

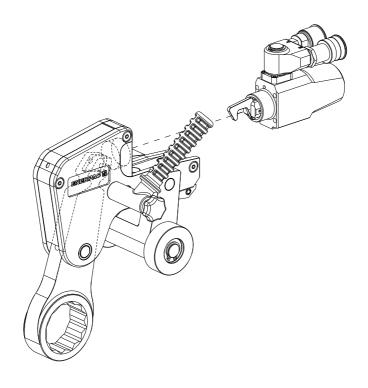
Instruction SheetWCR4000 Roller Cassette

L4021 Rev. B 09/2013



Instruction Sheet

Roller Cassette WCR4000



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1 Introduction

Overview

The Enerpac WCR4000 roller cassette provides controlled tightening and loosening of fasteners on pipe flanges. It is designed for use in confined spaces where an ordinary hydraulic torque wrench might not fit.

The roller cassette is powered by the

Enerpac W4000 Series drive unit and a compatible 690 bar (10,000 psi) torque wrench pump.

Spanners are available from Enerpac in a wide range of bolt sizes typically used on API flanges. The spanners can be changed quickly using standard hand tools.

Note: Drive unit, pump and spanners are sold separately and are not included with the roller cassette.

Delivery instructions

Upon delivery all components must be inspected for damage incurred during shipping. If damage is found the carrier should be notified at once. Shipping damage is not covered by the Enerpac warranty.

Warranty

- Enerpac guarantees the product only for the purpose for which is intended.
- All Enerpac products are guaranteed against defects in workmanship and materials for as long as you own them.

Any misuse or alteration invalidates the warranty.

- Observe all instructions as communicated in this manual.
- Replace any parts with Enerpac spare parts only.

2 Safety

Be aware that the operator is fully responsible during the operation of this tool. Enerpac is not responsible for damage or injury caused by misuse of this tool. Under some circumstances additional safety requirements beyond those described in this manual may be required. Contact Enerpac immediately if a potentially hazardous situation arises.

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Read this manual carefully and observe all safety precautions.

- Make sure you have completed a safety induction training, specific to the work surroundings. The operator should be thoroughly familiar with the controls and the proper use of the tool.
- The operator must be at least 18 years of age.
- Always wear protective headwear, ear protectors, footwear and gloves (at a minimum rigger type gloves) suitable for safe operation of the tool.
 The protective clothing must not interfere with safe operation of the tool or restrict the ability to communicate with co-workers.
- Make sure your workplace is safe.
- Do not place any part of the body between the reaction roller and the pipe flange.
- Do not place any objects between the reaction roller and the pipe flange. Keep the hoses away from this area to prevent them from becoming pinched or crushed.



- Do not stand in the line of movement of the tool when it is in operation. If the tool separates from the nut or bolt during operation it will detach in that direction.
- Tightening and loosening nuts and bolts involves little visible movement.
 The pressure and loads, however are extreme. Keep your hands away from the fastener being loosened or tightened.
- Make sure that the spanner used to retain the nut or bolt on the opposite end is secured.
- Always use Enerpac pumps and hoses.
- Make sure appropriate guards are always securely in position and free from damage.
- Maximum pressure is 690 bar (10,000 psi). Never apply more pressure to any tool or accessory than the maximum allowable pressure. Refer to pressure/torque tables for pressure/torque settings. (see sections 6.3.1 and 6.3.2)
- Make sure that the spanner size corresponds to the hex size of the fastener being loosened or tightened.
 Failure to do so can result in the tool becoming unstable and can lead to catastrophic failure of the tool.
- Do not abuse or overstress the hoses in any way. Do not bend the hoses excessively.
- Never carry the tool by its hoses.
- Always use Enerpac spare parts.
- Always position the tool for maximum stability.
- Make sure the pipe flange is adequate for the forces at work during operation of the tool.
- Be aware that a nut or bolt that breaks off during operation of the tool may become a high velocity projectile.
- When the spanner is placed on the

