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ENERPAC®

POWERFUL SOLUTIONS. GLOBAL FORCE.

BOLTING TOOLS

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Enerpac Bolting Tools

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

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.

Bolting Tools Overview

ATM-Serie, 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 Applications

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 aluminium tools for controlled bolting.

Bolting Solutions

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

NC and NS-Series, 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-Series, Wedge Spreaders

Pumps and Accessories

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

Pumps and Accessories

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

Accurate, Efficient Torque Multiplication

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

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

Typical Torque Multiplier Applications

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

Heavy Duty Sockets

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

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▼ **SELECTION CHART**

Torque Multiplier Type	Output Torque Capacity (Nm)	Output Torque Capacity (Ft.lbs)	Model Number
Reaction Bar Multiplier	1015	750	**E290PLUS**
	1355	1000	**E291**
	1625	1200	**E391**
	2980	2200	**E392**
	4340	3200	**E393**
Reaction Plate Multiplier	2980	2200	**E492**
	4340	3200	**E493**
	6780	5000	**E494**
	10.845	8000	**E495**

◀ *Enerpac Reaction Bar Torque Multiplier E393 used to manually torque bolts up to 4300 Nm.*

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:

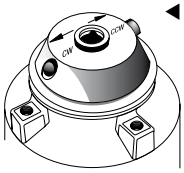
- above 3.200 Nm output torque
- on flanges and applications where neighboring bolt or nut is available to react against
- when extreme reaction forces are generated.

E Series

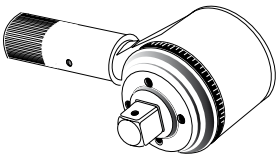
Maximum Output Torque:
1015 - 10.845 Nm

Torque Ratio:
3:1 - 52:1

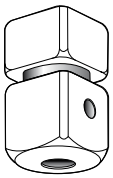
Multiplier Output Ratio Accuracy:
± 5 %



◀ **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 of 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.

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

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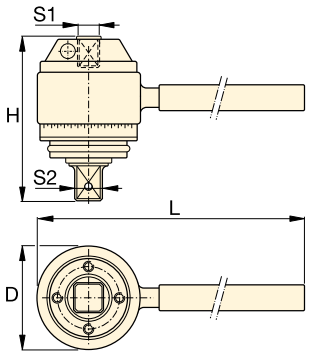
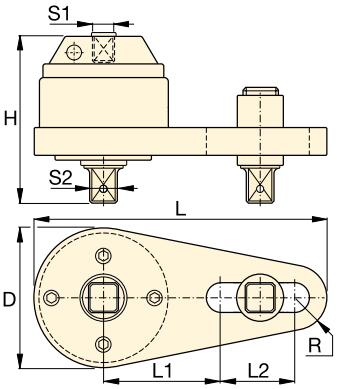


Reaction Bar Type [1]



Reaction Plate Type [1]

Input Torque (Nm)	Input Torque (Ft.lbs)	Torque Ratio	Input Female Square Drive S1 (inch)	Output Male Square Drive S2 (inch)	Output Male Square Drive Replaceable Shear Drive Model No.	Over-load Protec-tion	Anti-Back-lash	Dimensions (mm) D	H	L	L1	L2	R	(kg)	Model Number
338	250	3 : 1	½	¾	–	No	No	71	84	218	–	–	–	1,8	**E290PLUS**
451	333	3 : 1	½	¾	–	No	No	71	84	442	–	–	–	2,5	**E291**
271	200	6 : 1	½	¾	E391SDK	Yes	No	100	102	498	–	–	–	4,1	**E391**
220	162	13,6 : 1	½	1	E392SDK	Yes	Yes	103	146	498	–	–	–	6,9	**E392**
235	173	18,5 : 1	½	1	E393SDK	Yes	Yes	103	165	498	–	–	–	8,3	**E393**
220	162	13,6 : 1	½	1	E392SDK	Yes	Yes	124	140	356	140	124	32	7,8	**E492**
235	173	18,5 : 1	½	1	E393SDK	Yes	Yes	124	163	356	140	124	32	8,9	**E493**
256	189	26,5 : 1	½	1½	E494SDK	Yes	Yes	143	222	378	178	89	41	15,4	**E494**
209	154	52 : 1	½	1½	E495SDK	Yes	Yes	148	293	387	178	89	48	22,8	**E495**

[1] E200 and E400-series do not have an Angle-of-Turn Protractor (scale).
User must verify manual torque wrench accuracy prior to use to ensure accurate final output torque.

▼ From left to right: **S3000, S6000, S1500**

Rigid Steel Design

The *Professional* Square Drive Solution

Simplicity

- **Includes handle to improve tool handling and safety**
- **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**
- **Accuracy of ±3% can be achieved because the Uni-Body construction reduces internal deflections.**

S-Series, Torque Wrenches

The most advanced and safe torque wrenches on the market. To ensure that the tools you buy meet our own exacting requirements, during the design process every prototype was put through finite element stress analysis, photo-elastic modeling, rigorous cyclic testing and strain gauging.

The S-Series torque wrenches are tested and certified according to the Directive on Machinery: 2006/42/EC, and ATEX, Directive on potentially explosive atmospheres: 94/9/EC with the ratings of: CE Ex II 2 GD cT4.

Ex II 2 GD T4

TSP - Pro Series Swivel

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

How to Order

Order as an accessory which can be fitted to existing S-Series wrenches. Factory fitted: add suffix "P" to the wrench model number: **S1500P**.

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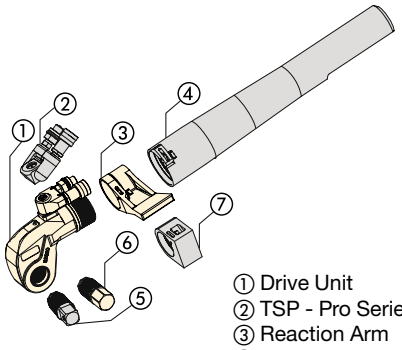
Torque Wrench Hoses

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

6 m long, 2 hoses	**THQ-706T**
12 m long, 2 hoses	**THQ-712T**

Double-Acting Square Drive Hydraulic Torque Wrenches



① Drive Unit
② TSP - Pro Series Swivel
③ Reaction Arm
④ Extended Reaction Arm
⑤ Square Drive
⑥ Allen Key Drive
⑦ Short Reaction Arm

Select the Right Torque

250%

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

S Series

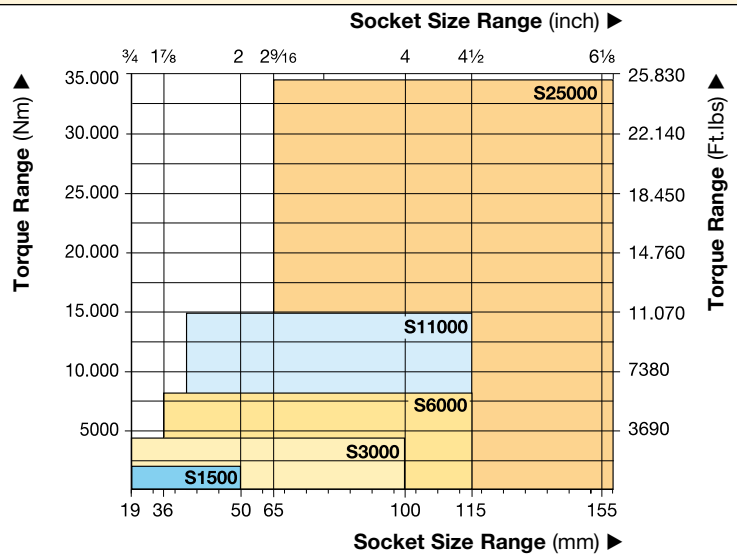
Maximum Torque at 700 bar:
34.079 Nm

Square Drive Range:
¾ - 2½ inch

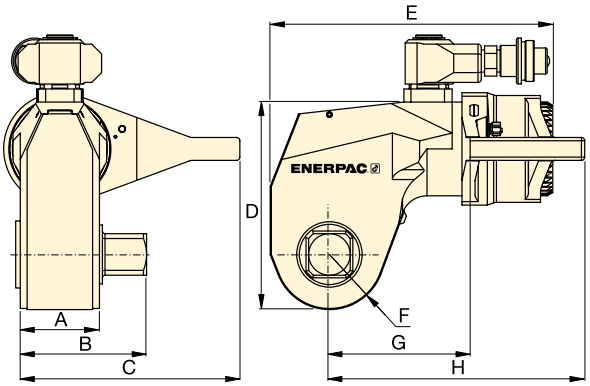
Nose Radius:
25,0 - 63,5 mm

Maximum Operating Pressure:
700 bar

*** TORQUE WRENCH SELECTION (based on socket size range)**



* Additional socket sizes available upon request. See page 10 for BSH-Series sockets.



Torque Wrench and Pump Selection Matrix

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

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

Maximum Torque at 700 bar		Square Drive		Torque Wrench Model Nr. *	Dimensions (mm)								
		Size (inch)	Model No. (included with wrench)										
Nm	(Ft.lbs)				A	B	C	D	E	F	G	H	(kg)
1898	1400	¾"	SD15-012	**S1500**	39	65	108	95	136	25	72	119	2,7
4339	3200	1"	SD30-100	**S3000**	48	80	134	125	173	33	91	159	5,0
8144	6010	1½"	SD60-108	**S6000**	55	92	167	155	193	41	113	186	8,5
14.914	11.000	1½"	SD110-108	**S11000**	72	114	196	187	228	50	133	226	15,0
34.079	25.140	2½"	SD250-208	**S25000**	89	143	244	241	287	64	182	291	31,0

* To order a S-series wrench fitted with the TSP swivel, suffix the model number with "P". e.g., **S1500P**.
Minimum output torque is 10% of maximum torque. See "Yellow Pages" section for torque conversions and tables of pressure versus torque (pages 77-78).

SDA-Series, Allen Key Drives

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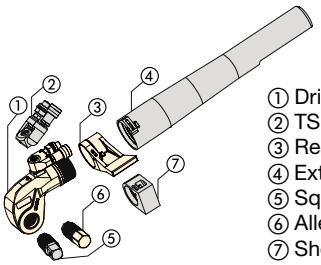


① Drive Unit
② TSP - Pro Series Swivel
③ Reaction Arm
④ Extended Reaction Arm
⑤ Square Drive
⑥ Allen Key Drive
⑦ Short Reaction Arm

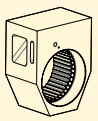
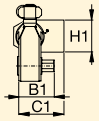
Maximum Torque at 700 bar:
34.079 Nm

Square Drive Range:
¾ - 2½ inch

Hexagon Size Allen Drive:
14 - 85 mm | ½-2¼"

For S Series

▼ **SELECTION CHART**

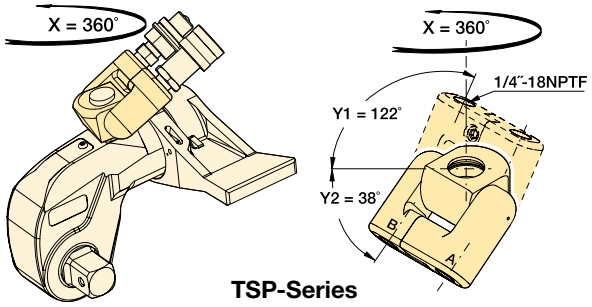
TORQUE WRENCH	OPTIONAL ALLEN DRIVES, IMPERIAL				OPTIONAL ALLEN DRIVES, METRIC				SHORT REACTION ARM FOR ALLEN DRIVES		
											
Model Number	**Hexagon Size** (inch)	**Maximum Torque** (Nm)	**Model Number**	**Dim. B1** (mm)	**Hexagon Size** (mm)	**Maximum Torque** (Nm)	**Model Number**	**Dim. B1** (mm)	**Model Number**	**Dimensions** (mm) **C1**	**H1**
S1500 (1898 Nm)	½	481	**SDA15-008**	66	**14**	644	**SDA15-14**	66	**SRA15**	67,5	65
	⅝	935	**SDA15-010**	67	**17**	1152	**SDA15-17**	68			
	¾	1619	**SDA15-012**	71	**19**	1606	**SDA15-19**	70			
	⅞	1897	**SDA15-014**	74	**22**	1897	**SDA15-22**	73			
	1	1897	**SDA15-100**	77	**24**	1897	**SDA15-24**	74			
S3000 (4339 Nm)	⅝	935	**SDA30-010**	77	**17**	1152	**SDA30-17**	77	**SRA30**	80,0	74
	¾	1619	**SDA30-012**	80	**19**	1606	**SDA30-19**	79			
	⅞	2568	**SDA30-014**	83	**22**	2486	**SDA30-22**	82			
	1	3828	**SDA30-100**	86	**24**	3232	**SDA30-24**	84			
	1⅛	4336	**SDA30-102**	88	**27**	4336	**SDA30-27**	85			
	1¼	4336	**SDA30-104**	89	**30**	4336	**SDA30-30**	87			
	–	–	–	–	**32**	4336	**SDA30-32**	88			
S6000 (8144 Nm)	⅝	935	**SDA60-010**	85	**17**	1152	**SDA60-17**	86	**SRA60**	91,5	89
	¾	1619	**SDA60-012**	89	**19**	1606	**SDA60-19**	88			
	⅞	2568	**SDA60-014**	92	**22**	2486	**SDA60-22**	91			
	1	3828	**SDA60-100**	95	**24**	3232	**SDA60-24**	93			
	1⅛	5454	**SDA60-102**	97	**27**	4600	**SDA60-27**	94			
	1¼	7480	**SDA60-104**	98	**30**	6308	**SDA60-30**	96			
	–	–	–	–	**32**	7656	**SDA60-32**	97			
S11000 (14.914 Nm)	**1¼**	7480	**SDA110-104**	115	**30**	6308	**SDA110-30**	112	**SRA110**	127,5	106
	1⅜	9953	**SDA110-106**	117	**32**	7656	**SDA110-32**	114			
	1½	12.920	**SDA110-108**	118	**36**	10.894	**SDA110-36**	117			
	1⅝	14.905	**SDA110-110**	122	**41**	14.905	**SDA110-41**	121			
	1¾	14.905	**SDA110-112**	125	**46**	14.905	**SDA110-46**	127			
S25000 (34.079 Nm)	**1½**	12.920	**SDA250-108**	141	**36**	10.894	**SDA250-36**	140	**SRA250**	158,5	135
	1⅝	16.423	**SDA250-110**	145	**41**	16.098	**SDA250-41**	144			
	1¾	20.508	**SDA250-112**	148	**46**	22.730	**SDA250-46**	148			
	1⅞	25.230	**SDA250-114**	149	**50**	29.194	**SDA250-50**	151			
	2	30.617	**SDA250-200**	151	**55**	34.079	**SDA250-55**	154			
	2¼	34.079	**SDA250-204**	154	**60**	34.079	**SDA250-60**	158			
	–	–	–	–	**65**	34.079	**SDA250-65**	161			
	–	–	–	–	**70**	34.079	**SDA250-70**	164			
	–	–	–	–	**75**	34.079	**SDA250-75**	168			
	–	–	–	–	**85**	34.079	**SDA250-85**	175			

Accessories for S-Series Torque Wrenches

TSP-Series, Pro Series Swivels

- Featuring Tilt and Swivel technology
- 360° X-axis and 160° Y-axis rotation
- Increases tool fit in restricted access areas
- Simplifies hose placement
- Includes male and female Spin-On couplers.

TSP
RTE
SRS
Series

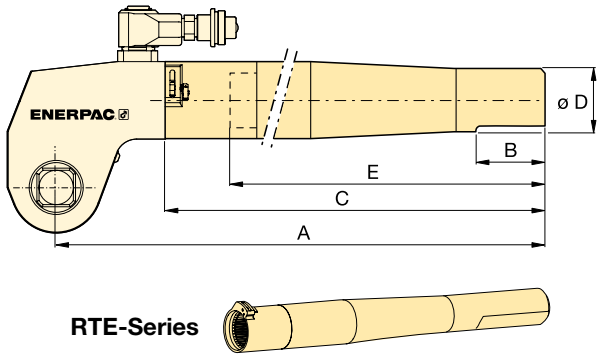


TSP-Series

For Torque Wrench Model Number	Model Number	Maximum Pressure (bar)	(kg)
S1500, S3000	**TSP100A**	700	0,2
S6000, S11000, S25000	**TSP200A**	700	0,2

To order an S-series wrench fitted with the TSP swivel, add suffix "P" to the model number. Example: **S1500P**. TSP-swivel include male (TH-630) and female (TR-30) couplers.

