

ENERPAC®

POWERFUL SOLUTIONS. GLOBAL FORCE.



BOLTING TOOLS

US

E 4 1 4

Enerpac's Bolting Solutions caters to the complete bolting work-flow, ensuring joint integrity in a variety of applications throughout industry:

Joint Assembly

From simple pipe alignment to complex joint positioning of large structural assemblies, our comprehensive line of joint assembly products range from hydraulic 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, ranging from manual torque multipliers, to pneumatic torque wrenches, as well as a comprehensive range of hydraulic torque wrenches and inter-connectable bolt tensioning tools.

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.

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All information in this catalog can be changed due to product improvements without prior notice.

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ATM – Flange Alignment Tools



Misaligned joints

Joints must be pulled together and correctly aligned prior to tightening. Current methods of manipulation tend to be dangerous and involve a high degree of manual lifting using slings, hooks and lifting gear. These methods can damage joint components, are time consuming in setup and disassembly, operational time and the amount of manpower required.

Solution: Flange Alignment Tools

The Enerpac ATM-Series Flange Alignment Tools are developed to rectify twist and rotational misalignment without additional stress in pipelines. Hydraulic cylinders, jacks and lifting wedges can also be used to assist in positioning and aligning.

E-Series, Manual Torque Multipliers



Controlled tightening when external power is unavailable

Applications are often located where external power sources to drive air or electric-powered tools are unavailable but controlled bolting is required, typically at values higher than an operator can generate using manual wrenches.

Solution: Manual Torque Multipliers

Enerpac E-series manual torque multipliers offer a range of output torques from manual inputs that can easily be achieved by an operator, providing accurate, efficient torque multiplication for make-up or break-out of joint fasteners.

S and W-Series Torque Wrenches



Industrial

Controlled tightening of a large range of fasteners including those in hard to reach areas, which require highly accurate torquing solutions.

Solution: Hydraulic Torque Wrenches

Professional tools for industrial applications. Truly versatile tools which utilize standard Impact Sockets, optional direct Allen® Drives or Interchangeable cassettes to provide controlled tightening of multiple-sized fasteners per tool. Optional accessories further extend the application range of these products.

PTW & ETW-Series Torque Wrenches



General Applications

Applications that require controlled bolting, feature a high volume of fastenings.

Solution: Pneumatic Torque Wrenches

Enerpac Pneumatic Torque Wrenches are fast, easy to use and highly accurate. The ETW-Series electric torque wrenches are particularly well suited for complex jobs, which demand precision and traceability.

Controlled Bolting

Increasing Health and Safety, Environmental and Productivity requirements demand even and parallel joint closure to ensure a sound assembly, especially on pressure containing vessels. This often requires the simultaneous tightening of multiple fasteners.

Solution: **Bolt Tensioners**

Enerpac Bolt Tensioners can achieve accurate preload in single or multiple fastener applications simultaneously, without inducing rotational twist or contending with the uncertainties of friction and lubrication.

Bolt Tensioners



Frozen or Corroded Nuts

Often nuts are difficult to remove, while loosening using tightening tools is possible it generally requires larger equipment and is time consuming. The use of cutting torches or hammers and chisels can cause damage to the joint components, requires significantly longer setup and operational time and can present a potential safety risk.

Solution: **Hydraulic Nut Cutters**

Nut splitting with the NC Series Nut Cutters or NS Series Nut Splitters is the safest method. It takes less time and avoids costly damage to joint components. The head design fitted with heavy-duty chisels permits the splitting of nuts on a wide variety of applications.

NC or NS – Hydraulic Nut Cutters & Splitters



Joint Separation

Separation of stubborn joints for inspection and maintenance particularly those fitted with ring grooves or those with external forces acting on them are often difficult to separate. The use of hammers and wedges, chain blocks and lever bars can damage joint components and present a potential safety risk.

Solution: **Flange Spreaders**

The FSH, FSM-Series parallel wedge spreaders offer controlled separation without bending or risk of slipping from the joint. The FS series spreaders are ideally suited to flanged joint applications.

FSH & FSM – Parallel Wedge Spreaders



Pumps and Accessories

A wide range of Pumps and Accessories are available including: Manual, Air and Electrically-operated pump units, hoses, gauges, manifolds and fittings.

Pumps and Accessories



▼ Shown: S3000X



Setting New Standards in Safety, Simplicity and Performance



Two Handle Styles

Robust angled positioning handles come standard with every S-Series (X-Edition) tool. Straight positioning handles are available as accessories.

Compatible S-Series (X-Edition) wrenches	Angled positioning handles (standard)	Straight positioning handles (optional)
S1500X, S3000X	SWH6A	SWH6S
S6000X, S11000X	SWH10A	SWH10S
S25000X	Supplied with an eyebolt handle (SWH10EA)	

Safety and Performance

- Compact, high-strength uni-body construction provides a small operating radius without sacrificing endurance
- 35° rotation angle and rapid return stroke for fast operation
- Tough manifold design with added safety feature for enhanced operator safety

Simplicity

- 360° click-on reaction arm with quick release lever provides easier handling, even when wearing gloves
- Includes robust handle which mounts on both sides of tool for extra maneuverability
- Push button square drive release for quickly reversing the square drive for tightening or loosening

Versatility

- Available with optional enhanced tilt and swivel TSP300 manifold for horizontal and vertical maneuverability, with greater durability*

Accuracy

- Constant torque output provides accuracy of +/-3% across full stroke
- Optional Angle-of-Turn Indicator provides measurement of rotation

* TSP300 is designed for X-Edition tools only, and is not compatible with standard edition tools. For replacement components for existing tools, refer to repair sheet on www.enerpac.com



TSP - Pro Series Swivel

The optional TSP300 tilt and swivel manifold with robust interlocking design provides 360° X-axis rotation and 160° Y-axis rotation.

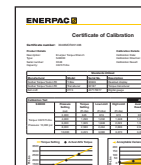
How to Order*

Factory fitted to S-Series (X-Edition) wrenches: Insert a "P" prior to the "X" in the tool designation, e.g.: S1500PX.

Order as an accessory using the part number: TSP300, which can be fitted to existing S-Series (X-Edition) wrenches.

*Includes male and female couplers.

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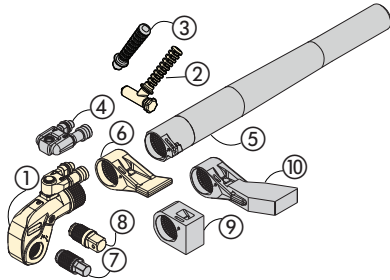


Calibration Certificate

All X-Edition tools are CE-ATEX declared, factory calibrated and are shipped complete with a calibration certificate.

CE  II 2 GD ck T4
CSA/SIRA 15XT072

S-Series, X-Edition, Square Drive Torque Wrenches



- ① Drive Unit
- ② Angled Positioning Handle
- ③ Straight Positioning Handle (optional)
- ④ Pro Series Swivel (optional)
- ⑤ Reaction Tube Extension (optional)
- ⑥ Standard Reaction Arm
- ⑦ Allen® Drive (optional)
- ⑧ Square Drive
- ⑨ Short Reaction Arm (optional)
- ⑩ Extended Reaction Arm (optional)



Select the Right Torque

Choose your Enerpac Torque Wrench using the untightening rule of thumb: Loosening torque equals about 250% of tightening torque.

S Series (X-Edition)



Nominal Torque at 10,000 psi:

26,150 Ft.lbs

Square Drive Range:

3/4-2 1/2 inch

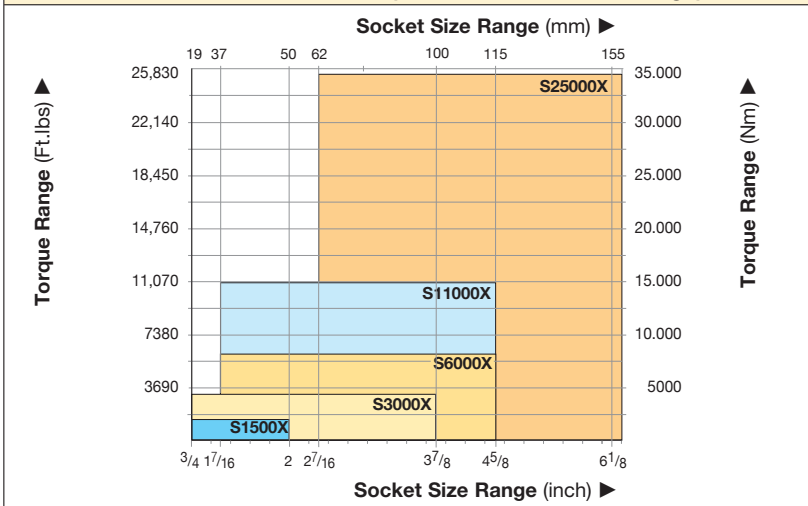
Nose Radius:

.98-2.52 inch

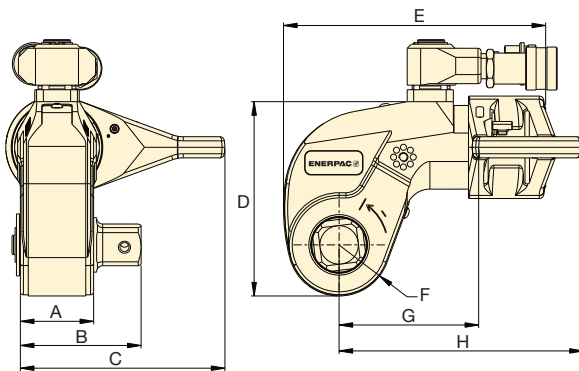
Maximum Operating Pressure:

10,000 psi

*TORQUE WRENCH SELECTION (based on socket size range)



See page 8 for BSH-Sockets.



Accessory Options

A full list of optional accessories can be found on page 7.

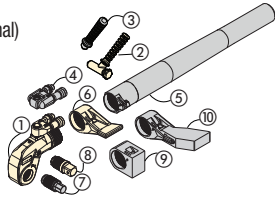
▼ The rigid steel design of the S-Series torque wrenches provides durability, reliability and safety.



Nominal Torque at 10,000 psi / 690 bar		Minimum Torque at 10,000 psi / 690 bar		Square Drive		Angle-of-Turn Model No. (optional)	Torque Wrench Model No.*	Dimensions (in)								Wt. (lbs)
(Ft.lbs)	(Nm)	(Ft.lbs)	(Nm)	Size (in)	Model No. (included with wrench)			A	B	C	D	E	F	G	H	
1440	1952	144	195	3/4"	SD15-012	AOT15	S1500X	1.54	2.56	4.25	3.82	5.35	0.98	2.76	5.08	7.0
3225	4373	323	438	1"	SD30-100	AOT30	S3000X	1.89	3.15	5.31	5.04	6.81	1.30	3.54	6.34	12.3
6150	8338	615	834	1 1/2"	SD60-108	AOT60	S6000X	2.17	3.62	6.65	6.18	7.56	1.57	4.33	7.40	20.2
11,175	15,151	1,118	1,515	1 1/2"	SD110-108	AOT110	S11000X	2.83	4.49	7.76	7.48	8.98	1.95	5.24	9.02	34.7
26,150	35,455	2,615	3,545	2 1/2"	SD250-208	AOT250	S25000X	3.50	5.63	9.69	9.61	11.30	2.52	7.17	11.61	70.8

* To order a S-series (X-Edition) wrench fitted with the TSP swivel, insert a "P" prior to the "X" in the tool designation. e.g., **S1500PX**.

- ① Drive Unit
- ② Angled Positioning Handle
- ③ Straight Positioning Handle (optional)
- ④ Pro Series Swivel (optional)
- ⑤ Reaction Tube Extension (optional)
- ⑥ Standard Reaction Arm
- ⑦ Allen® Drive (optional)
- ⑧ Square Drive
- ⑨ Short Reaction Arm (optional)
- ⑩ Extended Reaction Arm (optional)



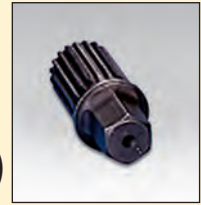
Nominal Torque at 10,000 psi:


26,150 Ft.lbs.

Hexagon Size Allen® Drive:

1/2-2 1/4 in. (14-85 mm)

For
S
Series
(X-Edition)



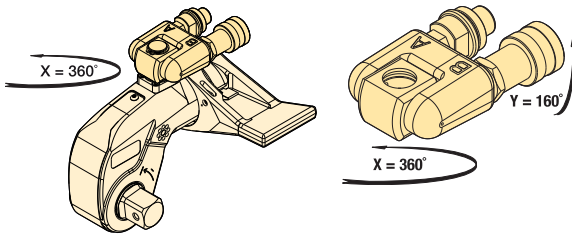
TORQUE WRENCH	OPTIONAL ALLEN® DRIVES, IMPERIAL				OPTIONAL ALLEN® DRIVES, METRIC				SHORT REACTION ARM FOR ALLEN® DRIVES		
	Model Number	Hexagon Size (in)	Maximum Torque (Ft.Lbs)	Model Number	Dim. B1 (in)	Hexagon Size (mm)	Maximum Torque (Ft.lbs)	Model Number	Dim. B1 (in)	Model Number	Dimensions (in) C1 H1
 S1500X (1440 Ft-lbs)	1/2	355	SDA15-008	2.6	14	475	SDA15-14	2.60	SRA15X	2.66	2.56
	5/8	690	SDA15-010	2.6	17	850	SDA15-17	2.68			
	3/4	1195	SDA15-012	2.8	19	1185	SDA15-19	2.76			
	7/8	1400	SDA15-014	2.9	22	1400	SDA15-22	2.87			
	1	1400	SDA15-100	3.0	24	1400	SDA15-24	2.91			
S3000X (3225 Ft-lbs)	5/8	690	SDA30-010	3.0	17	850	SDA30-17	3.03	SRA30X	3.15	2.91
	3/4	1195	SDA30-012	3.1	19	1185	SDA30-19	3.11			
	7/8	1895	SDA30-014	3.3	22	1835	SDA30-22	3.23			
	1	2825	SDA30-100	3.4	24	2385	SDA30-24	3.31			
	1 1/8	3200	SDA30-102	3.5	27	3200	SDA30-27	3.35			
	1 1/4	3200	SDA30-104	3.5	30	3200	SDA30-30	3.43			
	-	-	-	-	32	3200	SDA30-32	3.46			
S6000X (6050 Ft-lbs)	5/8	690	SDA60-010	3.3	17	850	SDA60-17	3.39	SRA60X	3.60	3.50
	3/4	1195	SDA60-012	3.5	19	1185	SDA60-19	3.46			
	7/8	1895	SDA60-014	3.6	22	1835	SDA60-22	3.58			
	1	2825	SDA60-100	3.7	24	2385	SDA60-24	3.66			
	1 1/8	4025	SDA60-102	3.8	27	3395	SDA60-27	3.70			
	1 1/4	5520	SDA60-104	3.9	30	4655	SDA60-30	3.78			
	-	-	-	-	32	5650	SDA60-32	3.82			
S11000X (11,175 Ft-lbs)	1 1/4	5520	SDA110-104	4.5	30	4655	SDA110-30	4.41	SRA110X	5.02	4.17
	1 3/8	7345	SDA110-106	4.6	32	5650	SDA110-32	4.49			
	1 1/2	9535	SDA110-108	4.6	36	8040	SDA110-36	4.61			
	1 5/8	11,000	SDA110-110	4.8	41	11,000	SDA110-41	4.76			
	1 3/4	11,000	SDA110-112	4.9	46	11,000	SDA110-46	5.00			
S25000X (26,150 Ft-lbs)	1 1/2	9535	SDA250-108	5.5	36	8040	SDA250-36	5.51	SRA250X	6.24	5.31
	1 5/8	12,120	SDA250-110	5.7	41	11,880	SDA250-41	5.67			
	1 3/4	15,135	SDA250-112	5.8	46	16,775	SDA250-46	5.83			
	1 7/8	18,620	SDA250-114	5.9	50	21,545	SDA250-50	5.94			
	2	22,595	SDA250-200	5.9	55	26,150	SDA250-55	6.06			
	2 1/4	26,150	SDA250-204	6.0	60	26,150	SDA250-60	6.22			
	-	-	-	-	65	26,150	SDA250-65	6.34			
	-	-	-	-	70	26,150	SDA250-70	6.46			
	-	-	-	-	75	26,150	SDA250-75	6.61			
	-	-	-	-	85	26,150	SDA250-85	6.89			

Accessories for S-Series, X-Edition Torque Wrenches

TSP-Series, Pro Series Swivels

- Robust interlocking design
- 360° X-axis and 160° Y-axis rotation
- Increases tool fit in restricted access areas
- Simplifies hose placement
- Includes male and female couplers

**TSP
RTEX
SRSX
Series**



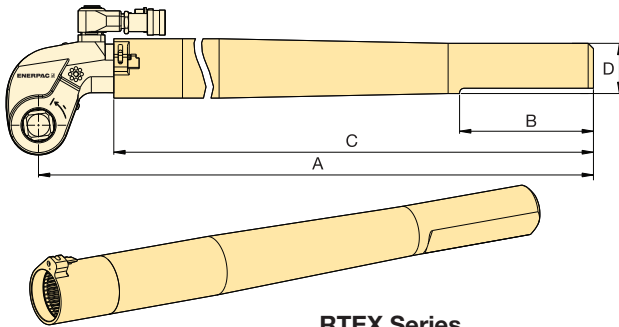
TSP Series

Torque Wrench Model Number	Model Number	Maximum Pressure (psi)	Wt. (lbs)
S1500X, S3000X, S6000X, S11000X, S25000X	TSP300*	10,000	0.44

Note: To order a S-series (X-Edition) wrench fitted with the TSP swivel, insert a "P" prior to the "X" in the tool designation, e.g., **S1500PX**.

* TSP300 is designed for X-Edition tools only, and is not compatible with standard edition tools. For replacement components for existing tools, refer to repair sheet on www.enerpac.com

RTEX-Series, Reaction Tube Extensions



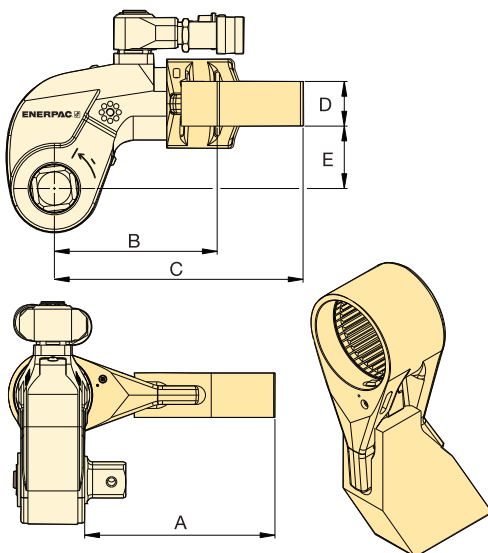
RTEX Series

- Full torque rated
- Increases tool fit in restricted access areas

Torque Wrench Model Number	Model Number	Dimensions (in)				Wt. (lbs)*
		A	B	C	D	
S1500X	RTE15X	27.80	5.98	25.04	2.28	10.1
S3000X	RTE30X	28.86	5.98	25.47	2.24	12.1
S6000X	RTE60X	29.41	5.98	25.94	2.56	17.0
S11000X	RTE110X	30.28	5.98	26.57	2.99	24.7
S25000X	RTE250X	32.01	5.98	26.97	3.94	38.1

* Weights indicated are for the accessories only and do not include the wrench.

SRSX-Series, Extended Reaction Arms



SRSX Series

- Lightweight interchangeable design

Wrench Model	Max. Torque (Ft-lbs)	Model Number	Dimensions (in)					Wt. (lbs)*
			A	B	C	D	E	
S1500X	1328	SRS151X	3.70	3.39	5.00	0.94	1.34	1.8
	1210	SRS152X	4.69	3.82	5.43	0.94	1.34	2.2
	1131	SRS153X	5.71	4.29	5.83	0.94	1.34	2.6
S3000X	2890	SRS301X	4.37	4.17	6.61	1.34	1.89	3.5
	2739	SRS302X	5.39	4.61	7.17	1.34	1.89	4.4
	2638	SRS303X	6.38	5.20	7.80	1.34	1.89	5.5
S6000X	5784	SRS601X	5.43	5.04	7.56	1.54	2.44	5.1
	5501	SRS602X	6.42	5.67	8.15	1.54	2.44	6.0
	5295	SRS603X	7.44	6.26	8.74	1.54	2.44	7.5
S11000X	10,812	SRS1101X	5.87	6.18	9.13	1.81	2.99	9.7
	10,300	SRS1102X	6.89	6.77	9.72	1.81	2.99	11.2
	9883	SRS1103X	7.87	7.36	10.28	1.81	2.99	12.8
S25000X	24,751	SRS2501X	7.20	8.23	11.61	1.97	3.94	16.8
	23,652	SRS2502X	8.19	8.74	12.20	1.97	3.94	18.5
	22,694	SRS2503X	9.17	9.29	12.83	1.97	3.94	22.0

* Weights indicated are for the accessories only and do not include the wrench.

- Heavy-duty impact sockets
- Supplied with "Pin and Ring"

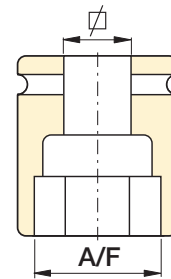
Hexagon Sizes:

3/4 - 6 1/8 inch
(19 - 155 mm)



IMPERIAL SOCKETS													
3/4" Square Drive		1" Square Drive				1 1/2" Square Drive				2 1/2" Square Drive			
Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)
BSH7519	3/4"	BSH1019	3/4"	BSH10231	2 5/16"	BSH15144	1 7/16"	BSH15281	2 13/16"	BSH25244	2 7/16"	BSH25419	4 3/16"
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 9/16"	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 1/4"	BSH10125	1 1/4"	BSH10263	2 5/8"	BSH15175	1 3/4"	BSH15313	3 1/8"	BSH2570	2 3/4"	BSH25463	4 5/8"
BSH75131	1 5/16"	BSH10131	1 5/16"	BSH10269	2 11/16"	BSH1546	1 13/16"	BSH15319	3 3/16"	BSH25281	2 13/16"	BSH25475	4 3/4"
BSH7535	1 3/8"	BSH1035	1 3/8"	BSH1070	2 3/4"	BSH15188	1 7/8"	BSH15325	3 1/4"	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 1/2"	BSH1038	1 1/2"	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 3/4"	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 3/4"	BSH10175	1 3/4"	BSH10313	3 1/8"	BSH15225	2 1/4"	BSH15100	3 15/16"	BSH25325	3 1/4"	BSH25140	5 1/2"
BSH7546	1 13/16"	BSH1046	1 13/16"	BSH10319	3 3/16"	BSH15231	2 5/16"	BSH15400	4"	BSH25338	3 3/8"	BSH25575	5 3/4"
BSH75188	1 7/8"	BSH10188	1 7/8"	BSH10325	3 1/4"	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 1/4"	BSH2595	3 3/4"	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 3/4"	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 1/4"			BSH1570	2 3/4"	BSH15463	4 5/8"	BSH25105	4 1/8"		

METRIC SOCKETS							
3/4" Square Drive		1" Square Drive		1 1/2" Square Drive		2 1/2" Square Drive	
Model Number	A/F (mm)	Model Number	A/F (mm)	Model Number	A/F (mm)	Model Number	A/F (mm)
BSH7519	19	BSH1019	19	BSH1536	36	BSH2565	65
BSH7524	24	BSH1024	24	BSH15163	41	BSH2570	70
BSH7527	27	BSH1027	27	BSH1546	46	BSH2575	75
BSH7530	30	BSH1030	30	BSH1550	50	BSH2580	80
BSH7532	32	BSH1032	32	BSH1555	55	BSH2585	85
BSH7536	36	BSH1036	36	BSH1560	60	BSH2590	90
BSH75163	41	BSH10163	41	BSH1565	65	BSH2595	95
BSH7546	46	BSH1046	46	BSH1570	70	BSH25100	100
BSH7550	50	BSH1050	50	BSH1575	75	BSH25105	105
		BSH1055	55	BSH1580	80	BSH25110	110
		BSH1060	60	BSH1585	85	BSH25115	115
		BSH1065	65	BSH1590	90	BSH25120	120
		BSH1070	70	BSH1595	95	BSH25125	125
		BSH1075	75	BSH15100	100	BSH25135	135
		BSH1080	80	BSH15105	105	BSH25140	140
		BSH1085	85	BSH15110	110	BSH25145	145
		BSH1090	90	BSH15115	115	BSH25150	150
		BSH1095	95			BSH25155	155
		BSH10100	100				



Pin and Ring

All sockets are supplied with a "Pin and Ring" to hold the socket in place on the square drive of the tool.



Select the Right Torque

Choose your Enerpac Torque Wrench using the untightening rule of thumb: Loosening torque equals about 250% of tightening torque.

Hydraulic Torque Wrench Applications

Setting new standards in safety, simplicity and performance.

Enerpac hydraulic torque wrenches are professional tools for industrial applications. Truly versatile tools which utilize standard Impact Sockets, optional direct Allen® Drives or Interchangeable Cassettes to provide controlled tightening of multiple-sized

fasteners per tool. Optional accessories further extend the application range of these products. All Enerpac professional series steel torque wrenches provide reliable controlled tightening solutions across many industries.



◀ *Refurbishing the bolted connections on a crane with the Enerpac S1500 torque wrench powered by a ZU4 torque wrench pump.*



◀ *W4000X low-profile torque wrench on an API pipe flange.*



◀ *A S6000X hydraulic torque wrench, powered by a ZU4 torque wrench pump, delivered precise torque output during the assembly of tower crane sections.*

OVERVIEW



▲ *A W4000X low-profile hexagon torque wrench tightens cylinder heads during maintenance operations.*

SAFETY AND PERFORMANCE

- Tough manifold design with added safety feature for enhanced operator safety

SIMPLICITY

- Robust handle which mounts on both sides of tool for extra maneuverability

VERSATILITY

- Available on X-edition tools, with optional enhanced tilt and swivel TSP300 manifold for horizontal and vertical maneuverability (not compatible on standard models)

ACCURACY

- Constant torque output provides accuracy of +/-3% across full stroke

▼ Shown: W4206X cassette with W4000X drive unit
(Rear model shows optional straight handle)



Setting New Standards in Safety, Simplicity and Performance



Two Handle Styles

Robust angled positioning handles come standard with every W-Series (X-Edition) tool. Straight positioning handles designed for extreme limited access applications are available as accessories.

Compatible W-Series (X-Edition) wrenches	Angled positioning handles (standard)	Straight positioning handles (optional)
W2000X, W4000X	SWH6A	SWH6S
W8000X, W15000X	SWH10A	SWH10S
W22000X, W35000X	Supplied with an eyebolt handle (SWH10EA)	

Safety and Performance

- Superior strength to size ratio provides easy access to difficult to reach applications without sacrificing endurance
- 30° rotation angle and rapid return stroke provide fast operation
- Tough manifold design with added safety feature for enhanced operator safety

Simplicity

- Fast release drive unit enables rapid exchange of cassettes, no tools required and no pins to lose
- Includes robust handles which mount on both sides, and the tops of cassettes to allow for extra maneuverability
- Quick and easy disassembly for maintenance without special tools

Versatility

- Available with optional enhanced tilt and swivel TSP300 manifold for horizontal and vertical maneuverability, with greater durability*
- X-Edition drive units, cassettes and most accessories are compatible with standard edition tools*
- Drive unit compatible with UltraSlim and WCR-Series cassettes

Accuracy

- Constant torque output provides accuracy of +/-3% across full stroke

* TSP300 is designed for X-Edition tools only, and is not compatible with standard edition tools. For replacement components for existing tools, refer to repair sheet on www.enerpac.com



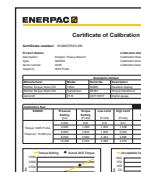
TSP - Pro Series Swivel

The optional TSP300 tilt and swivel manifold with robust interlocking design provides 360° X-axis rotation and 160° Y-axis rotation.

How to Order

Factory fitted to new W-Series (X-Edition) wrenches: Insert a "P" prior to the "X" in the tool designation, e.g.: **W2000PX**.

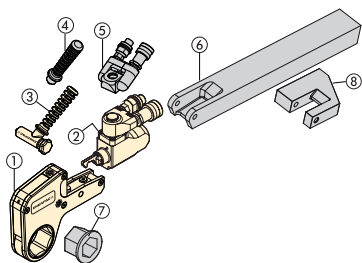
Order as an accessory using the part number: **TSP300**, which can be fitted to existing W-Series (X-Edition) wrenches.



Calibration Certificate

All X-Edition tools are CE-ATEX declared, factory calibrated and are shipped complete with a calibration certificate.

W-Series, X-Edition Hexagon Wrenches

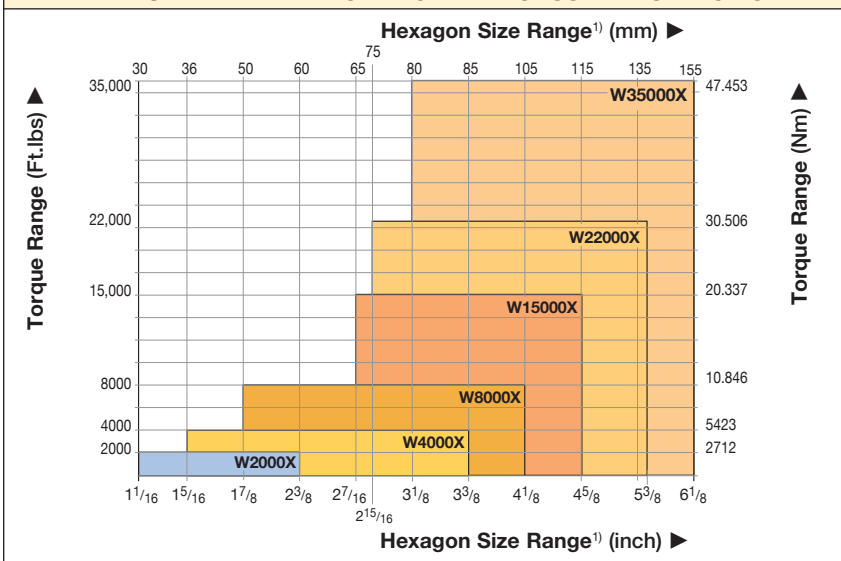


Hexagon Cassettes and Reducer Inserts

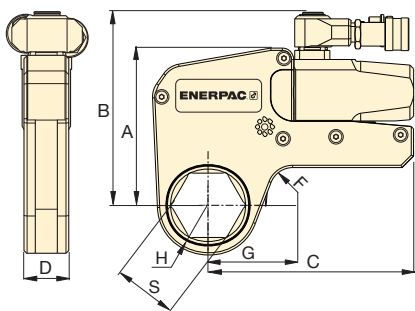
Full range of interchangeable hexagon cassettes and reducing inserts provides maximum versatility. Details available at www.enerpac.com

- ① Hexagon Cassette
- ② Drive Unit
- ③ Angled Positioning Handle
- ④ Straight Positioning Handle (optional)
- ⑤ Pro Series Swivel (optional)
- ⑥ Extended Reaction Arm (optional)
- ⑦ Reducer Insert (optional)
- ⑧ Reaction Paddle (optional)

DRIVE UNIT AND INTERCHANGEABLE CASSETTE SELECTION



¹⁾ See page 8 for table of hexagon sizes of bolts, nuts and related thread diameters.



SELECTION CHART

Hexagon Range *	Nominal Torque at 10,000 psi		Drive Unit Model Number **	Minimum Torque		Dimensions (see pages 12-19 for dimensions H, G, and S)					Weight (Drive unit without hexagon cassette)	
	(in)	(mm)		(Ft.lbs)	(Nm)	(Ft.lbs)	(Nm)	A	B	C		D
1 1/16 - 2 3/8	30 - 60	2040	2766	W2000X	204	277	4.29	5.55	5.83	1.26	.79	3.04
1 5/16 - 3 3/8	36 - 85	4175	5661	W4000X	418	566	5.35	6.57	7.01	1.61	.79	4.44
1 7/8 - 4 1/8	50 - 105	8470	11,484	W8000X	847	1148	6.77	8.07	8.19	2.07	.98	6.59
2 7/16 - 4 5/8	65 - 115	15,330	20,785	W15000X	1533	2079	8.15	9.45	9.96	2.48	.79	10.72
2 15/16 - 5 3/8	75 - 135	22,500	30,506	W22000X	2250	3050	8.94	10.46	11.68	3.03	1.38	16.98
3 1/8 - 6 1/8	80-155	35,000	47,453	W35000X	3500	4745	10.54	11.94	13.60	3.57	1.98	26.40

* With in-line reaction foot.