- nut or bolt a gap may exist between the reaction roller and the pipe flange. When the tool is operated the reaction roller will make forceful contact with the pipe flange. Always make sure the tool is stable.
- Provide adequate support in vertical and inverted applications.
- The maximum torque output of the tool must always exceed the torque required to loosen or tighten the nut or bolt.
- The torque required to loosen a nut is variable and may exceed the torque capacity of the tool. Therefore never operate the tool at maximum or close to maximum capacity when loosening a nut or bolt.
- Never operate the tool with a hydraulic supply connection to the advance side only as this may damage the internal parts.
- If the wrench is dropped from a height, have the tool inspected before you operate it again.
- In severe conditions the tool must be cleaned and lubricated more frequently (see section 5).
- Check that the swivel manifold post screws (see section 5.3.2) and gland are tight prior to use.
- If oil leakage is evident, replace seals accordingly (see section 5.3.2).
- Stop operation immediately if a gap appears between the cylinder locating plate and the drive unit. Have the tool inspected and serviced before you operate it again.
- Make sure to minimize torsional and bending stresses in the tool, the spanner and any accessories.
- Do not strike the tool with a hammer.
 This will invalidate the product warranty.
- Always observe the maintenance instructions.



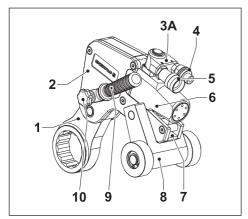


Fig. A

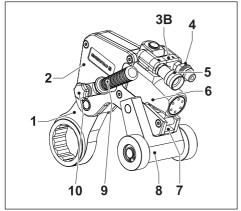


Fig. B

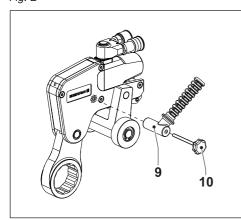


Fig. C

3 Assembly and adjustments

3.1 Overview and features (fig. A or B)

- 1 Spanner
- 2 Roller Cassette
- 3A Swivel manifold (standard)
- 3B TSP-Pro Swivel manifold (optional)
- 4 Advance hose connection
- 5 Return hose connection
- 6 Hydraulic drive unit
- 7 Cassette release lever
- 8 Reaction roller bracket and rollers
- 9 Positioning handle
- 10 Thumb screw

3.2.1 To attach the positioning handle (fig. C)

 Secure the positioning handle (9) with thumb screw (10). Tighten hand tight.
 Note: handle can be installed on either side of wrench (as needed).

3.2.2 To remove the cassette (fig. D)

- Make sure the piston is fully retracted.
- Hold the tool with the drive unit pointing upwards.
- Swing the reaction roller bracket (8) inward, toward center of tool.
- Pull the release lever (7) outwards.
- Remove the cassette (2) from the hydraulic drive unit (6).

3.2.3 To attach the cassette (fig. D and E)

- Make sure the retract link (11) aligns with the slot (12) in the spanner (1).
 Rotate the piston rod if necessary.
- Pull the release lever (7) outwards.
- Push the spigot (13) through the hole in the cylinder locating plate (14).
- Push the release lever (7) back into the cassette (2). Make sure the ball detent clicks into place.



Do not operate the tool if the cassette release lever is not fully closed.

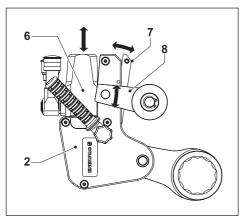


Fig. D

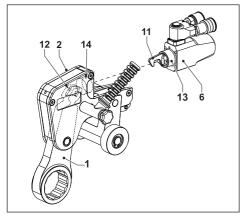


Fig. E

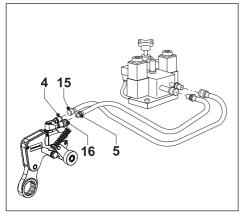


Fig. F

• Swing the reaction roller bracket (8) outward, away from center of tool.

3.3 To connect the hoses (fig. F)

 \triangle

Make sure all accessories meet the pressure requirements.

Make sure the quick connect couplings are securely attached before operating the tool.

The tool is fitted with male and female quick-connect couplings. Use Enerpac twin safety hoses only. Refer to the table below:

Hose model number	Description
THQ-706T	Two hoses, length 6 m (19.5 feet)
THQ-712T	Two hoses, length 12 m (39 feet)

- Remove the hose dust caps.
- Connect the hose with the female coupling (15) to the advance coupling (4).
- Pull the sleeve on the female coupling of the hose over the advance coupling.
- Tighten the sleeve.
- Connect the hose with the male coupling (16) into the return coupling (5).
- Pull the sleeve on the return coupling over the male coupling of the hose.
- Tighten the sleeve.
- Connect the hoses to the pump.