RTE-Series, Reaction Tube Extensions



RTE-Series

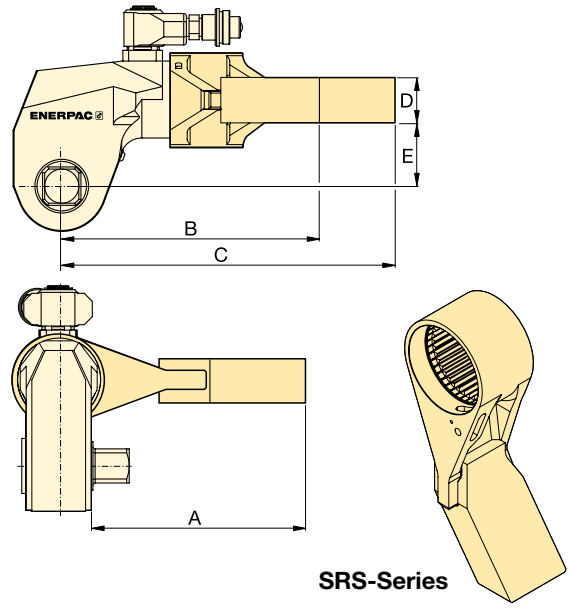
- Full torque rated
- Increases tool fit in restricted access areas.

For Torque Wrench Model Number	Model Number	Dimensions (mm)					(kg)*
		A	B	C	D	E	
S1500	**RTE15**	706	152	636	58	600	4,6
S3000	**RTE30**	733	152	647	57	600	5,5
S6000	**RTE60**	747	152	659	65	600	7,7
S11000	**RTE110**	769	152	675	76	600	11,2
S25000	**RTE250**	813	152	685	100	600	17,3

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

SRS-Series, Extended Reaction Arms

- Lightweight interchangeable design.



SRS-Series

For Wrench Model	Max. Torque (Nm)	Model Number	Dimensions (mm)					(kg)*
			A	B	C	D	E	
S1500	1800	**SRS151**	97	87	128	24	34	0,8
	1640	**SRS152**	122	98	139	24	34	1,0
	1533	**SRS153**	147	109	150	24	34	1,2
S3000	3918	**SRS301**	111	104	170	34	48	1,6
	3712	**SRS302**	137	119	185	34	48	2,0
	3574	**SRS303**	162	133	200	34	48	2,5
S6000	7842	**SRS601**	148	134	198	39	62	2,3
	7454	**SRS602**	173	149	213	39	62	2,7
	7175	**SRS603**	198	163	228	39	62	3,4
S11000	14.650	**SRS1101**	151	158	233	46	76	4,4
	13.957	**SRS1102**	176	173	248	46	76	5,1
	13.391	**SRS1103**	201	187	262	46	76	5,8
S25000	33.538	**SRS2501**	183	225	314	50	100	7,6
	32.049	**SRS2502**	208	240	329	50	100	8,4
	30.750	**SRS2503**	233	254	344	50	100	10,0

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

BSH-Series, Heavy-Duty Sockets

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

- **Heavy-duty impact sockets**
- **Supplied with “Pin and Ring”**

BSH Series

Hexagon Size:
19 - 155 mm, ¾" - 6⅛"

Select the Right Torque

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

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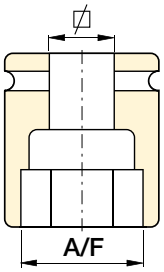

Hexagon Bolt and Nut Sizes

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

Page: 76

METRIC SOCKETS							
¾" Square Drive		1" Square Drive		1½" Square Drive		2½" Square Drive	
Model Number	A/F (mm)	Model Number	A/F (mm)	Model Number	A/F (mm)	Model Number	A/F (mm)
BSH7519	19	BSH1019	19	BSH1536	36	BSH2565	65
BSH7524	24	BSH1024	24	BSH15163	41	BSH2570	70
BSH7527	27	BSH1027	27	BSH1546	46	BSH2575	75
BSH7530	30	BSH1030	30	BSH1550	50	BSH2580	80
BSH7532	32	BSH1032	32	BSH1555	55	BSH2585	85
BSH7536	36	BSH1036	36	BSH1560	60	BSH2590	90
BSH75163	41	BSH10163	41	BSH1565	65	BSH2595	95
BSH7546	46	BSH1046	46	BSH1570	70	BSH25100	100
BSH7550	50	BSH1050	50	BSH1575	75	BSH25105	105
–	–	BSH1055	55	BSH1580	80	BSH25110	110
–	–	BSH1060	60	BSH1585	85	BSH25115	115
–	–	BSH1065	65	BSH1590	90	BSH25120	120
–	–	BSH1070	70	BSH1595	95	BSH25125	125
–	–	BSH1075	75	BSH15100	100	BSH25135	135
–	–	BSH1080	80	BSH15105	105	BSH25140	140
–	–	BSH1085	85	BSH15110	110	BSH25145	145
–	–	BSH1090	90	BSH15115	115	BSH25150	150
–	–	BSH1095	95	–	–	BSH25155	155
–	–	BSH10100	100	–	–	–	–

IMPERIAL SOCKETS													
¾" Square Drive		1" Square Drive				1½" Square Drive				2½" Square Drive			
Model Number	A/F (inch)	Model Number	A/F (inch)	Model Number	A/F (inch)	Model Number	A/F (inch)	Model Number	A/F (inch)	Model Number	A/F (inch)	Model Number	A/F (inch)
BSH7519	¾"	BSH1019	¾"	BSH10231	2 5/16"	BSH15144	1 7/16"	BSH15281	2 13/16"	BSH25244	2 7/16"	BSH25419	4 13/16"
BSH75088	⅞"	BSH10088	⅞"	BSH10238	2 ⅜"	BSH1538	1 ½"	BSH15288	2 ⅞"	BSH25250	2 ½"	BSH25425	4 ¼"
BSH75094	15/16"	BSH10094	15/16"	BSH10244	2 7/16"	BSH15156	1 9/16"	BSH1575	2 15/16"	BSH2565	2 13/16"	BSH25110	4 5/16"
BSH7527	1 1/16"	BSH1027	1 1/16"	BSH10250	2 ½"	BSH15163	1 ⅝"	BSH15300	3"	BSH25263	2 ⅝"	BSH25438	4 ⅜"
BSH7530	1 3/16"	BSH1030	1 3/16"	BSH1065	2 9/16"	BSH1543	1 11/16"	BSH15306	3 1/16"	BSH25269	2 11/16"	BSH25450	4 ½"
BSH75125	1 ¼"	BSH10125	1 ¼"	BSH10263	2 ⅝"	BSH15175	1 ¾"	BSH15313	3 ⅛"	BSH2570	2 ¾"	BSH25463	4 ⅝"
BSH75131	1 5/16"	BSH10131	1 5/16"	BSH10269	2 11/16"	BSH1546	1 13/16"	BSH15319	3 3/16"	BSH25281	2 11/16"	BSH25475	4 ¾"
BSH7535	1 ⅜"	BSH1035	1 ⅜"	BSH1070	2 ¾"	BSH15188	1 ⅞"	BSH15325	3 ¼"	BSH25288	2 ⅞"	BSH25488	4 ⅞"
BSH75144	1 7/16"	BSH10144	1 7/16"	BSH10281	2 13/16"	BSH15194	1 15/16"	BSH15338	3 ⅜"	BSH2575	2 15/16"	BSH25500	5"
BSH7538	1 ½"	BSH1038	1 ½"	BSH10288	2 ⅞"	BSH15200	2"	BSH15350	3 ½"	BSH25300	3"	BSH25513	5 ⅛"
BSH75156	1 9/16"	BSH10156	1 9/16"	BSH1075	2 15/16	BSH15206	2 1/16"	BSH15363	3 ⅝"	BSH25306	3 1/16"	BSH25519	5 3/16"
BSH75163	1 ⅝"	BSH10163	1 ⅝"	BSH10300	3"	BSH15213	2 ⅛"	BSH1595	3 ¾"	BSH25313	3 ⅛"	BSH25525	5 ¼"
BSH7543	1 11/16"	BSH1043	1 11/16"	BSH10306	3 1/16"	BSH15219	2 3/16"	BSH15388	3 ⅞"	BSH25319	3 3/16"	BSH25538	5 ⅜"
BSH75175	1 ¾"	BSH10175	1 ¾"	BSH10313	3 ⅛"	BSH15225	2 ¼"	BSH15100	3 15/16"	BSH25325	3 ¼"	BSH25140	5 ½"
BSH7546	1 3/16"	BSH1046	1 13/16"	BSH10319	3 3/16"	BSH15231	2 5/16"	BSH15400	4"	BSH25338	3 ⅜"	BSH25575	5 ¾"
BSH75188	1 ⅞"	BSH10188	1 ⅞"	BSH10325	3 ¼"	BSH15238	2 ⅜"	BSH15105	4 ⅛"	BSH25350	3 ½"	BSH25150	5 ⅞"
BSH75194	1 15/16"	BSH10194	1 15/16"	BSH10338	3 ⅜"	BSH15244	2 7/16"	BSH15419	4 3/16"	BSH25363	3 ⅝"	BSH25600	6"
BSH75200	2"	BSH10200	2"	BSH10350	3 ½"	BSH15250	2 ½"	BSH15425	4 ¼"	BSH2595	3 ¾"	BSH25613	6 ⅛"
–	–	BSH10206	2 1/16"	BSH10363	3 ⅝"	BSH1565	2 9/16"	BSH15110	4 5/16"	BSH25388	3 ⅞"	–	–
–	–	BSH10213	2 ⅛"	BSH1095	3 ¾"	BSH15263	2 ⅝"	BSH15438	4 ⅜"	BSH25100	3 15/16"	–	–
–	–	BSH10219	2 3/16"	BSH10388	3 ⅞"	BSH15269	2 11/16"	BSH15450	4 ½"	BSH25400	4"	–	–
–	–	BSH10225	2 ¼"	–	–	BSH1570	2 ¾"	BSH15463	4 ⅝"	BSH25105	4 ⅛"	–	–

Bolting Application Ideas

Enerpac professional series steel torque wrenches provide reliable controlled tightening solutions across the 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.

◀ S1500 Square Drive Torque Wrench with twice the flexibility

When looking to tighten the bolts on a large specialized piece of machining equipment the need for a unique tool was requested by the customer. A double-headed Reaction Arm and double-sided Square Drive was the answer to the situation.

Although in most instances the Enerpac product in the catalog can solve a customers requirements there are occasions where something custom is required. Enerpac has the capabilities to provide those solutions.

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 a compact ergonomic tool.

▼ Shown: **Drive units with interchangeable cassettes**

Rigid Steel Design

The *Professional* Low Profile Solution

W-Series, Torque Wrenches

The most advanced and safe torque wrenches on the market. 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.

The W-Series torque wrenches are tested and certified according to the Directive on Machinery: 2006/42/EC, and ATEX, Directive on potentially explosive atmospheres: 94/9/EC with the ratings of: CE Ex II 2 GD cT4.

Ex II 2 GD T4

Simplicity

- **Includes handle to improve tool handling and safety.**
- **No tools are needed for changing the hexagon cassettes**
- **Innovative, pinless wrench construction incorporates quick release cylinder and automatic crank engagement**
- **Single 360° hydraulic swivel manifold complete with screw lock couplings increases wrench and hose manoeuvrability.**

Design

- **Cylinders and low profile cassettes have been engineered to give ultra slim, compact low clearance tooling with a small nose radius**
- **Robust design with minimal parts enables easy on-site maintenance without special tools**
- **Nut sizes covered range from 30 - 155 mm (1⅛ - 6⅛ inch)**
- **Optimized strength-to-weight ratio**
- **Fast operation due to the large nut rotation per wrench cycle (30 degree rotation angle) and rapid return stroke.**

Reliability

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

Accuracy

- **Constant torque output provides accuracy ±3% across the full stroke**
- **In-line reaction foot 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 as an accessory which can be fitted to existing S-Series wrenches. Factory fitted: add suffix "P" to the wrench model number: **W2000P**.

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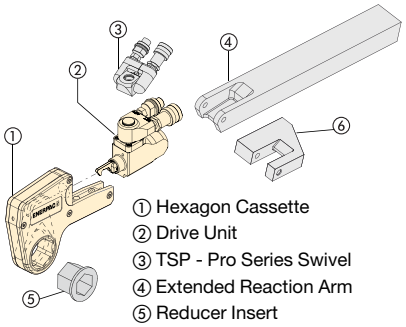
Torque Wrench Hoses

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

6 m long, 2 hoses	**THQ-706T**
12 m long, 2 hoses	**THQ-712T**

Double-Acting Hydraulic Hexagon Torque Wrenches



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 700 bar:
47.450 Nm

Hexagon Range:
30 - 155 mm, 1⅛ - 6⅛"

Nose Radius:
31 - 115 mm

Maximum Operating Pressure:
700 bar

Torque Wrench Pump Selection Matrix

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

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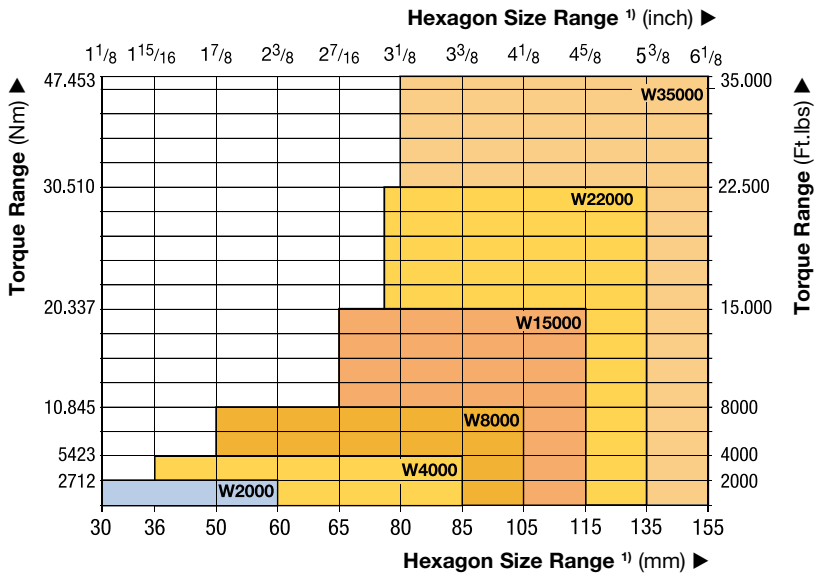
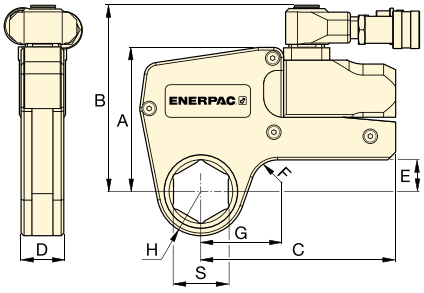
DRIVE UNIT AND INTERCHANGEABLE CASSETTE SELECTION



¹⁾ See page 76 for table of hexagon sizes of bolts, nuts and related thread diameters.

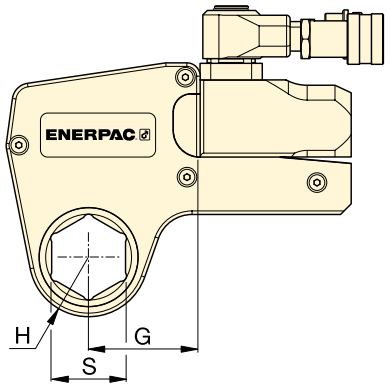


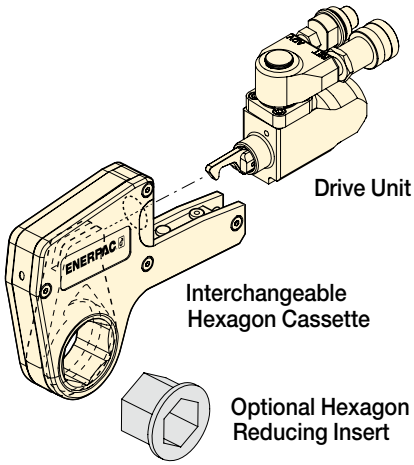
These rigid steel wrenches with low profile interchangeable hexagon cassettes guarantee durability and maximum versatility in bolting applications. ▶

▼ SELECTION CHART

Hexagon Range *  *Page:* 14		Maximum Torque at 700 bar		Drive Unit Model Number ** 	Minimum Torque		Dimensions (mm) (see pages 14-21 for dimensions H, G and S)						Weight (drive unit without hexagon cassette)
(mm)	(inch)	(Nm)	(Ft.lbs)		(Nm)	(Ft.lbs)	A	B	C	D	E	F	(kg)
30 - 60	1 ⅛ - 2 ⅜	2712	2000	**W2000**	271	200	109	141	148	32	24	20	1,4
36 - 85	1 5/16 - 3 ⅜	5423	4000	**W4000**	542	400	136	167	178	41	33	20	2,0
50 - 105	1 ⅞ - 4 ⅛	10.846	8000	**W8000**	1084	800	172	205	208	53	42	25	3,0
65 - 115	2 7/16 - 4 ⅝	20.337	15.000	**W15000**	2033	1500	207	240	253	63	50	20	5,0
75 - 135	2 15/16 - 5 ⅜	30.510	22.500	**W22000**	3050	2250	227	266	297	77	48	35	7,7
80 - 155	3 ⅛ - 6 ⅛	47.450	35.000	**W35000**	4745	3500	268	301	345	91	69-73	50	11,4

* With in-line reaction foot. ** To order a wrench fitted with the TSP swivel, suffix the model number with "P". Example: **W2000P**.
See "Yellow Pages" section for torque conversions and tables of pressure versus torque (pages 77-78).





