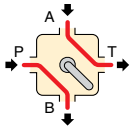
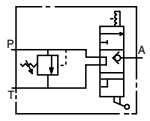
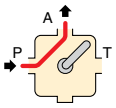
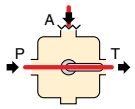
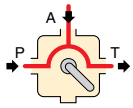
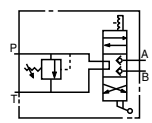
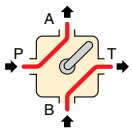
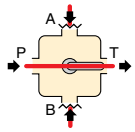
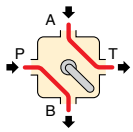
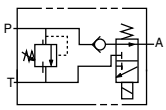
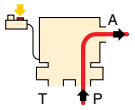
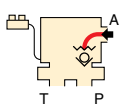
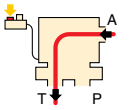
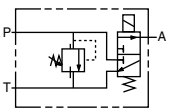
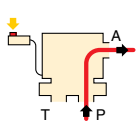
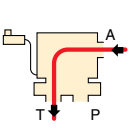
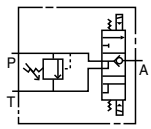
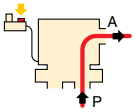
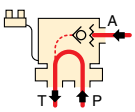
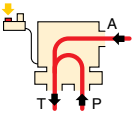
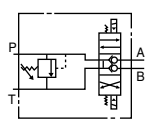
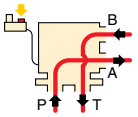
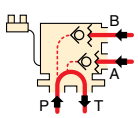
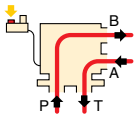
For Reliable Control of Single and Double-Acting Cylinders

Valve Operation	Used with Cylinder	Valve Type
Manual	Single-acting	3-Way 2 Position
Manual	Single-acting	3-Way 2 Position
Manual	Single-acting	3-Way 3 Position, Tandem Center
Manual	Double-acting	4-Way 3 Position, Tandem Center
Manual	Single-acting	3-Way 3 Position, Tandem Center, Locking
Manual	Double-acting	4-Way 3 Position, Tandem Center, Locking
Solenoid 24 VDC	Single-acting	3-Way 2 Position
Solenoid 24 VDC	Single-acting	3-Way 2 Position, Dump
Solenoid 24 VDC		3-Way, 3 Position, Tandem Center
Solenoid 115 VAC	Single-acting	3-Way, 3 Position, Tandem Center
Solenoid 24 VDC	Double-acting	4-Way, 3 Position, Tandem Center
Solenoid 115 VAC	Double-acting	4-Way, 3 Position, Tandem Center

For remote valve applications, see page 112.

Pump Mounted Directional Control Valves

All valves feature several gauge ports for "system", A port and B port pressure monitoring. User-adjustable relief valves are included on all models to allow the operator to easily set the optimum working pressure for each application. VM33 and VE43 valves include "System Check" feature, for more precise pressure holding and improved system control. The VM33 has improved porting which provides faster cylinder retraction while motor is running.

Model Number	Hydraulic Symbol	Schematic Flowpath			Weight
		Advance	Hold	Retract	(lbs)
VM22					5.6
VM32					5.6
VM33					6.7
VM43					6.8
VM33L					10.7
VM43L					10.8
VE32					8.7
VE32D					8.7
VE33					20.3
VE33-115					20.3
VE43					20.3
VE43-115					20.3

See page 113 for product dimensions.

VM, VE Series

Flow Capacity:
4.5 gal/min.

Maximum Operating Pressure:
10,000 psi

Push-Button Control Station

VE33-115 and VE43-115 electric valves are supplied with IC400 control station. These valves include an 8 ft. power cord, and can be used on any Enerpac pump. They require a separate 115 volt power supply to operate.

Locking Valves

For applications that require positive load holding, VM Series valves (except the VM22 and VM32 valve) are available with a pilot-operated check valve. This option provides hydraulic locking of the load until the valve is shifted into the retract position.

To order this feature, place an "L" at the end of the model number.

Pendants for VE-Series Solenoid Valves

When ordering Enerpac VE-Series solenoid valves, the pendant must be ordered separately for *Z-Class* pumps. Pendant connection to be plugged into electric box of pump.

To be used with solenoid valves:	Pendant Model No.
VE32D	**ZCP-1**
VE32, VE33, VE43	**ZCP-3**

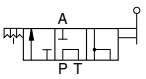
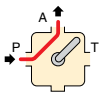
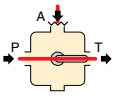
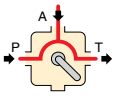
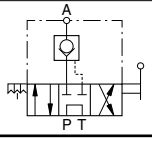
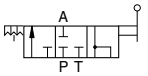
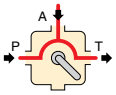
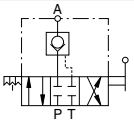
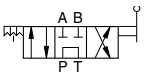
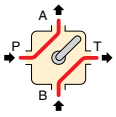
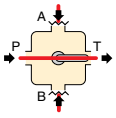
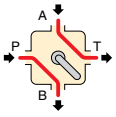
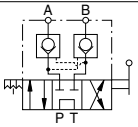
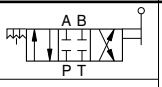
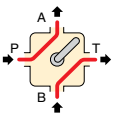
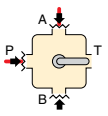
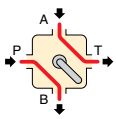
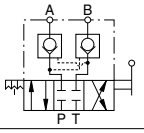
▼ Shown from left to right: **VC-20, VC-4L**

Reliable Remote Control

Locking Valves

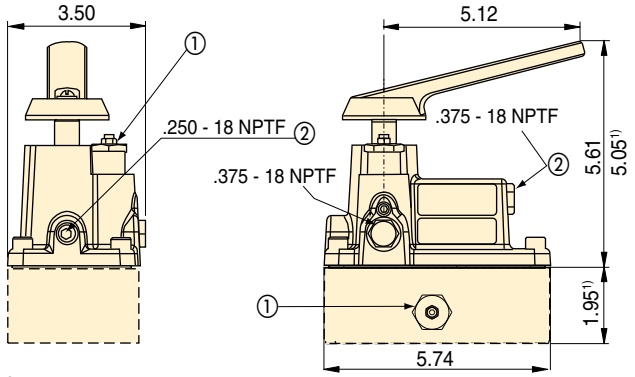
For applications that require positive load holding, VC and VM Series valves are available with a pilot-operated check valve. This option provides hydraulic locking of the load until the valve is shifted into the retract position.

- **Advance/Hold/Retract operation for use with single-acting or double-acting cylinders**

Valve Operation	Valve Type	Model Number	Hydraulic Symbol	Schematic Flowpath			Weight
				Advance	Hold	Retract	(lbs)
Manual	3-Way, 3 Position, Tandem Center	**VC-3**					6.4
Manual	3-Way, 3 Position, Tandem Center, Locking	**VC-3L**					10.3
Manual	3-Way, 3 Position, Closed Center	**VC-15**					6.4
Manual	3-Way, 3 Position, Closed Center, Locking	**VC-15L**					10.3
Manual	4-Way, 3 Position, Tandem Center	**VC-4**					6.4
Manual	4-Way, 3 Position, Tandem Center, Locking	**VC-4L**					10.3
Manual	4-Way, 3 Position, Closed Center	**VC-20**					6.4
Manual	4-Way, 3 Position, Closed Center, Locking	**VC-20L**					10.3

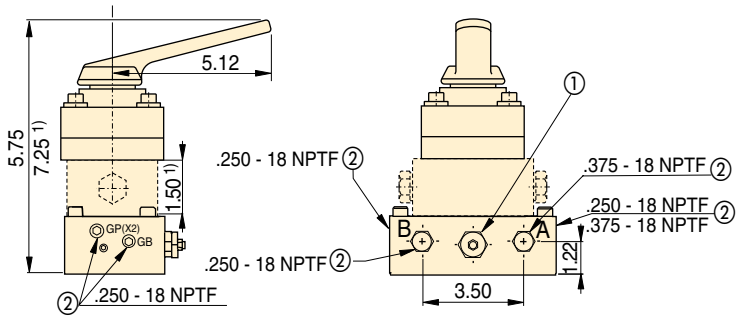
Return line kit included with remote valves

Valve dimensions in inches.



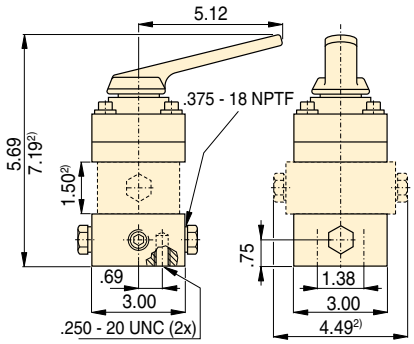
VM22, VM32

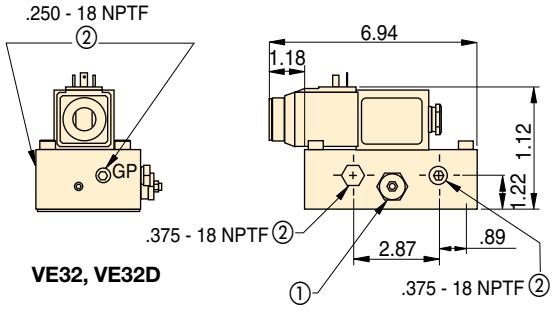
1) VM22 only



VM33, VM33L
VM43, VM43L

1) VM33L and VM43L only

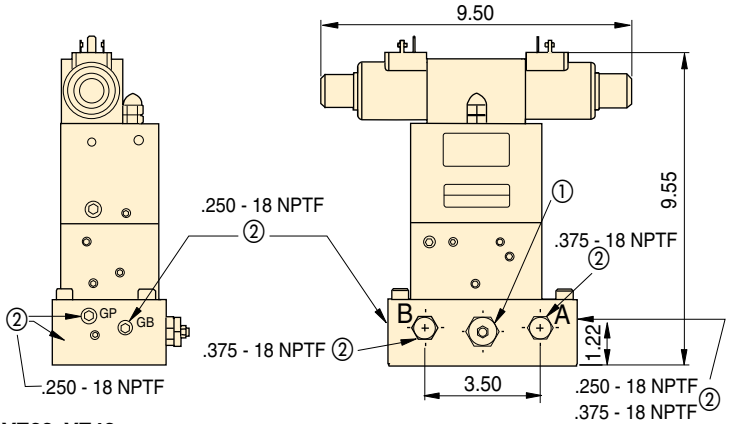




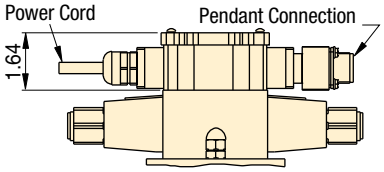
VE32, VE32D

VC3, VC3L, VC-15, VC15L, VC-4, VC4L, VC20, VC20L

2) VC3L, VC15L, VC4L and VC20L only



VE33, VE43



VE33-115
VE43-115

① User Adjustable Relief Valve
② Auxiliary Port

VC, VM, VE Series

Flow Capacity:
4.5 gal/min.

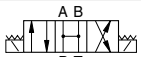
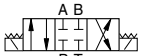
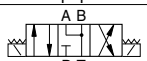
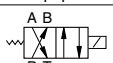
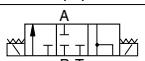
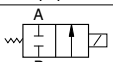
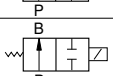
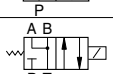
Maximum Operating Pressure:
10,000 psi

User Adjustable Relief Valve

All VM- and VE-Series have a user adjustable relief valve to allow the operator to easily set the optimum working pressure.

▼ Shown top to bottom: **VEC-15600D, VEK-15000B, VEC-15000B**

- **Ideal for independent control of multiple cylinders or functions**
- **Relief valve and pilot-operated check accessory valves are stackable between manifold and valve body**
- **Remote and pump mounting**

Valve Flow Path	Used with Cylinder	Valve Code	Hydraulic Symbol
4-Way, 3-Position (4/3) Open Center	Double-acting	**A**	
4-Way, 3-Position (4/3) Closed Center	Double-acting	**B**	
4-Way, 3-Position (4/3) Tandem Center	Double-acting	**C**	
4-Way, 3-Position (4/3) Float Center	Double-acting	**D**	
4-Way, 2-Position (4/2) Crossover Offset	Double-acting	**E**	
3-Way, 3-Position (3/3) Tandem Center	Single-acting	**F**	
3-Way, 3-Position (3/3) Closed Center	Single-acting	**G**	
2-Way, 2-Position (2/2) Normally Closed	System Un-loading	**H***	
2-Way, 2-Position (2/2) Normally Open		**K***	
4-Way, 2-Position (4/2) Float Offset	Double-acting	**M**	
3-Way, 2-Position (3/2) Normally Open	Single-acting	**P**	

* Requires use of tank port for dump or unloading

Unmatched Combinations and Possibilities

3-Way Check Valve

Use a **VS-51** 3-way pilot operated check valve assembly to convert your 3-way modular valve into a load-holding valve.

4-Way Check Valve

Use a **VS-61** 4-way pilot operated check valve assembly to convert your 4-way modular valve into a load-holding valve.

System Pressure Control

To add system pressure control to your modular valve, order **VS-11 Relief Valve** assembly.

Bolt Kits for Accessory Valves With No Manifold

Order Bolt Kit **BK-2** when adding one of the accessory valves. Order Bolt Kit **BK-3** when adding any combination of two accessory valves.

How to order one of the 1,300 possible model numbers?

With over 1,300 possible model numbers, Enerpac has the perfect valve for you. Use the “chart” to build your own valve for the specific application you require. This is the complete guide to all the Modular valves that are available.

CUSTOM BUILD YOUR MODULAR VALVES

▼ This is how a Modular Valve Model Number is built up:

VE	A	-	1	5	600	-	D
1	2		3	4	5		6
Solenoid Operated Valve	Valve Flow Path		Flow Capacity	Voltage	Accessory Valves		Manifold

1 Product Type
VE = Solenoid Operated Valve

2 Valve Code
A = 4/3 Open Center
B = 4/3 Closed Center
C = 4/3 Tandem Center
D = 4/3 Float Center
E = 4/2 Crossover Offset
F = 3/3 Tandem Center
G = 3/3 Closed Center
H = 2/2 Normally Closed
K = 2/2 Normally Open
M = 4/2 Float Offset
P = 3/2 Normally Open

3 Flow Capacity
1 = 4 gallons per minute

4 Voltage
1 = 24 VDC
2 = 220/240 V, 1 ph, 50 Hz
5 = 115 V, 1 ph, 60 Hz
6 = 230 V, 1 ph, 60 Hz

5 Accessory Valves
000 = No accessory valves
100 = Relief Valve only
150 = Relief Valve and 3-way pilot operated check valve
Only for VEF/VEG
160 = Relief Valve and 4-way pilot operated check valve
Only for VEA/VEB/VEC/VED
500 = 3-way pilot operated check valve
Only for VEF/VEG
600 = 4-way pilot operated check valve
Only for VEA/VEB/VEC/VED

6 Manifold
A = No manifold**
B = Remote Mounted
D = Pump Mounted*

* Only for valve code: **VEA/VEC/VEF**
** Must order Bolt Kit separately.

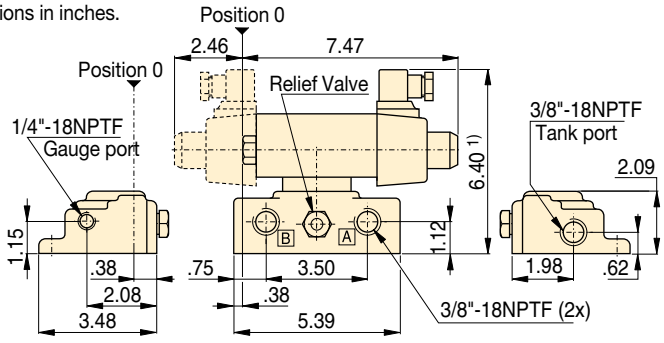
VE Series

Flow Capacity:
4 gal/min.

Maximum Operating Pressure:
10,000 psi

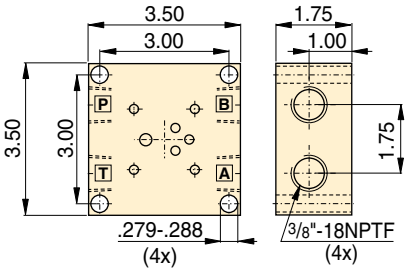
Example: VEA-15600-D
VEA-15600-D is a Modular Valve with a 4-way, 3-position open center flowpath, 115 VAC, and an integral pilot-operated check valve, for mounting on an Enerpac pump.

Valve dimensions in inches.



1) add 1.85 inch for each Accessory Valve

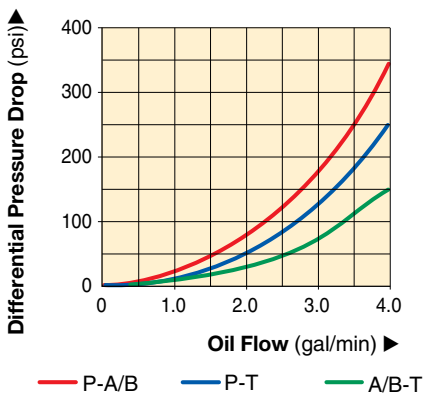
Modular Valve Pump Mounted



Modular Valve Remote Mount Manifold

Maximum Operating Pressure (psi)	Amperage Draw			Seal Material	Valve Plug
	24 VDC	115 VAC 60 Hz	230 V 60 Hz		
0 - 10,000	N/A inrush	3.6 A inrush	1.8 A inrush	Buna-N, Polyure-thane	DIN 43650
	2.5 A Holding	1.0 A Holding	.5 A Holding		

Pressure Drop versus Oil Flow



ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

ENERPAC System Components —
All the additional components you need to complete your high pressure hydraulic system. Engineered to work with your Enerpac cylinders, pumps and tools.
All Enerpac components are designed and manufactured to the most exacting standards.

With this complete line of hydraulic hoses, couplers, fittings, manifolds, oil and gauges Enerpac has the accessories to compliment your system and ensure the efficient operation, long life, and safety of your hydraulic equipment.

Yellow Pages
For sample system set-ups and how to correctly specify your system components, please view the Enerpac ***Yellow Pages***.
Page: **241**

Maintain System Integrity
Use Enerpac System Components, designed to interface with Enerpac Cylinders, Pumps and Tools to ensure your system operates at peak performance.

System Components and Control Valves Section Overview

Component Type	Series	Page
Hoses	700 900	 116 ▶
Couplers	A, C, F, Z	 118 ▶
Hydraulic Oil	HF LX	 120 ▶
Manifolds	A AM	 120 ▶
Fittings	FZ	 121 ▶
Hydraulic Force & Pressure Gauges	GF GP	 122 ▶
Hydraulic Pressure Gauges	G, H	 124 ▶
Test System Gauges	T	 128 ▶
Digital Gauges	DGR	 129 ▶
Gauge Accessories	GA, NV, V	 130 ▶
Pressure Control Valves	V	 132 ▶

▼ Shown from top to bottom: **HC-7206, HC-7210, HC-9206**

Crimped-on rubber strain relief for improved life and durability on all models.

Thermo-plastic Hoses (700-Series)

- **For demanding applications, featuring a 4:1 design factor**
- **Maximum working pressure of 10,000 psi**
- **Two layers of steel wire braids**
- **Outside jacket is polyurethane, to provide maximum abrasion resistance**
- **Exhibits low volumetric expansion under pressure to enhance overall system efficiency**

Heavy-duty Rubber Hoses (900-Series)

- **The most complete offering: 35 models up to 50 feet in length**
- **Rubber coated with two layers of steel wire braids**
- **Designed to comply with Material Handling Institute IJ-100 hose specification**
- **Flexible, with little "memory", is the best choice for long hose runs**

◀ *To prevent back pressure and to increase cylinder retraction speed, when using long hoses, the Enerpac HC-7300 range of hoses with increased internal diameter is the best choice.*

Emphasize Safety and Quality

To ensure the integrity of your system, specify only Enerpac hydraulic hoses.

WARNING !

- **Do not exceed 10,000 psi maximum pressure.**
- **Do not handle hoses while under pressure.**

More safety instructions in our "Yellow Pages".

Page: **241**

▼ **Hose End Couplings**

¼" NPTF	
⅜" NPTF	
A-604	
A-630	
AH-604	
AH-630	
C-604	
CH-604	

700 900 Series

Inside Diameter:
.25 and .38 inch

Length:
2-50 feet

Maximum Operating Pressure:
10,000 psi

Internal Dia.	Hose End Assemblies and Couplers*		Hose Length	700-Series Thermo-plastic		900-Series Heavy-duty Rubber	
(in)	End one	End two	(ft)	Model Number	Wt. (lbs)	Model Number	Wt. (lbs)
.25	¼" NPTF	¼" NPTF	6	–		H-9206Q	2.6
		⅜" NPTF	6	–		H-9206S	2.6
		A-630	6	HB-7206QB	2.4	HB-9206QB	3.1
		AH-630	6	–		HB-9206Q	2.9
		CH-604	6	HC-7206Q	2.3	HC-9206Q	3.0
	⅜" NPTF	⅜" NPTF	2	H-7202	1.2	H-9202	1.6
			3	H-7203	1.5	H-9203	1.9
			6	H-7206	2.0	H-9206	2.6
			10	H-7210	3.0	H-9210	3.9
			20	H-7220	6.2	H-9220	8.0
			30	H-7230	10.0	H-9230	13.0
			50	H-7250	15.4	H-9250	22.0
		A-604		–		–	
			6	HA-7206B	2.5	HA-9206B	3.2
			10	–		HA-9210B	4.5
		AH-604		–		–	
			3	–		HA-9203	2.1
			6	HA-7206	2.2	HA-9206	2.9
			10	HA-7210	3.2	HA-9210	4.2
		AH-630	6	HB-7206	2.2	HB-9206	2.9
		C-604	3	HC-7203B	2.2	HC-9203B	2.9
			6	HC-7206B	2.8	HC-9206B	3.7
			10	HC-7210B	3.9	HC-9210B	5.0
		CH-604	3	HC-7203	1.7	HC-9203	2.2
			6	HC-7206	2.3	HC-9206	3.0
			10	HC-7210	3.3	HC-9210	4.3
			20	HC-7220	6.4	HC-9220	8.3
	CH-604	CH-604	6	HC-7206C	2.4	HC-9206C	3.1
			50	HC-7250C	15.4	HC-9250C	20.0
.38	⅜" NPTF	⅜" NPTF	6	H-7306	3.5	H-9306	4.6
			10	H-7310	5.4	H-9310	7.0
			20	H-7320	10.0	H-9320	13.0
			30	H-7330	16.2	H-9330	21.0
			50	H-7350	15.2	H-9350	33.0
		CH-604	6	HC-7306	3.4	HC-9306	4.9
				–		HC-9308	6.2
			10	HC-7310	5.6	HC-9310	7.3
			20	HC-7320	11.2	HC-9320	14.6

* For technical information on couplers see next page.

Torque Wrenches Hoses

Use Enerpac 3.5:1 twin safety hoses with double-acting wrenches to ensure the integrity of your hydraulic system. See Selection Matrix.

Page: 210

Fittings

For additional fittings see the fitting page of the System Components section.

Page: 123

Hose Oil Capacity

When using long hose lengths, it is sometimes necessary to fill the pump reservoir after filling the hoses. To determine the hose oil capacity, use the following:

For .25" internal diameter hoses:
Capacity (in^3) = .5892 x Length (ft)

For .38" internal diameter hoses:
Capacity (in^3) = 1.3608 x Length (ft)

▼ Shown: **FH-604, FR-400, A-630 disassembled, C-604, AH-604, AR-400**

⅜" High Flow Couplers

- **Standard equipment on most Enerpac cylinders**
- **Recommended for use on all Enerpac pumps and cylinders where space and porting permits**
- **Include "2-in-1" dust cap for use on male and female coupler halves**

⅜" High Flow "Flush-face" Couplers

- **Featuring "Push-to-connect" operation, to guarantee good connection every time**
- **Flush-face, zero-leak operation for minimal spillage**
- **HTMA* recognized for safety and performance**

⅜" Regular Spee-D-Coupler®

- **For medium duty applications; for use with hand pumps**
- **Includes female steel dust cap**

¼" Regular Coupler

- **For use with small cylinders and hand pumps**
- **Includes female steel dust cap**

* Hydraulic Tool Manufacturers Association

Quick Connection of Hydraulic Lines

Thread Sealer

To seal NPTF threads use one of the new anaerobic thread sealers or Teflon paste. When using Teflon tape, apply the tape one thread back from the end of a fitting to prevent it from entering the hydraulic system.

WARNING!

Couplers should be pressurized only when completely connected, and should not be coupled or uncoupled when pressurized.

More safety instructions in our "Yellow Pages".

Page: 243

S- and W-Series Torque Wrench Couplers

S- and W-Series Torque Wrenches require 1/4" spin-on couplers and THQ hoses.

Page: 204

▼ *With the use of Enerpac High Flow Couplers, hoses are easily installed for multiple hydraulic line connections in this 34 points PLC-controlled lifting system.*

F-Series

Flush-faced couplers provide reduced pressure drop verses other types and are preferred in dirty, grimy construction and mining environments due to easy clean, non-dirt trapping faces.

Metal Dust Caps

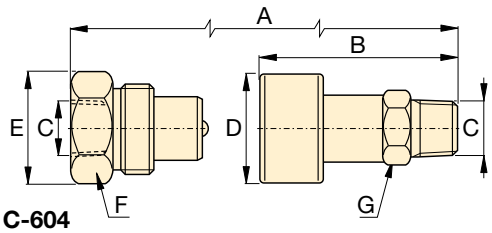
Steel dust caps are available for the C-604 series couplers.
Order model number:
CD-411M for female half
CD-415M for male half

A C F Series

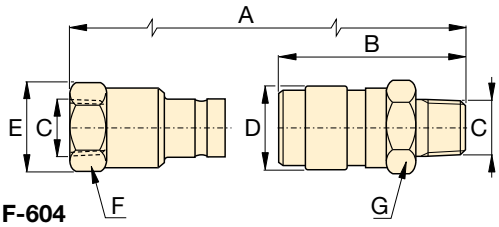
Maximum Flow Capacity:
2,500 in³/min.

Thread:
¼" and ⅜" NPTF

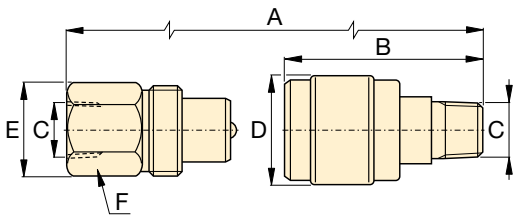
Maximum Operating Pressure:
10,000 psi



C-604



F-604



A-604, A-630

CT-604 Safety Tool

Use the Enerpac CT-604 to relieve hydraulic back pressure by safely bleeding the hydraulic coupler. Minimize injuries from projectile parts and under-skin hydraulic fluid injections by eliminating unsafe coupler bleeding practices. The CT-604 is Enerpac-engineering safe for use at 10,000 psi (700 bar).

NOTE: C-Series only.

Maximum Flow Capacity (in³/min)	Coupler Type	Model Numbers			Dimensions (in)							Dust Cap(s)
		Complete Set	Female Half	Male Half	A*	B	C	D	E	F	G	
2,500	**High Flow Coupler** 	C-604	CR-400	CH-604	3.26	2.87	⅜" NPTF	1.38	1.38	1.25	1.00	(2x) CD-411 Included
2,500	**Flush-face coupler** 	F-604	FR-400	FH-604	4.36	2.85	⅜" NPTF	1.23	1.23	1.06	1.12	–
462	**Regular Spee-D-Coupler®** 	A-604	AR-400	AH-604	3.09	2.53	⅜" NPTF	1.12	.94	.94	.73	Z-410 female only Included
462	**Regular Coupler** 	A-630	AR-630	AH-630	2.61	1.72	¼" NPTF	.87	.81	.75	.57	Z-640 female only Included

* Value A is total length when male and female halves are connected.

▼ Shown top to bottom: **HF-101, HF-100, HF-102, LX-101, A65, and FZ1055**

Genuine Enerpac System Components

Hydraulic Oil

Contents	Model Number	
1 Quart	**HF-100**	Highviscosity index ensures maximum lubricity over a wide range of operation temperatures.
1 Gallon	**HF-101**	
5 Gallons*	**HF-102**	
55 Gallons	**HF-104**	
1 Gallon**	**LX-101**	

⋆ Packed in two 2½ gallon cans.
⋆⋆ Hand pump oil.

HF Oil

- **Specially formulated for power pumps**
  - **maximum volumetric efficiency**
  - **maximum heat transfer**
  - **prevents cavitation**
  - **anti-sludge, anti-rust, anti-foam additives**
- **Maximum film protective lubricity**
  - **anti-oxidation additives**

LX Hand Pump Oil

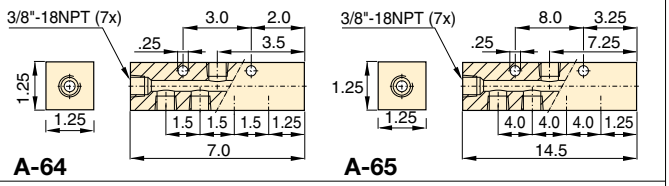
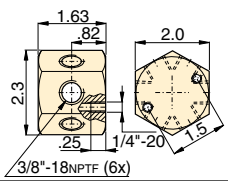
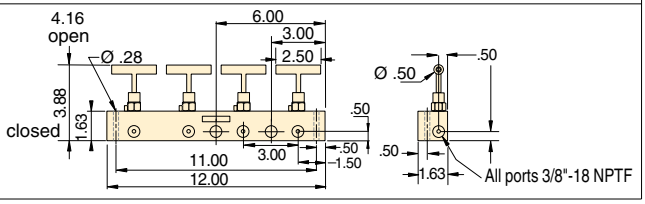
- **Specially formulated for hand pumps**
  - **anti-sludge, anti-rust additives**
- **Reduced handle effort over HF oil**
  - **good low temperature performance**
- **Not for use in power pumps**

▼ Oil Specifications Chart

	LX Oil	HF Oil
ISO Grade	15	32
Viscosity Index	101 min	100 min
Viscosity at 210 °F	3.2/3.7 S.U.S.	42/45 S.U.S.
Viscosity at 100 °F	13.5/16.5 S.U.S	150/165 S.U.S.
Viscosity at 0 °F	<2100 S.U.S.	<12000 S.U.S.
API Gravity	31.0/35.0	31.0/33.0
Flash, C.O.C. °F	370	375
Pour Point, °F	-30	-25
Paraffinic Base Color	Yellow	Blue

NOTE: SAE grades do not apply to hydraulic oil.

Manifolds

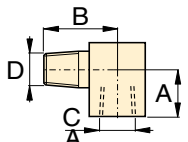
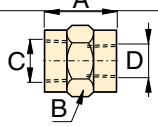
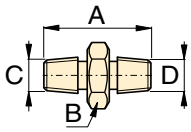
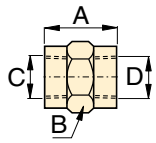
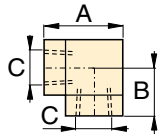
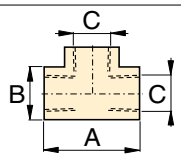
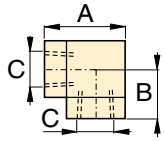
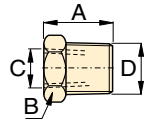
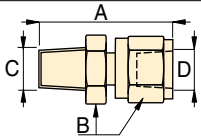
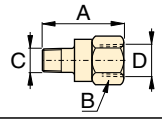
Description		Model No.	Dimensions (in)
7" Long Manifold with 7 female ports.		**A-64**	
14" Long Manifold that allows direct mounting of control valves to the manifold. 7 female ports.		**A-65**	
6-Port Hexagon Manifold Plugs furnished for all ports ⅜"-18 NPTF.		**A-66**	
Premounted Manifold Functions as split-flow valve to control 2 to 4 single-acting cylinders simultaneously. All ports ⅜"-18 NPTF.		**AM-21** **AM-41**	

Recommended Tubing for Hand Plumbing Applications

Enerpac does not supply high-pressure pipe or tubing but recommends the use of cold drawn steel tubing instead of regular pipe in the following dimensions:
In place of 1/4" pipe use 3/8" tubing with a 0.065" minimum wall thickness.
For 3/8" pipe use schedule 80 as a minimum or 1/2" with a 0.095" minimum wall thickness.
For 1/2" pipe use schedule 80 as a minimum or 3/4" tubing with a 0.135" minimum wall thickness.
All tubing wall thicknesses based on a 55,000 psi minimum tensile strength.

A, AM FZ, HF, LX Series

Fittings 10,000 psi

Description		Model Number	Dimensions (in) A	B	C	D	
Street Elbow From: ⅜"-NPTF Male To: ⅜"-NPTF Female		**FZ-1616**	.94	1.30	⅜"-18 NPTF	⅜"-18 NPTF	
Reducing Connector From: ⅜"-NPTF Female To: ¼"-NPTF Female		**FZ-1615**	1.13	1.00	⅜"-18 NPTF	¼"-18 NPTF	
From: ½"-NPTF Female To: ⅜"-NPTF Female		**FZ-1625**	1.88	1.14	½"-18 NPTF	⅜"-18 NPTF	
Hex Nipple From: ¼"-NPTF Male To: ¼"-NPTF Male		**FZ-1608**	1.50	.63	¼"-18 NPTF	¼"-18 NPTF	
From: ⅜"-NPTF Male To: ⅜"-NPTF Male		**FZ-1617**	1.47	.75	⅜"-18 NPTF	⅜"-18 NPTF	
Coupling From: ⅜"-NPTF Female To: ⅜"-NPTF Female		**FZ-1614** **FZ-1605**	1.13 1.13	1.00 .75	⅜"-18 NPTF ¼"-18 NPTF	⅜"-18 NPTF ¼"-18 NPTF	
Cross From: ⅜"-NPTF Female To: ⅜"-NPTF Female		**FZ-1613**	1.77	1.00	⅜"-18 NPTF	–	
Tee From: ⅜"-NPTF Female To: ⅜"-NPTF Female		**FZ-1612**	1.77	1.00	⅜"-18 NPTF	–	
Elbow From: ⅜"-NPTF Female To: ⅜"-NPTF Female		**FZ-1610**	1.38	.88	⅜"-18 NPTF	–	
Bushing From: ⅜"-NPTF Male To: ¼"-NPTF Female		**FZ-1630**	.75	.75	¼"-18 NPTF	⅜"-18 NPTF	
Swivel Fitting From: ⅜"-NPTF Male To: ⅜"-NPTF Female		**FZ-1660**	1.56	.88	⅜"-18 NPTF	⅜"-18 NPTF	
Adaptor Female / Male							
⅜"-18 NPTF / ¼"-18 NPTF		**FZ-1055**	1.75	.94	¼"-18 NPTF	⅜"-18 NPTF	
½"-14 NPTF / ¼"-18 NPTF		**FZ-1633**	1.69	1.13	¼"-18 NPTF	½"-14 NPTF	
½"-14 NPTF / ⅜"-18 NPTF		**FZ-1634**	1.69	1.13	⅜"-18 NPTF	½"-14 NPTF	

▼ Shown: **GF-871P, GP-10S**

Visual References for System Pressure and Force

Auto-Damper Valve

For automatic control of gauge fluctuations, the V-10 Auto-Damper Valve controls the movement of the gauge needle by restricting oil flow in and out of the gauge. No adjustments needed.

Page: 133

Snubber Valve

Infinitely adjustable for metering oil out of a gauge. The V-91 Snubber Valve is also suitable as a shut-off valve to protect the gauge during high cycle applications

Page: 133

- **GF-Series gauges are calibrated with dual scale reading for pressure and force**
- **Excellent readability; 4 inch diameter gauge face**
- **Fast, easy installation**
- **GF-Series gauges are glycerine filled**
- **Stainless steel gauge cases for corrosion resistance**
- **GP-Series gauges are calibrated with dual scale reading for psi and bar**

▼ *A GP-10S gauge is used on this press to check the hydraulic pressure required to bend flat steel bar.*

Used With	
	All Cylinders
	All Cylinders
	All 5 ton RC Cylinders
	All 10 ton RC Cylinders
	All 25 ton RC Cylinders
	RC and RR 50 ton Cylinders
	12 ton RCH-Series
	RCH/RRH-20, 30 and 60 ton
	RCS-201, 302
	RCS-502, 1002
	25 ton Presses
	50 ton Presses
	25-50 ton Presses
	100 ton Presses
	150-200 ton Presses

Maximum Indicator Pointer

Indicator retains peak readings of pressure or force generated by the system.

Order model number: **H-4000G**.

Can easily be installed on GP-Series dry gauges.

Load Gauges

To measure external load supported by a cylinder or jack. For pressing parts together under pre-determined loads, weighing, testing, etc.

Pressure Gauges

To measure the input pressure into cylinders, jacks or high pressure systems. Also for all testing applications.

GP-Series gauges are dry gauges.
GF-Series gauges are glycerine filled.

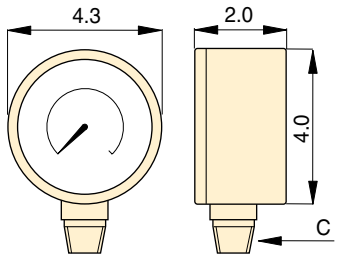
GF GP Series

Pressure Range:
0-15,000 psi

Face Diameter:
4 inch

Accuracy, % of full scale:
± 1%

All Models



Gauge Type and Calibration					Units per Division	Model Number*	Thread C	Gauge Adaptor		
								 133		
								Required		
psi	bar	psi	lbs	tons			(in)	GA-1	GA-2	GA-3
0-10,000	0-700	–	–	–	100 psi, 10 bar	**GP-10S**	½ NPTF	●	●	
0-15,000	0-1000	–	–	–	200 psi, 10 bar	**GP-15S**	½ NPTF	●	●	
–	–	0-10,000	0-10,000	0-5	100 psi, 100 lbs, .1 ton	**GF-5P**	½ NPTF	●	●	
–	–	0-10,000	0-22,200	0-11	100 psi, 200 lbs, .2 ton	**GF-10P**	½ NPTF	●	●	
–	–	0-10,000	0-51,500	0-25.5	100 psi, 500 lbs, .5 ton	**GF-20P**	½ NPTF	●	●	
–	–	0-10,000	0-110,000	0-55	100 psi, 1000 lbs, 1 ton	**GF-50P**	½ NPTF	●	●	
–	–	0-10,000	0-27,000	0-13.5	100 psi, 200 lbs, .25 ton	**GF-120P**	½ NPTF	●	●	
–	–	0-10,000	–	0-23.5/36/65	100 psi, .5/.5/1 ton	**GF-813P**	¼ NPTF			●
–	–	0-10,000	–	0-22/32	100 psi, .5/.5 ton	**GF-230P**	½ NPTF	●	●	
–	–	0-10,000	–	0-50/100	100 psi, 1/1 ton	**GF-510P**	½ NPTF	●	●	
–	–	0-10,000	0-51,500	0-25.5	100 psi, 500 lbs, .5 ton	**GF-20P**	½ NPTF	●	●	
–	–	0-10,000	0-11,000	0-55	100 psi, 1000 lbs, 1 ton	**GF-50P**	½ NPTF	●	●	
–	–	0-10,000	–	0-25.5/32.5/55	100 psi, .5/.5/.5 ton	**GF-835P**	¼ NPTF			●
–	–	0-10,000	–	0-79/103	100 psi, 1/1 ton	**GF-871P**	¼ NPTF			●
–	–	0-10,000	–	0-150/200	100 psi, 5/5 ton	**GF-200P**	¼ NPTF			●

* Metric scale Force Gauges are available by changing the “P” suffix to “B”.

▼ Shown: **H-4049L, G-2534R, G-4089L, G-2535L, G-4040L**

Visual References for System Pressure

Glycerine Filled (G-Series)

- **Calibrated in dual scale reading in psi and bar**
- **All pressure sensing parts sealed and dampened by glycerine for long life**
- **Includes safety blow-out disk and pressure equalizing membrane**
- **Gauge snubbers or needle valves recommended for high cycle applications**

High Cycle (H-Series)

- **Calibrated in dual scale reading in psi and bar**
- **Ideal for use in many applications, specifically for high cycle and harsh environments**
- **Gauge snubbers or needle valves recommended to shut off gauge when not in use**

Gauge Adaptor

For easy gauge installation into almost any system, Enerpac offers a complete line of gauge adaptors.

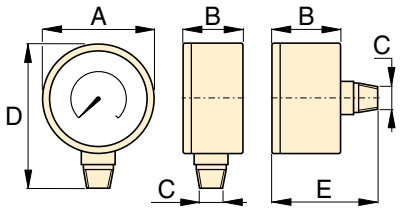
Page: 130

Snubber Valve

Infinitely adjustable for metering oil out of a gauge. The V-91 Snubber Valve is also suitable as a shut-off valve to protect the gauge during high-cycle applications.

Page: 133

◀ *When lifting or pressing, always use a gauge. A gauge is your "window" to the system–it lets you see what's going on.*



Dimensions (in)						
Face Diam.	**Connection**	A	B	C	D	E
2.5	Lower Mount	2.50	1.46	¼ NPTF	3.31	–
2.5	Center Rear	2.50	1.46	¼ NPTF	–	2.48
4.0	Lower Mount	4.0	1.15	¼ NPTF	4.80	–
4.0	Lower Mount	4.0	1.93	½ NPTF	5.38	–

Note: dimensions for reference only.

G H Series

Pressure Range:
0-15,000 psi

Face Diameter:
2.5-4 inches

Accuracy, % of full scale:
±1% and 1½%

Maximum Indicating Pointer

Indicator retains peak readings of pressure or force generated by the system.

Order model number: **H-4000G**.

Note: For use on H-Series gauges only.

▼ SELECTION CHART

Gauge Series	Pressure Range		Model Number				Major Graduation		Minor Graduation		Major Graduation		Minor Graduation	
			Face ø 2.5" ¼ NPTF Lower Mount	Face ø 2.5" ¼ NPTF Center Rear	Face ø 4" ¼ NPTF Lower Mount	Face ø 4" ½ NPTF Lower Mount	psi				bar			
	(psi)	(bar)	Accuracy ±1½%	Accuracy ±1½%	Accuracy ±1%	Accuracy ±1%	(2.5")	(4")	(2.5")	(4")	(2.5")	(4")	(2.5")	(4")
G-Series	0-100	0-7	**G2509L**	–	–	–	10	–	2	–	1	–	.01	–
	0-160	0-11	**G2510L**	–	–	–	10	–	2	–	1	–	.02	–
	0-200	0-14	**G2511L**	–	–	–	50	–	5	–	1	–	.02	–
	0-300	0-20	**G2512L**	–	–	–	50	–	5	–	5	–	.50	–
	0-600	0-40	**G2513L**	–	–	–	100	–	10	–	10	–	1	–
	0-1,000	0-70	**G2514L**	**G2531R**	–	–	100	–	20	–	10	–	1	–
	0-2,000	0-140	**G2515L**	–	–	–	500	–	50	–	10	–	2	–
	0-3,000	0-200	**G2516L**	–	–	–	500	–	50	–	50	–	5	–
	0-6,000	0-400	**G2517L**	**G2534R**	–	–	1000	–	100	–	100	–	10	–
	0-10,000	0-700	**G2535L**	**G2537R**	**G4088L**	**G4039L**	2000	1000	200	100	100	100	10	10
	0-15,000	0-1000	**G2536L**	**G2538R**	**G4089L**	**G4040L**	3000	3000	200	200	100	100	20	20
H-Series	0-10,000	0-700	–	–	**H4049L**	**H4071L**	–	1000	–	100	–	100	–	10

▼ Gauge shown: **T-6003L**

T Series

Pressure Range:
0-50,000 psi

Face Diameter:
6.4 inches

Accuracy, % of full scale:
± ½% and ± 1½%

Cone Mount Gauge Adaptor

Contains fittings to connect .25" cone fitting gauge to .38" cone system.
Kit includes **43-301** tee and **43-704** gauge adaptor.
Order model number: **83-011**.

Page: **71**

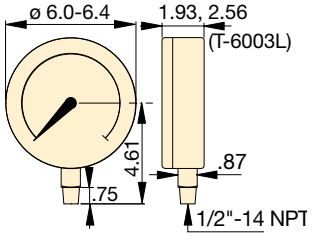
Cone Mount Gauge Connector

For connecting gauges with .25" cone fitting directly to model number 11-100 or 11-400 pump. May be used with other .25" cone systems.
Order model number: **43-704**

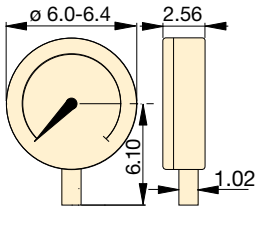
Page: **71**

- **Calibrated for dual scale reading in psi and bar**
- **All gauges have spring-loaded backs with rubber blow-out plugs to protect case assembly in case of over-pressurization**
- **40,000 and 50,000 psi models include flange mounting**
- **1/2" NPTF versions are made of high strength alloy steel**
- **.25" cone models are made of 316 stainless steel, with 403 stainless steel on 40,000 and 50,000 psi models**
- **Integral maximum indicator pointer standard on all gauges**

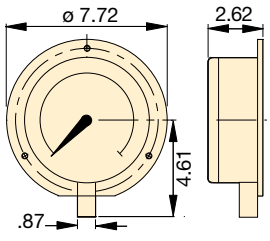
▼ *An Enerpac P-2282 hand pump equipped with a T-6011L test system gauge is used for proof pressure testing of hydraulic valves.*



T-6001L, -6002L, -6003L



T-6007L, -6008L



T-6010L, -6011L

Pressure Range (psi)	Pressure Range (bar)	Model Number: Alloy Steel ½" NPTF	Model Number: Stainless Steel .25" Cone	Number Intervals (psi)	Graduation Intervals (psi)	Number Intervals (bar)	Graduation Intervals (bar)
0-1,000*	0-70	**T-6001L**	–	100	10	10	1
0-5,000*	0-350	**T-6002L**	–	500	50	50	5
0-10,000*	0-700	**T-6003L**	**T-6007L**	1,000	100	100	10
0-20,000*	0-1400	–	**T-6008L**	1,000	100	200	20
0-40,000**	0-2800	–	**T-6010L**	5,000	200	500	20
0-50,000**	0-3500	–	**T-6011L**	5,000	500	500	50

* Accuracy: ± ½%
** Accuracy: ± 1½%

▼ Gauge shown: **DGR-1**

DGR
Series

Pressure Range:
0-15,000 psi

Voltage:
3 VDC (battery)

Accuracy, % of full scale:
± 0.2%

- **Rated for system pressure up to 15,000 psi**
- **Displays in psi, bar, MPa, kPa, mbar/hPa**
- **Zero reset – ensures that gauge reads actual system pressure**
- **Protective cover can be ordered separately**
- **3 VDC battery included – CR2430**
  - **1400 hours continuous operation in standard mode**
  - **IP65 protection**
- **Two modes**
  - **Automatic shut off (15 min.)**
  - **Continuous display**

Protective Cover

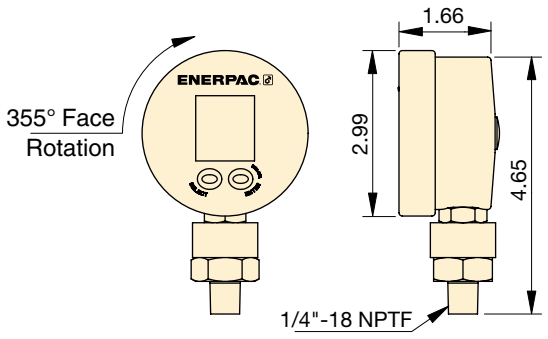
Fits over face of gauge for protection in harsh environments. Order Model No. **DGR-1PC**.

Gauge Adaptor

For easy gauge installation into almost any system, Enerpac offers a complete line of gauge adaptors.

Page: **130**

▼ *Greater accuracy and easier to read: enhance your ability to monitor and control hydraulic system pressure up to 15,000 psi.*



Pressure Rating (psi)		Model Number	Pressure Rating (bar)		Pressure Rating (kPa)		Pressure Rating (MPa)		Pressure Rating (mbar)		Weight
Range	Interval		Range	Interval	Range	Interval	Range	Interval	Range	Interval	(lbs)
0-15,000	3	**DGR-1**	0-1000	0.2	0-20,000	20	0-100	0.02	0-20,000	200	0.5

▼ Shown left to right: **GA-3, V-91, GA-1, GA-2, GA-4, NV-251, GA-918**

GA, NV, V
Series

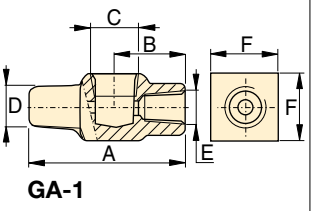
Operating Pressure:
10,000 psi

▼ *A gauge is easily installed into your hydraulic system using a gauge adaptor.*

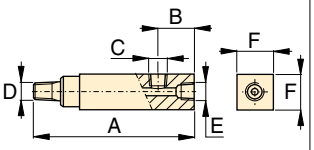
Gauge Adaptors (GA-Series)

- For easy mounting of a pressure gauge into your system
- Male end screws into pump or cylinder port, female end accepts hose or coupler, third port is for gauge connection
- GA-918 provides for swivel connection
- Simplifies gauge installation and reading

Model Number	Gauge Port (NPTF)	Male End (NPTF)	Female End (NPTF)	Dimensions (in) A	B	C	D	E	F
GA-1	½"	⅜"	⅜"	2.81	1.24	½ NPTF	⅜ NPTF	⅜ NPTF	1.25
GA-2	½"	⅜"		6.10	1.38	½ NPTF	⅜ NPTF	⅜ NPTF	1.25
GA-3	¼"	⅜"		5.25	1.38	¼ NPTF	⅜ NPTF	⅜ NPTF	1.25
GA-4	½"	¼"		4.38	1.38	½ NPTF	¼ NPTF	⅜ NPTF	1.25



GA-1

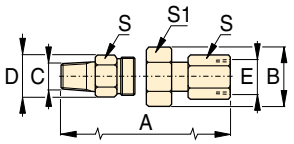


GA-2, GA-3, GA-4

Swivel Adaptor (GA-918)

- Simplifies gauge installation and reading

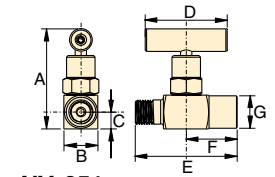
Model Number	Dimensions (in) A	B	C	D	E	S	S1
GA-918	4.62	1.72	½ NPTF	1.30	½ NPTF	1.13	1.50



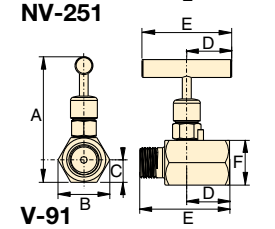
Needle Valves (NV- and V-Series)

- Both NV-251 and V-91 provide positive shut-off
- 316 stainless steel stem, 24 threads/in.

