

ENERPAC 

POWERFUL SOLUTIONS. GLOBAL FORCE.



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INDUSTRIAL TOOLS

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Integrated Solutions



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The World Class Brand

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.



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 the new XA-Series of air driven foot pumps, designed for less operator fatigue – with the unique XVARI® Technology, delivering variable oil flow and fine metering for precise control, a full range of aluminium cylinders with the strength of steel and the advantages of aluminium and the Z-Class series of power pumps ... pumps that were designed to run cooler, use less electricity and are easy to service.

To support the demands of the construction industry, Enerpac continues to develop Integrated Solutions capabilities. These capabilities include controlled hydraulic movement for your most challenging applications.



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 BRD-Series).



GR2 Bearing Technology

The exclusive GR2 is a unique bearing design on RC-Series DUO cylinders 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, RC-Series DUO cylinders provide long, trouble-free operation.

Improved saddle retention

Hardened plunger saddle protects plunger end during all lifting operations. Easily removable for access to plunger mounting threads.

Thread protector

Protector is easily attached and removed with oily hands or whilst wearing gloves.

Easy assembly and disassembly

External access to fasteners requires only standard shop tools for simplified maintenance.

Heavy-Duty return spring

Pre-tensioned return spring improves retraction performance, reducing retraction times.

Unique GR2 Bearing System

GR2 design surrounds seal of longer stroke models for improved life and reduced bearing loads. Bearing surface area increases side-load resistance and significantly improves cylinder life.



Coupler Protector

Coupler Dust Cap has new shape and more pliable material for easy push-on/pull-off operation. Protector is easily attached and removed with oily hands or whilst wearing gloves.

Easy assembly and disassembly

External access to fasteners requires only standard shop tools for simplified maintenance.



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

Cylinders and Lifting Products Section Overview

Capacity ¹⁾ ton (kN)	Stroke Range (mm)	Cylinder type and functions	Series	Page
5 - 95 (45 - 933)	16 - 362	General Purpose Cylinders, Single-Acting (incl. accessories)	RC	6 ▶
20 - 150 (229 - 1589)	50 - 250	Aluminium Cylinders, Single-Acting, Lock Nut, Hollow Plunger	RAC,	12 ▶
			RACL	14 ▶
			RACH	16 ▶
20 - 150 (229 - 1589)	50 - 250	Aluminium Cylinders, Double-Acting Solid Plunger	RAR	18 ▶
5 - 520 (45 - 5114)	6 - 62	Pancake and Low Height Cylinders, Single-Acting	CLP	20 ▶
			RSM	22 ▶
			RCS	
2,5 - 50 (24 - 505)	127 - 155	Pull Cylinders, Single-Acting	BRC BRP	24 ▶
13 - 145 (125 - 1429)	8 - 258	Hollow Plunger Cylinders Single- and Double-Acting	RCH	26 ▶
			RRH	28 ▶
4 - 23 (35 - 222)	28 - 260	Precision Production Cylinders Double-Acting (incl. mounting attachments)	BRD	30 ▶
10 - 520 (101 - 5108)	16 - 1219	Long Stroke Cylinders, Double-Acting	RR	32 ▶
50 - 1000 (496 - 10260)	50 - 300	High Tonnage Cylinders, integral stop ring and reduced collapsed height, Single-Acting	CLSG	36 ▶
			CLS	40 ▶
50 - 1000 (496 - 10260)	50 - 300	High Tonnage Cylinders, Double-Acting and Lock Nut Cylinder	CLRG	44 ▶
			CLL	48 ▶
2 - 150 (20 - 1335)	62 - 460	Aluminium and Steel Jacks Bottle Jacks	JHA, JH	52 ▶
			GBJ	53 ▶
54 - 181 (533 - 1778)	356 - 686	POW'R RISER® Lifting Jack	PR	54 ▶
10 - 25 (101 - 232)	54 - 158	High Temperature and Corrosion Resistant Cylinders, Hand Pumps and Valves	RC P V	56 ▶
5 - 95 (45 - 933)	38 - 362	Cylinder - Pump Sets, Single-Acting	SC	58 ▶

¹⁾ All ton values specified in this catalog are metric ton and are for cylinder class identification only. Please refer to the kN data for calculations.

RC-Series DUO, Single-Acting Cylinders

▼ From left to right: RC-506, RC-50, RC-2510, RC-154, RC-10010, RC-55, RC-1010



- Unique GR2 Bearing Design, reduces wear, extending life
- 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
- Redesigned cylinder thread protector for ease of use
- Heavy-duty, pretensioned spring improves retraction speed
- Baked enamel finish for increased corrosion resistance
- CR-400 coupler and dust cap included on all models
- Plunger wiper reduces contamination, extending cylinder life.

▼ General purpose Cylinder - Pump Set – maximum versatility and the easiest way to start working right away.



The Industry Standard General Purpose Cylinder



Saddles

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

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Base Plates

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

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Specialty Attachments

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

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



Single-Acting, General Purpose Cylinders




GR2 Bearing Technology

The exclusive GR2 is a unique bearing design on RC-Series DUO cylinders 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, RC-Series DUO cylinders provide long, trouble-free operation.

▼ QUICK SELECTION CHART

For complete technical information see next page.

Cylinder Capacity	Stroke	Model Number	Cylinder Effective Area	Oil Capacity	Collapsed Height	
ton (kN)	(mm)		(cm ²)	(cm ³)	(mm)	(kg)
5 (45)	16	RC-50**	6,5	10	41	1,0
	25	RC-51	6,5	16	110	1,0
	76	RC-53	6,5	50	165	1,5
	127	RC-55*	6,5	83	215	1,9
	177	RC-57	6,5	115	273	2,4
10 (101)	232	RC-59	6,5	151	323	2,8
	26	RC-101	14,5	38	89	1,8
	54	RC-102*	14,5	78	121	2,3
	105	RC-104	14,5	152	171	3,3
	156	RC-106*	14,5	226	247	4,4
	203	RC-108	14,5	294	298	5,4
	257	RC-1010*	14,5	373	349	6,4
	304	RC-1012	14,5	441	400	6,8
15 (142)	356	RC-1014	14,5	516	450	8,2
	25	RC-151	20,3	51	124	3,3
	51	RC-152	20,3	104	149	4,1
	101	RC-154*	20,3	205	200	5,0
	152	RC-156*	20,3	308	271	6,8
	203	RC-158	20,3	411	322	8,2
	254	RC-1510	20,3	516	373	9,5
	305	RC-1512	20,3	619	423	10,9
25 (232)	356	RC-1514	20,3	723	474	11,8
	26	RC-251	33,2	86	139	5,9
	50	RC-252*	33,2	166	165	6,4
	102	RC-254*	33,2	339	215	8,2
	158	RC-256*	33,2	525	273	10,0
	210	RC-258	33,2	697	323	12,2
	261	RC-2510	33,2	867	374	14,1
	311	RC-2512	33,2	1033	425	16,3
30(295)	362	RC-2514*	33,2	1202	476	17,7
50 (498)	209	RC-308	42,1	880	387	18,1
	51	RC-502	71,2	362	176	15,0
	101	RC-504	71,2	719	227	19,1
	159	RC-506*	71,2	1131	282	23,1
75 (718)	337	RC-5013	71,2	2399	460	37,6
	156	RC-756	102,6	1601	285	29,5
	333	RC-7513	102,6	3417	492	59,0
95 (933)	168	RC-1006	133,3	2239	357	59,0
	260	RC-10010	133,3	3466	449	72,6

* Available as set, see note on this page.

** RC-50 cylinder has a non removable grooved saddle and no collar thread.

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RC Series



Capacity:

5 - 95 ton

Stroke:

16 - 362 mm

Maximum Operating Pressure:

700 bar



Think Safety

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

Good practice encourages using only 80% of these ratings.

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Lightweight Aluminium Cylinders

If you need a higher cylinder capacity-to-weight-ratio the RAC-Series are the perfect choice.

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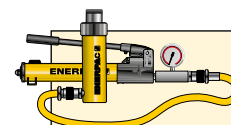


Gauges

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.

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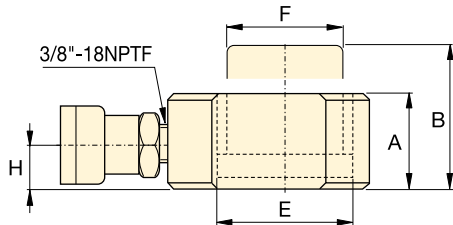
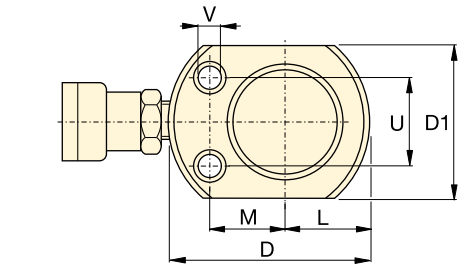


Cylinder-Pump Sets

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

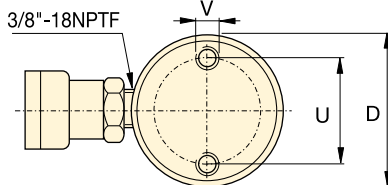
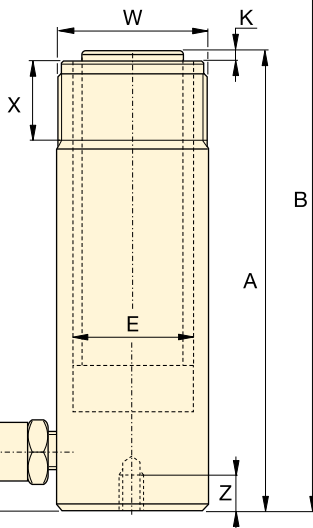
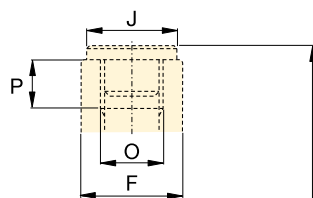
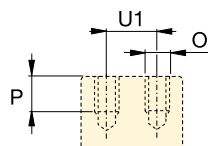
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RC-Series DUO, Single-Acting Cylinders

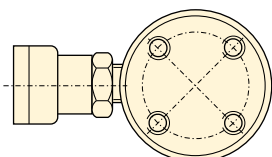


RC-50

RC-101 only
(U1 = 19 mm)



RC-51 - RC-5013



RC-1006, RC-10010



Speed Chart

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

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◀ For full features see previous page.

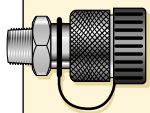
Cylinder Capacity	Stroke	Model Number	Cylinder Effective Area	Oil Capacity	Collapsed Height	Extended Height	Outside Dia.
ton (kN)	(mm)		(cm ²)	(cm ³)	A (mm)	B (mm)	D (mm)
5 (45)	16	RC-50**	6,5	10	41	57	58***
	25	RC-51	6,5	16	110	135	38
	76	RC-53	6,5	50	165	241	38
	127	RC-55*	6,5	83	215	342	38
	177	RC-57	6,5	115	273	450	38
10 (101)	232	RC-59	6,5	151	323	555	38
	26	RC-101	14,5	38	89	115	57
	54	RC-102*	14,5	78	121	175	57
	105	RC-104	14,5	152	171	276	57
	156	RC-106*	14,5	226	247	403	57
	203	RC-108	14,5	294	298	501	57
	257	RC-1010*	14,5	373	349	606	57
15 (142)	304	RC-1012	14,5	441	400	704	57
	356	RC-1014	14,5	516	450	806	57
	25	RC-151	20,3	51	124	149	69
	51	RC-152	20,3	104	149	200	69
	101	RC-154*	20,3	205	200	301	69
	152	RC-156*	20,3	308	271	423	69
	203	RC-158	20,3	411	322	525	69
25 (232)	254	RC-1510	20,3	516	373	627	69
	305	RC-1512	20,3	619	423	728	69
	356	RC-1514	20,3	723	474	830	69
	26	RC-251	33,2	86	139	165	85
	50	RC-252*	33,2	166	165	215	85
	102	RC-254*	33,2	339	215	317	85
	158	RC-256*	33,2	525	273	431	85
30 (295)	210	RC-258	33,2	697	323	533	85
	261	RC-2510	33,2	867	374	635	85
	311	RC-2512	33,2	1033	425	736	85
	362	RC-2514*	33,2	1202	476	838	85
	209	RC-308	42,1	880	387	596	101
	50 (498)	51	RC-502	71,2	362	176	227
101		RC-504	71,2	719	227	328	127
159		RC-506*	71,2	1131	282	441	127
337		RC-5013	71,2	2399	460	797	127
75 (718)	156	RC-756	102,6	1601	285	441	146
	333	RC-7513	102,6	3417	492	825	146
95 (933)	168	RC-1006	133,3	2239	357	525	177
	260	RC-10010	133,3	3466	449	709	177

* Available as set, see note on page 7.

** RC-50 cylinder has a non removable grooved saddle and no collar thread.

*** D1 = 41 mm, L = 20 mm, M = 25 mm.

Single-Acting, General Purpose Cylinders



Couplers Included!

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


Capacity:
5 - 95 ton

Stroke:
16 - 362 mm

Maximum Operating Pressure:
700 bar

RC Series



Cylinder Bore Dia. E (mm)	Plunger Dia. F (mm)	Base to Adv. Port H (mm)	Saddle Dia. J (mm)	Saddle Protr. from Plgr. K (mm)	Plunger Internal Thread O	Plunger Thread Length P (mm)	Base Mounting Holes			Collar Thread W	Collar Thread Length X (mm)	 (kg)	Model Number
							Bolt Circle U (mm)	Thread V	Thd. Depth Z (mm)				
28,7	25,4	19	**	**	**	**	28	5,6 mm	—	—	—	1,0	RC-50**
28,7	25,4	19	25	6	3/4" - 16 UN	14	25	1/4" - 20 UN	14	1 1/2" - 16 UN	28	1,0	RC-51
28,7	25,4	19	25	6	3/4" - 16 UN	14	25	1/4" - 20 UN	14	1 1/2" - 16 UN	28	1,5	RC-53
28,7	25,4	19	25	6	3/4" - 16 UN	14	25	1/4" - 20 UN	14	1 1/2" - 16 UN	28	1,9	RC-55*
28,7	25,4	19	25	6	3/4" - 16 UN	16	25	1/4" - 20 UN	14	1 1/2" - 16 UN	28	2,4	RC-57
28,7	25,4	19	25	6	3/4" - 16 UN	16	25	1/4" - 20 UN	14	1 1/2" - 16 UN	28	2,8	RC-59
42,9	38,1	19	—	—	#10 - 24 UN	6	39	5/16" - 18 UN	12	2 1/4" - 14	26	1,8	RC-101
42,9	38,1	19	35	6	1" - 8 UN	19	39	5/16" - 18 UN	12	2 1/4" - 14 UN	26	2,3	RC-102*
42,9	38,1	19	35	6	1" - 8 UN	19	39	5/16" - 18 UN	12	2 1/4" - 14 UN	26	3,3	RC-104
42,9	38,1	19	35	6	1" - 8 UN	19	39	5/16" - 18 UN	12	2 1/4" - 14 UN	26	4,4	RC-106*
42,9	38,1	19	35	6	1" - 8 UN	19	39	5/16" - 18 UN	12	2 1/4" - 14 UN	26	5,4	RC-108
42,9	38,1	19	35	6	1" - 8 UN	19	39	5/16" - 18 UN	12	2 1/4" - 14 UN	26	6,4	RC-1010*
42,9	38,1	19	35	6	1" - 8 UN	19	39	5/16" - 18 UN	12	2 1/4" - 14 UN	26	6,8	RC-1012
42,9	38,1	19	35	6	1" - 8 UN	19	39	5/16" - 18 UN	12	2 1/4" - 14 UN	26	8,2	RC-1014
50,8	41,4	19	38	9	1" - 8 UN	25	48	3/8" - 16 UN	12	2 3/4" - 16 UN	30	3,3	RC-151
50,8	41,4	19	38	9	1" - 8 UN	22	48	3/8" - 16 UN	12	2 3/4" - 16 UN	30	4,1	RC-152
50,8	41,4	19	38	9	1" - 8 UN	22	48	3/8" - 16 UN	12	2 3/4" - 16 UN	30	5,0	RC-154*
50,8	41,4	25	38	9	1" - 8 UN	25	48	3/8" - 16 UN	12	2 3/4" - 16 UN	30	6,8	RC-156*
50,8	41,4	25	38	9	1" - 8 UN	25	48	3/8" - 16 UN	12	2 3/4" - 16 UN	30	8,2	RC-158
50,8	41,4	25	38	9	1" - 8 UN	25	48	3/8" - 16 UN	12	2 3/4" - 16 UN	30	9,5	RC-1510
50,8	41,4	25	38	9	1" - 8 UN	25	48	3/8" - 16 UN	12	2 3/4" - 16 UN	30	10,9	RC-1512
50,8	41,4	25	38	9	1" - 8 UN	25	48	3/8" - 16 UN	12	2 3/4" - 16 UN	30	11,8	RC-1514
65,0	57,2	25	50	10	1 1/2" - 16 UN	25	58	1/2" - 13 UN	19	3 5/16" - 12 UN	49	5,9	RC-251
65,0	57,2	25	50	10	1 1/2" - 16 UN	25	58	1/2" - 13 UN	19	3 5/16" - 12 UN	49	6,4	RC-252*
65,0	57,2	25	50	10	1 1/2" - 16 UN	25	58	1/2" - 13 UN	19	3 5/16" - 12 UN	49	8,2	RC-254*
65,0	57,2	25	50	10	1 1/2" - 16 UN	25	58	1/2" - 13 UN	19	3 5/16" - 12 UN	49	10,0	RC-256*
65,0	57,2	25	50	10	1 1/2" - 16 UN	25	58	1/2" - 13 UN	19	3 5/16" - 12 UN	49	12,2	RC-258
65,0	57,2	25	50	10	1 1/2" - 16 UN	25	58	1/2" - 13 UN	19	3 5/16" - 12 UN	49	14,1	RC-2510
65,0	57,2	25	50	10	1 1/2" - 16 UN	25	58	1/2" - 13 UN	19	3 5/16" - 12 UN	49	16,3	RC-2512
65,0	57,2	25	50	10	1 1/2" - 16 UN	25	58	1/2" - 13 UN	19	3 5/16" - 12 UN	49	17,7	RC-2514*
73,2	57,2	57	50	10	1 1/2" - 16 UN	25	—	—	—	3 5/16" - 12 UN	49	18,1	RC-308
95,2	79,5	33	71	2	—	—	95	1/2" - 13 UN	19	5" - 12 UN	55	15,0	RC-502
95,2	79,5	33	71	2	—	—	95	1/2" - 13 UN	19	5" - 12 UN	55	19,1	RC-504
95,2	79,5	35	71	2	—	—	95	1/2" - 13 UN	19	5" - 12 UN	55	23,1	RC-506*
95,2	79,5	35	71	2	—	—	95	1/2" - 13 UN	19	5" - 12 UN	55	37,6	RC-5013
114,3	95,2	30	71	5	—	—	—	—	—	5 3/4" - 12 UN	44	29,5	RC-756
114,3	95,2	30	71	5	—	—	—	—	—	5 3/4" - 12 UN	44	59,0	RC-7513
130,3	104,9	41	71	2	—	—	140	3/4" - 10 UN	25	6 7/8" - 12 UN	44	59,0	RC-1006
130,3	104,9	41	71	2	—	—	140	3/4" - 10 UN	25	6 7/8" - 12 UN	44	72,6	RC-10010

▼ SELECTION CHART

For use with Cylinder Capacity ton (kN)	Saddles			Base Plate	Mounting Block	Clevis Eyes	
	Flat	Grooved ¹⁾	Tilt			Base ⁴⁾	Plunger
5 (45)	A-53F ²⁾	A-53G ²⁾	-	-	RB-5 ²⁾ , AW-51 ²⁾ , AW-53 ²⁾	REB-5 ²⁾	REP-5 ²⁾
10 (101)	A-12 ³⁾ , A-102F ³⁾	A-102G ³⁾	CAT-10 ³⁾	JB-10	RB-10, AW-102	REB-10	REP-10 ³⁾
15 (142)	-	A-152G	CAT-10	-	RB-15	REB-15	REP-10
25 (232)	A-29 ⁵⁾	A-252G	CAT-50	JB-25	RB-25	REB-25	REP-25
30 (295)	A-29 ⁵⁾	A-252G	CAT-50	-	RB-25	-	REP-25
50 (498)	-	-	CAT-100	JB-50	-	-	-
75 (718)	-	-	CAT-100	-	-	-	-
95 (933)	-	-	CAT-100	-	-	-	-

¹⁾ Standard on 5-30 ton RC-cylinders ²⁾ Except RC-50 ³⁾ Except RC-101 ⁴⁾ Mounting screws are included. ⁵⁾ Used with Bender Sets.

▼ DIMENSION CHARTS

Model Number	Saddle Dimensions (mm)			A-53F, A-102F A-12, A-29	Model Number	Tilt Saddle Dimensions (mm)			Diagram	
	A	B	C			A	B	C		
Flat						Tilt				
A-53F	25	6	17			CAT-10	35	15		22
A-102F	35	6	22			CAT-50	50	23		35
A-12	51	48	1"-8 UNC							
A-29	51	48	1 1/2"-16 UNC							
Grooved					Tilt					
A-53G	25	6	17		CAT-100	71	24		-	
A-102G	35	6	22							
A-152G	38	9	22							
A-252G	50	9	35							

Model Number	Base Plate Dimensions (mm)					Diagram
	A	B	C	D	E	
JB-10	228	228	135	58	20	
JB-25	279	279	140	86	26	
JB-50	304	15	95	131	31	

Model Number	Mounting Block Dimensions (mm)								Diagram
	A	B	C	D	E	F	G	H	
RB-5	1 1/2"-16UN	88	76	-	25	-	-	-	
AW-51	1 1/2"-16UN	70	59	10	24	54	1/4"-16 UN	41	
AW-53	1 1/2"-16UN	72	7	7	19	57	1/4"-20 UN	10	
RB-10	2 1/4"-14UN	114	88	-	25	-	-	-	
AW-102	2 1/4"-14UN	100	82	16	30	76	7/16"-20 UN	58	
RB-15	2 3/4"-16UN	101	114	-	38	-	-	-	
RB-25	3 3/16"-12UN	127	165	-	50	-	-	-	

Type	Model Number	Clevis Eye Dimensions (mm)						Pin-to-Pin * (mm)	Diagram
		A	B	C	D	E	F		
Base ⁴⁾	REB-5	44	47	14	16	16	25	60,2	
	REB-10	63	66	25	22	25	35	78,0	
	REB-15	76	66	25	22	25	35	78,0	
	REB-25	95	79	38	31	31	41	87,6	
Plunger	REP-5	28	45	14	16	16	19	-	
	REP-10	42	61	25	22	25	28	-	
	REP-25	57	71	38	31	31	35	-	

⁴⁾ Mounting screws are included.

* Pin to Pin – REB and REP Clevises fitted. Add cylinder collapsed height.

The Enerpac Lightweight Aluminium Cylinders

▼ From left to right: RAC, RACL, RACH, RAR



- **Lightweight, easy to carry and position to allow a higher cylinder capacity-to-weight-ratio**
- **Non-corrosive by design, aluminium 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.**



RA Series

Capacity:
20 - 150 ton

Stroke:
50 - 250 mm

Maximum Operating Pressure:
700 bar



Think Safety

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

Good practice encourages using only 80% of these ratings.

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Aluminium versus Steel

Aluminium 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. Aluminium cylinders should NOT be used in high-cycle applications such as production.

The Enerpac line of aluminium 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.



Steel Base Plate

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

The base holes in these aluminium 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 aluminium cylinders to attach any device to the cylinder.

RAC-Series, Aluminium Cylinders

▼ Shown from left to right: RAC-5010, RAC-15010, RAC-304, RAC-208



Lightweight for Maximum Portability



Saddles

All RAC-cylinders are equipped with bolt-on removable hardened steel saddles. For Tilt Saddles see next page.

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Lightweight Hand Pumps

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

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- 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 base plate 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.

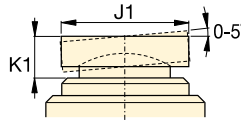
Cylinder Capacity @ 700 bar ton (kN)	Stroke (mm)	Model Number	Cylinder Effective Area (cm ²)
20 (218)	50	RAC-202	31,2
	100	RAC-204	31,2
	150	RAC-206	31,2
	200	RAC-208	31,2
	250	RAC-2010	31,2
30 (309)	50	RAC-302	44,2
	100	RAC-304	44,2
	150	RAC-306	44,2
	200	RAC-308	44,2
	250	RAC-3010	44,2
50 (496)	50	RAC-502	70,9
	100	RAC-504	70,9
	150	RAC-506	70,9
	200	RAC-508	70,9
	250	RAC-5010	70,9
100 (1002)	50	RAC-1002	143,1
	100	RAC-1004	143,1
	150	RAC-1006	143,1
	200	RAC-1008	143,1
	250	RAC-10010	143,1
150 (1589)	50	RAC-1502	227,0
	100	RAC-1504	227,0
	150	RAC-1506	227,0
	200	RAC-1508	227,0
	250	RAC-15010	227,0



◀ The unique Enerpac RA-Series cylinders – lightweight and entirely made of aluminium alloy – these RAC-506 cylinders are ideal for the positioning of tunnel elements under the river. (High Speed Train Line, The Netherlands)

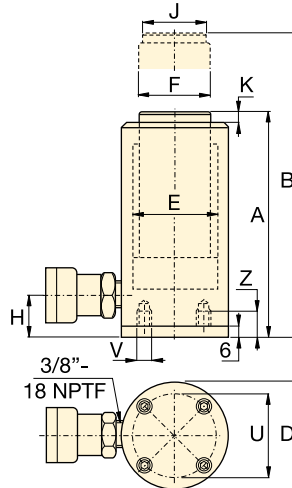
Single-Acting, Aluminium Cylinders

Optional Bolt-on Tilt Saddle Dimensions (mm)			
For Cylinder Model / Capacity ton	Tilt Saddle Model Number	Tilt Saddle Diameter J1	Saddle Protrusion from Plunger K1
RAC-50	CATG-50	50	24
RAC-100	CATG-150	91	31
RAC-150	CATG-200	118	35



Steel Base Plate Mounting Holes			
Cylinder Model / Capacity ton	Bolt Circle U (mm)	Thread V (mm)	Thread Depth ¹⁾ Z (mm)
RAC-20	70	M6	12
RAC-30	80	M6	12
RAC-50	110	M6	12
RAC-100	150	M10	12
RAC-150	200	M10	12

¹⁾ Including Base Plate Height of 6 mm and four (4) base plate bolts M6.



RAC Series



Capacity:

20 - 150 ton

Stroke:

50 - 250 mm

Maximum Operating Pressure:

700 bar

Oil Capacity (cm ³)	Collapsed Height A (mm)	Extended Height B (mm)	Outside Diameter D (mm)	Cylinder Bore Diameter E (mm)	Plunger Diameter F (mm)	Bottom to Advance Port H (mm)	Saddle Diameter J (mm)	Saddle Protrusion from Plunger K (mm)	Weight (kg)	Model Number
156	174	224	85	63	50	27	40	3	3,6	RAC-202
312	224	324	85	63	50	27	40	3	4,1	RAC-204
468	274	424	85	63	50	27	40	3	4,6	RAC-206
624	324	524	85	63	50	27	40	3	5,1	RAC-208
780	374	624	85	63	50	27	40	3	5,6	RAC-2010
221	181	231	100	75	60	32	40	3	4,5	RAC-302
442	231	331	100	75	60	32	40	3	5,2	RAC-304
663	281	431	100	75	60	32	40	3	5,9	RAC-306
884	331	531	100	75	60	32	40	3	6,6	RAC-308
1105	381	631	100	75	60	32	40	3	7,3	RAC-3010
354	186	236	130	95	80	30	50	3	8,5	RAC-502
709	236	336	130	95	80	30	50	3	9,8	RAC-504
1063	286	436	130	95	80	30	50	3	11,1	RAC-506
1417	336	536	130	95	80	30	50	3	12,4	RAC-508
1771	386	636	130	95	80	30	50	3	13,7	RAC-5010
715	221	271	180	135	110	46	94	3	17,3	RAC-1002
1431	271	371	180	135	110	46	94	3	19,6	RAC-1004
2147	321	471	180	135	110	46	94	3	21,9	RAC-1006
2863	371	571	180	135	110	46	94	3	24,2	RAC-1008
3578	421	671	180	135	110	46	94	3	26,5	RAC-10010
1135	243	293	230	170	140	51	113	3	25,3	RAC-1502
2270	293	393	230	170	140	51	113	3	29,3	RAC-1504
3405	343	493	230	170	140	51	113	3	33,3	RAC-1506
4540	393	593	230	170	140	51	113	3	37,3	RAC-1508
5675	443	693	230	170	140	51	113	3	41,3	RAC-15010

RACL-Series, Aluminium Lock Nut Cylinders

▼ Shown from left to right: RACL-1006, RACL-504, RACL-5010



- Aluminium Lock Nut provides mechanical load holding for extended periods
- Hardened steel stop ring increasing 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 base plate 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 supports during epoxy injection for bridge reinforcement.



Saddles

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

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Hoses

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

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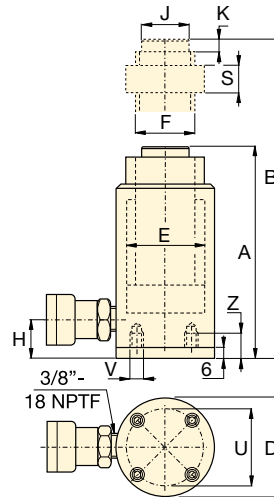
Cylinder Capacity @ 700 bar ton (kN)	Stroke (mm)	Model Number	Cylinder Effective Area (cm ²)
20 (218)	50	RACL-202	31,2
	100	RACL-204	31,2
	150	RACL-206	31,2
	200	RACL-208	31,2
	250	RACL-2010	31,2
30 (309)	50	RACL-302	44,2
	100	RACL-304	44,2
	150	RACL-306	44,2
	200	RACL-308	44,2
	250	RACL-3010	44,2
50 (496)	50	RACL-502	70,9
	100	RACL-504	70,9
	150	RACL-506	70,9
	200	RACL-508	70,9
	250	RACL-5010	70,9
100 (1002)	50	RACL-1002	143,1
	100	RACL-1004	143,1
	150	RACL-1006	143,1
	200	RACL-1008	143,1
	250	RACL-10010	143,1
150 (1589)	50	RACL-1502	227,0
	100	RACL-1504	227,0
	150	RACL-1506	227,0
	200	RACL-1508	227,0
	250	RACL-15010	227,0

Single-Acting, Aluminium Lock Nut Cylinders

Optional Bolt-on Tilt Saddle Dimensions (mm)				
For Cylinder Model / Capacity ton	Tilt Saddle Model Number	Tilt Saddle Diameter J1	Saddle Protrusion from Plunger K1	
RACL-50	CATG-50	50	24	
RACL-100	CATG-150	91	31	
RACL-150	CATG-200	118	35	

Steel Base Plate Mounting Holes			
Cylinder Model / Capacity ton	Bolt Circle U (mm)	Thread V (mm)	Thread Depth ¹⁾ Z (mm)
RACL-20	70	M6	12
RACL-30	80	M6	12
RACL-50	110	M6	12
RACL-100	150	M10	12
RACL-150	200	M10	12

¹⁾ Including Base Plate Height of 6 mm and four (4) base plate bolts M6.



RACL Series



Capacity:

20 - 150 ton

Stroke:

50 - 250 mm

Maximum Operating Pressure:

700 bar

Oil Capacity (cm ³)	Collapsed Height A (mm)	Extended Height B (mm)	Outside Diameter D (mm)	Cylinder Bore Diameter E (mm)	Plunger Diameter (Threaded) F (mm)	Bottom to Advance Port H (mm)	Saddle Diameter J (mm)	Saddle Protrusion from Plunger K (mm)	Lock Nut Height S (mm)	Weight (kg)	Model Number
156	224	274	85	63	Tr 55 x 4	27	40	3	50	4,0	RACL-202
312	274	374	85	63	Tr 55 x 4	27	40	3	50	4,6	RACL-204
468	324	474	85	63	Tr 55 x 4	27	40	3	50	5,2	RACL-206
624	374	574	85	63	Tr 55 x 4	27	40	3	50	5,8	RACL-208
780	424	674	85	63	Tr 55 x 4	27	40	3	50	6,4	RACL-2010
221	231	281	100	75	Tr 60 x 4	33	40	3	50	5,4	RACL-302
442	281	381	100	75	Tr 60 x 4	33	40	3	50	6,1	RACL-304
663	331	481	100	75	Tr 60 x 4	33	40	3	50	6,8	RACL-306
883	381	581	100	75	Tr 60 x 4	33	40	3	50	7,5	RACL-308
1105	431	681	100	75	Tr 60 x 4	33	40	3	50	8,2	RACL-3010
354	236	286	130	95	Tr 80 x 4	30	50	3	50	9,3	RACL-502
709	286	386	130	95	Tr 80 x 4	30	50	3	50	10,6	RACL-504
1063	336	486	130	95	Tr 80 x 4	30	50	3	50	11,9	RACL-506
1417	386	586	130	95	Tr 80 x 4	30	50	3	50	13,2	RACL-508
1771	436	686	130	95	Tr 80 x 4	30	50	3	50	14,5	RACL-5010
716	296	346	180	135	Tr 110 x 6	46	94	3	75	21,9	RACL-1002
1431	346	446	180	135	Tr 110 x 6	46	94	3	75	24,2	RACL-1004
2147	396	546	180	135	Tr 110 x 6	46	94	3	75	26,5	RACL-1006
2863	446	646	180	135	Tr 110 x 6	46	94	3	75	28,8	RACL-1008
3578	496	746	180	135	Tr 110 x 6	46	94	3	75	31,1	RACL-10010
1135	323	373	230	170	Tr 140 x 6	51	113	3	80	32,2	RACL-1502
2270	373	473	230	170	Tr 140 x 6	51	113	3	80	36,2	RACL-1504
3405	423	573	230	170	Tr 140 x 6	51	113	3	80	40,2	RACL-1506
4540	473	673	230	170	Tr 140 x 6	51	113	3	80	44,2	RACL-1508
5675	523	773	230	170	Tr 140 x 6	51	113	3	80	48,2	RACL-15010

▼ Shown from left to right: RACH-1504, RACH-15010, RACH-206, RACH-306



The Lightweight Solution for Tensioning and Testing



Saddles

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



Lightweight Hand Pumps

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

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- Hollow plunger design allows for both pull and push forces
- Composite bearings increase cylinder life and sideload resistance
- Hard-Coat finish on all surfaces resists damage and extends cylinder life
- Floating center tube increases seal and product life
- Handles standard on all models
- Steel base plate 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.



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

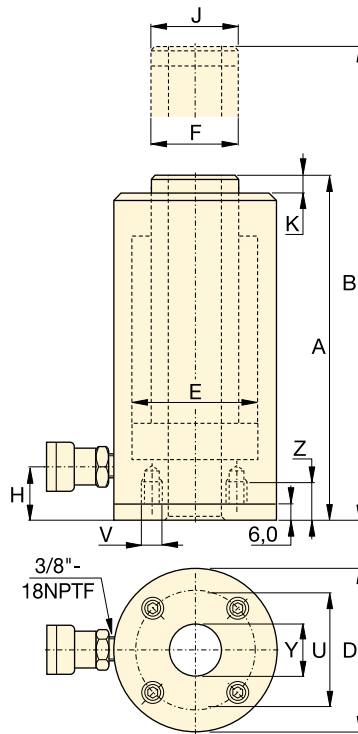
Cylinder Capacity @ 700 bar ton (kN)	Stroke (mm)	Model Number	Cylinder Effective Area (cm ²)
20 (229)	50	RACH-202	32,7
	100	RACH-204	32,7
	150	RACH-206	32,7
	200	RACH-208	32,7
	250	RACH-2010	32,7
30 (358)	50	RACH-302	51,1
	100	RACH-304	51,1
	150	RACH-306	51,1
	200	RACH-308	51,1
	250	RACH-3010	51,1
60 (596)	50	RACH-602	84,7
	100	RACH-604	84,7
	150	RACH-606	84,7
	200	RACH-608	84,7
	250	RACH-6010	84,7
100 (1157)	50	RACH-1002	164,6
	100	RACH-1004	164,6
	150	RACH-1006	164,6
	200	RACH-1008	164,6
	250	RACH-10010	164,6
150 (1588)	50	RACH-1502	225,8
	100	RACH-1504	225,8
	150	RACH-1506	225,8
	200	RACH-1508	225,8
	250	RACH-15010	225,8

Single-Acting, Aluminium Hollow Plunger Cylinders

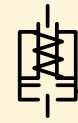
Steel Base Plate Mounting Holes

Cylinder Model / Capacity ton	Bolt Circle U (mm)	Thread V (mm)	Thread Depth ¹⁾ Z (mm)
RACH-20	80	M6	12
RACH-30	110	M6	12
RACH-60	160	M6	12
RACH-100	220	M10	12
RACH-150	245	M10	12

¹⁾ Including Base Plate Height of 6 mm and four (4) base plate bolts M6.



RACH Series



Capacity:

20 - 150 ton

Stroke:

50 - 250 mm

Center Hole Diameter:

27 - 79 mm

Maximum Operating Pressure:

700 bar

Oil Capacity (cm ³)	Collapsed Height A (mm)	Extended Height B (mm)	Outside Diameter D (mm)	Cylinder Bore Diameter E (mm)	Plunger Diameter F (mm)	Bottom to Advance Port H (mm)	Saddle Diameter J (mm)	Saddle Protrusion from Plunger K (mm)	Center Hole Diameter Y (mm)	Weight (kg)	Model Number
164	188	238	100	75	55	29	55	10	27	5,2	RACH-202
327	251	351	100	75	55	29	55	10	27	6,1	RACH-204
491	315	465	100	75	55	29	55	10	27	7,1	RACH-206
654	378	578	100	75	55	29	55	10	27	8,0	RACH-208
818	442	692	100	75	55	29	55	10	27	9,0	RACH-2010
256	208	258	130	95	70	29	70	10	34	8,0	RACH-302
511	267	367	130	95	70	29	70	10	34	9,5	RACH-304
766	333	483	130	95	70	29	70	10	34	11,2	RACH-306
1022	395	595	130	95	70	29	70	10	34	12,9	RACH-308
1277	458	708	130	95	70	29	70	10	34	14,5	RACH-3010
423	251	301	180	130	100	61	100	12	54	16,2	RACH-602
847	315	415	180	130	100	61	100	12	54	19,5	RACH-604
1270	380	530	180	130	100	61	100	12	54	25,6	RACH-606
1694	445	645	180	130	100	61	100	12	54	26,0	RACH-608
2117	510	760	180	130	100	61	100	12	54	29,6	RACH-6010
823	258	308	250	185	145	61	145	14	79	33,8	RACH-1002
1646	325	425	250	185	145	61	145	14	79	39,8	RACH-1004
2487	391	541	250	185	145	61	145	14	79	46,2	RACH-1006
3291	459	659	250	185	145	61	145	14	79	52,2	RACH-1008
4114	527	777	250	185	145	61	145	14	79	58,8	RACH-10010
1129	280	330	275	205	150	61	145	14	79	48,9	RACH-1502
2258	360	460	275	205	150	61	145	14	79	55,7	RACH-1504
3387	430	580	275	205	150	61	145	14	79	63,0	RACH-1506
4517	500	700	275	205	150	61	145	14	79	70,1	RACH-1508
5646	570	820	275	205	150	61	145	14	79	77,2	RACH-15010

RAR, Double-Acting, Aluminium Cylinders

▼ Shown from left to right: RAR-5010, RAR-308, RAR-204



Saddles

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

For Tilt Saddles see next page.

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Hoses

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

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- Double-acting for rapid retraction, regardless of hose lengths or system losses
- Composite bearings increase cylinder life and sideload resistance
- Hard-Coat finish on all surfaces resists damage and extends cylinder life
- Handles included on all models
- Steel base plate 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.

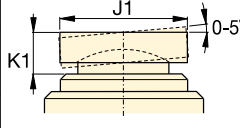
▼ An RAR-506 was easy to position under a bulldozer for repair of frame member.



Cylinder Capacity @ 700 bar	Stroke (mm)	Model Number	Max. Cylinder Capacity (kN)		Cylinder Effective Area (cm ²)		Oil Capacity (cm ³)	
			Push	Pull	Push	Pull	Push	Pull
20	50	RAR-202	218	130	31,2	18,6	156	93
	100	RAR-204	218	130	31,2	18,6	312	186
	150	RAR-206	218	130	31,2	18,6	468	279
	200	RAR-208	218	130	31,2	18,6	624	372
	250	RAR-2010	218	130	31,2	18,6	780	465
30	50	RAR-302	309	179	44,2	24,5	221	123
	100	RAR-304	309	179	44,2	24,5	442	245
	150	RAR-306	309	179	44,2	24,5	663	368
	200	RAR-308	309	179	44,2	24,5	884	490
	250	RAR-3010	309	179	44,2	24,5	1105	613
50	50	RAR-502	496	187	70,9	26,7	354	134
	100	RAR-504	496	187	70,9	26,7	709	267
	150	RAR-506	496	187	70,9	26,7	1063	401
	200	RAR-508	496	187	70,9	26,7	1417	534
	250	RAR-5010	496	187	70,9	26,7	1771	668
100	50	RAR-1002	1002	557	143,1	79,5	715	398
	100	RAR-1004	1002	557	143,1	79,5	1431	795
	150	RAR-1006	1002	557	143,1	79,5	2147	1193
	200	RAR-1008	1002	557	143,1	79,5	2863	1590
	250	RAR-10010	1002	557	143,1	79,5	3578	1988
150	50	RAR-1502	1589	924	227,0	132,0	1135	660
	100	RAR-1504	1589	924	227,0	132,0	2270	1320
	150	RAR-1506	1589	924	227,0	132,0	3405	1980
	200	RAR-1508	1589	924	227,0	132,0	4540	2640
	250	RAR-15010	1589	924	227,0	132,0	5675	3300

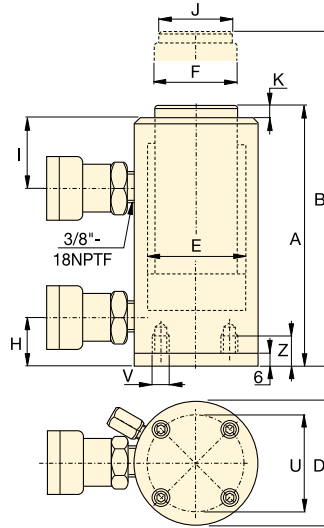
Double-Acting, Aluminium Cylinders

Optional Bolt-on Tilt Saddle Dimensions (mm)			
For Cylinder Model / Capacity ton	Tilt Saddle Model Number	Tilt Saddle Diameter J1	Saddle Protrusion from Plunger K1
RAR-50	CATG-50	50	24
RAR-100	CATG-100	73	29
RAR-150	CATG-150	91	31



Steel Base Plate Mounting Holes			
Cylinder Model / Capacity ton	Bolt Circle U (mm)	Thread V (mm)	Thread Depth ¹⁾ Z (mm)
RAR-20	93	M6	12
RAR-30	105	M6	12
RAR-50	110	M6	12
RAR-100	165	M6	12
RAR-150	200	M6	12

¹⁾ Including Base Plate Height of 6 mm and four (4) base plate bolts M6.



RAR Series



Capacity:
20 - 150 ton

Stroke:
50 - 250 mm

Maximum Operating Pressure:
700 bar

Collapsed Height A (mm)	Extended Height B (mm)	Outside Diameter D (mm)	Cylinder Bore Diameter E (mm)	Plunger Diameter F (mm)	Bottom to Advance Port H (mm)	Top to Retract Port I (mm)	Saddle Diameter J (mm)	Saddle Protrusion from Plunger K (mm)	Weight (kg)	Model Number
189	239	113	63	40	30	50	30	3	7,4	RAR-202
239	339	113	63	40	30	50	30	3	8,0	RAR-204
289	439	113	63	40	30	50	30	3	8,6	RAR-206
339	539	113	63	40	30	50	30	3	9,2	RAR-208
389	639	113	63	40	30	50	30	3	9,8	RAR-2010
201	251	125	75	50	30	55	40	3	8,6	RAR-302
251	351	125	75	50	30	55	40	3	9,5	RAR-304
301	451	125	75	50	30	55	40	3	10,4	RAR-306
351	551	125	75	50	30	55	40	3	11,3	RAR-308
401	651	125	75	50	30	55	40	3	12,2	RAR-3010
201	251	145	95	75	30	56	50	3	11,1	RAR-502
251	351	145	95	75	30	56	50	3	12,7	RAR-504
301	451	145	95	75	30	56	50	3	14,3	RAR-506
351	551	145	95	75	30	56	50	3	15,9	RAR-508
401	651	145	95	75	30	56	50	3	17,5	RAR-5010
251	301	185	135	90	43	80	75	3	16,4	RAR-1002
301	401	185	135	90	43	80	75	3	19,3	RAR-1004
351	501	185	135	90	43	80	75	3	22,2	RAR-1006
401	601	185	135	90	43	80	75	3	25,1	RAR-1008
451	701	185	135	90	43	80	75	3	28,0	RAR-10010
248	298	230	170	110	38	75	113	3	24,2	RAR-1502
298	398	230	170	110	38	75	113	3	28,9	RAR-1504
348	498	230	170	110	38	75	113	3	33,2	RAR-1506
398	598	230	170	110	38	75	113	3	37,9	RAR-1508
448	698	230	170	110	38	75	113	3	42,6	RAR-15010

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



- Extremely low height for use in confined areas
- Lock nut for positive and safe mechanical load holding over a long period of time
- Single-acting, load return
- Optional special synthetic coating for improved corrosion resistance and lower friction for smoother operation
- Overflow port functions as a stroke limiter
- CR-400 coupler and dust cap included on all models.

▼ 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.



The Shortest Power Lifter



Tilt 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.

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Hoses

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

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Cylinder Capacity	Stroke	Model Number *	Cylinder Effective Area	Oil Capacity
ton (kN)	(mm)		(cm ²)	(cm ³)
60 (606)	50	CLP-602	86,6	432
100 (1027)	50	CLP-1002	146,8	734
160 (1619)	45	CLP-1602	231,3	1040
200 (1999)	45	CLP-2002	285,6	1285
260 (2567)	45	CLP-2502	366,8	1650
400 (3916)	45	CLP-4002	559,5	2517
520 (5114)	45	CLP-5002	730,6	3287

* Please contact Enerpac for ordering information for CLP-cylinders with special synthetic coating.

Single-Acting, Pancake Lock Nut Cylinders



Speed Chart

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

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Longer Stroke Lock Nut Cylinders

For longer stroke lock nut applications **CLL-Series** cylinders are the perfect choice.

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CLP Series



Capacity:

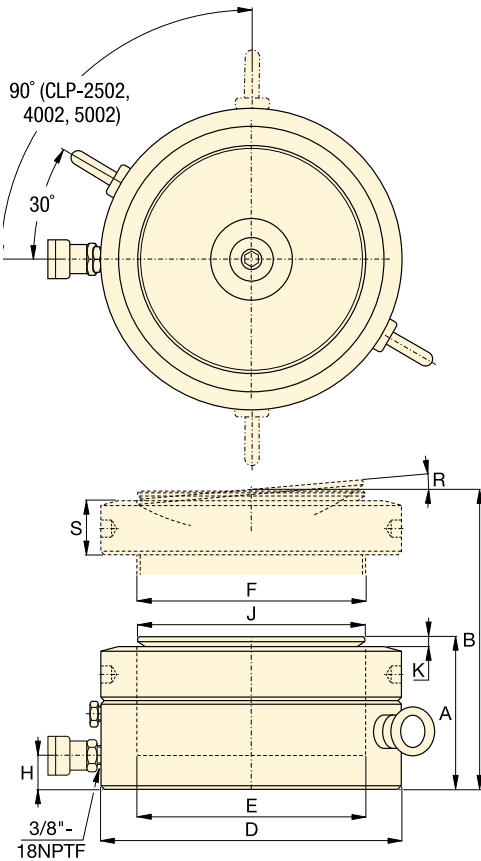
60 - 520 ton

Stroke:

45 - 50 mm

Maximum Operating Pressure:

700 bar



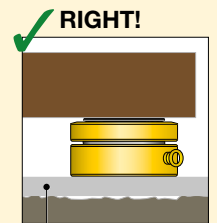
ALL CLP-SERIES CYLINDERS REQUIRE A SOLID LIFTING SURFACE FOR CORRECT SUPPORT.

THE USE OF PANCAKE CYLINDERS ON SURFACES SUCH AS SAND, MUD OR DIRT, MAY RESULT IN CYLINDER DAMAGE!



WRONG!

Rough soil



RIGHT!

Flat lifting surface

For more safety instructions see our 'Yellow Pages'.

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Collapsed Height	Extended Height	Outside Diameter	Cylinder Bore Diameter	Plunger Diameter	Base to Advance Port	Saddle Diameter	Saddle Protrusion from Plgr.	Saddle Max. Tilt Angle	Lock Nut Height	(kg)	Model Number *
A (mm)	B (mm)	D (mm)	E (mm)	F (mm)	H (mm)	J (mm)	K (mm)	R	S (mm)		
125	175	140	105,0	Tr 104 x 4	19	96	6	5°	28	15	CLP-602
137	187	175	136,7	Tr 136 x 6	21	126	8	5°	31	26	CLP-1002
148	193	220	171,6	Tr 171 x 6	27	160	9	5°	40	44	CLP-1602
155	200	245	190,7	Tr 190 x 6	30	180	10	5°	43	57	CLP-2002
159	204	275	216,1	Tr 216 x 6	32	200	11	5°	44	74	CLP-2502
178	223	350	266,9	Tr 266 x 6	39	250	11	4°	55	134	CLP-4002
192	237	400	305,0	Tr 305 x 6	48	290	10	3°	62	189	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.

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Low Clearance Lifting

The LW-16 Lifting Wedge and SOH-Series Machine Lifts are the perfect choice for lifting the first few millimeters.

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RSM-series, Flat-Jac® Cylinders

- Compact, flat design for use where most other cylinders will not fit
- Single-acting, spring return
- 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 models¹⁾
- Hard chrome plated high quality steel plungers
- Grooved plunger ends require no saddle.

RCS-series, Low Height Cylinders

- Lightweight, low profile design for use in confined spaces
- Single-acting, spring return
- 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.

▼ Only a couple of centimeters will do for an RSM-cylinder to lift a large construction.

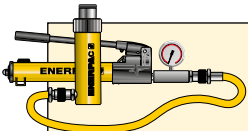


Cyl. Capacity	Stroke	Model Number	Cylinder Effective Area	Oil Capacity
ton (kN)	(mm)		(cm ²)	(cm ³)
5 (45)	6	RSM-50 ¹⁾	6,5	4
10 (101)	11	RSM-100	14,5	18
20 (201)	11	RSM-200	28,7	32
30 (295)	13	RSM-300	42,1	55
45 (435)	16	RSM-500	62,1	99
75 (718)	16	RSM-750	102,6	164
90 (887)	16	RSM-1000	126,7	203
150 (1386)	16	RSM-1500	198,1	317
10 (101)	38	RCS-101*	14,5	55
20 (201)	45	RCS-201*	28,7	129
30 (295)	62	RCS-302*	42,1	261
45 (435)	60	RCS-502*	62,1	373
90 (887)	57	RCS-1002*	126,7	722

¹⁾ RSM-50 is fitted with an AR-400 coupler.

* Available as set, see note on next page.

Single-Acting, Low Height Cylinders



Cylinder-Pump Sets

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

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RSM, RCS Series



Capacity:

5 - 150 ton

Stroke:

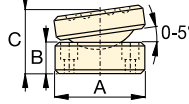
6 - 62 mm

Maximum Operating Pressure:

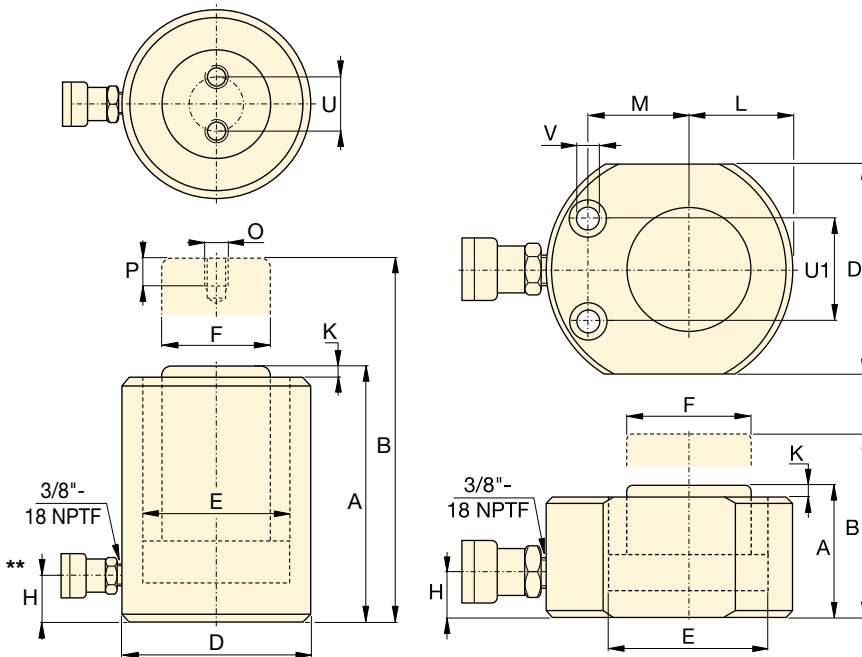
700 bar

Optional Bolt On Tilt Saddle Dimensions (mm)

For Cylinder Model:	Model Number	A	B	C*
RCS-101	CAT-11	35	11	21
RCS-201, -302, -502	CAT-51	50	15	29
RCS-1002	CAT-101	71	17	35



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



RCS-Series

RSM-Series

RSM Cylinder Mounting Hole Dimensions (mm)

Model Number	Bolt Circle U1	Hole Dia. V	Counter Bore Dia.	Counter Bore Depth
RSM-50	28,5	5,5	9,1	4,3
RSM-100	36,6	7,1	10,7	7,9
RSM-200	49,3	10,0	15,1	9,9
RSM-300	52,3	10,0	15,9	11,2
RSM-500	66,5	11,0	19,0	12,7
RSM-750	76,2	13,5	20,6	14,2
RSM-1000	76,2	13,5	20,6	14,2
RSM-1500	117,3	13,5	20,6	14,2

Collapsed Height	Extended Height	Outside Diameter	Cylinder Bore Dia.	Plunger Dia.	Base to Advance Port	Plunger Protrusion from Base	Plunger to Base	Plunger to Mtg. Hole	Thread	Thread Depth	Bolt Circle	Weight	Model Number
A (mm)	B (mm)	D (mm)	E (mm)	F (mm)	H (mm)	K (mm)	L (mm)	M (mm)	O (mm)	P (mm)	U (mm)	(kg)	
32	38	58 x 41	28,7	25,4	16	1	20	22	-	-	-	1,0	RSM-50 ¹⁾
43	54	82 x 55	42,9	38,1	19	1	27	34	-	-	-	1,4	RSM-100
51	62	101 x 76	60,5	50,8	19	1	39	39	-	-	-	3,1	RSM-200
58	71	117 x 95	73,2	63,4	19	2	47	44	-	-	-	4,5	RSM-300
66	82	140 x 114	88,9	69,8	19	2	57	53	-	-	-	6,8	RSM-500
79	95	165 x 139	114,3	82,6	19	2	69	66	-	-	-	11,3	RSM-750
85	101	178 x 153	127,0	92,2	19	2	76	74	-	-	-	14,5	RSM-1000
100	116	215 x 190	158,8	114,3	23	2	95	82	-	-	-	26,3	RSM-1500
88	126	69	42,9	38,1	17	5	-	-	M4	8	26	4,1	RCS-101*
98	143	92	60,5	50,8	17	3	-	-	M5	8	40	5,0	RCS-201*
117	179	101	73,2	66,5	19	3	-	-	M5	8	40	6,8	RCS-302*
122	182	124	88,9	69,8	23	2	-	-	M5	8	40	10,9	RCS-502*
141	198	165	127,0	92,2	31	1	-	-	M8	10	55	22,7	RCS-1002*

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

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

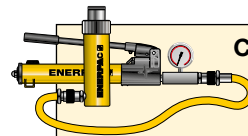


- High strength alloy steel construction
- Hard chrome-plated plunger for long life
- Replaceable links on BRP-models
- Baked enamel finish for increased corrosion resistance
- CR-400 coupler and dust cap included on all models
- Plunger wiper reduces contamination, extending cylinder life
- Single-acting,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

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



The Ultimate in Pulling Power



Cylinder-Pump Sets

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

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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.

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Attachments and Accessories

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.

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



Single-Acting, Pull Cylinders

BRC Cylinder Mounting Dimensions (mm)				
Model Number	Base Mounting Hole V	Collar Thread W	Collar Thd. Lgth. X	Mtg. Thd. Lgth. Z
BRC-25	3/4" - 14 NPT	1 1/2" - 16 UN	24	17
BRC-46	1 1/4" - 11 1/2 NPT	2 1/4" - 14 UN	26	24
BRC-106	M30 x 2	M85 x 2	25	24

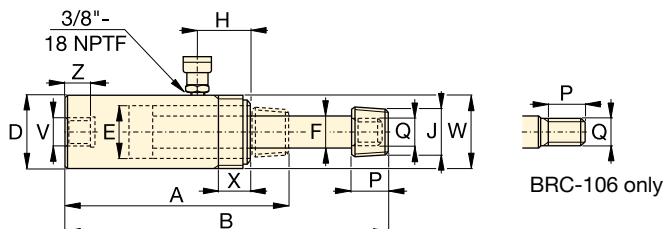
**BRC,
BRP
Series**



Capacity:
2,5 - 50 ton

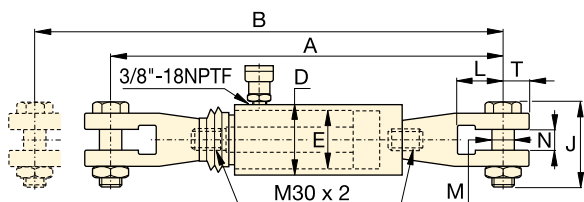
Stroke:
127 - 155 mm

Maximum Operating Pressure:
700 bar

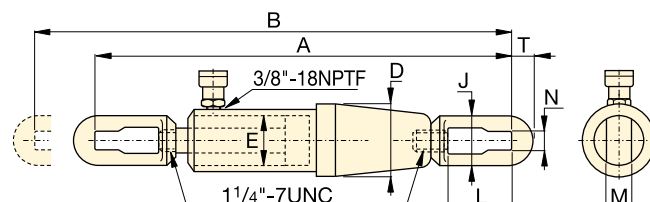


BRC-25, -46, 106

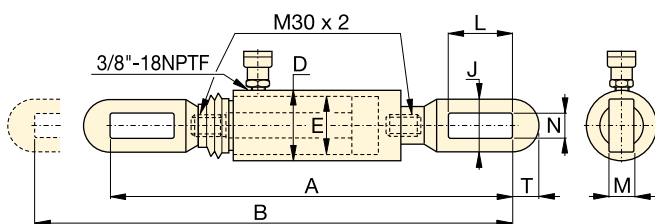
Cylinder Capacity	Stroke	Model Number	Cylinder Effective Area	Oil Capacity	Coll. Height	Ext. Height	Outside Dia.	Cylinder Bore Dia.	Plunger Dia.	Top to Inlet Port H	Saddle Diameter	Plunger Thread Length P	Plunger Outside Thread Q	
ton (kN)	(mm)		(cm ²)	(cm ³)	A (mm)	B (mm)	D (mm)	E (mm)	F (mm)	H (mm)	J (NPT)	P (mm)	Q	(kg)
2,5 (24)	127	BRC-25	3,5	45	264	391	48	28,4	19,0	45	3/4" - 14	28	1 1/16" - 24	1,8
5 (51)	140	BRC-46	7,3	101	301	441	57	42,9	30,2	42	1 1/4" - 11 1/2	32	1 3/16" - 16	4,5
10 (105)	151	BRC-106	15,0	228	289	440	85	54,1	31,8	39	-	25	M30x2	9,5



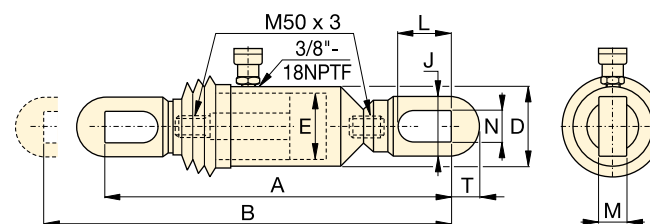
BRP-106C



BRP-306



BRP-106L



BRP-606

Cylinder Capacity	Stroke	Model Number	Cylinder Effective Area	Oil Capacity	Coll. Height	Ext. Height	Outside Dia.	Cyl. Bore Dia.	Link Height	Link Opening L	Link Thickness M	Link Width N	Slot to Link End T	
ton (kN)	(mm)		(cm ²)	(cm ³)	A (mm)	B (mm)	D (mm)	E (mm)	J (mm)	L (mm)	M (mm)	N (mm)	T (mm)	(kg)
10 (105)	151	BRP-106C*	15,0	227	587	738	85	54,1	119	62	30	35	32	15,9
	151	BRP-106L*	15,0	227	541	692	85	54,1	67	115	22	30	32	13,2
30 (326)	155	BRP-306*	46,6	722	1085	1240	136	88,9	114	145	35	39	50	48,1
50 (505)	152	BRP-606*	72,1	1096	719	871	140	110,0	130	149	39	50	70	53,5

* Available as set, see note on previous page. NOTE: BRP-106C, BRP-106L and BRP-606 are fitted with rubber bellows for rod protection.

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

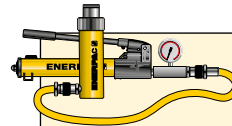


- Hollow plunger design allows for both, pull and push forces
- Single-acting, spring return
- Nickel-plated, floating center tube on models over 20 ton increases product life
- Baked enamel finish for increased corrosion resistance
- Collar threads for easy fixturing
- RCH-120 includes AR-630 coupler 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.

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



Versatility in Testing, Maintenance and Tensioning Applications



Cylinder-Pump Sets

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

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Ultra-Lightweight Aluminium Cylinders

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

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Saddles

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

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Cylinder Capacity	Stroke	Model Number	Cylinder Effective Area	Oil Capacity
ton (kN)	(mm)		(cm ²)	(cm ³)
13 (125)	8	RCH-120	17,9	14
	42	RCH-121*	17,9	75
	42	RCH-1211	17,9	75
	76	RCH-123	17,9	136
20 (215)	49	RCH-202*	30,7	150
	155	RCH-206	30,7	476
30 (326)	64	RCH-302*	46,6	298
	155	RCH-306	46,6	722
60 (576)	76	RCH-603*	82,3	626
	153	RCH-606	82,3	1259
95 (931)	76	RCH-1003*	133,0	1011

Available as set, see note on this page.

Single-Acting, Hollow Plunger Cylinders

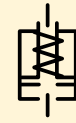


Hoses

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

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RCH Series



Capacity:

13-95 ton

Stroke:

8-155 mm

Center Hole Diameter:

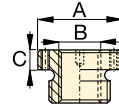
19,6-79,0 mm

Maximum Operating Pressure:

700 bar

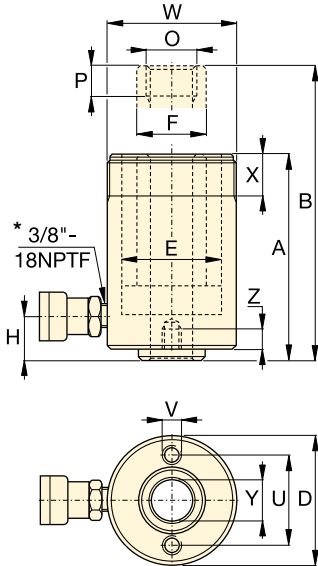
Optional Heat Treated Hollow Saddles

Saddle Type	Cylinder Model Number	Saddle Model Nr.	Saddle Dimensions (mm)		
			A	B	C
Threaded Hollow	RCH-202, 206	HP-2015	53	1" - 8	9
	RCH-302, 306	HP-3015	63	1 1/4" - 7	9
	RCH-603, 606	HP-5016	91	1 5/8" - 5 1/2	12
	RCH-1003	HP-10016	126	2 1/2" - 8	13



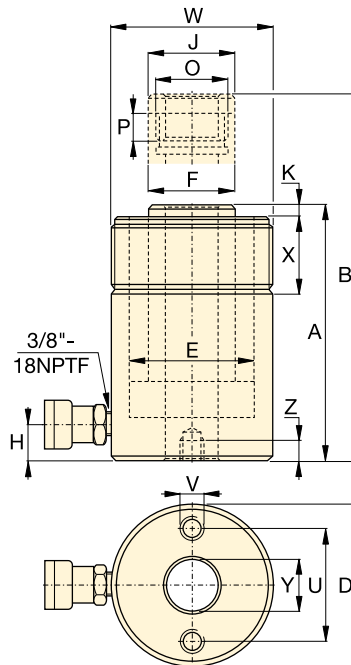
Smooth hollow saddles are standard on all RCH-models (except RCH-120, RCH-1211).

RCH-121 and RCH-1211 have a 47 mm dia. boss that protrudes 6 mm from base.



RCH-120 to RCH-123 models

* 1/4" NPTF for RCH-120 only



RCH-202 to RCH-1003 models

Base Mounting Hole Dimensions (mm)

Model Number	Bolt Circle U	Thread V	Thread Depth Z
RCH-120	50,8	5/16" - 18 UNC	9,0
RCH-121	-	-	-
RCH-1211	-	-	-
RCH-123	50,8	5/16" - 18 UNC	12,7
RCH-202	82,6	3/8" - 16 UNC	9,4
RCH-206	82,6	3/8" - 16 UNC	9,4
RCH-302	92,2	3/8" - 16 UNC	14,0
RCH-306	92,2	3/8" - 16 UNC	14,0
RCH-603	130,3	1/2" - 13 UNC	14,0
RCH-606	130,3	1/2" - 13 UNC	14,0
RCH-1003	177,8	5/8" - 11 UNC	19,0

Coll. Height A (mm)	Ext. Height B (mm)	Outside Dia. D (mm)	Cyl. Bore Dia. E (mm)	Plgr. Dia. F (mm)	Cyl. Base to Advance Port H (mm)	Saddle Dia. J (mm)	Saddle Protrusion from Plgr. K (mm)	Plunger Internal Thread O	Plunger Thread Length P (mm)	Collar Thread W	Collar Thread Length X (mm)	Center Hole Dia. Y (mm)	Weight (kg)	Model Number
55	63	69	54,1	35,1	9	-	-	3/4" - 16 UN	16	2 3/4" - 16	30	19,6	1,5	RCH-120
120	162	69	54,1	35,1	25	-	-	-	-	2 3/4" - 16	30	19,6	2,8	RCH-121*
120	162	69	54,1	35,1	25	-	-	3/4" - 16 UN	16	2 3/4" - 16	30	19,6	2,8	RCH-1211
184	260	69	54,1	35,1	25	-	-	-	-	2 3/4" - 16	30	19,6	4,4	RCH-123
162	211	98	73,1	54,1	19	54	9,7	1 9/16" - 16 UN	19	3 7/8" - 12	38	26,9	7,7	RCH-202*
306	461	98	73,1	54,1	25	54	9,7	1 9/16" - 16 UN	19	3 7/8" - 12	38	26,9	14,1	RCH-206
178	242	114	88,9	63,5	21	63	9,0	1 13/16" - 16 UN	22	4 1/2" - 12	42	33,3	10,9	RCH-302*
330	485	114	88,9	63,5	25	63	9,0	1 13/16" - 16 UN	22	4 1/2" - 12	42	33,3	21,8	RCH-306
247	323	159	123,9	91,9	31	91	12,0	2 3/4" - 16 UN	19	6 1/4" - 12	48	53,8	28,1	RCH-603*
323	476	159	123,9	91,9	31	91	12,0	2 3/4" - 16 UN	19	6 1/4" - 12	48	53,8	35,4	RCH-606
254	330	212	165,1	127,0	38	126	12,0	4" - 16 UN	25	8 3/8" - 12	60	79,0	63,0	RCH-1003*

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



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

Versatility in Testing, Maintenance and Tensioning Applications



Pump Selection

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

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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.

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Saddles

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

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



Cylinder Capacity ton	Stroke (mm)	Model Number	Max. Cylinder Capacity (kN)		Cylinder Effective Area (cm ²)		Oil Capacity (cm ³)	
			Advance	Retract	Advance	Retract	Advance	Retract
30	178	RRH-307	326	213	46,6	30,4	829	541
	258	RRH-3010	326	213	46,6	30,4	1202	784
60	89	RRH-603	576	380	82,3	54,2	733	482
	166	RRH-606	576	380	82,3	54,2	1366	900
	257	RRH-6010	576	380	82,3	54,2	2115	1393
95	38	RRH-1001	931	612	133,0	87,4	505	333
	76	RRH-1003	931	612	133,0	87,4	1011	666
	153	RRH-1006	931	612	133,0	87,4	2035	1337
	257	RRH-10010	931	612	133,0	87,4	3420	2246
145	203	RRH-1508	1429	718	204,1	102,6	4144	2083

Double-Acting, Hollow Plunger Cylinders



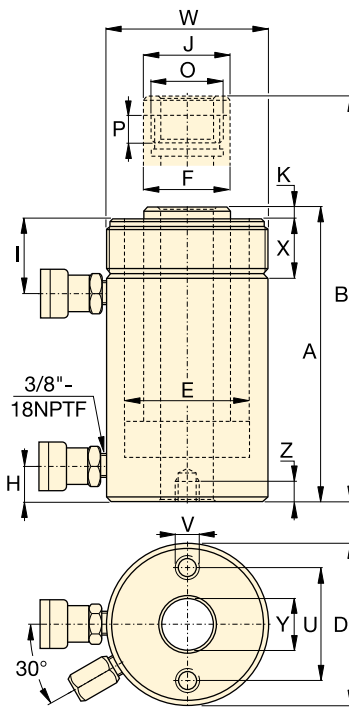
Hoses

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

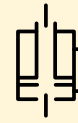
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Optional Heat Treated Hollow Saddles					
Saddle Type	Cylinder Model Number	Saddle Model Nr.	Saddle Dimensions (mm)		
			A	B	C
Threaded Hollow	RRH-307, 3010	HP-3015	63	1¼" - 7	9
	RRH-603, 606, 6010	HP-5016	91	1½" - 5½	12
	RRH-1001, 1003, RRH-1006, 10010	HP-10016	126	2½" - 8	13

Smooth hollow saddles are standard on all RRH-models.



RRH Series



Capacity:

30 - 145 ton

Stroke:

38 - 258 mm

Center Hole Diameter:

33,3 - 79,2 mm

Maximum Operating Pressure:

700 bar

Base Mounting Hole Dimensions (mm)			
Model Number	Bolt Circle U	Thread V	Thread Depth Z
RRH-307	92,2	3/8" - 16	15,7
RRH-3010	92,2	3/8" - 16	15,7
RRH-603	130,0	1/2" - 13	14,0
RRH-606	130,0	1/2" - 13	14,0
RRH-6010	130,0	1/2" - 13	14,0
RRH-1001	177,8	5/8" - 11	19,0
RRH-1003	177,8	5/8" - 11	19,0
RRH-1006	177,8	5/8" - 11	19,0
RRH-10010	177,8	5/8" - 11	19,0
RRH-1508	-	-	-

Coll. Height	Ext. Height	Out. Dia.	Cyl. Bore Dia.	Plgr. Dia.	Cyl. Base to Adv. Port	Cyl. Top to Return Port	Saddle Dia.	Saddle Protr. fr. Plgr.	Thread	Plunger Thread Length	Collar Thread	Collar Thread Length	Center Hole Dia.	Model Number
A	B	D	E	F	H	I	J	K	O	P	W	X	Y	(kg)
330	508	114	88,9	63,5	25	60	63	9	1 ¹³ / ₁₆ " - 16	22	4 ¹ / ₂ " - 12	42	33,3	21
431	689	114	88,9	63,5	25	60	63	9	1 ¹³ / ₁₆ " - 16	22	4 ¹ / ₂ " - 12	42	33,3	27
247	336	159	123,9	91,9	31	66	91	12	2 ³ / ₄ " - 16	19	6 ¹ / ₄ " - 12	48	53,8	28
323	489	159	123,9	91,9	31	66	91	12	2 ³ / ₄ " - 16	19	6 ¹ / ₄ " - 12	48	53,8	35
438	695	159	123,9	91,9	31	66	91	12	2 ³ / ₄ " - 16	19	6 ¹ / ₄ " - 12	48	53,8	45
165	203	212	165,1	127,0	38	44	126	12	4" - 16	25	-	-	79,2	33
254	330	212	165,1	127,0	38	85	126	12	4" - 16	25	8 ³ / ₈ " - 12	60	79,2	61
342	495	212	165,1	127,0	38	85	126	12	4" - 16	25	8 ³ / ₈ " - 12	60	79,2	79
460	717	212	165,1	127,0	38	85	126	12	4" - 16	25	8 ³ / ₈ " - 12	60	79,2	106
349	552	247	190,5	152,4	38	60	127	4	4 ¹ / ₄ " - 12	25	-	-	79,2	111

▼ Shown from left to right: BRD-2510, BRD-96, BRD-256, BRD-41, BRD-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.

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- 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
- Imperial models (RD-series) available on request.

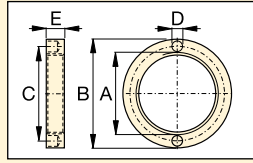
▼ Clamping application using Enerpac BRD cylinders (with clevis eye attachments on both ends) for their high pressure capability and mounting flexibility.



Cylinder Capacity (ton)	Stroke (mm)	Model Number	Max. Cylinder Capacity (kN)		Cylinder Effective Area (cm ²)		Oil Capacity (cm ³)		Coll. Height A (mm)	Extended Height B (mm)	Body Length C (mm)	Outside Dia. D (mm)	Cylinder Bore Dia. E (mm)	Plunger Dia. F (mm)
			Advance	Retract	Advance	Retract	Advance	Retract						
4	28	BRD-41	35	16	5,1	2,2	14	6	186	214	162	50	25,4	19,0
	79	BRD-43	35	16	5,1	2,2	40	17	237	316	213	50	25,4	19,0
	155	BRD-46	35	16	5,1	2,2	79	34	313	468	289	50	25,4	19,0
8	28	BRD-91	80	44	11,4	6,3	32	18	223	251	198	65	38,1	25,4
	79	BRD-93	80	44	11,4	6,3	90	50	274	353	249	65	38,1	25,4
	155	BRD-96	80	44	11,4	6,3	177	98	350	505	325	65	38,1	25,4
	257	BRD-910	80	44	11,4	6,3	293	162	452	709	427	65	38,1	25,4
15	159	BRD-166	142	77	20,3	10,6	323	169	389	548	359	80	50,8	35,0
	260	BRD-1610	142	77	20,3	10,6	528	276	491	751	461	80	50,8	35,0
23	159	BRD-256	222	98	31,7	13,7	504	218	424	583	397	92	63,5	47,8
	260	BRD-2510	222	98	31,7	13,7	824	356	526	786	499	92	63,5	47,8

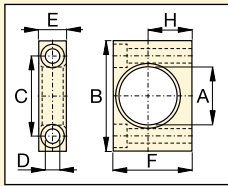
Double-Acting, Precision Production Cylinders

▼ BRD CYLINDER ATTACHMENTS



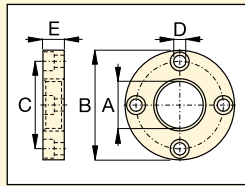
Retainer Nut

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



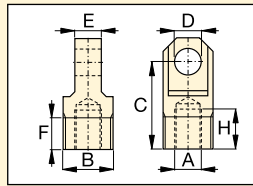
Foot Mounting

Mounts onto cylinder collar.



Flange Mounting

Mounts onto cylinder collar.



Clevis Eye

Threads onto plunger or into cylinder base.

Model Number	BRD-Cyl. (ton)	Dimensions (mm)						
		A	B	C	D	E	F	H
Foot Mounting with Retainer Nut								
BAD-141	4	42,1	80	58,0	10,5	20,0	57,0	31,8
BAD-171	8	56,1	105	78,0	13,5	25,0	82,5	44,5
BAD-181	15	70,1	127	95,2	20,0	35,0	100,0	52,4
BAD-191	23	85,1	159	117,5	26,5	45,0	125,0	63,5
Flange Mounting with Retainer Nut								
BAD-142	4	42,1	98,4	78,6	11,0	19,0	-	-
BAD-172	8	56,1	121	98,4	11,0	25,4	-	-
BAD-182	15	70,1	143	115,9	16,0	35,0	-	-
BAD-192	23	85,1	165	135,7	17,0	44,5	-	-
Retainer Nut								
BAD-143	4	M42 x 1,5	57	49,5	6,3	9,5	-	-
BAD-173	8	M56 x 2	75	65,5	6,7	12,7	-	-
BAD-183	15	M70 x 2	92	81,0	6,7	19,0	-	-
BAD-193	23	M85 x 2	108	96,5	6,7	25,4	-	-
Clevis Eye (See chart below for mounting dimensions L, L1 and M)								
BAD-150	4	M16 x 1,5	M30 x 1,5	52,4	16,0	15,9	19,1	23,8
BAD-151	8	M22 x 1,5	M42 x 1,5	57,1	20,0	25,4	25,4	23,8
BAD-152	15	M30 x 1,5	M56 x 2	77,8	25,0	31,8	25,4	30,2
BAD-153	23	M42 x 1,5	M70 x 2	77,8	32,0	38,2	25,4	27,0

BRD Series



Capacity:

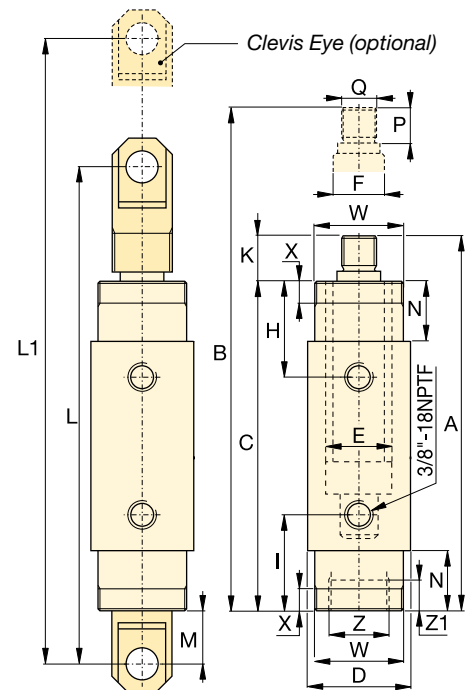
4 - 23 ton

Stroke:

28 - 260 mm

Maximum Operating Pressure:

700 bar



	Top to Retract Port H (mm)	Bottom to Advance Port I (mm)	Plunger Protrusion K (mm)	Clevis Eye Mounting Dimensions			Neck Length N (mm)	Plunger Thread Length P (mm)	Plunger External Thread Q (mm)	Cylinder Mounting Dimensions (mm)				Model Number	
				L (mm)	L1 (mm)	M (mm)				Collar Thread W	Collar Thread Length X	Internal Base Thread Z	Int. Base Thread Length Z1		
	47	47	24	258	286	41	29	22	M16 x 1,5	M42 x 1,5	11	M30 x 1,5	9	2,0	BRD-41
	47	47	24	308	387	41	29	22	M16 x 1,5	M42 x 1,5	11	M30 x 1,5	9	2,6	BRD-43
	47	47	24	385	540	41	29	22	M16 x 1,5	M42 x 1,5	11	M30 x 1,5	9	3,6	BRD-46
	57	57	25	295	323	38	38	22	M22 x 1,5	M56 x 2	14	M42 x 1,5	14	3,0	BRD-91
	57	57	25	346	425	38	38	22	M22 x 1,5	M56 x 2	14	M42 x 1,5	14	4,2	BRD-93
	57	57	25	422	577	38	38	22	M22 x 1,5	M56 x 2	14	M42 x 1,5	14	5,6	BRD-96
	57	57	25	524	781	38	38	22	M22 x 1,5	M56 x 2	14	M42 x 1,5	14	7,3	BRD-910
	73	73	30	492	651	52	54	28	M30 x 1,5	M70 x 2	22	M56 x 2	24	10,2	BRD-166
	73	73	30	593	853	52	54	28	M30 x 1,5	M70 x 2	22	M56 x 2	24	14,5	BRD-1610
	89	89	27	524	683	53	70	25	M42 x 1,5	M85 x 2	29	M70 x 2	26	16,0	BRD-256
	89	89	27	626	886	53	70	25	M42 x 1,5	M85 x 2	29	M70 x 2	26	20,3	BRD-2510

RR-Series, Double-Acting Cylinders

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



- 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 and dust caps included on all models
- Plunger wiper reduces contamination, extending cylinder life.

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



Most Versatile Performers



Most Versatile Performers

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



Saddles

RR-Series cylinders up to 75 ton have plunger mounting holes for installation of CAT-Series tilt saddles.

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Optimum Performance

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

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



Double-Acting Long Stroke Cylinders

▼ QUICK SELECTION CHART

For complete technical information see next page.

Cylinder Capacity ton (kN)	Stroke (mm)	Model Number	Cylinder Effective Area (cm ²)		Oil Capacity (cm ³)		Coll. Height (mm)
			Push	Pull	Push	Pull	
10 (101)	254	RR-1010	14,5	4,8	368	122	409
	305	RR-1012	14,5	4,8	442	147	457
30 (295)	209	RR-308	42,1	19,1	879	400	395
	368	RR-3014	42,1	19,1	1549	703	549
50 (498)	156	RR-506	71,2	21,5	1111	335	331
	334	RR-5013	71,2	21,5	2378	718	509
	511	RR-5020	71,2	21,5	3638	1099	733
75 (718)	156	RR-756	102,6	31,4	1601	490	347
	333	RR-7513	102,6	31,4	3417	1046	525
95 (933)	168	RR-1006	133,3	62,2	2238	1045	357
	333	RR-10013	133,3	62,2	4439	2071	524
	460	RR-10018	133,3	62,2	6132	2861	687
140 (1386)	57	RR-1502	198,1	95,4	1129	544	196
	156	RR-1506	198,1	95,4	3090	1488	385
	333	RR-15013	198,1	95,4	6597	3177	582
	815	RR-15032	198,1	95,4	16145	7775	1116
200 (1995)	152	RR-2006	285,0	145,3	4332	2209	430
	330	RR-20013	285,0	145,3	9405	4795	608
	457	RR-20018	285,0	145,3	13025	6640	765
	610	RR-20024	285,0	145,3	17385	8863	917
	914	RR-20036	285,0	145,3	26049	13280	1222
325 (3201)	1219	RR-20048	285,0	145,3	34741	17712	1527
	153	RR-3006	457,3	243,2	6997	3721	485
	305	RR-30012	457,3	243,2	13947	7418	638
	457	RR-30018	457,3	243,2	20889	11114	790
	609	RR-30024	457,3	243,2	27850	14811	943
	915	RR-30036	457,3	243,2	41843	22253	1247
440 (4292)	1219	RR-30048	457,3	243,2	55745	29646	1552
	152	RR-4006	613,1	328,1	9319	4987	538
	305	RR-40012	613,1	328,1	18700	10007	690
	457	RR-40018	613,1	328,1	28018	14995	843
	610	RR-40024	613,1	328,1	37400	20014	995
	914	RR-40036	613,1	328,1	56037	29988	1300
	1219	RR-40048	613,1	328,1	74737	39996	1605
520 (5108)	153	RR-5006	729,7	405,4	11164	6203	577
	305	RR-50012	729,7	405,4	22256	12365	730
	457	RR-50018	729,7	405,4	33347	18526	882
	609	RR-50024	729,7	405,4	44440	24689	1035
	915	RR-50036	729,7	405,4	66768	36973	1339
	1219	RR-50048	729,7	405,4	88951	49418	1644

RR Series



Capacity:

10 - 520 ton

Stroke:

57 - 1219 mm

Maximum Operating Pressure:

700 bar



Enerpac CLRG-Series

If your application does not require high cycle, Enerpac CLRG-Series cylinders may be the right alternative.