** To order a W-series (X-Edition) wrench fitted with the TSP swivel, insert a "P" prior to the "X" in the tool designation. e.g., W2000PX.

W Series (X-Edition)



Nominal Torque at 10,000 psi:

35,000 Ft.lbs

Hexagon Range:

1 1/16 - 6 1/8 inch

Nose Radius:

1.22-4.52 inch

Maximum Operating Pressure:

10,000 psi



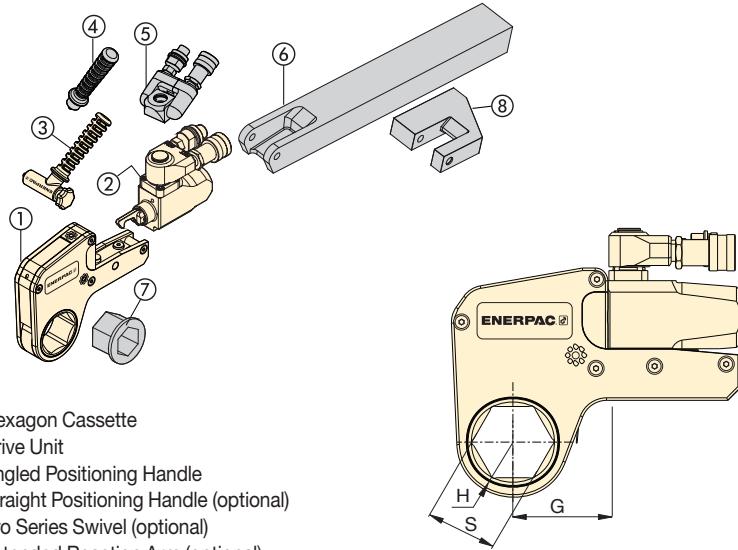
Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench and pump matrix.

Page: 24

▼ These rigid steel wrenches with low-profile interchangeable hexagon cassettes guarantee durability and maximum versatility in bolting applications.





- ① Hexagon Cassette
- ② Drive Unit
- ③ Angled Positioning Handle
- ④ Straight Positioning Handle (optional)
- ⑤ Pro Series Swivel (optional)
- ⑥ Extended Reaction Arm (optional)
- ⑦ Reducer Insert (optional)
- ⑧ Reaction Paddle (optional)

W Series (X-Edition)



Nominal Torque at 10,000 psi:
2040 Ft.lbs

Hexagon Range:
1¹/₁₆ - 2³/₈ inch

Maximum Operating Pressure:
10,000 psi



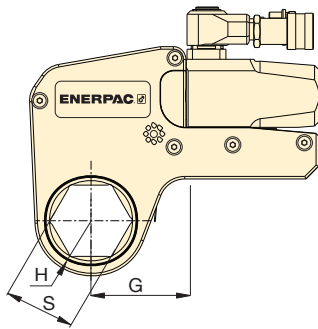
Metric Sizes

For metric sizes of hexagon cassettes and reducer inserts see:

▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius	Dim.	Model Number	Weight	Hexagon Reducer		Hexagon Reducer		Hexagon Reducer	
						Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
W2000X	S	H	G		(lbs)						
	(in)	(in)	(in)								
	1 ¹ / ₁₆	1.22	2.11	W2101X	4.19	-	-	-	-	-	-
	1 ¹ / ₈	1.22	2.11	W2102X	4.19	-	-	-	-	-	-
	1 ³ / ₁₆	1.22	2.11	W2103X	4.19	-	-	-	-	-	-
	1 ¹ / ₄	1.22	2.11	W2104X	4.19	-	-	-	-	-	-
	1 ⁵ / ₁₆	1.22	2.11	W2105X	4.48	-	-	-	-	-	-
	1 ³ / ₈	1.22	2.11	W2106X	4.43	-	-	-	-	-	-
	1 ⁷ / ₁₆	1.22	2.11	W2107X	4.37	1 ⁷ / ₁₆ - 1 ¹ / ₈	W2107R102	-	-	-	-
	1 ¹ / ₂	1.32	2.29	W2108X	4.51	-	-	-	-	-	-
	1 ⁹ / ₁₆	1.32	2.29	W2109X	4.44	-	-	-	-	-	-
	1 ⁵ / ₈	1.32	2.29	W2110X	4.38	1 ⁵ / ₈ - 1 ¹ / ₄	W2110R104	1 ⁵ / ₈ - 1 ³ / ₁₆	W2110R103	-	-
	1 ¹¹ / ₁₆	1.44	2.38	W2111X	4.63	-	-	-	-	-	-
	1 ³ / ₄	1.44	2.38	W2112X	4.57	-	-	-	-	-	-
	1 ¹³ / ₁₆	1.44	2.38	W2113X	4.46	1 ¹³ / ₁₆ - 1 ⁷ / ₁₆	W2113R107	1 ¹³ / ₁₆ - 1 ¹ / ₄	W2113R104	-	-
	1 ⁷ / ₈	1.54	2.48	W2114X	4.69	-	-	-	-	-	-
	1 ¹⁵ / ₁₆	1.54	2.48	W2115X	4.64	-	-	-	-	-	-
	2	1.54	2.48	W2200X	4.54	2 - 1 ⁵ / ₈	W2200R110	2 - 1 ⁷ / ₁₆	W2200R107	-	-
	2 ¹ / ₁₆	1.65	2.70	W2201X	4.83	-	-	-	-	-	-
	2 ¹ / ₈	1.65	2.70	W2202X	4.74	-	-	-	-	-	-
	2 ³ / ₁₆	1.65	2.70	W2203X	4.64	2 ³ / ₁₆ - 1 ¹³ / ₁₆	W2203R113	2 ³ / ₁₆ - 1 ⁵ / ₈	W2203R110	2 ³ / ₁₆ - 1 ⁷ / ₁₆	W2203R107
2 ¹ / ₄	1.75	2.55	W2204X	4.94	-	-	-	-	-	-	
2 ⁵ / ₁₆	1.75	2.55	W2205X	4.84	-	-	-	-	-	-	
2 ³ / ₈	1.75	2.55	W2206X	4.72	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 / ₈	W2206R110	

W4000X Series Imperial Cassettes & Reducer Inserts



Nominal Torque at 10,000 psi:

4175 Ft.lbs

Hexagon Range:

1⁵/₁₆-3³/₈ inch

Maximum Operating Pressure:

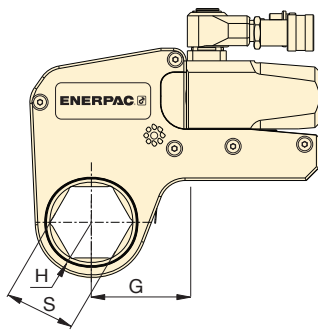
10,000 psi

W
Series
(X-Edition)



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius	Dim.	Model Number	Weight	Hexagon Reducer		Hexagon Reducer		Hexagon Reducer	
						Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
	S (in)	H (in)	G (in)		(lbs)						
W4000X	1 ⁵ / ₁₆	1.46	2.40	W4105X	8.15	-	-	-	-	-	-
	1 ³ / ₈	1.46	2.40	W4106X	8.15	-	-	-	-	-	-
	1 ⁷ / ₁₆	1.46	2.40	W4107X	8.15	-	-	-	-	-	-
	1 ¹ / ₂	1.46	2.40	W4108X	8.31	-	-	-	-	-	-
	1 ⁹ / ₁₆	1.46	2.40	W4109X	8.22	-	-	-	-	-	-
	1 ⁵ / ₈	1.46	2.40	W4110X	8.15	-	-	-	-	-	-
	1 ¹¹ / ₁₆	1.56	2.52	W4111X	8.43	-	-	-	-	-	-
	1 ³ / ₄	1.56	2.52	W4112X	8.35	-	-	-	-	-	-
	1 ¹³ / ₁₆	1.56	2.52	W4113X	8.25	-	-	-	-	-	-
	1 ⁷ / ₈	1.63	2.63	W4114X	8.45	-	-	-	-	-	-
	1 ¹⁵ / ₁₆	1.63	2.63	W4115X	8.39	-	-	-	-	-	-
	2	1.63	2.63	W4200X	8.28	2 - 1 ⁷ / ₁₆	W4200R107	-	-	-	-
	2 ¹ / ₁₆	1.73	2.89	W4201X	8.65	-	-	-	-	-	-
	2 ¹ / ₈	1.73	2.89	W4202X	8.53	-	-	-	-	-	-
	2 ³ / ₁₆	1.73	2.89	W4203X	8.42	2 ³ / ₁₆ - 1 ⁵ / ₈	W4203R110	2 ³ / ₁₆ - 1 ⁷ / ₁₆	W4203R107	2 ³ / ₁₆ - 1 ¹ / ₄	W4203R104
	2 ¹ / ₄	1.83	2.78	W4204X	8.73	-	-	-	-	-	-
	2 ⁵ / ₁₆	1.83	2.78	W4205X	8.61	-	-	-	-	-	-
	2 ³ / ₈	1.83	2.78	W4206X	8.47	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	1.95	3.00	W4207X	8.96	2 ⁷ / ₁₆ - 2	W4207R200	-	-	-	-
	2 ¹ / ₂	1.95	3.00	W4208X	8.86	2 ¹ / ₂ - 2	W4208R200	2 ¹ / ₂ - 1 ¹³ / ₁₆	W4208R113	2 ¹ / ₂ - 2 ¹ / ₁₆	W4208R201
	2 ⁹ / ₁₆	1.95	3.00	W4209X	8.67	2 ⁹ / ₁₆ - 2 ³ / ₁₆	W4209R203	2 ⁹ / ₁₆ - 2 ¹ / ₈	W4209R202	-	-
	-	-	-	-	-	2 ⁹ / ₁₆ - 2	W4209R200	2 ⁹ / ₁₆ - 1 ¹³ / ₁₆	W4209R113	-	-
	2 ⁵ / ₈	2.07	3.08	W4210X	9.14	-	-	-	-	-	-
	2 ¹¹ / ₁₆	2.07	3.08	W4211X	9.03	-	-	-	-	-	-
	2 ³ / ₄	2.07	3.08	W4212X	8.84	2 ³ / ₄ - 2 ³ / ₈	W4212R206	2 ³ / ₄ - 2 ³ / ₁₆	W4212R203	2 ³ / ₄ - 2 ¹ / ₈	W4212R202
	2 ¹³ / ₁₆	2.18	3.21	W4213X	9.32	-	-	-	-	-	-
	2 ⁷ / ₈	2.18	3.21	W4214X	9.17	-	-	-	-	-	-
	2 ¹⁵ / ₁₆	2.18	3.21	W4215X	8.96	2 ¹⁵ / ₁₆ - 2 ⁹ / ₁₆	W4215R209	2 ¹⁵ / ₁₆ - 2 ³ / ₈	W4215R206	2 ¹⁵ / ₁₆ - 2 ³ / ₁₆	W4215R203
	-	-	-	-	-	2 ¹⁵ / ₁₆ - 2	W4215R200	-	-	-	-
	3	2.30	3.29	W4300X	9.51	3 - 2 ³ / ₁₆	W4300R203	-	-	-	-
	3 ¹ / ₁₆	2.30	3.29	W4301X	9.42	-	-	-	-	-	-
	3 ¹ / ₈	2.30	3.29	W4302X	9.16	-	-	3 ¹ / ₈ - 2 ³ / ₄	W4302R212	3 ¹ / ₈ - 2 ⁹ / ₁₆	W4302R209
	-	-	-	-	-	3 ¹ / ₈ - 2 ³ / ₈	W4302R206	3 ¹ / ₈ - 2 ⁵ / ₁₆	W4302R205	3 ¹ / ₈ - 2 ¹ / ₄	W4302R204
	-	-	-	-	-	3 ¹ / ₈ - 2 ³ / ₁₆	W4302R203	3 ¹ / ₈ - 2 ¹ / ₈	W4302R202	3 ¹ / ₈ - 2	W4302R200
	3 ³ / ₁₆	2.44	3.37	W4303X	9.92	-	-	-	-	-	-
3 ¹ / ₄	2.44	3.37	W4304X	9.92	-	-	-	-	-	-	
3 ⁵ / ₁₆	2.44	3.37	W4305X	9.92	-	-	-	-	-	-	
3 ³ / ₈	2.44	3.37	W4306X	9.92	-	-	-	-	-	-	



Nominal Torque at 10,000 psi:

8470 Ft.lbs

Hexagon Range:

1 7/8 - 4 1/8 inch






Maximum Operating Pressure:

10,000 psi

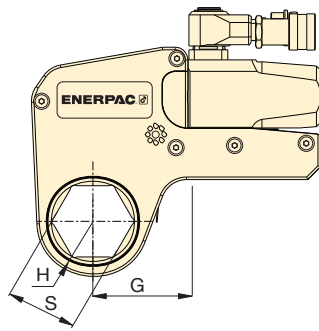
W
Series
(X-Edition)



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius	Dim.	Model Number	Weight						
						Hexagon Reducer	Model Number	Hexagon Reducer	Model Number	Hexagon Reducer	Model Number
	S (in)	H (in)	G (in)		(lbs)	(in)		(in)		(in)	
W8000X	1 7/8	1.77	3.08	W8114X	17.97	-	-	-	-	-	-
	1 15/16	1.77	3.08	W8115X	17.89	-	-	-	-	-	-
	2	1.77	3.08	W8200X	17.75	-	-	-	-	-	-
	2 1/16	1.89	3.15	W8201X	17.52	-	-	-	-	-	-
	2 1/8	1.89	3.15	W8202X	17.36	-	-	-	-	-	-
	2 3/16	1.89	3.15	W8203X	17.22	-	-	-	-	-	-
	2 1/4	2.01	3.25	W8204X	17.92	-	-	-	-	-	-
	2 5/16	2.01	3.25	W8205X	17.76	-	-	-	-	-	-
	2 3/8	2.01	3.25	W8206X	17.59	-	-	-	-	-	-
	2 7/16	2.07	3.38	W8207X	17.65	-	-	-	-	-	-
	2 1/2	2.07	3.38	W8208X	17.52	-	-	-	-	-	-
	2 9/16	2.07	3.38	W8209X	17.29	2 9/16 - 2	W8209R200	-	-	-	-
	2 5/8	2.20	3.34	W8210X	17.50	-	-	-	-	-	-
	2 11/16	2.20	3.34	W8211X	17.36	-	-	-	-	-	-
	2 3/4	2.20	3.34	W8212X	17.12	2 3/4 - 2 3/16	W8212R203	-	-	-	-
	2 13/16	2.28	3.35	W8213X	17.57	-	-	-	-	-	-
	2 7/8	2.28	3.35	W8214X	17.38	-	-	-	-	-	-
	2 15/16	2.28	3.35	W8215X	17.11	2 15/16 - 2 3/8	W8215R206	2 15/16 - 2 3/8	W8215R203	-	-
	3	2.38	3.52	W8300X	17.77	-	-	-	-	-	-
	3 1/16	2.38	3.52	W8301X	17.65	-	-	-	-	-	-
	3 1/8	2.38	3.52	W8302X	17.33	3 1/8 - 2 9/16	W8302R209	3 1/8 - 2 9/16	W8302R206	3 1/8 - 2 3/16	W8302R203
	-	-	-	-	-	-	3 1/8 - 2	W8302R200	-	-	-
	3 3/16	2.60	3.63	W8303X	18.99	-	-	-	-	-	-
	3 1/4	2.60	3.63	W8304X	18.72	-	-	-	-	-	-
	3 5/16	2.60	3.63	W8305X	18.54	-	-	-	-	-	-
	3 3/8	2.60	3.63	W8306X	18.36	-	-	-	-	-	-
	3 7/16	2.60	3.63	W8307IX	18.11	-	-	-	-	-	-
	3 1/2	2.60	3.63	W8308X	17.81	3 1/2 - 3	W8308R300	3 1/2 - 2 15/16	W8308R215	3 1/2 - 2 3/4	W8308R212
	3 9/16	2.91	4.05	W8309X	20.36	-	-	-	-	-	-
	3 5/8	2.91	4.05	W8310X	20.18	-	-	-	-	-	-
	3 11/16	2.91	4.05	W8311X	19.93	-	-	-	-	-	-
	3 3/4	2.91	4.05	W8312X	19.71	3 3/4 - 3 1/8	W8312R302	3 3/4 - 2 15/16	W8312R215	3 3/4 - 2 3/4	W8312R212
3 13/16	2.91	4.05	W8313X	19.46	-	-	-	-	-	-	
3 7/8	2.91	4.05	W8314X	19.10	3 7/8 - 3 1/8	W8314R302	3 7/8 - 2 15/16	W8314R215	-	-	
3 15/16	3.13	4.33	W8315X	20.31	-	-	-	-	-	-	
4	3.13	4.33	W8400X	20.04	-	-	-	-	-	-	
4 1/16	3.13	4.33	W8401IX	19.80	-	-	-	-	-	-	
4 1/8	3.13	4.33	W8402X	19.39	-	-	-	-	-	-	

W15000X Series Imperial Cassettes & Reducer Inserts



Nominal Torque at 10,000 psi:

15,330 Ft.lbs

Hexagon Range:

2⁷/₁₆-4⁵/₈ inch

Maximum Operating Pressure:

10,000 psi

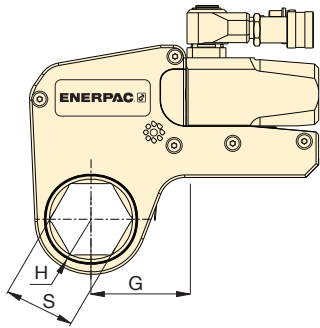
W
Series
(X-Edition)



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius		Dim. G	Model Number	Weight (lbs)	Hexagon Reducer		Hexagon Reducer		Hexagon Reducer	
		S (in)	H (in)				Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
W15000X	2 ⁷ / ₁₆	2.32	3.49		W15207X	30.72	-	-	-	-	-	-
	2 ¹ / ₂	2.32	3.49		W15208X	30.72	-	-	-	-	-	-
	2 ⁹ / ₁₆	2.32	3.49		W15209X	30.72	-	-	-	-	-	-
	2 ⁵ / ₈	2.32	3.49		W15210X	30.72	-	-	-	-	-	-
	2 ¹¹ / ₁₆	2.32	3.49		W15211X	30.72	-	-	-	-	-	-
	2 ³ / ₄	2.32	3.49		W15212X	30.72	-	-	-	-	-	-
	2 ¹³ / ₁₆	2.44	3.56		W15213X	30.62	-	-	-	-	-	-
	2 ⁷ / ₈	2.44	3.56		W15214X	30.39	-	-	-	-	-	-
	2 ¹⁵ / ₁₆	2.44	3.56		W15215X	30.08	-	-	-	-	-	-
	3	2.54	3.66		W15300X	30.86	3 - 2 ¹ / ₈	W15300R202	-	-	-	-
	3 ¹ / ₁₆	2.54	3.66		W15301X	30.71	-	-	-	-	-	-
	3 ¹ / ₈	2.54	3.66		W15302X	30.34	3 ¹ / ₈ - 2 ⁹ / ₁₆	W15302R209	-	-	-	-
	3 ³ / ₁₆	2.74	3.80		W15303X	32.38	-	-	-	-	-	-
	3 ¹ / ₄	2.74	3.80		W15304X	32.07	-	-	-	-	-	-
	3 ⁵ / ₁₆	2.74	3.80		W15305X	31.85	-	-	-	-	-	-
	3 ³ / ₈	2.74	3.80		W15306X	31.63	-	-	-	-	-	-
	3 ⁷ / ₁₆	2.74	3.80		W15307IX	31.32	-	-	-	-	-	-
	3 ¹ / ₂	2.74	3.80		W15308X	30.98	3 ¹ / ₂ - 2 ¹⁵ / ₁₆	W15308R215	3 ¹ / ₂ - 2 ³ / ₄	W15308R212	-	-
	3 ⁹ / ₁₆	2.95	4.01		W15309X	31.70	-	-	-	-	-	-
	3 ⁵ / ₈	2.95	4.01		W15310X	31.70	-	-	-	-	-	-
	3 ¹¹ / ₁₆	2.95	4.01		W15311X	31.70	-	-	-	-	-	-
	3 ³ / ₄	2.95	4.01		W15312X	31.70	3 ³ / ₄ - 3 ¹ / ₈	W15312R302	3 ³ / ₄ - 2 ¹⁵ / ₁₆	W15312R215	-	-
	3 ¹³ / ₁₆	2.95	4.01		W15313X	31.70	-	-	-	-	-	-
	3 ⁷ / ₈	2.95	4.01		W15314X	31.70	3 ⁷ / ₈ - 3 ¹ / ₈	W15314R302	3 ⁷ / ₈ - 2 ¹⁵ / ₁₆	W15314R215	-	-
	3 ¹⁵ / ₁₆	3.17	4.06		W15315X	34.02	-	-	-	-	-	-
	4	3.17	4.06		W15400X	33.70	-	-	-	-	-	-
	4 ¹ / ₁₆	3.17	4.06		W15401IX	33.41	-	-	-	-	-	-
	4 ¹ / ₈	3.17	4.06		W15402X	33.09	4 ¹ / ₈ - 3 ¹ / ₂	W15402R308	4 ¹ / ₈ - 3 ⁵ / ₁₆	W15402R305	4 ¹ / ₈ - 3 ¹ / ₄	W15402R304
	4 ³ / ₁₆	3.17	4.06		W15403IX	32.81	-	-	-	-	-	-
	4 ¹ / ₄	3.17	4.06		W15404X	32.29	4 ¹ / ₄ - 3 ¹ / ₂	W15404R308	4 ¹ / ₄ - 3 ¹ / ₈	W15404R302	-	-
	4 ⁵ / ₁₆	3.44	4.52		W15405X	35.61	-	-	-	-	-	-
	4 ³ / ₈	3.44	4.52		W15406X	35.32	-	-	-	-	-	-
4 ⁷ / ₁₆	3.44	4.52		W15407X	34.99	-	-	-	-	-	-	
4 ¹ / ₂	3.44	4.52		W15408IX	34.63	-	-	-	-	-	-	
4 ⁹ / ₁₆	3.44	4.52		W15409IX	34.28	-	-	-	-	-	-	
4 ⁵ / ₈	3.44	4.52		W15410IX	33.72	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	-	-	-	-	

W22000X Series Imperial Cassettes & Reducer Inserts



Nominal Torque at 10,000 psi:

22,500 Ft.lbs

Hexagon Range:

2¹⁵/₁₆ - 5³/₈ inch




Maximum Operating Pressure:

10,000 psi

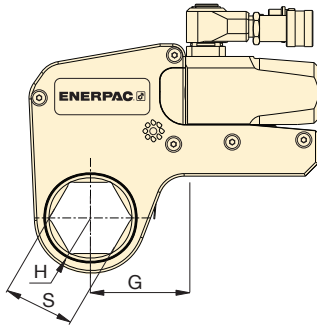
W
Series
(X-Edition)





▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius	Dim.	Model Number	Weight						
						Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
W22000X	2¹⁵/₁₆	2.64	4.02	W22215X	48.72	-	-	-	-	-	-
	3	2.64	4.02	W22300X	48.40	-	-	-	-	-	-
	3¹/₁₆	2.64	4.02	W22301X	48.22	-	-	-	-	-	-
	3¹/₈	2.64	4.02	W22302X	47.78	3 ¹ / ₈ - 2 ³ / ₈	W22302R206	3 ¹ / ₈ - 2 ³ / ₁₆	W22302R203	-	-
	3³/₁₆	2.85	4.23	W22303X	50.58	-	-	-	-	-	-
	3¹/₄	2.85	4.23	W22304X	50.19	-	-	-	-	-	-
	3⁵/₁₆	2.85	4.23	W22305X	49.92	-	-	-	-	-	-
	3³/₈	2.85	4.23	W22306X	49.66	-	-	-	-	-	-
	3⁷/₁₆	2.85	4.23	W22307X	50.29	-	-	-	-	-	-
	3¹/₂	2.85	4.23	W22308X	48.87	3 ¹ / ₂ - 2 ³ / ₄	W22308R212	3 ¹ / ₂ - 2 ⁹ / ₁₆	W22308R209	3 ¹ / ₂ - 2 ³ / ₈	W22308R206
	3⁹/₁₆	3.07	4.45	W22309X	51.58	-	-	-	-	-	-
	3⁵/₈	3.07	4.45	W22310X	51.30	-	-	-	-	-	-
	3¹¹/₁₆	3.07	4.45	W22311X	50.93	-	-	-	-	-	-
	3³/₄	3.07	4.45	W22312X	50.62	3 ³ / ₄ - 2 ¹⁵ / ₁₆	W22312R215	-	-	-	-
	3¹³/₁₆	3.07	4.45	W22313X	50.24	-	-	-	-	-	-
	3⁷/₈	3.07	4.45	W22314X	49.77	3 ⁷ / ₈ - 3 ¹ / ₈	W22314R302	3 ⁷ / ₈ - 2 ¹⁵ / ₁₆	W22314R215	3 ⁷ / ₈ - 2 ³ / ₄	W22314R212
	3¹⁵/₁₆	3.35	4.72	W22315X	53.57	-	-	-	-	-	-
	4	3.35	4.72	W22400X	53.19	-	-	-	-	-	-
	4¹/₁₆	3.35	4.72	W22401IX	52.82	-	-	-	-	-	-
	4¹/₈	3.35	4.72	W22402X	52.43	-	-	-	-	-	-
	4³/₁₆	3.35	4.72	W22403X	52.09	-	-	-	-	-	-
	4¹/₄	3.35	4.72	W22404X	51.48	4 ¹ / ₄ - 3 ¹ / ₂	W22404R308	4 ¹ / ₄ - 3 ¹ / ₈	W22404R302	4 ¹ / ₄ - 2 ¹⁵ / ₁₆	W22404R215
	4⁵/₁₆	3.54	4.92	W22405X	54.26	-	-	-	-	-	-
	4³/₈	3.54	4.92	W22406X	53.91	-	-	-	-	-	-
	4⁷/₁₆	3.54	4.92	W22407X	53.50	-	-	-	-	-	-
	4¹/₂	3.54	4.92	W22408IX	53.06	-	-	-	-	-	-
	4⁹/₁₆	3.54	4.92	W22409X	52.64	-	-	-	-	-	-
	4⁵/₈	3.54	4.92	W22410IX	51.99	4 ⁵ / ₈ - 3 ⁷ / ₈	W22410R314	4 ⁵ / ₈ - 3 ³ / ₄	W22410R312	4 ⁵ / ₈ - 3 ¹ / ₂	W22410R308
	4³/₄	3.74	5.12	W22412X	54.54	-	-	-	-	-	-
	4⁷/₈	3.74	5.12	W22414X	53.60	-	-	-	-	-	-
	5	3.74	5.12	W22500X	52.37	5 - 4 ¹ / ₄	W22500R404	5 - 4 ¹ / ₈	W22500R402	5 - 3 ⁷ / ₈	W22500R314
	5¹/₈	3.94	5.31	W22502X	55.10	-	-	-	-	-	-
5¹/₁₆	3.94	5.31	W22503X	54.71	-	-	-	-	-	-	
5¹/₄	3.94	5.31	W22504X	54.05	-	-	-	-	-	-	
5³/₈	3.94	5.31	W22506X	52.77	5 ³ / ₈ - 4 ⁵ / ₈	W22506R410	5 ³ / ₈ - 4 ¹ / ₄	W22506R404	5 ³ / ₈ - 4 ¹ / ₈	W22506R402	
-	-	-	W22506X	52.77	5 ³ / ₈ - 3 ⁷ / ₈	W22506R314	-	-	-	-	

W35000X Series Imperial Cassettes & Reducer Inserts



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius	Dim.	Model Number	Weight		
						Hexagon Reducer (in)	Model Number
W35000X	S (in)	H (in)	G (in)		(lbs)		
	3 ¹ / ₈	3.02	4.99	W35302X	72.30	3 ¹ / ₈ - 2	W35302R200
	3 ³ / ₁₆	3.02	4.99	W35303X	72.10	-	-
	3 ¹ / ₄	3.02	4.99	W35304X	71.70	-	-
	3 ⁵ / ₁₆	3.02	4.99	W35305X	71.40	-	-
	3 ³ / ₈	3.02	4.99	W35306X	71.00	-	-
	3 ⁷ / ₁₆	3.02	4.99	W35307IX	70.50	-	-
	3 ¹ / ₂	3.02	4.99	W35308X	70.10	3 ¹ / ₂ - 2 ⁵ / ₁₆	W35308R205
	3 ⁹ / ₁₆	3.23	5.22	W35309X	71.40	-	-
	3 ⁵ / ₈	3.23	5.22	W35310X	73.40	-	-
	3 ¹¹ / ₁₆	3.23	5.22	W35311X	73.00	-	-
	3 ³ / ₄	3.23	5.22	W35312X	72.50	-	-
	3 ¹³ / ₁₆	3.23	5.22	W35313X	72.10	-	-
	3 ⁷ / ₈	3.23	5.22	W35314X	71.40	3 ⁷ / ₈ - 2 ¹¹ / ₁₆	W35314R211
	3 ¹⁵ / ₁₆	3.45	5.39	W35315X	70.80	3 ¹⁵ / ₁₆ - 2 ¹³ / ₁₆	W35315R213
	4	3.45	5.39	W35400X	74.70	-	-
	4 ¹ / ₁₆	3.45	5.39	W35401X	74.30	-	-
	4 ¹ / ₈	3.45	5.39	W35402X	73.90	-	-
	4 ³ / ₁₆	3.45	5.39	W35403X	73.40	-	-
	4 ¹ / ₄	3.45	5.39	W35404X	72.80	4 ¹ / ₄ - 3 ¹³ / ₁₆	W35404R301
	4 ⁵ / ₁₆	3.69	5.63	W35405X	76.90	-	-
	4 ³ / ₈	3.69	5.63	W35406X	76.50	-	-
	4 ⁷ / ₁₆	3.69	5.63	W35407X	76.10	-	-
	4 ¹ / ₂	3.69	5.63	W35408X	75.60	-	-
	4 ⁹ / ₁₆	3.69	5.63	W35409IX	75.20	-	-
	4 ⁵ / ₈	3.69	5.63	W35410IX	74.50	4 ⁵ / ₈ - 3 ⁵ / ₈	W35410R310
	4 ³ / ₄	3.91	5.85	W35412X	78.50	4 ³ / ₄ - 3 ³ / ₄	W35412R312
	4 ⁷ / ₈	3.91	5.85	W35414X	76.90	-	-
	5	3.91	5.85	W35500X	75.60	5 - 4	W35500R400
	5 ¹ / ₈	4.09	6.02	W35502X	78.90	5 ¹ / ₈ - 4 ¹ / ₈	W35502R402
	5 ³ / ₁₆	4.09	6.02	W35503X	78.50	-	-
	5 ¹ / ₄	4.09	6.02	W35504X	77.60	-	-
5 ³ / ₈	4.09	6.02	W35506X	76.30	5 ³ / ₈ - 4 ⁵ / ₁₆	W35506R405	
5 ¹ / ₂	4.31	6.24	W35508X	79.80	-	-	
5 ⁹ / ₁₆	4.31	6.24	W35509X	79.40	-	-	
5 ⁵ / ₈	4.31	6.24	W35510X	78.50	-	-	
5 ³ / ₄	4.31	6.24	W35512X	76.90	5 ³ / ₄ - 4 ³ / ₄	W35512R412	
5 ⁷ / ₈	4.52	6.46	W35514X	80.90	5 ⁷ / ₈ - 4 ⁷ / ₈	W35514R414	
6	4.52	6.46	W35600X	79.60	-	-	
6 ¹ / ₈	4.52	6.46	W35602X	77.80	6 ¹ / ₈ - 5 ¹ / ₈	W35602R502	

W Series (X-Edition)



Nominal Torque at 10,000 psi:

35,000 Ft.lbs

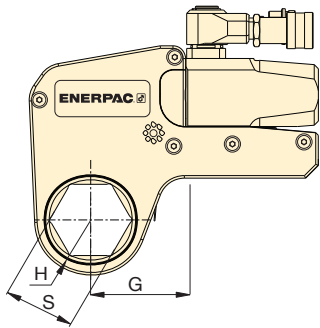
Hexagon Range:

3¹/₈-6¹/₈ inches

Maximum Operating Pressure:

10,000 psi

W-Series Metric Cassettes and Reducer Inserts








Hexagon Range:
30-105 mm

Maximum Operating Pressure:
10,000 psi (690 bar)

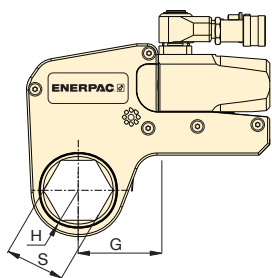
W
Series
(X-Edition)



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius	Dim.	Model Number	Wt.							
						Hexagon Reducer	Model Number	Hexagon Reducer	Model Number	Hexagon Reducer	Model Number	
	S (mm)	H (in)	G (in)		(lbs)	(mm)		(mm)		(mm)		
W2000X	30	1.22	2.11	W2103X	4.19	-	-	-	-	-	-	
	32	1.22	2.11	W2104X	4.19	-	-	-	-	-	-	
	36	1.22	2.11	W2107X	4.19	-	-	-	-	-	-	
	38	1.32	2.29	W2108X	4.51	-	-	-	-	-	-	
	41	1.32	2.29	W2110X	4.38	41 - 32	W2110R104	41 - 30	W2110R103	41 - 24	W2110R024M	
	46	1.44	2.38	W2113X	4.69	46 - 36	W2113R107	46 - 32	W2113R104	-	-	
	50	1.54	2.48	W2200X	4.54	50 - 41	W2200R110	50 - 36	W2200R107	-	-	
	55	1.65	2.70	W2203X	4.64	55 - 46	W2203R113	55 - 41	W2203R110	55 - 36	W2203R107	
	60	1.75	2.55	W2206X	4.72	60 - 50	W2206R200	60 - 46	W2206R113	60 - 41	W2206R110	
-	-	-	-	-	-	60 - 36	W2206R107	-	-	-	-	
W4000X	36	1.46	2.40	W4107X	7.72	-	-	-	-	-	-	
	41	1.46	2.40	W4110X	7.72	-	-	-	-	-	-	
	46	1.56	2.52	W4113X	7.94	-	-	-	-	-	-	
	50	1.63	2.63	W4200X	8.28	50 - 36	W4200R107	-	-	-	-	
	55	1.73	2.89	W4203X	8.42	55 - 41	W4203R110	55 - 36	W4203R107	55 - 32	W4203R104	
	60	1.83	2.78	W4206X	8.47	60 - 50	W4206R200	60 - 46	W4206R113	60 - 36	W4206R107	
	65	1.95	3.00	W4209X	8.67	65 - 55	W4209R203	65 - 50	W4209R200	65 - 46	W4209R113	
	70	2.07	3.08	W4212X	8.84	70 - 60	W4212R206	70 - 55	W4212R203	-	-	
	75	2.18	3.21	W4215X	8.96	75 - 65	W4215R209	75 - 60	W4215R206	-	-	
	-	-	-	-	-	-	75 - 55	W4215R203	75 - 50	W4215R200	-	-
	80	2.30	3.29	W4302X	9.16	80 - 75	W4302R215	80 - 70	W4302R212	80 - 65	W4302R209	
	-	-	-	-	-	-	80 - 55	W4302R203	80 - 50	W4302R200	-	-
W8000X	50	1.77	3.08	W8200X	17.75	-	-	-	-	-	-	
	55	1.89	3.15	W8203X	17.22	-	-	-	-	-	-	
	60	2.01	3.25	W8206X	17.59	-	-	-	-	-	-	
	65	2.07	3.38	W8209X	17.29	65 - 50	W8209R200	-	-	-	-	
	70	2.07	3.34	W8212X	17.12	70 - 55	W8212R203	-	-	-	-	
	75	2.28	3.35	W8215X	17.11	75 - 60	W8215R206	75 - 55	W8215R203	-	-	
	80	2.38	3.52	W8302X	17.33	80 - 65	W8302R209	80 - 60	W8302R206	80 - 55	W8302R203	
	-	-	-	-	-	-	80 - 50	W8302R200	-	-	-	
	85	2.60	3.63	W8085MX	18.42	85 - 70	W8085R070M	85 - 65	W8085R065M	85 - 60	W8085R060M	
	-	-	-	-	-	-	85 - 55	W8085R055M	-	-	-	
	90	2.91	4.05	W8090MX	20.46	90 - 75	W8090R075M	-	-	-	-	
	95	2.91	4.05	W8312X	19.71	95 - 80	W8312R302	95 - 75	W8312R215	-	-	
	100	3.13	4.33	W8315X	20.31	-	-	-	-	-	-	
105	3.13	4.33	W8402X	19.39	-	-	-	-	-	-		

W-Series Metric Cassettes and Reducer Inserts



Hexagon Range:

65-155 mm

Maximum Operating Pressure:

10,000 psi (690 bar)

W
Series
(X-Edition)



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius	Dim.	Model Number	Wt.	Hexagon Reducer		Hexagon Reducer	
						Hexagon Reducer (mm)	Model Number	Hexagon Reducer (mm)	Model Number
	S (mm)	H (in)	G (in)		(lbs)				
W15000X	65	2.32	3.49	W15209X	30.72	-	-	-	-
	70	2.32	3.49	W15212X	30.72	-	-	-	-
	75	2.44	3.56	W15215X	30.08	-	-	-	-
	80	2.54	3.66	W15302X	30.34	80-65	W15302R209	-	-
	85	2.74	3.80	W15085MX	31.70	85-70	W15085R070M	-	-
	90	2.95	4.01	W15090MX	33.32	90-75	W15090R075M	-	-
	95	2.95	4.01	W15312X	31.70	95-80	W15312R302	95 - 75	W15312R215
	100	3.17	4.06	W15315X	34.02	-	-	-	-
	105	3.17	4.06	W15402X	33.09	105-90	W15402R090M	-	-
	110	3.44	4.52	W15405X	35.61	110-95	W15110R095M	-	-
	115	3.44	4.52	W15115MX	34.48	115-100	W15115R100M	-	-
W22000X	75	2.64	4.02	W22215X	48.72	-	-	-	-
	80	2.64	4.02	W22302X	47.78	80-60	W22302R206	80 - 55	W22302R203
	85	2.85	4.23	W22085MX	49.74	85-65	W22085MR209	85 - 60	W22085MR206
	90	3.07	4.45	W22090MX	51.72	90-70	W22090M212	90 - 60	W22090MR206
	95	3.07	4.45	W22312X	50.62	95-75	W22312R215	-	-
	100	3.35	4.72	W22315X	53.57	-	-	-	-
	105	3.35	4.72	W22402X	52.09	-	-	-	-
	110	3.54	4.92	W22404X	51.48	-	-	-	-
	115	3.54	4.92	W22115MX	52.88	-	-	-	-
	120	3.74	5.12	W22412X	54.54	-	-	-	-
	123	3.74	5.12	W22123MX	53.80	-	-	-	-
	130	3.94	5.31	W22502X	55.10	-	-	-	-
	135	3.94	5.31	W22506X	52.77	135 - 105	W22506R402	-	-
W35000X	80	3.02	5.08	W35302X	72.30	80-50	W35302R200	-	-
	85	3.02	5.08	W35085MX	33.10	-	-	-	-
	90	3.23	5.33	W35090MX	34.30	90-60	W35090R206	-	-
	95	3.23	5.30	W35312X	72.50	-	-	-	-
	100	3.45	5.48	W35315X	70.80	-	-	-	-
	105	3.45	5.48	W35402X	73.90	-	-	-	-
	110	3.69	5.75	W35405X	76.90	110-85	W35405R085M	-	-
	115	3.69	5.75	W35115MX	77.10	-	-	-	-
	120	3.91	6.01	W35412X	78.50	120-95	W35412R312	-	-
	123	3.91	6.01	W35123MX	78.90	-	-	-	-
	130	4.09	6.30	W35502X	78.90	130-105	W35502R402	-	-
	135	4.09	6.30	W35506X	76.30	135-110	W35506R405	-	-
	140	4.31	6.43	W35508X	79.80	140-115	W35508R115M	-	-
	145	4.31	6.43	W35512X	76.90	145-120	W35512R412	-	-
	150	4.52	6.67	W35514X	80.90	-	-	-	-
	151	4.52	6.67	W35151MX	82.10	-	-	-	-
	155	4.52	6.67	W35602X	77.80	155-130	W35602R502	-	-

▼ Shown: W4206SL stepped-width cassette with W4000X drive unit



Your easy and long-lasting solution to difficult-access bolting applications



Designed for Tight Spots

Stepped width design provides easy access in confined areas. UltraSlim cassettes fit where standard solutions won't.



Built to Outperform

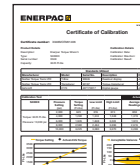
High endurance components keep working when others fail.



Top Mounted Handles

Standard top mounted handles provide safety and versatility; optional angled handles are also available.

Replacement handle (straight)	SWH6S
Angled handle (optional)	SWH6A



Calibration Certificate

All UltraSlim Series cassettes are CE - ATEX declared, factory calibrated and are shipped complete with a calibration certificate.

CE  II 2 GD ck T4
CSA/SIRA 15XT072

Versatility

- Lean, stepped width design allows tool to be mounted over bolts where other tools won't fit
- Bi-Hexagonal cassette allows twice as many positioning points on nut or bolt
- Uses same drive unit as standard W-series hexagon cassettes
- Robust top mounted handle stays out of the way, providing safe fastening in hard to reach areas

Performance

- Premium components provide best-in-class endurance

Ease of Use

- Few moving parts are easily accessible for quick field maintenance
- Fast release drive unit enables rapid exchange of cassettes, no tools required and no pins to lose
- Uses same drive unit as standard and X-Edition cassettes

Accuracy

- Constant torque output provides accuracy of +/- 3% across the full stroke

Slim enough to fit and tough enough to last. This UltraSlim wrench is the perfect controlled bolting solution for this oil and gas flange.



UltraSlim Stepped-Width Cassettes



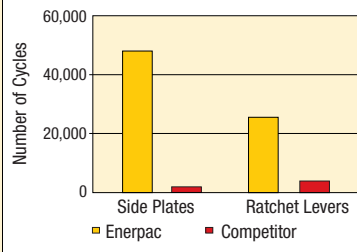
UltraSlim Stepped-Width Cassettes

Accessing narrow spaces normally requires

significantly reducing the width of the torque wrench. For the tool operator, this has always meant vastly reduced tool durability, and/or reduced torque output.

By using the highest-grade materials, perfecting the geometry, and placing the positioning handle on top of the tool, Enerpac UltraSlim cassettes are able to provide greater torque, get into tighter spaces, and vastly outperform the competition in product durability.*

Durability of Key Components*



*Average test results, whereby three Enerpac 1³/₁₆" UltraSlim cassettes and three competitor 1³/₁₆" cassettes were tested at 4000 ft-lbs for 50,000 cycles. The Enerpac side plates never broke for the full duration of the test.

W Series Ultra-Slim



Nominal Torque at 10,000 psi:

4360 Ft.lbs.

Hexagon Range:

1¹³/₁₆ - 2¹⁵/₁₆ inches

Maximum Operating Pressure:

10,000 psi



Torque Wrench Pumps

Visit enerpac.com for system matched air and electric torque wrench pumps that are ideal for use with hydraulic torque wrenches.

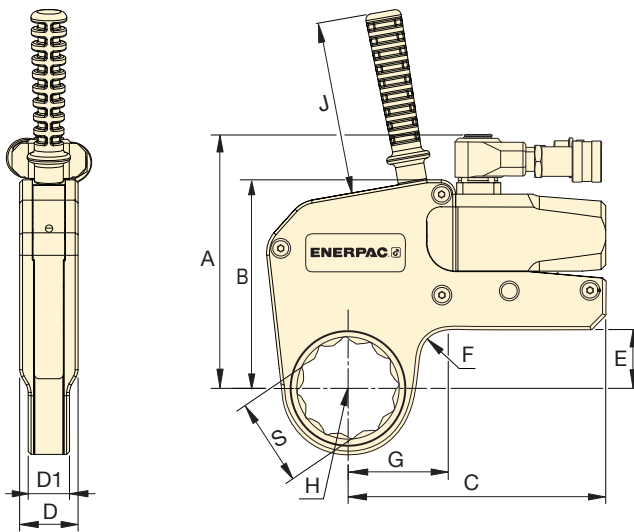
Page: 24




Torque Wrench Hoses

Use Enerpac THQ-700 Series hoses with W-Series torque wrenches to ensure the integrity of your hydraulic system.

19.5 feet long, 2 hoses	THQ-706T
39 feet long, 2 hoses	THQ-712T



▼ SELECTION CHART

Hexagon Size	Nominal Torque @ 10,000 psi	Cassette Model Number	Minimum Torque @ 1000 psi	Nose Radius	Dimensions (in)									Weight (lbs)	Drive Unit Model* (sold separately)	
					G	A	B	C	D	D1	E	F (radius)	J			
S (in)	(Ft.lbs)		(Ft.lbs)	H (in)												
1 ¹³ / ₁₆	1980	W2113SL	200	1.44	2.35										4.87	W2000X
2 ⁹ / ₁₆	1980	W2203SL	200	1.63	2.49	5.54	4.30	5.81	1.28	1.00	0.94	0.79	4.72	4.87		
2 ³ / ₈	1980	W2206SL	200	1.75	2.56									4.88		
2 ⁹ / ₁₆	4360	W4203SL	430	1.73	2.70									10.15	W4000X	
2 ³ / ₈	4360	W4206SL	430	1.89	2.82									10.36		
2 ⁹ / ₁₆	4360	W4209SL	430	1.99	2.92	6.91	5.69	7.03	1.59	1.13	1.61	0.79	4.72	10.37		
2 ³ / ₄	4360	W4212SL	430	2.11	2.98									10.42		
2 ¹⁵ / ₁₆	4360	W4215SL	430	2.20	2.99									10.37		

* May also be used with **W2000PX** and **W4000PX** drive units, featuring double-swivel manifolds.

▼ WCR4000 Roller Cassette with Spanner and W4000 Drive Unit



WCR Series

Bi-Hexagonal Spanner Size:

1⁷/₁₆-3¹/₈ inch

Spanner Nose Radius:

1.22-2.18 inch

Nominal Torque:

4250 Ft-lbs

Maximum Operating Pressure:

10,000 psi



WCR4000 Torque Wrench

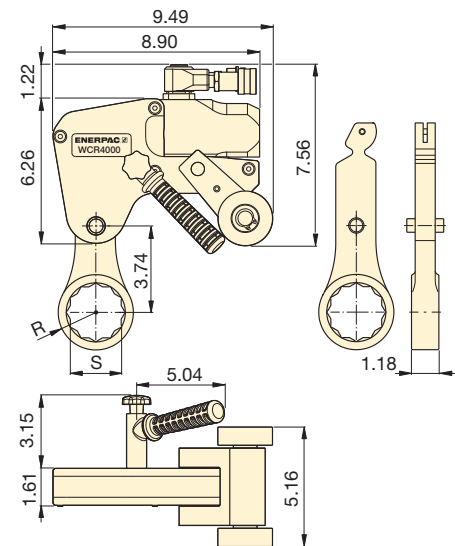
The **WCR4000** combines power and durability with a slim spanner design to provide bolting professionals with one of the most versatile and high performing limited access tools on the market today.

The tool was designed for use in narrow access applications, particularly in the height above the nut, and between the bolt center, and the inside of the joint.

Ideal for bolting API flanges, the **WCR4000** is available with a wide range of ring type spanners, and is powered by the standard W4000X drive unit.

- 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 1⁷/₁₆ - 3¹/₈ inches (36 - 80 mm)
- Includes handle to improve tool handling and safety
- Rigid solid steel body for maximum endurance and minimum downtime

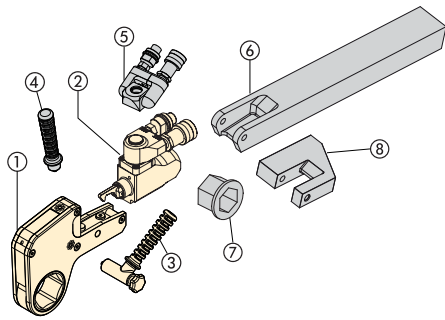
Closed Spanner Hexagon Size		Closed Spanner Model Number	Spanner Radius R (in)	Weight * (lb)	Roller Cassette Assy Model No.**	Drive Unit Model No.
S (in)	S (mm)					
1 ⁷ / ₁₆	36	W4107CS	1.22	4.2	WCR4000	W4000X
1 ¹ / ₂	38	W4108CS	1.29	4.4		
1 ⁵ / ₈	41	W4110CS	1.29	4.2		
1 ¹³ / ₁₆	46	W4113CS	1.40	4.3		
1 ⁷ / ₈	48	W4114CS	1.51	4.7		
2	50	W4200CS	1.51	4.2		
2 ⁹ / ₁₆	55	W4203CS	1.62	4.3		
2 ³ / ₈	60	W4206CS	1.77	4.6		
2 ⁹ / ₁₆	65	W4209CS	1.84	4.6		
2 ³ / ₄	70	W4212CS	1.95	4.7		
2 ¹⁵ / ₁₆	75	W4215CS	2.05	4.6		
3 ¹ / ₈	80	W4302CS	2.18	4.9		



*For total weight add 13.89 lbs for WCR4000, 4.40 lbs. for W4000X and weight of the spanner.

** The WCR4000 cassettes, spanners and drive units are all sold separately.

Accessories for W-Series, X-Edition Torque Wrenches

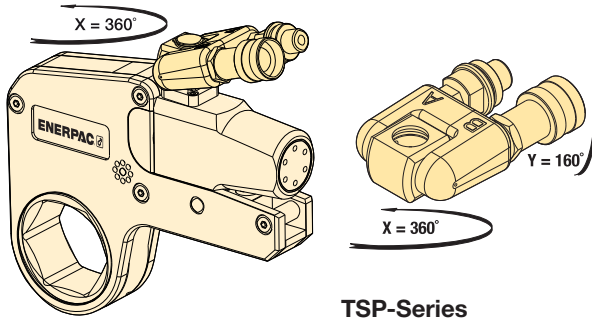


- ① Hexagon Cassette
- ② Drive Unit
- ③ Angled Positioning Handle
- ④ Straight Positioning Handle (optional)
- ⑤ Pro Series Swivel (optional)
- ⑥ Extended Reaction Arm (optional)
- ⑦ Reducer Insert (optional)
- ⑧ Reaction Paddle (optional)

**TSP
WTE
WRP
Series**



TSP-Series, Pro Series Swivels

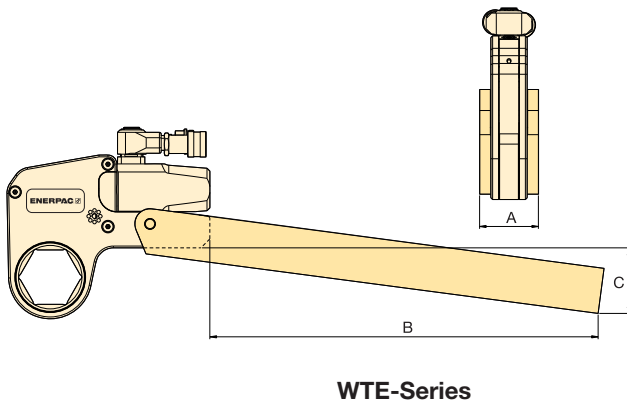


- Robust interlocking design
- 360° X-axis and 160° Y-axis rotation
- Increases tool fit in restricted access areas
- Simplifies hose placement
- Includes male and female couplers

Torque Wrench Model Number	Model Number	Maximum Pressure (psi)	Wt. (lbs)
W2000X, W4000X, W8000X, W15000X, W22000X, W35000X	TSP300*	10,000	.44

Note: To order a W-series (X-Edition) wrench fitted with the TSP swivel, insert a "P" prior to the "X" in the tool designation, e.g., W2000PX.
* TSP300 is designed for X-Edition tools only, and is not compatible with standard edition tools. For replacement components for existing tools, refer to repair sheet on www.enerpac.com

WTE-Series, Extended Reaction Arm

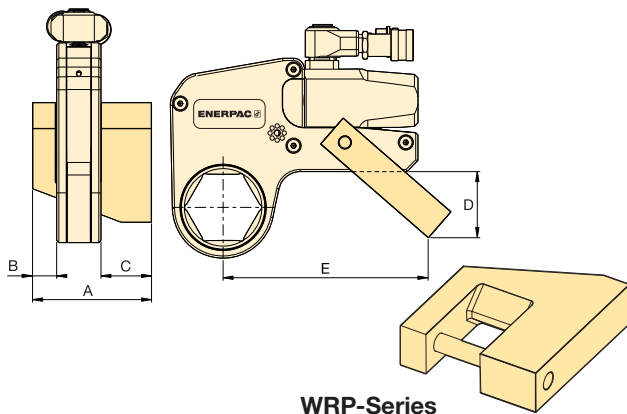


- Full torque rated
- Increases tool fit in restricted access areas

Torque Wrench Model Number	Model Number	Dimensions (in)			Wt.* (lbs)
		A	B	C	
W2000X	WTE20	2.20	15.67	2.66	5.73
W4000X	WTE40	2.60	17.17	2.91	10.14
W8000X	WTE80	3.35	17.68	2.15	16.76
W15000X	WTE150	4.02	19.61	2.83	26.46
W22000X	WTE220	4.49	20.51	3.03	38.14
W35000X	WTE350	5.00	16.48	5.23	39.24

* Weights indicated are for the accessories only and do not include the wrench.

WRP-Series Reaction Paddles






















- Lightweight interchangeable design
- Allows for offset reaction when in-line reaction is not available

Torque Wrench Model Number	Model Number	Dimensions (in)					Wt.* (lbs)
		A	B	C	D	E	
W2000X	WRP20	3.31	0.63	1.40	1.77	5.83	.88
W4000X	WRP40	4.29	0.83	1.87	2.32	7.48	1.76
W8000X	WRP80	5.37	1.02	2.25	2.72	8.78	4.41
W15000X	WRP150	6.50	1.26	2.74	3.43	10.12	8.60
W22000X	WRP220	8.15	1.52	3.58	5.28	12.48	15.87
W35000X	WRP350	9.22	1.79	3.58	7.17	13.98	23.37

* Weights indicated are for the accessories only and do not include the wrench.

Optimum Torque Wrench and Pump Combinations

For optimum speed and performance Enerpac recommends the following system set-up with wrench-pump-hose combinations.

		ELECTRIC PUMPS				AIR DRIVEN PUMP
		PMU-Series	ZU4-Series	TQ-700-Series	ZE4/5-Series	ZA4-Series
						
		Page: 25	Page: 28	Page: 26	Page: 32	Page: 34
Speed:						
Oil Capacity:	.5 - 1 Gal.	1 - 1.75 Gal.	1 Gal.	1-10 Gal.	1 - 1.75 Gal.	
Duty Cycle:	Standard duty	Standard duty	Medium duty	Heavy duty	Heavy duty	
Weight:						
Field/Factory Work:	Field	Field	Field/Factory	Factory	Field	
S-Series  4	S1500X	Optimal	Optimal	Optimal	Optimal	Optimal
	S3000X					
	S6000X					
	S11000X			-		
	S25000X			Acceptable		
W-Series  10	W2000X	Optimal	Optimal	Optimal	Optimal	Optimal
	W4000X					
	W8000X					
	W15000X					
	W22000X	-		Acceptable		
	W35000X					



ZU4 Electric Torque Wrench Pump

Utilizing a universal motor, the ZU4-Series has excellent low voltage characteristics. It works well with long extension cords or generator driven electrical power supplies. A field proven, efficient design ensures this pump is dependable and will draw less current—lowering your operating cost. The pumps are available in Pro and Classic formats.

ZU4 Pro pumps have an LCD feature to display torque or pressure, selectable torque wrench, and self-diagnostics – premium features not available on any other pump.

ZU4 Classic pumps feature an analogue gauge and a basic electrical package to deliver durable, safe and efficient hydraulic power.

ZE-Series Electric Torque Wrench Pump

The ZE-Series features premium options, such as the LCD to display torque or pressure values, and self-diagnostics. These pumps utilize an induction motor, making the ZE-Series the coolest and quietest pumps in their class.

ZA-Series Air Driven Torque Wrench Pump

Utilizing the highly efficient design of the Z-Class pumping element, this air driven pump is best suited to power medium to large size torque wrenches

TQ-700 Series Electric Torque Wrench Pump

Designed for both portability and production, the TQ-700 features optimized flow technology to deliver superior bolting speed.



Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000-psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

For S & W (10,000 psi)	
19.5' long, 2 hoses	THQ-706T
39' long, 2 hoses	THQ-712T
For SQD & HXD (11,600 psi)	
19.5' long, 2 hoses	THC-7062
39' long, 2 hoses	THC-7122

Portable Electric Torque Wrench Pumps

▼ Shown: PMU-10427



- Powerful two-speed pump is lightweight and easy to carry
- Standard heat exchanger package keeps pump cool under extreme use
- Glycerin filled gauge with scales reading in psi and bar
- Transparent overlays in Ft.lbs and Nm for all Enerpac torque wrenches provide a quick torque reference
- Universal motor for a high power-to-weight ratio; generates full pressure on as little as 50% of the rated line voltage
- Adjustable pressure relief valve for accurate torque adjustments and precise repeatability

PMU/PME Series

Reservoir Capacity:

0.5-1 gal.

Flow at 10,000 psi:

20 in³/min.

Motor Size:

0.5 hp

Maximum Operating Pressure:

10,000 and 11,600 psi



Pump Ratings

-Q suffix pumps are for 10,000-psi torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with 11,600 psi rated torque wrenches, and include polarized lock-ring safety couplers.

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Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000-psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

10,000 psi	
19.5 feet long, 2 hoses	THQ-706T
39 feet long, 2 hoses	THQ-712T
11,600 psi	
19.5 feet long, 2 hoses	THC-7062
39 feet long, 2 hoses	THC-7122

▼ SELECTION CHART

For Use With Torque Wrenches		Maximum Pressure Rating (psi)		Oil Flow Rate (in ³ /min)		Model Number*	Useable Oil Capacity (gal)	Electric Motor	Dimensions L x W x H (in)	Weight (lbs)
		1 st stage	2 nd stage	1 st stage	2 nd stage					
S1500X S3000X	W2000X W4000X	700	10,000	200	20	PMU-10427-Q	.50	115V- 1 ph -50/60Hz	17 x 11 x 15	46
		700	10,000	200	20	PMU-10447-Q	1.0	115V- 1 ph -50/60Hz	17 x 13 x 15	53
		700	10,000	200	20	PMU-10422-Q	.50	230V- 1 ph -50/60Hz	17 x 11 x 15	46
		700	10,000	200	20	PMU-10442-Q	1.0	230V- 1 ph -50/60Hz	17 x 13 x 15	53
SQD-25-I SQD-50-I	HXD-30 HXD-60	700	11,600	200	20	PMU-10427	.50	115V- 1 ph -50/60Hz	17 x 11 x 15	46
		700	11,600	200	20	PMU-10447	1.0	115V- 1 ph -50/60Hz	17 x 13 x 15	53
		700	11,600	200	20	PMU-10422	.50	230V- 1 ph -50/60Hz	17 x 11 x 15	46
		700	11,600	200	20	PMU-10442	1.0	230V- 1 ph -50/60Hz	17 x 13 x 15	53

* For pump without heat exchanger change PMU into PME. Example: PME-10442-Q.
PME-Series pump size 10 x 10 x 14 inches. Weight 37.5 lbs. (.50 gallon) and 44 lbs (1 gallon).

▼ Shown: TQ-700E



- Three-stage pump design delivers optimized flow rates and enables up to 50% faster bolting than competing pumps
- Compact and lightweight design fits through tight openings and provides easy handling
- Built-in protection for controls, gauge, and pendant for job-site durability
- IP55 rating for superior dust and water protection
- Advanced brushless motor provides for quiet, continuous operation, high voltage tolerance, and low maintenance
- Heat exchanger prevents breakdown of oil during heavy usage in hot environments
- Simple pressure setting and convenient pendant control for hassle-free operation

▼ The TQ-700E and the W-Series wrenches are a productive combination in wind applications.



Lightweight Electric Torque Wrench Pump



Optimized for S- and W-Series Hydraulic Torque Wrenches

Enerpac offers a complete range of square drive and hexagon cassette torque wrenches.

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Pendant Control

The TQ-700 comes equipped with a 20-foot pendant cord that allows the user to pressurize the pump from a distance increasing productivity and speed of setup.



Four-Port Manifold

The TQ-700 Classic offers an optional four wrench manifold as an accessory (TQM) factory installed. (Add suffix "M" at the end of the model number. For example: **TQ700EM**)



Twin Torque Wrench Hoses

Use Enerpac **THQ-700** series twin hoses with 10,000-psi pumps.

10,000 psi

19.5 feet long, 2 hoses	THQ-706T
39 feet long, 2 hoses	THQ-712T



Gauge Overlay Kit

Gauge overlay kits are also available separately.

GT-4015-Q includes overlays for all S- and W-Series Torque Wrenches.

GT-4015 includes overlays for all SQD and HXD torque wrenches.

Electric Torque Wrench Pump



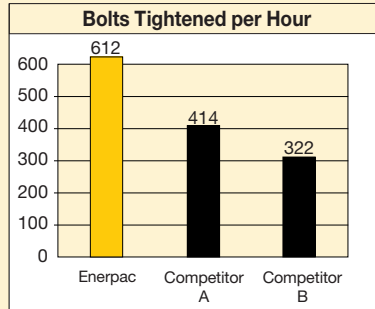
TQ-700 Series Pump Applications

The TQ-700 Series pump is ideal for powering hydraulic wrenches for the Power Generation and Wind Markets.

The TQ-700 has been engineered with **Optimized Flow Technology** to deliver up to 50% faster bolt tightening than competing pumps.

Bolting speed is more complex than how much flow per minute the pump produces. The key is optimizing 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:
1 gallon

Motor Size:
1.0 hp

Maximum Operating Pressure:
10,000 psi

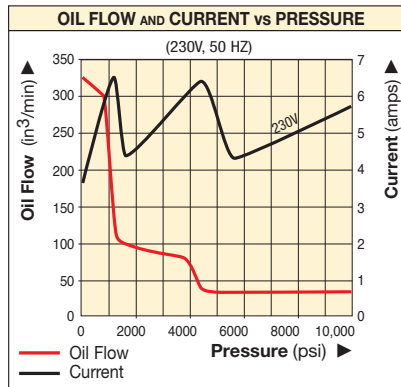
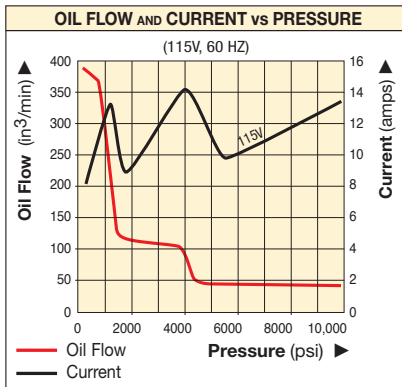


IP55 Rating for Superior Dust and Water Protection

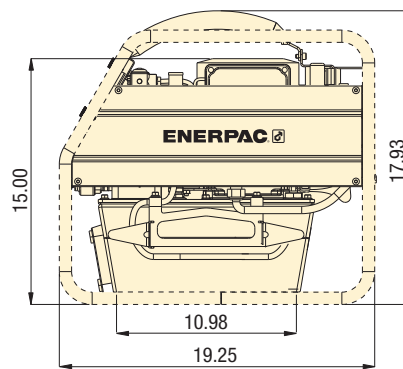
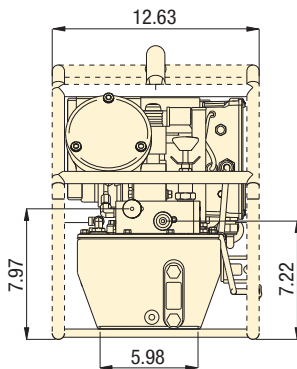
The IP Code (or Ingress Protection Rating) classifies and rates the degrees of protection provided against the intrusion of solid objects and water in mechanical casings and electrical enclosures.