Model Number	Orifice	Thread Size	Dimensions (in) A	B	C	D	E	F	G
NV-251	.17	¼" NPT	2.22	.75	.38	1.81	2.25	1.13	.72
V-91	.19	½" NPT	3.50	1.44	.63	1.25	2.50	1.25	–



NV-251



V-91

By using only Enerpac Branded Oil and Couplers, you are protecting the integrity of your system with components that are designed to work with your Enerpac Rams, Cylinders, Pumps and Tools. Protect your investment and personnel, demand only Enerpac accessories.

H-Series Hydraulic Hoses

Enerpac H-Series hydraulic hoses are designed to provide the best performance of your Enerpac products. Available in Thermoplastic or Rubber construction, a number of lengths and internal diameters, and with a number of end-configurations, there will be an Enerpac hose to perfectly match your exact application.

C-Series Couplers

Enerpac C-Series Couplers provide easy hose and tool connectivity while providing correct performance and pressure ratings to operate most all Enerpac products.

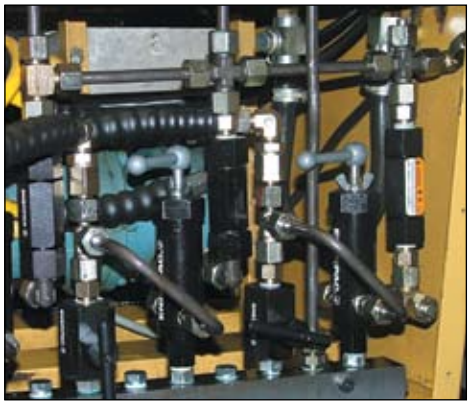
G-Series Gauges

Enerpac gauges and gauge adaptors makes monitoring your systems performance easy while minimizing the risk of overloading and ensuring long, dependable service. Gauges are available to read pressure or force in pounds or tons for many Enerpac cylinders.

▼ Shown from left to right: **V-152, V-66, V-82, V-161, V-42, V-17**

Your Hydraulic Control Solution

▼ *The V-152 Pressure Relief Valve limits the pressure or force developed in the hydraulic system.*

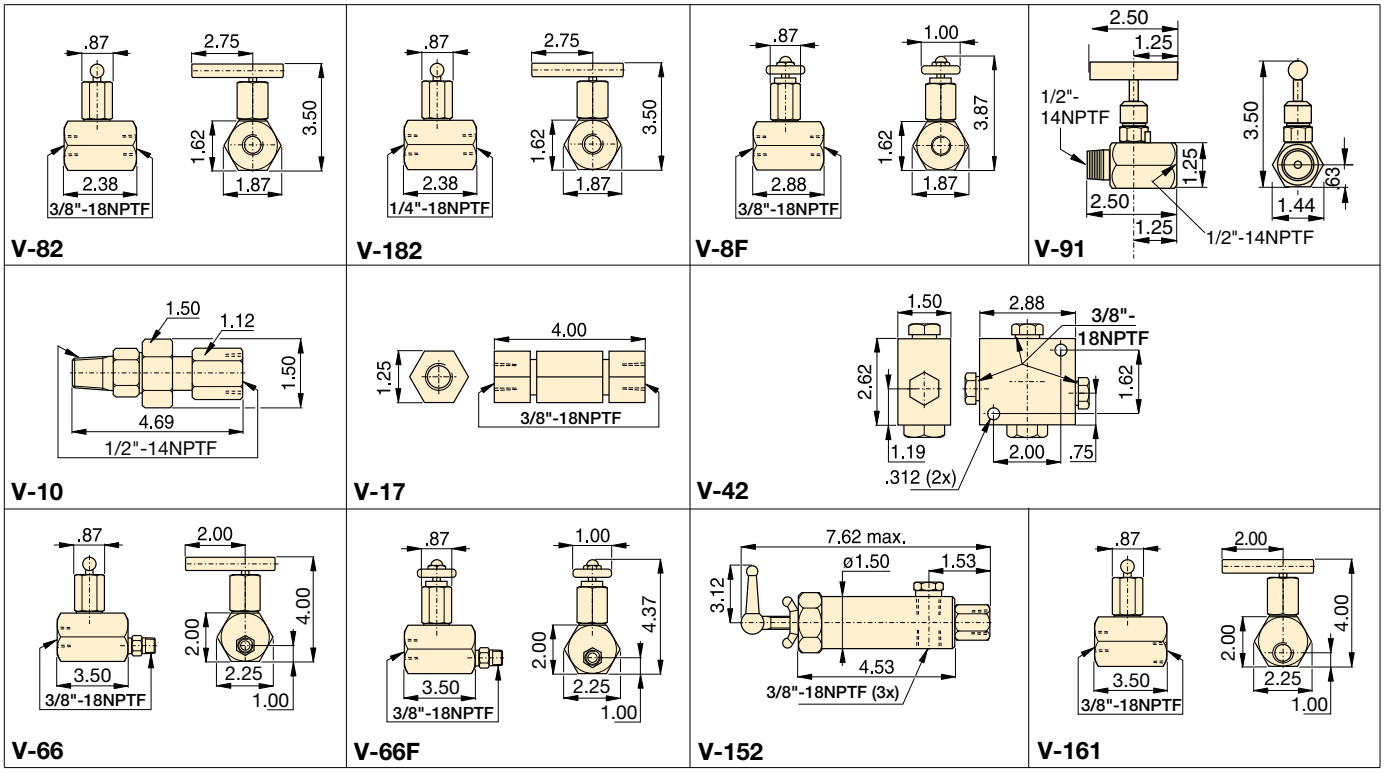


- **All valves are rated for 10,000 psi operating pressure**
- **All valves feature NPTF porting to insure against leakage at rated pressure**
- **All valves are painted, coated, or plated for corrosion resistance**

Valve Applications

To see these valves used in typical hydraulic circuits, please see our "Yellow Pages".

Page: **252**



Valve Dimensions in inches.

Flow and Pressure Control Valves

Premounted Manifold

For two or four port manifold with integral flow control valves, see the manifold page of the System Components section.

Page: 122

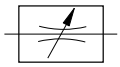
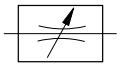
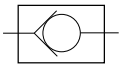
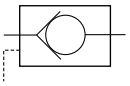
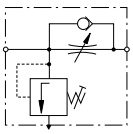
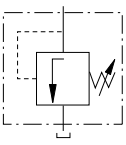
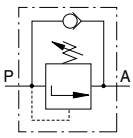
Fittings

For additional fittings see the fitting page of the System Components section.

Page: 123

V Series

Maximum Operating Pressure:
10,000 psi

Valve Type and Model Number		Description		Hydraulic Symbol
Needle Valve **V-82** **V-182F** **V-8F**		**V-82:** To control cylinder speed. Can also be used as shut-off valve for temporary load holding. ⅜" NPTF female ports. **V-182**: Same as V-82, but with	¼" NPTF female ports. Also suitable for gauge snubbing. **V-8F:** Similar to V-82, but with very fine metering for precise flow control. **Not recommended as shut-off valve.**	
Snubber Valve **V-91**		**V-91:** Adjustable for metering oil out of a gauge to prevent snapping of gauge pointer when load or pressure is suddenly released. Also suitable as shut-off valve to protect	the gauge during high cycling applications. ½" NPTF male and female threads for use with GA-1, GA-2 or GA-4 gauge adaptors.	
Auto Damper® Valve **V-10**		**V-10:** To be used when gauge pressure must be monitored during high cycle applications. Creates a flow resistance when load is released suddenly.	No adjustments are necessary. ½" NPTF male and female threads for use with GA-1, GA-2 or GA-4 gauge adaptors.	
Check Valve **V-17**		**V-17:** Ruggedly built to resist shock and operate with low pressure drop. Closes smoothly without pounding. ⅜" NPTF female ports.		
Pilot Operated Check Valve **V-42**		**V-42:** Can be mounted at the cylinder to hold the load in case of system pressure loss. Normally used with double-acting cylinders where pilot port receives pressure	from a Tee-fitting in the cylinder retract line. ⅜" NPTF female ports. Pilot pressure ratio 14% (6.5:1).	
Manually Operated Check Valve **V-66*** **V-66F**		**V-66:** Used for load holding applications with single and double acting cylinders. Valve is manually opened to allow oil to flow back to tank when cylinder retracts.	**V-66F:** Similar to V-66, but with very fine metering capability for precise flow control. Not designed for load holding applications.	
Pressure Relief Valve **V-152***		**V-152:** Limits pressure developed by the pump in hydraulic circuit, thus limiting the force created by other components. Valve opens whenever preset pressure is reached.	To increase pressure setting, turn handle clockwise. Includes: • 3 ft return line hose kit • ±3% repeatability • 800-10,000 psi adjustment range.	
Sequence Valve **V-161**		**V-161:** To control oil flow to a secondary circuit. Flow is blocked until system pressure rises to the V-161 setting. When this pressure level is reached, the V-161 opens to	allow flow to the secondary circuit. A pressure differential is always maintained between the primary and secondary circuit. **Min. operating pressure: 2000 psi.**	

* See page 56-57 for more information on extreme pressure and flow control valves.

Enerpac Hydraulic Presses

ENERPAC. POWERFUL SOLUTIONS. GLOBAL FORCE.

ENERPAC Hydraulic Presses are available in a wide variety of standard capacities and configurations, or you can "build your own" with the easy-to-use matrix.

The press frames are a welded construction for maximum strength and durability, and when combined with the power of high pressure hydraulics, will provide years of safe and dependable service in your workshop.

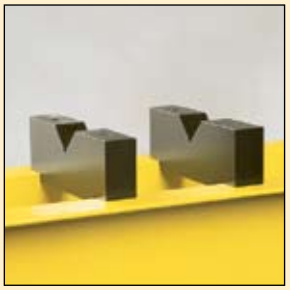
Enerpac press capacities range from 10-ton to 200-ton and are available in Bench, C-Frame, Arbor, H-Frame and Roll-Frame models.

These Press features increase productivity and broaden the range of applications:

Standard on many Enerpac IP Presses, the exclusive Hydra-Lift™ offers effortless adjustment to the press daylight by use of a hydraulic lift.

Easy horizontal cylinder position is achieved with the unique "roller-head" cylinder mounting block, standard on most Enerpac IP Presses.

Optional "V-blocks" for positioning of complex parts are designed with high-strength steel for long life.



Capacity (tons)	Press Type and Functions	Series	Page
10-200	H-Frame Presses	IP	 136 ▶
50-200	Roll Frame Presses	IPR	 140 ▶
5-20	C-Clamp Presses	A	 142 ▶
10-30	Arbor Presses	A	 142 ▶
10	Bench Frame Press	A IP	 142 ▶
5	Hydraulic Bench Vise	BV	 144 ▶
10-200	Press Accessories Press Speed Chart		 146 ▶
10-200	Custom Built Presses	IP	 147 ▶
5 1-100	Tension Meter Load Cells	TM LH	 148 ▶
	Press Application Ideas		 149 ▶

▼ Press shown: **IPE-5060**

Setting the Industry Standard

- **Quality welded frame for maximum strength and long life**
- **Exclusive "Hydra-Lift™" bed for effortless adjustment of the vertical daylight (10-ton models are manual)**
- **Roller head design is standard to allow movement and locking of the cylinder from side to side (10-ton, 25-ton and 30-ton are manual)**
- **All models in the Quick Selection Chart have been matched to a pump, cylinder, hoses and gauge, offering the complete package**

◀ *An Enerpac H-Frame press quickly removes the shaft from this assembly.*

Cylinder Mounting Block
Allows cylinder mounting into a press frame, while also allowing side to side adjustment of cylinder position.
Page: 146

Hydra-Lift™
Allows easy, effortless daylight adjustment. Standard on most H-Frame presses.
Page: 146

Pump Mounting Bracket
Heavy-duty steel brackets allow mounting of one of the Enerpac Power Sources to power your press.
Page: 146

Gauge Included
All standard press models include a gauge and gauge adaptor, matching the press capacity.
Page: 139

V-Blocks
These optional V-Blocks are designed for easy fixturing of round stock and other non-uniform materials. Featuring precise fit into the press bolster.
Page: 146

Ordering Variations

Any variations to a listed part number must be ordered as two seperate items. For example, if you need a different voltage electric pump, please order from the modular matrix on page 147 and the electric pump from the modular matrix on page 91 (electric) or page 103 (air).

Any questions should be directed to our Technical Service Department.

Page: 146

Cylinder Types

= Single-acting, Spring Return

= Double-acting, Hydraulic Return

IP Series

Capacity:
10-200 tons

Maximum Daylight and Width:
54.50 & 48.00 inches

Maximum Operating Pressure:
10,000 psi

▼ QUICK SELECTION CHART

For more technical information see next page.

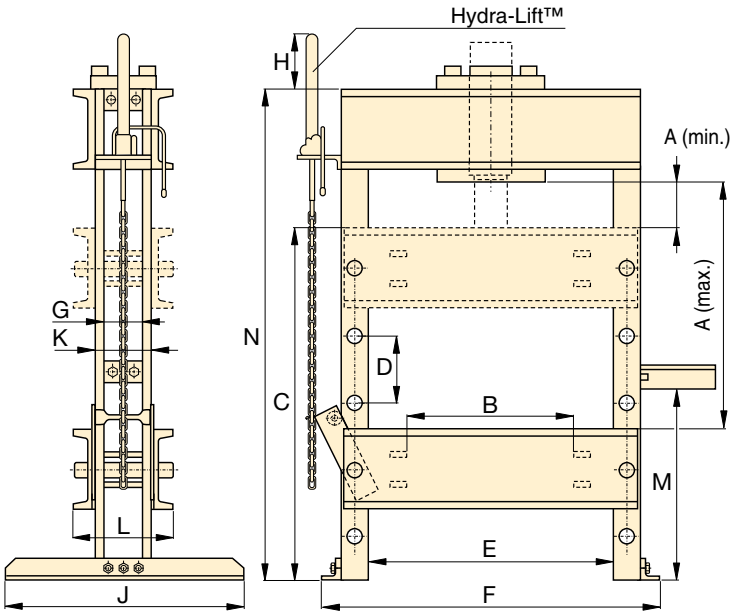
Press Capacity (tons)	Maximum Vertical Daylight (in)	Maximum Bed Width (in)	Power Source: Type: Man.	Type: Elec.	Type: Air	Valve: Man.	Valve: Elec.	Press Model Number	Cylinder: Spring Return	Cylinder: Hydraulic Return	Cylinder: Stroke (in)	Speed (sec/in)*: Rapid Advance	Speed (sec/in)*: Pressing
10 [101]	1016	473		●		●		IPE-1215	●		254	45	7,9
	1016	473			●	●		IPA-1220	●		254	7,5	1,9
	1016	473	●			●		IPH-1240	●		254	{7,8}	{1,7}
	1016	473	●			●		IPH-1234		●	254	{11}	{1,7}
	1016	473			●	●		IPA-1244		●	254	8,5	2,3
25 [232]	1384	736		●		●		IPE-2505	●		152	17	1,6
	1384	736		●			●	IPE-2510	●		355	36,9	3,3
	1384	736			●	●		IPA-2520	●		355	3,6	1,0
	1384	736	●			●		IPH-2531	●		355	{4,9}	{0,7}
30 [294]	1384	736			●	●		IPA-3071		●	355	42	0,6
	1384	736		●			●	IPE-3060		●	355	29,3	2,6
	1384	736	●			●		IPH-3080		●	355	{3,6}	{0,7}
50 [498]	1233	730		●			●	IPE-5010	●		330	24,9	2,3
	1233	730			●	●		IPA-5021	●		152	25	0,3
	1233	730	●			●		IPH-5030	●		152	{19}	{0,7}
	1233	730	●			●		IPH-5031	●		152	{2,3}	{0,3}
	1233	730		●		●		IPE-5005	●		152	7,7	0,8
	1233	730			●	●		IPA-5073		●	330	26	0,8
	1233	730		●			●	IPE-5060		●	330	24,9	2,3
	1233	730	●			●		IPH-5080		●	330	{19}	{0,7}
100 [933]	1079	889			●	●		IPA-10023	●		254	14	0,4
	1079	889		●			●	IPE-10010	●		254	13,3	1,2
	1079	889	●			●		IPH-10030	●		254	{10}	{0,4}
	1079	889		●			●	IPE-10060		●	330	13,3	1,2
	1079	889	●			●		IPH-10080		●	152	{10}	{0,4}
150 [1387]	1231	1219		●			●	IPE-15065		●	330	11,7	1,7
200 [1995]	1231	1219		●			●	IPE-20065		●	330	8,1	1,1

* {--} Speed in strokes per inch plunger travel

The moveable "cylinder mounting block" allows the user to quickly adapt the press to a specific job.▶

◀ For full features see page 136.

Press Capacity (tons)	Press Model Number	Pump Model Number	Page:	Cylinder Model Number	Page:	H-Frame Press Dimensions (in) A (max)	A (min)	B	C	D	E
10 (101)	**IPE-1215**	PEM-1201B	**76**	RC-1010	**6**	1016	62	–	1187	127	473
	IPA-1220	PATG-1102N	**98**	RC-1010	**6**	1016	62	–	1187	127	473
	IPH-1240	P-392	**62**	RC-1010	**6**	1016	62	–	1187	127	473
	IPH-1234	P-84	**64**	RR-1010	**32**	1016	62	–	1187	127	473
	IPA-1244	PAMG-1402N	**98**	RR-1010	**32**	1016	62	–	1187	127	473
25 (232)	**IPE-2505**	PUJ-1200B	**74**	RC-256	**6**	1391	177	–	1447	301	736
	IPE-2510	ZE3310SB-N	**88**	RC-2514	**6**	1391	177	–	1447	301	736
	IPA-2520	PATG-1102N	**98**	RC-2514	**6**	1391	177	–	1447	301	736
	IPH-2531	P-80	**64**	RC-2514	**6**	1391	177	–	1447	301	736
30 (294)	**IPA-3071**	PAM-1042	**101**	RR-3014	**32**	1391	177	–	1447	301	736
	IPE-3060	ZE3410SB-N	**89**	RR-3014	**32**	1391	177	–	1447	301	736
	IPH-3080	P-84	**64**	RR-3014	**32**	1391	177	–	1447	301	736
50 (498)	**IPE-5010**	ZE4320SB-N	**89**	RC-5013	**6**	1213	179	476	1371	263	730
	IPA-5021	PAM-1022	**101**	RC-506	**6**	1213	179	476	1371	263	730
	IPH-5030	P-462	**64**	RC-506	**6**	1213	179	476	1371	263	730
	IPH-5031	P-80	**64**	RC-506	**6**	1213	179	476	1371	263	730
	IPE-5005	PUJ-1200B	**74**	RC-506	**6**	1213	179	476	1371	263	730
	IPA-5073	ZA4208MX	**102**	RR-5013	**32**	1213	179	476	1371	263	730
	IPE-5060	ZE4420SB-N	**89**	RR-5013	**32**	1213	179	476	1371	263	730
	IPH-5080	P-464	**64**	RR-5013	**32**	1213	179	476	1371	263	730
100 (933)	**IPA-10023**	ZA4208MX	**102**	RC-10010	**6**	1054	177	508	1295	263	889
	IPE-10010	ZE4320SB-N	**89**	RC-10010	**6**	1054	177	508	1295	296	889
	IPH-10030	P-462	**64**	RC-10010	**6**	1054	177	508	1295	296	889
	IPE-10060	ZE4420SB-N	**89**	RR-10013	**32**	1054	177	508	1295	296	889
	IPH-10080	P-464	**64**	RR-1006	**32**	1054	177	508	1295	296	889
150 (1387)	**IPE-15065**	ZE5420SG-N	**89**	RR-15013	**32**	1257	317	711	1384	254	1219
200 (1995)	**IPE-20065**	ZE5420SG-N	**89**	RR-20013	**32**	1219	317	711	1384	254	1219



IP Series

Capacity:
10-200 tons

Maximum Daylight and Width:
54.50 & 48.00 inches

Maximum Operating Pressure:
10,000 psi

	H-Frame Press Dimensions (in)								Weight	Press Model Number
	F	G	H	J	K	L	M	N	(lbs)	
	632	–	–	755	108	189	889	1320	135	IPE-1215
	632	–	–	755	108	189	889	1320	72	IPA-1220
	632	–	–	755	108	189	889	1320	71	IPH-1240
	632	–	–	755	108	189	889	1320	85	IPH-1234
	632	–	–	755	108	189	889	1320	73	IPA-1244
	1028	101	336	762	133	271	673	1930	274	IPE-2505
	1028	101	336	762	133	271	673	1930	316	IPE-2510
	1028	101	336	762	133	271	673	1930	276	IPA-2520
	1028	101	336	762	133	271	673	1930	281	IPH-2531
	1028	101	336	762	133	271	673	1930	310	IPA-3071
	1028	101	336	762	133	271	673	1930	327	IPE-3060
	1028	101	336	762	133	271	673	1930	301	IPH-3080
	1085	127	222	914	184	365	781	1930	472	IPE-5010
	1085	127	222	914	184	365	781	1930	439	IPA-5021
	1085	127	222	914	184	365	781	1930	439	IPH-5030
	1085	127	222	914	184	365	781	1930	420	IPH-5031
	1085	127	222	914	184	365	781	1930	421	IPE-5005
	1085	127	222	914	184	365	781	1930	479	IPA-5073
	1085	127	222	914	184	365	781	1930	477	IPE-5060
	1085	127	222	914	184	365	781	1930	455	IPH-5080
	1295	171	222	914	222	438	841	1930	748	IPA-10023
	1295	171	222	914	222	438	841	1930	781	IPE-10010
	1295	171	222	914	222	438	841	1930	751	IPH-10030
	1295	171	222	914	222	438	841	1930	791	IPE-10060
	1295	171	222	914	222	438	841	1930	755	IPH-10080
	1706	231	78	1117	333	555	1212	2286	1772	IPE-15065
	1706	231	78	1117	333	555	1212	2286	1772	IPE-20065

H-Frame Press Gauges

All standard press models include a gauge and gauge adaptor, matching the press capacity:

Press Capacity (tons)	Gauge Model Number	Adaptor Model Number
10	GF-10P	GA-2
25	GF-20P	GA-2
30	GF-835P	GA-3
50	GF-50P	GA-2
100	GF-871P	GA-3
150	GF-200P	GA-3
200	GF-200P	GA-3

For more information on gauges, please refer to the System Components section.

Page: 117

Ordering Variations

Any variations to a listed part number must be ordered as two seperate items. For example, if you need a different voltage electric pump, please order from the modular matrix on page 147 and the electric pump fom the modular matrix on page 91 (electric) or page 103 (air).

Any questions should be directed to our Technical Service Department.

Page: 146

▼ Shown: **IPR-10075**

- **Quality welded frame for maximum strength and long life**
- **Frame rolls easily on four steel roller bearings**
- **Hydraulic clamp cylinders lock frame into position**
- **Exclusive "Hydra-Lift™" bolster for effortless adjustment of the vertical daylight**
- **Standard roller head design allows movement of the cylinder from side to side**
- **All models in the Quick Selection Chart have been matched to a pump, cylinder, hoses and gauge, offering the complete package**
- **Roll Frame design features a stationary bed with the ability to support heavy loads**

The One and Only

Cylinder Mounting Block
Allows cylinder mounting into a press frame, while also allowing side to side adjustment of cylinder position.

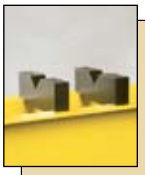
Page: **148**

Pump Mounting Bracket
Heavy duty steel brackets to allow conversion to one of the Enerpac Power Sources to power your press.

Page: **148**

Hydra-Lift™
Allows easy, effortless daylight adjustment.

Page: **148**

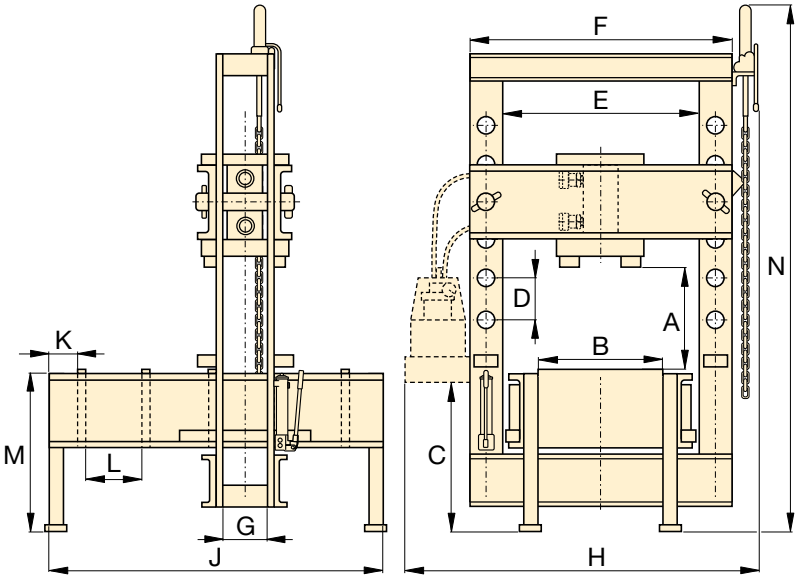


Optional V-Blocks
These V-Blocks, 200 ton only, are designed for easy fixturing of round stock and other non-uniform materials. Featuring precise fit into the press bolster.

Page: **148**

Press Capacity (tons)	Vertical Daylight A (in) minimum	Vertical Daylight A (in) maximum	Horizontal Daylight E (in)	Pump Model Number	Page:	Press Model Number	Cylinder, Double-Acting Hydraulic Return	Stroke (in)	Model Number	Page:	Speed (sec/in) Rapid Advance	Speed (sec/in) Pressing
50 (445)	152	942	730	ZE4420SB-N	**89**	**IPR-5075**	●	333	RR-5013	**33**	24,9	2,3
100 (890)	159	1048	889	ZE5420SG-N	**89**	**IPR-10075**	●	333	RR-10013	**33**	17,4	2,5
200 (1780)	279	1295	1219	ZE5420SG-N	**89**	**IPR-20075**	●	333	RR-20013	**33**	8,1	1,1

▼ *An IPR-20075 Roll Frame Press is used to remove a large shaft from this pillow-block assembly. The Roll Frame design allows this heavy part to be safely loaded with an overhead crane.*



IPR Series

Capacity:
50-200 tons

Maximum Daylight and Width:
51.00 & 48.00 inches

Maximum Operating Pressure:
10,000 psi

Roll Frame Press Gauges

All standard press models include a gauge and gauge adaptor, matching the press capacity:

Press Capacity (tons)	Gauge Model Number	Adaptor Model Number
50	GF-50P	GA-2
100	GF-871P	GA-3
200	GF-200P	GA-3

For more information on gauges, please refer to the System Components section.

Page: 117

Ordering Variations

Any variations to a listed part number must be ordered as two seperate items. For example, if you need a different voltage electric pump, please order from the modular matrix on page 147 and the electric pump fom the modular matrix on page 91 (electric) or page 103 (air).

Any questions should be directed to our Technical Service Department.

Page: 146

Roll Frame Press Dimensions (in)											Weight	Press Model Number
B	C	D	F	G	H	J	K	L	M	N	(lbs)	
397	971	263	933	127	1420	1625	203	270	762	2869	889	**IPR-5075**
437	965	222	1143	146	1605	1676	203	270	812	3021	1,746	**IPR-10075**
609	933	254	1625	231	2149	2197	203	381	914	3199	3,569	**IPR-20075**

▼ Shown from left to right: **A-220, A-330 and A-258**

The Standard In Workshop Tools

Push Pin A-183

For applications requiring precision pressing, such as shaft removal and insertion. This attachment fits 10 ton cylinders and requires the use of a threaded adaptor saddle (A-13).

Smooth Saddle A-185

For pressing applications of delicate parts, such as aluminum castings, this saddle decreases surface marks during the pressing application. Requires 10 ton cylinder and threaded adaptor saddle (A-13).

Arbor Press

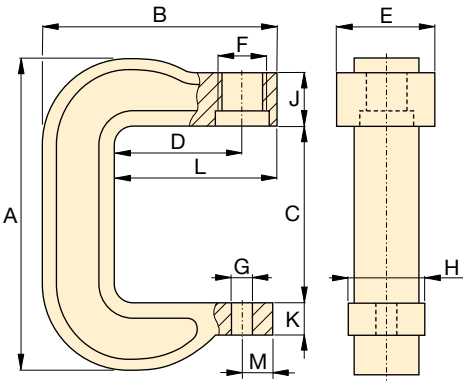
- **Foot mounting holes for horizontal or vertical positioning**
- **Machined work surfaces for easier fixturing**
- **Slotted back to simplify loading and unloading of longer parts**

C-Clamp Press

- **5, 10 and 20 ton capacity**
- **Operational in all positions**

Bench Frame Press

- **Cylinder mounting adaptor allows lateral positioning along rails**
- **Mounting holes for easy mounting to fixed surface**



C-Clamp Press A-205, A-210, A-220

◀ *A-310 Abor Press used for compacting powder at 10 tons.*

Press Type	Press Capacity (tons)	Maximum Vertical Daylight (in)	Maximum Bed Width (in)	Cylinder Series Number*	Press Model Number	Weight (lbs)
Arbor	**10** (89)	228	134	RC-10-x	**A-310**	28
	30 (267)	260	177	RC-30-x	**A-330**	100
C-Clamp	**5** (45)	165	50	RC-5-x	**A-205**	6
	10 (89)	228	57	RC-10-x	**A-210**	17
	20 (178)	304	69	**	**A-220**	38
Bench	**10** (89)	419	381	–	**A-258**	47
	10 (89)	419	381	RC-1010	**IPA-1022*** **	64
	10 (89)	419	381	RC-1010	**IPH-1040*** **	61

* Requires RC cylinder listed, see page 7 for specifications.
** Requires RC-25 ton cylinder, limited to 20 tons.
*** Complete set includes cylinder and pump.

▼ *A perfect example of the force and versatility of the Enerpac A-220 C-Clamp press.*

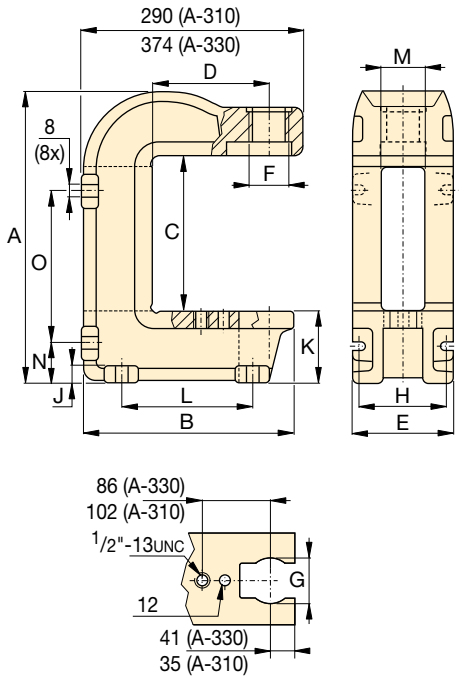
A IP Series

Capacity:
5-30 ton

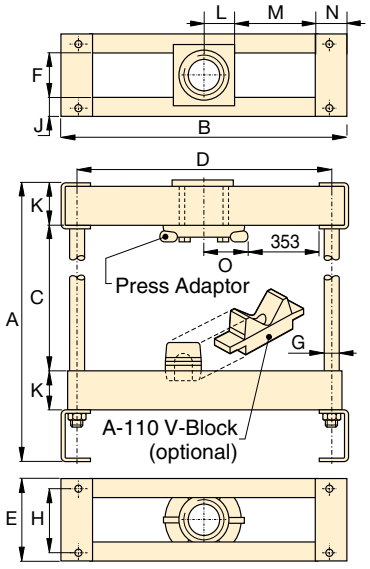
Maximum Daylight and Width:
15.38 and 15.00 inches

Mounting Capabilities:
Fixed or Portable

Maximum Operating Pressure:
10,000 psi



Arbor Press A-310, A-330



Bench Press Frame A-258

For high-cycle production applications, C-Clamp and Arbor presses should be limited in their capacity. Consult Enerpac Technical Services for specific application details.

Enerpac cylinders and power sources for C-Clamp and Arbor presses must be ordered separately.

Press Dimensions (in)														Press Model Number
A	B	C	D	E	F	G	H	J	K	L	M	N	O	
414	280	227	152	134	2¼"-14 un	63	122	19	96	174	65	54	219	**A-310**
557	352	260	152	177	3⁵⁄₁₆"-12 un	63	139	25	165	203	66	98	276	**A-330**
290	203	165	95	73	1½"-16 un	25	50	66	27	121	25	–	–	**A-205**
406	282	228	152	82	2¼"-14 un	25	57	64	43	194	29	–	–	**A-210**
539	346	304	152	108	3⁵⁄₁₆"-12 un	25	69	70	48	213	29	–	–	**A-220**
651	476	419	406	146	82	25	114	31	69	35	135	56	67	**A-258**
651	476	419	406	146	82	25	114	31	69	35	135	56	67	**IPA-1022**
651	476	419	406	146	82	25	114	31	69	35	135	56	67	**IPH-1040**

▼ Shown: **BV5 Hydraulic Bench Vise**

Safe, controlled, hands-free clamping

- **5-tons (44.5 kN) of force for forming and pressing applications**
- **8-inch (203 mm) jaws hold large objects, making cumbersome tasks into one-person jobs**
- **Hands-free operation for safe and controlled actuation when paired with an Enerpac XA11G airpowered foot pump**
- **Flexible-use and ergonomically-friendly tool mounts as a press vertically or as a bench vise horizontally with a swivel base**
- **Rapid spring return makes repetitive work faster**
- **Accessory Magnetic Jaw Liners free hands by holding sockets, screws, rings, c-clips, springs, etc.**
- **Ships assembled with a heavy-duty 10-foot thermoplastic hydraulic hose, HC7210**

Hydraulic Bench Vise Sets

Order everything needed in one box to start working. The BV5 Hydraulic Bench Vise is available as a set (pump with gauge, tool, hose).

BV5 Set Model Number	Hydraulic Bench Vise Model	Pump Model Number	Coupler Model Number
STV5X	BV5*	XA11G	CR400

* Includes hydraulic hose HC7210.

Magnetic Jaw Liners

Don't forget to order **BV5VC** Magnetic Jaw Liners. The magnet inserts hold steel objects like sockets, screws and rings.

Order model number[1)]	**BV5VC**

Hydraulic Swivel Connector

An **XSC1** Hydraulic Swivel Connector allows optimal orientation of the Hydraulic Hose at the pump.

Order model number[1)]	**XSC1**

[1)] Accessories must be ordered separately.

◀ *Enerpac BV5 Hydraulic Bench Vise powered with an XA11G Foot Pump can change a traditional two-person job into a one-person operation.*

Enerpac BV5 Hydraulic Bench Vise mounted vertically for high-force pressing applications. ▶

Hydraulic Bench Vise

The Hydraulic Bench Vise is a general purpose tool that can have multiple clamping and holding applications. Its hydraulic cylinder applies force of up to 5 tons (44.5 kN), three-to-five times the force of a manually operated vise. Hydraulic pressure closes the vise, and spring-return opens the jaws. By pairing the Hydraulic Bench Vise with an Enerpac XA11G air-powered hydraulic power unit, the user can actuate the vise with the foot pedals while using both hands to perform work. In holding large objects, this can enable an otherwise cumbersome task to become a fast and easy one-person job. In addition, the XA11G provides the control for the Hydraulic Bench Vise to hold even delicate objects without crushing. The integrated gauge of the XA11G provides clear indication of system status for better control of the tool.

The Hydraulic Bench Vise can be installed horizontally on a flat surface, vertically as a press, or in any other orientation that satisfies the safety criteria stipulated by the operators' manual.

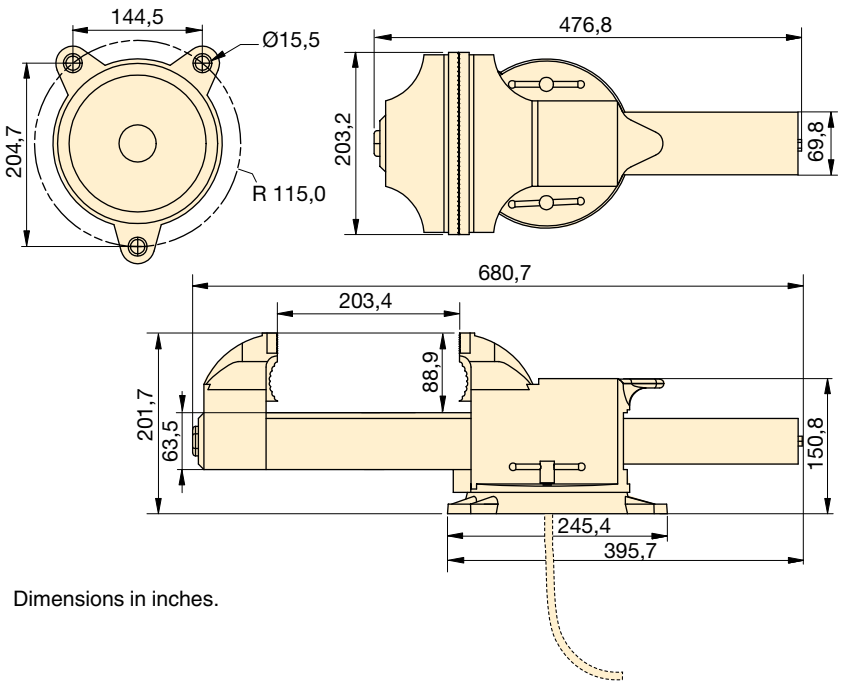
BV5 Series

Maximum Force:
5 tons

Maximum Jaw Opening:
8 inches

Jaw Width:
8 inches

Maximum Operating Pressure:
10,000 psi



Dimensions in inches.

▼ *Enerpac BV5 Hydraulic Bench Vise with hands-free XA11G Foot Pump for safe and controlled actuation.*

▼ **SELECTION CHART**

Maximum Force (10,000 psi) (ton)	Model Number	Oil Capacity (in^3)	Height (in)	Jaw Width (in)	Jaw Opening (Fully Open) (in)	Length (Jaws Closed) (in)	Length (Jaws Open) (in)	Weight (Vise only) (lbs)
44.5	**BV5**	131	202	203	203	477	680	25

Press Accessories and Press Speed Chart

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

Description	Frame Capacity	Model Number		Features
Cylinder Mounting Block	10 ton Bench 10 ton H-Frame 25 and 30 ton H-Frame 50 ton H-Frame 100 ton H-Frame 200 ton H-Frame	**AD-175** **IPK-1012** **IPK-3012** **PK-501** **PK-1002** **PK-2002**		• AD-175 converts the Bench press to use an RD-9 ton cylinder • All mounting blocks allow horizontal movement of cylinder
V- Blocks	10 ton Bench Press 10 ton H-Frame 25 and 30 ton H-Frame 50 ton H-Frame 100 ton H-Frame 150 & 200 ton H-Frame 200 ton Roll Frame	**A-110** **A-136** **A-130** **A-150** **A-175** **A-200** **A-200R**		• Machined from high strength steel for long life • A-110 includes one V-block • All other model numbers include two V-blocks
Hydra-Lift™	25-100 ton H-Frame 150-200 ton H-Frame 50 and 100 ton Roll Frame 200 ton Roll Frame	**IPL-100** **IPL-200** **IPLR-100** **IPLR-200**		• Allows easy, effortless daylight adjustments • Includes accessory chain
Pump Mounting Bracket	Hand operated and small Air Pumps; P-80, P-84, P-142, P-392, PA-133, Turbo II pumps Electric, large Hand Pumps, and ZA4 Air Pumps; ZE Series, P-462, P-464, 10/90 Series Air Pumps	**PMB-1** **PMB-2**		• Both mounting brackets are pre-drilled to accept a number of different pump models

Cylinder Speed

This chart will help you calculate the time required for an Enerpac cylinder to extend when powered by a 10,000 psi Enerpac hydraulic pump. The Cylinder Speed Chart can also be used to determine the pump type and model best suited for an application when you know the plunger speed required.

Cylinder and Pump Selection Chart

Cylinder Capacity (tons)	Cylinder Load	Hand Operated Pumps				Electric Pumps					Air Pumps			
		Strokes per inch of plunger travel				Seconds per inch of plunger travel								
		Single Speed	Two-Speed			½ HP Port.	½ HP Subm.	ZE3 Series	ZE4 Series	ZE5 Series	@100 psi air			
		P-391	P-392	P-80 P-84	P-462 P-464						Turbo II	PA-133	PAM 10 Series	ZA4
10 (89)	No load	1,7	7,8	11,3	87,5	38	28	85,1	122,9	160,7	12	7,6	123	161
	Load	1,7	1,7	1,7	3,3	3,8	3,8	7,6	11,3	22,7	1,5	1,5	1,7	5,7
25 (223)	No load	0,7	3,4	4,9	38,0	17	12	36,9	53,3	69,7	5,3	3,3	53	70
	Load	0,7	0,7	0,7	1,4	1,6	1,6	3,3	4,9	9,8	0,7	0,7	0,7	2,5
30 (267)	No load	0,6	2,7	3,9	30,1	13	2,1	29,3	42,3	55,3	4,2	2,6	42	55
	Load	0,6	0,6	0,6	1,1	1,3	1,3	2,6	3,9	7,8	0,5	0,5	0,6	2,0
50 (445)	No load	0,3	1,6	2,3	17,7	7,7	5,8	17,2	24,9	32,5	2,5	1,5	25	33
	Load	0,3	0,3	0,3	0,7	0,8	0,8	1,5	2,3	4,6	0,3	0,3	0,3	1,1
100 (890)	No load	0,2	0,8	1,2	9,5	4,1	3,1	9,2	13,3	17,4	1,3	0,8	13	17
	Load	0,2	0,2	0,2	0,4	0,4	0,4	0,8	1,2	2,5	0,2	0,2	0,2	0,6

Note: Values are approximate. Cylinder speed may vary in actual application.

CUSTOM BUILD YOUR OWN PRESS

If the press that would best fit your application cannot be found in the charts, you can easily build your custom press here. All presses must be ordered with cylinders. **The pump is ordered separately.**

▼ This is how a press model number is built up

IP	H	-	050	S	06	-	1
1 Product Type	2 Frame Type		3 Press Capacity	4 Cylinder Type	5 Cylinder Stroke		6 Pump Mounting Kit

1 Product Type
IP = Industrial Press

2 Frame Type
B = Bench [2]
H = H-Frame
R = Roll Frame [1]

3 Press Capacity
010 = 10 ton
025 = 25 ton
030 = 30 ton
050 = 50 ton
100 = 100 ton
150 = 150 ton
200 = 200 ton

4 Cylinder Type
S = Single-Acting (RC-Series)
D = Double-Acting (RR-Series)

5 Cylinder Stroke (in)
- 10 ton S/A: **06, 08, 10, 12, 14**
  10 ton D/A: **10, 12**
- 25 ton S/A: **06, 08, 10, 12, 14**
- 30 ton S/A: **08**
  30 ton D/A: **08, 14**
- 50 ton S/A: **06, 13**
  50 ton D/A: **06, 13, 20**
- 100 ton S/A: **06, 10**
  100 ton D/A: **06, 13, 18**
- 150 ton D/A: **06, 13, 32**
- 200 ton D/A: **13, 18, 24**

6 Pump Mounting Kit [3]
0 = No mounting kit
1 = Hand operated and small air pumps:
P-80, P-84, P-141, P-142, P-202, P-391, P-392, PA-133 and all Turbo II Air pumps
2 = Electric, large hand operated and modular air pumps:
PUJ-12, PEM-12, ZE3-6 Series P-462, P-464 PAM-10 and -90 Series

[1] Roll Frame Press: 50-, 100- and 200-ton press capacity only. (Assembly required)
[2] Bench Press: 10-ton press capacity S/A only. Convert A258 bench press to D/A using AD175 and RD910
[3] Includes hoses for press, except for option **0**.

Ordering Example

Model number: IPH-050S06-2

IPH-050S06-2 is a 50-ton H-Frame press with a single-acting, 6 inch stroke cylinder (RC-506). It has a pump mounting kit (for an electric Pump or a Modular Air Pump).

See the cylinder and pump selection chart on previous page for selecting the proper pump.

IP Series

Capacity:
10-200 tons

Maximum Daylight and Width:
54.50 & 48.00 inches

Maximum Operating Pressure:
10,000 psi

"No Load" indicates the plunger speed as it extends toward the load (1st stage).
"Load" indicates the plunger speed as the load is applied at a system pressure of 10,000 psi (2nd stage).

Formula V = A ÷ Q

V (sec/in) = **A** (in^2) ÷ **Q** (in^3/min)
V = Cylinder plunger speed in seconds per inch
A = Cylinder effective area in square inches (in^2)
Q = Pump oil flow in cubic inches (in^3)

$$\text{Cylinder Plunger Speed (sec/in)} = \frac{\text{Cylinder Effective Area (in}^2\text{)}}{\text{Pump Flow Rate (in}^3\text{/min)}} \times \frac{60\text{ sec}}{1}$$

▼ Shown: **LH-102 and TM-5** (in middle)

TM, LH
Series

Capacity:
2,000 to 200,000 lbs.

Accuracy, % of full scale:
± 2%

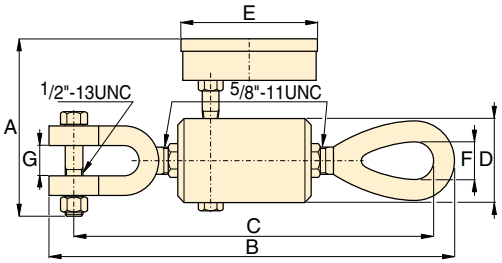
TM and LH models are 100% tested to verify accuracy within a ± 2% range.

If your application requires a calibrated tool, it must be submitted for certification testing.

Certification is NOT available from Enerpac.

Tension Meter TM-5

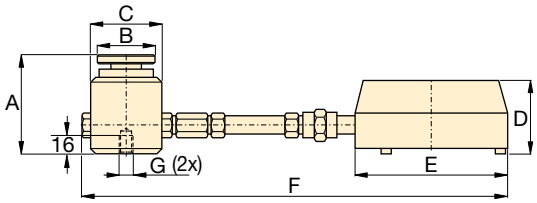
- **Accuracy, ± 2% of full scale**
- **Zinc and bronze plated to resist rust and corrosion**
- **Dual-range readout in kilograms and pounds**
- **Cushioned metal case provides safe storage and transport**
- **Maximum indicating pointer reading for pre-selected forces or to maintain maximum force readings**



TM-5

Load Cells LH Series

- **Accuracy, ± 2% of full scale**
- **Swivel loading pad reduces eccentric loading for improved accuracy**
- **Maximum indicating pointer reading for pre-selected forces or to maintain maximum force readings**
- **Dual-range readout in kilograms and pounds**



LH-Series

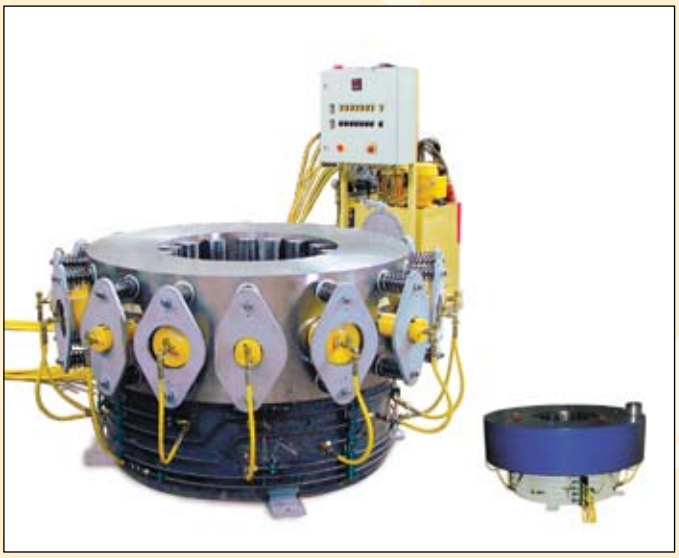
Type	Gauge Capacity		Model Number	Minimum Reading		Gauge Increments		Dimensions (in)						
	(lbs)	(kg)		(lbs)	(kg)	(lbs)	(kg)	A	B	C	D	E	F	G
Direct Mounted	4,500	10,000	**TM-5**	500	1000	100	100	120	247	236	50	93	22	19
Direct Load Cell Mounted	900	2,000	**LH-10**	100	200	20	20	77	44	57	60	101	254	¼"-20, 44,5 BC
	4,500	10,000	**LH-50**	500	1000	100	100	77	44	57	60	101	254	¼"-20, 44,5 BC
Remote Mounted with 2 ft. Hose	900	2,000	**LH-102**	100	200	20	20	77	44	57	60	147	846	¼"-20, 44,5 BC
	4,500	10,000	**LH-502**	500	1,000	100	100	77	44	57	60	147	840	¼"-20, 44,5 BC
	9,000	20,000	**LH-1002**	1,000	2,000	200	200	77	44	57	60	147	840	¼"-20, 44,5 BC
Remote Mounted with 6 ft. Hose	21,000	50,000	**LH-2506**	2,500	5,000	500	500	101	69	85	60	147	2094	⅜"-24, 63 BC
	45,000	100,000	**LH-5006**	2,500	5,000	1,000	1,000	132	101	127	60	147	2135	⅜"-24, 89 BC
	90,000	200,000	**LH-10006**	10,000	20,000	1,000	2,500	158	127	158	60	147	2166	⅜"-24, 102 BC

ENERPAC hydraulics power many custom press applications. By providing reliable and safe high-pressure solutions, Enerpac can solve your custom press application.

Fully Automated PLC-Controlled 1800 Ton High-Accuracy Press

The pressing and heating cycle, during the production of magnetic acceleration coils, required high force and high-accuracy to ensure absolute quality.

Enerpac was consulted to assist in the design of a high accuracy production press. Control of the press force is monitored along with the temperature of the coils during forming by a PLC Control System.



600 Ton High-Accuracy Collar Press

For production of accelerator coils, sheet metal needs to be formed into a specific shape and size. The end product of this forming is a cylindrical collar, which has a very solid structure, specific shape, and a tight tolerance for circularity and concentricity.

The Enerpac team was consulted to accomplish this task using proven high-pressure technology. The 600-ton press consisted of two separate hydraulic systems. The first system featured eight 25-ton cylinders, to position the sheets, while the second system featured eight 75-ton cylinders, to press the sheets into the correct shape.

The results were a hydraulic press system that increased productivity and lowered operating costs.

1000 Ton Cold Forming Press

A manufacturer of diesel engines needed to work-harden aluminum for crankshaft bearing inserts. Working with a customer-hired Systems Integrator, Enerpac provided a 1000-ton cylinder and hydraulic power supply, to the specifications required by the Integrator, to fit into his custom frame and operate with his control system. The Enerpac solution included a 50-series electric pump and 4-way electric solenoid valve.

The final products allowed the end user to quickly, accurately, and safely manufacture crankshaft bearings with an efficient production cycle.

ENERPAC offers a complete line of pullers with the widest range of sizes, capacities and styles. Whether your application requires mechanical, hydraulic or the patented Posi Lock® system, Enerpac can satisfy your requirements. Made of high strength steel alloys, you can depend on Enerpac pullers to provide years of trouble-free operation, even in the harshest environments.

Hydraulic Pullers

These hydraulic pullers eliminate time-consuming and unsafe hammering, heating or prying. Damage to parts is minimized through the use of controlled hydraulic power.