W Series

Maximum Torque at 700 bar:
2712 Nm

Hexagon Range:
1⅛ - 2⅜ inch

Maximum Operating Pressure:
700 bar

Metric Sizes
For metric sizes of hexagon cassettes and reducer inserts see:
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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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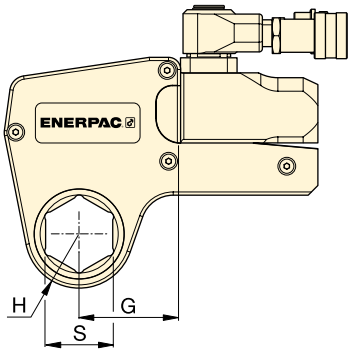
▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size S (inch)	Nose Radius H (mm)	G (mm)	Model Nr. Cassette	(kg)	Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer
W2000	1⅛	31,0	53,7	W2102	2,1	–	–	–	–	–	–
	1³⁄₁₆	31,0	53,7	W2103	2,1	–	–	–	–	–	–
	1¼	31,0	53,7	W2104	2,1	–	–	–	–	–	–
	1⁵⁄₁₆	31,0	53,7	W2105	2,1	–	–	–	–	–	–
	1⅜	31,0	53,7	W2106	2,1	–	–	–	–	–	–
	1⁷⁄₁₆	31,0	53,7	W2107	2,1	1⁷⁄₁₆ - 1⅛	W2107R102	–	–	–	–
	1½	33,5	58,2	W2108	2,2	–	–	–	–	–	–
	1⁹⁄₁₆	33,5	58,2	W2109	2,2	–	–	–	–	–	–
	1⅝	33,5	58,2	W2110	2,2	1⅝ - 1¼	W2110R104	1⅝ - 1³⁄₁₆	W2110R103	–	–
	1¹¹⁄₁₆	36,5	60,5	W2111	2,2	–	–	–	–	–	–
	1¾	36,5	60,5	W2112	2,2	–	–	–	–	–	–
	1¹³⁄₁₆	36,5	60,5	W2113	2,2	1¹³⁄₁₆ - 1⁷⁄₁₆	W2113R107	1¹³⁄₁₆ - 1¼	W2113R104	–	–
	1⅞	39,0	63,1	W2114	2,2	–	–	–	–	–	–
	1¹⁵⁄₁₆	39,0	63,1	W2115	2,2	–	–	–	–	–	–
	2	39,0	63,1	W2200	2,2	2 - 1⅝	W2200R110	2 - 1⁷⁄₁₆	W2200R107		–
	2¹⁄₁₆	41,8	68,6	W2201	2,3	–	–	–	–	–	–
	2⅛	41,8	68,6	W2202	2,3	–	–	–	–	–	–
	2³⁄₁₆	41,8	68,6	W2203	2,3	2³⁄₁₆ - 1¹³⁄₁₆	W2203R113	2³⁄₁₆ - 1⅝	W2203R110	2³⁄₁₆ - 1⁷⁄₁₆	W2203R107
	–	–	–	–	–	–	–	–	–	–	–
	2¼	44,5	64,8	W2204	2,2	–	–	–	–	–	–
	2⁵⁄₁₆	44,5	64,8	W2205	2,2	–	–	–	–	–	–
	2⅜	44,5	64,8	W2206	2,2	2⅜ - 2	W2206R200	2⅜ - 1⅞	W2206R114	2⅜ - 1¹³⁄₁₆	W2206R113
	–	–	–	–	–	2⅜ - 1½	W2206R108	2⅜ - 1⁷⁄₁₆	W2206R107	2⅜ - 1⅝	W2206R110

W4000, Inch-Cassettes & Reducer Inserts



Maximum Torque at 700 bar:
5423 Nm

Hexagon Range:
1 5/16 - 3 3/8 inch

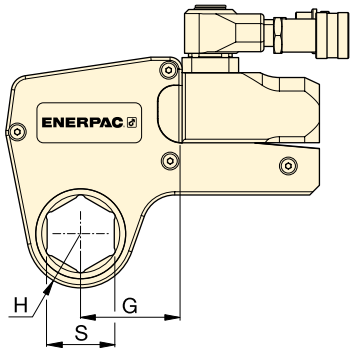
Maximum Operating Pressure:
700 bar

W Series

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size [1] S (inch)	Nose Radius H (mm)	G (mm)	Model Nr. Cassette	(kg)	Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer
W4000	1 5/16	37,0	61,0	W4105	3,7	–	–	–	–	–	–
	1 3/8	37,0	61,0	W4106	3,7	–	–	–	–	–	–
	1 7/16	37,0	61,0	W4107	3,7	–	–	–	–	–	–
	1 1/2	37,0	61,0	W4108	3,7	–	–	–	–	–	–
	1 9/16	37,0	61,0	W4109	3,7	–	–	–	–	–	–
	1 5/8	37,0	61,0	W4110	3,7	–	–	–	–	–	–
	1 11/16	39,5	64,0	W4111	3,8	–	–	–	–	–	–
	1 3/4	39,5	64,0	W4112	3,8	–	–	–	–	–	–
	1 13/16	39,5	64,0	W4113	3,8	–		–	–	–	–
	1 7/8	41,5	66,7	W4114	3,9	–	–	–	–	–	–
	1 15/16	41,5	66,7	W4115	3,9	–	–	–	–	–	–
	2	41,5	66,7	W4200	3,9	2 - 1 7/8	W4200R107	–	–	–	
	2 1/16	44,0	73,4	W4201	4	–	–	–	–	–	–
	2 1/8	44,0	73,4	W4202	4	–	–	–	–	–	–
	2 3/16	44,0	73,4	W4203	4	2 3/16 - 1 5/8	W4203R110	2 3/16 - 1 7/16	W4203R107	2 3/16 - 1 1/4	W4203R104
	2 1/4	46,5	70,6	W4204	4,1	–	–	–	–	–	–
	2 5/16	46,5	70,6	W4205	4,1	–	–	–	–	–	–
	2 3/8	46,5	70,6	W4206	4,1	2 3/8 - 2	W4206R200	2 3/8 - 1 13/16	W4206R113	2 3/8 - 1 7/16	W4206R107
	–	–	–	–	–	2 3/8 - 1 3/8	W4206R106		–	–	–
	2 7/16	49,5	76,2	W4207	4,1	2 7/16 - 2	W4207R200	–	–	–	–
	2 1/2	49,5	76,2	W4208	4,1	2 1/2 - 2	W4208R200	2 1/2 - 1 13/16	W4208R113	2 1/2 - 2 1/16	W4208R201
	2 9/16	49,5	76,2	W4209	4,1	2 9/16 - 2 3/16	W4209R203	2 9/16 - 2 1/8	W4209R202	2 9/16 - 2 1/16	W4209R201
	–	–	–	–	–	2 9/16 - 2	W4209R200	2 9/16 - 1 13/16	W4209R113	–	–
	2 5/8	52,5	78,3	W4210	4,2	–	–	–	–	–	–
	2 11/16	52,5	78,3	W4211	4,2	–	–	–	–	–	–
	2 3/4	52,5	78,3	W4212	4,2	2 3/4 - 2 3/8	W4212R206	2 3/4 - 2 3/16	W4212R203	2 3/4 - 2 1/8	W4212R202
	2 13/16	55,3	81,6	W4213	4,3	–	–	–	–	–	–
	2 7/8	55,3	81,6	W4214	4,3	–	–	–	–	–	–
	2 15/16	55,3	81,6	W4215	4,3	2 15/16 - 2 9/16	W4215R209	2 15/16 - 2 3/8	W4215R206	2 15/16 - 2 3/16	W4215R203
	–	–	–	–	–	2 15/16 - 2	W4215R200		–	–	–
	3	58,5	83,5	W4300	4,4	3 - 2 3/16	W4300R203	–	–	–	–
	3 1/16	58,5	83,5	W4301	4,4	–	–	–	–	–	–
	3 1/8	58,5	83,5	W4302	4,4	3 1/8 - 2 3/4	W4302R212	3 1/8 - 2 9/16	W4302R209	3 1/8 - 2 3/8	W4302R206
	–	–	–	–	–	3 1/8 - 2 5/16	W4302R205	3 1/8 - 2 1/4	W4302R204	3 1/8 - 2 3/16	W4302R203
	–	–	–	–	–	3 1/8 - 2 3/16	W4302R203	3 1/8 - 2 1/8	W4302R202	3 1/8 - 2	W4302R200
	3 3/16	62,0	85,5	W4303	4,5	–	–	–	–	–	–
	3 1/4	62,0	85,5	W4304	4,5	–	–	–	–	–	–
	3 5/16	62,0	85,5	W4305	4,5	–	–	–	–	–	–
	3 3/8	62,0	85,5	W4306	4,5	–	–	–	–	–	–

[1] See page 76 for table of hexagon sizes of bolts, nuts and related thread diameters.



Maximum Torque at 700 bar:
10.846 Nm

Hexagon Range:
1⅞ - 4⅛ inch

Maximum Operating Pressure:
700 bar

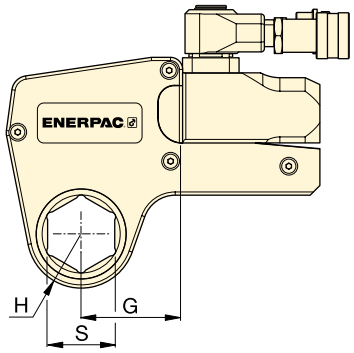
W Series

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size [1] S (inch)	Nose Radius H (mm)	G (mm)	Model Nr. Cassette	(kg)	Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer
W8000	1⅞	45,0	78,2	W8114	8,1	–	–	–	–	–	–
	1 15/16	45,0	78,2	W8115	8,1	–	–	–	–	–	–
	2	45,0	78,2	W8200	8,1	–	–	–	–	–	–
	2 1/16	48,0	80,0	W8201	8,1	–	–	–	–	–	–
	2⅛	48,0	80,0	W8202	8,1	–	–	–	–	–	–
	2 3/16	48,0	80,0	W8203	8,1	–	–	–	–	–	–
	2¼	51,0	82,5	W8204	8,1	–	–	–	–	–	–
	2 5/16	51,0	82,5	W8205	8,1	–	–	–	–	–	–
	2⅜	51,0	82,5	W8206	8,1	–	–	–	–	–	–
	2 7/16	52,5	85,9	W8207	8,1	–	–	–	–	–	–
	2½	52,5	85,9	W8208	8,1	–	–	–	–	–	–
	2 9/16	52,5	85,9	W8209	8,1	2 9/16 - 2	W8209R200		–		
	2⅝	56,0	84,8	W8210	8,1	–	–	–	–	–	–
	2 11/16	56,0	84,8	W8211	7,9	–	–	–	–	–	–
	2¾	56,0	84,8	W8212	7,9	2¾ - 2 3/16	W8212R203		–		
	2 13/16	58,0	85,0	W8213	7,9	–	–	–	–	–	–
	2⅞	58,0	85,0	W8214	7,9	–	–	–	–	–	–
	2 15/16	58,0	85,0	W8215	7,9	2 15/16 - 2⅜	W8215R206	2 15/16 - 2 3/16	W8215R203		
	3	60,5	89,5	W8300	8,0	–	–	–	–	–	–
	3 1/16	60,5	89,5	W8301	8,0	–	–	–	–	–	–
	3⅛	60,5	89,5	W8302	8,0	3⅛ - 2 9/16	W8302R209	3⅛ - 2⅜	W8302R206	3⅛ - 2 3/16	W8302R203
	–	–	–	–	–	3⅛ - 2	W8302R200		–		
	3 3/16	66,0	92,2	W8303	8,2	–	–	–	–	–	–
	3¼	66,0	92,2	W8304	8,2	–	–	–	–	–	–
	3 5/16	66,0	92,2	W8305	8,2	–	–	–	–	–	–
	3⅜	66,0	92,2	W8306	8,2	–	–	–	–	–	–
	3 7/16	66,0	92,2	W8307I	8,2	–	–	–	–	–	–
	3½	66,0	92,2	W8308	8,2	3½ - 3	W8308R300	3½ - 2 15/16	W8308R215	3½ - 2¾	W8308R212
	3 9/16	74,0	102,9	W8309	8,8	–	–	–	–	–	–
	3⅝	74,0	102,9	W8310	8,8	–	–	–	–	–	–
	3 11/16	74,0	102,9	W8311	8,8	–	–	–	–	–	–
	3¾	74,0	102,9	W8312	8,8	3¾ - 3⅛	W8312R302	3¾ - 2 15/16	W8312R215	3¾ - 2¾	W8312R212
	3 13/16	74,0	102,9	W8313	8,8	–	–	–	–	–	–
	3⅞	74,0	102,9	W8314	8,8	3⅞ - 3⅛	W8314R302	3⅞ - 2 15/16	W8314R215		–
	3 15/16	79,5	110,0	W8315	9,3	–	–	–	–	–	–
	4	79,5	110,0	W8400	9,3	–	–	–	–	–	–
	4 1/16	79,5	110,0	W8401I	9,3	–	–	–	–	–	–
	4⅛	79,5	110,0	W8402	9,3	–	–	–	–	–	–

[1] See page 76 for table of hexagon sizes of bolts, nuts and related thread diameters.