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Speed Chart

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

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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
	RR-1010, 1012	CAT-10
Tilt	RR-308, 3014	CAT-50
	RR-506, 5013	CAT-100
	RR-5020, 756	
	RR-7513	

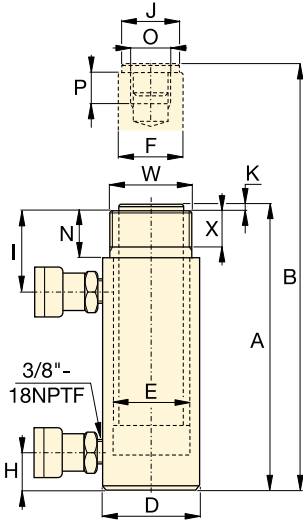
Standard Saddles:

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

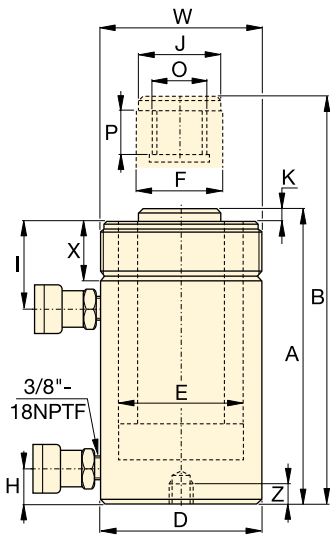
For additional information on saddles:

Page: 10

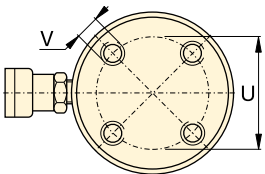
RR-Series, Double-Acting Cylinders



RR-1010 - RR-3014

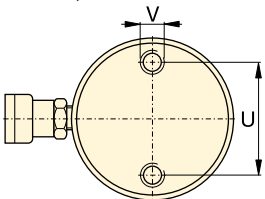


RR-506 - RR-50048



RR-1006 - RR-30048

No mounting holes on:
RR-506, 5013
RR-756, 7513
RR-1502, 15013



RR-4006 - RR-50048

Base mounting hole location is for reference only, as it is affected by assembly.



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: 275 bar
RR-506/5013/5020: 480 bar
RR-756/7513: 495 bar

◀ For full features see previous page.

Cylinder Capacity	Stroke (mm)	Model Number	Max. Cylinder Capacity (kN)		Cylinder Effective Area (cm ²)		Oil Capacity (cm ³)		Coll. Height	Ext. Height	Outside Dia.
			Push	Pull	Push	Pull	Push	Pull	A (mm)	B (mm)	D (mm)
10 ton	254	RR-1010 *	101	33	14,5	4,8	368	122	409	663	73
	305	RR-1012 *	101	33	14,5	4,8	442	147	457	762	73
30	209	RR-308 *	295	53	42,1	19,1	879	400	395	604	101
	368	RR-3014 *	295	53	42,1	19,1	1549	703	549	917	101
50	156	RR-506	498	103	71,2	21,5	1111	335	331	487	127
	334	RR-5013	498	103	71,2	21,5	2378	718	509	843	127
	511	RR-5020	498	103	71,2	21,5	3638	1099	733	1244	127
75	156	RR-756	718	156	102,6	31,4	1601	490	347	503	146
	333	RR-7513	718	156	102,6	31,4	3417	1046	525	858	146
95	168	RR-1006	933	435	133,3	62,2	2238	1045	357	525	177
	333	RR-10013	933	435	133,3	62,2	4439	2071	524	857	177
	460	RR-10018	933	435	133,3	62,2	6132	2861	687	1147	177
140	57	RR-1502	1386	668	198,1	95,4	1129	544	196	253	203
	156	RR-1506	1386	668	198,1	95,4	3090	1488	385	541	203
	333	RR-15013	1386	668	198,1	95,4	6597	3177	582	915	203
	815	RR-15032	1386	668	198,1	95,4	16145	7775	1116	1931	203
200	152	RR-2006	1995	1017	285,0	145,3	4332	2209	430	582	247
	330	RR-20013	1995	1017	285,0	145,3	9405	4795	608	938	247
	457	RR-20018	1995	1017	285,0	145,3	13025	6640	765	1222	247
	610	RR-20024	1995	1017	285,0	145,3	17385	8863	917	1527	247
	914	RR-20036	1995	1017	285,0	145,3	26049	13280	1222	2136	247
	1219	RR-20048	1995	1017	285,0	145,3	34741	17712	1527	2746	247
325	153	RR-3006	3201	1703	457,3	243,2	6997	3721	485	638	311
	305	RR-30012	3201	1703	457,3	243,2	13947	7418	638	943	311
	457	RR-30018	3201	1703	457,3	243,2	20889	11114	790	1247	311
	609	RR-30024	3201	1703	457,3	243,2	27850	14811	943	1552	311
	915	RR-30036	3201	1703	457,3	243,2	41843	22253	1247	2162	311
	1219	RR-30048	3201	1703	457,3	243,2	55745	29646	1552	2771	311
440	152	RR-4006	4292	2297	613,1	328,1	9319	4987	538	690	358
	305	RR-40012	4292	2297	613,1	328,1	18700	10007	690	995	358
	457	RR-40018	4292	2297	613,1	328,1	28018	14995	843	1300	358
	610	RR-40024	4292	2297	613,1	328,1	37400	20014	995	1605	358
	914	RR-40036	4292	2297	613,1	328,1	56037	29988	1300	2214	358
	1219	RR-40048	4292	2297	613,1	328,1	74737	39996	1605	2824	358
520	153	RR-5006	5108	2838	729,7	405,4	11164	6203	577	730	397
	305	RR-50012	5108	2838	729,7	405,4	22256	12365	730	1035	397
	457	RR-50018	5108	2838	729,7	405,4	33347	18526	882	1339	397
	609	RR-50024	5108	2838	729,7	405,4	44440	24689	1035	1644	397
	915	RR-50036	5108	2838	729,7	405,4	66768	36973	1339	2254	397
	1219	RR-50048	5108	2838	729,7	405,4	88951	49418	1644	2863	397

* For RR-1010 and RR-1012: N = 32 mm; for RR-308 and RR-3014: N = 55 mm.

Double-Acting Long Stroke Cylinders

Capacity:
10 - 520 ton

Stroke:
57 - 1219 mm

Maximum Operating Pressure:
700 bar

RR
Series



Cyl. Bore Dia. E (mm)	Plgr. Dia. F (mm)	Base to Adv. Port H (mm)	Top to Ret. Port I (mm)	Saddle Dia. J (mm)	Saddle Protr. fr. Plgr. K (mm)	Plunger Internal Thread O	Plunger Thread Length P (mm)	Base Mounting Holes			Collar Thread W	Collar Thread Length X (mm)	Model Number	
								Bolt Circle U (mm)	Thread V	Thread Depth Z (mm)				
42,9	34,9	36	57	35	6	1" - 8	25	-	-	-	2 1/4" - 14	26	12	RR-1010*
42,9	34,9	36	57	35	6	1" - 8	25	-	-	-	2 1/4" - 14	26	14	RR-1012*
73,2	54,1	39	81	50	10	1 1/2" - 16	25	-	-	-	3 5/16" - 12	49	18	RR-308*
73,2	54,1	39	81	50	10	1 1/2" - 16	25	-	-	-	3 5/16" - 12	49	29	RR-3014*
95,2	79,5	28	76	71	2	1" - 12	25	-	-	-	5" - 12	44	30	RR-506
95,2	79,5	28	76	71	2	1" - 12	25	-	-	-	5" - 12	44	52	RR-5013
95,2	79,5	57	76	71	2	1" - 12	25	76	1/2" - 13	25	5" - 12	44	68	RR-5020
114,3	95,2	30	76	71	6	1" - 12	38	-	-	-	5 3/4" - 12	38	41	RR-756
114,3	95,2	30	81	71	6	1" - 12	38	-	-	-	5 3/4" - 12	38	68	RR-7513
130,3	95,2	38	71	76	3	1 3/4" - 12	35	139	3/4" - 10	25	6 7/8" - 12	50	61	RR-1006
130,3	95,2	38	71	76	3	1 3/4" - 12	35	139	3/4" - 10	25	6 7/8" - 12	50	93	RR-10013
130,3	95,2	41	92	76	3	1 3/4" - 12	35	139	3/4" - 10	25	6 7/8" - 12	50	117	RR-10018
158,8	114,3	22	66	95	19	-	-	-	-	-	-	-	49	RR-1502
158,8	114,3	49	84	114	19	3 3/8" - 16	35	158	3/4" - 16	28	8" - 12	55	93	RR-1506
158,8	114,3	49	84	114	19	3 3/8" - 16	35	158	3/4" - 16	28	8" - 12	55	124	RR-15013
158,8	114,3	76	88	114	19	3 3/8" - 16	35	-	-	-	8" - 12	55	238	RR-15032
190,5	133,4	57	96	133	22	-	-	127	1" - 8	25	-	-	147	RR-2006
190,5	133,4	57	96	133	22	2 1/2" - 12	63	127	1" - 8	25	9 3/4" - 12	54	199	RR-20013
190,5	133,4	85	101	133	22	2 1/2" - 12	63	127	1" - 8	25	9 3/4" - 12	54	204	RR-20018
190,5	133,4	85	101	133	22	2 1/2" - 12	63	127	1" - 8	25	9 3/4" - 12	54	279	RR-20024
190,5	133,4	85	101	133	22	2 1/2" - 12	63	127	1" - 8	25	9 3/4" - 12	54	383	RR-20036
190,5	133,4	85	101	133	22	2 1/2" - 12	63	127	1" - 8	25	9 3/4" - 12	54	483	RR-20048
241,3	165,1	88	114	165	28	2 1/2" - 12	82	158	1 1/4" - 7	44	12 1/4" - 12	58	200	RR-3006
241,3	165,1	88	114	165	28	2 1/2" - 12	82	158	1 1/4" - 7	44	12 1/4" - 12	58	312	RR-30012
241,3	165,1	88	114	165	28	2 1/2" - 12	82	158	1 1/4" - 7	44	12 1/4" - 12	58	385	RR-30018
241,3	165,1	88	114	165	28	2 1/2" - 12	82	158	1 1/4" - 7	44	12 1/4" - 12	58	469	RR-30024
241,3	165,1	88	114	165	28	2 1/2" - 12	82	158	1 1/4" - 7	44	12 1/4" - 12	58	628	RR-30036
241,3	165,1	88	114	165	28	2 1/2" - 12	82	158	1 1/4" - 7	44	12 1/4" - 12	58	780	RR-30048
279,4	190,5	108	133	190	28	3" - 12	95	203	1 1/2" - 6	50	14 1/8" - 8	65	303	RR-4006
279,4	190,5	108	133	190	28	3" - 12	95	203	1 1/2" - 6	50	14 1/8" - 8	65	399	RR-40012
279,4	190,5	108	133	190	28	3" - 12	95	203	1 1/2" - 6	50	14 1/8" - 8	65	453	RR-40018
279,4	190,5	108	133	190	28	3" - 12	95	203	1 1/2" - 6	50	14 1/8" - 8	65	597	RR-40024
279,4	190,5	108	133	190	28	3" - 12	95	203	1 1/2" - 6	50	14 1/8" - 8	65	792	RR-40036
279,4	190,5	108	133	190	28	3" - 12	95	203	1 1/2" - 6	50	14 1/8" - 8	65	980	RR-40048
304,8	203,2	120	152	203	28	3 1/4" - 12	108	203	1 3/4" - 5	57	15 5/8" - 8	79	432	RR-5006
304,8	203,2	120	152	203	28	3 1/4" - 12	108	203	1 3/4" - 5	57	15 5/8" - 8	79	589	RR-50012
304,8	203,2	120	152	203	28	3 1/4" - 12	108	203	1 3/4" - 5	57	15 5/8" - 8	79	680	RR-50018
304,8	203,2	120	152	203	28	3 1/4" - 12	108	203	1 3/4" - 5	57	15 5/8" - 8	79	816	RR-50024
304,8	203,2	120	152	203	28	3 1/4" - 12	108	203	1 3/4" - 5	57	15 5/8" - 8	79	1002	RR-50036
304,8	203,2	120	152	203	28	3 1/4" - 12	108	203	1 3/4" - 5	57	15 5/8" - 8	79	1224	RR-50048

▼ Shown from left to right: CLSG-506, CLSG-5006, CLSG-4006



- Integral stop ring provides piston blow-out protection
- Baked enamel outside finish and plated pistons provide superior corrosion protection
- Interchangeable, hardened grooved saddles are standard
- Base mounting holes are 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.



The Single-Acting Heavy Lifting Solution with Integral Stop Ring



Saddles

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

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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.

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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.

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Low Height - High Tonnage

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

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Standard Features

- Interchangeable, hardened grooved saddles
- Top and side mounted lifting eye capability
- CR-400 coupler and dustcap
- All cylinders meet ASME B-30.1 and ISO 10100 standards.

Single-Acting, High Tonnage Cylinders

▼ QUICK SELECTION CHART

For complete technical information see next page.

Cylinder Capacity	Stroke	Model Number	Cylinder Effective Area	Oil Capacity	Collapsed Height	
ton (kN)	(mm)		(cm ²)	(cm ³)	(mm)	(kg)
50 (539)	50	CLSG-502	77,0	385	162	17
	100	CLSG-504	77,0	770	212	20
	150	CLSG-506	77,0	1155	262	23
	200	CLSG-508	77,0	1540	312	27
	250	CLSG-5010	77,0	1924	362	31
	300	CLSG-5012	77,0	2309	412	34
100 (929)	50	CLSG-1002	132,7	664	182	19
	100	CLSG-1004	132,7	1327	232	29
	150	CLSG-1006	132,7	1991	282	40
	200	CLSG-1008	132,7	2655	332	50
	250	CLSG-10010	132,7	3318	382	61
	300	CLSG-10012	132,7	3982	432	71
150 (1390)	50	CLSG-1502	198,6	993	196	39
	100	CLSG-1504	198,6	1986	246	52
	150	CLSG-1506	198,6	2978	296	65
	200	CLSG-1508	198,6	3971	346	78
	250	CLSG-15010	198,6	4964	396	92
	300	CLSG-15012	198,6	5957	446	105
200 (1861)	50	CLSG-2002	265,9	1330	216	55
	150	CLSG-2006	265,9	3989	316	91
	300	CLSG-20012	265,9	7977	466	146
250 (2565)	50	CLSG-2502	366,4	1832	235	102
	150	CLSG-2506	366,4	5497	335	136
	300	CLSG-25012	366,4	10993	485	207
300 (3193)	50	CLSG-3002	456,2	2281	312	184
	150	CLSG-3006	456,2	6843	412	232
	300	CLSG-30012	456,2	13685	562	303
400 (3919)	50	CLSG-4002	559,9	2800	375	270
	150	CLSG-4006	559,9	8399	475	330
	300	CLSG-40012	559,9	16797	625	421
500 (5114)	50	CLSG-5002	730,6	3653	419	401
	150	CLSG-5006	730,6	10959	519	480
	300	CLSG-50012	730,6	21918	669	599
600 (5987)	50	CLSG-6002	855,3	4276	429	474
	150	CLSG-6006	855,3	12829	529	565
	300	CLSG-60012	855,3	25659	679	701
800 (8234)	50	CLSG-8002	1176,3	5881	474	741
	150	CLSG-8006	1176,3	17644	574	880
	300	CLSG-80012	1176,3	35288	724	1058
1000 (10260)	50	CLSG-10002	1465,7	7329	564	1062
	150	CLSG-10006	1465,7	21986	664	1213
	300	CLSG-100012	1465,7	43972	814	1439

CLSG Series



Capacity:

50 - 1000 ton

Stroke:

50 - 300 mm

Maximum Operating Pressure:

700 bar



Higher Capacities

1500 and 2000 ton models available on request.

Additional Stroke Lengths

Models above 150 ton are also available with standard stroke lengths of 100, 200 and 250 mm. Please contact Enerpac for ordering information.



Lifting an Unbalanced Load?

When lifting an unbalanced load the **EVO-Series Enerpac Integrated Lifting**

Systems can be the solution with multiple lift point capabilities from 4 to 48 points. See our "Yellow Pages" for multi-cylinder set-ups.

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Optional features

To add optional features to your cylinders, add the following suffix to the end of the model number.

Collar thread *

E002

* On 400 ton models and higher.

Example:

- For CLSG-5006 cylinder with collar thread, order: **CLSG-5006E002**

Technical specifications for these features are available from Enerpac.

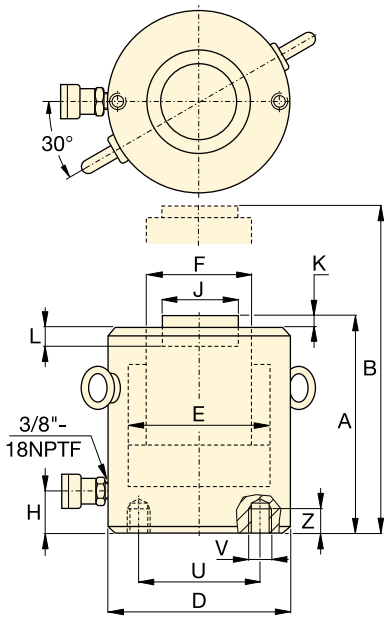
CLSG-Series, High Tonnage Cylinders



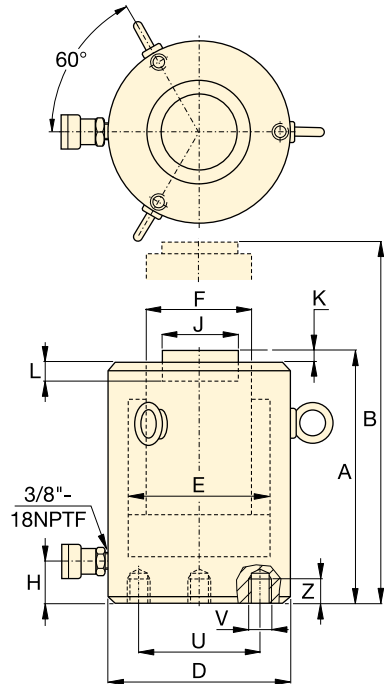
Mounting Hole Orientation

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

◀ For full features see previous page.



CLSG-502 - CLSG-15012



CLSG-2002 - CLSG-100012

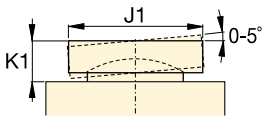
Cylinder Capacity ton (kN)	Stroke (mm)	Model Number	Cylinder Effective Area (cm ²)	Oil Capacity (cm ³)
50 (539)	50	CLSG-502	77,0	385
	100	CLSG-504	77,0	770
	150	CLSG-506	77,0	1155
	200	CLSG-508	77,0	1540
	250	CLSG-5010	77,0	1924
	300	CLSG-5012	77,0	2309
100 (929)	50	CLSG-1002	132,7	664
	100	CLSG-1004	132,7	1327
	150	CLSG-1006	132,7	1991
	200	CLSG-1008	132,7	2655
	250	CLSG-10010	132,7	3318
	300	CLSG-10012	132,7	3982
150 (1390)	50	CLSG-1502	198,6	993
	100	CLSG-1504	198,6	1986
	150	CLSG-1506	198,6	2978
	200	CLSG-1508	198,6	3971
	250	CLSG-15010	198,6	4964
	300	CLSG-15012	198,6	5957
200 (1861)	50	CLSG-2002	265,9	1330
	150	CLSG-2006	265,9	3989
	300	CLSG-20012	265,9	7977
250 (2565)	50	CLSG-2502	366,4	1832
	150	CLSG-2506	366,4	5497
	300	CLSG-25012	366,4	10993
300 (3193)	50	CLSG-3002	456,2	2281
	150	CLSG-3006	456,2	6843
	300	CLSG-30012	456,2	13685
400 (3919)	50	CLSG-4002	559,9	2800
	150	CLSG-4006	559,9	8399
	300	CLSG-40012	559,9	16797
500 (5114)	50	CLSG-5002	730,6	3653
	150	CLSG-5006	730,6	10959
	300	CLSG-50012	730,6	21918
600 (5987)	50	CLSG-6002	855,3	4276
	150	CLSG-6006	855,3	12829
	300	CLSG-60012	855,3	25659
800 (8234)	50	CLSG-8002	1176,3	5881
	150	CLSG-8006	1176,3	17644
	300	CLSG-80012	1176,3	35288
1000 (10260)	50	CLSG-10002	1465,7	7329
	150	CLSG-10006	1465,7	21986
	300	CLSG-100012	1465,7	43972

Base Mounting Hole ¹⁾ Dimensions (mm)			
Model / Capacity ton	Bolt Circle U	Thread Size V	Min. Thread Depth Z
CLSG-50	65	2x M12	22
CLSG-100	95	2x M12	22
CLSG-150	130	2x M12	22
CLSG-200	165	3x M12	22
CLSG-250	190	3x M12	22
CLSG-300	180	3x M16	30
CLSG-400	205	3x M16	30
CLSG-500	250	3x M24	36
CLSG-600	275	3x M24	36
CLSG-800	330	3x M24	36
CLSG-1000	375	3x M24	36

¹⁾ Base mounting holes are random positioned in regard to coupler position.

Single-Acting, High Tonnage Cylinders

Optional Tilt Saddle *



Capacity:
50 - 1000 ton

Stroke:
50 - 300 mm

Maximum Operating Pressure:
700 bar

CLSG Series



Collapsed Height A (mm)	Extended Height B (mm)	Outside Dia. D (mm)	Cylinder Bore Dia. E (mm)	Plunger Dia. F (mm)	Base to Adv. Port H (mm)	Standard Saddle Dia. J (mm)	Saddle Protr. from Plgr. K (mm)	Depth of Plunger Hole L (mm)	Weight (kg)	Model Number	* Optional Tilt Saddle		
											Saddle Dia. J1 (mm)	Saddle Height K1 (mm)	Saddle Model Number
162	212	130	99,0	70,0	52	50	1	19	17	CLSG-502	50	24	CATG-50
212	312	130	99,0	70,0	52	50	1	19	20	CLSG-504	50	24	CATG-50
262	412	130	99,0	70,0	52	50	1	19	23	CLSG-506	50	24	CATG-50
312	512	130	99,0	70,0	52	50	1	19	27	CLSG-508	50	24	CATG-50
362	612	130	99,0	70,0	52	50	1	19	31	CLSG-5010	50	24	CATG-50
412	712	130	99,0	70,0	52	50	1	19	34	CLSG-5012	50	24	CATG-50
182	232	165	130,0	95,0	54	75	1	19	19	CLSG-1002	73	29	CATG-100
232	332	165	130,0	95,0	54	75	1	19	29	CLSG-1004	73	29	CATG-100
282	432	165	130,0	95,0	54	75	1	19	40	CLSG-1006	73	29	CATG-100
332	532	165	130,0	95,0	54	75	1	19	50	CLSG-1008	73	29	CATG-100
382	632	165	130,0	95,0	54	75	1	19	61	CLSG-10010	73	29	CATG-100
432	732	165	130,0	95,0	54	75	1	19	71	CLSG-10012	73	29	CATG-100
196	246	205	159,0	114,0	61	94	1	19	39	CLSG-1502	91	31	CATG-150
246	346	205	159,0	114,0	61	94	1	19	52	CLSG-1504	91	31	CATG-150
296	446	205	159,0	114,0	61	94	1	19	65	CLSG-1506	91	31	CATG-150
346	546	205	159,0	114,0	61	94	1	19	78	CLSG-1508	91	31	CATG-150
396	646	205	159,0	114,0	61	94	1	19	92	CLSG-15010	91	31	CATG-150
446	746	205	159,0	114,0	61	94	1	19	105	CLSG-15012	91	31	CATG-150
216	266	235	184,0	133,0	67	113	1	24	55	CLSG-2002	118	35	CATG-200
316	466	235	184,0	133,0	67	113	1	24	91	CLSG-2006	118	35	CATG-200
466	766	235	184,0	133,0	67	113	1	24	146	CLSG-20012	118	35	CATG-200
235	285	275	216,0	165,0	73	145	1	24	102	CLSG-2502	144	46	CATG-250
335	485	275	216,0	165,0	73	145	1	24	136	CLSG-2506	144	46	CATG-250
485	785	275	216,0	165,0	73	145	1	24	207	CLSG-25012	144	46	CATG-250
312	362	310	241,0	197,0	101	177	1	19	184	CLSG-3002	160	62	CATG-300
412	562	310	241,0	197,0	101	177	1	19	232	CLSG-3006	160	62	CATG-300
562	862	310	241,0	197,0	101	177	1	19	303	CLSG-30012	160	62	CATG-300
375	425	350	267,0	216,0	114	196	3	27	270	CLSG-4002	193	51	CATG-400
475	625	350	267,0	216,0	114	196	3	27	330	CLSG-4006	193	51	CATG-400
625	925	350	267,0	216,0	114	196	3	27	421	CLSG-40012	193	51	CATG-400
419	469	400	305,0	248,0	114	228	3	27	401	CLSG-5002	228	63	CATG-500
519	669	400	305,0	248,0	114	228	3	27	480	CLSG-5006	228	63	CATG-500
669	969	400	305,0	248,0	114	228	3	27	599	CLSG-50012	228	63	CATG-500
429	479	430	330,0	267,0	114	247	3	27	474	CLSG-6002	241	76	CATG-600
529	679	430	330,0	267,0	114	247	3	27	565	CLSG-6006	241	76	CATG-600
679	979	430	330,0	267,0	114	247	3	27	701	CLSG-60012	241	76	CATG-600
474	524	505	387,0	317,0	149	297	3	27	741	CLSG-8002	287	75	CATG-800
574	724	505	387,0	317,0	149	297	3	27	880	CLSG-8006	287	75	CATG-800
724	1024	505	387,0	317,0	149	297	3	27	1058	CLSG-80012	287	75	CATG-800
564	614	560	432,0	343,0	174	323	3	27	1062	CLSG-10002	311	93	CATG-1000
664	814	560	432,0	343,0	174	323	3	27	1213	CLSG-10006	311	93	CATG-1000
814	1114	560	432,0	343,0	174	323	3	27	1439	CLSG-100012	311	93	CATG-1000

▼ Shown from left to right: CLS-1002, CLS-506, CLS-502



- Lowest collapsed height for use in confined spaces
- Overflow port functions as a stroke limiter
- Plunger wiper reduces contamination, extending cylinder life
- Interchangeable, hardened grooved saddles are standard
- Special synthetic coating for improved corrosion resistance and lower friction for smoother operation
- CR-400 coupler and dust cap included on all models
- Single-acting, load return.

▼ CLS-cylinders doing their job, synchronised lifting a complete fly-over for exact positioning.



The Single-Acting Heavy Lifting Solution With Reduced Collapsed Height



Saddles

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

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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.

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Remote Lifting

For heavy lifting in remote locations use the Enerpac Z-Class electric pumps.

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Low Height - High Tonnage

When low height with high force is required, **CLP-Series** Pancake Cylinders with locknut offer the

solution to lift the first few centimetres.

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Synchronous Lifting Systems


The solution for multiple lift point capabilities from 4 to 64 points.

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Single-Acting, High Tonnage Cylinders

▼ QUICK SELECTION CHART

For complete technical information see next page.

Cylinder Capacity	Stroke	Model Number	Cylinder Effective Area	Oil Capacity	Collapsed Height	
ton (kN)	(mm)		(cm ²)	(cm ³)	(mm)	(kg)
50 (496)	50	CLS-502	70,9	355	128	14
	100	CLS-504	70,9	709	178	18
	150	CLS-506	70,9	1064	228	23
	200	CLS-508	70,9	1418	278	28
	250	CLS-5010	70,9	1773	327	33
	300	CLS-5012	70,9	2127	378	38
100 (929)	50	CLS-1002	132,7	664	143	24
	100	CLS-1004	132,7	1327	193	32
	150	CLS-1006	132,7	1991	243	40
	200	CLS-1008	132,7	2654	293	49
	250	CLS-10010	132,7	3318	343	58
	300	CLS-10012	132,7	3981	392	66
150 (1390)	50	CLS-1502	198,6	993	165	43
	100	CLS-1504	198,6	1986	215	55
	150	CLS-1506	198,6	2979	265	69
	200	CLS-1508	198,6	3972	315	82
	250	CLS-15010	198,6	4965	365	95
	300	CLS-15012	198,6	5958	414	108
200 (1859)	50	CLS-2002	265,6	1330	193	66
	150	CLS-2006	265,6	3989	293	101
	300	CLS-20012	265,6	7977	443	154
250 (2562)	50	CLS-2502	366,1	1832	193	90
	150	CLS-2506	366,1	5496	293	137
	300	CLS-25012	366,1	10996	443	208
300 (3193)	50	CLS-3002	456,2	2281	235	137
	150	CLS-3006	456,2	6843	335	198
	300	CLS-30012	456,2	13710	485	288
400 (3919)	50	CLS-4002	559,9	2800	265	200
	150	CLS-4006	559,9	8399	365	275
	300	CLS-40012	559,9	16770	515	390
500 (5118)	50	CLS-5002	731,1	3656	295	289
	150	CLS-5006	731,1	10967	395	390
	300	CLS-50012	731,1	21900	545	540
600 (5983)	50	CLS-6002	854,8	4277	310	350
	150	CLS-6006	854,8	12830	410	465
	300	CLS-60012	854,8	25710	560	640
800 (8238)	50	CLS-8002	1176,9	5882	355	549
	150	CLS-8006	1176,9	17645	455	709
	300	CLS-80012	1176,9	35370	605	950
1000 (10260)	50	CLS-10002	1466,4	7329	385	729
	150	CLS-10006	1466,4	21986	485	921
	300	CLS-100012	1466,4	43950	635	1210

CLS Series



Capacity:

50 - 1000 ton

Stroke:

50 - 300 mm

Maximum Operating Pressure:

700 bar



Higher Capacities

1500 and 2000 ton models are available on request.

Additional Stroke Lengths

Models above 150 ton are also available with standard stroke lengths of 100, 200 and 250 mm. Please contact Enerpac for ordering information.



Lifting an Unbalanced Load?

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

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Optional features

To add optional features to your cylinders, add the following suffix to the end of the model number.

Spring return

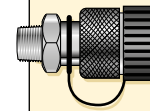
E001

Example:

- For CLS-5006 cylinder with spring return, order: **CLS-5006E001**

Technical specifications for these features are available from Enerpac.

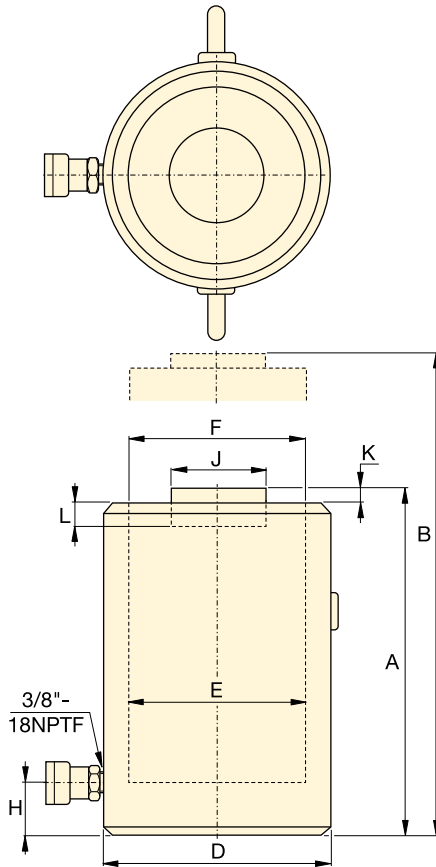
CLS-Series, High Tonnage Cylinders



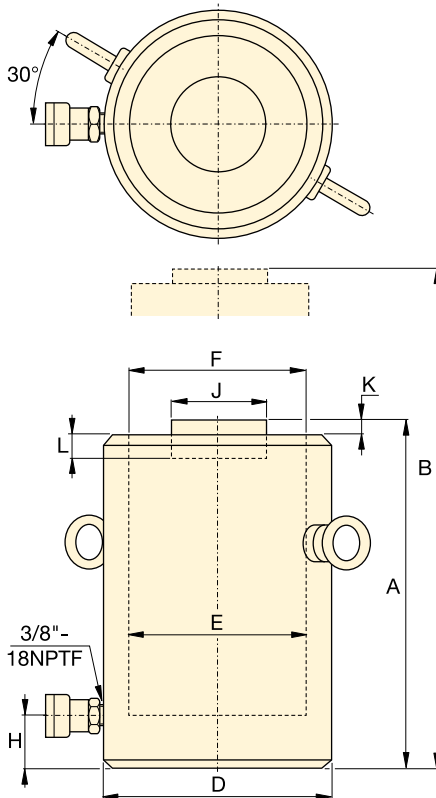
Couplers Included!

CR-400 couplers included on all models. Fit all HC-Series hoses.

◀ For full features see previous page.



CLS-502 - CLS-25012

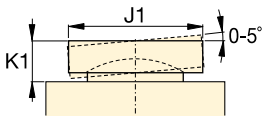


CLS-3002 - CLS-100012

Cylinder Capacity ton (kN)	Stroke (mm)	Model Number	Cylinder Effective Area (cm ²)	Oil Capacity (cm ³)
50 (496)	50	CLS-502	70,9	355
	100	CLS-504	70,9	709
	150	CLS-506	70,9	1064
	200	CLS-508	70,9	1418
	250	CLS-5010	70,9	1773
	300	CLS-5012	70,9	2127
100 (929)	50	CLS-1002	132,7	664
	100	CLS-1004	132,7	1327
	150	CLS-1006	132,7	1991
	200	CLS-1008	132,7	2654
	250	CLS-10010	132,7	3318
	300	CLS-10012	132,7	3981
150 (1390)	50	CLS-1502	198,6	993
	100	CLS-1504	198,6	1986
	150	CLS-1506	198,6	2979
	200	CLS-1508	198,6	3972
	250	CLS-15010	198,6	4965
	300	CLS-15012	198,6	5958
200 (1859)	50	CLS-2002	265,6	1330
	150	CLS-2006	265,6	3989
	300	CLS-20012	265,6	7977
250 (2562)	50	CLS-2502	366,1	1832
	150	CLS-2506	366,1	5496
	300	CLS-25012	366,1	10996
300 (3193)	50	CLS-3002	456,2	2281
	150	CLS-3006	456,2	6843
	300	CLS-30012	456,2	13710
400 (3919)	50	CLS-4002	559,9	2800
	150	CLS-4006	559,9	8399
	300	CLS-40012	559,9	16770
500 (5118)	50	CLS-5002	731,1	3656
	150	CLS-5006	731,1	10967
	300	CLS-50012	731,1	21900
600 (5983)	50	CLS-6002	854,8	4277
	150	CLS-6006	854,8	12830
	300	CLS-60012	854,8	25710
800 (8238)	50	CLS-8002	1176,9	5882
	150	CLS-8006	1176,9	17645
	300	CLS-80012	1176,9	35370
1000 (10260)	50	CLS-10002	1466,4	7329
	150	CLS-10006	1466,4	21986
	300	CLS-100012	1466,4	43950

Single-Acting, High Tonnage Cylinders

Optional Tilt Saddle *



Capacity:
50 - 1000 ton

Stroke:
50 - 300 mm

Maximum Operating Pressure:
700 bar

CLS Series



Collapsed Height A (mm)	Extended Height B (mm)	Outside Dia. D (mm)	Cylinder Bore Dia. E (mm)	Plunger Dia. F (mm)	Base to Adv. Port H (mm)	Standard Saddle Dia. J (mm)	Saddle Protr. from Plgr. K (mm)	Depth of Plunger Hole L (mm)	Weight (kg)	Model Number	* Optional Tilt Saddle		
											Saddle Dia. J1 (mm)	Saddle Height K1 (mm)	Saddle Model Number
128	178	125	95,0	95,0	30	71	2	13	14	CLS-502	71	24	CAT-100
178	278	125	95,0	95,0	30	71	2	13	18	CLS-504	71	24	CAT-100
228	378	125	95,0	95,0	30	71	2	13	23	CLS-506	71	24	CAT-100
278	478	125	95,0	95,0	30	71	2	13	28	CLS-508	71	24	CAT-100
327	578	125	95,0	95,0	30	71	2	13	33	CLS-5010	71	24	CAT-100
378	678	125	95,0	95,0	30	71	2	13	38	CLS-5012	71	24	CAT-100
143	193	165	130,0	130,0	30	71	2	13	24	CLS-1002	71	24	CAT-100
193	293	165	130,0	130,0	30	71	2	13	32	CLS-1004	71	24	CAT-100
243	393	165	130,0	130,0	30	71	2	13	40	CLS-1006	71	24	CAT-100
293	493	165	130,0	130,0	30	71	2	13	49	CLS-1008	71	24	CAT-100
343	593	165	130,0	130,0	30	71	2	13	58	CLS-10010	71	24	CAT-100
392	693	165	130,0	130,0	30	71	2	13	66	CLS-10012	71	24	CAT-100
165	215	205	159,0	159,0	39	130	2	25	43	CLS-1502	130	20	CAT-200
215	315	205	159,0	159,0	39	130	2	25	55	CLS-1504	130	20	CAT-200
265	415	205	159,0	159,0	39	130	2	25	69	CLS-1506	130	20	CAT-200
315	515	205	159,0	159,0	39	130	2	25	82	CLS-1508	130	20	CAT-200
365	615	205	159,0	159,0	39	130	2	25	95	CLS-15010	130	20	CAT-200
414	715	205	159,0	159,0	39	130	2	25	108	CLS-15012	130	20	CAT-200
193	243	235	183,9	183,9	50	130	2	25	66	CLS-2002	130	20	CAT-200
293	443	235	183,9	183,9	50	130	2	25	101	CLS-2006	130	20	CAT-200
443	743	235	183,9	183,9	50	130	2	25	154	CLS-20012	130	20	CAT-200
193	243	275	215,9	215,9	50	150	2	25	90	CLS-2502	150	21	CAT-250
293	443	275	215,9	215,9	50	150	2	25	137	CLS-2506	150	21	CAT-250
443	743	275	215,9	215,9	50	150	2	25	208	CLS-25012	150	21	CAT-250
235	285	310	241,0	241,0	59	139	5	25	137	CLS-3002	195	75	CAT-300
335	485	310	241,0	241,0	59	139	5	25	198	CLS-3006	195	75	CAT-300
485	785	310	241,0	241,0	59	139	5	25	288	CLS-30012	195	75	CAT-300
265	315	350	267,0	267,0	70	159	5	25	200	CLS-4002	225	85	CAT-400
365	515	350	267,0	267,0	70	159	5	25	275	CLS-4006	225	85	CAT-400
515	815	350	267,0	267,0	70	159	5	25	390	CLS-40012	225	85	CAT-400
295	345	400	305,1	305,1	80	179	5	25	289	CLS-5002	250	91	CAT-500
395	545	400	305,1	305,1	80	179	5	25	390	CLS-5006	250	91	CAT-500
545	845	400	305,1	305,1	80	179	5	25	540	CLS-50012	250	91	CAT-500
310	360	430	329,9	329,9	85	194	5	25	350	CLS-6002	275	96	CAT-600
410	560	430	329,9	329,9	85	194	5	25	465	CLS-6006	275	96	CAT-600
560	860	430	329,9	329,9	85	194	5	25	640	CLS-60012	275	96	CAT-600
355	405	505	387,1	387,1	100	224	5	25	549	CLS-8002	320	123	CAT-800
455	605	505	387,1	387,1	100	224	5	25	709	CLS-8006	320	123	CAT-800
605	905	505	387,1	387,1	100	224	5	25	950	CLS-80012	320	123	CAT-800
385	435	560	432,1	432,1	110	249	5	25	729	CLS-10002	360	136	CAT-1000
485	635	560	432,1	432,1	110	249	5	25	921	CLS-10006	360	136	CAT-1000
635	935	560	432,1	432,1	110	249	5	25	1210	CLS-100012	360	136	CAT-1000

▼ Shown from left to right: CLRG-506, CLRG-5006, CLRG-4006



- Double-acting, for positive retraction
- Integral stop ring provides piston blow-out protection
- Safety valve in retract side of cylinder helps to prevent damage in case of accidental over-pressurization
- Plunger wiper reduces contamination, extending cylinder life
- CR-400 coupler and dust cap included on all models
- Baked enamel finish and plated pistons provide superior corrosion resistance.

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



Double-Acting Power Lifters



Saddles

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

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Safety Device

A pilot-operated check valve (V-42) can be inserted between cylinder and pump. This valve provides a safety

lock on the cylinder under load at any position and remote control for unlocking.

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Optimum Performance

Enerpac's range of ZU4-Series electric pumps, fitted with manual or solenoid operated 4-way valves, offer

optimum combinations with CLRG cylinders.

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Standard Features

- Interchangeable, hardened grooved saddles
 - Top and side mounted lifting eyes
 - CR-400 coupler and dustcap
 - All cylinders meet ASME B-30.1 and ISO 10100 standards.

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



Double-Acting, High Tonnage Cylinders



RR-series

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

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▼ QUICK SELECTION CHART

For complete technical information see next page.

Cylinder Capacity ton (kN)	Stroke (mm)	Model Number	Cylinder Effective Area (cm ²)		Oil Capacity (cm ³)		Collapsed Height (mm)
			Push	Pull	Push	Pull	
50 (539)	50	CLRG-502	77,0	38,5	385	192	162
	100	CLRG-504	77,0	38,5	770	385	212
	150	CLRG-506	77,0	38,5	1155	577	262
	200	CLRG-508	77,0	38,5	1540	770	312
	250	CLRG-5010	77,0	38,5	1924	962	362
	300	CLRG-5012	77,0	38,5	2309	1155	412
100 (929)	50	CLRG-1002	132,7	61,9	664	309	179
	100	CLRG-1004	132,7	61,9	1327	619	229
	150	CLRG-1006	132,7	61,9	1991	928	279
	200	CLRG-1008	132,7	61,9	2655	1237	329
	250	CLRG-10010	132,7	61,9	3318	1546	379
	300	CLRG-10012	132,7	61,9	3982	1856	429
150 (1390)	50	CLRG-1502	198,6	96,5	993	482	196
	100	CLRG-1504	198,6	96,5	1986	965	246
	150	CLRG-1506	198,6	96,5	2978	1447	296
	200	CLRG-1508	198,6	96,5	3971	1930	346
	250	CLRG-15010	198,6	96,5	4964	2412	396
	300	CLRG-15012	198,6	96,5	5957	2895	446
200 (1861)	50	CLRG-2002	265,9	127,0	1330	635	212
	150	CLRG-2006	265,9	127,0	3989	1905	312
	300	CLRG-20012	265,9	127,0	7977	3809	462
250 (2565)	50	CLRG-2502	366,4	152,6	1832	763	235
	150	CLRG-2506	366,4	152,6	5497	2289	335
	300	CLRG-25012	366,4	152,6	10993	4578	485
300 (3193)	50	CLRG-3002	456,2	151,4	2281	757	322
	150	CLRG-3006	456,2	151,4	6843	2270	422
	300	CLRG-30012	456,2	151,4	13685	4541	572
400 (3919)	50	CLRG-4002	559,9	193,5	2800	967	374
	150	CLRG-4006	559,9	193,5	8399	2902	474
	300	CLRG-40012	559,9	193,5	16797	5804	624
500 (5114)	50	CLRG-5002	730,6	247,6	3653	1238	419
	150	CLRG-5006	730,6	247,6	10959	3713	519
	300	CLRG-50012	730,6	247,6	21918	7427	669
600 (5987)	50	CLRG-6002	855,3	295,4	4276	1477	429
	150	CLRG-6006	855,3	295,4	12829	4431	529
	300	CLRG-60012	855,3	295,4	25659	8862	679
800 (8234)	50	CLRG-8002	1176,3	387,0	5881	1935	484
	150	CLRG-8006	1176,3	387,0	17644	5806	584
	300	CLRG-80012	1176,3	387,0	35288	11611	734
1000 (10260)	50	CLRG-10002	1465,7	541,7	7329	2709	564
	150	CLRG-10006	1465,7	541,7	21986	8126	664
	300	CLRG-100012	1465,7	541,7	43972	16252	814

CLRG Series



Capacity:

50 - 1000 ton

Stroke:

50 - 300 mm

Maximum Operating Pressure:

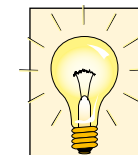
700 bar



Pump Selection

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

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Higher Capacities

1500 and 2000 ton models are available on request.

Additional Stroke Lengths

Models above 150 ton are also available with standard stroke lengths of 100, 200 and 250 mm. Please contact Enerpac for ordering information.



Optional features

To add optional features to your cylinders, add the following suffixes to the end of the model number.

Collar thread *	E002
Plunger thread	E003
Collar * and plunger thread	E005

* On 400 ton and higher

Example:

- For CLRG-5006 cylinder with collar thread, order: **CLRG-5006E002**

Technical specifications for these features are available from Enerpac.

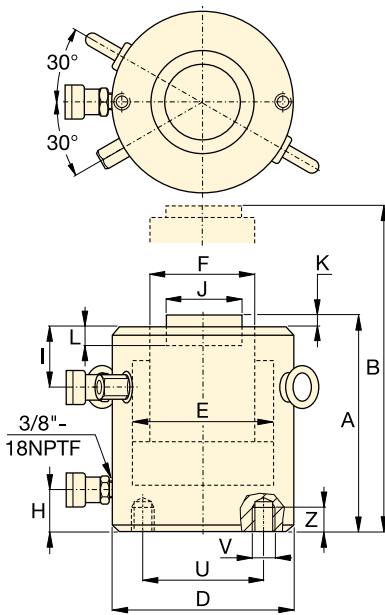
CLRG-Series, High Tonnage Cylinders



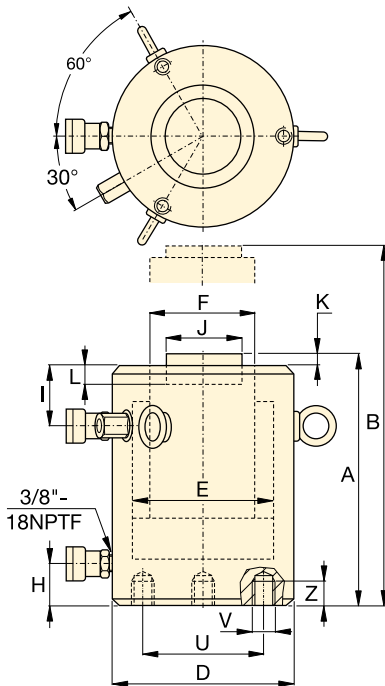
Mounting Hole Orientation

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

◀ For full features see previous page.



CLRG-502 - CLRG-15012



CLRG-2002 - CLRG-100012

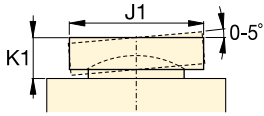
Base Mounting Hole ¹⁾ Dimensions (mm)			
Model / Capacity ton	Bolt Circle U	Thread Size V	Min. Thread Depth Z
CLRG-50	65	2x M12	22
CLRG-100	95	2x M12	22
CLRG-150	130	2x M12	22
CLRG-200	165	3x M12	22
CLRG-250	190	3x M12	22
CLRG-300	180	3x M16	30
CLRG-400	205	3x M16	30
CLRG-500	250	3x M24	36
CLRG-600	275	3x M24	36
CLRG-800	330	3x M24	36
CLRG-1000	375	3x M24	36

¹⁾ Base mounting holes are random positioned in regard to coupler position.

Cylinder Capacity ton (kN)	Stroke (mm)	Model Number	Maximum Cylinder Capacity (kN)		Cylinder Effective Area (cm ²)		Oil Capacity (cm ³)	
			Push	Pull	Push	Pull	Push	Pull
50	50	CLRG-502	539	269	77,0	38,5	385	192
	100	CLRG-504	539	269	77,0	38,5	770	385
	150	CLRG-506	539	269	77,0	38,5	1155	577
	200	CLRG-508	539	269	77,0	38,5	1540	770
	250	CLRG-5010	539	269	77,0	38,5	1924	962
	300	CLRG-5012	539	269	77,0	38,5	2309	1155
100	50	CLRG-1002	929	433	132,7	61,9	664	309
	100	CLRG-1004	929	433	132,7	61,9	1327	619
	150	CLRG-1006	929	433	132,7	61,9	1991	928
	200	CLRG-1008	929	433	132,7	61,9	2655	1237
	250	CLRG-10010	929	433	132,7	61,9	3318	1546
	300	CLRG-10012	929	433	132,7	61,9	3982	1856
150	50	CLRG-1502	1390	675	198,6	96,5	993	482
	100	CLRG-1504	1390	675	198,6	96,5	1986	965
	150	CLRG-1506	1390	675	198,6	96,5	2978	1447
	200	CLRG-1508	1390	675	198,6	96,5	3971	1930
	250	CLRG-15010	1390	675	198,6	96,5	4964	2412
	300	CLRG-15012	1390	675	198,6	96,5	5957	2895
200	50	CLRG-2002	1861	889	265,9	127,0	1330	635
	150	CLRG-2006	1861	889	265,9	127,0	3989	1905
	300	CLRG-20012	1861	889	265,9	127,0	7977	3809
250	50	CLRG-2502	2565	1068	366,4	152,6	1832	763
	150	CLRG-2506	2565	1068	366,4	152,6	5497	2289
	300	CLRG-25012	2565	1068	366,4	152,6	10993	4578
300	50	CLRG-3002	3193	1060	456,2	151,4	2281	757
	150	CLRG-3006	3193	1060	456,2	151,4	6843	2270
	300	CLRG-30012	3193	1060	456,2	151,4	13685	4541
400	50	CLRG-4002	3919	1354	559,9	193,5	2800	967
	150	CLRG-4006	3919	1354	559,9	193,5	8399	2902
	300	CLRG-40012	3919	1354	559,9	193,5	16797	5804
500	50	CLRG-5002	5114	1733	730,6	247,6	3653	1238
	150	CLRG-5006	5114	1733	730,6	247,6	10959	3713
	300	CLRG-50012	5114	1733	730,6	247,6	21918	7427
600	50	CLRG-6002	5987	2068	855,3	295,4	4276	1477
	150	CLRG-6006	5987	2068	855,3	295,4	12829	4431
	300	CLRG-60012	5987	2068	855,3	295,4	25659	8862
800	50	CLRG-8002	8234	2709	1176,3	387,0	5881	1935
	150	CLRG-8006	8234	2709	1176,3	387,0	17644	5806
	300	CLRG-80012	8234	2709	1176,3	387,0	35288	11611
1000	50	CLRG-10002	10260	3792	1465,7	541,7	7329	2709
	150	CLRG-10006	10260	3792	1465,7	541,7	21986	8126
	300	CLRG-100012	10260	3792	1465,7	541,7	43972	16252

Double-Acting, High Tonnage Cylinders

* Optional Tilt Saddle



Capacity:

50 - 1000 ton

Stroke:

50 - 300 mm

Maximum Operating Pressure:

700 bar

CLRG Series



Collaps. Height A (mm)	Extend. Height B (mm)	Outside Dia. D (mm)	Cyl. Bore Dia. E (mm)	Plunger Dia. F (mm)	Base to Advance Port H (mm)	Top to Retract Port I (mm)	Standard Saddle Dia. J (mm)	Saddle Protr. from Plgr. K (mm)	Depth of Plunger Hole L (mm)	Weight (kg)	Model Number	* Optional Tilt Saddle		
												Saddle Dia. J1 (mm)	Saddle Height K1 (mm)	Saddle Model Number
162	212	130	99	70	52	33	50	1	19	17	CLRG-502	50	24	CATG-50
212	312	130	99	70	52	33	50	1	19	20	CLRG-504	50	24	CATG-50
262	412	130	99	70	52	33	50	1	19	23	CLRG-506	50	24	CATG-50
312	512	130	99	70	52	33	50	1	19	27	CLRG-508	50	24	CATG-50
362	612	130	99	70	52	33	50	1	19	31	CLRG-5010	50	24	CATG-50
412	712	130	99	70	52	33	50	1	19	34	CLRG-5012	50	24	CATG-50
179	229	165	130	95	54	48	75	1	19	29	CLRG-1002	73	29	CATG-100
229	329	165	130	95	54	48	75	1	19	34	CLRG-1004	73	29	CATG-100
279	429	165	130	95	54	48	75	1	19	40	CLRG-1006	73	29	CATG-100
329	529	165	130	95	54	48	75	1	19	46	CLRG-1008	73	29	CATG-100
379	629	165	130	95	54	48	75	1	19	52	CLRG-10010	73	29	CATG-100
429	729	165	130	95	54	48	75	1	19	58	CLRG-10012	73	29	CATG-100
196	246	205	159	114	61	56	94	1	19	39	CLRG-1502	91	31	CATG-150
246	346	205	159	114	61	56	94	1	19	52	CLRG-1504	91	31	CATG-150
296	446	205	159	114	61	56	94	1	19	65	CLRG-1506	91	31	CATG-150
346	546	205	159	114	61	56	94	1	19	78	CLRG-1508	91	31	CATG-150
396	646	205	159	114	61	56	94	1	19	92	CLRG-15010	91	31	CATG-150
446	746	205	159	114	61	56	94	1	19	105	CLRG-15012	91	31	CATG-150
212	262	235	184	133	67	66	113	1	24	55	CLRG-2002	118	35	CATG-200
312	462	235	184	133	67	66	113	1	24	91	CLRG-2006	118	35	CATG-200
462	762	235	184	133	67	66	113	1	24	146	CLRG-20012	118	35	CATG-200
235	285	275	216	165	73	78	145	1	24	89	CLRG-2502	144	46	CATG-250
335	485	275	216	165	73	78	145	1	24	136	CLRG-2506	144	46	CATG-250
485	785	275	216	165	73	78	145	1	24	207	CLRG-25012	144	46	CATG-250
322	372	310	241	197	101	75	177	1	19	184	CLRG-3002	160	62	CATG-300
422	572	310	241	197	101	75	177	1	19	232	CLRG-3006	160	62	CATG-300
572	872	310	241	197	101	75	177	1	19	303	CLRG-30012	160	62	CATG-300
374	424	350	267	216	114	105	196	3	27	270	CLRG-4002	193	51	CATG-400
474	624	350	267	216	114	105	196	3	27	330	CLRG-4006	193	51	CATG-400
624	924	350	267	216	114	105	196	3	27	421	CLRG-40012	193	51	CATG-400
419	469	400	305	248	114	135	228	3	27	401	CLRG-5002	228	63	CATG-500
519	669	400	305	248	114	135	228	3	27	480	CLRG-5006	228	63	CATG-500
669	969	400	305	248	114	135	228	3	27	599	CLRG-50012	228	63	CATG-500
429	479	430	330	267	114	135	247	3	27	474	CLRG-6002	241	76	CATG-600
529	679	430	330	267	114	135	247	3	27	565	CLRG-6006	241	76	CATG-600
679	979	430	330	267	114	135	247	3	27	701	CLRG-60012	241	76	CATG-600
484	534	505	387	317	149	135	297	3	27	741	CLRG-8002	287	75	CATG-800
584	734	505	387	317	149	135	297	3	27	868	CLRG-8006	287	75	CATG-800
734	1034	505	387	317	149	135	297	3	27	1058	CLRG-80012	287	75	CATG-800
564	614	560	432	343	174	170	323	3	27	1062	CLRG-10002	311	93	CATG-1000
664	814	560	432	343	174	170	323	3	27	1213	CLRG-10006	311	93	CATG-1000
814	1114	560	432	343	174	170	323	3	27	1439	CLRG-100012	311	93	CATG-1000

▼ Shown from left to right: CLL-5010, CLL-502, CLL-1006



- Single-acting, load return
- Safety Lock Nut for mechanical load holding
- Special synthetic coating for improved corrosion resistance and lower friction for smoother operation
- Overflow port functions as a stroke limiter
- Interchangeable, hardened grooved saddles are standard
- CR-400 coupler and dust cap included on all models.

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



To Secure Loads Mechanically



Saddles

All CLL cylinders are equipped with bolt-on removable grooved saddles.

For information on optional tilt saddles, see selection chart at next page.

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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.

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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 centimetres.

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Single-Acting, Lock Nut Cylinders

▼ QUICK SELECTION CHART

For complete technical information see next page.

Cylinder Capacity	Stroke	Model Number	Cylinder Effective Area	Oil Capacity	Collapsed Height	
ton (kN)	(mm)		(cm ²)	(cm ³)	(mm)	(kg)
50 (496)	50	CLL-502	70,9	355	164	15
	100	CLL-504	70,9	709	214	20
	150	CLL-506	70,9	1064	264	25
	200	CLL-508	70,9	1418	314	30
	250	CLL-5010	70,9	1773	364	35
	300	CLL-5012	70,9	2127	414	40
100 (929)	50	CLL-1002	132,7	664	187	30
	100	CLL-1004	132,7	1327	237	39
	150	CLL-1006	132,7	1991	287	48
	200	CLL-1008	132,7	2654	337	56
	250	CLL-10010	132,7	3318	387	64
	300	CLL-10012	132,7	3981	437	73
150 (1390)	50	CLL-1502	198,6	993	209	53
	100	CLL-1504	198,6	1986	259	66
	150	CLL-1506	198,6	2979	309	78
	200	CLL-1508	198,6	3972	359	92
	250	CLL-15010	198,6	4965	409	104
	300	CLL-15012	198,6	5958	459	117
200 (1859)	50	CLL-2002	265,6	1330	243	83
	150	CLL-2006	265,6	3989	343	117
	300	CLL-20012	265,6	7995	493	170
250 (2562)	50	CLL-2502	366,1	1832	249	116
	150	CLL-2506	366,1	5496	349	162
	300	CLL-25012	366,1	10995	499	234
300 (3193)	50	CLL-3002	456,2	2281	295	173
	150	CLL-3006	456,2	6843	395	233
	300	CLL-30012	456,2	13740	545	323
400 (3919)	50	CLL-4002	559,9	2800	335	250
	150	CLL-4006	559,9	8399	435	327
	300	CLL-40012	559,9	16800	585	441
500 (5118)	50	CLL-5002	731,1	3653	375	367
	150	CLL-5006	731,1	10959	475	466
	300	CLL-50012	731,1	21930	625	617
600 (5983)	50	CLL-6002	854,8	4277	395	446
	150	CLL-6006	854,8	12830	495	562
	300	CLL-60012	854,8	25650	645	737
800 (8238)	50	CLL-8002	1176,9	5882	455	709
	150	CLL-8006	1176,9	17645	555	870
	300	CLL-80012	1176,9	35370	705	1110
1000 (10260)	50	CLL-10002	1466,4	7329	495	949
	150	CLL-10006	1466,4	21986	595	1141
	300	CLL-100012	1466,4	43980	745	1430

CLL Series



Capacity:

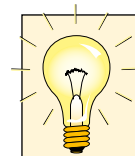
50 - 1000 ton

Stroke:

50 - 300 mm

Maximum Operating Pressure:

700 bar



Higher Capacities

1500 and 2000 ton models are available on request.

Additional Stroke Lengths

Models above 150 ton are also available with standard stroke lengths of 100, 200 and 250 mm. Please contact Enerpac for ordering information.



Lifting an Unbalanced Load?

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

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Speed Chart

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

Page: **255**



Optional features

To add an optional feature to your cylinders, add the following suffix to the end of the model number.

Spring return

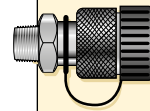
E001

Example:

- For CLL-5006 cylinder with spring return, order: **CLL-5006E001**

Technical specifications for these features are available from Enerpac.

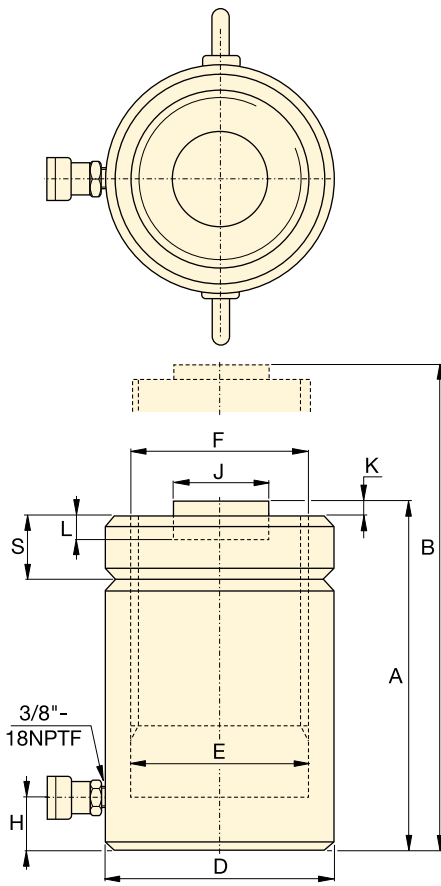
CLL-Series, Lock Nut Cylinders



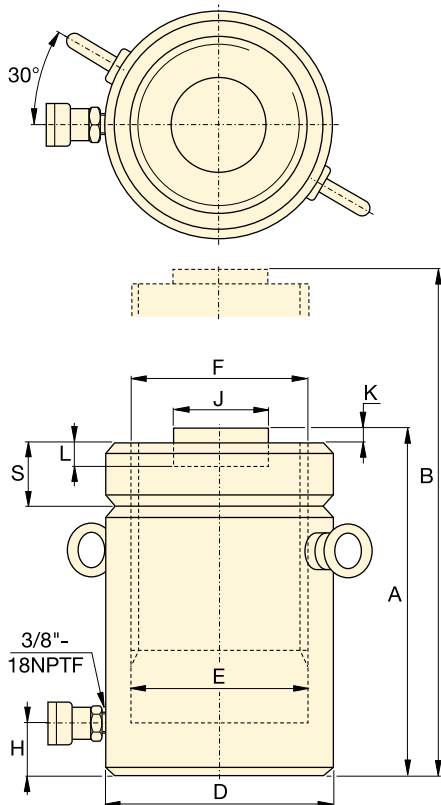
Couplers Included!

CR-400 couplers included on all models. Fit all HC-Series hoses.

◀ For full features see previous page.



CLL-502 - CLL-25012

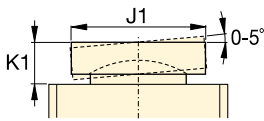


CLL-3002 - CLL-100012

Cylinder Capacity ton (kN)	Stroke (mm)	Model Number	Cylinder Effective Area (cm ²)	Oil Capacity (cm ³)
50 (496)	50	CLL-502	70,9	355
	100	CLL-504	70,9	709
	150	CLL-506	70,9	1064
	200	CLL-508	70,9	1418
	250	CLL-5010	70,9	1773
	300	CLL-5012	70,9	2127
100 (929)	50	CLL-1002	132,7	664
	100	CLL-1004	132,7	1327
	150	CLL-1006	132,7	1991
	200	CLL-1008	132,7	2654
	250	CLL-10010	132,7	3318
	300	CLL-10012	132,7	3981
150 (1390)	50	CLL-1502	198,6	993
	100	CLL-1504	198,6	1986
	150	CLL-1506	198,6	2979
	200	CLL-1508	198,6	3972
	250	CLL-15010	198,6	4965
	300	CLL-15012	198,6	5958
200 (1859)	50	CLL-2002	265,6	1330
	150	CLL-2006	265,6	3989
	300	CLL-20012	265,6	7995
250 (2562)	50	CLL-2502	366,1	1832
	150	CLL-2506	366,1	5496
	300	CLL-25012	366,1	10995
300 (3193)	50	CLL-3002	456,2	2281
	150	CLL-3006	456,2	6843
	300	CLL-30012	456,2	13740
400 (3919)	50	CLL-4002	559,9	2800
	150	CLL-4006	559,9	8399
	300	CLL-40012	559,9	16800
500 (5118)	50	CLL-5002	731,1	3653
	150	CLL-5006	731,1	10959
	300	CLL-50012	731,1	21930
600 (5983)	50	CLL-6002	854,8	4277
	150	CLL-6006	854,8	12830
	300	CLL-60012	854,8	25650
800 (8238)	50	CLL-8002	1176,9	5882
	150	CLL-8006	1176,9	17645
	300	CLL-80012	1176,9	35370
1000 (10260)	50	CLL-10002	1466,4	7329
	150	CLL-10006	1466,4	21986
	300	CLL-100012	1466,4	43980

Single-Acting, Lock Nut Cylinders

Optional Tilt Saddle *



Capacity:
50 - 1000 ton

Stroke:
50 - 300 mm

Maximum Operating Pressure:
700 bar

CLL Series



Coll. Height A (mm)	Ext. Height B (mm)	Outs. Dia. D (mm)	Cyl. Bore Dia. E (mm)	Plunger Dia. (threaded) F (mm)	Base to Adv. Port H (mm)	Standard Saddle Dia. J (mm)	Saddle Protr. from Plgr. K (mm)	Depth of Plunger Hole L (mm)	Lock-nut Height S (mm)	kg	Model Number	* Optional Tilt Saddle		
												Saddle Dia. J1 (mm)	Saddle Height K1 (mm)	Saddle Model Number
164	214	125	95,0	Tr 95 x 4	30	71	2	13	36	15	CLL-502	71	24	CAT-100
214	314	125	95,0	Tr 95 x 4	30	71	2	13	36	20	CLL-504	71	24	CAT-100
264	414	125	95,0	Tr 95 x 4	30	71	2	13	36	25	CLL-506	71	24	CAT-100
314	514	125	95,0	Tr 95 x 4	30	71	2	13	36	30	CLL-508	71	24	CAT-100
364	614	125	95,0	Tr 95 x 4	30	71	2	13	36	35	CLL-5010	71	24	CAT-100
414	714	125	95,0	Tr 95 x 4	30	71	2	13	36	40	CLL-5012	71	24	CAT-100
187	237	165	130,0	Tr 130 x 6	30	71	2	13	44	30	CLL-1002	71	24	CAT-100
237	337	165	130,0	Tr 130 x 6	30	71	2	13	44	39	CLL-1004	71	24	CAT-100
287	437	165	130,0	Tr 130 x 6	30	71	2	13	44	48	CLL-1006	71	24	CAT-100
337	537	165	130,0	Tr 130 x 6	30	71	2	13	44	56	CLL-1008	71	24	CAT-100
387	637	165	130,0	Tr 130 x 6	30	71	2	13	44	64	CLL-10010	71	24	CAT-100
437	737	165	130,0	Tr 130 x 6	30	71	2	13	44	73	CLL-10012	71	24	CAT-100
209	259	205	159,0	Tr 159 x 6	39	130	2	25	44	53	CLL-1502	130	20	CAT-200
259	359	205	159,0	Tr 159 x 6	39	130	2	25	44	66	CLL-1504	130	20	CAT-200
309	459	205	159,0	Tr 159 x 6	39	130	2	25	44	78	CLL-1506	130	20	CAT-200
359	559	205	159,0	Tr 159 x 6	39	130	2	25	44	92	CLL-1508	130	20	CAT-200
409	659	205	159,0	Tr 159 x 6	39	130	2	25	44	104	CLL-15010	130	20	CAT-200
459	759	205	159,0	Tr 159 x 6	39	130	2	25	44	117	CLL-15012	130	20	CAT-200
243	293	235	184,0	Tr 184 x 6	50	130	2	25	50	83	CLL-2002	130	20	CAT-200
343	493	235	184,0	Tr 184 x 6	50	130	2	25	50	117	CLL-2006	130	20	CAT-200
493	793	235	184,0	Tr 184 x 6	50	130	2	25	50	170	CLL-20012	130	20	CAT-200
249	299	275	216,0	Tr 216 x 6	50	150	2	25	56	116	CLL-2502	150	21	CAT-250
349	499	275	216,0	Tr 216 x 6	50	150	2	25	56	162	CLL-2506	150	21	CAT-250
499	799	275	216,0	Tr 216 x 6	50	150	2	25	56	234	CLL-25012	150	21	CAT-250
295	345	310	241,0	Tr 241 x 6	59	139	5	25	60	173	CLL-3002	195	75	CAT-300
395	545	310	241,0	Tr 241 x 6	59	139	5	25	60	233	CLL-3006	195	75	CAT-300
545	845	310	241,0	Tr 241 x 6	59	139	5	25	60	323	CLL-30012	195	75	CAT-300
335	385	350	267,0	Tr 266 x 6	70	159	5	25	70	250	CLL-4002	225	85	CAT-400
435	585	350	267,0	Tr 266 x 6	70	159	5	25	70	327	CLL-4006	225	85	CAT-400
585	885	350	267,0	Tr 266 x 6	70	159	5	25	70	441	CLL-40012	225	85	CAT-400
375	425	400	305,0	Tr 305 x 6	80	179	5	25	80	367	CLL-5002	250	91	CAT-500
475	625	400	305,0	Tr 305 x 6	80	179	5	25	80	466	CLL-5006	250	91	CAT-500
625	925	400	305,0	Tr 305 x 6	80	179	5	25	80	617	CLL-50012	250	91	CAT-500
395	445	430	330,0	Tr 330 x 6	85	194	5	25	85	446	CLL-6002	275	96	CAT-600
495	645	430	330,0	Tr 330 x 6	85	194	5	25	85	562	CLL-6006	275	96	CAT-600
645	945	430	330,0	Tr 330 x 6	85	194	5	25	85	737	CLL-60012	275	96	CAT-600
455	505	505	387,0	Tr 387 x 6	100	224	5	25	100	709	CLL-8002	320	123	CAT-800
555	705	505	387,0	Tr 387 x 6	100	224	5	25	100	870	CLL-8006	320	123	CAT-800
705	1005	505	387,0	Tr 387 x 6	100	224	5	25	100	1110	CLL-80012	320	123	CAT-800
495	545	560	432,0	Tr 432 x 6	110	249	5	25	110	949	CLL-10002	360	136	CAT-1000
595	745	560	432,0	Tr 432 x 6	110	249	5	25	110	1141	CLL-10006	360	136	CAT-1000
745	1045	560	432,0	Tr 432 x 6	110	249	5	25	110	1430	CLL-100012	360	136	CAT-1000

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



JH, JHA Series

Capacity:
7 - 150 ton

Stroke:
76 - 155 mm

Maximum Operating Pressure:
700 bar

- All-directional operation on 7, 15 and 35 ton JHA-series
- Internal relief valve to prevent overloading
- Machined flat front and bottom surfaces permit flush alignment in tight corners
- Chrome plated plungers
- Pumping handle included
- Automatic by-pass port to prevent over-extension (JH-series).



Lifting Wedge and Machine Lifts

Ideal to lift the load the first few centimeters. The LW-16 Lifting Wedge requires a very small access gap of only 10 mm.


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Load Skates

For moving heavy loads easily and safely.

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Style	Jack Capacity ton (kN)	Stroke (mm)	Model Number	Jack Effective Area (cm ²)	Collapsed Height (mm)	Extended Height (mm)	Bottom Plate Dimensions W x L (mm)	Plunger Diameter (mm)	Pump Speed	 (kg)
Conventional Jacks	7 (62)	76	JHA-73	9,6	133	209	73 x 158	30,2	Single	5,0
	15 (133)	153	JHA-156	20,3	247	401	92 x 238	41,4	Single	13,2
	35 (311)	155	JHA-356	45,6	257	412	117 x 254	54,1	Single	18,1
	75 (667)	153	JHA-756	102,6	285	439	174 x 325	114,3	Single	42,6
	150 (1335)	155	JHA-1506	197,9	327	482	241 x 407	158,8	2-Speed	95,3
Steel Jacks	30 (267)	155	JH-306	38,3	254	409	95 x 242	69,9	Single	26,8
	50 (445)	154	JH-506	62,1	260	414	127 x 258	88,9	2-Speed	40,8
	100 (890)	153	JH-1006	133,1	287	440	181 x 328	130,1	2-Speed	74,4

Industrial Steel Bottle Jacks

▼ Shown: GBJ-010, GBJ-030, GBJ-003



GBJ Series



Capacity:

2 - 100 ton

Stroke:

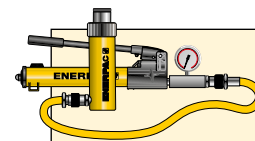
62 - 460 mm



Screw Extension Feature

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


- Lower handle effort reduces operator fatigue
- Fully serviceable
- High-strength beam and pump linkage for long life
- 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
- Thick base material with large area for increased strength and stability during lifting.



Cylinder-Pump Sets

As an alternative to bottle jacks where the operator is required to stand remote from the jacking point, see our range of cylinder-pump sets.

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Jack Capacity	Stroke	Model Number	Screw Extension	Minimum Height	Maximum Height	Plunger diameter	Saddle Diameter	Bottom Plate Dimensions W x L	
ton (kN)	(mm)		(mm)	(mm)	(mm)	(mm)	(mm)	W x L (mm)	(kg)
2 (19,6)	460	GBJ002L	-	570	1030	29,0	-	127 x 127	6,0
2 (19,6)	100	GBJ002	50	160	310	21,0	21	95 x 111	3,6
3 (29,4)	105	GBJ003	65	168	338	24,0	24	95 x 116	3,9
5 (49,0)	150	GBJ005	75	212	437	29,0	29	95 x 123	5,0
8 (78,4)	150	GBJ008	75	219	444	33,0	37	95 x 138	5,9
10 (98,0)	150	GBJ010	75	219	444	37,0	37	95 x 142	6,5
10 (98,0)	62	GBJ010S	30	131	223	37,0	37	95 x 142	5,5
15 (147,0)	150	GBJ015	75	228	453	44,5	44	112 x 163	9,0
20 (196,0)	150	GBJ020	75	234	459	51,0	58	127 x 171	12,1
20 (196,0)	105	GBJ020S	55	190	350	51,0	58	127 x 171	10,0
30 (294,0)	150	GBJ030	75	242	467	57,5	65	142 x 196	15,5
50 (490,0)	150	GBJ050	-	252	402	80,0	80	180 x 230	28,5
100 (980,0)	150	GBJ100	-	300	450	110,0	94	296 x 333	87,0

All GBJ Jacks meet or exceed: ANSI, PALD, CE.

▼ Shown: PRASA10027L and accessory Locking U-Rings



Safe, Efficient, Mobile Load Lifting



Pendant cord

Supplied with 3,5 m pendant cord for air driven units with pneumatic valves and 6 m pendant cord for electric driven units keeps operator away from the load.

- 54, 90, 136 and 181 ton capacities with pneumatic or electric pumps for the toughest jobs
- 102 mm ground clearance for transport over rail and rough terrain
- Double-acting cylinder
- Three position handle provides easy tilt back and transport
- Complies with ASME/ANSI B30.1/CE specifications
- Easy to change external filter minimizes down time
- Rugged, fully enclosed 610 mm wide frame with no exposed fittings or hoses
- SUP-R-STACK™ Extension System allows lifting at all heights without blocking.




POW'R LOCK – Self-Locking Mobile Lift System

A self-locking jack that performs automatic locking during lifting, lowering and holding. See the Enerpac **PL-Series** on our website.



◀ Enerpac POW'R-RISER® used in mining operations to lift heavy equipment.

Capacity ton (kN)	Stroke (mm)	Model Number with Electric Pump (230V - 1 ph - 50Hz)	 (kg)
54 (533)	356	PREME06014L	177
	686	PREME06027L	272
90 (889)	406	PREME10016L	231
	686	PREME10027L	272
	406	-	-
	686	-	-
136 (1333)	394	-	-
	673	-	-
	394	PREME15016L	258
	673	PREME15027L	321
181 (1778)	394	-	-
	673	-	-

POW'R-RISER® Lifting Jack



SUP-R-STACK Extensions

Increase useful height from 127 to 457 mm.

Model No.	Size (mm)	Model No.	Size (mm)
PRE5	127	PRE11	279
PRE7	178	PRE14	356
PRE9	229	PRE18	457
PRES6024	Extension set includes PRE5, PRE7, PRE11 and PRE18.		



Spacers

Fine tune your extension stack height.

Model No.	Size (mm)	Model No.	Size (mm)
PRS1	25	PRS3	76
PRS2	51	-	-
PRS4	Set includes (2x) PRS1, (1x) PRS2 and (1x) PRS3.		

PR Series



Rated Lifting Capacity:

54 - 181 ton

Stroke:

356 - 686 mm

Maximum Operating Pressure:

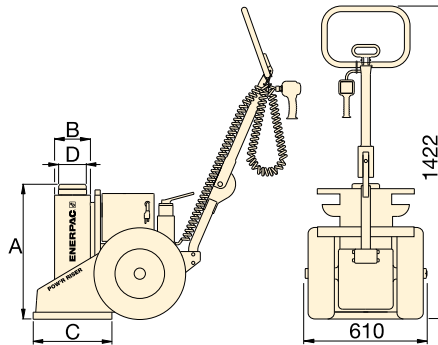
700 bar

Cap. (kN)	Swivel Load Saddle	Locking U-Rings					Set Model Number	Locking U-Ring Sets Include:								
		25 mm	76 mm	114 mm	140 mm	254 mm		Quantity & model numbers								
533	PRTS60	PRU11	PRU13	PRU14	-	PRU110	¹⁾ PRUS126	PRU11	PRU13	PRU14	-	²⁾ PRUS137	PRU11	PRU13	PRU14	PRU110
889	PRTS60	PRU11	PRU13	PRU14	-	PRU110	¹⁾ PRUS126	PRU11	PRU13	PRU14	-	²⁾ PRUS137	PRU11	PRU13	PRU14	PRU110
1333	PRTS150	PRU151	PRU153	-	PRU155	PRU1510	³⁾ PRUS1526	PRU151	PRU153	PRU155	-	²⁾ PRUS1537	PRU151	PRU1510	PRU155	-
1778	PRTS200	PRU201	PRU203	-	PRU205	PRU2010	³⁾ PRUS2026	PRU201	PRU203	PRU205	-	²⁾ PRUS2037	PRU201	PRU2010	PRU205	-

¹⁾ For 356 mm and 406 mm stroke models

²⁾ For 686 mm stroke models

³⁾ For 394 mm stroke models.



WARNING!

Extensions: Any two extensions may be stacked for loads up to 54 ton. For loads over 54 ton or strokes over 356 mm only one extension and one spacer can be used.

Spacers: Never exceed 76 mm in total spacer height.

Model Number with Air Pump	(kg)	A (mm)	B (mm)	C (mm)	D (mm)	Max. Additional Stack Height Using Optional Extension (mm)	Valve Type
PRAMA06014L	177	610	162	356	102	813*	Manual
PRAMA06027L	272	940	162	356	102	279	
PRAMA10016L	231	660	178	457	102	533**	
PRAMA10027L	272	940	178	457	102	279	
PRASA10016L	231	660	178	457	102	533**	
PRASA10027L	272	940	178	457	102	279	Pneumatic
PRASA15016L	258	660	203	457	127	533**	Manual
PRASA15027L	321	940	203	457	127	279	
-	-	660	203	457	127	533**	
-	-	940	203	457	127	279	Manual
PRASA20016L	290	660	241	457	152	533**	Pneumatic
PRASA20027L	374	940	241	457	152	279	

* Based on one 457 mm and one 279 mm extension and one 76 mm spacer.

** Based on one 457 mm extension and one 76 mm spacer.

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

Ordering Example:

Model No. PREME06014L is a 356 mm stroke, 54 ton model, with a manual valve and a 230 VAC, 1-ph., 50 Hz electric motor.

A Air Pump, 1416 l/min air consumption at 5,5 bar

B 115 VAC, 1-ph., 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 54 ton capacity.

▼ From left to right: P-142ALSS, P-392ALSS, V-152NV, V-66NV, RC-256NV, RC-106NV, RC-53NV



Maximum Corrosion Resistance



Applications

For use in wet environments such as food processing, pulp and paper, mining, construction and applications in high temperature or in welding areas.


- 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.





Hoses

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

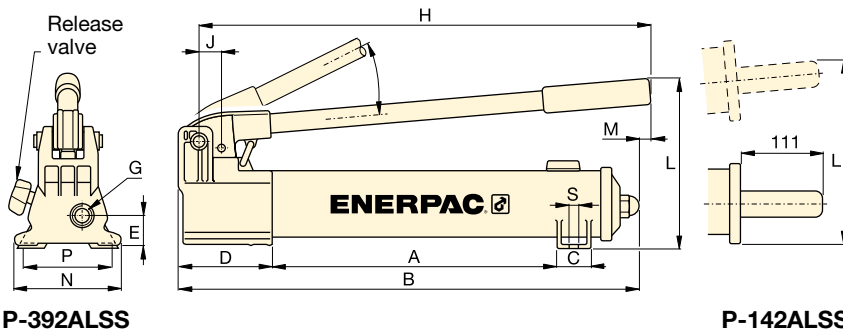
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CYLINDER CHART		Cylinder Capacity	Stroke	Model Number	Oil Capacity	Pressure Rating	Collapsed Height	Extended Height	Outside Diameter
		ton (kN)	(mm)		(cm ³)	(bar)	A (mm)	B (mm)	D (mm)
		5 (45)	76	RC-53NV	50	700	165	241	38
		10 (101)	51	RC-102NV	78	700	121	175	57
		10 (101)	156	RC-106NV	225	700	247	403	57
25 (232)	156	RC-256NV	528	700	273	431	85		

HAND PUMP CHART		Pump Type	Oil Capacity	Model Number	Pressure Rating	Oil Displacement per Stroke	Port Dimension	Piston Stroke
			(cm ³)		(bar)	(cm ³)	(NPTF)	(mm)
		Two Speed	327 901	P-142ALSS P-392ALSS	14 / 700 14 / 700	3,62 / 0,90 11,26 / 2,47	1/4"-18 3/8"-18	12,7 25,4

VALVE CHART*		Valve Type	Model Number	Function	Pressure Rating (bar)
		Manual Check Valve	V-66NV *	Load holding with cylinders	700
		Pressure Relief Valve	V-152NV *	Limits system pressure, ± 3% repeatability	55 -700

* See page 134 for valve function information of standard model products.



P-392ALSS

P-142ALSS

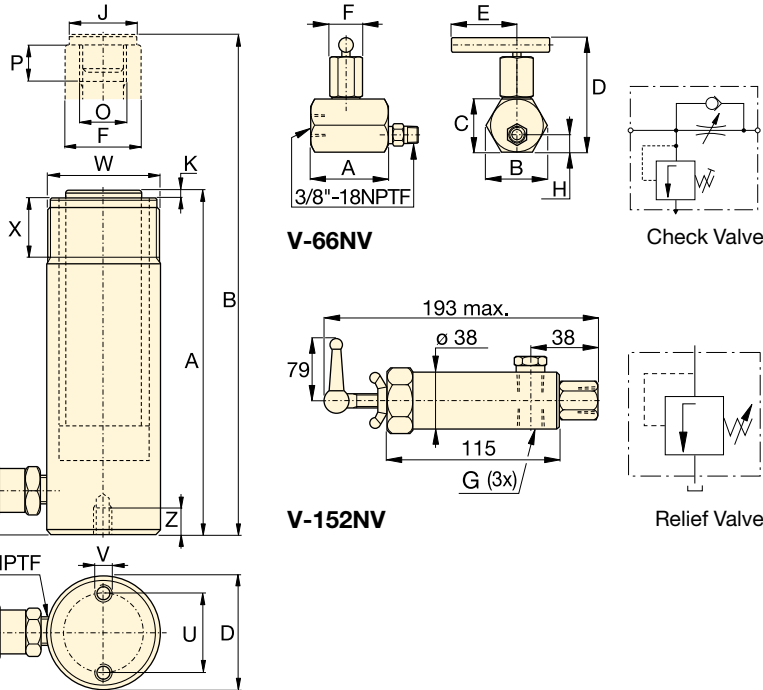
RC P V Series



Cylinder Capacity:
5 - 25 ton

Stroke:
54 - 158 mm

Maximum Operating Pressure:
700 bar



V-66NV

Check Valve

V-152NV

Relief Valve



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.

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

Plunger Diam. F (mm)	Base to Advance Port H (mm)	Saddle Diam. J (mm)	Saddle Protrusion from Plngr. K (mm)	Plunger Internal Thread O	Plunger Thread Length P (mm)	Base Mounting Holes			Collar Thread W	Collar Thread Length X (mm)	Weight (kg)	Model Number
						Bolt Circle U (mm)	Thread V	Thrd. Depth Z (mm)				
25,4	19	25	6	3/4"-16 UN	14	25	1/4"-20UN	14	1 1/2"-16	28	1,5	RC-53NV
38,1	19	35	6	1"-8 UN	19	39	5/16"-18UN	12	2 1/4"-14	28	2,3	RC-102NV
38,1	19	35	6	1"-8 UN	19	39	5/16"-18UN	12	2 1/4"-14	28	4,4	RC-106NV
57,2	25	50	10	1 1/2"-16 UN	25	58	1/2"-13UN	19	3 5/16"-12	49	10,0	RC-256NV

Pump Dimensions (mm)													Weight (kg)	Model Number
A	B	C	D	E	G	H	J	L	M	N	P	S		
185	336	28	85	28	1/4"-18 NPTF	319	19	143	-	95	80	7	2,0	P-142ALSS
344	533	36	99	33	3/8"-18 NPTF	522	30	177	16	120	-	-	4,1	P-392ALSS

Valve Dimensions (mm)									Weight (kg)	Model Number
A	B	C	D	E	F	G	H			
88,9	57,1	50,8	101,6	50,8	20,8	3/8"-18 NPTF	25,4	1,8	V-66NV *	
115,1	-	38,1	-	79,2	193,5	3/8"-18 NPTF	38,9	1,6	V-152NV *	

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



The Quickest and Easiest Way to Start Working Right Away





- Optimum match of individual components
- All sets are ready-for-use
- Sets include 1,8 m safety hose and gauge with gauge adaptor
- All hand pumps are two-speed.