Posi Lock® Pullers

The puller that meets the safety challenge. A control cage holds the pulling jaws securely in working position. This patented feature reduces the possibility of the puller jaws slipping off the work surface thereby increasing productivity and tool life while reducing dangerous situations for the user. The Posi Lock® feature is available in mechanical or hydraulic versions.

WARNING
Do not exceed 50% of the rated puller capacity when using a double crosshead (2 griparms) or when using puller legs in combination with bearing puller attachment.

CAUTION!
Not all puller components and configurations are rated at the set capacity. Please contact Enerpac for specific details.

Always wear Safety Goggles and Gloves while using pullers.

When selecting a puller it is important to consider three basic specifications:

1. Capacity:

The amount of force the puller is capable of producing.

Typically, the capacity required for a job can be determined by using the shaft diameter of the part being pulled.

For manual pullers, the center bolt diameter of the puller should be at least half the diameter of the shaft being pulled from.

For hydraulic pullers, the capacity in tons should be 7 to 10 times the shaft diameter. Use the following chart:

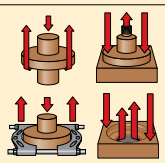
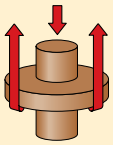
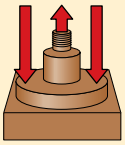
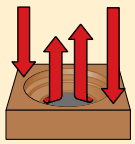
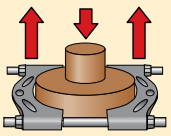
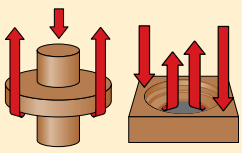
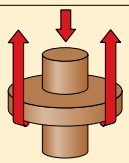
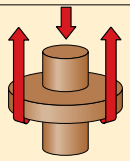
Shaft Diameter	Puller Capacity
0" to 1"	10 ton
1" to 2"	20 ton
2" to 3.5"	30 ton
3.5" to 5.5"	50 ton

2. Reach:

The distance between the bottom of the base and the jaw flats. The puller's reach must equal or exceed the same distance of the part being pulled.

3. Spread:

The distance between the jaws. The puller's spread needs to be greater than the width of the part being pulled.

Puller Function	Capacity (tons)	Puller Type	Series		Page
	8-50	**Master Puller Sets** Max. Reach: 27.56 in. Max. Spread: 43.30 in.	BHP		152 ▶
	8-50	**Grip Puller Sets** Max. Reach: 27.56 in. Max. Spread: 43.30 in.	BHP		153 ▶
	8-50	**Cross-Bearing Puller Sets** Max. Reach: 34.00 in. Max. Spread: 22.46 in.	BHP		154 ▶
	8-50	**Bearing Cup Pullers** Max. Reach: 5.71 in. Max. Spread 14.17 in.	BHP		155 ▶
	8-50	**Bearing Pullers** Max. Spread: 9.65 in. Max. Width 11.50 in.	BHP		155 ▶
	2-40	**Posi Lock® Mechanical Pullers** Max. Reach: 14.00 in. Max. Spread: 25.00 in.	EP, EPP, EPPMI, EPX		156 ▶
	10-50	**Posi Lock® Hydraulic Pullers** Max. Reach: 14.00 in. Max. Spread: 25.00 in.	EPH, EPHR, EPHS		160 ▶
	100	**Posi Lock® Hydraulic Pullers** Max. Reach: 48.0 in. Max. Spread: 70.0 in.	EPH EPHT		163 ▶

▼ Shown: **Master Puller Set BHP-3751G**

BHP
Series

Capacity:
8, 20, 30 and 50 tons

CAUTION!

Not all puller components and configurations are rated at the set capacity. Please contact Enerpac for specific details.

Visit the **Products** section of our web site for more information and product selection charts regarding puller sets and individual puller component parts. **www.enerpac.com**

- **Supplied with a full hydraulic set including pump, hose, cylinder, gauge and gauge adaptor in a storage case**
- **High quality, forged steel components provide superior reliability and service**
- **Sets include speed crank and adjusting screw for fast contact to work before hydraulics are applied**
- **All Master Puller Sets include a Grip Puller, a Cross Bearing Puller, a Bearing Cup Puller and a Bearing Puller which can be ordered separately. See items 10, 20, 30 and 40**

▼ *Maintenance engineers throughout the industry greatly appreciate Enerpac Master Puller sets.*

▼ **SELECTION CHART**

	Master Puller Set Capacity	8 ton	20 ton	30 ton	50 ton	Page Number
	Model Number ▶	**BHP-1752***	**BHP-2751G**	**BHP-3751G**	**BHP-5751G**	
	Included Hydraulics: set weight ▶	82 lbs	198 lbs	380 lbs	657 lbs	
	Hand Pump	P-142	P-392	P-392	P-80	**62** ▶
	Cylinder	RWH-121	RCH-202	RCH-302	RCH-603	**26** ▶
	Saddle	–	HP-2015	HP-3015	HP-5016	**27** ▶
	Hose	HB-7206QB	HC-7206	HC-7206	HC-7206	**119** ▶
	Gauge	GF-120P	GF-813P	GF-813P	GF-813P	**125** ▶
	Gauge Adaptor	GA-4	GA-3	GA-3	GA-3	**130** ▶
	Included Pullers:					
10	Grip Puller	BHP-1762	BHP-252	BHP-352	BHP-552	**153** ▶
20	Cross Bearing Puller	BHP-1772	BHP-262	BHP-362	BHP-562	**154** ▶
30	Bearing Cup Puller	BHP-180	BHP-280	BHP-380	BHP-580	**155** ▶
40	Bearing Puller	BHP-181	BHP-282	BHP-382	BHP-582	**155** ▶
	Storage Case	CM-6	CW-166	CW-550	CW-750	

* Includes FZ-1630 Adaptor.

▼ Shown: **Grip Puller Set BHP-351G**

BHP Series

Capacity:
8, 20, 30 and 50 tons

Maximum Reach:
9.92-27.56 inches

Maximum Spread:
9.84-43.30 inches

Maximum Operating Pressure:
10,000 psi

CAUTION!
Not all puller components and configurations are rated at the set capacity. Please contact Enerpac for specific details.

- **Precise hydraulic control allows fast, efficient and safe pulling**
- **High quality, forged steel components provide superior reliability and service**
- **Available with and without full hydraulic set**
- **Wooden case supplied standard**

Ordering Example

Model Number BHP-251G:
Includes Grip Puller BHP-252 and a full hydraulic set. (Hand pump, cylinder, saddle, hose, gauge and gauge adaptor.)

Model Number BHP-252:
Includes Grip Puller mechanical parts **only,** for use with your existing hydraulics.

▼ SELECTION CHART

Grip Puller Set Capacity		8 ton	20 ton	30 ton	50 ton
Model Number	**Included ▶**	**BHP-152*** **	**BHP-251G**	**BHP-351G**	**BHP-551G**
Hydraulics:	**set weight ▶**	48 lbs	123 lbs	200 lbs	353 lbs
Hand Pump		P-142	P-392	P-392	P-80
Cylinder		RWH-121	RCH-202	RCH-302	RCH-603
Saddle		–	HP-2015	HP-3015	HP-5016
Hose		HB-7206QB	HC-7206	HC-7206	HC-7206
Gauge		GF-120P	GF-813P	GF-813P	GF-813P
Gauge Adaptor		GA-4	GA-3	GA-3	GA-3
Grip Puller	**Model Number ▶**	**BHP-1762***	**BHP-252***	**BHP-352***	**BHP-552***
Maximum Spread**	2-jaw	9.84	15.75	23.38	35.43
	3-jaw	9.84	19.68	31.50	43.30
Maximum Reach**	2-jaw	9.92	11.81	15.25	27.56
	3-jaw	9.92	11.81	15.25	27.56
Jaw**	Thickness	.59	.79	.98	1.18
	Width	.94	1.10	1.50	1.57
Adjusting Screw**	Thread	¾"-16 UNF	1"-8 UNC	1¼"-7 UNC	1⅝"-5.5 NS
	Length	15.75	20.00	24.00	30.00
Wooden Case		CW-166	CW-166	CW-350	CW-750

* Grip Puller model number without hydraulics.
** Dimensions in inches.
*** Includes FZ-1630 Adaptor.

Cross Bearing Puller Sets

▼Shown: **Cross Bearing Puller Set BHP-361G**

BHP Series

Capacity:
8, 20, 30 and 50 tons

Maximum Reach:
14.0-34.00 inches

Maximum Spread:
10.50-22.46 inches

Maximum Operating Pressure:
10,000 psi

CAUTION!
Not all puller components and configurations are rated at the set capacity. Please contact Enerpac for specific details.

- **Precise hydraulic control allows fast, efficient and safe pulling**
- **High quality, forged steel components provide superior reliability and service**
- **The Cross Bearing Puller without hydraulics, Bearing Cup Puller and Bearing Puller may be ordered separately. See items 20, 30 and 40.**

Visit the **Products** section of our web site for more information and product selection charts regarding puller sets and individual puller component parts. **www.enerpac.com**

▼ SELECTION CHART

	Cross Bearing Puller Set Capacity		8 ton	20 ton	30 ton	50 ton
		Model Number ▶	**BHP-162****	**BHP-261G**	**BHP-361G**	**BHP-561G**
	Included Hydraulics:	**set weight ▶**	57 lbs	137 lbs	267 lbs	408 lbs
	Hand Pump		P-142	P-392	P-392	P-80
	Cylinder		RWH-121	RCH-202	RCH-302	RCH-603
	Saddle		–	HP-2015	HP-3015	HP-5016
	Hose		HB-7206QB	HC-7206	HC-7206	HC-7206
	Gauge		GF-120P	GF-813P	GF-813P	GF-813P
	Gauge Adaptor		GA-4	GA-3	GA-3	GA-3
20	**Cross Bearing Puller**	Model Number ▶	**BHP-1772**	**BHP-262**	**BHP-362**	**BHP-562**
	Spread*	Maximum	10.5	13.83	17.9	22.46
		Minimum	4.2	5.5	7.08	8.66
	Reach*	Maximum	14.0	22.5	28	34
	Adjusting Screw*	Diameter	¾"-16 UNF	1"-8 UNC	1¼"-7 UNC	1⅝"-5.50 NS
		Length	15.75	20	24	30
	Leg*	Length	4.13	9.43	8	24
		Length	14.2	16.52	18	34
		Length	–	22.5	28	–
		Length	–	4.5	–	–
	Upper Leg Ends*	Thread	¾"-16x1.0	¾"-16x1.0	1"-14x1.38	1¼"-12x1.50
	Lower Leg Ends*	Thread	⅝"-18x1.0	⅝"-18x1.0	1"-14x1.06	1¼"-12x1.50
30	**Bearing Cup Puller**	Model Number ▶	**BHP-180**	**BHP-280**	**BHP-380**	**BHP-580**
40	**Bearing Puller**	Model Number ▶	**BHP-181**	**BHP-282**	**BHP-382**	**BHP-582**
	Wooden Case	Model Number ▶	**CW-166**	**CW-166**	**CW-550**	**CW-750**

* Dimensions in inches.
** Includes FZ-1630 Adaptor.

▼ Shown: **BHP-380**

Bearing Cup Puller

- **Made of high strength steel alloy**
- **Easily adapted to Cross Bearing Pullers for fast and efficient removal of the most difficult parts**
- **Adjustable to fit a variety of bearings and seals**

BHP
Series

Puller Set Capacity:
8, 20, 30 and 50 tons

Maximum Reach:
4.33-5.71 inches

Maximum Spread:
4.33-14.17 inches

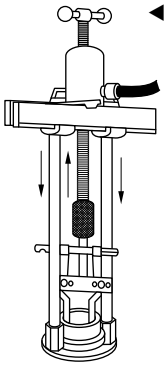
Maximum Operating Pressure:
10,000 psi

▼ **SELECTION CHART**

Puller Set Capacity**		8 ton	20 ton	30 ton	50 ton
30 **Bearing Cup Puller**					
Model Number ▶		**BHP-180**	**BHP-280**	**BHP-380**	**BHP-580**
Spread*	Max.	4.33	8.66	14.17	14.17
	Min.	1.06	.98	1.97	1.97
Reach*	Max.	4.33	5.51	5.71	5.71
Center Screw	Thread	¾"-16 UNF	1"-8 UNC	1¼"-7 UNC	1⅝"-5.50 NS

* Dimensions in inches.
** Puller capacity, not attachment capacity. See Warning box!

WARNING!
Do not exceed 50% of the rated puller capacity when using a double crosshead (2 griparms) or when using puller legs in combination with bearing puller attachment.

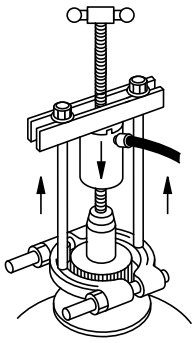


◀ *Bearing Cup Puller shown with Crosshead Puller attachment.*

▼ Shown: **BHP-382**

Bearing Puller

- **Made of high strength steel alloy**
- **Wedge-shaped edges allow removal of the most hard-to-grip components**
- **Easily adapted to Cross Bearing Pullers for fast and efficient removal of the most difficult parts**



Bearing Puller shown with Crosshead Puller attachment. ▶

▼ **SELECTION CHART**

Puller Set Capacity**		8 ton	20 ton	30 ton	50 ton
40 **Bearing Puller**					
Model Number ▶		**BHP-181**	**BHP-282**	**BHP-382**	**BHP-582**
Spread*	Max.	4.09	5.12	9.65	9.65
	Min.	.98	.39	.67	.67
Width*		4.96	5.91	11.50	11.50
Thread		⅝"-18 UNF	⅝"-18 UNF	1"-14 UNS	1¼"-12 UNF

* Dimensions in inches.
** Puller capacity, not attachment capacity. See Warning!

Bearing Puller

Bearing Puller has wedge shaped edges for placing puller behind hard to reach bearings, gears, etc., where clearance prevents direct application of grip puller arms.

The Bearing Puller can be used with the Cross Bearing Puller or the Grip Puller.

▼ Shown from left to right: **EP-206, EP-108**

For Safer and Faster Pulling

- **Patented "Safety Cage" jaw retention system**
- **Roll threaded shafts for less effort when applying high torque**
- **Slim tapered jaws for improved gripping in tight spots**
- **Available in 2 and 3 jaw design and inside and outside pulling configuration**
- **More efficient pulling, as one man can do the job where manual pullers often require two operators**

Long Jaws

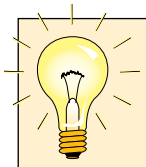
Long Jaws are used to increase the reach and spread of manual pullers. They maintain the same pulling capacity as the standard jaws, but reduce clamping force to 25%.

Page: **159**

Shaft Attachments

Shaft protectors and extenders are live centers that fit over the standard puller shaft for tip protection and additional reach.

Page: **159**



Application Tip

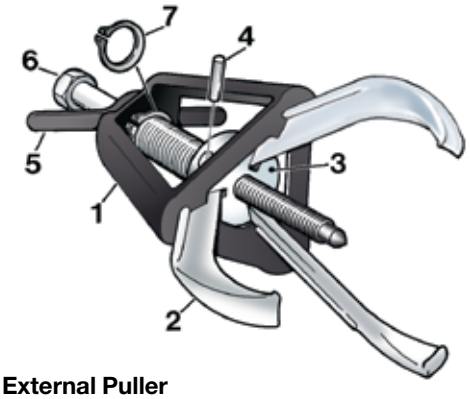
In determining the correct manual puller capacity for your application, use the folllowing rule:

The center bolt diameter of the puller should be at least 1/2 the diameter of the shaft being pulled on.

Example:

A part being pulled from a shaft with a diameter of 1.5" would require a puller with a center bolt diameter of at least .75".

◀ *Positioning an EP-104, 3-jaw puller on the accessory drive of a diesel engine.*



External Puller

1 Patented "Safety Cage" guides jaws, holding them securely onto the part.
2 Durable forged jaws provide positive grip.
3 Jaw head provides pivot and reaction point for jaws.
4 Pin, for easy jaw removal and replacement.
5 T-handle provides control of the puller jaws.
6 Drive bolt with rolled threads for increased force with reduced input torque.
7 Snap-ring retains cage to drive bolt and provides quick removal for easy service.

EP EPPMI Series

Capacity:
2-40 tons

Maximum Reach:
4.00-14.00 inches

Maximum Spread:
0.50-25.00 inches

▼ QUICK SELECTION CHART EXTERNAL PULLERS

For full technical information see next page.

Number of Jaws	Maximum Reach (in)	Spread Range (in)	Capacity (tons)	Model Number	Center Bolt Diameter (in)	Weight (lbs)
2	4.00	.5-5	2	**EP-204**	.56	3
3	4.00	.5-5	5	**EP-104**	.56	4
2	6.00	.5-7.0	6	**EP-206**	.66	7
3	6.00	.5-7.0	10	**EP-106**	.66	8
2	8.00	.75-12	12	**EP-208**	.79	12
3	8.00	.75-12	17	**EP-108**	.79	14
2	9.67	1.0-15	14	**EP-210**	.79	13
3	9.67	1.0-15	20	**EP-110**	.79	16
2	12.00	2.5-18	25	**EP-213**	1.17	38
3	12.00	2.5-18	30	**EP-113**	1.17	44
2	14.00	3.0-25	35	**EP-216**	1.23	57
3	14.00	3.0-25	40	**EP-116**	1.23	68

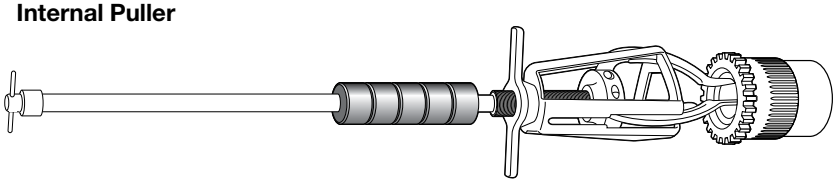
Always wear Safety Goggles and Gloves while using pullers.

Application Tip

Because of the unique Safety Cage design, Posi Lock® pullers will grip on surfaces where normal pullers would slip off; e.g. tapered bearings.

Visit the **Products** section of our web site for more information and product selection charts regarding puller sets and individual puller component parts. **www.enerpac.com**

Internal Puller

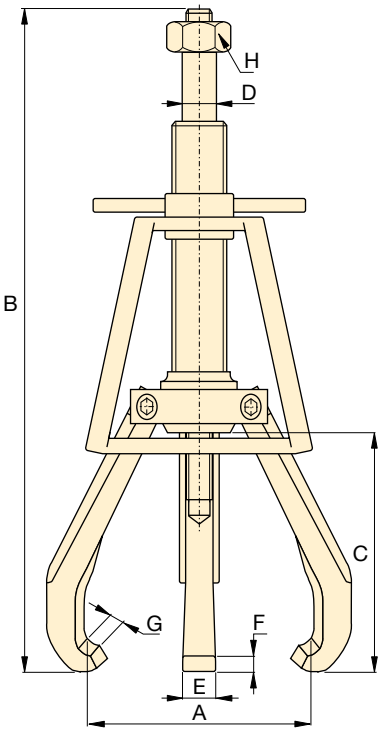


▼ QUICK SELECTION CHART INTERNAL PULLERS

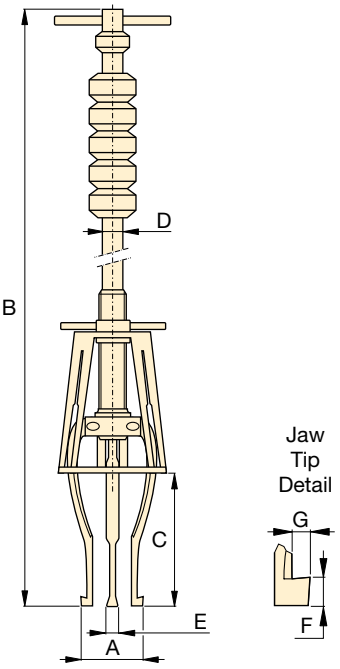
For full technical information see next page.

Number of Jaws	Maximum Reach (in)	Spread Range (in)	Jaw Style	Model Number	Jaw Length (in)	Weight (lbs)
3	5.87	.56-4.00	Standard	**EPPMI-6**	6.62	8.6
	7.70	1.0-5.25	Long		8.62	8.6

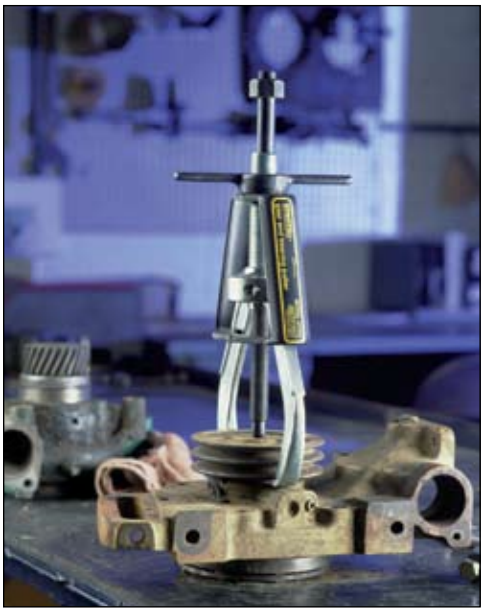
Visit the **Products** section of our web site for selection information regarding internal and external puller component parts. **www.enerpac.com**



2- and 3-Jaw External Puller EP-Series



Internal Puller EPPMI-Series



▲ *EP-204 2-jaw puller positioned to pull a water pump drive pulley.*

▼ SELECTION CHART EXTERNAL PULLERS

Number of Jaws	Maximum Reach C (in)	Spread Range A (in)	Capacity (tons)	Model Number	Center Bolt Diameter D (in)	Maximum Torque (ft.lb)
2	4.00	.5-5.0	2	**EP-204**	.56	20
3	4.00	.5-5.0	5	**EP-104**	.56	40
2	6.00	.5-7.0	6	**EP-206**	.66	75
3	6.00	.5-7.0	10	**EP-106**	.66	130
2	8.00	.75-12.0	12	**EP-208**	.79	150
3	8.00	.75-12.0	17	**EP-108**	.79	220
2	9.67	1.0-15.0	14	**EP-210**	.79	175
3	9.67	1.0-15.0	20	**EP-110**	.79	275
2	12.00	2.5-18.0	25	**EP-213**	1.17	475
3	12.00	2.5-18.0	30	**EP-113**	1.17	600
2	14.00	3.0-25.0	35	**EP-216**	1.23	800
3	14.00	3.0-25.0	40	**EP-116**	1.23	850

▼ SELECTION CHART INTERNAL PULLERS

Number of Jaws	Maximum Reach C (in)	Spread Range A (in)	Jaw Style	Model Number	Jaw Length (in)	Slide-hammer Weight (lbs)
3	5.87	.56-4.00	Standard	**EPPMI-6**	6.62	2.5
	7.70	1.00-5.25	Long		8.62	2.5

Shaft Protectors and Extenders

Shaft Protectors and Extenders are live centers that fit over the puller end for tip protection and added reach.

Length (in)	Diameter (in)	Increases Center Bolt Length (in)	Order: Model Number
1.00	0.75	0.38	**EPP-4**
1.97	0.75	1.50	**EPX-4**
1.22	0.87	0.50	**EPP-6**
1.97	0.87	1.50	**EPX-6**
1.22	1.00	0.50	**EPP-10**
1.97	1.00	1.50	**EPX-10**
2.00	1.38	0.83	**EPP-1316**

Note: See the chart below to reference matching pullers for these accessories.

Long Jaws

Long jaws are used for added reach and spread. They have the same capacity as standard jaws, but reduce the clamping force to 25%.

Spread (in)	Reach (in)	Order: Model Number
1.5-15	9.67	**EP-11054**
1.5-22	15.78	**EP-11054L**
1.5-30	20	**EP-11354L**
1.0-5.26	8.62	**EP-10554L***

* EPPMI-6 only

EP EPPMI Series

Capacity:
2-40 tons

Maximum Reach:
4.00-14.00 inches

Maximum Spread:
0.50-25.00 inches

▼ **Optional Accessories**

Dimensions					Model Number			
Overall Length B (in)	Jaw Width E (in)	Tip Clearance F (in)	Tip Depth G (in)	Hex Socket Size H (in)		 Shaft Protectors	 Extenders	 Long Jaws
9.68-12.75	.54	.16	.18	¾"	**EP-204**	**EPP-4**	**EPX-4**	**–**
9.68-12.75	.54	.16	.18	¾"	**EP-104**	**EPP-4**	**EPX-4**	**–**
12.75-18.75	.75	.32	.24	¾"	**EP-206**	**EPP-6**	**EPX-6**	**–**
12.75-18.75	.75	.32	.24	¾"	**EP-106**	**EPP-6**	**EPX-6**	**–**
16.25-24.25	.77	.25	.36	1"	**EP-208**	**EPP-10**	**EPX-10**	**EP-11054**
16.25-24.25	.77	.25	.36	1"	**EP-108**	**EPP-10**	**EPX-10**	**EP-11054**
19.25-29.00	.77	.25	.36	1"	**EP-210**	**EPP-10**	**EPX-10**	**EP-11054L**
19.25-29.00	.77	.25	.36	1"	**EP-110**	**EPP-10**	**EPX-10**	**EP-11054L**
26.00-38.00	1.25	.50	.38	1¼"	**EP-213**	**EPP-1316**	**–**	**EP-11354L**
26.00-38.00	1.25	.50	.38	1¼"	**EP-113**	**EPP-1316**	**–**	**EP-11354L**
31.50-45.50	1.44	.53	.46	1¼"	**EP-216**	**EPP-1316**	**–**	**–**
31.50-45.50	1.44	.53	.46	1¼"	**EP-116**	**EPP-1316**	**–**	**–**

Note: Overall length (B) is dependent on position of center bolt.

Dimensions (in)					Model Number
Overall Length B	Slide Rod Diameter D	Jaw Width E	Tip Clearance F	Tip Depth G	
29.00	.52	.33	.12	.06	**EPPMI-6**
31.00	.52	.33	.30	.18	

Visit the **Products** section of our web site for more information and product selection charts regarding puller sets and individual puller component parts. **www.enerpac.com**

▼ Shown: **EPHR-110**

- **Patented "Safety Cage" jaw retention system**
- **High force hydraulic system for effortless pulling of large components**
- **Slim tapered jaws for better gripping in tight spots**
- **Available in 2 and 3 jaw design**
- **More efficient pulling, as one man can do the job where normal pullers often require two operators**

◀ *An EPHR-116, 50-ton hydraulic Posi Lock® puller easily removes the main drive gear from this metal forming brake press.*

High-Tech Pulling

Transport and Store
Conveniently store and transport hydraulic pullers and accessories. Order the **EPT-2550** Storage Cart and make your job easier to do!

Long Jaws
Used to increase the reach and spread of pullers. They maintain the same pulling capacity as the standard jaws, but reduce clamping force to 25%.

Page: **161**

Visit the **Products** section of our web site for more information and product selection charts regarding puller sets and individual puller component parts. **www.enerpac.com**

Application Tip
Because of the unique safety cage design, Posi Lock® pullers will grip on surfaces where normal pullers would slip off; e.g. tapered bearings.

Basic Pullers only, cylinder not included.

Number of Jaws	Max. Spread (in)	Capacity (ton)	Model Number*
2	12.00	10	EPH-208
3	12.00		EPH-108
2	15.00	15	EPH-210
3	15.00		EPH-110
2	18.00	25	EPH-213
3	18.00		EPH-113
2	25.00	50	EPH-216
3	25.00		EPH-116

*Cylinder is not included.

Posi Lock® Hydraulic Grip Pullers

▼ SETS SELECTION CHART

Style	Capacity (ton)	Basic Puller	Cylinder	Stroke (in)	Pump Set	Set Model Number	Weight (lbs)
2 Jaw Puller	**10**	EPH-208	RC-106	6	–	**EPHR208**	24
	10	EPH-208	RC-106	6	EP-1	**EPHS208**	60
	15	EPH-210	RC-1510	10	–	**EPHR210**	49
	15	EPH-210	RC-1510	10	EP-1	**EPHS210**	85
	25	EPH-213	RC-2514	14.25	–	**EPHR213**	98
	25	EPH-213	RC-2514	14.25	EP-1	**EPHS213**	118
	50	EPH-216	RC-5013	13.25	–	**EPHR216**	192
3 Jaw Puller	**10**	EPH-108	RC-106	6	–	**EPHR108**	26
	10	EPH-108	RC-106	6	EP-1	**EPHS108**	62
	15	EPH-110	RC-1510	10	–	**EPHR110**	52
	15	EPH-110	RC-1510	10	EP-1	**EPHS110**	88
	25	EPH-113	RC-2514	14.25	–	**EPHR113**	106
	25	EPH-113	RC-2514	14.25	EP-1	**EPHS113**	126
	50	EPH-116	RC-5013	13.25	–	**EPHR116**	202

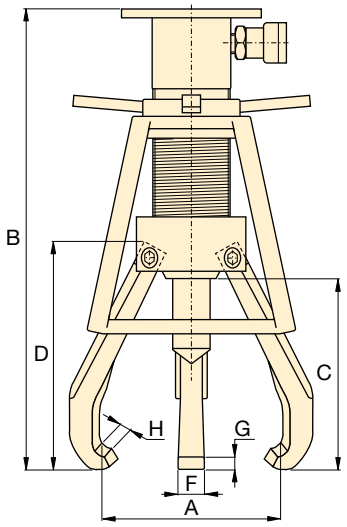
EPH Series

Capacity:
10-50 tons

Maximum Reach:
8.0-14.0 inches

Maximum Spread:
0.75-25.0 inches

Maximum Operating Pressure:
10,000 psi



Pump Sets

All Posi Lock Hydraulic Puller Sets that include 115 VAC pumps will feature the following components:

	EP-1 Pump Set
Pump	PUJ-1200B
Hose	HC-9210
Gauge	G-2535L

Components for 230 VAC pumps are available on request.

▼ *Optional Accessory

Dimensions (in)							Weight	Model Number			
Spread Range A	Overall Length B	Reach (max.) C	Jaw Length D	Jaw Width F	Tip Clearance G	Tip Depth H	(lbs)		Ram Point Sets	Lift Plates	*Long Jaws
.75-12.0	19.61	8.00	9.34	.88	.29	.27	14	**EPH-208**	EPH-155	EPH-11052	EPH-11054
.75-12.0	19.61	8.00	9.34	.88	.29	.27	16	**EPH-108**	EPH-155	EPH-11052	EPH-11054
1.0-15.0	26.19	10.00	10.64	1.00	.441	.36	22	**EPH-210**	EPH-155	EPH-11052	EPH-11054L
1.0-15.0	26.19	10.00	10.64	1.00	.441	.36	25	**EPH-110**	EPH-155	EPH-11052	EPH-11054L
2.5-18.0	33.31	12.00	13.72	1.25	.508	.38	47	**EPH-213**	EPH-257	EPH-11352	EPH-11354L
2.5-18.0	33.31	12.00	13.72	1.25	.508	.38	55	**EPH-113**	EPH-257	EPH-11352	EPH-11354L
3.0-25.0	36.19	14.00	16.29	1.44	.598	.46	90	**EPH-216**	EPH-508	EPH-11652	–
3.0-25.0	36.19	14.00	16.29	1.44	.598	.46	100	**EPH-116**	EPH-508	EPH-11652	–

For full details on puller accessories see page 162.

* Long Jaws are available as optional accessories.

▼ RAM POINT SETS SELECTION CHART

Fits Model Number	EPH-208 EPH-108 EPH-210 EPH-110	EPH-213 EPH-113	EPH-216 EPH-116
			
Set Number	**EPH-155**	**EPH-257**	**EPH-508**
Set Includes	**Dia. x Length** (in)	**Dia. x Length** (in)	**Dia. x Length** (in)
Flat Ram Point	1 x 1	1.5 x 2.25	2 x 3
	1 x 3	2 x 2.25	2.75 x 3
	–	2 x 4	2.75 x 5
Tapered Ram Point	1 x 1.5	1.5 x 2.5	2 x 3.75
	1 x 3.5	2 x 2.5	2 x 3.75
	–	2 x 4.5	2.75 x 5.5
Ram Point Adaptor	–	–	2.75 x 2.25

Always wear Safety Goggles and Gloves while using pullers.

Visit the **Products** section of our web site for more information and product selection charts regarding puller sets and individual puller component parts. **www.enerpac.com**

▼ LIFT PLATE SELECTION CHART

Fits Puller Set Model Number	Model Number *	Thickness (in)	Diameter (in)
EPH-208	**EPH-11052**	.25	6
EPH-108	**EPH-11052**	.25	6
EPH-210	**EPH-11052**	.25	6
EPH-110	**EPH-11052**	.25	6
EPH-213	**EPH-11352**	.38	8
EPH-113	**EPH-11352**	.38	8
EPH-216	**EPH-11652**	.38	10
EPH-116	**EPH-11652**	.38	10

* Mounting screws included. Lifting plates are standard included with EPH-Series Pullers.

◀ *EPHR-116 used to remove electric motor pulleys. Puller is positioned using the Lift Plate.*

▼ LONG JAW SELECTION CHART

Model Number	Fits Puller Set Model Number	No. of Jaws Required	Spread Dimensions (in)	Reach (in)	Weight (each) (lbs)
EPH-11054	**EPH-208**	2	2.25 - 15.0	9.7	2.5
	EPH-108	3			
EPH-11054L	**EPH-210**	2	1.5 - 22.0	15.8	5.5
	EPH-110	3			
EPH-11354L	**EPH-213**	2	1.5 - 30.0	20.0	10.5
	EPH-113	3			

◀ ***EPH-11054L***
Long Jaws are used for added reach and spread. They have the same load capacity as standard jaws with 25% of the clamping force.

Posi Lock® 100 Ton Hydraulic Grip Pullers

▼ **EPH-1003**

EPH Series

Capacity:
100 tons

Maximum Reach:
48 inches

Maximum Spread:
70 inches

Maximum Operating Pressure:
10,000 psi

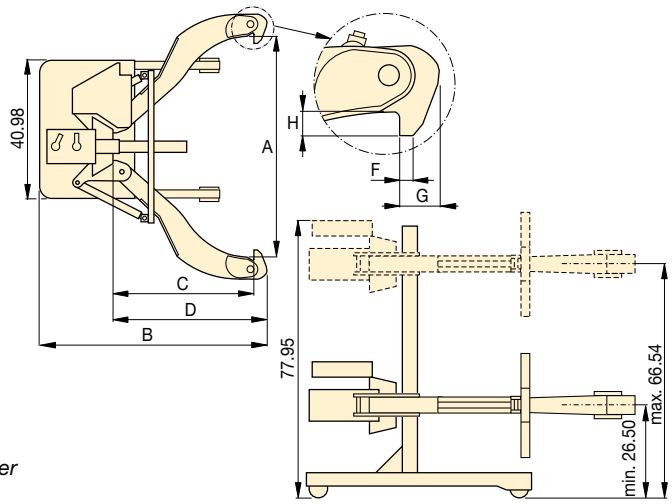
- **Roller cart with power lift**
- **Adjustable jaw tips**
- **Puller easily detaches from cart**
- **Self-contained unit**
- **Puller height range 26.5" to 66.5"**

Pushing Adaptors

All Posi Lock 100 Ton Hydraulic Pullers include (3) pushing adaptors.

Diameter	Overall Length	Model Number
3.5"	29"	**EPHT-1162**
3.5"	19"	**EPHT-1163**
3.5"	9"	**EPHT-1164**

◀ *The EPH-1002 quickly and easily removes this drive coupler from its shaft.*

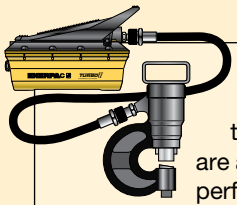


Number of Jaws	Max. Spread (in)	Capacity (tons)	Model Number	Dimensions (in)							Weight (lbs)
				Spread Range A	Overall Length B	Reach (max.) C	Jaw Length D	Jaw Width F	Tip Clearance G	Tip Depth H	
2	70.00	100	**EPH-1002**	7.5-70.0	77.00	48.00	53.00	1.25	3.5	3.5	1700
3	70.00		**EPH-1003**	7.5-70.0	77.00	48.00	53.00	1.25	3.5	3.5	1950

Enerpac Hydraulic Tools

ENERPAC offers an extensive range of dedicated tools for a variety of specific and flexible applications. Whatever your requirement… cutting, punching, spreading or bending… you can be sure that Enerpac has the correct tool to do your job safely and efficiently.

Featuring maintenance sets, machine lifts and load skates, as well as hole punches, pipe benders and cable cutters, Enerpac has the tools to ensure that even your most demanding applications can be undertaken with the highest degree of safety and accuracy.



Pump and Tool Sets

Selected hydraulic tools in this section are available in sets, for a perfect tool-pump match.

Hydraulic System Set-up

Check out our "Yellow Pages" section for help on system set-ups and valving configurations.

Page: 244

Bolting Tools

More Enerpac Tools can be found in the Bolting Tools section of this catalog.

Page: 186

Capacity (tons)	Tool Type and Functions	Series	Page
2.5-12.5	Maintenance Sets	MS	 166 ▶
35-50	Punches	SP	 170 ▶
16	Lifting Wedge	LW	 174 ▶
20	Hydraulic Machine Lifts	SOH	 175 ▶
1-80	Load Skates	ELP ER ES	 176 ▶
.67-16 (ft^3)	Storage Cases	CM	 178 ▶
.75-1.00	Hydraulic Wedgie Spread Cylinders	A, WR	 179 ▶
3-20	Hydraulic Cutterheads	WHC WHR	 180 ▶
3-20	Self-Contained Hydraulic Cutters	WMC	 181 ▶
Nominal Bore 1/2" - 4 inches	Pipe Benders	STB	 182 ▶
20-30 Strand Diameter 3/8" - .6 inch	Mono-strand Post Tensioning Tools Multi-strand Stressing Tool	DA, PTJ	 184 ▶

▼ Shown: **MS2-10**

The Universal Hydraulic Tool Box

Maintenance Sets

Enerpac Maintenance sets are a complete assortment of accessories matched to hydraulic powered tools. Using these sets allows you to quickly configure a unique tool to meet your most difficult jobs.

Built around the Enerpac lightweight hand pump, hose and cylinder, these sets enable you to push, pull, lift, press, straighten, spread and clamp with forces up to 12.5 tons.

- **All sets include Enerpac pump, hose, cylinder and gauge**
- **Lock-on or threaded connectors**
- **Complete set for almost every maintenance application**

More Information

For detailed information on all included attachments, see the following pages.

Page: 168

◀ *Clamping a workpiece is just one of the many applications for the Enerpac maintenance sets.*

▼ **QUICK SELECTION CHART**

Capacity using attachments* (tons)	**Set Model Number**						**Number of Attachment Components**	**Weight** (lbs)
2.5	**MS2-4**	P-142	HC-7206	RC-55	GP-10S	GA-4	34	59
2.5	**MSFP-5****	P-142	HC-7206	RC-55	G2535L	GA-3	24	44
5	**MSFP-10**	P-392	HC-7206	RC-106	G2535L	GA-3	22	105
5	**MS2-10**	P-392	HC-7206	RC-106	GP-10S	GA-2	35	140
12.5	**MS2-20**	P-392	HC-7206	RC-256	GP-10S	GA-2	13	210
5-12.5	**MS2-1020**	P-392	HC-7206	RC-102, -106, -256	GP-10S	GA-2	53	350

* If no attachments are being used, capacity is double these values. Maximum operating pressure is then 10,000 psi.
** This set also includes the FZ-1055 Adaptor.

CAUTION!

When cylinders are used with maintenance set attachments or components, the maximum system pressure must be limited to half the rated pressure (5,000 psi).

WARNING!

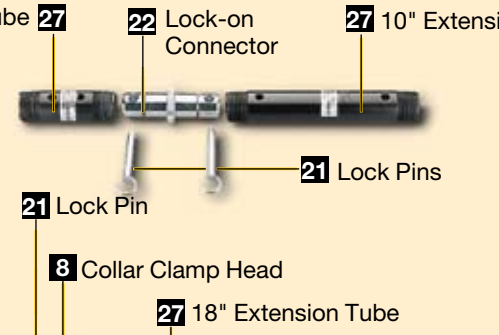
Only use attachments provided with set. Non-Enerpac attachments and longer extension tubes will reduce column strength, potentially creating unsafe conditions.

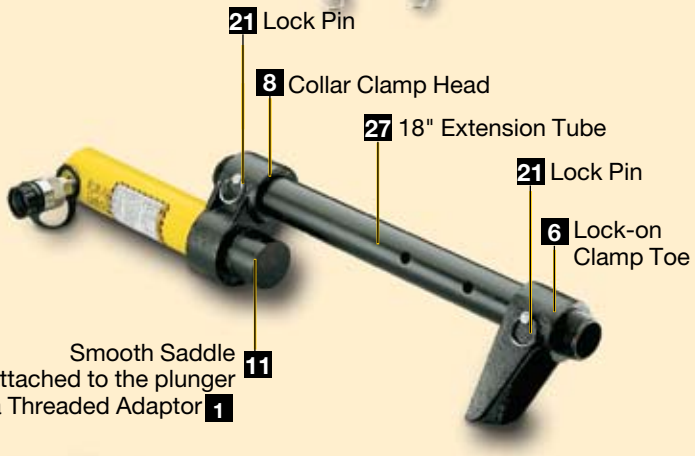
MS Series

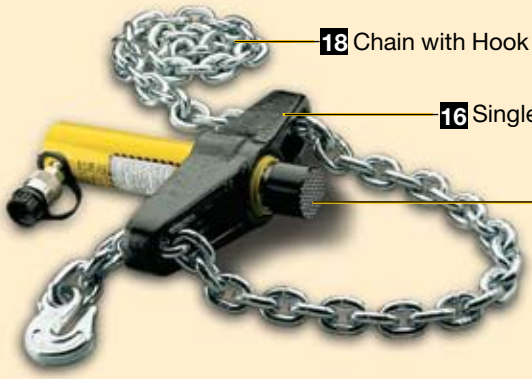
Capacity (using attachments):
2.5-12.5 tons

Max. Operating Pressure (using attachments):
5,000 psi

▼ APPLICATION EXAMPLES







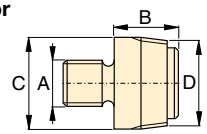
CAUTION! When cylinders are used with maintenance set attachments or components, the maximum system pressure must be limited to half the rated pressure (5,000 psi).

Note: All dimensions in inches.

Set Model No.	MS2-4	MSFP-5	MSFP-10	MS2-10	MS2-20	MS2-1020
Base/Collar/ Plunger Attachments	Capacity Using Attachments					
	2.5 tons	2.5 tons	5.0 tons	5.0 tons	12.5 tons	5-12.5 tons
Cylinder Series	RC-5	RC-5	RC-10	RC-10	RC-25	RC-10, RC-25
1	A-23	A-23	A-13	A-13	A-28	A-13 / A-28
2	A-25	A-25	A-21	A-21	A-27	A-21 / A-27
3	A-1034	A-1034	A-20	A-20	A-595	A-20 / A-595
4	MZ-4010	MZ-4010	A-14	A-14	A-243	A-14 / A-243
5	A-545	A-545	A-10	A-10	—	A-10(2x)
6	—	—	—	A-8	—	A-8
7	A-530	A-530	A-6	A-6	—	A-6
8	MZ-4011	—	—	A-192	—	A-192
9	—	—	—	A-305	—	A-305
10	A-531	A-531	A-18	A-18	—	A-18
11	—	—	—	A-185	—	A-185
12	A-532	A-532	A-15	A-15	—	A-15
13	—	—	—	—	A-607	A-607
14	A-629	A-629	A-129	A-129	—	A-129
15	A-539	A-539	A-128	A-128	—	A-128
Chains and Attachments for Pulling	2.5 tons	2.5 tons	5.0 tons	5.0 tons	12.5 tons	5-12.5 tons
Cylinder Series	RC-5	RC-5	RC-10	RC-10	RC-25	RC-10, RC-25
16	A-558	—	—	A-132	A-238	A-132, -238
17	—	—	—	A-5 (2x)	—	A-5(2x)
18	A-557(2x)	—	—	A-141(2x)	A-218(2x)	A-141(2x) / A-218(2x)
Tubes, Connectors and Adaptors	2.5 tons	2.5 tons	5.0 tons	5.0 tons	12.5 tons	5-12.5 tons
Cylinder Series	RC-5	RC-5	RC-10	RC-10	RC-25	RC-10, RC-25
19	A-544	—	—	A-19(2x)	A-242(2x)	A-19(2x) /
20						A-242(2x)
21	WR-5	WR-5	WR-5	A-92	—	A-92
22	MZ-4013(4x)	MZ-4013(4x)	A-16(4x)	A-16(4x)	—	A-16(4x)
23	MZ-4007(3x)	MZ-4007(3x)	MZ-1050(3x)	MZ-1050(2x)	—	MZ-1050(3x)
24	MZ-4008(2x)	—	—	MZ-1051	—	MZ-1051(2x)
25	MZ-4009	MZ-4009	MZ-1052	MZ-1052	—	MZ-1052
26	—	—	—	A-285	—	A-285
27	A-650	—	—	—	—	—
Length: 3"	MZ-4002	MZ-4002	—	—	—	
5"	MZ-4003	MZ-4003	MZ-1002	MZ-1002	—	MZ-1002
10"	MZ-4004	MZ-4004	MZ-1003	MZ-1003	A-239	MZ-1003
						and A-239
18"	MZ-4005(2x)	MZ-4005	MZ-1004	MZ-1004	A-240	MZ-1004(2x)
						and A-240
23"	MZ-4006(1x)	MZ-4006	—	—	—	—
30"	—	—	MZ-1005	MZ-1005	A-241	MZ-1005(2x)
						and A-241
Case	CM-6	CM-6	CW-166	CW-166	CW-166	CW-350
Weight	59 lbs.	44 lbs.	105 lbs.	140 lbs.	210 lbs.	350 lbs.

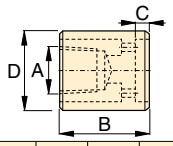
Base/Collar/Plunger Attachments

1 Threaded Adaptor



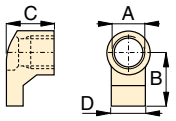
Tons	Model No.	A	B	C	D
2.5	A-23	¾"-16 UN	1.13	1.05	¾"-14 NPT
5.0	A-13	1"-8 UN	1.25	2.19	1¼"-11½ NPT
12.5	A-28	1½"-16 UN	1.87	2.75	2"-11½ NPT

2 Base Attachment



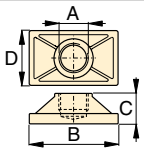
Tons	Model No.	A	B	C	D
2.5	A-25	¾"-14 NPT	2.00	.50	1.75
5.0	A-21	1¼"-11½ NPT	2.25	.50	2.56
12.5	A-27	2"-11½ NPT	2.50	.50	3.88

3 Collar Toe



Tons	Model No.	A	B	C	D
2.5	A-1034	1½"-16 UN	2.13	1.97	1.25
5.0	A-20	2¼"-14 UN	3.16	2.25	2.25
12.5	A-595	3⁵⁄₁₆"-12 UN	4.06	2.03	3.18

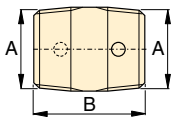
4 Flat Base



Tons	Model No.	A	B	C	D
2.5	MZ-4010	¾"-14 NPT	4.50	1.25	2.50
5.0	A-14	1¼"-11½ NPT	6.50	1.38	3.50
12.5	A-243*	2"-11½ NPT	6.50	2.31	6.50

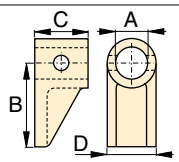
* A-243 is a round base model

5 Threaded Connector



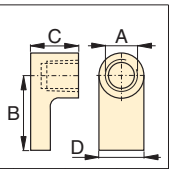
Tons	Model No.	A	B
2.5	A-545	¾"-14 NPT	1.38
5.0	A-10	1¼"-11½NPT	1.63

6 Lock-on Clamp To



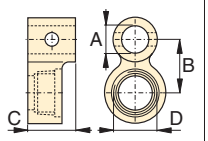
Tons	Model No.	A	B	C	D
5.0	A-8	1.69	4.13	2.00	2.25

7 Threaded Plunger Toe

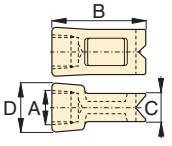
Tons	Model No.	A	B	C	D
2.5	A-530	¾"-14 NPT	2.25	1.00	1.33
5.0	A-6	1¼"-11½ NPT	3.12	1.25	2.25

8 Collar Clamp Head

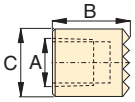
Tons	Model No.	A	B	C	D
2.5	MZ-4011	¾"-14 NPT	1.95	3.00	1½-16 UN
5.0	A-192	1.69	2.50	2.00	2¼-14 UN

9 Spreader Toe

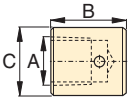
Tons	Model No.	A	B	C	D
5.0	A-305	1¼"-11½ NPT	4.50	1.00	2.00

10 Serrated Saddle

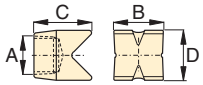
Tons	Model No.	A	B	C
2.5	A-531	¾"-14 NPT	1.25	1.09
5.0	A-18	1¼"-11½ NPT	2.00	1.50

11 Smooth Saddle

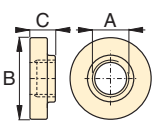
Tons	Model No.	A	B	C
5.0	A-185	1¼"-11½ NPT	1.50	2.00

12 90° V-Base

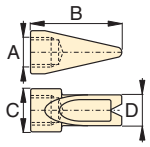
Tons	Model No.	A	B	C	D
2.5	A-532	¾"-14 NPT	1.50	1.88	1.00
5.0	A-15	1¼"-11½ NPT	2.13	2.25	2.13

13 Plunger Base

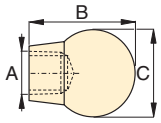
Tons	Model No.	A	B	C
12.5	A-607	2"-11½ NPT	6.56	1.53

14 Wedge Head

Tons	Model No.	A	B	C	D
2.5	A-629	¾"-14 NPT	2.75	1.31	1.13
5.0	A-129	1¼"-11½ NPT	4.00	2.00	1.75

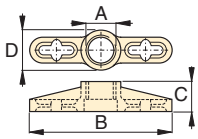
15 Rubber Flex-Head

Tons	Model No.	A	B	C
2.5	A-539	¾"-14 NPT	1.75	2.75
5.0	A-128	1¼"-11½ NPT	3.40	3.40

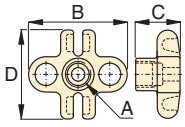
Chains and Attachments for Pulling

16 Single Chain Plate

Tons	Model No.	A	B	C	D
2.5	A-558	1½"-16 UN	7.75	1.56	1.75
5.0	A-132	2¼"-14 UN	12.12	2.50	3.12
12.5	A-238	3⁵⁄₁₆"-12 UN	17.75	4.03	4.93

17 Double Chain Plate

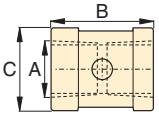
Tons	Model No.	A	B	C	D
5.0	A-5	1¼"-11½ NPT	6.18	2.00	4.96

18 Chain with Hook

Tons	Model No.	Chain Length
2.5	A-557	5 feet
5.0	A-141	6 feet
12.5	A-218	8 feet

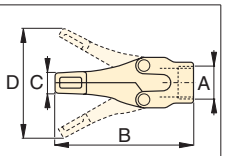
Tubes, Connectors and Adaptors

19 Pipe Coupling

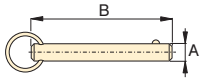
Tons	Model No.	A	B	C
2.5	A-544	¾"-14 NPT	1.69	1.31
5.0	A-19	1¼"-11½ NPT	1.94	2.15
12.5	A-242	2"-11½ NPT	3.50	3.25

20 Spreader

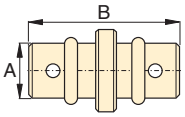
Tons	Model No.	A	B	C	D
1.0	WR-5	—	8.78	.50	3.70
1.0	A-92	2¼"-14 UN	9.63	1.38	6.25

21 Lock Pin

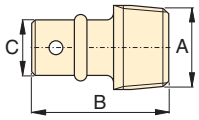
Tons	Model No.	A	B
2.5	MZ-4013	.25	2.38
5.0	A-16	.44	3.25

22 Lock-on Connector

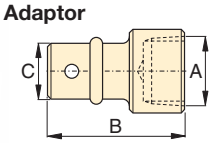
Tons	Model No.	A	B
2.5	MZ-4007	.75	3.12
5.0	MZ-1050	1.31	5.00

23 Male Lock-on Adaptor

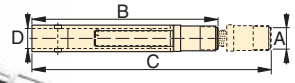
Tons	Model No.	A	B	C
2.5	MZ-4008	¾"-14 NPT	2.38	.75
5.0	MZ-1051	1¼"-11½ NPT	3.56	1.31

24 Female Lock-on Adaptor

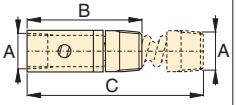
Tons	Model No.	A	B	C
2.5	MZ-4009	¾"-14 NPT	2.56	.75
5.0	MZ-1052	1¼"-11½ NPT	3.81	1.31

25 Adjustable Extension

Tons	Model No.	A	B	C	D
5.0	A-285	1¼"-11½ NPT	13.20	17.37	1.30

26 Slip-Lock Extension

Tons	Model No.	A	B	C
2.5	A-650	¾"-14 NPT	7.88	14.37

▼ Shown: **SP-35S**

- **.50" thick mild steel maximum capacity**
- **Round, oblong and square punches and dies are available to solve your punching applications**
- **Long life Enerpac single-acting, spring return design**
- **Durable steel case keeps tools and dies together and provides for easy carrying and storage**
- **CR-400 female coupler included**

◀ *This PUD-1100B is shown with the 35 ton punch and optional gauge.*

Much Faster than Drilling...