 Refer to the pump instruction manual.

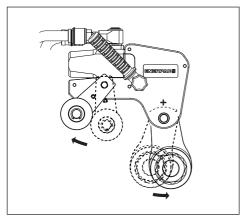


Fig. G

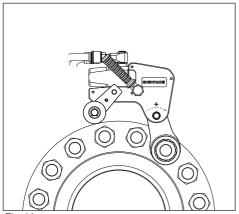


Fig. H

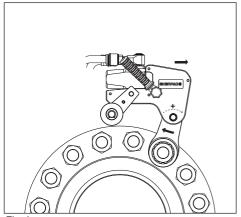


Fig. I

4 Operation

4.1 Prior to operation

- Make sure the nut or bolt to be fastened is clean and free of dust.
- Make sure the nut or bolt runs correctly on the thread.
- Make sure that the threads and the bearing surface are liberally coated with the correct lubricant or antiseizure compound.
- Make sure that the spanner used to keep the nut or bolt on the opposite end in place, is of the correct size and that there is an adequate abutment surface.

4.2 To set the torque

Adjust the pressure on the pump as necessary to set the torque. Refer to sections 6.3.1 and 6.3.2 for torque setting tables.

4.3.1 To tighten a nut or bolt (fig. G, H, I)

- Place the wrench on the ground or on a solid surface, such as a workbench.
- Operate the pump in the Retract direction until drive unit is fully retracted and the spanner socket moves fully outward. Stop the pump.
- Swing the reaction roller bracket fully outward, away from center of tool.
- Position the tool on the nut (bolt) with the clockwise (+) side facing upwards.
- Position reaction roller against pipe flange. Note: If a gap between roller and flange is present, position the roller as close to the flange as possible, so that gap is minimal.
- Operate the pump in the Advance direction to activate the wrench and begin tightening the nut (bolt).



Stop operation immediately if a gap appears between the cylinder locating plate and the drive unit.



Never strike the tool with a hammer.

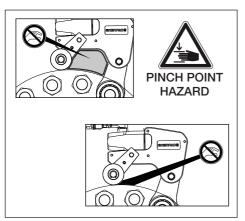


Fig. J

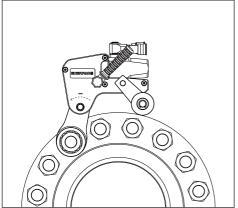


Fig. K

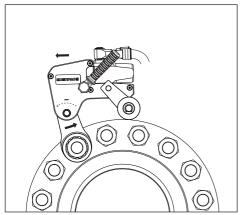


Fig. L



Keep hands and fingers clear of pinch point area between spanner and reaction roller. See Fig J.



Keep hands and fingers clear of pinch point area between pipe flange and reaction roller. See Fig J.

 Repeat previous steps as required until nut (bolt) is tightened to the proper torque.

Notes: Spanner must be repositioned after each wrench cycle by operating the pump in the *Retract* direction. The tool contains no spring return.

4.3.2 To loosen a nut or bolt (fig. K, L)

- Apply penetrating oil to the threads.
 Allow the oil to soak.
- Reinstall the positioning handle on counter-clockwise (-) side of wrench.
- To loosen the nut (bolt), follow steps in section 4.3.1, but with the counterclockwise (-) side of wrench facing upward.
- Repeat steps until nut (bolt) is loose.



If the nut or bolt will be re-used avoid excess load when loosening.

- Be aware that when loosening a nut or bolt more torque is usually required than when tightening.
- Humidity corrosion (rust) requires up to twice the torque required for tightening.
- Sea water and chemical corrosion requires up to two and a half times the torque required for tightening.
- Heat corrosion requires up to three times the torque required for tightening.



Be aware that when loosening a nut or bolt shock loading can occur. Do not apply more than 75% of the wrench's maximum torque when loosening nuts or bolts.



