

ENERPAC 

E410

Bolting Solutions

**A complete range of professional
hydraulic and mechanical tools
for the bolting industry**



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. From mechanical torque multipliers to hydraulically driven square drive wrenches, and from low profile torque wrenches to inter-connectable bolt tensioning tools; we offer the products you need for accurate and simultaneous tightening of multiple bolts.

Joint Separation

Enerpac also provides hydraulic nut splitters and a variety of mechanical and hydraulic spreading tools for joint separation during inspection, maintenance and decommissioning operations.

High quality bolting solutions from the brand you can trust. See how Enerpac can make your bolting work-flow more accurate, safer and efficient.



Bolting Integrity Software

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



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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 Application

Controlled Tightening of Multiple sized fasteners for industrial applications.

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.

SQD and HXD Series Torque Wrenches



General Applications

Controlled Tightening of Multiple sized fasteners.

Solution: Hydraulic Torque Wrenches

Lightweight aluminum tools for controlled bolting.



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 GT Series 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.

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

NC – Hydraulic Nut Cutters



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: **Parallel Wedge 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



For Bolting Solutions Think Enerpac

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



- 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 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)

Accurate, Efficient Torque Multiplication

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



Typical Torque Multiplier Applications

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



MTW-250 Manual Torque Wrench

Available to power manual torque multipliers.

Technical information:

- 1/2" Square Drive
- 45-250 Ft.lbs. (60-330 Nm)



◀ Enerpac Reaction Bar Torque Multiplier E393 used to manually torque bolts up to 3,200 ft-lbs.

▼ SELECTION CHART

Torque Multiplier Type	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



Maximum Output Torque:

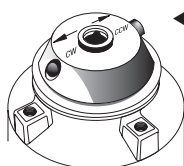
750-8000 Ft.lbs

Torque Ratio:

3:1-52:1

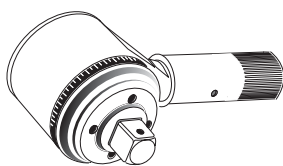
Multiplier Output Ratio Accuracy:

± 5 %



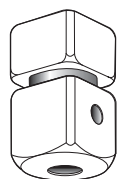
Selector Pawl

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



Angle-of-Turn Protractor

E391, E392 and E393 models include an angle-of-turn protractor (scale) to tighten fasteners using a "torque turn" method. Allows accurate measuring a specific number of degrees of rotation.



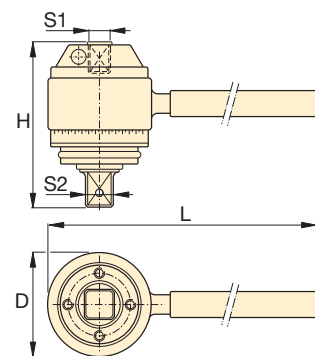
Shearable Square Drive

Provides overload protection on E300- and E400-series multiplier's power train by shearing at 103-110% of rated capacity. Internal shear pin prevents tool from falling off bolt.

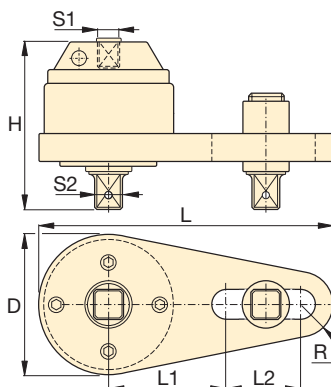


CAUTION!

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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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)			D	H	L	L1	L2	R		
227	308	3 : 1	1/2	3/4	—	No	No	2.8	3.3	8.6	—	—	—	4	E290PLUS
303	411	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	—	—	—	9.0	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	19.4	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.

▼ From left to right: S3000, S6000, S1500



Rigid Steel Design

The *Professional* Square Drive Solution



S-Series, Square Drive Wrenches

This product range has been designed using state-of-the-art CAD techniques to bring you the most advanced square drive torque wrench on the market. To ensure that the tools you buy meet our own exacting requirements, during the design process every prototype was put through finite element stress analysis, photo-elastic modeling, rigorous cyclic testing and strain gauging.

Simplicity

- 360° click-on, multi-position reaction arm
- Push button square drive release for quickly reversing the square drive for tightening or loosening
- Fine tooth ratchet prevents tool “lock-on”
- Single 360° hydraulic swivel manifold, complete with screw lock couplings, increases wrench and hose maneuverability

Design

- Compact, high-strength uni-body construction for a small operating radius
- Robust design with minimal parts enables easy on-site maintenance without special tools
- Lightweight, ergonomic design for easy handling and an easy fit, even in applications where access is limited
- Optimised strength-to-weight ratio
- Fast operation due to the large nut rotation per wrench cycle (35 degree rotation angle) and rapid return stroke

Reliability

- All wrenches are nickel-plated for excellent corrosion protection and improved durability in harsh environments

Accuracy

- Constant torque output provides high accuracy across the full stroke
- Uni-body construction ensures accuracy by reducing internal deflections



TSP - Pro Series Swivel

Featuring Tilt & Swivel technology the TSP provides 360° X-axis rotation and 160° y-axis rotation.

How to Order

Order an accessory which can be fitted to existing S-Series wrenches.

Factory fitted to new S-Series wrenches: Suffix the wrench model number with “-P” e.g.: **S1500-P**.

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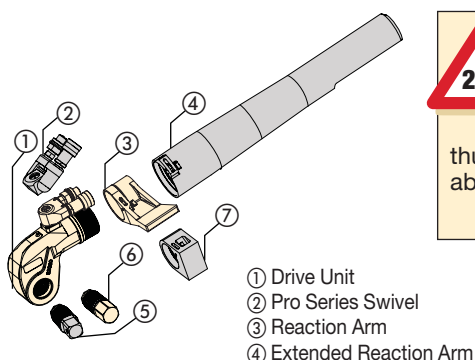


Torque Wrench Hoses

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

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

Double-Acting Square Drive Hydraulic Torque Wrenches



Select the Right Torque

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

S Series



Maximum Torque at 10,000 psi:

25,140 Ft.lbs

Square Drive Range:

3/4-2 1/2 inches

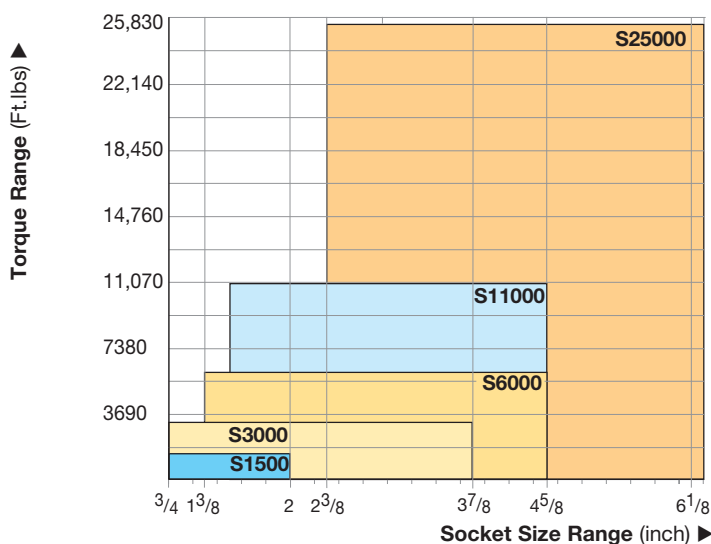
Nose Radius:

.99-2.50 inches

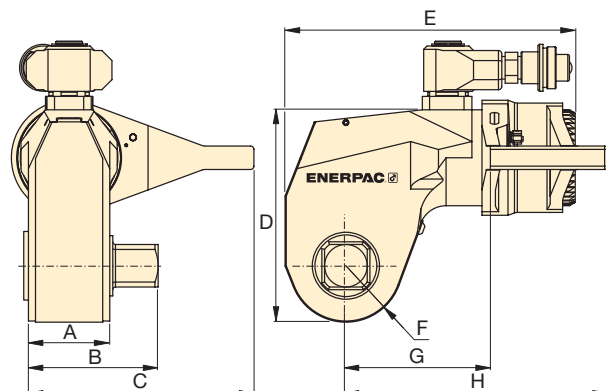
Maximum Operating Pressure:

10,000 psi

*TORQUE WRENCH SELECTION (based on socket size range)



*Additional socket sizes available upon request.



The rigid steel design of S-Series torque wrenches guarantee durability, reliability and safety. These wrenches can be powered by the portable ZU4T-Series pumps.





Torque Wrench and Pump Selection Matrix

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

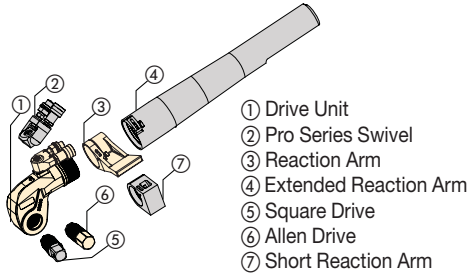
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Maximum Torque at 10,000 psi		Square Drive		Torque Wrench Model No.	Dimensions (in)								Weight (lbs)
		Size (in)	Model No. (included with wrench)		A	B	C	D	E	F	G	H	
(Ft.lbs)	Nm												
1400	1898	3/4"	SD15-012	S1500	1.54	2.48	4.33	3.74	5.36	0.99	2.72	4.69	5.94
3200	4339	1"	SD30-100	S3000	1.89	3.03	5.28	4.96	6.78	1.30	3.55	6.27	11.00
6010	8144	1 1/2"	SD60-108	S6000	2.24	3.55	7.05	6.38	7.92	1.66	4.41	7.37	18.70
11,000	14,914	1 1/2"	SD110-108	S11000	2.80	4.37	7.22	7.29	8.90	1.95	5.20	8.94	33.00
25,140	34,079	2 1/2"	SD250-208	S25000	3.43	5.63	9.61	9.46	11.50	2.50	7.17	11.50	68.20

See "Yellow Pages" section for torque conversions.

To order a S-series wrench fitted with the TSP swivel, suffix the model number with "-P". e.g., S1500-P.



Maximum Torque at 10,000 psi:

25.140 Ft.lbs.

Square Drive Range:

3/4-2 1/2 inches




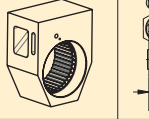

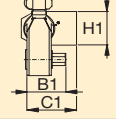
Hexagon Size Allen Drive:

14-85 mm

For
S
Series

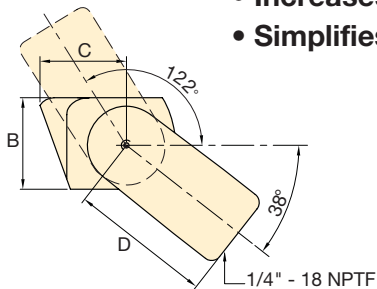


▼ **SELECTION CHART**

TORQUE WRENCH	OPTIONAL ALLEN DRIVES, IMPERIAL				OPTIONAL ALLEN DRIVES, METRIC				SHORT REACTION ARM FOR ALLEN DRIVES		
											
Model Number	Hexagon Size (in)	Maximum Torque (Ft.Lbs)	Model Number	Dim. B1 (in)	Hexagon Size (mm)	Maximum Torque (Ft.Lbs)	Model Number	Dim. B1 (in)	Model Number	Dimensions (in) C1 H1	
S1500 (1400 Ft-lbs)	1/2	355	SDA15-008	2.6	14	475	SDA15-14	2.60	SRA15	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	1184	SDA15-19	2.76			
	7/8	1400	SDA15-014	2.9	22	1399	SDA15-22	2.87			
	1	1400	SDA15-100	3.0	24	1399	SDA15-24	2.91			
S3000 (3200 Ft-lbs)	5/8	690	SDA30-010	3.0	17	850	SDA30-17	3.03	SRA30	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			
S6000 (6000 Ft-lbs)	5/8	690	SDA60-010	3.3	17	850	SDA60-17	3.39	SRA60	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			
S11000 (11,000 Ft-lbs)	1 1/4	5520	SDA110-104	4.5	30	4655	SDA110-30	4.41	SRA110	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			
S25000 (25,000 Ft-lbs)	1 1/2	9535	SDA250-108	5.5	36	8040	SDA250-36	5.51	SRA250	6.24	5.31
	1 5/8	12,120	SDA250-110	5.7	41	11880	SDA250-41	5.67			
	1 3/4	15,135	SDA250-112	5.8	46	16775	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	25,150	SDA250-55	6.06			
	2 1/4	25,150	SDA250-204	6.0	60	25,150	SDA250-60	6.22			
	—	—	—	—	65	25,150	SDA250-65	6.34			
	—	—	—	—	70	25,150	SDA250-70	6.46			
	—	—	—	—	75	25,150	SDA250-75	6.61			
	—	—	—	—	85	25,150	SDA250-85	6.89			

TSP Series

- Pro Series Swivel featuring Tilt and Swivel technology
- 360 degree X-axis and 160 degree Y-axis rotation
- 10,000 psi / 700 bar maximum working pressure
- Increases tool fit in restricted access areas
- Simplifies hose placement

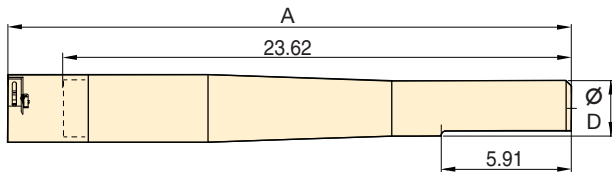


Wrench Model	Model Number	Dimensions (in)				Weight (lbs)
		A	B	C	D	
S1500, S3000	TSP100	2.52	1.06	.91	1.60	.41
S6000, S11000, S25000	TSP200	2.64	1.06	1.02	1.65	.43

To order a S-series wrench fitted with the TSP swivel, suffix the model number with "-P". e.g., S1500-P.

RTE Series

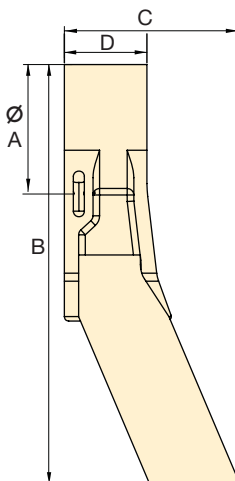
- Reaction Tube Extension for S-Series Wrenches
- Full torque rated
- Increases tool fit in restricted access areas



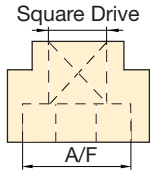
Wrench Model	Model Number	Dimensions (in)		Weight (lbs)
		A	D	
S1500	RTE15	25.00	2.28	10.19
S3000	RTE30	25.47	2.24	12.15
S6000	RTE60	25.95	2.56	17.00
S11000	RTE110	26.58	2.99	24.71
S25000	RTE250	26.98	3.94	38.12

SRS Series

- Extended Reaction Arms
- Lightweight interchangeable design
- Can be used with Long Reach Sockets



Wrench Model	Model Number	Dimensions (in)				Max. Torque (Ft-lbs)	Weight (lbs)
		A	B	C	D		
S1500	SRS151	2.24	5.59	1.45	1.48	1328	1.2
	SRS152		6.59			1210	1.5
	SRS153		7.59			1131	1.9
S3000	SRS301	2.57	6.61	2.89	1.89	2890	2.4
	SRS302		7.61			2738	2.9
	SRS303		8.61			2636	3.4
S6000	SRS601	3.11	8.07	3.91	2.30	5784	4.2
	SRS602		9.07			5498	4.9
	SRS603		10.07			5292	5.5
S11000	SRS1101	3.70	9.15	5.24	2.86	10805	7.5
	SRS1102		10.15			10294	8.7
	SRS1103		11.15			9877	9.8
S25000	SRS2501	4.84	11.30	5.82	3.44	24736	13.6
	SRS2502		12.30			23638	15.4
	SRS2503		13.30			22680	17.1



BSH Series Sockets

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

IMPERIAL SOCKETS

3/4" Square Drive		1" Square Drive		1 1/2" Square Drive		2 1/2" Square Drive	
Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)	Model Number	A/F (in)
BSH7519	3/4"	BSH1019	3/4"	BSH10231	2 5/16"	BSH15144	1 7/16"
BSH75088	7/8"	BSH10088	7/8"	BSH10238	2 3/8"	BSH1538	1 1/2"
BSH75094	15/16"	BSH10094	15/16"	BSH10244	2 7/16"	BSH15156	1 9/16"
BSH7527	1 1/16"	BSH1027	1 1/16"	BSH10250	2 1/2"	BSH15163	1 5/8"
BSH7530	1 3/16"	BSH1030	1 3/16"	BSH1065	2 9/16"	BSH1543	1 11/16"
BSH75125	1 1/4"	BSH10125	1 1/4"	BSH10263	2 5/8"	BSH15175	1 3/4"
BSH75131	1 5/16"	BSH10131	1 5/16"	BSH10269	2 11/16"	BSH1546	1 13/16"
BSH7535	1 3/8"	BSH1035	1 3/8"	BSH1070	2 3/4"	BSH15188	1 7/8"
BSH75144	1 7/16"	BSH10144	1 7/16"	BSH10281	2 13/16"	BSH15194	1 15/16"
BSH7538	1 1/2"	BSH1038	1 1/2"	BSH10288	2 7/8"	BSH15200	2"
BSH75156	1 9/16"	BSH10156	1 9/16"	BSH1075	2 15/16"	BSH15206	2 1/8"
BSH75163	1 5/8"	BSH10163	1 5/8"	BSH10300	3"	BSH15213	2 1/8"
BSH7543	1 11/16"	BSH1043	1 11/16"	BSH10306	3 1/16"	BSH15219	2 3/16"
BSH75175	1 3/4"	BSH10175	1 3/4"	BSH10313	3 1/8"	BSH15225	2 1/4"
BSH7546	1 13/16"	BSH1046	1 13/16"	BSH10319	3 3/16"	BSH15231	2 5/16"
BSH75188	1 7/8"	BSH10188	1 7/8"	BSH10325	3 1/4"	BSH15238	2 3/8"
BSH75194	1 15/16"	BSH10194	1 15/16"	BSH10338	3 3/8"	BSH15244	2 7/16"
BSH75200	2"	BSH10200	2"	BSH10350	3 1/2"	BSH15250	2 1/2"
		BSH10206	2 1/16"	BSH10363	3 5/8"	BSH1565	2 9/16"
		BSH10213	2 1/8"	BSH1095	3 3/4"	BSH15263	2 5/8"
		BSH10219	2 3/16"	BSH10388	3 7/8"	BSH15269	2 11/16"
		BSH10225	2 1/4"			BSH1570	2 3/4"
						BSH15463	4 5/8"

METRIC SOCKETS

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



Optional Allen Drives

Expanded versatility with a wide range of metric and imperial Allen drives.