Tool Kit SPK-10

Included with all 35 ton punches, this tool kit is used to remove and install the punch into the head.
Can be ordered as a replacement under model number **SPK-10**.

Ordering Information

The 35-ton hydraulic punch may be ordered by itself or as a set, including an electric, air or hand pump.

Please refer to the Quick Selection Chart information on next page.
A punch and die may also be ordered as a matched set.

▼ **STANDARD PUNCH AND DIE SETS SELECTION CHART**

Hole Shape	Imperial*		Metric*	
	Hole Size (in)	Bolt Size (in)	Hole Size (mm)	Bolt Size (mm)
●	.31	¼	7,9	–
●	.38	5⁄16	9,5	M8
●	.44	⅜	11,1	M10
●	.53	7⁄16	13,5	M12
●	.56	½	14,3	–
●	.69	⅝	17,5	M16
●	.78	–	19,8	M18
●	.81	¾	20,6	–
■	.31	¼	7,9	–
■	.38	5⁄16	9,5	M8
■	.44	⅜	11,1	M10
■	.50	7⁄16	12,7	M12
⬮	.31 x .75	¼	7,9 x 19	–
⬮	.38 x .75	5⁄16	9,5 x 19	M8
⬮	.44 x .75	⅜	11,1 x 19	M10
⬮	.50 x .75	7⁄16	12,7 x 19	M12

* Material thickness should **not** exceed hole diameter.

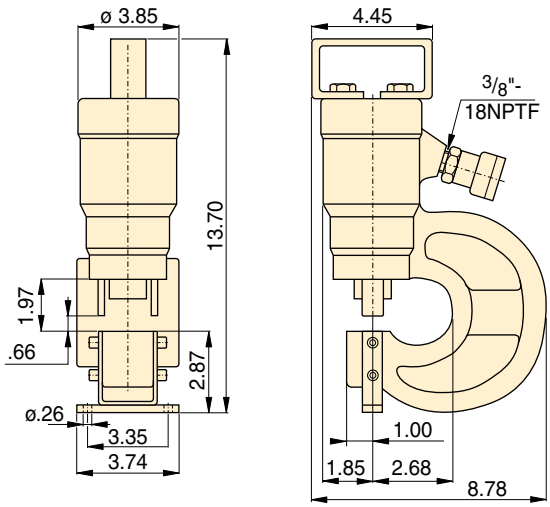
Single-Acting, Spring Return Hydraulic Punch

▼ QUICK SELECTION CHART

Included					Model Number	Weight
*	Punch and Die Set	Pump	Pump Type	Hose		(lbs)
SP-35	–	–	–	–	**SP-35**	35
SP-35	Standard**	–	–	–	**SP-35S**	40
SP-35	Standard**	PUD-1100B	E	HC-7206	**SP-35SP**	70
SP-35	Metric***	–	–	–	**MSP-351**	40
SP-35	Standard**	P-392	H	HC-7206	**STP-35H**	55
SP-35	Standard**	PATG-1102N	A	HC-7206	**STP-35A**	63

* Punch oil capacity: 4.58 in^3
Includes the following punch and die sets:
** SPD-438, SPD-688, SPD-563 and SPD-813
*** SPD-375, SPD-531, SPD-438 and SPD-688

E = Electric
H = Hand
A = Air operated



SP Series

Capacity:
35 tons

Hole Sizes:
0.31-0.81 inch

Maximum Operating Pressure:
10,000 psi

CAUTION!
Chart below is for reference only! Maximum allowable material thickness to be punched varies with set wear.

CAUTION!
Material thickness should not exceed hole diameter.

	Standard Punch & Die Set	Maximum Allowable Material Thickness To Be Punched (in)										
	Model No.	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)
	SPD-313	.31	.31	.25	.25	.25	.25	.13	.19	.25	.25	.25
	SPD-375	.38	.38	.31	.31	.31	.31	.19	.25	.31	.31	.31
	SPD-438	.44	.44	.38	.38	.38	.31	.19	.31	.31	.31	.31
	SPD-531	.50	.50	.44	.44	.44	.38	.25	.31	.38	.38	.38
	SPD-563	.50	.50	.50	.44	.50	.44	.25	.38	.44	.44	.44
	SPD-688	.50	.50	.50	.44	.50	.40	.25	.31	.40	.40	.40
	SPD-781	.50	.50	.50	.44	.50	.38	.25	.31	.38	.39	.38
	SPD-813	.50	.50	.50	.44	.50	.31	.19	.31	.31	.31	.31
	SPD-458	.31	.31	.25	.25	.25	.25	.13	.19	.25	.25	.25
	SPD-549	.38	.38	.31	.31	.31	.31	.19	.25	.31	.31	.31
	SPD-639	.44	.44	.38	.38	.38	.31	.19	.31	.31	.31	.31
	SPD-728	.50	.50	.44	.44	.44	.38	.25	.31	.38	.38	.34
	SPD-106	.31	.31	.25	.25	.25	.25	.13	.19	.25	.25	.25
	SPD-125	.38	.38	.31	.31	.31	.31	.19	.25	.31	.31	.31
	SPD-188	.44	.44	.38	.38	.38	.31	.19	.31	.31	.31	.31
	SPD-250	.50	.50	.44	.44	.44	.38	.25	.31	.38	.38	.38

Steel Qualities (see table):

1) Mild A-7
2) Boiler Plate
3) Structural A-36
4) Struct Corten (ASTM A242)
5) Cold Rolled C-1018
6) Hot Rolled C-1050
7) Hot Rolled C-1095
8) Hot Rolled C-1095 Annealed
9) Stainless Annealed
10) Stainless 304 Hot Rolled
11) Stainless 316 Cold Rolled

▼ Shown: **SP-50100**

- **Available as a complete set including electric pump and hoses**
- **Double-acting cylinder design for fast cycle times**
- **Punch and die changeover tools included**
- **Lifting handle for easy carrying**
- **Adjustable power stripper prevents movement of the metal during stripping**
- **CR-400 female couplers included**

◀ *Save time using this 50-ton Enerpac Punch.*

Cuts the Time Spent Forming Holes

Depth Stop

For simplified repetitive punching applications an adjustable Depth Stop is available.
Order model number: **SP-110.**

Foot Mounting Kit

A foot mounting kit for easy mounting of the 50 ton punch to workbench or fixture is available.
Please order: **SP-120.**

Ordering Information

The 50-ton Hydraulic Punch may be ordered by itself or as a set with an electric pump. A punch and die may be ordered as a matched set. Please refer to the selection chart information.

▼ *Shown below is the 50 ton punch with SP-120 and SP-110 assembled.*

▼ QUICK SELECTION CHART PUNCH SETS

Included				Set Model Number	Weight
Model Number Punch*	Punch & Die Sets	Pump	Hose (2x)		(lbs)
SP-50	All**	–	–	**SP-50100**	255
SP-50	All**	ZE4410SB	HC-7206	**SP-5000**	384

* Punch Oil Capacity:
Advance: 17 in^3
Retract: 14 in^3

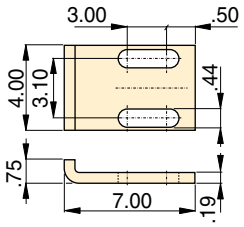
** All standard sets from chart below.

SP Series

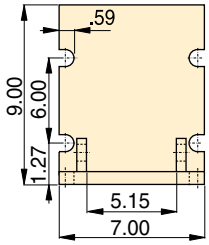
Capacity:
50 tons

Hole Sizes:
0.53-1.03 inches

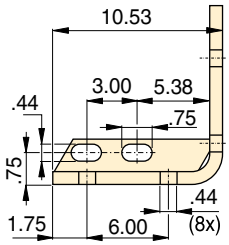
Maximum Operating Pressure:
10,000 psi

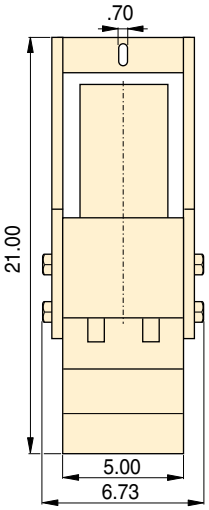


SP-110

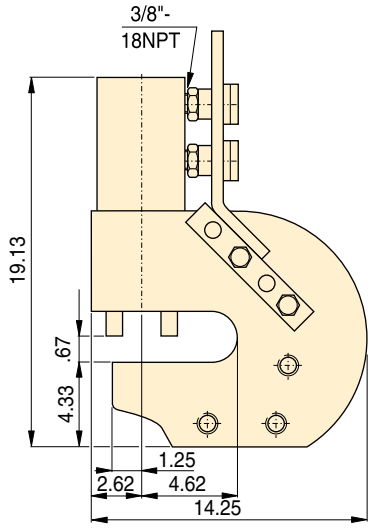


SP-120





SP-50



CAUTION!
Material thickness should not exceed hole diameter.

CAUTION!
Chart below is for reference only! Maximum allowable material thickness to be punched varies with set wear.

Steel Qualities (see table below):

1) Mild A-7
2) Boiler Plate
3) Structural A-36
4) Struct Corten (ASTM A242)
5) Cold Rolled C-1018
6) Hot Rolled C-1050
7) Hot Rolled C-1095
8) Hot Rolled C-1095 Annealed
9) Stainless Annealed
10) Stainless 304 Hot Rolled
11) Stainless 316 Cold Rolled

▼ STANDARD PUNCH AND DIE SELECTION CHART

Hole Shape	Hole Size	Bolt Size	Standard Punch and Die Set	Maximum Allowable Material Thickness To Be Punched (in)										
	(in)	(in)	Model Numbers	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)
●	.53	½	**SP-150**	.53	.53	.53	.53	.53	.49	.32	.40	.49	.49	.49
●	.66	⅝	**SP-170**	.56	.56	.56	.50	.56	.51	.32	.40	.51	.51	.51
●	.78	¾	**SP-190**	.56	.56	.56	.50	.56	.49	.32	.40	.49	.50	.49
●	.91	⅞	**SP-121**	.56	.56	.56	.50	.56	.35	.22	.35	.35	.35	.35
●	1.03	1	**SP-123**	.56	.56	.56	.44	.56	.31	.19	.31	.31	.31	.31

▼ Shown: **LW-16 with SB-2 and optional LWB-1**

LW Series

Minimum Clearance:
.39 inches

Maximum Lift Height:
2.02*-2.72* inches

Maximum Force:
16 tons

Maximum Operating Pressure:
10,000 psi

ER-Series Load Skates

In combination with the Enerpac Lifting Wedge we recommend Load Skates for moving heavy loads.

Page: 176

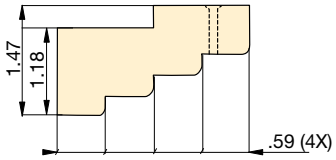
Split-Flow Manifolds

Split Flow Valves to control two or four lifting wedges simultaneously.

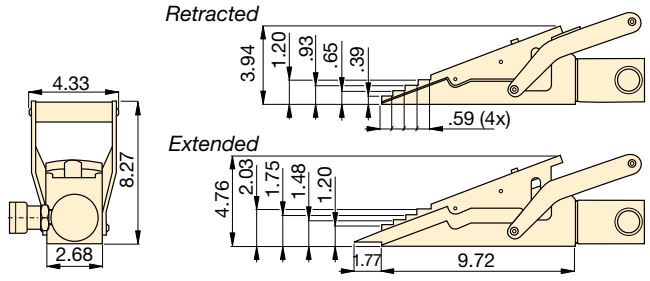
AM-21 with 3 ports 3/8" NPTF.
AM-41 with 5 ports 3/8" NPTF.

Page: 122

- **Requires .39 inch access gap**
- **Lifting force 16 ton at 10,000 psi hydraulic pressure**
- **Automatic mechanical retraction (single acting)**
- **Securely raises or lowers16 tons with no slippage**
- **Lifting wedge LW-16 includes safety block SB-2**
- **Use in tandem to lift 32 tons, or 64 tons**
- **.83 inch of vertical lift from each step (maximum lift to 2.72 inches with optional LWB-1 stepped block)**



▲ **Optional LWB-1 Stepped Block**



LW-16

▼ *For lifting heavy equipment with minimum floor clearance the LW-16 is the ideal tool.*

Max. Lifting Force (ton)	Model No.	Minimum Clearance Gap (in)	Max. Lift per Stage (in)	Max. Lifting Height (in)	Max. Lifting Height Using Stepped Block (in)	Oil Capacity (in^3)	Weight (lbs)
16	**LW-16**	.39	.83	2.02	2.72	4.75	15.4

*Use optional stepped block **LWB-1** to increase wedge lifting height .69 inches.

▼ Shown from left to right: **SOH-10-6, SOH-23-6**

SOH
Series

Lifting Capacity:
8.5-20 tons

Stroke:
5.39-6.18 inches

Toe Clearance:
0.79-1.18 inches

Maximum Operating Pressure:
10,000 psi

RSM Flat-Jac®
Low height, single acting spring-return cylinders are ideal for space restricted applications.

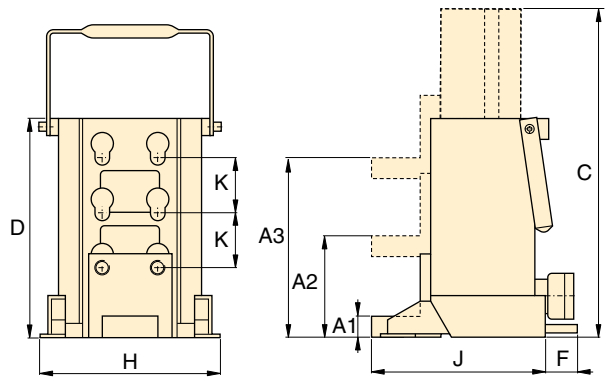
Page: 22

Best Match Manual Pump
To power your Enerpac Lifting Wedge, The Enerpac P-392 Hand Pump or P-392FP Foot Pump is an ideal choice.

Page: 62

- **For lifting heavy equipment with minimum available access**
- **Remote operation of hydraulic pump enhances safety**
- **Low-height lifting toe**
- **Precision guided to reduce friction and isolate cylinder from side-loads**
- **Two extendable support feet provide extra stability**
- **Includes RC-Series cylinder with CR-400 coupler**

▼ *Limited access under this machine makes the Enerpac Hydraulic Machine Lift the perfect solution.*



Capacity	Toe Clearance with Cylinder Retracted (in)			Stroke	Model Number	Oil Capacity	Dimensions (in)						Weight
	Minimum	Central	Maximum				Total Ext. Height	Total Body Height					
(ton)	A1	A2	A3	(in)		(in^3)	C	D	F	H	J	K	(lbs)
8.5	.79	3.74	6.69	5.39	**SOH-10-6**	13.7	17.00	11.61	–	7.48	8.46	2.95	59.2
20	1.18	4.33	7.48	6.18	**SOH-23-6**	32.0	18.58	12.40	2.56	10.24	9.84	3.15	99.2

▼ Shown: **Set ERS-20**

Move Heavy Loads Easily and Safely

Sets (see table) include all components necessary to handle a variety of applications. Two **ELB-1** link-up bars, two **ERH-1** handles (34.6" long) and one **EMB-1** metal box are included. Optional long handle **ERH-2** (46") also available.

Lifting Wedge and Machine Lifts

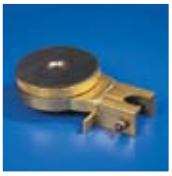
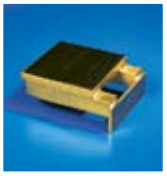
To place the Load Skates, the load must first be lifted. This can be done easily and safely using Enerpac Lifting Wedge or Machine Lifts.

Page: **174**

- **Rugged and sturdy construction for long life**
- **Low profile construction for increased stability**
- **Low rolling-resistance allows for easy load movement**
- **Attachable load leveling plates and swivel turntables for turning corners**

◀ *Heavy transport using Load Skates. The machine is first lifted, using SOH-Series Enerpac Machine Lifts.*

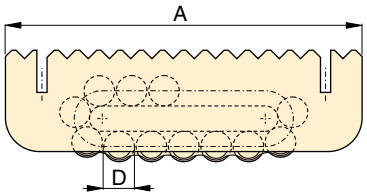
▼ **Load Skates may be ordered separately or as a matched set.**

Set Capacity* (tons)	Set Model Number	Load Skates (4)	Turntable Swivels (2)	Leveling Plates (2)	Weight Including handles and metal box (lbs)
					
20	**ERS-20**	ER-10	ES-10	ELP-10	110
30	**ERS-30**	ER-15	ES-15	ELP-15	123
60	**ERS-60**	ER-30	ES-30	ELP-30	167

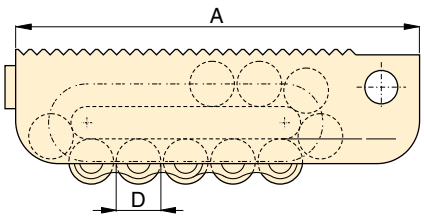
* Sets are designed to enable two skates to take full load for extra safety on uneven floor surfaces

ELP, ER, ES Series

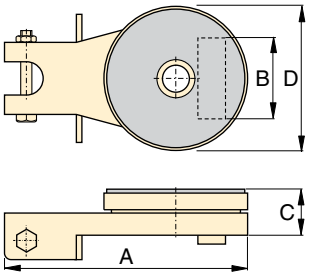
Maximum Carrying Capacity:
80 tons



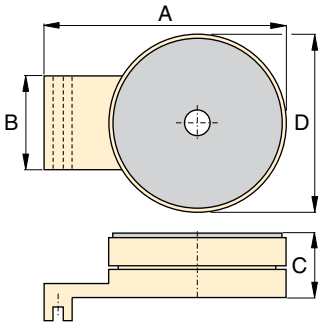
ER-1, ER-10, ER-15, ER-30



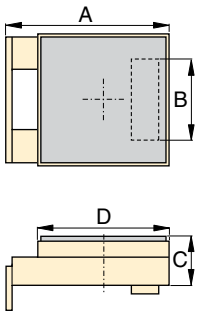
ER-60, ER-80



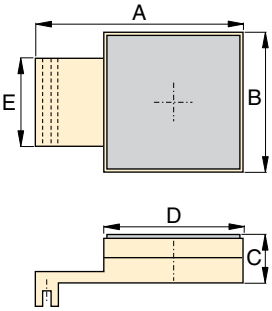
Turntable Swivel
ES-1, ES-10, ES-15, ES-30



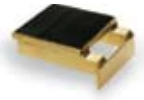
Turntable Swivel
ES-60, ES-80



Leveling Plate
ELP-10
ELP-15
ELP-30



Leveling Plate
ELP-60
ELP-80

	Capacity (ton)	Model Number	Dimensions (inch)						Contact Rolls per Skate	Rollers per Skate	Weight (lbs)
			A	B	C	D	E	F			
Load Skates 	1	**ER-1**	6.30	3.94	2.56	.71	2.00	.16	4	11	8.4
	10	**ER-10**	8.27	3.94	2.63	.71	2.00	.24	5	15	11.5
	15	**ER-15**	8.69	4.45	2.95	.94	2.38	.39	4	13	16.0
	30	**ER-30**	10.63	5.13	3.63	1.18	2.69	.39	4	13	28.6
	60	**ER-60**	15.00	6.63	4.94	1.65	3.00	.63	4	13	70.4
	80	**ER-80**	20.88	7.19	5.75	1.97	3.38	.75	6	17	134.2
Turntable Swivel 	1	**ES-1**	8.15	3.42	1.02	3.54	–	–	–	–	2.4
	10	**ES-10**	8.66	2.87	1.65	5.12	–	–	–	–	8.1
	15	**ES-15**	8.66	3.38	1.65	5.12	–	–	–	–	8.1
	30	**ES-30**	9.87	3.78	1.89	5.91	–	–	–	–	11.7
	60	**ES-60**	10.83	4.50	2.40	7.48	–	–	–	–	30.1
	80	**ES-80**	14.19	5.06	2.40	8.66	–	–	–	–	41.6
Leveling Plate 	10	**ELP-10**	5.87	2.87	1.65	4.72	–	–	–	–	8.1
	15	**ELP-15**	5.87	3.38	1.65	4.72	–	–	–	–	8.1
	30	**ELP-30**	7.00	3.78	1.89	5.31	–	–	–	–	11.6
	60	**ELP-60**	10.63	4.50	2.40	7.09	4.49	–	–	–	30.4
	80	**ELP-80**	13.78	5.06	2.40	7.87	5.04	–	–	–	41.4

▼ Shown: **CM-16**

CM Series

Case Size:
.67-16 Cubic Ft.

Protect your Equipment

- **Protect your equipment from dust, water, grease and dirt**
- **Reduce losses on the jobsite, maintenance area or shop**
- **Durable steel, painted with rust-resistant primer and finished in durable enamel**
- **Heavy duty hinges and lifting handles**
- **Lockable**

Maintenance Sets

Enerpac Maintenance sets are a complete assortment of accessories matched to hydraulic powered tools. Using these sets allows you to quickly configure a unique tool to meet your most difficult jobs.

Built around the Enerpac lightweight hand pump, hose and cylinder, these sets enable you to push, pull, lift, press, straighten, spread and clamp with forces up to 12.5 tons.

Hydraulic Pullers

These hydraulic pullers eliminate time-consuming and unsafe hammering, heating or prying. Damage to parts is minimized through the use of controlled hydraulic power.

Page: 151

▼ *When not storing the lifting system, this heavy-duty storage case doubles as a work station.*

Case Size (ft^3)	Model Number	Dimensions L x W x H (in)	Thickness (in)	Weight (lb)
.67	**CM-6**	23.5 x 7 x 7	.035	15.4
1.13	**CM-1**	25 x 11.5 x 6.6	.035	17.6
4.50	**CM-4**	31 x 18 x 14	.059	35.3
7.50	**CM-7**	47.5 x 15 x 18	.074	125.7
16.00	**CM-16**	48 x 24 x 24	.059	121.3

▼ Shown clockwise from top: **WR-13, WR-5, A-92, WR-15**

A, WR
Series

Capacity:
0.75-1.50 ton

Tip Clearance:
0.50-1.38 inches

Maximum Spread Range:
3.70-11.50 inches

Maximum Operating Pressure:
10,000 psi

RC-Series Cylinders

10 ton RC-Series cylinders (except RC-101) fit into A-92 Spreader Attachment.

Page: **6**

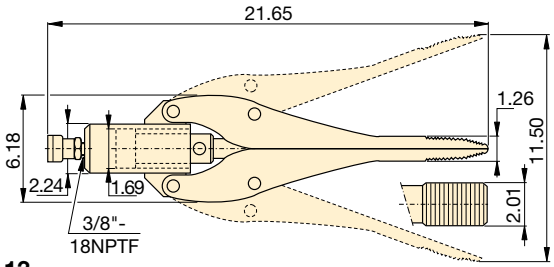
Best Match Hand Pump

To power your WR5 and WR15 the **P-392** hand pump is an ideal choice.

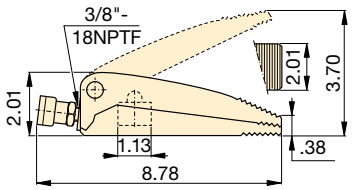
Page: **62**

- **Single-acting, spring return**
- **WR-13: Integrated pump offers portable power**
- **WR-15: For long stroke spreading applications**
- **WR-5: For use in very confined work areas**
- **A-92: Spreader attachment screws onto RC-Series 10 ton cylinders (except RC-101)**

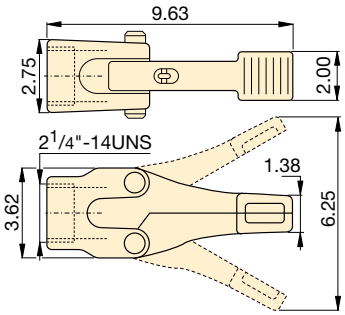
WR-15



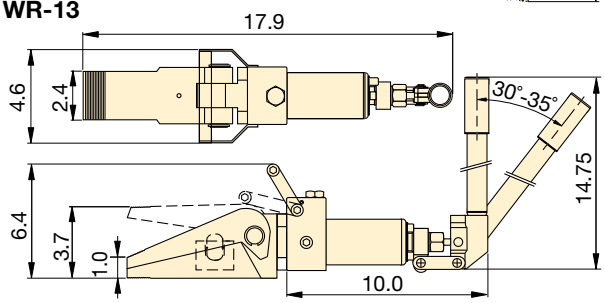
WR-5



A-92



WR-13



◀ *The portable Integrated Spreader gives you the power you need, fast. A WR13 Integrated Spreader is used to free a frozen rail switch.*

Spreader Capacity (ton)	Tip Clearance (in)	Model Number	Maximum Spread (in)	Cylinder Effective Area (in^2)	Oil Capacity (in^3)	Wt. (lbs)
1.00	.50	**WR-5**	3.70	1.00	.61	5.0
1.50	1.00	**WR-13**	3.70	1.76	–	26.4
.75	1.26	**WR-15**	11.50	2.25	3.91	25.0
1.00	1.38	**A-92**	6.25	–	–	8.0

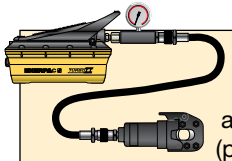
▼ Shown from left to right: **WHC-3380, WHC-750**

WHC, WHR
Series

Capacity:
3-20 tons

Cutting Capacity:
0.50-4 inches

Maximum Operating Pressure:
10,000 psi



Cutterhead Sets
Hydraulic Cutterheads are available as sets (pump, tool and hose).

Set Model Number	Cutter Model Number	Pump Model Number
STC-750H	WHC-750	P-392
STC-750A	WHC-750	PATG-1102N
STC1250H	WHC-1250	P-392
STC-1250A	WHC-1250	PATG-1102N
STC-750FP	WHC-750	P-392FP
STC-1250FP	WHC-1250	P-392FP

H = Hand Pump, A = Air Operated Pump
FP = Foot Pump

- **Single acting, spring return on all models, except WHR-1250**
- **Guillotine action for efficient operation**
- **Lifting handles on larger models**
- **Carrying bag included for easy carrying and tool protection**
- **Ideal for use with most Enerpac pumps featuring 3-way valve or dump valve and 10,000 psi pressure rating (except WHR-1250, which requires 4-way valve)**
- **CR-400 coupler and dust cap included on all models**

▼ *Steel rope is easily cut with the smooth guillotine action of an Enerpac cutterhead.*

▼ **Selection Chart Maximum Cutting Capacities** (diameter in inches)

Cutter Head Operation	Capacity (ton)	Model Number	Oil Capacity (in^3)	Length (in)	Steel Wire Rope, Hemp-core or IWRC 6x7 6x12 6x19	Round Bar: Copper Wire or Bar	Round Bar: Aluminum Wire or Bar	Round Bar: Soft Steel Bolts	Round Bar: Reinforcing Bar	Wire Strand: Bare Copper Wire Strands	Wire Strand: Bare Aluminum Wire Strands 6x7	Wire Strand: ACSR	Wire Strand: Guy Steel Wire Strands 1x7 1x19	Cable: Telephone Cable CPP	Cable: Underground Cable (Power)	Wt. (lbs)	Replacement Blades
Single-acting	**4**	**WHC-750***	1.2	5.0	.63	.75	.75	.75	.50***	.75	.75	.75	.63	☆	☆	7	**WCB-750**
	20	**WHC-1250***	8.2	11.00	1.25	1.13	1.25	1.13	1.00	1.25	1.25	1.25	.88	☆	☆	25	**WCB-1250**
	13	**WHC-2000**	7.3	15.00	1.00	1.25	1.25	.88	☆	2.00	2.00	2.00	.75	☆	2.00	23	**WCB-2000**
	3	**WHC-3380**	4.0	19.00	☆	☆	☆	☆	☆	1.63	1.69	☆	☆	3.38	3.38	20	**WCB-3380**
	8	**WHC-4000**	8.4	24.00	☆	☆	☆	☆	☆	☆	☆	☆	☆	4.00	4.00	32	**WCB-4000**
D/A**	**20**	**WHR-1250**	7.5	16.50	1.25	1.25	1.25	1.13	1.00	1.25	1.25	1.25	.88	☆	☆	26	**WCB-1250**

* Available in sets. ** D/A = Double-acting *** Low Alloy

☆ Will not cut designated material

▼ Shown from left to right: **WMC-2000, WMC-750**

WMC
Series

Capacity:
3-20 tons

Maximum Material Diameter:
0.38-3.38 inches

Maximum Operating Pressure:
10,000 psi

- **Rotating heads for operator convenience**
- **Guillotine action (except WMC-1000) for efficient operation**
- **Carrying bag included for easy carrying and tool protection**
- **Velcro straps to secure handles on larger models for easy transportation**
- **Spring return on all models**
- **Lightweight, self-contained tool, can be used anywhere**

Replacement Blades

To order 60-62HRc hardened replacement blades use one of the model numbers shown below.

For Cutter Model Number	Order Blade Model Number
WMC-580	**WCB-750**
WMC-750	**WCB-750**
WMC-1000	**WCB-1000**
WMC-1250	**WCB-1250**
WMC-1580	**WCB-1580**
WMC-2000	**WCB-2000**
WMC -3380	**WCB-3380**

Caution!

A "☆" in the charts on these pages means that this hydraulic cutter is not designed to cut this size or type of material. Any attempt to do so may result in personal injury and damage to the unit and will void the warranty.

▼ **Selection Chart Maximum Cutting Capacities** (diameter in inches)

Capacity (ton)	Model Number	Length (in)	Steel Wire Rope, Hemp-core or IWRC 6x7 6x12 6x19	Round Bar				Wire Strand					Cable		Weight (lbs)
				Copper Wire or Bar	Alumi-num Wire or Bar	Soft Steel Bolts	Rein-forcing Bar	Bare Copper Wire Strands	Bare Alumi-num Wire Strands 6x7	ACSR Wire Strands	Guy Steel Wire Strands 1x7	Guy Steel Wire Strands 1x19	Tele-phone Cable CPP	Under-ground Cable (Power)	
4	**WMC-580**	15.00	.63	.63	.63	.63	.38	.63	.63	.63	.56	.56	☆	.63	8
4	**WMC-750**	15.00	.63	.69	.69	.69	.50***	.75	.75	.75	.56	.56	☆	.68	8
20	**WMC-1000***	26.75	☆	.75	.75	.75	.75	☆	☆	☆	☆	☆	☆	☆	25
20	**WMC-1250**	26.75	1.25	1.13	1.25	1.25	.88	1.25	1.25	1.25	.88	1.00	☆	☆	23
6	**WMC-1580**	22.00	.75	.75	.75	.75	☆	1.50	1.63	1.63	.63	.63	☆	1.63	15
13	**WMC-2000**	24.75	1.00	1.25	1.25	.88	☆	2.00	2.00	2.00	.75	.75	☆	2.00	24
3	**WMC-3380**	26.00	☆	☆	☆	☆	☆	1.83	1.69	☆	☆	☆	3.37	3.38	22

* Cuts .50" alloy chain grade 70 (type G7 transport or tie-down) or grade 80 (for overhead lifting applications)

☆ Will not cut designated material

*** Low Alloy

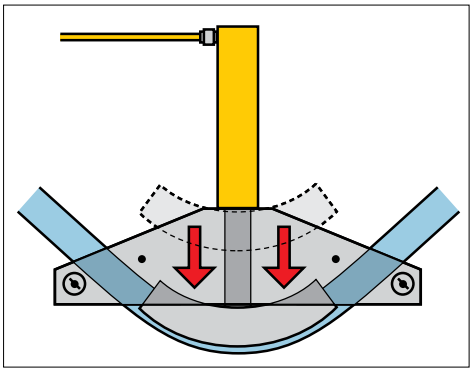
▼ Shown: **STB-101H**

Quick, Safe and Wrinkle-free Bending

'One Shot' and 'Sweep'

One shot shoes give up to a 90° bend without resetting. Sweep shoes are used where increased radii are required for multiple parallel pipe installations.

- **Makes smooth, wrinkle-free bends**
- **Sets include cylinder, hose and manual, air or electric pump**
- **Sets are also available without hydraulics**
- **Bending shoes and bending frame are lightweight, heat-treated aluminum**
- **All sets include sturdy steel storage case**
- **All sets include BZ-12091 angle indicator for accurate bending**
- **BZ-12377 Shoe Lock Pin included in every set**
- **Eject-O-Matic™ benders (STB-202 models) use a double-acting cylinder to eject pipe from the bending shoe**



▲ *Typical one shot bending operation.*

▼ **SELECTION CHART**

Pipe Range Nominal Size (in) One Shot	Pipe Range Nominal Size (in) Sweep	Set Model Number	Hand Pump*	Air Pump*	Electric Pump*	Cylinder*	Hose*	Steel Case*	Saddle	Weight (includes steel case) (lbs)
										
1/2 - 2	–	STB-101X	–	–	–	–	-	CM-4	A-12	88
		STB-101N	–	–		RC-1010	HC-7206	CM-4	A-12	105
		STB-101H	P-392	–	–	RC-1010	HC-7206	CM-4	A-12	114
		STB-101A	–	PATG-1102N	–	RC-1010	HC-7206	CM-4	A-12	119
		STB-101B	–	–	PUJ-1200B[2]	RC-1010	HC-7206	CM-4	A-12	127
1 - 2	2 1/2 - 4	STB-221X	–	–	–	–	-	CM-7	A-29	229
		STB-221N	–	–	–	RC-2510	HC-7206	CM-7	A-29	263
		STB-221H	P-80	–	–	RC-2510	HC-7206	CM-7	A-29	286
1 1/4 - 4	–	STB-202X[1]	–	–	–	–	-	CM-7	A-29	316
		STB-202N[1]	–	–	–	RR-3014	HC-7206 (2x)	CM-7	A-29	383
		STB-202B[1]	–	–	ZU4408SB[2]	RR-3014	HC-7206 (2x)	CM-7	A-29	467

* See corresponding sections of this catalog for more detailed specifications.

[1] Eject-O-Matic™ [2] For 230 volt applications change the last digit of Set Model Number from "B" to "E".

Nominal pipe size (outside dia.) (in)	Wall Thick-ness (in)	Schedule Pipe *	Pipe Bend Inside Radius (in)	STB-101 ½ - 2 One Shot	STB-221 1-2 One Shot 2½ - 4 Sweep	STB-202 1¼ - 4 One Shot	One Shot Bending Shoe Model Number	Sweep Bending Shoe Model Number
½ (.840)	.109	40	2⅞	Yes	–	–	BZ-12011	–
	.147	80		Yes	–	–		
	.187	160		WS	–	–		
	.294	DEH		WS	–	–		
¾ (1.050)	.113	40	4	Yes	–	–	BZ-12021	–
	.154	80		Yes	–	–		
	.218	160		WS	–	–		
	.308	DEH		WS	–	–		
1 (1.315)	.133	40	5⅛	Yes	Yes	–	BZ-12031	–
	.179	80		Yes	Yes	–		
	.250	160		WS	WS	–		
	.358	DEH		–	WS	–		
1¼ (1.660)	.140	40	6⅞	Yes	Yes	Yes	BZ-12041	–
	.191	80		Yes	Yes	Yes		
	.250	160		WS	WS	Yes		
	.342	DEH		–	WS	WS		
1½ (1.900)	.145	40	7 5⁄16	Yes	Yes	Yes	BZ-12051	–
	.200	80		Yes	Yes	Yes		
	.281	160		WS	WS	Yes		
	.400	DEH		–	WS	WS		
2 (2.375)	.154	40	8 5⁄16	Yes	Yes	Yes	BZ-12061	–
	.218	80		–	Yes	Yes		
	.343	160		–	WS	Yes		
2½ (2.875)	.203	40	9½	–	Yes	Yes	BZ-12341	BZ-12382
	.276	80		–	WS	Yes		
	.375	160		–	WS	Yes		
3 (3.500)	.216	40	11¼	–	Yes	Yes	BZ-12351	BZ-12383
	.300	80		–	WS	Yes		
3½ (4.000)	.226	40	15½	–	Yes	Yes	BZ-12391	BZ-12384
	.318	80		–	WS	Yes		
4 (4.500)	.237	40	17¾	–	Yes	Yes	BZ-12392	BZ-12385
	.337	80		–	–	Yes		

***Schedule Pipe: 40** = Standard; **80** = Extra Heavy; **160** = Double Extra Heavy;
DEH = Double Extra Heavy (slightly thicker than 160);
WS = Can be bent by using wider spacing for swivel shoes.

STB Series

Nominal Pipe Size:
0.5-4 inches

Maximum Bend Angle:
90°

Maximum Operating Pressure:
10,000 psi

All bender sets are designed to bend mild steel pipe. For other material please consult Enerpac.

Frame Assembly	Pivot Pin (2x incl)	Pivot Shoes (2x incl)	One Shot or Sweep[3] Bending Shoes included								Set Model Number
BZ-12371	BZ-12375	BZ-12071	BZ-12011	BZ-12021	BZ-12031	BZ-12041	BZ-12051	BZ-12061	–	–	STB-101X STB-101N STB-101H STB-101A STB-101B
BZ-12372	BZ-12376	BZ-13401	BZ-12031	BZ-12041	BZ-12051	BZ-12061	BZ-12382[3]	BZ-12383[3]	BZ-12384[3]	BZ-12385[3]	STB-221X STB-221N STB-221H
BZ-12374	BZ-12376	BZ-13401	–	BZ-12041	BZ-12051	BZ-12061	BZ-12341	BZ-12351	BZ-12391	BZ-12392	STB-202X[1] STB202N[1] STB-202B[1]

[3] Shoes are Sweep, all other shoes are One Shot.

▼ Shown: **PTJ5S and 5DA1**

Field-proven Tools for Mono-Strand Tensioning

- **Durable, field-proven designs, with "soft-grip" ergonomic handles reduce operator fatigue**
- **Single-acting *PTJ* models, with spring-seating and optional power-seating are equipped with the new Enerpac *RC* Post-tensioning cylinders with a 10" stroke, ideal for slab-on-grade applications**
- **Double-acting *DA* models have an 8.5" stroke and are machined from a steel billet; feature standard power-seating and "gun-drilled" internal hydraulic passages**
- **All jacks have a standard 3" nose assembly. Longer nose assemblies are available as accessories for all models**
- **A full line of grippers is available to tension common strand diameters**
- **Complete offering of Enerpac parts and soft kits allow quick and easy service**

SCJ Short Cable Jack

For pulling applications where the tendons are shortened, the SCJ Jack only requires 4" of exposed cable. Uses standard 10" stroke single-acting cylinders, other strokes available upon request.

Contact Enerpac for details.

RC-1010PT and RC-1510PT Cylinders

Longer spring life and improved retraction are the benefits from these specially designed cylinders.

5DA1-AL Reduced Weight Jack

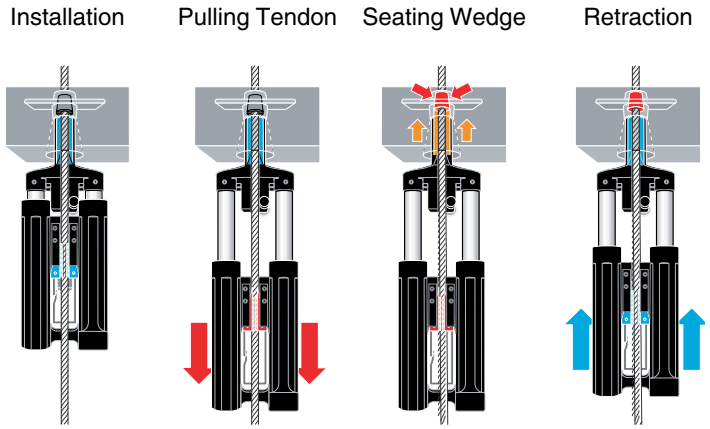
With a 17% weight reduction, this jack increases operator safety by reducing fatigue, while still having all the durability of a SURE-LOCK® product.

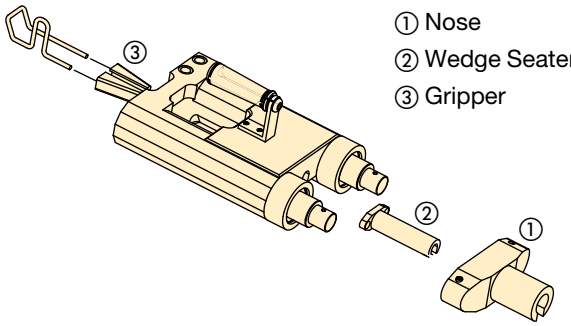
▼ **TOOL SELECTION CHART**

Tool Capacity (ton)	Seater Type	Strand Diameter Standard (in)	Model Number	Tool Operation	Stroke (in)	Oil Capacity (in^3)	Tool Effective Area (in^2)	Max. Pressure (psi)	Weight (lbs)
20	Spring	0.50-0.52	**PTJ5S**	S/A	10.0	45.3	4.48	10,000	55
20	Power	0.50-0.52	**PTJ5P**	S/A	10.0	45.3	4.48	10,000	55
20	Power	0.50-0.52	**5DA1-AL**	D/A	8.50	53.0	6.28	6,500	35
20	Power	0.50-0.52	**5DA1**	D/A	8.50	53.0	6.28	6,500	42
30	Spring	0.60-0.62	**PTJ6S**	S/A	10.0	62.8	6.28	10,000	76
30	Power	0.60-0.62	**PTJ6P**	S/A	10.0	62.8	6.28	10,000	76
26	Power	0.60-0.62	**6DA1**	D/A	8.50	67.6	7.95	6,500	52

Mono-Strand Tensioning Tool Operational Sequence

The sequence of operation of the double-acting **5DA1** tool is illustrated. Single-acting, spring-seat models are similar.

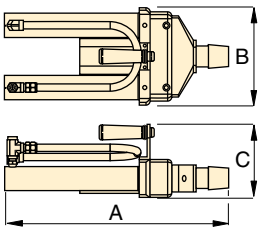




① Nose
② Wedge Seater
③ Gripper

Dimensions (in)			
Model No.	A	B	C
PTJ5	21.0	9.0	6.5
PTJ6	22.0	10.2	7.0
5DA1	18.5	7.5	6.5
6DA1	18.5	8.5	6.5

3/8" NPTF ports; PTJ and DA power seat models include FZ-1055 fitting.



DA, PTJ Series

Capacity:
20-30 tons

Stroke:
8.5-10 inches

Strand Diameters:
.375-.60 inch

Maximum Operating Pressure:
6,500-10,000 psi

Multi-Strand Stressing Jacks

For applications requiring multi-strand stressing, contact Enerpac *Integrated-Solutions* for information on Enerpac's multi-strand tensioning jacks.

Jack Feet

Two required per jack. Used in place of a nose to react on either side of wedge pocket.

Model Number	Used with Jack
402000	5DA1
403325	6DA1

▼ Optional and Replacement Accessories Selection Chart

Nose		Wedge Seater		Gripper Set Diameter							
3"	6"	3"	6"	0.38"	0.43"	0.50"	0.62"	4 mm	5 mm	6 mm	7 mm
											
400740*	401180	305340*	401200	400900	400880	400850*	N/A	400930	400940	400950	400960
400740*	401180	305340*	401200	400900	400880	400850*	N/A	400930	400940	400950	400960
401520*	401840	305360*	305365	401652	401655	401660*	N/A	–	401670	–	–
401520*	401840	305360*	305365	401652	401655	401660*	N/A	–	401670	–	–
400740*	401180	305340*	401200	400900	400880	400850	400980*	400930	400940	400950	400960
400740*	401180	305340*	401200	400900	400880	400850	400980*	400930	400940	400950	400960
403180*	403220	403140*	403165	400988	N/A	400986	400990*	–	–	–	–

*Shipped with tool.

Enerpac Bolting Tools

ENERPAC'S *Bolting Solutions* caters to the complete bolting work-flow, ensuring joint integrity in a variety of applications throughout industry:

Joint Assembly
From simple pipe alignment to complex joint positioning of large structural assemblies, our comprehensive line of joint assembly products range from hydraulic to mechanical alignment tools.

Controlled Tightening
Enerpac offers a variety of controlled tightening options to best meet the requirements of your application. From mechanical torque multipliers to hydraulically driven square drive wrenches, and low profile torque wrenches, we offer the products you need for accurate and simultaneous tightening of multiple bolts.

Joint Separation
Enerpac also provides hydraulic nut splitters and a variety of mechanical and hydraulic spreading tools for joint separation during inspection, maintenance and decommissioning operations.

High quality bolting solutions from the brand you can trust.
See how Enerpac can make your bolting work-flow more accurate, safer and efficient.

Bolting Integrity Software

Visit www.enerpac.com to access our free on-line bolting software application and obtain information on tool selection, bolt load calculations and tool pressure settings. A combined application data sheet and joint completion report is also available.

Bolting Tools and Pumps Section Overview

	Capacity	Tool Type and Functions	Series		Page
Controlled Tightening and Loosening	750-8000 Ft.lbs	Manual Torque Multipliers	E		188 ▶
	1400-25,140 Ft.lbs	Square Drive Hydraulic Torque Wrenches-Steel	S		190 ▶
	2000-15,000 Ft.lbs	Low Profile Hydraulic Torque Wrenches-Steel	W		196 ▶
	Flow 20 in^3/min.	Portable Electric Torque Wrench Pumps	PMU		205 ▶
	Flow 60 in^3/min.	Electric Torque Wrench Pumps	ZU4T		206 ▶
	Flow 60 in^3/min.	Electric Torque Wrench Pumps	ZE		210 ▶
	Flow 20 in^3/min.	Compact Air Driven Torque Wrench Pumps	PTA		212 ▶
	Flow 60 in^3/min.	Air Driven Torque Wrench Pumps	ZA4T		214 ▶
Joint Assembly	0.3-5.5 tons	Flange Alignment Tools	ATM		218 ▶
Joint Separation	8-14 tons	Step-type Industrial Spreader	FSM FSH		219 ▶
	5-10 tons	Pin-type Hydraulic Flange Spreaders	FS		220 ▶
	5-192 tons	Hydraulic Nut Cutters	NC NS		221 ▶

▼ Shown from left to right: **E291, E393, E494**

Accurate, Efficient Torque Multiplication

When accurate make-up or break-out of stubborn fasteners requires high torque

- **High-efficiency planetary gear sets achieve high output torque from low input torque**
- **Most models operator protected by anti-backlash device**
- **Multiplier output accuracy ± 5% of input torque**
- **Reversible, tighten or loosen bolts**
- **Reaction bar or reaction plate type**
- **Angle-of-turn protractor standard on E300 series models**
- **Reaction plate models offer increased versatility with reaction point locations**
- **E300 and E400 series replaceable shear drives provide overload protection of internal power train (one replacement shear drive is included)**

Typical Torque Multiplier Applications

- Locomotives
- Power plants
- Pulp and paper mills
- Refineries
- Chemical plants
- Mining and construction
- Off-road equipment
- Shipyards
- Cranes

MTW-250 Manual Torque Wrench

Available to power manual torque multipliers.

Technical information:
- 1/2" Square Drive
- 45-250 Ft-lbs. (60-330 Nm)

▼ **SELECTION CHART**

Torque Multiplier Type	Output Torque Capacity (Ft.lbs)	Output Torque Capacity (Nm)	Model Number
Reaction Bar Multiplier	750	1015	E290PLUS
	1000	1355	E291
	1200	1625	E391
	2200	2980	E392
	3200	4340	E393
Reaction Plate Multiplier	2200	2980	E492
	3200	4340	E493
	5000	6780	E494
	8000	10.845	E495

◀ *Enerpac Reaction Bar Torque Multiplier E393 used to manually torque bolts up to 3,200 ft-lbs.*

Manual Torque Multipliers

Enerpac manual torque multipliers provide efficient torque multiplication in wide clearance applications and when external power sources are not available.
Manual torque multipliers are used in most industrial, construction, and equipment maintenance applications. Hydraulic torque wrenches are better suited for tight tolerance, flange and repetitious bolting applications.

Use Reaction Bar Models:

- where space is limited
- where multiple reaction points are available
- when portability is desirable

Use Reaction Plate Models:

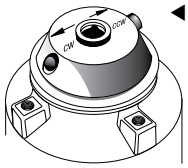
- above 3200 Ft-lbs. output torque
- on flanges and applications where neighboring bolt or nut is available to react against
- when extreme reaction forces are generated

E Series

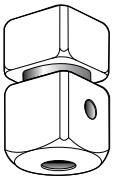
Maximum Output Torque:
750-8000 Ft.lbs

Torque Ratio:
3:1-52:1

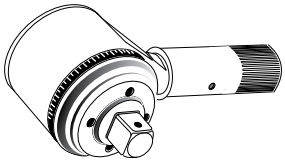
Multiplier Output Ratio Accuracy:
± 5 %



◀ **Selector Pawl**
Models with anti-backlash protection have directional selector pawls. Set the pawl for clockwise or counter-clockwise rotation.