Speed Chart

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

Pagina: **255**

1 Cylinder Selection (See Cylinder Section of this catalog for full product descriptions)		Set Capacity ton (kN)	Cylinder Model Number	Stroke (mm)	Collapsed Height (mm)
 <p>Single-Acting, General Purpose Cylinders: For maximum versatility. RC-Series</p>	Page: 6	5 (45)	RC-55	127	215
		10 (101)	RC-102	54	121
			RC-106	156	247
			RC-1010	257	349
		15 (142)	RC-154	101	200
			RC-156	152	271
		25 (232)	RC-252	50	165
			RC-254	102	215
			RC-256	158	273
			RC-2514	362	476
50 (498)	RC-506	159	282		
 <p>Single-Acting, Low Height Cylinders: Ideal where space is restricted. RCS-Series</p>	Page: 22	10 (101)	RCS-101	38	88
		20 (201)	RCS-201	45	98
		30 (295)	RCS-302	62	117
		45 (435)	RCS-502	60	122
		90 (887)	RCS-1002	57	141
 <p>Single-Acting, Hollow Cylinders: For pushing and pulling applications. RCH-Series</p>	Page: 26	13 (125)	RCH-121	42	120
		20 (215)	RCH-202	49	162
		30 (326)	RCH-302	64	178
		60 (576)	RCH-603	76	247
		95 (933)	RCH-1003	76	254
 <p>Pull Cylinders: The ultimate in pulling power. BRP-Series</p>	Page: 24	10 (105)	BRP-106C	151	587
			BRP-106L	151	541
		30 (326)	-	-	-
			BRP-306	155	1085
50 (505)	BRP-606	152	719		

Single-Acting Cylinder-Pump Sets

SET SELECTION:

- 1** Select the cylinder
- 2** Select the pump
- 3** Find the set model number in the blue matrix

SELECTION EXAMPLE

Selected cylinder:

- RC-106, Single-Acting cylinder with 156 mm stroke

Selected pump:

- P-392, Lightweight hand pump

Set model number:

- SCR-106H

Included:

- HC-7206 hose
- GF-10B gauge
- GA-2 adaptor

SC Series



Capacity:









5 - 95 ton

Stroke:

38 - 362 mm

Maximum Operating Pressure:

700 bar

2 Pump selection (See the Pump Section in 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 Number	Gauge Model Number	Gauge Adaptor Model Nr.
							
3							
SCR-55H	-	-	-	-	HC-7206	GP-10S	GA-4
-	SCR-102H	-	SCR-102FP	SCR-102XA	HC-7206	GF-10B	GA-2
-	SCR-106H	-	SCR-106FP	SCR-106XA	HC-7206	GF-10B	GA-2
-	SCR-1010H	-	SCR-1010FP	SCR-1010XA	HC-7206	GF-10B	GA-2
-	SCR-154H	-	SCR-154FP	SCR-154XA	HC-7206	GP-10S	GA-2
-	SCR-156H	-	SCR-156FP	SCR-156XA	HC-7206	GP-10S	GA-2
-	SCR-252H	-	SCR-252FP	SCR-252XA	HC-7206	GF-20B	GA-2
-	SCR-254H	-	SCR-254FP	SCR-254XA	HC-7206	GF-20B	GA-2
-	SCR-256H	-	SCR-256FP	SCR-256XA	HC-7206	GF-20B	GA-2
-	-	SCR-2514H	-	SCR-2514XA ¹⁾	HC-7206	GF-20B	GA-2
-	-	SCR-506H	-	SCR-506XA ¹⁾	HC-7206	GF-50B	GA-2
-	SCL-101H	-	SCL-101FP	SCL-101XA	HC-7206	GF-10B	GA-2
-	SCL-201H	-	SCL-201FP	SCL-201XA	HC-7206	GF-230B	GA-2
-	SCL-302H	-	SCL-302FP	SCL-302XA	HC-7206	GF-230B	GA-2
-	SCL-502H	-	SCL-502FP	SCL-502XA	HC-7206	GF-510B	GA-2
-	-	SCL-1002H	-	-	HC-7206	GF-510B	GA-2
SCH-121H	-	-	-	-	HB-7206	GF-120B	GA-4
-	SCH-202H	-	SCH-202FP	SCH-202XA	HC-7206	GF-813B	GA-3
-	SCH-302H	-	SCH-302FP	SCH-302XA	HC-7206	GF-813B	GA-3
-	-	SCH-603H	-	SCH-603XA ¹⁾	HC-7206	GF-813B	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⁾ With XA-12 air pump.

Enerpac hydraulic pumps are available in over 1000 different configurations. Whatever your high-pressure pump needs are... speed, control, intermittent or heavy duty cycle you will find an Enerpac pump suited to the application.

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

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Torque Wrench Pumps

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

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Pumps and Directional Valves Section Overview

Power Source	Pump Types	Maximum Reservoir Capacity (litres)	Max. Flow at Rated Pressure (l/min)	Max. Power Consumption	Series		Page
Manual	Lightweight Hand Pumps Exclusively from Enerpac	2,5	2,50 (cm ³ /stroke)	–	P		62 ▶
	ULTIMA Steel Hand Pumps	7,4	4,75	–	P		64 ▶
	Low Pressure Hand Pumps	3,3	9,50	–	P		66 ▶
	Multifluid Hand Pumps Pumping Fluids up to 1000 bar	–	21,8 (cm ³ /stroke)	–	MP		68 ▶
	Foot Pump For Hands Free Operation	0,5	2,47 (cm ³ /stroke)	–	P		69 ▶
	Ultra-High Pressure Hand Pumps Pressure up to 2800 bar	1,0	2,49 (cm ³ /stroke)	–	P 11		70 ▶
Electric	Battery Powered Hydraulic Pumps Cordless Hydraulic Power	2,0	0,25	0,37 (kW)	XC		72 ▶
	Economy Series Compact and Portable	3,8	0,32	0,37 (kW)	PU		74 ▶
	Submerged Series Powerful and Low-Noise	5,5	0,27	0,37 (kW)	PE		76 ▶
	Z-Class Pumps, Portable	40	1,0	1,25 (kW)	ZU		82 ▶
	Z-Class Pumps, Heavy-Duty	40	2,73	5,60 (kW)	ZE		88 ▶
	Split Flow Pumps Multiple outlets with equal oil flow	150	4,20	11 (kW)	SFP		94 ▶
Air	XA-Series Pumps, with XVARI® Technology For Productivity and Ergonomics	2,0	0,25	991 (l/min)	XA		96 ▶
	Turbo II Air Hydraulic Pumps Compact Air Over Hydraulic	5,0	0,16	340 (l/min)	PAT		98 ▶
	Air Hydraulic Pumps Single and Twin-Air Motor	1,3	0,13	255 (l/min)	PA		100 ▶
		8,0	0,15	510 (l/min)	PAM		101 ▶
	Z-Class Air Hydraulic Pumps Modular Air Pumps	40,0	1,31	2840 (l/min)	ZA		102 ▶
Gasoline	Z-Class Gasoline Hydraulic Pumps Gas Powered High Flow Pumps	40,0	1,64	4,8 (kW)	ZG5		104 ▶
	Z-Class Gasoline Hydraulic Pumps Gas Powered High Flow Pumps	40,0	3,30	9,7 (kW)	ZG6		106 ▶
	Atlas PGM-Series Small and Lightweight	8,0	0,66	2,2 (kW)	PGM		107 ▶
Directional Control Valves					VM, VC VE		108 ▶

P-Series, Lightweight Hand 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 aluminium pump base for maximum corrosion resistance
- Two-speed operation 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.

▼ Cylinder-pump set SCR-254H used to support the construction while monitoring pressure and load with the gauge.



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'.

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Speed Chart

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

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Tank Kits:

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

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



High Temperature and Corrosion Resistant Hand Pumps

The P-142 and P-392 hand pumps are available with Viton® seals, stainless steel pistons and anodized aluminium reservoir for use in extreme environments.

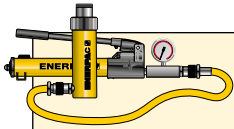
Page: 56

Pump Type	Usable Oil Capacity (cm ³)	Model Number	Pressure Rating ** (bar)		Oil Displacement per Stroke (cm ³)		Max. Handle Effort (kg)
			1 st stage	2 nd stage	1 st stage	2 nd stage	
Single-Speed	327	P-141	-	700	-	0,90	32,7
	901	P-391	-	700	-	2,47	38,6
Two-Speed	327	P-142*	13	700	3,62	0,90	35,4
	901	P-202	13	700	3,62	0,90	28,6
	901	P-392*	13	700	11,26	2,47	42,2
	2540	P-802	27	700	39,33	2,47	43,1
	2540	P-842	27	700	39,33	2,47	43,1

* Available as set, see note on next page.

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

Lightweight Hand Pumps



Pump-Cylinder Sets

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

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P Series



Reservoir Capacity:

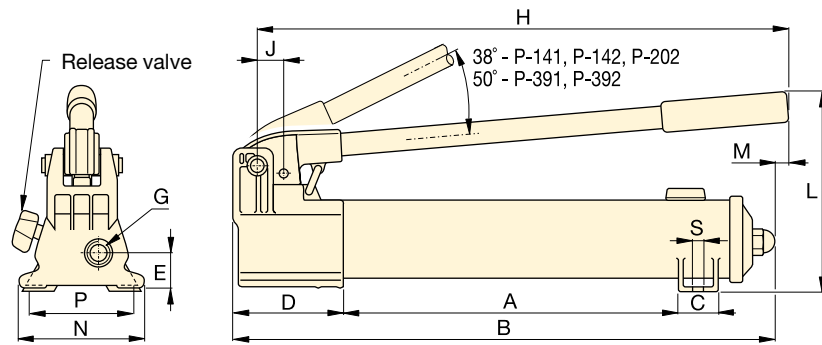
327 - 2540 cm³

Flow at Rated Pressure:

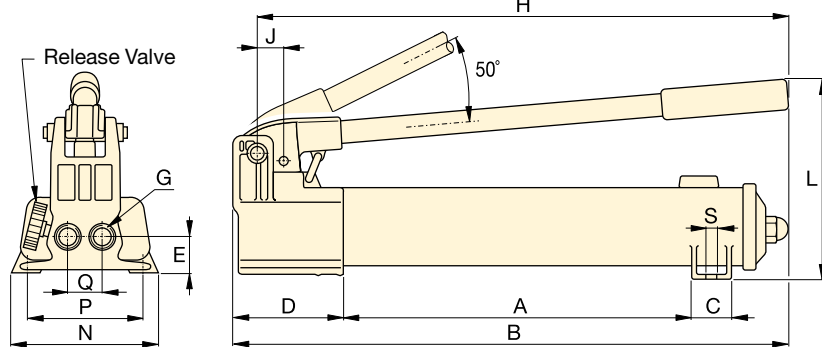
0,90 - 2,47 cm³/stroke

Operating Pressure:

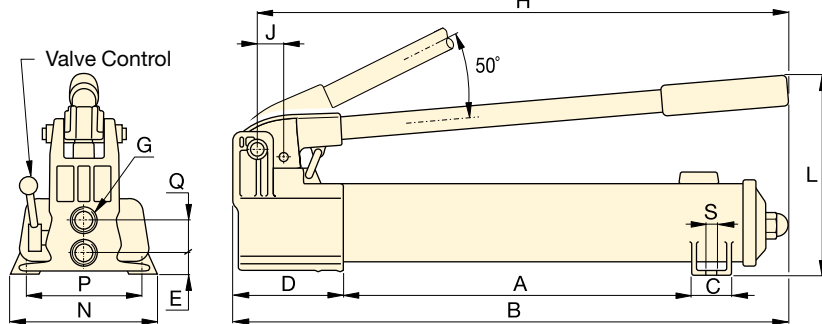
700 bar



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.

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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.

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Foot Pump P-392FP

For handsfree operation the lightweight and robust P-392FP Foot Pump is the perfect choice.

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Piston Stroke	Dimensions (mm)															Model Number
	(mm)	A	B	C	D	E	G	H	J	L	M	N	P	Q	S	
12,7	185	336	28	85	28	1/4"-18 NPTF	319	19	143	-	95	80	-	7	2,4	P-141
25,4	344	533	36	99	33	3/8"-18 NPTF	522	30	177	16	120	-	-	-	4,1	P-391
12,7	185	336	28	85	28	1/4"-18 NPTF	319	19	143	-	95	80	-	7	2,4	P-142*
12,7	344	509	36	85	28	1/4"-18 NPTF	400	19	144	16	95	-	-	-	3,4	P-202
25,4	344	533	36	99	33	3/8"-18 NPTF	522	30	177	16	120	-	-	-	4,1	P-392*
25,4	337	552	45	133	35	3/8"-18 NPTF	527	30	228	-	181	153	35	10	8,2	P-802
25,4	337	552	45	133	20	3/8"-18 NPTF	527	30	228	-	181	153	36	10	10,0	P-842

P-Series, ULTIMA Steel Hand Pumps

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



- Reduced handle effort and ergonomic grip for less operator fatigue
- Two-speed operation for fast and easy operation (except P-39)
- Vent free reservoir eliminates spills
- Quick grip handle allows for easy transport
- Integral reservoir over-pressurization protection
- All steel construction, chrome plated plunger and wiper system for durable, long lasting performance
- 4-way valving on the P-84 and P-464 for operation of double-acting cylinders.

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



The Solution for Tough Jobs



Two Speed Pumps

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



Foot Pump Conversion Kits

Convert your P-39, P-77, P-80 or P-801 to foot power with the **PC-11** Kit. Includes instructions for easy conversion.



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.

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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: 250

Pump Type	Usable Oil Capacity (cm ³)	Model Number	Pressure Rating ** (bar)		Oil Displacement per Stroke (cm ³)		Max. Handle Effort (kg)
			1 st stage	2 nd stage	1 st stage	2 nd stage	
Single	770	P-39	-	700	-	2,46	39
Two-Speed	770	P-77	34	700	16,39	2,46	40
	2200	P-80 *	34	700	16,39	2,46	35
	4100	P-801	34	700	16,39	2,46	35
	2200	P-84	34	700	16,39	2,46	35
	7423	P-462	14	700	126,20	4,75	49
	7423	P-464	14	700	126,20	4,75	49

* Available as a set, see note on next page.

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

ULTIMA Steel Hand Pumps

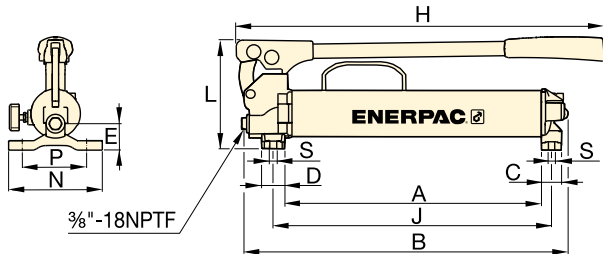
P Series



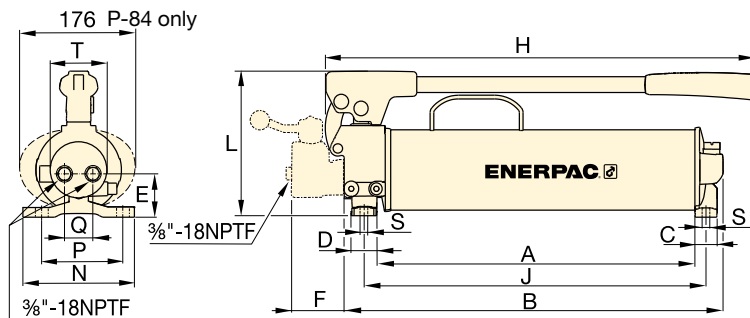
Reservoir Capacity:
770 - 7423 cm³

Flow at Rated Pressure:
2,46 - 4,75 cm³/stroke

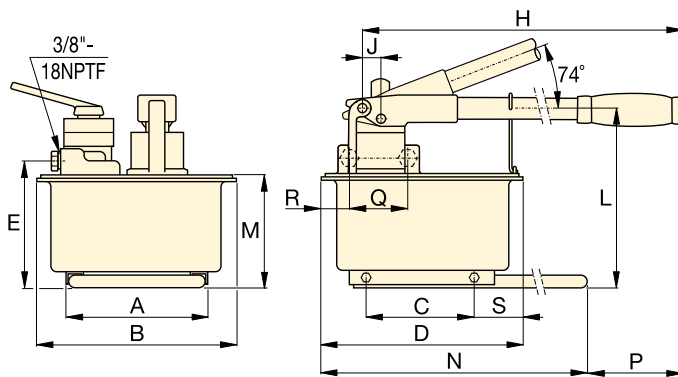
Maximum Operating Pressure:
700 bar



P-39, P-77



P-80, P-801, P-84



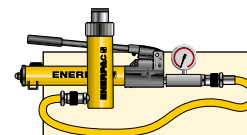
P-462, P-464



Extra Capacity Hand Pumps

P-462 and P-464 feature extra large reservoirs and high first-stage flow rate.

These pumps are ideally suited for powering high-capacity cylinders.



Pump-Cylinder Sets

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

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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'.

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Piston Stroke	Dimensions (mm)																	Model Number
	(mm)	A	B	C	D	E	F	H	J	L	M	N	P	Q	R	S	T	
25,4	383	480	30	35	37	-	550	416	163	-	140	111	-	-	8,4	-	6,2	P-39
25,4	391	487	30	35	47	-	550	424	163	-	140	111	-	-	8,4	-	7,1	P-77
25,4	428	511	30	35	55	-	579	460	195	-	150	121	42	-	8,4	74	10,7	P-80*
25,4	428	511	30	35	55	-	579	460	195	-	150	121	42	-	8,4	74	14,1	P-801
25,4	428	510	30	35	55	70	579	460	195	-	150	121	38	-	8,4	74	11,8	P-84
38,1	210	308	163	320	195	-	671	25	270	175	650	92	-	-	80	-	27,7	P-462
38,1	210	308	163	320	195	-	671	25	270	175	650	92	89	68	80	-	27,7	P-464

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



When Less Than 700 Bar is All You Need



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.

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Hoses

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

specify only genuine Enerpac hydraulic hoses.

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- 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.

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



Pump Type	Usable Oil Capacity (cm ³)	Model Number	Pressure Rating (bar)	Oil Displacement per Stroke (cm ³)	Max. Handle Effort (kg)
Single-Speed	360	P-18	200	2,46	16
	3277	P-25	175	9,50	27
	3277	P-50	350	4,75	27
	819	P-51	200	4,10	27

Low Pressure Hand Pumps

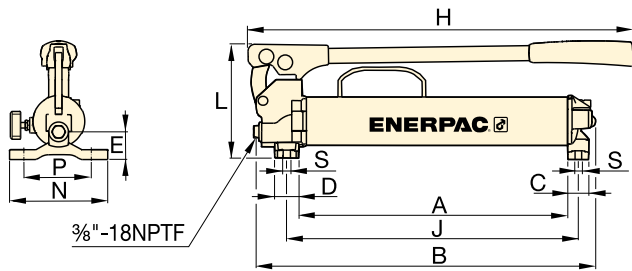
P Series



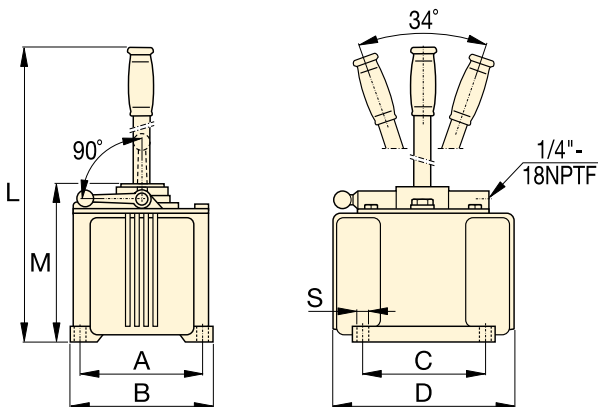
Reservoir Capacity:
360 - 3277 cm³

Flow at Rated Pressure:
2,46 - 9,50 cm³/stroke

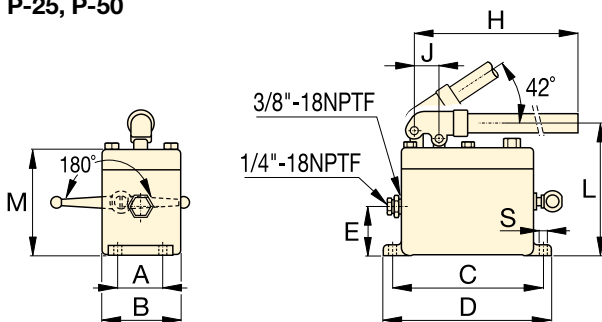
Maximum Operating Pressure:
175 - 350 bar



P-18



P-25, P-50



P-51



MP-Series Multifluid Hand Pumps

Corrosion resistant hand pumps for low pressure filling and high pressure testing applications, suitable for a wide range of fluids.

Page: **68**

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



Piston Stroke	Dimensions (mm)												Model Number
	(mm)	A	B	C	D	E	H	J	L	M	N	S	
25,4	221	316	30	35	37	385	254	163	–	140	8,4	5,0	P-18
38,1	152	173	152	240	–	–	–	684	200	–	10	16,3	P-25
38,1	152	173	152	240	–	–	–	684	200	–	10	16,8	P-50
25,4	52	92	181	200	57	610	29	160	129	–	9	5,4	P-51

MP-Series, Multifluid Hand Pumps

▼ Shown: **MP-110**



- Unbeatable corrosion resistance
- Standard supplied with Nitrile seals – can be used for a wide range of fluids such as demineralised water, oil/water emulsions, waterglycols, mineral oils
- Two speed pumps up to 1000 bar pressure
- Buna Nitrile seals can be exchanged with optional EPDM seal for use with Skydrol or brake fluids
- Impregnated aluminium anodized pump housing with stainless steel internal pumping components
- Externally adjustable pressure relief valve
- 1/4" NPTF gauge port.

MP Series

Flow at Rated Pressure:

2,2 - 21,8 cm³/stroke

Maximum Operating Pressure:

110 - 1000 bar



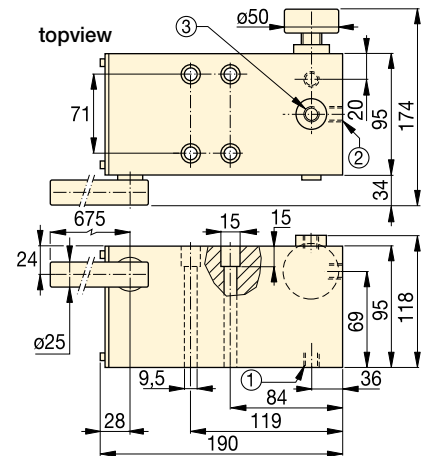
Multifluid Pump Applications

- Filling and testing of aircraft systems as shock absorbers
- Testing of aircraft systems using Skydrol fluid
- Testing of pressure vessels
- Operation of single-acting hydraulic tools and cylinders.



Optional Reservoir Kit

Includes 10 litres tank with skid frame, top plate with reservoir seal, suction pipe and mounting bolts. Useable oil capacity is 7,4 litres. Order model number: **MP-10T**.



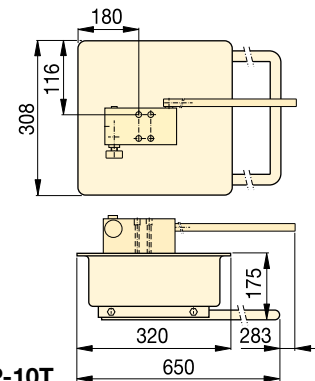
MP-110, 350, 700, 1000

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

Pump Type	Usable Oil Capacity ¹⁾ (cm ³)	Model Number	Pressure Rating (bar)		Oil Displacement per Stroke (cm ³)		Max. Handle Effort (kg)	Piston Stroke (mm)	Weight (kg)
			1st stage	2nd stage	1st stage	2nd stage			
Two Speed	*	MP-110	35	110	52,6	21,8	45	26,5	6,6
	*	MP-350	35	350	52,6	7,8	45	26,5	6,6
	*	MP-700	35	700	52,6	3,1	45	26,5	6,6
	*	MP-1000	35	1000	52,6	2,2	45	26,5	6,6

Note: MP-Pump includes 1,5 mm thick gasket for reservoir mounting.

¹⁾ MP-Series pumps requires the use of an external reservoir.



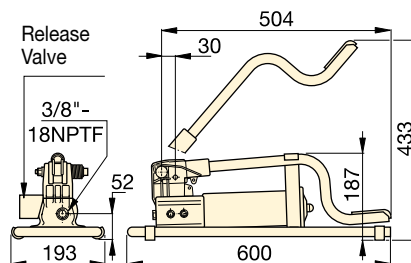
MP-10T

Lightweight Hydraulic Foot Pump

▼ Shown: P-392FP



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



Usable Oil Capacity (cm ³)	Model Number	Pressure Rating (bar)		Oil Displacement per Stroke (cm ³)		Max. Handle Effort (kg)	Piston Stroke (mm)	Piston Weight (kg)
		1st stage	2nd stage	1st stage	2nd stage			
492	P-392FP *	15	700	11,26	2,47	42	25,4	7,0

* Available as set, see note on this page.

P Series



Reservoir Capacity:

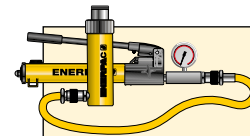
492 cm³

Flow at Rated Pressure:

2,47 cm³/stroke

Maximum Operating Pressure:

700 bar



Pump-Cylinder Sets

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

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Hoses

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

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



Ultra-High Pressure Hand Pumps

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



- Two-speed operation on the P-2282 allows for faster fill operation, 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, diesters, silicones, soluble oils and petroleum
- Large release knob for improved control of pressure release
- Outlet ports are 3/4"-16 cone for 2800 bar rating
- Ultra-high pressure fittings feature all stainless steel construction except adaptor 41-366 which features nickel plated carbon steel construction.

Ultra-High Pressure up to 2800 bar



2-Way Shut-Off Valve Model Nr. 72-750

For 2800 bar 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.

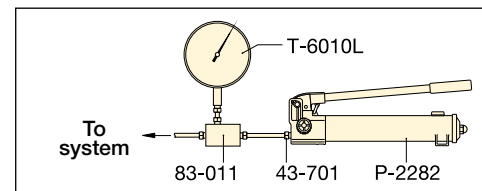


Test System Gauges

Ideal for monitoring pressure in your hydraulic circuit. Test System Gauges, such as the T6010L, are available

with cone threads or NPTF threads and a variety of pressure ranges.

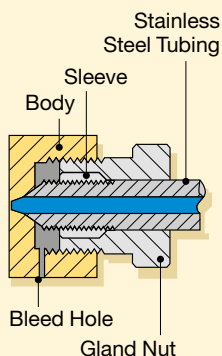
Page: 126



▲ Typical Test System

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 2800 bar seal.



Pump Type	Usable Oil Capacity (cm ³)	Model Number	Pressure Rating * (bar)		Oil Displacement per Stroke (cm ³)		Max. Handle Effort (kg)
			1 st stage	2 nd stage	1 st stage	2 nd stage	
Two-Speed	983	P-2282	13	2800	16,22	0,61	48,1
Single-Speed	737	11-100	-	700	-	2,49	54,4
	737	11-400	-	2800	-	0,62	54,4

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

Ultra-High Pressure Hand Pumps

▼ Optional Ultra-High Pressure Fittings and Tubings

Description	Connection	Model Nr.
2800 bar		
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
Tubing	100 mm tube, O.D. .38" * 200 mm tube, O.D. .38" * 300 mm tube, O.D. .38" *	45-116 45-126 45-136
700 bar only		
Adaptor	.38" F cone to 1/4" M NPTF	41-146
	.38" F cone to 3/8" M NPTF	41-166
Adaptor	.38" F cone to 1/4" F NPTF	41-246
	.38" F cone to 3/8" F NPTF	41-266
Adaptor	.38" M cone to 3/8" F NPTF	41-366

Note: .25" cone fittings use 9/16"-18 threads, 3/8" cone fittings use 3/4"-16 threads.
* Actual tubing lengths are 19 mm less than nominal size shown. These dimensions make distance between centers of valves and fittings multiples of 100 mm spaces.

P 11 Series



Reservoir Capacity:
737 - 983 cm³

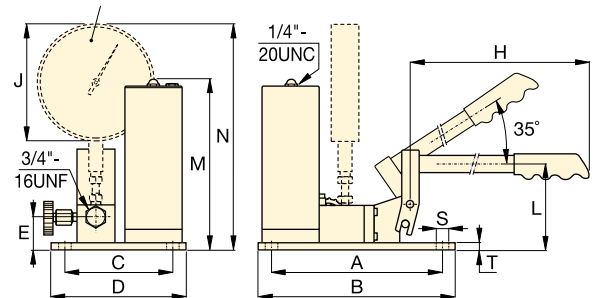
Flow at Rated Pressure:
0,61 - 2,49 cm³/stroke

Maximum Operating Pressure:
700 - 2800 bar

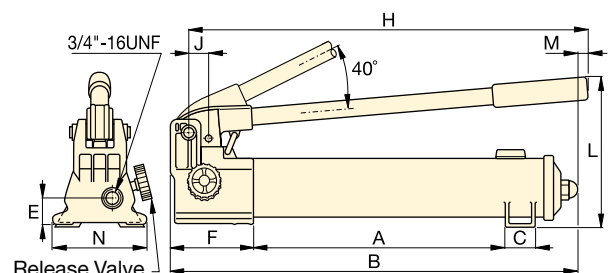


Ultra-High Pressure pumps DO NOT have an internal safety pressure relief valve.

Optional T-Series gauge and fitting



11-100, 11-400



P-2282

Piston Stroke	Dimensions (mm)														Model Number
	(mm)	A	B	C	D	E	F	H	J	L	M	N	S	T	
25,4	344	558	35	-	31	133	527	29	228	7	120	-	-	6,4	P-2282
19,8	240	266	151	177	45	-	635	162	114	237	314	7	9	10,0	11-100
19,8	240	266	151	177	45	-	635	162	114	237	314	7	9	10,0	11-400

▼ Shown: XC-1201ME



- Lightweight design with integrated handle and carrying strap for portability
- Bladder reservoir prevents contamination and allows pump usage in any position
- Powerful 0,37 kW motor and 28 Volt Lithium-Ion battery deliver exceptional speed and run time
- High-strength fiberglass reinforced composite shroud for superior durability in demanding job site environments
- Cordless technology eliminates tripping hazards found in other powered pumps.



Performance of a Powered Pump Portability of a Hand Pump



G2535L Gauge

Use gauge to check system pressure. Use gauge adaptor **GA-3** for easy mounting.

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



28-Volt Battery

The **XC-28V** with Lithium-Ion technology for maximum battery performance.



Battery Charger

1-hour quick charger.

Model Nr.	Voltage
XC-115VC	115 VAC
XC-230VC	230 VAC



3/8" Swivel Connector

360 degree swivel coupler for optimal orientation of the hydraulic connection on cylinders, pumps and hoses. Order Model Nr. **XSC-1**.

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◀ Power and simplicity for the toughest jobs.

Cordless Hydraulic Pumps



XC-Series Cordless Hydraulic Pumps

The XC-Series cordless pump is ideal for jobs using small to medium size cylinders and hydraulic tools, and is compatible with over 140 Enerpac tools and cylinders.

These cordless pumps combine the performance of a powered pump with the portability of a hand pump making them a perfect solution for remote applications with limited or no access to a power supply or for locations where corded solutions present trip hazards.

The Lithium-Ion battery provides superior run time:

- 250 cuts of 10 mm reinforcing bar using a WHC-750 cutter
- >100 lifts with a WR-5 spreader up to maximum load
- 45 splits on M27 - 8.8 nuts using a NC-3241 nut cutter
- 30 times lifting with a RC-104 cylinder (10 ton, 100 mm stroke).

Note: Actual number of cycles per charge will vary depending on condition of battery, tool and ambient conditions.

The XC-Series cordless pump is CSA and CE compliant.



XC Series

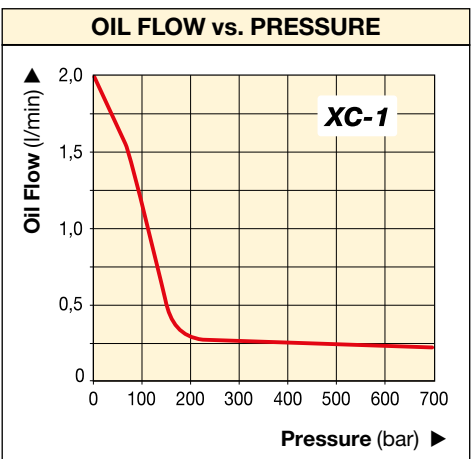
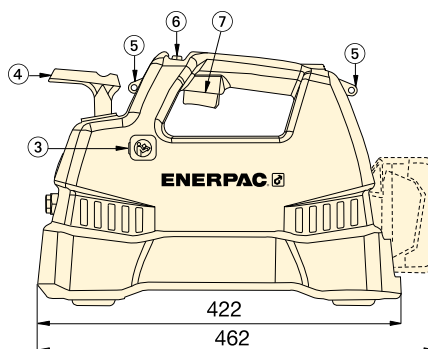
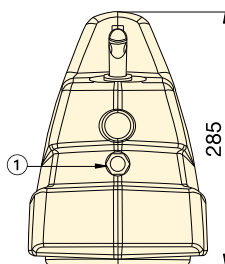
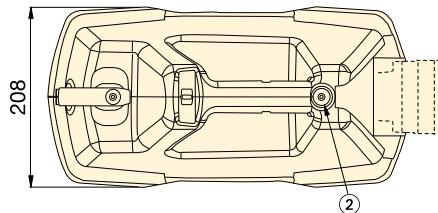


Reservoir Capacity:
1,0 - 2,0 litres

Flow at Rated Pressure:
0,25 l/min

Maximum Operating Pressure:
700 bar

- ① Outlet "Advance" Port 3/8"-18 NPTF
- ② Oil Fill (must use funnel)
- ③ User Adjustable Relief Valve Access Port
- ④ Directional Control Valve
- ⑤ Shoulder Strap Connection Points
- ⑥ Safety Lock Feature
- ⑦ On/Off Switch



▼ Take the battery pump anywhere without power cords or air hoses.



▼ SELECTION CHART

Useable Oil Capacity (litres)	Model Number	Output Flow Rate (l/min)			Valve Function **	Charger Voltage (VAC)	Weight (kg)
		No Load	140 bar	700 bar			
1,0	XC-1201MB	2,0	0,50	0,25	3-way, 2-pos.	115	10
2,0	XC-1202MB	2,0	0,50	0,25	3-way, 2-pos.	115	11
1,0	XC-1201ME *	2,0	0,50	0,25	3-way, 2-pos.	230	10
2,0	XC-1202ME *	2,0	0,50	0,25	3-way, 2-pos.	230	11

* Batteries and charger not included.

** For use with single-acting cylinders or tools.

www.enerpac.com

▼ Shown: PUJ-1200E



Heavy on Performance, Light on Weight

- Lightweight and compact design: 11,8 to 18,6 kg
- Large easy-carry handle for maximum portability
- Two-speed operation reduces cycle times for improved productivity
- 230 VAC 50/60-cycle universal motor will operate under poor voltage supply
- 24 VAC remote motor control, 3 m length for operator safety
- Starts under full load
- High strength molded shroud, with integral handle, protects motor from contamination and damage.



Gauges

Minimize the risk of overloading 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.

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Hoses

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

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Speed Chart

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

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Pump Type (Used with cylinder)	Usable Oil Capacity (litres)	Model Number *	Pressure Rating (bar)	
			1 st stage	2 nd stage
Single-Acting	1,9	PUD-1100E	13	700
	3,8	PUD-1101E	13	700
	1,9	PUJ-1200E	13	700
	3,8	PUJ-1201E	13	700
	1,9	PUD-1300E	13	700
	3,8	PUD-1301E	13	700
Double-Acting	1,9	PUJ-1400E	13	700
	3,8	PUJ-1401E	13	700

* For 115 volt applications replace 'E' suffix with 'B'.

** Electric dump valve for auto-retract of cylinders.

Economy Electric Pumps



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 make 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-retract of single-acting cylinders
- Ideal for punching applications
- For applications not requiring load holding
- 3 m pendant controls motor and valve operation.

PUD-1300 Series

- Provides advance-hold-retract of single-acting cylinders
- Ideal for applications requiring load-holding
- For applications requiring remote valve operations
- 3 m pendant controls motor and valve operation.

PUJ Series

- Manual valves provide advance-hold-retract tool operation
- Available with 3- and 4-way valves for single or double-acting cylinders
- 3 m pendant controls the motor operation.



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PU Series



Reservoir Capacity:

1,9 - 3,8 litres

Flow at Rated Pressure:

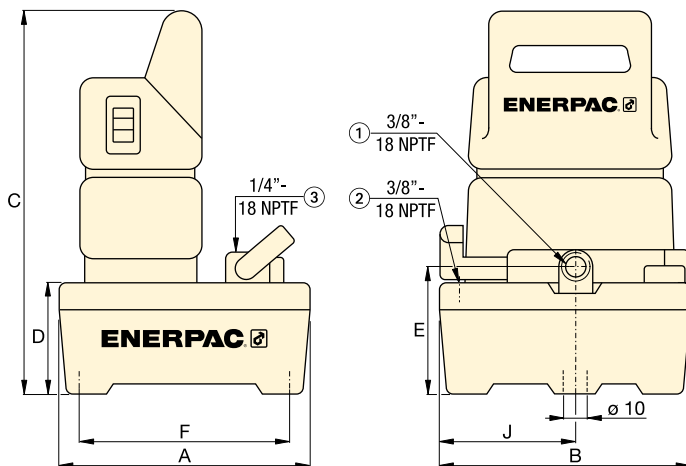
0,32 l/min

Motor Size:

0,37 kW

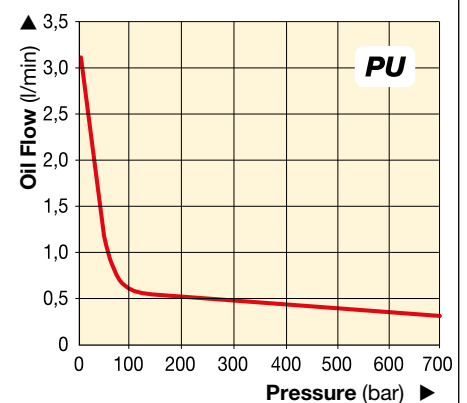
Maximum Operating Pressure:

700 bar



- ① Oil Outlet Port
- ② Tank Port
- ③ Gauge Port (PUJ-1200 and PUJ-1201 models only)

OIL FLOW VERSUS PRESSURE



Output Flow Rate (l/min)		Valve Type	Valve Function	Current Draw (Amps)	Motor Voltage (VAC)	Sound Level (dBA)	Dimensions (mm)							Weight (kg)	Model Number *
1 st stage	2 nd stage						A	B	C	D	E	F	J		
3,31	0,32	Dump**	Advance/Retract	3,2	230	85	244	244	362	101	119	203	133	11,8	PUD-1100E
3,31	0,32			3,2	230	85	368	309	373	105	130	323	142	17,2	PUD-1101E
3,31	0,32	3/2 manual	Advance/ Hold/Retract	3,2	230	85	244	244	362	101	119	203	133	10,0	PUJ-1200E
3,31	0,32			3,2	230	85	368	309	373	105	130	323	142	15,4	PUJ-1201E
3,31	0,32	3/2 solenoid	Advance/ Hold/Retract	3,2	230	85	244	244	362	101	119	203	133	12,0	PUD-1300E
3,31	0,32			3,2	230	85	368	309	373	105	130	323	142	17,5	PUD-1301E
3,31	0,32	4/3 manual	Advance/ Hold/Retract	3,2	230	85	244	244	362	101	119	203	133	13,2	PUJ-1400E
3,31	0,32			3,2	230	85	368	309	373	105	130	323	142	18,6	PUJ-1401E

▼ Shown: PEJ-1401E



- Two-speed operation reduces cycle times for improved productivity
- Powerful 0,37 kW induction motor is submerged in the oil reservoir to run cooler, protect the motor, simplify the pump interface, save space and reduce noise
- Large 5,5 litres 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.

Best Performance for Mid-Range Cylinders and Tools

▼ 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 79 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 3 m 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 3 m 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 3 m cord for remote motor operation

PES Series: with Pressure Switch

- Designed for continuous pressure applications, such as clamping, workholding and testing
- All versions include manual valves for directional control

* See the Valve Section in this catalog for technical information on valve types.

Submerged Electric Pumps



PE-Series Submerged Pump Application

The Submerged pump is best suited to power small to medium size cylinders or hydraulic tools, or whenever 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.

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PE Series



Reservoir Capacity:

5,5 litres

Flow at Rated Pressure:


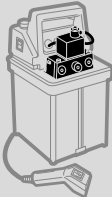

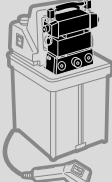
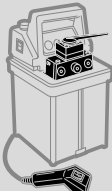

0,27 l/min

Motor Size:

0,37 kW

Maximum Operating Pressure:

700 bar

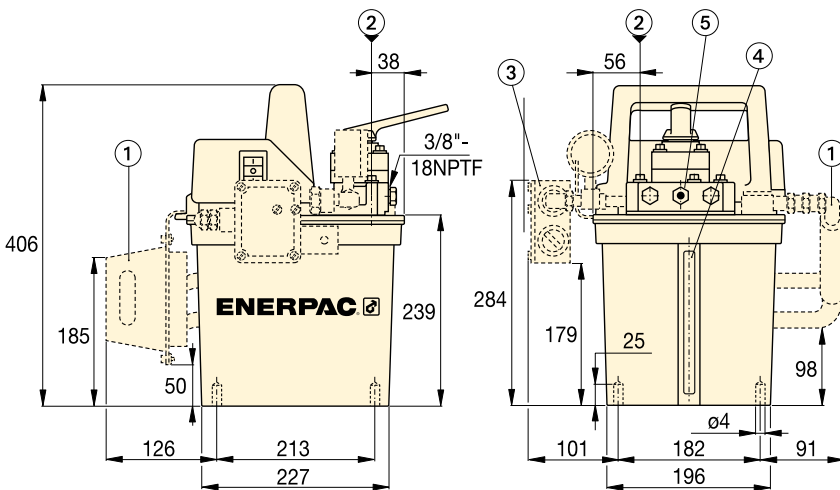
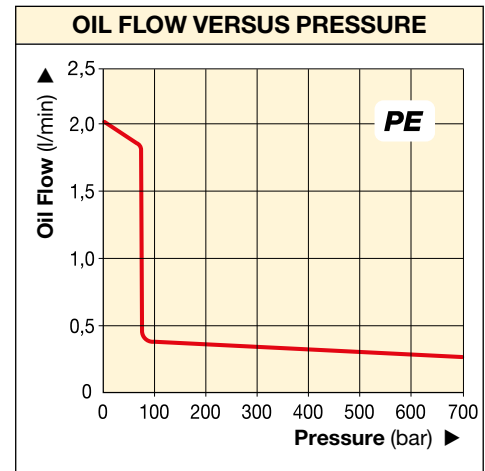
Pump Type	Used with Cylinder	Valve Function	Valve Type *	Usable Oil Capacity (litres)	Model Number 230 VAC, 1 ph	 (kg)
	Single-Acting	Advance/Retract	Dump	5,5	PED-1101E	24,9
	Single-Acting	Advance/Retract	Manual, 3-way, 2-position	5,5	PEM-1201E	24,0
	Single-Acting	Advance/Hold/Retract	Manual, 3-way, 3-position	5,5	PEM-1301E	24,0
	Double-Acting	Advance/Hold/Retract	Manual, 4-way, 3-position	5,5	PEM-1401E	24,0
	Single-Acting	Advance/Hold/Retract	Solenoid, 3-way, 3-position	5,5	PER-1301E	29,5
	Double-Acting	Advance/Hold/Retract	Solenoid, 4-way, 3-position	5,5	PER-1401E	29,5
	Single-Acting	Advance/Retract	Manual, 3-way, 2-position	5,5	PEJ-1201E	24,9
	Single-Acting	Advance/Hold/Retract	Manual, 3-way, 3-position	5,5	PEJ-1301E	24,9
	Double-Acting	Advance/Hold/Retract	Manual, 4-way, 3-position	5,5	PEJ-1401E	24,9
	Single-Acting	Advance/Retract	Manual, 3-way, 2-position	5,5	PES-1201E	28,1
	Double-Acting	Advance/Hold/Retract	Manual, 4-way, 3-position	5,5	PES-1401E	28,1

PE-Series, Submerged Electric Pumps

◀ For full features see previous page.

SUBMERGED PUMP PERFORMANCE							
Motor Size (kW)	Pressure Rating (bar)		Output Flow Rate at 50 Hz (l/min)		Motor Electrical Specifications *	Sound Level (dBA)	Relief Valve Adjustment Range (bar)
	1 st stage	2 nd stage	1 st stage	2 nd stage			
0,37	70	700	2,0	0,27	13 @ 115-1-50/60 6,75 @ 230-1-50/60	62-70	70-700

* At full load. See ordering matrix footnote for frequency notations.



- 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



Speed Chart

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

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Submerged Electric Pumps

CUSTOM BUILD YOUR SUBMERGED PUMP

If the Submerged Pump that would best fit your application cannot be found in the chart on page 77, here you can easily build your custom submerged pump.

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

P	E	M	-	1	3	01	E
1	2	3		4	5	6	7
Product Type	Motor Type	Pump Type		Pump Series	Valve Type	Reservoir Size	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 = 0,37 kW, 700 bar

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 solenoid valve (PER only)

6 Reservoir Capacity

01 = 5,5 litres

7 Motor Voltage and Heat Exchanger

B = 115 V, 1 Ph, 50/60 Hz ¹⁾

D = 115 V, 1 Ph, 50/60 Hz ¹⁾
with Heat Exchanger

E = 230 V, 1 Ph, 50/60 Hz ²⁾

F = 230 V, 1 Ph, 50/60 Hz ²⁾
with Heat Exchanger

I = 230 V, 1 Ph, 60 Hz

¹⁾ Solenoid valves operate only at 60 Hz. Can run on 50 Hz with manual valves.

²⁾ Solenoid valves operate only at 50 Hz. Can run on 60 Hz with manual valves.

Ordering Example

Model Number: PER-1301E

The PER-1301E is a 0,37 kW, 700 bar, submerged electric pump, with 5,5 litres usable oil capacity, a 3-way, 3-position, remote solenoid valve and a 230 V, 1 Phase, 50/60 Hz motor.

PE Series



Reservoir Capacity:

5,5 litres

Flow at Rated Pressure:

0,27 l/min

Motor Size:

0,37 kW

Maximum Operating Pressure:

700 bar



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: **116**



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: **124**

Z-Class Enerpac Power Pumps

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 power pumps from Enerpac – simply the best pump you will ever use.

Z Tough.
Dependable.
Innovative.
CLASS



Z-Class, An Innovation in Pump Design

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 V for improved operator safety.

Z-Class factory options & accessories

Extensive list of accessories including heat exchanger, roll cage, 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 power pumps for your application

Available in one flow range for universal motor and eight 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.

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).



Back-lit LCD available on ZU and ZE-Series Electric Pumps. ▶



ZU-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
- **Pump speed:** two stage pump unit.



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
- **Pump speed:** single or two stage pump unit.

Oil Flow Rate at 700 bar (l/min)	Z-Class Pump Series *	Electric Motor Power (kW)	Air Motor-Consumption (l/min)	Gasoline Engine Power (kW)	Page:
0,55	ZE3	0,75	–	–	88
0,82	ZE4(T)	1,12	–	–	88, 208
1,00	ZU4(T)	1,25	–	–	82, 204
1,30	ZA4(T)	–	2840	–	102, 212
1,60	ZG5	–	–	4,8	104
1,64	ZE5(T)	2,24	–	–	88, 208
2,73	ZE6	5,60	–	–	88
3,30	ZG6	–	–	9,7	106

* ZA4T, ZU4T, ZE4T and ZE5T-Series are Torque Wrench Pumps.

ZU4-Series, Portable Electric Pumps

▼ Shown from left to right: ZU4304ME, ZU4420SE-H, ZU4304PE-K



- High-efficiency two-speed pump design – higher oil flow and bypass pressure
- Powerful 1,25 kW universal electric motor provides high power-to-weight ratio and excellent low-voltage operating characteristics
- High-strength, moulded composite shroud protects motor and electronics, while providing an ergonomic, non-conductive handle for easy transport.

Pro-Series models only

- * Back-lit LCD readout provides pressure display and a number of diagnostics and readout capabilities never offered on a portable pump before
 - pump usage information, hour and cycle counts
 - self-test, diagnostic and read-out capabilities
 - pressure readout and auto-mode pressure settings.

Z Tough.
Dependable.
Innovative.
CLASS



ZU4-Series Features and Options

For special requirements see factory installed features and options.

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▼ 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	
<ul style="list-style-type: none"> • Ideal choice for most applications. • Manual valve control, for single-acting or double-acting applications. • Motor control on shroud. 	
Manual Valve with Pendant *	
<ul style="list-style-type: none"> • For light production and lifting applications. • Manual valve for single- or double-acting cylinders. • Manual valve with power seat (VM43LPS), ideal for post-tensioning applications. 	
Dump Valve *	
<ul style="list-style-type: none"> • Ideal for punching, crimping and cutting. • For use when load-holding is not required. 	
Solenoid Valve *	
<ul style="list-style-type: none"> • Ideal for lifting applications and where remote control is required. • With VE32 valve, motor only runs during the advance function, while holding and retracting, the motor is off. • Motor runs continuously on pumps with VE33 and VE43 valves. 	

* Low-voltage control pendant with 3 m. cord controls valve and motor.

ZU4-Series, Electric Pumps



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

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.

Standard Electric Pump

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

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.



ZU4 Series



Reservoir Capacity:

4 - 40 litres

Flow at Rated Pressure:

1,0 l/min

Motor Size:

1,25 kW

Maximum Operating Pressure:

700 bar

Pump type	Used with Cylinder		Valve Funktion			Valve Type ¹⁾	Pump Control	Useable Oil Capacity (litres)	Model Number 230 V - 1 phase - 50 Hz ²⁾			Pro Electric Weight ³⁾ (kg)
									Classic Electric	Standard (STD) Electric	Pro Electric (incl. LCD)	
	●		●		●	VM32	Manual	4,0	ZU4204RE	ZU4204ME	ZU4204LE	27
	●		●		●	VM32	Manual	8,0	ZU4208RE	ZU4208ME	ZU4208LE	32
	●		●	●	●	VM33	Manual	8,0	ZU4308RE	ZU4308ME	ZU4308LE	32
	●		●	●	●	VM33	Manual	20,0	ZU4320RE	ZU4320ME	ZU4320LE	50
		●	●	●	●	VM43	Manual	8,0	ZU4408RE	ZU4408ME	ZU4408LE	32
		●	●	●	●	VM43	Manual	20,0	ZU4420RE	ZU4420ME	ZU4420LE	50
	●		●		●	VM32	Remote (Man.)	4,0	ZU4204PE	ZU4204JE	ZU4204KE	27
	●		●		●	VM32	Remote (Man.)	8,0	ZU4208PE	ZU4208JE	ZU4208KE	32
	●		●		●	VM32	Remote (Man.)	20,0	ZU4220PE	ZU4220JE	ZU4220KE	50
	●		●	●	●	VM33	Remote (Man.)	8,0	ZU4308PE	ZU4308JE	ZU4308KE	32
		●	●	●	●	VM43	Remote (Man.)	8,0	ZU4408PE	ZU4408JE	ZU4408KE	32
		●	●	●	●	VM43	Remote (Man.)	20,0	ZU4420PE	ZU4420JE	ZU4420KE	50
	●		●		●	VE32D	Remote	4,0	N/A	N/A	ZU4104DE	29
	●		●		●	VE32D	Remote	8,0	N/A	N/A	ZU4108DE	33
	●		●		●	VE32D	Remote	20,0	N/A	N/A	ZU4120DE	51
						-	-	-	-	-	-	-
						-	-	-	-	-	-	-
						-	-	-	-	-	-	-
	●		●		●	VE32	Remote	4,0	N/A	N/A	ZU4204SE	29
	●		●		●	VE32	Remote	8,0	N/A	N/A	ZU4208SE	33
	●		●	●	●	VE33	Remote	8,0	N/A	N/A	ZU4308SE	39
		●	●	●	●	VE43	Remote	8,0	N/A	N/A	ZU4408SE	39
		●	●	●	●	VE43	Remote	20,0	N/A	N/A	ZU4420SE	56
						-	-	-	-	-	-	-
						-	-	-	-	-	-	-
						-	-	-	-	-	-	-

¹⁾ See valves section for technical information on valve types. ²⁾ See custom order matrix on page 87 for other voltage options.

³⁾ Subtract 1,4 kg for Standard (STD) Electric models.



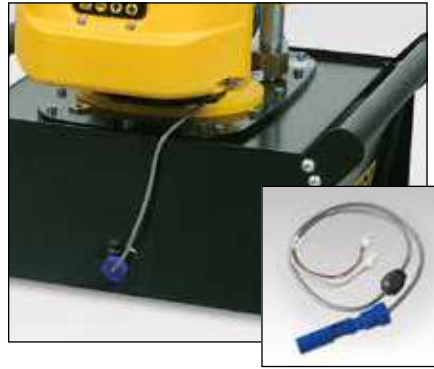
Pressure Transducer *

- 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 bar, psi or MPa.

* Requires LCD Electric


Accessory Kit Model Number	Adjustable Pressure Range (bar)	Switch-point repeatability	Dead-band (bar)
ZPT-U4 *	3,5 - 700	± 0,5%	3,5

* 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 (°C)	Maximum Pressure (bar)	 (kg)
ZLS-U4 *	5-110	10	0,1

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



Hoses

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

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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.

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Foot Switch

- Hands-free remote control on solenoid dump and 3-position valves
- With 3 metres cord.

Accessory Kit Modelnr.	Can be used on ZU4-Series Pumps with
ZCF-2 *	Solenoid VE-Series valves

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



Roll Cage

- Protects pump
- Provides greater pump stability.

Accessory Kit Modelnr.	Fits on reservoir
ZRC-04 *	4 and 8 litres ¹⁾
ZRC-04H *	4 and 8 litres ²⁾
ZRB-10 *	10 litres
ZRB-20 *	20 litres
ZRB-40 *	40 litres

* Add suffix **R** for factory installation.


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 Modelnr.	Fits on reservoir	 (kg)
SBZ-4 *	4 and 8 l without heat exchanger	2,2
SBZ-4L *	4 and 8 l with heat exchanger	3,2

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

ZU4-Series, Options & Accessories



ZU4-Series Options

Accessory Kits can be installed by the customer.

See chart below for all possible options on ZU4-Series pumps:

- Classic Electric,
 - Standard (STD) Electric (no LCD)
 - Pro Electric (with LCD).
- Refer to page 87 for ordering matrix.

ZU4-Series Options	Factory Installed			Accessory Kits		
	Classic Electric	Standard Electric	Pro Electric	Classic Electric	Standard Electric	Pro Electric
Return Line Filter	F	F	F	ZPF	ZPF	ZPF
Skid Bar ¹⁾	K	K	K	SBZ	SBZ	SBZ
Roll Cage	R	R	R	ZRC	ZRC	ZRC
Heat Exchanger	H	H	H	ZHE	ZHE	ZHE
1000 bar Pressure Gauge	G	G	G	G	G	G
Pressure Transducer	-	-	T	-	-	ZPT-U4
Level/Temperature Switch	-	-	L	-	-	ZLS-U4
Foot Switch	-	-	U	-	-	ZCF-2

¹⁾ Skid Bar not in combination with Roll Cage.

ZU4 Series



Reservoir Capacity:

4 - 40 litres

Flow at Rated Pressure:

1,0 l/min

Motor Size:

1,25 kW

Maximum Operating Pressure:

700 bar



25 Micron Return Line Filter

- Removes contaminants from return oil flow
- By-pass valve prevents damage if filter is dirty
- With maintenance indicator.

Accessory Kit Modelnr.	Maximum Pressure (bar)	Maximum Oil Flow (l/min)	By-pass Setting (bar)
ZPF *	13,8	45,4	1,7

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



Heat Exchanger

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

Accessory Kit Nr.	Can be used on	(kg)
ZHE-U115 *	115 V pumps	4,1
ZHE-U230 *	230 V pumps	4,1

* Add suffix **H** for factory installation.



Heat Exchanger

Can be factory installed on ZU4-Series Classic, Standard Electric and Pro Electric models.

- Extends system life.
- Stabilizes oil temperature at a maximum of 54 °C at 21 °C ambient temperature.

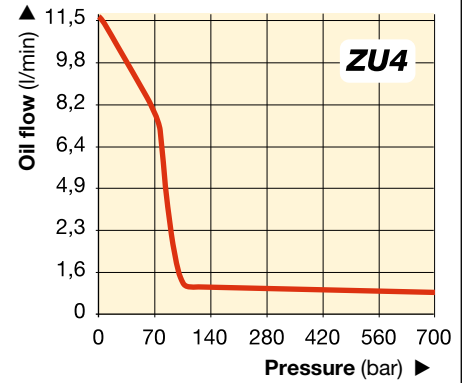
Do not exceed maximum oil flow and pressure ratings. Heat exchanger is not suitable for water-glycol or high water based fluids.

Thermal Transfer *		Maximum Pressure	Maximum Oil Flow	Voltage
Btu/h	kJoule	(bar)	(l/min)	(VDC)
900	950	20,7	26,5	12

* At 1,9 l/min at 21 °C ambient temperature.

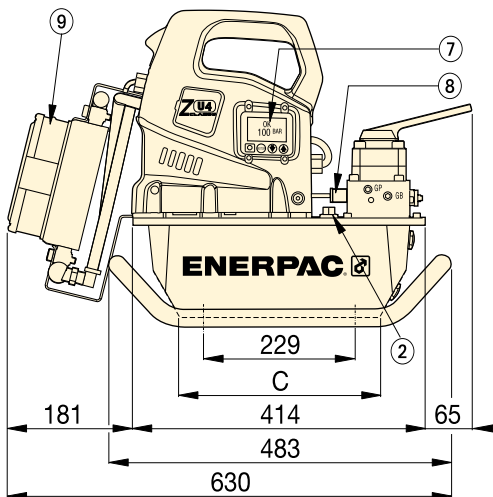
ZU4, Specifications and Dimensions

OIL FLOW VERSUS PRESSURE

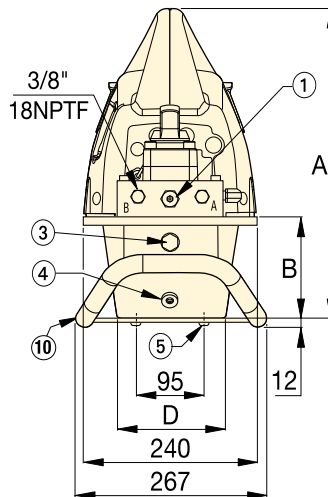


ZU4-SERIES PERFORMANCE CHART

Motor Size (kW)	Output Flow Rate at 50 Hz (l/min)				Motor Electrical Specifications (Volts-Ph-Hz)	Sound Level (dBA)	Relief Valve Adjustment Range (bar)
	7 bar	50 bar	350 bar	700 bar			
1,25	11,5	8,8	1,2	1,0	115-1-50/60 230-1-50/60	85-90	140-700



ZU4-Series with 4 and 8 litres reservoirs

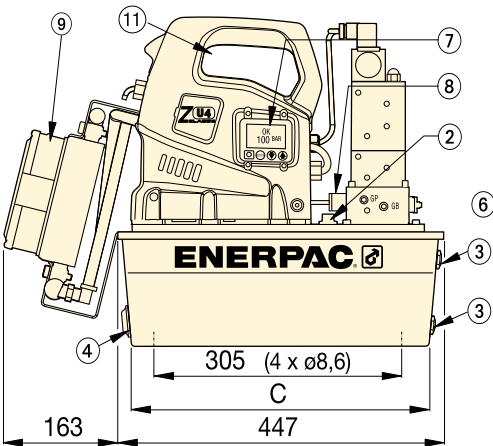


3/8"-18 NPTF Advance and Retract Ports

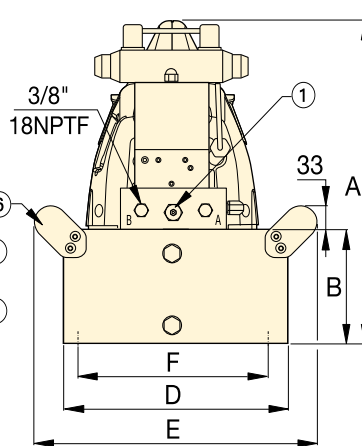
- ① User adjustable relief valve
- ② Oil fill port SAE #10 7/8"-14 UNF-2B
- ③ Oil level sight gauge
- ④ Oil drain 1/2" NPTF
- ⑤ M8, 6 mm deep
- ⑥ Handles on all 10, 20 and 40 litres reservoirs.

Options (see chart on page 85):

- ⑦ Back-lit LCD Electric
- ⑧ Pressure transducer
- ⑨ Heat Exchanger
- ⑩ Skid Bar
Fits 4 and 8 litres reservoirs
- ⑪ Handle guard installed on all 10, 20 and 40 litres reservoirs
- ⑫ Reservoir handles (not shown) included on all 10, 20 and 40 litres reservoirs.



ZU4-Series with 10, 20 and 40 litres reservoirs
(left view shown without side handle)



Pump Dimensions (mm)

Usable Reservoir Capacity (litres)	A	B	C	D	E	F
4,0	424	142	279	152	-	-
8,0	424	142	279	206	-	-
10,0	439	157	413	305	384	279
20,0	465	180	413	422	500	396
40,0	551	269	399	503	576	480

ZU4-Series, Pump Ordering Matrix

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 83, you can easily build your custom ZU4-Series pump here.

▼ This is how a ZU4-Series pump model number is built up:

Z	U	4	1	04	D	E	-	H	K	T
1	2	3	4	5	6	7		8		
Product Type	Motor Type	Flow Group	Valve Type	Reservoir Size	Valve Operation	Voltage		Options and Accessories		

1 Product Type

Z = Pump Series

2 Motor Type

U = Universal electric motor

3 Flow Group

4 = 1,0 l/min @ 700 bar

4 Valve Type (see page 110-111 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 (VM33L)
- 7** = 3 way/2 position manual (VM22)
- 8** = 4 way/3 position locking manual w/po check (VM43L)
- 9** = 4 way/3 position manual w/power seating (VM43-LPS)

5 Reservoir Size (useable capacity)

- 04** = 4 litres
- 08** = 8 litres
- 10** = 10 litres ¹⁾
- 20** = 20 litres ¹⁾
- 40** = 40 litres ¹⁾

¹⁾ reservoir 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 and Accessories (see page 85 for possibilities)

- F** = Filter
- G** = 0-1000 pressure gauge (ø 63,5 mm) ¹⁾
- H** = Heat exchanger
- K** = Skid Bar (4 and 8 litres reservoirs only)
- L** = Level/temperature switch ²⁾³⁾
- N** = No reservoir handles (includes lifting eyes)
- R** = Roll Cage
- T** = Pressure transducer ²⁾
- U** = Foot switch

¹⁾ Pressure gauge not available on pump models with pressure transducer

²⁾ These options require Pro Electric

³⁾ Not available on 4 and 8 litres reservoirs

ZU4 Series



Reservoir Capacity:

4 - 40 litres

Flow at Rated Pressure:

1,0 l/min

Motor Size:

1,25 kW

Maximum Operating Pressure:

700 bar



Speed Chart

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

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Ordering Example

Model Number:
ZU4408DE-HKT

ZU4408DE-HKT is a Pro Electric model pump with LCD, 1,0 l/min oil flow at 700 bar, pump with a dump valve, an 8 liter reservoir, operates on 230V, heat exchanger, pressure transducer and skid bar.



Torque Wrench Pumps and Hoses

Enerpac system matched air and electric torque wrench pumps provide control to operate hydraulic torque wrenches.

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ZE-Series, Electric Pumps

▼ Shown from left to right: ZE3304ME-K, ZE4110DE-FHR



Z Tough.
Dependable.
Innovative.












CLASS

The New Standard for Industrial Applications



Oil Level Glass

All ZE-Series pumps have an oil sight glass and steel reservoirs. Full sight oil level glass on 10, 20 and 40 litres reservoirs, oil level indicators on 4 and 8 litres reservoirs.

PUMP CONFIGURATIONS		Pump Type	Used with Tool or Cylinder		Valve Function ¹⁾			Valve ¹⁾ Model Number	Useable Oil Capacity (litres)	
For options and other model numbers see ordering matrix or contact your Enerpac office. (For Z-Class pumps with air motor see ZA-series pumps on page 102). Page:  93										
	No valve, without electric box ²⁾ or LCD							–	4,0	
	• For remote valves or pump mounting Enerpac VM-series valves							–	10,0	
	• For remote valve mounting order BSS1090 high pressure connecting plate.								–	20,0
									–	40,0
MANUAL VALVE CONTROL	With manual valve, without electric box or LCD		●	–	●	–	●	VM32	4,0	
	• Ideal choice for most application		●	–	●	●	●	VM33	8,0	
	• Manual valve control, for single and double-acting applications		●	–	●	●	●	VM33L	10,0	
	• Manual motor control		–	●	●	●	●	VM43	20,0	
	• On/Off switch on 1-phase electric motor.		–	●	●	●	●	VM43L	40,0	
MANUAL VALVE CONTROL	With manual valve, with electric box and LCD		●	–	●	–	●	VM32	4,0	
	• For single-acting or double-acting applications		●	–	●	–	●	VM32	8,0	
	• On/off switch on 1-phase electric motor		●	–	●	●	●	VM33	10,0	
	• All options available.		●	–	●	●	●	VM33L	10,0	
			–	●	●	●	●	VM43	20,0	
			–	●	●	●	●	VM43L	40,0	
REMOTE VALVE CONTROL	With solenoid dump valve, with electric box and LCD		●	–	●	–	●	VE32D	4,0	
	• Ideal for punching, crimping and cutting		●	–	●	–	●	VE32D	8,0	
	• For use when load holding is not required		●	–	●	–	●	VE32D	10,0	
	• Push-button pendant ³⁾ controls valve and motor		●	–	●	–	●	VE32D	20,0	
	• All options available.		●	–	●	–	●	VE32D	40,0	
			●	–	●	●	●	VE33	4,0	
REMOTE VALVE CONTROL	With solenoid 3-position valve, with electric box and LCD		●	–	●	●	●	VE33	8,0	
	• Ideal for production and lifting applications		●	–	●	●	●	VE33	10,0	
	• 3-position valves (advance/hold/retract)		●	–	●	●	●	VE33	10,0	
	• Push-button pendant ³⁾ controls valve and motor		–	●	●	●	●	VE43	10,0	
	• All options available.		–	●	●	●	●	VE43	20,0	
			–	●	●	●	●	VE43	40,0	

¹⁾ See Valve Section (page 111) for hydraulic symbols and details.

²⁾ For No Valve, with Electric Box, see ordering matrix on page 93.

³⁾ Pendant includes 3 meters cord.

ZE-Series, Electric Pumps

- High-efficiency pump design – higher oil flow and by-pass pressure
- High-strength, moulded electrical box protects electronics, power supplies and LCD readout and stands up to harsh industrial environments
- IP54 protection and isolation class
- Back-lit LCD provides self test, diagnostic and read-out capabilities never before offered on an industrial pump (included on pump with electric valves, optional on other models)
- Totally enclosed, fan-cooled industrial electric motors for extended life
- User adjustable relief valve built-in on manual and solenoid valves. Oil ports on valves are 3/8" NPTF
- Steel fan guard on all electric motors
- Full sight oil level glass
- 40 micron filter breather with splash guard
- Durable steel reservoirs.

ZE Series



Reservoir Capacity:
4 - 40 litres

Flow at Rated Pressure:
0,55 - 2,73 l/min

Motor Size:
0,75 - 5,60 kW

Maximum Operating Pressure:
700 bar



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.

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Single 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.

ZE3-Series 0,55 l/min at 700 bar Two-stage pump		ZE4-Series 0,82 l/min at 700 bar Two-stage pump		ZE5-Series 1,64 l/min at 700 bar Two-stage pump		ZE6-Series 2,73 l/min at 700 bar Two-stage pump	
Model Nr. ⁴⁾ 400V / 3 phase	(kg)	Model Nr. ⁴⁾ 400V / 3 phase	(kg)	Model Nr. ⁴⁾ 400V / 3 phase	(kg)	Model Nr. ⁴⁾ 400V / 3 phase	(kg)
ZE3004NW	36	ZE4004NW	40	–	–	–	–
ZE3010NW	45	ZE4010NW	49	ZE5010NW	54	ZE6010NW	72
ZE3020NW	57	ZE4020NW	61	ZE5020NW	66	ZE6020NW	84
ZE3040NW	80	ZE4040NW	84	ZE5040NW	89	ZE6040NW	107
ZE3204MW	39	ZE4204MW	43	–	–	–	–
ZE3308MW	44	ZE4308MW	48	–	–	–	–
ZE3610MW	50	ZE4610MW	54	ZE5610MW	59	ZE6610MW	77
ZE3420MW	60	ZE4420MW	64	ZE5420MW	69	ZE6420MW	87
ZE3840MW	85	ZE4840MW	89	ZE5840MW	94	ZE6840MW	112
ZE3204LW	42	ZE4204LW	46	–	–	–	–
ZE3208LW	47	ZE4208LW	51	–	–	–	–
ZE3310LW	51	ZE4310LW	55	ZE5310LW	60	ZE6310LW	78
ZE3610LW	53	ZE4610LW	57	ZE5610LW	62	ZE6610LW	80
ZE3420LW	63	ZE4420LW	67	ZE5420LW	72	ZE6420LW	90
ZE3840LW	88	ZE4840LW	92	ZE5840LW	97	ZE6840LW	115
ZE3104DW	44	ZE4104DW	48	–	–	–	–
ZE3108DW	49	ZE4108DW	53	–	–	–	–
ZE3110DW	53	ZE4110DW	57	ZE5110DW	62	ZE6110DW	79
ZE3120DW	65	ZE4120DW	69	ZE5120DW	74	ZE6120DW	92
ZE3140DW	88	ZE4140DW	92	ZE5140DW	97	ZE6140DW	115
ZE3304SW	49	ZE4304SW	53	–	–	–	–
ZE3308SW	54	ZE4308SW	58	–	–	–	–
ZE3310SW	58	ZE4310SW	62	ZE5310SW	67	ZE6310SW	85
ZE3410SW	58	ZE4410SW	62	ZE5410SW	67	ZE6410SW	85
ZE3420SW	70	ZE4420SW	74	ZE5420SW	79	ZE6420SW	97
ZE3440SW	93	ZE4440SW	97	ZE5440SW	102	ZE6440SW	120

⁴⁾ See custom ordering matrix on page 93 for other voltages.



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 10, 20 and 40 litres reservoirs.

Accessory Kit Modelnr.	Fixed Temperature Signal (°C)	Operating Temperature (°C)	Max. Pressure (bar)
ZLS-U4 *	80	5 - 110	10

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



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 Modelnr.	Maximum Pressure (bar)	Maximum Oil Flow (l/min)	By-pass Setting (bar)
ZPF *	13,8	45,4	1,7

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



Roll Cage

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



Skid Bar


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



Foot Switch ⁵⁾

- Hands-free remote control on solenoid dump and 3-position valves
- With 3 meters cord.


⁵⁾ 15 V, requires Electric Box.

Accessory Kit Nr.	Fits on reservoir size:	 (kg)
ZRC-04 *	4 and 8 litres ⁵⁾	5,5
ZRC-04H *	4 and 8 litres ⁶⁾	6,5
ZRB-10 *	10 litres	6,0
ZRB-20 *	20 litres	6,0
ZRB-40 *	40 litres	6,0

* Add suffix **R** for factory installation.

⁵⁾ For pump without heat exchanger

⁶⁾ For pump with heat exchanger.

Accessory Kit Nr.	Fits on reservoir size:	 (kg)
SBZ-4 *	4 and 8 litres ⁵⁾	2,2
SBZ-4L *	4 and 8 litres ⁶⁾	3,2

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

Accessory Kit Nr.	Can be used on ZE-Series pumps with
ZCF-2 *	Solenoid VE-Series valves

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

ZE-Series, 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 ²⁾.

¹⁾ 24 V, requires Electric Box.

²⁾ Or shifts valve to neutral position on pump models with VE33 and VE43 solenoid valves.

Accessory Kit Modelnr.	Adjustable Pressure Range (bar)	Switch-point repeatability	Dead-band (bar)
ZPT-U4 *	3,5 - 700	± 0,5%	3,5

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



Pressure Switch ³⁾

- Controls pump, monitors system
- Adjustable pressure 35-700 bar
- Includes glycerine filled 1000 bar pressure gauge G2536L
- Accuracy ± 1,5% of full scale.

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

Accessory Kit Modelnr.	Switch-point repeatability	Deadband (bar)	Oil Ports (NPTF)
ZPS-E3 *	± 2%	8 - 38	3/8"

* Add suffix **P** for factory installation.



Options

Accessory Kits can be installed by customer. See chart below for options on **Standard Electric** (without electric box) or **LCD Electric** (with electric box). Refer to page 93 for ordering matrix.

ZE-Series Options	Factory Installed		Accessory Kits	
	Std. Electr.	LCD Electr.	Std. Electr.	LCD Electr.
Return Line Filter	F	F	ZPF	ZPF
Skid Bar ¹⁾	K	K	SBZ	SBZ
Roll Cage	R	R	ZRB	ZRB
Single-stage	S	S	-	-
Heat Exchanger	-	H	-	ZHE
Pressure Gauge ²⁾	G	G	-	-
Pressure Switch ³⁾	-	P	-	ZPS-E3
Pressure Transducer ⁴⁾	-	T	-	ZPT-U4
Level/Temp Switch ⁵⁾	-	L	-	ZLS-U4
Foot Switch ⁶⁾	-	U	-	ZCF-2

¹⁾ Available for 4 and 8 litres reservoirs.

²⁾ Not available on pumps with pressure transducer.

³⁾ Includes 1000 bar gauge. Only available on manual valves without locking feature.

⁴⁾ Electric box can accept either pressure switch or pressure transducer, but not both.

⁵⁾ Available for 10, 20 and 40 litres reservoirs.

⁶⁾ For control of solenoid dump and 3-position valves.



Pendants ⁴⁾

- For pump types with valve operation “W” (No Valve, with Electric Box, without pendant).

⁴⁾ When ordering Enerpac VE-Series solenoid valve the pendant must be ordered separately. Pendant connection to be plugged into electric box.

Pendant Model Nr.	To be used with solenoid valve:
ZCP-1	VE32D
ZCP-3	VE32, VE33, VE43



Heat Exchanger ⁵⁾

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

Accessory Kit Nr.	Fits on reservoir size:	(kg)
ZHE-E04 *	4 and 8 litres	4,1
ZHE-E10 *	10, 20 and 40 litres	4,1

⁵⁾ 24 VDC, requires electric box.

* Add suffix **H** for factory installation.



ZPT-U4 Pressure Transducer

More durable against mechanical and hydraulic shock than analog gauges.

- Digital pressure read-out provides accuracy of 0,5% of full scale.
- Easy-viewing variable rate display automatically varies increments between 3, 14, 35 and 145 bar as rate of pressure change increases.
- “Set pressure” feature turns off motor at user defined pressure (or shifts valve to neutral on VE33 and VE43 valves).

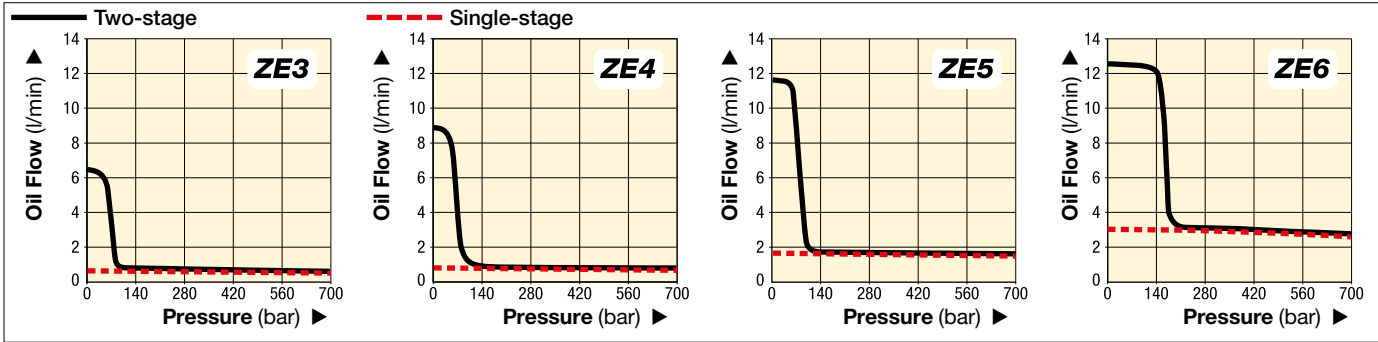


ZHE-Series Heat Exchangers

Heat exchanger stabilizes oil temperature at 54 °C at 21 °C ambient temperature. Thermal transfer at 1,9 l/min and 21 °C ambient temperature: 900 Btu/hour [950 kJ].

Do not exceed max. oil flow of 26,5 l/min and max. pressure of 20,7 bar. Not suitable for water-glycol or high water based fluids.

ZE-Series, Specifications & Dimensions



▼ ZE-SERIES PERFORMANCE CHART

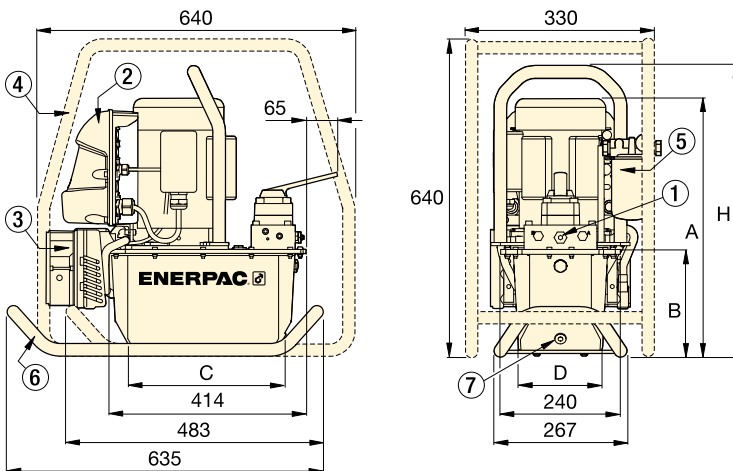
Pump Series	Output Flow Rate at 50 Hz * (l/min)				Pump Unit	Available Reservoir Sizes (useable oil) (litres)	Motor Size (kW)	Relief Valve Adjustment Range (bar)	Sound Level (dBA)
	low pressure at 7 bar	low pressure at 50 bar	high pressure at 350 bar	high pressure at 700 bar					
ZE3	0,59	0,59	0,57	0,55	Single-stage	4-8-10-20-40	0,75	70-700	75
	6,15	5,26	0,57	0,55	Two-stage				
ZE4	0,87	0,87	0,84	0,82	Single-stage	4-8-10-20-40	1,12	70-700	75
	8,88	8,20	0,84	0,82	Two-stage				
ZE5	1,75	1,72	1,68	1,64	Single-stage	10-20-40	2,24	70-700	75
	11,61	11,27	1,68	1,64	Two-stage				
ZE6	3,00	2,94	2,86	2,73	Single-stage	10-20-40	5,60	70-700	80
	12,29	12,15	2,86	2,73	Two-stage				

* Oil flow will be approximately 6/5 of these values at 60 Hz.

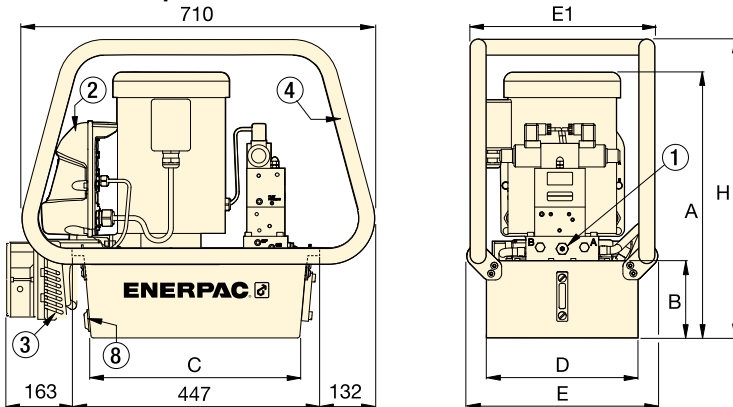


Single or Two-Stage

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.



ZE-Series Pumps with 4 - 8 litres reservoir



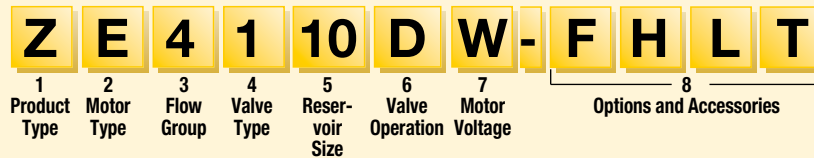
ZE-Series Pumps with 10 - 20 - 40 litres reservoir

- 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
- ③ Heat Exchanger
- ④ Roll Cage
- ⑤ Return Line Filter
- ⑥ Skid Bar
- ⑦ Magnetic Oil Drain
- ⑧ Oil Drain / Oil Level/Temperature Switch

Reservoir Size (useable oil in litres)	ZE-Series Pump Dimensions (mm)						
	A	B	C	D	E	E1	H
4,0	457	143	279	152	-	-	513
8,0	457	143	279	206	-	-	513
10,0	533	158	419	305	384	371	600
20,0	558	180	419	422	501	488	625
40,0	648	270	399	505	576	572	715

ZE-Series, Pump Ordering Matrix

▼ This is how ZE-Series pump model numbers are built up:



1 Product Type

Z = Pump Class

2 Prime Mover

E = Induction electric motor

3 Flow Group

- 3** = 0,55 l/min @ 700 bar (0,75 kW)
- 4** = 0,82 l/min @ 700 bar (1,12 kW)
- 5¹⁾** = 1,64 l/min @ 700 bar (2,24 kW)
- 6¹⁾** = 2,73 l/min @ 700 bar (5,60 kW)

4 Valve Type

- 0** = No valve, with cover plate
- 1** = 3/2 Dump valve VE32D
- 2** = 3/2 manual VM32
- 3** = 3/3 manual VM33 or electric VE33
- 4** = 4/3 manual VM43 or electric VE43
- 6** = 3/3 manual locking valve VM33L with pilot operated check.
- 8** = 4/3 manual locking valve VM43L with pilot operated check.

5 Reservoir Size, useable oil

- 04²⁾** = 4 litres
- 08²⁾** = 8 litres
- 10** = 10 litres
- 20** = 20 litres
- 40** = 40 litres

8 Options and Accessories

- F** = Return Line Filter
- G⁶⁾** = 1000 bar gauge
- H⁷⁾** = Heat exchanger
- K** = Skid Bar (only on 4 and 8 litres)
- L⁷⁾** = Oil Level/Temperature Switch⁸⁾
- N** = No reservoir handles (includes lifting eyes)
- P⁷⁾** = Pressure Switch (only available on manual valves without locking feature)
- R** = Roll Cage
- S** = Single-stage pump unit
- T⁷⁾** = Pressure transducer⁹⁾
- U⁷⁾** = Foot Switch

- ¹⁾ ZE5 and ZE6-Series only available with 3-phase electric motors.
- ²⁾ 4 and 8 litres only available on ZE3 and ZE4-Series.
- ³⁾ 1-phase motors only available on ZE3 and ZE4-Series
- ⁴⁾ 208-240V, 1 ph with European plug EMC directive compliant.
- ⁵⁾ Models with 3-ph motors without Electric Box shipped without cord, motor starter or overload protection.
- ⁶⁾ Not available on pumps with pressure transducer (T).
- ⁷⁾ Requires Electric Box.
- ⁸⁾ Not available on 4 and 8 litres reservoir.
- ⁹⁾ Provides digital pressure read-out on LCD-display of electric box.
- ¹⁰⁾ When using solenoid valve on valve type "W" order optional pendant.

All Z-Class electric pumps comply with TÜV and CE requirements.



ZE Series



Reservoir Capacity:

4 - 40 litres

Flow at Rated Pressure:

0,55 - 2,73 l/min

Motor Size:

0,75 - 5,60 kW

Maximum Operating Pressure:

700 bar



How to Order Single-Stage Pumps

To specify a single-stage pump, place the letter "S" at the end of the model number. For example:

ZE4210ME-S

ZE4-Series pump, oil flow 0,82 l/min at 700 bar, VM32 manual valve, 10 litres reservoir, without electrical box, without pendant, 240 Volt 1-phase electric motor and single-stage pump unit.

ZE3120DW-S

ZE3-Series pump, oil flow 0,55 l/min at 700 bar, VE32D solenoid dump valve, 20 litres reservoir, with electrical box (LCD), without pendant, 400 Volt 3-phase electric motor and single-stage pump unit.



Pendants

When ordering Enerpac VE-Series solenoid valve for use on "W" type valve operation (No Valve, with

Electric Box (LCD), without pendant) the pendant must be ordered separately. Pendant connection to be plugged into electric box.