An IP55 rating means the TQ-700 offers complete protection against contact with mechanical and electrical components, and that dust will not enter in a sufficient quantity to interfere with the operation of the equipment.

The IP55 rating also means water jets sprayed against the TQ-700 from any direction will not have any harmful effects.



Dimensions shown in inches.



Performance	For Use with Torque Wrenches		Pressure Rating (psi)	Model Number ¹⁾	Usable Oil Capacity (gal)	Motor Electrical Specification	Sound Level (dBA)	Weight (no oil) (lbs)
Optimal	S1500X	W2000X	10,000	TQ-700B	1	115V-1 ph, 50 / 60 Hz	82-85	68
	S3000X	W4000X		TQ-700E ²⁾	1	230V-1 ph, 50 Hz	82-85	66
S6000X	W8000X	TQ-700I ³⁾		1	230V-1 ph, 60 Hz	82-85	66	
Acceptable	S11000X	W15000X						
	S25000X	W22000X						
		W35000X						

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

▼ The TQ-700E and the W-Series wrenches are a productive combination.



ZU4T Electric Torque Wrench Pumps

▼ Shown: ZU4204TB-Q and ZU4204BB-Q



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CLASSIC



Classic Electrical

Basic electrical package includes mechanical contactor, ON/OFF toggle switch, pendant with electro-mechanical pushbuttons, 24V transformer timer and operator accessible circuit breaker.

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

Pro-Series

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



◀ Any brand of hydraulic torque wrench can be powered by the portable ZU4-Series torque wrench pump.



FIRMWARE for Pro-Series

- Display torque in Ft.lbs. or Nm
- Display pressure in bar, MPa or psi
- Torque wrench model is selectable
- "Auto cycle" setting easily programmable

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Back-lit LCD Display for Pro Series

- Digital pressure or torque read-out
- Programmable "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

ZU4T 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 ZU4 Hydraulic Pumps are built to power small to large torque wrenches. Choosing the right ZU4 torque wrench pump for your application is easy.

Classic Electric Torque Wrench Pump

- The Classic has an analog gauge and traditional electro-mechanical components (transformers, relays and switches) in place of solid-state electronics. The Classic

delivers durable, safe and efficient hydraulic power.

Pro Series Electric Torque Wrench Pump

- Digital (LCD) display features a built-in hour meter, pressure and torque display, and shows self-diagnostic, cycle-count and low voltage warning information. These premium features are not available on any other pump—anywhere!
- AutoCycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed. (Pump can be used with or without AutoCycle feature).

ZU4T Series



Reservoir Capacity:

1 and 1.75 gal.

Flow at 10,000 psi:

60 in³/min.

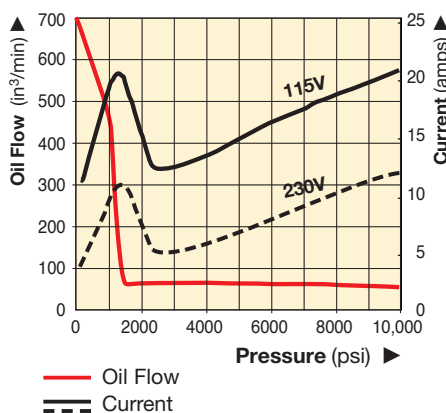
Motor Size:

1.7 hp

Maximum Operating Pressure:

10,000 psi

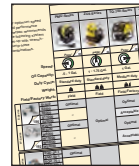
OIL FLOW AND CURRENT vs PRESSURE



COMMON PUMP MODELS

	For Use With Torque Wrenches	Model Number ^{1) 4)}	Motor Electrical Specification	Usable Oil Capacity (gal)	Weight with Oil (lbs)
Pro Series	All wrenches	ZU4204TB-Q	115 V-1 ph	1.0	70
		ZU4208TB-Q	115 V-1 ph	1.75	76
		ZU4204TE-Q ²⁾	208-240 V-1 ph	1.0	70
		ZU4208TE-Q ²⁾	208-240 V-1 ph	1.75	76
		ZU4204TI-Q ³⁾	208-240 V-1 ph	1.0	70
		ZU4208TI-Q ³⁾	208-240 V-1 ph	1.75	76
Classic	All wrenches	ZU4204BB-QH	115 V-1 ph	1.0	82
		ZU4204BB-Q	115 V-1 ph	1.0	73
		ZU4208BE-QH ²⁾	208-240 V-1 ph	1.75	83
		ZU4204BE-Q ²⁾	208-240 V-1 ph	1.0	74
		ZU4208BI-QH ³⁾	208-240 V-1 ph	1.75	88
		ZU4208BI-Q ³⁾	208-240 V-1 ph	1.75	79

1) All models meet CE safety requirements and all TÜV requirements
 2) European plug and CE EMC directive compliant
 3) With NEMA 6-15 plug
 4) Replace the Q- suffix with an -E suffix for Enerpac SQD and HXD 11,600 psi torque wrench pumps



Torque Wrench Pump Selection Matrix

For optimum speed and performance see the torque wrench pump and hose selection matrix.

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Pump Ratings

-Q suffix pumps are for 10,000-psi torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with 11,600-psi rated torque wrenches, and include polarized lock-ring safety couplers.

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Gauge Overlay Kit

Gauge overlay kits are also available separately.

GT-4015-Q includes overlays for all S- and W-Series torque wrenches.

GT-4015 includes overlays for all SQD and HXD torque wrenches.

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ZU4T Ordering Matrix and Specifications

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



1 Product Type

Z = Pump series

2 Motor Type

U = Universal electric motor

3 Flow Group

4 = 60 in³/min @ 10,000 psi

4 Valve Type

2 = Torque wrench valve

5 Reservoir Size (useable capacity)

04 = 1.0 gallon

08 = 1.75 gallons

6 Valve Operation

T = Solenoid valve with pendant, LCD electric and pressure transducer

B = Solenoid valve with pendant, classic electrical

7 Voltage

B = 115V, 1 ph, 50/60 Hz

E = 208-240V, 1 ph, 50/60 Hz (with European plug CE RF compliant)

I = 208-240V, 1 ph, 50/60 Hz (with NEMA 6-15 plug)

8 Factory installed features and options

E = 11,600 coupler for use with HXD-, SQD-Series or other wrenches

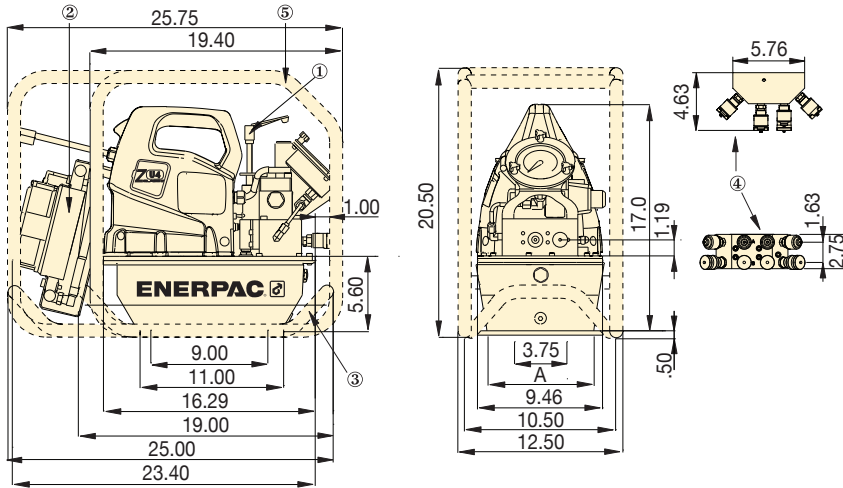
Q = 10,000 coupler for use with S- and W-Series or other wrenches

H = Heat exchanger

K = Skidbar

M = 4-wrench manifold

R = Roll cage



ZU4-Series Torque Wrench Pumps

Dimensions shown in inches

- ① User adjustable relief valve
- ② Heat exchanger (optional)
- ③ Skidbar (optional)
- ④ 4-wrench manifold (optional)
- ⑤ Roll cage (optional)

Reservoir Size (useable gallons)	A (in)
1	6.0
1.75	8.1

ZU4 Performance							
Motor Size (hp)	Output Flow Rate (in ³ /min)				Motor Electrical Specification*	Sound Level (dBA)	Relief Valve Adjustment Range (psi)
	100 psi	700 psi	5,000 psi	10,000 psi			
1.7	700	535	76	60	115 VAC, 1-ph 208-240 VAC, 1-ph	85-90	1,800-10,000**

* 50/60 HZ

** Pump type (-Q) shown, (-E) range is 1,800 - 11,600 psi.



How to order your ZU4T-Series torque wrench pump

Ordering Example 1

Model No. ZU4208TB-QMHK

10,000-psi pump for use with Enerpac S- and W-Series and other 10,000-psi torque wrenches, 115V motor, 1.75-gallon reservoir, 4-wrench manifold, heat exchanger and skidbar.

Refer to the torque wrench pump selection matrix for optimum wrench, pump and hose combinations.



Twin Torque Wrench Hoses

Use Enerpac **THQ-700** series twin hoses with 10,000-psi pumps, or use **THC-700** series twin hoses with 11,600-psi pumps.

10,000 psi	
19.5 feet long, 2 hoses	THQ-706T
39 feet long, 2 hoses	THQ-712T
11,600 psi	
19.5 feet long, 2 hoses	THC-7062
39 feet long, 2 hoses	THC-7122

▼ Most hydraulic torque wrenches can be powered by the Enerpac ZU4-Series torque wrench pump.



ZU4T Torque Wrench Pump Options



Heat Exchanger

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



Skidbar

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

ZU4T Series



Reservoir Capacity:
1 and 1.75 gal.

Flow at 10,000 psi:
60 in³/min.

Motor Size:
1.7 hp

Maximum Operating Pressure:
10,000 psi

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

* Add suffix **H** to pump model number for factory installation.
Heat Exchanger adds 9.1 lbs. to pump weight.

Ordering Example:
Model No. ZU4208TB-H

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
SBZ-4	1 and 1.75 gallon ¹⁾
SBZ-4L	1 and 1.75 gallon ²⁾

* Add suffix **K** to pump model number for factory installation.

¹⁾ Without heat exchanger 4.9 lbs.
²⁾ With heat exchanger 7.0 lbs.

Ordering Example:
Model No. ZU4208TB-QK



Roll Cage

- Protects pump
- Provides greater pump stability



4-Wrench Manifold

- For simultaneous operation of multiple torque wrenches
- Can be factory installed or ordered separately

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
ZRC-04	1 and 1.75 gallon reservoir ¹⁾
ZRC-04H	1 and 1.75 gallon reservoir ²⁾

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

¹⁾ For use with pumps without a heat exchanger fitted
²⁾ For use with pumps with a heat exchanger fitted

Ordering Example:
Model No. ZU4208BB-QR

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
ZTM-E	for 11,600-psi torque wrenches
ZTM-Q	for 10,000-psi torque wrenches

* Add suffix **M** to pump model number for factory installation.

Ordering Example:
Model No. ZU4208TB-QM

▼ Shown: ZE4204TB-QHR



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FIRMWARE for Pro-Series

- Display torque in Ft.lbs. or Nm
- Display pressure in bar, MPa or psi
- Torque wrench model is selectable
- "Auto-Cycle" setting easily programmable

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- 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



Back-lit LCD Display

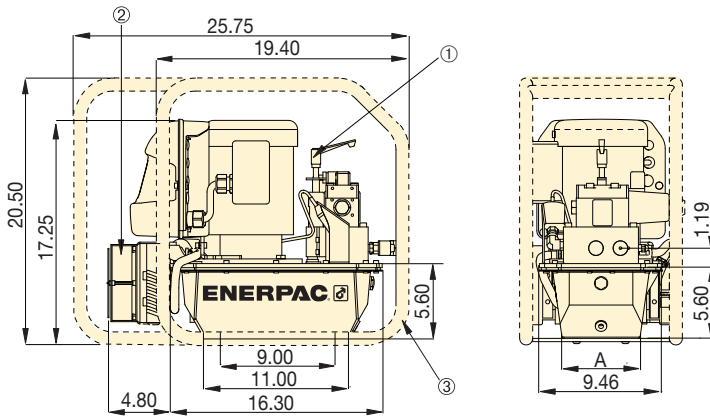
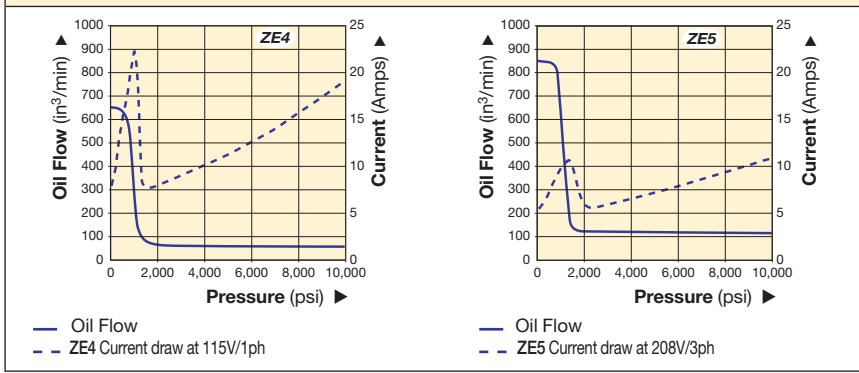
- Digital pressure or torque read-out
- Programmable "Auto-Cycle" setting
- "Auto-Cycle" setting easily programmable
- Torque wrench model is selectable
- Display torque in Nm or Ft.lbs
- Pump usage information, hour and cycle counts
- Low-voltage warning and recording
- Self-test and diagnostic capabilities
- Information can be displayed in English, French, German, Italian, Spanish and Portuguese
- Pressure transducer is more accurate and durable than analog gauges



◀ The ZE4 torque wrench pumps are perfectly matched for this W2000X wrench.

ZE Series Electric Torque Wrench Pumps

ZE4 and ZE5 Oil Flow and Current vs. Pressure



Reservoir Size (useable gallons)	A (in)
1	6.0
1.75	8.1

Dimensions shown in inches.
 ① User adjustable relief valve
 ② Heat Exchanger (optional)
 ③ Roll cage (optional)

▼ COMMON PUMP MODELS

For Use With Torque Wrenches	Max. Operating Pressure (psi)	Model Number with Heat Exchanger and Roll Cage	Motor Electrical Specification	Usable Oil Capacity ¹⁾ (gal)	Weight with Oil (lbs)
All S- and W-Series Wrenches	10,000	ZE4208TB-QHR	115 V-1 ph	2	129
	10,000	ZE4208TI-QHR	230 V-1 ph	2	129
	10,000	ZE4208TG-QHR	230 V-3 ph	2	131
	10,000	ZE5208TW-QHR	400 V-3 ph	2	131
All SQD and HXD-Series Wrenches	11,600	ZE4208TB-EHR	115 V-1 ph	2	138
	11,600	ZE4208TI-EHR	230 V-1 ph	2	129
	11,600	ZE4208TG-EHR	230 V-3 ph	2	141
	11,600	ZE5208TW-EHR	400 V-3 ph	2	132

¹⁾ Reservoir sizes available: 1, 2, 2.5, 5, 10 gallon. Contact Enerpac.

▼ PERFORMANCE CHART

Pump Series	Output Flow Rate (in³/min)				Motor Size		Relief Valve Adjustment Range (psi)	Sound Level (dBA)
	100 psi	700 psi	5,000 psi	10,000 psi	hp	RPM		
ZE4T	650	600	62	60	1.5	1750	1000 - 11,600	75
ZE5T	850	825	123	120	3.0	1750	1000 - 11,600	75

Flow rate will be approximately 5/6 of these values at 50 Hz.

ZE Series



Reservoir Capacity:

1.0 -10 gal.

Flow at 10,000 psi:

60-120 in³/min.

Motor Size:

1.5-3.0 hp

Maximum Operating Pressure:

10,000 and 11,600 psi



Accessory Options

A full list of optional accessories can be found in the ZU4 section.

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Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000-psi pumps, or use THC-700 series twin hoses with 11,600 psi pumps.

10,000 psi	
19.5 feet long, 2 hoses	THQ-706T
39 feet long, 2 hoses	THQ-712T
11,600 psi	
19.5 feet long, 2 hoses	THC-7062
39 feet long, 2 hoses	THC-7122

▼ Shown: ZA4204TX-QR



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- Two-speed operation and high by-pass pressure reduces cycle time for improved productivity
- Glycerin filled pressure gauge with transparent overlays in Ft.lbs and Nm for Enerpac torque wrenches provide a quick torque reference
- Regulator-Filter-Lubricator with removable bowls and auto drain is standard
- Ergonomic pendant allows remote operation up to 20 feet
- Valve technology reduces oil operating temperatures and withstands contaminants to increase pump reliability



Twin Torque Wrench Hoses

Use Enerpac **THQ-700** series twin hoses with 10,000-psi pumps, or use **THC-700** series twin hoses with 11,600 psi pumps.

10,000 psi	
19.5 feet long, 2 hoses	THQ-706T
39 feet long, 2 hoses	THQ-712T
11,600 psi	
19.5 feet long, 2 hoses	THC-7062
39 feet long, 2 hoses	THC-7122



Gauge Overlay Kit

Gauge overlay kits are also available separately.

GT-4015-Q includes overlays for all S- and W-Series torque wrenches.

W-Series torque wrenches.

GT-4015 includes overlays for all SQD and HXD torque wrenches.



◀ Most hydraulic torque wrenches can be powered by the Enerpac ZA4-Series torque wrench pump.

ZA4T Air Driven Torque Wrench Pumps



ZA4-Series Pump Applications

The ZA4-Series pump is best suited to power medium to large size torque wrenches.

Patent-pending *Z-Class* technology provides high by-pass pressures for increased productivity. Its high power-to-weight ratio and compact design make it ideal for applications which require easy transport of the pump.

For further application assistance contact your local Enerpac office.

ATEX Certified

The ZA-series pumps are tested and certified according to the **Equipment Directive 94 / 9 / EC "ATEX Directive"**.

The explosion protection is for equipment group II, equipment category 2 (hazardous area zone 1), in gas and/or dust atmospheres. The ZA-series pumps are marked with: Ex II 2 GD ck T4.



ZA4T Series

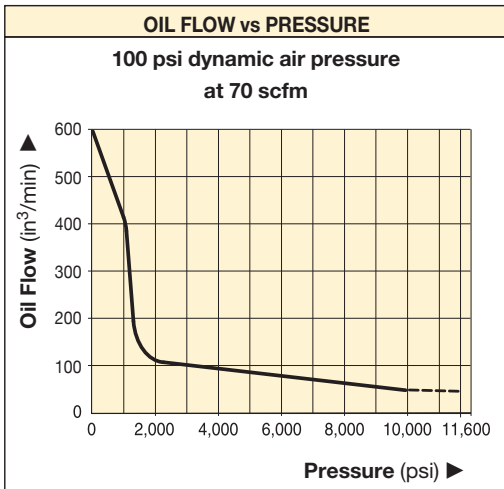


Reservoir Capacity:
1 and 1.75 gal.

Flow at 10,000 psi:
60 in³/min.

Air Consumption:
20-100 scfm

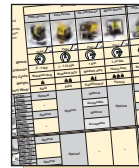
Maximum Operating Pressure:
10,000 and 11,600 psi



COMMON PUMP MODELS

For Use With Torque Wrenches	Maximum Operating Pressure (psi)	Model Number ¹⁾	Usable Oil Capacity (gal)	Weight with Oil (lbs)
For all S- and W- Series (X-Edition)	10,000	ZA4204TX-Q	1.0	94
	10,000	ZA4208TX-Q	1.75	100
	10,000	ZA4204TX-QR	1.0	101
	10,000	ZA4208TX-QR	1.75	112
For all SQD- and HXD-Series	11,600	ZA4204TX-E	1.0	94
	11,600	ZA4208TX-E	1.75	100
	11,600	ZA4204TX-ER	1.0	101
	11,600	ZA4208TX-ER	1.75	112

¹⁾ All models meet CE safety requirements and all TÜV requirements.



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** = Skidbar
- M** = 4-wrench manifold
- R** = Roll cage

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Pump Ratings

-Q suffix pumps are for 10,000-psi torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with Enerpac SQD and HXD 11,600 psi torque wrenches, and include polarized lock-ring safety couplers.

ZA4T Ordering Matrix and Specifications

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

Z	A	4	2	08	T	X	-	Q	M	R
1	2	3	4	5	6	7		8	8	8
Product Type	Motor Type	Flow Group	Valve Type	Reservoir Size	Valve Operation	Voltage		Must be E or Q	Options	Options

1 Product Type

Z = Pump Series

2 Motor Type

A = Air motor

3 Flow Group

4 = 60 in³/min @ 10,000 psi

4 Valve Type

2 = Torque Wrench Valve

5 Reservoir Size (useable capacity)

04 = 1.0 gallon

08 = 1.75 gallons

6 Valve Operation

T = Air operated valve with pendant

7 Voltage

X = Not applicable

8 Factory installed features and options

E = 11,600 psi coupler for use with HXD- and SQD-Series wrenches

Q = 10,000-psi coupler for use with S- and W-Series or other wrenches

K = Skidbar

M = 4-wrench manifold

R = Roll cage



How to order your ZA4-Series torque wrench pump

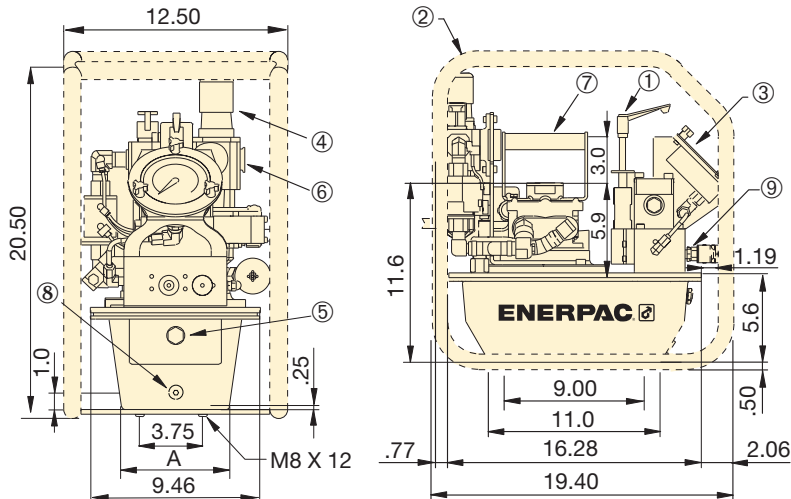
Ordering Example 1

Model No. ZA4208TX-QMR

10,000-psi pump for use with Enerpac S- and W-Series and other 10,000-psi torque wrenches, 1.75-gallon reservoir, 4-wrench manifold, and roll cage.

Refer to the torque wrench pump selection matrix for optimum wrench, pump and hose combinations.

Dimensions shown in inches.



- ① User adjustable relief valve
- ② Roll bar cage (optional)
- ③ Gauge with overlays
- ④ Filter/lubricator/regulator
- ⑤ Oil level sight gauge
- ⑥ Air input 1/2" NPTF
- ⑦ Standard handle
- ⑧ Oil drain
- ⑨ 1/4"-18 NPTF Oil Outlet

ZA4-Series Torque Wrench Pumps

Reservoir Size (useable gallons)	A (in)
1	6.0
1.75	8.1

▼ Most hydraulic torque wrenches can be powered by the Enerpac ZA4-Series torque wrench pump.



Output Flow Rate (in ³ /min)					ZA4 Performance			
100 psi	700 psi	5,000 psi	10,000 psi	11,600 psi	Dynamic Air Pressure Range (psi)	Air Consumption (scfm)	Sound Level at 100 psi Dynamic (dBA)	Relief Valve Adjustment Range (psi)
600	500	80	60	55	60-100	20-100	80-95	1,400-10,000*

* Pump type (-Q) shown.

ZA4T Torque Wrench Pump Options



Skidbar

- Provides greater pump stability on soft or uneven surfaces
- Provides two-handed lift

Accessory Kit No. *	Can be used on ZA4-Series torque wrench pumps
SBZ-4	1 and 1.75-gallon reservoir

* Add suffix **K** for factory installation.
Skidbar weight 4.9 lbs.

Ordering Example:

Model No. ZA4208TX-QK



4-Wrench Manifold

- For simultaneous operation of multiple torque wrenches
- Can be factory installed or ordered separately

Accessory Kit No. *	Can be used on ZA4-Series torque wrench pumps
ZTM-E	for 11,600-psi torque wrenches
ZTM-Q	for 10,000-psi torque wrenches

* Add suffix **M** for factory installation.

Ordering Example:

Model No. ZA4208TX-QM

ZA4T Series



Reservoir Capacity:

1 and 1.75 gal.

Flow at 10,000 psi:

60 in³/min.

Air Consumption:

20-100 scfm

Maximum Operating Pressure:

10,000 and 11,600 psi



10,000-psi Spin-on Couplers

Model No.: TH-630 male coupler
TR-630 female coupler

- Mounted on:
 - Torque wrench pumps with suffix "Q"
 - S and W-Series wrenches
 - THQ-Series hoses
 - 4-Wrench manifold ZTM-Q



10,000-psi Lock-ring Couplers

Model No.: CMF-250 male coupler
CFF-250 female coupler

- Mounted on:
 - Torque wrench pumps with suffix "E"
 - THC-Series hoses
 - 4-Wrench manifold ZTM-E



Roll Cage

- Protects pump
- Provides greater pump stability

Accessory Kit No. *	Can be used on ZA4-Series torque wrench pumps
ZRC-04	1 and 1.75-gallon reservoir

* Add suffix **R** for factory installation.
Roll bar cage weight 7.5 lbs.

Ordering Example:

Model No. ZA4208TX-QR

When You Require a Solution Tailored to Your Needs

Although Enerpac has the broadest portfolio of high-pressure, high-force tools, we know that some situations require a solution not available in our standard offering. These applications require a custom product or solution to meet your needs.

The Custom Products & Solutions group is dedicated to understanding your objectives, recommending a solution and delivering it in a timely basis. Whether you have a solution in mind or are not sure where to begin, we are committed to serving you. We welcome all requests, regardless of complexity.

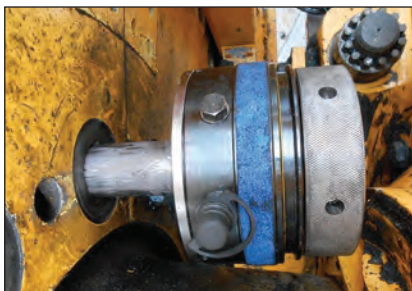
Bring us your challenge; we'll deliver you a solution.

Torque Wrenches



◀ *Custom hydraulic torque wrench fitted with a custom reaction arm/socket.*

Tensioners



◀ *Custom tensioner for removing studs on a stacker reclaimer.*

Pumps



◀ *Private-labeled electric torque wrench pumps for OEMs.*

OVERVIEW



▲ **QUALITY:** All custom products and solutions are tested to the most exacting standards to comply with global standards and directives.

CUSTOM SOLUTIONS:

When the scope of your job requires more than a standard or custom product, we develop a custom solution. Our custom solutions often combine multiple high-pressure hydraulics, controls, steel fabrication and power units. They are developed to be a turnkey system to meet the most unique challenges.

Custom products and solutions are necessary for a variety of reasons, but common requests for applications are listed below:

- Extreme environments or use (hot, cold, corrosive, dusty, explosive or high cycle)
- Requirement of more or less than our standard products' capacities (tonnage or speed)
- Physical constraints that our standard products cannot meet (size, shape, oil capacity, accuracy, control and feedback)
- Private-label products for OEM customers

Looking for customized components to help solve your torquing problems? Enerpac has the experience and capabilities to help find solutions to your problems.

Enerpac hydraulic torque wrenches are designed to accommodate most bolting applications. However, due to space constraints, location of reaction points

or need for special sockets and adaptors, there is often a need for customized components.



◀ *Torque wrench with custom reaction arm for use on fracking equipment maintenance.*



◀ *Custom S6000X hydraulic torque wrench fitted with a custom reaction arm/socket.*



◀ *Custom hydraulic torque wrench with reaction paddles for use with a flexible flowline.*

OVERVIEW



▲ *Custom S11000X torque wrench with a custom torque link and reaction roller*

CUSTOMIZABLE FEATURES:

- Reaction Arms
- Torque Links (split or layered for extremely space restricted applications)
- Reaction Roller Assemblies
- Sockets (direct drive, castellated, peg drive, stacked)
- Drives (direct Allen, spline, square drive size)
- Hex Reducing and Square Drive Inserts

▼ Shown: GT-Series bolt tensioners



- Six load cells from 5/8" to 3 3/4" or from M16 to M95
- Twin ports for quick connection of multiple tools
- Only one size of bridge per size of load cell
- Detachable and rotational bridge simplifies tool positioning
- Full bridge window
- Piston stroke indicator
- Black surface treatment protects against corrosion
- Anti-slip grip for more secure handling
- Universal and multi-use tool

Accurate & Reliable Extreme Performance Bolt Tensioner



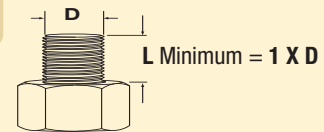
Tensioning pumps, hoses and Couplers

High-pressure pumps, hoses and fittings matched for use with the Enerpac GT Bolt Tensioning system.

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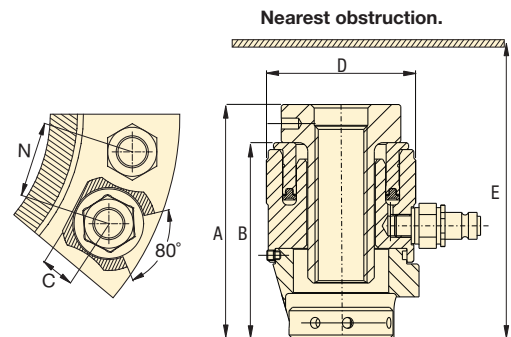
Minimum Stud Protrusion



Ultra-High Pressure

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

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▼ GT2 Bolt Tensioner on a flange joint.