Page: 8



Pin and Ring

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



Select the Right Torque

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

ENERPAC professional series steel torque wrenches provide reliable controlled tightening solutions across Industry.

S3000 Square Drive Torque Wrench on Wind Tower erection and maintenance

S3000 used to connect wind tower segments during assembly and maintenance. A robust but compact solution is required for tightening of bolts on wind tower sections. Large numbers of fasteners require precise application of torque to ensure joint integrity is achieved and maintained.

The Enerpac S-Series wrench was selected as it offers simple and reliable operation while providing accurate and repeatable results.



W4000 Low Profile Torque Wrench on an ANSI Pipe Flange

Throughout the Oil and Gas, Petrochemical and Processing Industries, pipeline joints, valves, pumps and machinery present challenges for controlled bolting.

The restricted access on this pipeline elbow was easily overcome by the selection of an Enerpac W-Series Torque Wrench. A member of the professional series steel torque wrench family the W Wrenches offer reliability and control ensuring even and consistent torque is applied to all bolts.

S6000 on a High Volume Pump Unit

High vibration requires long studs to be accurately tightened to the calculated preload.

During maintenance quick turnaround times are essential; S Series wrenches are chosen as they provide a large angle of nut rotation per stroke, offering speed and accuracy in compact ergonomic tool.



▼ Shown: Drive units with interchangeable cassettes



Rigid Steel Design

The *Professional* Low Profile Solution



W-Series, Low Profile Torque Wrenches

This product range has been designed using state-of-the art CAD techniques to bring you the most advanced low profile torque wrench on the market. Safety, quality, toughness and reliability are built in.

During the design process every prototype was put through finite element stress analysis, photo-elastic modelling, rigorous cyclic testing and strain gauging.

Simplicity

- No tools are needed for changing the hexagon cassettes
- Innovative, pinless wrench construction incorporates quick release cylinder and automatic crank engagement
- Single 360° hydraulic swivel manifold complete with screw lock couplings increases wrench and hose maneuverability

Design

- Cylinders and low profile cassettes have been engineered to give ultra slim, compact low clearance tooling with a small nose radius
- Robust design with minimal parts enables easy on-site maintenance without special tools
- Nut sizes covered range from 1 $\frac{1}{8}$ - 4 $\frac{5}{8}$ inch (30 - 115 mm)
- Optimized strength-to-weight ratio
- Fast operation due to the large nut rotation per wrench cycle (30 degree rotation angle) and rapid return stroke

Reliability

- All wrenches are nickel-plated for excellent corrosion protection and improved durability in harsh environments
- All wrenches are fitted with bronze bushings to ensure the ratchet will never seize in the sideplates, thus eliminating costly repairs

Accuracy

- Constant torque output provides high accuracy across the full stroke
- In-line reaction foot ensures accuracy by reducing internal deflections



TSP - Pro Series Swivel

Featuring Tilt and Swivel technology the TSP provides 360° X-axis rotation and 160° Y-axis rotation.

How to Order

Order an accessory which can be fitted to existing W-Series wrenches.

Factory fitted to new W-Series wrenches: Suffix the wrench model number with "-P" e.g.: W2000-P.

Page: 19

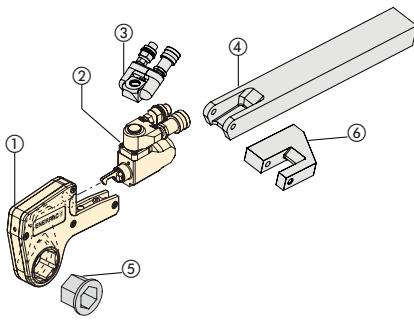


Torque Wrench Hoses

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

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

Double-Acting Hydraulic Hexagon Torque Wrenches



- ① Hexagon Cassette
- ② Drive Unit
- ③ Pro Series Swivel
- ④ Extended Reaction Arm
- ⑤ Reducer Insert
- ⑥ Reaction Paddle



Hexagon Cassettes and Reducer Inserts

Maximum versatility with the full range of interchangeable hexagon cassettes and hexagon reducing inserts is available in metric and inch sizes.

Page: 14

W Series



Maximum Torque at 10,000 psi:

15,000 Ft.lbs

Hexagon Range:

1 1/8 - 4 5/8 inches

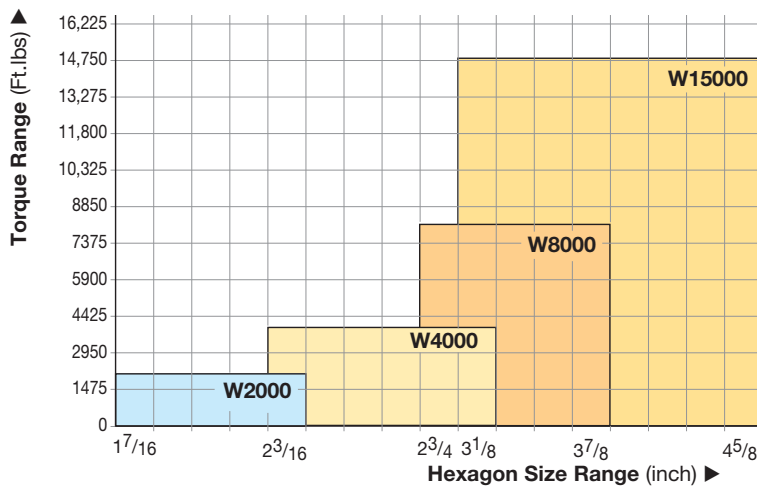
Nose Radius:

1.22-3.44 inches

Maximum Operating Pressure:

10,000 psi

DRIVE UNIT AND INTERCHANGEABLE CASSETTE SELECTION

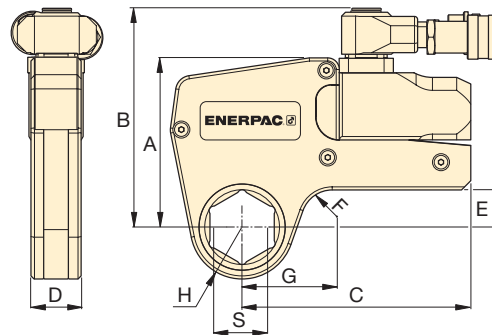


Torque Wrench Pump Selection Matrix

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

Page: 28

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

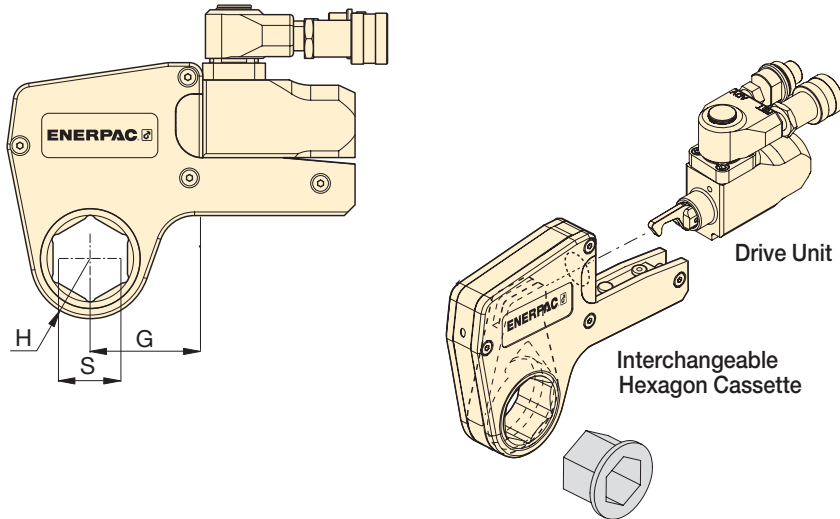


▼ SELECTION CHART

Hexagon Range *		Maximum Torque at 10,000 psi		Drive Unit Model Number	Minimum Torque		Dimensions (see pages 14-18 for dimensions H, G and S)						Weight
							(in)						Drive unit without hexagon cassette
(in)	(mm)	(Ft.lbs)	(Nm)		(Ft.lbs)	(Nm)	A	B	C	D	E	F	(lbs)
1 1/8 - 2 3/8	30 - 60	2000	2712	W2000	200	271	4.29	5.55	5.83	1.26	.94	.79	3.09
1 5/16 - 3 3/8	36 - 85	4000	5423	W4000	400	542	5.35	6.57	7.01	1.61	1.29	.79	4.41
1 7/8 - 4 1/8	50 - 105	8000	10,846	W8000	800	1084	6.77	8.07	8.19	2.07	1.65	.98	6.61
2 7/16 - 4 5/8	65 - 115	15,000	20,337	W15000	1500	2033	8.15	9.45	9.96	2.48	1.97	.79	11.02

* With in-line reaction foot.

To order a W-series wrench fitted with the TSP swivel, suffix the model number with "-P". e.g., W2000-P.



Optional Hexagon Reducing Insert (see pages 14-18)

W Series



Maximum Torque at 10,000 psi:
2000 Ft.lbs

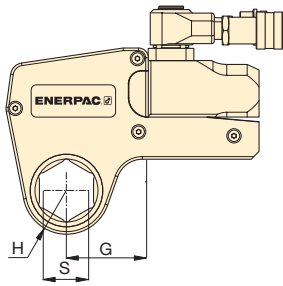
Hexagon Range:
1¹/₈-2³/₈ inches

Maximum Operating Pressure:
10,000 psi

▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size S	Nose Radius H	G	Model Number	Weight (lbs)						
						Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
	1 ¹ / ₈	1.22	2.11	W2102	0.95	—	—	—	—	—	—
	1 ³ / ₁₆	1.22	2.11	W2103	0.95	—	—	—	—	—	—
	1 ¹ / ₄	1.22	2.11	W2104	0.95	—	—	—	—	—	—
	1 ⁵ / ₁₆	1.22	2.11	W2105	0.95	—	—	—	—	—	—
	1 ³ / ₈	1.22	2.11	W2106	0.95	—	—	—	—	—	—
	1 ⁷ / ₁₆	1.22	2.11	W2107	0.95	1 ⁷ / ₁₆ - 1 ¹ / ₈	W2107R102	—	—	—	—
	1 ¹ / ₂	1.32	2.29	W2108	0.99	—	—	—	—	—	—
	1 ⁹ / ₁₆	1.32	2.29	W2109	0.99	—	—	—	—	—	—
	1 ⁵ / ₈	1.32	2.29	W2110	0.99	1 ⁵ / ₈ - 1 ¹ / ₄	W2110R104	1 ⁵ / ₈ - 1 ³ / ₁₆	W2110R103	—	—
	1 ¹¹ / ₁₆	1.44	2.38	W2111	0.99	—	—	—	—	—	—
	1 ³ / ₄	1.44	2.38	W2112	0.99	—	—	—	—	—	—
	1 ¹³ / ₁₆	1.44	2.38	W2113	0.99	1 ¹³ / ₁₆ - 1 ⁷ / ₁₆	W2113R107	1 ¹³ / ₁₆ - 1 ¹ / ₄	W2113R104	—	—
	1 ⁷ / ₈	1.54	2.48	W2114	0.99	—	—	—	—	—	—
	1 ¹⁵ / ₁₆	1.54	2.48	W2115	0.99	—	—	—	—	—	—
	2	1.54	2.48	W2200	0.99	2 - 1 ⁵ / ₈	W2200R110	2 - 1 ⁷ / ₁₆	W2200R107	—	—
	2 ¹ / ₁₆	1.65	2.70	W2201	1.04	—	—	—	—	—	—
	2 ¹ / ₈	1.65	2.70	W2202	1.04	—	—	—	—	—	—
	2 ³ / ₁₆	1.65	2.70	W2203	1.04	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	W2204	1.00	—	—	—	—	—	—
	2 ⁵ / ₁₆	1.75	2.55	W2205	1.00	—	—	—	—	—	—
	2 ³ / ₈	1.75	2.55	W2206	1.00	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	—	—

W4000 Series Imperial Cassettes & Reducer Inserts



Maximum Torque at 10,000 psi:

4000 Ft.lbs

Hexagon Range:

1⁵/₁₆-3³/₈ inches




Maximum Operating Pressure:

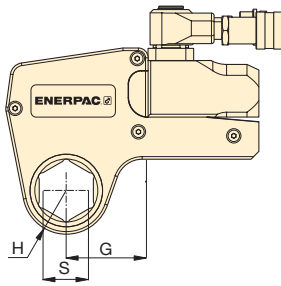
10,000 psi

**W
Series**



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size S	Nose Radius H	G	Model Number	Weight						
						Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
W4000	1 ⁵ / ₁₆	1.46	2.40	W4105	1.68	—	—	—	—	—	—
	1 ³ / ₈	1.46	2.40	W4106	1.68	—	—	—	—	—	—
	1 ⁷ / ₁₆	1.46	2.40	W4107	1.68	—	—	—	—	—	—
	1 ¹ / ₂	1.46	2.40	W4108	1.68	—	—	—	—	—	—
	1 ⁹ / ₁₆	1.46	2.40	W4109	1.68	—	—	—	—	—	—
	1 ⁵ / ₈	1.46	2.40	W4110	1.68	—	—	—	—	—	—
	1 ¹¹ / ₁₆	1.56	2.52	W4111	1.72	—	—	—	—	—	—
	1 ³ / ₄	1.56	2.52	W4112	1.72	—	—	—	—	—	—
	1 ¹³ / ₁₆	1.56	2.52	W4113	1.72	—	—	—	—	—	—
	1 ⁷ / ₈	1.63	2.63	W4114	1.77	—	—	—	—	—	—
	1 ¹⁵ / ₁₆	1.63	2.63	W4115	1.77	—	—	—	—	—	—
	2	1.63	2.63	W4200	1.77	2 - 1 ⁷ / ₈	W4200R107	—	—	—	—
	2 ¹ / ₁₆	1.73	2.89	W4201	1.81	—	—	—	—	—	—
	2 ¹ / ₈	1.73	2.89	W4202	1.81	—	—	—	—	—	—
	2 ³ / ₁₆	1.73	2.89	W4203	1.81	2 ³ / ₁₆ - 1 ⁵ / ₈	W4203R110	2 ³ / ₁₆ - 1 ⁷ / ₁₆	W4203R107	2 ³ / ₁₆ - 1 ¹ / ₄	W4203R104
	2 ¹ / ₄	1.83	2.78	W4204	1.86	—	—	—	—	—	—
	2 ⁵ / ₁₆	1.83	2.78	W4205	1.86	—	—	—	—	—	—
	2 ³ / ₈	1.83	2.78	W4206	1.86	2 ³ / ₈ - 2	W4206R200	2 ³ / ₈ - 1 ¹³ / ₁₆	W4206R113	2 ³ / ₈ - 1 ⁷ / ₁₆	W4206R107
	—	—	—	—	—	2 ³ / ₈ - 1 ³ / ₈	R4206R106	—	—	—	—
	2 ⁷ / ₁₆	1.95	3.00	W4207	1.86	2 ⁷ / ₁₆ - 2	W4207R200	—	—	—	—
	2 ¹ / ₂	1.95	3.00	W4208	1.86	2 ¹ / ₂ - 2	W4208R200	2 ¹ / ₂ - 1 ¹³ / ₁₆	W4208R113	—	—
	2 ⁹ / ₁₆	1.95	3.00	W4209	1.86	2 ⁹ / ₁₆ - 2 ³ / ₁₆	W4209R203	2 ⁹ / ₁₆ - 2 ¹ / ₈	W4209R202	2 ⁹ / ₁₆ - 2 ¹ / ₁₆	W4208R201
	—	—	—	—	—	2 ⁹ / ₁₆ - 2	W4209R200	2 ⁹ / ₁₆ - 2 ¹³ / ₁₆	W4209R113	—	—
	2 ⁵ / ₈	2.07	3.08	W4210	1.91	—	—	—	—	—	—
	2 ¹¹ / ₁₆	2.07	3.08	W4211	1.91	—	—	—	—	—	—
	2 ³ / ₄	2.07	3.08	W4212	1.91	2 ³ / ₄ - 2 ³ / ₈	W4212R206	2 ³ / ₄ - 2 ³ / ₁₆	W4212R203	2 ³ / ₄ - 2 ¹ / ₈	W4212R202
	2 ¹³ / ₁₆	2.18	3.21	W4213	1.95	—	—	—	—	—	—
	2 ⁷ / ₈	2.18	3.21	W4214	1.95	—	—	—	—	—	—
	2 ¹⁵ / ₁₆	2.18	3.21	W4215	1.95	2 ¹⁵ / ₁₆ - 2 ⁹ / ₁₆	W4215R209	2 ¹⁵ / ₁₆ - 2 ³ / ₈	W4215R206	2 ¹⁵ / ₁₆ - 2 ³ / ₁₆	W4215R203
	—	—	—	—	—	2 ¹⁵ / ₁₆ - 2	W4215R200	—	—	—	—
	3	2.30	3.29	W4300	2.00	3 - 2 ³ / ₁₆	W4300R203	—	—	—	—
	3 ¹ / ₁₆	2.30	3.29	W4301	2.00	—	—	—	—	—	—
	3 ¹ / ₈	2.30	3.29	W4302	2.00	3 ¹ / ₈ - 2 ³ / ₄	W4302R212	3 ¹ / ₈ - 2 ⁹ / ₁₆	W4302R209	3 ¹ / ₈ - 2 ³ / ₈	W4302R206
	—	—	—	—	—	3 ¹ / ₈ - 2 ⁵ / ₁₆	W4302R205	3 ¹ / ₈ - 2 ¹ / ₄	W4302R204	3 ¹ / ₈ - 2 ³ / ₁₆	W4302R203
	—	—	—	—	—	3 ¹ / ₈ - 2 ¹ / ₈	W4302R202	3 ¹ / ₈ - 2	W4302R200	—	—
	3 ³ / ₁₆	2.44	3.37	W4303	2.04	—	—	—	—	—	—
	3 ¹ / ₄	2.44	3.37	W4304	2.04	—	—	—	—	—	—
	3 ⁵ / ₁₆	2.44	3.37	W4305	2.04	—	—	—	—	—	—
	3 ³ / ₈	2.44	3.37	W4306	2.04	—	—	—	—	—	—