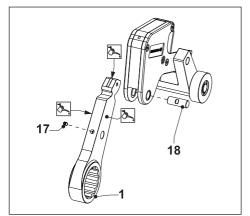


Fig. M

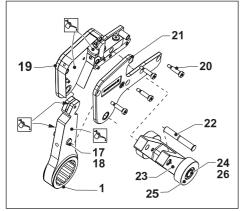


Fig. N

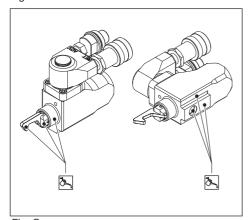


Fig. O

5 Maintenance and troubleshooting

5.1 Spanner replacement (Fig M)

- Remove drive unit from cassette.
- Loosen and remove set screw (17).
- Tap spanner pin (18) on one end and remove it from the cassette.
- Slide spanner (1) out of cassette housing.
- Apply a thin coat of molybdenum disulphide lubricant to the sides of the new spanner and to the spring pin at top of spanner.
- Slide new spanner (1) into cassette housing. Align hole in spanner with mating holes in sideplates.
- Install spanner pin (18) through holes.
 Before installation, be sure that flat area of pin is aligned with set screw hole in spanner.
- Apply a small amount of Loctite 243 to threads of set screw (17).
- Reinstall set screw (17).

5.2 Preventative maintenance (Fig N & O)

Preventative maintenance can be carried out by the user. Full maintenance must be carried out by an approved and authorized technician appointed by Enerpac. Recommended service intervals are:

- a) 3 months Heavy Duty use
- b) 6 months Normal use
- c) 12 months Infrequent use
- Non destructive testing must be carried out if the tool has been used under severe conditions.

5.2.1 The roller cassette

- Remove drive unit from cassette.
- Remove the shoulder screws (20). Lift and remove the sideplate (21).
- Remove spanner (1), spanner pin (18) and set screw (17) as an assembly.
- Remove reaction roller bracket pin (22) and reaction roller bracket (23).

- Remove circlips (24) reaction rollers (25) and roller pin (26).
- Clean all exposed components with a mild solvent.
- Inspect all parts for damage.
- Dry all components. Apply a thin coat of molybdenum disulphide lubricant
 as indicated.

5.2.2 The hydraulic drive unit

- Check tightness of swivel manifold post retaining screws (see 5.3.2) and gland.
- Pressurize the drive unit to maximum pressure (Advance and Retract), and check for any signs of leakage.
- Any damaged components or seals must be replaced.
- Dry all components and apply a thin coat of molybdenum disulphide lubricant a indicated.

5.3 Full maintenance

Note: Refer to the WCR4000 repair parts sheet for detailed views of components and subassemblies referenced in sections 5.3.1 and 5.3.2.

5.3.1 The roller cassette

- Strip down and clean all exposed components with a mild solvent.
- Drift out the spring pin holding the cylinder retaining pin, and remove the retaining pin.
- Inspect all parts for damage.
- Perform non destructive testing by magnetic particle inspection on the following components:
 - Sideplates
 - Cylinder locating plate
 - Cylinder retaining pin
 - Reaction roller bracket and pin
 - Reaction rollers and roller pin
- Dry all components. Apply a thin coat of molybdenum disulphide lubricant
 as indicated.

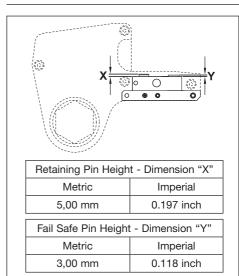


Fig. P

- Check retaining pin height (X) and fail safe pin height (Y). Refer to Fig. P.
- Reverse the procedure to reassemble the tool.

5.3.2 The hydraulic drive unit

- Remove the circlip from the swivel manifold block.
- Remove the hydraulic couplings.
- Remove the swivel manifold block from the drive unit.
- Remove the retaining screws and the swivel manifold post.
- Remove all 'O' rings from swivel manifold post.
- Carefully hold the cylinder body to unscrew the cylinder gland.
- Hold the two flat sides of the piston rod with a spanner. The rod is located at the spigot.
- Remove the button head cap screw from the piston.
- Remove the piston rod from the cylinder spigot end.
- Remove the piston from the cylinder gland end, using a suitable drift.

- Clean all exposed components with a mild solvent.
- Inspect all parts for damage.
- Perform non destructive testing by magnetic particle inspection on the following components:
 - Cylinder body
 - Piston rod
- Apply a small amount of Loctite 243 to the threads of the button head capscrew before reassembly.
- Apply a small amount of Loctite 243 to the threads in the drive unit, assemble the swivel manifold post and tighten the degreased retaining screws to 5,1 Nm (3.76 Ft.lbs).