W15000, Inch-Cassettes & Reducer Inserts



Maximum Torque at 700 bar:
20.337 Nm

Hexagon Range:
2 7/16 - 4 5/8 inch

Maximum Operating Pressure:
700 bar

W Series

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size [1] S (inch)	Nose Radius H (mm)	G (mm)	Model Nr. Cassette	(kg)	Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer
W15000	2 7/16	59,0	88,6	W15207	13,6	–	–	–	–	–	–
	2 1/2	59,0	88,6	W15208	13,6	–	–	–	–	–	–
	2 9/16	59,0	88,6	W15209	13,6	–	–	–	–	–	–
	2 5/8	59,0	88,6	W15210	13,6	–	–	–	–	–	–
	2 11/16	59,0	88,6	W15211	13,6	–	–	–	–	–	–
	2 3/4	59,0	88,6	W15212	13,6	–	–	–	–	–	–
	2 13/16	62,0	90,5	W15213	13,7	–	–	–	–	–	–
	2 7/8	62,0	90,5	W15214	13,7	–	–	–	–	–	–
	2 15/16	62,0	90,5	W15215	13,7	–	–	–	–	–	–
	3	64,5	92,9	W15300	13,8	3 - 2 1/8	W15300R202	–	–	–	–
	3 1/16	64,5	92,9	W15301	13,8	–	–	–	–	–	–
	3 1/8	64,5	92,9	W15302	13,8	3 1/8 - 2 9/16	W15302R209	–	–	–	
	3 3/16	69,5	96,6	W15303	14,1	–	–	–	–	–	–
	3 1/4	69,5	96,6	W15304	14,1	–	–	–	–	–	–
	3 5/16	69,5	96,6	W15305	14,1	–	–	–	–	–	–
	3 3/8	69,5	96,6	W15306	14,1	–	–	–	–	–	–
	3 7/16	69,5	96,6	W15307I	14,1	–	–	–	–	–	–
	3 1/2	69,5	96,6	W15308	14,1	3 1/2 - 2 15/16	W15308R215	3 1/2 - 2 3/4	W15308R212	–	–
	3 9/16	75,0	101,8	W15309	14,6	–	–	–	–	–	–
	3 5/8	75,0	101,8	W15310	14,6	–	–	–	–	–	–
	3 11/16	75,0	101,8	W15311	14,6	–	–	–	–	–	–
	3 3/4	75,0	101,8	W15312	14,6	3 3/4 - 3 1/8	W15312R302	3 3/4 - 2 15/16	W15312R215	–	–
	3 13/16	75,0	101,8	W15313	14,5	–	–	–	–	–	–
	3 7/8	75,0	101,8	W15314	14,5	3 7/8 - 3 1/8	W15314R302	3 7/8 - 2 15/16	W15314R215	–	–
	3 15/16	80,5	103,1	W15315	14,8	–	–	–	–	–	–
	4	80,5	103,1	W15400	14,8	–	–	–	–	–	–
	4 1/16	80,5	103,1	W15401I	14,8	–	–	–	–	–	–
	4 1/8	80,5	103,1	W15402	14,8	4 1/8 - 3 1/2	W15402R308	4 1/8 - 3 5/16	W15402R305	4 1/8 - 3 1/4	W15402R304
	4 3/16	80,5	103,1	W15403I	14,8	–	–	–	–	–	–
	4 1/4	80,5	103,1	W15404	14,8	4 1/4 - 3 1/2	W15404R308	4 1/4 - 3 1/8	W15404R302	–	–
	4 5/16	87,5	114,8	W15405	15,1	–	–	–	–	–	–
	4 3/8	87,5	114,8	W15406	15,1	–	–	–	–	–	–
	4 7/16	87,5	114,8	W15407	15,1	–	–	–	–	–	–
	4 1/2	87,5	114,8	W15408I	15,1	–	–	–	–	–	–
	4 9/16	87,5	114,8	W15409I	15,1	–	–	–	–	–	–
	4 5/8	87,5	114,8	W15410I	15,1	4 5/8 - 3 15/16	W15410R315	4 5/8 - 3 7/8	W15410R314	4 5/8 - 3 3/4	W15410R312
	–	–	–	–	–	4 5/8 - 3 1/2	W15410R308	–	–	–	–

[1] See page 76 for table of hexagon sizes of bolts, nuts and related thread diameters.

W22000, Inch-Cassettes & Reducers

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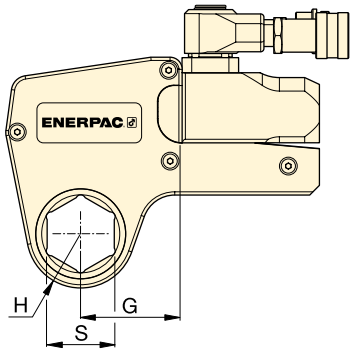


Maximum Torque at 700 bar:
30.510 Nm

Hexagon Range:
2 15/16 - 5 3/8 inch

Maximum Operating Pressure:
700 bar

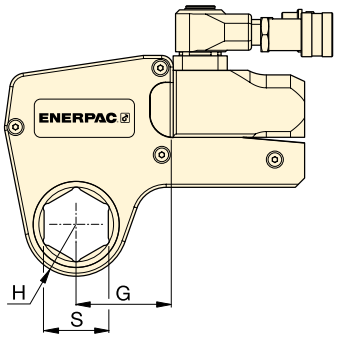
W Series

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size [1] S (inch)	Nose Radius H (mm)	G (mm)	Model Nr. Cassette	(kg)	Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer	Hexagon Reducer (inch)	Model Number Reducer
W22000	2 15/16	67,0	102,1	W22215	22,1	–	–	–	–	–	–
	3	67,0	102,1	W22300	22,0	–	–	–	–	–	–
	3 1/16	67,0	102,1	W22301	21,9	–	–	–	–	–	–
	3 1/8	67,0	102,1	W22302	21,6	3 1/8 - 2 3/8	W22302R206	3 1/8 - 2 3/16	W22302R203	–	–
	3 3/16	72,4	107,4	W22303	22,9	–	–	–	–	–	–
	3 1/4	72,4	107,4	W22304	22,8	–	–	–	–	–	–
	3 5/16	72,4	107,4	W22305	22,6	–	–	–	–	–	–
	3 3/8	72,4	107,4	W22306	22,5	–	–	–	–	–	–
	3 7/16	72,4	107,4	W22307	22.8	–	–	–	–	–	–
	3 1/2	72,4	107,4	W22308	22,2	3 1/2 - 2 3/4	W22308R212	3 1/2 - 2 9/16	W22308R209	3 1/2 - 2 3/8	W22308R206
	3 9/16	77,9	113,0	W22309	23,4	–	–	–	–	–	–
	3 5/8	77,9	113,0	W22310	23,3	–	–	–	–	–	–
	3 11/16	77,9	113,0	W22311	23,1	–	–	–	–	–	–
	3 3/4	77,9	113,0	W22312	22,9	3 3/4 - 2 15/16	W22312R215	–	–	–	–
	3 13/16	77,9	113,0	W22313	22,8	–	–	–	–	–	–
	3 7/8	77,9	113,0	W22314	22,6	3 7/8 - 3 1/8	W22314R302	3 7/8 - 2 15/16	W22314R215	3 7/8 - 2 3/4	W22314R212
	3 15/16	85,1	119,9	W22315	24,3	–	–	–	–	–	–
	4	85,1	119,9	W22400	24,1	–	–	–	–	–	–
	4 1/16	85,1	119,9	W22401	24,0	–	–	–	–	–	–
	4 1/8	85,1	119,9	W22402	23,6	–	–	–	–	–	–
	4 3/16	85,1	119,9	W22403	23,6	–	–	–	–	–	–
	4 1/4	85,1	119,9	W22404	24,6	4 1/4 - 3 1/2	W22404R308	4 1/4 - 3 1/8	W22404R302	4 1/4 - 2 15/16	W22404R215
	4 5/16	89,9	125,0	W22405	24,6	–	–	–	–	–	–
	4 3/8	89,9	125,0	W22406	24,5	–	–	–	–	–	–
	4 7/16	89,9	125,0	W22407	24,3	–	–	–	–	–	–
	4 1/2	89,9	125,0	W22408	24,1	–	–	–	–	–	–
	4 9/16	89,9	125,0	W22409	23.9	–	–	–	–	–	–
	4 5/8	89,9	125,0	W22410	23,6	4 5/8 - 3 7/8	W22410R314	4 5/8 - 3 3/4	W22410R312	4 5/8 - 3 1/2	W22410R308
	4 3/4	95,0	130,0	W22412	24,7		–	–	–	–	–
	4 7/8	95,0	130,0	W22414	24,3	–	–	–	–	–	–
	5	95,0	130,0	W22500	23,8	5 - 4 1/4	W22500R404	5 - 4 1/8	W22500R402	5 - 3 7/8	W22500R314
	5 1/8	100,0	134,8	W22502	25,0	–	–	–	–	–	–
	5 3/16	100,0	134,8	W22503	24,8	–	–	–	–	–	–
	5 1/4	100,0	134,8	W22504	24,5	–	–	–	–	–	–
	5 3/8	100,0	134,8	W22506	23,9	5 3/8- 4 5/8	W22506R410	5 3/8- 4 1/4	W22506R404	5 3/8- 4 1/8	W22506R402
	–	–	–	W22506	23,9	5 3/8- 3 7/8	W22506R314	–	–	–	–

[1] See page 76 for table of hexagon sizes of bolts, nuts and related thread diameters.

W35000, Inch-Cassettes & Reducer Inserts



W Series

Maximum Torque at 700 bar:
47.453 Nm

Hexagon Range:
3⅛ - 6⅛ inch

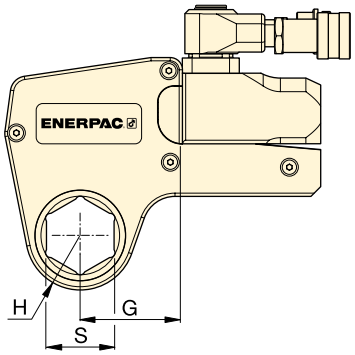
Maximum Operating Pressure:
700 bar

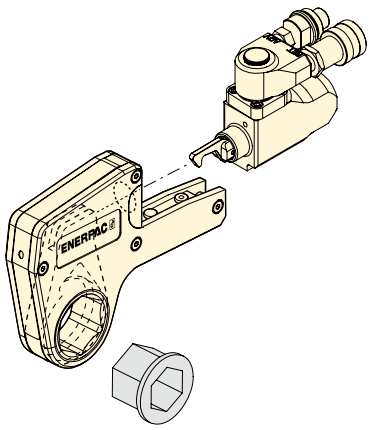
Hexagon Bolt and Nut Sizes
See the table for hexagon sizes of bolts, nuts and related thread diameters.

Page: 76

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size S (inch)	Nose Radius H (mm)	G (mm)	Model Nr. Cassette	(kg)	Hexagon Reducer (inch)	Model Number Reducer
W35000	3⅛	76,0	126,8	W35302	32,8	3⅛ – 2	W35302R200
	3⁹⁄₁₆	76,0	126,8	W35303	32,7	–	–
	3¼	76,0	126,8	W35304	32,5	–	–
	3⁵⁄₁₆	76,0	126,8	W35305	32,4	–	–
	3⅜	76,0	126,8	W35306	32,2	–	–
	3⁷⁄₁₆	76,0	126,8	W35307	32,0	–	–
	3½	76,0	126,8	W35308	31,8	3½ - 2⁵⁄₁₆	W35308R205
	3⁹⁄₁₆	81,5	132,5	W35309	32,4	–	–
	3⅝	81,5	132,5	W35310	33,3	–	–
	3¹¹⁄₁₆	81,5	132,5	W35311	33,1	–	–
	3¾	81,5	132,5	W35312	32,9	–	–
	3¹³⁄₁₆	81,5	132,5	W35313	32,7	–	–
	3⅞	81,5	132,5	W35314	32,4	3⅞ - 2¹¹⁄₁₆	W35314R211
	3¹⁵⁄₁₆	87,0	137,0	W35315	34,1	3¹⁵⁄₁₆ - 2¹³⁄₁₆	W35315R213
	4	87,0	137,0	W35400	33,9		–
	4¹⁄₁₆	87,0	137,0	W35401	33,7	–	–
	4⅛	87,0	137,0	W35402	33,5	–	–
	4³⁄₁₆	87,0	137,0	W35403	33,3	–	–
	4¼	87,0	137,0	W35404	33,0	4¼ - 3¹⁄₁₆	W35404R301
	4⁵⁄₁₆	93,0	143,0	W35405	34,9	–	–
	4⅜	93,0	143,0	W35406	34,7	–	–
	4⁷⁄₁₆	93,0	143,0	W35407	34,5	–	–
	4½	93,0	143,0	W35408	34,3	–	–
	4⁹⁄₁₆	93,0	143,0	W35409	34,1	–	–
	4⅝	93,0	143,0	W35410	33,7	4⅝ - 3⅝	W35410R310
	4¾	98,5	148,5	W35412	35,6	4¾ - 3¾	W35412R312
	4⅞	98,5	148,5	W35414	34,9	–	–
	5	98,5	148,5	W35500	34,3	5 - 4	W35500R400
	5⅛	103,0	153,0	W35502	35,8	5⅛ - 4⅛	W35502R402
	5³⁄₁₆	103,0	153,0	W35503	35,6	–	–
	5¼	103,0	153,0	W35504	35,2	–	–
	5⅜	103,0	153,0	W35506	34,6	5⅜ - 4⁵⁄₁₆	W35506R405
	5½	108,5	158,5	W35508	36,2	–	–
	5⁹⁄₁₆	108,5	158,5	W35509	36,0	–	–
	5⅝	108,5	158,5	W35510	35,6	–	–
	5¾	108,5	164,0	W35512	34,9	5¾ - 4¾	W35512R412
	5⅞	114,0	164,0	W35514	36,7	5⅞ - 4⅞	W35514R414
	6	114,0	164,0	W35600	36,1	–	
	6⅛	114,0	164,0	W35602	35,3	6⅛ - 5⅛	W35602R502





W Series

Hexagon Range:
24 - 105 mm

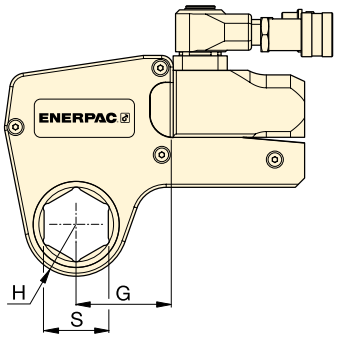
Maximum Operating Pressure:
700 bar

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size [1] S (mm)	Nose Radius H (mm)	Dim. G (mm)	Model Nr. Cassette	(kg)	Hexagon Reducer (mm)	Model Number Reducer	Hexagon Reducer (mm)	Model Number Reducer	Hexagon Reducer (mm)	Model Number Reducer
W2000	**30**	31	54	**W2103**	2,1	–	**–**	–	**–**	–	**–**
	32	31	54	**W2104**	2,1	–	**–**	–	**–**	–	**–**
	36	31	54	**W2107**	2,1	–	**–**	–	**–**	–	**–**
	38	34	58	**W2108**	2,2	–	**–**	–	**–**	–	**–**
	41	34	58	**W2110**	2,2	41 - 32	**W2110R104**	41 - 30	**W2110R103**	41 - 24	**W2110R024M**
	46	34	61	**W2113**	2,2	46 - 36	**W2113R107**	46 - 32	**W2113R104**	–	**–**
	50	39	63	**W2200**	2,2	50 - 41	**W2200R110**	50 - 36	**W2200R107**		**–**
	55	42	69	**W2203**	2,3	55 - 46	**W2203R113**	55 - 41	**W2203R110**	55 - 36	**W2203R107**
	60	45	65	**W2206**	2,2	60 - 50	**W2206R200**	60 - 46	**W2206R113**	60 - 41	**W2206R110**
	–	–	–	**–**		60 - 36	**W2206R107**	–	**–**	–	**–**
W4000	**36**	37	61	**W4107**	3,7	–	**–**	–	**–**	–	**–**
	41	37	61	**W4110**	3,7	–	**–**	–	**–**	–	**–**
	46	40	64	**W4113**	3,8	–	**–**	–	**–**	–	**–**
	50	42	67	**W4200**	3,9	50 - 36	**W4200R107**	–	**–**	–	**–**
	55	44	73	**W4203**	4,0	55 - 41	**W4203R110**	55 - 36	**W4203R107**	55 - 32	**W4203R104**
	60	47	71	**W4206**	4,1	60 - 50	**W4206R200**	60 - 46	**W4206R113**	60 - 36	**W4206R107**
	65	50	76	**W4209**	4,1	65 - 55	**W4209R203**	65 - 50	**W4209R200**	65 - 46	**W4209R113**
	70	53	78	**W4212**	4,2	70 - 60	**W4212R206**	70 - 55	**W4212R203**	–	**–**
	75	55	82	**W4215**	4,3	75 - 65	**W4215R209**	75 - 60	**W4215R206**	–	**–**
	–			**W4215**		75 - 55	**W4215R203**	75 - 50	**W4215R200**	–	**–**
	80	59	84	**W4302**	4,4	80 - 75	**W4302R215**	80 - 70	**W4302R212**	80 - 65	**W4302R209**
	–	–	–	**W4302**		80 - 55	**W4302R203**	80 - 50	**W4302R200**	–	**–**
	85	62	86	**W4085M**	4,5	–	**–**	–	**–**	–	**–**
W8000	**50**	45	78	**W8200**	8,1	–	**–**	–	**–**	–	**–**
	55	48	80	**W8203**	8,1	–	**–**	–	**–**	–	**–**
	60	51	83	**W8206**	8,1	–	**–**	–	**–**	–	**–**
	65	56	85	**W8209**	8,1	65 - 50	**W8209R200**	–	**–**	–	**–**
	70	56	85	**W8212**	7,9	70 - 55	**W8212R203**	–	**–**	–	**–**
	75	58	85	**W8215**	7,9	75 - 60	**W8215R206**	75 - 55	**W8215R203**	–	**–**
	80	61	90	**W8302**	8	80 - 65	**W8302R209**	80 - 60	**W8302R206**	80 - 55	**W8302R203**
	–	–	–	**–**	–	80 - 50	**W8302R200**	–	**–**	–	**–**
	85	66	92	**W8085M**	8,2	85 - 70	**W8085R070M**	85 - 65	**W8085R065M**	85 - 60	**W8085R060M**
	–	–	–	**–**	–	85 - 55	**W8085R055M**	–	**–**	–	**–**
	90	74	103	**W8090M**	8,8	90 - 75	**W8090R075M**	–	**–**	–	**–**
	95	74	103	**W8312**	8,8	95 - 80	**W8312R302**	95 - 75	**W8312R215**	–	**–**
	100	80	110	**W8315**	9,3	–	**–**	–	**–**	–	**–**
	105	80	110	**W8402**	9,3	–	**–**	–	**–**	–	**–**

[1] See page 76 for table of hexagon sizes of bolts, nuts and related thread diameters.