▼ SFP421SW and SFP404SW



- 2, 4 or 6 split-flow outlets
- Individual or simultaneously operation of valves, with advance/hold/retract function
- Joystick (manual) controlled or pendant (solenoid) controlled valves
- Flow per outlet ranging from 0,45 to 4,2 l/min at 700 bar
- For double- and single-acting cylinders
- Adjustable pressure relief valve per circuit
- Reservoir: 40 or 150 litres.

▼ Step-by-step stage lifting an old windmill using double-acting RR-506 cylinders powered by a split-flow pump.



Multiple Outlets with Equal Oil Flow



Typical Split Flow Pump Applications

For lifting applications on multiple points Split-Flow Pumps are a far better alternative than using separate operated pumps. Where synchronization of maximum 4% is acceptable and load is even distributed over the lifting points, split flow pumps are a safe and economical solution.

The SFP-Series pumps feature both single and synchronized multiple outlet control either through joystick or pendant operation.

Application examples:

- Bridge deck lifting for bearing maintenance
- Stage lifting in construction and shipbuilding
- Skidding to move structures and buildings
- Levelling of constructions like wind turbines.



Remote Control Pendant

Split Flow pumps with solenoid valves include a remote pendant with selector switches for each individual outlet, allowing single or multiple cylinder operation.



Gauges and Adaptors

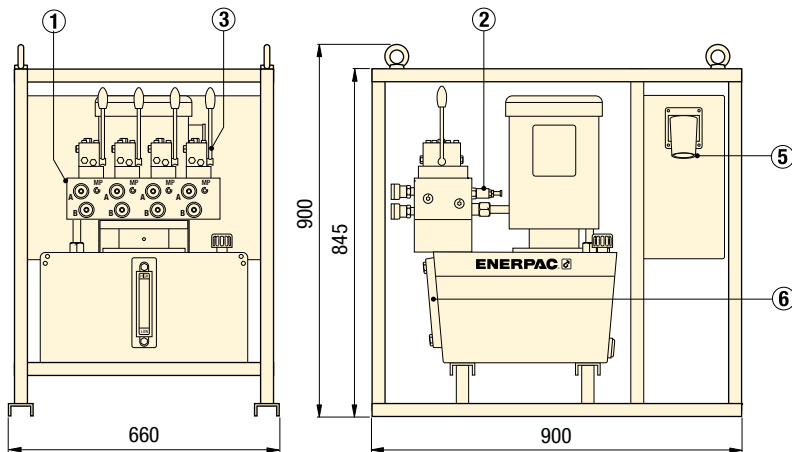
Always use gauges to visualise pressure or load in your hydraulic system to work safer.



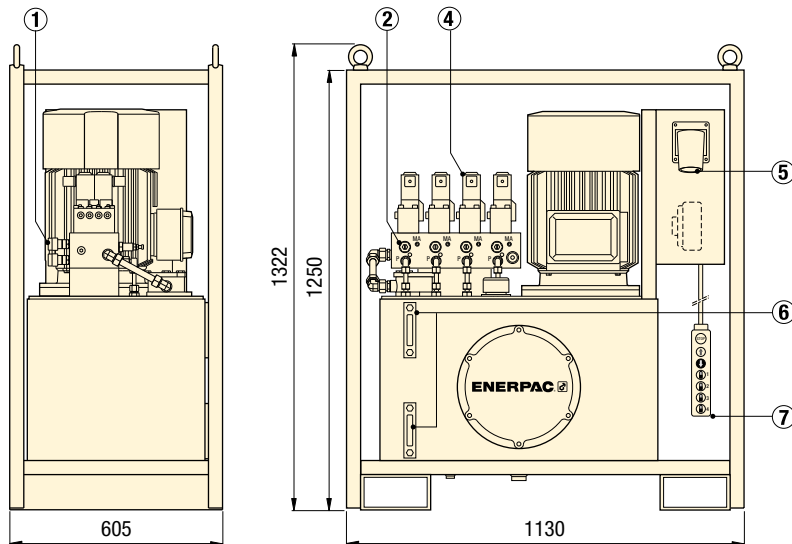
Hoses and Couplers

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

700 bar Split Flow Hydraulic Pumps



SFP-Series with 40 litres reservoir (shown with 4 split flow outlets)



SFP-Series with 150 litres reservoir (shown with 4 split flow outlets)

SFP Series



Reservoir Capacity:

40 - 150 litres

Split Flow Outlets:

2, 4 and 6 outlets

Flow at Rated Pressure:

0,45 - 4,20 l/min

Maximum Operating Pressure:

700 bar

- ① Manifold with split flow outlets and CR-400 couplers
- ② Adjustable pressure relief valve per circuit
- ③ Manual 4/3 control valves with joysticks
- ④ Solenoid 4/3 control valves (24 VDC)
- ⑤ 3+N+PE 400V 16A plug
- ⑥ Oil sight gauge(s)
- ⑦ Remote control pendant with 10 meter cable.



Lifting Cylinders

For a complete line of Enerpac cylinders, see the Cylinder and Lifting Products in our catalogue.

Page: **5**



Lifting an unbalanced load?

See the Enerpac **EVO-Series** modular PLC-controlled synchronous lifting systems to control 4, 8 or 12 lifting points.

Page: **234**

▼ Split flow pump used to operate double-acting cylinders to lift steel bridge segments.



Number of Split Flow Outlets	Reservoir Size (litres)	Oil Flow per Outlet @ 700 bar (l/min)	Pump Model Number 4/3 Valve Operation Advance/Hold/Retract		Motor Size 400 V - 3ph 50 Hz (kW)	Weight (kg)
			Manual (Joystick)	24 V Solenoid (Pendant)		
2	40	1,30	SFP 213MW	—	5,5	240
			—	SFP 213SW		240
	150	2,80	SFP 228MW	—	7,5	488
			—	SFP 228SW		488
4	40	0,45	SFP 404MW	—	5,5	240
			—	SFP 404SW		240
	150	0,90	SFP 409MW	—	7,5	475
			—	SFP 409SW		475
6	40	1,40	SFP 414MW	—	11	488
			—	SFP 414SW		488
	150	2,10	SFP 421MW	—	11	526
			—	SFP 421SW		526
6	40	0,45	SFP 604MW	—	5,5	240
			—	SFP 604SW		240

▼ Shown: XA11G



- Ergonomic design for less operator fatigue
- Variable oil flow & 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
- External adjustable pressure setting valve
- Ground screw for improved ATEX explosion safety.

 II 2 GD ck T4

XVARI[®] TECHNOLOGY

Productivity & Ergonomics



Optional Pressure Gauge

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



4/3 Control Valve

For powering double-acting hydraulic cylinders and tools.



2 Litres Reservoir

Double oil capacity for powering larger hydraulic cylinders and tools.



Pedal Safety Guard

Customer installed frame protects both pedals against accidental activation.

Model Number¹⁾

XPG1



“Joy-stick” Lever Kit

Customer installed set of handles for manual operation of both pedals.

Model Number¹⁾

XLK1



Swivel Connector

Customer installed swivel connector for optimal orientation of the hydraulic hose. See page 121 for details.

Model Number¹⁾

XSC1

¹⁾ Accessories must be ordered separately.

XVARI® Technology, Air Driven Hydraulic Foot Pumps

XA Series



Reservoir Capacity:

1,0 - 2,0 litres

Flow at Rated Pressure:

0,25 l/min

Air Consumption:

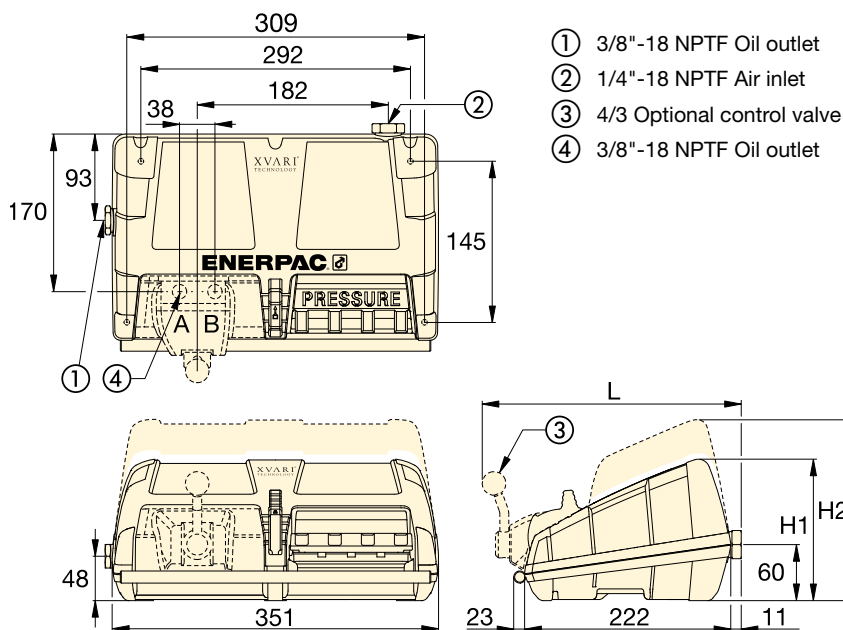
283 - 991 l/min

Maximum Operating Pressure:

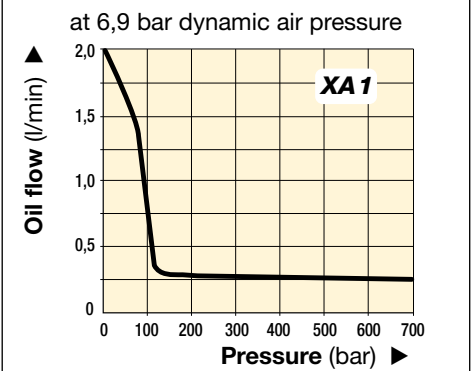
700 bar

▼ XA-SERIES PERFORMANCE CHART

Maximum Pressure (bar)	Output Flow Rate (l/min)		Pump Series	Valve Function	Dynamic Air Pressure (bar)
	No load	Load			
700	2,0	0,25	XA1	Advance / Hold / Retract	2,1 - 8,6



OIL FLOW VERSUS PRESSURE




Regulator-Filter-Lubricator

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

Model Number¹⁾

RFL-102

▼ SELECTION CHART

For use with cylinder or tool	Usable Oil Capacity (litres)	Model Number ¹⁾	Pressure Gauge	3-way 3-pos. Valve	4-way 3-pos. Valve	Dimensions (mm)			 (kg)
						H1	H2	L	
Single-acting	1,0	XA 11²⁾	–	•	–	152	–	–	8,6
	2,0	XA 12²⁾	–	•	–	–	170	–	10,2
Single-acting	1,0	XA 11G	•	•	–	152	–	–	8,8
	2,0	XA 12G	•	•	–	–	170	–	10,4
Double-acting	1,0	XA 11V	–	–	•	152	–	279	10,1
	2,0	XA 12V	–	–	•	–	170	279	11,7
Double-acting	1,0	XA 11VG	•	–	•	152	–	279	10,3
	2,0	XA 12VG	•	–	•	–	170	279	11,9

¹⁾ High-Flow coupler CR-400 and accessories must be ordered separately. ²⁾ Available as cylinder-pump set, see page 58.

▼ Shown from top to bottom: PAMG-1402N, PARG-1102N, PATG-1102N, PATG-1105N



- External adjustable pressure relief valve (behind sight glass)
- Return-to-tank port for use in remote valve applications
- Internal pressure relief valve provides overload protection
- Quieter operation – reduced noise level to 76 dBA
- Operating air pressure: 2,8 - 8,8 bar, enables pump to start at extremely low pressure
- High efficiency cast aluminium air motor
- Reinforced heavy-duty lightweight reservoir for applications in tough environments
- Air pendant for remote control operation.

Compact Air Over Hydraulic



Regulator-Filter-Lubricator

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

Model Number

RFL-102



Large Reservoir Models

The Turbo II Air Pump is also available with an enlarged 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.

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◀ Easily operated by hand or by foot.

Used with Cylinder	Usable Oil Capacity (cm ³)	Model Number
Single-Acting	2081	PATG-1102N
	3770	PATG-1105N
Single-Acting	2081	PARG-1102N
	3770	PARG-1105N
Double-Acting	2081	PAMG-1402N
	3770	PAMG-1405N

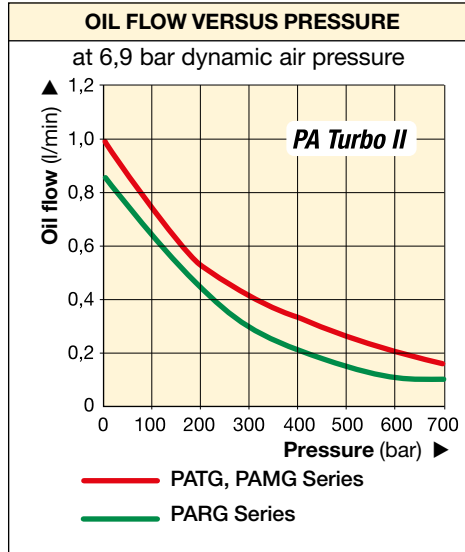
PA-Series, Turbo II Air Hydraulic Pumps



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

PAMG-models use a treadle with a locking feature to control air, and a 4-way manual valve to control hydraulics.

PARG-models use air pendant for remote control.



PATG PAMG PARG Series



Reservoir Capacity:
2,5 - 5,0 litres

Flow at Rated Pressure:
0,10 - 0,16 l/min

Air Consumption:
227 - 340 l/min

Maximum Operating Pressure:
700 bar

Maximum Pressure (bar)	Output Flow Rate (l/min)		Pump Series	Valve Function	Air Pressure Range (bar)	Air Consumption at 5,2 bar air (l/min)	Sound Level (dBA)
	No Load	Load					
700	1,00	0,16	PATG	A / H / R *	2,8 - 8,8	340	76
700	0,76	0,10	PARG	A / H / R *	2,8 - 10,3	227	76
700	1,00	0,16	PAMG	A / H / R *	2,8 - 8,8	340	76

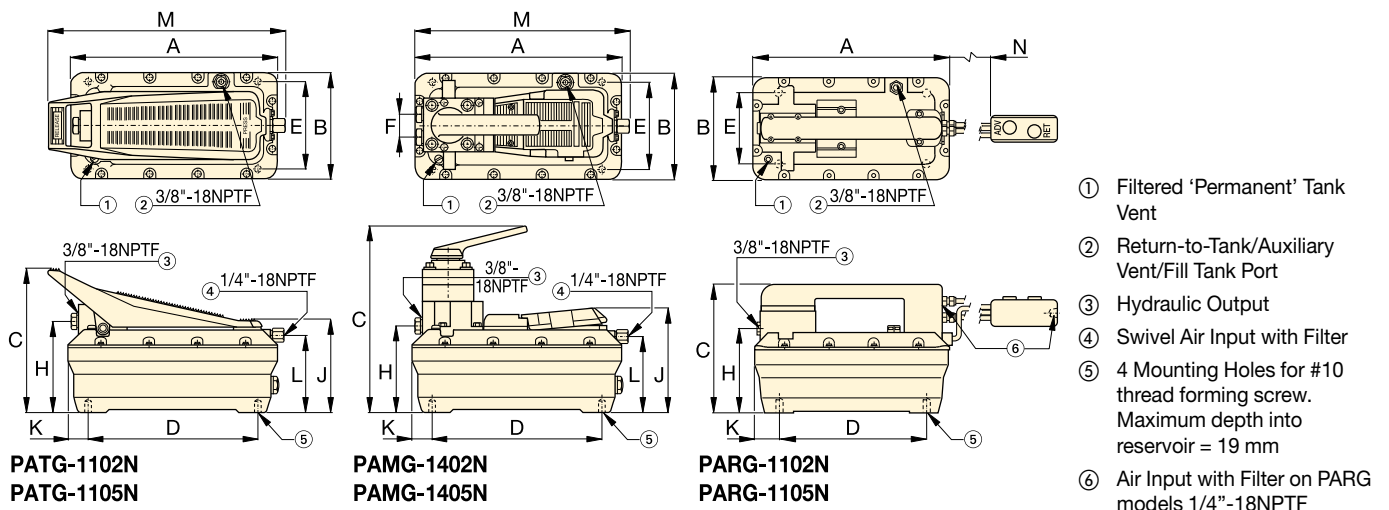
* Valve function: Advance / Hold / Retract.



Speed Chart

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

Page: 255



Valve Operation	Turbo II Dimensions (mm)													Model Number
	A	B	C	D	E	F	H	J	K	L	M	N	(kg)	
Treadle 3/3	313	165	211	230	102	-	129	146	42	113	347	-	8,2	PATG-1102N
	396	201	209	230	102	-	131	146	86	112	437	-	9,9	PATG-1105N
Air Pendant 3/3	313	165	200	230	102	-	129	-	42	-	-	4500	10,0	PARG-1102N
	396	201	209	230	102	-	131	-	86	-	-	4500	11,7	PARG-1105N
Manual 4/3	313	165	267	230	102	36	130	152	42	113	315	-	11,0	PAMG-1402N
	396	201	267	230	102	36	132	152	86	112	405	-	12,7	PAMG-1405N

PA-Series, Air Hydraulic Foot Pumps

▼ Shown: PA-1150, PA-133



PA Series

Reservoir Capacity:
0,6 - 1,3 litres

Flow at Rated Pressure:
0,13 l/min

Air Consumption:
255 l/min

Maximum Operating Pressure:
700 bar



Reservoir Conversion Kit

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

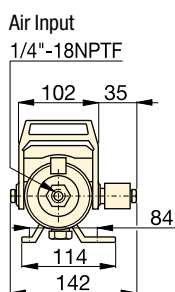
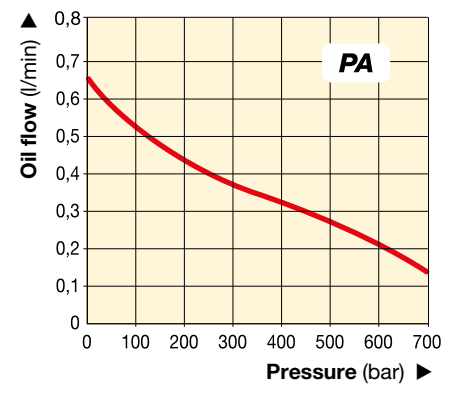
Model Number

PC-66

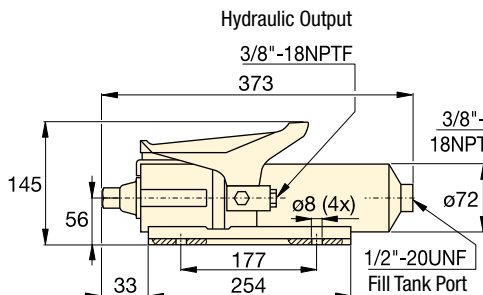
- Rugged construction – built for long life and easy service
- Swivel coupling simplifies hydraulic connection and pump operation
- Three-position treadle provides cylinder advance, hold or retract operation
- Operates in all positions for increased versatility in use and mounting (except PA-1150)
- Base mounting slots provided on PA-133.

OIL FLOW VERSUS PRESSURE

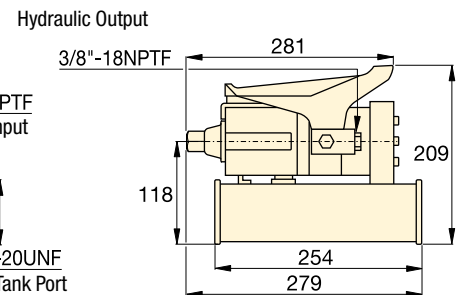
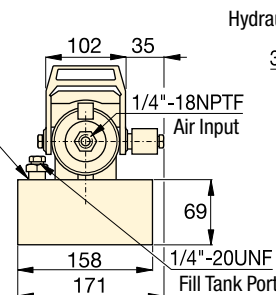
at 6,9 bar air pressure



PA-133



PA-1150



Used with Cylinder	Usable Oil Capacity (cm ³)	Model Number	Pressure Rating (bar)	Output Flow Rate (l/min)		Valve Function	Air Pressure Range * (bar)	Air Consumption (l/min)	Sound Level (dBA)	Weight (kg)
				No load	Load					
Single-Acting	589	PA-133	700	0,65	0,13	Advance / Hold / Retract	4,1 - 8,3	255	85	5,4
	1311	PA-1150	700	0,65	0,13	Advance / Hold / Retract	4,1 - 8,3	255	85	8,2

* Recommended Regulator-Filter-Lubricator: RFL-102.

PAM-Series, Air Hydraulic Pumps

▼ Shown: PAM-1041



PAM Series

Reservoir Capacity:
4,0 - 8,0 litres

Flow at Rated Pressure:
0,15 l/min

Air Consumption:
510 l/min

Maximum Operating Pressure:
700 bar



Locking Valves

Pumps with 4/3 manual valves are available with 4/3 manual locking valves instead. Add suffix "L" to pump model number.

Page: 110

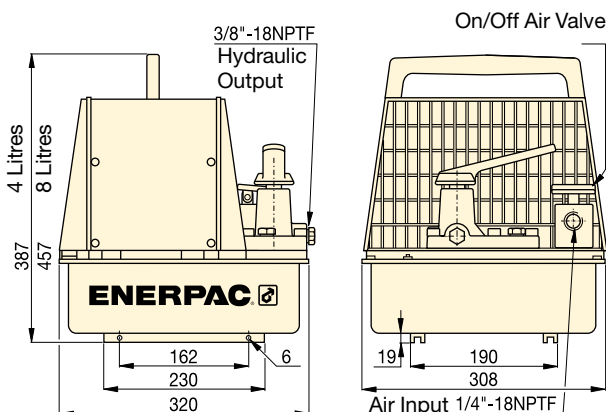


Remote Air Valve

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

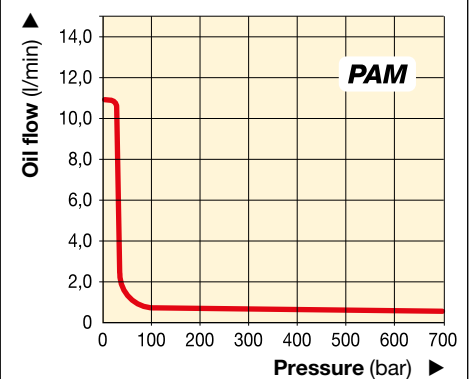
Model Number **VA-2**

- Twin air motor configuration delivers high-flow performance in first stage, up to 14 bar, for rapid cylinder advance
- 4 and 8 litres reservoirs for use with a wide range of cylinders
- Integral shroud protects air motors and provides easy portability.



OIL FLOW VERSUS PRESSURE

at 6,9 bar air pressure



Used with Cylinder	Usable Oil Cap. (litres)	Model Number with Shroud	Pressure Rating (bar)	Output Flow Rate (l/min)		Valve Function	Valve Type	Air Pressure Range * (bar)	Air Consumption (l/min)	Sound Level (dBA)	Weight (kg)
				1 st stage	2 nd stage						
Single-Acting	2,6	PAM-1021	700	10,65	0,15	Advance / Hold / Retract	3/2	4,1 - 8,3	510	87	22,7
	7,6	PAM-1022	700	10,65	0,15	Advance / Hold / Retract	3/2	4,1 - 8,3	510	87	27,2
Double-Acting	2,6	PAM-1041	700	10,65	0,15	Advance / Hold / Retract	4/3	4,1 - 8,3	510	87	22,7
	7,6	PAM-1042	700	10,65	0,15	Advance / Hold / Retract	4/3	4,1 - 8,3	510	87	27,2

* Recommended Regulator-Filter-Lubricator: RFL-102.

▼ Shown: ZA4208MX, ZA4420MX



Z Tough Dependable Innovative CLASS



ATEX 95 Certified

The Enerpac ZA4-series air pumps are tested and certified according to the **Equipment Directive 94 / 9 / EC "ATEX Directive"** for equipment and protective systems intended for use in potentially explosive atmospheres.



Page: **245**

- **ATEX 95 certified for use in potentially explosive atmospheres**
- **Features Z-Class high efficiency pump design, higher oil flow and bypass pressure**
- **Two-speed operation reduces cycle time for improved productivity**
- **User adjustable relief valve built-in on manual valves. Oil ports on valves are 3/8" NPTF**
- **Optional heat exchanger warms exhaust air to prevent freezing and cools the oil**
- **Full sight oil level glass on 10, 20 and 40 litres reservoirs, oil level indicators on 4 and 6,6 litres reservoirs.**



Speed Chart

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

Page: **255**



Hoses

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

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Used with Cylinder	Usable Oil Capacity (litres)	Manual Valve ¹⁾ Model Number	Valve Function	Model Number	Output Flow Rate ³⁾				Relief Valve Adjustment Range (bar)	Maximum Air Consumption ⁴⁾ (l/min)
					at 7 bar	at 50 bar	at 350 bar	at 700 bar		
–	4,0	– ²⁾	–	ZA4004NX ²⁾	14,0	11,0	1,8	1,3	–	2840
Single-acting	4,0	VM32	Advance / Retract	ZA4204MX	14,0	11,0	1,8	1,3	70 - 700	2840
	6,6	VM33	Advance / Hold /Retract	ZA4308MX	14,0	11,0	1,8	1,3	70 - 700	2840
	10,0	VM33L	Advance / Hold /Retract	ZA4610MX	14,0	11,0	1,8	1,3	70 - 700	2840
Double-acting	4,0	VM43	Advance / Hold /Retract	ZA4404MX	14,0	11,0	1,8	1,3	70 - 700	2840
	6,6	VM43	Advance / Hold /Retract	ZA4408MX	14,0	11,0	1,8	1,3	70 - 700	2840
	10,0	VM43L	Advance / Hold /Retract	ZA4810MX	14,0	11,0	1,8	1,3	70 - 700	2840
	20,0	VM43	Advance / Hold /Retract	ZA4420MX	14,0	11,0	1,8	1,3	70 - 700	2840
	40,0	VM43	Advance / Hold /Retract	ZA4440MX	14,0	11,0	1,8	1,3	70 - 700	2840

¹⁾ See pages 110-111 for hydraulic symbols of these valves.

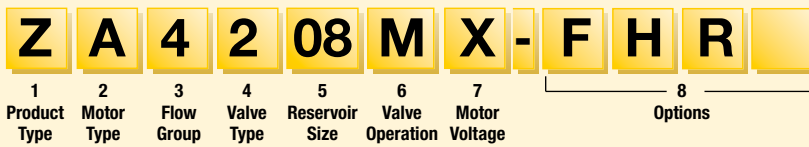
²⁾ For remote valve mounting order **BSS1090** high pressure connecting plate.

³⁾ Actual oil flow will vary with air supply.

⁴⁾ Dynamic air pressure range: 4 - 7 bar.

Modulair Air Hydraulic Pumps

▼ This is how a ZA4-Series pump model number is built up:



1 Product Type

Z = Pump Class

2 Prime Mover

A = Air motor

3 Flow Group

4 = 1,3 l/min @ 700 bar

4 Valve Type

0 = No valve, with cover plate

2 = 3/2 manual valve VM32

3 = 3/3 manual valve VM33

4 = 4/3 manual valve VM43

6 = 3/3 manual locking valve VM33L with pilot operated check

7 = 3/2 manual valve VM22

8 = 4/3 manual locking valve VM43L with pilot operated check.

6 Valve Operation

M = Manual valve

N = No valve

7 Motor Voltage

X = Not applicable

8 Options

F = Return Line Filter

G = 1000 bar gauge

H = Heat exchanger (on 4 and 6,6 litres reservoir only)

K = Skid Bar (on 4 and 6,6 litres reservoir only)

N = No reservoir handles (includes lifting eyes on 10, 20 and 40 litres)

R = Roll Cage

Ordering Example

Model Number: **ZA4208MX-FHK**

ZA4208MX-FHK is an air operated pump with a 3-way, 2-position manual valve, 6,6 litres reservoir, filter, heat exchanger and skid bar.

ZA4 Series



Reservoir Capacity:

4 - 40 litres

Flow at Rated Pressure:

1,3 l/min

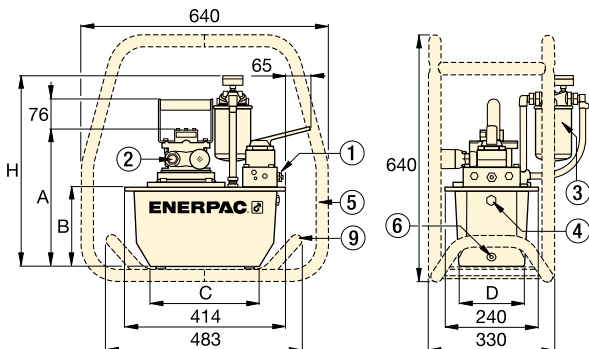
Air Consumption:

2840 l/min

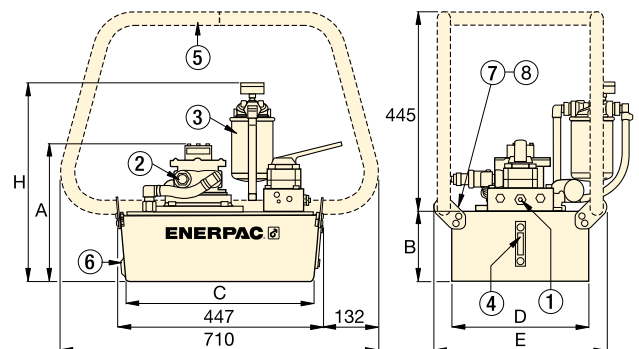
Maximum Operating Pressure:

700 bar

- ① User adjustable relief valve on all manual valves. 3/8" NPTF on A and B ports; 1/4" NPTF on auxiliary ports.
- 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 (optional)
- ⑧ Handles
- ⑨ Skid Bar (Modelnr. SBZ-4) (optional)

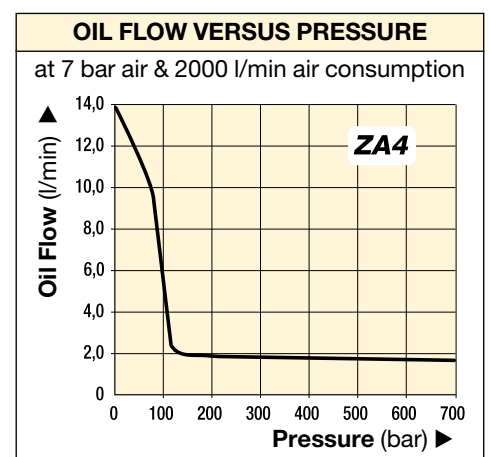


ZA4-Series Pumps with 4 - 6,6 litres reservoir



ZA4-Series Pumps with 10, 20 and 40 litres reservoir

Sound Level (dBA)	Motor Size (kW)	Dimensions (mm)							Model Number
		A	B	C	D	E	H		
80 - 95	3,0	295	142	279	152	-	429	27	ZA4004NX ²⁾
80 - 95	3,0	295	142	279	152	-	429	30	ZA4204MX
80 - 95	3,0	356	203	279	205	-	490	34	ZA4308MX
80 - 95	3,0	330	180	414	421	500	467	51	ZA4610MX
80 - 95	3,0	295	142	279	152	-	429	31	ZA4404MX
80 - 95	3,0	356	203	279	205	-	490	35	ZA4408MX
80 - 95	3,0	305	155	419	305	384	442	40	ZA4810MX
80 - 95	3,0	330	180	414	421	500	467	52	ZA4420MX
80 - 95	3,0	419	269	399	505	584	556	75	ZA4440MX



▼ Shown: ZG5420MX-R



- Features Z-Class high efficiency pump design, higher oil flow and bypass pressure
- Two-speed operation reduces cycle time for improved productivity
- User adjustable relief valve built-in on manual valves. Oil ports on valves are 3/8" NPTF
- Available in two 4-cycle engine sizes: 4,1 kW Honda and 4,8 kW Briggs & Stratton
- Full sight oil level glass on all reservoirs allow quick and easy oil level monitoring.

Z CLASS

**Tough, Dependable,
Innovative**



Speed Chart

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

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ZG-Series, Gasoline Pump Performance

Elevation can affect the performance of any gasoline engine. ZG-Series pumps are designed to develop rated performance at elevations up to 1500 m. For applications above this elevation, please consult your Enerpac office.



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.

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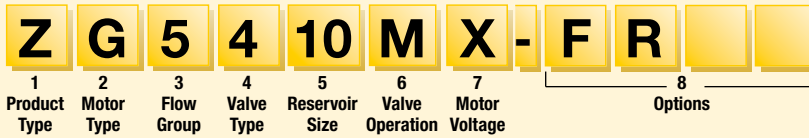
▼ SELECTION CHART

Used with Cylinder	Usable Oil Capacity (litres)	Manual Valve ¹⁾ Model Number	Valve Function	Model Number with Roll Cage	Output Flow Rate (l/min)				4-Cycle Engine Type and Size
					at 7 bar	at 50 bar	at 350 bar	at 700 bar	
Single-Acting	10	VM33	Advance / Hold / Retract	ZG5310MX-R	11,5	10,7	1,8	1,6	Honda 4,1 kW
	20	VM33	Advance / Hold / Retract	ZG5320MX-R	11,5	10,7	1,8	1,6	
Double-Acting	10	VM43	Advance / Hold / Retract	ZG5410MX-R	11,5	10,7	1,8	1,6	
	20	VM43	Advance / Hold / Retract	ZG5420MX-R	11,5	10,7	1,8	1,6	
Single-Acting	10	VM33	Advance / Hold / Retract	ZG5310MX-BR	6,5	6,2	1,8	1,6	Briggs & Stratton 4,8 kW
	20	VM33	Advance / Hold / Retract	ZG5320MX-BR	6,5	6,2	1,8	1,6	
Double-Acting	10	VM43	Advance / Hold / Retract	ZG5410MX-BR	6,5	6,2	1,8	1,6	
	20	VM43	Advance / Hold / Retract	ZG5420MX-BR	6,5	6,2	1,8	1,6	
	40	VM43L	Advance / Hold / Retract	ZG5840MX-BR	6,5	6,2	1,8	1,6	

¹⁾ See pages 110-112 for hydraulic symbols of these valves.

Gasoline Hydraulic Pumps

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



1 Product Type

Z = Pump Class

2 Prime Mover

G = Gasoline Engine

3 Flow Group

5 = 1,6 l/min @ 700 bar

6 = 3,3 l/min @ 700 bar (see page 106)

4 Valve Type

0 = No valve, with cover plate ¹⁾

2 = 3/2 manual valve **VM32**

3 = 3/3 manual valve **VM33**

4 = 4/3 manual valve **VM43**

6 = 3/3 manual locking valve **VM33L** with pilot operated check

8 = 4/3 manual locking valve **VM43L** with pilot operated check.

¹⁾ For remote valve mounting order

BSS1090 high pressure connecting plate.

5 Reservoir Size, useable oil

10 = 10 litres

20 = 20 litres

40 = 40 litres

6 Valve Operation

M = Manual valve

N = No valve

7 Motor Voltage

X = Not applicable

8 Factory installed options

B = Briggs & Stratton gasoline engine

F = Return Line Filter

G = 1000 bar pressure gauge

N = No reservoir handles (includes lifting eyes on 10, 20 and 40 litres)

R = Roll Cage

Ordering Example

Model Number: **ZG5420MX-FR**

This is a 700 bar hydraulic pump, with a 4/3 manual valve, 20 litres reservoir, with a 4,1 kW Honda gasoline engine pump, return line filter and roll bar.

ZG5 Series



Reservoir Capacity:

10 - 20 - 40 litres

Flow at Rated Pressure:

1,6 l/min

Engine Size:

4,1 - 4,8 kW

Maximum Operating Pressure:

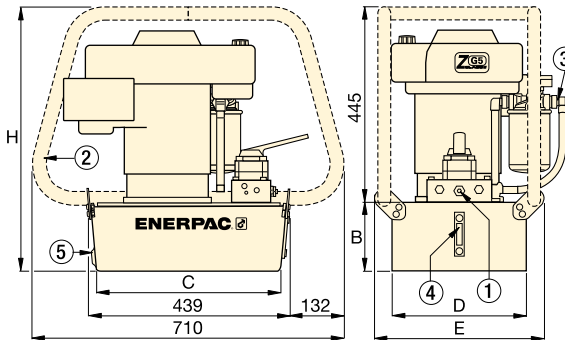
700 bar



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.

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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

③ Return Line Filter

④ Oil Level Gauge

⑤ Oil Drain



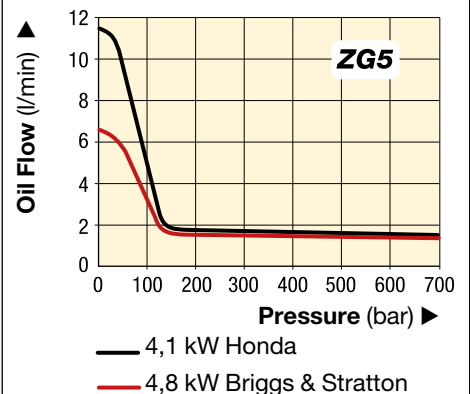
ZG6-Series 9,7 kW Pump

The ZG6-pump has 3,3 l/min oil flow at 700 bar, Briggs & Stratton 4-cycle gasoline engine with electric start and 12 Volt charge output for accessories.

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Relief Valve Adjustment Range (bar)	Sound Level (dBA)	Dimensions (mm)					Model Number with Roll Cage	Weight (kg)
		B	C	D	E	H		
70 - 700	88 - 93	155	419	305	384	600	52	ZG5310MX-R
70 - 700	88 - 93	180	414	421	500	625	64	ZG5320MX-R
70 - 700	88 - 93	155	419	305	384	600	52	ZG5410MX-R
70 - 700	88 - 93	180	414	421	500	625	64	ZG5420MX-R
70 - 700	91 - 95	155	419	305	384	600	50	ZG5310MX-BR
70 - 700	91 - 95	180	414	421	500	625	63	ZG5320MX-BR
70 - 700	91 - 95	155	419	305	384	600	50	ZG5410MX-BR
70 - 700	91 - 95	180	414	421	500	625	63	ZG5420MX-BR
70 - 700	91 - 95	269	399	505	557	714	86	ZG5840MX-BR

OIL FLOW VERSUS PRESSURE



Gasoline Hydraulic Pump

▼ Shown: ZG6440MX-BCFH



ZG6 Series

Reservoir Capacity:
40 litres

Flow at Rated Pressure:
3,3 l/min

Engine Size:
9,7 kW

Maximum Operating Pressure:
700 bar

Z Tough
Dependable
Innovative
CLASS

- Features Z-Class high efficiency pump design:
 - higher oil flow and bypass pressure
 - patented balanced rotating pump components to reduce vibration
 - replaceable piston check valves that increase service life of pump components
- Two-speed operation reduces cycle time for improved productivity
- Easy serviceable 9,7 kW, 4-cycle gasoline engine with electric start and 12 Volt charge output for accessories
- Dual forced air heat exchangers stabilizes hydraulic oil temperature
- Roll cage for easy portability and hoisting, protects pump
- Sturdy wheeled cart with collapsible handles
- Fullsight oil level-glass for easy oil level monitoring.



Speed Chart

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


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Adjustable Pressure Relief Valve

ZG-Series pumps have a manual directional control valve with a user adjustable relief valve to allow the operator to easily set the optimum working pressure. Relief valve adjustment range 70-700 bar. Oil ports are 3/8" NPTF.

▼ SELECTION CHART

For use with cylinder	Usable Oil Capacity (litres)	Manual Control Valve Type	Valve Function	Model Number	Output Flow Rate (l/min)		4-Cycle Engine Size (kW)	Outside Dimensions L x B x H (mm)	 (kg)
					at 7 bar	at 700 bar			
DbI-Act.	40	4/3	Advance/Hold/Retract	ZG6440MX-BCFH	14,7	3,3	9,7	1205 x 840 x 935	152

PGM-Series, Gasoline Hydraulic Pumps

▼ Shown: **PGM-2408R**



- **Patented Genesis Technology means**
 - coaxial piston design ensures high performance
 - first-stage piston pump for improved efficiency
- **High by-pass pressures improve productivity**
- **All Atlas pumps feature sturdy roll cage for use in tough environments**
- **Four-cycle Honda motor 2,2 kW.**

PGM Series



Reservoir Capacity:

4 - 8 litres

Flow at Rated Pressure:

0,66 l/min

Motor Size:

2,2 kW

Maximum Operating Pressure:

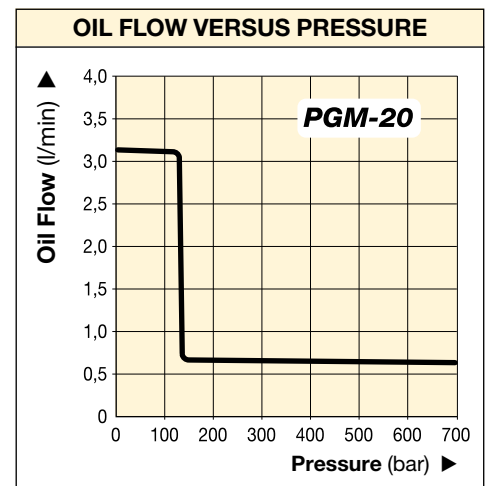
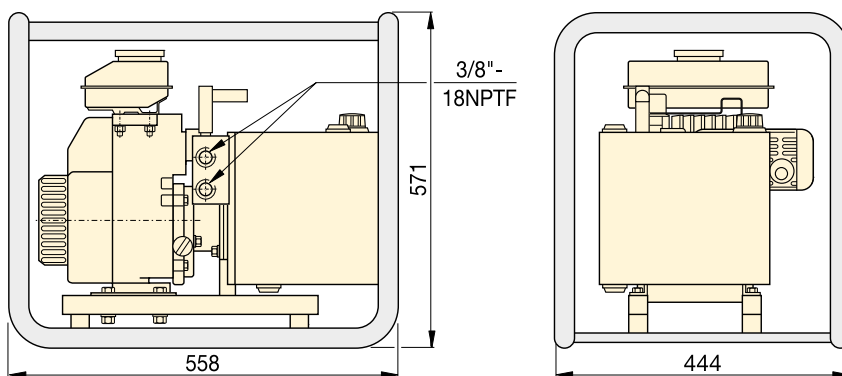
700 bar



Hoses

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

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Used with Cylinder	Usable Oil Capacity (litres)	Model Number	Pressure Rating (bar)	Output Flow Rate (l/min)		By-Pass Pressure (bar)	Manual Valve Type	Valve Function	Sound Level (dBA)	Sound Level (kg)
				1 st stage	2 nd stage					
Single-Acting	3,8	PGM-2304R *	700	3,2	0,66	140	3/3	Advance / Hold / Retract	89	25
Double-Acting	3,8	PGM-2404R *	700	3,2	0,66	140	4/3	Advance / Hold / Retract	89	25
Single-Acting	7,6	PGM-2308R *	700	3,2	0,66	140	3/3	Advance / Hold / Retract	89	33
Double-Acting	7,6	PGM-2408R *	700	3,2	0,66	140	4/3	Advance / Hold / Retract	89	33

* Note: The PGM-20 series are available with a carrying handle instead of a roll cage. For ordering omit the 'R' from the model number

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 700 bar, 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.



Pressure and Flow Control Valves

For more hydraulic system control with pressure relief valves, shut-off valves, check valves and sequence valves see our "System Components".

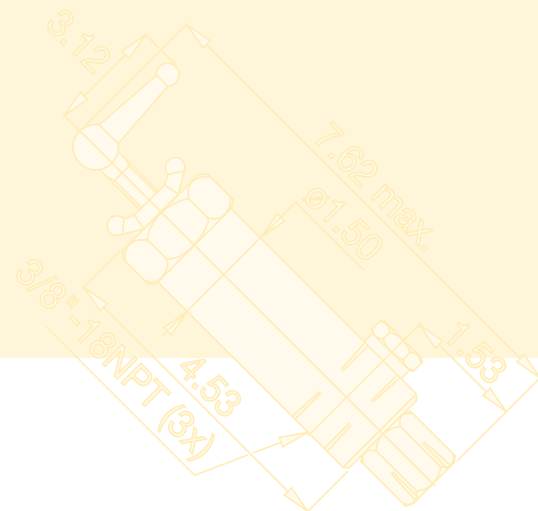
Page: 130



Valving Help

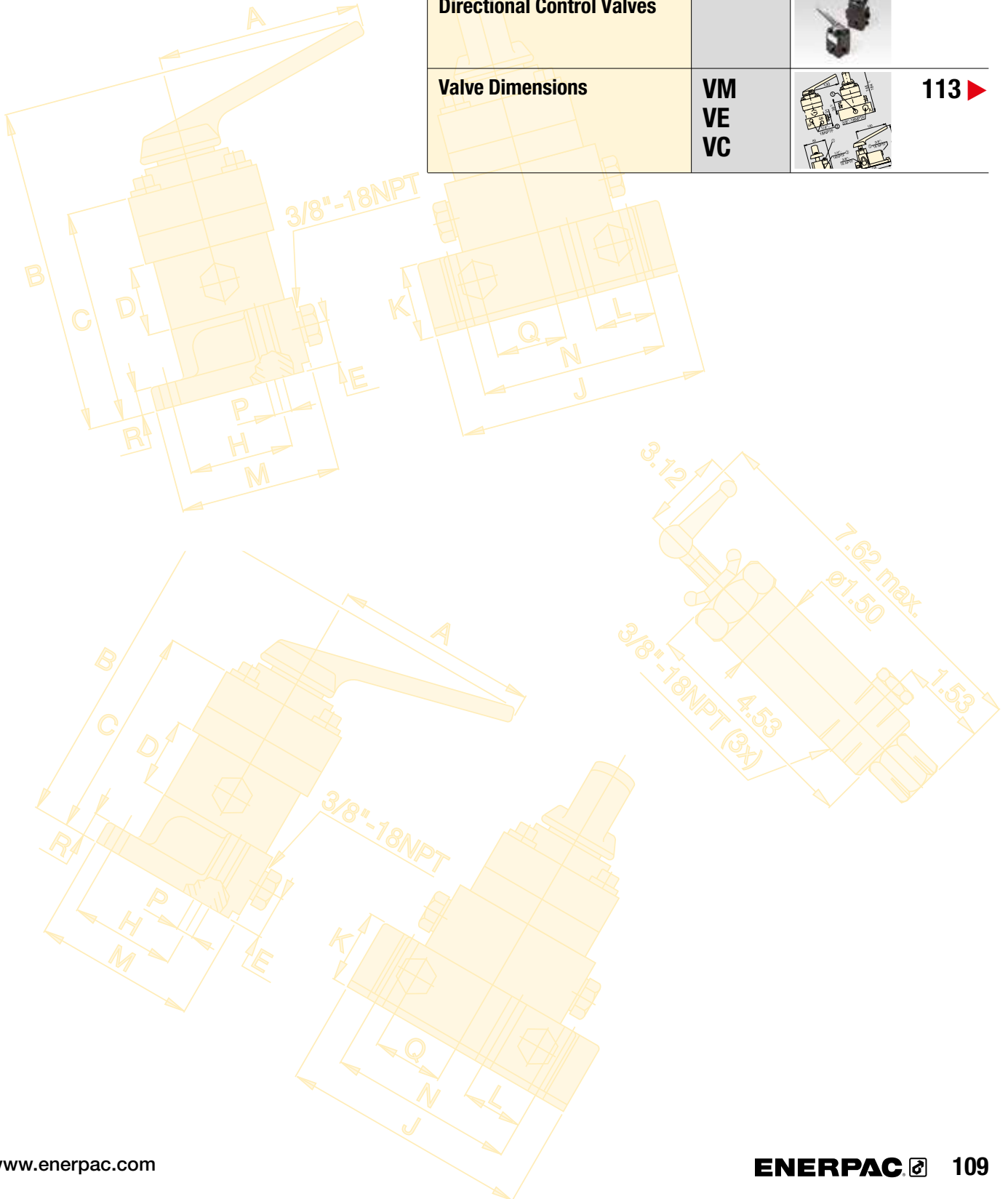
See Basic System Set-Up and Valve Information in our 'Yellow Pages'.

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Directional Control Valves Section Overview

Valve Type	Series	Page
Pump Mounted Manual and Solenoid Directional Control Valves	VM VE	110 ▶
Remote Mounted Manual Directional Control Valves	VC	112 ▶
Valve Dimensions	VM VE VC	113 ▶



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



- Advance/Retract and Advance/Hold/Retract operation of single-acting and double-acting cylinders and tools
- 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
- User adjustable relief valve allows the operator to easily set the working pressure.

▼ Enerpac wind turbine levelling system with a VM-33L manual valve, used to accurately level the transition piece after installation on the foundation pile.



Reliable Control of Single and Double-Acting Cylinders and Tools

Valve Operation	Used with Cylinder	Valve Type	
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	Single-acting	3-Way, 3-Position, Tandem Center	
Solenoid 24 VDC	Double-acting	4-Way, 3-Position, Tandem Center	

For remote valve information, see page 112.

Pump Mounted Directional Control Valves



Adjustable relief valve

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.

VM VE Series



Max. Flow Capacity:

17 l/min

Maximum Operating Pressure:

700 bar

Model Number	Hydraulic Symbol	Schematic Flowpath			(kg)
		Advance	Hold	Retract	
VM32					2,5
VM33					3,0
VM43					3,1
VM33L					4,8
VM43L					4,9
VE32					3,9
VE32D					3,9
VE33					9,3
VE43					9,3

See page 113 for valve dimensions.



Fittings

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

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Locking Valves

For applications that require positive load holding, VM-Series valves (except 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.



Pendants for VE-Series Solenoid Valves

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

To be used with solenoid valves:	Pendant Model Nr.
VE32D	ZCP-1
VE32, VE33, VE43	ZCP-3

Page: 91

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



Remote Control of Single and Double-Acting Cylinders and Tools



Locking Valves

For applications that require positive load holding, VC-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.

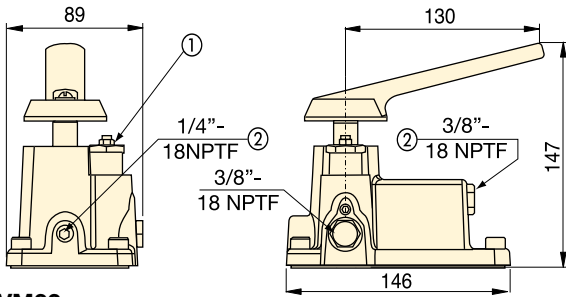
- Advance/Hold/Retract operation for use with single-acting or double-acting cylinders and tools.

Valve Operation	Used with Cylinder	Valve Type	Model Number	Hydraulic Symbol	Schematic Flowpath			Weight (kg)
					Advance	Hold	Retract	
Manual	Single-Acting	3-Way, 3-Position, Tandem Center	VC-3					2,9
Manual	Single-Acting	3-Way, 3-Position, Tandem Center, Locking	VC-3L					4,7
Manual	Single-Acting	3-Way, 3-Position, Closed Center	VC-15					2,9
Manual	Single-Acting	3-Way, 3-Position, Closed Center, Locking	VC-15L					4,7
Manual	Double-Acting	4-Way, 3-Position, Tandem Center	VC-4					2,9
Manual	Double-Acting	4-Way, 3-Position, Tandem Center, Locking	VC-4L					4,7
Manual	Double-Acting	4-Way, 3-Position, Closed Center	VC-20					2,9
Manual	Double-Acting	4-Way, 3-Position, Closed Center, Locking	VC-20L					4,7

Return line kit included with remote valves.

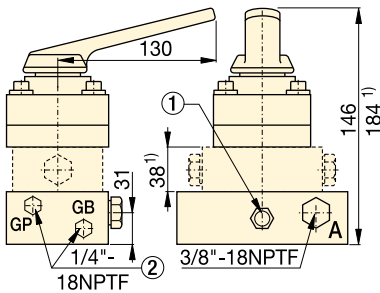
Directional Control Valves Dimensions

Pump Mounted Directional Control Valves



VM32

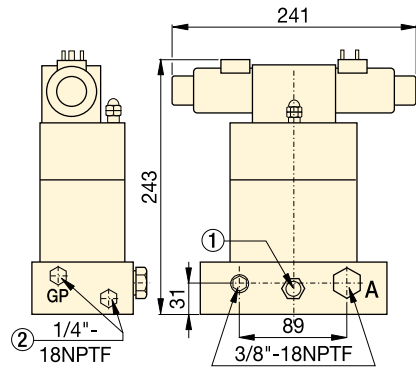
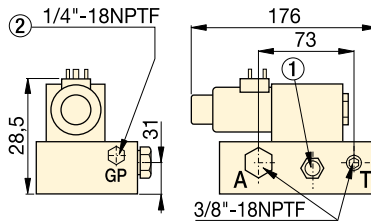
- ① User Adjustable Relief Valve
- ② Auxiliary Port



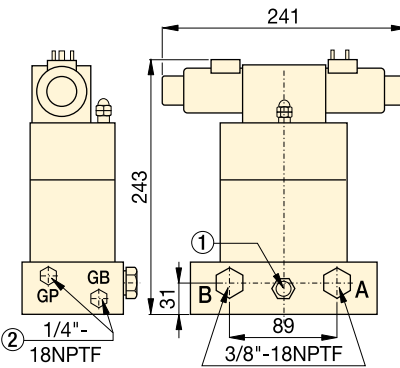
VM33, VM33L, VM43, VM43L

¹⁾ VM33L and VM43L only

VE32D

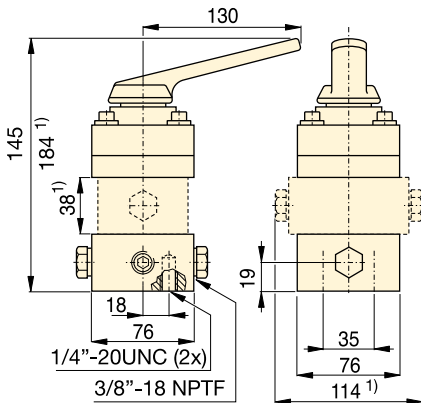


VE33



VE43

Remote Manual Directional Control Valves



VC-3, VC-3L, VC-15, VC-15L

VC-4, VC-4L, VC-20, VC-20L

¹⁾ VC-3L, VC-15L, VC-4L and VC-20L only

VM VE VC Series



Max. Flow Capacity:

17 l/min

Maximum Operating Pressure:

700 bar



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: 124



Fittings

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

Page: 121



Valving Help

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

Page: 256

Enerpac System Components:

All the additional elements you need to complete your high pressure hydraulic system and get started.

Engineered to work with your Enerpac cylinders, pumps and tools, all Enerpac components are designed to the most exacting standards.

With this complete line of hydraulic hoses, couplers, fittings, manifolds, oil and gauges, Enerpac has the accessories to complement 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" section in this catalogue.

Page: 

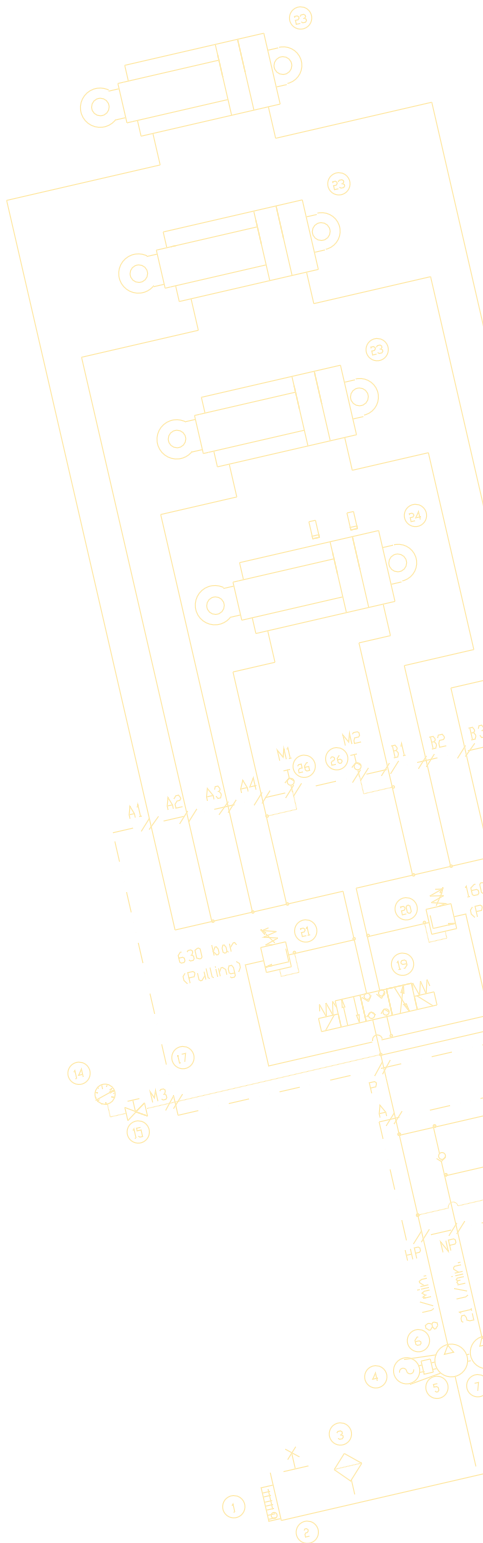















Maintain System Integrity

Use Enerpac System Components, designed to interface with Enerpac cylinders, pumps and tools to ensure your system operates at peak performance.



System Components & Control Valves Overview



Component Type	Series		Page
Hoses	H700		116 ▶
Couplers	A, C, F, T		118 ▶
Hydraulic Oil	HF		120 ▶
Manifolds	A		120 ▶
Control Manifolds	AM		120 ▶
Fittings	BFZ FZ XSC		121 ▶
Force Gauges Pressure Gauges	GF GP		122 ▶
Pressure Gauges, glycerine filled Pressure Gauges, dry	G H		124 ▶
Test System Gauges	T		126 ▶
Digital Pressure Gauges	DGR		127 ▶
Gauge Adaptor Assembly	GA45		128 ▶
Gauge Accessories	GA NV V		129 ▶
Pressure and Flow Control Valves	V		130 ▶

▼ Shown: HC-7206



Thermo-Plastic Safety Hoses (700-Series)

- For demanding applications, featuring a 4:1 safety factor
- Maximum working pressure of 700 bar
- Outside jacket is polyurethane, to provide maximum abrasion resistance
- Exhibits low volumetric expansion under pressure to enhance overall system efficiency
- Crimped-on rubber strain relief for improved life and durability on all models.

▼ To prevent back pressure and to increase cylinder retraction speed, when using long hoses with single-acting cylinders, the Enerpac HC-7300-Series of hoses with increased internal diameter is the best choice.



Safety and Quality



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

WARNING !

- Do not exceed 700 bar maximum pressure.
- Do not handle hoses which are under pressure.

More safety instructions in our 'Yellow pages'.

Page: **246**

▼ Hose End Couplings

1/4" NPTF	
3/8" NPTF	
A-604	
A-630	
AH-604	
AH-630	
C-604	
CH-604	

High Pressure Hydraulic Hoses

H700 Series



Inside Diameter:


6,4 - 9,7 mm

Length:

0,6 - 15 m

Maximum Operating Pressure:

700 bar

Internal Diameter (mm)	Hose End Assemblies and Couplers *		Hose Length (m)	Model Number	 (kg)	
	End one	End two				
6,4	1/4" NPTF		-	-	-	
			-	-	-	
		A-630	1,8	HB-7206QB	1,1	
			-	-	-	
		CH-604	1,8	HC-7206Q	1,0	
	3/8" NPTF			0,6	H-7202	0,5
				0,9	H-7203	0,7
				1,8	H-7206	0,9
				3,0	H-7210	1,4
				6,1	H-7220	2,8
				9,1	H-7230	4,5
				15	H-7250	7,0
				-	-	-
		A-604	1,8	HA-7206B	1,1	
			-	-	-	
		AH-604		-	-	-
				1,8	HA-7206	1,0
				3,0	HA-7210	1,5
				-	-	-
		AH-630	1,8	HB-7206	1,0	
		C-604		0,9	HC-7203B	1,0
			1,8	HC-7206B	1,3	
			3,0	HC-7210B	1,8	
	CH-604		0,9	HC-7203	0,8	
		1,8	HC-7206	1,0		
		3,0	HC-7210	1,5		
		6,1	HC-7220	2,9		
CH-604	CH-604		1,8	HC-7206C	1,1	
			15	HC-7250C	7,0	
9,7	3/8" NPTF		1,8	H-7306	1,6	
				-	-	-
				3,0	H-7310	2,4
				6,1	H-7320	4,5
				9,1	H-7330	7,3
		CH-604		15	H-7350	11,5
				1,8	HC-7306	1,7
				3,0	HC-7310	2,5
				6,1	HC-7320	5,1
				-	-	-

* For technical information on couplers see next page.



Torque Wrench Hoses

Use Enerpac twin safety hoses with double-acting wrenches to ensure the integrity of your hydraulic system.

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Fittings

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

Page: 121

Hose Oil Capacity

When using greater 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 6,4 mm inside diameter hoses:
Capacity (cm³) = 32,1699 x Length (m)

For 9,7 mm inside diameter hoses:
Capacity (cm³) = 73,8981 x Length (m)

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



3/8" High Flow Couplers

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

3/8" High Pressure '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
- Will not interchange with low pressure couplers

3/8" Regular Spee-D-Couplers®

- For medium duty applications with hand pumps
- Includes female aluminium dust cap

1/4" Regular Couplers

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

1/4" Spin-on Torque Wrench Couplers

- For use with 700 bar S and W-Series torque wrenches, THQ-Series hoses and 700 bar torque wrench pumps

1/4" Lock-ring Torque Wrench Couplers

- For use with 800 bar HXD and SQD-Series torque wrenches, THC-Series hoses and 800 bar torque wrench pumps.

* 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 from the end of a fitting to prevent it from winding up in 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'.

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F-Series

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

▼ 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.



Hydraulic Couplers



CT-604 Safety Tool

Use the Enerpac CT-604 to relieve hydraulic back pressure by safely bleeding the hydraulic coupler.

NOTE: For use on C-Series 700 bar High-Flow Couplers only

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 700 bar.

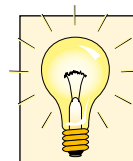
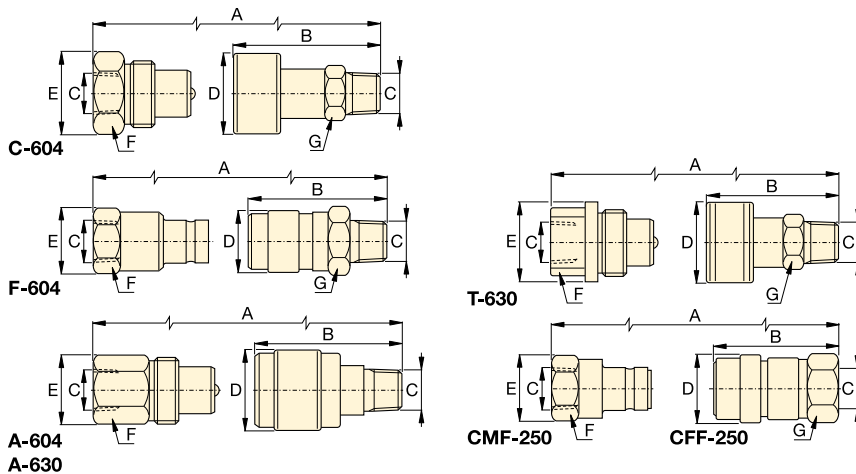
A, C, F, T Series



Maximum Flow Capacity:
6,1 - 40,0 l/min

Thread:
1/4" - 3/8" NPTF

Maximum Operating Pressure:
700 - 800 bar



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

Maximum Flow Capacity (l/min)	Coupler Type	Model Numbers			Dimensions (mm)							Dust Cap(s) Modelnr.
		Complete Set	Female Half	Male Half	A*	B	C	D	E	F	G	
35	700 bar High-Flow Coupler 	C-604	CR-400	CH-604	83	64	3/8" NPTF	35	36	32	25	(2x) CD-411
40	700 bar Flush-Face coupler 	F-604	FR-400	FH-604	111	72	3/8" NPTF	31	31	27	29	-
7,6	700 bar Regular Spee-D-Coupler® 	A-604	AR-400	AH-604	77	42	3/8" NPTF	28	26	23	19	Z-410 female only
7,6	700 bar Regular Coupler 	A-630	AR-630	AH-630	66	35	1/4" NPTF	22	20	19	15	Z-640 female only
11,4	700 bar Spin-on Coupler 	T-630	TR-630	TH-630	73	60	1/4" NPTF	29	29	19	21	-
6,1	800 bar Lock-ring Coupler 	-	CFF-250	CMF-250	76	58	1/4" NPTF	23	28	24	22	-

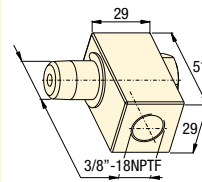
* Value A is total length when male and female half are connected.

Hydraulic Oil, Manifolds and Fittings



3/8" Swivel Connector

360 degree swivel coupler for optimal orientation of the hydraulic connection on cylinders, pumps and hoses. Order Model Nr. **XSC-1**.



**A, AM
BFZ
FZ
HF
Series**



700 bar Fittings		Model Number	Dimensions (mm)				Diagram	
			A	B	C	D		
Street Elbow			FZ-1616	23	33	3/8"-18 NPTF	3/8"-18 NPTF	
From: 3/8"-NPTF Male	To: 3/8"-NPTF Female							
Reducing Connector			FZ-1615	28	25	3/8"-18 NPTF	1/4"-18 NPTF	
From: 3/8"-NPTF Female	To: 1/4"-NPTF Female							
From: 1/2"-NPTF Female	To: 3/8"-NPTF Female							
Hexagon Nipple			FZ-1608	38	16	1/4"-18 NPTF	1/4"-18 NPTF	
From: 1/4"-NPTF	To: 1/4"-NPTF							
From: 3/8"-NPTF	To: 3/8"-NPTF							
From: 3/8"-NPTF	To: 3/8"-NPTF							
Coupling			FZ-1614	29	23	3/8"-18 NPTF	3/8"-18 NPTF	
From: 3/8"-NPTF	To: 3/8"-NPTF							
			FZ-1605	29	19	1/4"-18 NPTF	1/4"-18 NPTF	
From: 1/4"-NPTF	To: 1/4"-NPTF							
Cross			FZ-1613	45	25	3/8"-18 NPTF	-	
From: 3/8"-NPTF Female	To: 3/8"-NPTF Female							
Tee			FZ-1612	45	25	3/8"-18 NPTF	-	
From: 3/8"-NPTF	To: 3/8"-NPTF							
From: 1/4"-NPTF	To: 1/4"-NPTF							
Street Tee			BFZ-16312	56	26	3/8"-18 NPTF	3/8"-18 NPTF	
From: 3/8"-NPTF Female	To: 3/8"-NPTF Male							
Elbow			FZ-1610	33	20	3/8"-18 NPTF	-	
From: 3/8"-NPTF	To: 3/8"-NPTF							
			FZ-1638	36	24	1/4"-18 NPTF	-	
From: 1/4"-NPTF	To: 1/4"-NPTF							
Reducer			FZ-1630	19	19	1/4"-18 NPTF	3/8"-18 NPTF	
From: 3/8"-NPTF	To: 1/4"-NPTF							
From: 1/4"-NPTF	To: 1/2"-NPTF							
			BFZ-1630	28	22	1/4"-18 NPTF	1/2"-14 NPTF	
From: 3/8"-NPTF	To: G1/4"							
			BFZ-16301	19	19	G1/4"	3/8"-18 NPTF	
From: 3/8"-NPTF	To: G1/4"							
Adaptor			BFZ-16411	35	19	1/4"-18 NPTF	G1/4"	
From: G1/4"	To: 1/4"-NPTF							
From: G1/4"	To: 1/8"-NPTF							
From: G3/8"	To: 1/4"-NPTF							
			BFZ-16421	31	19	1/8"-27 NPTF	G1/4"	
From: G3/8"	To: 3/8"-NPTF							
			BFZ-16323	43	24	1/4"-18 NPTF	G3/8"	
From: G3/8"	To: 3/8"-NPTF							
			BFZ-16324	43	24	3/8"-18 NPTF	G3/8"	
From: G3/8"	To: 3/8"-NPTF							
Adaptor			FZ-1055	44	23	1/4"-18 NPTF	3/8"-18 NPTF	
From: 1/4"-NPTF	To: 3/8"-NPTF							
From: 1/4"-NPTF	To: 1/8"-NPTF							
			FZ-1642	30	19	1/8"-27 NPTF	1/4"-18 NPTF	
From: 1/2"-NPTF	To: 3/8"-NPTF							
			FZ-1634	42	28	3/8"-18 NPTF	1/2"-18 NPTF	
From: 1/2"-NPTF	To: 3/8"-NPTF							
Swivel Fitting			FZ-1660	40	22	3/8"-18 NPTF	3/8"-18 NPTF	
From: 3/8"-NPTF Male	To: 3/8"-NPTF Female							

▼ Shown from left to right: GF-230B, GF-835B, GP-10S



- **GF-series gauges:** calibrated with dual scale reading for pressure and force in bar and kN
- **GF-series gauges:** all pressure sensing parts are sealed and dampened by glycerine for long life
- **GP-series gauges:** calibrated with dual scale reading for pressure in bar and psi
- **Excellent readability:** gauge face dimensions 100 mm
- **Fast, easy installation**
- **Stainless steel gauge cases for corrosion resistance.**

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



Visual Reference for System Pressure and Force



Auto-Damper Valve V-10

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.

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Snubber Valve V-91

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.

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	Used With
	All Cylinders
	All Cylinders
	All 5 ton Cylinders
	All 10 ton Cylinders
	All 25 ton RC-Cylinders
	All 50 ton RC, RR-Cylinders
	13 ton RCH-Series
	RCS-201, 302
	RCS-502, 1002
	RCH-202, 302, 603
	All 25, 30, 50 ton cylinders
	All 75, 100 ton cylinders
	All 150, 200 ton cylinders
	10 ton VLP Presses
	25 ton XLP Presses
	50 ton XLP, BPR Presses
100 ton VLP, BPR Presses	
200 ton VLP, BPR Presses	

Hydraulic Force & Pressure Gauges



Maximum Indicator Pointer

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

Can easily be installed on GP and H-Series gauges.
Order model nr: **BSA-881**.



Pressure Gauges

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

Force Gauges

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

GP-Series are dry gauges.

GF-Series are glycerine filled gauges.

GF GP Series



Pressure Range:

0 - 1000 bar

Force Range:

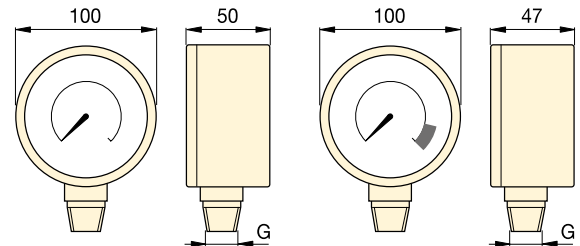
0 - 2000 kN

Gauge Face Diameter:

100 mm




Accuracy, % of full scale:

± 1%



GP-serie

GF-serie

Gauge Type and Calibration				Units per Division	Model Number *	Thread G	Gauge Adaptor		
							 129		
bar	psi	bar	kN				Required		
							GA-1	GA-2	GA-3
0-700	0-10.000	-	-	10 bar, 100 psi	GP-10S	1/2" NPTF	●	●	
0-1000	0-15.000	-	-	10 bar, 200 psi	GP-15S	1/2" NPTF	●	●	
-	-	0-700	0-45	10 bar, 0,5 kN	GF-5B	1/2" NPTF	●	●	
-	-	0-700	0-100	10 bar, 1 kN	GF-10B	1/2" NPTF	●	●	
-	-	0-700	0-232	10 bar, 2 kN	GF-20B	1/2" NPTF	●	●	
-	-	0-700	0-500	10 bar, 5 kN	GF-50B	1/2" NPTF	●	●	
-	-	0-700	0-124	10 bar, 1 kN	GF-120B	1/2" NPTF	●	●	
-	-	0-700	0-175/275	10 bar, 2 + 5 kN	GF-230B	1/2" NPTF	●	●	
-	-	0-700	0-450/900	10 bar, 5 + 10 kN	GF-510B	1/2" NPTF	●	●	
-	-	0-700	0-210/320/570	10 bar, 5 kN	GF-813B	1/4" NPTF			●
-	-	0-700	0-232/300/500	10 bar, 5 kN	GF-835B	1/4" NPTF			●
-	-	0-700	0-720/930	10 bar, 10 kN	GF-871B	1/4" NPTF			●
-	-	0-700	0-1400/2000	10 bar, 25 kN	GF-200B	1/4" NPTF			●
-	-	0-700	0-100	10 bar, 1 kN	GF-10B	1/2" NPTF	●	●	
-	-	0-700	0-232	10 bar, 2 kN	GF-20B	1/2" NPTF	●	●	
-	-	0-700	0-500	10 bar, 5 kN	GF-50B	1/2" NPTF	●	●	
-	-	0-700	0-720/930	10 bar, 10 kN	GF-871B	1/4" NPTF			●
-	-	0-700	0-1400/2000	10 bar, 25 kN	GF-200B	1/4" NPTF			●

* GF-Series Force gauges with imperial scale reading (psi, lbs) are available by changing the suffix 'B' into 'P'.

▼ Shown from left to right: H4049L, G-2534R, G-4089L, G-2535L, G-4040L



Visual Reference of System Pressure

Glycerine Filled (G-Series)

- Dual scale reading calibrated in bar and psi
- 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 Dry Gauges (H-Series)

- Dual scale reading calibrated in bar and psi
- 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.



GA45GC Gauge adaptor assembly

45° Angled gauge adaptor improves safe working conditions.

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Gauge adaptor

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

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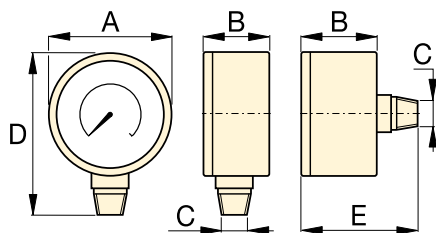
Snubber Valve V-91

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.

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

Hydraulic Pressure Gauges



Size (mm)	Connection	Dimensions (mm)				
		A	B	C	D	E
63	Lower Mount	63	37	¼" NPTF	84	–
63	Center Rear	63	37	¼" NPTF	–	63
100	Lower Mount	100	29	¼" NPTF	121	–
100	Lower Mount	100	49	½" NPTF	136	–

Note: dimensions for reference only.

G H Series



Pressure Range:

0 - 1000 bar

Face Diameter:

63 - 100 mm

Accuracy, % of full scale:

± 1,0 - 1,5%



Maximum Indicator Pointer

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

Can easily be installed on GP and H-Series gauges.

Order model nr: **BSA-881**.

▼ SELECTION CHART

Gauge Series	Pressure Range		Model Number				Major Graduation		Minor Graduation		Major Graduation		Minor Graduation	
			ø 63 ¼" NPTF Lower Mount	ø 63 ¼" NPTF Center Rear	ø 100 ¼" NPTF Lower Mount	ø 100 ½" NPTF Lower Mount	bar		psi		bar		psi	
	(bar)	(psi)	Accuracy: ± 1,5 %		Accuracy: ± 1,0 %		ø 63	ø 100	ø 63	ø 100	ø 63	ø 100	ø 63	ø 100
G-Series	0-7	0-100	G2509L	–	–	–	1	–	0,01	–	10	–	2	–
	0-11	0-160	G2510L	–	–	–	1	–	0,02	–	10	–	2	–
	0-14	0-200	G2511L	–	–	–	1	–	0,02	–	50	–	5	–
	0-20	0-300	G2512L	–	–	–	5	–	0,50	–	50	–	5	–
	0-40	0-600	G2513L	–	–	–	10	–	1	–	100	–	10	–
	0-70	0-1.000	G2514L	G2531R	–	–	10	–	1	–	100	–	20	–
	0-140	0-2.000	G2515L	–	–	–	10	–	5	–	500	–	50	–
	0-200	0-3.000	G2516L	–	–	–	50	–	5	–	500	–	50	–
	0-400	0-6.000	G2517L	G2534R	–	–	100	–	10	–	1000	–	100	–
	0-700	0-10.000	G2535L	G2537R	G4088L	G4039L	100	100	10	10	2000	1000	200	100
0-1000	0-15.000	G2536L	G2538R	G4089L	G4040L	100	100	20	20	3000	3000	200	200	
H-Series	0-700	0-10.000	–	–	H4049L	H4071L	–	100	–	10	–	1000	–	100

▼ Gauge shown: T-6003L



- Dual scale reading calibrated in bar and psi
- All gauges have spring-loaded backs with rubber blow-out plugs to protect case assembly in case of over-pressurization
- Integral maximum indicator pointer standard included
- 2800 and 3500 bar models include flange mounting
- 1/2" NPTF versions are made of high strength alloy steel
- 0.25" cone models are made of 316 stainless steel, with 403 stainless steel on 2800 and 3500 bar models.

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



T Series

Pressure Range:
0 - 3500 bar

Face Diameter:
162 - 192 mm

Accuracy, % of full scale:
± 0,5 - 1,5%



Cone Mount Gauge Adaptor

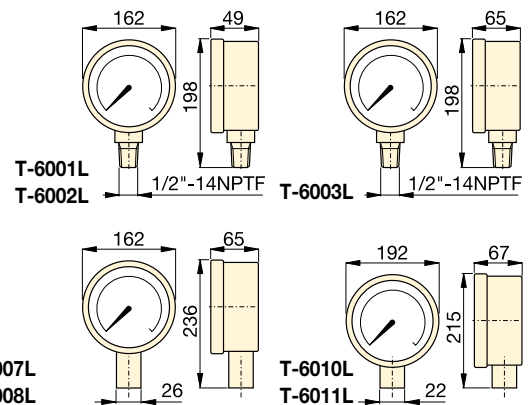
Contains fittings to connect 1/4" cone fitting gauge to 3/8" cone system. Kit includes 43-301 tee, 43-704 gauge adaptor and 45-116 tubing. Order model number: **83-011**.

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Cone Mount Gauge Connector

For connecting gauges with 0.25" cone fitting directly to model number **11-100** or **11-400** pump (page 70). May be used with other 0.25" cone systems. Order model number: **43-704**



Pressure Range (bar)	Pressure Range (psi)	Model Number		Number Intervals (bar)	Graduation Intervals (bar)	Number Intervals (psi)	Graduation Intervals (psi)
		Alloy Steel 1/2" NPTF	Stainless Steel 0,25 cone				
0-70 ¹⁾	0-1000	T-6001L	–	10	1	100	10
0-350 ¹⁾	0-5000	T-6002L	–	50	5	500	50
0-700 ¹⁾	0-10.000	T-6003L	T-6007L	100	10	1.000	100
0-1400 ¹⁾	0-20.000	–	T-6008L	200	20	1.000	100
0-2800 ²⁾	0-40.000	–	T-6010L	500	20	5.000	200
0-3500 ²⁾	0-50.000	–	T-6011L	500	50	5.000	200

¹⁾ Accuracy ± 0,5%

²⁾ Accuracy ± 1,5%

Digital Hydraulic Pressure Gauge

▼ Gauge shown: **DGR-2**



- Rated for system pressure up to 1380 bar
- Displays high pressure in bar, psi, MPa and kg/cm²
- Zero reset - ensures that gauge reads actual pressure
- IP65 protection
- 3 Volt battery included (type CR2430), condition indicator on read-out
- Shut-off slectable – menu driven
- Protective cover included.

DGR Series

Pressure Range:

0 - 1380 bar

Voltage:

3 Volt (battery)

Accuracy, % of full scale:

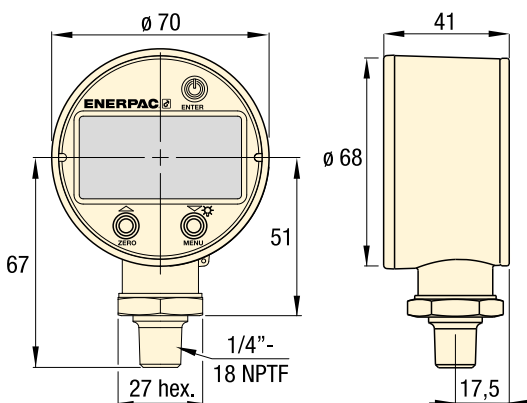
± 0,25%



Gauge adaptor

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

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High Pressure Rating (bar)		High Pressure Rating (MPa)		Model Number	High Pressure Rating (psi)		High Pressure Rating (kg/cm ²)	
Range	Interval	Range	Interval		Range	Interval	Range	Interval
0-1380	0,1	0-140	0,01	DGR-2	0-20.000	1	0-1400	0,1

Weight: 0,23 kg.

Gauge Adaptor Assembly

▼ Shown: **GA45GC**



GA45GC Series

Connection 1:
3/8" NPTF male

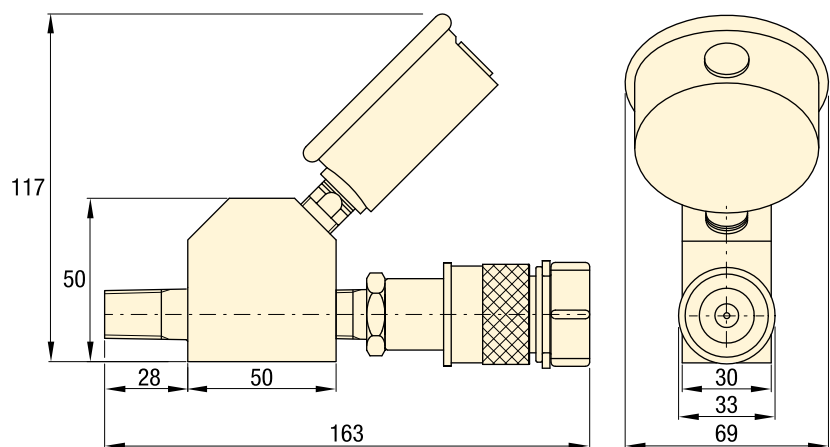
Connection 2:
CR-400 coupler

Operating Pressure:
700 bar

45° Angled gauge adaptor improves safe working conditions

- 45° angled gauge improves visibility
- Slim and narrow design
- Easy to fit in a broad range of systems
- Maximize controlled load movement
- Glycerin dampened gauge with dual scale
- Enerpac High Flow female coupler.

▼ *The Gauge Adaptor Assembly is the window to your system; allows easy reading of the pressure for safe operation.*



Model Number	Gauge Port (1/4" NPTF)	Male End (NPTF)	Female End (3/8" NPTF)	Gauge Range	
				(bar)	(psi)
GA45GC	G2535L	3/8" -18	CR-400	0 - 700	0 - 10.000

▼ Shown from left to right: **GA-3, V-91, GA-1, GA-2, GA-4, NV-251, GA-918**



GA, NV, V Series

Operating Pressure:
700 bar

▼ A gauge is easily installed into your hydraulic system using a gauge adaptor.



Gauge Adaptors (GA-Series)

- For easy mounting of a pressure gauge onto your system
- Male end screws into pump or cylinder port, female end accepts hose or coupler, 3rd port is for gauge connection
- GA-918 provides for swivel connection.

GA-1

GA-2, GA-3, GA-4

Model Number	Gauge Port (NPTF)	Male End (NPTF)	Female End (NPTF)	Dimensions (mm)					
				A	B	C	D	E	F
GA-1	1/2"	3/8"	3/8"	71	31	1/2" NPTF	3/8" NPTF	3/8" NPTF	32
GA-2	1/2"	3/8"		155	35	1/2" NPTF	3/8" NPTF	3/8" NPTF	32
GA-3	1/4"	3/8"		133	48	1/4" NPTF	3/8" NPTF	3/8" NPTF	32
GA-4	1/2"	1/4"		111	35	1/2" NPTF	1/4" NPTF	3/8" NPTF	32

Swivel Adaptor (GA-918)

- Simplifies gauge installation and reading.

Model Number	Dimensions (mm)						
	A	B	C	D	E	S	S1
GA-918	117	43	1/2" NPTF	28,5	1/2" NPTF	29	38

Needle Valves (V- and NV-Series)

- Both NV-251 and V-91 provide positive shut-off
- 303 stainless steel stem, 16 threads/in (NV-251).