Threaded Fastener Range		Load Cell and Bridge Reference	Technical Data			Dimensions (in)				Weight (lbs)
			Cylinder Effective Area (in ²)	Load Capacity (ton)	Stroke (in)	A	B	C	D	
(in)	(mm)									
5/8" - 1"	M16-M30	GT1-LCB	2.32	25.2	0.39	5.31	4.45	1.06	3.39	6.60
1 1/8" - 1 1/2"	M30-M39	GT2-LCB	4.15	45.1	0.39	5.35	4.37	1.38	4.21	9.02
1 1/2" - 2"	M39-M52	GT3-LCB	7.95	86.4	0.39	6.30	4.96	1.81	5.43	15.40
2" - 2 1/2"	M52-M68	GT4-LCB	15.16	164.9	0.39	7.09	5.55	2.44	6.85	26.84
2 1/2" - 3 1/4"	M68-M80	GT5-LCB	23.37	254.1	0.39	7.95	6.18	3.07	8.27	41.14
3 1/4" - 3 3/4"	M80-M95	GT6-LCB	29.41	319.8	0.39	8.62	6.81	3.23	9.45	61.16

GT-Series Hydraulic Bolt Tensioners

Load Cell and Bridge Reference	Thread Size	Adaptor Kit Model Number	Pitch Between Bolts N (in)	Minimum Height E (in)	Weight (lbs)
GT1-LCB	M16 x 2	GT1PM-NRS01620	2.17	6.65	3.48
	M18 x 2.5	GT1PM-NRS01825	2.20	6.50	3.32
	M20 x 2.5	GT1PM-NRS02025	2.24	6.50	3.15
	M24 x 3	GT1PM-NRS02430	2.32	6.46	2.88
	M27 x 3	GT1PM-NRS02730	2.44	6.57	2.55
	M30 x 3.5	GT1PM-NRS03035	2.56	6.69	2.22
	$\frac{5}{8}$ " 11UN	GT1P-NRS0625U11	2.17	6.65	3.45
	$\frac{3}{4}$ " 10UN	GT1P-NRS0750U10	2.20	6.50	3.17
	$\frac{7}{8}$ " 9UN	GT1P-NRS0875U09	2.32	6.46	2.86
	1" 8UN	GT1P-NRS1000U08	2.44	6.57	2.68
	1 $\frac{1}{8}$ " 8UN	GT1P-NRS1125U08	2.56	6.69	2.31
GT2-LCB	M30 x 3.5	GT2PM-NRS03035	2.80	6.81	5.68
	M33 x 3.5	GT2PM-NRS03335	2.91	6.85	5.21
	M36 x 4	GT2PM-NRS03640	3.03	6.97	4.77
	M39 x 4	GT2PM-NRS03940	3.15	7.09	4.25
	1 $\frac{1}{8}$ " 8UN	GT2P-NRS1125U08	2.80	6.81	5.81
	1 $\frac{1}{4}$ " 8UN	GT2P-NRS1250U08	2.91	6.85	5.32
	1 $\frac{3}{8}$ " 8UN	GT2P-NRS1375U08	3.03	6.97	4.84
GT3-LCB	1 $\frac{1}{2}$ " 8UN	GT2P-NRS1500U08	3.15	7.09	4.29
	M39 x 4	GT3PM-NRS03940	3.62	8.35	12.50
	M42 x 4.5	GT3PM-NRS04245	3.78	8.46	11.77
	M45 x 4.5	GT3PM-NRS04545	3.90	8.58	10.96
	M48 x 5	GT3PM-NRS04850	4.13	8.50	10.25
	M52 x 5	GT3PM-NRS05250	4.25	8.66	9.20
	1 $\frac{1}{2}$ " 8UN	GT3P-NRS1500U08	3.62	8.35	12.56
	1 $\frac{5}{8}$ " 8UN	GT3P-NRS1625U08	3.78	8.46	11.70
	1 $\frac{3}{4}$ " 8UN	GT3P-NRS1750U08	3.90	8.58	10.89
	1 $\frac{7}{8}$ " 8UN	GT3P-NRS1875U08	4.13	8.50	10.10
GT4-LCB	2" 8UN	GT3P-NRS2000U08	4.25	8.66	9.17
	M52 x 5	GT4PM-NRS05250	4.65	9.45	23.63
	M56 x 5.5	GT4PM-NRS05655	4.76	9.61	22.22
	M60 x 5.5	GT4PM-NRS06055	4.88	9.76	20.77
	M64 x 6	GT4PM-NRS06460	5.00	9.92	19.32
	M68 x 6	GT4PM-NRS06860	5.12	10.08	17.80
	2" 8UN	GT4P-NRS2000U08	4.65	9.45	23.63
	2 $\frac{1}{4}$ " 8UN	GT4P-NRS2250U08	4.76	9.61	21.23
GT5-LCB	2 $\frac{1}{2}$ " 8UN	GT4P-NRS2500U08	5.00	9.92	18.63
	M68 x 6	GT5PM-NRS06860	5.71	10.94	38.02
	M72 x 6	GT5PM-NRS07260	5.87	11.10	36.06
	M76 x 6	GT5PM-NRS07660	5.98	11.26	34.03
	M80 x 6	GT5PM-NRS08060	6.38	11.54	32.01
	2 $\frac{1}{2}$ " 8UN	GT5P-NRS2500U08	5.67	10.79	39.16
	2 $\frac{3}{4}$ " 8UN	GT5P-NRS2750U08	5.87	11.10	35.84
GT6-LCB	3" 8UN	GT5P-NRS3000U08	5.98	11.26	32.45
	3 $\frac{1}{4}$ " 8UN	GT5P-NRS3250U08	6.38	11.54	28.86
	M80 x 6	GT6PM-NRS08060	6.65	12.28	49.02
	M85 x 6	GT6PM-NRS08560	6.65	12.28	46.20
	M90 x 6	GT6PM-NRS09060	7.01	12.48	42.57
	M95 x 6	GT6PM-NRS09560	7.13	12.68	39.69
	3 $\frac{1}{4}$ " 8UN	GT6P-NRS3250U08	6.65	12.28	45.56
GT6-LCB	3 $\frac{1}{2}$ " 8UN	GT6P-NRS3500U08	7.01	12.48	41.43
	3 $\frac{3}{4}$ " 8UN	GT6P-NRS3750U08	7.13	12.68	36.94

GT Series



Bolt Range:

$\frac{5}{8}$ " - $3\frac{3}{4}$ " | M16-M95

Load:

0-319.8 tons

Maximum Operating Pressure

21,750 psi



How to Order

To provide maximum flexibility Load Cell and Bridges are ordered separately from Adaptor Kits.

Example, to order a complete tensioner for a 1" threaded bolt order:

1 x Load Cell and Bridge: **GT1-LCB**
1 x Adaptor Kit: **GT1P-NRS1000U08**



Bolting Integrity Software

A comprehensive 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.

www.enerpac.com

▼ Shown: PGT-Series Single Stage and Double Deck Tensioners



High Precision, Low Maintenance



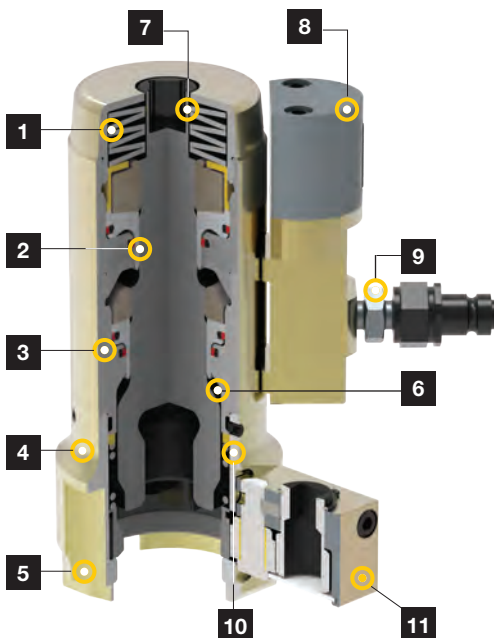
Engineering Team

Enerpac's Bolting Engineering Team is staffed with a large and highly experienced group of tensioning professionals who specialize in creating customized solutions for unique applications.

- PGT-Series Bolt Tensioners are designed for critical fastening applications in wind, steam and gas turbines
- A broad range of single stage and double deck tensioners provide high performance in tight spaces associated with Power Generation applications
- PGT-Series Bolt Tensioners are loaded with performance enhancing features such as Auto-Retract Pistons, Cycle Counters and a premium coating to offer the ultimate in efficiency, durability and ease of use

Description	Single Stage	Double Deck
Auto-Retract Piston	●	●
Zinc Coating	●	●
Geared Nut-Run-down	●	●
Over-stroke Indicator	●	●
Over-stroke Preventer	●	●
Single Male Fitting	◆	◆
Swivel Manifold	◆	◆
Cycle Counter	◆	◆

- = Standard
- ◆ = Possible option
- ✦ = Option not available



- 1. Auto-retract piston:** Simplifies use and improves speed of operation.
- 2. Long-life puller:** For maximum durability.
- 3. Long-life seals:** For maximum durability and extended service life intervals.
- 4. Corrosion protection:** Zinc coating provides best-in-class corrosion resistance.
- 5. Interchangeable bridge:** For optimal application fit.
- 6. Over-stroke Preventer:** Mechanically prevents over-stroke, extending cylinder life.
- 7. Over-stroke Indicator:** Extends cylinder life by helping to prevent over-stroking of cylinder.
- 8. Optional counter:** Helps indicate when maintenance is due to maximize uptime.
- 9. Quick-disconnect coupler:** For safe, simple hydraulic connection. OPTIONAL 360' swivel available for additional hose positioning flexibility.
- 10. Spring-loaded nut engagement:** Keeps socket positioned on nut for faster and easier seating process.
- 11. Auto-engage nut run-down:** For rapid and accurate seating of nuts.

▲ The model above illustrates a typical tool configuration. Actual model configurations vary.

PGT-Series, Power Generation Bolt Tensioners

▼ This is how a Power Generation Bolt Tensioner model number is built up:

PGT

1
Product
Type

1 Product Type

PGT = Power Generation Tensioner

D

2
No. of
Stages

2 Model Type

S = Single stage
D = Double Deck

36

3
Bolt
Diameter
(mm)

3 Bolt Diameter (mm)

Example: 36 = M36

55

4
Nut AF
Dimension
(mm)

4 Nut Across the Flats Measurement

Example: 55 = 55 mm AF

SW

5
Fitting
Type

5 Fitting Type

S = Includes single male fitting
SW = Includes swivel manifold with single male fitting

C

6
Counter*

6 Counter

C = Includes Counter

* Not available with single-stage tools.

**PGT
Series**



Bolt Range:

M20-M42

Load Range:

0-106 Tons

Maximum Operating Pressure*:

21,750 psi / 1500 bar

* Max. Pressure varies, see specification table for details.



Tensioner Pumps

Electric, pneumatic and manual high-pressure tensioning pumps are available for use with Enerpac hydraulic tensioners.

Enerpac hydraulic tensioners.

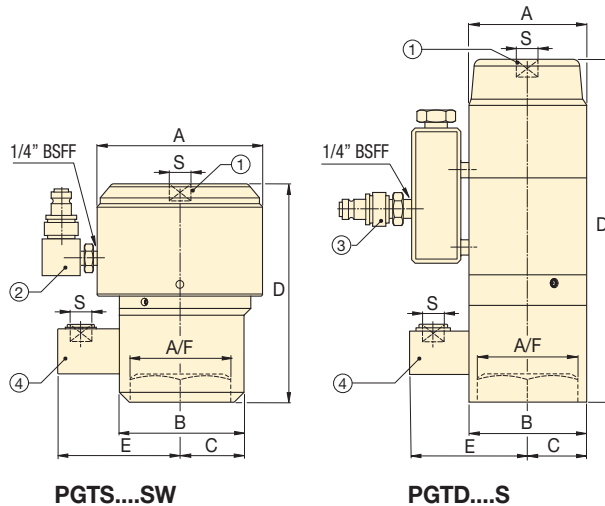
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Hoses and Fittings

High-pressure hoses and fittings for use with Enerpac tensioning systems are available.

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PGTS....SW

PGTD....S

▼ SPECIFICATION TABLE*

Type	Bolt Diameter		Thread	Model Number*	Nut AF (in)	Max. Pressure (psi)	Hydraulic Pressure Area (in ²)	Load Capacity (tons)	Stroke (in)	Dimensions (in)					Wt. (lbs)	Bolt Protrusion (in)		
	(in)	(mm)								A	B	C	D	E		S	Min.	Max.
Single Stage	0.79	20	M20 x 2.5	PGTS2030S	1.18	21,750	2.12	22.9	0.28	2.52	2.52	0.98	3.19	3.07	3/8	4.37	1.73	2.17
	0.94	24	M24 x 3.0	PGTS2436S	1.42	21,750	3.02	32.8	0.28	3.03	3.03	0.98	3.86	3.23	3/8	6.44	1.93	2.44
	1.42	36	M36 x 4.0	PGTS3655S	2.17	21,750	6.92	75.3	0.35	4.37	3.54	1.57	5.04	3.75	1/2	13.98	2.80	3.74
	1.65	42	M42 x 4.5	PGTS4265S	2.56	21,750	9.70	105.5	0.39	5.28	4.09	1.73	6.97	3.90	1/2	27.25	3.11	4.53
Double Deck	1.06	27	M27 x 3.0	PGTD2742S	1.65	19,575	4.56	44.6	0.24	2.68	2.95	1.34	7.72	3.28	1/2	11.55	2.36	2.67
	1.18	30	M30 x 3.5	PGTD3046S	1.81	19,575	5.31	52	0.28	2.87	3.35	1.46	7.68	3.46	1/2	12.70	2.36	2.76
	1.30	33	M33 x 3.5	PGTD3350S	1.97	19,575	6.62	64.8	0.28	3.07	3.03	1.52	8.19	3.54	1/2	15.15	2.56	3.03
	1.42	36	M36 x 4.0	PGTD3655S	2.17	19,575	7.74	75.8	0.31	3.31	3.23	1.61	8.58	3.66	1/2	17.06	2.76	3.43
	1.65	42	M42 x 4.5	PGTD4265S	2.56	19,575	10.64	104.2	0.39	3.86	4.09	1.73	9.78	3.90	1/2	25.02	3.23	3.58

* These models reflect a standard configuration. To select an optional modification, apply the appropriate nomenclature indicated at the top of the page. If models beyond those indicated in this table are required, contact Enerpac.

▼ Shown: **FTR-Series Foundation Bolt Tensioner**



High Precision, Low Maintenance



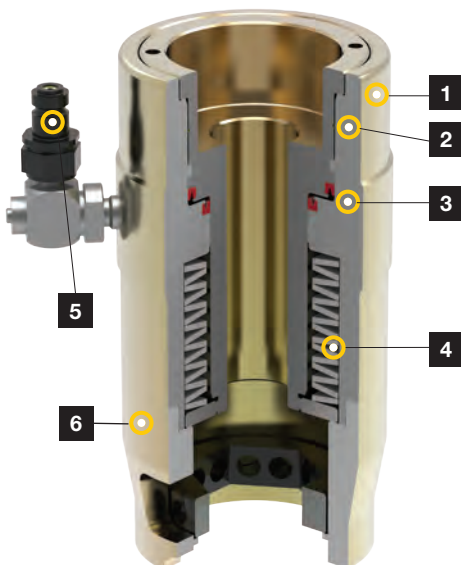
FTR-Series Foundation Bolt Tensioners

FTR-Series Foundation Bolt Tensioners are designed specifically for tensioning wind tower foundation bolts. These tensioners provide the speed and precision required by this critical application.

Potential thread fit problems are eliminated through the use of existing rebar hex nuts as a reaction point.

The FTR-Series includes long-stroke models, which provide greater speed and ease of use by enabling applications to be completed in a single pull.

- **FTR-Series Foundation Bolt Tensioners provide fast, accurate and easy tightening of external or internal-ring wind tower foundations**
- **Standard models are available for 75, 150 ksi and metric style Williams, Dyson and Macalloy® bar types**
- **Long-stroke options accelerate process with single-pull tensioning**



- 1. Corrosion protection:** Zinc coating provides best-in-class corrosion resistance.
- 2. Over-stroke indicator:** Extends life by helping to prevent over-stroking of cylinder.
- 3. Long-life seals:** For maximum durability and extended service life intervals
- 4. Auto-retract piston:** Simplifies use and improves speed of operation.
- 5. Quick-disconnect coupler:** For safe, simple hydraulic connection. *OPTIONAL 360° swivel available for additional hose positioning flexibility.*
- 6. Interchangeable bridge:** For optimal application fit.

▼ *FTR-Series Foundation Bolt Tensioner*



FTR-Series, Foundation Bolt Tensioners

▼ This is how an FTR-Series Foundation Bolt Tensioner model number is built up:



1 Product Type

FTR = Foundation Tensioner, Round

2 Bar Grade

75 = 75 ksi
150 = 150 ksi
(or metric designation)

3 Bar Size Designation

Example: 14 = No. 14 bar

4 Maximum Stroke

Example: **20** = 20 mm max. stroke

5 Fitting Type

S = Includes single male fitting
SW = Includes swivel manifold with single male fitting

6 Run-Down Gear

G = Includes Run-Down Gear (available in select models)

FTR Series



Load Range:

0-308 Tons

Maximum Operating Pressure*:

21,750 psi / 1500 bar

* Max. Pressure varies, see specification table for details.



Tensioner Pumps

Electric, pneumatic and manual high-pressure tensioning pumps are available for use with Enerpac hydraulic tensioners.

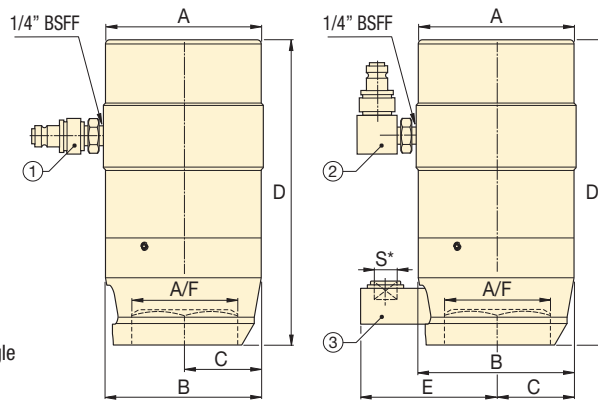
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Hoses and Fittings

High-pressure hoses and fittings for use with Enerpac tensioning systems are available.

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- ① Single male fitting
- ② Swivel manifold with single male fitting
- ③ Nut run-down gear box

FTR...S

FTR...SWG

▼ SPECIFICATION TABLE

Bar Grade	Bolt Diameter		Bar Size Designation	Model Number	Nut AF (in)	Maximum Pressure (psi)	Hydraulic Pressure Area (in ²)	Load Capacity (tons)	Stroke (in)	Dimensions (in)					Wt. (lbs)	Min. Bolt Protrusion (in)
	(in)	(mm)								A	B	C	D	E		
75 ksi	1.38	35	#10	FTR751010S	2.00	17,400	4.86	42.3	0.39	3.90	3.48	1.74	6.42	-	12.9	7.87
	1.38	35	#10	FTR751025S	2.00	17,400	4.84	42.1	0.98	4.53	4.02	1.65	8.64	-	24.1	9.84
	1.50	38	#11	FTR751110S	2.25	21,750	4.86	52.8	0.39	3.90	3.86	1.50	7.01	-	12.1	8.66
	1.50	38	#11	FTR751125SG	2.25	21,750	4.84	52.7	0.98	4.53	4.02	2.01	8.92	3.78	25.3	10.24
	1.88	48	#14	FTR751420S	2.75	16,965	9.44	80.1	0.79	5.20	5.20	2.60	10.55	-	40.2	12.40
150 ksi	1.44	37	1.25	FTR15012510S	2.25	16,965	8.34	90.8	0.39	4.37	4.33	1.57	7.01	-	18.2	8.66
	1.56	40	1.375	FTR15013810S	2.50	21,750	8.34	90.8	0.39	4.37	4.33	1.50	7.01	-	17.8	8.86
	2.75	70	2.500	FTR15025025S	4.25	21,750	28.27	307.5	1.00	8.44	8.35	3.39	13.68	-	127.8	17.72
10.9	1.42	36	36	FTR1093610SG	2.36	21,750	5.92	64.4	0.39	4.02	3.90	1.57	6.93	3.74	19.0	7.68

Gear box square drive dimension S = 1/2 inch.

▼ Shown: FTE-Series Elliptical Foundation Tensioner



High Precision, Low Maintenance



FTE-Series, Foundation Bolt Tensioners

Similar to Standard Foundation Tensioners, Elliptical tensioners were designed specifically for foundation fastening applications on wind towers, and utilize the existing hex nut as a reaction point in order to eliminate thread fit misalignment.

Unlike Standard FTR-Series Tensioners, FTE-Series Tensioners feature an elliptical geometry, which enables fit in narrow access foundation applications, without reducing load capabilities.

Operators may access the nut with a Tommy bar rather than employing the use of an offset run-down gear.

Elliptical tensioners are ideal for close-clearance applications, or as a universal tool that will work in nearly any foundation application, whether standard or narrow access.

- FTE-Series Foundation Bolt Tensioners provide fast and accurate performance in difficult, narrow access foundation tensioning applications
- Standard models are available for 75, 150 ksi and metric style Williams, Dyson and Macalloy® bar types
- Ideal universal solution that fits both standard and narrow access applications

-
1. **Max. stroke Indicator:** Extends life by helping to prevent over-stroking of cylinder.
 2. **Long-life seals:** For maximum durability and extended service life intervals.
 3. **Auto-retract piston:** Simplifies use and improves speed of operation.
 4. **Elliptical form:** Provides access to close clearance applications.
 5. **Corrosion protection:** Zinc coating provides best-in-class corrosion resistance.
 6. **Quick-disconnect coupler (not shown):** For safe, simple hydraulic connection. *OPTIONAL 360° swivel available for additional hose positioning flexibility.*

▼ FTE-Series, Foundation Bolt Tensioner.



FTE-Series, Foundation Bolt Tensioners (Elliptical)

▼ This is how an FTE-Series Foundation Bolt Tensioner model number is built up:



1 Product Type

FTE = Foundation Tensioner, Elliptical

2 Bar Grade

75 = 75 ksi
150 = 150 ksi
(or metric designation)

3 Bar Size Designation

Example: 10 = No. 10 bar

4 Fitting Type

S = Includes single male fitting
SW = Includes swivel manifold with single male fitting

FTE Series



Load Range:

0-86 Tons

Maximum Operating Pressure*:

21,750 psi / 1500 bar

* Max. Pressure varies, see specification table for details.



Tensioner Pumps

Electric, pneumatic and manual high-pressure tensioning pumps are available for use with Enerpac hydraulic tensioners.

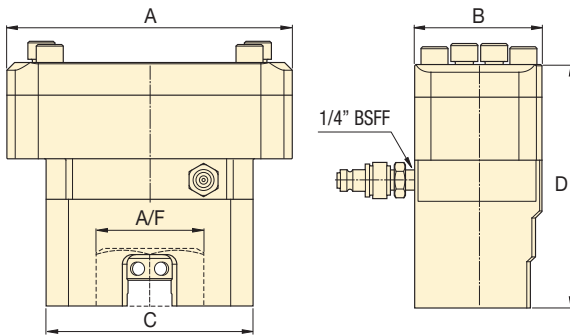
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Hoses and Fittings

High-pressure hoses and fittings for use with Enerpac tensioning systems are available.

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▼ SPECIFICATION TABLE

Bar Grade	Bolt Diameter		Bar Size Designation	Model Number	Nut AF	Maximum Pressure	Hydraulic Pressure Area	Load Capacity	Stroke	Dimensions (in)				Wt. (lbs)	Min. Bolt Protrusion (in)
	(in)	(mm)								A	B	C	D		
75 ksi	1.38	35	#10	FTE7510S	2.00	17,400	4.82	41.9	0.39	6.69	3.23	5.59	5.81	18.19	7.87
	1.50	38	#11	FTE7511S	2.25	21,750	4.82	52.4	0.39	6.69	3.23	5.59	5.81	18.19	8.66
150 ksi	1.44	37	1.25	FTE150125S	2.25	17,400	7.86	68.4	0.39	8.74	3.90	6.34	8.01	41.67	9.45
	1.56	40	1.375	FTE150138S	2.50	21,750	7.86	85.6	0.39	8.74	3.90	6.34	8.01	40.81	9.06
8.8	1.42	36	36	FTE8836S	2.36	21,750	4.82	52.4	0.39	5.59	3.23	5.59	5.81	21.32	7.09

▼ Shown: HPT-1500



HPT Series

Reservoir Capacity:

155 in³

Flow at 10,000 psi:

.037-.99 in³/stroke

Maximum Operating Pressure:

21,750 psi (1500 bar)

- 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 gauge and coupler for direct connection to GT-Series bolting tools
- Integrated relief valve set at 21,750 psi



Applications

The Enerpac HPT high-pressure Hand Pump is ideally suited for use with hydraulic bolt tensioning tools and hydraulic nuts.

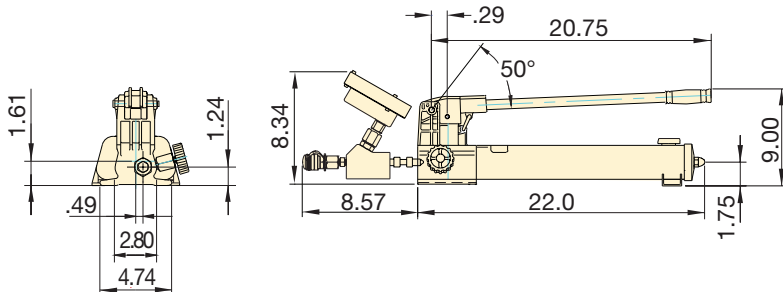
Page: 40



Ultra-High Pressure

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

Page: 50



▼ 21,750 PSI ULTRA-HIGH PRESSURE PUMP

Model Number	Description	Usable Oil Capacity (in ³)	Oil Displacement per Stroke (in ³)		Pressure Rating (psi)		Weight (lbs)
			1 st stage	2 nd stage	1 st stage	2 nd stage	
HPT-1500	Ultra-High Pressure Hand Pump with Gauge	155	.99	0.037	200	21,750	19

ZUTP-Series, Electric Tensioning Pump

▼ Shown: ZUTP-1500B



ZUTP Series

Reservoir Capacity:

1 gallon

Flow at Rated Pressure:

20.0 in³/min.

Maximum Operating Pressure:

21,750 psi (1500 bar)

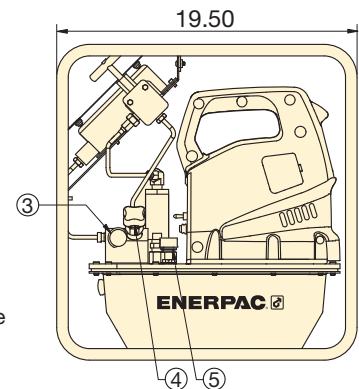
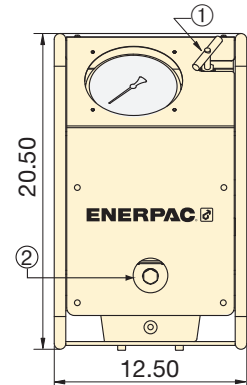


Ultra-High Pressure

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

Page: 50

- High-efficiency Universal Motor draws lower amps for superior performance in remote locations with low power quality
- 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
- Compact and lightweight design fits through tight openings and provides easy handling
- Panel mounted 6" pressure gauge, with polycarbonate cover, is set into the protective metal shroud for improved visibility and safety
- Panel mounted user adjustable valve for safe and precise pressure control
- Safety relief-valve limits output pressure



- ① Release Valve
- ② Sight Glass
- ③ 1/4" BSPM Outlet Port
- ④ User-Adjustable Pressure Control Valve
- ⑤ Breather

21,750 PSI ULTRA-HIGH PRESSURE PUMP

Pump Type	Useable Oil Capacity (gal)	Valve Type	Model Number ¹⁾	Output Flow Rate at 0 psi (in ³ /min)	Output Flow Rate at 21,750 psi (in ³ /min)	Motor Electrical Specification	Sound Level (dBA)	Weight with oil (lbs)
Ultra-High Pressure	1.0	Manual	ZUTP-1500B	230	20	115 VAC, 1-ph	89	65
			ZUTP-1500E ²⁾			230 VAC, 1-ph		
			ZUTP-1500I ³⁾			230 VAC, 1-ph		

¹⁾ All models meet CE safety requirements and all TÜV requirements.
²⁾ European plug and CE EMC directive compliant.

³⁾ With NEMA 6-15 plug.
⁴⁾ Add suffix "H" for factory installation of Heat Exchanger.

ATP-Series Ultra-High Pressure Air Pump

▼ Shown: ATP-1500



ATP Series



Reservoir Capacity:

1.0 gallon

Flow at Rated Pressure:

4 in³/min.

Maximum Operating Pressure:

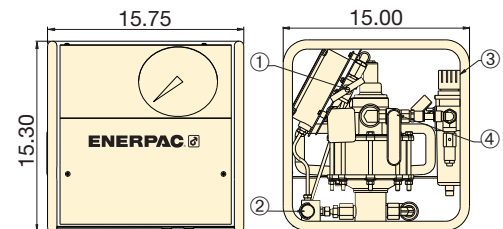
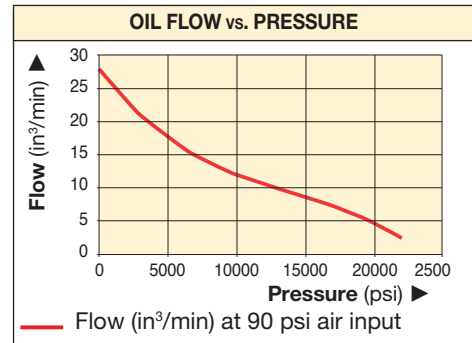
21,750 psi (1500 bar)










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

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

The ATP-series pump was 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 ATP-series pump is marked with: Ex II 2 GD ck T4.



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

Model Number	Hoses	End 1	End 2	Length (ft)	Description	Fittings	Complete Set	Female Half	Male Half
HT-1503		1/4 BSPM 120° Cone	1/4 BSPM 120° Cone	3.28	Quick Disconnect Coupler*		B150	BR150	BH150
HT-1510		1/4 BSPM 120° Cone	1/4 BSPM 120° Cone	9.84	Quick Disconnect Coupler and Adaptor Kit*		BW150AW	—	—
HT-1503HR*		BH150	BR150	3.28	Quick Disconnect Blanking Coupler Set*		B150B	—	—
HT-1510HR*		BH150	BR150	9.84					

* Includes dust caps

* Includes dust caps

Pump Type	Useable Oil Capacity (gal)	Model Number	Pressure Rating (psi)	Output Flow Rate at 0 psi (in ³ /min)	Output Flow Rate at 21,750 psi (in ³ /min)	Air Pressure Range (psi)	Air Consumption (sfcms)	Sound Level (dBA)	Weight (lbs)
Ultra-High pressure	1.0	ATP-1500	21,750	26	4	80-90	70	70	65

When the standard tensioner doesn't fit your needs Enerpac can help find a solution that does.

Enerpac hydraulic tensioners are designed to accommodate most bolting applications, especially when accurate tightening is needed. However, due to space constraints and a need for special adaptors,

there is often a need for customized components. Our group can meet the requirements of your application, whether it's a large order, simple modification, or even private-label products.

OVERVIEW



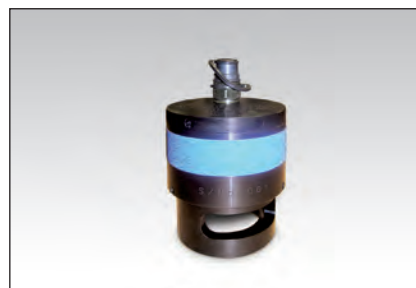
▲ Custom tensioners used for tensioning multiple bolts on pipe line flange



◀ Custom tensioner for removing studs on a stacker reclaimer.



◀ Custom hydraulic tensioners to suit 5-inch studs load output 944202 lbf (4200 kN).



◀ Custom screw-on tensioner to suit M30 stud load output 343.2 kN (77150 lbf).

CUSTOMIZABLE FEATURES:

- Adaptor kits with puller sleeves to suit different thread sizes and/or pitch
- Nut rotating sockets to accommodate different nut A/F (across flats) sizes
- Bridges to suit round or non-standard nuts or clear obstructions
- Load cells with various capacities
- Screw-on tensioners to overcome space restrictions

▼ Shown from left to right: E291, E393, E494



Accurate, Efficient Torque Multiplication

When accurate make-up or break-out of stubborn fasteners requires high torque

- High-efficiency planetary gear sets achieve high output torque from low input torque
- Most models operator protected by anti-backlash device
- Multiplier output accuracy $\pm 5\%$ of input torque
- Reversible, tighten or loosen bolts
- Reaction bar or reaction plate type
- Angle-of-turn protractor standard on E300 series models
- Reaction plate models offer increased versatility with reaction point locations
- E300 and E400 series replaceable shear drives provide overload protection of internal power train (one replacement shear drive is included)



Typical Torque Multiplier Applications

- Locomotives
- Power plants
- Pulp and paper mills
- Refineries
- Chemical plants
- Mining and construction
- Off-road equipment
- Shipyards
- Cranes



▼ SELECTION CHART

Torque Multiplier Type	Nominal Output Torque Capacity		Model Number
	(Ft.lbs)	(Nm)	
Reaction Bar Multiplier	750	1015	E290PLUS
	1000	1355	E291
	1200	1625	E391
	2200	2980	E392
	3200	4340	E393
Reaction Plate Multiplier	2200	2980	E492
	3200	4340	E493
	5000	6780	E494
	8000	10845	E495



Manual Torque Multipliers

Enerpac manual torque multipliers provide efficient torque multiplication in wide clearance applications and when external power sources are not available.

Manual torque multipliers are used in most industrial, construction, and equipment maintenance applications. Hydraulic torque wrenches are better suited for tight tolerance, flange and repetitious bolting applications.