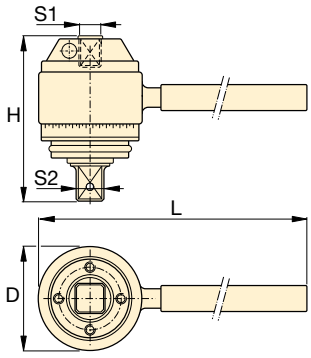
◀ **Shearable Square Drive**
Provides overload protection on E300- and E400-series multiplier's power train by shearing at 103-110% of rated capacity. Internal shear pin prevents tool from falling off bolt.



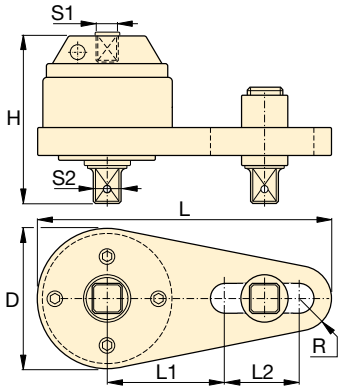
▲ **Angle-of-Turn Protractor**
E391, E392 and E393 models include an angle-of-turn protractor (scale) to tighten fasteners using a "torque turn" method. Allows accurate measuring a specific number of degrees of rotation.

CAUTION!
Never use impact type air tools for power driving torque multipliers. Torque multiplier drive train damage will occur.

Hydraulic Torque Wrenches
Enerpac offers a complete range of square drive and hexagon cassette torque wrenches.
Page: 190



Reaction Bar Type [1)]



Reaction Plate Type [1)]

Input Torque (Ft.lbs)	Input Torque (Nm)	Torque Ratio	Input Female Square Drive S1 (in)	Output Male Square Drive S2 (in)	Output Male Square Drive Replaceable Shear Drive Model No.	Over-load Protec-tion	Anti-Back-lash	Dimensions (in) D	H	L	L1	L2	R	Wt. (lbs)	Model Number
227	308	3 : 1	½	¾	–	No	No	2.8	3.3	8.6	–	–	–	4.0	**E290PLUS**
303	411	3 : 1	½	¾	–	No	No	2.8	3.3	17.4	–	–	–	5.5	**E291**
200	271	6 : 1	½	¾	E391SDK	Yes	No	3.9	4.0	19.6	–	–	–	9.1	**E391**
162	219	13.6 : 1	½	1	E392SDK	Yes	Yes	4.1	5.7	19.6	–	–	–	18.3	**E392**
173	234	18.5 : 1	½	1	E393SDK	Yes	Yes	4.1	6.5	19.6	–	–	–	15.2	**E393**
162	219	13.6 : 1	½	1	E392SDK	Yes	Yes	4.9	5.5	14.0	5.5	4.9	1.3	17.2	**E492**
173	234	18.5 : 1	½	1	E393SDK	Yes	Yes	4.9	6.4	14.0	5.5	4.9	1.3	19.5	**E493**
189	256	26.5 : 1	½	1½	E494SDK	Yes	Yes	5.6	8.7	14.9	7.0	3.5	1.7	34.0	**E494**
154	208	52 : 1	½	1½	E495SDK	Yes	Yes	5.8	10.7	15.2	7.0	3.5	1.9	50.3	**E495**

[1)] E200 and E400-series do not have an Angle-of-Turn Protractor (scale).
User must verify manual torque wrench accuracy prior to use to ensure accurate final output torque.

▼ From left to right: **S3000, S6000, S1500**

Rigid Steel Design

The *Professional* Square Drive Solution

Simplicity

- **360° click-on, multi-position reaction arm**
- **Push button square drive release for quickly reversing the square drive for tightening or loosening**
- **Fine tooth ratchet prevents tool "lock-on"**
- **Single 360° hydraulic swivel manifold, complete with screw lock couplings, increases wrench and hose maneuverability**

Design

- **Compact, high-strength uni-body construction for a small operating radius**
- **Robust design with minimal parts enables easy on-site maintenance without special tools**
- **Lightweight, ergonomic design for easy handling and an easy fit, even in applications where access is limited**
- **Optimised strength-to-weight ratio**
- **Fast operation due to the large nut rotation per wrench cycle (35 degree rotation angle) and rapid return stroke**

Reliability

- **All wrenches are nickel-plated for excellent corrosion protection and improved durability in harsh environments**

Accuracy

- **Constant torque output provides high accuracy across the full stroke**
- **Uni-body construction ensures accuracy by reducing internal deflections**

S-Series, Square Drive Wrenches

This product range has been designed using state-of-the-art CAD techniques to bring you the most advanced square drive torque wrench on the market.

To ensure that the tools you buy meet our own exacting requirements, during the design process every prototype was put through finite element stress analysis, photo-elastic modeling, rigorous cyclic testing and strain gauging.

TSP - Pro Series Swivel

Featuring Tilt & Swivel technology the TSP provides 360° X-axis rotation and 160° Y-axis rotation.

How to Order

Order as an accessory which can be fitted to existing S-Series wrenches.

Factory fitted to new S-Series wrenches: Suffix the wrench model number with "-P" e.g.: **S1500-P**.

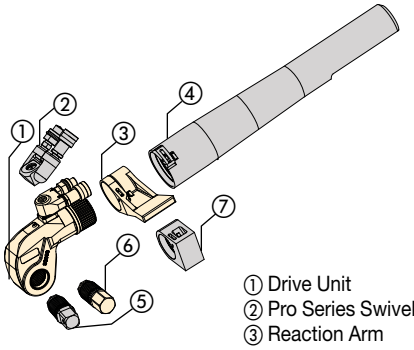
Page: 193

Torque Wrench Hoses

Use Enerpac THQ-700 Series torque wrench hoses with S-Series torque wrenches to ensure the integrity of your hydraulic system.

19.5 feet long, 2 hoses	**THQ-706T**
39 feet long, 2 hoses	**THQ-712T**

Double-Acting Square Drive Hydraulic Torque Wrenches



① Drive Unit
② Pro Series Swivel
③ Reaction Arm
④ Extended Reaction Arm
⑤ Square Drive
⑥ Allen Drive
⑦ Short Reaction Arm

250%

Select the Right Torque

Choose your Enerpac Torque Wrench using the untightening rule of thumb: Loosening torque equals about 250% of tightening torque.

S Series

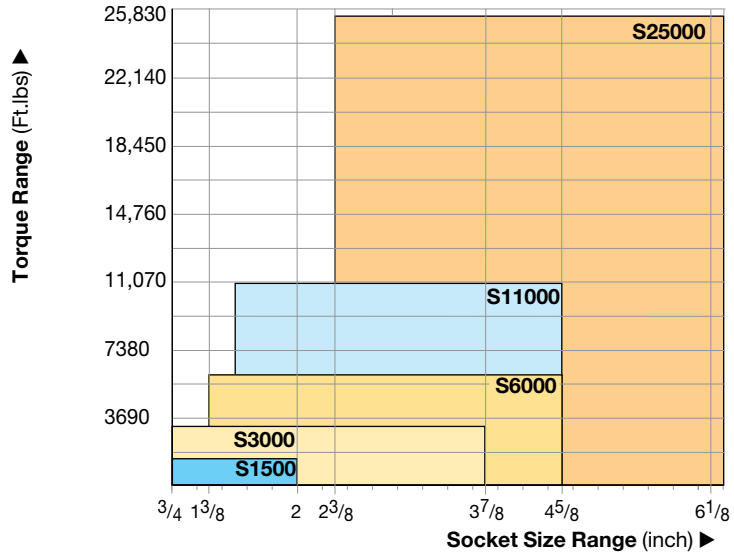
Maximum Torque at 10,000 psi:
25,140 Ft.lbs

Square Drive Range:
¾-2½ inch

Nose Radius:
.99-2.50 inch

Maximum Operating Pressure:
10,000

***TORQUE WRENCH SELECTION (based on socket size range)**

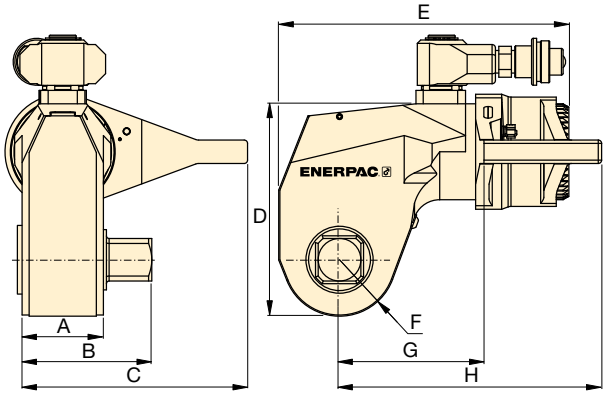


*Additional socket sizes available upon request.

Torque Wrench and Pump Selection Matrix

For optimum speed and performance see the torque wrench and pump matrix.

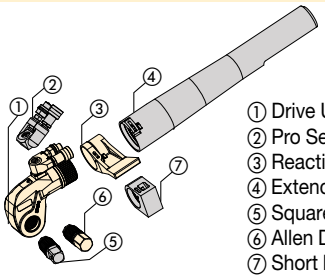
Page: 204



The rigid steel design of S-Series torque wrenches guarantee durability, reliability and safety. These wrenches can be powered by the portable ZU4T-Series pumps. ▶

Maximum Torque at 10,000 psi		Square Drive		Torque Wrench Model No.	Dimensions (in)								Weight
		Size (in)	Model No. (included with wrench)		A	B	C	D	E	F	G	H	
(Ft.lbs)	(Nm)												(lbs)
1400	1898	¾"	SD15-012	**S1500**	1.54	2.48	4.33	3.74	5.36	0.99	2.72	4.69	5.94
3200	4339	1"	SD30-100	**S3000**	1.89	3.03	5.28	4.96	6.78	1.30	3.55	6.27	11.00
6010	8144	1½"	SD60-108	**S6000**	2.24	3.55	7.05	6.38	7.92	1.66	4.41	7.37	18.70
11,000	14.914	1½"	SD110-108	**S11000**	2.80	4.37	7.22	7.29	8.90	1.95	5.20	8.94	33.00
25,140	34.079	2½"	SD250-208	**S25000**	3.43	5.63	9.61	9.46	11.50	2.50	7.17	11.50	68.20

See "Yellow Pages " section for torque conversions.
To order a S-series wrench fitted with the TSP swivel, suffix the model number with "-P". e.g., S1500-P.



① Drive Unit
② Pro Series Swivel
③ Reaction Arm
④ Extended Reaction Arm
⑤ Square Drive
⑥ Allen Drive
⑦ Short Reaction Arm

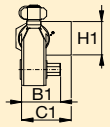
Maximum Torque at 10,000 psi:
25,140 Ft.lbs.

Square Drive Range:
¾-2½ inches

Hexagon Size Allen Drive:
14-85 mm

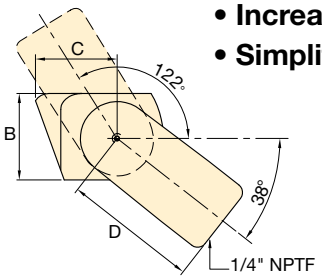
For S Series

▼ **SELECTION CHART**

TORQUE WRENCH	OPTIONAL ALLEN DRIVES, IMPERIAL				OPTIONAL ALLEN DRIVES, METRIC				SHORT REACTION ARM FOR ALLEN DRIVES		
											
Model Number	**Hexagon Size** (in)	**Maximum Torque** (Ft.Lbs)	**Model Number**	**Dim. B1** (in)	**Hexagon Size** (mm)	**Maximum Torque** (Ft.lbs)	**Model Number**	**Dim. B1** (in)	**Model Number**	**Dimensions** (in) **C1**	**H1**
S1500 (1400 Ft-lbs)	½	**355**	**SDA15-008**	2.6	14	**475**	**SDA15-14**	2.60	**SRA15**	2.66	2.56
	⅝	**690**	**SDA15-010**	2.6	17	**850**	**SDA15-17**	2.68			
	¾	**1195**	**SDA15-012**	2.8	19	**1184**	**SDA15-19**	2.76			
	⅞	**1400**	**SDA15-014**	2.9	22	**1399**	**SDA15-22**	2.87			
	1	**1400**	**SDA15-100**	3.0	24	**1399**	**SDA15-24**	2.91			
S3000 (3200 Ft-lbs)	⅝	**690**	**SDA30-010**	3.0	17	**850**	**SDA30-17**	3.03	**SRA30**	3.15	2.91
	¾	**1195**	**SDA30-012**	3.1	19	**1185**	**SDA30-19**	3.11			
	⅞	**1895**	**SDA30-014**	3.3	22	**1835**	**SDA30-22**	3.23			
	1	**2825**	**SDA30-100**	3.4	24	**2385**	**SDA30-24**	3.31			
	1⅛	**3200**	**SDA30-102**	3.5	27	**3200**	**SDA30-27**	3.35			
	1¼	**3200**	**SDA30-104**	3.5	30	**3200**	**SDA30-30**	3.43			
	–	**–**	**–**	–	32	**3200**	**SDA30-32**	3.46			
S6000 (6000 Ft-lbs)	⅝	**690**	**SDA60-010**	3.3	17	**850**	**SDA60-17**	3.39	**SRA60**	3.60	3.50
	¾	**1195**	**SDA60-012**	3.5	19	**1185**	**SDA60-19**	3.46			
	⅞	**1895**	**SDA60-014**	3.6	22	**1835**	**SDA60-22**	3.58			
	1	**2825**	**SDA60-100**	3.7	24	**2385**	**SDA60-24**	3.66			
	1⅛	**4025**	**SDA60-102**	3.8	27	**3395**	**SDA60-27**	3.70			
	1¼	**5520**	**SDA60-104**	3.9	30	**4655**	**SDA60-30**	3.78			
	–	**–**	**–**	–	32	**5650**	**SDA60-32**	3.82			
S11000 (11,000 Ft-lbs)	1¼	**5520**	**SDA110-104**	4.5	30	**4655**	**SDA110-30**	4.41	**SRA110**	5.02	4.17
	1⅜	**7345**	**SDA110-106**	4.6	32	**5650**	**SDA110-32**	4.49			
	1½	**9535**	**SDA110-108**	4.6	36	**8040**	**SDA110-36**	4.61			
	1⅝	**11,000**	**SDA110-110**	4.8	41	**11,000**	**SDA110-41**	4.76			
	1¾	**11,000**	**SDA110-112**	4.9	46	**11,000**	**SDA110-46**	5.00			
S25000 (25,000 Ft-lbs)	1½	**9535**	**SDA250-108**	5.5	36	**8040**	**SDA250-36**	5.51	**SRA250**	6.24	5.31
	1⅝	**12,120**	**SDA250-110**	5.7	41	**11880**	**SDA250-41**	5.67			
	1¾	**15,135**	**SDA250-112**	5.8	46	**16775**	**SDA250-46**	5.83			
	1⅞	**18,620**	**SDA250-114**	5.9	50	**21,545**	**SDA250-50**	5.94			
	2	**22,595**	**SDA250-200**	5.9	55	**25,150**	**SDA250-55**	6.06			
	2¼	**25,150**	**SDA250-204**	6.0	60	**25,150**	**SDA250-60**	6.22			
	–	**–**	**–**	–	65	**25,150**	**SDA250-65**	6.34			
	–	**–**	**–**	–	70	**25,150**	**SDA250-70**	6.46			
	–	**–**	**–**	–	75	**25,150**	**SDA250-75**	6.61			
	–	**–**	**–**	–	85	**25,150**	**SDA250-85**	6.89			

TSP Series

- Pro Series Swivel featuring Tilt and Swivel technology
- 360 degree X-axis and 160 degree Y-axis rotation
- 10,000 psi / 700 bar maximum working pressure
- Increases tool fit in restricted access areas
- Simplifies hose placement

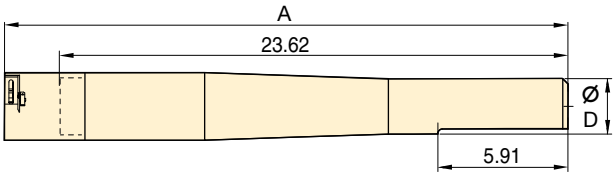


Wrench Model	Model Number	Dimensions (in)				Weight
		A	B	C	D	(lbs)
S1500, S3000	**TSP100**	2.52	1.06	.91	1.60	.41
S6000, S11000, S25000	**TSP200**	2.64	1.06	1.02	1.65	.43

To order a S-series wrench fitted with the TSP swivel, suffix the model number with "-P". e.g., **S1500-P.**

RTE Series

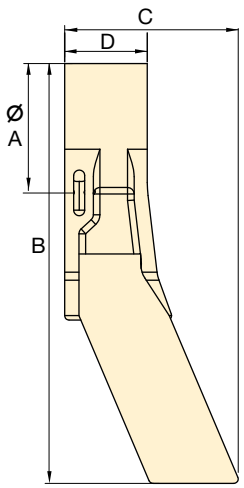
- Reaction Tube Extension for S-Series Wrenches
- Full torque rated
- Increases tool fit in restricted access areas



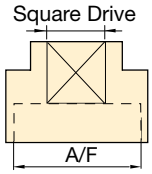
Wrench Model	Model Number	Dimensions (in)		Weight
		A	D	(lbs)
S1500	**RTE15**	25.00	2.28	10.19
S3000	**RTE30**	25.47	2.24	12.15
S6000	**RTE60**	25.95	2.56	17.00
S11000	**RTE110**	26.58	2.99	24.71
S25000	**RTE250**	26.98	3.94	38.12

SRS Series

- Extended Reaction Arms
- Lightweight interchangeable design
- Can be used with Long Reach Sockets



Wrench Model	Model Number	Dimensions (in)				Max. Torque (Ft-lbs)	Weight (lbs)
		A	B	C	D		
S1500	**SRS151**	2.24	5.59	1.45	1.48	1328	1.2
	SRS152		6.59			1210	1.5
	SRS153		7.59			1131	1.9
S3000	**SRS301**	2.57	6.61	2.89	1.89	2890	2.4
	SRS302		7.61			2738	2.9
	SRS303		8.61			2636	3.4
S6000	**SRS601**	3.11	8.07	3.91	2.30	5784	4.2
	SRS602		9.07			5498	4.9
	SRS603		10.07			5292	5.5
S11000	**SRS1101**	3.70	9.15	5.24	2.86	10805	7.5
	SRS1102		10.15			10294	8.7
	SRS1103		11.15			9877	9.8
S25000	**SRS2501**	4.84	11.30	5.82	3.44	24736	13.6
	SRS2502		12.30			23638	15.4
	SRS2503		13.30			22680	17.1



BSH Series Sockets

- **Heavy-duty impact sockets**
- **Supplied with "Pin and Ring"**

IMPERIAL SOCKETS													
3/4" Square Drive		1" Square Drive				1 1/2" Square Drive				2 1/2" Square Drive			
Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)
BSH7519	¾"	BSH1019	¾"	BSH10231	2 5/16"	BSH15144	1 7/16"	BSH15281	2 13/16"	BSH25244	2 7/16"	BSH25419	4 13/16"
BSH75088	⅞"	BSH10088	⅞"	BSH10238	2 ⅜"	BSH1538	1 ½"	BSH15288	2 ⅞"	BSH25250	2 ½"	BSH25425	4 ¼"
BSH75094	15/16"	BSH10094	15/16"	BSH10244	2 7/16"	BSH15156	1 9/16"	BSH1575	2 15/16"	BSH2565	2 9/16"	BSH25110	4 5/16"
BSH7527	1 1/16"	BSH1027	1 1/16"	BSH10250	2 ½"	BSH15163	1 5/8"	BSH15300	3"	BSH25263	2 5/8"	BSH25438	4 ⅜"
BSH7530	1 3/16"	BSH1030	1 3/16"	BSH1065	2 9/16"	BSH1543	1 11/16"	BSH15306	3 1/16"	BSH25269	2 11/16"	BSH25450	4 ½"
BSH75125	1 ¼"	BSH10125	1 ¼"	BSH10263	2 5/8"	BSH15175	1 ¾"	BSH15313	3 1/8"	BSH2570	2 ¾"	BSH25463	4 5/8"
BSH75131	1 5/16"	BSH10131	1 5/16"	BSH10269	2 11/16"	BSH1546	1 13/16"	BSH15319	3 3/16"	BSH25281	2 13/16"	BSH25475	4 ¾"
BSH7535	1 ⅜"	BSH1035	1 ⅜"	BSH1070	2 ¾"	BSH15188	1 ⅞"	BSH15325	3 ¼"	BSH25288	2 ⅞"	BSH25488	4 ⅞"
BSH75144	1 7/16"	BSH10144	1 7/16"	BSH10281	2 13/16"	BSH15194	1 15/16"	BSH15338	3 ⅜"	BSH2575	2 15/16"	BSH25500	5"
BSH7538	1 ½"	BSH1038	1 ½"	BSH10288	2 ⅞"	BSH15200	2"	BSH15350	3 ½"	BSH25300	3"	BSH25513	5 1/8"
BSH75156	1 9/16"	BSH10156	1 9/16"	BSH1075	2 15/16	BSH15206	2 1/16"	BSH15363	3 5/8"	BSH25306	3 1/16"	BSH25519	5 3/16"
BSH75163	1 5/8"	BSH10163	1 5/8"	BSH10300	3"	BSH15213	2 1/8"	BSH1595	3 ¾"	BSH25313	3 1/8"	BSH25525	5 ¼"
BSH7543	1 11/16"	BSH1043	1 11/16"	BSH10306	3 1/16"	BSH15219	2 3/16"	BSH15388	3 ⅞"	BSH25319	3 3/16"	BSH25538	5 ⅜"
BSH75175	1 ¾"	BSH10175	1 ¾"	BSH10313	3 1/8"	BSH15225	2 ¼"	BSH15100	3 15/16"	BSH25325	3 ¼"	BSH25140	5 ½"
BSH7546	1 13/16"	BSH1046	1 13/16"	BSH10319	3 3/16"	BSH15231	2 5/16"	BSH15400	4"	BSH25338	3 ⅜"	BSH25575	5 ¾"
BSH75188	1 ⅞"	BSH10188	1 ⅞"	BSH10325	3 ¼"	BSH15238	2 ⅜"	BSH15105	4 1/8"	BSH25350	3 ½"	BSH25150	5 ⅞"
BSH75194	1 15/16"	BSH10194	1 15/16"	BSH10338	3 ⅜"	BSH15244	2 7/16"	BSH15419	4 3/16"	BSH25363	3 5/8"	BSH25600	6"
BSH75200	2"	BSH10200	2"	BSH10350	3 ½"	BSH15250	2 ½"	BSH15425	4 ¼"	BSH2595	3 ¾"	BSH25613	6 1/8"
		BSH10206	2 1/16"	BSH10363	3 5/8"	BSH1565	2 9/16"	BSH15110	4 5/16"	BSH25388	3 ⅞"		
		BSH10213	2 1/8"	BSH1095	3 ¾"	BSH15263	2 5/8"	BSH15438	4 ⅜"	BSH25100	3 15/16"		
		BSH10219	2 3/16"	BSH10388	3 ⅞"	BSH15269	2 11/16"	BSH15450	4 ½"	BSH25400	4"		
		BSH10225	2 ¼"			BSH1570	2 ¾"	BSH15463	4 5/8"	BSH25105	4 1/8"		

METRIC SOCKETS							
3/4" Square Drive		1" Square Drive		1 1/2" Square Drive		2 1/2" Square Drive	
Model Number	A/F (mm)	Model Number	A/F (mm)	Model Number	A/F (mm)	Model Number	A/F (mm)
BSH7519	19	BSH1019	19	BSH1536	36	BSH2565	65
BSH7524	24	BSH1024	24	BSH15163	41	BSH2570	70
BSH7527	27	BSH1027	27	BSH1546	46	BSH2575	75
BSH7530	30	BSH1030	30	BSH1550	50	BSH2580	80
BSH7532	32	BSH1032	32	BSH1555	55	BSH2585	85
BSH7536	36	BSH1036	36	BSH1560	60	BSH2590	90
BSH75163	41	BSH10163	41	BSH1565	65	BSH2595	95
BSH7546	46	BSH1046	46	BSH1570	70	BSH25100	100
BSH7550	50	BSH1050	50	BSH1575	75	BSH25105	105
		BSH1055	55	BSH1580	80	BSH25110	110
		BSH1060	60	BSH1585	85	BSH25115	115
		BSH1065	65	BSH1590	90	BSH25120	120
		BSH1070	70	BSH1595	95	BSH25125	125
		BSH1075	75	BSH15100	100	BSH25135	135
		BSH1080	80	BSH15105	105	BSH25140	140
		BSH1085	85	BSH15110	110	BSH25145	145
		BSH1090	90	BSH15115	115	BSH25150	150
		BSH1095	95			BSH25155	155
		BSH10100	100				

Optional Allen Drives

Expanded versatility with a wide range of metric and imperial Allen drives.

Page: 192

Pin and Ring

All sockets are supplied with a "Pin and Ring" to hold the socket in place on the square drive of the tool.

Select the Right Torque

Choose your Enerpac Torque Wrench using the untightening rule of thumb: Loosening torque equals about 250% of tightening torque.

ENERPAC professional series steel torque wrenches provide reliable controlled tightening solutions across many industries.

S3000 Square Drive Torque Wrench on Wind Tower Assembly and Maintenance

S3000 used to connect wind tower segments during assembly and maintenance. A robust but compact solution is required for bolt tightening on wind tower sections. Large numbers of fasteners require precise application of torque to ensure joint integrity is achieved and maintained.

The Enerpac S-Series wrench offers simple and reliable operation while providing accurate and repeatable results.

W4000 Low Profile Torque Wrench on an ANSI Pipe Flange

Throughout the Oil and Gas, Petrochemical and Processing Industries, pipeline joints, valves, pumps and machinery present challenges for controlled bolting.

The restricted access on this pipeline elbow was easily overcome with an Enerpac W-Series Torque Wrench. The W Wrenches offer reliability and control, ensuring even and consistent torque is applied to all bolts.

S6000 on a High Volume Pump Unit

High vibration requires long studs to be accurately tightened to the calculated preload.

During maintenance, quick turnaround times are essential; S Series wrenches provide a large angle of nut rotation per stroke, offering speed and accuracy in a compact ergonomic tool.

▼ Shown: **Drive units with interchangeable cassettes**

Rigid Steel Design

The *Professional* Low Profile Solution

Simplicity

- **No tools are needed for changing the hexagon cassettes**
- **Innovative, pinless wrench construction incorporates quick release cylinder and automatic crank engagement**
- **Single 360° hydraulic swivel manifold complete with screw lock couplings increases wrench and hose manueverability**

Design

- **Cylinders and low profile cassettes have been engineered to give ultra slim, compact low clearance tooling with a small nose radius**
- **Robust design with minimal parts enables easy on-site maintenance without special tools**
- **Nut sizes covered range from 1⅛ - 4⅝ inch (30 - 115 mm)**
- **Optimized strength-to-weight ratio**
- **Fast operation due to the large nut rotation per wrench cycle (30 degree rotation angle) and rapid return stroke**

Reliability

- **All wrenches are nickel-plated for excellent corrosion protection and improved durability in harsh environments**
- **All wrenches are fitted with bronze bushings to ensure the ratchet will never seize in the sideplates, thus eliminating costly repairs**

Accuracy

- **Constant torque output provides high accuracy across the full stroke**
- **In-line reaction foot ensures accuracy by reducing internal deflections**

W-Series, Low Profile Torque Wrenches

This product range has been designed using state-of-the art CAD techniques to bring you the most advanced low profile torque wrench on the market. Safety, quality, toughness and reliability are built in.

During the design process every prototype was put through finite element stress analysis, photo-elastic modelling, rigorous cyclic testing and strain gauging.

TSP - Pro Series Swivel

Featuring Tilt and Swivel technology the TSP provides 360° X-axis rotation and 160° Y-axis rotation.

How to Order

Order as an accessory which can be fitted to existing W-Series wrenches.

Factory fitted to new W-Series wrenches: Suffix the wrench model number with "-P" e.g.: **W2000-P.**

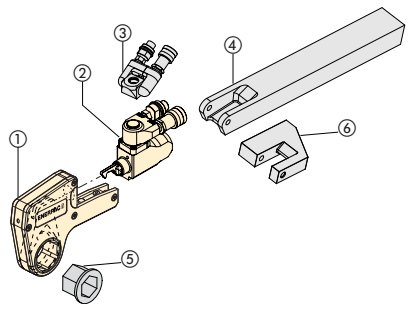
Page: 203

Torque Wrench Hoses

Use Enerpac THQ-700 Series hoses with W-Series torque wrenches to ensure the integrity of your hydraulic system.

19.5 feet long, 2 hoses	**THQ-706T**
39 feet long, 2 hoses	**THQ-712T**

Double-Acting Hydraulic Hexagon Torque Wrenches



① Hexagon Cassette
② Drive Unit
③ Pro Series Swivel
④ Extended Reaction Arm
⑤ Reducer Insert
⑥ Reaction Paddle

Hexagon Cassettes and Reducer Inserts

Maximum versatility with the full range of interchangeable hexagon cassettes and hexagon reducing inserts is available in metric and inch sizes.

Page: 200

W Series

Maximum Torque at 10,000 psi:
15,000 Ft.lbs

Hexagon Range:
1⅛ -4⅝ inch

Nose Radius:
1.22-3.44 inch

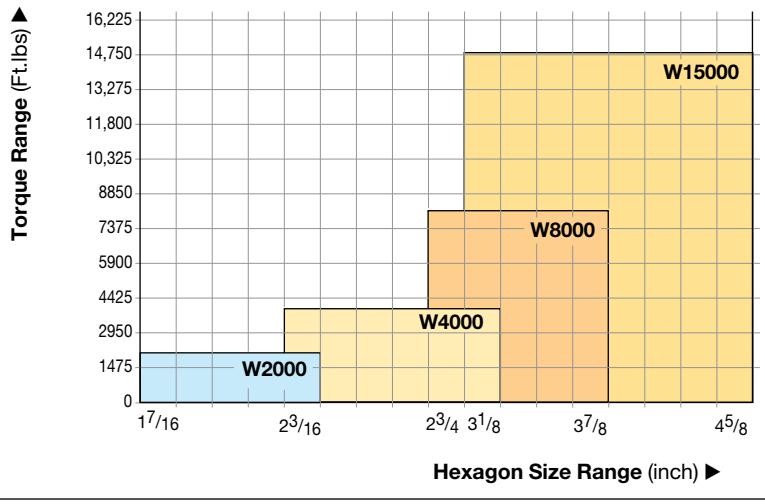
Maximum Operating Pressure:
10,000 psi

Torque Wrench Pump Selection Matrix

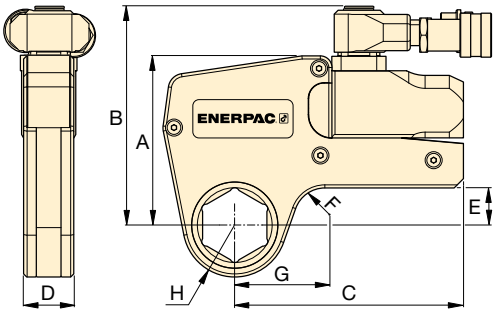
For optimum speed and performance see the torque wrench and pump matrix.

Page: 204

DRIVE UNIT AND INTERCHANGEABLE CASSETTE SELECTION



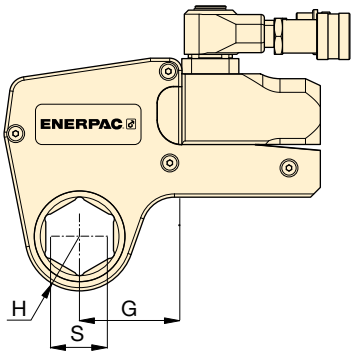
▼ *These rigid steel wrenches with low profile interchangeable hexagon cassettes guarantee durability and maximum versatility in bolting applications.*

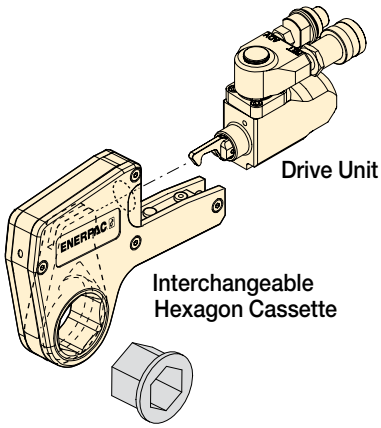


▼ SELECTION CHART

Hexagon Range *  *Page:* 204		Maximum Torque at 10,000 psi		Drive Unit Model Number ** 	Minimum Torque		Dimensions (see pages 198-202 for dimensions H, G, and S) (in)						Weight Drive unit without hexagon cassette
(in)	(mm)	(Ft.lbs)	(Nm)		(Ft.lbs)	(Nm)	A	B	C	D	E	F	(lbs)
1⅛ - 2⅜	30 - 60	2000	2712	**W2000**	200	271	4.29	5.55	5.83	1.26	.94	.79	3.09
1⁵⁄₁₆ - 3⅜	36 - 85	4000	5423	**W4000**	400	542	5.35	6.57	7.01	1.61	1.29	.79	4.41
1⅞ - 4⅛	50 - 105	8000	10,846	**W8000**	800	1084	6.77	8.07	8.19	2.07	1.65	.98	6.61
2⁷⁄₁₆ - 4⅝	65 - 115	15,000	20,337	**W15000**	1500	2033	8.15	9.45	9.96	2.48	1.97	.79	11.02

* With in-line reaction foot.
** To order a W-series wrench fitted with the TSP swivel, suffix the model number with "-P". e.g., W2000-P.





Optional Hexagon Reducing
Insert (see pages 200-204)

W Series

Maximum Torque at 10,000 psi:
2000 Ft.lbs

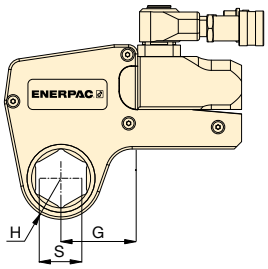
Hexagon Range:
1⅛-2⅜ inch

Maximum Operating Pressure:
10,000 psi

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size S (in)	Nose Radius H (in)	G (in)	Model Number	Weight (lbs)	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
W2000	1⅛	1.22	2.11	**W2102**	0.95	–	–	–	–	–	–
	1³⁄₁₆	1.22	2.11	**W2103**	0.95	–	–	–	–	–	–
	1¼	1.22	2.11	**W2104**	0.95	–	–	–	–	–	–
	1⁵⁄₁₆	1.22	2.11	**W2105**	0.95	–	–	–	–	–	–
	1⅜	1.22	2.11	**W2106**	0.95	–	–	–	–	–	–
	1⁷⁄₁₆	1.22	2.11	**W2107**	0.95	1⁷⁄₁₆ - 1⅛	**W2107R102**	–	–	–	–
	1½	1.32	2.29	**W2108**	0.99	–	–	–	–	–	–
	1⁹⁄₁₆	1.32	2.29	**W2109**	0.99	–	–	–	–	–	–
	1⅝	1.32	2.29	**W2110**	0.99	1⅝ - 1¼	**W2110R104**	1⅝ - 1³⁄₁₆	**W2110R103**	–	–
	1¹¹⁄₁₆	1.44	2.38	**W2111**	0.99	–	–	–	–	–	–
	1¾	1.44	2.38	**W2112**	0.99	–	–	–	–	–	–
	1¹³⁄₁₆	1.44	2.38	**W2113**	0.99	1¹³⁄₁₆ - 1⁷⁄₁₆	**W2113R107**	1¹³⁄₁₆ - 1¼	**W2113R104**	–	–
	1⅞	1.54	2.48	**W2114**	0.99	–	–	–	–	–	–
	1¹⁵⁄₁₆	1.54	2.48	**W2115**	0.99	–	–	–	–	–	–
	2	1.54	2.48	**W2200**	0.99	2 - 1⅝	**W2200R110**	2 - 1⁷⁄₁₆	**W2200R107**	–	–
	2¹⁄₁₆	1.65	2.70	**W2201**	1.04	–	–	–	–	–	–
	2⅛	1.65	2.70	**W2202**	1.04	–	–	–	–	–	–
	2³⁄₁₆	1.65	2.70	**W2203**	1.04	2³⁄₁₆ - 1¹³⁄₁₆	**W2203R113**	2³⁄₁₆ - 1⅝	**W2203R110**	2³⁄₁₆ - 1⁷⁄₁₆	**W2203R107**
	–	–	–	–	–	–	–	–	–	–	–
	2¼	1.75	2.55	**W2204**	1.00	–	–	–	–	–	–
	2⁵⁄₁₆	1.75	2.55	**W2205**	1.00	–	–	–	–	–	–
	2⅜	1.75	2.55	**W2206**	1.00	2⅜ - 2	**W2206R200**	2⅜ - 1⅞	**W2206R114**	2⅜ - 1¹³⁄₁₆	**W2206R113**
	–	–	–	–	–	2⅜ - 1½	**W2206R108**	2⅜ - 1⁷⁄₁₆	**W2206R107**	–	–

W4000 Series Imperial Cassettes & Reducer Inserts



Maximum Torque at 10,000 psi:
4000 Ft.lbs

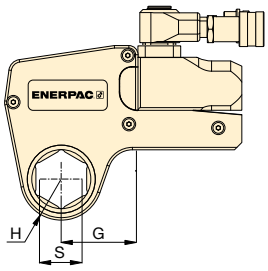
Hexagon Range:
1 5/16-3 3/8 inch

Maximum Operating Pressure:
10,000 psi

W Series

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size S (in)	Nose Radius H (in)	G (in)	Model Number	Weight (lbs)	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
W4000	1 5/16	1.46	2.40	W4105	1.68	–	–	–	–	–	–
	1 3/8	1.46	2.40	W4106	1.68	–	–	–	–	–	–
	1 7/16	1.46	2.40	W4107	1.68	–	–	–	–	–	–
	1 1/2	1.46	2.40	W4108	1.68	–	–	–	–	–	–
	1 9/16	1.46	2.40	W4109	1.68	–	–	–	–	–	–
	1 5/8	1.46	2.40	W4110	1.68	–	–	–	–	–	–
	1 11/16	1.56	2.52	W4111	1.72	–	–	–	–	–	–
	1 3/4	1.56	2.52	W4112	1.72	–	–	–	–	–	–
	1 13/16	1.56	2.52	W4113	1.72	–		–	–	–	–
	1 7/8	1.63	2.63	W4114	1.77	–	–	–	–	–	–
	1 15/16	1.63	2.63	W4115	1.77	–	–	–	–	–	–
	2	1.63	2.63	W4200	1.77	2 - 1 7/8	W4200R107	–	–	–	
	2 1/16	1.73	2.89	W4201	1.81	–	–	–	–	–	–
	2 1/8	1.73	2.89	W4202	1.81	–	–	–	–	–	–
	2 3/16	1.73	2.89	W4203	1.81	2 3/16 - 1 5/8	W4203R110	2 3/16 - 1 7/16	W4203R107	2 3/16 - 1 1/4	W4203R104
	2 1/4	1.83	2.78	W4204	1.86	–	–	–	–	–	–
	2 5/16	1.83	2.78	W4205	1.86	–	–	–	–	–	–
	2 3/8	1.83	2.78	W4206	1.86	2 3/8 - 2	W4206R200	2 3/8 - 1 13/16	W4206R113	2 3/8 - 1 7/16	W4206R107
	–	–	–	–		2 3/8 - 1 3/8	R4206R106	–	–	–	–
	2 7/16	1.95	3.00	W4207	1.86	2 7/16 - 2	W4207R200	–	–	–	–
	2 1/2	1.95	3.00	W4208	1.86	2 1/2 - 2	W4208R200	2 1/2 - 1 13/16	W4208R113	–	–
	2 9/16	1.95	3.00	W4209	1.86	2 9/16 - 2 3/16	W4209R203	2 9/16 - 2 1/8	W4209R202	2 9/16 - 2 1/16	W4208R201
	–	–	–	–		2 9/16 - 2	W4209R200	2 9/16 - 2 **13/16**	W4209R113	–	–
	2 5/8	2.07	3.08	W4210	1.91	–	–	–	–	–	–
	2 11/16	2.07	3.08	W4211	1.91	–	–	–	–	–	–
	2 3/4	2.07	3.08	W4212	1.91	2 3/4 - 2 3/8	W4212R206	2 3/4 - 2 3/16	W4212R203	2 3/4 - 2 1/8	W4212R202
	2 13/16	2.18	3.21	W4213	1.95	–	–	–	–	–	–
	2 7/8	2.18	3.21	W4214	1.95	–	–	–	–	–	–
	2 15/16	2.18	3.21	W4215	1.95	2 15/16 - 2 9/16	W4215R209	2 15/16 - 2 3/8	W4215R206	2 15/16 - 2 3/16	W4215R203
	–	–	–	–		2 15/16 - 2	W4215R200	–	–	–	–
	3	2.30	3.29	W4300	2.00	3 - 2 **3/16**	W4300R203	–	–	–	–
	3 1/16	2.30	3.29	W4301	2.00	–	–	–	–	–	–
	3 1/8	2.30	3.29	W4302	2.00	3 1/8 - 2 3/4	W4302R212	3 1/8 - 2 9/16	W4302R209	3 1/8 - 2 3/8	W4302R206
	–	–	–	–		3 1/8 - 2 5/16	W4302R205	3 1/8 - 2 1/4	W4302R204	3 1/8 - 2 3/16	W4302R203
	–	–	–	–		3 1/8 - 2 1/8	W4302R202	3 1/8 - 2	W4302R200	–	
	3 3/16	2.44	3.37	W4303	2.04	–	–	–	–	–	–
	3 1/4	2.44	3.37	W4304	2.04	–	–	–	–	–	–
	3 5/16	2.44	3.37	W4305	2.04	–	–	–	–	–	–
	3 3/8	2.44	3.37	W4306	2.04	–	–	–	–	–	–



Maximum Torque at 10,000 psi:
8000 Ft.lbs

Hexagon Range:
1⅞ -4⅛ inch

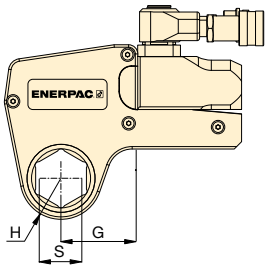
Maximum Operating Pressure:
10,000 psi

W Series

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size S (in)	Nose Radius H (in)	G (in)	Model Number	Weight (lbs)	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
W8000	1⅞	1.77	3.08	W8114	3.68	–	–	–	–	–	–
	1 15/16	1.77	3.08	W8115	3.68	–	–	–	–	–	–
	2	1.77	3.08	W8200	3.68	–	–	–	–	–	–
	2 1/16	1.89	3.15	W8201	3.68	–	–	–	–	–	–
	2⅛	1.89	3.15	W8202	3.68	–	–	–	–	–	–
	2 3/16	1.89	3.15	W8203	3.68	–	–	–	–	–	–
	2¼	2.01	3.25	W8204	3.68	–	–	–	–	–	–
	2 5/16	2.01	3.25	W8205	3.68	–	–	–	–	–	–
	2⅜	2.01	3.25	W8206	3.68	–	–	–	–	–	–
	2 7/16	2.07	3.38	W8207	3.68	–	–	–	–	–	–
	2½	2.07	3.38	W8208	3.68	–	–	–	–	–	–
	2 9/16	2.07	3.38	W8209	3.68	2 9/16 - 2	W8209R200		–		
	2⅝	2.20	3.34	W8210	3.68	–	–	–	–	–	–
	2 11/16	2.20	3.34	W8211	3.58	–	–	–	–	–	–
	2¾	2.20	3.34	W8212	3.58	2¾ - 2 3/16	W8212R203		–		
	2 13/16	2.28	3.35	W8213	3.58	–	–	–	–	–	–
	2⅞	2.28	3.35	W8214	3.58	–	–	–	–	–	–
	2 15/16	2.28	3.35	W8215	3.58	2 15/16 - 2⅜	W8215R206	2 15/16 - 2 3/16	W8215R203	–	
	3	2.38	3.52	W8300	3.63	–	–	–	–	–	–
	3 1/16	2.38	3.52	W8301	3.63	–	–	–	–	–	–
	3⅛	2.38	3.52	W8302	3.63	3⅛ - 2 9/16	W8302R209	3⅛ - 2⅜	W8302R206	3⅛ - 2 3/16	W8302R203
	–	–	–	–	–	3⅛ - 2	W8302R200	–	–	–	
	3 3/16	2.60	3.63	W8303	3.72	–	–	–	–	–	–
	3¼	2.60	3.63	W8304	3.72	–	–	–	–	–	–
	3 5/16	2.60	3.63	W8305	3.72	–	–	–	–	–	–
	3⅜	2.60	3.63	W8306	3.72	–	–	–	–	–	–
	3 7/16	2.60	3.63	W8307I	3.72	–	–	–	–	–	–
	3½	2.60	3.63	W8308	3.72	3½ - 3	W8308R300	3½ - 2 15/16	W8308R215	3½ - 2¾	W8308R212
	3 9/16	2.91	4.05	W8309	3.99	–	–	–	–	–	–
	3⅝	2.91	4.05	W8310	3.99	–	–	–	–	–	–
	3 11/16	2.91	4.05	W8311	3.99	–	–	–	–	–	–
	3¾	2.91	4.05	W8312	3.99	3¾ - 3⅛	W8312R302	3¾ - 2 15/16	W8312R215	3¾ - 2¾	W8312R212
	3 13/16	2.91	4.05	W8313	3.99	–	–	–	–	–	–
	3⅞	2.91	4.05	W8314	3.99	3⅞ - 3⅛	W8314R302	3⅞ - 2 15/16	W8314R215	–	–
	3 15/16	3.13	4.33	W8315	4.22	–	–	–	–	–	–
	4	3.13	4.33	W8400	4.22	–	–	–	–	–	–
	4 1/16	3.13	4.33	W8401I	4.22	–	–	–	–	–	–
	4⅛	3.13	4.33	W8402	4.22	–	–	–	–	–	–

W15000 Series Imperial Cassettes & Reducer Inserts



Maximum Torque at 10,000 psi:
15,000 Ft.lbs

Hexagon Range:
2 7/16-4 5/8 inch

Maximum Operating Pressure:
10,000 psi

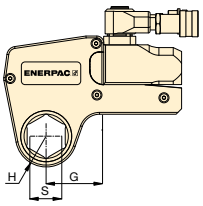
W Series

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size S (in)	Nose Radius H (in)	G (in)	Model Number	Weight (lbs)	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
W15000	2 7/16	2.32	3.49	W15207	6.17	–	–	–	–	–	–
	2 1/2	2.32	3.49	W15208	6.17	–	–	–	–	–	–
	2 9/16	2.32	3.49	W15209	6.17	–	–	–	–	–	–
	2 5/8	2.32	3.49	W15210	6.17	–	–	–	–	–	–
	2 11/16	2.32	3.49	W15211	6.17	–	–	–	–	–	–
	2 3/4	2.32	3.49	W15212	6.17	–	–	–	–	–	–
	2 13/16	2.44	3.56	W15213	6.22	–	–	–	–	–	–
	2 7/8	2.44	3.56	W15214	6.22	–	–	–	–	–	–
	2 15/16	2.44	3.56	W15215	6.22	–	–	–	–	–	–
	3	2.54	3.66	W15300	6.26	3 - 2 1/8	W15300R202	–	–	–	–
	3 1/16	2.54	3.66	W15301	6.26	–	–	–	–	–	–
	3 1/8	2.54	3.66	W15302	6.26	3 1/8 - 2 9/16	W15302R209		–		
	3 3/16	2.74	3.80	W15303	6.40	–	–	–	–	–	–
	3 1/4	2.74	3.80	W15304	6.40	–	–	–	–	–	–
	3 5/16	2.74	3.80	W15305	6.40	–	–	–	–	–	–
	3 3/8	2.74	3.80	W15306	6.40	–	–	–	–	–	–
	3 7/16	2.74	3.80	W15307I	6.40	–	–	–	–	–	–
	3 1/2	2.74	3.80	W15308	6.40	3 1/2 - 2 15/16	W15308R215	3 1/2 - 2 3/4	W15308R212		–
	3 9/16	2.95	4.01	W15309	6.62	–	–	–	–	–	–
	3 5/8	2.95	4.01	W15310	6.62	–	–	–	–	–	–
	3 11/16	2.95	4.01	W15311	6.62	–	–	–	–	–	–
	3 3/4	2.95	4.01	W15312	6.62	3 3/4 - 3 1/8	W15312R302	3 3/4 - 2 15/16	W15312R215		–
	3 13/16	2.95	4.01	W15313	6.58	–	–	–	–	–	–
	3 7/8	2.95	4.01	W15314	6.58	3 7/8 - 3 1/8	W15314R302	3 7/8 - 2 15/16	W15314R215	–	–
	3 15/16	3.17	4.06	W15315	6.72	–	–	–	–	–	–
	4	3.17	4.06	W15400	6.72	–	–	–	–	–	–
	4 1/16	3.17	4.06	W15401I	6.72	–	–	–	–	–	–
	4 1/8	3.17	4.06	W15402	6.72	4 1/8 - 3 1/2	W15402R308	4 1/8 - 3 5/16	W15402R305	4 1/8 - 3 1/4	W15402R304
	4 3/16	3.17	4.06	W15403I	6.72	–	–	–	–	–	–
	4 1/4	3.17	4.06	W15404	6.72	4 1/4 - 3 1/2	W15404R308	4 1/4 - 3 1/8	W15404R302	–	–
	4 5/16	3.44	4.52	W15405	6.85	–	–	–	–	–	–
	4 3/8	3.44	4.52	W15406	6.85	–	–	–	–	–	–
	4 7/16	3.44	4.52	W15407	6.85	–	–	–	–	–	–
	4 1/2	3.44	4.52	W15408I	6.85	–	–	–	–	–	–
	4 9/16	3.44	4.52	W15409I	6.85	–	–	–	–	–	–
	4 5/8	3.44	4.52	W15410I	6.85	4 5/8 - 3 15/16	W15410R315	4 5/8 - 3 7/8	W15410R314	4 5/8 - 3 3/4	W15410R312
	–	–	–	–	–	4 5/8 - 3 1/2	W15410R308	–	–	–	–

W Series Metric Cassettes and Reducer Inserts

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.