W-Series, Metric Cassettes and Reducers



Hexagon Range:
50 - 155 mm

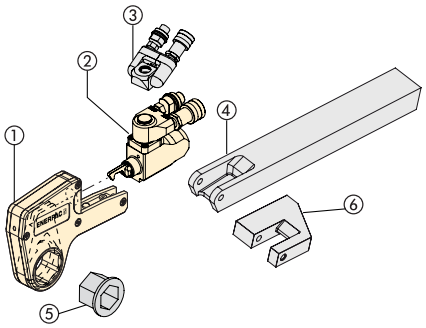
Maximum Operating Pressure:
700 bar

W Series

▼ **SELECTION CHART**

Drive Unit Model Number	Hexagon Size [1] S (mm)	Nose Radius H (mm)	Dim. G (mm)	Model Nr. Cassette	(kg)	Hexagon Reducer (mm)	Model Number Reducer	Hexagon Reducer (mm)	Model Number Reducer
W15000	**65**	59	89	**W15209**	13,6	–	**–**	–	**–**
	70	59	89	**W15212**	13,6	–	**–**	–	**–**
	75	62	91	**W15215**	13,7	–	**–**	–	**–**
	80	65	93	**W15302**	13,8	80 - 65	**W15302R209**	–	**–**
	85	70	97	**W15085M**	14,1	85 - 70	**W15085R070M**	–	**–**
	90	75	102	**W15090M**	14,5	90 - 75	**W15090R75M**	–	**–**
	95	75	102	**W15312**	14,6	95 - 80	**W15312R302**	95 - 75	**W15312R215**
	100	81	103	**W15315**	14,8	–	**–**	–	**–**
	105	81	103	**W15402**	14,8	105 - 90	**W15402R090M**	–	**–**
	110	88	115	**W15405**	15,1	110 - 95	**W15110R095M**	–	**–**
	115	88	115	**W15115M**	15,1	115 - 100	**W15115R100M**	–	**–**
W22000	**75**	67	102	**W22215**	22,0	–	**–**	–	**–**
	80	67	102	**W22302**	21,6	80-60	**W22302R206**	80 - 55	**W22302R203**
	85	73	107	**W22085M**	22,5	85-65	**W22085MR209**	85 - 60	**W22085MR206**
	90	78	113	**W22090M**	23,4	90-70	**W22090M212**	90 - 60	**W22090MR206**
	95	78	113	**W22312**	22,9	95-75	**W22312R215**	–	**–**
	100	85	120	**W22315**	24,3	–	**–**	–	**–**
	105	85	120	**W22402**	23,4	–	**–**	–	**–**
	110	90	125	**W22404**	24,6	–	**–**	–	**–**
	115	90	125	**W22115M**	24,0	–	**–**	–	**–**
	120	95	130	**W22412**	24,7	–	**–**	–	**–**
	123	95	130	**W22123M**	24,4	–	**–**	–	**–**
	130	100	135	**W22502**	25,0	–	**–**	–	**–**
	135	100	135	**W22506**	23,9	135 - 105	**W22506R402**	–	**–**
W35000	**80**	77	129	**W35302**	32,8	80 - 50	**W35302R200**	–	**–**
	85	77	129	**W35085M**	32,3	–	**–**	–	**–**
	90	82	135	**W35090M**	33,5	90 - 60	**W35090R206**	–	**–**
	95	82	135	**W35312**	32,9	–	**–**	–	**–**
	100	88	139	**W35315**	34,1		**–**	–	**–**
	105	88	139	**W35402**	33,5	–	**–**	–	**–**
	110	94	146	**W35405**	34,9	110 - 85	**W35405R085M**	–	**–**
	115	94	146	**W35115M**	34,2	–	**–**	–	**–**
	120	100	153	**W35412**	35,6	120 - 95	**W354121R312**	–	**–**
	123	100	153	**W35123M**	35,0	–	**–**	–	**–**
	130	104	160	**W35502**	35,8	130 - 105	**W35502R402**	–	**–**
	135	104	160	**W35506**	34,6	135 - 110	**W35506R405**	–	**–**
	140	110	163	**W35508**	36,2	140 - 115	**W35508R115M**	–	**–**
	145	110	163	**W35512**	34,9	145 - 120	**W35512R412**	–	**–**
	150	115	169	**W35514**	36,7	–	**–**	–	**–**
	151	115	169	**W35151M**	36,5	–	**–**	–	**–**
	155	115	169	**W35602**	35,3	155 - 130	**W35602R502**	–	**–**

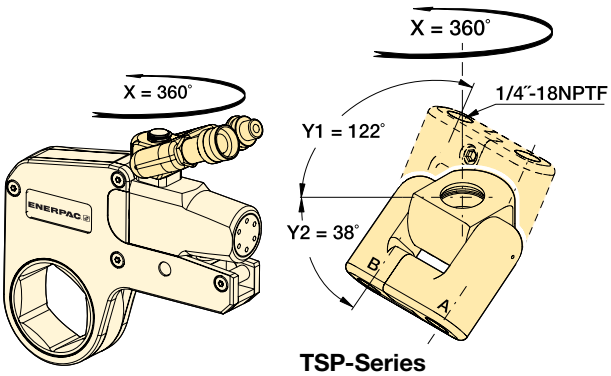
[1] See page 76 for table of hexagon sizes of bolts, nuts and related thread diameters.



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

TSP
WTE
WRP
Series

TSP-Series, Pro Series Swivels



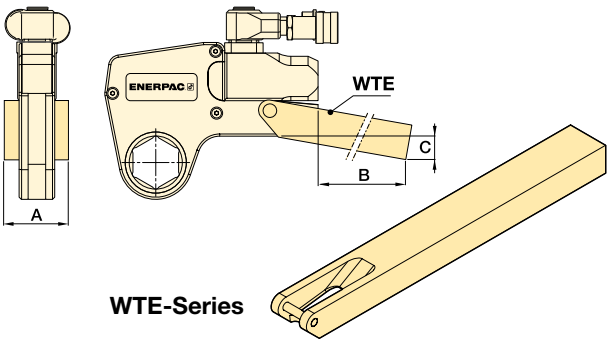
TSP-Series

- **Featuring Tilt and Swivel technology**
- **360° X-axis and 160° Y-axis rotation**
- **Increases tool fit in restricted access areas**
- **Simplifies hose placement**
- **Includes male and female Spin-On couplers.**

For Torque Wrench Model Number	Model Number	Maximum Pressure (bar)	(kg)
W2000, W4000	**TSP100A**	700	0,2
W8000, W15000, W35000	**TSP200A**	700	0,2

To order an W-series wrench fitted with the TSP swivel, add suffix "P" to the model number. Example: **W2000P**. TSP-swivel include male (TH-630) and female (TR-30) couplers.

WTE-Series, Extended Reaction Arm



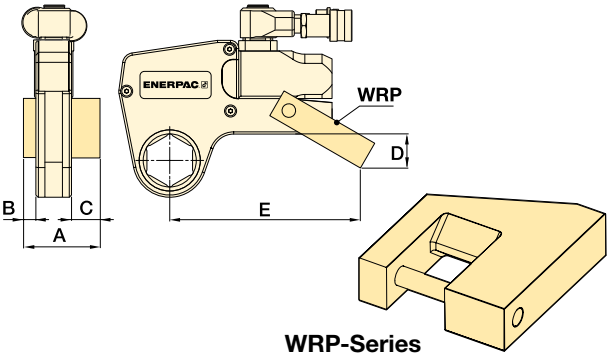
WTE-Series

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

For Torque Wrench Model Number	Model Number	Dimensions (mm)			(kg)*
		A	B	C	
W2000	**WTE20**	56	398	76	2,6
W4000	**WTE40**	66	436	74	4,6
W8000	**WTE80**	85	449	66	7,6
W15000	**WTE150**	102	498	72	12,0
W22000	**WTE220**	114	524	77	17,3
W35000	**WTE350**	127	419	133	17,8

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

WRP-Series, Low Profile Reaction Paddles



WRP-Series

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

For Torque Wrench Model Nr.	Model Number	Dimensions (mm)					(kg)*
		A	B	C	D	E	
W2000	**WRP20**	84	16	35	45	148	0,4
W4000	**WRP40**	109	21	47	59	190	0,8
W8000	**WRP80**	137	26	57	69	223	2,0
W15000	**WRP150**	165	32	69	87	257	3,9
W22000	**WRP220**	207	37	91	134	317	7,2
W35000	**WRP350**	225	42	91	182	367	10,6

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

Enerpac W-Series Torque Wrenches provide high accuracy across the full stroke for safety critical applications.

Easy service with W2000P on a ship's crane ▶

Ship maintenance using the low profile torque wrench. The use of the handle improves tool handling and safety while the TSP-swivel coupler simplifies hose placement.

◀ 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.

The W-Series Wrenches offer reliability and control resulting in even and consistent torque being applied to all bolts.

W8000 Low Profile Torque Wrench tightening the bolts on turbine ▶

Using the strength and accuracy of a steel wrench to tighten highly stressed bolts on a turbine is the safe way to handle a critical application.

All of Enerpac's W-Series and S-Series Wrenches are made of high-strength steel which gives you additional stiffness that other alloys cannot provide. This added stiffness translates into a stronger and more durable tool.

▼ Shown: **SQD-50-I**

Lightweight Aluminium High-Power Wrench for Sockets or Allen Drives

- **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 ± 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.**

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-Series double-acting wrenches to ensure the integrity of your system.

Length 6 m, 2 hoses	**THC-7062**
Length 12 m, 2 hoses	**THC-7122**

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 Hydraulic Wrenches

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

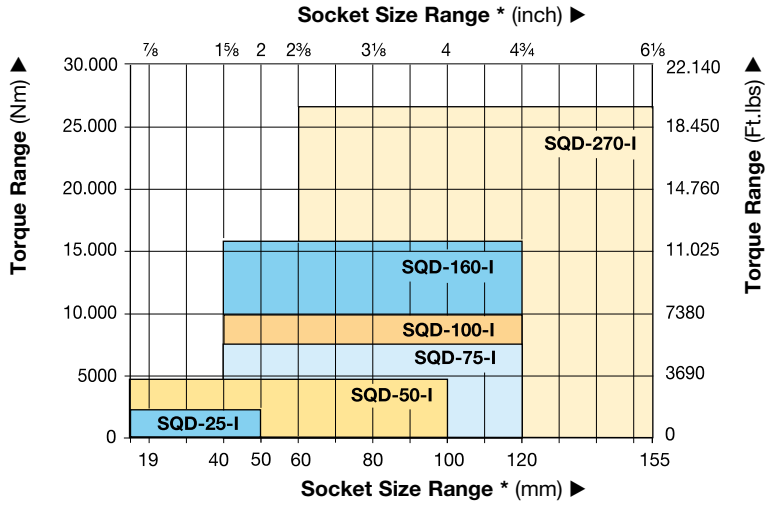
SQD Series

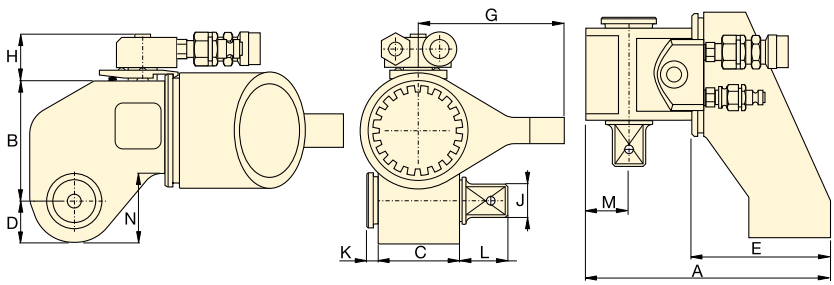
Maximum Torque:
27.000 Nm

Square Drive Range:
¾ - 2½ inch

Maximum Operating Pressure:
800 bar

TORQUE WRENCH SELECTION (based on socket size range)





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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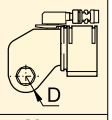
▼ SELECTION CHART

Square Drive Size	Maximum Torque @ 800 bar		Torque Wrench Model Number	Dimensions (mm)												Weight (including reaction arm and square drive)
(inch)	(Nm)	(Ft.lbs)		A	B	C	D	E	G	H	J	K	L	M	N	(kg)
¾	2350	1735	**SQD-25-I**	167	72	53	24	108	95	35	¾	6	28	27	36	2,5
1	4800	3550	**SQD-50-I**	204	92	68	31	135	115	35	1	15	33	34	52	4,3
1½	7560	5570	**SQD-75-I**	226	107	76	36	153	122	35	1½	12	43	39	64	6,7
1½	10.000	7360	**SQD-100-I**	253	115	84	39	164	130	35	1½	13	39	43	68	8,0
1½	16.000	11.835	**SQD-160-I**	272	134	100	48	178	150	50	1½	11	45	54	81	12,0
2½	27.000	19.875	**SQD-270-I**	342	164	119	59	218	200	50	2½	18	76	63	99	24,5

* See page 10 for BSH-series Heavy-Duty Impact Sockets.

▼ SELECTION CHART

TORQUE WRENCH		OPTIONAL ALLEN DRIVES, IMPERIAL			REACTION ARM FOR ALLEN DRIVE
					
Model Number (max. capacity)	Nose Radius D (mm)	Hexagon Size (inch)	Maximum Torque (Nm)	Model Number	Model Number
SQD-25-I (2350 Nm)	24	½	530	25A-050	RAH-25
		⅝	1000	25A-063	
		¾	1800	25A-075	
		⅞	2350	25A-088	
		1	2350	25A-100	
SQD-50-I (4800 Nm)	31	⅝	1000	50A-063	RAH-50
		¾	1800	50A-075	
		⅞	2800	50A-088	
		1	4200	50A-100	
		1⅛	4800	50A-113	
		1¼	4800	50A-125	
		–	–	–	
SQD-75-I (7560 Nm)	31	⅝	1000	75A-063	RAH-75
		¾	1800	75A-075	
		⅞	2800	75A-088	
		1	4200	75A-100	
		1⅛	5900	75A-113	
		1¼	7560	75A-125	
		–	–	–	
SQD-100-I (10.000 Nm)	39	⅞	2800	100A-088	RAH-100
		1	4200	100A-100	
		1⅛	5900	100A-113	
		1¼	8500	100A-125	
		1⅜	10.000	100A-138	
		1½	10.000	100A-150	
SQD-160-I (16.000 Nm)	48	1¼	8500	160A-125	RAH-160
		1⅜	10.500	160A-138	
		1½	14.000	160A-150	
		1⅝	16.000	160A-163	
		1¾	16.000	160A-175	
SQD-270-I (27.000 Nm)	59	1½	14.000	270A-150	RAH-270
		1⅝	18.000	270A-163	
		1¾	22.000	270A-175	
		1⅞	27.000	270A-188	
		2	27.000	270A-200	
		2¼	27.000	270A-225	
		–	–	–	
		–	–	–	

For SQD Series

Maximum Torque at 800 bar:
27.000 Nm

Allen Drive Range:
½ - 2¼ inch

Nose Radius:
24 - 59 mm

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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NS and NC-Series Nut Splitters

Remove rusted or corroded nuts easily with Enerpac Nut Cutters. Cuts hexagon nut sizes up to 130 mm.