NV-251

V-91

Model Number	Orifice (mm)	Thread Size	Dimensions (mm)						
			A	B	C	D	E	F	H
NV-251	4,3	1/4" NPTF	57	29	1/4" NPTF	57	46	19	19
V-91	4,8	1/2" NPTF	89	32	1/2" NPTF	64	32	37	37

▼ From left to right: V-152, V-66, V-82, V-161, V-42, V-17



Your Hydraulic Control Solution



Valve Applications

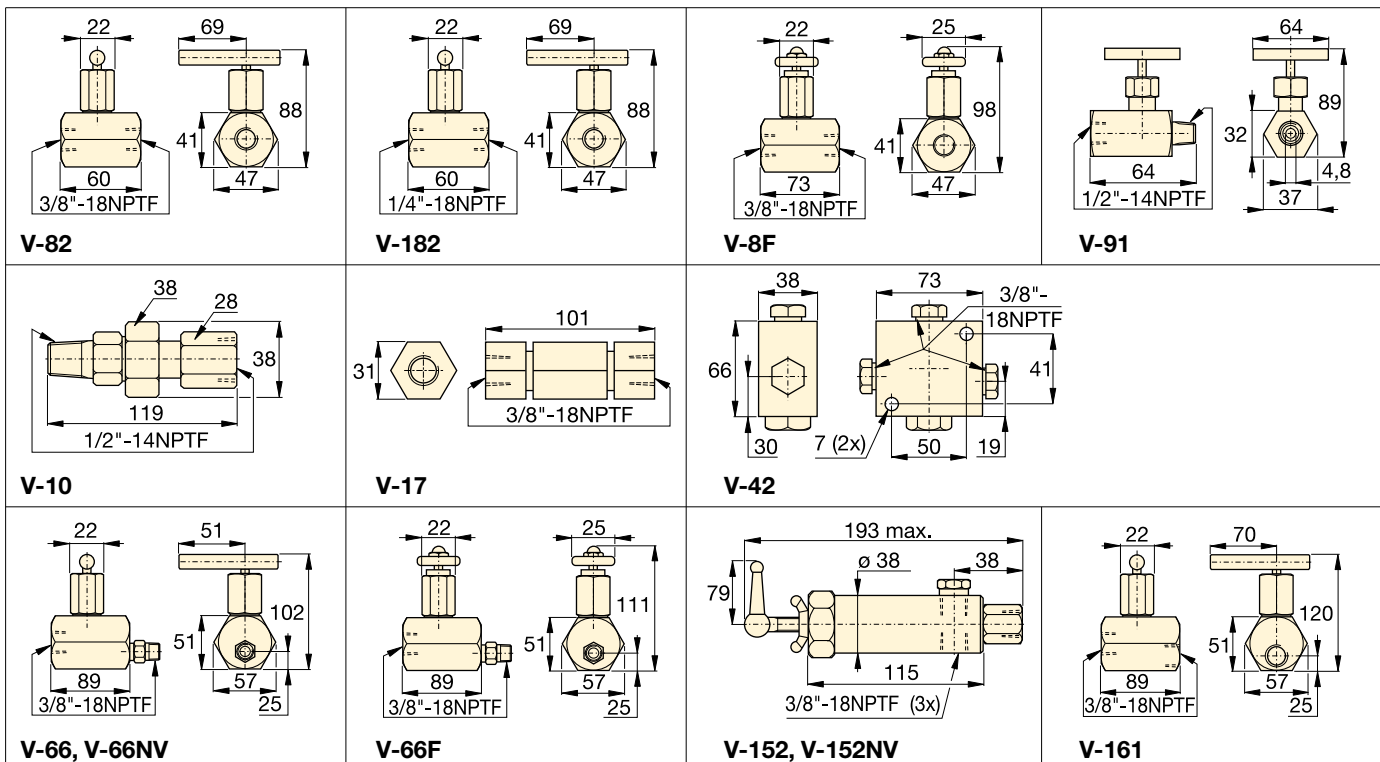
To see these valves used in typical hydraulic circuits, please see our 'Yellow Pages'.

Page: **250**

▼ The V-152 pressure relief valve limits the pressure or force developed in the hydraulic system.



- All valves are rated for 700 bar operating pressure
- All valves feature NPTF porting to insure against leakage at rated pressure
- All valves are painted, coated, or plated for corrosion resistance
- Viton® seals (in V-66NV and V-152NV) for high temperature applications, nickel-plated for maximum corrosion resistance.



Valve dimensions in mm

Pressure and Flow Control Valves



Control Manifolds

For two or four port manifolds with integral flow control valves, see the manifold page of the System Components section.

Page: 120



Fittings

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

Page: 121

V Series



Maximum Operating Pressure:
700 bar

Valve Type and Model Number		Description		Hydraulic Symbol
Needle Valve V-82 V-182 V-8F		V-82: To control cylinder speed. Can also be used as shut-off valve for temporary load holding. $\frac{3}{8}$ " NPTF female ports. V-182: Same as V-82, but with	$\frac{1}{4}$ " NPTF female ports. Also suitable for gauge snubbing (also V-82). V-8F: Like V-82, but with very fine metering for precise flow control. Not recommended as shut-off valve.	
Snubber Valve V-91		V-91: Infinitely 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. $\frac{1}{2}$ " 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. $\frac{1}{2}$ " 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. $\frac{3}{8}$ " NPTF female port.		
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. $\frac{3}{8}$ " NPTF female ports. Pilot pressure ratio 14% (6,5:1).	
Manually Operated Check Valve V-66, V-66NV * V-66F		V-66, V-66NV: For load holding applications with single and double acting cylinders. Valves allow oil to flow back to tank when cylinder retracts. V-66NV with Viton seals,	nickel-plated. V-66F: Similar to V-66, but with very fine metering capability for precise flow control. V-66F is not designed for load holding.	
Pressure Relief Valve V-152 V-152NV *		V-152: Limits pressure developed by the pump in hydraulic circuit, thus limiting the force imposed on other components. Valve opens whenever preset pressure is reached.	To increase pressure setting, turn handle clockwise. Includes: • 0,9 m return line hose kit, • $\pm 3\%$ repeatability, • 55-700 bar 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: 140 bar.	

* See page 56 for more information about products for use in high temperature and extreme environment applications.

Enerpac Hydraulic Presses are available in a variety of capacities and sizes. The press frames are designed for maximum strength and durability. Strong frames and powerful high-pressure hydraulics will provide years of dependable service in many applications.

Enerpac Presses are available in Bench, C-Frame, Arbor, Workshop and Roll-Frame models.

These Press features increase productivity and broaden the range of applications:

Side-to-side cylinder movement

Lateral movement capability of cylinder in upper bed.



Press Kits

The 50 and 75 ton XLP-Series presses come as unassembled kits, and include complete press frame, winch, cylinder, pump with gauge, couplers and hose.










Winch

Movable upper and lower bed with self-braking winch on XLP-Series presses.



Hydraulic Presses Section Overview

Capacity ton (kN)	Press type and functions	Series		Page
10 (101)	Bench Presses	VLP		134 ▶
25 - 200 (232 - 1995)	Workshop Presses	XLP VLP		134 ▶
50 - 200 (498 - 1995)	Roll-Frame Presses	BPR		136 ▶
5 - 20 (45 - 178)	C-Clamp Presses	A		138 ▶
10 - 30 (101 - 295)	Arbor Presses	A		138 ▶
10 - 200 (101 - 1995)	Press Accessories Press Application Idea	VB, A, IPL		140 ▶
900 - 90.000 kg	Tension Meters Load Cells	TM LH		141 ▶

Available in capacities from 10 to 200 ton, each Enerpac press consists of three basic high quality components: a press frame, a power source and a cylinder.

Press Frame

Press frames include features like workpiece side-loading and height adjustment of the upper and lower bed.

Power Source

Depending on the production requirements, Enerpac presses can be powered by manual, air-hydraulic and electric-drive power sources.

Cylinder

Depending on the application, double-acting cylinders offer increased efficiency. Check out the Selection Charts for the press best suited for your needs.

Gauge

All Workshop presses and Roll-Frame Presses feature an easy to monitor pressure/force gauge for increased safety.



IMPORTANT!

The frameworks of the workshop presses are exclusively designed for pressing operations, not for pulling. For pulling applications please contact Enerpac.

In order to fully comply with CE regulations, some presses must be equipped with specific safety components, such as spring centered valves, two-hand control devices, guards or others.

Enerpac standard general purpose presses are supplied without guards, and have a plunger speed of less than 10 mm/second. However, your application may require that measures should be taken to reduce the risk of injury to operators and other personnel by providing appropriate safeguarding, training and conducting a risk assessment, which eliminates or reduces danger.

Health & safety within your workplace is your responsibility, not that of Enerpac.

Advice on such matters is available from your local enforcement agency. If you require any further information on Enerpac accessories that may help you conform to the Machinery Directive or European legislation contact Enerpac.



▼ From left to right: XLP-506XA12G, XLP-256XA11G



- All presses equipped with long life Golden Ring Design cylinder
- XLP-Series presses**
- Multi-functional presses in kit form (50 and 75 ton presses)
- Easy grip forklift access on 50 and 75 ton presses
- Height adjustment of upper or lower bed with winch (50 & 75 ton)
- Width adjustment allows cylinder to move from side-to-side
- Pump options include XA-Series air-operated foot pump
 - pressure gauge integrated in pump for optimal control
 - suitable for delicate pressing jobs from variable oil flow.

VLP-Series presses

- Unique “Hydrajust” bed positioning device on 100 and 200 ton VLP-presses allows adjustment of the lower bed.

No Workshop can do without one



XA-Series Foot Pump

The XLP-press with XA-Series air powered foot pump: no need to fully lift up foot – rest bodyweight on

heel, resulting in a handsfree and stable working position – safe and controlled press operation (see page 100 for XA-Series Pumps).



Press Kits *

The 50 and 75 ton presses come standard as unassembled kits, and include complete press

frame, winch, cylinder, pump with gauge, couplers and hose.



Easy grip forklift access



Cut-away in lower frame for pallet truck access allows easy transportation of 50 and 75 ton XLP-series presses.



Side-to-side cylinder movement

Cylinder can be positioned horizontally side-to-side on all XLP-Series presses.

▼ SELECTION CHART

Press Capacity ton (kN)	Maximum Daylight (mm)		Press Model Number	Power Source					Cylinder						
	Vertical	Horizontal		Pump Type			Valve Type		Pump Model Nr.	Page:			Stroke (mm)	Cylinder Model Nr.	Page:
				Man.	Elec.	Air	Man.	Elec.							
10 (101)	430	435	VLP-106P142	●			●		P-142	62	●		156	RC-106	6
	430	435	VLP-106PAT1			●	●		PATG-1102N	98	●		156	RC-106	6
25 (232)	1225	510	XLP-256P392	●			●		P-392	62	●		158	RC-256	6
	1225	510	XLP-256XA11G			●	●		XA-11G	96	●		158	RC-256	6
50 (498)	993	990	XLP-506P802 *	●			●		P-802	64	●		159	RC-506	6
	993	990	XLP-506XA12G *			●	●		XA-12G	96	●		159	RC-506	6
	993	990	XLP-506ZES *		●			●	ZE4410SE-E050	88		●	156	RR-506	32
	993	990	XLP-5013ZES *		●			●	ZE4410SE-E050	88		●	334	RR-5013	32
75 (718)	989	990	XLP-756XA12G *			●	●		XA-12G	96	●		156	RC-756	32
100 (933)	989	990	VLP-1006ZES		●			●	ZE5420SW-E050	88		●	168	RR-1006	32
	989	990	VLP-10013ZES		●			●	ZE5420SW-E050	88		●	333	RR-10013	32
200 (1995)	1340	1220	VLP-20013ZES		●			●	ZE6420SW	88		●	330	RR-20013	32

* 50 and 75 ton XLP-Series presses can be ordered as factory assembled press frame. Add suffix “M” to press model number. Example: XLP-506XA12G-M.



= Single-Acting



= Double-Acting

Bench and Workshop Presses

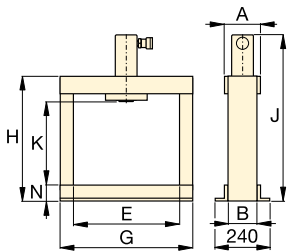


Optional V-Blocks

To facilitate positioning of pipes and bars, or placed upside-down, to serve as a convenient worktable.

Featuring precise fit into the press bolster. Each model number includes two V-blocks.

To be used with press (ton)	V-Blocks Model Number
10	VB-10
25	VB-25
50	VB-501
75, 100	VB-101
200	A-200



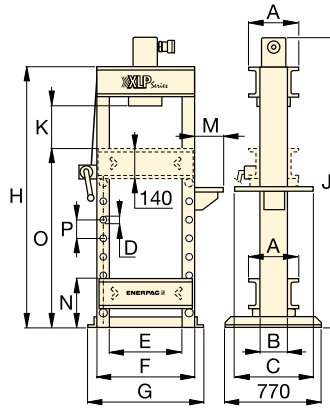
VLP 10 ton

“Hydrajust” Bed Positioning

Allows vertical adjustment of the lower bed on 100 and 200 ton VLP presses.

IMPORTANT: The “Hydrajust” bed positioning is not designed to withstand full cylinder capacity, only to be used for bed adjustment.

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XLP 25 ton

XLP, VLP Series



Capacity:

10 - 200 ton

Maximum Daylight x Width:

1340 x 1220 mm

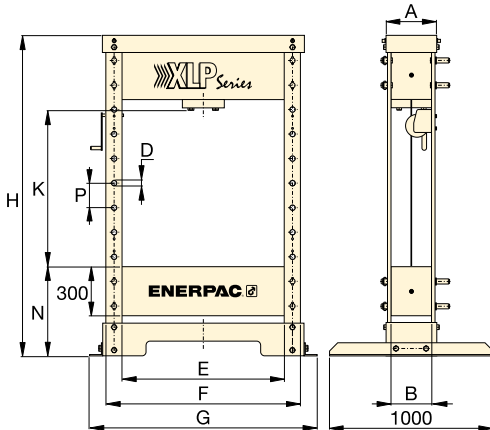
Maximum Operating Pressure:

700 bar

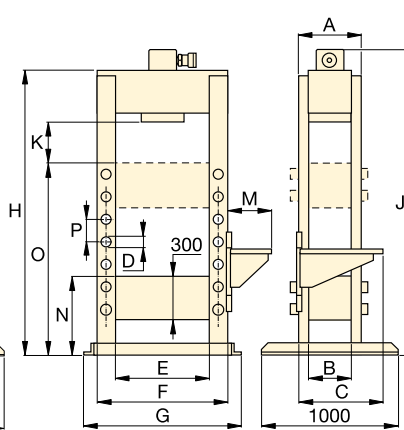


IMPORTANT!

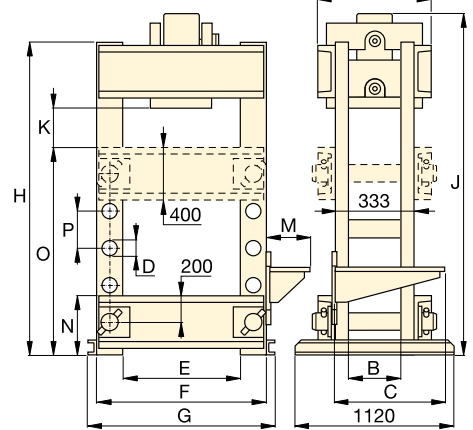
The frameworks of the workshop presses are exclusively designed for pressing operations, not for pulling. For pulling applications please contact Enerpac.



XLP 50 and 75 ton



VLP 100 ton



VLP 200 ton

Speed (mm/s) **		Dimensions (mm)															Press Model Number
Rapid Advance	Pressing	A	B	C	D	E	F	G	H	J	K	M	N	O	P	(kg)	
{2,5} **	{0,6} **	110	80	-	-	435	-	542	620	748	430	-	80	-	-	49	VLP-106P142
10,0	1,8	110	80	-	-	435	-	542	620	748	430	-	80	-	-	54	VLP-106PAT1
{3,4} **	{0,7} **	260	140	510	32	510	630	700	1622	1740	370	140	212	1070	122	165	XLP-256P392
10,0	1,3	260	140	610	32	510	630	700	1622	1740	370	323	212	1070	122	170	XLP-256XA11G
{5,5} **	{0,3} **	310	240	-	32	990	1190	1390	1995	-	210-940	-	540	-	150	595	XLP-506P802 *
4,7	0,6	310	240	-	32	990	1190	1390	1995	-	210-940	-	540	-	150	600	XLP-506XA12G *
10,0	2,0	310	240	-	32	990	1190	1390	1995	-	210-940	-	540	-	150	660	XLP-506ZES *
10,0	2,0	310	240	-	32	990	1190	1390	1995	-	210-940	-	540	-	150	700	XLP-5013ZES *
3,2	0,4	420	330	-	40	990	1240	1430	1995	-	210-940	-	540	-	150	900	XLP-756XA12G *
10,0	2,1	400	340	560	40	990	1240	1400	1879	1885	239	425	540	1290	150	970	VLP-1006ZES
10,0	2,1	400	340	560	40	990	1240	1400	1879	2050	239	425	540	1290	150	993	VLP-10013ZES
6,6	1,6	553	233	560	76	1220	1620	1740	2285	2370	377	425	453	1415	254	1992	VLP-20013ZES

** {...} = advance speed in mm per handpump stroke.

▼ Shown: BPR-5075



- Quality welded frame for maximum strength and long life
- Frame rolls easily on 4 steel roller bearings
- Exclusive 'Hydra-Lift' bolster for effortless adjustment of the vertical daylight
- Roller head design is standard to allow lateral movement and locking of the cylinder up to 300 mm left or right of centre
- All models in the quick selection chart have been matched to an electric pump, double-acting cylinder, hose and gauge, offering the complete package
- Roll-Frame design features a stationary bed with the ability to support heavy loads.

Expert Designed Versatility



Cylinder adjustment

Cylinder adjustment allows horizontal side to side cylinder positioning.



Hydra-Lift

Allows easy, effortless daylight adjustment. Standard on all Roll-Frame presses.

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Optional V-Blocks

These V-Blocks are designed for easy fixturing of round stock and other non-uniform materials. Featuring precise fit into the press bolster.

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▼ SELECTION CHART

Press Capacity ton (kN)	Vertical Daylight A (mm)		Maximum Bed Width E (mm)	Electric Pump		Press Model Number	Double-Acting Cylinder			Speed (mm/sec)	
	min.	max.		Model Number	Page		Stroke (mm)	Model Number	Page	Rapid Advance	Pressing
50 (498)	152	942	730	ZE5420SW-S	88	BPR-5075	334	RR-5013	32	4,1	3,9
100 (933)	159	1048	889	ZE3420SW	88	BPR-10075	333	RR-10013	32	7,7	0,7
200 (1995)	279	1295	1219	ZE4420SW	88	BPR-20075	330	RR-20013	32	5,2	0,5

Roll-Frame Presses



Gauges

All press models include a gauge and gauge adaptor, matching the press capacity:

Press Capacity	Gauge Model Number	Adaptor Model Number
ton		
50	GF-50B	GA-2
100	GF-871B	GA-3
200	GF-200B	GA-3

For more information on gauges, please refer to the System Components section.

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BPR Series



Capacity:

50 - 200 ton

Maximum Daylight x Width:

1295 x 1222 mm

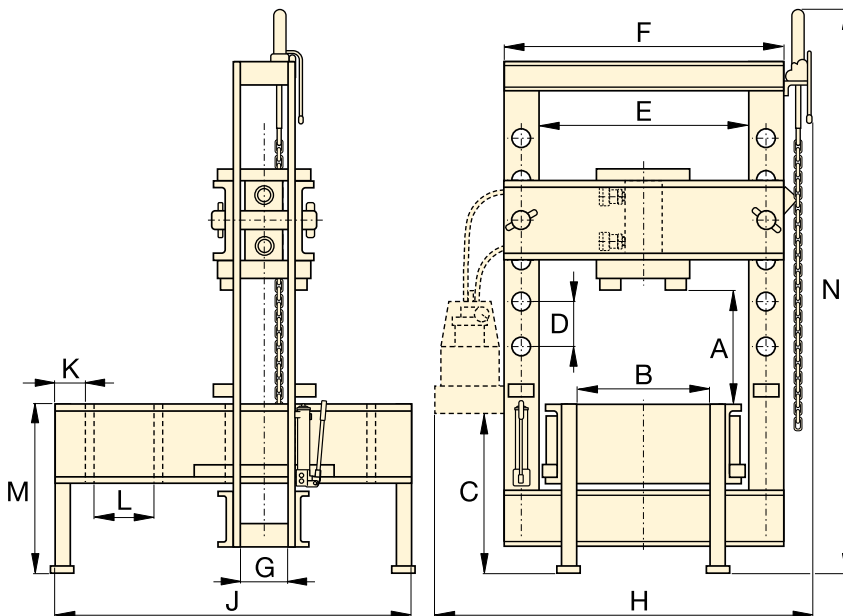
Maximum Operating Pressure:

700 bar



IMPORTANT!

The frameworks of the presses are exclusively designed for pressing operations, not for pulling. For pulling applications please contact Enerpac.



Roll-Frame Press Dimensions (mm)													Press Model Number	
A (min.-max.)	B	C	D	E	F	G	H	J	K	L	M	N		(kg)
152 - 942	526	971	264	730	933	127	1420	1626	203	270	762	2870	917	BPR-5075
159 - 1048	673	965	222	889	1143	146	1605	1676	203	270	813	3021	1767	BPR-10075
279 - 1295	984	933	254	1219	1626	232	2150	2197	203	381	915	3200	4186	BPR-20075

▼ Shown from left to right: A-220, A-330 and A-310



The Standard Workshop Tools

C-Clamp Press

- 5, 10 and 20 ton capacity
- Operational in all positions.

Arbor Press

- 10 and 30 ton capacity
- Foot mounting holes for horizontal or vertical positioning
- Machined working surfaces for easier fixturing
- Slotted back to simplify loading and unloading of longer parts.

▼ A-310 Arbor Press



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).

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Hydra-Lift

Allows easy, effortless daylight adjustment. Standard on all Roll-Frame presses.

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10 ton Bench Presses

For 10 ton VLP-Series Bench Presses selection see:

Page: 134

▼ SELECTION CHART

Press Type	Press Capacity ton (kN)	Maximum Vertical Daylight (mm)	Maximum Bed Width (mm)	Press Model Number	Cylinder Model Number *	Page:
C-Clamp	5 (45)	165	51	A-205	5 ton RC-cylinder*	6
	10 (101)	228	57	A-210	10 ton RC-cylinder*	6
	20 (178)	305	70	A-220	25 ton RC-cylinder**	6
Arbor	10 (101)	227	135	A-310	10 ton RC-cylinder*	6
	30 (295)	260	178	A-330	RC-308*	6

* Recommended cylinder must be ordered separately.

** Must be limited to 20 ton.

C-Clamp and Arbor Presses



▲ A perfect example of the force and versatility of the Enerpac A-220 C-Clamp press.

A Series



Capacity:
5 - 30 ton

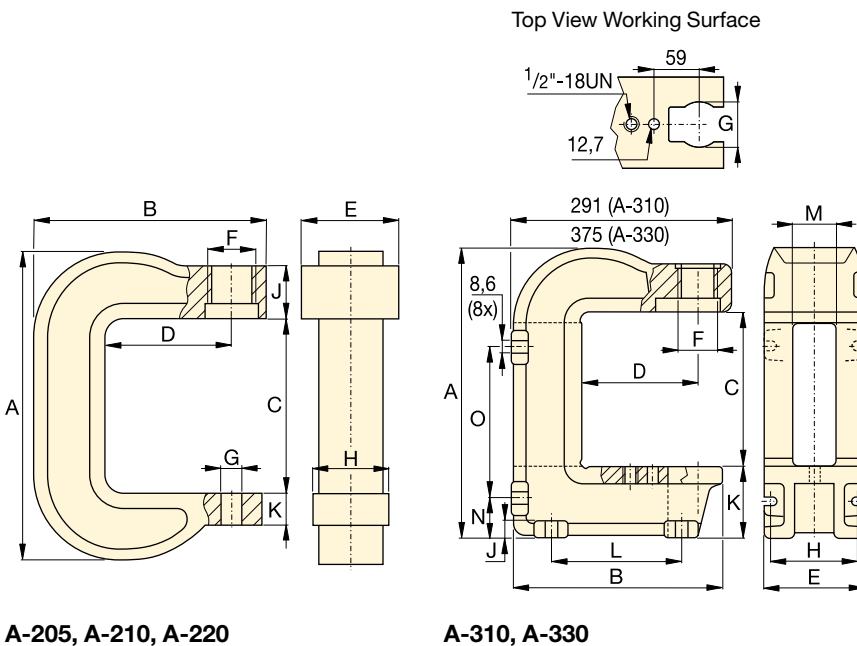
Maximum Daylight x Width:
305 x 178 mm

Maximum Operating Pressure:
700 bar



IMPORTANT!

For high-cycle production applications, the C-Clamp and Arbor presses should be limited to 50% of their capacity.



A-205, A-210, A-220

A-310, A-330



Hydraulic Cylinders

Cylinders for C-Clamps and Arbor Presses must be ordered separately.


Page: 6

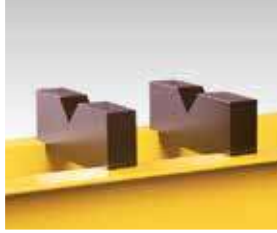




Hydraulic Pumps

Pumps for C-Clamps and Arbor Presses must be ordered separately.

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Press Dimensions (mm)																Press Model Number
A	B	C	D	E	F	G	H	J	K	L	M	N	O	(kg)		
291	203	165	95	73	1½" -16 UNS	26	51	66	25	-	-	-	-	7	A-205	
406	283	228	152	83	2¼" -14 UNS	26	76	64	41	-	-	-	-	17	A-210	
540	346	305	152	121	3⁵⁄₁₆" -12 UNS	26	95	70	44	-	-	-	-	38	A-220	
414	281	230	152	135	2¼" -14 UNS	63	122	19	97	175	65	54	219	27	A-310	
557	353	260	152	178	3⁵⁄₁₆" -12 UNS	63	140	25	165	203	67	98	276	86	A-330	

Description	Press Capacity and Press Series	Model Number		Features
V-Blocks	10 ton Bench VLP-Presses 25 ton Workshop XLP-Presses 50 ton Workshop XLP-Presses 75 ton XLP- and 100 ton VLP-Presses 200 ton Workshop VLP-Press 200 ton BPR-Roll-Frame Press	VB-10 VB-25 VB-501 VB-101 A-200 A-200R		<ul style="list-style-type: none"> Facilitate positioning of pipes and bars All V-Block model numbers include 2 V-blocks.
Hydra-Lift	50 ton BPR-Roll-Frame Press 100 ton BPR-Roll-Frame Press 200 ton BPR-Roll-Frame Press	IPL-R100 IPL-R100 IPL-R200		<ul style="list-style-type: none"> Allows easy, effortless daylight adjustments Includes accessory chain.
Hydrajust Bed Positioning	100 ton Workshop VLP-Presses 200 ton Workshop VLP-Press IMPORTANT! The “Hydrajust” bed positioning is not designed to withstand full cylinder capacity, only to be used for bed adjustment.	VHJ-100 BSS-5380		<ul style="list-style-type: none"> Allowing effortless daylight adjustment by moving the lower bed up and down Can be used with presses equipped with double-acting cylinder.

▼ PRESS APPLICATION IDEAS



◀ 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.

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.



Tension Meter and Load Cells

▼ Shown: LH-102 and TM-5 (in middle)



TM LH Series



Capacity:

900 - 90.000 kg

Accuracy, % of full scale:

± 2%

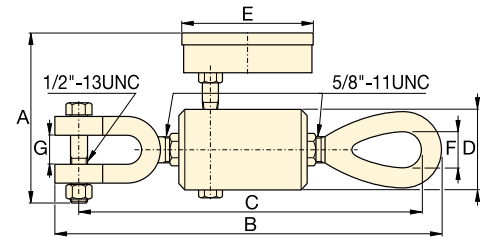


TM and LH models are 100% tested to verify accuracy within a ± 2% range.

If your application requires a calibrated tool, it must be submitted for certification testing. Certification is NOT available from Enerpac.

Tension Meter TM-5

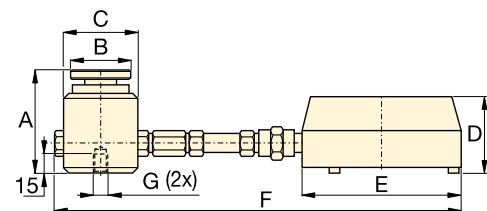
- Accuracy ± 2% of full scale
- Zinc and bronze plated to resist corrosion
- Dual-range readout in kilograms and pounds
- Maximum indicating pointer reading for pre-selected forces or to maintain force readings
- Cushioned metal case provides safe storage and transport.



TM-5

Load Cells LH-Series

- Accuracy ± 2% of full scale
- Swivel loading pad reduces eccentric loading for improved accuracy
- Maximum indicating pointer reading pre-selected forces or to maintain maximum force readings
- Dual-range readout in kilograms and pounds.



LH-Series

▼ SELECTION CHART

Type	Gauge Capacity		Model Number	Minimum Reading		Gauge Scale Increments		Dimensions (mm)						
	(kg)	(lbs)		(kg)	(lbs)	(kg)	(lbs)	A	B	C	D	E	F	G*
Direct Mounted	4.500	10.000	TM-5	500	1.000	100	100	120	247	236	50	93	22	19
Direct Mounted Load Cell	900	2.000	LH-10	100	200	20	20	77	44	57	60	101	215	¼"- 20, 44,5 BC
	4.500	10.000	LH-50	500	1.000	100	100	77	44	57	60	101	215	¼"- 20, 44,5 BC
Remote Mounted with 0,6 m 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	846	¼"- 20, 44,5 BC
	9.000	20.000	LH-1002	1.000	2.000	200	200	77	44	57	60	147	846	¼"- 20, 44,5 BC
Remote Mounted with 1,8 m Hose	21.000	50.000	LH-2506	3.000	5.000	500	500	101	69	85	60	147	2094	¾"- 24, 63 BC
	45.000	100.000	LH-5006	5.000	5.000	1.000	1.000	132	101	127	60	147	2135	¾"- 24, 89 BC
	90.000	200.000	LH-10006	10.000	10.000	1.000	2.500	158	127	158	60	147	2166	¾"- 24, 102 BC

* BC = Bolt Circle

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 and reducing dangerous situations for the user. The Posi Lock® feature is available in a mechanical or hydraulic version.



WARNING

Do not exceed 50% of the rated puller capacity when using a double crosshead (2 grip arms) 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 details.



IMPORTANT!

Always wear Safety Goggles while using pullers.

Puller Section Overview

When selecting a puller it is important to consider 3 basic specifications:

1. The Capacity:

is 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 0,28 to 0,4 times the shaft diameter in mm. Use the following chart:

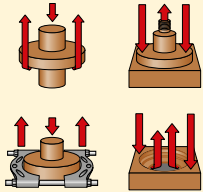

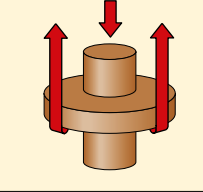

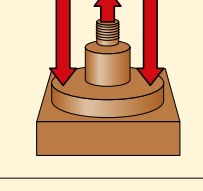

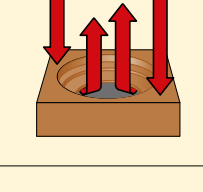

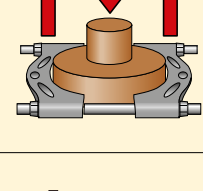

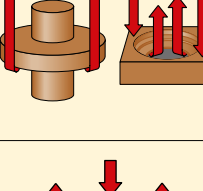

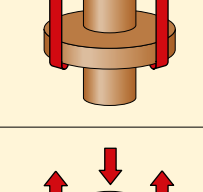

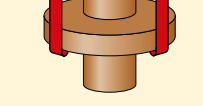

Shaft Diameter	Puller Capacity
0 - 25 mm	10 ton
25 - 50 mm	20 ton
50 - 89 mm	30 ton
89 - 140 mm	50 ton

2. The Reach:

is 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. The Spread:

is the distance between the jaws. The puller's spread needs to be greater than the width of the part being pulled.

Puller Function	Capacity ton	Puller Type	Series	Page
	8-50	Master Puller Sets Max. Reach: 252 - 700 mm Max. Spread: 250 - 1100 mm	BHP	 144 ▶
	8-50	Grip Puller Sets Max. Reach: 249 - 700 mm Max. Spread: 50 - 580 mm	BHP	 145 ▶
	8-50	Cross Bearing Puller Sets Max. Reach: 354 - 863 mm Max. Spread: 266 - 570 mm	BHP	 146 ▶
	8-50	Bearing Cup Pullers Max. Reach: 110 - 145 mm Max. Spread: 26 - 359 mm	BHP	 147 ▶
	8-50	Bearing Pullers Max. Width: 110 - 292 mm Max. Spread: 10 - 245 mm	BHP	 147 ▶
	2-40	Posi Lock® Mechanical Pullers Max. Reach: 101 - 355 mm Max. Spread: 12 - 635 mm	EP EPP EPX EPPMI	 148 ▶
	10-50	Posi Lock® Hydraulic Pullers Max. Reach: 203 - 355 mm Max. Spread: 304 - 635 mm	EPH EPHR EPHS	 152 ▶
	100	Posi Lock® Hydraulic Pullers Max. Reach: 1219 mm Max. Spread: 190 - 1778 mm	EPH	 155 ▶

▼ Shown: Master Puller Set BHP-3751G



Multi Purpose Puller Set



WARNING

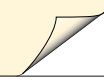
Do not exceed 50% of the rated puller capacity when using a double crosshead (2 grip arms) or when using puller legs in combination with bearing puller attachment.

- Supplied with a full hydraulic set including pump, hose, cylinder, gauge, gauge adaptor and wooden 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 Attachment, which can be ordered separately, see items nr. 10, 20, 30 and 40.

▼ Maintenance engineers throughout the industry greatly appreciate the Enerpac Master Puller sets



▼ SELECTION CHART

Master Puller Set Capacity *	8 ton	20 ton	30 ton	50 ton	Page:
Model Number ▶	BHP-1752 ¹⁾	BHP-2751G	BHP-3751G	BHP-5751G	
Included Hydraulics Set Weight ▶	37 kg	90 kg	172 kg	298 kg	
• Hand Pump	P-142	P-392	P-392	P-80	
• 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	116 ▶
• Gauge	GF-120B	GF-813B	GF-813B	GF-813B	122 ▶
• Gauge Adaptor	GA-4	GA-3	GA-3	GA-3	129 ▶
Included Pullers					
10 Grip Puller	BHP-1762	BHP-252	BHP-352	BHP-552	145 ▶
20 Cross Bearing Puller	BHP-1772	BHP-262	BHP-362	BHP-562	146 ▶
30 Bearing Cup Puller	BHP-180	BHP-280	BHP-380	BHP-580	147 ▶
40 Bearing Puller	BHP-181	BHP-282	BHP-382	BHP-582	147 ▶
• Case	CM-6	CW-350	CW-350	CW-750	

¹⁾ Includes Adaptor FZ-1630.

* See warning on this page.

Grip Puller Sets

▼ Shown: Grip Puller Set BHP-351G



- 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.

BHP Series



Capacity:

8, 20, 30 and 50 ton

Reach:

252 - 700 mm

Spread:

249 - 1100 mm

Maximum Operating Pressure:

700 bar

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 ►		BHP-152 ¹⁾	BHP-251G	BHP-351G	BHP-551G
Included Hydraulics Set Weight ►		22 kg	56 kg	91 kg	160 kg
• 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-120B	GF-813B	GF-813B	GF-813B
• Gauge Adaptor		GA-4	GA-3	GA-3	GA-3
10	Grip Puller Model Number ►	BHP-1762*	BHP-252*	BHP-352*	BHP-552*
Maximum Spread (mm)	2-jaw	249	400	593	899
	3-jaw	249	499	800	1100
Maximum Reach (mm)	2-jaw	252	300	387	700
	3-jaw	252	300	387	700
Jaw (mm)	Thickness	15	20	24	30
	Width	23	27	38	39
Adjusting Screw (mm)	Thread	¾" - 16 UNF	1" - 8 UNC	1¼" - 7 UNC	1½" - 5.5 UNC
	Length	400	675	795	975
• Case		CW-166	CW-166	CW-350	CW-750

¹⁾ Includes Adaptor FZ-1630.

* Grip Puller order number without hydraulics.

** See warning on page 144.

Cross Bearing Puller Sets

▼ Shown: Cross Bearing Puller Set BHP-361G



- Precise hydraulic control allows fast, efficient and safe pulling
- High quality, forged steel components provide superior reliability and service.

BHP Series



Capacity:
8, 20, 30 and 50 ton

Reach:
354 - 863 mm

Spread:
266 - 570 mm

Maximum Operating Pressure:
700 bar



The cross bearing puller without hydraulics, bearing cup puller and a bearing puller can be ordered separately, see items nr. 10, 20, 30 and 40.

▼ SELECTION CHART

Cross Bearing Puller Set Capacity		8 ton	20 ton	30 ton	50 ton	
	Model Number ▶	BHP-162 ¹⁾	BHP-261G	BHP-361G	BHP-561G	
	Set Weight ▶	26 kg	62 kg	121 kg	185 kg	
•	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-120B	GF-813B	GF-813B	GF-813B	
•	Gauge Adaptor	GA-4	GA-3	GA-3	GA-3	
20	Cross Bearing Puller ²⁾	Model Number ▶	BHP-1772	BHP-262	BHP-362	BHP-562
	Spread (mm)	Maximum	266	351	454	570
		Minimum	106	139	179	220
	Reach (mm)	Maximum	462	571	711	863
	Adjusting Screw (mm)	Diameter	3/4" - 16 UNF	1" - 8 UNC	1 1/4" - 7 UNC	1 5/8" - 5.5 UNS
			Length	400	675	795
	Leg (mm)	Length	105	239	203	609
		Length	354	419	457	863
		Length	–	571	711	–
		Length	–	114	–	–
	Upper Leg Ends (mm)	Thread	3/4" - 16 x 25	3/4" - 16 x 25	1-14 x 35	1 1/4" - 12 x 38
	Lower Leg Ends (mm)	Thread	5/8" - 18 x 25	5/8" - 18 x 25	1-14 x 27	1 1/4" - 12 x 38
30	Bearing Cup Puller ²⁾	Model Number ▶	BHP-180	BHP-280	BHP-380	BHP-580
40	Bearing Puller ²⁾	Model Number ▶	BHP-181	BHP-282	BHP-382	BHP-582
•	Wooden Case		CM-6	CW-187	CW-350	MK-05

¹⁾ Includes Adaptor FZ-1630.

²⁾ Can be ordered separately without hydraulic components, see next page.

Bearing Cup and Bearing Pullers

▼ 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



Capacity:

8, 20, 30 and 50 ton

Maximum Reach:

110 - 145 mm

Spread Range:

110 - 359 mm

Maximum Operating Pressure:

700 bar

▼ SELECTION CHART

Capacity *		8 ton	20 ton	30 ton	50 ton
30 Bearing Cup Puller					
Model Number ▶		BHP-180	BHP-280	BHP-380	BHP-580
Spread (mm)	Max.	110	220	359	359
	Min.	26	25	50	50
Reach (mm)	Max.	110	140	145	145
	Center Screw Thread	3/4" - 16 UNF	1" - 8 UNC	1 1/4" - 7 UNC	1 5/8" - 5.5

* Puller capacity, not attachment capacity. See warning on this page.



WARNING

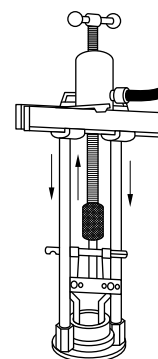
Do not exceed 50% of the rated puller capacity when using a double crosshead (2 grip arms) or when using puller legs in combination with bearing puller attachment.

▼ Shown: **BHP-382**

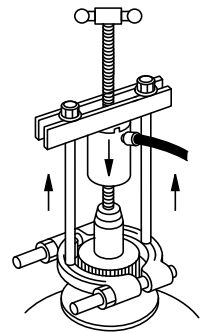


Bearing Puller

- 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 Cup Puller shown with Crosshead Puller Attachment.



Bearing Puller shown with Crosshead Puller Attachment. ▶

▼ SELECTION CHART

Capacity *		8 ton	20 ton	30 ton	50 ton
40 Bearing Puller					
Model Number ▶		BHP-181	BHP-282	BHP-382	BHP-582
Spread (mm)	Max.	104	130	245	245
	Min.	25	9	17	17
Width (mm)		126	150	292	292
Thread		5/8" - 18 UNF	5/8" - 18 UNF	1" - 14 UNS	1 1/4" - 12 UNF

* Puller capacity, not attachment capacity. See warning on this page.



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



- 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.



◀ EP-204 2 jaw puller positioned to pull a water pump drive pulley.

For Safer and Faster Pulling



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%.

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Shaft Attachments

Shaft protectors and extenders are live centers that fit over the standard puller shaft for tip protection and additional reach.

Page: 151

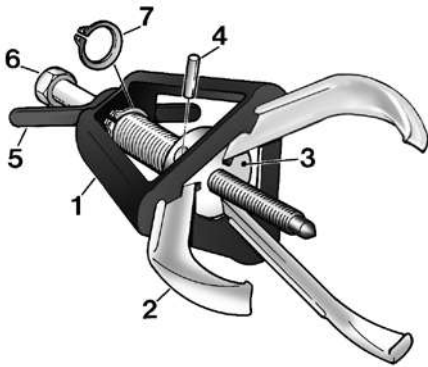


Application Tip

Because of the unique safety cage design, Posi Lock® pullers will grip on surfaces where normal pullers would slip off; e.g. tapered bearings.

Posi Lock® Mechanical Grip Pullers

External Posi Lock® Pullers



- 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 EPP Series



Capacity:

2 - 40 ton

Maximum Reach:


101 - 355 mm

Spread Range:

12 - 635 mm

▼ QUICK SELECTION CHART EXTERNAL PULLERS

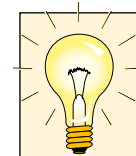
For quick technical information see next page.

Number of Jaws	Maximum Reach	Spread (min. - max.)	Capacity	Model Number	Center Bolt Diameter	 (kg)
	(mm)					
2	101	12 - 127	2 (17)	EP-204	14	1,4
3	101	12 - 127	5 (45)	EP-104	14	1,8
2	152	12 - 178	6 (53)	EP-206	16	3,2
3	152	12 - 178	10 (89)	EP-106	16	3,6
2	203	19 - 304	12 (106)	EP-208	20	5,4
3	203	19 - 304	17 (151)	EP-108	20	6,4
2	245	25 - 381	14 (124)	EP-210	20	5,9
3	245	25 - 381	20 (178)	EP-110	20	7,3
2	304	63 - 457	25 (222)	EP-213	29	17,2
3	304	63 - 457	30 (267)	EP-113	29	20,0
2	355	76 - 635	35 (311)	EP-216	31	25,8
3	355	76 - 635	40 (356)	EP-116	31	30,8



IMPORTANT!

Always wear Safety Goggles while using pullers.



Application Tip

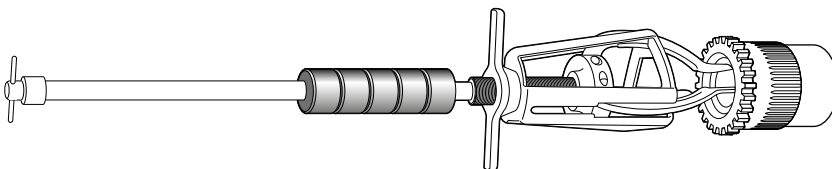
In determining the correct manual puller capacity for your application, use the following rule:

The center bolt diameter of the puller should be at least ½ the diameter of the shaft being pulled on.


Example:

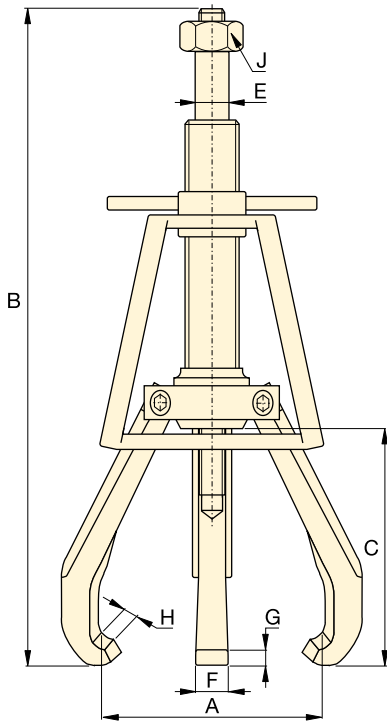
A part being pulled from a shaft with a diameter of 38 mm would require a puller with a center bolt diameter of at least 19 mm.

Internal Posi Lock® Puller

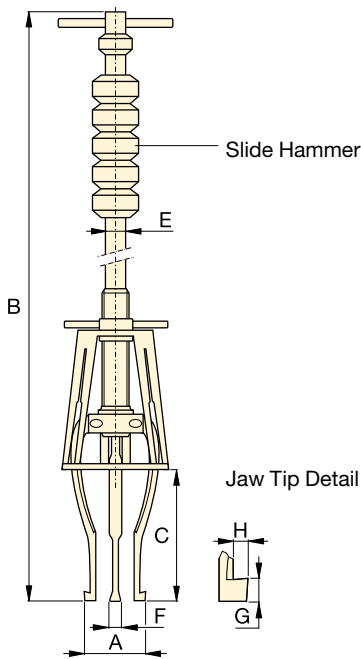


▼ QUICK SELECTION CHART INTERNAL PULLERS

Number of Jaws	Maximum Reach	Spread min. - max.	Jaw Style	Model Number	Jaw Length	 (kg)
	(mm)				(mm)	
3	168	14 - 101	Standard	EPPMI-6	168	3,9
	218	25 - 133	Long		218	3,9



**2 and 3 Jaw External Puller
EP-Series**



**Internal Puller
EPPMI-6**

▼ QUICK SELECTION CHART EXTERNAL PULLERS

Number of Jaws	Maximum Reach (mm)	Spread min. - max. (mm)	Capacity ton (kN)	Model Number	Center Bolt Diameter (mm)	Maximum Torque (Nm)
2	101	12 - 127	2 (17)	EP-204	14	27
3	101	12 - 127	5 (45)	EP-104	14	54
2	152	12 - 178	6 (53)	EP-206	16	102
3	152	12 - 178	10 (89)	EP-106	16	176
2	203	19 - 304	12 (106)	EP-208	20	203
3	203	19 - 304	17 (151)	EP-108	20	298
2	245	25 - 381	14 (124)	EP-210	20	237
3	245	25 - 381	20 (178)	EP-110	20	373
2	304	63 - 457	25 (222)	EP-213	29	644
3	304	63 - 457	30 (267)	EP-113	29	814
2	355	76 - 635	35 (311)	EP-216	31	1085
3	355	76 - 635	40 (356)	EP-116	31	1153

▼ QUICK SELECTION CHART INTERNAL PULLERS

Number of Jaws	Maximum Reach (mm)	Spread min. - max. (mm)	Jaw Style	Model Number	Jaw Style (mm)	Slide-hammer weight (kg)
3	168	14 - 101	Standard	EPPMI-6	168	1,1
	218	25 - 133	Long		218	1,1

Posi Lock® Mechanical Pullers



Shaft Attachments

Shaft protectors and extenders are live centers that fit over the standard puller shaft for tip protection and additional reach.



Long Jaws

Long Jaws are 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% of rating.

EP EPP Series



Capacity:

2 - 40 ton

Maximum Reach:

101 - 355 mm

Spread Range:

12 - 635 mm




▼ SHAFT ATTACHMENTS

Length (mm)	Dia- meter (mm)	Increases Center Bolt Length (mm)	Model Number
25	19	9	EPP-4
50	19	38	EPX-4
31	22	12	EPP-6
50	22	38	EPX-6
31	25	12	EPP-10
50	25	38	EPX-10
50	35	21	EPP-1316

▼ LONG JAWS

Spread min. - max. (mm)	Max. Reach (mm)	Model Number
57 - 381	245	EP-11054
38 - 558	400	EP-11054L
38 - 762	508	EP-11354L
25 - 133	218	EP-10554L*

* for EPPMI-6 only

Dimensions (mm)									Model Number	Optional Accessories		
Spread min. - max. A	Overall Length B	Max. Reach C	Center Bolt Diam. E	Jaw Width F	Tip Clearance G	Tip Depth H	Hex Socket Size (inch) J					
12 - 127	245 - 323	101	14	15	4,1	4,6	7/8	EP-204	EPP-4	EPX-4	-	
12 - 127	245 - 323	101	14	15	4,1	4,6	7/8	EP-104	EPP-4	EPX-4	-	
12 - 178	323 - 476	152	16	19	8,1	6,1	1 1/16	EP-206	EPP-6	EPX-6	-	
12 - 178	323 - 476	152	16	19	8,1	6,1	1 1/16	EP-106	EPP-6	EPX-6	-	
19 - 304	412 - 615	203	20	22	6,4	9,1	1 1/4	EP-208	EPP-10	EPX-10	EP-11054	
19 - 304	412 - 615	203	20	22	6,4	9,1	1 1/4	EP-108	EPP-10	EPX-10	EP-11054	
25 - 381	489 - 736	245	20	25	6,4	9,1	1 1/4	EP-210	EPP-10	EPX-10	EP-11054L	
25 - 381	489 - 736	245	20	25	6,4	9,1	1 1/4	EP-110	EPP-10	EPX-10	EP-11054L	
63 - 457	660 - 965	304	29	31	12,7	9,7	1 11/16	EP-213	EPP-1316	-	EP-11354L	
63 - 457	660 - 965	304	29	31	12,7	9,7	1 11/16	EP-113	EPP-1316	-	EP-11354L	
76 - 635	800 - 1155	355	31	36	13,5	11,7	1 13/16	EP-216	EPP-1316	-	EP-11654L	
76 - 635	800 - 1155	355	31	36	13,5	11,7	1 13/16	EP-116	EPP-1316	-	EP-11654L	

Note: Overall length (B) is dependent on position of center bolt.

Dimensions (mm)							Model Number
Spread min. - max. A	Overall Length B	Max. Reach C	Slide Rod Dia. E	Jaw Width F	Tip Clearance G	Tip Depth H	
14 - 101	736	168	14,2	8	3,0	1,5	EPPMI-6
25 - 133	787	218	14,2	8	7,6	4,6	



Always wear Safety Goggles while using pullers.

▼ 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 manual pullers often require two operators.

High-Tech Pulling



Transport and Store

Conveniently stores and transports 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: 154



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.


▼ SELECTION CHART

Number of Jaws	Maximum Spread (mm)	Capacity ton (kN)	Model Number*
2	304	10 (101)	EPH-208
3	304		EPH-108
2	381	15 (142)	EPH-210
3	381		EPH-110
2	457	25 (232)	EPH-213
3	457		EPH-113
2	635	50 (498)	EPH-216
3	635		EPH-116

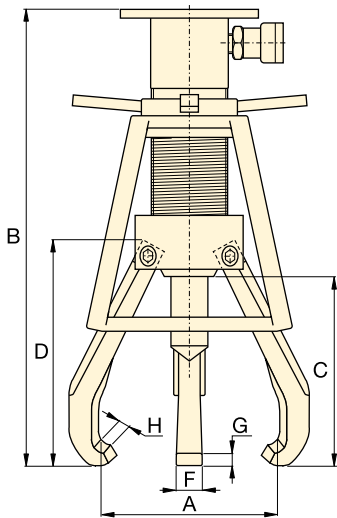
* Cylinder is not included.

Posi Lock® Hydraulic Grip Pullers

▼ SETS SELECTION CHART

Style	Capacity (ton)	Basic Puller	Cylinder	Stroke (mm)	Pump Set	Set Model Number *	 (kg)
2 Jaw Puller	10	EPH-208	RC-106	152	-	EPHR208	10
	10	EPH-208	RC-106	152	EP-1E	EPHS208E	27
	15	EPH-210	RC-1510	254	-	EPHR210	22
	15	EPH-210	RC-1510	254	EP-1E	EPHS210E	38
	25	EPH-213	RC-2514	362	-	EPHR213	44
	25	EPH-213	RC-2514	362	EP-1E	EPHS213E	53
	50	EPH-216	RC-5013	336	-	EPHR216	87
3 Jaw Puller	10	EPH-108	RC-106	152	-	EPHR108	11
	10	EPH-108	RC-106	152	EP-1E	EPHS108E	28
	15	EPH-110	RC-1510	254	-	EPHR110	23
	15	EPH-110	RC-1510	254	EP-1E	EPHS110E	39
	25	EPH-113	RC-2514	362	-	EPHR113	48
	25	EPH-113	RC-2514	362	EP-1E	EPHS113E	57
	50	EPH-116	RC-5013	336	-	EPHR116	91
	50	EPH-116	RC-5013	336	EP-2E	EPHS116E	127

* Standard set EPHS models shipped with 230 VAC pump.



EPH Series



Capacity:

10 - 50 ton

Maximum Reach:

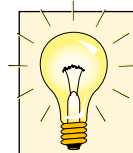
203 - 355 mm

Spread Range:

19 - 635 mm

Maximum Operating Pressure:

700 bar






Pump Sets

All Posi Lock® Hydraulic Puller Sets that include 230 VAC pumps, will feature the following components:




	EP-1E Pump Set	EP-2E Pump Set
Pump	PUJ-1200E	ZE4210ME
Hose	HC-7210	HC-7210
Gauge	G-2535L	G-2535L
Adaptor	GA-3	GA-3

Components for 115 VAC pumps are available on request.

	Accessories ¹⁾		
	Standard included	Standard included	Optional
			
	Ram Point Sets	Lift Plates	Long Jaws
19 - 304	EPH-155	EPH-11052	EP-11054
19 - 304	EPH-155	EPH-11052	EP-11054
25 - 381	EPH-155	EPH-11052	EPH-11054L
25 - 381	EPH-155	EPH-11052	EPH-11054L
63 - 457	EPH-257	EPH-11352	EPH-11354L
63 - 457	EPH-257	EPH-11352	EPH-11354L
76 - 635	EPH-508	EPH-11652	EPH-21654L
76 - 635	EPH-508	EPH-11652	EPH-11654L

¹⁾ See next page for details.

▼ RAM POINT SETS SELECTION CHART

Fits Puller Set Model Number	EPH-208, EPH-210 EPH-108, EPH-110	EPH-213 EPH-113	EPH-216 EPH-116
			
Ram Point Set ¹⁾ Model Number	EPH-155	EPH-257	EPH-508
Ram Points Included:	Ram Point Dimensions Diameter x Length (mm)		
Flat Ram Points	ø25 x 25	ø38 x 57	ø51 x 76
	ø25 x 76	ø51 x 57	ø70 x 76
	–	ø51 x 102	ø70 x 127
Tapered Ram Points	ø25 x 38	ø38 x 64	ø51 x 95
	ø25 x 89	ø51 x 64	ø51 x 95
	–	ø51 x 114	ø70 x 140
Ram Point Adaptor	–	–	ø70 x 57

¹⁾ Standard included in EPH-Series Posi Lock Pullers.

EPH Series



Capacity:

10 - 50 ton

Maximum Reach:

38 - 762 mm

Spread Range:

246 - 508 mm




IMPORTANT!

Always wear Safety Goggles while using pullers.


▼ LIFT PLATE SELECTION CHART


Fits Puller Set Model Number	Model Number *	Thick-ness (mm)	Dia-meter (mm)
EPH-208	EPH-11052	6,4	ø153
EPH-108	EPH-11052	6,4	ø153
EPH-210	EPH-11052	6,4	ø153
EPH-110	EPH-11052	6,4	ø153
EPH-213	EPH-11352	9,7	ø203
EPH-113	EPH-11352	9,7	ø203
EPH-216	EPH-11652	9,7	ø254
EPH-116	EPH-11652	9,7	ø254



* Mounting screws included. Lifting plates are standard included with EPH-Series Pullers.

▼ LONG JAW SELECTION CHART

Fits Puller Set Model Number	Model Number	Number of Jaws required	Spread (mm)	Reach (mm)	 (kg)
EPH-208	EP-11054	2	57 - 381	246	1,1
EPH-108	EP-11054	3	57 - 381	246	1,1
EPH-210	EPH-11054L	2	38 - 559	401	2,5
EPH-110	EPH-11054L	3	38 - 559	401	2,5
EPH-213	EPH-11354L	2	38 - 762	508	4,8
EPH-113	EPH-11354L	3	38 - 762	508	4,8
EPH-216	EPH-21654L	2	50 - 965	635	7,5
EPH-116	EPH-11654L	3	50 - 965	635	7,5



Long Jaws are optional accessories and 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-1003E



- Roller cart with power lift
- Hydraulically actuated lift cylinder on cart extends puller from ground to a height of 1,69 m
- Adjustable jaw tips
- Includes electric one stage pump with remote pendant for fingertip control of the removal process
- Puller height range 673 to 1690 mm
- Multiple pushing adaptors included.



◀ The EPH-1002E quickly and easily removes this drive coupler from its shaft.

EPH Series

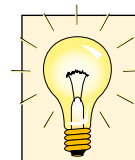


Capacity:
100 ton

Maximum Reach:
1219 mm

Spread Range:
190 - 1778 mm

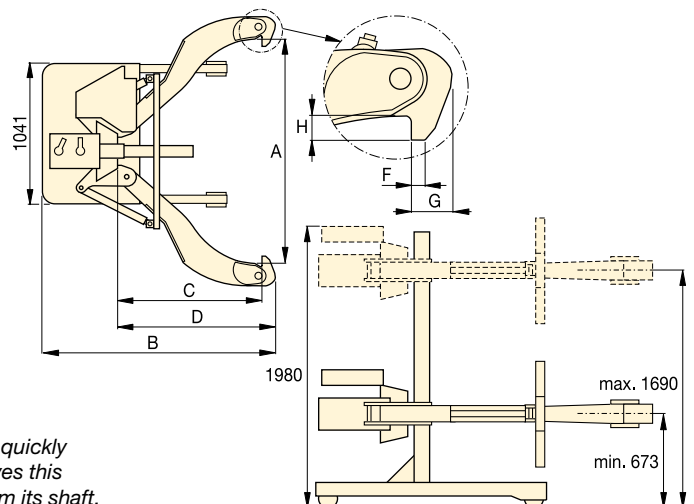
Maximum Operating Pressure:
700 bar



Pushing Adaptors

All Posi Lock® 100 Ton Hydraulic Pullers include following pushing adaptors.

Diameter (mm)	Length (mm)	Model Number
89	737	EPHT-1162
89	483	EPHT-1163
89	229	EPHT-1164

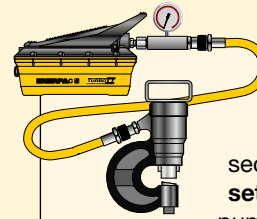


Number of Jaws	Spread Range A (mm)	Capacity ton (kN)	Model Number	Cylinder Stroke (mm)	Overall Length B (mm)	Reach C (mm)	Jaw Length D (mm)	Jaw Width F (mm)	Tip Clearance G (mm)	Tip Depth H (mm)	Weight (kg)
2	190 - 1778	100 (980)	EPH-1002E	250	1955	1219	1346	32	89	89	771
3	190 - 1778	100 (980)	EPH-1003E	250	1955	1219	1346	32	89	89	907

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.



Tool-Pump Sets

Most 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: 250













Bolting Tools

More Enerpac Tools you will find in our Bolting Tools section in this catalogue.

Page: 176



Hydraulic Tools Section Overview

Capacity ton (kN)	Tool type and functions	Series		Page
2,5 - 12,5 (22 - 116)	Maintenance Sets	MS		158 ▶
35 - 50 (311 - 498)	Punch Punch-Pump Sets	MSP		162 ▶
		SP		164 ▶
16 (157)	Lifting Wedge	LW		166 ▶
8,5 - 20 (75 - 178)	Machine Lifts	SOH		167 ▶
1 - 80 (8,9 - 712)	Heavy-Duty Load Skates	ER ES ELP		168 ▶
19 - 453 litres	Industrial Storage Cases	CM		170 ▶
0,75 - 1,0 (6 - 8,9)	Hydraulic Wedgie Spread Cylinders	A WR		171 ▶
3 - 20 (26 - 178)	Hydraulic Cutterheads Cutterhead-Pump Sets	WHC WHR STC		172 ▶
3 - 20 (26 - 178)	Self-Contained Hydraulic Cutters	WMC		173 ▶
Nominal Bore ½ - 4 inch	Pipe Bender Sets	STB		174 ▶

▼ Shown: MS2-10



The Universal Hydraulic Tool Box



Maintenance Sets

Enerpac Maintenance sets are a complete assortment of 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 ton.

- All sets include Enerpac pump, hose, cylinder and gauge
- Lock-on or threaded connectors
- Complete maintenance set for almost every maintenance application.









More Information

For detailed information on all included attachments, see the next pages.

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▼ QUICK SELECTION CHART

Capacity using attachments* ton (kN)	Set Model Number						Number of Attachment Components	 (kg)
2,5 (22)	MS2-4	P-142	HC-7206	RC-55	GP-10S	GA-4	35	26
2,5 (22)	MSFP-5	P-142	HC-7206	RC-55	G2535L	GA-3	24	20
5,0 (50)	MSFP-10	P-392	HC-7206	RC-106	G2535L	GA-3	22	48
5,0 (50)	MS2-10	P-392	HC-7206	RC-106	GP-10S	GA-2	40	63
12,5 (116)	MS2-20	P-392	HC-7206	RC-256	GP-10S	GA-2	19	95
5,0-12,5 (50-116)	MS2-1020	P-392	HC-7206	RC-102, -106, -256	GP-10S	GA-2	59	158

* If no attachments are being used, capacity is double these values. Maximum operating pressure is then 700 bar.

Universal Maintenance Sets



CAUTION!

When cylinders are used with maintenance set attachments or components, the maximum system pressure must be limited to half the rated pressure (350 bar).



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 ton

Maximum Operating Pressure:

350 bar

▼ APPLICATION EXAMPLES



MS-Series, Maintenance Sets



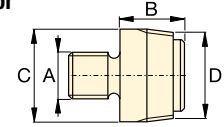
CAUTION! When cylinders are used with maintenance set attachments or components, the maximum system pressure must be limited to half the rated pressure (350 bar).

Note: All dimensions in millimetres.

Set Model Number	MS2-4	MSFP-5	MSFP-10	MS2-10	MS2-20	MS2-1020
Base, Collar and Plunger Attachments	2,5 ton	2,5 ton	5,0 ton	5,0 ton	12,5 ton	5,0 - 12,5 ton
Cylinder Model(s)	RC-55	RC-55	RC-106	RC-106	RC-256	RC-102, 106, 256
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 Applications	2,5 ton	2,5 ton	5,0 ton	5,0 ton	12,5 ton	5,0 - 12,5 ton
16	A-558	-	-	A-132	A-238	A-132, A-238
17	-	-	-	A-5 (2x)	-	A-5 (2x)
18	A-557 (2x)	-	-	A-141 (2x)	A-218 (2x)	A-141 (2x), A-18 (2x)
Extension Tubes, Connectors and Adaptors	2,5 ton	2,5 ton	5,0 ton	5,0 ton	12,5 ton	5,0 - 12,5 ton
19	A-544	-	-	A-19 (2x)	A-242 (2x)	A-19 (2x) A-242 (2x)
20	WR-5	WR-5	WR-5	A-92	-	A-92
21	MZ-4013 (4x)	MZ-4013 (4x)	A-16 (4x)	A-16 (4x)	-	A-16 (4x)
22	MZ-4007 (3x)	MZ-4007 (3x)	MZ-1050 (2x)	MZ-1050 (2x)	-	MZ-1050 (3x)
23	MZ-4008 (2x)	-	-	MZ-1051	-	MZ-1051 (2x)
24	MZ-4009	MZ-4009	MZ-1052	MZ-1052	-	MZ-1052
25	-	-	-	A-285	-	A-285
26	A-650	-	-	-	-	-
27 Length (mm)	76	MZ-4002	MZ-4002	-	-	-
 ∅ 42,5 mm	127	MZ-4003	MZ-4003	MZ-1002	MZ-1002	-
	254	MZ-4004	MZ-4004	MZ-1003	MZ-1003	A-239
	254	-	-	-	-	A-239
	457	MZ-4005 (2x)	MZ-4005 (2x)	MZ-1004	MZ-1004	A-240
	457	-	-	-	-	A-240
	584	MZ-4006 (2x)	MZ-4006 (2x)	-	-	-
762	-	-	MZ-1005	MZ-1005	A-241	
762	-	-	-	-	-	
28 Storage Case	CM-6	CM-6	CW-350	CW-350	CW-350	MK-05
Set Weight (kg)	26	20	48	63	95	158

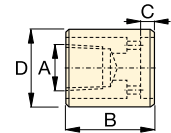
Base, Collar and Plunger Attachments

1 Threaded Adaptor



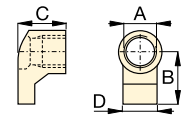
ton	Model Nr.	A	B	C	D
2,5	A-23	3/4" - 16 UN	28	26	3/4" - 14 NPT
5,0	A-13	1" - 8 UN	31	42	1 1/4" - 11 1/2 NPT
12,5	A-28	1 1/2" - 16 UN	47	69	2" - 11 1/2 NPT

2 Base Attachment



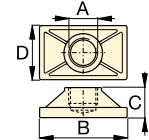
ton	Model Nr.	A	B	C	D
2,5	A-25	3/4" - 14 NPT	50	12	44
5,0	A-21	1 1/4" - 11 1/2 NPT	57	12	65
12,5	A-27	2" - 11 1/2 NPT	63	12	98

3 Collar Toe



ton	Model Nr.	A	B	C	D
2,5	A-1034	1 1/2" - 16 UN	54	50	31
5,0	A-20	2 1/4" - 14 UN	80	57	57
12,5	A-595	3 5/16" - 12 UN	103	51	80

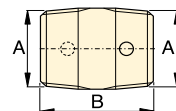
4 Flat Base



ton	Model Nr.	A	B	C	D
2,5	MZ-4010	3/4" - 14 NPT	114	31	63
5,0	A-14	1 1/4" - 11 1/2 NPT	165	35	88
12,5	A-243*	2" - 11 1/2 NPT	165	58	165

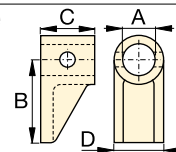
* A-243 is a round base model.

5 Threaded Connector



ton	Model Nr.	A	B
2,5	A-545	3/4" - 14 NPT	35
5,0	A-10	1 1/4" - 11 1/2 NPT	41

6 Lock-on Clamp Toe



ton	Model Nr.	A	B	C	D
5,0	A-8	43	105	50	57

Universal Maintenance Sets, MS-Series

7 Threaded Plunger Toe

ton	Model Nr.	A	B	C	D
2,5	A-530	¾" - 14 NPT	57	25	33
5,0	A-6	1¼" - 11½ NPT	82	31	57

14 Wedge Head

ton	Model Nr.	A	B	C	D
2,5	A-629	¾" - 14 NPT	69	33	28
5,0	A-129	1¼" - 11½ NPT	101	50	44

20 Spreader

ton	Model Nr.	A	B	C	D
1,0	WR-5	—	223	12,8	94
1,0	A-92	2¼" - 14 UN	244	35	158

8 Collar Clamp Head

ton	Model Nr.	A	B	C	D
2,5	MZ-4011	¾" - 14 NPT	49	76	1½" - 16 UN
5,0	A-192	42	63	50	2¼" - 14 UN

15 Rubber Flex Head

ton	Model Nr.	A	B	C
2,5	A-539	¾" - 14 NPT	44	69
5,0	A-128	1¼" - 11½ NPT	86	86

21 Lock Pin

ton	Model Nr.	A	B
2,5	MZ-4013	7,9	41
5,0	A-16	11,2	82

9 Spreader Toe

ton	Model Nr.	A	B	C	D
5,0	A-305	1¼" - 11½ NPT	114	25	50

Chains and Attachments for Pulling

16 Single Chain Plate

ton	Model Nr.	A	B	C	D
2,5	A-558	1½" - 16 UN	196	39	44
5,0	A-132	2¼" - 14 UN	307	63	79
12,5	A-238	3⅝" - 12 UN	450	102	125

22 Lock-on Connector

ton	Model Nr.	A	B
2,5	MZ-4007	19	79
5,0	MZ-1050	33	127

10 Serrated Saddle

ton	Model Nr.	A	B	C
2,5	A-531	¾" - 14 NPT	27	31
5,0	A-18	1¼" - 11½ NPT	38	50

17 Double Chain Plate

ton	Model Nr.	A	B	C	D
5,0	A-5	1¼" - 11½ NPT	130	50	126

23 Male Lock-on Adaptor

ton	Model Nr.	A	B	C
2,5	MZ-4008	¾" - 14 NPT	60	19
5,0	MZ-1051	1¼" - 11½ NPT	90	33

11 Smooth Saddle

ton	Model Nr.	A	B	C
5,0	A-185	1¼" - 11½ NPT	38	50

18 Chain with Hook

ton	Model Nr.	Chain Length
2,5	A-557	1,5 metres
5,0	A-141	1,8 metres
12,5	A-218	2,4 metres

24 Female Lock-on Adaptor

ton	Model Nr.	A	B	C
2,5	MZ-4009	¾" - 14 NPT	65	19
5,0	MZ-1052	1¼" - 11½ NPT	96	33

12 90° V-Base

ton	Model Nr.	A	B	C	D
2,5	A-532	¾" - 14 NPT	38	47	25
5,0	A-15	1¼" - 11½ NPT	54	57	54

Tubes, Connectors and Adaptors

19 Pipe Coupling

ton	Model Nr.	A	B	C
2,5	A-544	¾" - 14 NPT	42	33
5,0	A-19	1¼" - 11½ NPT	49	54
12,5	A-242	2" - 11½ NPT	88	82

25 Adjustable Extension

ton	Model Nr.	A	B	C	D
5,0	A-285	1¼" - 11½ NPT	335	441	33

13 Plunger Base

ton	Model Nr.	A	B	C
12,5	A-607	2" - 11½ NPT	166	38

26 Slip-on Extension

ton	Model Nr.	A	B	C
2,5	A-650	¾" - 14 NPT	200	365

SP-Series, Lightweight Hydraulic Punch

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ Shown: SP-35S



- 12,7 mm thick capacity through mild steel
- 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 coupler included.



◀ SP-Series, Lightweight Hydraulic Punch – Much Faster than Drilling.

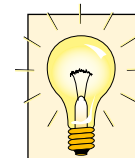
Much Faster than Drilling



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 a pump. A punch or die may also be ordered separately or as a matched set. Please refer to the Quick Selection Chart information on top of the next page.



▼ STANDARD PUNCHES AND DIES SELECTION CHART

Hole Shape	Imperial ¹⁾ (inch)		Metric ¹⁾ (mm)	
	Hole Size	Bolt Size	Hole Size	Bolt Size
●	0,31	1/4	7,9	–
●	0,38	5/16	9,5	M8
●	0,44	3/8	11,1	M10
●	0,53	7/16	13,5	M12
●	0,56	1/2	14,3	–
●	0,69	5/8	17,5	M16
●	0,78	–	19,8	M18
●	0,81	3/4	20,6	–
■	0,31	1/4	7,9	–
■	0,38	5/16	9,5	M8
■	0,44	3/8	11,1	M10
■	0,50	7/16	12,7	M12
■	.31 x .75	1/4	7,9 x 19	–
■	.38 x .75	5/16	9,5 x 19	M8
■	.44 x .75	3/8	11,1 x 19	M10
■	.50 x .75	7/16	12,7 x 19	M12

¹⁾ Material thickness should not exceed hole diameter

Single-Acting, Spring Return Hydraulic Punch

▼ QUICK SELECTION CHART

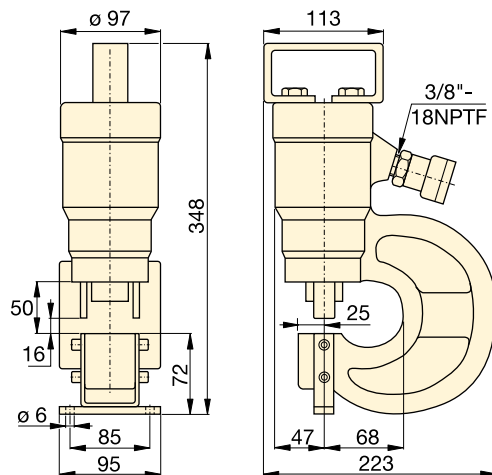
* 	Punch & Die Set	Included				Model Number	 (kg)
		Pump	Hose	Gauge	Gauge Adaptor		
SP-35	Standard**	P-392	HC-7206	GP-10S	GA-2	STP-35H	25
SP-35	Standard**	PATG-1102N	HC-7206	GP-10S	GA-2	STP-35A	29
SP-35	-	-	-	-	-	SP-35	16
SP-35	Standard**	-	-	-	-	SP-35S	18
SP-35	Standard**	PUD-1100E	HC-7206	-	-	SP-35SPE	29
SP-35	Metric***	-	-	-	-	MSP-351	21
SP-35	Metric***	PUD-1100E	HC-7206	-	-	MSP-351PE	32

* Punch oil capacity: 76 cm³

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



MSP SP STP Series



Capacity:

35 ton

Hole Sizes:

7,9 - 20,6 mm

Maximum Operating Pressure:

700 bar




CAUTION!

The 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.

Model Nr. Standard Punch & Die Set	Maximum allowable material thickness to be punched (mm) Material thickness should not exceed hole diameter										
	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)
 SPD-313	7,9	7,9	6,4	6,4	6,4	6,4	3,3	4,8	6,4	6,4	6,4
SPD-375	9,7	9,7	7,9	7,9	7,9	7,9	4,8	6,4	7,9	7,9	7,9
SPD-438	11,2	11,2	9,7	9,7	9,7	7,9	4,8	7,9	7,9	7,9	7,9
SPD-531	12,7	12,7	11,2	11,2	11,2	9,7	6,4	7,9	9,7	9,7	9,7
SPD-563	12,7	12,7	12,7	11,2	12,7	11,2	6,4	9,7	11,2	11,2	11,2
SPD-688	12,7	12,7	12,7	11,2	12,7	10,2	6,4	7,9	10,2	10,2	10,2
SPD-781	12,7	12,7	12,7	11,2	12,7	9,7	6,4	7,9	9,7	9,9	9,7
SPD-813	12,7	12,7	12,7	11,2	12,7	7,9	4,8	7,9	7,9	7,9	7,9
SPD-458	7,9	7,9	6,4	6,4	6,4	6,4	3,3	4,8	6,4	6,4	6,4
SPD-549	9,7	9,7	7,9	7,9	7,9	7,9	4,8	6,4	7,9	7,9	7,9
SPD-639	11,2	11,2	9,7	9,7	9,7	7,9	4,8	7,9	7,9	7,9	7,9
SPD-728	12,7	12,7	11,2	11,2	11,2	9,7	6,4	7,9	9,7	9,7	8,6
SPD-106	7,9	7,9	6,4	6,4	6,4	6,4	3,3	4,8	6,4	6,4	6,4
SPD-125	9,7	9,7	7,9	7,9	7,9	7,9	4,8	6,4	7,9	7,9	7,9
SPD-188	11,2	11,2	9,7	9,7	9,7	7,9	4,8	7,9	7,9	7,9	7,9
SPD-250	12,7	12,7	11,2	11,2	11,2	9,7	6,4	7,9	9,7	9,7	9,7

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

SP-Series, 50 Ton Hydraulic Punch

ENERPAC 
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ 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 bracket included
- Adjustable power stripper prevents movement of the metal during stripping
- CR-400 female couplers included.



◀ Save time using the 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. Order model number: **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.



50 Ton Double-Acting Hydraulic Punch

▼ QUICK SELECTION CHART PUNCH SETS

Included				Set Model Number	 (kg)
Model Number Punch*	Punch & Die Sets	Electric Pump	Hydraulic Hose (2x)		
SP-50	All**	-	-	SP-50100	116
SP-50	All**	ZE4410SE	HC-7206	SP-5000	174

* Punch Oil Capacity:

Advance: 278 cm³

Retract: 229 cm³

** All standard sets from chart below.

SP Series



Capacity:

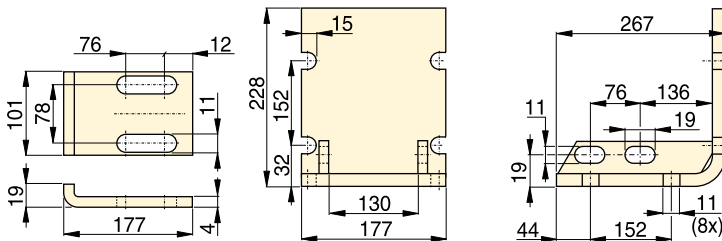
50 ton (490 kN)

Hole Sizes:

13,5 - 26,2 mm

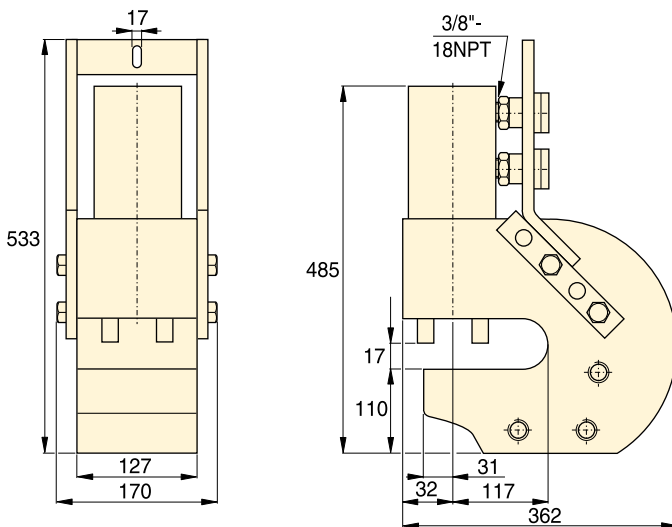
Maximum Operating Pressure:

700 bar



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 (mm)	Bolt Size (mm)	Model Numbers Standard Punch and Die Set	Maximum Allowable Material Thickness To Be Punched (mm)										
				1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)
●	13,5	M12	SP-150	13,5	13,5	13,5	13,5	13,5	12,4	8,1	10,2	12,4	12,4	12,4
●	16,7	M16	SP-170	-	-	-	-	-	13,0	8,1	10,2	13,0	13,0	13,0
●	19,8	M18	SP-190	-	-	-	-	-	12,4	8,1	10,2	12,4	12,7	12,4
●	23,1	M20	SP-121	14,2	14,2	14,2	12,7	14,2	8,9	5,6	8,9	8,9	8,9	8,9
●	26,2	M24	SP-123	14,2	14,2	14,2	11,2	14,2	7,9	4,8	7,9	7,9	7,9	7,9

Hydraulic Vertical Lifting Wedge

▼ LW-16 with SB-2 and optional LWB-1



- Requires very small access gap of only 10 mm
- Lifting force 16 ton at 700 bar hydraulic pressure
- Each step can spread under full load
- Straight vertical lifting
- Unique interlocking wedge design: no first step bending and risk of slipping out
- Single-acting, spring return cylinder
- Lifting wedge LW-16 includes safety block SB-2
- Includes RC-Series Cylinder with CR-400 coupler.

▼ For lifting heavy equipment with minimum floor clearance the LW-16 is the ideal tool.



LW Series

Maximum Lifting Force:
16 ton (157 kN)

Lifting Stroke:
21 mm

Tip Clearance / Maximum Spread*:
10 mm / 81,5 mm

Maximum Operating Pressure:
700 bar



Best Match Hand Pump

To power your Enerpac Machine Lift, the Enerpac P-392 hand pump is an ideal choice.

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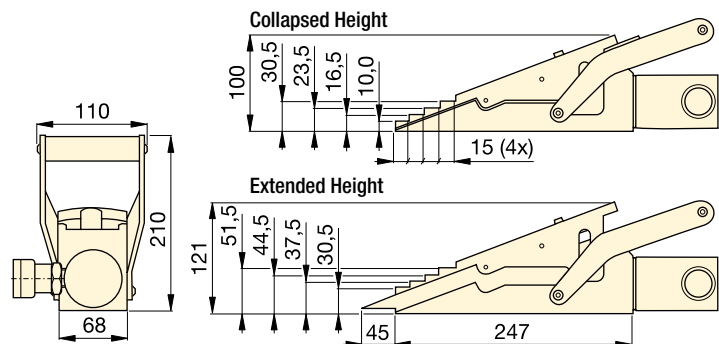
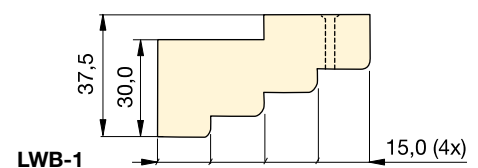



Control Manifolds

Control Manifold to control two or four lifting wedges simultaneously.

AM-21 with 3 ports 3/8" NPTF
AM-41 with 5 ports 3/8" NPTF.

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Maximum Lifting Force	Lifting Stroke	Model Number	Tip Clearance	Maximum Operating Pressure	Oil Capacity	
ton (kN)	(mm)		(mm)	(bar)	(cm ³)	(kg)
16 (157)	21	LW-16	10	700	78	9,0

Use optional stepped block LWB-1 to increase wedge lifting height by 30 mm.

* Using LWB-1.

Hydraulic Machine Lifts

▼ SOH-10-6



SOH Series

Lifting Capacity:
8,5 - 20 ton

Stroke:
136 - 157 mm

Toe Clearance:
20 mm

Maximum Operating Pressure:
700 bar



RSM Flat-Jac®

Low height, single acting spring-return cylinders are ideal for space restricted applications.

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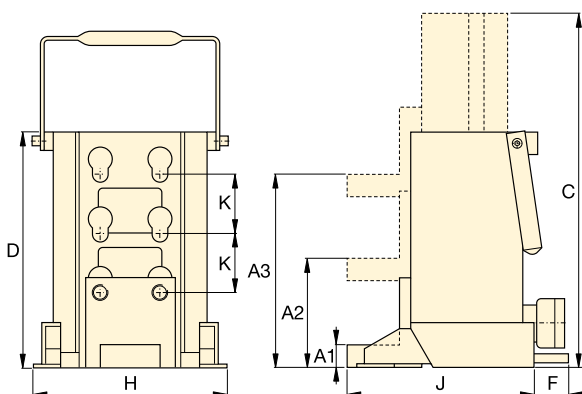
Load Skates

In combination with the Enerpac Machine Lifts we recommend Load Skates for moving heavy loads.

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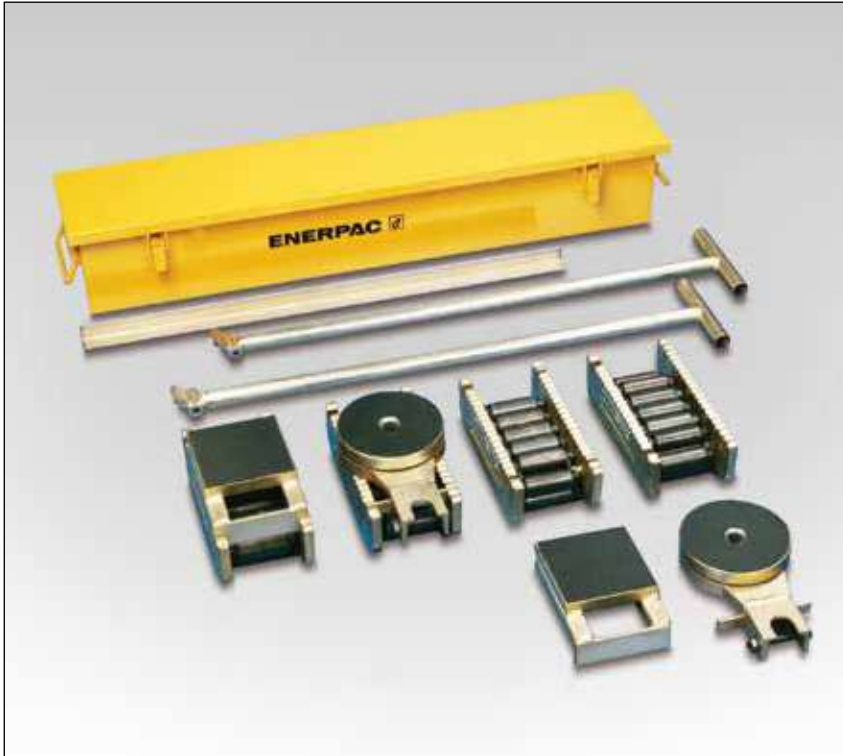
- For lifting heavy equipment with minimum available access
- Remote hydraulic pump enhances safety
- Low height lifting toe
- Precision guided to reduce friction and isolate cylinder from side-loads
- Two extendable support feet provide extra stability
- Includes RC-Series DUO Cylinder with CR-400 coupler.

▼ Limited access under this machine makes the Enerpac hydraulic machine lift the perfect solution.



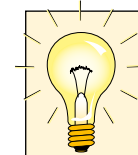
Capacity	Toe Clearance (mm)			Stroke	Model Number	Oil Capacity	Dimensions (mm)						🏋️ (kg)
	Minimum A1	Central A2	Maximum A3				Total Ext. Height C	Total Body Height D	F	H	J	K	
8,5 (75)	20	95	169	136	SOH-10-6	224	430	294	-	190	214	74	26
20 (178)	30	110	190	157	SOH-23-6	525	472	320	65	265	250	80	45

▼ Shown: Set ERS-20



- Rugged and sturdy construction for long life
- Low profile construction for increased stability
- Low rolling-resistance allows for easy transportation
- Attachable load leveling plates and swivel turntables for turning corners.

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 (880 mm long) and one **EMB-1** metal box are included.

Optional long handle **ERH-2** (1295 mm) available for 60 and 80 ton only.



Lifting Wedge and Machine Lifts

To place the Load Skates, the load must first be lifted. This can be done easily and safely using the Enerpac Lifting Wedge or Machine Lifts.

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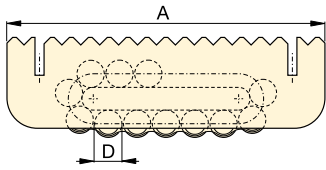
▼ Load Skates may be ordered separately or as a matched set.