Reverse the procedure to reassemble.



When reassembling the drive unit make sure that the piston rod is inserted through the cylinder spigot end.



When reassembling the drive unit make sure that the piston is inserted through the gland end. Tap the piston gently into place against the piston rod.

 Pressurize the assembled drive unit to max pressure (Advance and Retract), and check for any signs of leakage.

5.4 Troubleshooting

5.4.1 Drive Unit

Symptom	Cause	Remedy
Cylinder does not advance or retract.	Quick-connect coupling	Replace the coupling.
	is damaged.	
	Quick connect coupling is	Reconnect the hoses
	not connected.	and couplings securely.
	Dirt in the direction control	Disassemble the unit and
	valve on the pumping unit.	clean the valve.
Cylinder does not build pressure.	Piston seal leaks.	Replace the seals.
	Pump does not build pressure.	Adjust the pressure.
	Pump is defective.	Refer to the pump manual.
Cylinder leaks.	Seal failure.	Replace the cylinder seals.
Cylinder operates backwards.	Connections are reversed.	Reconnect hoses correctly.

5.4.2 Cassette

Symptom	Cause	Remedy
Drive unit operates	Spanner broken	Replace the spanner.
but spanner does not move.	or damaged.	Note: Top of spanner
		contains fail-safe area
		that is designed to
		break in event of overload.
Spanner operation	Fasteners loose.	Check tightness of all
rough or erratic.		screws and other fasteners.
	Parts bent, worn	Disassemble and inspect
	or damaged.	roller cassette. Clean,
	_	lubricate and replace
		parts as needed.



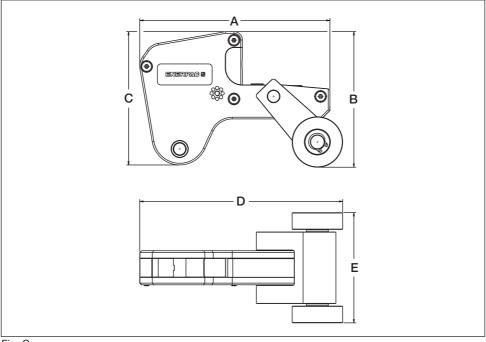


Fig. Q

6 Technical specifications and torque settings

6.1 Capacities and dimensions - Model WCR4000 (fig. Q)

Spanner size range			mm	(36 - 80
		inch		1 ⁷ / ₁₆ - 3 ¹ / ₈	
Maximum ope	rating pressure	е	bar	(690
			psi		10,000
Max. torque	at 690 bar		Nm	į	5.762
	at 10,000 p	si	Ft.lbs	4	4,250
Min. torque			Nm	į	576
			Ft.lbs	4	425
Dimensions	Α	mm	(inch)		226 (8.9)
	В	mm	(inch)		161 (6.3)
	С	mm	(inch)		159 (6.25)
	D	mm	(inch)		241 (9.5)
	E	mm	(inch)		131 (5.2)
Weight (cassette only)		kį	g (lbs)		6,2 (13.6)
(drive unit only) (drive unit and cassette)		kg	g (lbs)		4,0 (8.8)
		kç	g (lbs)		10,2 (22.5)
Mater Defende	t' 0 0 f -				lake the all allowers allowed

Note: Refer to section 6.2 for spanner weights and dimensions.

6.2 Technical Data - Closed End Spanners (fig. R)

6.2.1 Metric system table

Spanner	(F)	(G)	(H)	Weight
Model	mm	mm	mm	kg
W4107CS	36	31,0	30,0	1,9
W4108CS	38	32,8	30,0	2,1
W4110CS	41	32,8	30,0	2,2
W4113CS	46	35,6	30,0	2,1
W4114CS	48	38,4	30,0	2,1
W4200CS	50	38,4	30,0	2,2
W4203CS	55	41,2	30,0	2,1
W4206CS	60	45,0	30,0	2,2
W4209CS	65	46,8	30,0	2,1
W4212CS	70	49,6	30,0	2,2
W4215CS	75	52,1	30,0	2,1
W4302CS	80	55,4	30,0	2,2