Maximum Torque at 10,000 psi:

8000 Ft.lbs

Hexagon Range:

1 $\frac{7}{8}$ - 4 $\frac{1}{8}$ inches



Maximum Operating Pressure:

10,000 psi

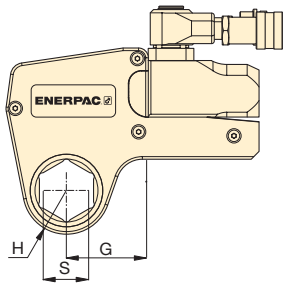
W
Series



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size S	Nose Radius H	G	Model Number	Weight						
						Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
W8000	1 $\frac{7}{8}$	1.77	3.08	W8114	3.68	—	—	—	—	—	—
	1 $\frac{15}{16}$	1.77	3.08	W8115	3.68	—	—	—	—	—	—
	2	1.77	3.08	W8200	3.68	—	—	—	—	—	—
	2 $\frac{1}{16}$	1.89	3.15	W8201	3.68	—	—	—	—	—	—
	2 $\frac{1}{8}$	1.89	3.15	W8202	3.68	—	—	—	—	—	—
	2 $\frac{3}{16}$	1.89	3.15	W8203	3.68	—	—	—	—	—	—
	2 $\frac{1}{4}$	2.01	3.25	W8204	3.68	—	—	—	—	—	—
	2 $\frac{5}{16}$	2.01	3.25	W8205	3.68	—	—	—	—	—	—
	2 $\frac{3}{8}$	2.01	3.25	W8206	3.68	—	—	—	—	—	—
	2 $\frac{7}{16}$	2.07	3.38	W8207	3.68	—	—	—	—	—	—
	2 $\frac{1}{2}$	2.07	3.38	W8208	3.68	—	—	—	—	—	—
	2 $\frac{9}{16}$	2.07	3.38	W8209	3.68	2 $\frac{9}{16}$ - 2	W8209R200	—	—	—	—
	2 $\frac{5}{8}$	2.20	3.34	W8210	3.68	—	—	—	—	—	—
	2 $\frac{11}{16}$	2.20	3.34	W8211	3.58	—	—	—	—	—	—
	2 $\frac{3}{4}$	2.20	3.34	W8212	3.58	2 $\frac{3}{4}$ - 2 $\frac{3}{16}$	W8212R203	—	—	—	—
	2 $\frac{13}{16}$	2.28	3.35	W8213	3.58	—	—	—	—	—	—
	2 $\frac{7}{8}$	2.28	3.35	W8214	3.58	—	—	—	—	—	—
	2 $\frac{15}{16}$	2.28	3.35	W8215	3.58	2 $\frac{15}{16}$ - 2 $\frac{3}{8}$	W8215R206	2 $\frac{15}{16}$ - 2 $\frac{3}{16}$	W8215R203	—	—
	3	2.38	3.52	W8300	3.63	—	—	—	—	—	—
	3 $\frac{1}{16}$	2.38	3.52	W8301	3.63	—	—	—	—	—	—
	3 $\frac{1}{8}$	2.38	3.52	W8302	3.63	3 $\frac{1}{8}$ - 2 $\frac{9}{16}$	W8302R209	3 $\frac{1}{8}$ - 2 $\frac{3}{8}$	W8302R206	3 $\frac{1}{8}$ - 2 $\frac{3}{16}$	W8302R203
	—	—	—	—	—	3 $\frac{1}{8}$ - 2	W8302R200	—	—	—	—
	3 $\frac{3}{16}$	2.60	3.63	W8303	3.72	—	—	—	—	—	—
	3 $\frac{1}{4}$	2.60	3.63	W8304	3.72	—	—	—	—	—	—
	3 $\frac{5}{16}$	2.60	3.63	W8305	3.72	—	—	—	—	—	—
	3 $\frac{3}{8}$	2.60	3.63	W8306	3.72	—	—	—	—	—	—
	3 $\frac{7}{16}$	2.60	3.63	W8307I	3.72	—	—	—	—	—	—
	3 $\frac{1}{2}$	2.60	3.63	W8308	3.72	3 $\frac{1}{2}$ - 3	W8308R300	3 $\frac{1}{2}$ - 2 $\frac{15}{16}$	W8308R215	3 $\frac{1}{2}$ - 2 $\frac{3}{4}$	W8308R212
	3 $\frac{9}{16}$	2.91	4.05	W8309	3.99	—	—	—	—	—	—
	3 $\frac{5}{8}$	2.91	4.05	W8310	3.99	—	—	—	—	—	—
	3 $\frac{11}{16}$	2.91	4.05	W8311	3.99	—	—	—	—	—	—
	3 $\frac{3}{4}$	2.91	4.05	W8312	3.99	3 $\frac{3}{4}$ - 3 $\frac{1}{8}$	W8312R302	3 $\frac{3}{4}$ - 2 $\frac{15}{16}$	W8312R215	3 $\frac{3}{4}$ - 2 $\frac{3}{4}$	W8312R212
	3 $\frac{13}{16}$	2.91	4.05	W8313	3.99	—	—	—	—	—	—
	3 $\frac{7}{8}$	2.91	4.05	W8314	3.99	3 $\frac{7}{8}$ - 3 $\frac{1}{8}$	W8314R302	3 $\frac{7}{8}$ - 2 $\frac{15}{16}$	W8314R215	—	—
	3 $\frac{15}{16}$	3.13	4.33	W8315	4.22	—	—	—	—	—	—
	4	3.13	4.33	W8400	4.22	—	—	—	—	—	—
	4 $\frac{1}{16}$	3.13	4.33	W8401I	4.22	—	—	—	—	—	—
	4 $\frac{1}{8}$	3.13	4.33	W8402	4.22	—	—	—	—	—	—

W15000 Series Imperial Cassettes & Reducer Inserts



Maximum Torque at 10,000 psi:

15,000 Ft.lbs

Hexagon Range:

2⁷/₁₆-4⁵/₈ inches




Maximum Operating Pressure:

10,000 psi

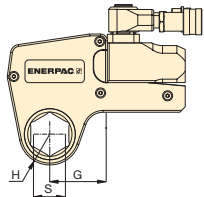
**W
Series**



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size S	Nose Radius H	G	Model Number	Weight (lbs)						
						Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
W15000	2 ⁷ / ₁₆	2.32	3.49	W15207	6.17	—	—	—	—	—	—
	2 ¹ / ₂	2.32	3.49	W15208	6.17	—	—	—	—	—	—
	2 ⁹ / ₁₆	2.32	3.49	W15209	6.17	—	—	—	—	—	—
	2 ⁵ / ₈	2.32	3.49	W15210	6.17	—	—	—	—	—	—
	2 ¹¹ / ₁₆	2.32	3.49	W15211	6.17	—	—	—	—	—	—
	2 ³ / ₄	2.32	3.49	W15212	6.17	—	—	—	—	—	—
	2 ¹³ / ₁₆	2.44	3.56	W15213	6.22	—	—	—	—	—	—
	2 ⁷ / ₈	2.44	3.56	W15214	6.22	—	—	—	—	—	—
	2 ¹⁵ / ₁₆	2.44	3.56	W15215	6.22	—	—	—	—	—	—
	3	2.54	3.66	W15300	6.26	3 - 2 ¹ / ₈	W15300R202	—	—	—	—
	3 ¹ / ₁₆	2.54	3.66	W15301	6.26	—	—	—	—	—	—
	3 ¹ / ₈	2.54	3.66	W15302	6.26	3 ¹ / ₈ - 2 ⁹ / ₁₆	W15302R209	—	—	—	—
	3 ³ / ₁₆	2.74	3.80	W15303	6.40	—	—	—	—	—	—
	3 ¹ / ₄	2.74	3.80	W15304	6.40	—	—	—	—	—	—
	3 ⁵ / ₁₆	2.74	3.80	W15305	6.40	—	—	—	—	—	—
	3 ³ / ₈	2.74	3.80	W15306	6.40	—	—	—	—	—	—
	3 ⁷ / ₁₆	2.74	3.80	W15307I	6.40	—	—	—	—	—	—
	3 ¹ / ₂	2.74	3.80	W15308	6.40	3 ¹ / ₂ - 2 ¹⁵ / ₁₆	W15308R215	3 ¹ / ₂ - 2 ³ / ₄	W15308R212	—	—
	3 ⁹ / ₁₆	2.95	4.01	W15309	6.62	—	—	—	—	—	—
	3 ⁵ / ₈	2.95	4.01	W15310	6.62	—	—	—	—	—	—
	3 ¹¹ / ₁₆	2.95	4.01	W15311	6.62	—	—	—	—	—	—
	3 ³ / ₄	2.95	4.01	W15312	6.62	3 ³ / ₄ - 3 ¹ / ₈	W15312R302	3 ³ / ₄ - 2 ¹⁵ / ₁₆	W15312R215	—	—
	3 ¹³ / ₁₆	2.95	4.01	W15313	6.58	—	—	—	—	—	—
	3 ⁷ / ₈	2.95	4.01	W15314	6.58	3 ⁷ / ₈ - 3 ¹ / ₈	W15314R302	3 ⁷ / ₈ - 2 ¹⁵ / ₁₆	W15314R215	—	—
	3 ¹⁵ / ₁₆	3.17	4.06	W15315	6.72	—	—	—	—	—	—
	4	3.17	4.06	W15400	6.72	—	—	—	—	—	—
	4 ¹ / ₁₆	3.17	4.06	W15401I	6.72	—	—	—	—	—	—
	4 ¹ / ₈	3.17	4.06	W15402	6.72	4 ¹ / ₈ - 3 ¹ / ₂	W15402R308	4 ¹ / ₈ - 3 ⁵ / ₁₆	W15402R305	4 ¹ / ₈ - 3 ³ / ₄	W15402R304
	4 ³ / ₁₆	3.17	4.06	W15403I	6.72	—	—	—	—	—	—
	4 ¹ / ₄	3.17	4.06	W15404	6.72	4 ¹ / ₄ - 3 ¹ / ₂	W15404R308	4 ¹ / ₄ - 3 ¹ / ₈	W15404R302	—	—
	4 ⁵ / ₁₆	3.44	4.52	W15405	6.85	—	—	—	—	—	—
	4 ³ / ₈	3.44	4.52	W15406	6.85	—	—	—	—	—	—
	4 ⁷ / ₁₆	3.44	4.52	W15407	6.85	—	—	—	—	—	—
	4 ¹ / ₂	3.44	4.52	W15408I	6.85	—	—	—	—	—	—
	4 ⁹ / ₁₆	3.44	4.52	W15409I	6.85	—	—	—	—	—	—
	4 ⁵ / ₈	3.44	4.52	W15410I	6.85	4 ⁵ / ₈ - 3 ¹⁵ / ₁₆	W15410R315	4 ⁵ / ₈ - 3 ⁷ / ₈	W15410R314	4 ⁵ / ₈ - 3 ³ / ₄	W15410R312
	—	—	—	—	—	4 ⁵ / ₈ - 3 ¹ / ₂	W15410R308	—	—	—	—

W Series Metric Cassettes and Reducer Inserts



Maximum Torque at 10,000 psi:

8000 Ft.lbs

Hexagon Range:

30-115 mm




Maximum Operating Pressure:

10,000 psi (700 bar)

**W
Series**

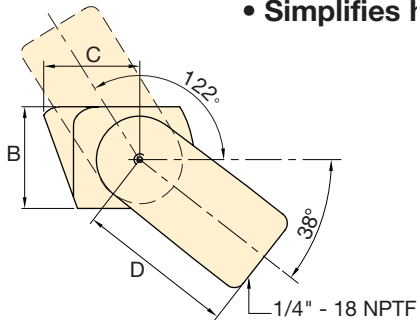


▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size S	Nose Radius H	G	Model Number	Weight						
						Hexagon Reducer (mm)	Model Number	Hexagon Reducer (mm)	Model Number	Hexagon Reducer (mm)	Model Number
W2000	30	1.22	2.11	W2103	0.95	-	-	-	-	-	-
	32	1.22	2.11	W2104	0.95	-	-	-	-	-	-
	36	1.22	2.11	W2107	0.95	-	-	-	-	-	-
	38	1.32	2.29	W2108	1.00	-	-	-	-	-	-
	41	1.32	2.29	W2110	1.00	41 - 32	W2110R104	41 - 30	W2110R103	41 - 24	W2110R024M
	46	1.44	2.38	W2113	1.00	46 - 36	W2113R107	46 - 32	W2113R104	-	-
	50	1.54	2.48	W2200	1.00	50 - 41	W2200R110	50 - 36	W2200R107	-	-
	55	1.65	2.70	W2203	1.04	55 - 46	W2203R113	55 - 41	W2203R110	55 - 36	W2203R107
	60	1.75	2.55	W2206	1.00	60 - 50	W2206R200	60 - 46	W2206R113	60 - 41	W2206R110
	-	-	-	-	-	60 - 36	W2206R107	-	-	-	-
W4000	36	1.46	2.40	W4107	1.68	-	-	-	-	-	-
	41	1.46	2.40	W4110	1.68	-	-	-	-	-	-
	46	1.56	2.52	W4113	1.72	-	-	-	-	-	-
	50	1.63	2.63	W4200	1.77	50 - 36	W4200R107	-	-	-	-
	55	1.73	2.89	W4203	1.81	55 - 41	W4203R110	55 - 36	W4203R107	55 - 32	W4203R104
	60	1.83	2.78	W4206	1.86	60 - 50	W4206R200	60 - 46	W4206R113	60 - 36	W4206R107
	65	1.95	3.00	W4209	1.86	65 - 55	W4209R203	65 - 50	W4209R200	65 - 46	W4209R113
	70	2.07	3.08	W4212	1.91	70 - 60	W4212R206	70 - 55	W4212R203	-	-
	75	2.18	3.21	W4215	1.95	75 - 65	W4215R209	75 - 60	W4215R206	-	-
	-	-	-	W4215	-	75 - 55	W4215R203	75 - 50	W4215R200	-	-
	80	2.30	3.29	W4302	2.00	80 - 75	W4302R215	80 - 70	W4302R212	80 - 65	W4302R209
	-	-	-	W4302	-	80 - 55	W4302R203	80 - 50	W4302R200	-	-
	85	2.44	3.37	W4085M	2.04	-	-	-	-	-	-
W8000	50	1.77	3.08	W8200	3.68	-	-	-	-	-	-
	55	1.89	3.15	W8203	3.68	-	-	-	-	-	-
	60	2.01	3.25	W8206	3.68	-	-	-	-	-	-
	65	0.09	3.38	W8209	3.68	65 - 50	W8209R200	-	-	-	-
	70	2.07	3.34	W8212	3.58	70 - 55	W8212R203	-	-	-	-
	75	2.28	3.35	W8215	3.58	75 - 60	W8215R206	75 - 55	W8215R203	-	-
	80	2.38	3.52	W8302	3.63	80 - 65	W8302R209	80 - 60	W8302R206	80 - 55	W8302R203
	-	-	-	-	-	80 - 50	W8302R200	-	-	-	-
	85	2.60	3.63	W8085M	3.72	85 - 70	W8085R070M	85 - 65	W8085R065M	85 - 60	W8085R060M
	-	-	-	-	-	85 - 55	W8085R055M	-	-	-	-
	90	2.91	4.05	W8090M	3.99	90 - 75	W8090R075M	-	-	-	-
	95	2.91	4.05	W8312	3.99	95 - 80	W8312R302	95 - 75	W8312R215	-	-
	100	3.13	4.33	W8315	4.22	-	-	-	-	-	-
	105	3.13	4.33	W8402	4.22	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
W15000	65	2.32	3.49	W15209	6.17	-	-	-	-	-	-
	70	2.32	3.49	W15212	6.17	-	-	-	-	-	-
	75	2.44	3.56	W15215	6.22	-	-	-	-	-	-
	80	2.54	3.66	W15302	6.26	80 - 65	W15302R209	-	-	-	-
	85	2.74	3.80	W15085M	6.40	85 - 70	W15085R070M	-	-	-	-
	90	2.95	4.01	W15090M	6.58	90 - 75	W15090R75M	-	-	-	-
	95	2.95	4.01	W15312	6.62	95 - 80	W15312R302	95 - 75	W15312R215	-	-
	-	-	-	-	-	-	-	-	-	-	-
	100	3.17	4.06	W15315	6.72	-	-	-	-	-	-
	105	3.17	4.06	W15402	6.72	105 - 90	W15402R090M	-	-	-	-
	110	3.44	4.52	W15405	6.85	110 - 95	W15110R095M	-	-	-	-
	115	3.44	4.52	W15115M	6.85	115 - 100	W15115R100M	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-