Set Capacity * ton (kN)	Set Model Number	Load Skates (4x)	Turntable Swivels (2x)	Leveling Plates (2x)	Weight including handles and metal box (kg)
20 (178)	ERS-20	ER-10	ES-10	ELP-10	49
30 (267)	ERS-30	ER-15	ES-15	ELP-15	55
60 (533)	ERS-60	ER-30	ES-30	ELP-30	75

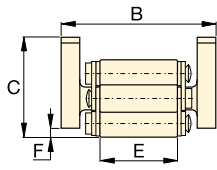
* Sets are designed to enable two skates to take full load for extra safety on uneven floor surfaces

◀ Heavy transport using Load Skates. The machine is first lifted, using SOH-Series Enerpac Machine Lifts.

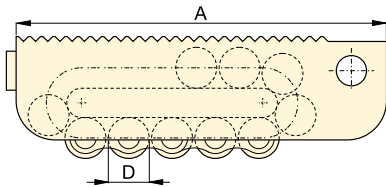
Heavy Duty Caterroller™ Load Skates



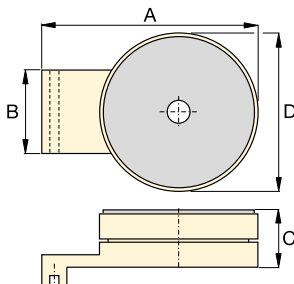
ER-1, ER-10, ER-15, ER-30



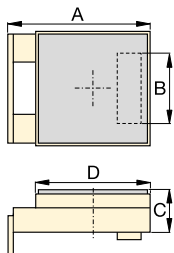
ER-60, ER-80



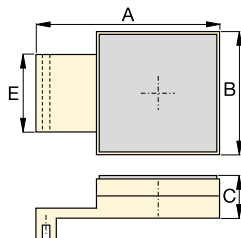
Turntable Swivel
ES-1, ES-10, ES-15, ES-30



Turntable Swivel
ES-60, ES-80



Leveling Plate
ELP-10, ELP-15, ELP-30



Leveling Plate
ELP-60, ELP-80




**EL
ER
ES
Series**



Maximum Carrying Capacity:
80 ton (711 kN)

▼ *Chemical tank transportation: The first few centimetres the load was lifted with RCS-Series low height cylinders and then moved on to load skates for transportation.*



	Capacity ton (kN)	Model Number	Dimensions (mm)						Contact Rolls per Skate	Rollers per Skate	🏋️ (kg)
			A	B	C	D	E	F			
 Load Skates	1 (8,9)	ER-1	160	100	65	18	51	4	4	11	3,8
	10 (89)	ER-10	210	102	66	18	51	6	5	15	5,2
	15 (133)	ER-15	220	115	75	24	60	10	4	13	7,3
	30 (267)	ER-30	270	130	92	30	68	10	4	13	13,0
	60 (533)	ER-60	380	168	125	42	76	16	4	13	31,9
	80 (711)	ER-80	530	182	145	50	86	19	6	17	60,9
 Turntable Swivel	1 (8,9)	ES-1	207	86	26	90	-	-	-	-	1,1
	10 (89)	ES-10	220	73	42	130	-	-	-	-	3,7
	15 (133)	ES-15	220	86	42	130	-	-	-	-	3,7
	30 (267)	ES-30	250	96	48	150	-	-	-	-	5,3
	60 (533)	ES-60	275	114	61	190	-	-	-	-	13,7
	80 (711)	ES-80	360	128	61	220	-	-	-	-	18,9
 Leveling Plate	10 (89)	ELP-10	149	73	42	120	-	-	-	-	3,7
	15 (133)	ELP-15	149	86	42	120	-	-	-	-	3,7
	30 (267)	ELP-30	178	96	48	130	-	-	-	-	5,3
	60 (533)	ELP-60	270	114	61	180	-	-	-	-	13,8
	80 (711)	ELP-80	350	128	61	200	-	-	-	-	18,8

▼ CM-16



- 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.

▼ When not storing the lifting system, this heavy-duty storage case doubles as a work station.



CM Series

Case Size:
19 - 453 litres

Protect your Equipment



Maintenance Sets

Enerpac Maintenance sets are a complete assortment of 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 ton.

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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.

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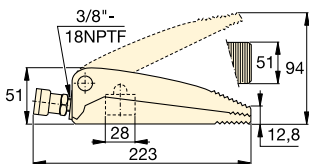
Case Size (litres)	Model Number	Dimensions L x W x H (mm)	Thickness (mm)	 (kg)
19	CM-6	597 x 178 x 178	0,9	7
32	CM-1	635 x 292 x 168	0,9	8
127	CM-4	787 x 457 x 355	1,5	16
212	CM-7	1206 x 381 x 457	1,9	57
453	CM-16	1219 x 609 x 609	1,5	55

Hydraulic Wedgie and Spread Cylinders

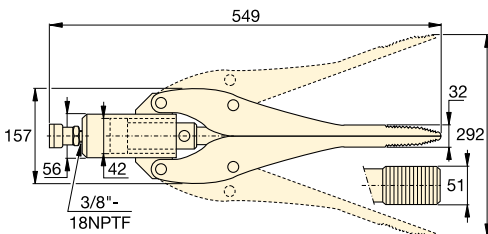
▼ Shown clockwise from top: WR-15, WR-5, A-92



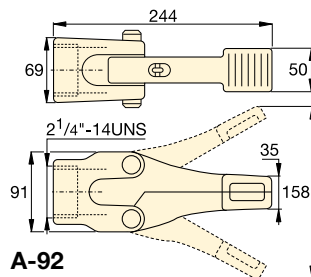
- **WR-5:** For use in very confined work areas
- **WR-15:** For long stroke spreading applications
- **Single-acting, spring return**
- **A-92:** Spreader attachment; threads on 10 ton RC-Series DUO cylinders (except RC-101).




WR-5



WR-15



A-92

Cylinder Capacity	Tip Clearance	Model Number	Maximum Spread	Cylinder Effective Area	Oil Capacity	
ton (kN)	(mm)		(mm)	(cm ²)	(cm ³)	(kg)
1,0 (8,9)	12,8	WR-5	94	6,5	10	2,3
0,75 (6)	32,0	WR-15	292	14,5	64	11,3
1,0 (8,9)	35,0	A-92	158	–	–	3,6

A WR Series



Capacity:

0,75 - 1,0 ton

Tip Clearance:

12,8 - 35 mm

Maximum Spread:

94 - 292 mm

Maximum Operating Pressure:

700 bar



RC-Series Cylinders

10 ton RC-Series DUO cylinders (except RC-101) fit into A-92 Spreader Attachment.

Page: **6**



Best Match Hand Pump

To power your WR-5 and WR-15 the **P-392** hand pump is an ideal choice. Use Enerpac H700-Series (page 116) for hydraulic connection.

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▼ A WR-5 wedgie cylinder is used to position a concrete block on a construction site.



Hydraulic Cutterheads

▼ Shown from left to right: WHC-4000, WHC-750



- Single-acting, spring return on all models, except WHR-1250
- Guillotine action for easy operation
- Lifting handles on larger models for easy transport
- Carrying bag included for easy carrying and tool protection
- Ideal for use with most Enerpac pumps featuring 3-way valve or dump valve and 700 bar pressure rating (except WHR-1250, which requires 4-way valve)
- CR-400 coupler and dust cap included on all models.

WHC, WHR, STC Series

Capacity:

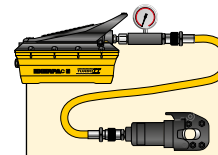
3 - 20 ton

Cutting Capacity:

ø 12 - 101 mm

Maximum Operating Pressure:

700 bar



Tool-Pump Sets

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

Cutterhead Model Nr.	Pump Model Nr.	Set Model Number
WHC-750	P-392	STC-750H
WHC-750	P-392FP	STC-750FP
WHC-750	PATG-1102N	STC-750A
WHC-1250	P-392	STC-1250H
WHC-1250	P-392FP	STC-1250FP
WHC-1250	PATG-1102N	STC-1250A

▼ Steel rope is easily cut with the smooth guillotine action of an Enerpac cutterhead.



Cutter Head Operation	Capacity ton	Model Number	Oil Capacity (cm³)	Length (mm)	Steel Wire Rope, Hemp-core or IWRC 6x7 6x12 6x19	Round Bar				Wire Strand				Cable		Replacement Blades (kg)	
						Copper Wire or Bar	Aluminum Wire or Bar	Soft Steel Bolts	Reinforcing Bar	Bare Copper Wire Strands	Bare Aluminum Wire Strands	ACSR	Guy Steel Wire Strands	Telephone Cable CPP	Underground Cable (Power)		
Single-Acting	4	WHC-750*	19,7	127	19	19	19	19	12	19	19	19	16	☆	☆	3,2	WCB-750
	20	WHC-1250*	134,4	279	31	28	31	28	25	31	31	31	22	☆	☆	11,3	WCB-1250
	13	WHC-2000	119,6	381	25	31	31	22	☆	50	50	50	19	☆	50	10,4	WCB-2000
	3	WHC-3380	65,5	482	☆	☆	☆	☆	☆	41	42	☆	☆	85	85	9,1	WCB-3380
	8	WHC-4000	137,7	609	☆	☆	☆	☆	☆	☆	☆	☆	☆	101	101	14,5	WCB-4000
Dbl.-Act.	20	WHR-1250	122,9	419	31	31	31	28	25	31	31	31	22	☆	☆	11,8	WCB-1250

* Available in sets with P-392 Hand Pump, P-392FP Foot Pump or PATG-1102N Turbo Air Pump.

☆ Will not cut designated material

Self-Contained Hydraulic Cutters

▼ Shown from left to right: **WMC-2000, WMC-750**



- Rotating heads for operator convenience
- Guillotine action for easy operation
- Carrying bag included for easy carrying and tool protection
- Velcro straps to secure handles on larger models for easy carry
- Spring return for easy operation
- Light weight self-contained tool, can be used anywhere.

WMC Series



Capacity:

3 - 20 ton

Cutting Capacity:

Ø 14 - 85 mm

Maximum Operating Pressure:

700 bar



Replacement Blades

60-62HRc hardened replacement blades.

For Cutter Model Number	Order Blades Model Number
WMC-580	WCB-580
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 (Ø in mm)

Capacity ton	Model Number	Length (mm)	Steel Wire Rope, Hempcore or IWRC 6x7 6x12 6x19	Round Bar				Wire Strand					Cable		⚡ (kg)
				Copper Wire or Bar	Aluminum Wire or Bar	Soft Steel Bolts	Reinforcing Bar	Bare Copper Wire Strands	Bare Aluminum Wire Strands	ACSR Wire Strands	Guy Steel Wire Strands	Guy Steel Wire Strands	Telephone Cable CPP	Underground Cable (Power)	
4	WMC-580	381	16	16	16	16	☆	16	16	16	14	14	☆	16	3,6
4	WMC-750	381	19	17	17	17	☆	19	19	19	14	14	☆	17	3,6
20	WMC-1000*	679	☆	19	19	19	19	☆	☆	☆	☆	☆	☆	☆	11,3
20	WMC-1250	679	31	28	31	31	22	31	31	31	22	25	☆	☆	10,4
6	WMC-1580	558	19	19	19	19	☆	38	41	41	16	16	☆	41	6,8
13	WMC-2000	628	25	31	31	22	☆	50	50	50	19	19	☆	50	10,9
3	WMC-3380	660	☆	☆	☆	☆	☆	46	42	☆	☆	☆	85	85	10,0

* Cuts 12 mm alloy chain grade 70 (type G7 transport or tie-down) or grade 80 (for overhead lifting applications)

☆ Will not cut designated material.

www.enerpac.com

STB-Series, Pipe Bender Sets

▼ Shown: STB-101H



Quick, Safe and Wrinkle-free Bending

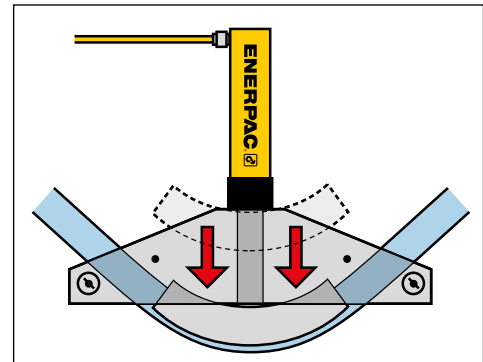


'One Shot' and 'Sweep'

One shot shoes give up to a 90° bend without resetting.









Sweep shoes are used where increasing radii are required for multiple parallel pipe installations.

- Makes smooth, wrinkle-free bends
- Sets include genuine Enerpac cylinder, hose and manual, air or electric pump
- Sets are also available without hydraulics
- Bending shoes and bending frame are lightweight, heat-treated aluminium
- 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) have double-acting cylinder to eject pipe from the bending shoe.



▲ Typical one shot bending operation.

▼ SELECTION CHART

Pipe Range Nominal Size (inch)		Bender Set Model Number	Hand Pump *	Air Pump *	Electric Pump *		Cylinder *	Hose *	Saddle *	 (kg)
One Shot	Sweep									
1/2 - 2	-	STB-101X	-	-	-	-	-	-	A-12	40
		STB-101N	-	-	-	-	RC-1010	HC-7206	A-12	48
		STB-101H	P-392	-	-	-	RC-1010	HC-7206	A-12	52
		STB-101A	-	PATG-1102N	-	-	RC-1010	HC-7206	A-12	54
		STB-101E	-	-	PUJ-1200E ²⁾	-	RC-1010	HC-7206	A-12	57
1 - 2	2 1/2 - 4	STB-221X	-	-	-	-	-	-	A-29	104
		STB-221N	-	-	-	-	RC-2510	HC-7206	A-29	119
		STB-221H	P-80	-	-	-	RC-2510	HC-7206	A-29	130
1 1/4 - 4	-	STB-202X ¹⁾	-	-	-	-	-	-	A-29	143
		STB-202N ¹⁾	-	-	-	-	RR-3014	HC-7206 (2x)	A-29	174
		STB-202E ¹⁾	-	-	-	ZU4408SE ²⁾	RR-3014	HC-7206 (2x)	A-29	212

* See corresponding sections in this catalog for more detailed specifications.

¹⁾ Eject-O-Matic™ ²⁾ For 115 volt applications replace the last digit of Set Model Number and pump from 'E' to 'B'.

Pipe Bender Sets

Nominal Pipe Size (inch)	Wall Thickness (mm)	Schedule Pipe *	Pipe Bend Inside Radius (inch)	STB-101	STB-221 ø 1 - 2" One Shot	STB-202	One Shot Bending Shoe Model Number	Sweep Bending Shoe Model Number
				ø ½ - 2" One Shot	ø 2¼ - 4" Sweep	ø 1¼ - 4" One Shot		
½	2,8	40	27/8	Yes	Yes	WS	BZ-12011	-
	3,7	80		Yes	Yes	WS		
	4,7	160		WS	WS	WS		
	7,5	DEH		WS	WS	WS		
¾	2,9	40	4	Yes	Yes	WS	BZ-12021	-
	3,9	80		Yes	Yes	WS		
	5,5	160		WS	WS	WS		
	7,8	DEH		WS	WS	WS		
1	3,4	40	5½	Yes	Yes	WS	BZ-12031	-
	4,5	80		Yes	Yes	WS		
	6,4	160		WS	WS	WS		
	9,1	DEH		-	WS	WS		
1¼	3,6	40	67/16	Yes	Yes	Yes	BZ-12041	-
	4,9	80		Yes	Yes	Yes		
	6,4	160		WS	WS	Yes		
	8,7	DEH		-	WS	WS		
1½	3,7	40	7 5/16	Yes	Yes	Yes	BZ-12051	-
	5,1	80		Yes	Yes	Yes		
	7,1	160		WS	WS	Yes		
	10,2	DEH		-	WS	WS		
2	3,9	40	8 5/16	-	Yes	Yes	BZ-12061	-
	5,5	80		-	Yes	Yes		
	8,7	160		-	WS	Yes		
2½	5,2	40	9½	-	Yes	Yes	BZ-12341	BZ-12382
	7,0	80		-	WS	Yes		
	9,5	160		-	WS	Yes		
3	5,5	40	11¼	-	Yes	Yes	BZ-12351	BZ-12383
	7,6	80		-	WS	Yes		
3½	5,7	40	15½	-	Yes	Yes	BZ-12391	BZ-12384
	8,1	80		-	WS	Yes		
4	6,0	40	17¾	-	Yes	Yes	BZ-12392	BZ-12385
	8,6	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 using wider spacing for swivel shoes.

STB Series



Nominal Pipe Size:

½ - 4 inch

Maximum Bending:

90°

Maximum Operating Pressure:

700 bar

Frame Assembly	Pivot Pins (2x)	Pivot Shoes (2x)	Bending Shoes included (Shoes with ³ are Sweep, all other shoes are One Shot)									Bender 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-101E
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		
											STB-202N ¹		
												STB-202E ¹	

Enerpac's Bolting Solutions cater to the complete bolting work-flow, ensuring joint integrity in a variety of applications throughout the 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 and mechanical alignment tools to PLC-controlled multi-point positioning systems.

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 from low profile torque wrenches to inter-connectable bolt tensioning tools; 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.























Torque Tightening

See our 'Yellow Pages' for information on torque tightening.

Page: **258**



Bolting Tools & Pumps Section Overview

Applications	Capacity	Tool type and functions	Series	Page	
Controlled Tightening and Loosening	1015 - 10.845 Nm 750 - 8000 Ft.lbs	Manual Torque Multipliers	E		178 ▶
	1952 - 34.099 Nm 1440 - 25.150 Ft.lbs	Square Drive Hydraulic Torque Wrenches Rigid steel design & maximum versatility	S		180 ▶
	19 - 155 mm ¾ - 6⅞ inch	Heavy-Duty Impact Sockets Square drive	BSH		184 ▶
	2766 - 47.454 Nm 2040 - 35.000 Ft.lbs	Hexagon Hydraulic Torque Wrenches Rigid steel design & low profile	W		186 ▶
	5762 Nm 4250 Ft.lbs	Roller Cassette Torque Wrench Versatile high performance limited access tools	WCR		196 ▶
		Selection Matrix Torque Wrenches - Pumps - Hoses			200 ▶
	Flow: 0,34 l/min Power: 0,37 kW	Portable Electric Torque Wrench Pumps Compact Economy	PME PMU		201 ▶
	Flow: 0,50 l/min Power: 0,75 kW	Electric Torque Wrench Pumps Lightweight	TQ		202 ▶
	Flow: 0,90 l/min Power: 1,25 kW	Portable Electric Torque Wrench Pumps Z-Class innovation	ZU4T		204 ▶
	Flow: 0,82-1,64 l/min Power: 1,1 - 2,2 kW	Electric Torque Wrench Pumps Z-Class innovation	ZE4T ZE5T		208 ▶
	Flow: 0,33 l/min Air: 1130 l/min	Air Driven Torque Wrench Pumps Portable and Compact	PTA		210 ▶
	Flow: 0,90 l/min Air: 2840 l/min	Air Driven Torque Wrench Pumps Z-Class innovation	ZA4T		212 ▶
	Flow: 0,61 cm³/stroke	Ultra-High Pressure Hand Pump & Accessories Tensioning pump upto 1500 bar	HPT		216 ▶
	Flow: 0,07 l/min Air: 590 l/min	Ultra-High Pressure Air Pump Upto 1500 bar	ATP		217 ▶
	Flow: 0,13 l/min Power: 1,25 kW	Electric Tensioning Pumps Z-Class Tensioning pumps upto 1500 bar	ZUTP		218 ▶
Joint Assembly and Joint Separation	10 - 75 mm hexagon 70 - 130 mm hexagon	Hydraulic Nut Cutters	NC NS		219 ▶ 220 ▶
	5 - 10 ton (45 - 101 kN)	Pin-type Hydraulic Flange Spreaders	FS		222 ▶
	8 - 14 ton (72 - 125 kN)	Step-type Industrial Spreaders Mechanical and Hydraulic	FSH FSM		223 ▶
	1 - 9 ton (10 - 90 kN)	Flange Alignment Tools Mechanical and Hydraulic	ATM		224 ▶
	Ø 1 - 12 inch flanges	QuickFace – Mechanical Pipe Flange Face Tool Refacing of flat pipe flange surfaces	FF		226 ▶

▼ 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
- Operator protected by anti-backlash device
- Torque multiplier accuracy $\pm 5\%$
- Reversible, tighten or loosen bolts
- Reaction bar or reaction plate style
- Angle-of-turn protractor standard on E300-Series models
- Reaction plate models offer increased versatility with reaction point locations
- E300 and E400-Series have replaceable shear drives, providing overload protection of internal power train
- One replacement shear drive is included with each E300 and E400-Series models.



Typical Torque Multiplier Applications

- Locomotives
- Power plants
- Pulp and paper mills
- Refineries
- Chemical plants
- Mining and construction
- Off-road equipment
- Shipyards
- Cranes.

▼ SELECTION CHART

Torque Multiplier Type	Output Torque Capacity		Model Number
	(Nm)	(Ft.lbs)	
Reaction Bar Multiplier	1015	750	E290PLUS
	1355	1000	E291
	1625	1200	E391
	2980	2200	E392
	4340	3200	E393
Reaction Plate Multiplier	2980	2200	E492
	4340	3200	E493
	6780	5000	E494
	10845	8000	E495

Manual Torque Multipliers



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 4300 Nm output torque,
- On flanges and applications where neighbouring bolt or nut is available to react against
- When extreme reaction forces are generated.

E Series



Maximum Output Torque:

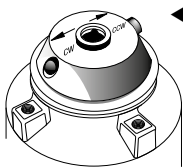
1015 - 10.845 Nm

Torque Ratio:

3,3:1 - 52:1

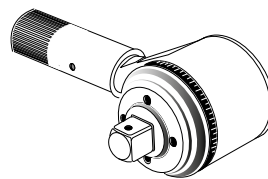
Output Ratio Accuracy:

± 5 %



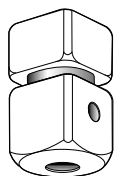
Selector Pawl

Models with anti-backlash protection have directional selector pawls. Set the pawl for clockwise or counter-clockwise rotation.



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.



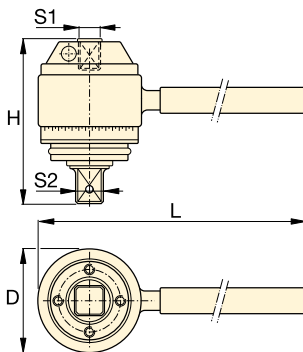
Shearable Square Drive

Provides overload protection on E300- and E400-series multiplier's power train by shearing when the rated capacity of the tool is exceeded. Internal shear pin prevents tool from falling off bolt.

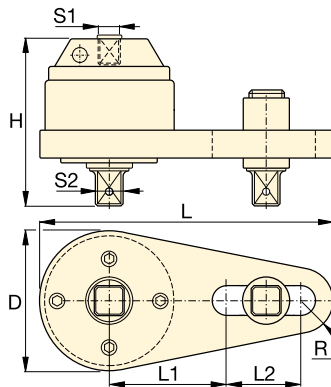


CAUTION!

Never use impact air tools for power driving torque multipliers. Torque multiplier drive train damage will occur.



Reaction Bar Type ¹⁾



Reaction Plate Type ¹⁾



Hydraulic Torque Wrenches

Enerpac offers a complete range of square drive and hexagon cassette torque wrenches.

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BSH-Series Sockets

Heavy-Duty Impact Sockets for power driven torquing equipment.

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Input Torque ²⁾	Torque Ratio	Input Female Square Drive	Output Male Square Drive		Over-load protection	Anti-Backlash	Dimensions (mm)						Model Number	
			S2 (inch)	Replaceable Shear Drive Model Nr.			D	H	L	L1	L2	R		
338 (Nm) / 250 (Ft.lbs)	3,3 : 1	1/2 (inch)	3/4 (inch)	-	No	No	71	84	218	-	-	-	1,8 (kg)	E290PLUS
451 (Nm) / 333 (Ft.lbs)	3,3 : 1	1/2 (inch)	3/4 (inch)	-	No	No	71	84	442	-	-	-	2,5 (kg)	E291
271 (Nm) / 200 (Ft.lbs)	6 : 1	1/2 (inch)	3/4 (inch)	E391SDK	Yes	No	100	102	498	-	-	-	6,3 (kg)	E391
219 (Nm) / 162 (Ft.lbs)	13,6 : 1	1/2 (inch)	1 (inch)	E392SDK	Yes	Yes	103	146	498	-	-	-	6,9 (kg)	E392
234 (Nm) / 173 (Ft.lbs)	18,5 : 1	1/2 (inch)	1 (inch)	E393SDK	Yes	Yes	103	165	498	-	-	-	8,3 (kg)	E393
219 (Nm) / 162 (Ft.lbs)	13,6 : 1	1/2 (inch)	1 (inch)	E392SDK	Yes	Yes	124	140	356	140	124	32	7,8 (kg)	E492
234 (Nm) / 173 (Ft.lbs)	18,5 : 1	1/2 (inch)	1 (inch)	E393SDK	Yes	Yes	124	163	356	140	124	32	10,6 (kg)	E493
256 (Nm) / 189 (Ft.lbs)	26,5 : 1	1/2 (inch)	1 1/2 (inch)	E494SDK	Yes	Yes	143	222	378	178	89	42	15,4 (kg)	E494
208 (Nm) / 154 (Ft.lbs)	52 : 1	1/2 (inch)	1 1/2 (inch)	E495SDK	Yes	Yes	148	273	386	178	89	48	22,8 (kg)	E495

¹⁾ E200 and E400-series do not have an Angle-of-Turn Protractor (scale).

²⁾ User must verify manual torque wrench accuracy prior to use to ensure accurate final output torque.

▼ From left to right: S3000X, S6000X, S1500X



Simplicity

- Includes handle to improve tool handling and safety
- 360° click-on, multi-position reaction arm
- Push button square drive release to quickly reverse 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 manoeuvrability.

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
- Accuracy of $\pm 3\%$ can be achieved because the Uni-Body construction reduces internal deflections.

Rigid Steel Design

The Professional Square Drive Solution



S-Series, Torque Wrenches

The most advanced and safe torque wrenches on the market. 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 modelling, rigorous cyclic testing and strain gauging.

ATEX 95 Certified



TSP300 Double Swivel

Featuring Tilt & Swivel technology the TSP provides 360° X-axis rotation and 160° Y-axis rotation. Includes male and female Spin-On couplers.

How to Order:

Factory fitted to S-Series wrenches (X-edition): Add suffix “P” to the torque wrench model number.

Example: **S1500PX**.

TSP300: accessory for S & W-series torque wrenches (X-edition).

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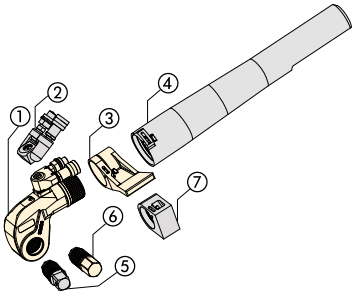
Torque Wrench Hoses

Use Enerpac THQ-700 Series torque wrench hoses with S-Series torque wrenches to ensure the integrity of your

hydraulic system.

6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T

Double-acting Square Drive Hydraulic Torque Wrenches



- ① Drive Unit
- ② Pro Series Swivel (page 183)
- ③ Reaction Arm (page 183)
- ④ Extended Reaction Arm (page 183)
- ⑤ Square Drive
- ⑥ Allen Drive (page 182)
- ⑦ Short Reaction Arm (page 182)



Use only Heavy Duty Impact Sockets

For power driven torquing equipment, according to ISO2725 and ISO1174;

DIN 3129 and DIN 3121 or ASME-B107.2/1995.

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S Series



Maximum Torque at 690 bar:

34.099 Nm

Square Drive Range:

3/4 - 2 1/2 inch

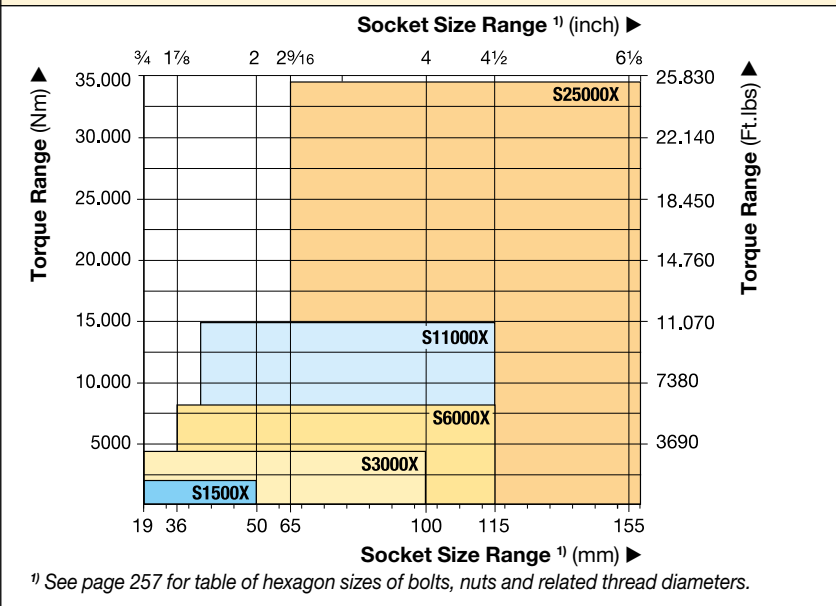
Nose Radius:

25,0 - 63,5 mm

Maximum Operating Pressure:

690 bar

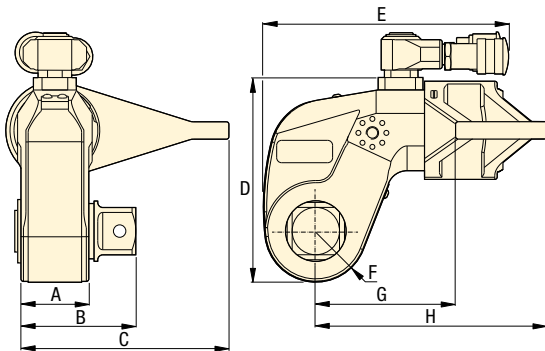
TORQUE WRENCH SELECTION (based on socket size range ¹⁾)



Torque Wrench Pump Selection Matrix



For optimum speed and performance see the torque wrench and pump matrix.

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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.

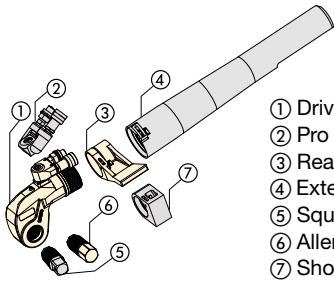


Maximum Torque at 690 bar		Square Drive		Torque Wrench Model Number *	Dimensions (mm)								(kg)	
		Size (inch)	Model Nr. (included with wrench)		A	B	C	D	E	F	G	H		
(Nm)	(Ft.lbs)													
1952	1440	3/4	SD15-012	S1500X	39	65	108	97	136	25	70	129	3,2	
4373	3225	1	SD30-100	S3000X	48	80	135	128	173	33	90	161	6,6	
8338	6150	1 1/2	SD60-108	S6000X	55	92	169	157	192	40	110	188	9,2	
15.151	11.175	1 1/2	SD110-108	S11000X	72	114	197	190	228	50	133	229	15,8	
34.099	25.150	2 1/2	SD250-208	S25000X	89	143	246	244	287	64	182	295	32,1	

See "Yellow Pages" section for torque conversions and page 260 for pressure versus torque chart.

* To order a S-series wrench fitted with the TSP swivel, add suffix "P" to the model number. Example: **S1500PX**.

SDA-Series, Allen Drives



- 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 690 bar:

34.099 Nm

Hexagon Size Allen Drive:



1/2 - 2 1/4 inch

Hexagon Size Allen Drive:

14 - 85 mm

For
S
Series



Torque Wrench	Optional Allen Drives, Imperial				Optional Allen Drives, Metric				Short Reaction Arm for Allen Drives		
	Hexagon Size ¹⁾ (inch)	Maximum Torque (Nm)	Model Number	Dim. B1 (mm)	Hexagon Size ¹⁾ (mm)	Maximum Torque (Nm)	Model Number	Dim. B1 (mm)	Model Number	Dimensions (mm) C1 H1	
 S1500X (1952 Nm)	1/2	481	SDA15-008	66	14	644	SDA15-14	66	 SRA15X	67,5	65
	5/8	936	SDA15-010	67	17	1152	SDA15-17	68			
	3/4	1620	SDA15-012	71	19	1607	SDA15-19	70			
	7/8	1952	SDA15-014	74	22	1952	SDA15-22	73			
	1	1952	SDA15-100	77	24	1952	SDA15-24	74			
S3000X (4373 Nm)	5/8	936	SDA30-010	77	17	1152	SDA30-17	77	SRA30X	80,0	74
	3/4	1620	SDA30-012	80	19	1607	SDA30-19	79			
	7/8	2569	SDA30-014	83	22	2488	SDA30-22	82			
	1	3830	SDA30-100	86	24	3234	SDA30-24	84			
	1 1/8	4373	SDA30-102	88	27	4373	SDA30-27	85			
	1 1/4	4373	SDA30-104	89	30	4373	SDA30-30	87			
	-	-	-	-	32	4373	SDA30-32	88			
S6000X (8338 Nm)	5/8	936	SDA60-010	85	17	1152	SDA60-17	86	SRA60X	91,5	89
	3/4	1620	SDA60-012	89	19	1607	SDA60-19	88			
	7/8	2569	SDA60-014	92	22	2488	SDA60-22	91			
	1	3830	SDA60-100	95	24	3234	SDA60-24	93			
	1 1/8	5457	SDA60-102	97	27	4603	SDA60-27	94			
	1 1/4	7484	SDA60-104	98	30	6311	SDA60-30	96			
	-	-	-	-	32	7660	SDA60-32	97			
S11000X (15.151 Nm)	1 1/4	7484	SDA110-104	115	30	6311	SDA110-30	112	SRA110X	127,5	106
	1 3/8	9958	SDA110-106	117	32	7660	SDA110-32	114			
	1 1/2	12.928	SDA110-108	118	36	10.901	SDA110-36	117			
	1 5/8	15.151	SDA110-110	122	41	15.151	SDA110-41	121			
	1 3/4	15.151	SDA110-112	125	46	15.151	SDA110-46	127			
S25000X (34.099 Nm)	1 1/2	12.928	SDA250-108	141	36	10.901	SDA250-36	140	SRA250X	158,5	135
	1 5/8	16.433	SDA250-110	145	41	16.107	SDA250-41	144			
	1 3/4	20.520	SDA250-112	148	46	22.744	SDA250-46	148			
	1 7/8	25.245	SDA250-114	149	50	29.211	SDA250-50	151			
	2	30.635	SDA250-200	151	55	34.099	SDA250-55	154			
	2 1/4	34.099	SDA250-204	154	60	34.099	SDA250-60	158			
	-	-	-	-	65	34.099	SDA250-65	161			
	-	-	-	-	70	34.099	SDA250-70	164			
	-	-	-	-	75	34.099	SDA250-75	168			
	-	-	-	-	85	34.099	SDA250-85	175			

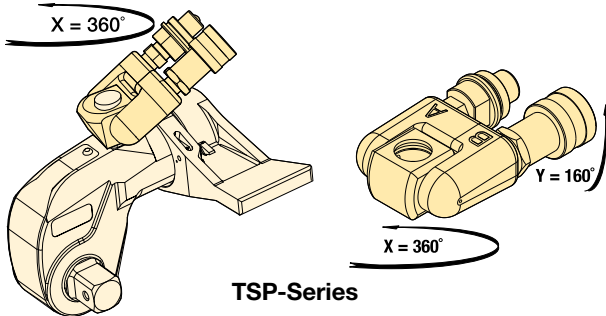
¹⁾ See page 257 for table of hexagon sizes of bolts, nuts and related thread diameters.


Accessories for S-Series Torque Wrenches

TSP-Series, Pro Series Swivels

- Featuring Tilt and Swivel technology
- 360° X-axis and 160° Y-axis rotation
- Increases tool fit in restricted access areas
- Simplifies hose placement
- Includes male and female Spin-On couplers.

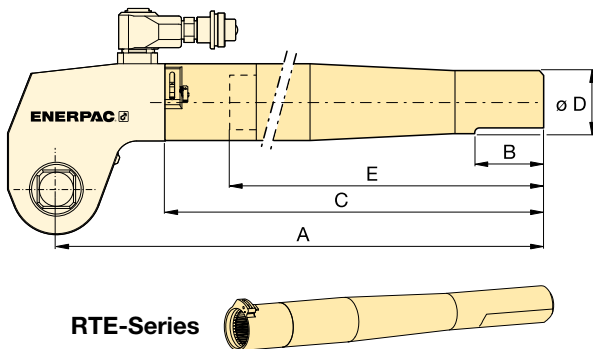
**TSP
RTE
SRS
Series**




For Torque Wrench Model Number	Model Number	Maximum Pressure (bar)	 (kg)
S1500X, S3000X	TSP300	690	0,2
S6000X, S11000X, S25000X	TSP300	690	0,2

To order an S-series wrench fitted with the TSP swivel, add suffix "P" to the model number. Example: **S1500PX**. TSP-swivel includes male (TH-630) and female (TR-630) couplers.

RTE-Series, Reaction Tube Extensions

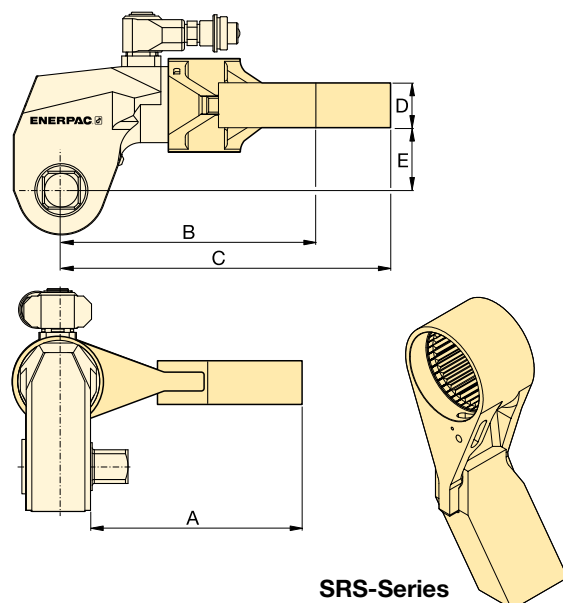


- Full torque rated
- Increases tool fit in restricted access areas.


For Torque Wrench Model Number	Model Number	Dimensions (mm)					 (kg)*
		A	B	C	D	E	
S1500X	RTE15X	706	152	636	58	600	4,6
S3000X	RTE30X	733	152	647	57	600	5,5
S6000X	RTE60X	747	152	659	65	600	7,7
S11000X	RTE110X	769	152	675	76	600	11,2
S25000X	RTE250X	813	152	685	100	600	17,3

* Weights indicated are for the accessories only and do not include the wrench.

SRS-Series, Extended Reaction Arms



- Lightweight interchangeable design.

For Wrench Model	Max. Torque (Nm)	Model Number	Dimensions (mm)					 (kg)*
			A	B	C	D	E	
S1500X	1801	SRS151X	94	86	127	24	34	0,8
	1641	SRS152X	119	97	138	24	34	1,0
	1533	SRS153X	145	109	148	24	34	1,2
S3000X	3918	SRS301X	111	106	168	34	48	1,6
	3712	SRS302X	137	117	182	34	48	2,0
	3574	SRS303X	162	132	198	34	48	2,5
S6000X	7842	SRS601X	138	128	192	39	62	2,3
	7454	SRS602X	163	144	207	39	62	2,7
	7175	SRS603X	189	159	222	39	62	3,4
S11000X	14.650	SRS1101X	149	157	232	46	76	4,4
	13.957	SRS1102X	175	172	247	46	76	5,1
	13.391	SRS1103X	200	187	261	46	76	5,8
S25000X	33.538	SRS2501X	183	209	295	50	100	7,6
	32.049	SRS2502X	208	222	310	50	100	8,4
	30.750	SRS2503X	233	236	326	50	100	10,0

* Weights indicated are for the accessories only and do not include the wrench.

BSH-Series, Heavy-Duty Sockets

- Heavy-duty impact sockets
- Supplied with "Pin and Ring"

METRIC SOCKETS

¾" Square Drive		1" Square Drive		1½" Square Drive		2½" 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	-	-	-	-

BSH Series



Hexagon Size:

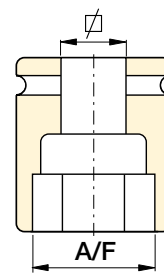
19 - 155 mm | ¾" - 6 1/8"



Select the Right Torque

Choose your Enerpac Torque Wrench using the untightening rule of thumb: Loosening torque equals about 250% of tightening torque.

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Hexagon Bolt and Nut Sizes

See the table of hexagon sizes of bolts, nuts and related thread diameters.

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IMPERIAL SOCKETS

¾" Square Drive		1" Square Drive				1½" Square Drive				2½" Square Drive			
Model Number	A/F (inch)	Model Number	A/F (inch)	Model Number	A/F (inch)	Model Number	A/F (inch)	Model Number	A/F (inch)	Model Number	A/F (inch)	Model Number	A/F (inch)
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	7/8"	BSH10088	7/8"	BSH10238	2 3/8"	BSH1538	1 1/2"	BSH15288	2 7/8"	BSH25250	2 1/2"	BSH25425	4 1/4"
BSH75094	15/16"	BSH10094	15/16"	BSH10244	2 7/16"	BSH15156	1 9/16"	BSH1575	2 15/16"	BSH2565	2 13/16"	BSH25110	4 5/16"
BSH7527	1 1/16"	BSH1027	1 1/16"	BSH10250	2 1/2"	BSH15163	1 5/8"	BSH15300	3"	BSH25263	2 5/8"	BSH25438	4 3/8"
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 1/2"
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 11/16"	BSH25475	4 ¾"
BSH7535	1 3/8"	BSH1035	1 3/8"	BSH1070	2 ¾"	BSH15188	1 7/8"	BSH15325	3 ¼"	BSH25288	2 7/8"	BSH25488	4 7/8"
BSH75144	1 7/16"	BSH10144	1 7/16"	BSH10281	2 13/16"	BSH15194	1 15/16"	BSH15338	3 3/8"	BSH2575	2 15/16"	BSH25500	5"
BSH7538	1 ½"	BSH1038	1 ½"	BSH10288	2 7/8"	BSH15200	2"	BSH15350	3 1/2"	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 1/4"
BSH7543	1 11/16"	BSH1043	1 11/16"	BSH10306	3 1/16"	BSH15219	2 3/16"	BSH15388	3 7/8"	BSH25319	3 3/16"	BSH25538	5 3/8"
BSH75175	1 ¾"	BSH10175	1 ¾"	BSH10313	3 1/8"	BSH15225	2 ¼"	BSH15100	3 15/16"	BSH25325	3 ¼"	BSH25140	5 1/2"
BSH7546	1 3/16"	BSH1046	1 13/16"	BSH10319	3 3/16"	BSH15231	2 5/16"	BSH15400	4"	BSH25338	3 3/8"	BSH25575	5 ¾"
BSH75188	1 7/8"	BSH10188	1 7/8"	BSH10325	3 ¼"	BSH15238	2 3/8"	BSH15105	4 1/8"	BSH25350	3 1/2"	BSH25150	5 7/8"
BSH75194	1 15/16"	BSH10194	1 15/16"	BSH10338	3 3/8"	BSH15244	2 7/16"	BSH15419	4 3/16"	BSH25363	3 5/8"	BSH25600	6"
BSH75200	2"	BSH10200	2"	BSH10350	3 1/2"	BSH15250	2 1/2"	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 7/8"	-	-
-	-	BSH10213	2 1/8"	BSH1095	3 ¾"	BSH15263	2 5/8"	BSH15438	4 3/8"	BSH25100	3 15/16"	-	-
-	-	BSH10219	2 3/16"	BSH10388	3 7/8"	BSH15269	2 11/16"	BSH15450	4 1/2"	BSH25400	4"	-	-
-	-	BSH10225	2 ¼"	-	-	BSH1570	2 ¾"	BSH15463	4 5/8"	BSH25105	4 1/8"	-	-

Enerpac professional series steel torque wrenches provide reliable controlled tightening solutions across the industry.

S3000X Square Drive Torque Wrench on Wind Tower erection and maintenance ►

S3000X used to connect wind tower segments during assembly and maintenance. A robust but compact solution is required for tightening of bolts 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 was selected as it offers simple and reliable operation while providing accurate and repeatable results.



◀ S3000X Square Drive Torque Wrench

Easy and reliable service in the field using Enerpac S-series torque wrenches. The handle to improve tool handling and safety.

S6000X 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 are chosen as they 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



W-Series, Torque Wrenches

The most advanced and safe torque wrenches on the market. 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 modelling, rigorous cyclic testing and strain gauging.

ATEX 95 Certified   II 2 GD T4

Simplicity

- Includes handle to improve tool handling and safety
- 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 manoeuvrability.

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 30 - 155 mm (1 1/8 - 6 1/8 inch)
- 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 $\pm 3\%$ across the full stroke
- In-line reaction foot ensures accuracy by reducing internal deflections.



TSP - Pro Series Swivel

Featuring Tilt and Swivel technology the TSP provides 360° X-axis rotation and 160° Y-axis rotation.

Includes male and female

Spin-On couplers.

How to Order

Factory fitted to new W-Series (X-edition) wrenches: Suffix the wrench model number with "P" e.g.: **W2000PX**.

TSP300: accessory for W & S-series torque wrenches (X-edition).

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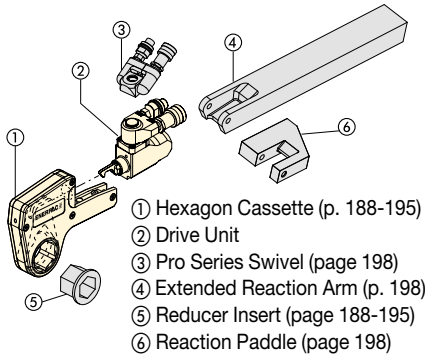


Torque Wrench Hoses

Use Enerpac THQ-700 Series hoses with W-Series torque wrenches to ensure the integrity of your hydraulic system.

6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T

Double-Acting Hydraulic Hexagon Torque Wrenches



- ① Hexagon Cassette (p. 188-195)
- ② Drive Unit
- ③ Pro Series Swivel (page 198)
- ④ Extended Reaction Arm (p. 198)
- ⑤ Reducer Insert (page 188-195)
- ⑥ Reaction Paddle (page 198)



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: 188

W Series



Maximum Torque at 690 bar:

47.454 Nm

Hexagon Range:

30-155 mm / 1 1/8 - 6 1/8"

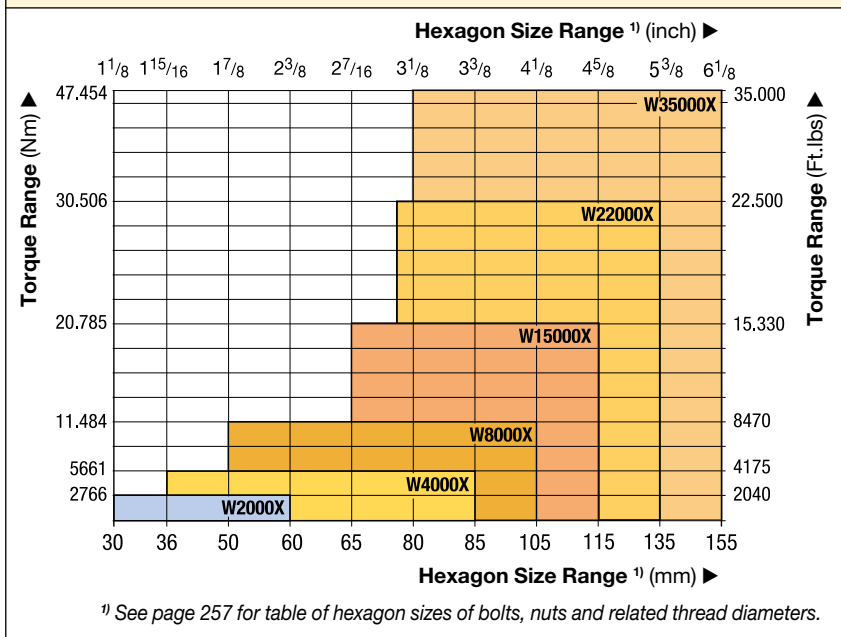
Nose Radius:

31 - 115 mm

Maximum Operating Pressure:

690 bar

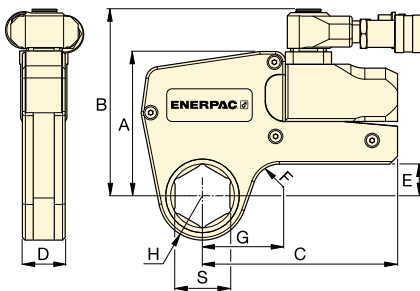
DRIVE UNIT AND INTERCHANGEABLE CASSETTE SELECTION



Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench and pump matrix.

Page: 200



These rigid steel wrenches with low profile interchangeable hexagon cassettes guarantee durability and maximum versatility in bolting applications.

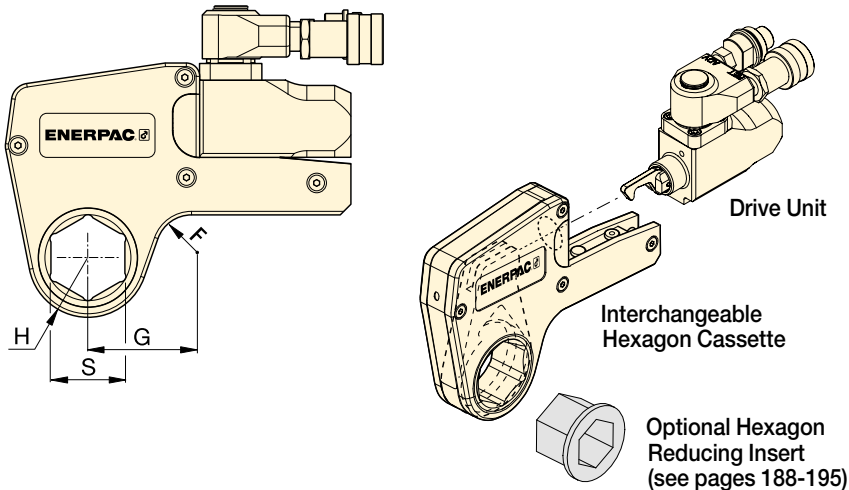


SELECTION CHART

Hexagon Range *		Maximum Torque at 690 bar		Drive Unit Model Number **	Minimum Torque		Dimensions (mm) (see pages 188-195 for dimensions G, H and S)						Weight (drive unit without hexagon cassette) (kg)
(mm)	(inch)	(Nm)	(Ft.lbs)		(Nm)	(Ft.lbs)	A	B	C	D	E	F	
30 - 60	1 1/8 - 2 3/8	2766	2040	W2000X	276	204	109	141	148	32	24	20	1,4
36 - 85	1 5/16 - 3 3/8	5661	4175	W4000X	566	417	136	167	178	41	33	20	2,0
50 - 105	1 7/8 - 4 1/8	11.484	8470	W8000X	1148	847	172	205	208	53	42	25	3,0
65 - 115	2 7/16 - 4 5/8	20.785	15.330	W15000X	2078	1533	207	240	253	63	50	20	5,0
75 - 135	2 15/16 - 5 3/8	30.506	22.500	W22000X	3050	2250	227	266	297	77	48	35	7,7
80 - 155	3 1/8 - 6 1/8	47.454	35.000	W35000X	4745	3500	268	301	345	91	69-73	50	11,4

* With in-line reaction foot. ** To order a W-series wrench fitted with the TSP swivel, suffix the model number with "-P". Example: **W2000PX**. See "Yellow Pages" section for torque conversions and page 261 for pressure versus torque chart.

W2000X, Inch-Cassettes & Reducer Inserts



W Series



Maximum Torque at 690 bar:

2766 Nm

Hexagon Range:

1 1/8 - 2 3/8 inch

Maximum Operating Pressure:

690 bar



Metric Sizes

For metric sizes of hexagon cassettes and reducer inserts see:

Page: **194**



Hexagon Bolt and Nut Sizes

See the table for hexagon sizes of bolts, nuts and related thread diameters.

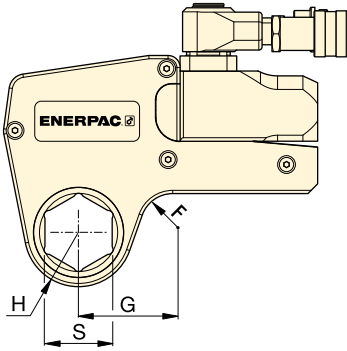
Page: **257**

▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size ¹⁾	Nose Radius	Dim.	Model Number	Weight (kg)	Hexagon Reducer		Hexagon Reducer		Hexagon Reducer	
						Hexagon Reducer (inch)	Model Number	Hexagon Reducer (inch)	Model Number	Hexagon Reducer (inch)	Model Number
W2000X	1 1/8	31,0	53,7	W2102X	2,1	-	-	-	-	-	-
	1 3/16	31,0	53,7	W2103X	2,1	-	-	-	-	-	-
	1 1/4	31,0	53,7	W2104X	2,1	-	-	-	-	-	-
	1 5/16	31,0	53,7	W2105X	2,1	-	-	-	-	-	-
	1 3/8	31,0	53,7	W2106X	2,1	-	-	-	-	-	-
	1 7/16	31,0	53,7	W2107X	2,1	1 7/16 - 1 1/8	W2107R102	-	-	-	-
	1 1/2	33,5	58,2	W2108X	2,2	-	-	-	-	-	-
	1 9/16	33,5	58,2	W2109X	2,2	-	-	-	-	-	-
	1 5/8	33,5	58,2	W2110X	2,2	1 5/8 - 1 1/4	W2110R104	1 5/8 - 1 3/16	W2110R103	-	-
	1 11/16	36,5	60,5	W2111X	2,2	-	-	-	-	-	-
	1 3/4	36,5	60,5	W2112X	2,2	-	-	-	-	-	-
	1 13/16	36,5	60,5	W2113X	2,2	1 13/16 - 1 7/16	W2113R107	1 13/16 - 1 1/4	W2113R104	-	-
	1 7/8	39,0	63,1	W2114X	2,2	-	-	-	-	-	-
	1 5/8	39,0	63,1	W2115X	2,2	-	-	-	-	-	-
	2	39,0	63,1	W2200X	2,2	2 - 1 5/8	W2200R110	2 - 1 7/16	W2200R107	-	-
	2 1/16	41,8	68,6	W2201X	2,3	-	-	-	-	-	-
	2 1/8	41,8	68,6	W2202X	2,3	-	-	-	-	-	-
	2 3/16	41,8	68,6	W2203X	2,3	2 3/16 - 1 13/16	W2203R113	2 3/16 - 1 5/8	W2203R110	2 3/16 - 1 7/16	W2203R107
	-	-	-	-	-	-	-	-	-	-	-
	2 1/4	44,5	64,8	W2204X	2,2	-	-	-	-	-	-
2 5/16	44,5	64,8	W2205X	2,2	-	-	-	-	-	-	
2 3/8	44,5	64,8	W2206X	2,2	2 3/8 - 2	W2206R200	2 3/8 - 1 7/8	W2206R114	2 3/8 - 1 13/16	W2206R113	
-	-	-	-	-	2 3/8 - 1 1/2	W2206R108	2 3/8 - 1 7/16	W2206R107	2 3/8 - 1 5/16	W2206R110	

¹⁾ See page 257 for table of hexagon sizes of bolts, nuts and related thread diameters.

W4000X-Series, Inch-Cassettes & Reducer Inserts



Maximum Torque at 690 bar:

5661 Nm

Hexagon Range:

1⁵/₁₆ - 3³/₈ inch

Maximum Operating Pressure:

690 bar

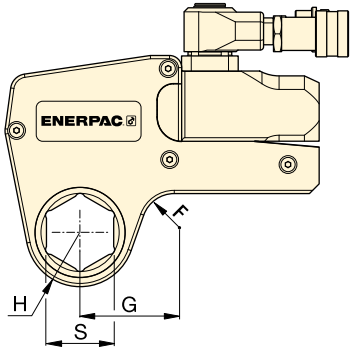
**W
Series**



Drive Unit Model Number	Hexagon Size ¹⁾	Nose Radius	Dim.	Model Number	Weight	Hexagon Reducer		Hexagon Reducer		Hexagon Reducer	
						Hexagon Reducer (inch)	Model Number	Hexagon Reducer (inch)	Model Number	Hexagon Reducer (inch)	Model Number
W4000X	S (inch)	H (mm)	G (mm)		(kg)						
	1 ⁵ / ₁₆	37,0	61,0	W4105X	3,7	-	-	-	-	-	-
	1 ³ / ₈	37,0	61,0	W4106X	3,7	-	-	-	-	-	-
	1 ⁷ / ₁₆	37,0	61,0	W4107X	3,7	-	-	-	-	-	-
	1 ¹ / ₂	37,0	61,0	W4108X	3,7	-	-	-	-	-	-
	1 ⁹ / ₁₆	37,0	61,0	W4109X	3,7	-	-	-	-	-	-
	1 ⁵ / ₈	37,0	61,0	W4110X	3,7	-	-	-	-	-	-
	1 ¹¹ / ₁₆	39,5	64,0	W4111X	3,8	-	-	-	-	-	-
	1 ³ / ₄	39,5	64,0	W4112X	3,8	-	-	-	-	-	-
	1 ¹³ / ₁₆	39,5	64,0	W4113X	3,8	-	-	-	-	-	-
	1 ⁷ / ₈	41,5	66,7	W4114X	3,9	-	-	-	-	-	-
	1 ¹⁵ / ₁₆	41,5	66,7	W4115X	3,9	-	-	-	-	-	-
	2	41,5	66,7	W4200X	3,9	2 - 1 ⁷ / ₈	W4200R107	-	-	-	-
	2 ¹ / ₁₆	44,0	73,4	W4201X	4,0	-	-	-	-	-	-
	2 ¹ / ₈	44,0	73,4	W4202X	4,0	-	-	-	-	-	-
	2 ³ / ₁₆	44,0	73,4	W4203X	4,0	2 ³ / ₁₆ - 1 ⁵ / ₈	W4203R110	2 ³ / ₁₆ - 1 ⁷ / ₁₆	W4203R107	2 ³ / ₁₆ - 1 ¹ / ₄	W4203R104
	2 ¹ / ₄	46,5	70,6	W4204X	4,1	-	-	-	-	-	-
	2 ⁵ / ₁₆	46,5	70,6	W4205X	4,1	-	-	-	-	-	-
	2 ³ / ₈	46,5	70,6	W4206X	4,1	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	W4206R106	-	-	-	-
	2 ⁷ / ₁₆	49,5	76,2	W4207X	4,1	2 ⁷ / ₁₆ - 2	W4207R200	-	-	-	-
	2 ¹ / ₂	49,5	76,2	W4208X	4,1	2 ¹ / ₂ - 2	W4208R200	2 ¹ / ₂ - 1 ⁷ / ₁₆	W4208R113	2 ¹ / ₂ - 2 ¹ / ₁₆	W4208R201
	2 ⁹ / ₁₆	49,5	76,2	W4209X	4,1	2 ⁹ / ₁₆ - 2 ³ / ₁₆	W4209R203	2 ⁹ / ₁₆ - 2 ¹ / ₈	W4209R202	2 ⁹ / ₁₆ - 2 ¹ / ₁₆	W4209R201
	-	-	-	-	-	2 ⁹ / ₁₆ - 2	W4209R200	2 ⁹ / ₁₆ - 1 ¹³ / ₁₆	W4209R113	-	-
	2 ⁵ / ₈	52,5	78,3	W4210X	4,2	-	-	-	-	-	-
	2 ¹¹ / ₁₆	52,5	78,3	W4211X	4,2	-	-	-	-	-	-
	2 ³ / ₄	52,5	78,3	W4212X	4,2	2 ³ / ₄ - 2 ³ / ₈	W4212R206	2 ³ / ₄ - 2 ³ / ₁₆	W4212R203	2 ³ / ₄ - 2 ¹ / ₈	W4212R202
	2 ¹³ / ₁₆	55,3	81,6	W4213X	4,3	-	-	-	-	-	-
	2 ⁷ / ₈	55,3	81,6	W4214X	4,3	-	-	-	-	-	-
	2 ¹⁵ / ₁₆	55,3	81,6	W4215X	4,3	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	58,5	83,5	W4300X	4,4	3 - 2 ⁹ / ₁₆	W4300R203	-	-	-	-
	3 ¹ / ₁₆	58,5	83,5	W4301X	4,4	-	-	-	-	-	-
	3 ¹ / ₈	58,5	83,5	W4302X	4,4	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 ³ / ₁₆	W4302R203	3 ¹ / ₈ - 2 ¹ / ₈	W4302R202	3 ¹ / ₈ - 2	W4302R200
3 ³ / ₁₆	62,0	85,5	W4303X	4,5	-	-	-	-	-	-	
3 ¹ / ₄	62,0	85,5	W4304X	4,5	-	-	-	-	-	-	
3 ⁵ / ₁₆	62,0	85,5	W4305X	4,5	-	-	-	-	-	-	
3 ³ / ₈	62,0	85,5	W4306X	4,5	-	-	-	-	-	-	

¹⁾ See page 257 for table of hexagon sizes of bolts, nuts and related thread diameters.

W8000X-Series, Inch-Cassettes & Reducers



Maximum Torque at 690 bar:

11.484 Nm

Hexagon Range:

1⁷/₈ - 4¹/₈ inch






Maximum Operating Pressure:

690 bar

W Series

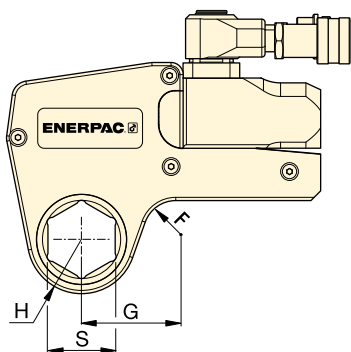


▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size ¹⁾	Nose Radius	Dim.	Model Number							
						Hexagon Reducer (inch)	Model Number	Hexagon Reducer (inch)	Model Number	Hexagon Reducer (inch)	Model Number
W8000X	S (inch)	H (mm)	G (mm)		(kg)						
	1 ⁷ / ₈	45,0	78,2	W8114X	8,1	–	–	–	–	–	–
	1 ¹⁵ / ₁₆	45,0	78,2	W8115X	8,1	–	–	–	–	–	–
	2	45,0	78,2	W8200X	8,1	–	–	–	–	–	–
	2 ¹ / ₁₆	48,0	80,0	W8201X	8,1	–	–	–	–	–	–
	2 ¹ / ₈	48,0	80,0	W8202X	8,1	–	–	–	–	–	–
	2 ³ / ₁₆	48,0	80,0	W8203X	8,1	–	–	–	–	–	–
	2 ¹ / ₄	51,0	82,5	W8204X	8,1	–	–	–	–	–	–
	2 ⁵ / ₁₆	51,0	82,5	W8205X	8,1	–	–	–	–	–	–
	2 ³ / ₈	51,0	82,5	W8206X	8,1	–	–	–	–	–	–
	2 ⁷ / ₁₆	52,5	85,9	W8207X	8,1	–	–	–	–	–	–
	2 ¹ / ₂	52,5	85,9	W8208X	8,1	–	–	–	–	–	–
	2 ⁹ / ₁₆	52,5	85,9	W8209X	8,1	2 ⁹ / ₁₆ - 2	W8209R200	–	–	–	–
	2 ⁵ / ₈	56,0	84,8	W8210X	8,1	–	–	–	–	–	–
	2 ¹¹ / ₁₆	56,0	84,8	W8211X	7,9	–	–	–	–	–	–
	2 ³ / ₄	56,0	84,8	W8212X	7,9	2 ³ / ₄ - 2 ³ / ₁₆	W8212R203	–	–	–	–
	2 ¹³ / ₁₆	58,0	85,0	W8213X	7,9	–	–	–	–	–	–
	2 ⁷ / ₈	58,0	85,0	W8214X	7,9	–	–	–	–	–	–
	2 ¹⁵ / ₁₆	58,0	85,0	W8215X	7,9	2 ¹⁵ / ₁₆ - 2 ³ / ₈	W8215R206	2 ¹⁵ / ₁₆ - 2 ³ / ₁₆	W8215R203	–	–
	3	60,5	89,5	W8300X	8,0	–	–	–	–	–	–
	3 ¹ / ₁₆	60,5	89,5	W8301X	8,0	–	–	–	–	–	–
	3 ¹ / ₈	60,5	89,5	W8302X	8,0	3 ¹ / ₈ - 2 ⁹ / ₁₆	W8302R209	3 ¹ / ₈ - 2 ³ / ₈	W8302R206	3 ¹ / ₈ - 2 ⁹ / ₁₆	W8302R203
	–	–	–	–	–	3 ¹ / ₈ - 2	W8302R200	–	–	–	–
	3 ³ / ₁₆	66,0	92,2	W8303X	8,2	–	–	–	–	–	–
	3 ¹ / ₄	66,0	92,2	W8304X	8,2	–	–	–	–	–	–
	3 ⁵ / ₁₆	66,0	92,2	W8305X	8,2	–	–	–	–	–	–
	3 ³ / ₈	66,0	92,2	W8306X	8,2	–	–	–	–	–	–
	3 ⁷ / ₁₆	66,0	92,2	W8307IX	8,2	–	–	–	–	–	–
	3 ¹ / ₂	66,0	92,2	W8308X	8,2	3 ¹ / ₂ - 3	W8308R300	3 ¹ / ₂ - 2 ¹⁵ / ₁₆	W8308R215	3 ¹ / ₂ - 2 ³ / ₄	W8308R212
	3 ⁹ / ₁₆	74,0	102,9	W8309X	8,8	–	–	–	–	–	–
	3 ⁵ / ₈	74,0	102,9	W8310X	8,8	–	–	–	–	–	–
	3 ¹¹ / ₁₆	74,0	102,9	W8311X	8,8	–	–	–	–	–	–
3 ³ / ₄	74,0	102,9	W8312X	8,8	3 ³ / ₄ - 3 ¹ / ₈	W8312R302	3 ³ / ₄ - 2 ¹⁵ / ₁₆	W8312R215	3 ³ / ₄ - 2 ³ / ₄	W8312R212	
3 ¹³ / ₁₆	74,0	102,9	W8313X	8,8	–	–	–	–	–	–	
3 ⁷ / ₈	74,0	102,9	W8314X	8,8	3 ⁷ / ₈ - 3 ¹ / ₈	W8314R302	3 ⁷ / ₈ - 2 ¹⁵ / ₁₆	W8314R215	–	–	
3 ¹⁵ / ₁₆	79,5	110,0	W8315X	9,3	–	–	–	–	–	–	
4	79,5	110,0	W8400X	9,3	–	–	–	–	–	–	
4 ¹ / ₁₆	79,5	110,0	W8401IX	9,3	–	–	–	–	–	–	
4 ¹ / ₈	79,5	110,0	W8402X	9,3	–	–	–	–	–	–	

¹⁾ See page 257 for table of hexagon sizes of bolts, nuts and related thread diameters.

W15000X-Series, Inch-Cassettes & Reducer Inserts



Maximum Torque at 690 bar:

20.785 Nm

Hexagon Range:

2¹/₈ - 4⁵/₈ inch

Maximum Operating Pressure:

690 bar

W Series

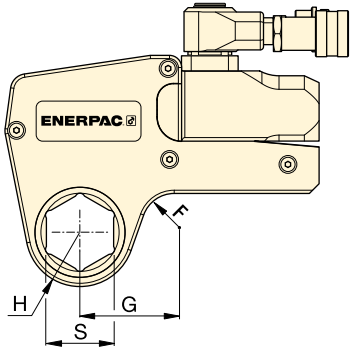


▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size ¹⁾	Nose Radius	Dim.	Model Number	Weight	Hexagon Reducer		Hexagon Reducer		Hexagon Reducer	
						Hexagon Reducer (inch)	Model Number	Hexagon Reducer (inch)	Model Number	Hexagon Reducer (inch)	Model Number
W15000X	2 ⁷ / ₁₆	59,0	88,6	W15207X	13,6	-	-	-	-	-	-
	2 ¹ / ₂	59,0	88,6	W15208X	13,6	-	-	-	-	-	-
	2 ⁹ / ₁₆	59,0	88,6	W15209X	13,6	-	-	-	-	-	-
	2 ⁵ / ₈	59,0	88,6	W15210X	13,6	-	-	-	-	-	-
	2 ¹¹ / ₁₆	59,0	88,6	W15211X	13,6	-	-	-	-	-	-
	2 ³ / ₄	59,0	88,6	W15212X	13,6	-	-	-	-	-	-
	2 ¹³ / ₁₆	62,0	90,5	W15213X	13,7	-	-	-	-	-	-
	2 ⁷ / ₈	62,0	90,5	W15214X	13,7	-	-	-	-	-	-
	2 ¹⁵ / ₁₆	62,0	90,5	W15215X	13,7	-	-	-	-	-	-
	3	64,5	92,9	W15300X	13,8	3 - 2 ¹ / ₈	W15300R202	-	-	-	-
	3 ¹ / ₁₆	64,5	92,9	W15301X	13,8	-	-	-	-	-	-
	3 ¹ / ₈	64,5	92,9	W15302X	13,8	3 ¹ / ₈ - 2 ⁹ / ₁₆	W15302R209	-	-	-	-
	3 ³ / ₁₆	69,5	96,6	W15303X	14,1	-	-	-	-	-	-
	3 ¹ / ₄	69,5	96,6	W15304X	14,1	-	-	-	-	-	-
	3 ⁵ / ₁₆	69,5	96,6	W15305X	14,1	-	-	-	-	-	-
	3 ³ / ₈	69,5	96,6	W15306X	14,1	-	-	-	-	-	-
	3 ⁷ / ₁₆	69,5	96,6	W15307IX	14,1	-	-	-	-	-	-
	3 ¹ / ₂	69,5	96,6	W15308X	14,1	3 ¹ / ₂ - 2 ¹⁵ / ₁₆	W15308R215	3 ¹ / ₂ - 2 ³ / ₄	W15308R212	-	-
	3 ⁹ / ₁₆	75,0	101,8	W15309X	14,6	-	-	-	-	-	-
	3 ⁵ / ₈	75,0	101,8	W15310X	14,6	-	-	-	-	-	-
	3 ¹¹ / ₁₆	75,0	101,8	W15311X	14,6	-	-	-	-	-	-
	3 ³ / ₄	75,0	101,8	W15312X	14,6	3 ³ / ₄ - 3 ¹ / ₈	W15312R302	3 ³ / ₄ - 2 ¹⁵ / ₁₆	W15312R215	-	-
	3 ¹³ / ₁₆	75,0	101,8	W15313X	14,5	-	-	-	-	-	-
	3 ⁷ / ₈	75,0	101,8	W15314X	14,5	3 ⁷ / ₈ - 3 ¹ / ₈	W15314R302	3 ⁷ / ₈ - 2 ¹⁵ / ₁₆	W15314R215	-	-
	3 ¹⁵ / ₁₆	80,5	103,1	W15315X	14,8	-	-	-	-	-	-
	4	80,5	103,1	W15400X	14,8	-	-	-	-	-	-
	4 ¹ / ₁₆	80,5	103,1	W15401IX	14,8	-	-	-	-	-	-
	4 ¹ / ₈	80,5	103,1	W15402X	14,8	4 ¹ / ₈ - 3 ¹ / ₂	W15402R308	4 ¹ / ₈ - 3 ⁵ / ₁₆	W15402R305	4 ¹ / ₈ - 3 ¹ / ₄	W15402R304
	4 ³ / ₁₆	80,5	103,1	W15403IX	14,8	-	-	-	-	-	-
	4 ¹ / ₄	80,5	103,1	W15404X	14,8	4 ¹ / ₄ - 3 ¹ / ₂	W15404R308	4 ¹ / ₄ - 3 ¹ / ₈	W15404R302	-	-
	4 ⁵ / ₁₆	87,5	114,8	W15405X	15,1	-	-	-	-	-	-
	4 ³ / ₈	87,5	114,8	W15406X	15,1	-	-	-	-	-	-
4 ⁷ / ₁₆	87,5	114,8	W15407X	15,1	-	-	-	-	-	-	
4 ¹ / ₂	87,5	114,8	W15408IX	15,1	-	-	-	-	-	-	
4 ⁹ / ₁₆	87,5	114,8	W15409IX	15,1	-	-	-	-	-	-	
4 ⁵ / ₈	87,5	114,8	W15410IX	15,1	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	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	

¹⁾ See page 257 for table of hexagon sizes of bolts, nuts and related thread diameters.

W22000X, Inch-Cassettes & Reducers



Maximum Torque at 690 bar:

30.506 Nm

Hexagon Range:

2¹⁵/₁₆ - 5³/₈ inch

Maximum Operating Pressure:

690 bar

W
Series

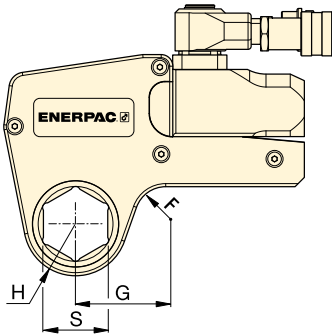


▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size ¹⁾ S (inch)	Nose Radius H (mm)	G (mm)	Model Nr. Cassette	Weight (kg)	Hexagon Reducer		Hexagon Reducer		Hexagon Reducer	
						Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer
W22000X	2 ¹⁵ / ₁₆	67,0	102,1	W22215X	22,1	-	-	-	-	-	-
	3	67,0	102,1	W22300X	22,0	-	-	-	-	-	-
	3 ¹ / ₁₆	67,0	102,1	W22301X	21,9	-	-	-	-	-	-
	3 ¹ / ₈	67,0	102,1	W22302X	21,6	3 ¹ / ₈ - 2 ³ / ₈	W22302R206	3 ¹ / ₈ - 2 ³ / ₁₆	W22302R203	-	-
	3 ³ / ₁₆	72,4	107,4	W22303X	22,9	-	-	-	-	-	-
	3 ¹ / ₄	72,4	107,4	W22304X	22,8	-	-	-	-	-	-
	3 ⁵ / ₁₆	72,4	107,4	W22305X	22,6	-	-	-	-	-	-
	3 ³ / ₈	72,4	107,4	W22306X	22,5	-	-	-	-	-	-
	3 ⁷ / ₁₆	72,4	107,4	W22307X	22,8	-	-	-	-	-	-
	3 ¹ / ₂	72,4	107,4	W22308X	22,2	3 ¹ / ₂ - 2 ³ / ₄	W22308R212	3 ¹ / ₂ - 2 ⁹ / ₁₆	W22308R209	3 ¹ / ₂ - 2 ³ / ₈	W22308R206
	3 ⁹ / ₁₆	77,9	113,0	W22309X	23,4	-	-	-	-	-	-
	3 ⁵ / ₈	77,9	113,0	W22310X	23,3	-	-	-	-	-	-
	3 ¹¹ / ₁₆	77,9	113,0	W22311X	23,1	-	-	-	-	-	-
	3 ³ / ₄	77,9	113,0	W22312X	22,9	3 ³ / ₄ - 2 ¹⁵ / ₁₆	W22312R215	-	-	-	-
	3 ¹³ / ₁₆	77,9	113,0	W22313X	22,8	-	-	-	-	-	-
	3 ⁷ / ₈	77,9	113,0	W22314X	22,6	3 ⁷ / ₈ - 3 ¹ / ₈	W22314R302	3 ⁷ / ₈ - 2 ¹⁵ / ₁₆	W22314R215	3 ⁷ / ₈ - 2 ³ / ₄	W22314R212
	3 ¹⁵ / ₁₆	85,1	119,9	W22315X	24,3	-	-	-	-	-	-
	4	85,1	119,9	W22400X	24,1	-	-	-	-	-	-
	4 ¹ / ₁₆	85,1	119,9	W22401X	24,0	-	-	-	-	-	-
	4 ¹ / ₈	85,1	119,9	W22402X	23,6	-	-	-	-	-	-
	4 ³ / ₁₆	85,1	119,9	W22403X	23,6	-	-	-	-	-	-
	4 ¹ / ₄	85,1	119,9	W22404X	24,6	4 ¹ / ₄ - 3 ¹ / ₂	W22404R308	4 ¹ / ₄ - 3 ¹ / ₈	W22404R302	4 ¹ / ₄ - 2 ¹⁵ / ₁₆	W22404R215
	4 ⁵ / ₁₆	89,9	125,0	W22405X	24,6	-	-	-	-	-	-
	4 ³ / ₈	89,9	125,0	W22406X	24,5	-	-	-	-	-	-
	4 ⁷ / ₁₆	89,9	125,0	W22407X	24,3	-	-	-	-	-	-
	4 ¹ / ₂	89,9	125,0	W22408X	24,1	-	-	-	-	-	-
	4 ⁹ / ₁₆	89,9	125,0	W22409X	23,9	-	-	-	-	-	-
	4 ⁵ / ₈	89,9	125,0	W22410X	23,6	4 ⁵ / ₈ - 3 ⁷ / ₈	W22410R314	4 ⁵ / ₈ - 3 ³ / ₄	W22410R312	4 ⁵ / ₈ - 3 ¹ / ₂	W22410R308
	4 ³ / ₄	95,0	130,0	W22412X	24,7	-	-	-	-	-	-
	4 ⁷ / ₈	95,0	130,0	W22414X	24,3	-	-	-	-	-	-
	5	95,0	130,0	W22500X	23,8	5 - 4 ¹ / ₄	W22500R404	5 - 4 ¹ / ₈	W22500R402	5 - 3 ⁷ / ₈	W22500R314
	5 ¹ / ₈	100,0	134,8	W22502X	25,0	-	-	-	-	-	-
5 ³ / ₁₆	100,0	134,8	W22503X	24,8	-	-	-	-	-	-	
5 ¹ / ₄	100,0	134,8	W22504X	24,5	-	-	-	-	-	-	
5 ³ / ₈	100,0	134,8	W22506X	23,9	5 ³ / ₈ - 4 ⁵ / ₈	W22506R410	5 ³ / ₈ - 4 ¹ / ₄	W22506R404	5 ³ / ₈ - 4 ¹ / ₈	W22506R402	
-	-	-	W22506X	23,9	5 ³ / ₈ - 3 ⁷ / ₈	W22506R314	-	-	-	-	

¹⁾ See page 257 for table of hexagon sizes of bolts, nuts and related thread diameters.

W35000X, Inch-Cassettes & Reducer Inserts



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size S (inch)	Nose Radius H (mm)	G (mm)	Model Nr. Cassette	Weight (kg)	Reducer Options	
						Hexagon Reducer (inch)	Model Number Reducer
W35000X	3 ¹ / ₈	76,0	126,8	W35302X	32,8	3 ¹ / ₈ - 2	W35302R200
	3 ³ / ₁₆	76,0	126,8	W35303X	32,7	-	-
	3 ¹ / ₄	76,0	126,8	W35304X	32,5	-	-
	3 ⁵ / ₁₆	76,0	126,8	W35305X	32,4	-	-
	3 ³ / ₈	76,0	126,8	W35306X	32,2	-	-
	3 ⁷ / ₁₆	76,0	126,8	W35307X	32,0	-	-
	3 ¹ / ₂	76,0	126,8	W35308X	31,8	3 ¹ / ₂ - 2 ⁵ / ₁₆	W35308R205
	3 ⁹ / ₁₆	81,5	132,5	W35309X	32,4	-	-
	3 ⁵ / ₈	81,5	132,5	W35310X	33,3	-	-
	3 ¹¹ / ₁₆	81,5	132,5	W35311X	33,1	-	-
	3 ³ / ₄	81,5	132,5	W35312X	32,9	-	-
	3 ¹³ / ₁₆	81,5	132,5	W35313X	32,7	-	-
	3 ⁷ / ₈	81,5	132,5	W35314X	32,4	3 ⁷ / ₈ - 2 ¹¹ / ₁₆	W35314R211
	3 ¹⁵ / ₁₆	87,0	137,0	W35315X	34,1	3 ¹⁵ / ₁₆ - 2 ¹³ / ₁₆	W35315R213
	4	87,0	137,0	W35400X	33,9	-	-
	4 ¹ / ₁₆	87,0	137,0	W35401X	33,7	-	-
	4 ¹ / ₈	87,0	137,0	W35402X	33,5	-	-
	4 ³ / ₁₆	87,0	137,0	W35403X	33,3	-	-
	4 ¹ / ₄	87,0	137,0	W35404X	33,0	4 ¹ / ₄ - 3 ¹ / ₁₆	W35404R301
	4 ⁵ / ₁₆	93,0	143,0	W35405X	34,9	-	-
	4 ³ / ₈	93,0	143,0	W35406X	34,7	-	-
	4 ⁷ / ₁₆	93,0	143,0	W35407X	34,5	-	-
	4 ¹ / ₂	93,0	143,0	W35408X	34,3	-	-
	4 ⁹ / ₁₆	93,0	143,0	W35409X	34,1	-	-
	4 ⁵ / ₈	93,0	143,0	W35410X	33,7	4 ⁵ / ₈ - 3 ⁵ / ₈	W35410R310
	4 ³ / ₄	98,5	148,5	W35412X	35,6	4 ³ / ₄ - 3 ³ / ₄	W35412R312
	4 ⁷ / ₈	98,5	148,5	W35414X	34,9	-	-
	5	98,5	148,5	W35500X	34,3	5 - 4	W35500R400
	5 ¹ / ₈	103,0	153,0	W35502X	35,8	5 ¹ / ₈ - 4 ¹ / ₈	W35502R402
	5 ³ / ₁₆	103,0	153,0	W35503X	35,6	-	-
	5 ¹ / ₄	103,0	153,0	W35504X	35,2	-	-
	5 ³ / ₈	103,0	153,0	W35506X	34,6	5 ³ / ₈ - 4 ⁵ / ₁₆	W35506R405
5 ¹ / ₂	108,5	158,5	W35508X	36,2	-	-	
5 ⁹ / ₁₆	108,5	158,5	W35509X	36,0	-	-	
5 ⁵ / ₈	108,5	158,5	W35510X	35,6	-	-	
5 ³ / ₄	108,5	164,0	W35512X	34,9	5 ³ / ₄ - 4 ³ / ₄	W35512R412	
5 ⁷ / ₈	114,0	164,0	W35514X	36,7	5 ⁷ / ₈ - 4 ⁷ / ₈	W35514R414	
6	114,0	164,0	W35600X	36,1	-	-	
6 ¹ / ₈	114,0	164,0	W35602X	35,3	6 ¹ / ₈ - 5 ¹ / ₈	W35602R502	

W Series



Maximum Torque at 690 bar:

47.454 Nm

Hexagon Range:

3¹/₈ - 6¹/₈ inch

Maximum Operating Pressure:

690 bar

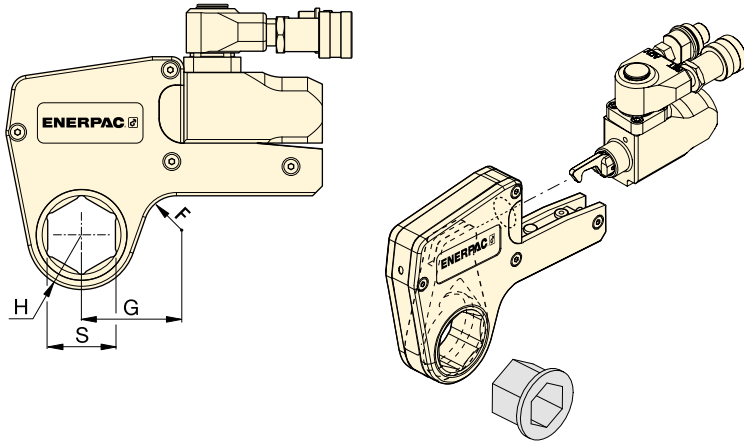


Hexagon Bolt and Nut Sizes

See the table for hexagon sizes of bolts, nuts and related thread diameters.