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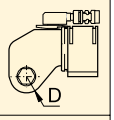
▼ *SQD-100-I with RAH-100 Reaction Arm and Allen drive used for loosening hexagon socket head cap screws.*

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** (mm)	**Hexagon Size** (mm)	**Maximum Torque** (Nm)	**Model Number**	**Model Number**
SQD-25-I (2350 Nm)	24	**14**	750	**25A-14**	**RAH-25**
		17	1300	**25A-17**	
		19	1800	**25A-19**	
		22	2350	**25A-22**	
		24	2350	**25A-24**	
SQD-50-I (4800 Nm)	31	**17**	1300	**50A-17**	**RAH-50**
		19	1800	**50A-19**	
		22	2800	**50A-22**	
		24	3500	**50A-24**	
		27	4800	**50A-27**	
		30	4800	**50A-30**	
		32	4800	**50A-32**	
SQD-75-I (7560 Nm)	31	**17**	1300	**75A-17**	**RAH-75**
		19	1800	**75A-19**	
		22	2800	**75A-22**	
		24	3500	**75A-24**	
		27	5000	**75A-27**	
		30	7000	**75A-30**	
		32	7560	**75A-32**	
SQD-100-I (10.000 Nm)	39	**22**	2800	**100A-22**	**RAH-100**
		24	3500	**100A-24**	
		27	5000	**100A-27**	
		30	7000	**100A-30**	
		32	8500	**100A-32**	
		36	10.000	**100A-36**	
SQD-160-I (16.000 Nm)	48	**30**	7000	**160A-30**	**RAH-160**
		32	8500	**160A-32**	
		36	12.000	**160A-36**	
		41	16.000	**160A-41**	
		46	16.000	**160A-46**	
SQD-270-I (27.000 Nm)	59	**36**	12.000	**270A-36**	**RAH-270**
		41	18.000	**270A-41**	
		46	25.000	**270A-46**	
		50	27.000	**270A-50**	
		55	27.000	**270A-55**	
		60	27.000	**270A-60**	
		65	27.000	**270A-65**	
		70	27.000	**270A-70**	

For SQD Series

Maximum Torque at 800 bar:
27.000 Nm

Allen Drive Range:
14 - 70 mm

Nose Radius:
24 - 59 mm

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.*

▼ HXD-60 with CC-680

Aluminium, Low Profile

- **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 ± 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.**

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. Cuts hexagon nut sizes up to 130 mm.

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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.

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▼ *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.*

▼ *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 30 and 31.

HXD Series

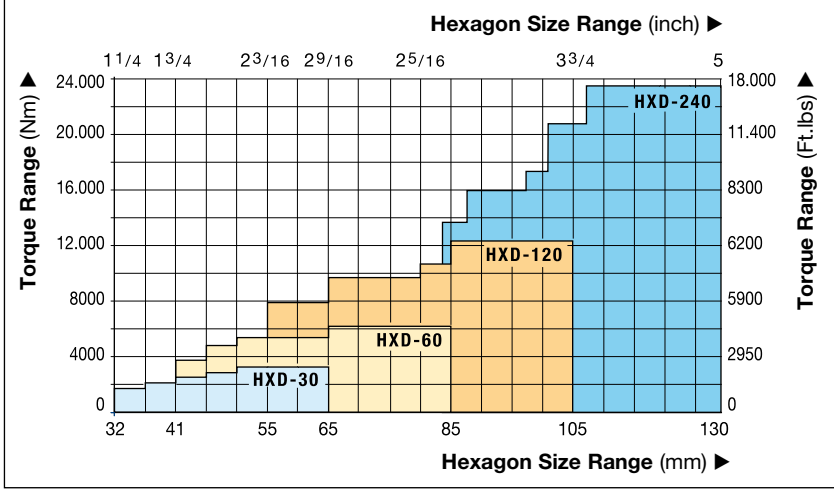
Maximum Torque:
24.210 Nm

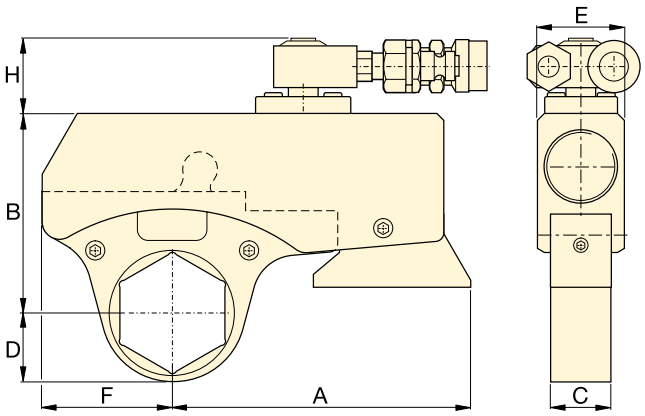
Hexagon Range:
32-130 mm / 1¼-5 inch

Nose Radius:
28,5 - 96,0 mm

Maximum Operating Pressure:
800 bar

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: 30

Hexagon Bolt and Nut Sizes
See the table for hexagon sizes of bolts, nuts and related thread diameters.
Page: 76

Torque Wrench Pumps
System matched air and electric pumps provide control to operate Enerpac HXD Torque Wrenches.
Page: 32

▼ QUICK SELECTION CHART

Cassette Range (mm)	Cassette Range (inch)	Page:	Maximum Torque at 800 bar (Nm)	Drive Unit * Model Number	A	B	C	D	E	F	H	Weight (including smallest cassette) (kg)
32 - 60	1¼ - 2⅜	30	3290	**HXD-30**	135	91 - 103	28	28,5 - 47,5	40	60	38	1,6
41 - 80	1⅝ - 3⅛	30	6190	**HXD-60**	156	115 - 130	35	34,5 - 60,5	50	75	38	2,5
55 - 100	2 3/16 - 3⅞	30	12.500	**HXD-120**	200	141 - 156	47	46,5 - 73,5	65	96	38	4,8
80 - 130	3⅛ - 5	30	24.210	**HXD-240**	259	182 - 202	56	62,0 - 96,0	82	125	50	8,2

* With integrated reaction arm.

HXD-Series, Inch-Cassettes and Inserts

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

Maximum Torque at 800 bar:
24.210 Nm

Hexagon Range:
1¼ - 5 inch

◀ *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
			D							
Model Number (max. capacity)	Max. Torque (Nm)	Hex. Size [1] (inch)	Nose Radius D (mm)	Model Number	(kg)	Hexagon Size (inch)	Model Number	Hexagon Size (inch)	Model Number	Model Number
HXD-30 (3290 Nm)	1700	1¼	28,5	CC-3125	0,6	–	–	–	–	–
	2100	1 7/16	31,5	CC-3144	0,7	1 7/16 – 1¼	IN3144-125	–	–	HR-36
	2500	1⅝	34,5	CC-3163	0,7	1⅝ – 1 7/16	IN3163-144	1⅝ – 1¼	IN3163-125	HR-41
	2890	1 13/16	38,5	CC-3181	0,8	1 13/16 – 1⅝	IN3181-163	1 13/16 – 1 7/16	IN3181-144	HR-46
	3290	2	42,0	CC-3200	0,9	2 – 1 13/16	IN3200-181	2 – 1⅝	IN3200-163	HR-50
		2 3/16	45,0	CC-3219	1,0	2 3/16 – 2	IN3219-200	2 3/16 – 1 13/16	IN3219-181	HR-55
		2⅜	47,5	CC-3238	1,1	2⅜ – 2 3/16	IN3238-219	2⅜ – 2	IN3238-200	HR-60
HXD-60 (6190 Nm)	3840	1⅝	34,5	CC-6163	1,2	–	–	–	–	–
	4805	1 13/16	39,5	CC-6181	1,3	1 13/16 – 1⅝	IN6181-163	–	–	HR-46
	5410	2	43,5	CC-6200	1,4	2 – 1 13/16	IN6200-181	2 – 1⅝	IN6200-163	HR-50
		2 3/16	46,5	CC-6219	1,5	2 3/16 – 2	IN6219-200	2 3/16 – 1 13/16	IN6219-181	HR-55
		2⅜	48,5	CC-6238	1,6	2⅜ – 2 3/16	IN6238-219	2⅜ – 2	IN6238-200	HR-60
	6190	2 9/16	52,5	CC-6256	1,8	2 9/16 – 2⅜	IN6256-238	2 9/16 – 2 3/16	IN6256-219	HR-65
		2¾	55,5	CC-6275	1,9	2¾ – 2 9/16	IN6275-256	2¾ – 2⅜	IN6275-238	HR-70
		2 15/16	57,5	CC-6293	2,0	2 15/16 – 2¾	IN6293-275	2 15/16 – 2 9/16	IN6293-256	HR-75
		3⅛	60,5	CC-6313	2,1	3⅛ – 2 15/16	IN6313-293	3⅛ – 2¾	IN6313-275	HR-80
HXD-120 (12.500 Nm)	8000	2 3/16	46,5	CC-12219	2,6	2 3/16 – 2	IN12219-200	2 3/16 – 1 13/16	IN12219-181	HR-55
		2⅜	48,5	CC-12238	2,7	2⅜ – 2 3/16	IN12238-219	2⅜ – 2	IN12238-200	HR-60
	9800	2 9/16	52,5	CC-12256	2,7	2 9/16 – 2⅜	IN12256-238	2 9/16 – 2 3/16	IN12256-219	HR-65
		2¾	55,5	CC-12275	2,8	2¾ – 2 9/16	IN12275-256	2¾ – 2⅜	IN12275-238	HR-70
		2 15/16	57,5	CC-12293	2,9	2 15/16 – 2¾	IN12293-275	2 15/16 – 2 9/16	IN12293-256	HR-75
		3	57,5	CC-12300	2,9	3 – 2¾	IN12300-275	3 – 2 9/16	IN12300-256	HR-75
	10.860	3⅛	60,5	CC-12313	3,0	3⅛ – 2 15/16	IN12313-293	3⅛ – 2¾	IN12313-275	HR-80
	12.500	3⅜	64,5	CC-12338	3,5	3⅜ – 3	IN12338-300	3⅜ – 2 15/16	IN12338-293	HR-85
		3½	67,5	CC-12350	3,6	3½ – 3⅛	IN12350-313	3½ – 3	IN12350-300	HR-90
		3¾	70,5	CC-12375	3,7	3¾ – 3½	IN12375-350	3¾ – 3⅜	IN12375-338	HR-95
		3⅞	73,5	CC-12388	3,8	3⅞ – 3½	IN12388-350	3⅞ – 3⅜	IN12388-338	HR-100
HXD-240 (24.210 Nm)	14.000	3⅛	62,0	CC-24313 [2]	5,1	3⅛ – 2 15/16	IN24313-293	3⅛ – 2¾	IN24313-275	HR-80
	15.840	3⅜	66,0	CC-24338	5,2	3⅜ – 3⅛	IN24338-313	3⅜ – 3	IN24338-300	HR-85
	16.570	3½	69,0	CC-24350	5,2	3½ – 3⅛	IN24350-313	3½ – 3	IN24350-300	HR-90
	17.320	3¾	72,0	CC-24375	5,4	3¾ – 3½	IN24375-350	3¾ – 3⅜	IN24375-338	HR-95
	18.050	3⅞	76,0	CC-24388 [3]	5,6	4⅛ – 3⅞	IN24413-388	3⅞ – 3⅜	IN24388-338	HR-100
	21.000	4⅛	80,0	CC-24413	5,7	4¼ – 3⅞	IN24425-388	4⅛ – 3¾	IN24413-375	HR-105
	24.210	4¼	84,0	CC-24425	6,8	4⅝ – 4¼	IN24463-425	4¼ – 3¾	IN24425-375	HR-110
		4⅝	90,0	CC-24463	7,3	5 – 4⅝	IN24500-463	4⅝ – 4⅛	IN24463-413	HR-120
		5	96,0	CC-24500	7,4	–	–	5 – 4¼	IN24500-425	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 76.
[2] Additional Reducer Insert: 3⅛"–2 9/16" **IN24313-256** fits **CC-24313** Cassette. Use **HR-80** Holding Ring.
[3] Additional Reducer Insert: 3¾"–2 9/16" **IN24375-313** fits **CC-24388** Cassette. Use **HR-100** Holding Ring.

HXD-Series, Metric Cassettes and Reducer Inserts

Maximum Torque at 800 bar:
24.210 Nm

Hexagon Range:
32 - 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
			D									
Model Number (max. capacity)	Max. Torque (Nm)	Hex. Size [1] (mm)	Nose Radius D (mm)	Model Number	(kg)	Hexagon Size (mm)	Model Number	Hexagon Size (mm)	Model Number	Hexagon Size (mm)	Model Number	Model Number
HXD-30 (3290 Nm)	1700	32	28,5	CC-332	0,6	–	–	–	–	–	–	–
	2100	36	31,5	CC-336	0,7	–	–	–	–	–	–	–
	2500	41	34,5	CC-341	0,7	41/36	IN3-4136	41/32	IN3-4132	41/30	IN3-4130	HR-41
	2890	46	38,5	CC-346	0,8	46/41	IN3-4641	46/36	IN3-4636	46/32	IN3-4632	HR-46
	3290	50	42,0	CC-350	0,9	50/46	IN3-5046	50/41	IN3-5041	50/36	IN3-5036	HR-50
		55	45,0	CC-355	1,0	55/50	IN3-5550	55/46	IN3-5546	55/41	IN3-5541	HR-55
		60	47,5	CC-360	1,1	60/55	IN3-6055	60/50	IN3-6050	60/46	IN3-6046	HR-60
HXD-60 (6190 Nm)	3840	41	34,5	CC-641	1,2	41/36	IN6-4136	–	–	–	–	HR-41
	4805	46	39,5	CC-646	1,3	–	–	–	–	–	–	–
	5410	50	43,5	CC-650	1,4	50/46	IN6-5046	50/41	IN6-5041	50/36	IN6-5036	HR-50
		55	46,5	CC-655	1,5	55/50	IN6-5550	55/46	IN6-5546	55/41	IN6-5541	HR-55
		60	48,5	CC-660	1,6	60/55	IN6-6055	60/50	IN6-6050	60/46	IN6-6046	HR-60
	6190	65	52,5	CC-665	1,8	65/60	IN6-6560	65/55	IN6-6555	65/50	IN6-6550	HR-65
		70	55,5	CC-670	1,9	70/65	IN6-7065	70/60	IN6-7060	70/55	IN6-7055	HR-70
		75	57,5	CC-675	2,0	75/70	IN6-7570	75/65	IN6-7565	75/60	IN6-7560	HR-75
		80	60,5	CC-680	2,1	80/75	IN6-8075	80/70	IN6-8070	80/65	IN6-8065	HR-80
HXD-120 (12.500 Nm)	8000	55	46,5	CC-1255	2,6	55/50	IN12-5550	55/46	IN12-5546	55/41	IN12-5541	HR-55
		60	48,5	CC-1260	2,7	60/55	IN12-6055	60/50	IN12-6050	60/46	IN12-6046	HR-60
	9800	65	52,5	CC-1265	2,7	65/60	IN12-6560	65/55	IN12-6555	65/50	IN12-6550	HR-65
		70	55,5	CC-1270	2,8	70/65	IN12-7065	70/60	IN12-7060	70/55	IN12-7055	HR-70
		75	57,5	CC-1275	2,9	75/70	IN12-7570	75/65	IN12-7565	75/60	IN12-7560	HR-75
		–	–	–	–	–	–	–	–	–	–	–
	10.860	80	60,5	CC-1280	3,0	80/75	IN12-8075	80/70	IN12-8070	80/65	IN12-8065	HR-80
	12.500	85	64,5	CC-1285	3,5	85/80	IN12-8580	85/75	IN12-8575	85/70	IN12-8570	HR-85
		90	67,5	CC-1290	3,6	90/85	IN12-9085	90/80	IN12-9080	90/75	IN12-9075	HR-90
		95	70,5	CC-1295	3,7	95/90	IN12-9590	95/85	IN12-9585	95/80	IN12-9580	HR-95
		100	73,5	CC-12100	3,8	100/95	IN12-10095	100/90	IN12-10090	100/85	IN12-10085	HR-100
HXD-240 (24.210 Nm)	13.890	80	62,0	CC-2480	5,1	80/75	IN24-8075	80/70	IN24-8070	80/65	IN24-8065	HR-80
	16.030	85	66,0	CC-2485	5,2	85/80	IN24-8580	85/75	IN24-8575	85/70	IN24-8570	HR-85
	16.560	90	69,0	CC-2490	5,2	90/85	IN24-9085	90/80	IN24-9080	90/75	IN24-9075	HR-90
	17.100	95	72,0	CC-2495	5,4	95/90	IN24-9590	95/85	IN24-9585	95/80	IN24-9580	HR-95
	18.170	100	76,0	CC-24100	5,6	100/95	IN24-10095	100/90	IN24-10090	100/85	IN24-10085	HR-100
	20.840	105	80,0	CC-24105	5,7	105/100	IN24-105100	105/95	IN24-10595	105/90	IN24-10590	HR-105
	24.210	110	84,0	CC-24110	5,8	110/105	IN24-110105	110/100	IN24-110100	110/95	IN24-11095	HR-110
		115	87,0	CC-24115	7,1	115/110	IN24-115110	115/105	IN24-115105	115/100	IN24-115100	HR-115
		120	90,0	CC-24120	7,3	120/115	IN24-120115	120/110	IN24-120110	120/105	IN24-120105	HR-120
		125	93,0	CC-24125	7,3	125/120	IN24-125120	125/115	IN24-125115	125/110	IN24-125110	HR-125
		130	96,0	CC-24130	7,4	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 76.