TSP Series

- Pro Series Swivel featuring Tilt and Swivel technology
- 360 degree X-axis and 160 degree Y-axis rotation
- 10,000 psi / 700 bar maximum working pressure
- Increases tool fit in restricted access areas
- Simplifies hose placement

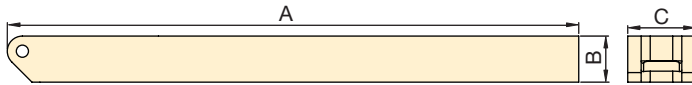


Wrench Model	Model Number	Dimensions (in)				Weight (lbs)
		A	B	C	D	
W2000, W4000	TSP100	2.52	1.06	.91	1.60	.41
W8000, W15000	TSP200	2.64	1.06	1.02	1.65	.43

To order a W-series wrench fitted with the TSP swivel, suffix the model number with "-P". e.g., W2000-P.

WTE Series

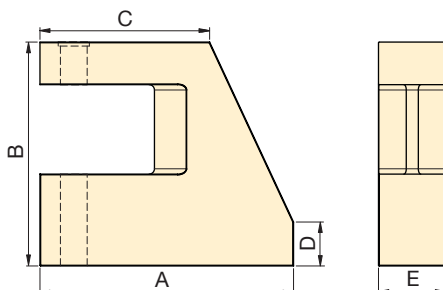
- Extended reaction arm for W-series wrench
- Full torque rated
- Increases tool fit in restricted access areas



Wrench Model	Model Number	Dimensions (in)			Weight (lbs)
		A	B	C	
W2000	WTE20	18.60	1.50	2.19	0.81
W4000	WTE40	20.73	2.00	2.58	1.83
W8000	WTE80	21.48	2.50	3.35	4.30
W15000	WTE150	24.26	3.00	4.00	8.69

WRP Series

- Low profile reaction paddle
- Lightweight interchangeable design
- Provides greater flexibility in areas with restricted access



Wrench Model	Model Number	Dimensions (in)					Weight (lbs)
		A	B	C	D	E	
W2000	WRP20	3.75	3.31	2.50	.64	1.00	.82
W4000	WRP40	5.15	4.29	3.31	1.10	1.25	1.83
W8000	WRP80	6.10	5.37	4.08	1.04	1.78	4.30
W15000	WRP150	7.34	6.50	5.93	1.25	2.00	8.69

▼ Shown: **SQD-50-I**



- Very high torque-to-weight ratio
- High speed, double-acting operation
- High degree of rotation angle for increased productivity
- Never-jam mechanism
- High repeatability, with accuracy $\pm 3\%$
- Slim nose radius and 360° swivel hose connection allow easier positioning in confined areas
- Few moving parts means durability and low maintenance
- Push-button drive release; no tools needed to reverse square or Allen drives for tightening or loosening
- Storage case (included) protects from damage, water and dirt
- Lock-ring couplers are standard on all torque wrenches, pumps and hoses



Lightweight Aluminum High-Power Wrench for Sockets or Allen Drives



Swivel Hose Connection

All Enerpac torque wrenches feature a 360° swivel connection to allow easy access in all positions.



Twin 3.5:1 Safety Hoses

Use only Enerpac THC-700 series twin 3.5:1 safety hoses with SQD double-acting wrenches to ensure the integrity of your system.

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Optional Allen Drives

Expanded versatility with a wide range of metric and imperial Allen drives.

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◀ Easy and reliable service in the field using Enerpac SQD-series torque wrenches.

Double-Acting, Square Drive Wrenches



▲ All wrenches come standard with swivel coupler, square drive and reaction arm.

SQD Series



Maximum Torque:
19,875 Ft.lbs

Square Drive Range:
3/4-2 1/2 inches

Maximum Operating Pressure:
11,600 psi



Use only heavy-duty Impact Sockets for power driven torquing equipment, according to ISO 2725 and ISO 1174; DIN 3129 and DIN 3121 or ASME-B107.2/1995.

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Torque Wrench Pumps and Hoses

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

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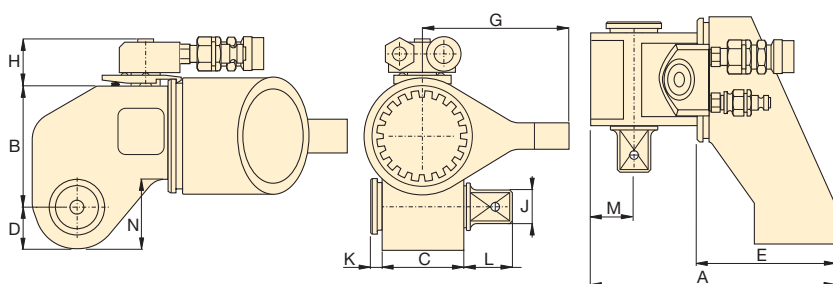
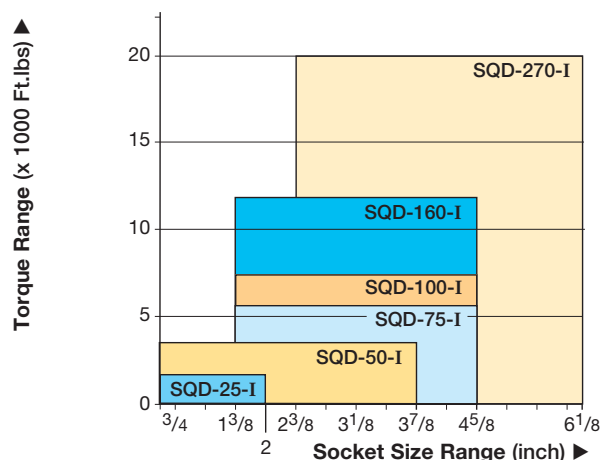


Hexagon Bolt and Nut Sizes

See the table for hexagon sizes of bolts, nuts and related thread diameters.



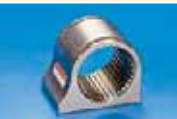
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TORQUE WRENCH SELECTION (based on socket size range)



Square Drive (in)	Max. Torque @ 11,600 psi		Torque Wrench Model No.	Dimensions (in)												Weight (incl. reaction arm and square drive) (lbs)
	(Ft.lbs)	(Nm)		A	B	C	D	E	G	H	J	K	L	M	N	
3/4	1735	2350	SQD-25-I	6.57	2.83	2.09	.94	4.25	3.74	1.38	3/4	.24	1.08	1.04	1.44	5.52
1	3550	4800	SQD-50-I	8.05	3.62	2.67	1.22	5.31	4.53	1.38	1	.59	1.30	1.34	2.07	9.35
1 1/2	5570	7560	SQD-75-I	8.89	4.21	2.95	1.41	6.02	4.80	1.38	1 1/2	.47	1.69	1.54	2.52	11.90
1 1/2	7360	10,000	SQD-100-I	9.96	4.53	3.31	1.54	6.46	5.12	1.38	1 1/2	.50	1.55	1.69	2.68	17.64
1 1/2	11,835	16,000	SQD-160-I	10.71	5.28	3.94	1.89	7.00	5.91	1.97	1 1/2	.44	1.76	2.13	3.21	26.55
2 1/2	19,875	27,000	SQD-270-I	13.45	6.46	4.69	2.32	8.58	7.87	1.97	2 1/2	.69	2.97	2.48	3.90	54.00

▼ SELECTION CHART

TORQUE WRENCH		OPTIONAL ALLEN DRIVES, IMPERIAL			REACTION ARM FOR ALLEN DRIVE
					
Model Number (max. capacity)	Nose Radius D (in)	Hexagon Size (in)	Maximum Torque ¹⁾ (Ft.lbs)	Model Number	Model Number
SQD-25-I (1735 Ft.lbs)	0.94	1/2	390	25A-050	RAH-25
		5/8	735	25A-063	
		3/4	1325	25A-075	
		7/8	1735	25A-088	
		1	1735	25A-100	
SQD-50-I (3550 Ft.lbs)	1.22	5/8	735	50A-063	RAH-50
		3/4	1325	50A-075	
		7/8	2065	50A-088	
		1	3095	50A-100	
		1 1/8	3550	50A-113	
		1 1/4	3550	50A-125	
		—	—	—	
SQD-75-I (5570 Ft.lbs)	1.41	5/8	735	75A-063	RAH-75
		3/4	1325	75A-075	
		7/8	2065	75A-088	
		1	3095	75A-100	
		1 1/8	4350	75A-113	
		1 1/4	5570	75A-125	
SQD-100-I (7360 Ft.lbs)	1.54	7/8	2065	100A-088	RAH-100
		1	3095	100A-100	
		1 1/8	4350	100A-113	
		1 1/4	6270	100A-125	
		1 3/8	7360	100A-138	
		1 1/2	7360	100A-150	
SQD-160-I (11,835 Ft.lbs)	1.89	1 1/4	6270	160A-125	RAH-160
		1 3/8	7745	160A-138	
		1 1/2	10,325	160A-150	
		1 5/8	11,835	160A-163	
		1 3/4	11,835	160A-175	
SQD-270-I (19,875 Ft.lbs)	2.32	1 1/2	10,325	270A-150	RAH-270
		1 5/8	13,275	270A-163	
		1 3/4	16,225	270A-175	
		1 7/8	19,875	270A-188	
		2	19,875	270A-200	
		2 1/4	19,875	270A-225	
		—	—	—	
		—	—	—	

¹⁾ Determine maximum torque according to the bolt size and grade.

For SQD Series



Maximum Torque at 11,600 psi:

19,875 Ft.lbs

Allen Drive Range:

1/2-2 1/4 inches

Nose Radius:

0.94-2.32 inches



Torque Wrench Pumps and Hoses

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

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Nut Cutters

Remove rusted or corroded nuts easily with Enerpac Nut Cutters. Hexagon nut capacities up to 2.88 in.

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Hexagon Bolt and Nut Sizes

See the table for hexagon sizes of bolts, nuts and related thread diameters.


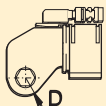


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▼ SQD-100-I with RAH-100 Reaction Arm and Allen drive used for loosening hexagon socket head cap screws.



SQD-Series, Metric Allen Drives

▼ SELECTION CHART

TORQUE WRENCH		OPTIONAL ALLEN DRIVES, METRIC			REACTION ARM FOR ALLEN DRIVE
					
Model Number (max. capacity)	Nose Radius D (in)	Hexagon Size (mm)	Maximum Torque (Ft.lbs)	Model Number	Model Number
SQD-25-I (1735 Ft.lbs)	0.94	14	550	25A-14	RAH-25
		17	955	25A-17	
		19	1325	25A-19	
		22	1735	25A-22	
		24	1735	25A-24	
SQD-50-I (3550 Ft.lbs)	1.22	17	955	50A-17	RAH-50
		19	1325	50A-19	
		22	2065	50A-22	
		24	2580	50A-24	
		27	3550	50A-27	
		30	3550	50A-30	
		32	3550	50A-32	
SQD-75-I (5570 Ft.lbs)	1.41	17	955	75A-17	RAH-75
		19	1325	75A-19	
		22	2065	75A-22	
		24	2580	75A-24	
		27	3685	75A-27	
		30	5160	75A-30	
		32	5570	75A-32	
SQD-100-I (7360 Ft.lbs)	1.54	22	2065	100A-22	RAH-100
		24	2580	100A-24	
		27	3685	100A-27	
		30	5160	100A-30	
		32	6270	100A-32	
		36	7360	100A-36	
SQD-160-I (11,835 Ft.lbs)	1.89	30	5160	160A-30	RAH-160
		32	6270	160A-32	
		36	8850	160A-36	
		41	11,835	160A-41	
		46	11,835	160A-46	
SQD-270-I (19,875 Ft.lbs)	2.32	36	8850	270A-36	RAH-270
		41	13,275	270A-41	
		46	18,440	270A-46	
		50	19,875	270A-50	
		55	19,875	270A-55	
		60	19,875	270A-60	
		65	19,875	270A-65	
		70	19,875	270A-70	

For
SQD
Series



Maximum Torque at 11,600 psi:

19,875 Ft.lbs

Allen Drive Range:

14-70 mm

Nose Radius:

0.94-2.32 inches



Optional Allen Drives and Reaction Arm

The RAH-Reaction Arm for Allen drives must be used instead of reaction arm for square drives.



Flange Spreaders

Separates pipe flanges with ease, enabling efficient maintenance tasks.

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Select the Right Torque

Choose your Enerpac Torque Wrench using the loosening torque rule of thumb:

Loosening torque may require 250% of tightening torque depending on the condition of the fastener.

▼ SQD-50-I with 50A-22 Allen drive with RAH-50 Reaction Arm for Allen drives.



▼ Shown from left to right: HXD-60 with CC-680, HXD-30 with CC-360



- High torque-to-weight ratio, slim nose radius and flat design
- High speed, high degree of rotation angle
- Snap in, interchangeable cassettes, no tools required
- 360° swivel hose connection allows easier positioning in confined areas
- High repeatability, with accuracy $\pm 3\%$
- Strong unibody design, integrated reaction arm and few moving parts make wrenches durable and reliable
- Extensive range of metric and imperial hexagon cassettes and reducers
- Drive unit and cassette come in storage case to protect from damage, water and dirt
- Lock-ring couplers are standard

▼ The HXD-30 drive unit combined with cassette CC-3238 is the best solution for this turbine application. The slim nose radius and swivel couplers allow easy access in all positions.



Aluminum, Low Profile



Twin 3.5:1 Safety Hoses

Use only Enerpac THC-700 series twin 3.5:1 safety hoses with HXD double-acting wrenches to ensure the integrity of your system.

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Nut Cutters

Remove rusted or corroded nuts easily with Enerpac Nut Cutters. Hexagon nut capacities up to 2.88 in.

Page: 48



Select the Right Torque

Choose your Enerpac Torque Wrench using the loosening torque rule of thumb:

Loosening torque may require 250% of tightening torque depending on the condition of the fastener.

▼ An Enerpac HXD hydraulic wrench brings safety and efficiency to this flange maintenance job at a refinery.



Double-Acting Hydraulic Torque Wrenches

▼ Shown from left to right: CC-3238, HXD-30



Torque Wrench Selection in 2 steps:

- 1. Drive Unit**
Select the HXD-drive Unit using the quick selection chart below.
- 2. Cassette**
Select the appropriate CC-cassette from pages 26 and 27.

HXD Series



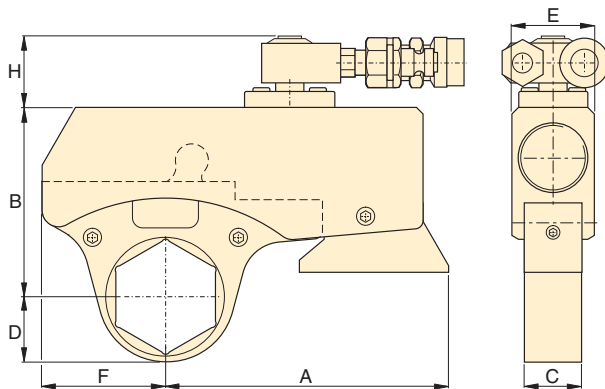
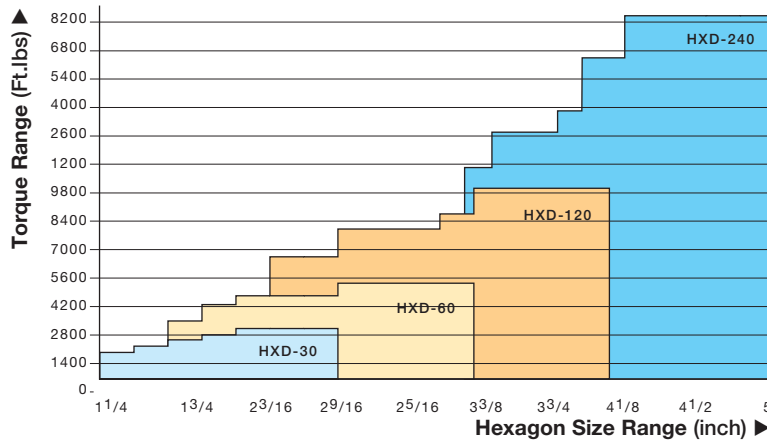
Maximum Torque:
17,860 Ft.lbs

Hexagon Range:
1¼-5 inches

Nose Radius:
1.12-3.78 inches

Maximum Operating Pressure:
11,600 psi

DRIVE UNIT AND INTERCHANGEABLE CASSETTE SELECTION



Drive Unit with Cassette



Metric and Imperial Sizes
Expanded versatility with the full range of metric and imperial Reducer Inserts and Holding Rings.