Page: 257

W-Series, Metric Cassettes and Reducers



W Series







Hexagon Range:

24 - 105 mm

Maximum Operating Pressure:

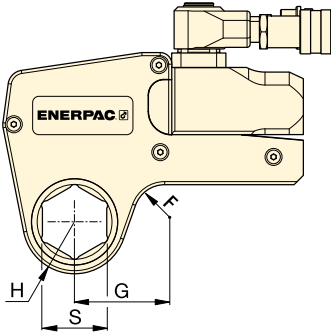
690 bar

▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size ¹⁾ S (mm)	Nose Radius H (mm)	Dim. G (mm)	Model Nr. Cassette	 (kg)						
						Hexagon Reducer (mm)	Model Number Reducer	Hexagon Reducer (mm)	Model Number Reducer	Hexagon Reducer (mm)	Model Number Reducer
W2000X (2766 Nm)	30	31	54	W2103X	2,1	-	-	-	-	-	-
	32	31	54	W2104X	2,1	-	-	-	-	-	-
	36	31	54	W2107X	2,1	-	-	-	-	-	-
	38	34	58	W2108X	2,2	-	-	-	-	-	-
	41	34	58	W2110X	2,2	41 - 32	W2110R104	41 - 30	W2110R103	41 - 24	W2110R024M
	46	34	61	W2113X	2,2	46 - 36	W2113R107	46 - 32	W2113R104	-	-
	50	39	63	W2200X	2,2	50 - 41	W2200R110	50 - 36	W2200R107	-	-
	55	42	69	W2203X	2,3	55 - 46	W2203R113	55 - 41	W2203R110	55 - 36	W2203R107
	60	45	65	W2206X	2,2	60 - 50	W2206R200	60 - 46	W2206R113	60 - 41	W2206R110
	-	-	-	-	-	-	60 - 36	W2206R107	-	-	-
W4000X (5661 Nm)	36	37	61	W4107X	3,7	-	-	-	-	-	-
	41	37	61	W4110X	3,7	-	-	-	-	-	-
	46	40	64	W4113X	3,8	-	-	-	-	-	-
	50	42	67	W4200X	3,9	50 - 36	W4200R107	-	-	-	-
	55	44	73	W4203X	4,0	55 - 41	W4203R110	55 - 36	W4203R107	55 - 32	W4203R104
	60	47	71	W4206X	4,1	60 - 50	W4206R200	60 - 46	W4206R113	60 - 36	W4206R107
	65	50	76	W4209X	4,1	65 - 55	W4209R203	65 - 50	W4209R200	65 - 46	W4209R113
	70	53	78	W4212X	4,2	70 - 60	W4212R206	70 - 55	W4212R203	-	-
	75	55	82	W4215X	4,3	75 - 65	W4215R209	75 - 60	W4215R206	-	-
	-	-	-	W4215X	-	75 - 55	W4215R203	75 - 50	W4215R200	-	-
80	59	84	W4302X	4,4	80 - 75	W4302R215	80 - 70	W4302R212	80 - 65	W4302R209	
-	-	-	W4302X	-	80 - 55	W4302R203	80 - 50	W4302R200	-	-	
85	62	86	W4085MX	4,5	-	-	-	-	-	-	
W8000X (11.484 Nm)	50	45	78	W8200X	8,1	-	-	-	-	-	-
	55	48	80	W8203X	8,1	-	-	-	-	-	-
	60	51	83	W8206X	8,1	-	-	-	-	-	-
	65	56	85	W8209X	8,1	65 - 50	W8209R200	-	-	-	-
	70	56	85	W8212X	7,9	70 - 55	W8212R203	-	-	-	-
	75	58	85	W8215X	7,9	75 - 60	W8215R206	75 - 55	W8215R203	-	-
	80	61	90	W8302X	8	80 - 65	W8302R209	80 - 60	W8302R206	80 - 55	W8302R203
	-	-	-	-	-	80 - 50	W8302R200	-	-	-	-
	85	66	92	W8085MX	8,2	85 - 70	W8085R070M	85 - 65	W8085R065M	85 - 60	W8085R060M
	-	-	-	-	-	85 - 55	W8085R055M	-	-	-	-
	90	74	103	W8090MX	8,8	90 - 75	W8090R075M	-	-	-	-
	95	74	103	W8312X	8,8	95 - 80	W8312R302	95 - 75	W8312R215	-	-
	100	80	110	W8315X	9,3	-	-	-	-	-	-
105	80	110	W8402X	9,3	-	-	-	-	-	-	

¹⁾ See page 257 for table of hexagon sizes of bolts, nuts and related thread diameters.

W-Series, Metric Cassettes and Reducers



Hexagon Range:

50 - 155 mm

Maximum Operating Pressure:

690 bar

**W
Series**



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size ¹⁾	Nose Radius	Dim.	Model Nr. Cassette	Weight (kg)	Hexagon Reducer		Model Number Reducer	
						Hexagon Reducer (mm)	Model Number Reducer	Hexagon Reducer (mm)	Model Number Reducer
W15000X (20.785 Nm)	65	59	89	W15209X	13,6	-	-	-	-
	70	59	89	W15212X	13,6	-	-	-	-
	75	62	91	W15215X	13,7	-	-	-	-
	80	65	93	W15302X	13,8	80 - 65	W15302R209	-	-
	85	70	97	W15085MX	14,1	85 - 70	W15085R070M	-	-
	90	75	102	W15090MX	14,5	90 - 75	W15090R75M	-	-
	95	75	102	W15312X	14,6	95 - 80	W15312R302	95 - 75	W15312R215
	100	81	103	W15315X	14,8	-	-	-	-
	105	81	103	W15402X	14,8	105 - 90	W15402R090M	-	-
	110	88	115	W15405X	15,1	110 - 95	W15110R095M	-	-
	115	88	115	W15115MX	15,1	115 - 100	W15115R100M	-	-
W22000X (30.506 Nm)	75	67	102	W22215X	22,0	-	-	-	-
	80	67	102	W22302X	21,6	80-60	W22302R206	80 - 55	W22302R203
	85	73	107	W22085MX	22,5	85-65	W22085MR209	85 - 60	W22085MR206
	90	78	113	W22090MX	23,4	90-70	W22090M212	90 - 60	W22090MR206
	95	78	113	W22312X	22,9	95-75	W22312R215	-	-
	100	85	120	W22315X	24,3	-	-	-	-
	105	85	120	W22402X	23,4	-	-	-	-
	110	90	125	W22405X	24,6	-	-	-	-
	115	90	125	W22115MX	24,0	-	-	-	-
	120	95	130	W22412X	24,7	-	-	-	-
	123	95	130	W22123MX	24,4	-	-	-	-
W35000X (47.454 Nm)	130	100	135	W22502X	25,0	-	-	-	-
	135	100	135	W22506X	23,9	135 - 105	W22506R402	-	-
	80	77	129	W35302X	32,8	80 - 50	W35302R200	-	-
	85	77	129	W35085MX	32,3	-	-	-	-
	90	82	135	W35090MX	33,5	90 - 60	W35090R206	-	-
	95	82	135	W35312X	32,9	-	-	-	-
	100	88	139	W35315X	34,1	-	-	-	-
	105	88	139	W35402X	33,5	-	-	-	-
	110	94	146	W35405X	34,9	110 - 85	W35405R085M	-	-
	115	94	146	W35115MX	34,2	-	-	-	-
	120	100	153	W35412X	35,6	120 - 95	W35412R312	-	-
	123	100	153	W35123MX	35,0	-	-	-	-
	130	104	160	W35502X	35,8	130 - 105	W35502R402	-	-
	135	104	160	W35506X	34,6	135 - 110	W35506R405	-	-
	140	110	163	W35508X	36,2	140 - 115	W35508R115M	-	-
	145	110	163	W35512X	34,9	145 - 120	W35512R412	-	-
	150	115	169	W35514X	36,7	-	-	-	-
151	115	169	W35151MX	36,5	-	-	-	-	
155	115	169	W35602X	35,3	155 - 130	W35602R502	-	-	

¹⁾ See page 257 for table of hexagon sizes of bolts, nuts and related thread diameters.

WCR-Series, Roller Cassette Torque Wrench

ENERPAC 
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ WCR4000 Roller Cassette with Spanner and W4000X Drive Unit



Resolves bolt to pipe & bolt height restrictions

- Provides a safe and reliable controlled bolting solution for flanges with limited access
- Spanners available to fit most commonly used API flanges
- Small nose radius – resolves bolt to pipe restrictions
- Slim spanner design – reduces bolt height restrictions
- Wide range of spanners ranging from 36 - 80 mm (1⁷/₁₆ - 3¹/₈ inch)
- Includes handle to improve tool handling and safety
- Rigid steel body for maximum endurance and minimum downtime.



SAFE LINK Design

SAFE-LINK spanner design includes a mechanical fuse inside the cassette, providing a safer bolting experience for the operator and bystanders.



Closed Bi-Hex Spanner

Slim ring style profile with bi-hexagonal design provides the ultimate mixture of versatility and durability.

▼ The small nose radius of the closed spanner resolves bolt to pipe restrictions where standard hexagon cassettes do not fit.



▼ The slim closed spanner design allows tool location between bolts where access is restricted and standard hexagon cassettes do not fit.



▼ The WCR-wrench must be removed and repositioned after each wrench cycle by operating the pump in the retract direction. The tool contains no spring return.



Hydraulic Roller Cassette Torque Wrench



WCR4000-Series Applications

The WCR4000 helps resolve narrow clearance restrictions in bolting of API and BOP flanges.

The Enerpac WCR4000 Roller Cassette has been developed for applications where there are severe clearance restrictions, particularly in height above the nut or between the bolt center and the inside of the joint.

Powered by the standard W4000X drive unit which is compatible with standard W-Series hexagon cassettes.

The WCR-wrench must be removed and repositioned after each wrench cycle by operating the pump in the retract direction. The tool contains no spring return.

Rigid Steel Design

The most advanced and safe torque wrenches 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.

Steel tool body for maximum endurance and minimum downtime.

WCR Series



Bi-Hexagonal Spanner Size:

36 - 80 mm, 1⁷/₁₆ - 3¹/₈"

Spanner Nose Radius:

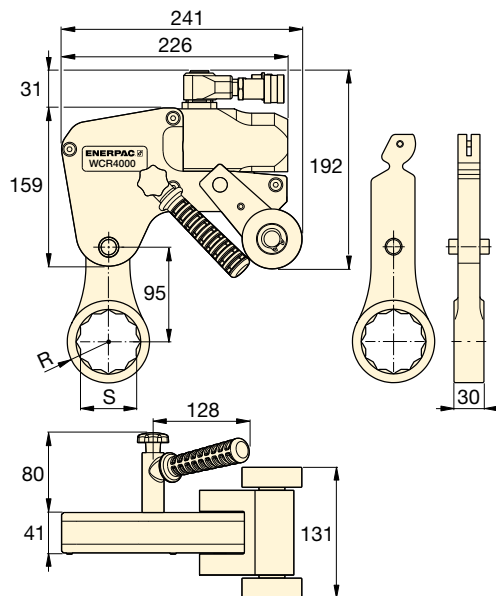
31 - 55 mm

Maximum Torque:

5762 Nm (4250 Ft.lbs)

Maximum Operating Pressure:

690 bar



Torque Wrench Pumps

Visit enerpac.com for system matched air and electric torque wrench pumps providing control to operate hydraulic torque

wrenches.

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Torque Wrench Hoses

Use Enerpac THQ-700 Series torque wrench hoses with W-Series torque wrenches to ensure the integrity of your hydraulic system.

hydraulic system.

6 m long, 2 hoses

THQ-706T

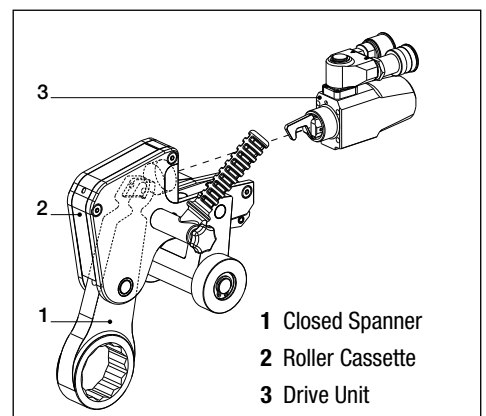
12 m long, 2 hoses

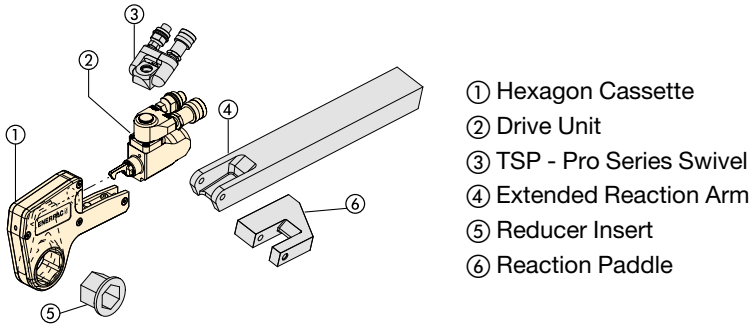
THQ-712T

Closed Spanner Hexagon Size S		Closed Spanner Model Number	Maximum Torque (Nm)	Spanner Radius R (mm)	Spanner Weight * (kg)	Roller Cassette Assembly Model Nr.	Drive Unit Model Nr.
(inch)	(mm)						
1 ⁷ / ₁₆	36	W4107CS	5762	31	1,9	WCR4000	W4000X
1 ¹ / ₂	38	W4108CS	5762	33	2,0		
1 ⁵ / ₈	41	W4110CS	5762	33	1,9		
1 ⁹ / ₁₆	46	W4113CS	5762	36	1,9		
1 ⁷ / ₈	48	W4114CS	5762	38	2,1		
2	50	W4200CS	5762	38	1,9		
2 ³ / ₁₆	55	W4203CS	5762	41	2,0		
2 ³ / ₈	60	W4206CS	5762	45	2,1		
2 ⁹ / ₁₆	65	W4209CS	5762	47	2,1		
2 ³ / ₄	70	W4212CS	5762	50	2,1		
2 ¹⁵ / ₁₆	75	W4215CS	5762	52	2,1		
3 ¹ / ₈	80	W4302CS	5762	55	2,2		

* Spanner weight. For total weight add 6,3 kg for WCR4000 and 2,0 kg for W4000X.

▼ Powered by the standard W4000X drive unit which is compatible with standard W-Series hexagon cassettes.



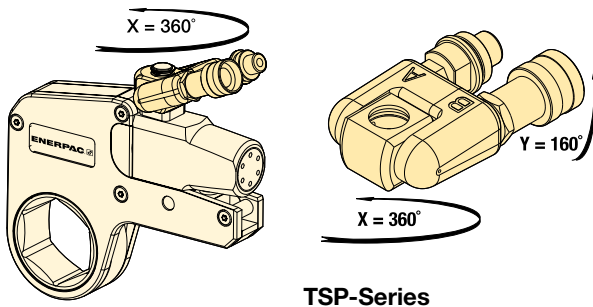


- ① Hexagon Cassette
- ② Drive Unit
- ③ TSP - Pro Series Swivel
- ④ Extended Reaction Arm
- ⑤ Reducer Insert
- ⑥ Reaction Paddle

TSP WTE WRP Series




TSP-Series, Pro Series Swivels



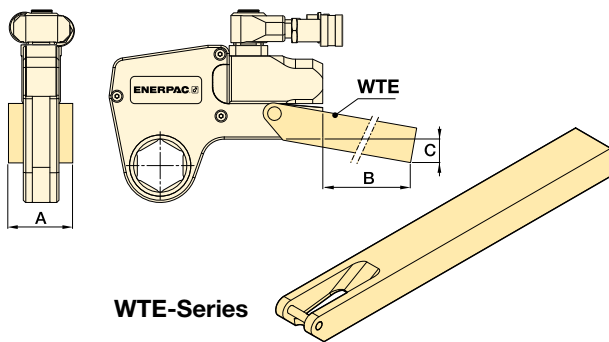
TSP-Series

- Featuring Tilt and Swivel technology
- 360° X-axis and 160° Y-axis rotation
- Increases tool fit in restricted access areas
- Simplifies hose placement
- Includes male and female Spin-On couplers.

For Torque Wrench Model Number	Model Number	Maximum Pressure (bar)	 (kg)
W2000X, W4000X, W8000X,	TSP300	690	0,2
W15000X, W22000X, W35000X	TSP300	690	0,2


To order an W-series wrench fitted with the TSP swivel, add suffix "P" to the model number. Example: **W2000PX**. TSP-swivel include male (TH-630) and female (TR-630) couplers.

WTE-Series, Extended Reaction Arm



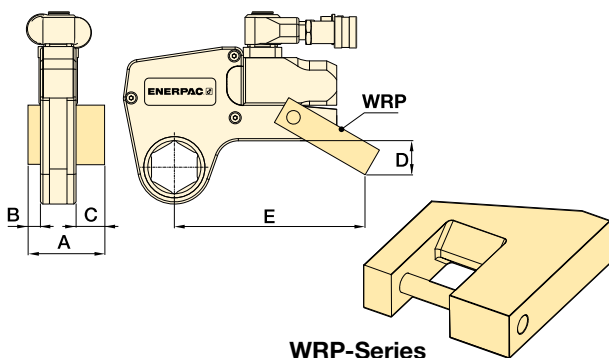
WTE-Series

- Full torque rated
- Increases tool fit in restricted access areas.

For Torque Wrench Model Number	Model Number	Dimensions (mm)			 (kg)*
		A	B	C	
W2000X	WTE20	56	398	76	2,6
W4000X	WTE40	66	436	74	4,6
W8000X	WTE80	85	449	55	7,6
W15000X	WTE150	102	498	72	12,0
W22000X	WTE220	114	524	77	17,3
W35000X	WTE350	127	419	133	17,8


* Weights indicated are for the accessories only and do not include the wrench.

WRP-Series, Low Profile Reaction Paddles



WRP-Series

- Lightweight interchangeable design
- Allows for offset reaction when in-line reaction is not available.

For Torque Wrench Model Nr.	Model Number	Dimensions (mm)					 (kg)*
		A	B	C	D	E	
W2000X	WRP20	84	16	35	45	148	0,4
W4000X	WRP40	109	21	47	59	190	0,8
W8000X	WRP80	137	26	57	69	223	2,0
W15000X	WRP150	165	32	69	87	257	3,9
W22000X	WRP220	207	37	91	134	317	7,2
W35000X	WRP350	225	42	91	182	367	10,6

* Weights indicated are for the accessories only and do not include the wrench.

Enerpac W-Series Torque Wrenches provide high accuracy across the full stroke for safety critical applications.

Easy service with W2000PX on a ship's crane ►

Ship maintenance using the low profile torque wrench. The use of the handle improves tool handling and safety while the TSP-swivel coupler simplifies hose placement.



◀ W4000X 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 by the selection of an Enerpac W-Series Torque Wrench.

The W-Series Wrenches offer reliability and control resulting in even and consistent torque being applied to all bolts.

W8000X Low Profile Torque Wrench tightening the bolts on turbine ►

Using the strength and accuracy of a steel wrench to tighten highly stressed bolts on a turbine is the safe way to handle a critical application.




























All of Enerpac's W-Series and S-Series Wrenches are made of high-strength steel which gives you additional stiffness that other alloys cannot provide.

This added stiffness translates into a stronger and more durable tool.



Optimum Torque Wrench and Pump Combinations

For optimum speed and performance Enerpac recommends the following system set-up with wrench-pump-hose combinations. For other combinations, consult your Enerpac bolting expert or your authorized Enerpac distributor.

		ELECTRIC PUMPS				AIR DRIVEN PUMPS		
		PME, PMU-Series	ZU4-Series	TQ-Series	ZE-Series	PTA-Series	ZA4-Series	
								
		Page: 201	Page: 204	Page: 202	Page: 208	Page: 210	Page: 212	
Speed:								
Reservoir Capacity:	1,9 - 3,8 litres	4,0 - 8,0 litres	4,0 litres	4,0 - 40 litres	3,8 litres	4,0 - 8,0 litres		
Duty Cycle:	Standard	Standard	Medium	Heavy-Duty	Standard	Heavy-Duty		
Weight:		 	 	  		  		
Field/Factory Work:	Field	Field	Field/Factory	Factory	Field	Field		
S-Series 	S1500X	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	
	S3000X							
	S6000X							
	S11000X			-		Acceptable		
	S25000X							
W-Series 	W2000X	Optimal		Optimal		Optimal		
	W4000X							
	W8000X							
	W15000X							
	W22000X	-		Acceptable				
	W35000X							



ZU4 – Electric Wrench Pumps

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 cost. ZU4-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 analogue gauge and a basic electrical package to deliver durable, safe and efficient hydraulic power.

ZE-Series Electric Wrench Pumps

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 Driven Wrench Pumps

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.

TQ-700 Series Electric Wrench Pumps

Designed for both portability and production, the TQ-700 features optimized flow technology to deliver superior bolting speed.



Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For S & W	Modelnr.
6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T
For SQD & HXD	
6 m long, 2 hoses	THC-7062
12 m long, 2 hoses	THC-7122



Torque Wrench Couplers

For torque wrench couplers see our “System Components” section in this catalogue.

Portable Electric Torque Wrench Pumps

▼ Shown: PMU-10422



- Powerful two-speed pump is lightweight and easy to carry
- Standard heat exchanger package on PMU-Series keeps pump cool under extreme use
- Glycerin filled gauge with scales reading in psi and bar
- Transparent overlays in Nm and Ft.lbs 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.

PME PMU Series



Reservoir Capacity:

1,9 - 3,8 litres

Flow at Rated Pressure:

0,33 l/min

Motor Size:

0,37 kW

Maximum Operating Pressure:

700 - 800 bar



Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model-Nr.
6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T
For 800 bar	
6 m long, 2 hoses	THC-7062
12 m long, 2 hoses	THC-7122



Gauge and Overlay Kit

Available separately for use with PMU-Series pumps: **GT-4015-Q** includes gauge and overlays for all S- and

W-Series wrenches. **GT-4015** includes gauge and overlays for all SQD and HXD Series wrenches.

▼ SELECTION CHART

For Use With Torque Wrenches		Maximum Pressure Rating (bar)		Oil Flow Rate (l/min)		Model Number with Heat Exchanger *	Useable Oil Capacity (litres)	Electric Motor (Volt-phase-Hz)	Dimensions L x W x H (mm)	Weight (kg)
		1 st stage	2 nd stage	1 st stage	2 nd stage					
S1500X S3000X	W2000X W4000X	48	700	3,3	0,33	PMU-10427-Q	1,9	115 - 1 - 50/60	431x280x381	24
		48	700	3,3	0,33	PMU-10447-Q	3,8	115 - 1 - 50/60	431x330x381	27
		48	700	3,3	0,33	PMU-10422-Q	1,9	230 - 1 - 50/60	431x280x381	24
		48	700	3,3	0,33	PMU-10442-Q	3,8	230 - 1 - 50/60	431x330x381	27
SQD-25-I SQD-50-I	HXD-30 HXD-60	48	800	3,3	0,33	PMU-10427	1,9	115 - 1 - 50/60	431x280x381	24
		48	800	3,3	0,33	PMU-10447	3,8	115 - 1 - 50/60	431x330x381	27
		48	800	3,3	0,33	PMU-10422	1,9	230 - 1 - 50/60	431x280x381	24
		48	800	3,3	0,33	PMU-10442	3,8	230 - 1 - 50/60	431x330x381	27

* For pump without heat exchanger change PMU into PME. Example **PME-10442-Q**.
PME-Series pump size: 250 x 250 x 360 mm. Weight 17 kg (1,9 litres) and 20 kg (3,8 litres).

▼ TQ-700E



- Optimized flow technology – three stage pump maximizes productivity of the pump and tool while minimizing heat build-up and down time
- Heat exchanger is standard included
- A quiet (<85 dBA), lightweight pump with a compact footprint – easy to move around and through the work site
- Durable roll cage with an ergonomically sized handle and shielded gauge – a pump that is easy to put into position and safe from on site operational hazards
- Maintenance made simple with a brushless motor designed for continuous usage
- Straightforward operation with a simple pressure set and convenient to use 6 m pendant control – immediate productivity for crews operating the pump
- IP55 Rating for Superior Dust and Water Protection
- Transparent gauge overlays in Nm and Ft.lbs for all Enerpac S and W-Series torque wrenches provide a quick torque reference.

Lightweight Torque Wrench Pumps



Four Port Manifold

The **TQ-700** offers an optional four wrench manifold as an accessory factory installed. (Add suffix "M" at the end of the model number. For example: **TQ-700EM**).



Hydraulic Torque Wrenches

Enerpac offers a complete range of square drive and hexagon cassette torque wrenches.

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Torque Wrench Hoses

Use Enerpac **THQ-700** series twin hoses with 700 bar pumps.

For 700 bar	Model Nr.
6 meters long, 2 hoses	THQ-706T
12 meters long, 2 hoses	THQ-712T

The TQ-700E and the W-Series wrenches are a productive combination in wind applications. ▶



Electric Torque Wrench Pumps

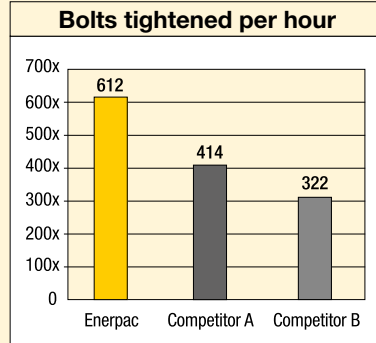


TQ-700 Applications

The TQ-700 Series pump is ideal for powering hydraulic wrenches for the Power Generation and Wind Markets.

Bolting speed is more complex than how much flow per minute the pump produces. The key is optimising the flow rate across the entire bolting cycle. With more oil flowing at the right time and at the right volume, you achieve the optimized flow for a hydraulic bolting system.

The result of this optimized flow is more bolts tightened faster and a more productive work team.



Internal laboratory testing based on standard torquing procedure on a pipe flange with 14, 1 1/8" bolts.

TQ Series



Reservoir Capacity:
4,0 litres

Flow at Rated Pressure:
0,5 l/min

Motor Size:
0,75 kW

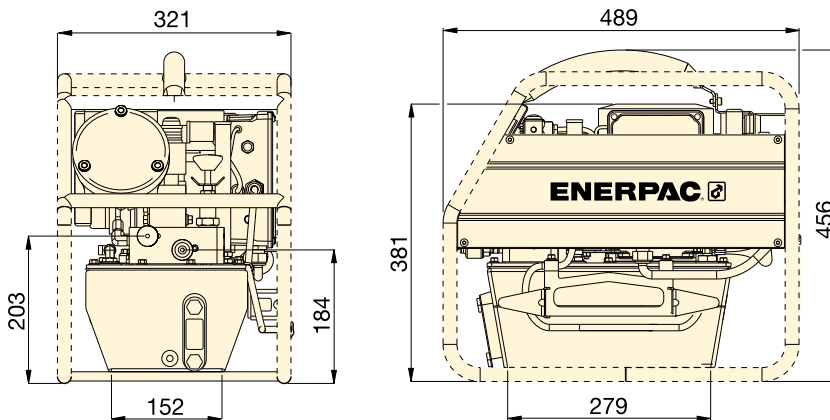
Maximum Operating Pressure:
700 bar



Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench, pump and hose selection matrix.

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For Use with Torque Wrenches	Pressure Rating (bar)	Model Number ¹⁾	Useable Oil Capacity (litres)	Motor Size (kW)	Motor Electrical Specifications (Volt - Ph - Hz)	Sound Level (dBA)	Weight (kg)
All S and W-Series	700	TQ-700 B	4,0	0,75	115 - 1 - 60	82 - 85	31
	700	TQ-700 E ²⁾	4,0	0,75	230 - 1 - 50	82 - 85	30
	700	TQ-700 I ³⁾	4,0	0,75	230 - 1 - 60	82 - 85	30

¹⁾ All models meet CE safety requirements and all TÜV requirements.

²⁾ TQ-700E with European plug and CE EMC directive compliant.

³⁾ TQ-700I with NEMA 6-15 plug.

▼ The TQ-700E and the W-Series wrenches are a productive combination.



ZU4T, Electric Torque Wrench Pumps

ENERPAC 
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ ZU4204TE-Q (Pro-Series), ZU4204BE-Q (Classic)



- 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 1,25 kW 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

Pro Series pump only

- LCD readout provides pressure 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).



◀ Any brand of hydraulic torque wrench can be powered by the portable ZU4-Series torque wrench pump.

Z Tough, Dependable Innovative CLASS



FIRMWARE 7.0, for Pro-Series

- Display torque in Nm or Ft.lbs
- 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 push buttons, 24V transformer timer and operator accessible circuit breaker.



Pro-Series

Back-lit LCD and Pressure Transducer featuring Auto-Cycle Technology.

- Digital read-out and “Autocycle” setting
- 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
- Easy-viewing variable rate display
- Display pressure in bar, MPa or psi.

ZU4T-Series, Torque Wrench Pumps



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 ZU4T-Series pumps are built to power small to large torque wrenches. Choosing the right ZU4T-Series torque wrench pump for your application is easy.

Classic Electric Torque Wrench 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.

Pro Series Electric Torque Wrench Pump

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

These premium features are not available on any other pump – anywhere!

- 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).

ZU4T Series



Reservoir Capacity:

4,0 - 8,0 litres

Flow at Rated Pressure:

1,0 l/min

Motor Size:

1,25 kW

Maximum Operating Pressure:

700 - 800 bar

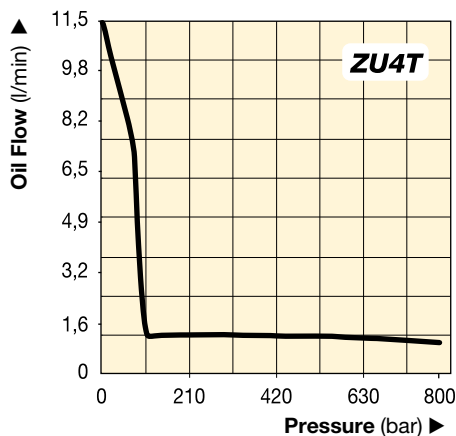


Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench pump and hose selection matrix.

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OIL FLOW VERSUS PRESSURE



COMMON PUMP MODELS

	For Use With Torque Wrenches	Model Number ^{1) 4)}	Motor Electrical Specification	Usable Oil Capacity (litres)	(kg)
Pro Series	All wrenches	ZU4204TB-Q	115 VAC, 1-ph	4,0	32
		ZU4208TB-Q	115 VAC, 1-ph	8,0	34
		ZU4204TE-Q ²⁾	208-240 VAC, 1-ph	4,0	32
		ZU4208TE-Q ²⁾	208-240 VAC, 1-ph	8,0	34
		ZU4204TI-Q ³⁾	208-240 VAC, 1-ph	4,0	32
		ZU4208TI-Q ³⁾	208-240 VAC, 1-ph	8,0	34
Classic	All wrenches	ZU4204BB-QH	115 VAC, 1-ph	4,0	37
		ZU4204BB-Q	115 VAC, 1-ph	4,0	33
		ZU4208BE-QH ²⁾	208-240 VAC, 1-ph	8,0	38
		ZU4204BE-Q ²⁾	208-240 VAC, 1-ph	4,0	34
		ZU4208BI-QH ³⁾	208-240 VAC, 1-ph	8,0	40
		ZU4208BI-Q ³⁾	208-240 VAC, 1-ph	8,0	36



Pump Ratings

-Q suffix pumps are for 700 bar torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with 800 bar torque wrenches, and include polarized lock-ring safety couplers.

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Gauge and Overlay Kit

Available separately for use with ZU4T-Series Classic: **GT-4015Q** includes gauge and overlays for all S- and

W-Series torque wrenches.

GT-4015 includes gauge and overlays for all SQD and HXD torque wrenches.

¹⁾ All models meet CE safety requirements and all CSA 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 800 bar torque wrenches, see page 207.

ZU4T-Series, Pump Options



4-Wrench Manifold

- For simultaneous operation of multiple torque wrenches
- Can be factory installed or ordered separately.

Accessory Kit * Model Nr.	Can be used on ZU4-Series torque wrench pumps
ZTM-E	for 800 bar torque wrenches
ZTM-Q	for 700 bar torque wrenches

* Add suffix **M** for factory installation.

Ordering Example: **ZU4208TE-QM**



Skid Bar

- Provides greater pump stability on soft or uneven surfaces
- Provides easy two-handed lift.

Accessory Kit * Model Nr.	Can be used on ZU4-Series torque wrench pumps
SBZ-4	4 and 8 litres reservoir ¹⁾
SBZ-4L	4 and 8 litres reservoir ²⁾

* Add suffix **K** to pump model number for factory installation.

¹⁾ Without heat exchanger 2,2 kg.

²⁾ With heat exchanger 3,2 kg.

Ordering Example: **ZU4208TE-QK**



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 * Model Nr.	Can be used on ZU4-Series torque wrench pumps
ZHE-U115	115 V pumps
ZHE-U230	230 V pumps

* Add suffix **H** to pump model number for factory installation.

Heat Exchanger adds 4,1 kg to pump weight.

Ordering Example: **ZU4208TE-QH**

▼ Most hydraulic torque wrenches can be powered by the Enerpac ZU4T-Series torque wrench pump.



Roll Cage

- Protects pump
- Provides greater pump stability.

Accessory Kit * Model Nr.	Can be used on ZU4-Series torque wrench pumps
ZRC-04	4 and 8 litres reservoir ¹⁾
ZRC-04H	4 and 8 litres reservoir ²⁾

* Add suffix **R** for factory installation.

¹⁾ Without heat exchanger.

²⁾ With heat exchanger.

Ordering Example: **ZU4208TE-QR**

Thermal Transfer *	Max. Pressure	Max. Oil Flow	Voltage
(Btu/h)	(bar)	(l/min)	(VDC)
900	20,7	26,5	12

* At 1,9 l/min at 21 °C ambient temperature.
Do not exceed maximum oil flow and pressure ratings.
Heat exchanger is not suitable for water-glycol or high water-based fluids.

ZU4T-Series, Ordering Matrix and Specifications

▼ This is how a ZU4T-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	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 = 1,0 l/min @ 700 bar

4 Valve Type

2 = Torque wrench valve

5 Reservoir Size (useable oil)

04 = 4 litres

08 = 8 litres

6 Valve Operation

T = **Pro Serie pump** with solenoid valve and pendant, LCD Electric and pressure transducer

B = **Classic pump** with solenoid valve and pendant.

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 Options

E = **800 bar coupler** for use with HXD and SQD-Series or other wrenches

Q = **700 bar coupler** for use with S and W-Series or other wrenches

H = Heat exchanger

K = Skid bar

M = 4-wrench manifold

R = Roll cage

ZU4T Series



Reservoir Capacity:

4 - 8 litres

Flow at Rated Pressure:

1,0 l/min

Motor Size:

1,25 kW

Maximum Operating Pressure:

700 - 800 bar



How to order your ZU4T-Series torque wrench pump

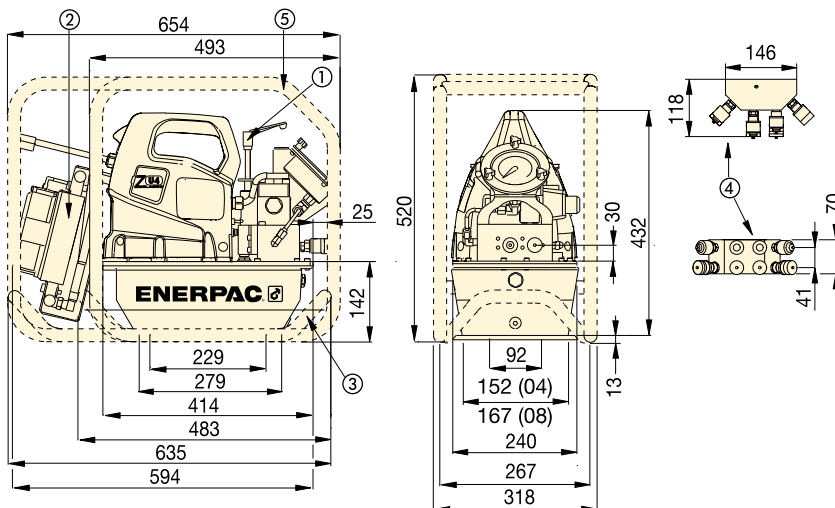
Ordering Example

Model No. ZU4208TE-QMHK

700 bar Pro Serie pump for use with Enerpac S and W-Series and other 700 bar torque wrenches, 230V motor, 8 litres reservoir, 4-wrench manifold, heat exchanger and skidbar.

Refer to the torque wrench pump selection matrix for optimum wrench, pump and hose combinations.

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ZU4T-Series Torque Wrench Pumps

- ① User adjustable relief valve
- ② Heat Exchanger (optional)
- ③ Skidbar (optional)
- ④ 4-wrench manifold (optional)
- ⑤ Roll cage (optional)

ZU4T-Series Performance Chart									
Motor Size (kW)	Output Flow Rate (l/min)				Motor Electrical Specification (Volt - Phase - Hz)	Sound Level (dBA)	Relief Valve Adjustment Range (bar)		
	7 bar	50 bar	350 bar	700 bar					
1,25	11,5	8,8	1,2	1,0	115 - 1 - 50/60 208-240 - 1 - 50/60	85-90	124-700 *		

* Pump type (-Q) shown, (-E) range is 124-800 bar.



Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model-Nr.
6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T
For 800 bar	
6 m long, 2 hoses	THC-7062
12 m long, 2 hoses	THC-7122

▼ ZE4204TE-QHR



Z Tough,
Dependable
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CLASS

- 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)
- LCD readout provides pressure and torque display and a number of diagnostic and readout capabilities never before offered on a portable electric pump
- Totally enclosed, fan-cooled industrial electric motors supply extended life and stand up to harsh industrial environments
- High-strength, molded electrical enclosure protects electronics, power supplies and LCD readout from harsh environments.



ZE4T and ZE5T-Series Torque Wrench Pumps

Back-lit LCD and Pressure Transducer featuring Auto-Cycle Technology.

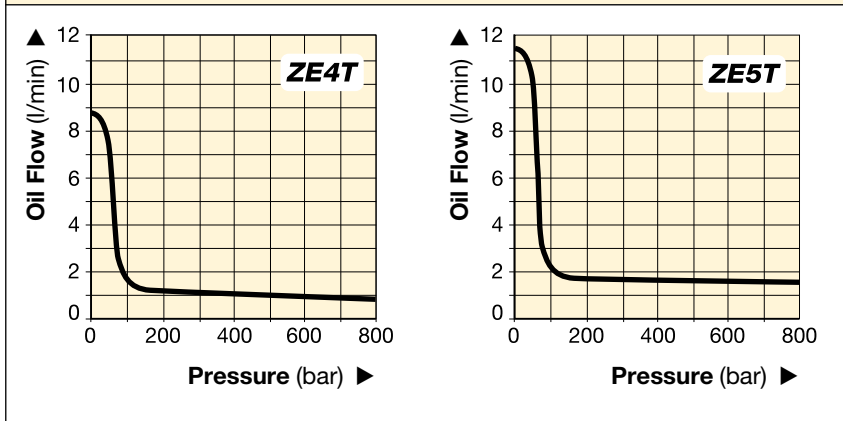
- Digital read-out and “Auto-Cycle” setting
- Auto cycle” setting easily programmable.
- Torque wrench model is selectable
- Display torque in Nm or Ft.lbs
- Pump usage information, hour and cycle counts
- Low-voltage warning and recording
- Self-test and diagnostic capabilities
- Information can be displayed in English, French, German, Italian, Spanish and Portuguese
- Pressure transducer is more accurate and durable than analog gauges
- Easy-viewing variable rate display
- Display pressure in bar, MPa or psi.



◀ The ZE4T-Series torque wrench pumps are perfectly matched for this W2000X wrench.

Electric Torque Wrench Pumps

ZE4T AND ZE5T-SERIES OIL FLOW VERSUS PRESSURE



ZE4T ZE5T Series



Reservoir Capacity:

4 - 40 litres

Flow at Rated Pressure:

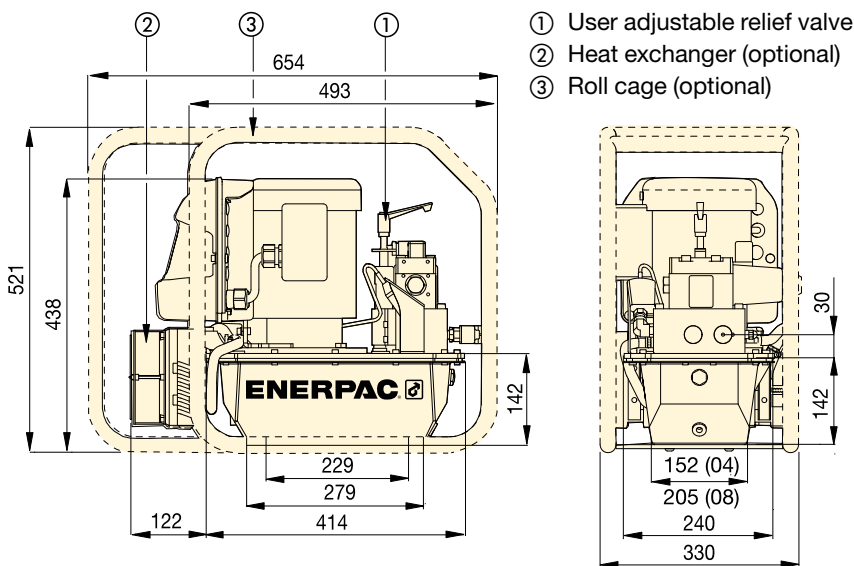
0,82 - 1,64 l/min

Motor Size:

1,1 - 2,2 kW

Maximum Operating Pressure:

700 - 800 bar



ZE4T and ZE5T-Series, 4 and 8 litres reservoirs

▼ COMMON TORQUE WRENCH PUMP MODELS

For Use With Torque Wrenches	Max. Operating Pressure (bar)	Model Number with Heat Exchanger and Roll Cage	Motor Electrical Specification (Volt - Ph - Hz)	Usable Oil Capacity ¹⁾ (litres)	Weight (kg)
all S and W-Series	700	ZE4204TB-QHR	115 - 1 - 50/60	4,0	61
	700	ZE4204TE-QHR	230 - 1 - 50/60	4,0	61
	700	ZE4204TG-QHR	230 - 3 - 50/60	4,0	62
	700	ZE5204TW-QHR	400 - 3 - 50/60	4,0	62
all SQD and HXD-Series	800	ZE4204TB-EHR	115 - 1 - 50/60	4,0	61
	800	ZE4204TE-EHR	230 - 1 - 50/60	4,0	61
	800	ZE4204TG-EHR	230 - 3 - 50/60	4,0	62
	800	ZE5204TW-EHR	400 - 3 - 50/60	4,0	62

¹⁾ Larger reservoirs (8, 10, 20 and 40 litres) are available. Contact Enerpac.

▼ PERFORMANCE CHART

Pump Series	Output Flow Rate at 50 Hz ²⁾ (l/min)				Motor Size (kW)	Relief Valve Adjustment Range (bar)	Sound Level (dBA)
	7 bar	50 bar	350 bar	700 bar			
ZE4T	8,8	8,1	0,9	0,8	1,1	70 - 800	75
ZE5T	11,8	11,2	1,7	1,6	2,2	70 - 800	75

²⁾ Flow rate will be approximately 6/5 higher at 60 Hz.



Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench pump and hose selection matrix.

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Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model Nr.
6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T
For 800 bar	
6 m long, 2 hoses	THC-7062
12 m long, 2 hoses	THC-7122

▼ 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 pressure (125 bar) for faster torque cycles
- High power-to-weight ratio suits all Enerpac torque wrenches
- Glycerine filled pressure gauge with scales reading in bar/psi
- Transparent overlays in Nm and Ft.lbs for all Enerpac torque wrenches provide a quick torque reference
- Internal safety relief valve, factory preset.



Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model Nr.
6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T
For 800 bar	
6 m long, 2 hoses	THC-7062
12 m long, 2 hoses	THC-7122



Gauge Overlay Kit

Available separately for use with PTA-Series pumps: **GT-4015-Q** includes overlays for all S and

W-Series torque wrenches.

GT-4015 includes overlays for all SQD and HXD torque wrenches.



◀ *Easy and reliable service and maintenance in the workshop with Enerpac steel wrenches powered by a pneumatic torque wrench pump.*

Compact Pneumatic Torque Wrench Pump

PTA Series



Reservoir Capacity:

3,8 litres

Flow at Rated Pressure:

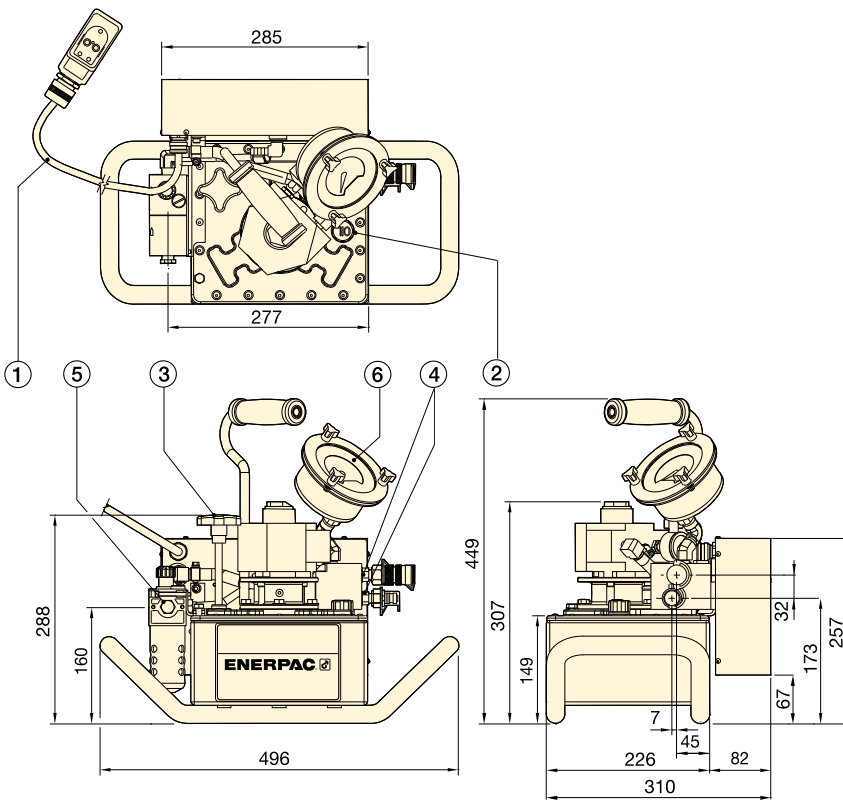
0,33 l/min

Air Consumption:

1133 l/min

Maximum Operating Pressure:

700 - 800 bar



- ① 5 mtr Air control pendant
- ② Vent/Fill plug
- ③ Externally adjustable relief valve
- ④ 1/4"-18 NPTF Hydraulic ports
- ⑤ 3/8"-18 NPTF Air inlet
- ⑥ Gauge with overlay kit

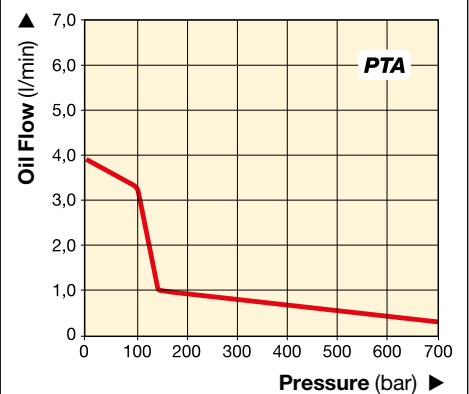


Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench pump and hose selection matrix.

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OIL FLOW VERSUS PRESSURE



▼ SELECTION CHART

For Use With Torque Wrenches		Pressure Rating		Model Number	Oil Flow Rate		Reservoir Capacity	Useable Oil Capacity	Air Motor Consumption at 7 bar	Air Pressure Range	Weight
		1st stage	2nd stage		1st stage	2nd stage					
S1500X S3000X	W2000X W4000X	125	700	PTA-1404-Q	3,9	0,33	3,8	1,9	1133	3,4 - 7,0	24,5
SQD-25-I SQD-50-I	HXD-30 HXD-60	125	800	PTA-1404	3,9	0,33	3,8	1,9	1133	3,4 - 7,0	24,5

▼ ZA4204TX-ER



- Two-speed operation and high by-pass pressure reduces cycle time for improved productivity
- Glycerin filled pressure gauge with transparent overlays in Nm and Ft.lbs for Enerpac torque wrenches provide a quick torque reference
- Regulator-Filter-Lubricator with removable bowls and auto drain is standard
- Heat exchanger warms exhaust air to prevent freezing and cools the oil
- Ergonomic pendant allows remote operation up to 6 m.

Z Tough,
Dependable
Innovative
CLASS



Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model Nr.
6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T
For 800 bar	
6 m long, 2 hoses	THC-7062
12 m long, 2 hoses	THC-7122



Gauge and Overlay Kit

Gauge Overlay Kits are available separately for use with ZA4T-Series pumps:

GT-4015-Q includes gauge and overlays for all S- and W-Series torque wrenches.
GT-4015 includes gauge and overlays for all SQD and HXD torque wrenches.



◀ Most hydraulic torque wrenches can be powered by the Enerpac ZA4T-Series torque wrench pump.

Air Driven Torque Wrench Pumps



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.

All ZA4T-Series pump models meet CE, CSA and TÜV safety requirements. For further application assistance contact your local Enerpac office.

ATEX 95 Certified

The ZA4T-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 ZA4T-Series pumps are marked with: Ex II 2 GD ck T4.



ZA4T Series



Reservoir Capacity:
4,0 - 8,0 litres

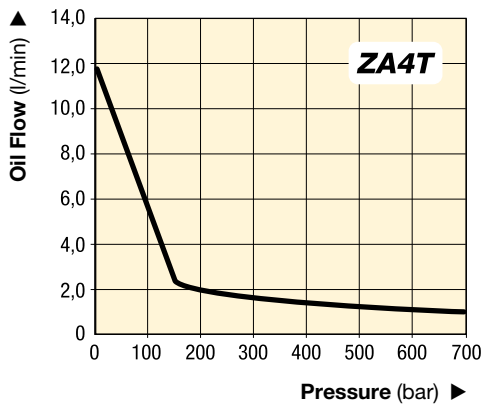
Flow at Rated Pressure:
1,0 l/min

Air Consumption:
600 - 2840 l/min

Maximum Operating Pressure:
700 - 800 bar

OIL FLOW VERSUS PRESSURE

6,9 bar dynamic air pressure at 2840 l/min



Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench pump and hose selection matrix.

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Accessory Options

Available by placing the following additional suffix at the end of the model number:

- K** = Skid bar
- M** = 4-wrench manifold
- R** = Roll cage.

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COMMON PUMP MODELS

For Use With Torque Wrenches	Maximum Operating Pressure (bar)	Model Number	Usable Oil Capacity (litres)	Weight (kg)
all S and W-Series	700	ZA4204TX-Q	2,7	42
	700	ZA4208TX-Q	6,6	47
	700	ZA4204TX-QR	2,7	46
	700	ZA4208TX-QR	6,6	51
all SQD and HXD-Series	800	ZA4204TX-E	2,7	42
	800	ZA4208TX-E	6,6	47
	800	ZA4204TX-ER	2,7	46
	800	ZA4208TX-ER	6,6	51



Skid Bar

- Provides greater pump stability on soft or uneven surfaces
- Provides easy two-handed lift.



4-Wrench Manifold

- For simultaneous operation of multiple torque wrenches
- Can be factory installed or ordered separately.



Roll Cage

- Protects pump
- Provides greater pump stability.

Accessory Kit * Model Nr.	Can be used on ZA4T-Series torque wrench pumps
SBZ-4	Reservoir 04 and 08

* Add suffix **K** for factory installation.
Weight skid bar 2,2 kg.
Ordering Example: **ZA4208TX-QK**

Accessory Kit * Model Nr.	Can be used on ZA4T-Series torque wrench pumps
ZTM-E	for 800 bar torque wrenches
ZTM-Q	for 700 bar torque wrenches

* Add suffix **M** for factory installation.
Weight manifold 4,5 kg.
Ordering Example: **ZA4208TX-QM**

Accessory Kit * Model Nr.	Can be used on ZA4T-Series torque wrench pumps
ZRC-04	Reservoir 04 and 08

* Add suffix **R** for factory installation.
Roll cage weight 3,4 kg.
Ordering Example: **ZA4208TX-QR**



700 bar Spin-on Couplers

- Mounted on:
 - Torque wrench pumps with suffix "Q"
 - S and W-Series wrenches
 - THQ-Series hoses
 - 4-Wrench manifold ZTM-Q.



800 bar Lock-ring Couplers

- Mounted on:
 - Torque wrench pumps with suffix "E"
 - HXD and SQD-Series wrenches
 - THC-Series hoses
 - 4-Wrench manifold ZTM-E.



Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model Nr.
6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T
For 800 bar	
6 m long, 2 hoses	THC-7062
12 m long, 2 hoses	THC-7122



Torque Wrench Couplers

For Enerpac torque wrench couplers see our "System Components" section in this catalogue.

Ordering Matrix and Specifications

▼ 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	8 Options

1 Product Type

Z = Pump series

2 Motor Type

A = Air motor

3 Flow Group

4 = 1,0 l/min @ 700 bar

4 Valve Type

2 = Torque Wrench Valve

5 Reservoir Size

(useable capacity)

04 = 2,7 litres

08 = 6,6 litres

6 Valve Operation

T = Air operated valve with pendant

7 Voltage

X = Not applicable

8 Options

E = **800 bar couplers** for use with HXD and SQD-Series or other wrenches

Q = **700 bar couplers** for use with S and W-Series or other wrenches

K = Skid bar

M = 4-wrench manifold

R = Roll cage

ZA4T Series



Reservoir Capacity:

4 - 8 litres

Flow at Rated Pressure:

1,0 l/min

Air Consumption:

600 - 2840 l/min

Maximum Operating Pressure:

700 - 800 bar

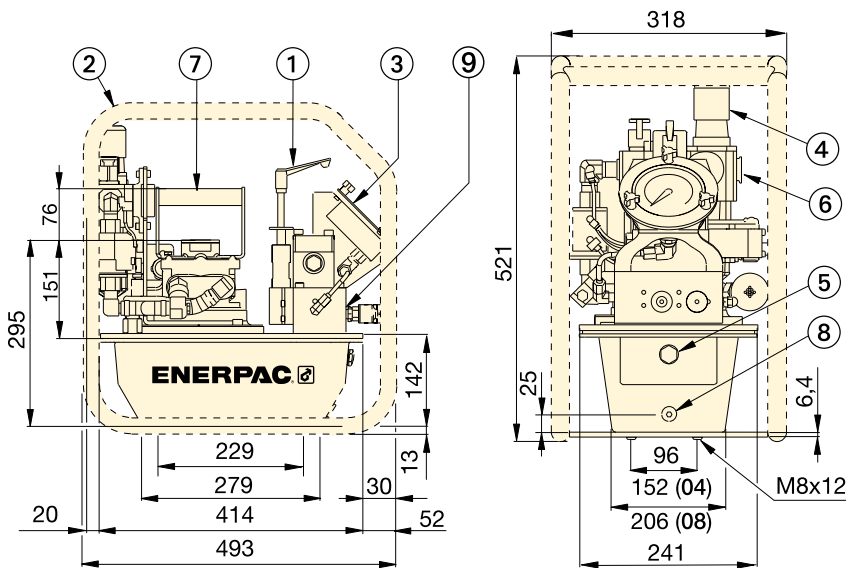


How to order your ZA4T-Series torque wrench pump

Model No. ZA4208TX-QMR

700 bar pump for use with Enerpac S- and W-Series and other 700 bar torque wrenches, 8 litres reservoir, 4-wrench manifold, and roll cage.

Refer to the torque wrench pump selection matrix for optimum wrench, pump and hose combinations.



- ① User adjustable relief valve
- ② Roll 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
- ⑨ 1/4"-18 NPTF Oil outlet

ZA4T-Series Performance							
Output Flow Rate (l/min)				Dynamic Air Pressure Range (bar)	Air Consumption (l/min)	Sound Level (dBA)	Relief Valve Adjustment Range (bar)
7 bar	50 bar	350 bar	700 bar				
11,5	8,8	1,2	1,0	4,0 - 6,9	600 - 2840	85-90	124-700 *

* Pump type (-Q) shown, (-E) range is 124-800 bar.

▼ Most hydraulic torque wrenches can be powered by the Enerpac ZA4T-Series torque wrench pump.



▼ HPT-1500



HPT, HT, B Series

Reservoir Capacity:

2,5 litres

Flow at Rated Pressure:

0,61 cm³/stroke

Maximum Operating Pressure:

1500 bar



This pump operates at ultra-high pressure, use only the specified fittings and hoses designed for these pressures.

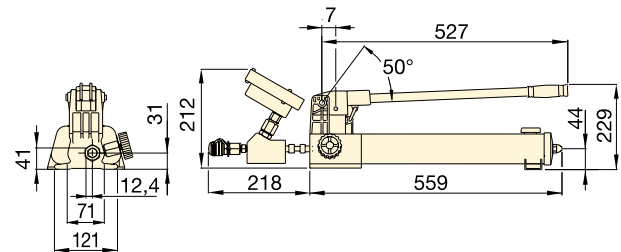


Applications

The hand pump is ideally suited for use with GT-Series hydraulic bolt tensioning tools and hydraulic nuts.

See our E412e Bolting Tools catalogue or enerpac.com

- Lightweight and portable high-pressure hand pump
- Two-speed operation displaces a larger volume of oil per stroke, reducing cycle times for many testing applications
- Includes a pressure gauge and coupler for direct connection to GT-Series bolt tensioners
- Integrated relief valve set at 1500 bar.



1500 bar ULTRA-HIGH PRESSURE PUMP

Pump Type	Useable Oil Capacity (litres)	Model Number	Pressure Rating (bar)		Oil Displacement per Stroke (cm ³)		High Pressure Oil Port with female coupler	Weight (kg)
			1st stage	2nd stage	1st stage	2nd stage		
Two Speed	2,54	HPT-1500	14	1500	16,22	0,61	1/4" BSPP + BR-150	9,0

1500 bar HOSES

Model Number		Hose End 1	Hose End 2	Length (m)
HT-1503		1/4" BSPM 120° Cone	1/4" BSPM 120° Cone	1,0
HT-1510		1/4" BSPM 120° Cone	1/4" BSPM 120° Cone	3,0
HT-1503HR*		BH-150	BR-150	1,0
HT-1510HR*		BH-150	BR-150	3,0

* Includes dust caps.

1500 bar COUPLERS

Description		Complete Set	Female Half	Male Half
Quick Disconnect Coupler*		B-150	BR-150	BH-150
Quick Disconnect Coupler and Adaptor Kit*		BW-150AW	-	-
Quick Disconnect Blanking Coupler Set*		B-150B	-	-

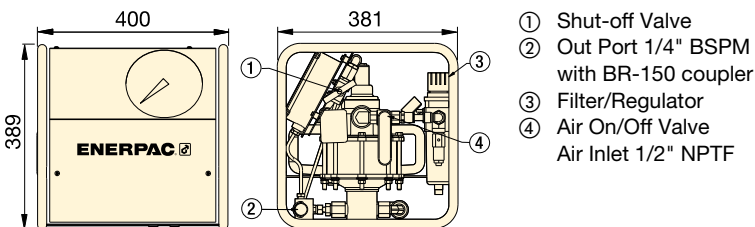
* Includes dust caps.

Ultra-High Pressure Air Pump

▼ ATP-1500



- General purpose, high pressure air driven two speed pump unit for products requiring up to 1500 bar 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.



ATP Series

Reservoir Capacity:

3,8 litres

Flow at Rated Pressure:

0,07 l/min

Maximum Operating Pressure:

1500 bar



This pump operates at ultra-high pressure, use only the specified fittings and hoses designed for these pressures.



Applications

The ATP-pump is ideally suited for use with GT-Series hydraulic bolt tensioning tools and hydraulic nuts.

See our E412e Bolting Tools catalogue or enerpac.com



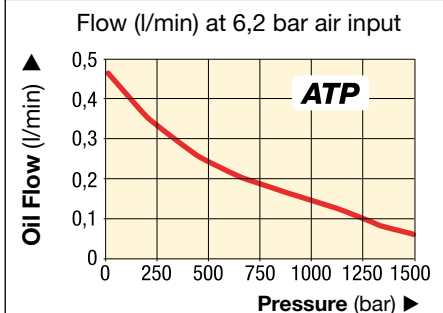
ATEX Certified

The ATP-Pump is tested and certified according ATEX.




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OIL FLOW VERSUS PRESSURE



1500 bar HIGH PRESSURE AIR PUMP

Pump Type	Useable Oil Capacity (litres)	Pressure Rating (bar)	Model Number	Output Flow Rate at 0 bar (l/min)	Output Flow Rate at 1500 bar (l/min)	Air Pressure Range (bar)	Air Consumption (l/min)	Sound Level (dBA)	 (kg)
Two speed	3,8	1500	ATP-1500	0,43	0,07	5,5 - 6,2	594	70	32

▼ ZUTP-1500E



ZUTP Series

Reservoir Capacity:

4,0 litres

Flow at Rated Pressure:

0,13 l/min

Motor Size:

1,25 kW

Maximum Operating Pressure:

1500 bar



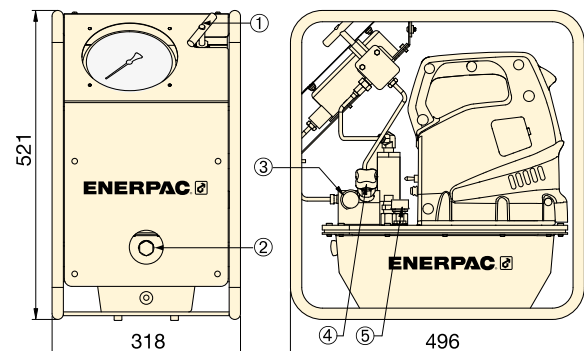
Ultra-high pressure

This pump operates at ultra-high pressure, use only the specified fittings and hoses designed for these pressures.


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- Two-stage pump design provides high flow at low pressure for fast system fills and controlled flow at high pressure for safe and accurate operation
- Z-Class high-efficiency pump design runs cooler and requires less current draw which is especially helpful in remote locations
- 6 m pendant cord enables motor control
- Angled 153 mm pressure gauge, with polycarbonate cover, built into a protective metal shroud for improved visibility and protection
- Safety relief valve limits output pressure
- Compact, lightweight and rugged aluminium frame for increased durability and ease of handling.

- ① Release Valve
- ② Sight Glass
- ③ Out Port 1/4" BSPM and BR-150 female coupler
- ④ User Adjustable Relief Valve
- ⑤ Breather



1500 bar HIGH PRESSURE PUMP

Pump Type	Useable Oil Capacity (litres)	Model Number ¹⁾	Pressure Rating (bar)	Output Flow Rate at 0 bar (l/min)	Output Flow Rate at 1500 bar (l/min)	Motor Electrical Specification	Motor Size (kW)	Sound Level (dBA)	 (kg)
Two speed	4,0	ZUTP-1500B	1500	2,90	0,13	115 VAC, 1-ph	1,25	89	29,5
	4,0	ZUTP-1500E ²⁾	1500	2,90	0,13	230 VAC, 1-ph ²⁾	1,25	89	29,5
	4,0	ZUTP-1500I ³⁾	1500	2,90	0,13	230 VAC, 1-ph ³⁾	1,25	89	29,5

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.

Single-Acting Hydraulic Nut Splitters

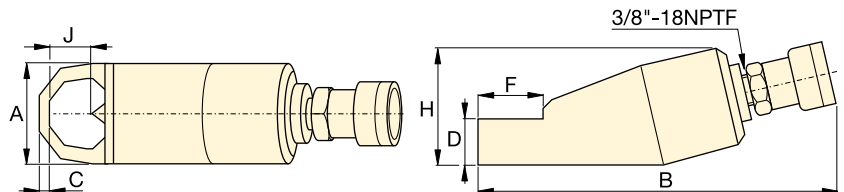
▼ Shown from left to right: NC-3241, NC-1319, NC-1924



- Compact and ergonomic design, easy to use
- Unique angled head design
- Single-acting, spring return cylinder
- Heavy duty chisels can be reground
- Nut Splitters include spare chisel, spare set screw and wrench used to secure the chisel. A CR-400 coupler is standard.
- Applications include service trucks, piping industry, tank cleaning, petrochemical, steel construction, mining, etc.



◀ Easily removing rusty nuts during railroad construction is just one of many application examples for the Enerpac Nut Splitter.



NC, STN Series



Capacity:

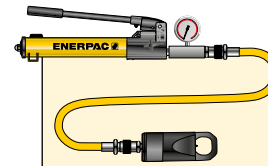
49 - 882 kN (5-90 ton)

Bolt Range:

M6 - M48

Maximum Operating Pressure:

700 bar



Tool-Pump Sets

Hydraulic Nut Splitters are available as **sets**

(pump, tool, gauge, gauge adaptor, couplers and hose) for your ordering convenience.

Nut Splitter Model Nr.	Hand Pump Model Nr.	Set Model Nr
NC-1924	P-392	STN-1924H
NC-2432	P-392	STN-2432H
NC-3241	P-392	STN-3241H



NS-Series, Nut Splitters

For splitting hexagon nut sizes from 70 - 130 mm see our high performance nut splitters.

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Bolt Range (mm)	Hexagon Nut Range (mm)	Capacity ton (kN)	Oil Capacity (cm ³)	Model Number	Dimensions (mm)							Replacement Chisel Model Number	
					A	B	C	D	F	H	J		
M6 - M12	10 - 19	5 (49)	15	NC-1319	40	170	7	19	28	48	21	1,2	NCB-1319
M12 - M16	19 - 24	10 (98)	20	NC-1924 *	54	191	10	26	40	62	25	2,0	NCB-1924
M16 - M22	24 - 32	15 (147)	60	NC-2432 *	64	222	13	29	51	72	33	3,0	NCB-2432
M22 - M27	32 - 41	20 (196)	80	NC-3241 *	75	244	17	36	66	88	43	4,4	NCB-3241
M27 - M33	41 - 50	35 (343)	155	NC-4150	94	288	21	45	74	105	54	8,2	NCB-4150
M33 - M39	50 - 60	50 (490)	240	NC-5060	106	318	23	54	90	128	60	11,8	NCB-5060
M39 - M48	60 - 75	90 (882)	492	NC-6075	156	393	26	72	110	181	80	34,1	NCB-6075

* Available as Tool-Pump Set, see note on this page.

Ordering Notes: Maximum allowable hardness to split is HRc-44. Not to be used on square nuts.

▼ Shown: NS-Series Hydraulic Nut Splitters



- 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 manoeuvrability
- Nickel-plated cylinder body for excellent corrosion protection and improved durability in harsh environments
- Internal Pressure Relief Valve for overload protection
- CR-400 coupler and dustcap included on all models.



◀ Heavily corroded and weathered nuts are quickly split and removed using a NS-Series Nut Splitter.

Power and Precision High Performance Nut Splitter



Blade Cutting Depth Scale

Adjustable cutting depth scale for controlled blade extension, which avoids damage to bolt threads.

The scale indicates the bolt range in metric and imperial values on each cutting head.



NC-Series, Hydraulic Nut Cutters

The NC-Series models are available featuring an angle-head design for 10 - 75 mm hexagon nuts.

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Joint Separation Tools

FS and FSH-Series parallel wedge spreaders provide quick and easy joint separation using hydraulic or mechanical force.

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Flange Alignment Tools

The ATM-Series provide safe and high-precision flange alignment tools that fit most commonly used ANSI, API, BS and DIN flanges.

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Hydraulic Nut Splitters



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:

917 - 1711 kN

Hexagon Nut Size:

70 - 130 mm

Bolt Range:

M45 - M90

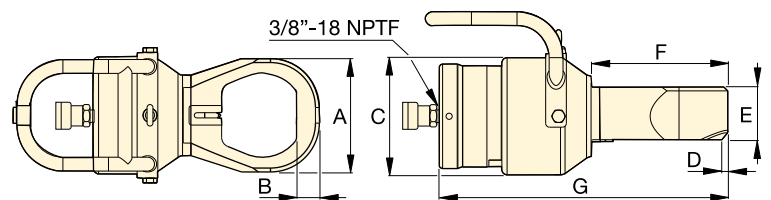
Maximum Operating Pressure:

700 bar

▼ TOOL-PUMP SET SELECTION CHART

Nut Splitter Model Nr.	Tool-Pump Set Model Nr.	Pump Selection			Accessories Included			
		Hand Pump Model Nr.	Air Pump Model Nr.	Electric Pump Model Nr.	Pressure Gauge Model Nr.	Gauge Adaptor Model Nr.	Hydraulic Hose Model Nr.	Storage Case Model Nr.
NS-70105	NS-70105SH	P-392	-	-	GP-10S	GA-2	HC-7206	CM-4
NS-70105	NS-70105SA	-	XA-11G *	-	2)	-	HC-7206	CM-4
NS-70105	NS-70105SEE	-	-	PUD-1100E	GP-10S	GA-2	HC-7206	CM-7
NS-110130	NS-110130SH	P-802	-	-	GP-10S	GA-2	HC-7206	CM-4
NS-110130	NS-110130SA	-	XA-11G *	-	2)	-	HC-7206	CM-4
NS-110130	NS-110130SEE	-	-	PUD-1100E	GP-10S	GA-2	HC-7206	CM-7

* XA-11G air pump features an integrated pressure gauge.



▼ NUT SPLITTER SPECIFICATIONS

Bolt Range	Hexagon Nut Range ¹⁾	Capacity	Oil Capacity	Model Number ²⁾	Dimensions (mm)							Cylinder ³⁾	Cutting Head ³⁾	Replacement Blade	
					A	B	C	D	E	F	G				
(mm)	(mm)	ton (kN)	(cm ³)									(kg)			
M45 - M52	70 - 80	103 (917)	377	NS-7080	132	28	180	8,0	81	186	412	37,0	NSC-70	NSH-7080	NSB-70
M45 - M56	70 - 85	103 (917)	377	NS-7085	145	30	180	8,0	81	196	422	37,0	NSC-70	NSH-7085	NSB-70
M45 - M64	70 - 95	103 (917)	377	NS-7095	160	32	180	8,0	81	201	432	38,5	NSC-70	NSH-7095	NSB-70
M45 - M72	70 - 105	103 (917)	377	NS-70105	174	35	180	9,0	81	209	443	39,5	NSC-70	NSH-70105	NSB-70
M76 - M80	110 - 115	193 (1711)	819	NS-110115	189	36	234	3,7	111	234	472	69,0	NSC-110	NSH-110115	NSB-110
M76 - M90	110 - 130	193 (1711)	819	NS-110130	219	41	234	2,5	111	242	493	71,5	NSC-110	NSH-110130	NSB-110

¹⁾ Maximum allowable hardness to split is HRC-44. See page 257 for hexagon bolt and nut sizes and related thread diameters.

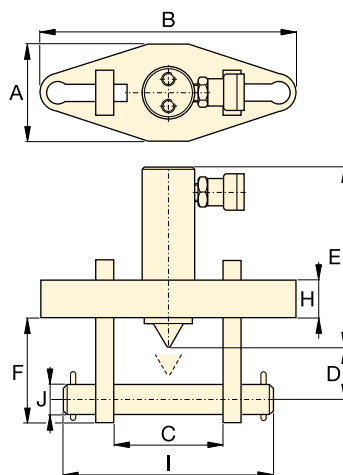
²⁾ NS-Series Nut Splitters ship in two cases: One containing the NSC-Cylinder and one containing the NSH-Cutting Head. Assembly required.


³⁾ Both, the NSH-head and the NSC-cylinder include a cutting blade.

▼ Shown: FS-56



- Lightweight, ergonomic design for ease of use
- Adjustable jaw widths from 70 mm to 216 mm for a wide range of applications
- Single-acting, spring return RC-Series DUO cylinders for fast trouble-free operation.



Maximum Flange Thickness (mm)	Stud Size (mm)	Standard Wedge (mm)	Capacity (ton)	Stroke (mm)	Oil Capacity (cm ³)	Model Number	Dimensions (mm)										 (kg)		
							A		B		C		D	E	F	H		I	J
							Min.	Max.	Min.	Max.	Min.	Max.							
2 x 57	19 - 28	3 - 28	5	38	24,6	FS-56*	76	209	70	155	32	196	88	25	206	19	11,5		
2 x 92	31 - 41	3 - 28	10	54	78,7	FS-109*	108	279	104	216	50	152	114	38	273	31	18,1		

* Available as Tool-Pump Set, see note on this page.

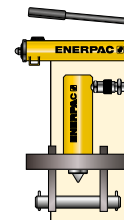
FS, STF Series



Capacity:
5 and 10 ton

Spread:
70 - 216 mm

Maximum Operating Pressure:
700 bar



Tool-Pump Sets

Both Flange Spreaders are available as **sets** (pump, tool, gauge, gauge adaptor, couplers and hose) for your ordering convenience.

Spreader Model Nr.	Pump Model Nr.	Set Model Number
FS-56	P-392	STF-56H
FS-109	P-392	STF-109H
FS-109	PATG-1102N	STF-109A



Wedge Spreaders

Friction-free, smooth and parallel wedge movement with unique interlock wedge design. Eliminates flange damage and risk of spreading arm failure.

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Flange Spreader Matching Chart

ASA Rating (bar)	Pipe Size (mm)	
	FS-56	FS-109
10	127 - 508	558 - 1066
20	63 - 355	406 - 711
27	63 - 304	355 - 609
35	63 - 254	304 - 508
62	12 - 152	203 - 406
103	12 - 88	101 - 203
172	12 - 63	76 - 101

Hydraulic and Mechanical Wedge Spreaders

▼ FSH-14 and FSM-8 with safety blocks SB-1



- For maintenance, commissioning, shutdowns, testing and valve change outs
- Integrated wedge concept: Friction-free, smooth and 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 6 mm
- Stepped spreader arm design - each step can spread under full load
- Few moving parts mean durability and low maintenance
- Safety block SB-1 and ratchet spanner SW-22 included with FSM-8 mechanical wedge spreader
- Safety block SB-1 and Enerpac RC-102 single-acting cylinder included with FSH-14 hydraulic wedge spreader.

FSH, FSM, STF Series

Tip Clearance / Maximum Spread ¹⁾:
6 mm / 80 mm

Maximum Spread Force:
8 - 14 ton

Maximum Operating Pressure:
700 bar (FSH-14)



Stepped Blocks FSB-1

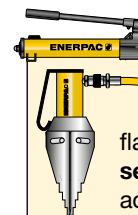
Use stepped blocks to increase wedge opening up to 80 mm. Fits both FSH-14 and FSM-8.



Control Manifolds

For simultaneously and even spreading of flange joints, 180° apart with FSH-14.

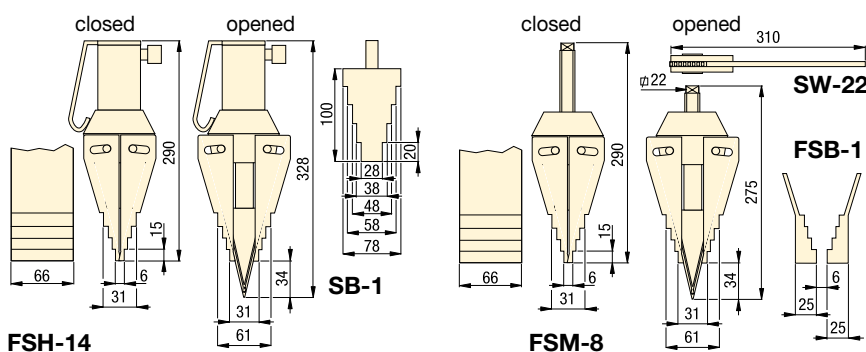
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Tool-Pump Sets

The hydraulic flange spreader is available as set (pump, tool, gauge adaptor, couplers and hose) for your ordering convenience.

Spreader Model Nr.	Handpump Model Nr.	Set Model Number
FSH-14	P-392	STF-14H



Maximum Spreading Force ton (kN)	Model Number	Tip Clearance (mm)	Maximum Spread ¹⁾ (mm)	Spreader Type	Oil Capacity (cm ³)	Weight (kg)
14 (125)	FSH-14*	6	80	Hydraulic	78	7,1
8 (72)	FSM-8	6	80	Mechanical	-	6,5

¹⁾ Using stepped blocks FSB-1

* Available as pump-tool set, see note on this page.

▼ Flange maintenance and joint separation with FSH-14 Hydraulic Wedge Spreader.



▼ From left to right: ATM-4, ATM-9, ATM-2 (ATM-9 shown without pump and hose)



The faster, simpler and safer way to align flanges.

- Enerpac ATM-Series tools rectify twist and rotational misalignment quickly, safely and without the need for an external power source
- Appropriate for use on most ANSI, API, BS and DIN flanges
- Reduces set-up time: no need for chains, pulleys or rigs
- Safety strap helps provide secure operation
- Can be installed and used in any position
- Stays stable in position under full load
- Portable, lightweight design enables easy transport and use, even in remote locations
- Each ATM-model contains a tool and kit box.



Adjustable Reach

The highly adjustable reach of the wing and drop leg on ATM-4 and ATM-9 allow precise alignment.



Gauge and Adaptor

The ATM-9 includes P-142 hand pump and HC-7206C 1,8 m long hose. Enerpac recommend the use of the

pressure gauge **GP-10S** and gauge adaptor **GA-4** for easy mounting of the gauge onto your system.

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▼ The compact ATM-2 is actuated by simply hand turning the crank.



▼ The ATM-9 is shown here with optional pressure gauge and gauge adaptor.



Flange Alignment Tools

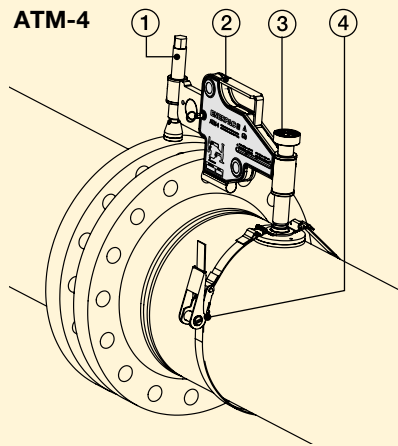


Applications

Enerpac ATM-Series Tools help correct flange misalignment, and allow bolts to be placed into joints. This alignment takes place during pipework construction, or maintenance.

These tools provide pipe installers and maintenance personnel with some of the simplest, safest and most productive solutions available for flange alignment in the market today.

- ① Extendable wing provides usage on wide variety of flanges.
- ② Portable, light weight design enables easy transport and use.
- ③ Hand-adjustable base for easy positioning by a single operator.
- ④ Safety strap helps provide secure operation from a horizontal or vertical position.



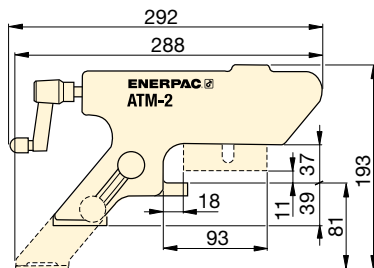
ATM Series



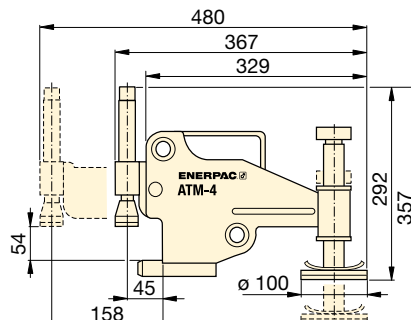
Minimum Bolt Size:
16 - 31,5 mm

Flange Wall Thickness:
14 - 228 mm

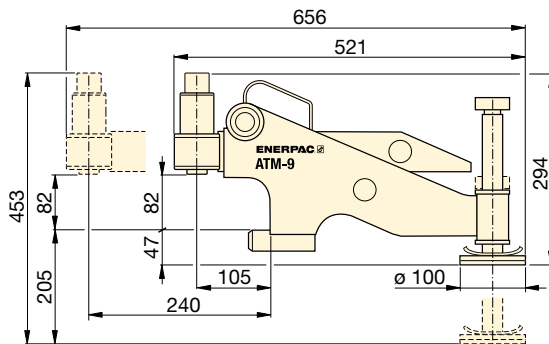
Maximum Lifting Force:
1 - 9 ton (10 - 90 kN)



ATM-2



ATM-4



ATM-9

Maximum Lifting Force		Model Number	Minimum Bolt Size		Flange Wall Thickness		(kg)
ton	kN		(mm)	(inch)	(mm)	(inch)	
1	10	ATM-2	16	.63	14 - 82	.55 - 3.29	1,6
4	40	ATM-4	24	.95	30 - 133	1.18 - 5.23	8,6
9	90	ATM-9 *	31,5	1.24	93 - 228	3.66 - 9.00	14,5

* ATM-9 includes an Enerpac hand pump and hydraulic hose (gauge and adaptor sold separately). ATM-9 weight includes tool only.



Cylinder-Pump Sets

Hydraulic cylinders, jacks and lifting wedges can also be used to assist in pipe line positioning and aligning.

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Pipe Flange Face Tool

The portable, hand powered tool FF-120 makes even the hardest to reach pipe flanges resurfaceable in a safe and convenient way.

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▼ The ATM-Series – the faster, simpler and safer way to align flanges.



▼ Shown: FF-120



- Makes refacing easy – hand operated machine tool can be set up anywhere without the need for air, electric or hydraulic power
- Lightweight and portable (15 kg in storage box)
- Adjustable cutting head for reface of flat flange surfaces of pipes with flange OD facing range 25,4 - 304,8 mm [1 - 12 inch]
- Interchangeable collets for ID mounting range 25,4 - 152,4 mm [1-6 inch] allow the user to work on many different flanges with minimal time between set-ups
- Interchangeable lead screws suitable for refacing damaged raised-face (RF), flat-face (FF) or lens-ring joint flanges
- Tool body with expanding collets centers itself providing real concentric operation.

▼ The Enerpac FF-120 used to face a pipe flange.



Safe, efficient and accurate refacing of flat pipe flange surfaces



Complete in Wheeled Carrying Case

The FF-120 comes as portable set (15 kg). Can be transported, easy set-up and operated by a

single technician. Set includes:

FFL-kit with locators, O-Rings and extensions;

FSS-kit with feed screw and nut ½"-20 UN for surface roughness Ra 1,6 - 2,4 μ.

FSF-kit with feed screw and nut ½"-11 UNF for surface roughness Ra 3,2 - 6,3 μ.



Joint Separation Tools

FS and FSH-Series

parallel wedge spreaders provide quick and easy joint separation using hydraulic or

mechanical force.

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Flange Alignment Tools

The ATM-Series provide safe and high-precision flange alignment tools that fit most commonly used ANSI, API,

BS and DIN flanges.

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Controlled Tightening and Loosening

Use Enerpac Bolting Tools to seal the joint to the precise torque or tension required:

E-Series manual torque multipliers, S and W-Series hydraulic torque wrenches or GT-Series hydraulic bolt tensioners.

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QuickFace – Mechanical Pipe Flange Face Tool



QuickFace, Mechanical Flange Face Tool

Portable, hand powered tool makes even the hardest to reach pipe flanges resurface-able in a safe and convenient way.

Makes refacing easy

A simple and cost effective solution – the FF-120 turns a two man operation with heavy equipment, compressors and portable generators into a one man job. The FF-120 has interchangeable lead screws that make it suitable for resurfacing damaged flat-faced, raised-face or lens-ring joint flanges to the high safety standards required. After selecting the correct lead screw for the operation, the tool body is inserted in the pipe end and centres itself with adjustable locators to provide real concentric operation.

The tool arm is then rotated by hand using a worm-gear mechanism to provide a perfect spiral “gramophone” finish. The tool can be adjusted with a calibrated slide to define cut depth and the correct finish.

Surface finish & accuracy

A serrated finish with 30-55 grooves per inch and a resultant roughness of between Ra 3,2-12,5 μ (125-500 micro inches).

The FF-120 has same precision and quality of finish as a lathe.

Cost effective solution

Small and portable enough to be a permanent addition to your equipment range, Enerpac’s FF-120 is the perfect solution to all of your small diameter facing problems.

FF Series



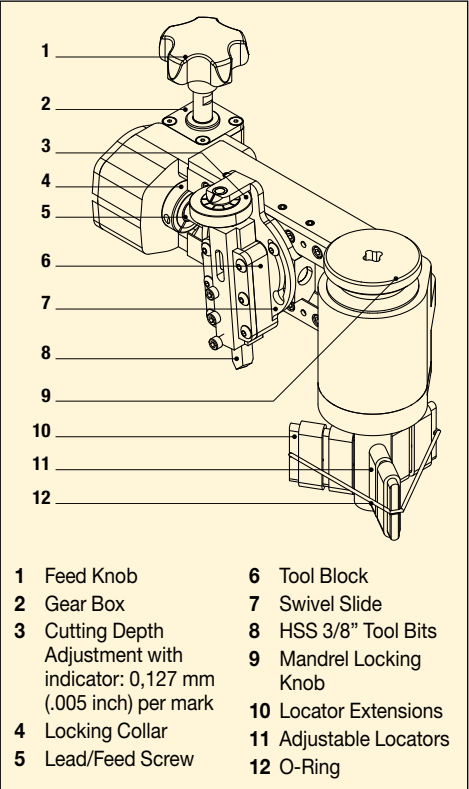
Pipe Flange Cutting Diameter Range:
ø 25-305 mm / 1-12"

Internal Pipe Mounting Range:
ø 25-152 mm / 1-6"

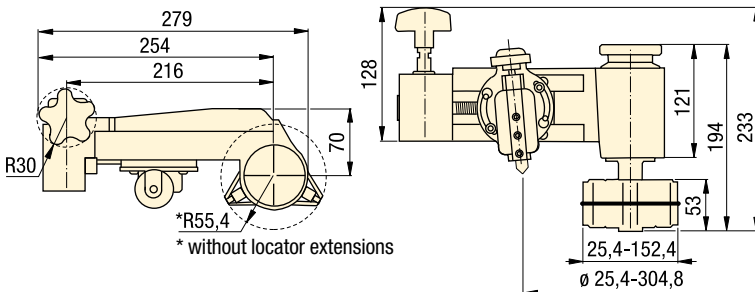
Cutting Resultant Roughness:
Ra 3,2 - 12,5 μ



- 1 Hand-operated cold work tool – no need for external power and hot work permits.
- 2 Calibrated cross slide for accurate cutting control.
- 3 Adjustable cutting head for reface of flat flange surfaces of pipes with flange OD facing range ø 25,4-304,8 mm [1-12 inch].
- 4 Interchangeable lead screws enable selection of surface finish between Ra 3,2-12,5 μ.
- 5 Utilizes standard 3/8 inch or 10 mm tool steel.
- 6 Range of interchangeable collets allow the tool to accommodate ø 25,4 - 152,4 mm (1 - 6 inch) pipe ID.
- 7 Tool body with expanding collets centers in the bore ensuring concentric and accurate set-up.