Use Reaction Bar Models:

- where space is limited
- where multiple reaction points are available
- when portability is desirable

Use Reaction Plate Models:

- above 3200 Ft.-lbs. output torque
- on flanges and applications where neighboring bolt or nut is available to react against
- when extreme reaction forces are generated

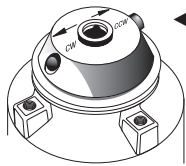
E Series



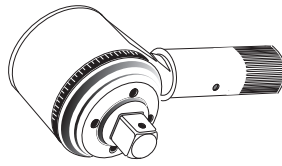
Nominal Output Torque:
750-8000 Ft.lbs

Torque Ratio:
3:1-52:1

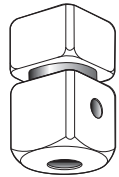
Multiplier Output Ratio Accuracy:
± 5 %



Selector Pawl
Models with anti-backlash protection have directional selector pawls. Set the pawl for clockwise or counter-clockwise rotation.



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.

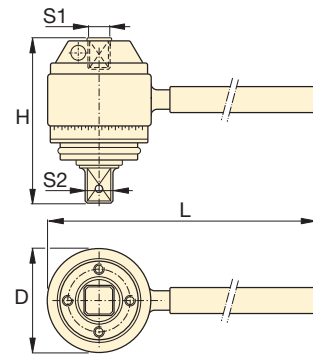


Shearable Square Drive
Designed to provide overload protection on E300- and E400-series multiplier power train by shearing when excess input torque is applied. Internal shear pin prevents tool from falling off bolt.

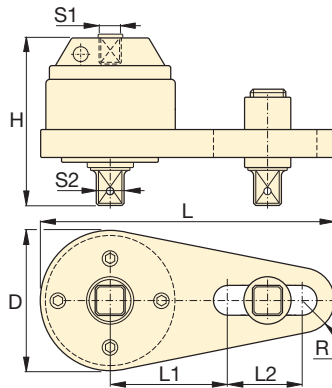


CAUTION!

Never use impact type 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		Torque Ratio	Input Female Square Drive		Output Male Square Drive		Over-load Protection	Anti-Back-lash	Dimensions (in)						Wt. (lbs)	Model Number
(Ft.lbs)	(Nm)		S1 (in)	S2 (in)	Replaceable Shear Drive Model No.	D			H	L	L1	L2	R			
250	338	3 : 1	1/2	3/4	–	No	No	2.8	3.3	8.6	–	–	–	4.0	E290PLUS	
333	451	3 : 1	1/2	3/4	–	No	No	2.8	3.3	17.4	–	–	–	5.5	E291	
200	271	6 : 1	1/2	3/4	E391SDK	Yes	No	3.9	4.0	19.6	–	–	–	13.8	E391	
162	219	13.6 : 1	1/2	1	E392SDK	Yes	Yes	4.1	5.7	19.6	–	–	–	18.3	E392	
173	234	18.5 : 1	1/2	1	E393SDK	Yes	Yes	4.1	6.5	19.6	–	–	–	15.2	E393	
162	219	13.6 : 1	1/2	1	E392SDK	Yes	Yes	4.9	5.5	14.0	5.5	4.9	1.3	17.2	E492	
173	234	18.5 : 1	1/2	1	E393SDK	Yes	Yes	4.9	6.4	14.0	5.5	4.9	1.3	23.4	E493	
189	256	26.5 : 1	1/2	1 1/2	E494SDK	Yes	Yes	5.6	8.7	14.9	7.0	3.5	1.7	34.0	E494	
154	208	52 : 1	1/2	1 1/2	E495SDK	Yes	Yes	5.8	10.7	15.2	7.0	3.5	1.9	50.3	E495	

¹⁾ E200 and E400-series do not have an Angle-of-Turn Protractor (scale).

User must verify manual torque wrench accuracy prior to use to ensure accurate final output torque.

▼ Shown: PTW1000



Continuous Rotation Controlled Torque



Typical Pneumatic Torque Wrench Applications

Mining

- Track maintenance
- Undercarriage maintenance
- Wheel maintenance
- Shovel maintenance

Power Generation

- Turbine bolts
- Tower segments
- Turbine casings

Oil and Gas

- Pipe flanges
- Valves
- Manway covers
- Pressure vessels

Productivity

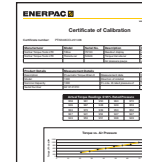
- High speed continuous rotation for constant torque output
- Low friction planetary gearbox design minimizes wear and extends uptime

Safety

- Ergonomic, low vibration design reduces fatigue and the risk of vibration related injuries for the operator
- Low noise air motor provides quiet, consistent performance for indoor and outdoor applications

Convenience

- Provided with standard reaction arm; wide assortment of custom arms and accessories are available
- Available with or without Filter-Regulator-Lubricator (FRL)
- Unique calibration certificate provided with each tool



Calibration Certificate

All PTW tools are CE declared and are shipped complete with a calibration certificate.



▼ PTW-Series Pneumatic Torque Wrenches are ideal for applications where speed and precision are critical, such as track maintenance.



◀ The PTW1000 makes quick work of this flange maintenance job.



Pneumatic Torque Wrenches



PTW-Series Pneumatic Torque Wrenches

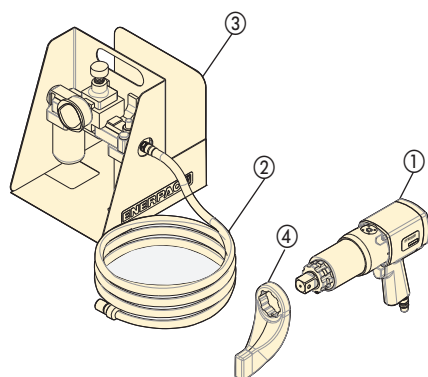
Enerpac PTW-Series Pneumatic Torque

Wrenches are designed for applications that require speed and control. The standard package includes a Torque Wrench with a calibration certificate, an FRL (Filter/Regulator/Lubricator), and a 10 ft. (3 m) long, 1/2" (13 mm) diameter air hose, which connects the FRL to the wrench.

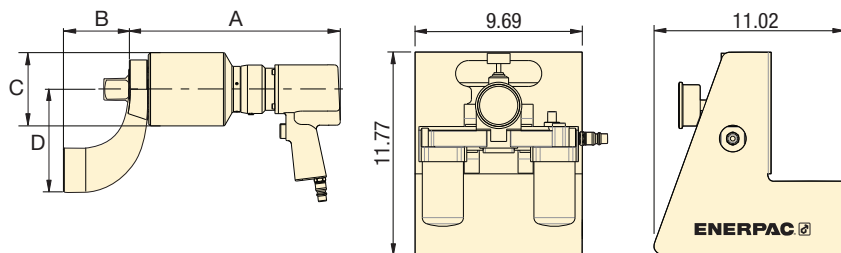
Once the air hoses are connected, the operator simply adjusts the air pressure on the FRL to achieve the desired torque using the calibration certificate. After this, the tool is ready to go to work!*

The air source used with the PTW system must be regulated and/or limited to 120 psi (8.3 bar), and must be capable of providing a volume of at least 50 CFM (85 CMH) at 100 psi (6.9 bar). A separate 1/2" (13 mm) hose (not included) must be used to connect the FRL to the air supply.

*See instruction manual for comprehensive instructions



- ① PTW Torque Wrench
- ② Hose
- ③ Filter-Regulator-Lubricator
- ④ Reaction Arm



All tools are shipped complete with standard reaction arm and FRL*.

▼ SELECTION CHART

Minimum Torque		Nominal Torque		Square Drive (in)	Model Number*	RPM	Dimensions (in)				Weight** (lbs)
(Ft.lbs)	(Nm)	(Ft.lbs)	(Nm)				A	B	C	D	
300	407	1000	1356	1	PTW1000C	12.6	10.70	3.27	2.83	5.12	18
500	678	2000	2712	1	PTW2000C	8.0	11.26	3.27	3.11	5.24	19.5
900	1220	3000	4067	1	PTW3000C	3.1	13.50	3.27	3.74	5.24	23
1300	1763	6000	8135	1 1/2	PTW6000C	2.5	14.40	4.49	5.00	7.00	39

* To order without FRL and hose, remove "C" Suffix (e.g. PTW3000).

** Weight of wrench only without reaction arm. Reaction arm weight for PTW1000, PTW2000, PTW3000 is 2.9 lbs. and for the PTW6000 is 7.75 lbs.

PTW Series



Nominal Output Torque:

6000 Ft.lbs

Square Drive Range:

1 - 1 1/2 inch



Pneumatic Torque Wrench Accessories

Enerpac offers a full line of accessories including a range of reaction arms and drives.

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Filter-Regulator-Lubricator

Recommended for use with all PTW pneumatic torque wrenches.

Provides clean, lubricated air and allows for air pressure adjustment.

Order model number*

FRL120C



BSH-Series Sockets

Heavy-Duty Impact Sockets for power driven torquing equipment.

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Hydraulic Torque Wrenches

Enerpac offers a complete range of square drive and hexagon cassette torque wrenches. Details on

www.enerpac.com.

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▼ Shown: TW3000B (torque wrench shown without servo motor cord)*



Your Simple Solution for Smart Bolting



Touchscreen Control Box

ETW tools feature an easy to use, interactive touch-screen control box, which helps make even the most complex jobs simple to complete.

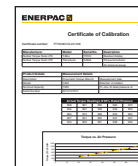
A single control box may be used to operate multiple wrench models.

Firmware upgrades may be uploaded online and easily transferred to the tool via a USB connection.



Easy Access to Controls

Controls on back of wrench with LED display allow user to directly input desired torque, change direction of rotation, and monitor the fastening process.



Certifications, Declarations

All ETW tools:

- Are shipped complete with a calibration certificate
- Are certified for North American Electrical Safety by CSA International
- Carry a CSA US and Canada mark
- Are CE declared



▼ ETW-Series Electric Torque Wrenches are ideal for high volume fastening applications that require precision and traceability, such as this wind tower job.



Versatility

- Patented firmware design provides accurate fastening on soft, hard, or pre-tightened joints
- Single control box may be used to operate multiple wrench models
- Wrenches and control boxes may be purchased separately or as a set

Performance

- High-speed continuous rotation gets the job done faster
- Torque and angle functionality allows input of nominal torque value followed by a specific angle of rotation
- Pass/Fail LED indicator on back of tool verifies fastening has been completed according to specified input

Simplicity

- Control box with large 7-inch touchscreen simplifies tool operation
- Controls on back of wrench enable operator to monitor and manage the fastening process without returning to the control box
- Brightly lit three-line LED display on wrench is easy to read in any environment

Traceability

- Fastening record can be viewed on-screen and transferred to a computer
- Each tool is performance tested and shipped complete with a factory calibration certificate

Safety

- Lift points on wrench enable use with positioning handle or lifting device for greater handling safety
- Ground fault detector protects operator in the event of insufficient grounding

* NOTE: Wrench cannot be used without control box.



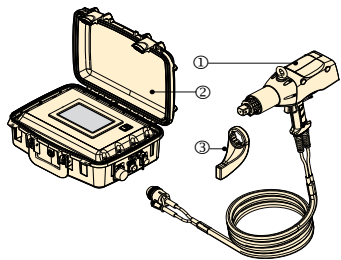
ETW-Series Electric Torque Wrenches

Enerpac ETW-Series Electric Torque Wrenches are particularly well suited to complex jobs which demand precision and traceability. The tools feature an automatic mode, which helps simplify and automate complex jobs, including those with torque and angle specifications, through the creation of presets.

Using the touchscreen, simply input the number of fasteners and desired torque value for each fastening step, followed by the required angle of turn. This sequence may then be saved as an automatic preset for future use.

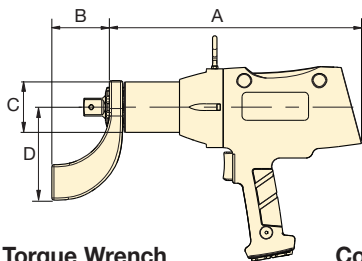
Once the input torque is achieved, the tool stalls, and a pass/fail indicator verifies that it is ready to move on to the next fastener.

When the job is completed, the fastening record can be viewed on the touch screen, or exported to a computer via a USB connection on the control box.

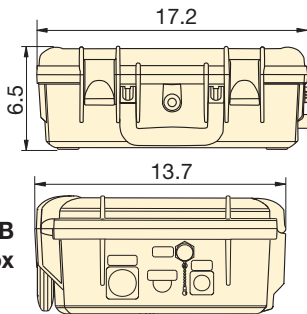


ETW Set

- ① ETW Torque Wrench (with 20-ft. servo cord)
- ② Control Box (with 6-ft. power cord)
- ③ Reaction Arm



ETW Torque Wrench



ETWCB Control Box

ETW Series



Nominal Output Torque:
6000 Ft.lbs

Square Drive Range:
1 - 1½ inch



Torque Wrench Accessories

Enerpac offers a full line of accessories including a wide range of reaction arms and drives.

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BSH-Series Sockets

Heavy-Duty Impact Sockets for power driven torquing equipment. Details on www.enerpac.com.

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Voltage: (Model No. ending with suffix)

- B = 115V, 60 Hz
- I = 230V, 60 Hz (with NEMA 6-15 plug)
- E = 230V, 50 Hz (with commonly used European (SCHUKO) plug)

Minimum Torque		Nominal Torque		Square Drive (in)	ETW Set Model Number	ETW Set Includes		Voltage	Nominal Speed RPMs	Dimensions (in)				Wrench Weight ¹⁾ (lbs)
(Ft.lbs)	(Nm)	(Ft.lbs)	(Nm)			Wrench Model No. ²⁾	Control Box Model No. ²⁾			A	B	C	D	
200	270	1000	1355	1.0	ETW1000B	TW1000B	ETWCB-B	115V 60 Hz	9.8	14.4	3.3	2.8	5.2	18.1
200	270	1000	1355	1.0	ETW1000I	TW1000EI	ETWCB-I	230V 60 Hz	15.2	14.4	3.3	2.8	5.2	18.1
200	270	1000	1355	1.0	ETW1000E	TW1000EI	ETWCB-E	230V 50 Hz	15.2	14.4	3.3	2.8	5.2	18.1
400	540	2000	2710	1.0	ETW2000B	TW2000B	ETWCB-B	115V 60 Hz	5.8	15.0	3.3	3.1	5.2	19.7
400	540	2000	2710	1.0	ETW2000I	TW2000EI	ETWCB-I	230V 60 Hz	9.0	15.0	3.3	3.1	5.2	19.7
400	540	2000	2710	1.0	ETW2000E	TW2000EI	ETWCB-E	230V 50 Hz	9.0	15.0	3.3	3.1	5.2	19.7
600	810	3000	4065	1.0	ETW3000B	TW3000B	ETWCB-B	115V 60 Hz	2.8	17.1	3.3	3.7	5.2	26.3
600	810	3000	4065	1.0	ETW3000I	TW3000EI	ETWCB-I	230V 60 Hz	4.3	17.1	3.3	3.7	5.2	26.3
600	810	3000	4065	1.0	ETW3000E	TW3000EI	ETWCB-E	230V 50 Hz	4.3	17.1	3.3	3.7	5.2	26.3
1200	1625	6000	8135	1.5	ETW6000B	TW6000B	ETWCB-B	115V 60 Hz	1.9	17.8	4.5	5.0	7.0	42.1
1200	1625	6000	8135	1.5	ETW6000I	TW6000EI	ETWCB-I	230V 60 Hz	2.9	17.8	4.5	5.0	7.0	42.1
1200	1625	6000	8135	1.5	ETW6000E	TW6000EI	ETWCB-E	230V 50 Hz	2.9	17.8	4.5	5.0	7.0	42.1

¹⁾ Weight of wrench only without reaction arm. Reaction arm weight for ETW1000, ETW2000, ETW3000 is 2.9 lbs. and for the ETW6000 is 7.75 lbs. Standard reaction arm included with TW-models. Weight of control box is 20 lbs.

²⁾ Use of ETW requires both wrench and control box. These may be purchased separately, or as a calibrated set.



PTW and ETW-Series Torque Wrenches

Enerpac offers the following accessories to support a wide variety of applications in industries such as mining, power generation and oil and gas. For additional custom accessories not pictured here, please contact Enerpac.

PTW ETW Series

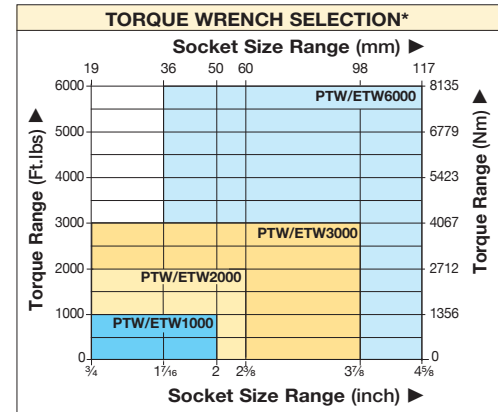
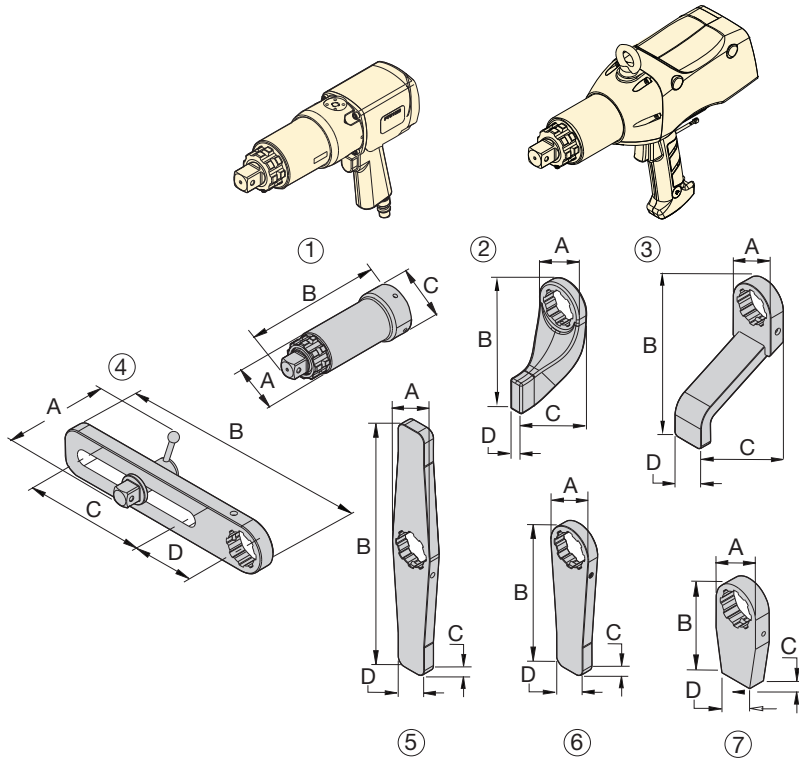


Nominal Output Torque:

6000 Ft.lbs

Square Drive Range:

1 - 1½ inch



BSH-Series Sockets

Heavy-Duty Impact Sockets for power driven torquing equipment. Details on www.enerpac.com.

8

▼ Optional accessories for use with PTW1000, ETW1000, PTW2000, ETW2000, PTW3000, ETW3000 models

No.	Description	Model No.	Application	Dimensions in inches			
				A	B	C	D
1	Extended Drive, 6 inch (152 mm)	ED6TWS	Nose extension, primarily for truck wheel bolts	2.44	8.11	2.87	—
1	Extended Drive, 12 inch (305 mm)	ED12TWS		2.44	15.12	2.87	—
1	Extended Drive, 18 inch (457 mm)	ED18TWS		2.44	20.12	2.87	—
2	Standard Reaction Arm	RATWS	Standard arm included with PTW/ETW model	2.99	6.77	4.02	0.83
3	Extended Reaction Arm	ERATWS	Long plate for use with deep well sockets	2.87	5.91	7.95	2.01
4	Sliding Reaction Arm	SLRATWS	For widely spaced and uneven bolt centers	4.41	15.00	7.99	4.02
5	Double Straight Reaction Arm	DSATWS	Reduces time to reposition arm *	2.87	15.98	0.75	4.02
6	Straight Reaction Arm	SRATWS	Long plate for wide spaced reaction points	2.87	9.45	0.75	2.01
7	Blank Reaction Arm **	BLTWS	Weldable blank for custom applications **	2.83	5.94	0.98	2.01

▼ For use with PTW6000, ETW6000 models

1	Extended Drive 6 inch (152 mm)	ED6TWL	Nose extension, primarily for truck wheel bolts	3.31	9.13	4.02	—
1	Extended Drive 12 inch (305 mm)	ED12TWL		3.31	15.12	4.02	—
2	Standard Reaction Arm	RATWL	Standard arm included with PTW/ETW model	4.02	9.02	5.75	1.26
3	Extended Reaction Arm	ERATWL	Long plate for use with deep well sockets	4.02	10.00	7.24	2.52
4	Sliding Reaction Arm	SLRATWL	For widely spaced and uneven bolt centers	5.98	16.50	7.48	4.49
5	Double Straight Arm	DSATWL	Reduces time to reposition arm *	4.02	20.00	1.26	2.24
6	Straight Reaction Arm	SRATWL	Long plate for wide spaced reaction points	4.02	12.01	1.26	2.24
7	Blank Reaction Arm **	BLTWL	Weldable blank for custom applications **	4.02	5.98	1.26	2.24

* Time to reposition arm when repeatedly moving from tightening to loosening.

** ⚠ WARNING: Blank reaction arms must be heat treated to HRc 38-42 prior to use.

PTW- & ETW-SERIES TORQUE WRENCHES

A simple-to-use solution for tough bolting jobs, when you want them done quickly and safely.

Typical PTW & ETW-Series Torque Wrench Applications



Mining

- Track maintenance
- Undercarriage maintenance
- Wheel maintenance
- Shovel maintenance



Power Generation

- Turbine bolts
- Tower segments
- Turbine casings



Oil & Gas

- Pipe flanges
- Valves
- Manway covers
- Pressure vessels

ADVANTAGES



▲ Safe and Quiet Axle Correction with a Pneumatic Torque Wrench.

PRODUCTIVITY

- High speed continuous rotation for constant torque output
- Low friction planetary gearbox design minimizes wear and extends uptime

SAFETY

- Ergonomic, low vibration design reduces operator fatigue and vibration-related injuries
- Low noise air motor provides quiet, consistent performance for indoor and outdoor applications

SIMPLICITY

- Ready to go tool comes with Filter/Regulator/Lubricator (FRL) and calibration certificate
- Simple to operate trigger style handle with easily accessible tightening/loosening control

▼ Shown: MCS-Series, Mobile Calibration System

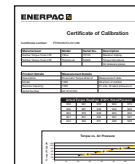


When Precision, Versatility, and Performance Matter



Versatile Design

The uniquely versatile design of the MCS, together with a set of adjustable reaction stops and an adaptable run-down fixture, enable use with a wide variety of tools.



Calibration Certificates

Integrated software enables creation of unique calibration tests, and generation of calibration certificates.



Versatility

- Accurately measures torque output for continuous rotation tools from 150 to 7,500 Ft.lbs.
- Adaptable design enables use with a large variety of Enerpac and competitive wrenches
- Standard global electrical adaptor set enables use in most electrical outlet types from 90V to 250V

Performance

- Certificate Manager feature enables quick and easy creation of calibration certificates
- Tool database feature allows specific wrench data and calibration results to be recorded and saved for future use

Ease of Use

- Compact design facilitates easy transport, allowing calibration to be carried out in the shop, on jobsites, or even in a vehicle
- Integrated digital interface enables torque values to be displayed, saved, printed or transferred to a computer

Compact design allows for calibration in a shop, job site or vehicle. ►





MCS-Series Mobile Calibration System

The MCS-Series Mobile Calibration System is the solution of choice for users with a wide range of controlled bolting tools being used in diverse locations.

The compact and lightweight construction is equally at home in the field or the back of a van, and is equipped with a dynamic run-down fixture capable of accurately measuring torque from 150 to 7500 Ft.lbs.

A heavy-duty, adjustable reaction block facilitates use with all Enerpac continuous rotation tools, and most competitive tools. A secondary reaction post enables use with those tools that won't fit the standard reaction block.

Simply mount the wrench to be calibrated onto the MCS, position the reaction arm into the reaction block, and actuate the wrench. A digital display indicates the torque output.

An integrated software (comes with standard MCS package) allows multiple runs to be recorded, graphed, displayed or printed using a computer equipped with Microsoft Windows (computer not included).

The software package also facilitates the creation of calibration certificates utilizing preset or operator designated calibration parameters.

When the job is finished, the calibration test results or certificate can be printed or stored electronically for later reference.

MCS Series



Output Torque Range:

175-7500 Ft.lbs

Square Drive:

1½ Inch*



Female Drive Adaptors

Range of female drive adaptors included with standard packages:
1 ½ x 1 with ¼ inch flange
1 ½ x 1 with 30 mm flange

1 ½ x ¾ with ¼ inch flange
1 ½ x 1 ½ with 50 mm flange



Optional Case

Optional high strength case provides secure and convenient transportation and storage.

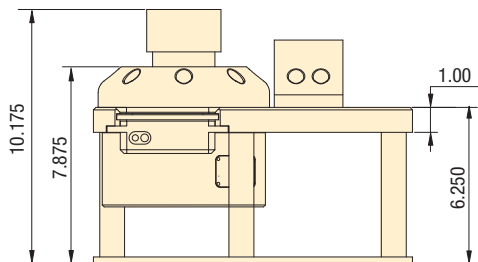
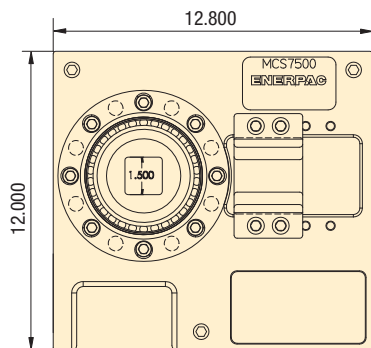


PTW- and ETW Series Torque Wrenches

Smart, simple and productive solutions for controlled bolting. Visit enerpac.com.



Each MCS comes with a standard calibration. To receive a special ISO17025 calibration, add the suffix "ISO" to the designation. For example "MCS7500ISO"



▼ SELECTION CHART

Minimum Torque		Nominal Torque		Female Square Drive	Model Number*	Description	Weight
(Ft.lbs)	(Nm)	(Ft.lbs)	(Nm)				
150	203	7500	10169	1½	MCS7500	Mobile Calibration System (MCS)	50
150	203	7500	10169	1½	MCS7500C	MCS with carrying case	63

* Standard packages come with multiple adaptors: 1 ½ x 1 with ¼ inch flange; 1 ½ x 1 with 30 mm flange; 1 ½ x ¾ with ¼ inch flange; 1 ½ x 1 ½ with 50mm flange.

Joint Assembly Tools

Correct joint assembly and alignment are crucial to joint integrity. Whether you are pulling in a pipeline connection, fitting winches to a boat deck or overhauling a dragline, our comprehensive line of Enerpac's Joint Assembly products provide simple-to-use, dependable solutions to the time-consuming, less accurate traditional methods.

Joint Separation Tools

Correct joint disassembly is especially important during maintenance operations. Separation of stubborn joints is often a laborious and time-consuming task. Traditional methods may carry the risk of personal injury or damage to expensive joint components. Our wide range of Joint Separation equipment (spread cylinders, flange spreaders, wedge spreaders, nut splitters) is designed specifically to provide quicker, simpler and safer solutions.



◀ Joint Separation Tools

Hydraulic nut cutters, nut splitters, flange spreaders and industrial spreaders, wedgies and spread cylinders, mechanical flange face tool



◀ Joint Assembly Tools

Flange Alignment Tools

OVERVIEW



▲ *These rigid steel wrenches with low profile interchangeable hexagon cassettes guarantee durability and maximum versatility in bolting applications.*

Expanded Line of Industrial Bolting Solutions

Enerpac offers an expanded line of bolting tools suited to a wide variety of industries and applications. Enerpac's bolting products provide precise and effective force to make your work more productive, safer, and easier to perform. From joint assembly and controlled tightening to joint separation, Enerpac's bolting tools and accessories offer the solution best-suited to the project, available from one source. From hydraulic torque wrenches and torque wrench pumps to nut splitters, flange spreaders and alignment tools, Enerpac has the solutions to complete your most difficult bolting jobs with the degree of safety and accuracy demanded in today's work environment.

Hydraulic Nut Cutters

▼ Shown from left to right: NC-3241, NC-1319, NC-1924



NC, STN Series



Capacity:
5-90 tons

Hexagon Nut Range:
0.5-2.88 inches

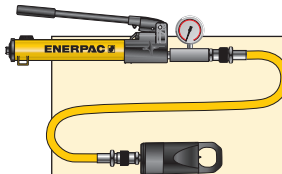
Maximum Operating Pressure:
10,000 psi



Enerpac Nut Cutters

Nut Cutters include a spare chisel, a spare set screw and the wrench used to secure the chisel. A CR-400 coupler is standard.

- Compact and ergonomic design, easy to use
- Unique angled head allows flush access
- Single-acting, spring return cylinder
- Heavy-duty chisels can be reground
- Applications include servicing trucks, piping industry, tank cleaning, petrochemical, steel construction and mining



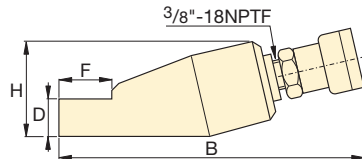
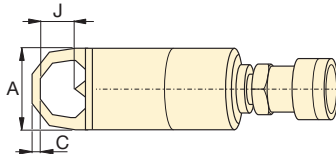
Nut Cutter Sets

Hydraulic Nut Cutters are available as sets (pump, tool, gauge, adaptor and hose).

Set Model Number	Splitter Model Number	Pump Model Number
STN-1924H	NC-1924	P-392
STN-2432H	NC-2432	P-392
STN-3241H	NC-3241	P-392



◀ Easily removing rusty nuts during railroad construction is just one of many application examples for the Enerpac Nut Cutters.



Hexagon Nut Range (in)	Bolt Range (in)	Capacity (ton)	Oil Capacity (in ³)	Model Number	Dimensions (in)							Weight (lbs)	Replacement Chisel Model Number
					A	B	C	D	F	H	J		
.50-.75	.31-.50	5	.92	NC-1319	1.57	7.87	.24	.75	1.10	1.89	.83	1.8	NCB-1319
.75-.94	.50-.63	10	1.22	NC-1924*	2.17	8.94	.32	.98	1.50	2.80	1.00	4.4	NCB-1924
.94-1.13	.63-.88	15	3.66	NC-2432*	2.60	10.24	.39	1.22	1.93	2.99	1.30	6.6	NCB-2432
1.13-1.56	.88-1.13	20	4.88	NC-3241*	2.95	11.26	.59	1.38	2.60	3.50	1.69	9.7	NCB-3241
1.56-2.00	1.13-1.38	35	9.46	NC-4150	3.78	12.80	.83	1.77	2.87	4.29	2.13	18.0	NCB-4150
2.00-2.25	1.38-1.50	50	14.64	NC-5060	4.17	14.41	1.06	2.13	3.63	4.96	2.38	26.0	NCB-5060
2.38-2.88	1.50-1.88	90	30.00	NC-6075	6.14	14.43	1.06	2.95	4.33	7.09	3.07	75.1	NCB-6075

Ordering Notes: Maximum allowable hardness to split is HRc-44. Not to be used on square nuts. Larger sizes available upon request.

* Available as Tool-Pump set, see note on this page.

▼ Shown: NS-7080, NS-70105



- Specially designed to suit standard ANSI B16.5 / BS1560 flanges
- Single-acting, spring return cylinder
- Tri-blade technology provides three cutting surfaces on a single blade
- Interchangeable heads provide maximum nut range flexibility
- Preset scale allows controlled blade extension, which avoids damage to bolt threads
- Grip tape and handle included for more secure maneuverability
- Nickel-plated cylinder body for excellent corrosion protection and improved durability in harsh environments
- Internal Pressure Relief Valve for overload protection



◀ Heavily corroded and weathered nuts are quickly split and removed using an 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.



Hydraulic Nut Cutters

The NC-Series models are available featuring an angle-head design for 0.50" -2.88" hexagon nuts.

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FS-Series Spreaders

FS-Series Flange Spreaders provide quick and easy joint separation using hydraulic or mechanical force.

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ATM Flange Alignment Tools

The ATM series provides safe high-precision flange alignment tools that fit most commonly used ANSI, API, BS, and DIN flanges.

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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-xxxSx). Select Nut Splitter size and pump style from the chart below.

To order additional Cutting Heads (NSH-xxxxxx), Cylinders (NSC-xxx) or Replacement Blades (NSB-xxx), see Selection Chart below.