Optimum Torque Wrench and Pump Combinations

For optimum speed and performance Enerpac recommends the following system set-up with wrench-pump-hose combinations.
For other combinations, consult your Enerpac bolting expert or your authorized Enerpac distributor.

			ELECTRIC PUMPS				AIR DRIVEN PUMPS	
			PME, PMU-Series	ZU4-Series	TQ-Series	ZE-Series	PTA-Series	ZA4-Series
								
			Page: 33	Page: 34	Page: 40	Page: 38	Page: 42	Page: 44
		Speed:						
		Reservoir Capacity:	1,9 - 3,8 litres	4,0 - 8,0 litres	4,0 litres	4,0 - 40 litres	3,8 litres	4,0 - 8,0 litres
		Duty Cycle:	Standard	Standard	Medium	Heavy-Duty	Standard	Heavy-Duty
		Weight:						
		Field/Factory Work:	Field	Field	Field/Factory	Factory	Field	Field
S-Series	 6	S1500	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal
		S3000						
		S6000	–				–	
		S11000			Acceptable			
		S25000						
W-Series	 12	W2000	Optimal		Optimal		Optimal	
		W4000						
		W8000	–				–	
		W15000			Acceptable			
		W22000						
		W35000						
SQD-Series	 24	SQD-25-I	Optimal	Optimal	–	–	Optimal	Optimal
		SQD-50-I						
		SQD-75-I	–				–	
		SQD-100-I						
		SQD-160-I						
		SQD-270-I						
HXD-Series	 28	HXD-30	Optimal				Optimal	
		HXD-60						
		HXD-120	–				–	
		HXD-240						
		–						

ZU4 – Electric Wrench Pumps

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

ZU4 Pro pumps have an LCD feature to display torque or pressure, selectable torque wrench, and self-diagnostics – premium features not available on any other pump.
ZU4 Classic pumps feature an analogue gauge and a basic electrical package to deliver durable, safe and efficient hydraulic power.

ZE-Series Electric Wrench Pumps

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

ZA-Series Air Driven Wrench Pumps

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

TQ-700 Series Electric Wrench Pumps

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

Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For S & W	Modelnr.
6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T
For SQD & HXD	
6 m long, 2 hoses	THC-7062
12 m long, 2 hoses	THC-7122

Portable Electric Torque Wrench Pumps

▼ Shown: **PMU-10422**

PME PMU Series

Reservoir Capacity:
1,9 - 3,8 litres

Flow at Rated Pressure:
0,33 l/min

Motor Size:
0,37 kW

Maximum Operating Pressure:
700 - 800 bar

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

Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model-Nr.
6 m long, 2 hoses	**THQ-706T**
12 m long, 2 hoses	**THQ-712T**
For 800 bar	
6 m long, 2 hoses	**THC-7062**
12 m long, 2 hoses	**THC-7122**

Gauge and Overlay Kit

Available separately for use with PME, PMU-Series pumps: **GT-4015Q** includes gauge and overlays for all S- and W-Series wrenches.
GT-4015 includes gauge and overlays for all SQD and HXD-Series wrenches.

▼ **SELECTION CHART**

For Use with Torque Wrenches		Maximum Pressure Rating (bar)		Oil Flow Rate (l/min)		Model Number with Heat Exchanger *	Useable Oil Capacity	Electric Motor	Dimensions L x W x H	
		1st stage	2nd stage	1st stage	2nd stage		(litres)	(Volt-phase-Hz)	(mm)	(kg)
S1500 S3000	W2000 W4000	48	700	3,3	0,33	**PMU-10427-Q**	1,9	115 - 1 - 50/60	431x280x381	24
		48	700	3,3	0,33	**PMU-10447-Q**	3,8	115 - 1 - 50/60	431x330x381	27
		48	700	3,3	0,33	**PMU-10422-Q**	1,9	230 - 1 - 50/60	431x280x381	24
		48	700	3,3	0,33	**PMU-10442-Q**	3,8	230 - 1 - 50/60	431x330x381	27
SQD-25-I SQD-50-I	HXD-30 HXD-60	48	800	3,3	0,33	**PMU-10427**	1,9	115 - 1 - 50/60	431x280x381	24
		48	800	3,3	0,33	**PMU-10447**	3,8	115 - 1 - 50/60	431x330x381	27
		48	800	3,3	0,33	**PMU-10422**	1,9	230 - 1 - 50/60	431x280x381	24
		48	800	3,3	0,33	**PMU-10442**	3,8	230 - 1 - 50/60	431x330x381	27

* For pump without heat exchanger change PMU into PME. Example **PME-10442-Q**.
PME-Series pump size: 250 x 250 x 360 mm. Weight 17 kg (1,9 litres) and 20 kg (3,8 litres).

ZU4T, Electric Torque Wrench Pumps

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ ZU4204TE-Q (Pro Electric serie), ZU4204BE-Q (Classic Electric serie)

Z Tough, Dependable Innovative CLASS

- **Features *Z-Class* high-efficiency pump design; higher oil flow and bypass pressure, cooler running and requires 18% less current draw than comparable pumps**
- **Powerful 1,25 kW universal electric motor provides high power-to-weight ratio and excellent low-voltage operating characteristics**
- **High-strength, molded composite shroud protects motor and electrical components, while providing an ergonomic, non-conductive handle for easy transport**
- **Pendant provides additional safety for the operator**

Pro Series pump only

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

FIRMWARE for Pro-Series

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

Classic Electrical

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

Pro-Series

Back-lit LCD and Pressure Transducer featuring Auto-Cycle Technology.

- Digital read-out and "Autocycle" setting
- Pump usage information, hour and cycle counts
- Low-voltage warning and recording
- Self-test and diagnostic capabilities
- Information can be displayed in English, French, German, Italian, Spanish and Portuguese
- Pressure transducer is more accurate and durable than analog gauges
- Easy-viewing variable rate display
- Display pressure in bar, MPa or psi.

◀ *Any brand of hydraulic torque wrench can be powered by the portable ZU4T-Series torque wrench pump.*

ZU4T-Series, Torque Wrench Pumps

Z-Class – A Pump For Every Application

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

Enerpac ZU4T-Series pumps are built to power small to large torque wrenches. Choosing the right ZU4T-Series torque wrench pump for your application is easy.

Classic Electric Torque Wrench Pump

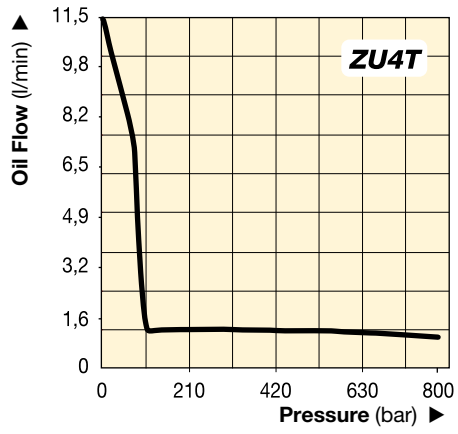
- The Classic has traditional electro-mechanical components (transformers, relays and switches) in place of solid-state electronics. The Classic delivers durable, safe and efficient hydraulic power.

Pro Series Electric Torque Wrench Pump

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

  These premium features are not available on any other pump – anywhere!
- Auto-Cycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed (pump can be used with or without Auto-Cycle feature).

OIL FLOW VS. PRESSURE



ZU4T Series

Reservoir Capacity:
4,0 - 8,0 litres

Flow at Rated Pressure:
1,0 l/min

Motor Size:
1,25 kW

Maximum Operating Pressure:
700 - 800 bar

Torque Wrench Pump Selection Matrix

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

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Pump Ratings

-Q suffix pumps are for **700 bar** torque wrenches, and include spin-on couplers.

-E suffix pumps are for use with Enerpac SQD and HXD **800 bar** torque wrenches, and include polarized lock-ring safety couplers.

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Gauge and Overlay Kit

Available separately for use with ZU4T-Series Classic: **GT-4015Q** includes gauge and overlays for all S- and W-Series torque wrenches.
GT-4015 includes gauge and overlays for all SQD and HXD torque wrenches.

▼ **COMMON PUMP MODELS**

For Use With Torque Wrenches		Model Number [1) 4)]	Motor Electrical Specification	Usable Oil Capacity (litres)	(kg)
Pro Series Pumps	All wrenches	**ZU4204TB-Q**	115 VAC, 1-ph	4,0	32
		ZU4208TB-Q	115 VAC, 1-ph	8,0	34
		ZU4204TE-Q [2)]	208-240 VAC, 1-ph	4,0	32
		ZU4208TE-Q [2)]	208-240 VAC, 1-ph	8,0	34
		ZU4204TI-Q [3)]	208-240 VAC, 1-ph	4,0	32
		ZU4208TI-Q [3)]	208-240 VAC, 1-ph	8,0	34
Classic Pumps	All wrenches	**ZU4204BB-QH**	115 VAC, 1-ph	4,0	37
		ZU4204BB-Q	115 VAC, 1-ph	4,0	33
		ZU4208BE-QH [2)]	208-240 VAC, 1-ph	8,0	38
		ZU4204BE-Q [2)]	208-240 VAC, 1-ph	4,0	34
		ZU4208BI-QH [3)]	208-240 VAC, 1-ph	8,0	40
		ZU4208BI-Q [3)]	208-240 VAC, 1-ph	8,0	36

1) All models meet CE safety requirements and all CSA requirements.
2) European plug and CE EMC directive compliant
3) With NEMA 6-15 plug
4) Select -E suffixed pumps for Enerpac SQD and HXD 800 bar torque wrenches, see page 37.

4-Wrench Manifold

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

Accessory Kit * Model Nr.	Can be used on ZU4-Series torque wrench pumps
ZTM-E	for 800 bar torque wrenches
ZTM-Q	for 700 bar torque wrenches

* Add suffix **M** for factory installation. Weight 4,0 kg.

Ordering Example: ZU4208TE-QM

Skid Bar

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

Accessory Kit * Model Nr.	Can be used on ZU4-Series torque wrench pumps
SBZ-4	04 and 08 reservoir [1]
SBZ-4L	04 and 08 reservoir [2]

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

[1] Without heat exchanger 2,2 kg.

[2] With heat exchanger 3,2 kg.

Ordering Example: ZU4208TE-QK

Heat Exchanger

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

Accessory Kit * Model Nr.	Can be used on ZU4-Series torque wrench pumps
ZHE-U115	115 Volt pumps
ZHE-U230	230 Volt pumps

* Add suffix **H** to pump model number for factory installation.
Heat Exchanger adds 4,1 kg to pump weight.

Ordering Example: ZU4208TE-QH

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

Roll Cage

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

Accessory Kit * Model Nr.	Can be used on ZU4-Series torque wrench pumps
ZRC-04	04 and 08 reservoir [1]
ZRC-04H	04 and 08 reservoir [2]

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

[1] Without heat exchanger 5 kg.

[2] With heat exchanger 7 kg.

Ordering Example: ZU4208TE-QR

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

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

Do not exceed maximum oil flow and pressure ratings.

Heat exchanger is not suitable for water-glycol or high water-based fluids.

ZU4T-Series, Ordering Matrix and Specifications

▼ This is how a ZU4T-Series pump model number is built up:

Z	U	4	2	08	T	E	-	Q	H	M
1 Product Type	2 Motor Type	3 Flow Group	4 Valve Type	5 Reser-voir Size	6 Valve Operation	7 Voltage		8 Must be E or Q	8 Options	8 Options

1 Product Type
Z = Pump series

2 Motor Type
U = Universal electric motor

3 Flow Group
4 = 1,0 l/min @ 700 bar

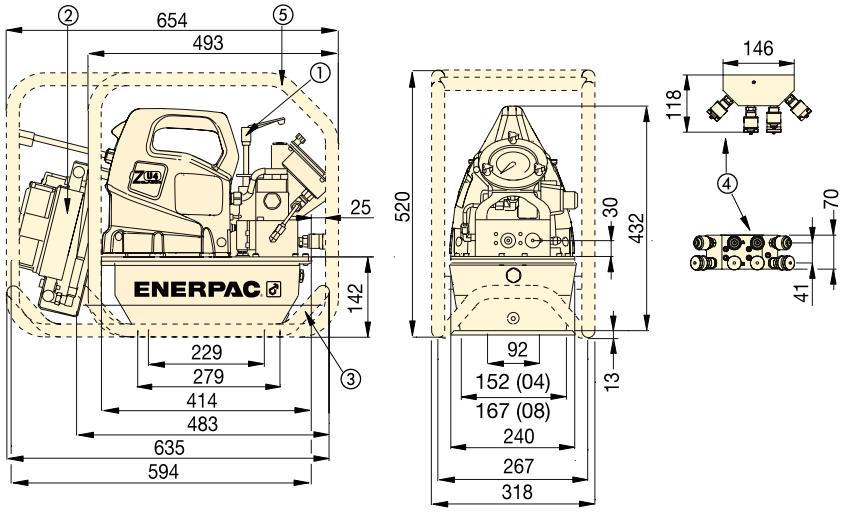
4 Valve Type
2 = Torque wrench valve

5 Reservoir Size
04 = 4,0 litres usable oil
08 = 4,0 litres usable oil

6 Valve Operation
T = **Pro Electric Serie pump** with solenoid valve and pendant, LCD Electric and pressure transducer
B = **Classic Electric pump** with solenoid valve and pendant.

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

8 Options
E = **800 bar coupler** for use with HXD and SQD-Series or other wrenches
Q = **700 bar coupler** for use with S and W-Series or other wrenches
H = Heat exchanger
K = Skid bar
M = 4-wrench manifold
R = Roll cage



ZU4T-Series Torque Wrench Pumps
① User adjustable relief valve
② Heat Exchanger (optional)
③ Skidbar (optional)
④ 4-wrench manifold (optional)
⑤ Roll cage (optional)

ZU4T-Series Performance Chart

Motor Size (kW)	Output Flow Rate (l/min) 7 bar	50 bar	350 bar	700 bar	Motor Electrical Specification (Volt - Phase - Hz)	Sound Level (dBA)	Relief Valve Adjustment Range (bar)
1,25	11,5	8,8	1,2	1,0	115 - 1 - 50/60 208-240 - 1 - 50/60	85-90	124-700 *

* Pump type (-Q) shown, (-E) range is 124-800 bar.

ZU4T Series

Reservoir Capacity:
4,0 - 8,0 litres

Flow at Rated Pressure:
1,0 l/min

Motor Size:
1,25 kW

Maximum Operating Pressure:
700 - 800 bar

How to order your ZU4T-Series torque wrench pump

Ordering Example
Model No. ZU4208TE-QMHK
700 bar Pro Electric Series pump for use with Enerpac S and W-Series and other 700 bar torque wrenches, 230V motor, 8 litres reservoir, 4-wrench manifold, heat exchanger and skidbar.