Maximum Torque at 10,000 psi:
8000 Ft.lbs

Hexagon Range:
30-115 mm

Maximum Operating Pressure:
10,000 psi (700 bar)

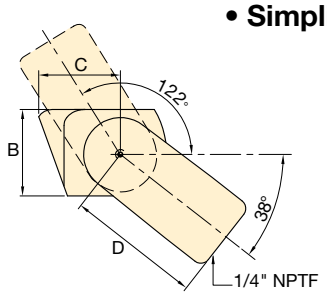
W Series

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size S (mm)	Nose Radius H (in)	G (in)	Model Number	Weight (lbs)	Hexagon Reducer (mm)	Model Number	Hexagon Reducer (mm)	Model Number	Hexagon Reducer (mm)	Model Number
W2000	30	1.22	2.11	W2103	0.95	–	–	–	–	–	–
	32	1.22	2.11	W2104	0.95	–	–	–	–	–	–
	36	1.22	2.11	W2107	0.95	–	–	–	–	–	–
	38	1.32	2.29	W2108	1.00	–	–	–	–	–	–
	41	1.32	2.29	W2110	1.00	41 - 32	W2110R104	41 - 30	W2110R103	41 - 24	W2110R024M
	46	1.44	2.38	W2113	1.00	46 - 36	W2113R107	46 - 32	W2113R104	–	–
	50	1.54	2.48	W2200	1.00	50 - 41	W2200R110	50 - 36	W2200R107	–	–
	55	1.65	2.70	W2203	1.04	55 - 46	W2203R113	55 - 41	W2203R110	55 - 36	W2203R107
	60	1.75	2.55	W2206	1.00	60 - 50	W2206R200	60 - 46	W2206R113	60 - 41	W2206R110
	–	–	–	–	–	60 - 36	W2206R107	–	–	–	–
W4000	36	1.46	2.40	W4107	1.68	–	–	–	–	–	–
	41	1.46	2.40	W4110	1.68	–	–	–	–	–	–
	46	1.56	2.52	W4113	1.72	–	–	–	–	–	–
	50	1.63	2.63	W4200	1.77	50 - 36	W4200R107	–	–	–	–
	55	1.73	2.89	W4203	1.81	55 - 41	W4203R110	55 - 36	W4203R107	55 - 32	W4203R104
	60	1.83	2.78	W4206	1.86	60 - 50	W4206R200	60 - 46	W4206R113	60 - 36	W4206R107
	65	1.95	3.00	W4209	1.86	65 - 55	W4209R203	65 - 50	W4209R200	65 - 46	W4209R113
	70	2.07	3.08	W4212	1.91	70 - 60	W4212R206	70 - 55	W4212R203	–	–
	75	2.18	3.21	W4215	1.95	75 - 65	W4215R209	75 - 60	W4215R206	–	–
	–	–	–	W4215	–	75 - 55	W4215R203	75 - 50	W4215R200	–	–
	80	2.30	3.29	W4302	2.00	80 - 75	W4302R215	80 - 70	W4302R212	80 - 65	W4302R209
	–	–	–	W4302	–	80 - 55	W4302R203	80 - 50	W4302R200		–
	85	2.44	3.37	W4085M	2.04	–	–	–	–	–	–
W8000	50	1.77	3.08	W8200	3.68	–	–	–	–	–	–
	55	1.89	3.15	W8203	3.68	–	–	–	–	–	–
	60	2.01	3.25	W8206	3.68	–	–	–	–	–	–
	65	0.09	3.38	W8209	3.68	65 - 50	W8209R200	–	–	–	–
	70	2.07	3.34	W8212	3.58	70 - 55	W8212R203	–	–	–	–
	75	2.28	3.35	W8215	3.58	75 - 60	W8215R206	75 - 55	W8215R203	–	–
	80	2.38	3.52	W8302	3.63	80 - 65	W8302R209	80 - 60	W8302R206	80 - 55	W8302R203
	–	–	–	–	–	80 - 50	W8302R200		–	–	–
	85	2.60	3.63	W8085M	3.72	85 - 70	W8085R070M	85 - 65	W8085R065M	85 - 60	W8085R060M
	–	–	–	–	–	85 - 55	W8085R055M	–	–	–	–
	90	2.91	4.05	W8090M	3.99	90 - 75	W8090R075M	–	–	–	–
	95	2.91	4.05	W8312	3.99	95 - 80	W8312R302	95 - 75	W8312R215	–	–
	100	3.13	4.33	W8315	4.22	–	–	–	–	–	–
	105	3.13	4.33	W8402	4.22	–	–	–	–	–	–
W15000	65	2.32	3.49	W15209	6.17	–	–	–	–	–	–
	70	2.32	3.49	W15212	6.17	–	–	–	–	–	–
	75	2.44	3.56	W15215	6.22	–	–	–	–	–	–
	80	2.54	3.66	W15302	6.26	80 - 65	W15302R209	–	–	–	–
	85	2.74	3.80	W15085M	6.40	85 - 70	W15085R070M	–		–	–
	90	2.95	4.01	W15090M	6.58	90 - 75	W15090R75M	–	–	–	–
	95	2.95	4.01	W15312	6.62	95 - 80	W15312R302	95 - 75	W15312R215	–	–
					–	–		–		–	
	100	3.17	4.06	W15315	6.72	–	–	–	–	–	–
	105	3.17	4.06	W15402	6.72	105 - 90	W15402R090M	–	–	–	–
	110	3.44	4.52	W15405	6.85	110 - 95	W15110R095M	–	–	–	–
	115	3.44	4.52	W15115M	6.85	115 - 100	W15115R100M	–	–	–	–

TSP Series

- **Pro Series Swivel featuring Tilt and Swivel technology**
- **360 degree X-axis and 160 degree Y-axis rotation**
- **10,000 psi / 700 bar maximum working pressure**
- **Increases tool fit in restricted access areas**
- **Simplifies hose placement**

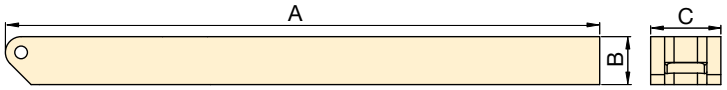


Wrench Model	Model Number	Dimensions (in)				Weight
		A	B	C	D	(lbs)
W2000, W4000	**TSP100**	2.52	1.06	.91	1.60	.41
W8000, W15000	**TSP200**	2.64	1.06	1.02	1.65	.43

To order a W-series wrench fitted with the TSP swivel, suffix the model number with "-P". e.g., W2000-P.

WTE Series

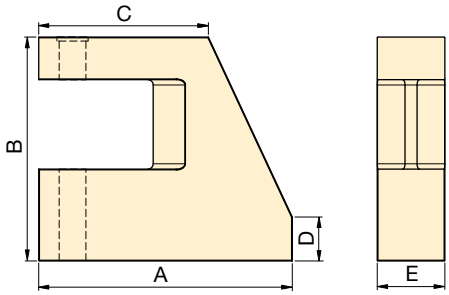
- **Extended reaction arm for W-series wrench**
- **Full torque rated**
- **Increases tool fit in restricted access areas**



Wrench Model	Model Number	Dimensions (in)			Weight
		A	B	C	(lbs)
W2000	**WTE20**	18.60	1.50	2.19	0.81
W4000	**WTE40**	20.73	2.00	2.58	1.83
W8000	**WTE80**	21.48	2.50	3.35	4.30
W15000	**WTE150**	24.26	3.00	4.00	8.69

WRP Series

- **Low profile reaction paddle**
- **Lightweight interchangeable design**
- **Provides greater flexibility in areas with restricted access**



Wrench Model	Model Number	Dimensions (in)					Weight
		A	B	C	D	E	(lbs)
W2000	**WRP20**	3.75	3.31	2.50	.64	1.00	.82
W4000	**WRP40**	5.15	4.29	3.31	1.10	1.25	1.83
W8000	**WRP80**	6.10	5.37	4.08	1.04	1.78	4.30
W15000	**WRP150**	7.34	6.50	5.93	1.25	2.00	8.69

Optimum Torque Wrench and Pump Combinations

For optimum speed and performance Enerpac recommends the following system set-up with wrench-pump-hose combinations.

		ELECTRIC PUMPS				AIR DRIVEN PUMPS		TWIN HOSES
		PMU-Series		ZU4-Series	ZE4/5-Series	PTA-Series	ZA4T-Series	THQ-Series THC-Series
								
				Page: 208	Page: 212	Page: 214	Page: 216	
10,000 psi Torque Wrenches Model No.		Flow at rated pressure: 20 in³/min 115V, 1 ph	Flow at rated pressure: 20 in³/min 230V, 1 ph	Flow at rated pressure: 60 in³/min 115V, 1 ph	Flow at rated pressure: 60-120 in³/min 115V, 230V, 380V, 3 ph	Flow at rated pressure: 20 in³/min	Flow at rated pressure: 60 in³/min	
 192	S1500 S3000	PMU-10427-Q	PMU-10422-Q	Any ZU4-Series pump may be used.	Any ZE-Series pump may be used.	PTA-1404-Q	Any ZA4T-Series pump may be used.	THQ-706T (19.5 ft) THQ-712T (39.0 ft)
	S6000 S11000 S25000	–	–			–		
 198	W2000 W4000	PMU-10427-Q	PMU-10422-Q			PTA-1404-Q		
	W8000 W15000	–	–			–		

ZU4-Series Electric Torque Wrench Pump

Utilizing a universal motor, the ZU4-Series has excellent low voltage characteristics. It works well with long extension cords or generator driven electrical power supplies. A field proven, efficient design ensures this pump is dependable and will draw less current—lowering your operating costs. The pumps are available in Pro and Classic formats. *ZU4 Pro* pumps have an LCD feature to display torque or pressure, selectable torque wrench, and self diagnostics – premium features not available on any other pump. *ZU4 Classic* pumps feature an analog gauge and a basic electrical package to deliver durable, safe and efficient hydraulic power.

ZE-Series Electric Torque Wrench Pump

The ZE-Series features premium options, such as the LCD to display torque or pressure values, and self diagnostics. These pumps utilize an induction motor, making the ZE-Series the coolest and quietest pumps in their class.

ZA-Series Air Torque Wrench Pump

Utilizing the highly efficient design of the *Z-Class* pumping element, this air driven pump is best suited to power medium to large size torque wrenches.

11,600 psi (800 bar) pumps are available for higher pressure wrenches. See pump product pages.

IMPORTANT!

Always make sure that the torque scale on the pump matches the torque wrench size for accurate torque settings.

Call Enerpac!

For other combinations, consult your Enerpac bolting expert or your authorized Enerpac distributor.

Portable Electric Torque Wrench Pumps

▼ Shown: **PMU-10427**

PMU Series

Reservoir Capacity:
0.5-1 gal.

Flow at 10,000 psi:
20 in³/min.

Motor Size:
0.5 hp

Maximum Operating Pressure:
10,000 and 11,600 psi

- **Powerful two-speed pump is lightweight and easy to carry**
- **Standard heat exchanger package keeps pump cool under extreme use**
- **Glycerin filled gauge with scales reading in psi and bar**
- **Transparent overlays in Ft.lbs and Nm for all Enerpac torque wrenches provide a quick torque reference**
- **Universal motor for a high power-to-weight ratio; generates full pressure on as little as 50% of the rated line voltage**
- **Adjustable pressure relief valve for accurate torque adjustments and precise repeatability**

Pump Ratings

-Q suffix pumps are for 10,000 psi torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with 11,600 psi rated torque wrenches, and include polarized lock-ring safety couplers.

Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000 psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

10,000 psi	
19.5 feet long, 2 hoses	**THQ-706T**
39 feet long, 2 hoses	**THQ-712T**
11,600 psi	
19.5 feet long, 2 hoses	**THC-7062**
39 feet long, 2 hoses	**THC-7122**

▼ PERFORMANCE CHART

For Use With Torque Wrenches		Maximum Pressure Rating (psi)		Oil Flow Rate (in³/min)		Model Number	Useable Oil Capacity (gal)	Electric Motor	Dimensions L x W x H (in)	Weight (lbs)
		1st stage	2nd stage	1st stage	2nd stage					
S1500 S3000	W2000 W4000	700	10,000	200	20	**PMU-10427-Q**	.50	115V- 1 ph -50/60Hz	17 x 11 x 15	53
		700	10,000	200	20	**PMU-10447-Q**	1.0	115V- 1 ph -50/60Hz	17 x 13 x 15	60
		700	10,000	200	20	**PMU-10422-Q**	.50	230V- 1 ph -50/60Hz	17 x 11 x 15	53
		700	10,000	200	20	**PMU-10442-Q**	1.0	230V- 1 ph -50/60Hz	17 x 13 x 15	60
SQD-25-I SQD-50-I	HXD-30 HXD-60	700	11,600	200	20	**PMU-10427**	.50	115V- 1 ph -50/60Hz	17 x 11 x 15	53
		700	11,600	200	20	**PMU-10447**	1.0	115V- 1 ph -50/60Hz	17 x 13 x 15	60
		700	11,600	200	20	**PMU-10422**	.50	230V- 1 ph -50/60Hz	17 x 11 x 15	53
		700	11,600	200	20	**PMU-10442**	1.0	230V- 1 ph -50/60Hz	17 x 13 x 15	60

▼ Shown: **ZU4204TB-Q and ZU4204BB-Q**

- **Features *Z-Class* high-efficiency pump design; higher oil flow and bypass pressure, cooler running and requires 18% less current draw than comparable pumps**
- **Powerful 1.7 hp universal electric motor provides high power-to-weight ratio and excellent low-voltage operating characteristics**
- **High-strength, molded composite shroud protects motor and electrical components, while providing an ergonomic, non-conductive handle for easy transport**
- **Low-voltage pendant provides additional safety for the operator**
- **Valve technology reduces oil operating temperatures and withstands contaminants to increase pump reliability**
- **LCD readout provides pressure and torque display and a number of diagnostic and readout capabilities never before offered on a portable electric pump**
- **Auto cycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed. (Pump can be used with or without auto cycle feature)**

Z Tough.
Dependable.
Innovative.
CLASS

New FIRMWARE, for Pro-Series

- Display torque in Ft.lbs. or Nm
- Display pressure in bar, MPa or psi
- Torque wrench model is selectable
- "Auto cycle" setting easily programmable

Classic Electrical

Basic electrical package includes mechanical contactor, ON/OFF toggle switch, pendant with electro-mechanical pushbuttons, 24V transformer timer and operator accessible circuit breaker.

Back-lit LCD, for Pro-Series

- Pump usage information, hour and cycle counts
- Low-voltage warning and recording
- Self-test and diagnostic capabilities
- Information can be displayed in English, French, German, Italian, Spanish and Portuguese
- Pressure transducer is more accurate and durable than analog gauges

▼ *Any brand of hydraulic torque wrench can be powered by the portable ZU4-Series torque wrench pump.*

Z-Class – A Pump For Every Application

Patented *Z-Class* pump technology provides high by-pass pressures for increased productivity—important in applications using long hose runs and high pressure-drop circuits, like heavy lifting or certain double-acting tools.

Enerpac ZU4 Hydraulic Pumps are built to power small to large torque wrenches. Choosing the right ZU4 torque wrench pump for your application is easy.

Classic Electric Torque Wrench Pump

- The Classic has an analog gauge and traditional electro-mechanical components (transformers, relays and switches) in place of solid-state electronics. The Classic delivers durable, safe and efficient hydraulic power.

Pro Series Electric Torque Wrench Pump

- Digital (LCD) display features a built-in hour meter, pressure and torque display, and shows self-diagnostic, cycle-count and low voltage warning information. These premium features are not available on any other pump—anywhere!

  AutoCycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed. (Pump can be used with or without AutoCycle feature).

ZU4 Series

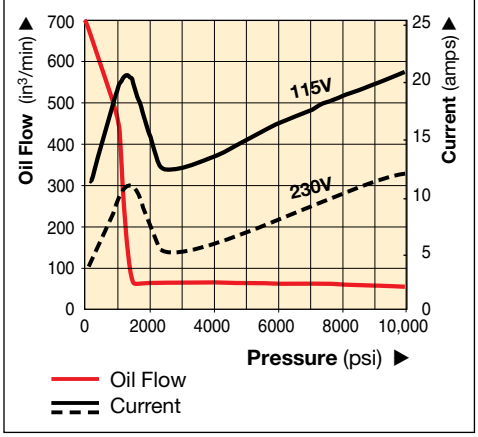
Reservoir Capacity:
1 and 1.75 gal.

Flow at 10,000 psi:
60 in³/min.

Motor Size:
1.7 hp

Maximum Operating Pressure:
10,000 and 11,600 psi

OIL FLOW AND CURRENT vs PRESSURE



Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench pump and hose selection matrix.

Page: 204

Pump Ratings

-Q suffix pumps are for 10,000 psi torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with 11,600 psi rated torque wrenches, and include polarized lock-ring safety couplers.

Gauge Overlay Kit

Gauge overlay kits are also available separately. **GT-4015-Q** includes overlays for all S- and W-Series torque wrenches.

▼ COMMON PUMP MODELS

	For Use With Torque Wrenches	Model Number 1) 4)	Motor Electrical Specification	Usable Oil Capacity (gal)	Weight with Oil (lbs)
Pro Series	All wrenches	**ZU4204TB-Q**	115 VAC, 1-ph	1.0	70
		ZU4208TB-Q	115 VAC, 1-ph	1.75	76
		ZU4204TE-Q 2)	208-240 VAC, 1-ph	1.0	70
		ZU4208TE-Q 2)	208-240 VAC, 1-ph	1.75	76
		ZU4204TI-Q 3)	208-240 VAC, 1-ph	1.0	70
		ZU4208TI-Q 3)	208-240 VAC, 1-ph	1.75	76
Classic	All wrenches	**ZU4204BB-QH**	115 VAC, 1-ph	1.0	82
		ZU4204BB-Q	115 VAC, 1-ph	1.0	73
		ZU4208BE-QH 2)	208-240 VAC, 1-ph	1.75	83
		ZU4204BE-Q 2)	208-240 VAC, 1-ph	1.0	74
		ZU4208BI-QH	208-240 VAC, 1-ph	1.75	88
		ZU4208BI-Q	208-240 VAC, 1-ph	1.75	79

1) All models meet CE safety requirements and all TÜV requirements
2) European plug and CE EMC directive compliant
3) With NEMA 6-15 plug
4) Select -E suffixed pumps for Enerpac SQD and HXD 11,600 psi torque wrenches

ZU4 Ordering Matrix and Specifications

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ This is how a ZU4 Series pump model number is built up:

Z	U	4	2	08	T	E	-	Q	H	M
1 Product Type	2 Motor Type	3 Flow Group	4 Valve Type	5 Reservoir Size	6 Valve Operation	7 Voltage		8 Must be E or Q	8 Options	8 Options

1 Product Type
- **Z** = Pump series

2 Motor Type
- **U** = Universal electric motor

3 Flow Group
- **4** = 60 in³/min @ 10,000 psi

4 Valve Type
- **2** = Torque wrench valve

5 Reservoir Size (useable capacity)
- **04** = 1.0 gallon
- **08** = 1.75 gallons

6 Valve Operation
- **T** = Solenoid valve with pendant, LCD Electric and pressure transducer.
- **B** = Solenoid valve with pendant, classic electrical

7 Voltage
- **B** = 115V, 1 ph, 50/60 Hz
- **E** = 208-240V, 1 ph, 50/60 Hz (with European plug CE RF compliant)
- **I** = 208-240V, 1 ph, 50/60 Hz (with NEMA 6-15 plug)

8 Factory installed features and options
- **E** = 11,600 coupler for use with HXD-, SQD-Series or other wrenches
- **Q** = 10,000 coupler for use with S- and W-Series or other wrenches
- **H** = Heat exchanger
- **K** = Skidbar
- **M** = 4-wrench manifold
- **R** = Roll cage

How to order your ZU4-Series torque wrench pump

Ordering Example 1

Model No. ZU4208TB-QMHK
10,000 psi pump for use with Enerpac S- and W-Series and other 10,000 psi torque wrenches, 115V motor, 1.75 gallon reservoir, 4-wrench manifold, heat exchanger and skidbar.

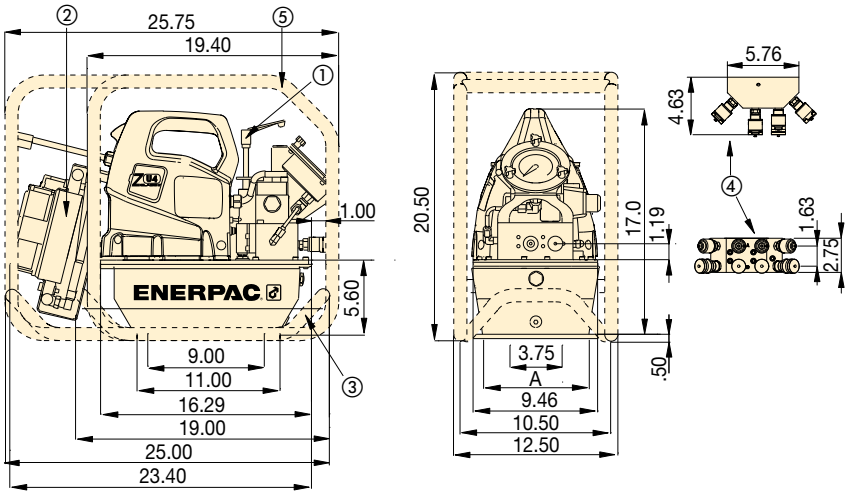
Refer to the torque wrench pump selection matrix for optimum wrench, pump and hose combinations.

Page: 204

Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000 psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

10,000 psi	
19.5 feet long, 2 hoses	**THQ-706T**
39 feet long, 2 hoses	**THQ-712T**
11,600 psi	
19.5 feet long, 2 hoses	**THC-7062**
39 feet long, 2 hoses	**THC-7122**



ZU4-Series Torque Wrench Pumps

Reservoir Size (useable gallons)	A (in)
1	6.0
1.75	8.1

Dimensions shown in inches
① User adjustable relief valve
② Heat exchanger (optional)
③ Skidbar (optional)
④ 4-wrench manifold (optional)
⑤ Roll cage (optional)

▼ Most hydraulic torque wrenches can be powered by the Enerpac ZU4-Series torque wrench pump.

ZU4 Performance

Motor Size (hp)	Output Flow Rate (in³/min) 100 psi	700 psi	5,000 psi	10,000 psi	*Motor Electrical Specification	Sound Level (dBA)	Relief Valve Adjustment Range (psi)
1.7	700	535	76	60	115 VAC, 1-ph 208-240 VAC, 1-ph	85-90	1,800-10,000**

* 50/60 HZ
** Pump type (-Q) shown, (-E) range is 1,800 - 11,600 psi.

ZU4 Torque Wrench Pump Options

Heat Exchanger

- **Removes heat from the bypass oil to provide cooler operation**
- **Stabilizes oil viscosity, increasing oil life and reduces wear of pump and other hydraulic components**

Accessory Kit No. *	Can be used with:
ZHE-U115	115V pumps
ZHE-U230	230V pumps

* Add suffix **H** to pump model number for factory installation.
Heat Exchanger adds 9.1 lbs. to pump weight.

Ordering Example:
Model No. ZU4208TE-H

Skidbar

- **Provides greater pump stability on soft or uneven surfaces**
- **Provides easy two-handed lift**

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
SBZ-4	1 and 2 gallon[1)]
SBZ-4L	1 and 2 gallon[2)]

* Add suffix **K** to pump model number for factory installation.

[1)] Without heat exchanger 4.9 lbs.
[2)] With heat exchanger 7.0 lbs.

Ordering Example:
Model No. ZU4208TB-QK

Roll Cage

- **Protects pump**
- **Provides greater pump stability**

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
ZRC-04	1 and 2 gallon reservoir[1)]
ZRC-04H	1 and 2 gallon reservoir[2)]

* Add suffix **R** for factory installation.
[1)] Without heat exchanger
[2)] With heat exchanger

Ordering Example:
Model No. ZU4208BB-QR

ZU4 Series

Reservoir Capacity:
1 and 1.75 gal.

Flow at 10,000 psi:
60 in³/min.

Motor Size:
1.7 hp

Maximum Operating Pressure:
10,000 and 11,600 psi

4-Wrench Manifold

- **For simultaneous operation of multiple torque wrenches**
- **Can be factory installed or ordered separately**

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
ZTM-E	for 11,600 psi torque wrenches
ZTM-Q	for 10,000 psi torque wrenches

* Add suffix **M** to pump model number for factory installation.

Ordering Example:
Model No. ZU4208TB-QM

▼ Shown: **ZE4204TB-QHR**

Z Tough. Dependable. Innovative. CLASS

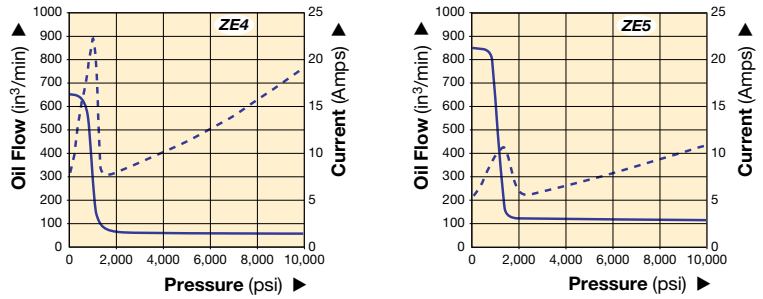
- **Features *Z-Class* high-efficiency pump design; higher oil flow and bypass pressure, cooler running and requires 18% less current draw than comparable pumps**
- **Totally enclosed, fan-cooled industrial electric motors supply extended life and stand up to harsh industrial environments**
- **Low-voltage pendant provides additional safety for the operator**
- **High-strength, molded electrical enclosure protects electronics, power supplies and LCD readout from harsh environments**
- **LCD readout provides pressure and torque display and a number of diagnostic and readout capabilities never before offered on a portable electric pump**
- **Auto cycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed (Pump can be used with or without auto cycle feature)**
- **Valve technology reduces oil operating temperatures and withstands contaminants to increase pump reliability**

New FIRMWARE 7.0
- Display torque in Ft.lb. or Nm
- Display pressure in bar, MPa or psi
- Torque wrench model is selectable
- "Auto cycle" setting easily programmable

Back-lit LCD
- Pump usage information, hour and cycle counts
- Low-voltage warning and recording
- Self-test and diagnostic capabilities
- Information can be displayed in English, French, German, Italian, Spanish and Portuguese
- Pressure transducer is more accurate and durable than analog gauges

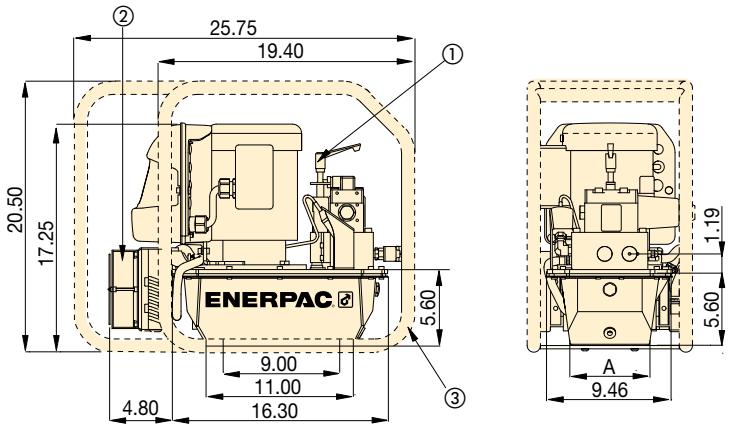
▼ *The ZE4 torque wrench pumps are perfectly matched for this W2000 wrench.*

ZE4 and ZE5 Oil Flow and Current vs. Pressure



— Oil Flow
- - ZE4 Current draw at 115V/1ph

— Oil Flow
- - ZE5 Current draw at 208V/3ph



Reservoir Size (useable gallons)	A (in)
1	6.0
1.75	8.1

Dimensions shown in inches.
① User adjustable relief valve
② Heat Exchanger (optional)
③ Roll cage (optional)

▼ COMMON PUMP MODELS

Max. Operating Pressure (psi)	Model Number	Motor Electrical Specification	Usable Oil Capacity (gal)	Weight with Oil (lbs)
10,000	ZE4204TB-QHR	115V 1 phase	1	129
10,000	ZE4204TE-QHR	230V 1 phase	1	129
10,000	ZE4204TG-QHR	230V 3 phase	1	131
10,000	ZE5204TW-QHR	400V 3 phase	1	131
11,600	ZE4204TB-EHR	115V 1 phase	1	129
11,600	ZE4204TE-EHR	230V 1 phase	1	129
11,600	ZE4204TG-EHR	230V 3 phase	1	132
11,600	ZE5204TW-EHR	400V 3 phase	1	132

▼ PERFORMANCE CHART

Pump Series	Output Flow Rate (in³/min)				Motor Size		Relief Valve Adjustment Range	Sound Level
	100 psi	700 psi	5,000 psi	10,000 psi	hp	RPM	(psi)	(dBA)
ZE4	650	600	62	60	1.5	1750	1000 - 11,600	75
ZE5	850	825	123	120	3.0	1750	1000 - 11,600	75

Flow rate will be approximately 5/6 of these values at 50 Hz.

ZE Series

Reservoir Capacity:
1.0-10 gal.

Flow at 10,000 psi:
60-120 in³/min.

Motor Size:
1.5-3.0 hp

Maximum Operating Pressure:
10,000 and 11,600 psi

All *Z-Class* electric pumps are TÜV and CE compliant.

Accessory Options
A full list of optional accessories can be found in the ZU4 section.

Page: 209

▼ Shown: **PTA-1404**

Two-Stage Power in a Portable Design

- **Compact and portable**
- **Handle located directly over pump's center of gravity for greater ease in carrying**
- **High bypass (1800 psi) for faster torque cycles**
- **High power-to-weight ratio suits all Enerpac torque wrenches**
- **Glycerine filled pressure gauge with scales reading in psi/bar**
- **Transparent overlays in Ft.lbs and Nm for all Enerpac torque wrenches provide a quick torque reference**
- **Internal safety relief valve, factory preset**
- **15 ft. air pendant assembly enables easy maneuvering at the job site**

Pump Ratings

-Q suffix pumps are for 10,000 psi torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with 11,600 psi rated torque wrenches, and include polarized lock-ring safety couplers.

Twin Torque Wrench Hoses

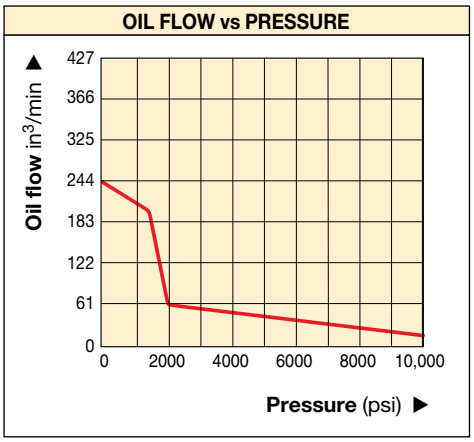
Use Enerpac THQ-700 series twin hoses with 10,000 psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

10,000 psi	
19.5 feet long, 2 hoses	**THQ-706T**
39 feet long, 2 hoses	**THQ-712T**
11,600 psi	
19.5 feet long, 2 hoses	**THC-7062**
39 feet long, 2 hoses	**THC-7122**

Gauge Overlay Kit

Gauge overlay kits are also available separately. **GT-4015-Q** includes overlays for all S- and W-Series torque wrenches.

Compact Pneumatic Torque Wrench Pump



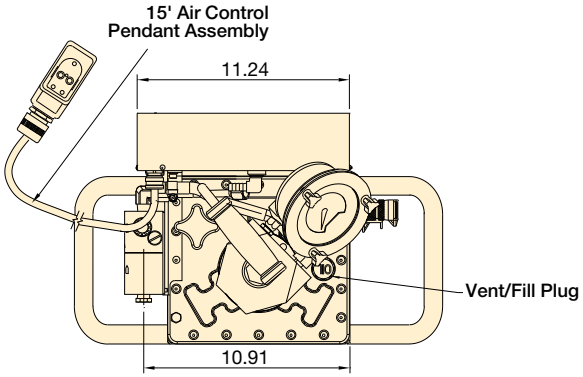
PTA Series

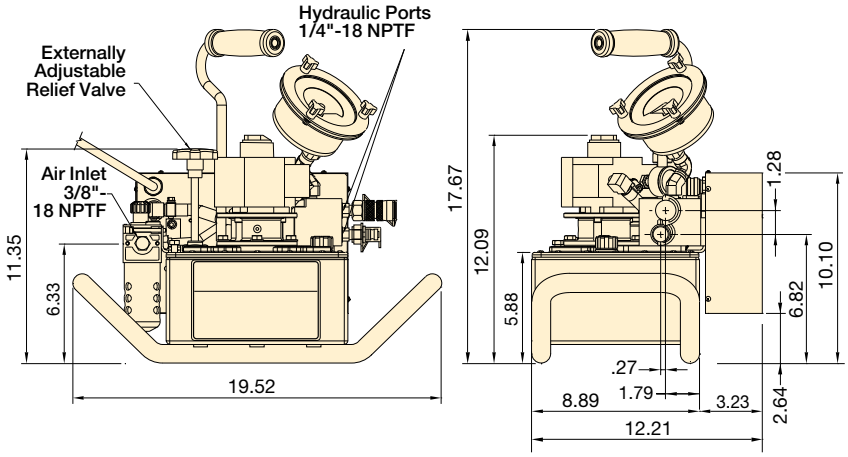
Reservoir Capacity:
1 gal.

Flow at 10,000 psi:
20 in³/min.

Maximum Operating Pressure:
10,000 and 11,600 psi

Dimensions shown in inches.





Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench pump and hose selection matrix.

Page: **204**

▼ **PERFORMANCE CHART**

For Use With Torque Wrenches		Pressure Rating (psi)	Model Number	Reservoir Capacity (gal)	Useable Oil Capacity (gal)	Pump Flow Rates (in³) 1st stage	Pump Flow Rates (in³) 2ND stage	Air Consumption @ 100 psi (scfm)	Air Pressure Range (psi)	Weight with Oil (lbs)
S1500 S3000	W2000 W4000	10,000	**PTA-1404-Q**	1.0	0.5	240	20	40	49-101	54
SQD-25-I SQD-50-I	HXD-30 HXD-60	11,600	**PTA-1404**	1.0	0.5	240	20	40	49-101	54

▼ Shown: **ZA4204TX-Q**

Z Tough. Dependable. Innovative. CLASS

- **Features *Z-Class* high-efficiency pump design; higher oil flow and bypass pressure**
- **Two-speed operation and high by-pass pressure reduces cycle time for improved productivity**
- **Heat exchanger warms exhaust air to prevent freezing and cools the oil**
- **Ergonomic pendant allows remote operation up to 20 feet**
- **Glycerin filled pressure gauge with transparent overlays in Ft.lbs and Nm for Enerpac torque wrenches provide a quick torque reference**
- **Regulator-Filter-Lubricator with removeable bowls and auto drain is standard**
- **Valve technology reduces oil operating temperatures and withstands contaminants to increase pump reliability**

Pump Ratings

-Q suffix pumps are for 10,000 psi torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with 11,600 psi rated torque wrenches, and include polarized lock-ring safety couplers.

Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000 psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

10,000 psi	
19.5 feet long, 2 hoses	**THQ-706T**
39 feet long, 2 hoses	**THQ-712T**
11,600 psi	
19.5 feet long, 2 hoses	**THC-7062**
39 feet long, 2 hoses	**THC-7122**

◀ *Most hydraulic torque wrenches can be powered by the Enerpac ZA4T-Series torque wrench pump.*

ZA4T-Series Pump Applications

The ZA4T-Series pump is best suited to power medium to large size torque wrenches.

Patent-pending *Z-Class* technology provides high by-pass pressures for increased productivity. Its high power-to- weight ratio and compact design make it ideal for applications which require easy transport of the pump.

For further application assistance contact your local Enerpac office.

ZA4T Series

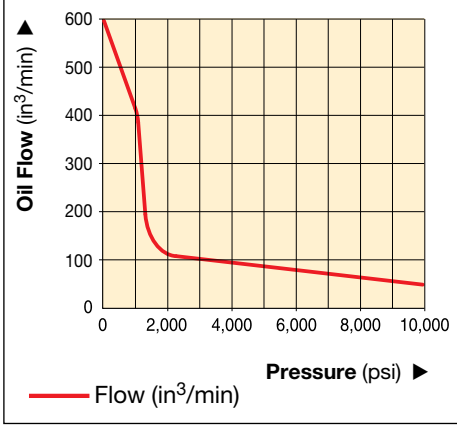
Reservoir Capacity:
1 and 1.75 gal.

Flow at 10,000 psi:
60 in³/min.

Maximum Operating Pressure:
10,000 and 11,600 psi

OIL FLOW vs PRESSURE

100 psi dynamic air pressure at 70 scfm



ATEX Certified

The ZA-series pumps are tested and certified according to the Equipment Directive 94 / 9 / EC "ATEX Directive". The explosion protection is for equipment group II, equipment category 2 (hazardous area zone 1), in gas and/or dust atmospheres. The ZA-series pumps are marked with: Ex II 2 GD ck T4.

Ex II 2 GD ck T4
KEMA 0602

CE

Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench, pump and hose selection matrix.

Page: 204

Accessory Options

Available by placing the following additional suffix at the end of the model number:

K = Skidbar
M = 4-wrench manifold
R = Roll cage

Page: 216

▼ COMMON PUMP MODELS

For Use With Torque Wrenches		Maximum Operating Pressure (psi)	Model Number 1)	Usable Oil Capacity (gal)	Weight with Oil (lbs)
S1500 S3000 S6000 S11000 S25000	W2000 W4000 W8000 W15000	**10,000**	**ZA4204TX-Q**	1.0	94
		10,000	**ZA4208TX-Q**	1.75	100
		10,000	**ZA4204TX-QR**	1.0	101
SQD-75-I SQD-100-I SQD-160-I SQD-270-I	HXD-120 HXD-240	**11,600**	**ZA4204TX-E**	1.0	94
		11,600	**ZA4208TX-E**	1.75	100
		11,600	**ZA4204TX-ER**	1.0	101

1) All models meet CE safety requirements and all TÜV requirements.

ZA4T Ordering Matrix and Specifications

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ This is how a ZA4T-Series pump model number is built up:

Z	A	4	2	08	T	X	-	Q	M	R
1 Product Type	2 Motor Type	3 Flow Group	4 Valve Type	5 Reservoir Size	6 Valve Operation	7 Voltage		8 Must be E or Q	8 Options	8 Options

1 Product Type
Z = Pump Series

2 Motor Type
A = Air motor

3 Flow Group
4 = 60 in³/min @ 10,000 psi

4 Valve Type
2 = Torque Wrench Valve

5 Reservoir Size (useable capacity)
04 = 1.0 gallon
08 = 1.75 gallons

6 Valve Operation
T = Air operated valve with pendant

7 Voltage
X = Not applicable

8 Factory installed features and options
E = 11,600 psi coupler for use with HXD- and SQD-Series wrenches
Q = 10,000 psi coupler for use with S- and W-Series or other wrenches
K = Skidbar
M = 4-wrench manifold
R = Roll cage

How to order your ZA4T-Series torque wrench pump

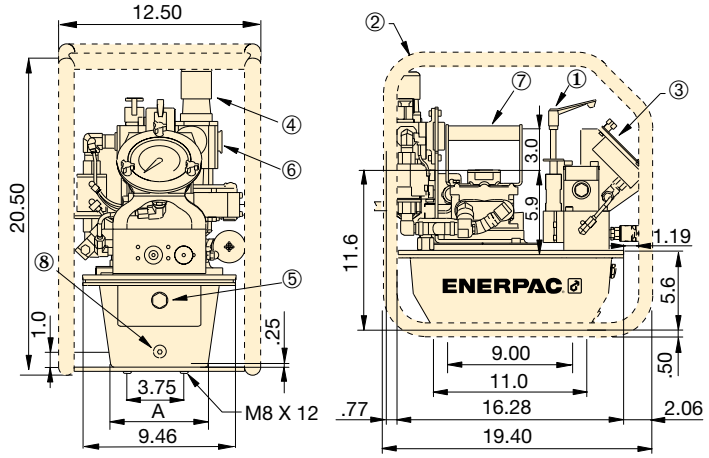
Ordering Example 1

Model No. ZA4208TX-QMR

10,000 psi pump for use with Enerpac S- and W-Series and other 10,000 psi torque wrenches, 1.75 gallon reservoir, 4-wrench manifold, and roll cage.

Refer to the torque wrench pump selection matrix for optimum wrench, pump and hose combinations.

Dimensions shown in inches.



① User adjustable relief valve
② Roll bar cage (optional)
③ Gauge with overlays
④ Filter/lubricator/regulator
⑤ Oil level sight gauge
⑥ Air input 1/2" NPTF
⑦ Standard handle
⑧ Oil drain

ZA4T-Series Torque Wrench Pumps

Reservoir Size (useable gallons)	A (in)
1	6.0
1.75	8.1

ZA4T Performance								
Output Flow Rate (in³/min)					Dynamic Air Pressure Range	Air Consumption	Sound Level at 100 psi Dynamic	Relief Valve Adjustment Range
100 psi	700 psi	5,000 psi	10,000 psi	11,600 psi	(psi)	(scfm)	(dBA)	(psi)
600	500	80	60	55	60-100	20-100	80-95	1,400-10,000*

* Pump type (-Q) shown.

ZA4T Torque Wrench Pump Options

Skidbar

- **Provides greater pump stability on soft or uneven surfaces**
- **Provides two-handed lift**

Accessory Kit No. *	Can be used on ZA4T-Series torque wrench pumps
SBZ-4	1 and 2 gallon reservoir

* Add suffix **K** for factory installation. Skidbar weight 4.9 lbs.

Ordering Example:
Model No. ZA4208TX-QK

4-Wrench Manifold

- **For simultaneous operation of multiple torque wrenches**
- **Can be factory installed or ordered separately**

Accessory Kit No. *	Can be used on ZA4T-Series torque wrench pumps
ZTM-E	for 11,600 psi torque wrenches
ZTM-Q	for 10,000 psi torque wrenches

* Add suffix **M** for factory installation.

Ordering Example:
Model No. ZA4208TX-QM

ZA4T Series

Reservoir Capacity:
1 and 1.75 gal.

Flow at 10,000 psi:
60 in³/min.

Maximum Operating Pressure:
10,000 and 11,600 psi

Gauge Overlay Kit

Gauge overlay kits are also available separately. **GT-4015** includes overlays for all SQD and HXD torque wrenches. **GT-4015-Q** includes overlays for all S- and W-Series torque wrenches.

Roll Cage

- **Protects pump**
- **Provides greater pump stability**

Accessory Kit No. *	Can be used on ZA4T-Series torque wrench pumps
ZRC-04	1 and 2 gallon reservoir

* Add suffix **R** for factory installation. Roll bar cage weight 7.5 lbs.

Ordering Example:
Model No. ZA4208TX-QR

Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000 psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

10,000 psi	
19.5 feet long, 2 hoses	**THQ-706T**
39 feet long, 2 hoses	**THQ-712T**
11,600 psi	
19.5 feet long, 2 hoses	**THC-7062**
39 feet long, 2 hoses	**THC-7122**

▼ From left to right: **ATM-3, ATM-1, ATM-5**

ATM Series

Bolt Hole Range:
11/16-2 1/8 inches

Flange Wall Thickness:
11/16-8 inches

Maximum Force:
0.3-5.5 tons

Adjustable Reach-on ATM-3

The highly adjustable reach of the wing, the reversible lift hook and manual torque wrench **TW-22** (3/8" drive) allow precise alignment.

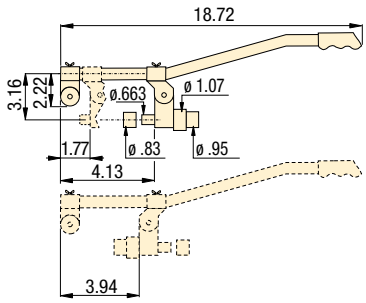
ATM-5 Including Hydraulics

Including 10,000 psi hydraulics: RC-53 single-acting cylinder, P-142 two-speed hand pump and 6 ft. long safety hose (HC-7206C).

- **Rectifies twist and rotational misalignment without additional stress in pipe lines**
- **For most commonly used ANSI, API, BS and DIN flanges**
- **No slings, hooks, or lifting gear. Extremely safe, high precision**
- **ATM-1 supplied with three bushings for different bolt hole sizes. Can be used in reversed position.**
- **ATM-3 fits when flange joint is:**
  - **– between 1.18 - 5.23 inches apart and**
  - **– bolt hole size 0.95 inches or greater**
- **ATM-5 fits when flange joint is:**
  - **– between 3.75 - 9 inches apart and**
  - **– bolt hole size 1.25 inches or greater**
- **Can be installed and used in any position and any location**
- **Stays stable in position under full load**

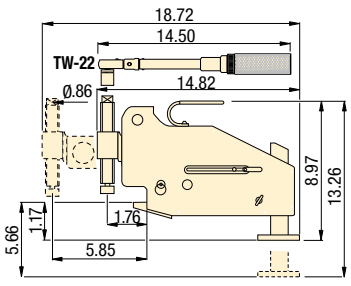
All dimensions shown in inches.

ATM-1

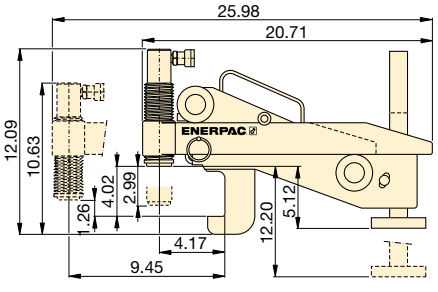


▼ *The Enerpac ATM-3 used to align a large ANSI flange.*

ATM-3



ATM-5



Maximum Lifting Force (ton)	Model Number	Bolt Hole Range (in)	Bolt Hole Range (mm)	Flange Wall Thickness (in)	Flange Wall Thickness (mm)	Weight (lbs)
0.3	**ATM-1**	11/16 - 1 1/8	17 - 27,2	11/16 - 2	17 - 50	4.4
3.3	**ATM-3**	1 - 2 1/8	25 - 54	1 3/16 - 4 1/2	30 - 115	21.4
5.5	**ATM-5 ***	≥ 1 1/4	≥ 31,5	3 1/8 - 8	80 - 203	35.7

* At 10,000 psi maximum operating pressure.
ATM-5 weight including hydraulic cylinder. Total set weight 62 lbs.

Hydraulic and Mechanical Industrial Spreaders

▼ Shown: **FSH-14 and FSM-8 with safety blocks SB1**

FSM/FSH Series

Tip Clearance / Maximum Spread*:
0.24/3.16 inches

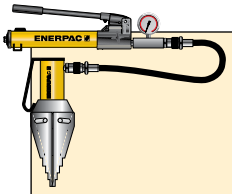
Maximum Spread Force:
8-14 tons

Maximum Operating Pressure:
10,000 psi (FSH-14)

- **Integrated wedge concept: friction-free, smooth, parallel wedge movement eliminates flange damage and spreading arm failure**
- **Unique interlocking wedge design: no first step bending and risk of slipping out of joint**
- **Requires very small access gap of only .24 in. (6 mm)**
- **Stepped spreader arm design: each step can spread under full load**
- **Few moving parts means durability and low maintenance**
- **Safety block SB-1 and ratchet spanner SW-22 included with FSM-8**
- **Safety block and Enerpac RC-102 cylinder included with FSH-14**

Stepped Blocks FSB-1

Use this pair of stepped blocks to increase wedge opening up to 3.16 in. (81 mm). Fits both FSH-14 and FSM-8.

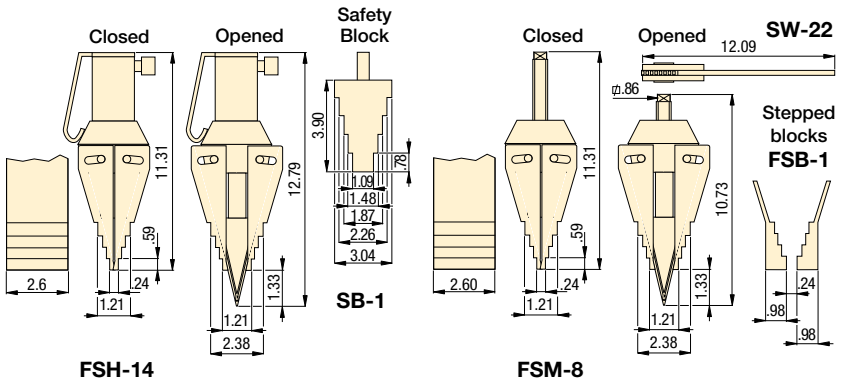


Flange Spreader Sets

Hydraulic FSH-14 is available as a set (pump, tool, gauge, adaptor and hose).

Set Model Number	Set Includes:	
STF-14H	FSH-14	GA-2
	P-392	GP-10S
	HC-7206	–

▼ *Two FSH-14 spreaders used simultaneously with Enerpac handpump, hoses and AM-21 split-flow manifold.*



Max. Spreading Force (ton)	Model Number	Tip Clearance (in)	Max. Spread* (in)	Type	Oil Capacity (in^3)	Weight (lbs)
8	FSM-8	.24	3.16	Mechanical	-	14.3
14	FSH-14	.24	3.16	Hydraulic	4.76	15.7

* Using stepped blocks FSB-1.

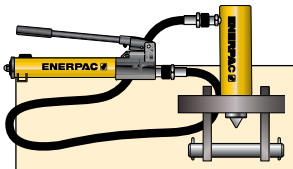
▼ Shown: **FS-56**

FS Series

Capacity:
5-10 tons

Maximum Operating Pressure:
10,000 psi

- **Lightweight, ergonomic design for ease of use**
- **Adjustable jaw widths from 2.75" to 8.50" for a wide range of applications**
- **Single-acting, spring return RC Series cylinders for fast trouble-free operation**



Flange Spreader Sets

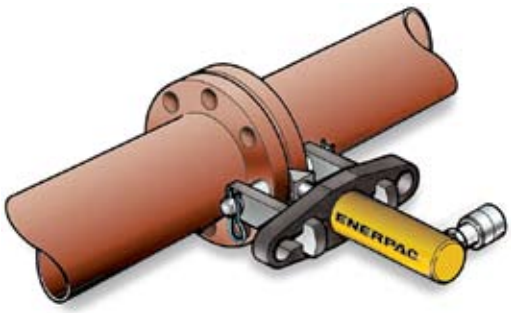
Both Hydraulic Flange Spreaders are available as sets (includes pump, tool, gauge, adaptor and hose).

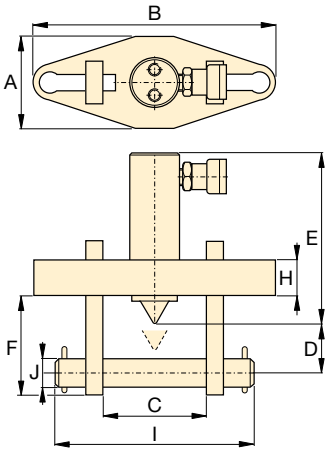
Set Model Number	Spreader Model Number	Pump Model Number
STF-56H	FS-56	P-142
STF-109H	FS-109	P-392
STF-109A	FS-109	PATG-1102N

Wedge Spreaders

Friction-free, smooth and parallel wedge movement with unique interlock wedge design. Eliminates flange damage and risk of spreading arm failure.