SET SELECTION:

- 1** Select your Nut Splitter
- 2** Select your pump type

NS Series



Capacity:

103.2-192.5 tons

Hexagon Nut Range:

2.75-5.38 inches

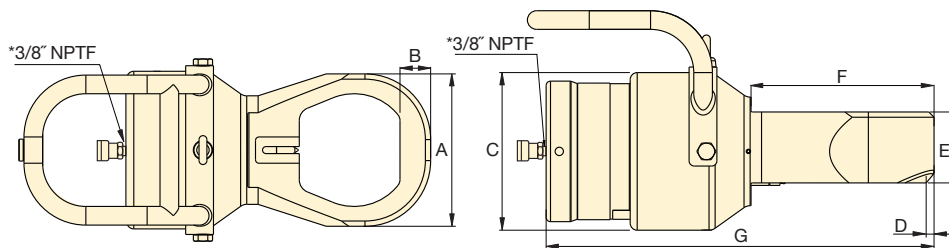
Maximum Operating Pressure:

10,000 psi

Nut Splitter Model Number	Set Model Number	Pump Options				Accessories Included			
		Hand Pump Model No.	Air Pump Model No.	Cordless Pump Model No. ¹⁾	Electric Pump Model No.	Gauge Model No.	Gauge Adaptor Model No.	Hose Model No.	Storage Case Model No.
NS-70105	NS-70105SH	P392	-	-	-	GP-10S	GA-2	HC-7206	CM-4
NS-70105	NS-70105SA	-	XA-11G*	-	-	integrated*	-	HC-7206	CM-4
NS-70105	NS-70105SCB	-	-	XC-1202MB	-	GA45GC		HC-7206	CM-4
NS-70105	NS-70105SE	-	-	-	PUD-1100B	GP-10S	GA-2	HC-7206	CM-7
NS-110130	NS-110130SH	P802	-	-	-	GP-10S	GA-2	HC-7206	CM-4
NS-110130	NS-110130SA	-	XA-11G*	-	-	integrated*	-	HC-7206	CM-4
NS-110130	NS-110130SCB	-	-	XC-1202MB	-	GA45GC		HC-7206	CM-4
NS-110130	NS-110130SE	-	-	-	PUD-1100B	GP-10S	GA-2	HC-7206	CM-7

¹⁾ XC Cordless Pump includes 115 V charger, for 230 V charger replace the "B" in the model number with an "E".

* XA-11G air pump features an integrated pressure gauge.



Hexagon Nut Range**	Bolt Range	Cap.	Oil Cap.	Model Number*	Dimensions (in)							Weight (lbs)	NS Cylinder	NS Cutting Head	Replacement Blade
					A	B	C	D	E	F	G				
(in)	(in)	(ton)	(in ³)												
2.75-3.13	1.75-2.00	103.2	23.0	NS-7080	5.2	1.1	7.1	0.3	3.2	7.3	16.2	81.4	NSC-70	NSH-7080	NSB-70
2.75-3.50	1.75-2.25	103.2	23.0	NS-7085	5.7	1.2	7.1	0.3	3.2	7.7	16.6	82.7	NSC-70	NSH-7085	NSB-70
2.75-3.88	1.75-2.50	103.2	23.0	NS-7095	6.3	1.3	7.1	0.3	3.2	7.9	17	84.9	NSC-70	NSH-7095	NSB-70
2.75-4.25	1.75-2.75	103.2	23.0	NS-70105	6.9	1.4	7.1	0.4	3.2	8.2	17.5	87.1	NSC-70	NSH-70105	NSB-70
4.25-4.63	2.75-3.00	192.5	50.0	NS-110115	7.4	1.4	9.2	0.1	4.4	9.2	18.6	151.6	NSC-110	NSH-110115	NSB-110
4.25-5.38	2.75-3.50	192.5	50.0	NS-110130	8.6	1.6	9.2	0.1	4.4	9.5	19.4	158.3	NSC-110	NSH-110130	NSB-110

* NS-Series Nut Splitters ship in two cases: One containing the NSC Cylinder and one containing the NSH Cutting Head. Assembly required.

** Maximum allowable hardness to split is HRc-44.

Pin Type Hydraulic Flange Spreaders

▼ Shown: FS-56



- Lightweight, ergonomic design for ease of use
- Adjustable jaw widths from 2.75" to 8.50" for a wide range of applications
- Single-acting, spring-return RC-Series cylinders for fast trouble-free operation

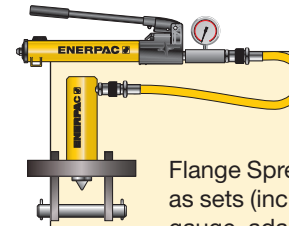
FS, STF Series



Capacity:
5-10 tons

Spread:
2.75 - 8.50 inches

Maximum Operating Pressure:
10,000 psi



Flange Spreader Sets*

Both Hydraulic Flange Spreaders are available as sets (includes pump, tool, gauge, adaptor and hose).

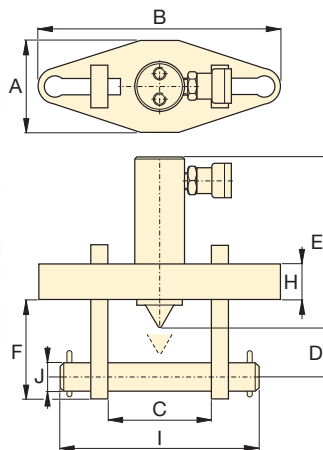
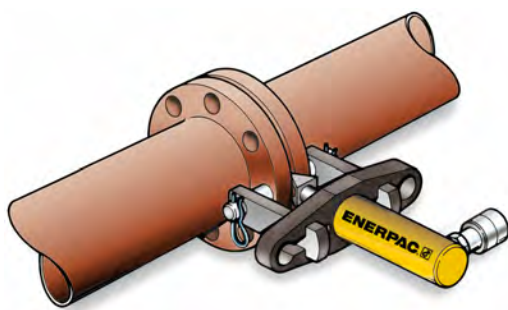
Set Model Number	Spreader Model Number	Pump Model Number
STF-56H	FS-56	P-392
STF-109H	FS-109	P-392
STF-109A	FS-109	PATG-1102N



Wedge Spreaders

Friction-free, smooth and parallel wedge movement with unique interlock wedge design. Eliminates flange damage and risk of spreading arm failure.

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Flange Spreader Matching Chart

ASA Rating (psi)	Pipe Size (in)	
	FS-56	FS-109
150	5-20	22-42
300	2.50-14	16-28
400	2.50-12	14-24
500	2.50-10	12-20
900	.50-6	8-16
1500	.50-3.50	4-8
2500	.50-2.50	3-4

Maximum Flange Thickness (in)	Stud Size (in)	Standard Wedge (in)	Cap. (ton)	Stroke (in)	Oil Cap. (in ³)	Model Number	Dimensions (in)										Weight (lbs)
							A	B	C		D	E	F	H	I	J	
									Min.	Max.							
2 x 2.25	.75-1.13	.13-1.13	5	1.50	1.50	FS-56*	3.00	8.25	2.75	6.10	1.28	7.71	3.45	1.00	8.10	.75	26
2 x 3.63	1.25-1.63	.13-1.13	10	2.13	4.80	FS-109*	4.25	11.00	4.10	8.50	1.98	6.00	4.50	1.50	10.75	1.25	40

* Available as Tool-Pump Set, see note on this page.

Hydraulic and Mechanical Industrial Spreaders

▼ Shown: FSH-14 and FSM-8 with safety blocks SB1



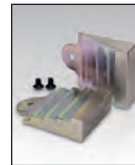
- Integrated wedge concept: friction-free, smooth, parallel wedge movement eliminates flange damage and spreading arm failure
- Unique interlocking wedge design: no first step bending and risk of slipping out of joint
- Requires very small access gap of only .24 inch (6 mm)
- Stepped spreader arm design: each step can spread under full load
- Few moving parts means durability and low maintenance
- Safety block SB-1 and ratchet spanner SW-22 included with FSM-8
- Safety block and Enerpac RC-102 cylinder included with FSH-14

FSM/FSH/STF Series

Tip Clearance / Maximum Spread*:
0.24/3.16 inches

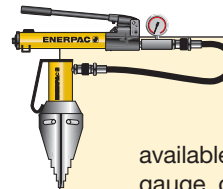
Maximum Spread Force:
8-14 tons

Maximum Operating Pressure:
10,000 psi (FSH-14)



Stepped Blocks FSB-1

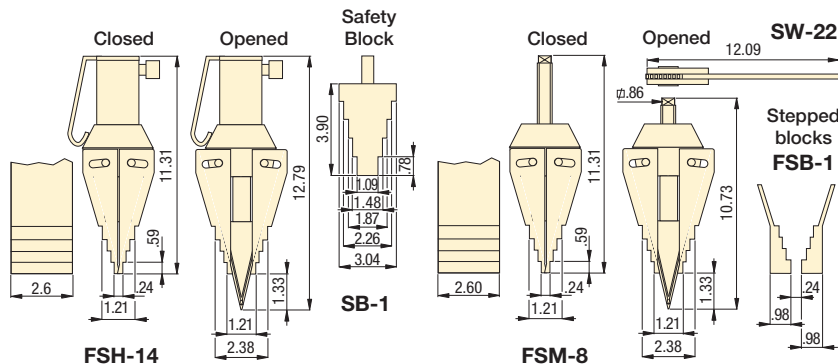
Use this pair of stepped blocks to increase wedge opening up to 3.16 in. (81 mm). Fits both FSH-14 and FSM-8.



Flange Spreader Sets

The hydraulic flange spreader, **FSH-14**, is available as a **set** (pump, tool, gauge, gauge adaptor, couplers and hose) for your ordering convenience.

Spreader Model No.	Handpump Model No.	Set Model Number
FSH-14	P-392	STF-14H



Max. Spreading Force (ton)	Model Number	Tip Clearance (in)	Max. Spread ¹⁾ (in)	Type	Oil Capacity (in ³)	Weight (lbs)
8	FSM-8	.24	3.16	Mechanical	-	14.3
14	FSH-14*	.24	3.16	Hydraulic	4.76	15.7

¹⁾ Using stepped blocks FSB-1.

* Available as Tool-Pump Set, see note on this page.

▼ Two FSH-14 spreaders used simultaneously with Enerpac handpump, hoses and AM-21 split-flow manifold.



▼ Shown clockwise from top: WR-5, A-92, WR-15



A, WR Series

Capacity:
0.75-1.00 ton

Tip Clearance:
0.50-1.38 inches

Maximum Spread Range:
3.70-11.50 inches

Maximum Operating Pressure:
10,000 psi

- Single-acting, spring return
- WR-15: For long-stroke spreading applications
- WR-5: For use in very confined work areas
- A-92*: Spreader attachment screws onto RC-Series 10-ton cylinders (except RC-101)



RC Series DUO Cylinders
10-ton RC Series DUO cylinders (except RC-101) fit into A-92 Spreader Attachment.

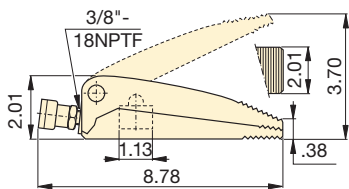
www.enerpac.com



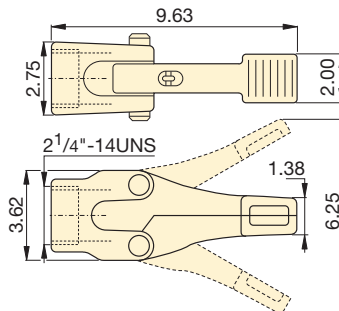
Best Match Hand Pump
To power your WR5 and WR15 the P-392 hand pump is an ideal choice.

www.enerpac.com

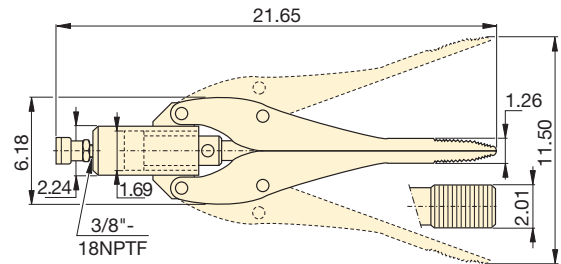
WR-5



A-92



WR-15



▼ A WR-5 wedgie cylinder is used for maintenance on a bridge bearing.



Spreader Capacity	Tip Clearance	Model Number	Maximum Spread	Cylinder Effective Area	Oil Capacity	Wt.
(ton)	(in)		(in)	(in ²)	(in ³)	(lbs)
1.00	.50	WR-5	3.70	1.00	.61	5.0
.75	1.26	WR-15	11.50	2.25	3.91	25.0
1.00	1.38	A-92*	6.25	–	–	8.0

* Maximum system pressure must be limited to half the rated pressure (5000 psi)

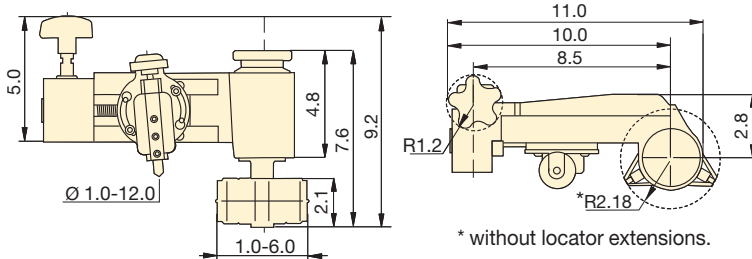
FF-Series, Mechanical Flange Face Tool

▼ Shown: FF-120



- Refacing made easy — hand-operated machine tool can be set up anywhere without the need for air, electric or hydraulic power support
- Lightweight and portable — easily transported to remote locations for increased productivity
- Adjustable cutting range for flange diameters between 1-12 inches [25,4-304,8 mm]
- Interchangeable collets for ID mounting range from 1-6 inches allowing 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

Dimensions shown in inches.



▼ TOOL SELECTION CHART

Pipe Flange Cutting Diameter Range		Internal Pipe Mounting Diameter Range		Average Roughness (Ra)		Model Number	Wt. (lbs)
(in)	(mm)	(in)	(mm)	(μ in)	(μ m)		
1.0-12.0	25,4-304,8	1.0-6.0	25,4-152,4	125-250	3,18-6,35	FF-120	15
				60-100*	1,52-2,54*		

* When using fine thread feed screw, FF120FSF.

FF Series

Pipe Flange Cutting Diameter Range:

1-12 in (25,4-304,8 mm)

Internal Pipe Mounting Diameter Range:

1-6 in (25,4-152,4 mm)

Average Roughness:

125-250 μ in (3,18-6,35 μ m)



Joint Separation Tools

FS and FSH-Series parallel wedge spreaders provide quick and easy joint separation using hydraulic or mechanical force.

Page: 66



Joint Assembly Tools

Rectify twist and rotational alignment without additional stress in pipe lines using the ATM-Series flange alignment tools.

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Fine Thread Feed Screw

Accessory Kit FF120FSF is included as standard and provides a fine thread feed screw, 1/2"-20 UNF, and delivers a Ra of:

60-100 μ in (1,52-2,54 μ m)

▼ The Enerpac FF120 Quick Face has same precision and quality of finish as powered machines.



▼ From left to right: **ATM-4**, **ATM-9**, **ATM-2**



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
- No slings, hooks or lifting gear required
- Can be installed and used in any position (horizontally or vertically)
- Portable, lightweight design enables easy transport and use, even in remote locations



Adjustable Reach

The highly adjustable reach of the wing and drop leg on the **ATM-4** and **ATM-9** allows precise alignment.



Gauge and Adaptor

The **ATM-9** includes P-142 hand pump and HC-7206C 6 ft. 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.

▼ *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.*



ATM-Series, Flange Alignment Tools

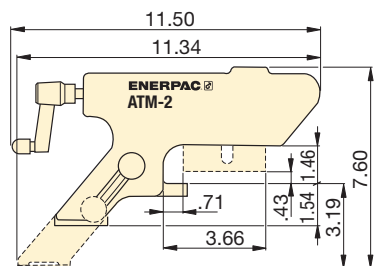
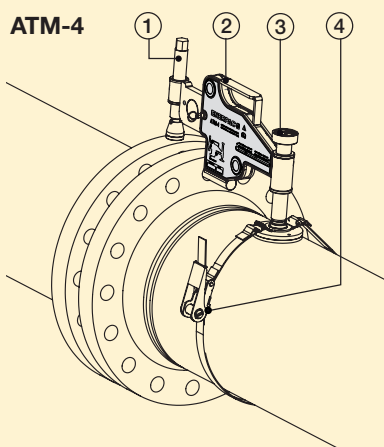


Applications

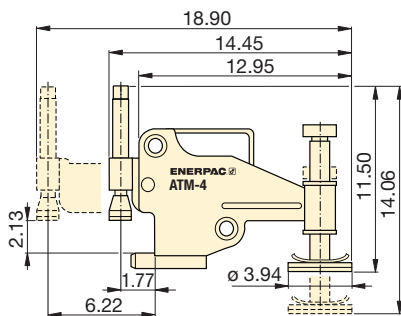
Enerpac ATM-Series Tools help correct flange misalignment, and allow bolts to be placed into joints. This alignment takes place during pipework construction, or maintenance.

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.

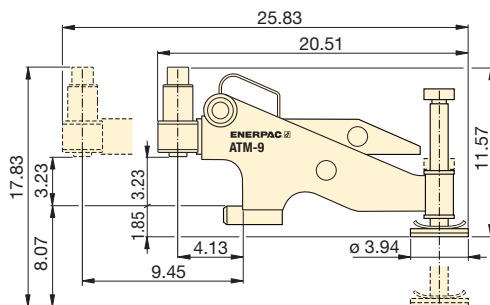
- ① Extendable wing provides usage on wide variety of flanges.
- ② Portable, light weight design enables easy transport and use.
- ③ Hand-adjustable base for easy positioning by a single operator.
- ④ Safety strap helps provide secure operation from a horizontal or vertical position.



ATM-2



ATM-4



ATM-9

ATM Series



Minimum Bolt Size:

.63-1.24 inches

Flange Wall Thickness:

.55-9.00 inches

Maximum Lifting Force:

1-10 tons



Cylinder-Pump Sets

Hydraulic cylinders, jacks and lifting wedges can also be used to assist in pipe line positioning and aligning.

www.enerpac.com



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.



Maximum Lifting Force (ton)* (kN)*	Model Number	Minimum Bolt Size**		Flange Wall Thickness (max)		Wt. (lbs)	
		(in)	(mm)	(in)	(mm)		
1	10	ATM-2	.63	16	.55 - 3.29	14 - 82	3.5
4	40	ATM-4	.95	24	1.18 - 5.23	30 - 133	19
10	90	ATM-9**	1.24	31,5	3.66 - 9.00	93 - 228	32

* At 10,000-psi maximum operating pressure.

** ATM-9 includes an Enerpac hand pump and hydraulic hose (gauge and adaptor sold separately). ATM-9 weight includes tool only.



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		74 ▶
Bolting Theory		76 ▶
Torque Tightening		78 ▶
Tensioning		80 ▶
Hexagon Bolt & Nut Sizes		82 ▶
Key to measurement		83 ▶
Pressure vs Torque Charts for S & W (X-Edition) Wrenches		84 ▶



ENERPAC WARRANTY STATEMENT

www.enerpac.com

Visit our website for the complete Enerpac Global Warranty or call your Enerpac Authorized Service Center.

Enerpac is certified for several quality standards. These standards require compliance with standards for management, administration, product development and manufacturing.



Enerpac’s Quality Management System is certified to the ISO 9001-2015 requirements.

CE Marking & Conformity

Enerpac provides Declarations of Conformity, Declarations of Incorporation, and CE marking for products that conform to the European Community Directives.



Where specified, Enerpac electric power units meet the design, assembly and test requirements of The Standards Council of Canada (CAN C22.2 No. 68-92), and UL73 for the United States. Units were tested and certified for both USA and Canada by TUV and CSA, Nationally Recognized Testing Laboratories.

EMC Directive

Where specified, Enerpac electric power pumps meet the requirements for Electro-magnetic Compatibility per EMC Directive 2014/30/EU.



DEKRA & IBEx
ATP-1500, ZA and XA-Series air-motor driven pumps, and S- and W-Series Torque Wrenches are tested and certified according to the Directive 2014 / 34 / EU “ATEX Directive”. The explosion protection is for equipment group II, equipment category 2 (hazardous area zone 1), in gas and/or dust atmospheres. ATP-1500, ZA and XA-Series pumps are marked with: Ex II 2 GD ck T4.

ASME B30.1-2015

Our cylinders fully comply with the criteria set forth by the American Society of Mechanical Engineers (except RD, BRD, CUSP, HCL, and LPL-Series).

ISO1402

Enerpac thermoplastic and rubber hoses are tested to the criteria set forth in this standard.

Product Design Criteria

All hydraulic components are designed and tested to be safe for use at maximum 10,000 psi unless otherwise specifically noted.

Bolting Solution and Application Worksheet



▼ Please complete the following information prior contacting Enerpac for your bolting proposal:

Requested By: _____ Requested Date: _____

Company: _____ Industry: _____

Contact: _____ Title: _____

Phone: _____ Fax: _____ Email: _____

Description of Application (provide drawings if possible):

Type of Application:

APPLICATION TECHNICAL DATA

Bolt Quantity: _____

Bolt Diameter: _____

Bolt Threads per Inch/Pitch: _____

Bolt Grade: _____

Bolt Coating: _____

Gasket Type: _____

App. Operating Temp., °C or °F: _____

Known Bolting Values:

Load
(Lbs. / kN) _____
% of Yield (psi/Nmm²) _____

Stretch-Bolt Length
(inch / mm) _____

Turn of Nut
(Preload / Degrees) _____

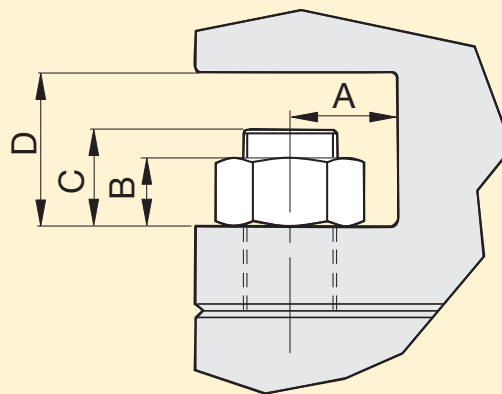
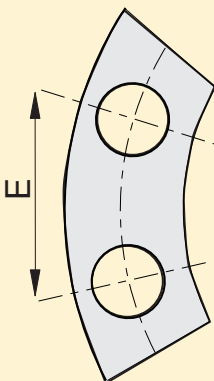
Torque
(Ft.lbs / Nm / Kgm) _____

Application Position:

Top-side

Vertical

Inverted



Specify Dimensions:

INCH

MM (Metric)

A _____ B _____ C _____ D _____ E _____

Distance to Closure: _____

Current Lubrication: Type _____ Brand _____



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 photos of Enerpac products throughout this catalog are used to portray how some of our customers have used hydraulics in industry.

In designing similar systems, care must be taken to select the proper components that provide safe operation and fit your needs.

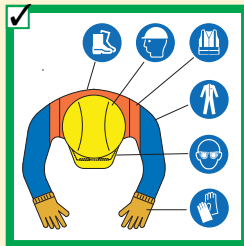
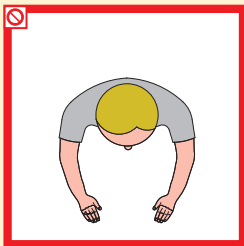
Check to see if all safety measures have been taken to avoid the risk of injury and property damage from your application or system.

Enerpac can not be held responsible for damage or injury, caused by unsafe use, maintenance or application of its products.

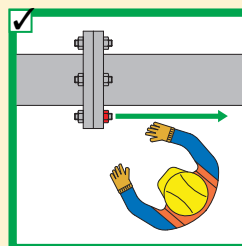
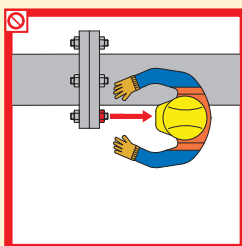
Please contact the Enerpac office or a representative for guidance when you are in doubt as to the proper safety precautions to be taken in designing and setting up your particular system.

In addition to these tips, every Enerpac product comes with instructions spelling out specific safety information. Please read them carefully.

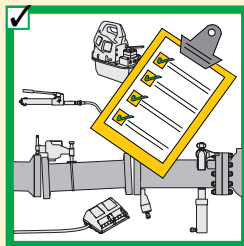
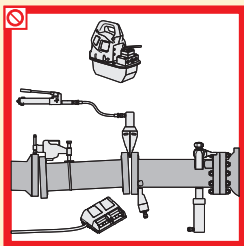
Bolting Tools



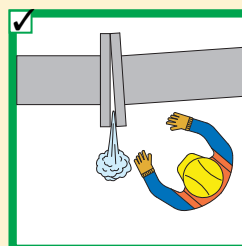
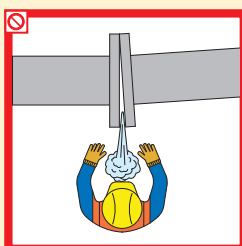
◀ Always use the proper personal protection equipment (PPE).



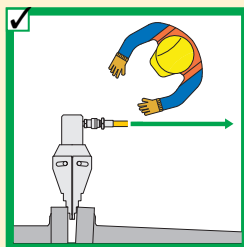
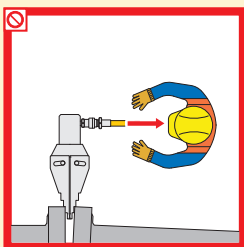
◀ Never stand in-line with the bolt axis.



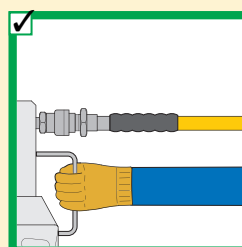
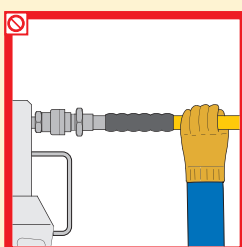
◀ Always check your system set-up and follow the correct bolting procedures.



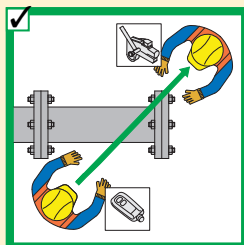
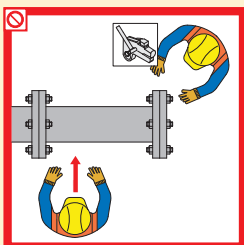
◀ Never stand in-line with the flange or pipe opening.



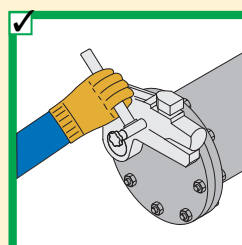
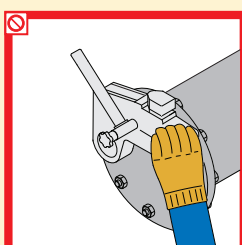
◀ Never stand in-line with the pressure, couplers or hoses.



◀ Never hold pressurized hoses.

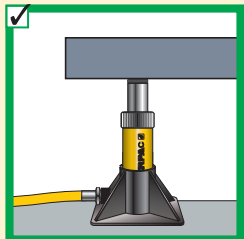
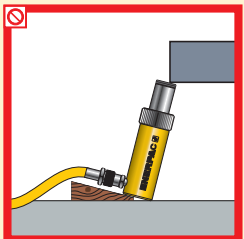


◀ The torque wrench (or tool) operator is always in charge.



◀ Hold torque wrench (or tool) at handle only. Do not place any part of body between wrench and reaction point.

Cylinders



◀ Provide a solid support for the entire cylinder base area. Use cylinder base attachment for more stability.

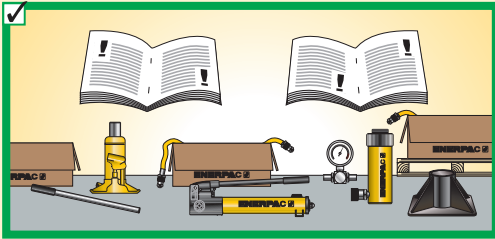


◀ As with jacks, never place any part of your body under the load. Load must be on cribbing before venturing under.

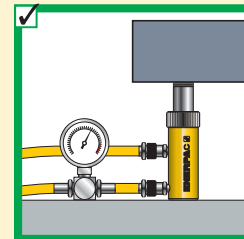
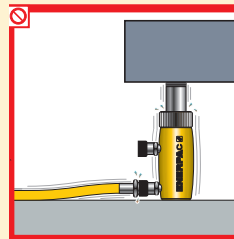


General

80% Manufacturer's rating of load and stroke are maximum safe limits. **80%**
Good practice encourages using only 80% of these ratings!

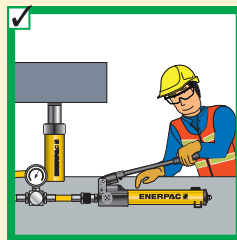
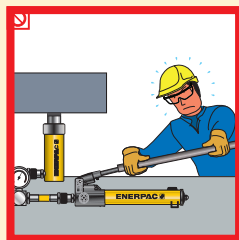


Always read instructions and safety warnings that come with your Enerpac hydraulic equipment.

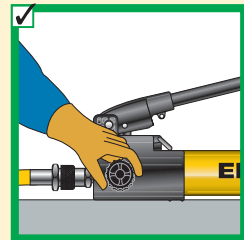
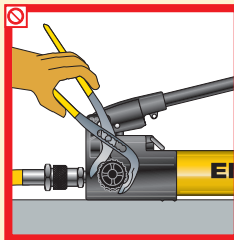


Both couplers must be connected when using double-acting cylinders. Ensure return hose is fitted.

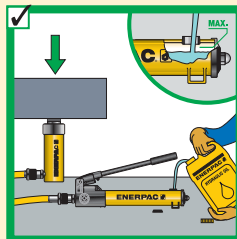
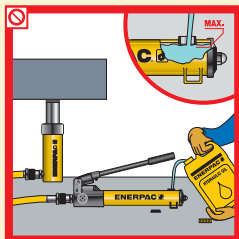
Pumps



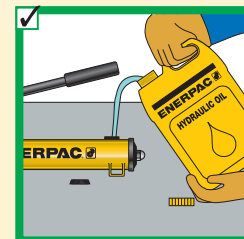
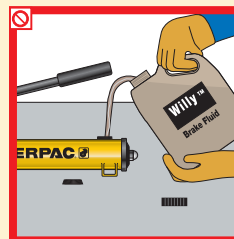
Don't use handle extenders. Hand pumps should be easy to operate when used correctly.



Close release valve finger tight. Using force will ruin the valve.

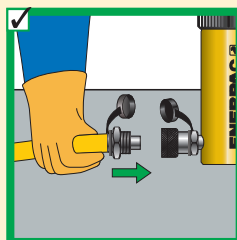
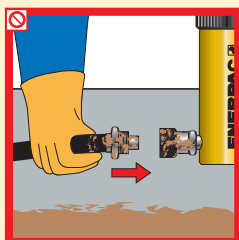


Fill pump only to recommended level. Fill only when connected cylinder is fully retracted.

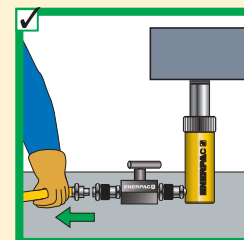
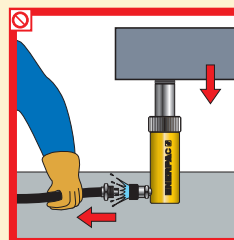


Always use genuine Enerpac hydraulic oil.

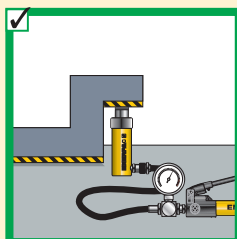
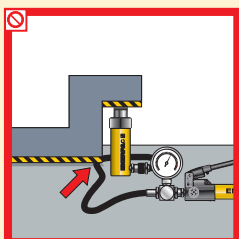
Hoses and couplers



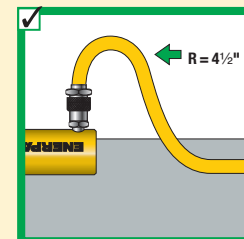
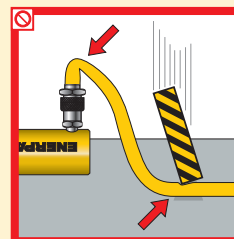
Clean both coupler parts before connecting. Use dust caps when coupler parts are not connected.