6.2.2 Imperial system table

Spanner	(F)	(G)	(H)	Weight
Model	inch	inch	inch	lbs
W4107CS	1 7/16	1.22	1.18	4.0
W4108CS	1 1/2	1.26	1.18	4.7
W4110CS	1 5/8	1.26	1.18	4.7
W4113CS	1 13/16	1.38	1.18	4.6
W4114CS	1 7/8	1.50	1.18	4.6
W4200CS	2	1.50	1.18	4.8
W4203CS	2 3/16	1.61	1.18	4.5
W4206CS	2 3/8	1.81	1.18	4.9
W4209CS	2 9/16	1.81	1.18	4.5
W4212CS	2 3/4	1.93	1.18	4.9
W4215CS	2 15/16	2.05	1.18	4.5
W4302CS	3 1/8	2.17	1.18	4.9

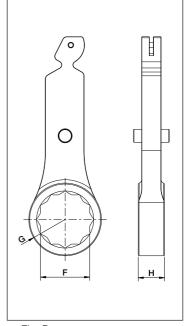


Fig. R

6.3 Torque settings

To set the torque, adjust the pump pressure according to the following calculation:

Pump pressure = Torque / Torque factor

Measurement system	Torque factor
Metric	8,351
Imperial	0.425

6.3.1 Metric system pressure/torque table - Model WCR4000

Pump pressure (bar)	Torque (Nm)
69	576
124	1.036
179	1.495
207	1.729
234	1.954
262	2.188
290	2.422
317	2.647
345	2.881
372	3.107
400	3.340
428	3.574
455	3.800
483	4.034
510	4.259
538	4.493
566	4.727
593	4.952
621	5.186
648	5.411
690	5.762

6.3.2 Imperial system pressure/torque table - Model WCR4000

Pump pressure (psi) 1,000	Torque (Ft.lbs) 425
1,800	765
2,600	1,105
3,000	1,275
3,400	1,445
3,800	1,615
4,200	1,785
4,600	1,955
5,000	2,125
5,400	2,295
5,800	2,465
6,200	2,635
6,600	2,805
7,000	2,975
7,400	3,145
7,800	3,315
8,200	3,485
8,600	3,655
9,000	3,825
9,400	3,995
10,000	4,250

7 Replacement parts and recommended tools

7.1 To order replacement parts

For replacement parts information, refer to the Enerpac repair parts sheet for your wrench model. Repair parts sheets are available on the internet at www.enerpac.com.

Have the following information ready when ordering replacement parts:

- Wrench model and serial numbers (for both drive unit and cassette).
- Approximate date of purchase.
- Part number and description of each part being ordered.

7.2 Recommended tools for performing maintenance and repairs

- 1 7/8" A/F spanner
- 1 3/4" A/F spanner
 - 1 5/8" A/F spanner
- 1 Circlip pliers
- 1 Seal extraction tool
 - 1 ø 4 mm x 5 mm LG x 25 mm PCD pin spanner
- 1 6 mm A/F Allen key
- 1 4 mm A/F Allen key
- 1 3 mm A/F Allen key
- 1 2,5 mm A/F Allen key
 - Copper hammer
- 1 3 mm terminal screwdriver

Notes:

A/F = Across Flats

PCD = Pitch Circle Diameter

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Enerpac Worldwide Locations ♦ e-mail: info@enerpac.com ♦ internet: www.enerpac.com

Australia and New Zealand

Actuant Australia Ltd. Block V Unit 3 Regents Park Estate 391 Park Road Regents Park NSW 2143 (P.O. Box 261) Australia +61 (0)2 9743 8988 +61 (0)2 9743 8648 sales-au@enerpac.com

Power Packer do Brasil Ltda. Rua Luiz Lawrie Reid, 548 09930-760 - Diadema (SP) T +55 11 5687 2211 +55 11 5686 5583 Toll Free: 0800 891 5770 vendasbrasil@enerpac.com

Actuant Canada Corporation 6615 Ordan Drive, Unit 14-15 Mississauga, Ontario L5T 1X2 +1 905 564 5749 +1 905 564 0305 +1 800 268 4987 +1 800 461 2456

customer.service@actuant.com

Actuant (China) Industries Co. Ltd. No. 6 Nanjing East Road, Taicang Economic Dep Zone Jiangsu, China +86 0512 5328 7500 +86 0512 5335 9690 Toll Free: +86 400 885 0369 sales-cn@enerpac.com