Page: **219**





Flange Spreader Matching Chart

ASA Rating (psi)	Pipe Size (in)	
	FS-56	**FS-109**
150	5-20	22-42
300	2.50-14	16-28
400	2.50-12	14-24
500	2.50-10	12-20
900	.50-6	8-16
1500	.50-3.50	4-8
2500	.50-2.50	3-4

Maximum Flange Thickness (in)	Stud Size (in)	Standard Wedge (in)	Cap. (ton)	Stroke (in)	Oil Cap. (in^3)	Model Number	Dimensions (in)										Weight (lbs)
									C								
							A	B	Min.	Max.	D	E	F	H	I	J	
2 x 2.25	.75-1.13	.13-1.13	5	1.50	1.50	**FS-56**	3.00	8.25	2.75	6.10	1.28	7.71	3.45	1.00	8.10	.75	26
2 x 3.63	1.25-1.63	.13-1.13	10	2.13	4.80	**FS-109**	4.25	11.00	4.10	8.50	1.98	6.00	4.50	1.50	10.75	1.25	40

Hydraulic Nut Cutters

▼ Shown from left to right: **NC-3241, NC-1319, NC-1924**

NC Series

Capacity:
5-90 tons

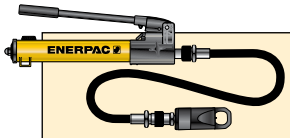
Hexagon Nut Range:
0.5-2.88 inches

Maximum Operating Pressure:
10,000 psi

- **Compact and ergonomic design, easy to use**
- **Unique angled head allows flush access**
- **Single-acting, spring return cylinder**
- **Heavy-duty chisels can be reground**
- **Applications include servicing trucks, piping industry, tank cleaning, petrochemical, steel construction and mining**

Enerpac Nut Cutters

Nut Cutters include a spare chisel, a spare set screw and the wrench used to secure the chisel. A CR-400 coupler is standard.

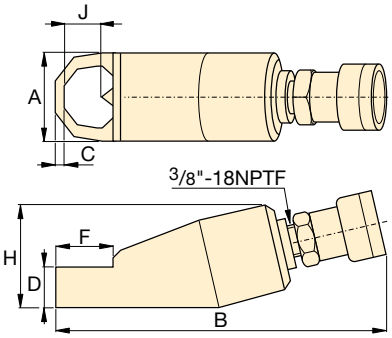


Nut Cutter Sets

Hydraulic Nut Cutters are available as sets (pump, tool, gauge, adaptor and hose).

Set Model Number	Splitter Model Number	Pump Model Number
STN-1924H	NC-1924	P-392
STN-2432H	NC-2432	P-392
STN-3241H	NC-3241	P-392

◀ *Easily removing rusty nuts during railroad construction is just one of many application examples for the Enerpac Nut Cutters.*



Hexagon Nut Range (in)	Bolt Range (in)	Capacity (ton)	Oil Capacity (in^3)	Model Number	Dimensions (in)							Weight (lbs)	Replacement Chisel Model Number
					A	B	C	D	F	H	J		
.50-.75	.31-.50	5	.92	**NC-1319**	1.57	7.87	.24	.75	1.10	1.89	.83	1.8	**NCB-1319**
.75-.94	.50-.63	10	1.22	**NC-1924**	2.17	8.94	.32	.98	1.50	2.80	1.00	4.4	**NCB-1924**
.94-1.13	.63-.88	15	3.66	**NC-2432**	2.60	10.24	.39	1.22	1.93	2.99	1.30	6.6	**NCB-2432**
1.13-1.56	.88-1.13	20	4.88	**NC-3241**	2.95	11.26	.59	1.38	2.60	3.50	1.69	9.7	**NCB-3241**
1.56-2.00	1.13-1.38	35	9.46	**NC-4150**	3.78	12.80	.83	1.77	2.87	4.29	2.13	18.0	**NCB-4150**
2.00-2.25	1.38-1.50	50	14.64	**NC-5060**	4.17	14.41	1.06	2.13	3.63	4.96	2.38	26.0	**NCB-5060**
2.38-2.88	1.50-1.88	90	30.00	**NC-6075**	6.14	14.43	1.06	2.95	4.33	7.09	3.07	75.1	**NCB-6075**

Ordering Notes: Maximum allowable hardness to split is HRc-44. Not to be used on square nuts.
Larger sizes available upon request.

▼ Shown: **NS Hydraulic Nut Splitters**

Power and Precision

High Performance Nut Splitter

- **Specially designed to suit standard ANSI B16.5 / BS1560 flanges**
- **Single-acting, spring return cylinder**
- **Tri-blade technology provides three cutting surfaces on a single blade**
- **Interchangeable heads provide maximum nut range flexibility**
- **Preset scale allows controlled blade extension, which avoids damage to bolt threads**
- **Grip tape and handle included for more secure maneuverability**
- **Nickel-plated cylinder body for excellent corrosion protection and improved durability in harsh environments**
- **Internal Pressure Relief Valve for overload protection**

Hydraulic Nut Cutters

The NC-Series models are available featuring an angle-head design for 0.50"-2.88" hexagon nuts.

Page: 221

FS-Series Spreaders

FS-Series Flange Spreaders provide quick and easy joint separation using hydraulic or mechanical force.

Page: 220

ATM Flange Alignment Tools

The ATM series provides safe high-precision flange alignment tools that fit most commonly used ANSI, API, BS, and DIN flanges.

Page: 218

◀ *Heavily corroded and weathered nuts are quickly split and removed using an NS-Series Nutsplitter.*

Nut Splitter Sets

To provide maximum flexibility, NS-Series Nut Splitters can also be ordered in sets (NS-xxxSy). Select Nut Splitter size and pump style from the chart below.

To order additional Cutting Heads (NSH-xxxxxx), Cylinders (NSC-xxx) or Replacement Blades (NSB-xxx), see Selection Chart below.

SET SELECTION:

1. **Select your Nut Splitter**
2. **Select your pump type**

NS Series

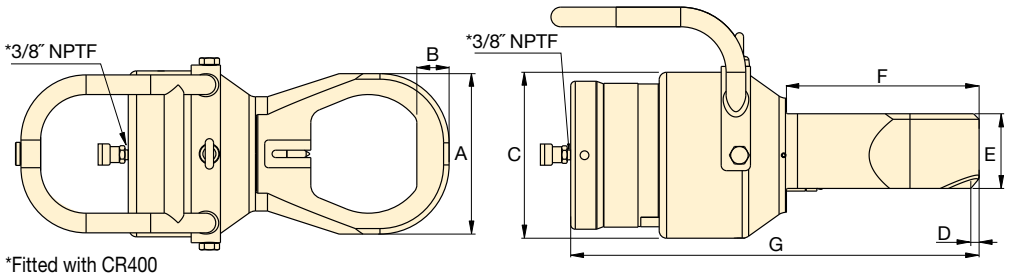
Capacity:
103.2-192.5 tons

Hexagon Nut Range:
2.75-5.38 inches

Maximum Operating Pressure:
10,000 psi

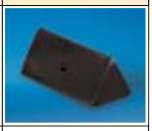
Available Set Model Number	1 Nut Splitter Model Number	2 Pump Options			Accessories Included			
		Hand Pump Model No.	Air Pump Model No.	Electric Pump Model No.	Gauge Block Model No.	Gauge Model No.	Hose Model No.	Storage Case Model No.
								
NS-70105SH	NS-70105	P392	–	–	GA-2	GP-10S	HC-7206	CM-4
NS-70105SA	NS-70105	–	XA-11G	–	–	integrated*	HC-7206	CM-4
NS-70105SE	NS-70105	–	–	PUD-1100B	GA-2	GP-10S	HC-7206	CM-7
NS-110130SH	NS-110130	P802	–	–	GA-2	GP-10S	HC-7206	CM-4
NS-110130SA	NS-110130	–	XA-11G	–	–	integrated*	HC-7206	CM-4
NS-110130SE	NS-110130	–	–	PUD-1100B	GA-2	GP-10S	HC-7206	CM-7

*XA-IIG air pump features an integrated pressure gauge.



*Fitted with CR400

▼ SELECTION CHART

Hexagon Nut Range** (in)	Bolt Range (in)	Cap. (ton)	Oil Cap. (in^3)	Model Number*	Dimensions (in) A	B	C	D	E	F	G	Weight (lbs)	NS Cylinder	NS Cutting Head	Replacement Blade
															
2.75-3.13	**1.75-2.00**	103.2	23.0	**NS-7080**	5.2	1.1	7.1	0.3	3.2	7.3	16.2	81.4	NSC-70	NSH-7080	NSB-70
2.75-3.50	**1.75-2.25**	103.2	23.0	**NS-7085**	5.7	1.2	7.1	0.3	3.2	7.7	16.6	82.7	NSC-70	NSH-7085	NSB-70
2.75-3.88	**1.75-2.50**	103.2	23.0	**NS-7095**	6.3	1.3	7.1	0.3	3.2	7.9	17	84.9	NSC-70	NSH-7095	NSB-70
2.75-4.25	**1.75-2.75**	103.2	23.0	**NS-70105**	6.9	1.4	7.1	0.4	3.2	8.2	17.5	87.1	NSC-70	NSH-70105	NSB-70
4.25-4.63	**2.75-3.00**	192.5	50.0	**NS-110115**	7.4	1.4	9.2	0.1	4.4	9.2	18.6	151.6	NSC-110	NSH-110115	NSB-110
4.25-5.38	**2.75-3.50**	192.5	50.0	**NS-110130**	8.6	1.6	9.2	0.1	4.4	9.5	19.4	158.3	NSC-110	NSH-110130	NSB-110

* NS-Series Nut Splitters ship in two cases: One containing the NSC Cylinder and one containing the NSH Cutting Head. Assembly required.
** Maximum allowable hardness to split is HRc-44.

Enerpac Integrated Solutions

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

With more than 50 years supporting industrial markets, Enerpac has gained the unique and in-depth expertise that is respected by industrial professionals around the world. Across every continent, Enerpac's network of application engineers, authorized distributors and technical service centers can reach any location, and deliver innovative solutions, technical assistance and quality products.

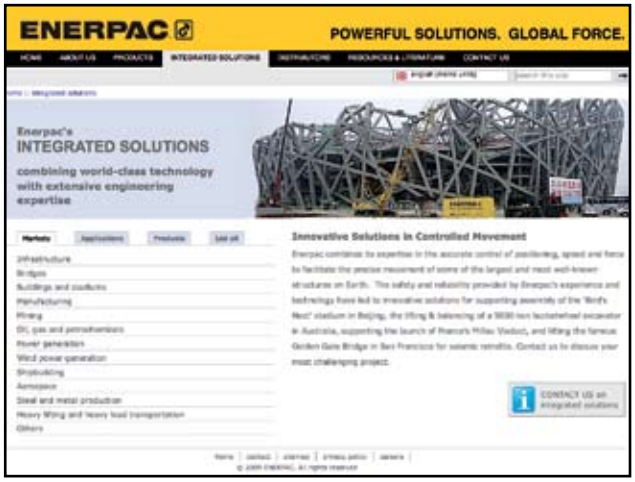
Enerpac's complete line of standard and customized products and a unique systems approach offers the benefits of safety and efficiency to applications where high forces are required. Whether constructing a signature bridge across a deep valley, lifting a national landmark for seismic retrofit or simultaneously testing hundreds of foundation pilings to support a new building, Enerpac will supply the high-force solutions to get the job done.

Integrated Solutions Section Overview

Capacity (tons)	Capabilities	Series	Page
N/A	Synchronous Lift Systems	SLCG8 ESS	 226 ▶
42-1109	Strand Jacking Systems	TT	 230 ▶
50-200	Stage Lifting Systems	BLS	 234 ▶
70-125	Synchronous Hoist Systems	SHS	 236 ▶
.025-250	Uni-Lift® Actuators	M, B	 238 ▶

Contact Enerpac!

Contact the Enerpac office nearest to you for advice and technical assistance in the layout of your ideal Lift System or visit us on the web: www.enerpac.com.
You can also ask Enerpac for assistance by e-mail at **integratedsolutions@enerpac.com**.



▼ Shown: **SLCG-8, control valves, sensors and cylinders**

The Economical Solution for Up to 8 Point Synchronous Lifting

- **Control up to 8 lifting points**
- **Stroke controlled movement for precise positioning**
- **Accuracy of 0.040" between leading and lagging cylinders**
- **Uses latest Programmable Logic Control (PLC) technology**
- **User friendly color touch screen**
- **Stroke alarms for optimal safety**
- **For use with standard single- or double-acting cylinders**
- **Uses standard 10,000 psi Enerpac pumps with electric directional control valve**

Heavy Lifting Cylinders

For a complete line of Enerpac cylinders, see the Cylinder Section of this catalog.

Page: 5

Accessory Valves

Controls for pressure and flow for optimum accuracy and safety.

Page: 132

Extension Cables (optional)

Used to extend cable lengths for valves and sensors.

Pump Selection

The pump selection charts in the “Yellow Pages” section of the latest Industrial Tools Catalog will help you to determine the optimum hydraulic power source for your application.

Page: 242

◀ *Enerpac’s PLC based Synchronous Lift Systems provide a solution for precise control of multiple lift points, for safe and efficient load movement.*

Basic 2 to 8 Point Lift System

Synchronous Lifting Applications

The Synchronous Lift system uses feedback from multiple sensors to control the lifting, lowering and positioning of any large, heavy or complex structure, regardless of weight distribution. Synchronous lifting reduces the risk of bending, twisting or tilting, due to uneven weight distribution or load-shifts between the lift points.

A PLC controller monitors each lift position stroke and optional load transducers located at each lift point. By varying the oil flow to each lift point, the system maintains very accurate positional control. This control maintains structural integrity and can increase the productivity and safety of the lift, by eliminating manual intervention in the event of a load-shift or other problem.

Programmable, failsafe monitoring and safety alarms include operating parameters and hydraulic conditions, such as oil-level and over-temperature. Programmable data recording and "differential-lift" options allow a load to be manipulated into a pre-set position.

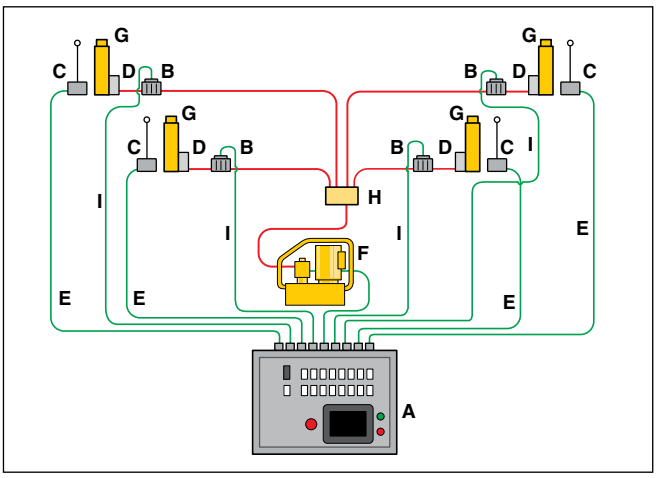
SLCG-8 Series

Number of Lift Points:
2 to 8

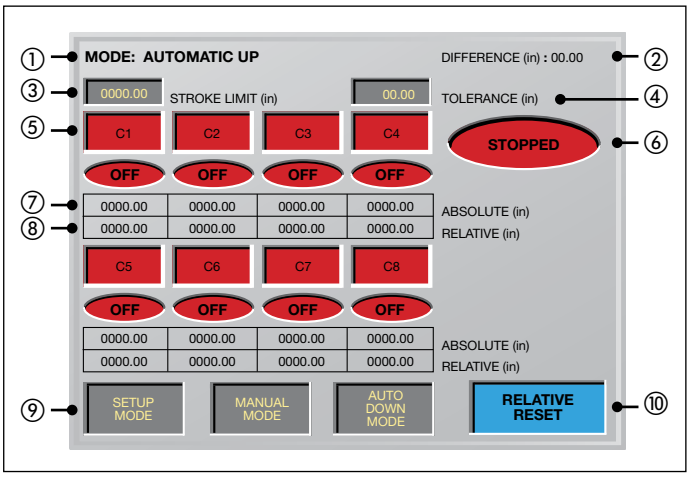
Maximum System Operating Pressure:
10,000 psi

Accuracy Over Full Stroke:
Up to 0.040 inch

Digital Controlled Synchronous Components – typical 4-point layout for single-acting cylinders



Touch screen display for SLCG-8 Synchronous Lift Controller



System Components

- Controller
- Cylinder Control Valve
- Stroke Sensor
- Velocity Fuse/Check Valve
- Sensor Cable
- Hydraulic Pump
- Hydraulic Cylinder
- Manifold Block
- Control Valve Cable

① Current Lifting Mode
② Cylinder Stroke Difference
③ Cylinder Stroke Limit
④ Cylinder Stroke Tolerance
⑤ Cylinder On/Off
⑥ System Status
⑦ Absolute Sensor Position
⑧ Relative Sensor Position
⑨ Operating Modes
⑩ Relative Position Reset

▼ Shown: **4-point ESS Standard Synchronous Lift System**

The Solution For Up to 12 Lifting Points With Load Control

- **Control up to 12 lifting points**
- **Stroke and load controlled movement for positioning and weighing**
- **Accuracy of 0.040" between leading and lagging cylinders**
- **Data storage and recording capabilities**
- **Load and stroke alarms for optimal safety**
- **For use with standard single- or double-acting cylinders**
- **Integrated 10,000 psi hydraulic pump and controls**

Typical Synchronous Lifting Applications

- Bridge lifting and repositioning
- Bridge launching
- Lifting and lowering of heavy equipment
- Leveling of existing structures and buildings
- Structural testing
- Lifting and weighing of oil platforms
- Tunnel jacking and pushing

Contact Enerpac!

Contact the Enerpac office nearest to you for advice and technical assistance in the layout of your ideal Lift System.
You can also ask Enerpac for assistance by e-mail at **integratedsolutions@enerpac.com**.

Hoses

Enerpac offers a complete line of high-quality hydraulic hoses. To ensure the integrity of your system, specify only genuine Enerpac hydraulic hoses.

Page: 118

Increase Control Capabilities

For increased control capabilities and options contact the Enerpac office nearest to you for advice.

▼ *Lifting a 3500 ton dragline was successfully done with an Enerpac synchronous lifting system. This operation provided for exact alignment of the bearing on the rail.*

Synchronous Lifting Applications

The Synchronous Lift system uses feedback from multiple sensors to control the lifting, lowering and positioning of any large, heavy or complex structure, regardless of weight distribution. Synchronous lifting reduces the risk of bending, twisting or tilting, due to uneven weight distribution or load-shifts between the lift points.

A PLC controller monitors each lift position stroke and optional load transducers located at each lift point. By varying the oil flow to each lift point, the system maintains very accurate positional control. This control maintains structural integrity and can increase the productivity and safety of the lift, by eliminating manual intervention in the event of a load-shift or other problem.

Programmable and failsafe monitoring and safety alarms include operating parameters and hydraulic conditions, such as oil-level and over-temperature. Programmable data recording and "differential-lift" options allow a load to be manipulated into a pre-set position.

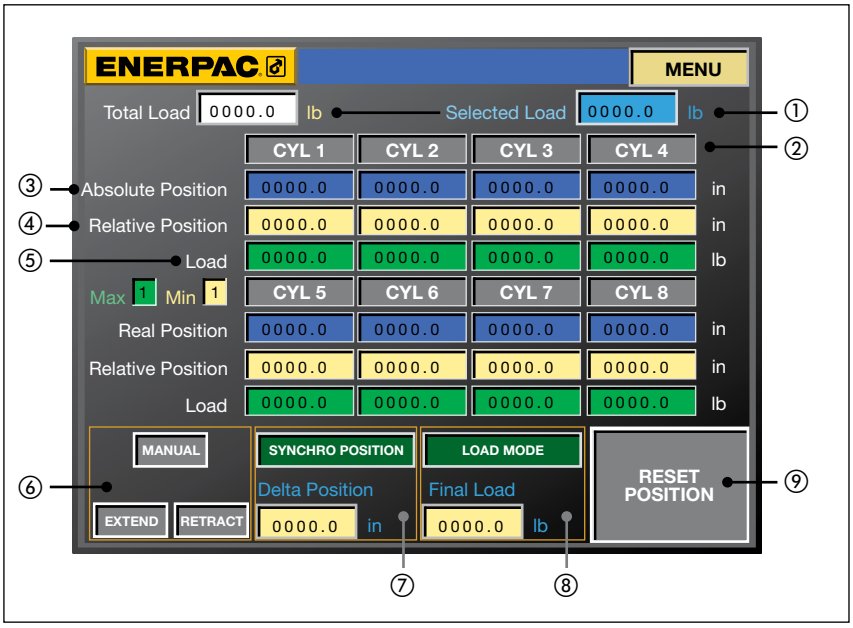
ESS Series

Number of Lift Points:
2 to 12

Maximum System Operating Pressure:
10,000 psi

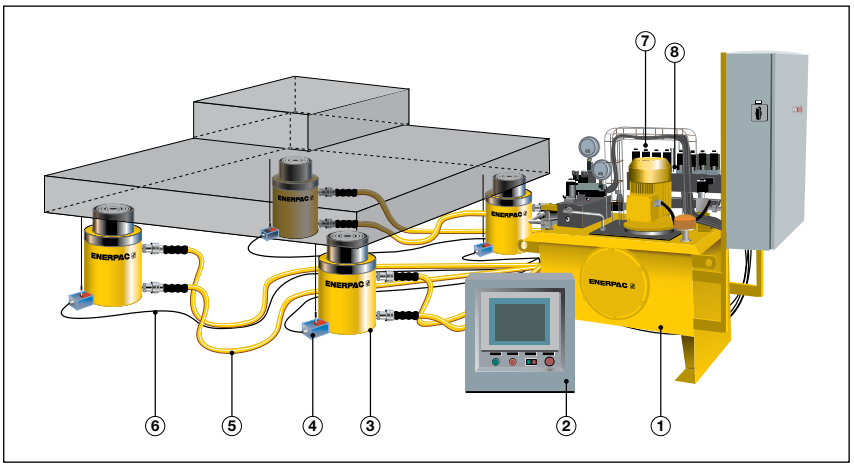
Accuracy Over Full Stroke:
Up to 0.040"

Touch screen display for ESS Synchronous Lift Controller



① Load Readings
② Cylinder On/Off
③ Absolute Sensor Position
④ Relative Sensor Position
⑤ Individual Load Readings
⑥ Manual Controls
⑦ Stroke Controls
⑧ Load Controls
⑨ Relative Position Reset

Typical layout for a 4-point synchronous lifting system



① Hydraulic Pump
② PLC-Control with Touch Screen
③ Hydraulic Cylinders
④ Stroke Sensors
⑤ Hydraulic Hoses
⑥ Sensor Cables
⑦ Solenoid Control Valves
⑧ Pressure Transducer

▼ Shown: **96-ton jack**

From the Leader in Heavy Lifting Technology

- **Hydraulic wedge setting and wedge release for positive load control**
- **Individual strand guidance through jack for strand control**
- **Multi functional coating for corrosion protection, and trouble-free wedge release**
- **Jacks designed to be operative in all positions: vertical, horizontal or angled**
- **Strand jack designed according to the highest safety standards with a minimum of 2.5:1 of strand breaking load**
- **Built-in sensors for closed-loop control**
- **High Alloy CrMo steel for maximum durability**

Lifting in Unusual Situations

When loads need to be lifted or lowered in tight areas or in situations where overhead clearance is limited, Enerpac offers this economical alternative to traditional rigging equipment.

Pre-stress Cap

Included with all strand jacks. Used for tensioning strand prior to operation.

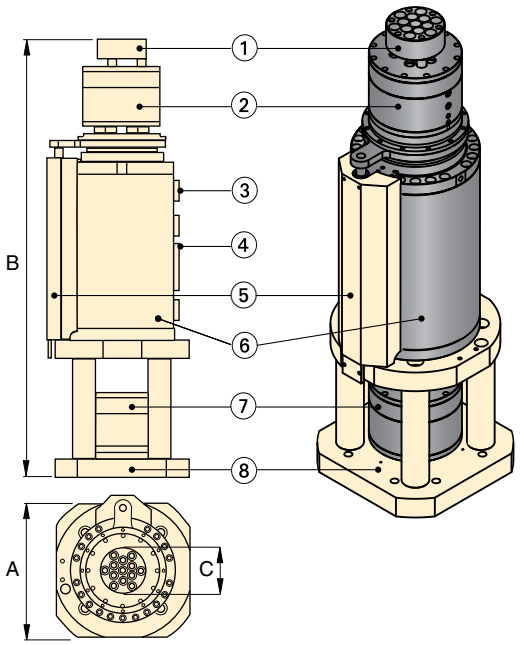
Strand Wedges

Specially designed wedges for use with Enerpac strand jacks are included and available to purchase separately.

Lifting Attachments

A variety of lifting attachments are available for connecting strand to the load.

▼ *Lifting bridge deck sections 100 feet was problematic and time consuming using traditional lifting methods. Eighty-five ton strand jacks were used to lift efficiently and safely.*



1. Pre-Stress Cap
2. Moving Lock Device
3. Pilot-Operated Check Valve
4. Electrical Connections
5. Stroke Sensor Anti Rotation Device
6. Lifting Cylinder
7. Static Lock Device
8. Chair

TT Series

Rated Capacity per Jack:
42-1109 ton

Effective Stroke:
19.7 inches

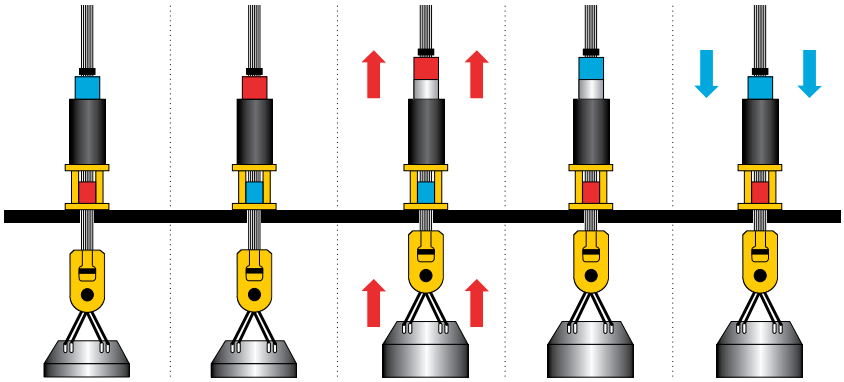
Working Pressure:
4350 psi

Strand

Strand Jacks are designed for use with 0.60 or 0.70 inch diameter heavy lifting strand (sold separately).

Strand Jacking Lifting Sequence

The sequence of operation is illustrated with the lock devices shown in *red* when the wedges are closed. The lock devices are shown in *blue* when the wedges are open.



Bottom Wedges Closed | **Top Wedges Closed** | **Lifting Load** | **Bottom Wedges Closed** | **Top Wedges Open and Reset**

ST120M06 Strand Lifting Jack

For heavy-lifting applications where a crane or hoist will not fit, the **ST120M06** may be the only solution. Contact Enerpac Integrated-Solutions for more details on this unique lifting solution.

PLC Control Unit

Using a network cable to interconnect each strand jack pump to the master control enables the use of an unlimited number of jacks.

Contact Enerpac!

Contact the Enerpac office nearest to you for advice and technical assistance in the layout of your ideal Lift System.
You can also ask Enerpac for assistance by e-mail at **integratedsolutions@enerpac.com**.

Strand Jack Capacity (ton*)	Strand Diameter (in)	Number of Strands	Effective Area (in²)	Square Base A (in)	Retracted Height B (in)	Strand Circle Diameter C (in)
42	0.6	3	19.1	11.8	68.1	2.4
96	0.6	7	44.5	16.9	69.5	3.7
157	0.6	12	72.2	19.3	69.5	5.2
254	0.6	19	116.9	23.6	70.5	6.7
367	0.6	27	168.8	25.6	70.5	8.2
500	0.6	37	230.3	27.6	80.3	9.7
628	0.6	48	289.1	29.9	81.5	11.2
741	0.6	55	340.8	35.4	81.5	11.5
1109	0.7	61	510.1	40.9	89.0	15.9

[1] All strand jack models are also available to operate with 0.7 inch (18 mm) strands upon request.
[2] Detailed strand jack data sheets are available upon request.
* If used with compact strand.

▼ Shown: **Hydraulic Strand Jack Pump**

Hydraulic Power for Demanding Strand Jacking Applications

Motor Size:
2-100 hp

Lifting Speed:
6-80 ft/hr

Working Pressure:
4350 psi

- **Multiple pump sizes to achieve desired Jack-Pump performance**
- **PLC-controlled operation**
- **Fully enclosed cabinet**
- **One pump per strand jack allows for short connections**
- **Includes electrical oil level and temperature switch**
- **Includes return-line filter with electrical clog indicator**

Premium Options:

- **Variable frequency drive for flow control and accurate synchronization between multiple lifting points**
- **Oil cooler for operation in high temperature environments or continuous operation**
- **Reinforced cabinet with steel frame and lifting lugs**
- **Different reservoir sizes**
- **Sound isolation**
- **Oil pre-heater in low temperature applications**
- **Biodegradable oil**

Hand Pendant

Allows individual control of strand jacks for set-up and manual operation. Included with each pump unit.

Contact Enerpac!

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You can also ask Enerpac for assistance by e-mail at **integratedsolutions@enerpac.com**.

Two concrete arches of this viaduct in Silleda, Spain are moved towards each other by Enerpac Heavy Lifting Strand Jacking Systems. ▶

▼ Shown: **Master PLC Control Unit**

Control Multiple Strand Jacks from One Master Controller

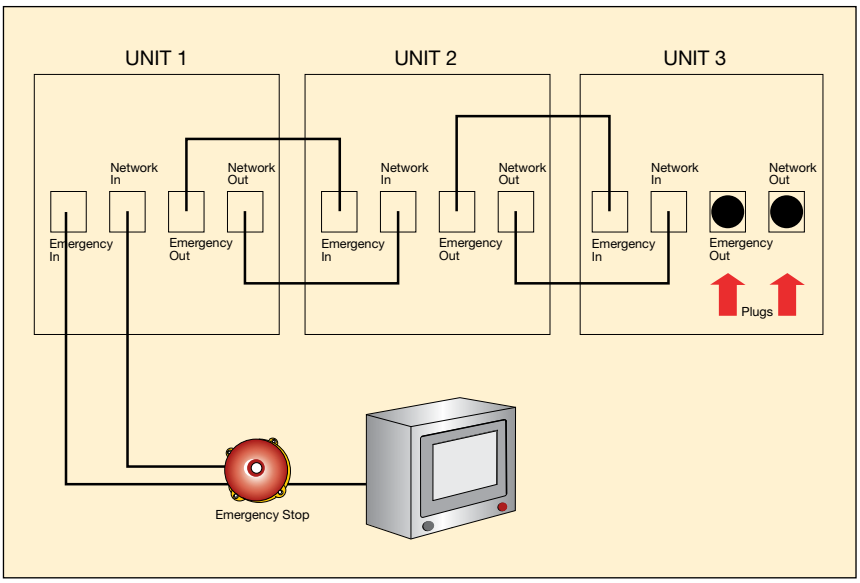
Controlling Network

By using a network cable to interconnect each strand jack pump, multiple strand jacks can be operated from one master controller.

- **Modular based system**
- **Control up to 32-points with one controller**
- **Multiple controllers can be networked**
- **Synchronous stroke control maintains .040 inch accuracy between leading and lagging jacks**
- **Individual stroke and load readouts**
- **Stroke and load alarms for safety**
- **Data logging capabilities**
- **Alarm button monitors many types of system failures**

▼ *Two 96-ton strand jacks used for bridge construction.*

▼ **Illustration of how multiple units are networked together and controlled from a single location**



▼ Shown: **BLS-506 in three lifting positions.**

A Simple Solution to Higher Lifting Jobs

- **Double-acting cylinder with solid plunger design**
- **Simple three-stage operation**
- **Swivel saddle and large support attachments for stability**
- **Anti-rotation device**
- **Built-in overload protection**

Lifting Height

Stage-lift cylinders overcome the usual limitation of lift height imposed by the cylinder's plunger stroke length.

Large objects, such as oil tanks, can be lifted, held and lowered for maintenance without sending for a crane.

Synchronous Lift System

Multi-cylinder arrangements can be powered and fully synchronized by Enerpac's Synchronous Lift System.

Page: 228

▼ *Typical stage-lift application using a custom built Enerpac system to lift the 396-ton Akkerwinde wooden bridge in the Netherlands.*

Stage Lifting Application

For many lifting applications, the cylinder stroke can not be made long enough to lift the load to the required height. There is a direct relationship between the stroke length and the collapsed height of a cylinder. This relationship many times prevents a cylinder with the proper stroke length from also fitting in the required position to lift the load correctly. When these limitations are experienced, sometimes Stage-Lifting is the only solution.

Stage-Lifting is the process of lifting the load to the maximum stroke of the cylinder and then "cribbing" or holding, the load at this point. Once this is done and the load is secure, the cylinder is retracted, cribbing is then placed under the cylinder and then the cycle is repeated. This stage-lifting cycle allows the load to be lifted many times the stroke of the cylinder and total height is only limited by the strength and stability of the cribbing system.

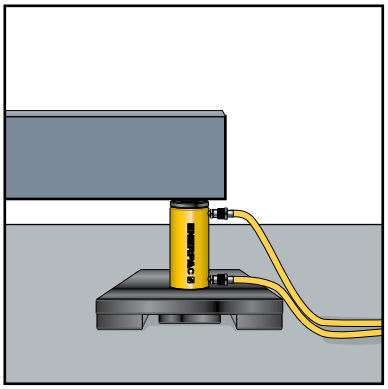
The BLS-Series of cylinders feature attachments that facilitate the cribbing application, by providing reaction points for both the load and the piston cribbing reaction points.

BLS Series

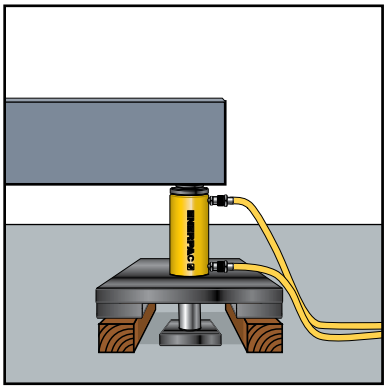
Capacity per lift point:
50-200 tons

Stroke per stage:
6 inch

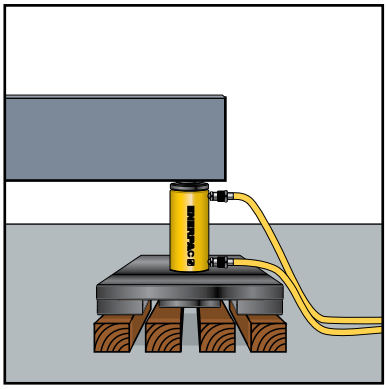
Maximum Operating Pressure:
10,000 psi



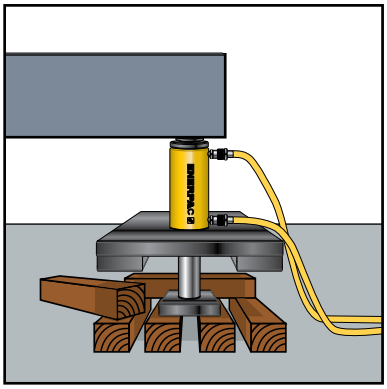
1 The Stage Lift cylinder is placed on a solid support under the load (retracted plunger).



2 Plunger extends, lifting the load and giving clearance to insert two outer blocks under the spreading plate.



3 Plunger retracts, giving clearance to position the central blocks which will support the plunger plate for the next extension.



4 Plunger extends, lifting the load and giving clearance to insert two new blocks, placed crosswise under the spreading plate.

Think Safety

Manufacturer's rating of load and stroke are maximum safe limits.

Good practice encourages using only 80% of these ratings!

▼ 8 Point SyncHoist System featuring premium control package

Accurate Hoisting and Load Positioning with a Crane

- **High precision vertical load maneuvering, with the use of one crane**
- **Reduces the risk of damage from oscillations due to sudden crane starts/stops**
- **Improves operating speed and worker safety**
- **Optional PLC controls for high accuracy hoisting and load positioning system**
- **10,000 psi double-acting push/pull cylinders equipped with safety valve for protection in event of hose rupture or coupler damage**

Typical SyncHoist Functions and Applications

Functions

- High precision load positioning
- Pre-programmed positioning, tilting and aligning
- Counterweighing – determining center of gravity

Applications

- Positioning of roof sections, concrete elements, steel structures
- Positioning of turbines, transformers, fuel rods
- Precise machinery loading, mill rod changes, bearing changes
- Precise positioning of pipe lines, blow out valves
- Positioning and aligning of ship segments prior to assembly

See **www.enerpac.com** and Enerpac in Action for more application information.

Contact Enerpac!

Contact the Enerpac office nearest to you for advice and technical assistance in the layout of your ideal Lift System.
You can also ask Enerpac for assistance by e-mail at **integratedsolutions@enerpac.com**.

▼ *An Enerpac SyncHoist system is used to place a 660 ton ship module, allowing the positioning to be done with only one crane.*

Synchronous Hoist High Precision Load Positioning

Enerpac SyncHoist Systems

Cylinder Load Capacity:[1]	**70 ton**	**93 ton**	**125 ton**
Stroke:	59 in.	59 in.	59 in.
Push force @ 1300 psi	15 ton	20 ton	28 ton
Pull force @ 10,000 psi	70 ton	93 ton	125 ton

Pump Single-Stage

Oil flow at 10,000 psi:	240 in^3/min	240 in^3/min	240 in^3/min

Control Options and System Management [2] [3]

Manual:	Joystick controls
Extended manual:	Joystick controls with position display
PLC-control:	Fully closed–loop control system

1) Total system capacity subject to angle and position of lifting cylinders.
2) Each cylinder equipped with safety valve for protection in event of hose/coupler damage.
   Note: Enerpac SyncHoist comes standard with 4 lifting points. In the event more or fewer lifting points are required, contact your local Enerpac representative.
3) See chart below for detailed control features.

SHS Series

Capacity per Lifting Point:
70-125 tons

Maximum Stroke:
59 inches

Accuracy Over Full Stroke:
.040 in

Maximum Operating Pressure:
10,000 psi

Three Options for System Management and Control

Contact Enerpac for the following options.

1. Manual Control
- Plunger stroke control
- System warnings for
  – oil level, filter indication, thermal motor protection

2. Extended Manual Control
- Plunger stroke control
- Load & stroke display
- System warnings for
  – maximum cylinder load control setting
  – oil level, filter indication, thermal motor protection

3. PLC-control
- Touch screen control input
- Remote wireless radio control
- Load and stroke monitoring
- Load calculations (center of gravity)
- Pre-programmable motions and data recording
- System warnings for
  – maximum cylinder load control setting
  – stroke and position control
  – oil level, filter indication, thermal motor protection

▼ *Roof lifting for the Auditorium at Tenerife in the Canary Islands – Spain. A 4-point Enerpac hydraulic SyncHoist system is used for accurate roof positioning.*

▼ Shown: Mechanical Actuators

Precision Positioning and Control in a Mechanical Package

- **Machine screw versions up to 250 tons for low-cycle, high-load applications and positive load holding**
- **Ball-Screw versions up to 50 tons for high-cycle, high-speed applications**
- **Electro-Mechanical Drive System can be interlinked and easily synchronized**
- **Precision rolled load screws Class 3 fit for additional strength**
- **Preloaded tapered roller bearings tolerate high thrust loads and mimimize side loading**
- **Precision machine gear sets provide minimum backlash while reducing wear**
- **Wide variety of base mounting and screw end configurations**

Maximize Your System Control

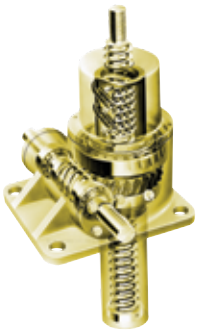
Custom control boxes designed to meet your specific application requirements.

System Accessories

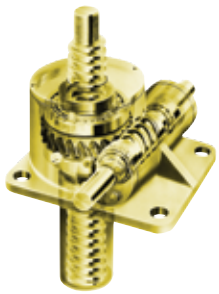
Enerpac offers a large array of motors, drive components, and boots to meet any demanding project.

◀ *Uni-Lift® Actuators were the ideal choice to position and adjust the complex scaffolding for aircraft maintenance. Precision movement and flexibility was an asset in getting the job done efficiently and safely.*

Uni-Lift® Mechanical Actuators



Ball Screw Cutaway



Machine Screw Cutaway

B, M Series

Capacity:
.25-250 tons

Maximum Stroke:
15-240 inches

Types:
Machine & Ball Screw

Design Features:

- Available with translating, rotating and keyed load screw designs
- High-strength rolled load screws provides maximum durability
- Rugged aluminum alloy and ductile iron housings for demanding or rigorous environment
- Corrosion resistant zinc plating is standard on most units
- The widest range options gear ratios are available to meet all application requirements
- Speeds up to 400 inches per minute

Actuator Accessories:

- High-quality bellow boots for added loadscrew protection
- Easy mounting of optional screw ends are available in plain, top plate and clevis design
- Wide selection of motors and C-face adaptors
- Limit switches and encoders for complete system control
- Couplers and shafting available for individual system requirements
- A large choice of mitre gear boxes and reducers provide maximum system design flexibility
- Custom built control boxes to meet your specific need

Over-travel Stop Nuts provide a mechanical stop and are used to prevent the ejection of the power screw from the actuator.

Contact Enerpac!

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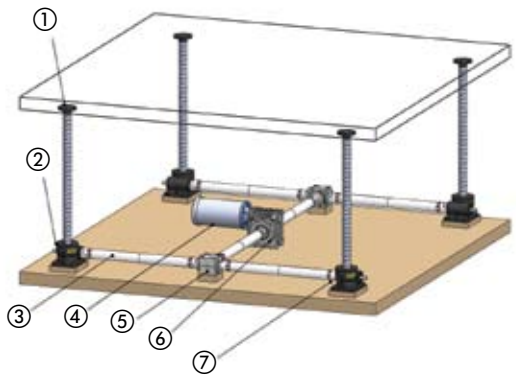
You can also ask Enerpac for assistance by e-mail at **integratedsolutions@enerpac.com**.

Typical Mechanical Actuator Set-Up



① Top Plate (4)
② Uni-Lift® Mechanical Actuator (4)
③ Shafting (6)
④ Electric Motor (1)
⑤ Mitre Gearbox (2)
⑥ Reducer (1)
⑦ Coupler (12)

CAD Modeling Software

Our experienced sales team and application engineers will deliver the precise support you need to meet the most demanding and unique requirements. State-of-the art CAD modeling software offers the needed flexibility to design custom built “special” screw jacks to suit all customer needs.

Engineers utilitzed two (2) Uni-Lift® 100-ton actuators with 15' of travel to raise and lower the ramp on each ferry dock along the Mississippi River, USA. The Department of Transportation engineers needed a way of lifting and lowering ramps during high and low tide conditions, while holding up to the harsh environmental conditions of the gulf coast.

When engineers needed a quick and compact way of opening the large doors of these large plating tanks, they contacted Uni-Lift® for help. This application utilizes two 5-ton double-clevis actuators, with a motor and a limit switch box mounted on each actuator. The operator just pushes a button to open the doors, and pushes another button to close them. This method greatly enhances operator safety and helps prevents cross contamination between tanks.

Uni-Lift® screw jacks are used extensively in a variety of material handling applications. Whether used in positioning conveyer belts, placing tension on overhead beams or moving heavy-duty equipment, Uni-Lift® actuators are the ideal solution for many jackings, tensionings, and positioning applications. Whether you have one lifting point or multiple lifting points, Uni-Lift® actuators are the perfect solution for many different OEM motion control applications.

Enerpac "Yellow Pages" *stand for* Hydraulic Information!

If selecting hydraulic equipment is not your daily routine then you will appreciate these pages. The "Yellow Pages" are designed to help you work with hydraulics. They will help you to better understand the basics of hydraulics, of system set-ups and of the most commonly used hydraulic techniques. The better your choice of equipment, the better you will appreciate hydraulics. Take the time to go through these "Yellow Pages" and you will benefit even more from Enerpac High Pressure Hydraulics.

GLOBAL LIFETIME WARRANTY STATEMENT

www.enerpac.com
Visit our web site for the complete Global Lifetime Warranty or call your Authorized Service Center.

Enerpac products are warranted to be free of defects in materials and workmanship. Any product that does not conform to specification will be repaired or replaced at Enerpac's expense, anywhere in the world; simple as that!

This warranty does not cover ordinary wear and tear, abuse, misuse, alterations, or the use of improper fluids. Determination of the authenticity of a warranty claim will be made only by Enerpac or its Authorized Service Centers.

Enerpac is certified for several quality standards. These standards require compliance with standards for management, administration, product development and manufacturing.

ISO 9001 REGISTERED
ENERPAC, 720 W. James St., Columbus, WI 53925 USA

Enerpac works hard to maintain the ISO 9001 quality rating, in its ongoing pursuit of excellence.

CE Marking & Conformity
Enerpac provides Enerpac provides Declarations of Conformity, Declarations of Incorporation, and CE marking for products that conform to the European Community Directives.

Where specified, Enerpac electric power units meet the design, assembly and test requirements of The Standards Council of Canada (CAN C22.2 No. 68-92), and UL73 for the United States. Units were tested and certified for both USA and Canada by TUV, a nationally recognized testing laboratory.

EMC Directive 2004/108/EC
Where specified, Enerpac electric power pumps meet the requirements for Electro-magnetic Compatibility per EMC Directive 2004/108/EC.

Ex II 2 GD ck T4
KEMA 0602

The ZA-series pumps are tested and certified according to the Directive 94 / 9 / EC "ATEX Directive". The explosion protection is for equipment group II, equipment category 2 (hazardous area zone 1), in gas and/or dust atmospheres. The ZA-series pumps are marked with: Ex II 2 GD ck T4.

ASME B30.1–2004
Our cylinders fully comply with the criteria set forth by the American Society of Mechanical Engineers (except **RD** series).

DIN 20024
Enerpac thermoplastic hoses are related to the criteria set forth in Deutsche Industrie Norm 20024.

Product Design Criteria
All hydraulic components are designed and tested to be safe for use at maximum 10,000 psi unless otherwise specifically noted.

Safety Instructions

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

- **Lift slowly and check often**
- **Avoid standing in the line of force**
- **Anticipate possible problems and take steps to avoid them**

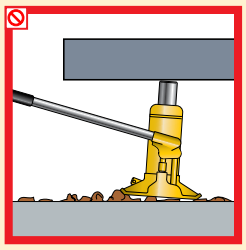
When used correctly, hydraulic power is one of the safest methods of applying force to your work. To that end we offer some DO's and DON'Ts, simple common sense points which apply to practically all Enerpac hydraulic products.

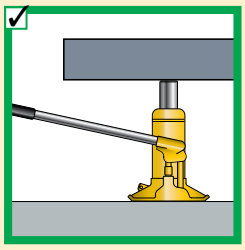
The illustrations and application photos of Enerpac products throughout this catalog are used to portray how some of our customers have used hydraulics in industry. In designing similar systems, care must be taken to select the proper components that provide safe operation and fit your needs. Check to see if all safety measures have been taken to avoid the risk of injury and property damage from your application or system. Enerpac cannot be held responsible for damage or injury caused by unsafe use, maintenance or application of its products.

Please contact the Enerpac office or a representative for guidance when you are in doubt as to the proper safety precautions to be taken in designing and setting up your particular system.

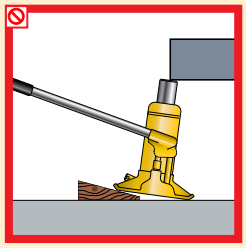
In addition to these tips, every Enerpac product comes with specific safety information and instructions. Please read them carefully.

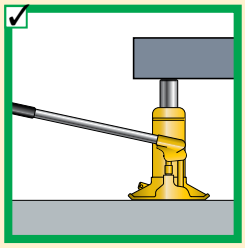
Jacks



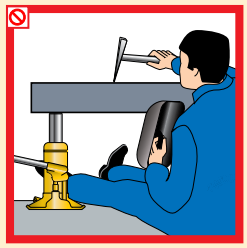


◀ **Provide a level and solid support for the entire jack base area.**

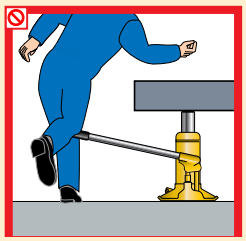


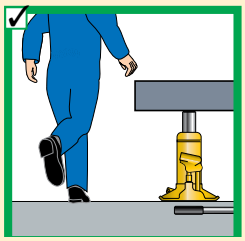


◀ **The entire jack saddle must be in contact with the load. Movement of the load must be in the same direction as jack plunger.**



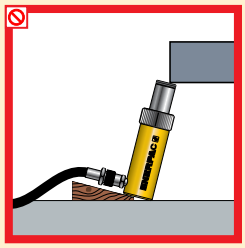
◀ **Never place any part of your body under the load. Ensure the load is on a solid support before venturing under.**

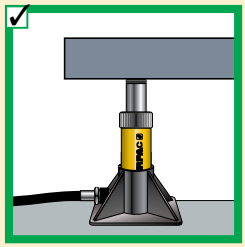




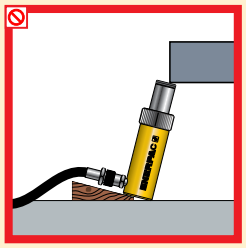
◀ **Remove the jack handle when it is not being used.**

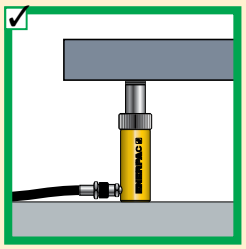
Cylinders



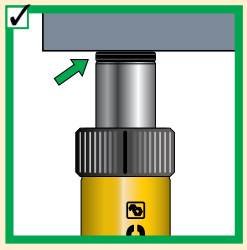


◀ **Provide a solid support for the entire cylinder base area. Use cylinder base attachment for more stability.**

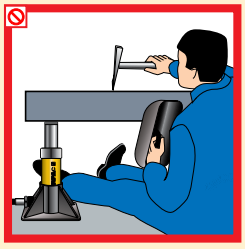




◀ **The entire cylinder saddle must be in contact with the load. Movement of the cylinder must be parallel with the movement of the load.**

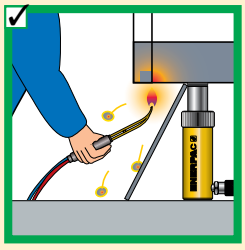


◀ **Do not use cylinder without saddle. This will cause plunger to "mushroom". Saddles distribute load evenly on the plunger.**



◀ **As with jacks, never place any part of your body under the load. Load must be on cribbing before venturing under.**

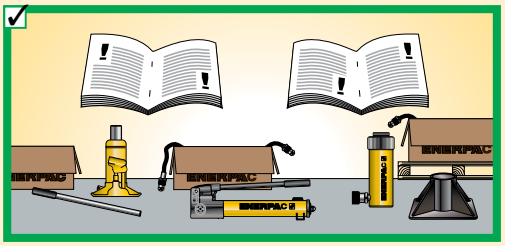
◀ **Always protect cylinder threads for use with attachments.**



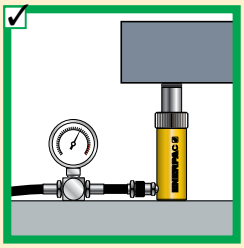
◀ **Keep hydraulic equipment away from open fire and temperatures above 150 °F (65 °C).**

General

80% Manufacturer's rating of load and stroke are maximum safe limits. Good practice encourages using only 80% of these ratings! 80%

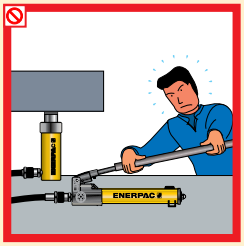


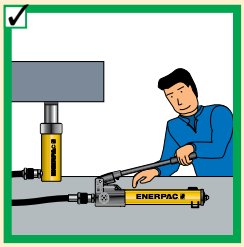
◀ Always read instructions and safety warnings that come with your Enerpac hydraulic equipment.