Page: 12



Hexagon Bolt and Nut Sizes
See the table for hexagon sizes of bolts, nuts and related thread diameters.


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

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▼ QUICK SELECTION CHART

Cassette Range		Maximum Torque at 11,600 psi	Drive Unit * Model Number	Drive Unit and Cassette Dimensions							Weight (including smallest cassette)	
	<i>Page:</i> 26			(in)								
(in)	(mm)			(Ft.lbs)	A	B	C	D	E	F		H
1¼ - 2¾	32 - 60	2425	HXD-30	5.31	3.58 - 4.06	1.10	1.12 - 1.87	1.57	2.36	1.50	4.6	
1⅝ - 3⅝	41 - 80	4565	HXD-60	6.14	4.53 - 5.12	1.38	1.36 - 2.38	1.97	2.95	1.50	8.1	
2¾ - 3¾	55 - 100	9220	HXD-120	7.87	5.55 - 6.14	1.85	1.83 - 2.89	2.56	3.78	1.50	16.3	
3⅞ - 5	80 - 130	17860	HXD-240	10.20	6.80 - 7.95	2.20	2.44 - 3.78	3.22	4.92	2.00	28.9	

* With integrated reaction arm.

HXD-Series, Imperial Cassettes and Inserts

ENERPAC 
POWERFUL SOLUTIONS. GLOBAL FORCE.



Maximum Torque at 11,600 psi:

17,860 Ft.lbs

Hexagon Range:

1.25-5 inches



◀ The optional Reducer Insert must be secured in the Cassette with a Holding Ring.

**CC
IN
HR
Series**



▼ SELECTION CHART

DRIVE UNIT	INTERCHANGEABLE CASSETTE, IMPERIAL					OPTIONAL ADD-ON REDUCER INSERTS, IMPERIAL				HOLDING RINGS
	Model Number	Max. Torque	Hex. Size ¹⁾	Nose Radius D	Model Number	Weight	Hexagon Size	Model Number	Hexagon Size	Model Number
	(max. capacity)	(Ft.lbs)	(in)	(in)		(lbs)	(in)		(in)	
HXD-30 (2425 Ft.lbs)		1250	1 1/4	1.12	CC-3125	1.2	—	—	—	—
		1545	1 7/16	1.24	CC-3144	1.4	1 7/16 – 1 1/4	IN3144-125	—	HR-36
		1840	1 5/8	1.36	CC-3163	1.5	1 5/8 – 1 7/16	IN3163-144	1 5/8 – 1 1/4	IN3163-125
		2130	1 13/16	1.52	CC-3181	1.8	1 13/16 – 1 5/8	IN3181-163	1 13/16 – 1 7/16	IN3181-144
			2	1.65	CC-3200	2.1	2 – 1 13/16	IN3200-181	2 – 1 5/8	IN3200-163
		2425	2 3/16	1.77	CC-3219	2.2	2 3/16 – 2	IN3219-200	2 3/16 – 1 13/16	IN3219-181
			2 3/8	1.87	CC-3238	2.3	2 3/8 – 2 3/16	IN3238-219	2 3/8 – 2	IN3238-200
HXD-60 (4565 Ft.lbs)		2830	1 5/8	1.36	CC-6163	2.6	—	—	—	—
		3540	1 13/16	1.56	CC-6181	2.9	1 13/16 – 1 5/8	IN6181-163	—	HR-46
			2	1.71	CC-6200	3.2	2 – 1 13/16	IN6200-181	2 – 1 5/8	IN6200-163
		3990	2 3/16	1.83	CC-6219	3.3	2 3/16 – 2	IN6219-200	2 3/16 – 1 13/16	IN6219-181
			2 3/8	1.91	CC-6238	3.4	2 3/8 – 2 3/16	IN6238-219	2 3/8 – 2	IN6238-200
			2 9/16	2.07	CC-6256	4.1	2 9/16 – 2 3/8	IN6256-238	2 9/16 – 2 3/16	IN6256-219
		4565	2 3/4	2.19	CC-6275	4.2	2 3/4 – 2 9/16	IN6275-256	2 3/4 – 2 3/8	IN6275-238
			2 15/16	2.26	CC-6293	4.3	2 15/16 – 2 3/4	IN6293-275	2 15/16 – 2 9/16	IN6293-256
			3 1/8	2.38	CC-6313	4.4	3 1/8 – 2 15/16	IN6313-293	3 1/8 – 2 3/4	IN6313-275
HXD-120 (9220 Ft.lbs)		5900	2 3/16	1.83	CC-12219	5.8	2 3/16 – 2	IN12219-200	2 3/16 – 1 13/16	IN12219-181
			2 3/8	1.91	CC-12238	5.8	2 3/8 – 2 3/16	IN12238-219	2 3/8 – 2	IN12238-200
			2 9/16	2.07	CC-12256	6.1	2 9/16 – 2 3/8	IN12256-238	2 9/16 – 2 3/16	IN12256-219
		7225	2 3/4	2.19	CC-12275	6.2	2 3/4 – 2 9/16	IN12275-256	2 3/4 – 2 3/8	IN12275-238
			2 15/16	2.26	CC-12293	6.3	2 15/16 – 2 3/4	IN12293-275	2 15/16 – 2 9/16	IN12293-256
			3	2.26	CC-12300	6.3	3 – 2 3/4	IN12300-275	3 – 2 9/16	IN12300-256
		8010	3 1/8	2.38	CC-12313	6.5	3 1/8 – 2 15/16	IN12313-293	3 1/8 – 2 3/4	IN12313-275
			3 3/8	2.54	CC-12338	7.8	3 3/8 – 3	IN12338-300	3 3/8 – 2 15/16	IN12338-293
			3 1/2	2.66	CC-12350	8.0	3 1/2 – 3 1/8	IN12350-313	3 1/2 – 3	IN12350-300
		9220	3 3/4	2.78	CC-12375	8.2	3 3/4 – 3 1/2	IN12375-350	3 3/4 – 3 3/8	IN12375-338
			3 7/8	2.89	CC-12388	8.3	3 7/8 – 3 1/2	IN12388-350	3 7/8 – 3 3/8	IN12388-338
HXD-240 (17860 Ft.lbs)		10325	3 1/8	2.44	CC-24313²⁾	11.2	3 1/8 – 2 15/16	IN24313-293	3 1/8 – 2 3/4	IN24313-275
		11685	3 3/8	2.60	CC-24338	11.4	3 3/8 – 3 1/8	IN24338-313	3 3/8 – 3	IN24338-300
		12225	3 1/2	2.71	CC-24350	11.4	3 1/2 – 3 1/8	IN24350-313	3 1/2 – 3	IN24350-300
		12775	3 3/4	2.83	CC-24375	11.9	3 3/4 – 3 1/2	IN24375-350	3 3/4 – 3 3/8	IN24375-338
		13315	3 7/8	2.99	CC-24388³⁾	12.3	4 1/8 – 3 7/8	IN24413-388	3 7/8 – 3 3/8	IN24388-338
		15490	4 1/8	3.15	CC-24413	12.5	4 1/4 – 3 7/8	IN24425-388	4 1/8 – 3 3/4	IN24413-375
			4 1/4	3.30	CC-24425	14.9	4 5/8 – 4 1/4	IN24463-425	4 1/4 – 3 3/4	IN24425-375
		17860	4 5/8	3.54	CC-24463	16.0	5 – 4 5/8	IN24500-463	4 5/8 – 4 1/8	IN24463-413
			5	3.78	CC-24500	16.3			5 – 4 1/4	IN24500-425

Other Reducer Insert dimensions available upon request.

¹⁾ See the table of hexagon bolt and nut sizes and related thread diameters on page 60.

²⁾ Additional imperial Reducer Insert: 3 1/8"–2 9/16" **IN24313-256** fits **CC-24313** Cassette. Use **HR-80** Holding Ring.

³⁾ Additional imperial Reducer Insert: 3 3/4"–2 9/16" **IN24375-313** fits **CC-24388** Cassette. Use **HR-100** Holding Ring.

HXD-Series, Metric Cassettes and Inserts



Maximum Torque at 11,600 psi:

17,860 Ft.lbs

Hexagon Range:

30-130 mm













◀ The optional Reducer Insert must be secured in the Cassette with a Holding Ring.

**CC
IN
HR
Series**



▼ SELECTION CHART

DRIVE UNIT	INTERCHANGEABLE CASSETTES, METRIC					OPTIONAL ADD-ON REDUCER INSERTS, METRIC						HOLDING RINGS
												
Model Number (max. capacity)	Max. Torque (Ft.lbs)	Hex. Size ¹⁾ (mm)	Nose Radius D (in)	Model Number	Weight (lbs)	Hexagon Size (mm)	Model Number	Hexagon Size (mm)	Model Number	Hexagon Size (mm)	Model Number	Model Number
HXD-30 (2425 Ft.lbs)	1250	32	1.12	CC-332	1.2	—	—	—	—	—	—	—
	1545	36	1.24	CC-336	1.4	—	—	—	—	—	—	—
	1840	41	1.36	CC-341	1.5	41/36	IN3-4136	41/32	IN3-4132	41/30	IN3-4130	HR-41
	2130	46	1.52	CC-346	1.8	46/41	IN3-4641	46/36	IN3-4636	46/32	IN3-4632	HR-46
	2425	50	1.65	CC-350	2.1	50/46	IN3-5046	50/41	IN3-5041	50/36	IN3-5036	HR-50
		55	1.77	CC-355	2.2	55/50	IN3-5550	55/46	IN3-5546	55/41	IN3-5541	HR-55
		60	1.87	CC-360	2.3	60/55	IN3-6055	60/50	IN3-6050	60/46	IN3-6046	HR-60
HXD-60 (4565 Ft.lbs)	2830	41	1.36	CC-641	2.6	41/36	IN6-4136	—	—	—	—	HR-41
	3540	46	1.56	CC-646	2.9	—	—	—	—	—	—	—
	3990	50	1.71	CC-650	3.2	50/46	IN6-5046	50/41	IN6-5041	50/36	IN6-5036	HR-50
		55	1.83	CC-655	3.3	55/50	IN6-5550	55/46	IN6-5546	55/41	IN6-5541	HR-55
		60	1.91	CC-660	3.4	60/55	IN6-6055	60/50	IN6-6050	60/46	IN6-6046	HR-60
	4565	65	2.07	CC-665	4.1	65/60	IN6-6560	65/55	IN6-6555	65/50	IN6-6550	HR-65
		70	2.19	CC-670	4.2	70/65	IN6-7065	70/60	IN6-7060	70/55	IN6-7055	HR-70
		75	2.26	CC-675	4.3	75/70	IN6-7570	75/65	IN6-7565	75/60	IN6-7560	HR-75
		80	2.38	CC-680	4.4	80/75	IN6-8075	80/70	IN6-8070	80/65	IN6-8065	HR-80
	HXD-120 (9220 Ft.lbs)	5900	55	1.83	CC-1255	5.8	55/50	IN12-5550	55/46	IN12-5546	55/41	IN12-5541
60			1.91	CC-1260	5.8	60/55	IN12-6055	60/50	IN12-6050	60/46	IN12-6046	HR-60
7225		65	2.07	CC-1265	6.1	65/60	IN12-6560	65/55	IN12-6555	65/50	IN12-6550	HR-65
		70	2.19	CC-1270	6.2	70/65	IN12-7065	70/60	IN12-7060	70/55	IN12-7055	HR-70
		75	2.26	CC-1275	6.3	75/70	IN12-7570	75/65	IN12-7565	75/60	IN12-7560	HR-75
		—	—	—	—	—	—	—	—	—	—	—
8010		80	2.38	CC-1280	6.5	80/75	IN12-8075	80/70	IN12-8070	80/65	IN12-8065	HR-80
9220		85	2.54	CC-1285	7.8	85/80	IN12-8580	85/75	IN12-8575	85/70	IN12-8570	HR-85
		90	2.66	CC-1290	8.0	90/85	IN12-9085	90/80	IN12-9080	90/75	IN12-9075	HR-90
		95	2.78	CC-1295	8.2	95/90	IN12-9590	95/85	IN12-9585	95/80	IN12-9580	HR-95
		100	2.89	CC-12100	8.3	100/95	IN12-10095	100/90	IN12-10090	100/85	IN12-10085	HR-100
HXD-240 (17860 Ft.lbs)	10245	80	2.44	CC-2480	11.2	80/75	IN24-8075	80/70	IN24-8070	80/65	IN24-8065	HR-80
	11820	85	2.60	CC-2485	11.4	85/80	IN24-8580	85/75	IN24-8575	85/70	IN24-8570	HR-85
	12215	90	2.72	CC-2490	11.4	90/85	IN24-9085	90/80	IN24-9080	90/75	IN24-9075	HR-90
	12610	95	2.83	CC-2495	11.9	95/90	IN24-9590	95/85	IN24-9585	95/80	IN24-9580	HR-95
	13400	100	2.99	CC-24100	12.3	100/95	IN24-10095	100/90	IN24-10090	100/85	IN24-10085	HR-100
	15370	105	3.15	CC-24105	12.5	105/100	IN24-105100	105/95	IN24-10595	105/90	IN24-10590	HR-105
	17860	110	3.31	CC-24110	12.8	110/105	IN24-110105	110/100	IN24-110100	110/95	IN24-11095	HR-110
		115	3.43	CC-24115	15.6	115/110	IN24-115110	115/105	IN24-115105	115/100	IN24-115100	HR-115
		120	3.54	CC-24120	16.1	120/115	IN24-120115	120/110	IN24-120110	120/105	IN24-120105	HR-120
		125	3.66	CC-24125	16.1	125/120	IN24-125120	125/115	IN24-125115	125/110	IN24-125110	HR-125
		130	3.78	CC-24130	16.3	130/125	IN24-130125	130/120	IN24-130120	130/115	IN24-130115	HR-130










Other Reducer Insert dimensions available upon request.

¹⁾ See the table of hexagon bolt and nut sizes and related thread diameters on page 60.



Optimum Torque Wrench and Pump Combinations

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

For optimum speed and performance Enerpac recommends the following system set-up with wrench-pump-hose combinations.		ELECTRIC PUMPS				AIR DRIVEN PUMPS		TWIN HOSES
		PMU-Series		ZU4-Series		PTA-Series	ZA4T-Series	THQ-Series THC-Series
								
		Page: 29		Page: 30		Page: 34	Page: 36	
10,000 psi Torque Wrenches	Model No.	Flow at rated pressure: 20 in ³ /min 115V, 1 ph	Flow at rated pressure: 20 in ³ /min 230V, 1 ph	Flow at rated pressure: 60 in ³ /min 115V, 1 ph	Flow at rated pressure: 60 in ³ /min 230V, 1 ph	Flow at rated pressure: 20 in ³ /min	Flow at rated pressure: 60 in ³ /min	
	 6	S1500 S3000 S6000 S11000 S25000	PMU-10427-Q	PMU-10422-Q	Any ZU4-Series pump may be used.	PTA-1404-Q	Any ZA4T- Series pump may be used.	THQ-706T (19.5 ft) THQ-712T (39.0 ft)
		-	-	-				
	 12	W2000 W4000 W8000 W15000	PMU-10427-Q	PMU-10422-Q		PTA-1404-Q		
		-	-	-				
11,600 psi Torque Wrenches								
Model No.								
 20	SQD-25-I SQD-50-I SQD-75-I SQD-100-I SQD-160-I SQD-270-I	PMU-10427	PMU-10422	Any ZU4-Series pump may be used.	PTA-1404	Any ZA4T- Series pump may be used.	THC-7062 (19.5 ft) THC-7122 (30.0 ft)	
		-	-		-			
	 24	HXD-30 HXD-60 HXD-120 HXD-240	PMU-10427		PMU-10422			PTA-1404
		-	-		-			



Select the right torque

Choose your Enerpac torque wrench using the untightening rule of thumb:

- Be aware that when loosening a nut or bolt more torque is usually required than when tightening.
- Do not apply more than 75% of the maximum torque output of the tool when loosening nuts or bolts.

Conditions of bolted joints

- For fully threaded UNC nuts and bolts do not exceed **1½ times** nominal torque for a friction coefficient of 0,1.
- Humidity corrosion (rust) requires up to **2 times** 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.