France, Switzerland, North Africa and French speaking African countries **ENERPAC**

Une division d'ACTUANT France S.A. ZA de Courtaboeuf 32, avenue de la Baltique 91140 VILLEBON /YVETTE France

+33 1 60 13 68 68 +33 1 69 20 37 50 sales-fr@enerpac.com

Germany and Austria

ENERPAC GmbH P.O. Box 300113 D-40401 Düsseldorf Willstätterstrasse 13 D-40549 Düsseldorf, Germany +49 211 471 490 +49 211 471 49 28 sales-de@enerpac.com

ENERPAC Hydraulics Pvt. Ltd. No. 1A, Peenya Industrial Area IInd Phase, Bangalore, 560 058, India +91 80 40 792 777 +91 80 40 792 792

sales-in@enerpac.com

Italy

ENERPAC S.p.A. Via Canova 4 20094 Corsico (Milano) +39 02 4861 111 +39 02 4860 1288 sales-it@enerpac.com

Japan

Applied Power Japan LTD KK Besshocho 85-7 Kita-ku, Saitama-shi 331-0821, Japan +81 48 662 4911 +81 48 662 4955 sales-jp@enerpac.com

Middle East, Egypt and Libya

ENERPAC Middle East FZE Office 423, LOB 15 P.O. Box 18004, Jebel Ali, Dubai United Arab Emirates +971 (0)4 8872686 +971 (0)4 8872687 sales-ua@enerpac.com

Russia

Rep. office Enerpac Russian Federation Admirala Makarova Street 8 125212 Moscow, Russia +7 495 98090 91 +7 495 98090 92 sales-ru@enerpac.com

Southeast Asia, Hong Kong and Taiwan

Actuant Asia Pte Ltd. 83 Joo Koon Circle Singapore 629109 +65 68 63 0611 +65 64 84 5669 Toll Free: +1800 363 7722 sales-sq@enerpac.com

South Korea

Actuant Korea Ltd. 3Ba 717, Shihwa Industrial Complex Jungwang-Dong, Shihung-Shi, Kyunggi-Do Republic of Korea 429-450 +82 31 434 4506 +82 31 434 4507 sales-kr@enerpac.com

Spain and Portugal

ENERPAC SPAIN, S.L. Avda. Los Frailes, 40 - Nave C & D Pol. Ind. Los Frailes 28814 Daganzo de Arriba (Madrid) Spain +34 91 884 86 06

+34 91 884 86 11 sales-es@enerpac.com

Sweden, Denmark, Norway, Finland and Iceland

Enerpac Scandinavia AB Fabriksgatan 7 412 50 Gothenburg Sweden

+46 (0) 31 799 0281 +46 (0) 31 799 0010

scandinavianinguiries@enerpac.com

The Netherlands, Belgium, Luxembourg,

Central and Eastern Europe, Baltic States, Greece, Turkey and CIS countries

ENERPAC B.V. Galvanistraat 115 6716 AE Ede P.O. Box 8097 6710 AB Ede The Netherlands

+31 318 535 911 +31 318 535 848 sales-nl@enerpac.com

Energac Integrated Solutions B.V.

Opaalstraat 44 7554 TS Hengelo P.O. Box 421 7550 AK Hengelo The Netherlands +31 74 242 20 45 +31 74 243 03 38 integratedsolutions@enerpac.com

South Africa and other English speaking African countries

Enerpac Africa Pty Ltd. No. 5 Bauhinia Avenue Cambridge Office Park Block E Highveld Techno Park Centurion 0157 South Africa T: +27 12 940 0656

United Kingdom and Ireland

ENERPAC Ltd. Bentley Road South Darlaston, West Midlands WS10 8LQ England +44 (0)121 50 50 787 +44 (0)121 50 50 799 sales-uk@enerpac.com

USA, Latin America and Caribbean

P.O. Box 3241 Milwaukee WI 53201 USA +1 262 293 1600 +1 262 293 7036 User inquiries: T +1 800 433 2766 Distributor inquiries/orders: +1 800 558 0530 +1 800 628 0490

ENERPAC

Technical inquiries: techservices@enerpac.com sales-us@enerpac.com

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