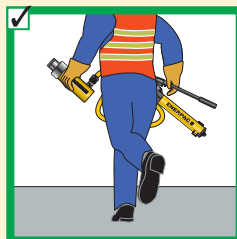
Detach cylinder only when fully retracted or use shut-off valves or safety valves to lock-in cylinder pressure.



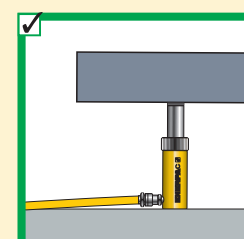
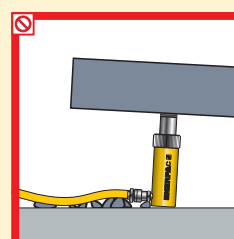
Keep hoses away from the area beneath loads.



Don't kink hoses. Bending radius should be at least 4 1/2 inch. Don't drive over or drop heavy objects on hoses.



Don't lift hydraulic equipment by the hoses.



Never allow the cylinder to be lifted off of the ground through the couplers.

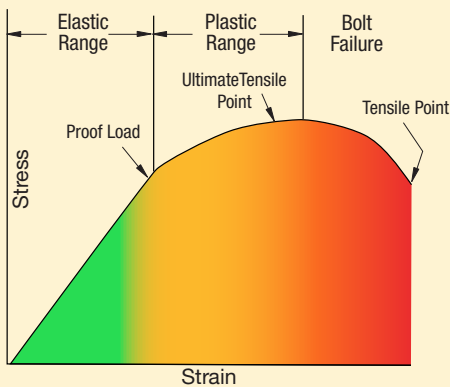


Function of Bolts and Nuts

Threaded fasteners are used across industry to assemble products ranging from pipelines to heavy-duty earth movers and from cranes to bridges and many more. Their principle function is to create a clamping force across the joint which is able to sustain the operating conditions without loosening.

Correctly tightened bolts make use of their elastic properties, to work well they must behave like springs. When load is applied, the bolt stretches and tries to return to its original length. This creates compressive force across the joint members.

Hooke's Law of Physics



Behavior of Bolts and Nuts

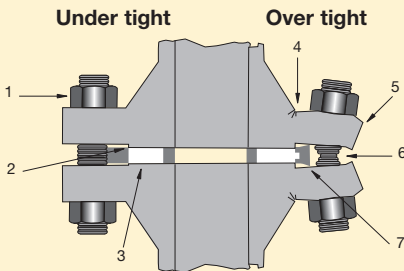
Elasticity is defined in Hooke's Law of physics: The stress in a bolt is directly proportional to its strain. The stress-strain of a bolt has an **elastic range** and a **plastic range**. In the elastic range Hooke's Law is true.

All of the elongation applied within the elastic range is relieved when the load is removed. The amount of elongation increases when more load is applied. When a bolt is stressed beyond its **proof load** (maximum load under which a bolt will behave in an elastic manner), the elastic elongation changes to plastic deformation and the strain will no longer be proportional to the stress.

In the plastic deformation a part of the elongation will remain after the load is removed. The point where this permanent elongation occurs is called the yield strength. The further application of load takes the bolt to a point where it begins to fail this is termed its **ultimate tensile strength** (UTS). At this UTS-point, if additional force is applied to the bolt it will continue to elongate until it finally breaks. The point at which the bolt breaks is called the **tensile point**.

Careful attention must be paid to the grade of bolt being used as bolt grades differ in the elastic range.

Uniform preload (residual load)



1. Bolt loosens due to cycle loads of vibration.
2. Sealing face surface damage.
3. No compression.
4. Cracking.
5. Flange rotation.
6. Yielding of bolts.
7. Over compression of gasket.

Preload

The main purpose of a bolt and nut is to clamp parts together with the correct force to prevent loosening in operation. The term **preload** refers to the loading in a bolt immediately after it has been tightened.

The amount of preload (residual load) is critical as the joint can fail if the load in the bolt is too high, too low or not uniform in every bolt.

Uneven bolt loads can result in:

- Some bolts being loose while others are overloaded.
- Crushing of the gasket on one side, leakage on the other side.

Preload is normally dictated by the joint design, (see Enerpac Bolted Joint Integrity) for information on common joint types or contact your local representative.



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. There are two main techniques: Torque tightening and Bolt tensioning.

1. **Torque tightening** - Achieves preload in a bolt and nut assembly via the nut in a controlled manner using a tool.
2. **Bolt tensioning** - Achieves preload in a bolt and nut assembly by stretching the bolt axially using a tool.

Advantages of Controlled Tightening

Known, controllable and accurate bolt loads

Employs tooling with controllable outputs and adopts calculation to determine the required tool settings.

Safe operation following prescribed procedures

Eliminates the dangerous activities of manual uncontrolled tightening and requires that the operators be skilled and follow procedures.

Reliable and repeatable results

Using calibrated, tested equipment, following procedures and employing skilled operators achieves known results consistently.

Uniformity of bolt loading

Especially important on gasketed joints as an even and consistent compression is required for the gasket to be effective.

Reduces operational time resulting in increased productivity

Reduces tightening time and operator fatigue by replacing manual effort with the use of controlled tooling.

The right results first time

Many of the uncertainties surrounding in-service joint failures are removed by ensuring the correct assembly and tightening of the joint are carried out the first time.



Bolting Integrity Software

A comprehensive 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.

The screenshot displays the Enerpac Bolting Calculator interface. It features a navigation menu with 'Calculations', 'Inquiries', 'Help', 'Contact Us', and 'Enerpac.com'. The main content area is titled 'Torque Calculation' and includes a 'Calculation Information' section with various input fields for tightening method, pressure units, lubricant, standard, breakout, flange size, flange class, flange material, gasket, joint type, and bolt material. A 'Tooling Options' list is also visible. On the right, there are 'Diagram Values' and 'Tightening Values' tables. A 'Selected Tool' section shows 'No Tool Selected'. At the bottom, there is a 'Messages' area.

Bolt Hole Diameter (I):	35mm (1.37")
Flange OD (d):	311mm (12.24")
Bolt Circle Diameter (k):	241mm (9.5")
Total Flange Length (h):	126mm (4.93")
Flange Thickness (b):	54mm (2.13")
Weld Neck OD (m):	162mm (6.38")
Pipe OD (a):	114mm (4.5")

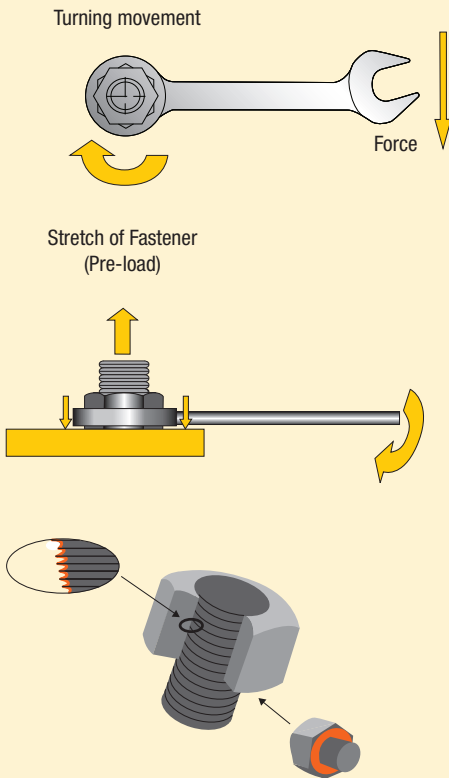
Residual Stress:	334 N/mm ²	48394 lbs/in ²
Bolt Load:	209956 N	47200 lbf
Torque:	1102 Nm	813 lbf.ft
Lubricant:	μ advised as 0.12 (0.12μ)	

Joint Thickness (basic):	125mm (4.93")	
(Extra):	0mm (0")	
Bolts:	8 x M33	
Min Bolt Length:	211mm (8.32")	
NUT A/P:	50mm (1.91")	
Minimum To Seal:	254.49 N/mm ² (36909 Psi)	
Yield Stress:	724 N/mm ²	
Allowable Stress:	615.4 N/mm ²	
% Residual Yield:	46%	
Applied Stress:	334 N/mm ²	48394 lbs/in ²
Applied Load:	209956 N	47200 lbf

Visit www.enerpac.com to access our free on-line bolting software application and obtain information on tool selection, bolt load calculations and tool pressure settings. A combined application data sheet and joint completion report is also available.



Torque Tightening



Friction points should always be lubricated when using the torque tightening method.

What is Torque?

It is a measure of how much force acting on an object which causes that object to rotate.

What is Torque Tightening?

The application of preload to a fastener by the turning of the fastener's nut.

Torque Tightening and Preload

The amount of preload created when torqueing is largely dependant on the effects of friction.

Principally there are three different "torque components":

- torque to stretch the bolt
- torque to overcome the friction in bolt and nut threads
- torque to overcome friction at the nut spot face (bearing contact surface).



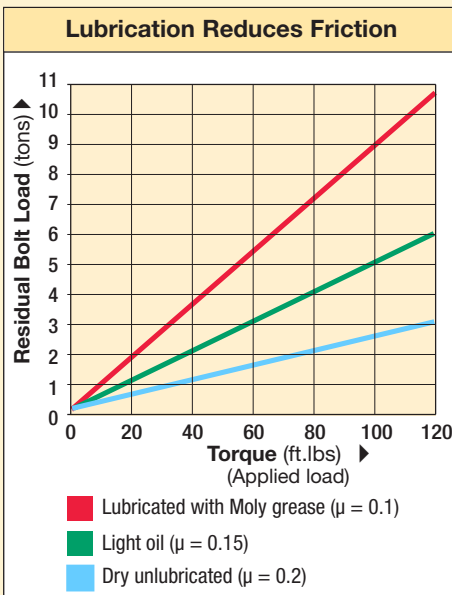
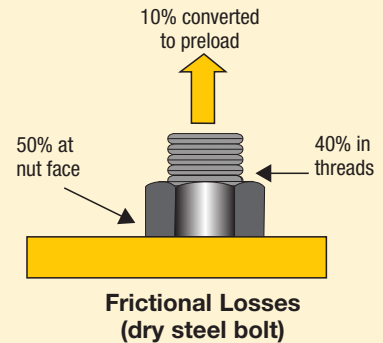
$$\text{Preload (residual load)} = \text{Applied Torque} \textit{ minus} \text{ Frictional Losses}$$

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



Example of how a lubricant can reduce the effect of friction and convert more torque to bolt preload.

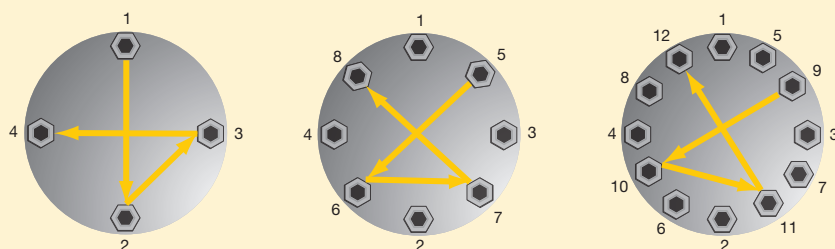


Manufacturer's rating of pressure and torque are maximum safe limits. Good practice encourages using only 80% of these ratings!

Torque Procedure

When torquing it is common to tighten only one bolt at a time, this can result in Point Loading and Load Scatter. To avoid this, torque is applied in stages following a prescribed pattern:

Torque Sequence



- Step 1:** Spanner tight ensuring that 2-3 threads extend above nut
- Step 2:** Tighten each bolt to one-third of the final required torque following the pattern as shown above.
- Step 3:** Increase the torque to two-thirds following the pattern shown above.

- Step 4:** Increase the torque to full torque following the pattern shown above.
- Step 5:** Perform one final pass on each bolt working clockwise from bolt 1, at the full final torque.



Select the Correct 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.

Minimum Output Torque

- The recommended minimum torque value of a hydraulic wrench is 10% of the maximum rated value.



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.

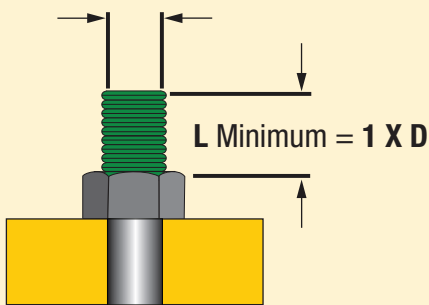
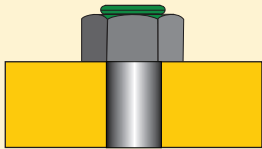
Breakout torque cannot be accurately calculated, however, depending on conditions it can take up to 2½ times the input torque to breakout.

The use of penetrating oils or anti-seize products is always recommended when performing breakout operations.



Tensioning

Tensioning requires longer bolts



What is Bolt Tensioning

Tensioning is the direct axial stretching of the bolt to achieve **preload**. Inaccuracies created through friction are eliminated. Massive mechanical effort to create torque is replaced with simple hydraulic pressure. A uniform load can be applied by tensioning multiple studs simultaneously.

Tensioning requires longer bolts, and a seating area on the assembly around the nut. Tensioning can be done using detachable Bolt Tensioners or Hydraulic Nuts.



Preload (residual load) = Applied Load minus Load Losses

What is Load Loss

Load loss is a loss of bolt elongation depending on factors such as thread deflections, radial expansion of the nut, and embedding of the nut into the contact area of the joint. Load loss is accounted for in calculation and is added to the preload value to determine the initial **Applied Load**.

The preload depends on **Applied Load and Load Loss (load loss factor)**.



GLOSSARY OF TERMS

Applied Load: The load applied to a bolt during tensioning which includes an allowance for Load Loss.

Bolt Tensioning: A method of controlled tightening which applies preload to a bolt by stretching it axially.

Breakout Torque: The amount of torque required to loosen a tightened bolt. (Usually more torque is required to loosen a bolt than was used to tighten it.)

Elastic Range: The range on a bolt's stress / strain curve where stress is directionally proportional to strain.

Load Loss: The losses in a bolt which occur on transfer of load from a tensioning device to the bolt assembly (these may arise from phenomena such

as thread deflection and embedding of the nut to the contact area of the joint, and is calculated as a factor of the length to diameter ratio of the bolt).

Load Scatter: The spread of differing loads in a sequence of bolts after they have been loaded. It is mostly due to the elastic interaction of the bolts and the joint member; as subsequently tightened bolts further compress the joint, previously tightened bolts are subject to some relaxation.

Plastic Range: The range on a stress/strain curve where the tensile load applied to a bolt results in permanent deformation.

Preload: The load in a bolt immediately after it has been tightened.

Proof Load: Proof load is often used interchangeably with Yield Strength but is usually measured at 0.2% plastic strain.

Tensile Point: The point at which the tensile loading on a bolt causes the bolt to rupture.

Torque Tightening: The application of Preload to a bolt by turning of the bolt's nut.

Ultimate Strength: The maximum tension which can be created by tensile load on a bolt.

Yield Strength: The point at which a bolt begins to plastically deform under tensile loading.

NOTE: Bolt is used as a generic term for a threaded fastener.



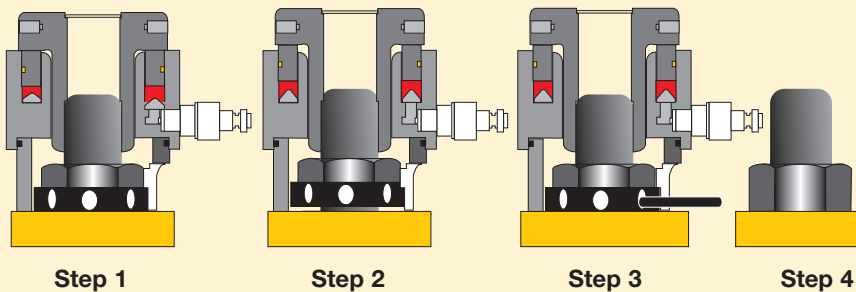
Manufacturer's rating of pressure and load are maximum safe limits. Good practice encourages using only 80% of these ratings!

Tensioning Operation

Tensioning permits the simultaneous tightening of multiple bolts; the tools are connected in sequence via a high-pressure hose assembly to a single pump unit. This ensures each tool develops the exact same load and

provides a uniform clamping force across the joint. This is especially important for pressure containing vessels requiring even gasket compression to affect a seal.

General Procedure



Step 1: The bolt Tensioner is fitted over the stud.

Step 2: Hydraulic pressure is applied to the tensioner which then stretches the stud.

Step 3: The Stud's nut is wound down against the joint face.

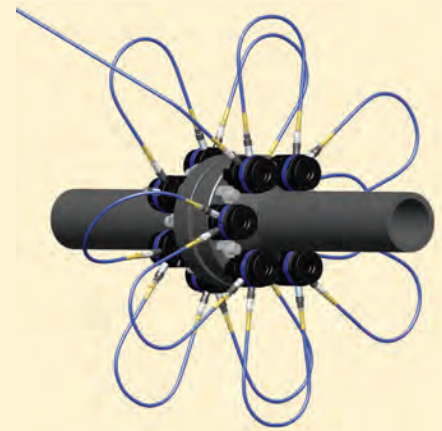
Step 4: Pressure is released and the tool removed.

The bolt behaves like a spring, when the pressure is released the bolt is under tension and attempts to contract, creating the required clamping force across the joint.

Less than 100% Tensioning

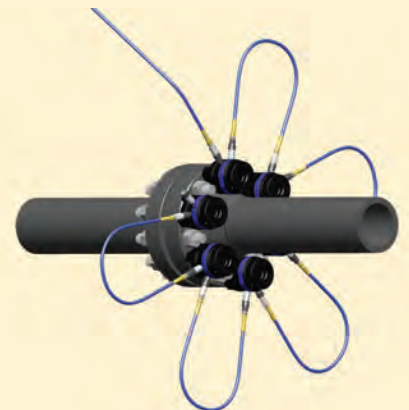
Not all applications allow for the simultaneous fit of a tensioning device on each bolt, in these cases at least two tensioning pressures are applied. This is to account for a load loss in those bolts already tensioned as the

next sets are tightened. The load losses are accounted for in calculation and a higher load is applied to allow the first sets to relax back to the target preload.



Set-up using a 100% tensioning procedure

All bolts are tensioned simultaneously.



Set-up using a 50% tensioning procedure

Half the bolts are tensioned simultaneously, the tools are relocated on the remaining bolts and they are subsequently tensioned.



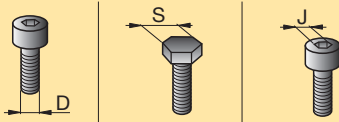
Read Instruction Manuals

Please refer to the product Instruction Sheets for safe use guidelines and detail on the correct set up and operation of the equipment.



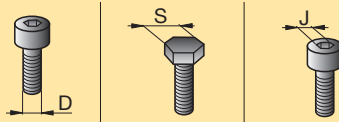
Hexagon Nut and Bolt Sizes

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 (in)	Hexagon Size * S (in)	Hexagon Size J (in)
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.



Use only Heavy Duty Impact Sockets for power driven torquing equipment, according to ISO2725 and ISO1174; DIN3129 and DIN3121 or ASME-B107.2/1995.

Page: 10



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.

FDM Conversion Chart		
Inches	Decimal	mm
1/16	0.06	1,59
1/8	0.13	3,18
3/16	0.19	4,76
1/4	0.25	6,35
5/16	0.31	7,94
3/8	0.38	9,53
7/16	0.44	11,11
1/2	0.50	12,70
9/16	0.56	14,29
5/8	0.63	15,88
11/16	0.69	17,46
3/4	0.75	19,05
13/16	0.81	20,64
7/8	0.88	22,23
15/16	0.94	23,81
1	1.00	25,40

Pressure:

1 psi	= 0,069 bar
1 bar	= 14,50 psi
	= 10 N/cm ²
1 kPa	= 0,145 psi
1 MPa	= 145 psi

Force:

1 lbf	= 4.45 N
1 klb	= 1000 lbf
1 kN	= 1000 N

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

Temperature:

To Convert °C to °F:
 $T^{\circ}\text{F} = (T^{\circ}\text{C} \times 1,8) + 32$

To Convert °F to °C:
 $T^{\circ}\text{C} = (T^{\circ}\text{F} - 32) \div 1,8$

Volume:

1 in ³	= 16,387 cm ³
1 cm ³	= 0,061 in ³
1 liter	= 61,02 in ³
	= 0,264 gal
1 US gal	= 3,785 cm ³
	= 3,785 l
	= 231 in ³

Other measurements:

1 in	= 25,4 mm
1 mm	= 0,039 in
1 ft	= 0,3048 m
1 m	= 3,2808 ft
1 in ²	= 6,452 cm ²
1 cm ²	= 0,155 in ²
1 hp	= 0,746 kW
1 kW	= 1,340 hp
1 Nm	= 0,738 Ft.lbs
1 Ft.lbs	= 1,356 Nm
1 kN	= 224,82 lbs
1 lb	= 4,448 N



Free Conversion Calculator

Visit enerpac.com and download the free conversion calculator.



Pressure vs Torque

See the pressure vs torque charts for S and W-Series hydraulic torque wrenches.

Page: **84**

Torque Conversion Factors

Units to be converted	International System - S.I. Nm	Imperial Lbf.ft	Metric kgf.m
1 Ft.lbs	1,356	1,000	0,138
1 Nm	1,000	0,738	0,102
1 kgf.m	9,807	7,233	1,000



Pressure vs. Torque S-Series, (X-Edition)



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.

$$T = P \times T_F$$

$$P = T / T_F$$

Where: T = target torque

P = pressure

T_F = theoretical applied torque



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▼ S-Series (X-Edition)

Pressure vs. Torque – S-Series Torque Wrench Imperial Table					
Pump Pressure	S1500X Torque Output (T _F 0.144)	S3000X Torque Output (T _F 0.3225)	S6000X Torque Output (T _F 0.615)	S11000X Torque Output (T _F 1.1175)	S25000X Torque Output (T _F 2.515)
(psi)	(ft-lbs)	(ft-lbs)	(ft-lbs)	(ft-lbs)	(ft-lbs)
1000	144	323	615	1118	2515
1200	173	387	738	1341	3018
1400	202	452	861	1565	3521
1600	230	516	984	1788	4024
1800	259	581	1107	2012	4527
2000	288	645	1230	2235	5030
2200	317	710	1353	2459	5533
2400	346	774	1476	2682	6036
2600	374	839	1599	2906	6539
2800	403	903	1722	3129	7042
3000	432	968	1845	3353	7545
3200	461	1032	1968	3576	8048
3400	490	1097	2091	3800	8551
3600	518	1161	2214	4023	9054
3800	547	1226	2337	4247	9557
4000	576	1290	2460	4470	10,060
4200	605	1355	2583	4694	10,563
4400	634	1419	2706	4917	11,066
4600	662	1484	2829	5141	11,569
4800	691	1548	2952	5364	12,072
5000	720	1613	3075	5588	12,575
5200	749	1677	3198	5811	13,078
5400	778	1742	3321	6035	13,581
5600	806	1806	3444	6258	14,084
5800	835	1871	3567	6482	14,587
6000	864	1935	3690	6705	15,090
6200	893	2000	3813	6929	15,593
6400	922	2064	3936	7152	16,096
6600	950	2129	4059	7376	16,599
6800	979	2193	4182	7599	17,102
7000	1008	2258	4305	7823	17,605
7200	1037	2322	4428	8046	18,108
7400	1066	2387	4551	8270	18,611
7600	1094	2451	4674	8493	19,114
7800	1123	2516	4797	8717	19,617
8000	1152	2580	4920	8940	20,120
8200	1181	2645	5043	9164	20,623
8400	1210	2709	5166	9387	21,126
8600	1238	2774	5289	9611	21,629
8800	1267	2838	5412	9834	22,132
9000	1296	2903	5535	10,058	22,635
9200	1325	2967	5658	10,281	23,138
9400	1354	3032	5781	10,505	23,641
9600	1382	3096	5904	10,728	24,144
9800	1411	3161	6027	10,952	24,647
10,000	1440	3225	6150	11,175	26,150

Pressure vs. Torque W-Series, (X-Edition)



▼ W-Series (X-Edition)

Pressure vs. Torque – W-Series Torque Wrench Imperial Table						
Pump Pressure	W2000X Torque Output	W4000X Torque Output	W8000X Torque Output	W15000X Torque Output	W22000X Torque Output	W35000X Torque Output
	(T _F 0.204)	(T _F 0.4175)	(T _F 0.847)	(T _F 1.533)	(T _F 2.25)	(T _F 3.50)
(psi)	(ft-lbs)	(ft-lbs)	(ft-lbs)	(ft-lbs)	(ft-lbs)	(ft-lbs)
1000	204	418	847	1533	2250	3500
1200	245	501	1016	1840	2700	4200
1400	286	585	1186	2146	3150	4900
1600	326	668	1355	2453	3600	5600
1800	367	752	1525	2759	4050	6300
2000	408	835	1694	3066	4500	7000
2200	449	919	1863	3373	4950	7700
2400	490	1002	2033	3679	5400	8400
2600	530	1086	2202	3986	5850	9100
2800	571	1169	2372	4292	6300	9800
3000	612	1253	2541	4599	6750	10500
3200	653	1336	2710	4906	7200	11200
3400	694	1420	2880	5212	7650	11900
3600	734	1503	3049	5519	8100	12600
3800	775	1587	3219	5825	8550	13300
4000	816	1670	3388	6132	9000	14000
4200	857	1754	3557	6439	9450	14700
4400	898	1837	3727	6745	9900	15400
4600	938	1921	3896	7052	10350	16100
4800	979	2004	4066	7358	10800	16800
5000	1020	2088	4235	7665	11250	17500
5200	1061	2171	4404	7972	11700	18200
5400	1102	2255	4574	8278	12150	18900
5600	1142	2338	4743	8585	12600	19600
5800	1183	2422	4913	8891	13050	20300
6000	1224	2505	5082	9198	13500	21000
6200	1265	2589	5251	9505	13950	21700
6400	1306	2672	5421	9811	14400	22400
6600	1346	2756	5590	10118	14850	23100
6800	1387	2839	5760	10424	15300	23800
7000	1428	2923	5929	10731	15750	24500
7200	1469	3006	6098	11038	16200	25200
7400	1510	3090	6268	11344	16650	25900
7600	1550	3173	6437	11651	17100	26600
7800	1591	3257	6607	11957	17550	27300
8000	1632	3340	6776	12264	18000	28000
8200	1673	3424	6945	12571	18450	28700
8400	1714	3507	7115	12877	18900	29400
8600	1754	3591	7284	13184	19350	30100
8800	1795	3674	7454	13490	19800	30800
9000	1836	3758	7623	13797	20250	31500
9200	1877	3841	7792	14104	20700	32200
9400	1918	3925	7962	14410	21150	32900
9600	1958	4008	8131	14717	21600	33600
9800	1999	4092	8301	15023	22050	34300
10,000	2040	4175	8470	15330	22500	35000



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Where: T = target torque

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T_F = theoretical applied torque



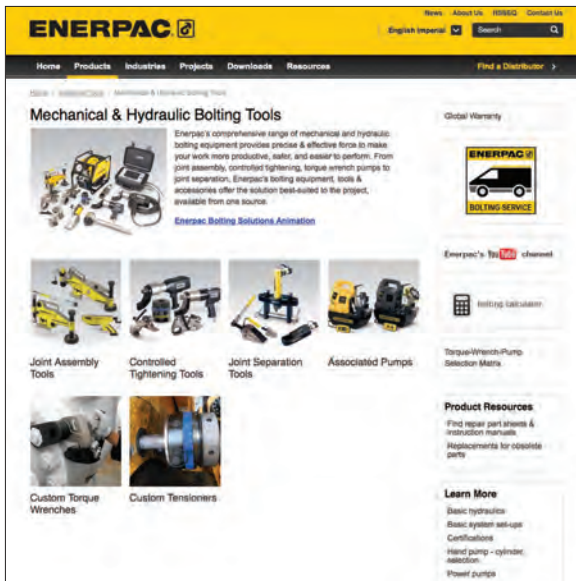
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The software offers Tool selection, Bolt Load calculations and Tool pressure settings, as well as, a combined Application data sheet and Joint completion report.



Torque Calculation Engine

Enerpac's Bolting Calculator is our free web-based calculator designed to technically support our products. The software will calculate as well as recommend bolt load/stresses for your bolted applications. You may choose between torque or tension as your tightening method and all calculations include hydraulic tool pressures based on tool selection.

Calculation Features

ANSI B16.5 & B16.47 Flanges
API 6A & 17D Flanges

Custom Calculations

Customer Support Features
Access to Technical Documents
Engineering Inquiry Section
Procedures and Guidance

Log on to the bolting calculator at www.enerpac.com

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.

www.enerpac.com for latest Enerpac information

Visit the Enerpac Web Site and find out about:

- Bolting Calculator
- Learn more about hydraulics
- Promotions
- New products
- Electronic Catalogs
- Trade shows
- Manuals (instruction and repair sheets)
- Nearest Distributors & Service Centers
- Enerpac products in action
- Heavy Lifting Technology

Ordering Products and Catalogs

To find the name of the closest Enerpac distributor or service center, to request literature or technical application assistance, go to www.enerpac.com



Enerpac Bolting Van

Enerpac's Bolting Van offers full bolting tool service and maintenance wherever you need it.

- Demonstrate Enerpac Bolting Tools on your premises
- Repair and calibrate all Bolting Tool brands
- Training for the safe and efficient use of Bolting Tools

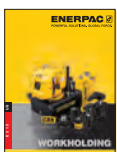
Enerpac catalogs/brochures to meet your needs:

To obtain your copy just give us a call, or visit our Internet site www.enerpac.com



E329, The Full Enerpac Industrial Tool Line

Ask for your free copy of the Enerpac Industrial Tools catalog for information about Enerpac High Force Tools. The catalog contains our full line of cylinders, pumps, tools, valves, bolting solutions, and accessories.



E215 Workholding Catalog

Offers innovative products and solutions to provide powerful clamping and positioning force to every type of manufacturing process. Enerpac Workholding solutions increase product quality and production output.



At Enerpac, we are committed to safety. Unfortunately, serious incidents can happen on a job site. Nevertheless, such mishaps may be avoidable if workers pay attention to the hazards and potential risks, and know how to use tools correctly. Whether you work in maintenance or production, power plant, shipyard, mine, shop floor or construction site; learning to use hydraulic tools safely is mandatory.

Our Goal Zero initiative is part of our global commitment to improve workplace safety. We are committed to achieve the Goal of Zero harm to customers and end-users of our products.

Enerpac Academy - The Power of Knowledge



The Enerpac Academy is our in-house training program, offering Enerpac product operators and maintenance staff the opportunity to be trained in the use and maintenance of high-pressure hydraulic tools.

Operating these tools requires sound knowledge of how they work and how they should be maintained. Correct use of these tools increases safety and reduces risk – both for the operator and the environment in which the tools are used. Having the right training enables the operator to use the tools safely and properly.



Enerpac Academy

- Safety focus for operators, tools and environment
- Dedicated in-house Enerpac training centers
- Both standard training courses and specialized training services
- Highly experienced trainers
- Selection of training courses with a proven (value-added) track record
- Knowledge and experience sharing

In-house Training Centers

Do you work with high-pressure hydraulic tools on a regular basis or even every day? The training courses are designed to be highly interactive with a strong hands-on element. Each training course is led by a qualified trainer, an Enerpac specialist capable of providing high quality training. A written or practical exam is part of certain training courses.



Training Center Locations

- Columbus, Wisconsin (USA)
- Ede (The Netherlands)
- Hosur, Bangalore area (India)
- Singapore
- Sydney (Australia)

Enerpac Academy offers a meticulously compiled training program covering tool knowledge, repairs and maintenance, and safe operation of Enerpac hydraulic tools. If you would like to schedule a training course, please contact Enerpac for a training calendar, application form, and brochure at www.enerpac.com.



<http://www.enerpac.com/en/enerpac-locations>

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All illustrations, performance specifications, weights and dimensions reflect the nominal values and slight variations may occur due to manufacturing tolerances. Please consult Enerpac if final dimensions are critical.

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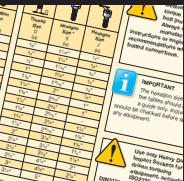


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