IMPORTANT!

Always make sure that the torque scale on the pump matches the torque wrench size for accurate torque settings.



Call Enerpac!

For other combinations, consult your Enerpac bolting expert or your authorized Enerpac distributor.

Portable Electric Torque Wrench Pumps

▼ Shown: **PMU-10427**



- **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 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 Enerpac SQD and HXD 11,600 psi torque wrenches, and include polarized locking safety couplers.



Twin Torque Wrench Hoses

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

THC-700 series twin hoses with 11,600 psi pumps.

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

▼ PERFORMANCE CHART

For Use With Torque Wrenches		Maximum Pressure Rating (psi)		Oil Flow Rate (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					
S1500 S3000	W2000 W4000	700	10,000	200	20	PMU-10427-Q	.50	115V- 1 ph -50/60Hz	17 x 11 x 15	53
		700	10,000	200	20	PMU-10447-Q	1.0	115V- 1 ph -50/60Hz	17 x 13 x 15	60
		700	10,000	200	20	PMU-10422-Q	.50	230V- 1 ph -50/60Hz	17 x 11 x 15	53
		700	10,000	200	20	PMU-10442-Q	1.0	230V- 1 ph -50/60Hz	17 x 13 x 15	60
SQD-25-I SQD-50-I	HXD-30 HXD-60	700	11,600	200	20	PMU-10427	.50	115V- 1 ph -50/60Hz	17 x 11 x 15	53
		700	11,600	200	20	PMU-10447	1.0	115V- 1 ph -50/60Hz	17 x 13 x 15	60
		700	11,600	200	20	PMU-10422	.50	230V- 1 ph -50/60Hz	17 x 11 x 15	53
		700	11,600	200	20	PMU-10442	1.0	230V- 1 ph -50/60Hz	17 x 13 x 15	60

▼ Shown: ZU4204TB-Q and ZU4204BB-Q



Z Tough.
Dependable.
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CLASS



FIRMWARE 7.0, for Pro-Series

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



Classic Electrical

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



Back-lit LCD, for Pro-Series

- Pump usage information, hour and cycle counts
- Low-voltage warning and recording
- Self-test and diagnostic capabilities
- Information can be displayed in English, French, German, Italian, Spanish and Portuguese
- Pressure transducer is more accurate and durable than analog gauges

- Features Z-CLASS high-efficiency pump design; higher oil flow and bypass pressure, cooler running and requires 18% less current draw than comparable pumps
- Powerful 1.7 hp universal electric motor provides high power-to-weight ratio and excellent low-voltage operating characteristics
- High-strength, molded composite shroud protects motor and electrical components, while providing an ergonomic, non-conductive handle for easy transport
- Low-voltage pendant provides additional safety for the operator
- Valve technology reduces oil operating temperatures and withstands contaminants to increase pump reliability
- LCD readout provides pressure and torque display and a number of diagnostic and readout capabilities never before offered on a portable electric pump
- Auto cycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed. (Pump can be used with or without auto cycle feature)



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

ZU4 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.

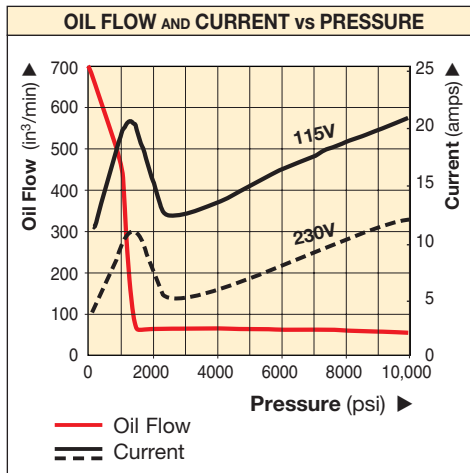
Classic Electric Torque Wrench Pump

- 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).



ZU4 Series



Reservoir Capacity:

1 and 1.75 gal.

Flow at 10,000 psi:

60 in³/min.

Motor Size:

1.7 hp

Maximum Operating Pressure:

10,000 and 11,600 psi



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 Enerpac SQD and HXD 11,600 psi torque wrenches, and include polarized lock-ring safety couplers.

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COMMON PUMP MODELS

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

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

2) European plug and CE EMC directive compliant

3) With NEMA 6-15 plug

4) Select -E suffixed pumps for Enerpac SQD and HXD 11,600 psi torque wrenches



Gauge Overlay Kit

Gauge overlay kits are also available separately.

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

ZU4 Ordering Matrix and Specifications

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

1	2	3	4	5	6	7	8	8	8
Z	U	4	2	08	T	E	-	Q	H M
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

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

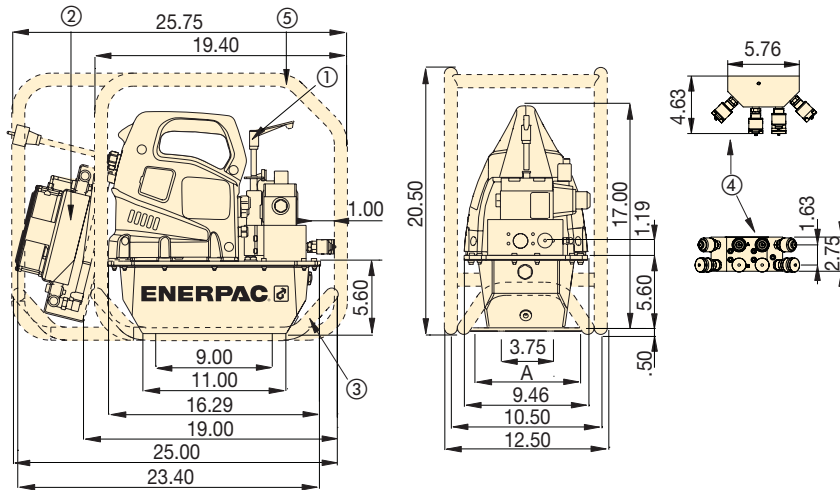
Q = 10,000 coupler for use with S- and W-Series or other wrenches

H = Heat exchanger

K = Skidbar

M = 4-wrench manifold

R = Roll cage



ZU4-Series Torque Wrench Pumps

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

Dimensions shown in inches

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

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 ZU4-Series torque wrench pump

Ordering Example 1

Model No. ZU4208TB-QMHK

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

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

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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

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



ZU4 Torque Wrench Pump Options



Heat Exchanger

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

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
ZHE-U4	1 and 1.75 gallon reservoir

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

Ordering Example:

Model No. ZU4208TE-H

Thermal Transfer *	Max. Pressure	Max. Oil Flow	Voltage
Btu/h	(psi)	(gpm)	(VDC)
900	300	7.0	12

* At 5 gpm at 70 °F ambient temperature.

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



Skidbar

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

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
SBZ-4	1 and 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

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⁾ Without heat exchanger

²⁾ With heat exchanger

Ordering Example:

Model No. ZU4208BB-QR

ZU4 Series



Reservoir Capacity:

1 and 1.75 gal.

Flow at 10,000 psi:

60 in³/min.

Motor Size:

1.7 hp

Maximum Operating Pressure:

10,000 and 11,600 psi



4-Wrench Manifold

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

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

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

Ordering Example:

Model No. ZU4208TB-QM

▼ Shown: PTA-1404



Two-Stage Power in a Portable Design



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.

- Compact and portable
- Handle located directly over pump's center of gravity for greater ease in carrying
- High bypass (1800 psi) for faster torque cycles
- High power-to-weight ratio suits all Enerpac torque wrenches
- Glycerine filled pressure gauge with scales reading in psi/bar
- Transparent overlays in Ft.lbs and Nm for all Enerpac torque wrenches provide a quick torque reference
- Internal safety relief valve, factory preset
- 15 ft. air pendant assembly enables easy maneuvering at the job site
- Fitted with polarized safety lock-ring couplers



Twin Torque Wrench Hoses

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

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

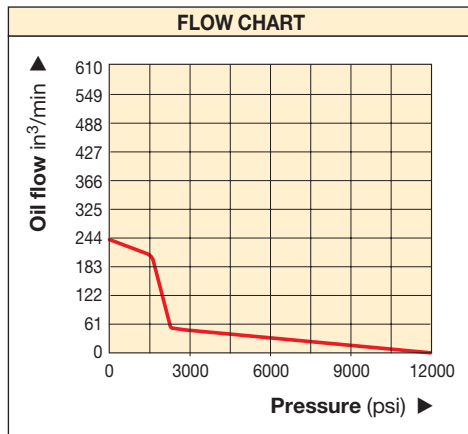


Gauge Overlay Kit

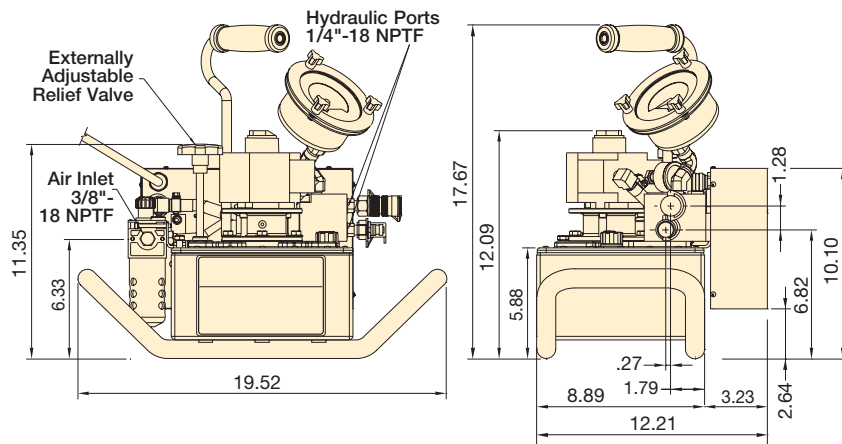
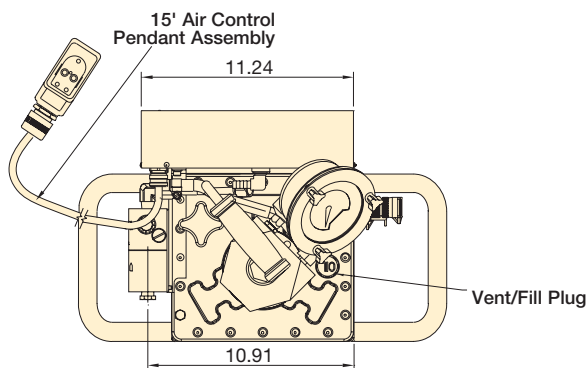
Gauge overlay kits are also available separately.

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

Compact Pneumatic Torque Wrench Pump



Dimensions shown in inches.



PTA Series



Reservoir Capacity:

1 gal.

Flow at 10,000 psi:

20 in³/min.

Maximum Operating Pressure:

10,000 and 11,600 psi



Torque Wrench Pump Selection Matrix

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

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▼ PERFORMANCE CHART

For Use With Torque Wrenches		Pressure Rating (psi)	Model Number	Reservoir Capacity (gal)	Useable Oil Capacity (gal)	Pump Flow Rates (in³)		Air Consumption @ 100 psi (scfm)	Air Pressure Range (psi)	Weight with Oil (lbs)
						1 st stage	2 nd stage			
S1500	W2000	10,000	PTA-1404-Q	1.0	0.5	240	20	40	49-101	54
S3000	W4000									
SQD-25-I	HXD-30	11,600	PTA-1404	1.0	0.5	240	20	40	49-101	54
SQD-50-I	HXD-60									

▼ Shown: **ZA4204TX-ER**



Z Tough.
Dependable.
Innovative.
CLASS

- Features **Z-CLASS** high-efficiency pump design; higher oil flow and bypass pressure
- Two-speed operation and high by-pass pressure reduces cycle time for improved productivity
- Heat exchanger warms exhaust air to prevent freezing and cools the oil
- Ergonomic pendant allows remote operation up to 20 feet
- Glycerin filled pressure gauge with transparent overlays in Ft.lbs and Nm for Enerpac torque wrenches provide a quick torque reference
- Regulator-Filter-Lubricator with removeable bowls and auto drain is standard



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 locking safety couplers.



Twin Torque Wrench Hoses

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

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



◀ Most hydraulic torque wrenches can be powered by the Enerpac ZA4T-Series torque wrench pump.



ZA4T-Series Pump Applications

The ZA4T-Series pump is best suited to power medium to large size torque wrenches.

Patent-pending **Z-CLASS** technology provides high by-pass pressures for increased productivity. Its high power to

weight ratio and compact design make it ideal for applications which require easy transport of the pump.

For further application assistance contact your local Enerpac office.

ZA4T Series



Reservoir Capacity:

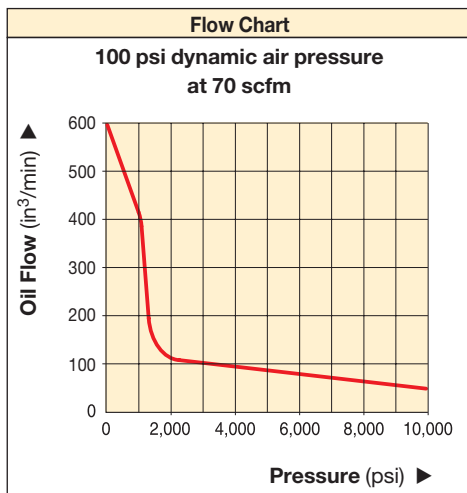
1 and 1.75 gal.

Flow at 10,000 psi:

60 in³/min.

Maximum Operating Pressure:

10,000 and 11,600 psi



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.



▼ COMMON PUMP MODELS

For Use With Torque Wrenches		Maximum Operating Pressure (psi)	Model Number ¹⁾	Usable Oil Capacity (gal)	Weight with Oil (lbs)
S1500 S3000 S6000 S11000 S25000	W2000 W4000 W8000 W15000	10,000	ZA4204TX-Q	1.0	94
		10,000	ZA4208TX-Q	1.75	100
		10,000	ZA4204TX-QR	1.0	101
SQD-75-I SQD-100-I SQD-160-I SQD-270-I	HXD-120 HXD-240	11,600	ZA4204TX-E	1.0	94
		11,600	ZA4208TX-E	1.75	100
		11,600	ZA4204TX-ER	1.0	101

¹⁾ All models meet CE safety requirements and all CSA 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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ZA4T Ordering Matrix and Specifications

▼ This is how a ZA4T-Series pump model number is built up:



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 ZA4T-Series torque wrench pump

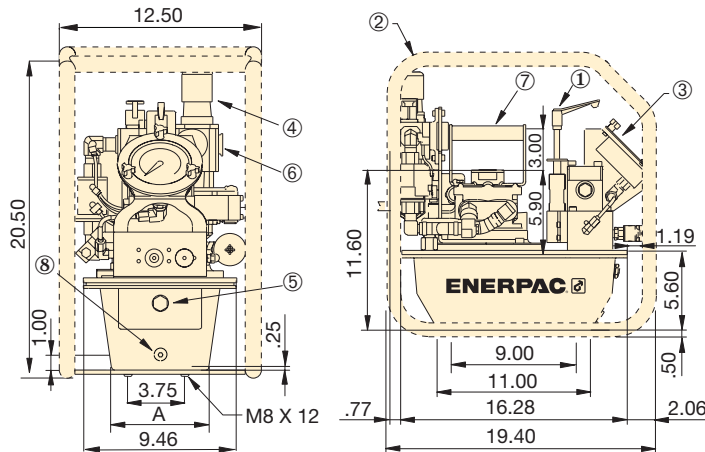
Ordering Example 1

Model No. ZA4208TX-QMR

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

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

Dimensions shown in inches.



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

ZA4T-Series Torque Wrench Pumps

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

ZA4T Performance									
Output Flow Rate (in ³ /min)					Dynamic Air Pressure Range (psi)	Air Consumption (scfm)	Sound Level at 100 psi Dynamic (dBA)	Relief Valve Adjustment Range (psi)	
100 psi	700 psi	5,000 psi	10,000 psi	11,800 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



4-Wrench Manifold

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

ZA4T Series



Reservoir Capacity:

1 and 1.75 gal.

Flow at 10,000 psi:

60 in³/min.

Maximum Operating Pressure:

10,000 and 11,600 psi

Accessory Kit No. *	Can be used on ZA4T-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**

Accessory Kit No. *	Can be used on ZA4T-Series torque wrench pumps
ZTM-E	for 11,600 psi torque wrenches
ZTM-Q	for 10,000 psi torque wrenches

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

Ordering Example:

Model No. **ZA4208TX-QM**



Gauge Overlay Kit

Gauge overlay kits are also available separately.