- | | |
|--|------------------------|
| 1 Feed Knob | 6 Tool Block |
| 2 Gear Box | 7 Swivel Slide |
| 3 Cutting Depth Adjustment with indicator: 0,127 mm (.005 inch) per mark | 8 HSS 3/8" Tool Bits |
| 4 Locking Collar | 9 Mandrel Locking Knob |
| 5 Lead/Feed Screw | 10 Locator Extensions |
| | 11 Adjustable Locators |
| | 12 O-Ring |



SELECTION CHART

Pipe Flange Cutting Diameter Range		Internal Pipe Mounting Diameter Range		Cutting Resultant Roughness	Model Number	Weight (kg)
(mm)	(inch)	(mm)	(inch)			
25,4 - 304,8	1,0 - 12,0	25,4 - 152,4	1,0 - 6,0	3,2 - 12,5	FF-120	6,8

▼ The Enerpac FF-120 QuickFace has same precision and quality of finish as a lathe.



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.

Courtesy of Caltrans



Integrated Solutions Section Overview

Capacity ton (kN)	Capabilities	Series	Page
60 - 1100 (60 - 10780)	Hydraulic Gantries For your most demanding lifting and rigging operations	SL SBL MBL	 230 ▶
15 - 1250 (147 - 12250)	Strand Jacks Compact high capacity system for controlled lifting and lowering	HSL	 231 ▶
125 - 250 (1225- 2450)	Skidding Systems An ancient technology meets the 21st century	HSK HSKLH	 232 ▶
61 (600)	Self-Propelled Modular Trailer Hydraulic strength in a linear drive transport system	SPMT	 233 ▶
N/A	Synchronous Lifting Systems The multi-functional synchronous lifting system	EVO	 234 ▶
50 - 200 (498 - 1995)	Stage Lifting Systems The solution for incremental lifting	BLS	 236 ▶
55 - 110 (539 - 1078)	SynchHoist – Synchronous Hoisting Systems Hydraulic precision positioning systems	SHS	 238 ▶
N/A	Custom Solutions		 240 ▶
0,25 - 250 (2,2 - 2222)	Uni-Lift® Actuators Mechanical precision positioning	M B	 242 ▶



Contact Enerpac!

Contact the Enerpac office nearest to you for advice and technical assistance in the layout of your ideal Lifting System or visit us at: www.enerpac.com.

Or ask Enerpac for assistance by email: integratedsolutions@enerpac.com.

▼ Shown: **SBL1100 Hydraulic Gantry**



- **Self-contained hydraulics and electronics**
- **Intelli-Lift wireless control system**
- **Self-propelled wheels or tank rollers**
- **Foldable boom on SBL900, SBL1100, MBL500 and MBL600**
- **Full range of supplementary equipment: header beams, lifting lugs, side shift, skid tracks**
- **All gantries are ASME B30.1 compliant.**

▼ Shown: **SBL1100**



SL, SBL, MBL Series

Capacity with 4 towers:

60 - 1100 ton

Lifting Height:

3,39 - 14,52 m



Hydraulic Gantries

Hydraulic Gantries are a safe, efficient way to lift and position heavy loads in applications where traditional cranes will not fit and permanent overhead structures for job cranes are not an option.

Hydraulic Gantries are placed on skid tracks to provide a means for moving and placing heavy loads, many times with only one pick.

Enerpac offers three series of Hydraulic Gantry systems:

- the cost-effective SL-Series offers entry level control and capacity
- the heavy-duty SBL-Series offers capacities up to 1100 ton and 3-stage lifting capability through the boom structure
- the MBL-Series incorporates all features of the SBL-Series and offers full lifting capacity over the full stroke. The MBL Gantries have been designed with increased footprint stability and can therefore lift using 2 legs as well as 4.

All Enerpac gantries are delivered with specific properties and control systems to ensure optimum stability and safety.

▼ Shown: HSL50006 Strand Jack



- Full control of lifting and lowering through SCC control
- Two sizes strand diameter: 15,7 and 18 mm
- Complete line of electric and diesel power packs
- Nickel plated telescopic pipes preventing bird caging
- Standard supplied with lifting anchor
- Automated locking – unlocking operation
- Special corrosion treated high endurance multi-use wedges
- Full range of accessories: strand dispenser, strand guide, re-coiler and strand tensioner.

▼ Shown: HSL85007



HSL Series

Capacity:

15 - 1250 ton



Strand Jacks

A strand jack can be considered a linear winch. In a strand jack, a bundle of steel cables or strands are guided through a hydraulic cylinder. Above and below the cylinder are anchor systems with wedges that grip the strand bundle simultaneously, this is how the strand jack is able to carry a load. Lifting and lowering a load is achieved by hydraulically controlling the main jack and both mini jacks alternately.

Enerpac utilizes Smart Cylinder Control (SCC), ensuring full control of the lifting and lowering operation.

Today strand jacks are widely recognized as the most sophisticated heavy lifting solution. Strand jacks are used all over the world to erect bridges, load out offshore structures, and lift/lower heavy loads where the use of conventional cranes is neither economical nor practical.

▼ Shown: HSK1250 Skidding System



- PTFE skid pads with dimpled surface for low friction and long lifetime
- Easy to replace skid pads, no tools necessary
- Unique gripper anchor system complete with lever for easy selection of skidding direction
- Double acting hydraulic cylinders with sufficient capacity in both push and pull direction. No need to turn the skid shoe for reverse skidding direction
- Large load support surface on the skid beam
- Bottom of skid shoes equipped with stainless steel sliding plates.

▼ Shown: HSK1250



HSK, HSKLH Series

Capacity per shoe:

125 - 250 ton

Stroke Push/Pull Cylinders:

600 mm



Skidding Systems

The HSK skidding system is comprised of a series of skid-shoes powered by hydraulic push-pull cylinders, travelling over a pre-constructed track.

Enerpac Skidding Systems are available in three versions:

- **HSK1250** with a capacity of 125 ton per skid unit
- **HSK2500** with a capacity of 250 ton per skid unit
- **HSK1H2500** with a capacity of 250 ton per skid unit and a lower collapsed height.

The HSK1250 and HSK2500 skidding systems are available in 2 varieties: using a “skid shoe jack” or a “skid shoe beam”. The skid shoe jack includes an integrated lifting cylinder. A skid shoe beam is designed for skidding purposes only.

To calculate the minimum required capacity per shoe, the entire load has to be able to rest safely on 2 of the 4 shoes. To skid a load of 500 ton, the required skidding system is **HSK2500**.

Self-Propelled Modular Trailer

▼ Shown: **SPMT600**



- **Multiple configurations possible**
- **Reduced height and slim design**
- **Intellidrive wireless control system**
- **Up to 3 units per power pack.**

▼ Shown: **SPMT600**



SPMT Series

Capacity:

61 ton (600 kN)

Transport Speed:

3 km/h



Self-Propelled Modular Trailer

The Enerpac Self Propelled Modular Trailer features a minimized height and slim design, which make it very easy to operate in confined spaces. Each unit has 3 axles.

Each wheel unit has a steering as well as a lifting cylinder at its disposal. Wheel propulsion is accomplished by hydraulic propulsion. The power pack has a 54 kW tier 4 driven engine.

The SPMT is controlled by Intelli-drive, a wireless control system that allows the entire system to be operated by one person.

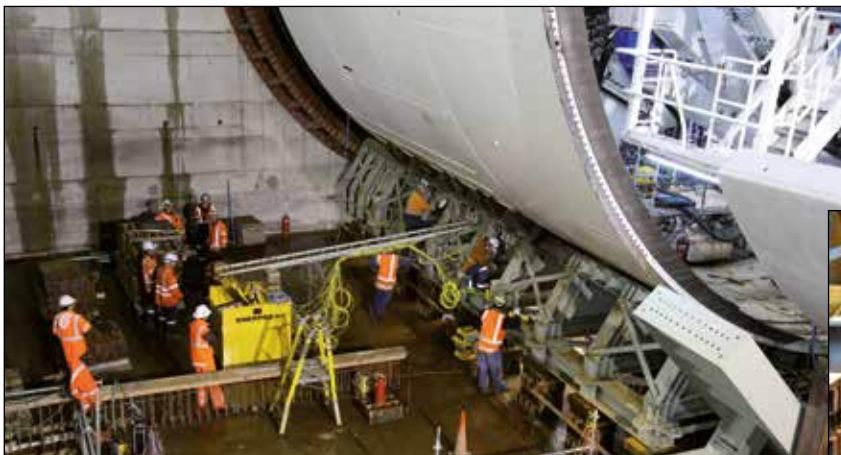
One of the unique features of the system is that it is able to be containerized. Two units and a power pack can be shipped inside a 20 ft. container.

▼ EVO-8 (shown with optional cylinders and wire stroke sensors)



- **Modular lifting system to control 4, 8 or 12 lifting points**
- **Can be connected to single- or double-acting cylinders with the same or different lifting capacities**
- **PLC-controlled system with integrated 700 bar hydraulic power unit, 3,0 kW motor, 250 litres reservoir**
- **Network capability to link up to 4 HPU's to a separate master control box via wireless control**
- **Intuitive user interface providing easy set up, control and navigation**
- **Data storage and recording capabilities**
- **Variable frequency drive motor (VFDM) and PLC for precise synchronization and oil flow control.**

▼ 3600 ton Tunnel Boring Machine lowered and tilted into its starting position with the EVO-Series Synchronous Lifting System.



The multi-functional synchronous lifting system



Typical Synchronous Lifting Applications

- Bridge lifting and repositioning
- Bridge launching
- Bridge maintenance
- Incremental launching and box jacking
- Lifting and lowering of heavy equipment
- Lifting, lowering, levelling and weighing of heavy structures and buildings
- Structural and pile testing
- Lifting and weighing of oil platforms
- Foundation levelling of onshore and offshore wind turbines
- De-propping/load transfer from temporary steel work
- Foundation shoring.



EVO-System Work Modes

The application possibilities are infinite with the EVO-system, powering interlinked hydraulic cylinders – single or double-acting, push or pull, stage lift, hollow plunger or lock nut cylinders.

The EVO-System has 9 work modes. The operator can navigate to any of these menus:

1. Manual
2. Pre-Load
3. Automatic
4. Retract Fast
5. Depressurize
6. Tilting
7. Stage Lift
8. Weighing *
9. Center of Gravity determination *

* Available in the EVO-W System.



What is Synchronous Lifting ?

To achieve high-precision movement of heavy objects it is necessary to control and synchronise the movements of multiple lifting points.

The PLC-control uses feedback from multiple sensors to control the lifting, lowering and positioning of any large, heavy or complex structure, regardless of weight distribution.

By varying the oil flow to each cylinder, the system maintains very accurate positional control. This control maintains structural integrity and increases the productivity and safety of the lift, by eliminating manual intervention.

PLC-controlled synchronous lifting systems reduce the risk of bending, twisting or tilting, due to uneven weight distribution or load-shifts between the lift points.

Benefits of the Enerpac EVO-System Precise control of multiple lift points

- Comprehensive understanding and management of a lifting operation from a central control system improves safety and operational productivity.
- Programmable synchronized lifting.
- Automatic stop at pre-set cylinder stroke or load limit.

Safe and efficient movement of loads

- System secured with warning and stop features to realize optimal safety.

High accuracy

- Variable frequency drive (VDFM) and PLC for precise synchronization and control of oil flow, stroke and speed.
- Depending the cylinder capacities used, an accuracy of 1,0 mm between lifting points is achieved.

Ease of operation

- User friendly interface: visual screens, icons, symbols and color coding.
- A single operator controls the entire operation.

Monitoring and Data Recording

- Displays data of the operation.
- Data recording at user-defined intervals.
- Data storage and read-out for reporting.

Network capability

- Ethernet IP protocol for communication between hydraulic power units, allow easy "plug and play".

Global standardized system

- Enerpac global coverage ensures local support.

EVO-W Weighing System

Weighing applications with 1% accuracy

- Includes calibrated sensors and auto-calibration of external load cells.
- Center of gravity determination functionality.
- Parameters for "waiting time for stabilization" and "number of cycles".

EVO Series



Number of Lifting Points:

4, 8 or 12

Accuracy EVO-System:

1,0 mm over full stroke

Accuracy EVO-W (weighing) System:

1% of full scale



Lifting Cylinders

For a complete line of Enerpac cylinders, see the Cylinder and Lifting Products in our catalogue.



▲ Box jacking: Multi-point synchronous system to push hydraulically the tunnel segments under the railway.

▼ The superlifting and launch of a 43.000-ton floating oil production system in Malaysia for the Gumusut-Kakap offshore field has set high benchmarks for safety through its use of sophisticated EVO-Series synchronous hydraulics to lift, balance, weigh and smoothly launch massive resources structures.



▼ Lifting and levelling a building foundation.



▼ Shown: BLS-1006



- Double-acting cylinder
- Swivel saddle for load adjustment
- Large footprint for stability
- Anti-rotation device
- Built-in overload protection.

▼ Synchronous Stage Lifting: 48 double-acting jacks (25 and 50 ton) are networked in to a 16 points synchronous system to lift this 50 metres long, 1000 ton building up to a height of 2,5 metres to construct a new floor level.



A Simple Solution to Incremental Lifting



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.



Split-Flow Pumps

SFP-Series Pumps with multiple outlets with equal oil flow. For lifting applications on multiple points Split-Flow

Pumps are a far better alternative than using separate operated pumps.

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EVO-Series, Synchronous Lifting Systems

The EVO-system is the ideal system for stage lifting, powering interlinked

hydraulic cylinders – single or double-acting, push or pull, stage lift, hollow plunger or lock nut cylinders. The EVO-system has 9 work modes including the stage lift work mode.

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Cylinder Capacity	Stroke	Model Number	Max. Cylinder Capacity (kN)	
			Push	Pull
ton	(mm)			
50	150	BLS-506	498	103
95	161	BLS-1006	933	435
140	151	BLS-1506	1386	668
200	151	BLS-2006	1995	1017

Double-Acting Stage-Lift Cylinders



◀ Typical stage-lift application using a custom built Enerpac system to lift the 360 ton Akkerwinde wooden bridge in the Netherlands.

BLS Series



Capacity per Lifting Point:

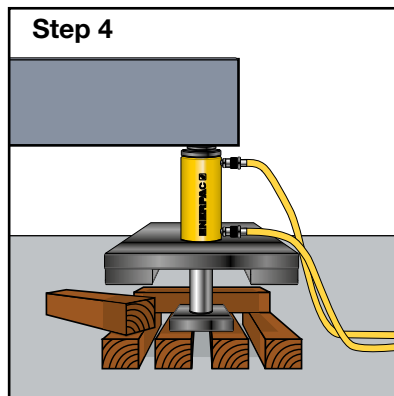
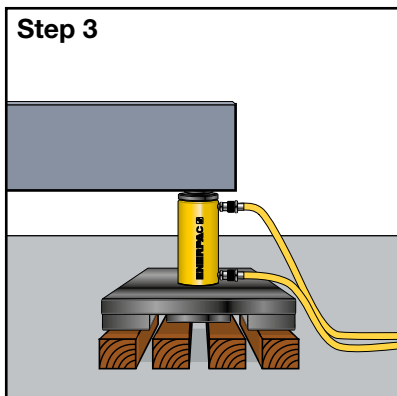
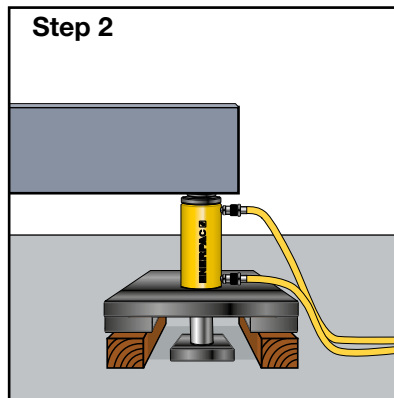
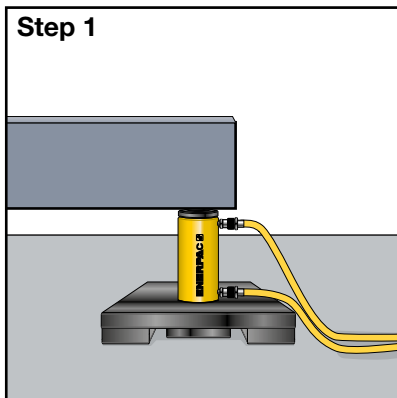
50 - 200 ton

Stroke per Stage:

150 - 161 mm

Maximum Operating Pressure:

700 bar



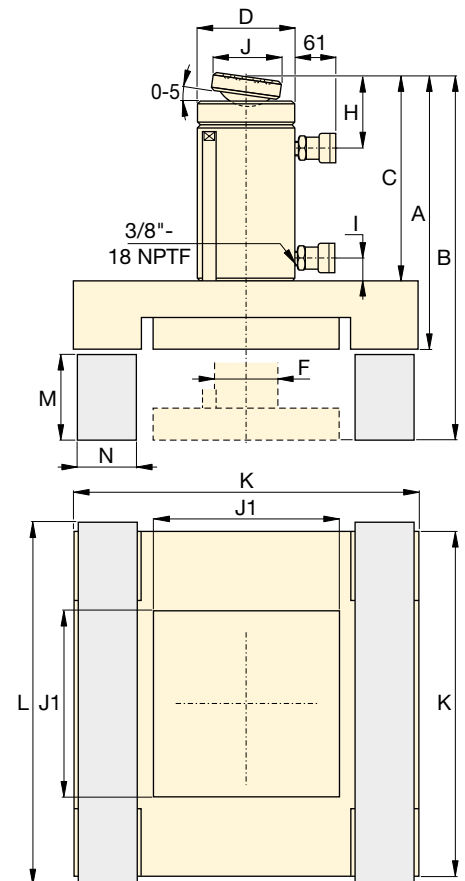
▲ Stage Lifting Sequence

Step 1: The Stage Lift cylinder is placed on a solid support under the load (retracted plunger).

Step 2: Plunger extends, lifting the load and giving clearance to insert two outer blocks under the spreading plate.

Step 3: Plunger retracts, giving clearance to position the central blocks which will support the plunger plate for the next extension.

Step 4: Plunger extends, lifting the load, giving clearance to insert two new blocks, placed crosswise under the spreading plate.



Cylinder Effective Area (cm ²)		Oil Capacity (cm ³)		Stage Lift Cylinder Dimensions (mm)											Support Blocks * and Dimensions (mm)				Model Number	
Push	Pull	Push	Pull	A	B	C	D	F	H	I	J	J1	K	T	Material	L	M	N		(kg)
71,2	21,5	1111	335	406	556	318	127	79	57	36	50	240	515	90	Azobe	565	140	120	170	BLS-506
133,3	62,2	2238	1045	445	606	343	177	95	76	24	71	330	670	82	Wood	720	150	160	315	BLS-1006
198,1	95,4	3090	1488	473	624	370	624	114	94	39	130	230	475	85	Solid	500	140	115	322	BLS-1506
285,6	145,6	4332	2209	510	661	387	248	133	102	37	130	270	550	70	Aluminium	575	140	135	373	BLS-2006

* Support blocks are not supplied by Enerpac.

▼ SHS-Series 4-Point SyncHoist System



- High precision load manoeuvring, vertically and horizontally – using one crane
- Reduces the risk of damage from oscillations of wire rope due to crane jogging and sudden starts/stops
- Vastly improving worker safety, operating speed and control
- Weather conditions play less critical role
- PLC-controlled hydraulics turn lifting into high accuracy hoisting and load positioning system
- Double-acting push/pull cylinders with load holding valves for added safety in case of hose rupture or coupler damage
- Cost reduction compared to conventional load positioning methods.

Options for system management & control:

- **Manual control:** stroke control and system warning functions
- **Automatic control:** fully PLC-monitored system with programmable functions using touch screen and wireless remote control and system warning functions.

▼ Bridge segments are hoisted from the ground, being positioned with a 4-point SyncHoist system with fully monitorized cylinders.



▼ The Enerpac SyncHoist system was used with one hydraulic cylinder to level and position the 95 ton, 115 m diameter rotor assembly of wind turbine.



Accurate Hoisting and Load Positioning Enhancing a Crane's Capability



Synchronous Hoisting

Enerpac SyncHoist is a unique crane product for below-the-hook positioning of heavy loads that require precision placement. The SyncHoist system may reduce the number of cranes needed and reduce the costs of multiple picks.

Functions

- High precision horizontal and vertical load positioning
- Pre-programmed positioning, tilting and aligning.

Applications

- Positioning of rotor, stator and propeller blades of wind turbines
- 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.

▼ An 4 x 110 ton SyncHoist system used to align steel blocks of the ship's control tower sections allowing gradual lift of the load and dynamic adjustment in relation to the centre of gravity during the lift.



SyncHoist - High Precision Load Positioning



What is SyncHoist?

Enerpac SHS-Series SyncHoist is a hydraulically operated auxiliary attachment for high precision load positioning for cranes. The PLC-controlled hydraulic pump monitors and guides the powerful double-acting push-pull cylinders integrated into the lifting points above the load. The SyncHoist system can be used for pre-programmed positioning, tilting and aligning of loads.

SyncHoist improves safety, operating speed and control of load movement

Geometric positioning of heavy loads in a horizontal and vertical plane are frequently done using more than one crane. Synchronising movements between cranes are difficult and risky. The lifting inaccuracy can result in damage to the load and support structures and puts workers at risks. The SyncHoist system can be used for controlled hydraulic horizontal and vertical material handling.

Two options for system management and control

Contact Enerpac for the following options, or other customised stroke, capacity and control configurations.

1. Manual control

- Valve with manual levers
- Plunger stroke control
- Warnings for thermal motor protection
- Visual check: oil level, filter indication.

2. Automatic control

- Electric valve with pendant
- PLC-control and touch screen
- Remote wireless radio control
- Load and stroke monitoring
- Pre-programmable motions and data recording
- System warnings for:
 - maximum cylinder load control setting
 - stroke and position control
 - thermal motor protection
 - oil level and filter indication.

SHS Series



Capacity Per Lifting Point:

55 - 85 - 110 ton

Maximum Stroke:

1000 - 1500 mm

Accuracy Over Full Stroke:

± 1,0 mm

Maximum Operating Pressure:

700 bar

▼ 4 x 85 ton SyncHoist system mounted in an auxiliary frame for levelling and positioning metal structures during construction of an oil & gas installation.

SHS-Series, Enerpac Synchronous Hoisting Systems

System Load Capacity	220 ton (2156 kN)	340 ton (3332 kN)	440 ton (4312 kN)
Max. handling load ¹⁾	4 x 55 ton	4 x 85 ton	4 x 110 ton
Number of lifting points ²⁾	1, 2, 3 or 4	1, 2, 3 or 4	1, 2, 3 or 4
System reach	1000-1500 mm	1000-1500 mm	1000-1500 mm
Cylinder configuration			
Push force (kN) @ 90 bar	9,6 ton (94)	14,0 ton (137)	19,3 ton (189)
Pull force (kN) @ 700 bar	55 ton (539)	85 ton (833)	110 ton (1078)
Plunger stroke ²⁾	1000 mm 1500 mm	1000 mm 1500 mm	1000 mm 1500 mm

Control options & system management ³⁾

Manual control	Manual directional control valves
Automatic control	Fully closed-loop PLC-controlled system

Pump configurations (single-stage)

Oil flow (manual control)	4 x 1,0 l/min	4 x 1,0 l/min	4 x 1,0 l/min
Oil flow (automatic control)	4 x 2,1 l/min	4 x 2,1 l/min	4 x 2,1 l/min
Motor power (manual control)	5,5 kW	5,5 kW	5,5 kW
Motor power (automatic control)	15 kW	15 kW	15 kW
Reservoir capacity	250 litres	250 litres	250 litres
Usable oil capacity	200 litres	200 litres	200 litres

¹⁾ Subject to angle and position of lifting cylinders.

²⁾ Cylinder are equipped with parachute valve for added safety in event of hose rupture or coupler damage.

Note: Enerpac SyncHoist have standard 4 lifting points. In the event that more or less lifting points are required, contact your local Enerpac representative.

³⁾ See information box above for detailed control features.



When your application requires something other than our standard product offering, look to Enerpac's Integrated Solutions Team.

Our group of engineers, designers and specialist, will work with you to understand your specific application and provide a turn-key solution that will exceed your expectations.



STEEL FABRICATION

Enerpac has a dedicated facility for steel fabrication and welding. We design and manufacture custom structures used in demanding heavy-lifting applications.



ENGINEERING

Enerpac has a multi-disciplined engineering team capable of design and development of all aspects of an Integrated Solutions system. Leveraging design and application experience with the latest in computer software, rapid prototyping and analysis methods ensures delivery of the highest quality systems.



ELECTRONICS

Enerpac designs all control systems in-house. This capability keeps control technology close to the design engineers who are developing the rest of the system. In doing so, we can tailor the control system to match unique project requirements.



MACHINING

Enerpac utilizes the latest in CNC machining technologies and manufactures all large and special hydraulic cylinders in-house. We can machine diameters up to 1000 mm with lengths to 6000 mm.



FIELD SUPPORT

Enerpac Integrated Solutions is available to provide on-site support including training and troubleshooting of systems. We also stock repair parts and consumable items at several locations to ensure fast delivery and minimal downtime.



HYDRAULIC POWER UNITS

Enerpac designs, assembles and tests small to large hydraulic power units in-house. Power units range from 0,5 to 240 kW and are tested with the system they are intended to operate.



MAINTENANCE and REPAIR

Due to the unique nature of Enerpac's Integrated Solutions systems, we offer complete maintenance and repair services. Our M&R group is available to assist customers who do not have access to local service facilities qualified to work on these systems.



SYNCHRONOUS HOISTING

A unique crane product for below-the-hook positioning of heavy loads that require precision placement. May reduce the number of cranes needed and reduce the costs for multiple picks.



STRAND JACK GANTRY

The strand jack gantry is a steel structure to facilitate erection and skidding back, forth and sideways of heavy loads. The Enerpac strand jack gantry allows you to operate in confined spaces.

The Strand Jack Gantry system consists of 3 major components:

- Steel Construction
- Strand Jacks for Vertical Lifting
- Skidding System for Horizontal Skidding

This is powered by a hydraulic power unit that is situated on ground level. The capacity, height and width of the construction can be modified in cooperation with our engineering team.



BRIDGE LIFTING & LAUNCHING

Providing a solution for the most complex and demanding bridge construction applications, Enerpac has over 20 years providing unique customer bridge launching systems.



SYNCHRONOUS LIFTING

The superlifting and launch of a 43,000 ton floating oil production system in Malaysia has set high benchmarks for safety through its use of sophisticated synchronous hydraulics to lift, balance, weigh and smoothly launch massive resources structures. The active skids, mounted on guidance tracks, were used for weighing and establishing structures' centre of gravity to ensure safety and structural integrity.



CHAIN PULLERS

The MCS Napoli was caught in a storm and was beached in Lyme Bay in 2007. The ship cracked and was broken up into sections. The 3450 ton back of the ship, measuring 65 m by 36 m, was hoisted onto two pontoons using 24 hydraulically operated chain pullers, each with a lifting capacity of 227 ton. Once on the pontoon, the wreck was sawn into pieces before being transported to land.



MECHANIZATION SYSTEM and HYDRAULIC ROTATING MECHANISM

Enerpac supplied two major components for the Las Vegas 168m High Roller Observation Wheel. The Mechanization System which is the primary system used to drive the wheel every day for the expected 50 year life span and the Hydraulic Rotating Mechanism which was used to erect the rim of the wheel.



SELF-ERECTING TOWER

The Enerpac Self Erecting Tower (ESET) is a self-erecting-tower-lift system that enables you to build a free standing gantry from ground level. The ESET can be supplied in various capacities and lifting heights and is built with standard modular components, enabling a flexible solution to future project demands.

The Self Erecting Tower enables moving the load in all directions: lifting, lowering, skidding back and forth, and has side shift capabilities. Lifting and skidding are achieved using standard Enerpac strand jacks that can also be used for other applications.

The Self Erecting Tower is a versatile lift-system that can be used in a wide variety of operations, for example the installation of reactor vessels in a petrochemical plants or erecting a shipyard crane. When compared with large capacity cranes, the Self Erecting Tower significantly reduces transportation and set up costs.

▼ Shown: Uni-Lift® Mechanical Actuators



- Machine screw versions up to 250 ton for low-cycle, high-load applications and positive load holding
- Ball-Screw versions up to 5 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 minimize side loading
- Precision machine gear sets provide minimum backlash while reducing wear
- Wide variety of base-mounting and screw-end configurations.

Precision Positioning and Control in a Mechanical Package



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

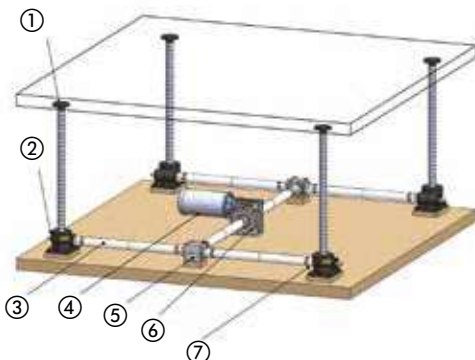
Design Features:

- Available with translating, rotating and keyed load screw designs
- High-strength rolled load screws provide 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 0,17 m/sec.

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.

Typical Mechanical Actuator Set-Up



- ① Top Plate (4x)
- ② Uni-Lift® Mechanical Actuator (4x)
- ③ Shafting (6x)
- ④ Electric Motor (1x)
- ⑤ Mitre Gearbox (2x)
- ⑥ Reducer (1x)
- ⑦ Coupler (1x)

B, M Series



Capacity:

2,2 - 2222 kN

Maximum Stroke:

380 - 6095 mm

Actuator Types:

Machine Screw & Ball Screw



Over-travel Stop Nuts

Provide a mechanical stop and are used to prevent the ejection of the power screw from the actuator.



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.

See Uni-Lift® Solutions in Action.

Page: 244



Contact Enerpac!

Contact the Enerpac office nearest to you for advice and technical assistance in the layout of your ideal Lifting System or visit us at: www.enerpac.com.

Configuring Your UNI-LIFT Actuator On-Line

www.enerpac.com/unilift

for latest Enerpac Uni-Lift® information

Visit the Enerpac Web Site and use the UNI-LIFT® Configurator to properly select the type, ratio, and size of the machine or ball screw actuator for your application.

- Provides instant results that are downloadable in 2D and 3D CAD
- Configuration snapshot is generated from your selection input
- Supports imperial and metric units
- Informative help topics guide you through the entire process.



Actuators move the ramp of ferry dock

Engineers utilized two (2) Uni-Lift® 100-ton actuators with 5 metres 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.



Opening large doors of plating tanks

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 to prevent cross contamination between tanks.



OEM motion control solutions

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!

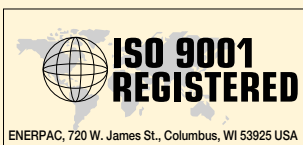
If selecting hydraulic equipment is not your daily routine, then you will appreciate these pages. The 'Yellow Pages' are designed to help you work with hydraulics. They will help you to better understand the basics of hydraulics, of system set-ups and of the most commonly used hydraulic techniques. The 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.

Section		Page
Safety Instructions		246-247 ▶
Pump Selection Selection Worksheet		248 ▶ 249 ▶
Basic System Set-ups		250-251 ▶
Basic Hydraulics		252-253 ▶
Conversion Tables Cylinder Speed Charts		254 ▶ 255 ▶
Valve Information Hexagon Bolt and Nut Sizes		256 ▶ 257 ▶
Torque Tightening Pressure versus Torque Tables		258-259 ▶ 260-261 ▶



ENERPAC WARRANTY STATEMENT

Visit our web site for the complete Global Lifetime Warranty or call your Authorized Service Center.



Enerpac is certified for several quality standards. These standards require compliance with standards for management, administration, product development and manufacturing. Enerpac worked hard to earn the quality rating ISO 9001, in its ongoing pursuit of excellence.

DIN 20024

Enerpac thermoplastic hoses are related to the criteria set forth in Deutsche Industrie Norm 20024.



ATEX 95 Certified

The ATP, ZA and XA-Series air pumps and S and W-Series torque wrenches are tested and certified according to the Equipment Directive 94 / 9 / EC "ATEX Directive".

Product Design Criteria

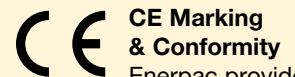
All hydraulic components are designed and tested to be safe for use at maximum 700 bar (10,000 psi) pressure unless otherwise specifically noted.



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 Electromagnetic Compatibility per EMC Directive 2004/108/EC.



Enerpac provides a Declaration of Conformity and CE marking for products that conform with the European Community Directives.

ASME B30.1

Our cylinders fully comply with the criteria set forth by the American National Standards Institute (except 'BRD', 'CLL' and CLS series).



Safety Instructions



When used correctly, hydraulic power is one of the safest methods of applying force to your work.

And to that end we offer some DO's and DON'Ts, simple common sense points which apply to practically all Enerpac hydraulic products.

- Lift slowly and check the load often
- Avoid standing in the line of force
- Anticipate possible problems and take steps to avoid them.

The line drawings and application photo's 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 can not 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 instructions spelling out specific safety information. 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 to 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.

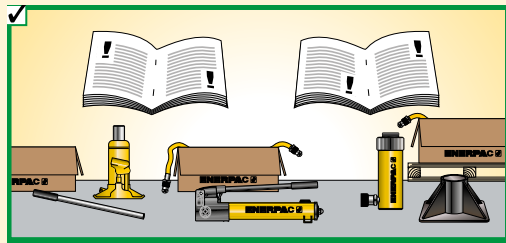
Cylinders

		◀ 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 65 °C (150 °F).

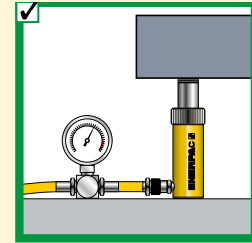
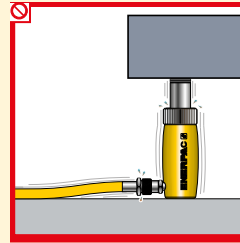


General

80% Manufacturer's rating of load and stroke are maximum safe limits. **80%** Good practice encourages using only 80% of these ratings!

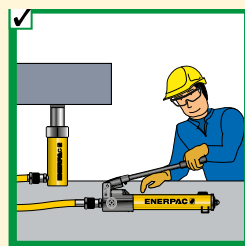
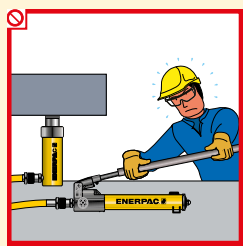


Always read instructions and safety warnings that come with your Enerpac hydraulic equipment.

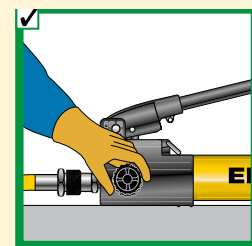
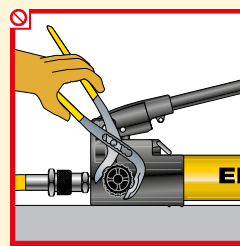


Don't override the factory setting of relief valves. Always use a gauge to check system pressure.

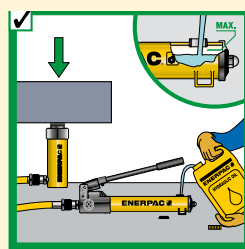
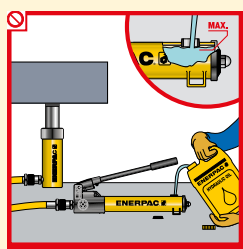
Pumps



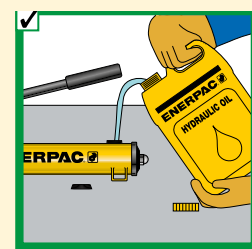
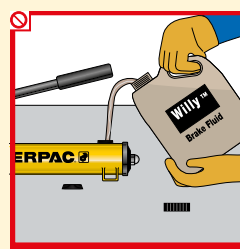
Don't use handle extenders. Hand pumps should be easy to operate when used correctly.



Close release valve finger tight. Using force will ruin the valve.

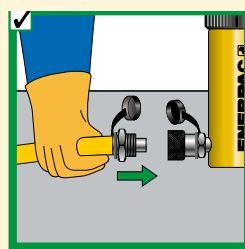
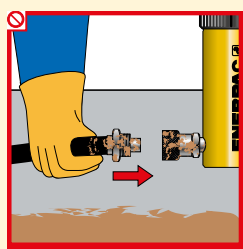


Fill pump only to recommended level. Fill only when connected cylinder is fully retracted.

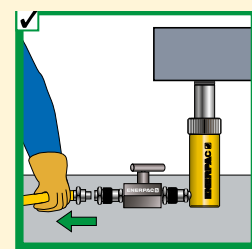
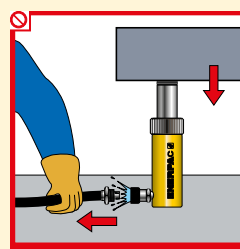


Use only genuine Enerpac hydraulic oil. Wrong fluid can destroy seals and pump and will render your warranty null and void your guarantee.

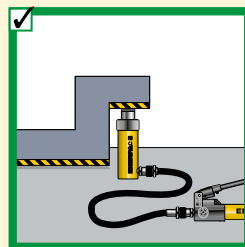
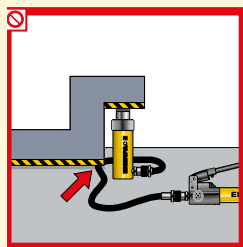
Hoses and couplers



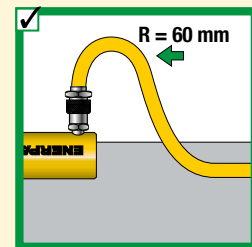
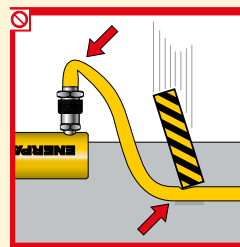
Clean both coupler parts before connecting. Use dust caps when coupler parts are not connected.



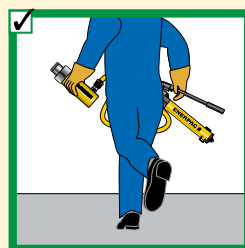
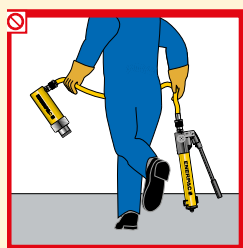
Detach cylinder only when fully retracted or use shut-off valves or safety valves to lock-in cylinder pressure.



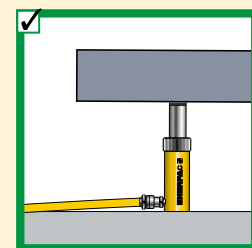
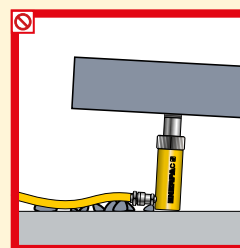
Keep hoses away from the area beneath loads.



Don't kink hoses. Bending radius should be at least 60 millimetres. 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 (ton) ▶ ▼ Stroke	5 t	10 t	15 t	25 t	30 t	50 t	60 t	75 t	100 t	150 t
< 25 mm										
25 mm										
50 mm										
75 mm										
100 mm										
125 mm										
150 mm										
175 mm										
200 mm										
225 mm										
250 mm										
300 mm										
325 mm										
350 mm										
		P-392			P-80		P-462			
		Page: 62			Page: 64		Page: 64			

Note: Selection based on oil capacity requirements of cylinders.

▼ POWER PUMP SELECTION CHART

Oil Flow*	Low (0,1 - 0,3 l/min)		Medium (0,5 - 2,0 l/min)		High (2,0 - 4,2 l/min)	
Usable Oil Capacity	1,9 - 3,8 litres	5,7 litres	4 - 40 litres	4 - 40 litres	10 - 40 litres	40 - 150 litres
Duty Cycle**	Intermittent	Extended	Intermittent	Extended	Extended	Extended
Portability ***	Portable	Stationary	Portable	Stationary	Stationary	Stationary
Recommended Series	PU-Series Economy	PE-Series Submerged	ZU4-Series	ZE3-, ZE4- and ZE5-Series	ZE6-Series	SFP-Series
						
	Page: 74	Page: 76	Page: 82	Page: 88	Page: 88	Page: 94

* Oil 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 would be used less than one hour, depending on reservoir capacity.

*** Portability

- | | |
|-------------------------------|----------------------------------|
| <u>Portable</u> | <u>Stationary</u> |
| • Ergonomic handles | • Mounting options |
| • Flexible power requirements | • Normally requires stable power |

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 ton:	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:			
	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 Battery Electric Compressed Air Petrol

Hand pump _____ Not for high cycle applications
Single- or double-acting operation Use 4-way valve for D/A applications
 Check speed chart on page 255 for number of mm per stroke)

Selected hand pump: ▶

Electric or Compressed Air pump

Need for portability: _____
Duty cycle: Intermittent or extended
Required usable oil capacity: Intermittent = 1,2 x oil capacity
 high cycle = 2 x oil capacity

Available Voltage: _____
Lifting speed (Important/not important): Use speed chart on page 255
Type of control: Manual/remote pendant
Type of actuation/function: Advance/hold/retract
Accessories: Filter Kit, Level Switch, Roll bar ...

Selected pump: ▶

Including Coupler: Oil connection

System Components

Number of hoses and length required: _____

Selected Hoses: ▶

Manifold or tee: ▶
Extra hose per manifold (2): ▶
Gauge (kN or bar scale): GF-series glycerine filled for high cycle ▶
Gauge adapter: ▶
Fittings: ▶
Pressure Relief Safety Valve: ▶
Load-holding Valve(s): ▶
Hydraulic oil: ▶



1 Cylinder

Applies hydraulic force.
Page 5

2 Cylinder Base Plate

For applications like lifting where additional cylinder stability is required.
Page 10

3 Pump

Provides hydraulic flow.
Page 61

4 Hose

Transports hydraulic fluid.
Page 116-117

5 Male Coupler

For quick connection of the hose to system components.
Page 118-119

6 Female Coupler

For quick connection of the hose end to the system components.
Page 118-119

7 Gauge

To monitor pressure of the hydraulic circuit.
Page 122-128

8 Gauge Adaptor

For quick and easy gauge installation.
Page 128-129

9 Swivel Connector

Allows proper alignment of valves and/or gauges. Used when units being connected cannot be rotated.
Page 129

10 Auto-Damper Valve V-10

Used to protect gauge from damage due to sudden pressure pulses in the system. Needs no adjustment and allows correct positioning of gauge, prior to tightening.
Page 130-131

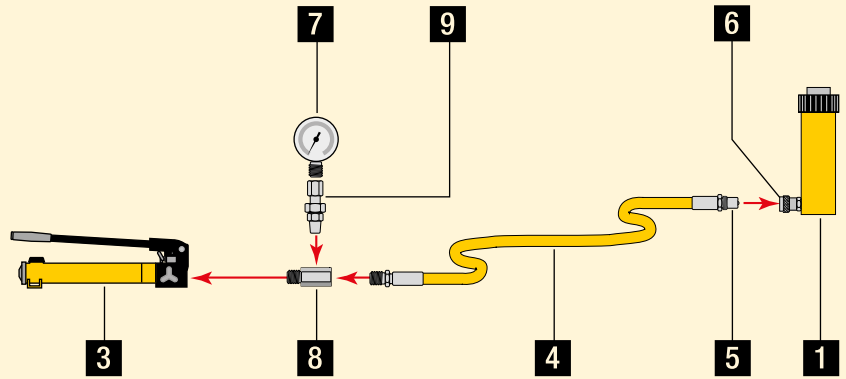
11 4-Way Directional Control Valve

Controls the direction of hydraulic fluid in a double-acting system.
Page 110-111

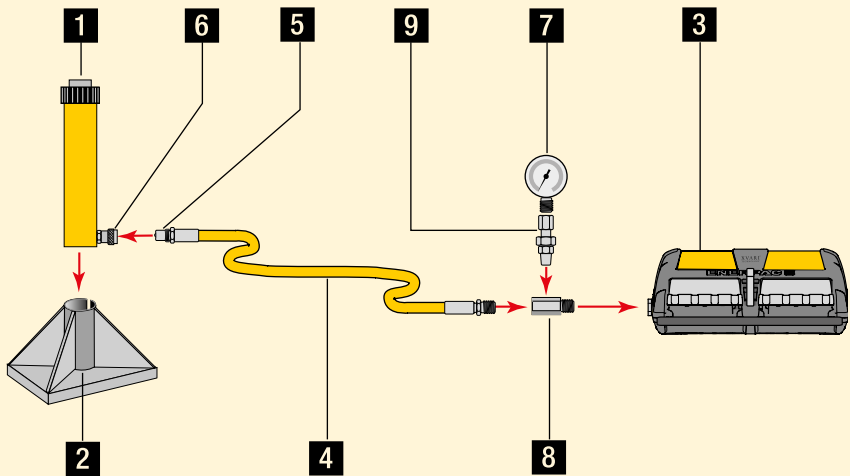
Single-acting push application, such as in a press.

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.

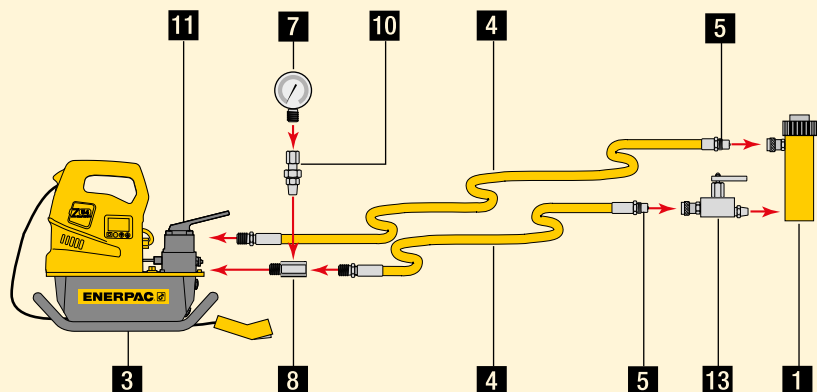
Examples of pump, hose and cylinder sets can be found on page 58.



Single-acting cylinder with longer stroke used for lifting applications.

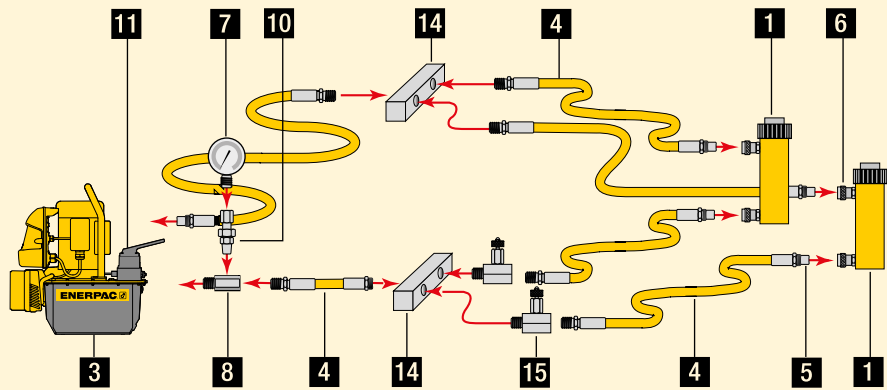


Double-acting cylinder set-up used for lifting applications where a slow controlled descent of the load must be maintained.





Double-acting cylinder set-up used in a push/pull application.



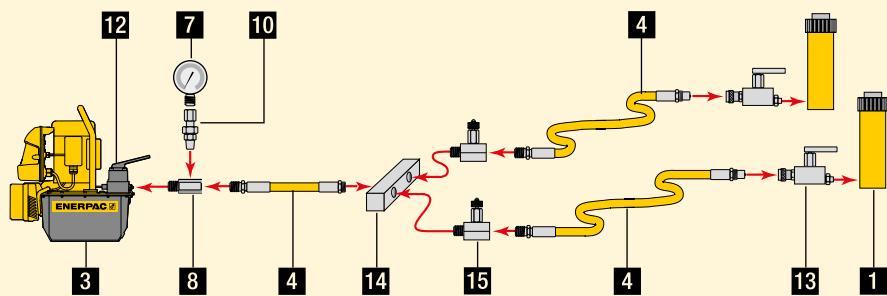
12 3-Way Directional Control Valve
Controls the direction of hydraulic fluid in a single-acting system.
Page 110-111

13 Safety Holding Valve
Controls load descent in lifting applications.
Page 130-131

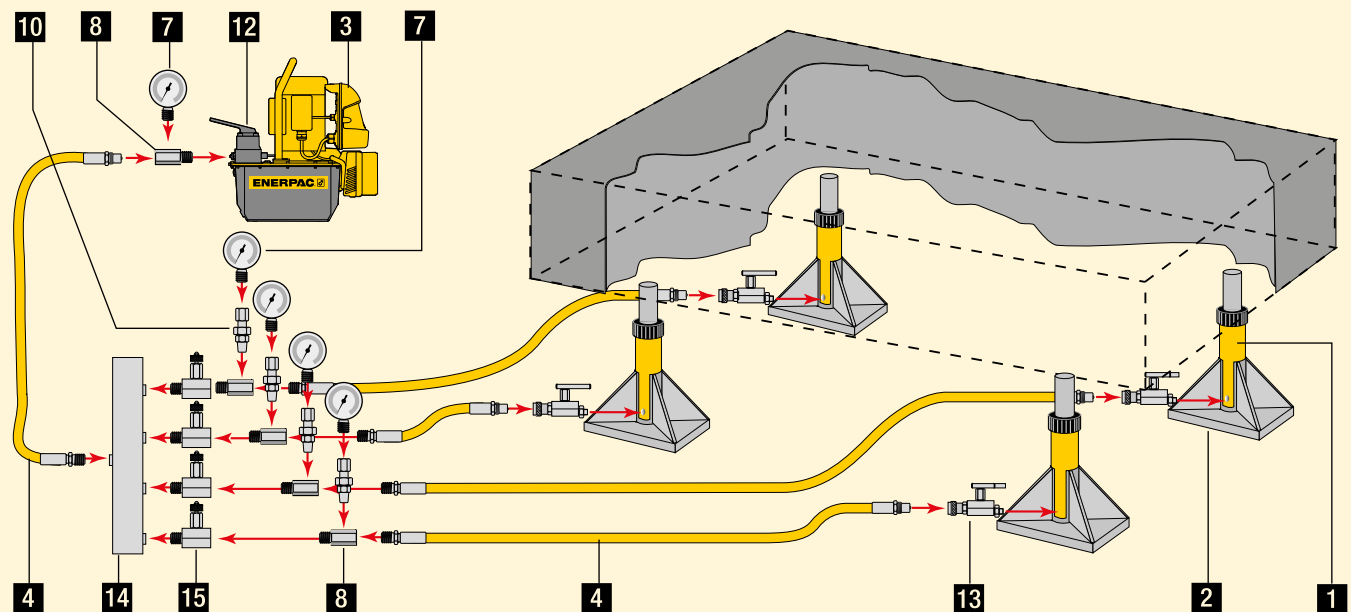
14 Manifold
Allows distribution of hydraulic fluid from one power source to several cylinders.
Page 120

15 Needle valve
Regulates the flow of hydraulic fluid to or from the cylinders.
Page 130-131

Two point lifting set-up using single-acting cylinders.



Four point lifting set-up, using single-acting cylinders and directional control valves.

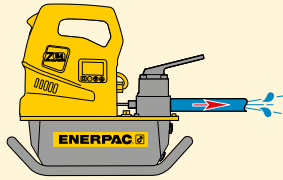


www.enerpac.com
Visit our web site to learn more about hydraulics and system set-ups.



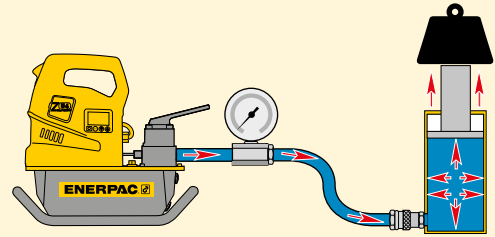
Flow

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).

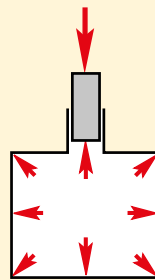


Figure 1

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 section Integrated Solutions) must be added to the system (Load B).

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.

INCORRECT!

CORRECT!

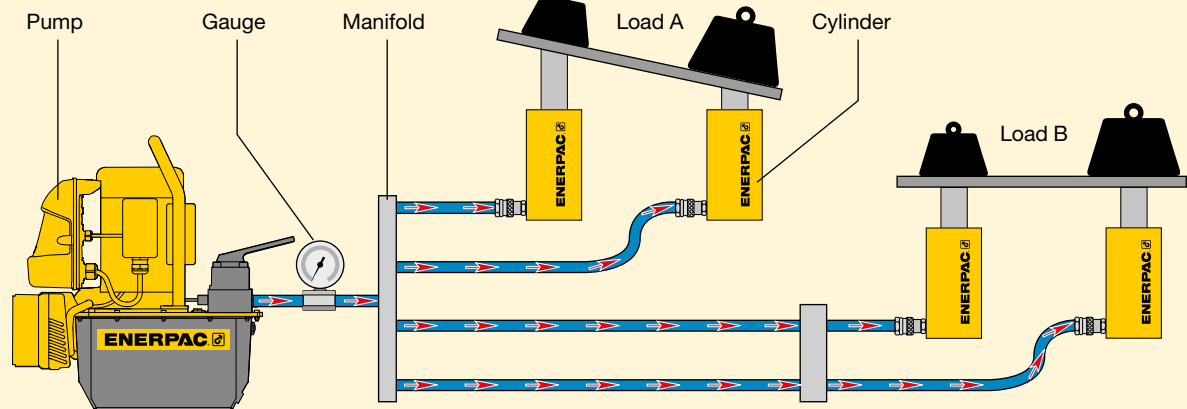


Figure 2

Synchronous Lift or Control Valves to provide uniform lifting of load.



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.



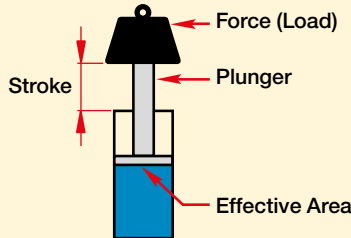
Learn more about hydraulics

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 14,5 cm² effective area operating at 700 bar will generate what force?

$$\text{Force} = 7000 \text{ N/cm}^2 \times 14,5 \text{ cm}^2 = 101500 \text{ N} = 101,5 \text{ kN}$$

Example 2

An RC-106 cylinder lifting 7000 kg will require what pressure?

$$\text{Pressure} = 7000 \times 9,8 \text{ N} \div 14,5 \text{ cm}^2 = 4731,0 \text{ N/cm}^2 = 473 \text{ bar.}$$

Example 3

An RC-256 cylinder is required to produce a force of 190.000 N. What pressure is required?

$$\text{Pressure} = 190.000 \text{ N} \div 33,2 \text{ cm}^2 = 5722,9 \text{ N/cm}^2 = 572 \text{ bar.}$$

Example 4

Four RC-308 cylinders are required to produce a force of 800.000 N. What pressure is required?

$$\text{Pressure} = 800.000 \text{ N} \div (4 \times 42,1 \text{ cm}^2) = 4750,6 \text{ N/cm}^2 = 476 \text{ bar.}$$

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 is going to be used with a power source that is capable of 500 bar. What is the theoretical force available from that cylinder?

$$\text{Force} = 5000 \text{ N/cm}^2 \times 366,4 \text{ cm}^2 = 1.832.000 \text{ N} = 1832 \text{ kN.}$$

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 20,3 cm² effective area and 200 mm stroke requires what volume of oil?

$$\text{Oil Capacity} = 20,3 \text{ cm}^2 \times 20 \text{ cm} = 406 \text{ cm}^3$$

Example 2:

An RC-5013 cylinder has an effective area of 71,2 cm² and a stroke of 320 mm. How much oil will be required?

$$\text{Oil Capacity} = 71,2 \text{ cm}^2 \times 32 \text{ cm} = 2278,4 \text{ cm}^3$$

Example 3:

An RC-10010 cylinder has an effective area of 133,3 cm² and a stroke of 260 mm. How much oil will it require?

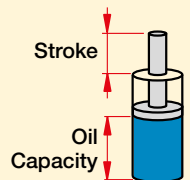
$$\text{Oil Capacity} = 133,3 \text{ cm}^2 \times 26 \text{ cm} = 3466 \text{ cm}^3$$

Example 4:

Four RC-308 cylinders are being used, each with an effective area of 42,1 cm² and a stroke of 209 mm. How much oil will be required?

$$\text{Oil Capacity} = 42,1 \text{ cm}^2 \times 20,9 \text{ cm} = 880 \text{ cm}^3 \text{ for one cylinder}$$

Multiply by four to obtain the required capacity: 3520 cm³



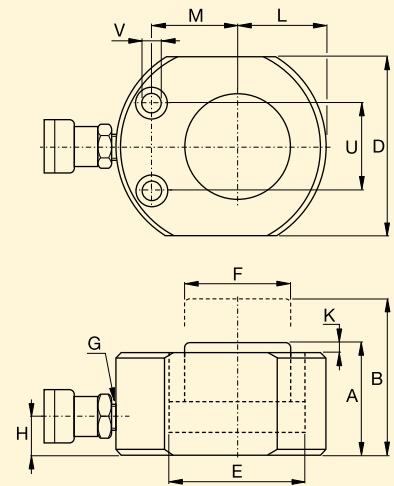
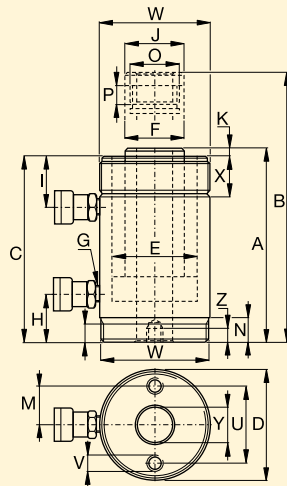
CAUTION!
Enerpac oil will compress 2,28% at 350 bar and 4,1% at 700 bar.



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 Z1 for depth of internal base thread.

- | | |
|---|---------------------------------------|
| A = Collapsed height | L = Plunger centre to side of base |
| B = Extended height | M = Mounting holes to plunger centre |
| C = Cylinder body length | N = Length of smaller cylinder part |
| D = Cylinder outside diameter | O = Plunger hole or thread of saddle |
| D1 = Cylinder width | P = Plunger thread length |
| E = Cylinder inside diameter | Q = Plunger outside thread |
| F = Plunger rod diameter | U = Pitch (BC) of mounting holes |
| G = Oil inlet thread | V = Thread of cylinder mounting holes |
| H = Cylinder bottom to advance port | W = Collar thread |
| I = Cylinder top to retract port | X = Collar thread length |
| J = Saddle outside diameter | Y = Centre hole diameter |
| K = Cylinder rod protrusion at collapsed height | Z = Internal base thread |
| | Z1 = 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.

All ton values specified in this catalogue are metric tonnes and are for cylinder class identification only. Please refer to the kN data for calculations.

Free Conversion Calculator

Visit enerpac.com and download the free conversion calculator.

Pressure:

- | | |
|-------|-------------------------|
| 1 psi | = 0,069 bar |
| 1 bar | = 14,50 psi |
| | = 9,8 N/cm ² |
| | = 100.000 Pa |
| 1 kPa | = 0,145 psi |
| 1 MPa | = 145 psi |

Volume:

- | | |
|-------------------|--------------------------|
| 1 in ³ | = 16,387 cm ³ |
| 1 cm ³ | = 0,061 in ³ |
| 1 litre | = 61,02 in ³ |
| | = 0,264 gal |
| 1 USgal | = 3785 cm ³ |
| | = 3,785 l |
| | = 231 in ³ |

Weight:

- | | |
|---------------|-------------|
| 1 pound (lb) | = 0,4536 kg |
| 1 kg | = 2,205 lbs |
| 1 metric ton | = 2205 lbs |
| | = 1000 kg |
| 1 ton (short) | = 2000 lbs |
| | = 907,18 kg |

Torque:

- | | |
|----------|----------------|
| 1 Nm | = 0,738 Ft.lbs |
| | = 0,102 kgf.m |
| 1 Ft.lbs | = 1,356 Nm |
| | = 0,138 kgf.m |

Temperature:

- To Convert °C to °F:
 $T^{\circ F} = (T_{\circ C} \times 1,8) + 32$
 To Convert °F to °C:
 $T^{\circ C} = (T_{\circ F} - 32) \div 1,8$

Other measurements:

- | | |
|-------------------|-------------------------|
| 1 in | = 25,4 mm |
| 1 mm | = 0,039 in |
| 1 in ² | = 6,452 cm ² |
| 1 cm ² | = 0,155 in ² |
| 1 hp | = 0,746 kW |
| 1 kW | = 1,359 hp |
| 1 kN | = 225 lbs |

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 700 bar 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-256 cylinder (25 ton) is powered by a ZE3-Series two stage pump. While lifting the load, the cylinder plunger travels at 2,8 mm per second. While extending towards the load, the cylinder plunger travels at 30,9 mm per second.



To determine:

Best matching pump

Your 25 ton cylinder needs to move a load at a speed of 3,0 mm per second. Simply go down from the top of the chart, to the value of 2,8 mm per second. Follow the chart to the right to find that the ZE3-Series pump is most suitable for your application.



Millimetres of Cylinder Plunger Travel per Hand Pump Plunger Stroke

Cyl. Capacity ▶	5 ton		10 ton		15 ton		25 ton		30 ton		50 ton		75 ton		100 ton		Pump Type	Page:
	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load		
▼ Power Source Manual	3,9	3,9	1,7	1,7	1,2	1,2	0,7	0,7	0,6	0,6	0,3	0,3	0,2	0,2	0,2	0,2	P-391	62
	17,6	3,9	7,8	1,7	5,5	1,2	3,4	0,7	2,6	0,6	1,6	0,3	1,0	0,2	0,8	0,2	P-392	62
	25,3	3,8	11,2	1,7	7,9	1,2	4,9	0,7	3,7	0,6	2,3	0,3	1,5	0,2	1,1	0,2	P-80/801/84	64
	61,4	3,9	27,1	1,7	19,3	1,2	11,8	0,7	9,0	0,6	5,5	0,3	3,5	0,2	2,8	0,2	P-802/842	64
	197	7,4	87,1	3,3	61,8	2,3	37,9	1,4	29,0	1,1	17,7	0,7	11,4	0,4	8,8	0,3	P-462/464	64

Millimetres per Second of Cylinder Plunger Travel

Cyl. Capacity ▶	5 ton		10 ton		15 ton		25 ton		30 ton		50 ton		75 ton		100 ton		Pump Type	Page:
	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load	No Load	Load		
▼ Power Source Electric Pumps (speed based on 50 Hz)	51,3	6,4	23,0	2,9	16,4	2,1	10,0	1,3	7,9	1,0	4,7	0,6	3,2	0,4	2,5	0,3	XC Cordless Pump	72
	86	8,3	38	3,7	27	2,6	17	1,6	13	1,3	7,7	0,7	5,4	0,5	4,1	0,4	PU Economy	74
	53	7,1	24	3,2	17	2,2	10	1,4	8,1	1,1	4,8	0,6	3,3	0,4	2,6	0,3	PE Submerged	76
	295	25,6	132	11,5	94,4	8,2	57,7	5,0	45,5	4,0	26,9	2,3	18,7	1,6	14,4	1,3	ZU4-Series	80, 82
	15,1	14,1	6,8	6,3	4,8	4,5	3,0	2,8	2,2	1,4	1,3	1,0	0,9	0,7	0,7	ZE3 one stage	80, 88	
	158	14,1	70,7	6,3	50,5	4,5	30,9	2,8	24,3	2,2	14,4	1,3	10,0	0,9	7,7	0,7	ZE3 two stage	80, 88
	22,3	21,0	10,0	9,4	7,1	6,7	4,4	4,1	3,4	3,2	2,0	1,9	1,4	1,3	1,1	1,0	ZE4 one stage	80, 88
	228	21,0	102	9,4	72,9	6,7	44,6	4,1	35,2	3,2	20,8	1,9	14,4	1,3	11,1	1,0	ZE4 two stage	80, 88
	44,9	42,1	20,1	18,9	14,4	13,5	8,8	8,2	6,9	6,5	4,1	3,8	2,8	2,7	2,2	2,1	ZE5 one stage	80, 88
	298	42,1	133	18,9	95,3	13,5	58,3	8,2	46,0	6,5	27,2	3,8	18,9	2,7	14,5	2,1	ZE5 two stage	80, 88
	76,9	70,0	34,5	31,4	24,6	22,4	15,1	13,7	11,9	10,8	7,0	6,4	4,9	4,4	3,8	3,4	ZE6 one stage	80, 88
	315	70,0	141	31,4	101	22,4	61,7	13,7	48,7	10,8	28,8	6,4	20,0	4,4	15,4	3,4	ZE6 two stage	80, 88
	53,8	53,8	24,1	24,1	17,2	17,2	10,5	10,5	8,3	8,3	4,9	4,9	3,4	3,4	2,6	2,6	SFP421 (11 kW)	94
Air Driven Pumps (at 6,9 bar air pressure)	51,3	6,4	23,0	2,9	16,4	2,1	10,0	1,3	7,9	1,0	4,7	0,6	3,2	0,4	2,5	0,3	XA-Series	96
	25,9	4,2	11,6	1,9	8,2	1,3	5,0	0,8	4,0	0,6	2,3	0,4	1,6	0,3	1,3	0,2	Turbo II Air	98
	17	3,4	7,6	1,5	5,4	1,1	3,3	0,7	2,6	0,5	1,5	0,3	1,1	0,2	0,8	0,2	PA-Series	100
	277	3,8	123	1,7	88	1,2	53	0,7	42	0,6	25	0,3	17	0,2	13,0	0,2	PAM-Series	101
	357	33,6	160	15,1	114	10,8	69,9	6,6	55,1	5,2	32,6	3,1	22,6	2,1	17,4	1,6	ZA-Series	102
Gasoline Engine	85	17	38	7,6	27	5,4	16	3,3	13	2,6	7,7	1,5	5,3	1,1	4,1	0,8	PGM-20 Atlas	107
	295	41	132	18,4	94,4	13,1	57,7	8,0	45,5	6,3	26,9	3,7	18,7	2,6	14,4	2,0	ZG5-Series 4,1 kW	104
	166	41	74,7	18,4	53,4	13,1	32,6	8,0	25,7	6,3	15,2	3,7	10,6	2,6	8,1	2,0	ZG5-Series 4,8 kW	104
	376	85	169	37,9	121	27,1	73,8	16,6	58,2	13,1	34,4	7,7	23,9	5,4	18,4	4,1	ZG6-Series 9,7 kW	106

No Load indicates the plunger speed as the plunger extends towards the load (1st stage).

Load indicates the plunger speed as the load is lifted at a system pressure of 700 bar (2nd stage).

Example: At what speed (V) will the RC-256 (25 ton) cylinder move when powered by a ZE3-Series pump?
RC-256 Cylinder Effective Area = 33,2 cm²
ZE3-Series pump oil Flow (no load) = 6150 cm³/min

$$\text{Cylinder Plunger Speed (mm/sec)} = \frac{\text{Pump Oil Flow (cm}^3\text{/min)} \times 10}{\text{Cylinder Effective Area (cm}^2\text{)} \times 60}$$

$$\text{Speed V} = \frac{6150 \text{ cm}^3\text{/min} \times 10}{33,2 \times 60} = 30,9 \text{ mm/sec}$$



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.

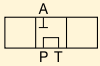
Double-Acting cylinders require a 4-way valve, providing control of the flow to each cylinder port.

Positions

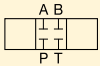
The number of control points a valve can provide. A 2-position valve has the ability to control only the advance or retraction of the cylinder. To be able to control the cylinder with a hold position, the valve requires a 3rd position.

Centre Configuration

The centre 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 Centre**. 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 Centre** 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 type of valves, such as Open Centre and Float Centre. These valves are used mostly in complex hydraulic circuits and require other special considerations.



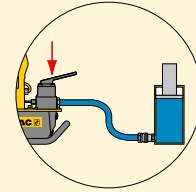
Open Centre



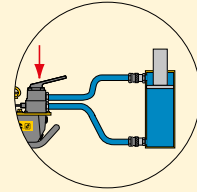
Float Centre

Directional Control Valves

3-Way Valves are used with single-acting cylinders.



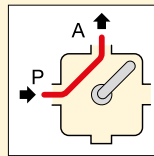
4-Way Valves are used with double-acting cylinders.



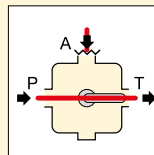
Valves may be either pump mounted or remote mounted.	Pump Mounted	Remote Mounted
Valves may be either manually or solenoid operated.	Manually Operated	Solenoid Operated

Advance Hold Retract

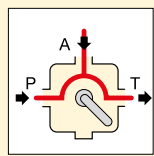
Single-acting cylinder Controlled by a 3-way, 3-position valve.



The oil flows from the pump pressure port P to the cylinder port A: the cylinder plunger will extend.

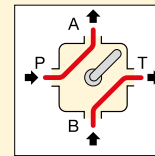


The oil flows from the pump pressure port P to the tank T. The cylinder port A is closed: the cylinder plunger will maintain its position.

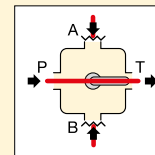


The oil flows from the pump and cylinder port A to the tank T: the cylinder plunger will retract.

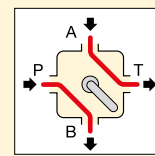
Double-acting cylinder Controlled by a 4-way, 3-position valve.



The oil flows from the pump pressure port P to the cylinder port A and from cylinder port B to tank T.



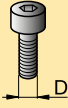
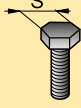
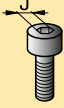
The oil flows from the pump pressure port P to the tank T. The cylinder ports A and B are closed: the cylinder plunger will maintain position.

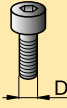
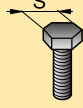



The oil flows from the pump pressure port P to cylinder port B and from cylinder port A to tank T: the cylinder plunger will retract.

Hexagon Nut and Bolt Sizes



METRIC SIZES		
		
Thread Size D (mm)	Hexagon Size S (mm)	Hexagon Size J (mm)
M 10	17	8
M 12	19	10
M 14	22	12
M 16	24	14
M 18	27	14
M 20	30	17
M 22	32	17
M 24	36	19
M 27	41	19
M 30	46	22
M 33	50	24
M 36	55	27
M 39	60	27 (30)
M 42	65	32
M 45	70	-
M 48	75	36
M 52	80	36
M 56	85	41
M 60	90	46
M 64	95	46
M 68	100	50
M 72	105	55
M 76	110	60
M 80	115	65
M 85	120	70
M 90	130	70 (75)
M 95	135	-
M 100	145	85
M 105	150	-
M 110	155	-
M 115	165	-
M 120	170	-
M 125	180	-
M 130	185	-
M 140	200	-
M 150	210	-

IMPERIAL SIZES		
		
Thread Size D (inch)	Hexagon Size * S (inch)	Hexagon Size J (inch)
5/8"	1 1/16"	1/2"
3/4"	1 1/4"	5/8"
7/8"	1 7/16"	3/4"
1"	1 5/8"	3/4"
1 1/8"	1 13/16"	7/8"
1 1/4"	2"	7/8"
1 3/8"	2 3/16"	1"
1 1/2"	2 3/8"	1"
1 5/8"	2 9/16"	-
1 3/4"	2 3/4"	1 1/4"
1 7/8"	2 15/16"	1 3/8"
2"	3 1/8"	1 5/8"
2 1/4"	3 1/2"	1 3/4"
2 1/2"	3 7/8"	1 7/8"
2 3/4"	4 1/4"	2"
3"	4 5/8"	2 1/4"
3 1/4"	5"	2 1/4"

* Heavy hexagon nuts.



Determine the maximum torque according to the bolt (nut) size and grade. Always consult the manufacturers instructions or engineering recommendations when making bolted connections.



IMPORTANT

The hexagon sizes shown in the tables should be used as a guide only. Individual sizes should be checked before specifying any equipment.



BSH-Series Sockets

Use only Heavy Duty Impact Sockets for power driven torquing equipment, according to ISO2725 and ISO1174; DIN3129 and DIN3121 or ASME-B107.2/1995.

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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.

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 the first time.



Bolting Solutions

For further information on Torque Tightening or other controlled tightening methods, please visit our website or ask for our **E412e** Bolting Tools Catalogue.

Bolting Integrity Software

A comprehensive free on-line software solution for Bolted Joint Integrity. Integral databases hold data for:

- BS1560, MSS SP44, API 6A and 17D flanged joints
- Common gasket materials and configurations
- Comprehensive range of bolt materials
- Comprehensive range of lubricants
- Enerpac's Controlled Bolting Equipment including: Torque Multipliers, Hydraulic Wrenches and Bolt Tensioning tools.

Custom Joint information can also be entered.

The software offers Tool selection, Bolt Load calculations and Tool pressure settings, as well as a combined Application data sheet and Joint completion report.

What is Torque?

It is a measure of how much force acting on an object 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

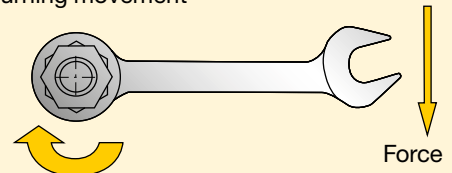
The amount of preload created when torqueing is largely dependant on the effects of friction.

Principally there are three different "torque components":

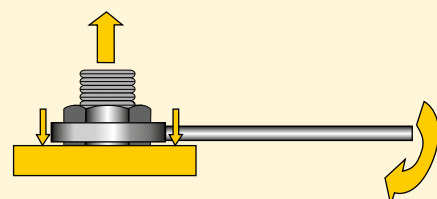
- torque to stretch the bolt
- torque to overcome the friction in bolt and nut threads
- torque to overcome friction at the nut spot face (bearing contact surface).

Torque Tightening

Turning movement



Stretch of Fastener (Pre-load)





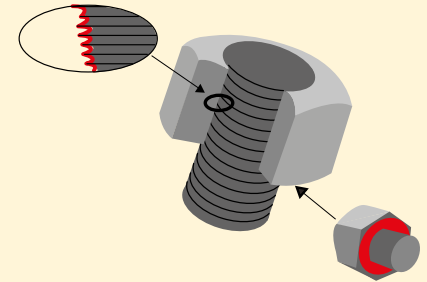
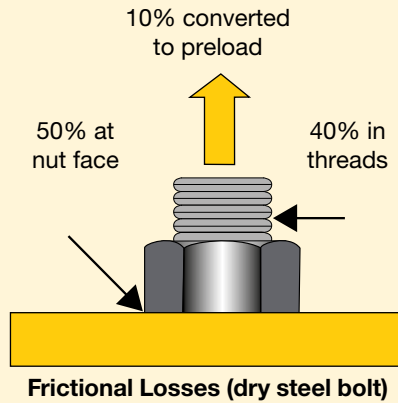
Preload (residual load) = Applied Torque *minus* Frictional Losses

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



Friction points should always be lubricated when using the torque tightening method.



Select the Right Torque 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

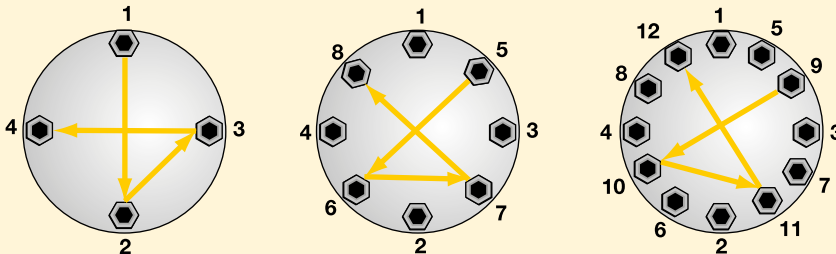
- Humidity corrosion (rust) requires up to **twice** the torque required for tightening.
- Sea water and chemical corrosion requires up to **2½ times** the torque required for tightening.
- Heat corrosion requires up to **3 times** the torque required for tightening.

Torque Procedure

When torquing it is common to tighten only one bolt at a time, which 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.



Pressure versus Torque – S-Series Torque Wrenches

Pump Pressure (bar)	S1500X	S3000X	S6000X	S11000X	S25000X
	Torque Output (T _F = 2,83) (Nm)	Torque Output (T _F = 6,34) (Nm)	Torque Output (T _F = 12,08) (Nm)	Torque Output (T _F = 21,96) (Nm)	Torque Output (T _F = 49,42) (Nm)
69	195	437	834	1515	3410
83	235	526	1003	1823	4102
97	274	615	1172	2130	4794
110	311	697	1329	2415	5436
124	351	786	1498	2723	6128
138	390	875	1668	3030	6820
152	430	963	1837	3338	7512
166	470	1052	2006	3645	8203
179	506	1134	2163	3931	8846
193	546	1223	2332	4238	9538
207	586	1312	2501	4545	10.230
221	625	1400	2671	4853	10.922
234	662	1483	2828	5138	11.564
248	702	1572	2997	5446	12.256
262	741	1660	3166	5753	12.948
276	781	1749	3335	6061	13.640
290	821	1838	3504	6368	14.331
303	857	1920	3662	6653	14.974
317	897	2009	3831	6961	15.666
331	937	2098	4000	7268	16.358
345	976	2186	4169	7576	17.049
359	1016	2275	4338	7883	17.741
372	1053	2357	4495	8169	18.384
386	1092	2446	4665	8476	19.076
400	1132	2535	4834	8783	19.767
414	1171	2624	5003	9091	20.459
428	1211	2712	5172	9398	21.151
441	1248	2795	5329	9684	21.794
455	1287	2883	5498	9991	22.485
469	1327	2972	5668	10.298	23.177
483	1367	3061	5837	10.606	23.869
497	1406	3149	6006	10.913	24.561
510	1443	3232	6163	11.199	25.203
524	1483	3321	6332	11.506	25.895
538	1522	3409	6501	11.814	26.587
552	1562	3498	6671	12.121	27.279
566	1602	3587	6840	12.428	27.971
579	1638	3669	6997	12.714	28.613
593	1678	3758	7166	13.021	29.305
607	1718	3847	7335	13.329	29.997
621	1757	3935	7504	13.636	30.689
634	1794	4018	7662	13.922	31.331
648	1834	4106	7831	14.229	32.023
662	1873	4195	8000	14.536	32.715
676	1913	4284	8169	14.844	33.407
690	1952	4373	8338	15.151	34.099



Convert pressure into torque

The function of a hydraulic Torque Wrench, is to convert hydraulic pressure into torque. This chart is a “quick-reference” to help in determining what this conversion factor is.

If you do not find your torque and pressure values in the chart, then the following conversion formulas can be used to find your theoretical torque value. The actual value may vary due to wrench condition and age.

$$T = P \times T_F$$

$$P = T \div T_F$$

- Where:
- T** = target torque
 - P** = pressure
 - T_F** = theoretical applied torque



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Pressure versus Torque W-Series



Pressure versus Torque – W-Series Torque Wrenches						
Pump Pressure (bar)	W2000X Torque Output (T _F = 4,01) (Nm)	W4000X Torque Output (T _F = 8,20) (Nm)	W8000X Torque Output (T _F = 16,64) (Nm)	W15000X Torque Output (T _F = 30,12) (Nm)	W22000X Torque Output (T _F = 44,21) (Nm)	W35000X Torque Output (T _F = 68,77) (Nm)
69	277	566	1148	2078	3051	4745
83	333	681	1381	2500	3670	5708
97	389	796	1614	2922	4289	6671
110	441	902	1831	3314	4864	7565
124	497	1017	2064	3735	5483	8528
138	553	1132	2297	4157	6102	9491
152	609	1247	2530	4579	6721	10.453
166	665	1362	2763	5000	7340	11.416
179	718	1468	2979	5392	7915	12.310
193	774	1583	3212	5814	8534	13.273
207	830	1698	3445	6235	9153	14.236
221	886	1813	3678	6657	9772	15.199
234	938	1920	3894	7049	10.347	16.093
248	994	2035	4128	7470	10.996	17.055
262	1050	2149	4361	7892	11.585	18.018
276	1106	2264	4594	8314	12.204	18.981
290	1162	2379	4827	8736	12.823	19.944
303	1215	2486	5043	9127	13.398	20.838
317	1271	2601	5276	9549	14.017	21.801
331	1327	2715	5509	9971	14.636	22.764
345	1383	2830	5742	10.392	15.255	23.726
359	1439	2945	5975	10.814	15.874	24.689
372	1491	3052	6191	11.206	16.449	25.583
386	1547	3167	6424	11.627	17.068	26.546
400	1603	3281	6657	12.049	17.687	27.509
414	1660	3396	6890	12.471	18.306	28.472
428	1716	3511	7123	12.893	18.925	29.434
441	1768	3618	7340	13.284	19.500	30.328
455	1824	3733	7573	13.706	20.119	31.291
469	1880	3848	7806	14.128	20.738	32.254
483	1936	3962	8039	14.549	21.357	33.217
497	1992	4077	8272	14.971	21.976	34.180
510	2044	4184	8488	15.363	22.551	35.074
524	2100	4299	8721	15.784	23.170	36.037
538	2157	4414	8954	16.206	23.789	36.999
552	2213	4528	9187	16.628	24.408	37.962
566	2269	4643	9420	17.049	25.027	38.925
579	2321	4750	9636	17.441	25.602	39.819
593	2377	4865	9869	17.863	26.221	40.782
607	2433	4980	10.102	18.285	26.840	41.745
621	2489	5094	10.335	18.706	27.459	42.707
634	2541	5201	10.552	19.098	28.034	43.601
648	2598	5316	10.785	19.520	28.653	44.654
662	2654	5431	11.018	19.941	29.272	45.527
676	2710	5546	11.251	20.363	29.891	46.490
690	2766	5661	11.484	20.785	30.506	47.454



Convert pressure into torque

The function of a hydraulic Torque Wrench, is to convert hydraulic pressure into torque. This chart is a “quick-reference” to help in determining what this conversion factor is.

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Enerpac is the leading global provider of high-pressure hydraulic tools and solutions with a broad range of products, local expertise and worldwide distribution network. With a proven track record in a wide range of markets, Enerpac designs and manufactures high-quality tools and solutions for all industrial applications.

Enerpac has gained unique experience in delivering hydraulic solutions for the controlled movement and positioning of heavy objects. Enerpac supports your business by offering the right solutions and service to help you get your work done efficiently and safely.

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Do you work with high-pressure hydraulic tools regularly or even every day? Operating such tools requires sound knowledge of how they work and this should be maintained. Effective use of these tools boosts safety and reduces risk - both for you as the operator and for the environment within which the tools are used. Having the right training will enable you to use the tools safely and properly.

Enerpac Academy is our in-house training centre, set up exclusively for Enerpac business partners, Enerpac users and Enerpac employees: training programs ranging from tool expertise, repairs and maintenance, to safe operation of high-pressure hydraulic tools.

Putting theory into practice

The training courses are interactive and benefit from a highly diverse program that puts the covered theory into practice right away. Our training services are grounded in many years of experience in providing and applying Enerpac tools.

Tailored training

Enerpac Academy offers you the exclusive opportunity to train your (new) employees in making proper use of Enerpac tools. Our trainings can also be done on-site.

Safety training: Safe use of Enerpac high pressure hydraulic tools, user and environmental safety.

Controlled bolting trainings: Bolting tool theory, tool applications, hands-on training on safe and efficient use of torque wrenches, tensioners and pumps.

General hydraulic sales training: Knowledge of hydraulics, hydraulic tools and applications.

Tool repair training: Repair and maintenance of general Enerpac tools.

Application training: Tool feature and benefits, tool application review, safe use of hydraulic tools and market information.



Enerpac Academy – The Power of Knowledge

- Specialist in-house Enerpac training center
- Standard and tailored training programs
- Highly experienced trainers
- Selection of training courses with a proven (value adding) track record
- Knowledge and experience sharing
- User and tool safety come first.

EMP – Enerpac Maintenance Program

EMP is a preventive maintenance program. Your Enerpac Authorised Service Centre will check the tools on essential points: leaking, oil level and quality, maximum pressure setting, and damage. EMP reduces operational risks, increases safety and minimises extremely expensive delays in your operations. You will be advised about regular maintenance of the Enerpac tools.

- Work more safely
- Minimise operational risk
- Ensure tools are always available and in tip-top shape
- As good as new after repair
- Prevent downtime
- Advice on safe and effective use
- Maintenance when tools are not used.

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