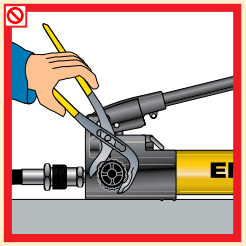
◀ Don't override the factory setting of relief valves. Always use a gauge to check system pressure.

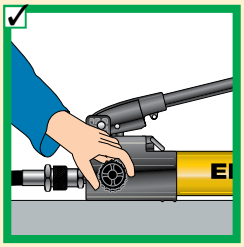
Pumps



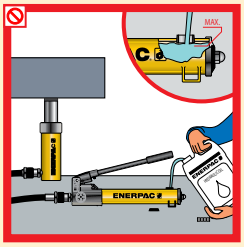


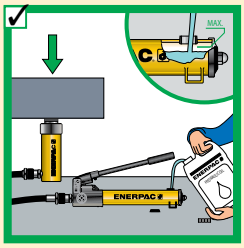
◀ Don't use handle extenders. Hand pumps should be easy to operate when used correctly.



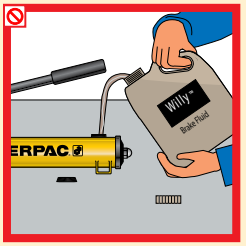


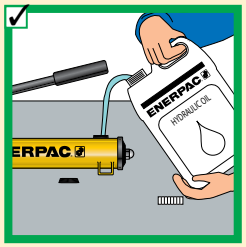
◀ Close release valve finger tight. Using force will ruin the valve.





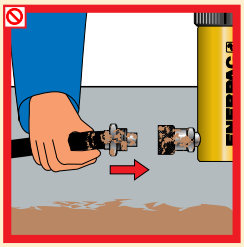
◀ Fill pump only to recommended level. Fill only when connected cylinder is fully retracted.

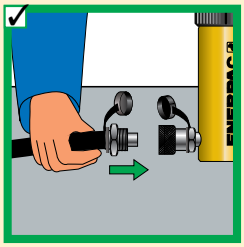




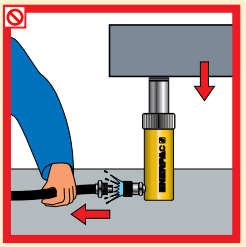
◀ Use only genuine Enerpac hydraulic oil. The wrong fluid can destroy your seals and pump and will render your warranty null and void.

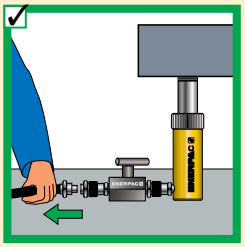
Hoses and couplers



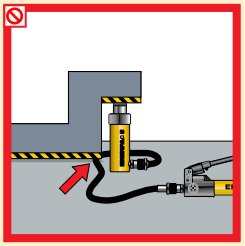


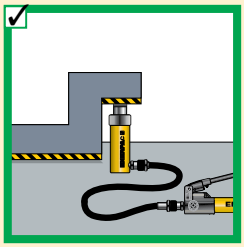
◀ Clean both coupler parts before connecting. Use dust caps when coupler parts are not connected.



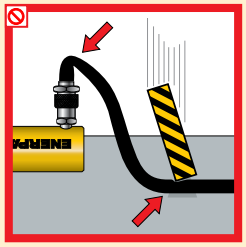


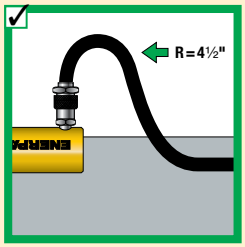
◀ Detach cylinder only when fully retracted or use shut-off valves or safety valves to lock-in cylinder pressure.



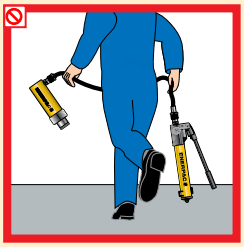


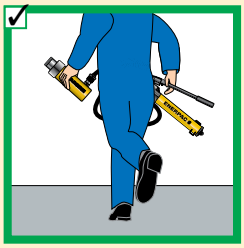
◀ Keep hoses away from the area beneath loads.



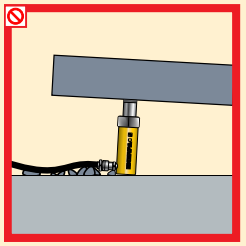


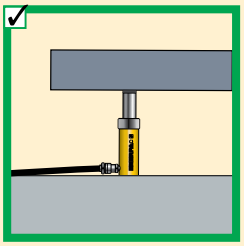
◀ Don't kink hoses. Bending radius should be at least 4½ inch. Don't drive over or drop heavy objects on hoses.





◀ Don't lift hydraulic equipment by the hoses.





◀ Never allow the cylinder to be lifted off of the ground through the couplers.

▼ HAND PUMP AND SINGLE-ACTING CYLINDER MATCHING CHART

Capacity (tons) ▸ / ▼ Stroke (inches)	5	10	15	25	30	50	60	75	100	150
< 1.00										
1.00										
2.00										
3.00										
4.00										
5.00										
6.00										
7.00										
8.00										
9.00										
10.00										
12.00										
13.00										
14.00										

P-392

Page: 62

P-80

Page: 64

P-462

Page: 64

Note: Selection based on oil capacity requirements of cylinders.

▼ POWER PUMP SELECTION CHART

Flow*	Low (20 in³/min)		Medium (60 to 200 in³/min)		High (463 in³/min)
Reservoir Oil Capacity	0.5-1 gal.	1.5 gal.	1.0-10 gal.	1.0-10 gal.	25 gal.
Duty Cycle**	Intermittent	Extended	Intermittent	Extended	Extended
Portable/Stationary***	Portable	Stationary	Portable	Stationary	Stationary
Recommended Series	**Economy**	**Submerged**	**ZU4**	**ZE3-6**	**8000 Series**
					
	Page: 74	Page: 76	Page: 82	Page: 88	Page: 94

* Flow
- Determined by motor size
- Directly affects electrical power requirements
- Determines cylinder or tool speed

** Duty Cycle
- Extended applications require more than one hour of uninterrupted pump use
- Intermittent use – from 20 minutes to one hour, depending on reservoir capacity (contact Enerpac for details)

*** Portability

Portable
- Ergonomic handles
- Flexible power requirements

Stationary
- Mounting options
- Normally requires stable power

Product Selection Worksheet

▼ **Complete the following information to select the right products:**

Cylinder Selection

Question:	*Tips/help*	*Data*	*Model Number*
Total force required in tons:	Total load		
Number of cylinders required:	Number of lifting points		
Force per cylinder in tons:	Should be 80% of total cylinder cap.		
Stroke required:	Plunger travel		
Single or double acting (D/A):	D/A used when pull force is required, or retract speed is critical		
Type of plunger required:	Hollow or solid		
Collapsed height required:	Height with plunger fully retracted		
Optional saddle required:	Tilt, Grooved, Flat		
Cylinder base:	Improves stability		
Cylinder attachments: (RC-series)	Expanded functions		
Selected cylinder model:		▶	
Including coupler model:			

Pump Selection

The three most commonly selected pumps are hand pumps, electric pumps and air-driven pumps. Gas powered pumps, however can be selected in the same way.

Available power source: ☐ **Manual** ☐ **Electric** ☐ **Compressed Air** ☐ **Gasoline**

Hand pump			
Single- or double-acting operation	Not for high-cycle applications Use 4-way valve for D/A applications Check speed chart on page 251 for number of strokes per inch)		
Selected hand pump:		▶	
Electric or compressed air pump			
Need for portability:	Weight and power requirements		
Duty cycle:	Intermittent or extended		
Required usable oil capacity:	Intermittent =1.2 x cylinder oil capacity high cycle = 2 x cylinder oil capacity		
Available voltage:	Single phase or Three phase		
Lifting speed (Important/not important):	Use speed chart on page 251		
Type of control:	Manual/remote pendant		
Type of actuation/function:	Advance/hold/retract		
Accessories:	Roll bar, Oil Filter kit, ...		
Selected pump:		▶	
To suit hose:	Oil connection		

System Components

Number of hoses and length required:			
Selected hoses:		▶	
Manifold or tee:		▶	
Extra hose per manifold (2):		▶	
Gauge (psi, lbs or tons scale):	Glycerine for high cycle	▶	
Gauge adaptor:		▶	
Fittings:		▶	
Pressure relief safety valve:		▶	
Load-holding valve(s):		▶	
Hydraulic oil:		▶	

1 Cylinder
Applies hydraulic force.
Page **5**

2 Cylinder Base Plate
For applications such as lifting where additional cylinder stability is required.
Page **10**

3 Pump
Provides hydraulic flow.
Page **61**

4 Hose
Transports hydraulic fluid.
Page **118-119**

5 Male Coupler
For quick connection of the hose to system components.
Page **120-121**

6 Female Coupler
For quick connection of the hose end to the system components.
Page **120-121**

7 Gauge
To monitor pressure of the hydraulic circuit.
Page **124-127**

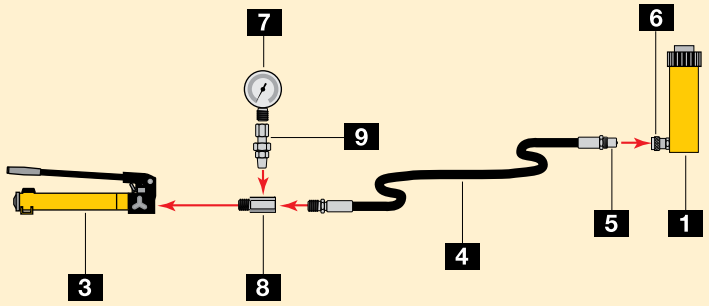
8 Gauge Adaptor
For quick and easy gauge installation.
Page **130**

9 Swivel Connector
Allows proper allignment of valves and/or gauges. Used when units being connected cannot be rotated.
Page **130**

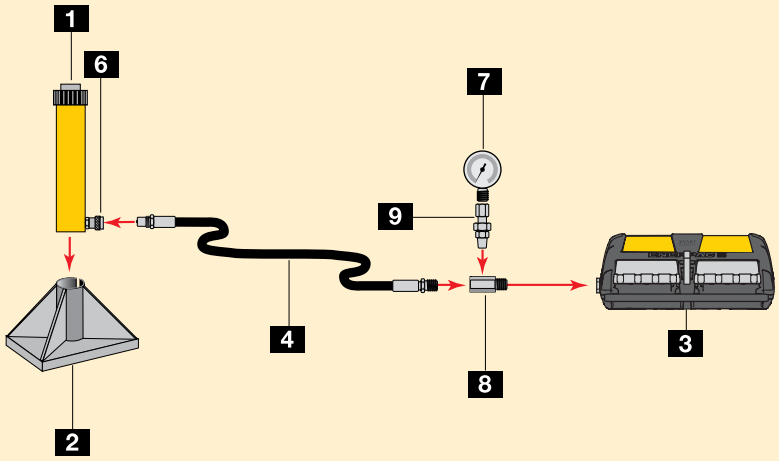
10 Auto-damper Valve V-10
Used to protect gauge from damage due to sudden pulses in the system. Needs no adjustment and allows correct positioning of gauge, prior to tightening.
Page **133**

Single-acting push application, such as in a press. The hand pump offers controlled cylinder advance, but may require many hand pump strokes in longer stroke applications when the cylinder capacity is 25 ton or above.

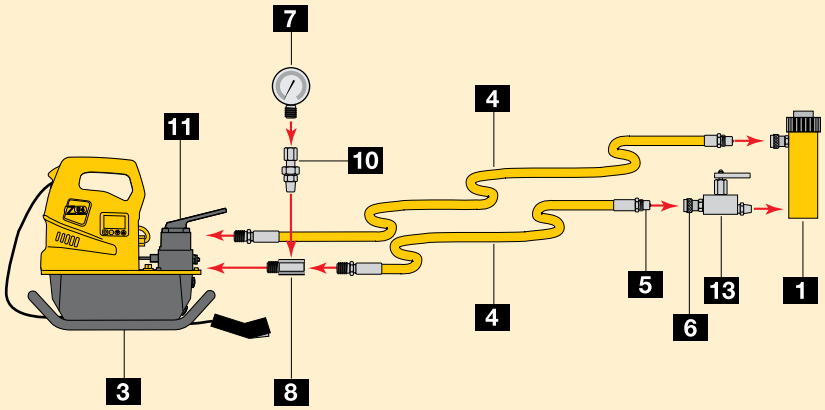
Examples of pump, hose and cylinder sets can be found on page 59.



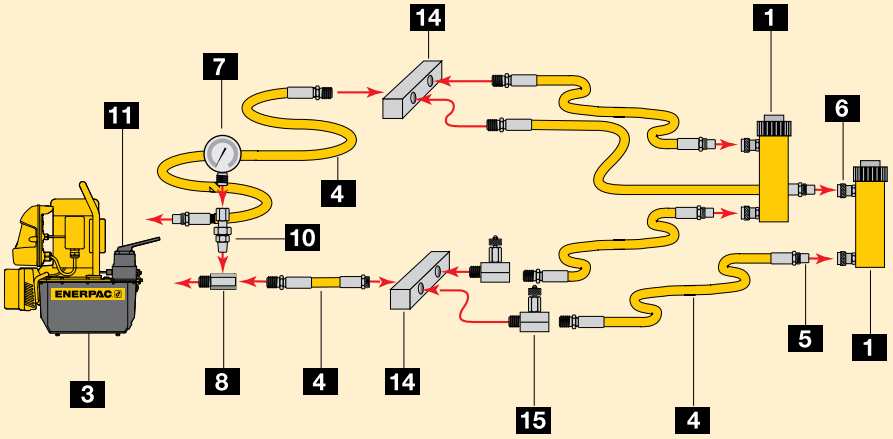
Single-acting cylinder with longer stroke used for lifting applications.



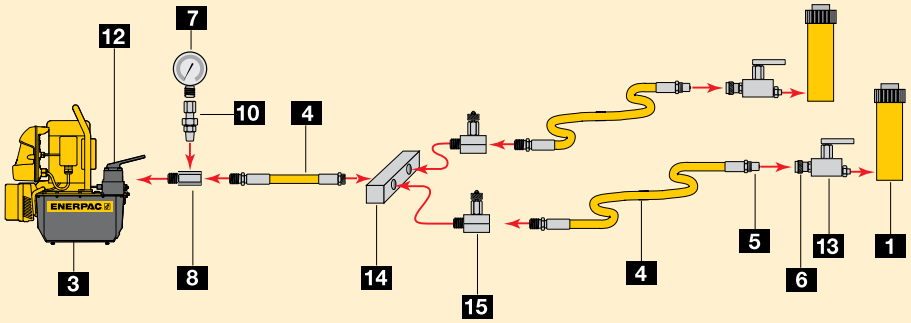
Double-acting cylinder set-up used for lifting applications where a slow controlled descent of the load must be maintained.



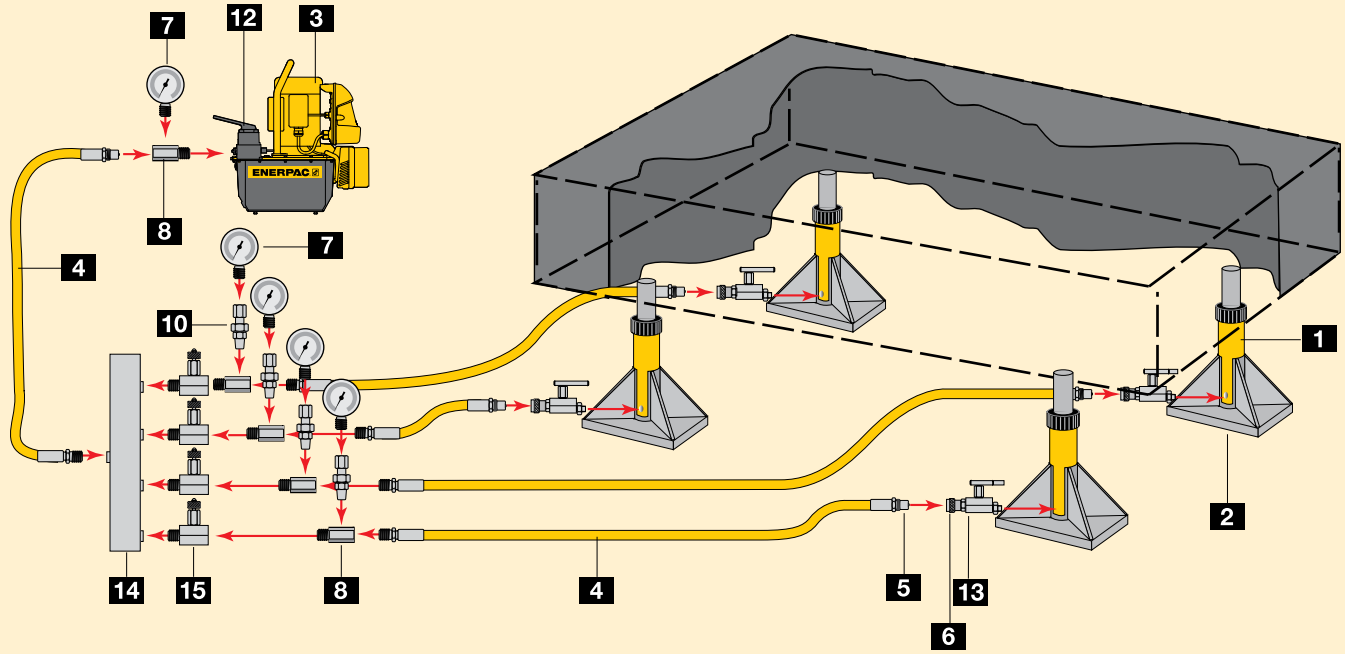
Double-acting cylinder set-up used in a push/pull application.



Two point lifting set-up using single-acting cylinders.



Four point lifting set-up, using single-acting cylinders, flow control valves and safety valves.



11 4-Way Directional Control Valve
Controls the direction of hydraulic fluid in a double-acting system.
Page **110**

12 3-Way Directional Control Valve
Controls the direction of hydraulic fluid in a single-acting system.
Page **110**

13 Safety Holding Valve
Controls load descent in lifting applications.
Page **133**

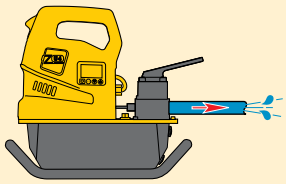
14 Manifold
Allows distribution of hydraulic fluid from one power source to several cylinders
Page **122**

15 Needle Valve
Regulates the flow of hydraulic fluid to or from the cylinders.
Page **133**

www.enerpac.com
Visit our web site to learn more about hydraulics and system set-ups.

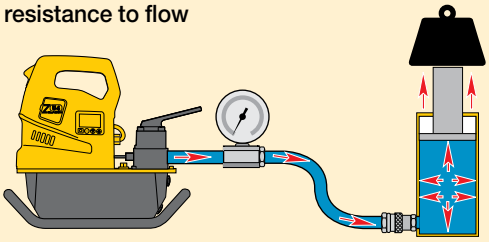
Flow

A hydraulic pump produces flow



Pressure

Pressure occurs when there is resistance to flow



Pascal's Law

Pressure applied at any point upon a confined liquid is transmitted undiminished in all directions (Fig.1).
This means that when more than one hydraulic cylinder is being used, each cylinder will lift at its own rate, depending on the force required to move the load at that point (Fig. 2). Cylinders with the lightest load will move first, and cylinders with the heaviest load will move last (Load A), as long as the cylinders have the same capacity.

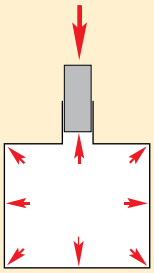


Figure 1

To have all cylinders operate uniformly so that the load is being lifted at the same rate at each point, either control valves (see Valve section) or Synchronous Lift System components (see Cylinder section) must be added to the system (Load B).

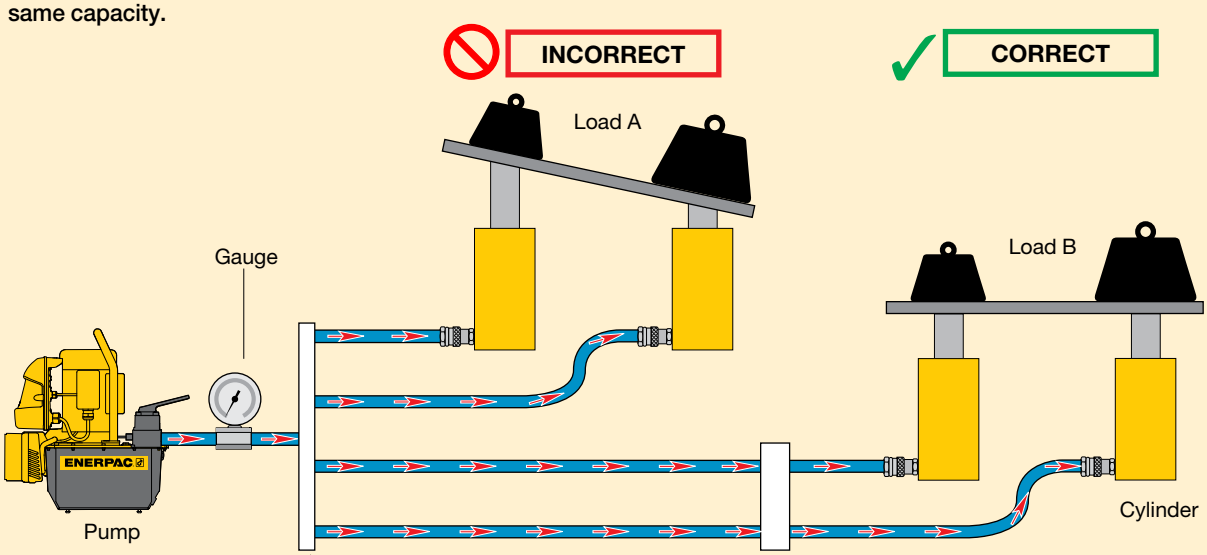


Figure 2

CAUTION!

When lifting or pressing, always use a gauge.
A gauge is your "window" to the system. It lets you see what's going on. You will find the gauges in the System Components section.

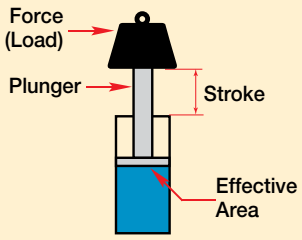
Page: 117

Learn more about hydraulics

Visit **www.enerpac.com** to learn more about hydraulics and system set-ups.

Force

The amount of force a hydraulic cylinder can generate is equal to the hydraulic pressure times the "effective area" of the cylinder (see cylinder selection charts).



Force	=	Hydraulic Working Pressure	x	Cylinder Effective Area
F	=	P	x	A

Use this formula to determine either force, pressure or effective area if two of the variables are known.

Example 1
An RC-106 cylinder with 2.24 in^2 effective area operating at 8,000 psi will generate what force?
Force = 8,000 psi x 2.24 in^2 = 17,920 lbs.

Example 2
An RC-106 cylinder lifting 14,000 lbs will require what pressure?
Pressure = 14,000 lbs ÷ 2.24 in^2 = 6,250 psi.

Example 3
An RC-256 cylinder with 5.15 in^2 effective area is required to produce a force of 41,000 lbs. What pressure is required?
Pressure = 41,000 lbs. ÷ 5.15 in^2 = 7961 psi.

Example 4
Four RC-308 cylinders each with 6.49 in^2 effective area are required to produce a force of 180,000 lbs. What pressure is required?
Pressure = 180,000 lbs ÷ (4 x 6.49 in^2) = 6933 psi.
Remember, since four cylinders are used together, the area for one cylinder must be multiplied by the number of cylinders used.

Example 5
A CLL-2506 cylinder with 56.79 in^2 effective area is going to be used with a power source that is capable of 7,500 psi. What is the theoretical force available from that cylinder?
Force = 7,500 psi x 56.79 in^2 = 425,925 lbs.

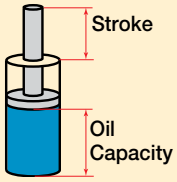
Cylinder Oil Capacity

The volume of oil required for a cylinder (cylinder oil capacity) is equal to the effective area of the cylinder times the stroke*.

Cylinder Oil Capacity	=	Cylinder Effective Area	x	Cylinder Stroke

* Note: these are theoretical examples and do not take into account the compressibility of oil under high pressure.

Example 1
An RC-158 cylinder with 3.14 in^2 effective area and an 8 in. stroke will require what volume of oil?
Oil Capacity = 3.14 in^2 x 8 in = 25.12 in^3



Example 2
An RC-5013 cylinder has an effective area of 11.05 in^2 and a stroke of 13.25 in. How much oil will be required?
Oil Capacity = 11.05 in^2 x 13.25 in = 146.41 in^3

Example 3
An RC-10010 cylinder has an effective area of 20.63 in^2 and a stroke of 10.25 in. How much oil will it require?
Oil Capacity = 20.63 in^2 x 10.25 in = 211.46 in^3

Example 4
Four RC-308 cylinders are being used, each with an effective area of 6.49 in^2 and stroke of 8.25 in. How much oil will be required?
Oil Capacity = 6.49 in^2 x 8.25 in = 53.54 in^3 for one cylinder
Multiply by four to obtain the required capacity: 214.17 in^3

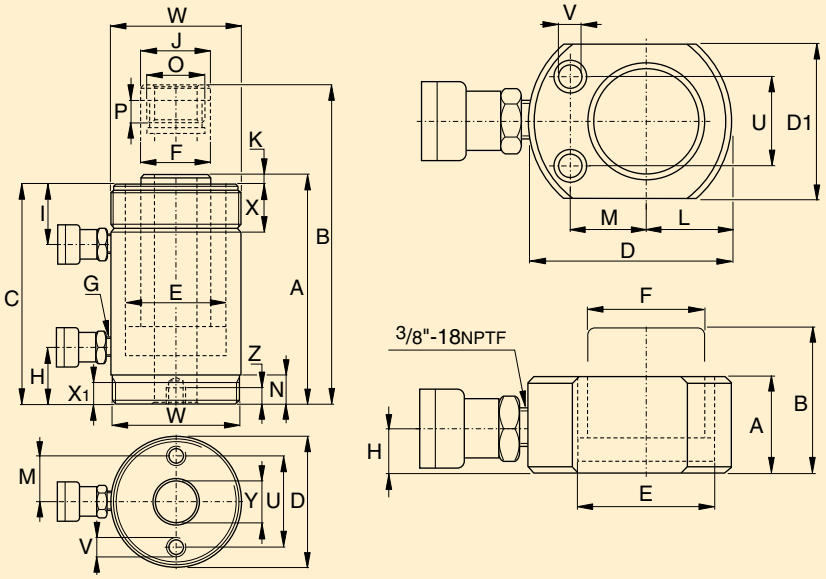
Enerpac oil will compress 2.28% at 5,000 psi and 4.1% at 10,000 psi.

Page: 122

Key to cylinder dimensions

Dimensions shown in the Selection Charts of the cylinder section are identified on the relevant drawings by the capital letter references listed here: A for collapsed height through Z for depth of internal base thread.

A = Collapsed height
B = Extended height
C = Cylinder body length
D = Cylinder outside diameter
D1 = Cylinder width
E = Cylinder inside diameter (bore)
F = Plunger rod diameter
G = Oil inlet thread
H = Cylinder bottom to advance port
I = Cylinder top to retract port
J = Saddle outside diameter
K = Cylinder rod protrusion at collapsed height
L = Plunger center to side of base
M = Mounting holes to plunger center
N = Length of smaller cylinder part
O = Plunger hole or thread of saddle
P = Plunger thread length
Q = Plunger outside thread (pull cylinders only)
U = Bolt circle diameter of mounting holes
V = Thread of cylinder mounting holes
W = Collar thread
X = Collar thread length
Y = Center hole diameter (hollow cylinders only)
Z = Depth of internal base thread



Key to measurements

All capacities and measurements in the catalog are expressed in uniform values.

The conversion chart provides helpful information for their translation into equivalent systems.

You can also visit our website at **www.enerpac.com** to download **Conpaq**, a FREE conversion calculator.

Pressure:

1 psi	= .069 bar
1 bar	= 14.50 psi
1 kPa	= .145 psi

Volume:

1 in^3	= 16.387 cm^3
1 cm^3	= .061 in^3
1 liter	= 61.02 in^3
1 liter	= .264 gal
1 US gal	= 3,785 cm^3
	= 3.785 l
	= 231 in^3

Weight:

1 pound (lb)	= .4536 kg
1 kg	= 2.205 lbs
1 metric ton	= 2,205 lbs
1 ton (short)	= 2,000 lbs
1 ton (short)	= 907.18 kg

Temperature:

To convert °F to °C:
$T_{°C} = (T_{°F} - 32) \div 1.8$
To convert °C to °F:
$T^{°F} = (T_{°C} \times 1.8) + 32$

Other measurements:

1 in	= 25.4 mm
1 mm	= .039 in
1 in^2	= 6.452 cm^2
1 cm^2	= .155 in^2
1 hp	= .735 kW
1 kW	= 1.359 hp
1 Nm	= .73756 Ft.lbs
1 Ft.lbs	= 1.355818 Nm

Imperial to metric

Inches	Decimal	mm
1/16	.06	1.59
1/8	.13	3.18
3/16	.19	4.76
1/4	.25	6.35
5/16	.31	7.94
3/8	.38	9.53
7/16	.44	11.11
1/2	.50	12.70
9/16	.56	14.29
5/8	.63	15.88
11/16	.69	17.46
3/4	.75	19.05
13/16	.81	20.64
7/8	.88	22.23
15/16	.94	23.81
1	1.00	25.40

Cylinder Speed Charts

Cylinder Speed

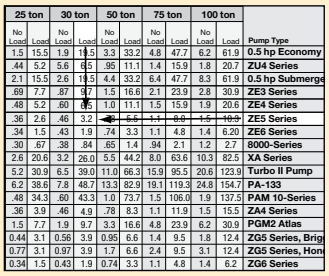
This chart will help you calculate the time required for an Enerpac cylinder to lift a load when powered by a 10,000 psi Enerpac hydraulic pump.

The Cylinder Speed Chart can also be used to determine the pump type and model best suited for an application when you know the plunger speed required.

To determine:

Cylinder plunger speed

An RC-308 cylinder (30 ton) is powered by a ZE-5 pump. While lifting the load, the cylinder plunger will require 3.2 seconds to travel 1 inch. While extending towards the load, the cylinder plunger travels at .46 sec/in.

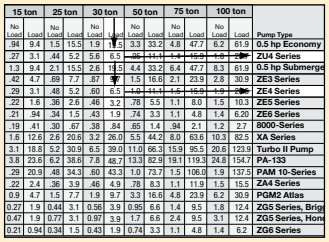


25 ton		30 ton		50 ton		75 ton		100 ton		
No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	Pump Type
1.5	15.5	1.9	19.5	3.3	33.2	4.8	47.7	6.2	61.9	0.5 hp Economy
.44	5.2	5.6	6.5	.95	11.1	1.4	15.9	1.8	20.7	ZU4 Series
2.1	15.5	2.6	19.5	4.4	33.2	6.4	47.7	8.3	61.9	0.5 hp Submerge
.69	7.7	.87	9.7	1.5	16.6	2.1	23.9	2.8	30.9	ZE3 Series
.48	5.2	.60	6.5	1.0	11.1	1.5	15.9	1.9	20.6	ZE4 Series
.36	2.6	.46	3.2	.78	5.5	1.1	8.0	1.5	10.3	ZE5 Series
.34	1.5	.43	1.9	.74	3.3	1.1	4.8	1.4	6.20	ZE6 Series
.30	.67	.38	.84	.65	1.4	.94	2.1	1.2	2.7	8000-Series
2.6	20.6	3.2	26.0	5.5	44.2	8.0	63.6	10.3	82.5	XA Series
5.2	30.9	6.5	39.0	11.0	66.3	15.9	95.5	20.6	123.9	Turbo II Pump
6.2	38.6	7.8	48.7	13.3	82.9	19.1	119.3	24.8	154.7	PA-133
.48	34.3	.60	43.3	1.0	73.7	1.5	106.0	1.9	137.5	PAM 10-Series
.36	3.9	.46	4.9	.78	8.3	1.1	11.9	1.5	15.5	ZA4 Series
1.5	7.7	1.9	9.7	3.3	16.6	4.8	23.9	6.2	30.9	PGM2 Atlas
0.44	3.1	0.56	3.9	0.95	6.6	1.4	9.5	1.8	12.4	ZG5 Series, Brig
0.77	3.1	0.97	3.9	1.7	6.6	2.4	9.5	3.1	12.4	ZG5 Series, Hon
0.34	1.5	0.43	1.9	0.74	3.3	1.1	4.8	1.4	6.2	ZG6 Series

To determine:

Best matching pump

Your 30 ton cylinder needs to move a load at a speed of 6.50 sec/in. Simply go down from the top of the chart, to the value of 6.50 sec/in. Then follow the chart to the right to find that the ZE4 pump or ZU4 is most suitable for your application.



15 ton		25 ton		30 ton		50 ton		75 ton		100 ton		
No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	Pump Type
.94	9.4	1.5	15.5	1.9	19.5	3.3	33.2	4.8	47.7	6.2	61.9	0.5 hp Economy
.27	3.1	.44	5.2	5.6	6.5	.95	11.1	1.4	15.9	1.8	20.7	ZU4 Series
1.3	9.4	2.1	15.5	2.6	19.5	4.4	33.2	6.4	47.7	8.3	61.9	0.5 hp Submerge
.42	4.7	.69	7.7	.87	9.7	1.5	16.6	2.1	23.9	2.8	30.9	ZE3 Series
.29	3.1	.48	5.2	.60	6.5	1.0	11.1	1.5	15.9	1.9	20.6	ZE4 Series
.22	1.6	.36	2.6	.46	3.2	.78	5.5	1.1	8.0	1.5	10.3	ZE5 Series
.21	.94	.34	1.5	.43	1.9	.74	3.3	1.1	4.8	1.4	6.20	ZE6 Series
.19	.41	.30	.67	.38	.84	.65	1.4	.94	2.1	1.2	2.7	8000-Series
1.6	12.6	2.6	20.6	3.2	26.0	5.5	44.2	8.0	63.6	10.3	82.5	XA Series
3.1	18.8	5.2	30.9	6.5	39.0	11.0	66.3	15.9	95.5	20.6	123.9	Turbo II Pump
3.8	23.6	6.2	38.6	7.8	48.7	13.3	82.9	19.1	119.3	24.8	154.7	PA-133
.29	20.9	.48	34.3	.60	43.3	1.0	73.7	1.5	106.0	1.9	137.5	PAM 10-Series
.22	2.4	.36	3.9	.46	4.9	.78	8.3	1.1	11.9	1.5	15.5	ZA4 Series
0.9	4.7	1.5	7.7	1.9	9.7	3.3	16.6	4.8	23.9	6.2	30.9	PGM2 Atlas
0.27	1.9	0.44	3.1	0.56	3.9	0.95	6.6	1.4	9.5	1.8	12.4	ZG5 Series, Brig
0.47	1.9	0.77	3.1	0.97	3.9	1.7	6.6	2.4	9.5	3.1	12.4	ZG5 Series, Hon
0.21	0.94	0.34	1.5	0.43	1.9	0.74	3.3	1.1	4.8	1.4	6.2	ZG6 Series

Number of Pump Handle Strokes per Inch of Cylinder Plunger Travel

Cyl. Capacity ▶	5 ton		10 ton		15 ton		25 ton		30 ton		50 ton		75 ton		100 ton			
▼ Power Source	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	Pump Type	Page
Manual	7	7	15	15	21	21	34	34	43	43	73	73	105	105	137	137	**P-391**	**62**
	2	7	4	15	5	21	8	34	10	43	16	73	24	105	30	137	**P-392**	**62**
	1	7	2	15	3	21	5	34	7	43	11	73	16	105	21	137	**P-80/84/801**	**64**
	1	7	1	15	1	21	2	34	3	43	5	73	7	105	9	137	**P-802/842**	**62**
	1	3	1	8	1	11	1	18	1	23	2	38	2	55	3	71	**P-462/464**	**64**

Seconds per Inch of Cylinder Plunger Travel

Cyl. Capacity ▶	5 ton		10 ton		15 ton		25 ton		30 ton		50 ton		75 ton		100 ton			
▼ Power Source	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	Pump Type	Page
Electric (speed based on 60 Hz)	.30	3.0	.67	6.7	.94	9.4	1.5	15.5	1.9	19.5	3.3	33.2	4.8	47.7	6.2	61.9	**0.5 hp Economy**	**74**
	.08	1.0	.19	2.2	.27	3.1	.44	5.2	5.6	6.5	.95	11.1	1.4	15.9	1.8	20.7	**ZU4 Series**	**82**
	.40	3.0	.90	6.7	1.3	9.4	2.1	15.5	2.6	19.5	4.4	33.2	6.4	47.7	8.3	61.9	**0.5 hp Submerged**	**76**
	.13	1.5	.30	3.4	.42	4.7	.69	7.7	.87	9.7	1.5	16.6	2.1	23.9	2.8	30.9	**ZE3 Series**	**88**
	.09	1.0	.21	2.2	.29	3.1	.48	5.2	.60	6.5	1.0	11.1	1.5	15.9	1.9	20.6	**ZE4 Series**	**88**
	.07	.50	.16	1.12	.22	1.6	.36	2.6	.46	3.2	.78	5.5	1.1	8.0	1.5	10.3	**ZE5 Series**	**88**
	.07	.30	.15	.67	.21	.94	.34	1.5	.43	1.9	.74	3.3	1.1	4.8	1.4	6.20	**ZE6 Series**	**88**
	.06	.13	.13	.29	.19	.41	.30	.67	.38	.84	.65	1.4	.94	2.1	1.2	2.7	**8000-Series**	**94**
Air (speed based on 100 psi air pressure)	.05	4.0	1.1	9.0	1.6	12.6	2.6	20.6	3.2	26.0	5.5	44.2	8.0	63.6	10.3	82.5	**XA Series**	**96**
	1.0	5.9	2.2	13.4	3.1	18.8	5.2	30.9	6.5	39.0	11.0	66.3	15.9	95.5	20.6	123.9	**Turbo II Pump**	**98**
	1.2	7.4	2.7	16.8	3.8	23.6	6.2	38.6	7.8	48.7	13.3	82.9	19.1	119.3	24.8	154.7	**PA-133**	**100**
	.09	6.6	.21	14.9	.29	20.9	.48	34.3	.60	43.3	1.0	73.7	1.5	106.0	1.9	137.5	**PAM 10-Series**	**101**
	.07	.74	.16	1.7	.22	2.4	.36	3.9	.46	4.9	.78	8.3	1.1	11.9	1.5	15.5	**ZA4 Series**	**102**
Gasoline	0.3	1.5	0.7	3.4	0.9	4.7	1.5	7.7	1.9	9.7	3.3	16.6	4.8	23.9	6.2	30.9	**PGM2 Atlas**	**105**
	0.08	0.59	0.19	1.3	0.27	1.9	0.44	3.1	0.56	3.9	0.95	6.6	1.4	9.5	1.8	12.4	**ZG5 Series, Briggs**	**106**
	0.15	0.59	0.34	1.3	0.47	1.9	0.77	3.1	0.97	3.9	1.7	6.6	2.4	9.5	3.1	12.4	**ZG5 Series, Honda**	**106**
	0.07	0.30	0.15	0.67	0.21	0.94	0.34	1.5	0.43	1.9	0.74	3.3	1.1	4.8	1.4	6.2	**ZG6 Series**	**106**

No Load indicates the plunger speed as the plunger extends toward the load (1st stage). **Load** indicates the plunger speed as the load is lifted at a system pressure of 10,000 psi (2nd stage).

Formula V = A ÷ Q

V (sec/in) = **A** (in^2) ÷ **Q** (in^3/min)

V = Cylinder plunger speed in seconds per inch

A = Cylinder effective area in square inches

Q = Pump oil flow in cubic inches

$$\textbf{Cylinder Plunger Speed (sec/in)} = \frac{\textbf{Cylinder Effective Area (in}^2\textbf{)}}{\textbf{Pump Flow Rate (in}^3\textbf{/min)}} \times \frac{\textbf{60 sec}}{\textbf{1}}$$

Example

At what speed (V) will the RC-308 (30 ton) cylinder move when powered by a ZE3 electric driven pump?

ZE3 pump:
Oil flow Q, (no load) is 450 in^3/min

RC-308 cylinder:
Effective area A is 6.50 in^2

V = 6.50 in^2 ÷ 450 in^3/min x 60 = **.87 sec/in**

Ways

The (oil) ports on a valve.
A 3-way valve has 3 ports:
pressure (P), tank (T), and cylinder (A).
A 4-way valve has 4 ports:
pressure (P), tank (T), advance (A) and retract (B).

Single-acting cylinders require at least a 3-way valve, and can, under certain instances, be operated with a 4-way valve.

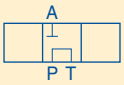
Double-acting cylinders require a 4-way valve, providing control of the flow to each cylinder port.

Positions

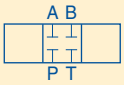
The number of control points a valve can provide. A 2-position valve has the ability to control only the advance or retraction of the cylinder. To be able to control the cylinder with a hold position, the valve requires a 3rd position.

Center Configuration

The center position of a valve is the position at which there is no movement required of the hydraulic component, whether a tool or cylinder.



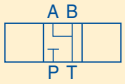
The most common is the **Tandem Center**. This configuration provides for little to no movement of the cylinder and the unloading of the pump. This provides for minimum heat build-up.



The next most common is the **Closed Center** configuration, which is used mostly for independent control of multi-cylinder applications. This configuration again provides for little to no movement of the cylinder, but also dead-heads the pump, isolating it from the circuit.
Use of this type of valve may require some means of unloading the pump to prevent heat build-up.

There are many more types of valves, such as Open Center and Float Center. These valves are used mostly in complex hydraulic circuits and require other special considerations.

Open Center

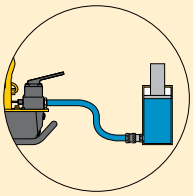


Float Center

Directional Control Valves

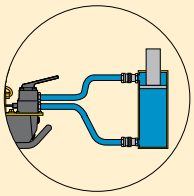
3-Way Valves

are used with single-acting cylinders

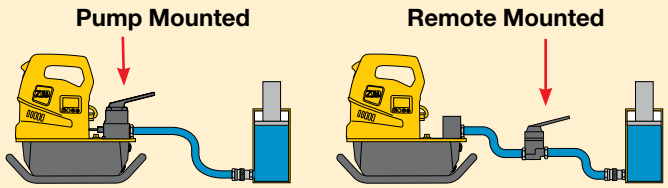


4-Way Valves

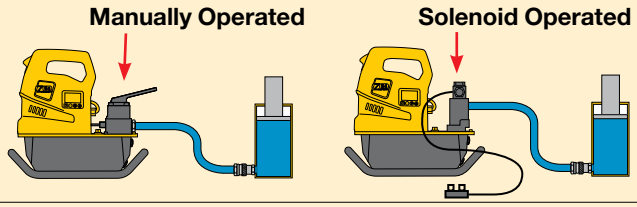
are used with double-acting cylinders



Valves may be either pump mounted or remote mounted.



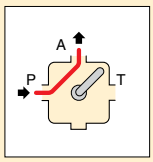
Valves may be either manually or solenoid operated.



Advance Hold Retract

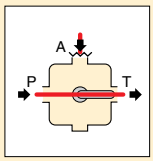
Single-acting cylinder

Controlled by a 3-way, 3-position valve.



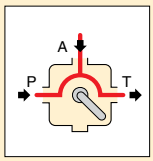
Advance

The oil flows from the pump pressure port P to the cylinder port A: the cylinder plunger will extend.



Hold

The oil flows from the pump pressure port P to the tank T. The cylinder port A is closed: the cylinder plunger will maintain its position.

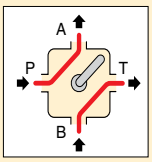


Retract

The oil flows from the pump port P and cylinder port A to the tank T: the cylinder plunger will retract.

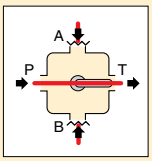
Double-acting cylinder

Controlled by a 4-way, 3-position valve.



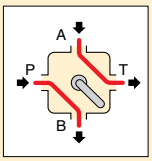
Advance

The oil flows from the pump pressure port P to the cylinder port A, and from cylinder port B to tank T: the cylinder plunger will extend.



Hold

The oil flows from the pump pressure port P to the tank T. The cylinder ports A and B are closed: the cylinder plunger will maintain position.



Retract

The oil flows from the pump pressure port P to cylinder port B, and from cylinder port A to tank T: the cylinder plunger will retract.

Tightening Methods

Principally there are two modes of tightening: "Uncontrolled" and "Controlled".

Uncontrolled tightening
Uses equipment and/or procedures that cannot be measured. Preload is applied to a bolt and nut assembly using a hammer and spanner or other types of impact tools.

Controlled tightening
Employs calibrated and measurable equipment, follows prescribed procedures and is carried out by trained personnel.

For further information on Torque Tightening or other controlled tightening methods, please visit **www.enerpac.com.**

Advantages of Controlled Tightening

Known, controllable and accurate bolt loads

Employs tooling with controllable outputs and adopts calculation to determine the required tool settings.

Uniformity of bolt loading

Especially important on gasketed joints as an even and consistent compression is required for the gasket to be effective.

Safe operation following prescribed procedures

Eliminates the dangerous activities of manual uncontrolled tightening and requires that the operators be skilled and follow procedures.

Reduces operational time resulting in increased productivity

Reduces tightening time and operator fatigue by replacing manual effort with the use of controlled tooling.

Reliable and repeatable results

Using calibrated, tested equipment, following procedures and employing skilled operators achieves known results consistently.

The right results first time

Many of the uncertainties surrounding in-service joint failures are removed by ensuring the correct assembly and tightening of the joint are carried out the first time.

What is Torque?

It is a measure of how much force acting on an object which causes that object to rotate.

What is Torque Tightening?
The application of preload to a fastener by the turning of the fastener's nut.

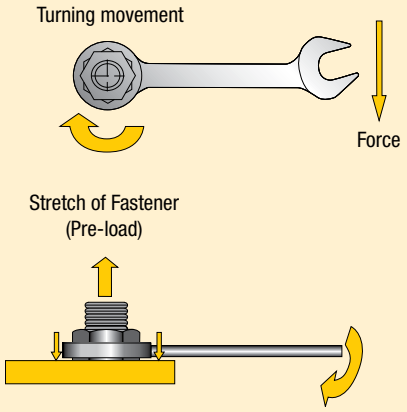
Torque Tightening and Preload

The amount of preload created when torqueing is largely dependant on the effects of friction.

Principally there are three different "torque components":

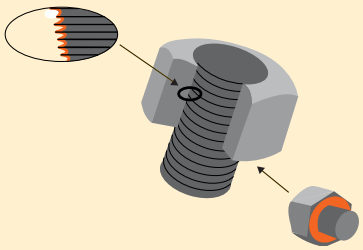
- torque to stretch the bolt
- torque to overcome the friction in bolt and nut threads
- torque to overcome friction at the nut spot face (bearing contact surface).

Torque Tightening



Visit www.enerpac.com to access our free on-line bolting software application and obtain information on tool selection, bolt load calculations and tool pressure settings. A combined application data sheet and joint completion report is also available.

Torque Tightening



Friction points should always be lubricated when using the torque tightening method.

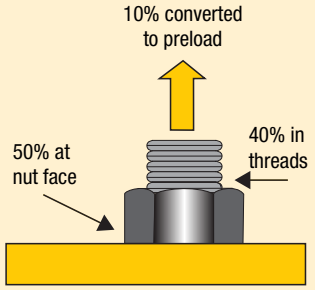
Preload (residual load) = Applied Torque *minus* Frictional Losses

Lubrication Reduces Friction

Lubrication reduces the friction during tightening, decreases bolt failure during installation and increases bolt service life. Variation in friction coefficients affect the amount of preload achieved at a specified torque. Higher friction results in less conversion of torque to preload. The value for the friction coefficient provided by the lubricant manufacturer must be known to accurately establish the required torque value.

Lubricant or anti-seizure compounds should be applied to both the nut bearing surface and the male threads.

Frictional Losses

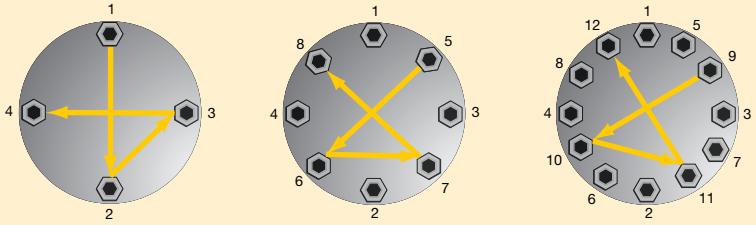


Frictional Losses (dry steel bolt)

Torque Procedure

When torquing it is common to tighten only one bolt at a time, this can result in Point Loading and Load Scatter. To avoid this, torque is applied in stages following a prescribed pattern:

Torque Sequence



Step 1 Spanner tight ensuring that 2 - 3 threads extend above nut

Step 2 Tighten each bolt to **one-third** of the final required torque following the pattern as shown above.

Step 3 Increase the torque to **two-thirds** following the pattern shown above.

Step 4 Increase the torque to **full torque** following the pattern shown above.

Step 5 Perform one final pass on each bolt working clockwise from bolt 1, at the full final torque.

Breakout Torque

When loosening bolts a torque value higher than the tightening torque is normally required. This is mainly due to corrosion and deformations in the bolt and nut threads.

Breakout torque cannot be accurately calculated, however, depending on conditions it can take up to 2½ times the input torque to breakout.

The use of penetrating oils or anti-seize products is always recommended when performing breakout operations.

Select the Right Wrench

Choose your Enerpac torque wrench using the untightening rule of thumb:

- When loosening a nut or bolt more torque is usually required than when tightening.
- For general conditions it can take up to 2½ times the input torque to breakout.
- Do not apply more than 75% of the maximum torque output of the tool when loosening nuts or bolts.

Conditions of bolted joints

- Humidity corrosion (rust) requires up to twice the torque required for tightening.
- Sea water and chemical corrosion requires up to 2½ times the torque required for tightening.
- Heat corrosion requires up to 3 times the torque required for tightening.

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E326

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Page 4-59

Pumps & Directional Control Valves
Page 60-115

System Components & Control Valves
Page 116-133

Presses
Page 134-149

Pullers
Page 150-163

Tools
Page 164-185

Bolting Tools
Page 186-223

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Page 224-240

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