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



Roll Cage

- Protects pump
- Provides greater pump stability

Accessory Kit No. *	Can be used on ZA4T-Series torque wrench pumps
ZRC-04	1 and 1.75 gallon reservoir

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

Ordering Example:

Model No. **ZA4208TX-QR**



Twin Torque Wrench Hoses

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

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

▼ Shown: GT-Series bolt tensioners



Accurate & Reliable Extreme Performance Bolt Tensioner



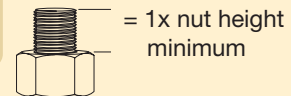
Pumps and accessories

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

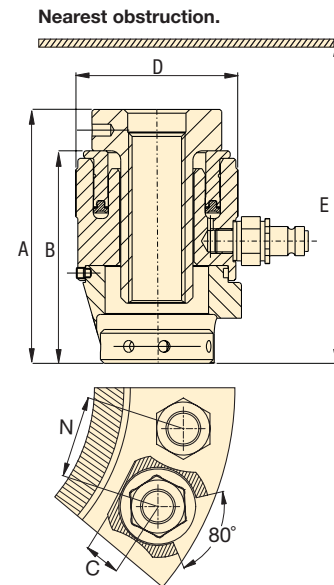
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Minimum stud protrusion



- Six load cells from $\frac{5}{8}$ " to $3\frac{3}{4}$ " 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



▼ GT2 Bolt Tensioner on a flange joint.



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)									
$\frac{5}{8}$ " - 1"	M16-M30	GT1-LCB	2.32	25.2	0.39	5.31	4.45	1.06	3.39	6.60
$1\frac{1}{8}$ " - $1\frac{1}{2}$ "	M30-M39	GT2-LCB	4.15	45.1	0.39	5.35	4.37	1.38	4.21	9.02
$1\frac{1}{2}$ " - 2"	M39-M52	GT3-LCB	7.95	86.4	0.39	6.30	4.96	1.81	5.43	15.40
2" - $2\frac{1}{2}$ "	M52-M68	GT4-LCB	15.16	164.9	0.39	7.09	5.55	2.44	6.85	26.84
$2\frac{1}{2}$ " - $3\frac{1}{4}$ "	M68-M80	GT5-LCB	23.37	254.1	0.39	7.95	6.18	3.07	8.27	41.14
$3\frac{1}{4}$ " - $3\frac{3}{4}$ "	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 (224 kN)	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
	5/8" 11UN	GT1P-NRS0625U11	2.17	6.65	3.45
	3/4" 10UN	GT1P-NRS0750U10	2.20	6.50	3.17
	7/8" 9UN	GT1P-NRS0875U09	2.32	6.46	2.86
	1" 8UN	GT1P-NRS1000U08	2.44	6.57	2.68
GT2-LCB (401 kN)	1 1/8" 8UN	GT1P-NRS1125U08	2.56	6.69	2.31
	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 1/8" 8UN	GT2P-NRS1125U08	2.80	6.81	5.81
	1 1/4" 8UN	GT2P-NRS1250U08	2.91	6.85	5.32
	1 3/8" 8UN	GT2P-NRS1375U08	3.03	6.97	4.84
GT3-LCB (769 kN)	1 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 1/2" 8UN	GT3P-NRS1500U08	3.62	8.35	12.56
	1 5/8" 8UN	GT3P-NRS1625U08	3.78	8.46	11.70
	1 3/4" 8UN	GT3P-NRS1750U08	3.90	8.58	10.89
	1 7/8" 8UN	GT3P-NRS1875U08	4.13	8.50	10.10
GT4-LCB (1467 kN)	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 1/4" 8UN	GT4P-NRS2250U08	4.76	9.61	21.23
GT5-LCB (2261 kN)	2 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 1/2" 8UN	GT5P-NRS2500U08	5.67	10.79	39.16
	2 3/4" 8UN	GT5P-NRS2750U08	5.87	11.10	35.84
	3" 8UN	GT5P-NRS3000U08	5.98	11.26	32.45
GT6-LCB (2845 kN)	3 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 1/4" 8UN	GT6P-NRS3250U08	6.65	12.28	45.56
	3 1/2" 8UN	GT6P-NRS3500U08	7.01	12.48	41.43
	3 3/4" 8UN	GT6P-NRS3750U08	7.13	12.68	36.94

GT Series



Bolt Range:
5/8"-3 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: **ATP-1500**



ATP Series

Reservoir Capacity:

1 gallon

Flow at Rated Pressure:

4 in³/min.

Maximum Operating Pressure:

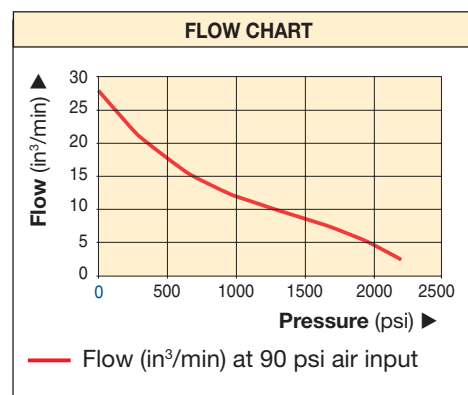
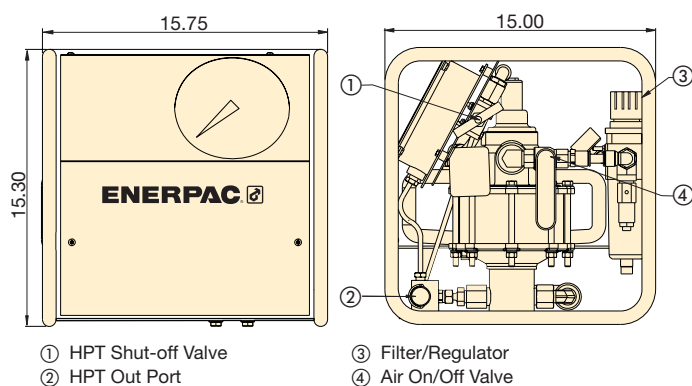
21,750 psi

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



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

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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 (scfm)	Sound Level (dBA)	Weight (lbs)
High pressure	1.0	ATP-1500	21,755	26	4	80-90	70	70	70

HPT Pump and Accessories

▼ 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)



Applications

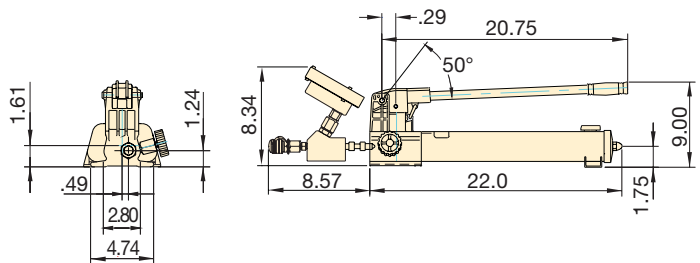
The Enerpac HPT high-pressure Hand Pump is ideally suited for use with hydraulic bolt tensioning tools and hydraulic nuts.

Page: **40**



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

- 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



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	High Pressure Hand Pump with Gauge	155	.99	0.037	200	21,750	19

▼ HOSES

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

* Includes dust caps

▼ FITTINGS

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



* Includes dust caps

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



Portable Hydraulic Power to Ease Joint Assembly

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

1 Cylinder Selection		Nominal Set Capacity (ton)	Cylinder Model No.	Stroke (in)	Collapsed Height (in)
	RC-Series, Single-acting, General Purpose Cylinders: For maximum versatility. <ul style="list-style-type: none"> • Collar and plunger threads along with base mounting holes enable easy fixturing for use on specialized positioning tools • Can be used in all positions • Heavy-duty return springs • Baked enamel finish for corrosion resistance • Multiple stroke lengths and tonnages to match many joint positioning and assembly applications 	10	RC-102	2.13	4.78
			RC-106	6.13	9.75
			RC-1010	10.13	13.75
		15	RC-154	4.00	7.88
			RC-156	6.00	10.69
		25	RC-252	2.00	6.50
			RC-254	4.00	8.50
			RC-256	6.25	10.75
			RC-2514	14.25	18.75
		50	RC-506	6.25	11.13
	RCH-Series, Single-acting, Hollow Cylinders: For pushing and pulling applications. <ul style="list-style-type: none"> • Hollow plunger design is ideal for both pull and push joint assembly applications • Heavy-duty return springs • Nickel-plated, floating center tube on models over 20 tons increase product life • Center-hole diameters match-up to many threaded rods and strands for use in joint assembly applications 	20	RCH-202	2.00	6.31
		30	RCH-302	2.50	7.03
		60	RCH-603	3.00	9.75
		100	RCH-1003	3.00	10.00
		—	—	—	—
		—	—	—	—
		—	—	—	—
		—	—	—	—

Single-Acting, Cylinder Pump Sets

SET SELECTION:

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

SELECTION EXAMPLE

Selected cylinder:

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

Selected pump:

- P-392, Lightweight hand pump

Set model number:

- SCR-106H

Included:

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

SC Series



Capacity:







5-95 tons

Stroke:

1.50-14.25 inches

Maximum Operating Pressure:

10,000 psi

2 Pump selection			Accessories Included		
Hand Pump P-392	Hand Pump P-80	XA-Series Air Pump XA-11	Hose Model No.	Gauge Model No.	Gauge Adaptor Model No.
					
SCR-102H	–	SCR-102A	HC-7206	GF-10P	GA-2
SCR-106H	–	SCR-106A	HC-7206	GF-10P	GA-2
SCR-1010H	–	SCR-1010A	HC-7206	GF-10P	GA-2
SCR-154H	–	SCR-154A	HC-7206	GP-10S	GA-2
SCR-156H	–	SCR-156A	HC-7206	GP-10S	GA-2
SCR-252H	–	SCR-252A	HC-7206	GF-20P	GA-2
SCR-254H	–	SCR-254A	HC-7206	GF-20P	GA-2
SCR-256H	–	SCR-256A	HC-7206	GF-20P	GA-2
–	SCR-2514H	SCR-2514A	HC-7206	GF-20P	GA-2
–	SCR-506H	SCR-506A	HC-7206	GF-50P	GA-2
SCH-202H	–	SCH-202A	HC-7206	GF-813P	GA-3
SCH-302H	–	SCH-302A	HC-7206	GF-813P	GA-3
–	SCH-603H	SCH-603A	HC-7206	GF-813P	GA-3
–	SCH-1003H	–	HC-7206	GP-10S	GA-2
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–
–	–	–	–	–	–

▼ Typical layout for a 4 point synchronous positioning system



- Multiple points, 9 to 910 tons capacity per point
- High accuracy (+/- .040 in.)
- PLC-control, user friendly touch screen
- Automatic data storage, reporting and graphical presentation
- Secure system with warning and stop features

System Options:

- Precise load and force measurement up to 1% of full scale
- Digital sensors provide:
 - load read-out by positional point and system total
 - two axis differential control to level structures
- Oil heater or heat exchanger for extreme conditions



◀ Positioning a 3500 ton dragline was successfully done with an Enerpac synchronous system. This operation provided for exact alignment of the bearing on the rail, prior to torque tightening of the slew ring bolts.

ESS Series



Capacity per lifting point:

9-910 tons

Maximum Stroke:

200 inches

Accuracy:

± .040 inch

Maximum Operating Pressure:

10,000 psi

Precise Positioning System for Assembly and Separation of Large Structures



Synchronous Positioning Applications

The Synchronous Positioning system uses feedback from multiple sensors to control the positioning of any large, heavy or complex structure, regardless of weight distribution. Synchronous positioning reduces the risk of bending, twisting, tilting or mis-alignment due to uneven weight distribution or load-shifts between the positional points.

A PLC controller monitors each position and optional load sensor located at each point. By varying the oil flow to each point, the system maintains a very accurate positional control. This control maintains structural integrity and can increase productivity and safety of the job, by eliminating manual intervention in the event of a load-shift or other problem.

Flange Alignment Tools

▼ From left to right: **ATM-3, ATM-1, ATM-5**



- Rectifies twist and rotational misalignment without additional stress in pipe lines
- For most commonly used ANSI, API, BS and DIN flanges
- No slings, hooks, or lifting gear. Extremely safe, high precision
- ATM-1 supplied with three bushings for different bolt hole sizes. Can be used in reversed position.
- ATM-3 fits when flange joint is:
 - between 1.18 - 5.23 inches apart and
 - bolt hole size 0.95 inches or greater
- ATM-5 fits when flange joint is:
 - between 3.75 - 9 inches apart and
 - bolt hole size 1.25 inches or greater
- Can be installed and used in any position and any location
- Stays stable in position under full load

ATM Series

Bolt Hole Range:

1¹/₁₆-2¹/₈ inches

Flange Wall Thickness:

1¹/₁₆-8 inches

Maximum Force:

0.3-5 tons



Adjustable Reach-on ATM-3

The highly adjustable reach of the wing, the reversible lift hook and manual

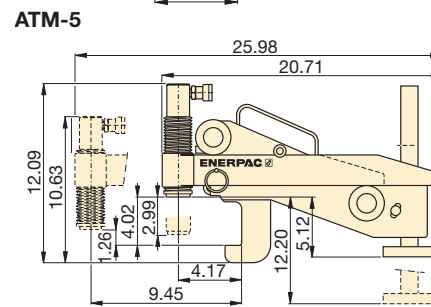
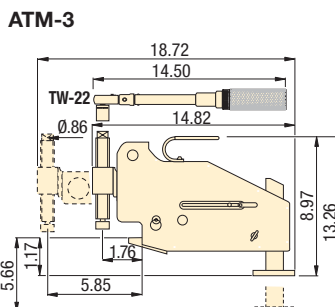
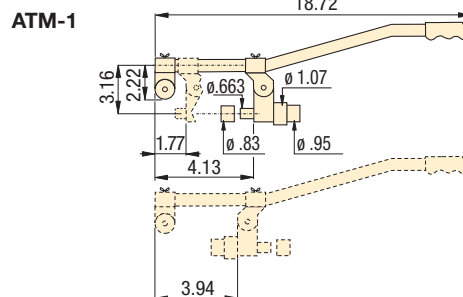
torque wrench **TW-22** (3/8" drive) allow precise alignment.



ATM-5 Including Hydraulics

Including 10,000 psi hydraulics: RC-53 single-acting cylinder, P-142 two-speed hand pump and 6 ft. long safety hose (HC-7206C).

All dimensions shown in inches.



▼ The Enerpac ATM-3 used to align a large ANSI flange.



Maximum Lifting Force (ton)	Model Number	Bolt Hole Range		Flange Wall Thickness		Weight (lbs)
		(in)	(mm)	(in)	(mm)	
0.3	ATM-1	11/16 - 11/8	17 - 27,2	11/16 - 2	17 - 50	4.4
3.3	ATM-3	1 - 21/8	25 - 54	13/16 - 41/2	30 - 115	21.4
5.5	ATM-5 *	≥ 11/4	≥ 31,5	31/8 - 8	80 - 203	35.7

* At 10,000 psi maximum operating pressure.

ATM-5 weight including hydraulic cylinder. Total set weight 62 lbs.

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



- 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

NC Series



Capacity:
5-90 tons

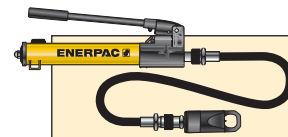
Hexagon Nut Range:
0.5-2.88 inches

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.



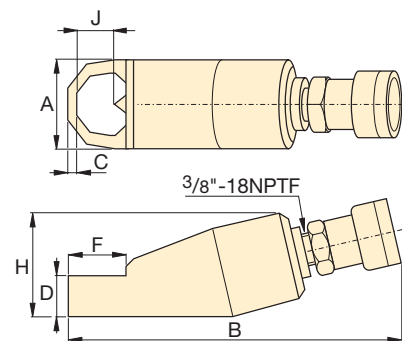
Nut Cutter Sets

Hydraulic Nut Cutters are available as sets (pump, tool 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.

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 in. (6 mm)
- Stepped spreader arm design: each step can spread under full load
- Few moving parts means durability and low maintenance
- Safety block SB-1 and ratchet spanner SW-22 included with FSM-8
- Safety block and Enerpac RC-102 cylinder included with FSH-14

FSM/FSH Series

Tip Clearance / Maximum Spread*:

0.24/3.16 inches

Maximum Spread Force:

8-14 tons

Maximum Operating Pressure:

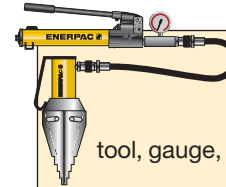
10,000 psi (FSH-14)



Stepped Blocks FSB-1

Use this pair of stepped blocks to increase wedge opening up to 3.16 in.

(81 mm). Fits both FSH-14 and FSM-8.

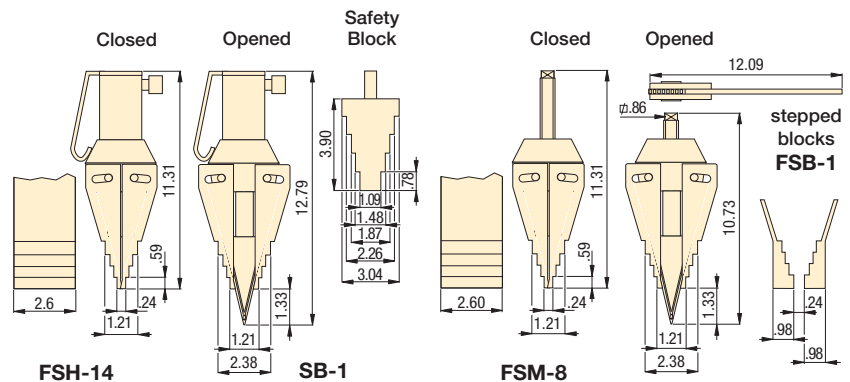


Flange Spreader Sets

Hydraulic FSH-14 is available as a set (pump, tool, gauge, adaptor and hose).

Set Model Number	Set Includes:	
STF-14H	FSH-14	GA-2
	P-392	GP-10S
	HC-7206	-

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



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

* Using stepped blocks FSB-1

▼ Shown: FS-56



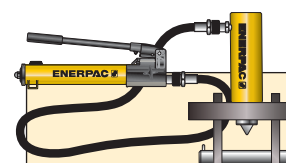
- Lightweight, ergonomic design for ease of use
- Adjustable jaw widths from 2.75" to 8.50" for a wide range of applications
- Single-acting, spring return RC Series cylinders for fast trouble-free operation

FS Series



Capacity:
5-10 tons

Maximum Operating Pressure:
10,000 psi



Flange Spreader Sets

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

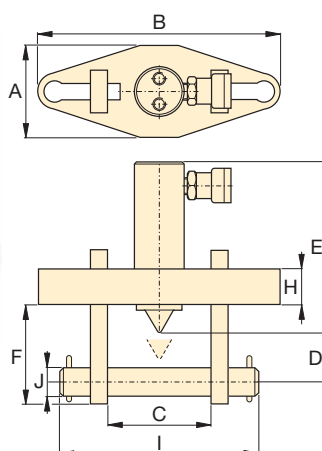
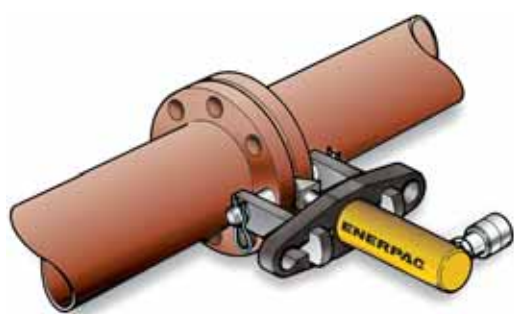
Set Model Number	Spreader Model Number	Pump Model Number
STF-56H	FS-56	P-142
STF-109H	FS-109	P-392
STF-109A	FS-109	PATG-1102N



Wedge Spreaders

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

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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. (tons)	Stroke (in)	Oil Cap. (in³)	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

Hydraulic Wedgie and Spread Cylinders

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



A, WR Series

Capacity:

0.75-1 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)



Nut Cutters

Remove rusted or corroded nuts easily with Enerpac Nut Splitters. Hexagon nut capacities up to 2.88 in.

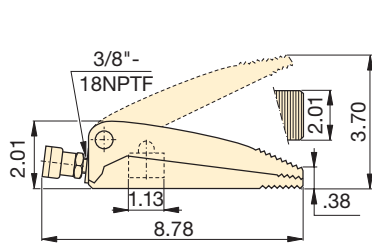
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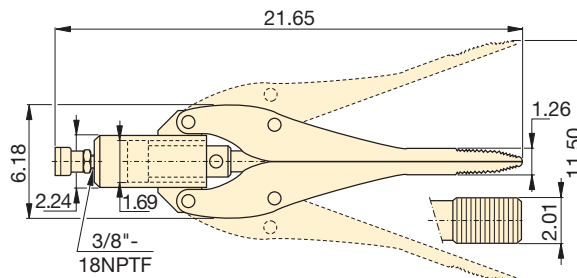
Best Match Hand Pump

To power your Wedgie and Spreader attachment the **P-392** Hand Pump is an ideal choice.

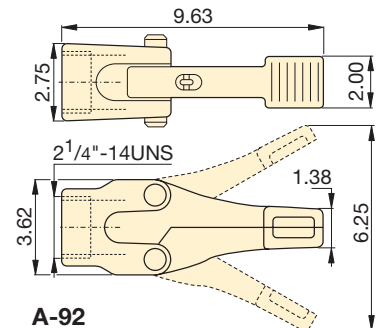
See the *Enerpac E326* catalog for the full range of hand pump options.



WR-5



WR-15



A-92

Spreader Capacity	Tip Clearance	Model Number	Maximum Spread	Cylinder Effective Area	Oil Capacity	Wt.
(tons)	(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


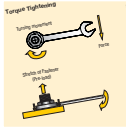

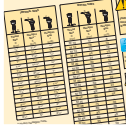
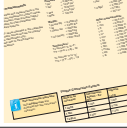
A WR-5 wedgie cylinder is used to position a concrete block on a construction site. ►





Enerpac 'Yellow Pages' *stand for* Technical Information!

If selecting bolting tools 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 bolting system set-ups and of the most commonly used bolting techniques. The better your choice of equipment, the better you will appreciate these tools. Take the time to go through these 'Yellow Pages' and you will benefit even more from Enerpac Bolting Solutions.

Section		
Bolting Theory		54 ▶
Torque Tightening		56 ▶
Tensioning		58 ▶
Bolt and Nut Sizes		60 ▶
Key to measurement		61 ▶

GLOBAL LIFETIME WARRANTY STATEMENT



www.enerpac.com

Visit our web site for the complete Global Lifetime Warranty or call your Authorized Service Center.

Enerpac products are warranted to be free of defects in materials and workmanship. Any product that does not conform to specification will be repaired or replaced at Enerpac's expense, anywhere in the world; simple as that !!

This warranty does not cover ordinary wear and tear, abuse, misuse, alterations, or the use of improper fluids. Determination of the authenticity of a warranty claim will be made only by Enerpac or its Authorized Service Centers.

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

CE Marking & Conformity

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



Where specified, Enerpac electric pump assemblies meet the design, assembly and test requirements of the TÜV German Body.

EMC Directive 2004/108/EC

Where specified, Enerpac electric power pumps meet the requirements for Electromagnetic Compatibility per EMC Directive 2004/108/EC.



The ZA-series pumps are tested and certified according to the Directive 94 / 9 / EC "ATEX Directive". The explosion protection is for equipment group II, equipment category 2 (hazardous area zone 1), in gas and/or dust atmospheres. The ZA-series pumps are marked with: Ex II 2 GD ck T4.

ASME B30.1-2004

Our cylinders fully comply with the criteria set forth by the American Society of Mechanical Engineers (except RD series).

DIN 20024

Enerpac thermoplastic hoses are related to the criteria set forth in Deutsche Industrie Norm 20024.

Product Design Criteria

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



ENERPAC, 720 W. James St., Columbus, WI 53925 USA

Enerpac works hard to maintain the ISO 9001 quality rating, in its ongoing pursuit of excellence.

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: _____

Application Position:

Bolt Diameter: _____

☐ Top-side

☐ Vertical

☐ Inverted

Bolt Threads per Inch/Pitch: _____

Bolt Grade: _____

Bolt Coating: _____

Gasket Type: _____

App. Operating Temp., °C or °F: _____

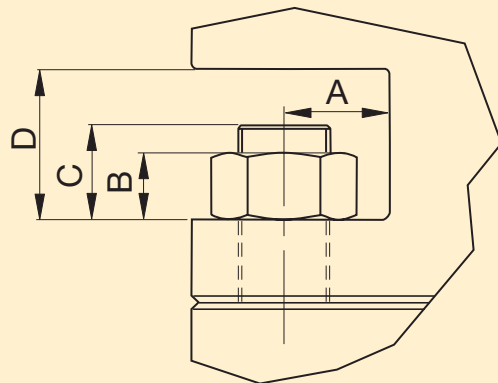
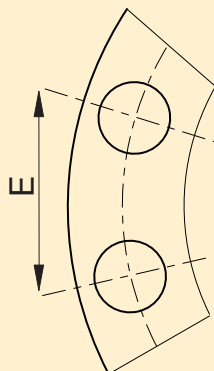
Known Bolting Values:

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

☐ Stretch-Bolt Length
(In. / mm) _____

☐ Turn of Nut
(Preload / Degrees) _____

☐ Torque
(Ft.lbs / Nm / Kgm) _____



Specify Dimensions:

INCH

MM (Metric)

A _____ B _____ C _____ D _____ E _____

Distance to Closure: _____

Current Lubrication: Type _____ Brand _____

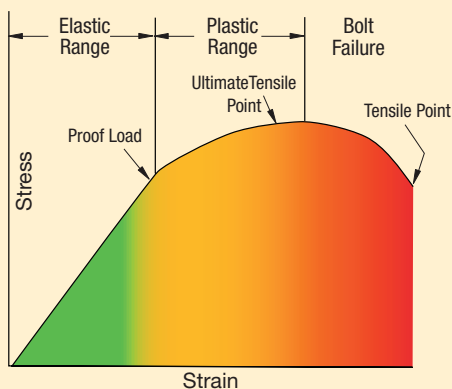


Function of Bolts and Nuts

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

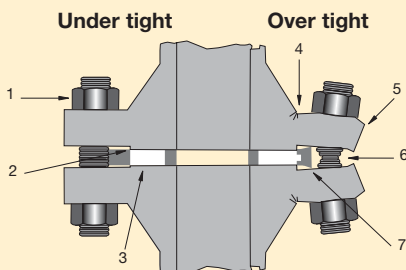
Elasticity is defined in Hooke's Law of physics: The stress in a bolt is directly proportional to its strain. The stress-strain of a bolt has an **elastic range** and a **plastic range**. In the elastic range Hooke's Law is true.

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.

ENERPAC
Torque Calculation System

Instructions
To populate the list of available tools, select a tightening method then set options, such as sizes, materials etc. Select a tool to view data calculated specifically for it.

Options
Tightening Method: ☒ Torquing ☐ Tensioning
Nut Series: ☐ Standard ☐ Heavy
Pressure Units: ☐ Paig ☐ Barig
Lubricant:
Units:

Calculation Details
Standard:
Joint Data:

Tooling Options
S1100
S3000
S6000
V6200
V4800
V8600
SGD-25
SGD-50
SGD-75
SGD-100
SGD-150

Messages

Calculation Information
Change units between mm and inches

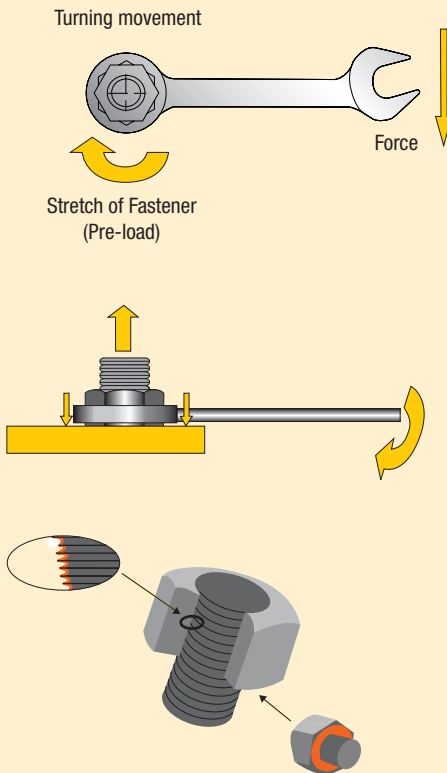
TIGHTENING VALUES
Residual Bolt Stress: 324 N/mm² 46394 Psi
Bolt Load: 209856 N 47200 lbf
Torque: 1182 Nm 873 lbf ft

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

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).



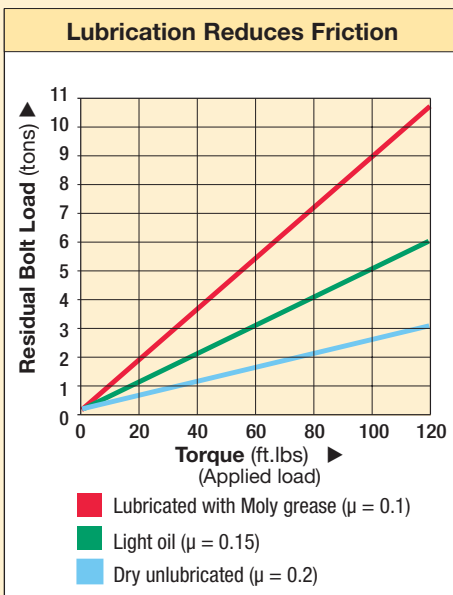
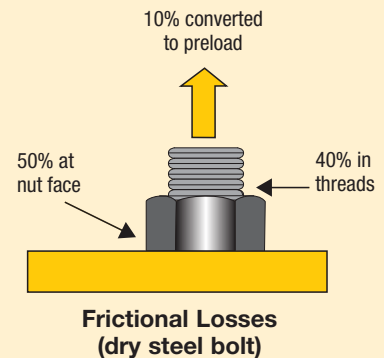
Preload (residual load) = Applied Torque *minus* Frictional Losses

Lubrication Reduces Friction

Lubrication reduces the friction during tightening, decreases bolt failure during installation and increases bolt service life. Variation in friction coefficients affect the amount of preload achieved at a specified torque. Higher friction results in less conversion of torque to preload. The value for the friction coefficient provided by the lubricant manufacturer must be known to accurately establish the required torque value.

Lubricant or anti-seizure compounds should be applied to both the nut bearing surface and the male threads.

Frictional Losses



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

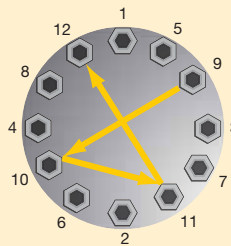
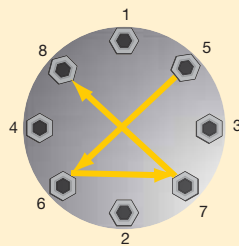
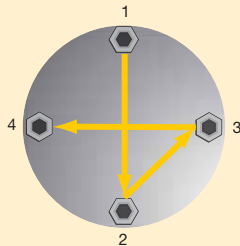


**Manufacturer's rating of pressure and torque are maximum safe limits.
Good practice encourages using only 80% of these ratings!**

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.

Breakout Torque

When loosening bolts a torque value higher than the tightening torque is normally required. This is mainly due to corrosion and deformations in the bolt and nut threads.

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

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



Select the Right Wrench

Choose your Enerpac torque wrench using the untightening rule of thumb:

- When loosening a nut or bolt more torque is usually required than when tightening.
- For general conditions it can take up to 2½ times the input torque to breakout.
- Do not apply more than 75% of the maximum torque output of the tool when loosening nuts or bolts.

Conditions of bolted joints

- Humidity corrosion (rust) requires up to twice the torque required for tightening.
- Sea water and chemical corrosion requires up to 2½ times the torque required for tightening.
- Heat corrosion requires up to 3 times the torque required for tightening.



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.

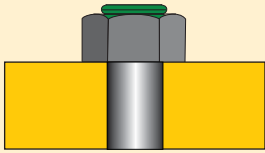


Tensioning

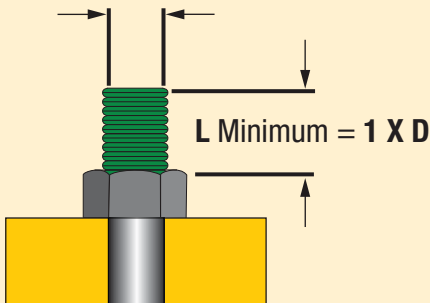
Tensioning requires longer bolts



INCORRECT



CORRECT



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!**

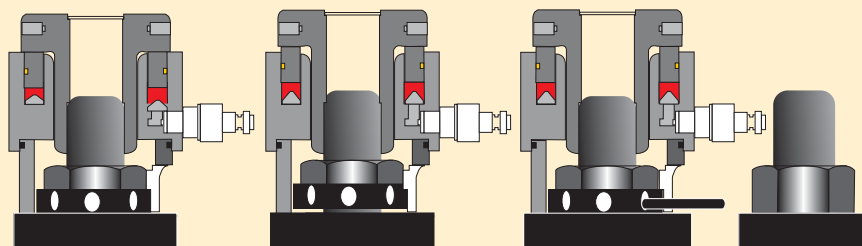
Tensioning Operation

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.



Step 1

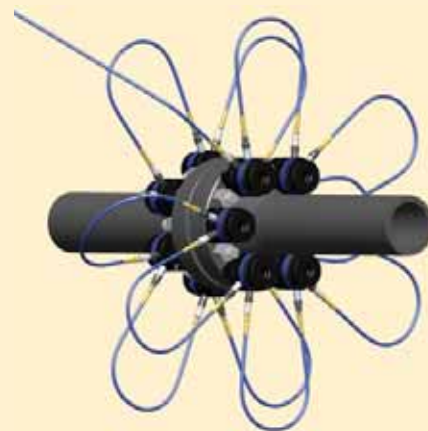
Step 2

Step 3

Step 4

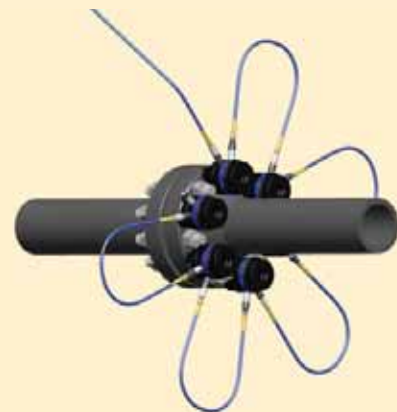
Less than 100% Tensioning

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.



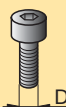
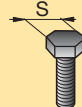

Read Instruction Manuals

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

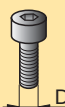


Hexagon Nut and Bolt Sizes

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.

Key To Measurements



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 klbf	= 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

Torque Conversion Factors



Free Conversion Calculator
 Visit enerpac.com
 and download the
 free conversion calculator.

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

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