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

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Torque Wrench Hoses
Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model-Nr.
6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T
For 800 bar	
6 m long, 2 hoses	THC-7062
12 m long, 2 hoses	THC-7122

▼ ZE4204TE-QHR

Tough, Dependable Innovative CLASS

- **Auto-Cycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed (pump can be used with or without auto cycle feature)**
- **LCD readout provides pressure and torque display and a number of diagnostic and readout capabilities never before offered on a portable electric pump**
- **Totally enclosed, fan-cooled industrial electric motors supply extended life and stand up to harsh industrial environments**
- **High-strength, molded electrical enclosure protects electronics, power supplies and LCD readout from harsh environments.**

FIRMWARE for Pro-Series

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

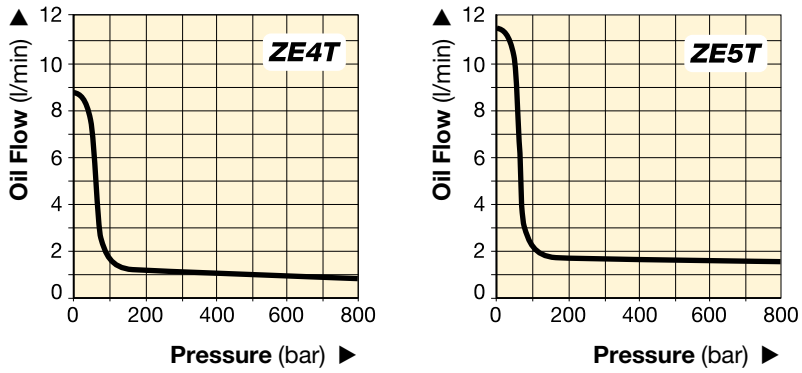
ZE-Series Torque Wrench Pumps

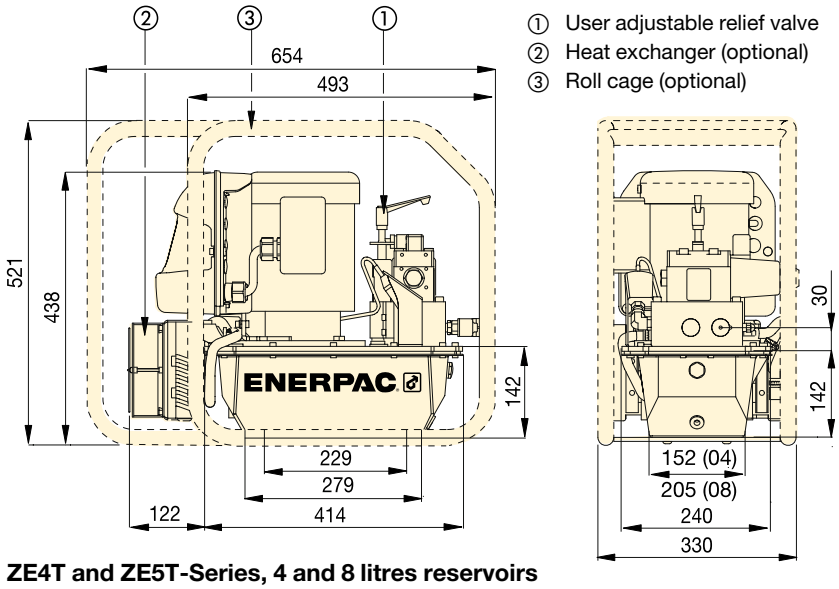
Back-lit LCD and Pressure Transducer featuring Auto-Cycle Technology.

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

◀ *The ZE4T-Series torque wrench pumps are perfectly matched for this W2000 wrench.*

ZE4T AND ZE5T-SERIES OIL FLOW VERSUS PRESSURE





① User adjustable relief valve
② Heat exchanger (optional)
③ Roll cage (optional)

ZE4T and ZE5T-Series, 4 and 8 litres reservoirs

▼ COMMON TORQUE WRENCH PUMP MODELS

For Use With Torque Wrenches	Max. Operating Pressure (bar)	Model Number with Heat Exchanger and Roll Cage	Motor Electrical Specification (Volt - Ph - Hz)	Usable Oil Capacity[1] (litres)	(kg)
all S and W-Series	700	**ZE4204TB-QHR**	115 - 1 - 50/60	4,0	61
	700	**ZE4204TE-QHR**	230 - 1 - 50/60	4,0	61
	700	**ZE4204TG-QHR**	230 - 3 - 50/60	4,0	62
	700	**ZE5204TW-QHR**	400 - 3 - 50/60	4,0	62
all SQD and HXD-Series	800	**ZE4204TB-EHR**	115 - 1 - 50/60	4,0	61
	800	**ZE4204TE-EHR**	230 - 1 - 50/60	4,0	61
	800	**ZE4204TG-EHR**	230 - 3 - 50/60	4,0	62
	800	**ZE5204TW-EHR**	400 - 3 - 50/60	4,0	62

[1] Larger reservoirs (8, 10, 20 and 40 litres) are available. Contact Enerpac.

▼ PERFORMANCE CHART

Pump Series	Output Flow Rate at 50 Hz [2] (l/min)				Motor Size	Relief Valve Adjustment Range	Sound Level
	7 bar	50 bar	350 bar	700 bar	(kW)	(bar)	(dBA)
ZE4T	8,8	8,1	0,9	0,8	1,1	70 - 800	75
ZE5T	11,8	11,2	1,7	1,6	2,2	70 - 800	75

[2] Flow rate will be approximately 6/5 higher at 60 Hz.

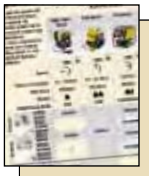
ZE4T ZE5T Series

Reservoir Capacity:
4,0 - 40 litres

Flow at Rated Pressure:
0,82 - 1,64 l/min

Motor Size:
1,1 - 2,2 kW

Maximum Operating Pressure:
700 - 800 bar



Torque Wrench Pump Selection Matrix

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

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Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model Nr.
6 m long, 2 hoses	**THQ-706T**
12 m long, 2 hoses	**THQ-712T**
For 800 bar	
6 m long, 2 hoses	**THC-7062**
12 m long, 2 hoses	**THC-7122**

▼ TQ-700E

Lightweight Torque Wrench Pumps

- **Optimized flow technology – three stage pump maximizes productivity of the pump and tool while minimizing heat build-up and down time**
- **A quiet (<85 dBA), lightweight pump with a compact footprint – easy to move around and through the work site**
- **Durable roll cage with an ergonomically sized handle and shielded gauge – a pump that is easy to put into position and safe from on site operational hazards**
- **Maintenance made simple with a brushless motor designed for continuous usage**
- **Straightforward operation with a simple pressure set and convenient to use 6 m pendant control – immediate productivity for crews operating the pump**
- **IP55 Rating for Superior Dust and Water Protection**
- **Transparent gauge overlays in Nm and Ft.lbs for all Enerpac S and W-Series torque wrenches provide a quick torque reference**

Four Port Manifold

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

Hydraulic Torque Wrenches

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

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Torque Wrench Hoses

Use Enerpac **THQ-700** series twin hoses with 700 bar pumps.

For 700 bar	Model Nr.
6 meters long, 2 hoses	**THQ-706T**
12 meters long, 2 hoses	**THQ-712T**

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

TQ-700 Applications

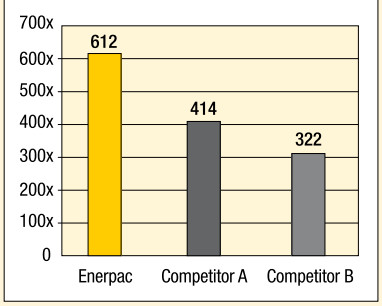
The TQ-700 Series pump is ideal for powering hydraulic wrenches for the Power Generation and Wind Markets.

Optimized for optimal performance with small to medium sized wrenches: (S1500, S3000, S6000, W2000, W4000, W8000).

Bolting speed is more complex than how much flow per minute the pump produces. The key is optimising the flow rate across the entire bolting cycle. With more oil flowing at the right time and at the right volume, you achieve the optimized flow for a hydraulic bolting system.

The result of this optimized flow is more bolts tightened faster and a more productive work team.

Bolts tightened per hour



Internal laboratory testing based on standard torqueing procedure on a pipe flange with 14, 1⅞" bolts.

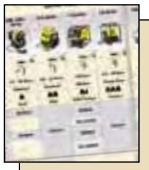
TQ Series

Reservoir Capacity:
4,0 litres

Flow at Rated Pressure:
0,5 l/min

Motor Size:
0,75 kW

Maximum Operating Pressure:
700 bar



Torque Wrench Pump Selection Matrix

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

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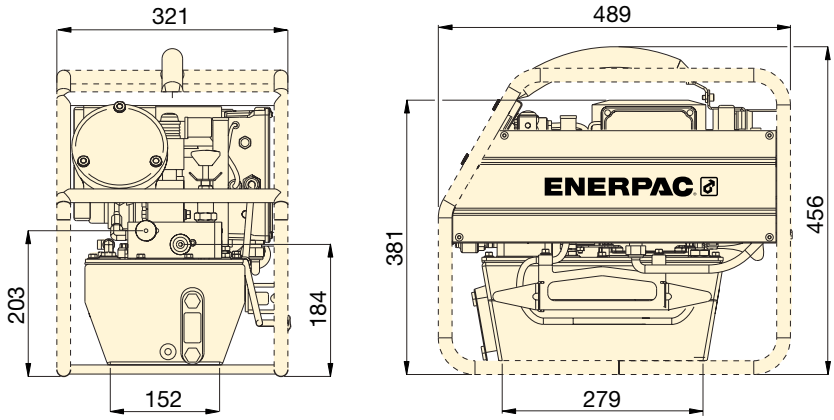

For Use with Torque Wrenches	Pressure Rating (bar)	Model Number [1]	Useable Oil Capacity (litres)	Motor Size (kW)	Motor Electrical Specifications (Volt - Ph - Hz)	Sound Level (dBA)	(kg)
All S and W-Series	700	**TQ-700B**	4,0	0,75	115 - 1 - 60	82 - 85	31
	700	**TQ-700E** [2]	4,0	0,75	230 - 1 - 50	82 - 85	30
	700	**TQ-700I** [3]	4,0	0,75	230 - 1 - 60	82 - 85	30

[1] All models meet CE safety requirements and all TÜV requirements.
[2] TQ-700E with European plug and CE EMC directive compliant.
[3] TQ-700I with NEMA 6-15 plug.

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

▼ **PTA-1404**

Two-Stage Power in a Portable Design

- **Compact and portable**
- **Handle located directly over pump's center of gravity for greater ease in carrying**
- **High bypass (125 bar) for faster torque cycles**
- **High power-to-weight ratio suits all Enerpac torque wrenches**
- **Glycerine filled pressure gauge with scales reading in bar/psi**
- **Transparent overlays in Nm and Ft.lbs for all Enerpac torque wrenches provide a quick torque reference**
- **Internal safety relief valve, factory preset.**

Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model Nr.
6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T
For 800 bar	
6 m long, 2 hoses	THC-7062
12 m long, 2 hoses	THC-7122

Gauge and Overlay Kit

Available separately for use with PTA-Series pumps:
GT-4015Q includes gauge and overlays for all S- and W-Series wrenches.
GT-4015 includes gauge and overlays for all SQD and HXD-Series wrenches.

◀ *Easy and reliable service and maintenance with Enerpac steel wrenches powered by a pneumatic torque wrench pump.*

Compact Pneumatic Torque Wrench Pump

PTA Series

Reservoir Capacity:
3,8 litres

Flow at Rated Pressure:
0,33 l/min

Air Consumption:
1133 l/min

Maximum Operating Pressure:
700 - 800 bar

Torque Wrench Pump Selection Matrix

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

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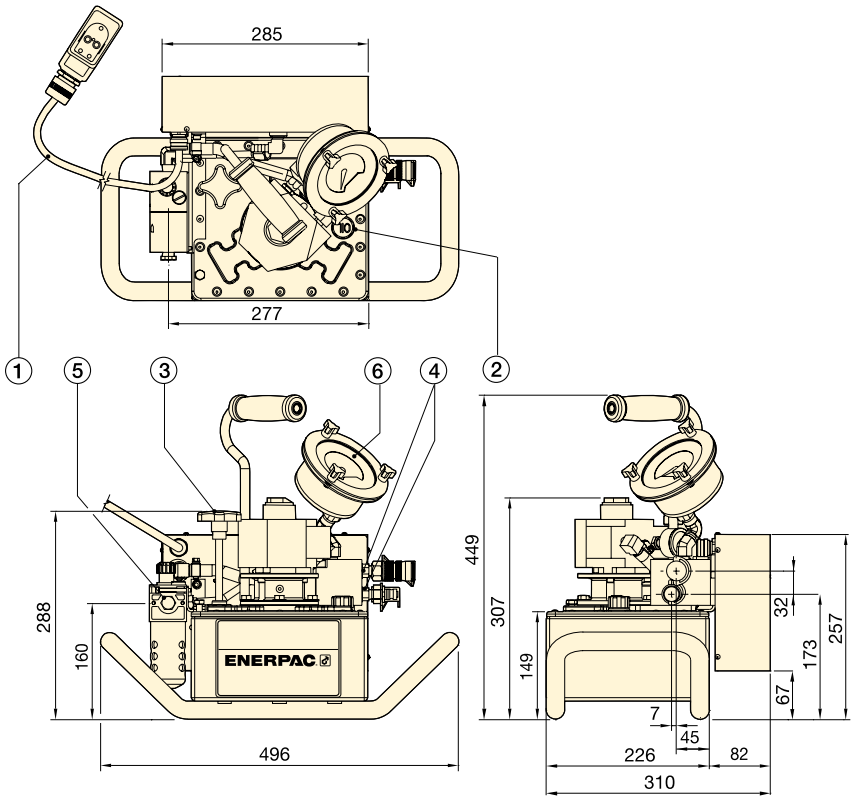
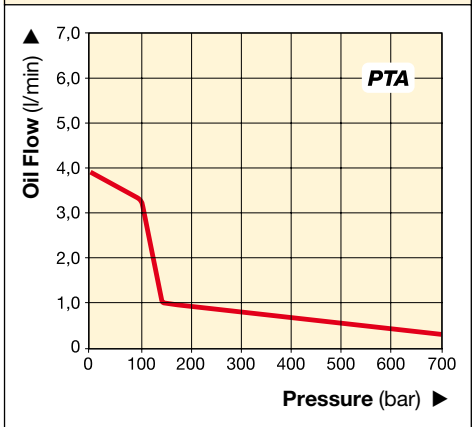


① 5 mtr Air control pendant
② Vent/Fill plug
③ Externally adjustable relief valve
④ 1/4”-18 NPTF Hydraulic ports
⑤ 3/8”-18 NPTF Air inlet
⑥ Gauge with overlay kit

OIL FLOW VERSUS PRESSURE



▼ PERFORMANCE CHART

For Use With Torque Wrenches		Pressure Rating (bar)		Model Number	Oil Flow Rate (l/min)		Reservoir Capacity	Useable Oil	Air Consumption at 7 bar (l/min)	Air Pressure Range	
		1st stage	2nd stage		1st stage	2nd stage	(litres)	(litres)		(bar)	(kg)
S1500 S3000	W2000 W4000	125	**700**	**PTA-1404-Q**	3,9	0,33	3,8	1,9	1133	3,4 - 7,0	24,5
SQD-25-I SQD-50-I	HXD-30 HXD-60	125	**800**	**PTA-1404**	3,9	0,33	3,8	1,9	1133	3,4 - 7,0	24,5

ZA4T-Series, Air Driven Torque Pumps

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ **ZA4204TX-ER**

Z Tough, Dependable Innovative CLASS

- **Two-speed operation and high by-pass pressure reduces cycle time for improved productivity**
- **Glycerin filled pressure gauge with transparent overlays in Nm and Ft.lbs for Enerpac torque wrenches provide a quick torque reference**
- **Regulator-Filter-Lubricator with removable bowls and auto drain is standard**
- **Heat exchanger warms exhaust air to prevent freezing and cools the oil**
- **Ergonomic pendant allows remote operation up to 6 m.**

Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model Nr.
6 m long, 2 hoses	**THQ-706T**
12 m long, 2 hoses	**THQ-712T**
For 800 bar	
6 m long, 2 hoses	**THC-7062**
12 m long, 2 hoses	**THC-7122**

Gauge and Overlay Kit

Available separately for use with ZA4T-Series pumps:
GT-4015Q includes gauge and overlays for all S- and W-Series wrenches.
GT-4015 includes gauge and overlays for all SQD and HXD-Series wrenches.

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

Air Driven Torque Wrench Pumps

Pump Applications

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

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

All ZA4T-Series pump models meet CE, CSA and TÜV safety requirements. For further application assistance contact your local Enerpac office.

ATEX 95 Certified

The ZA4T-Series pumps are tested and certified according to the **Equipment Directive 94 / 9 / EC "ATEX Directive"**.

The explosion protection is for equipment group II, equipment category 2 (hazardous area zone 1), in gas and/or dust atmospheres.
The ZA4T-Series pumps are marked with: Ex II 2 GD ck T4.

Ex II 2 GD ck T4
KEMA 0602

ZA4T Series

Reservoir Capacity:
4,0 - 8,0 litres

Flow at Rated Pressure:
1,0 l/min

Air Consumption:
600 - 2840 l/min

Maximum Operating Pressure:
700 - 800 bar

Torque Wrench Pump Selection Matrix

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

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Accessory Options

Available by placing the following additional suffix at the end of the model number:

K = Skid bar
M = 4-wrench manifold
R = Roll cage.

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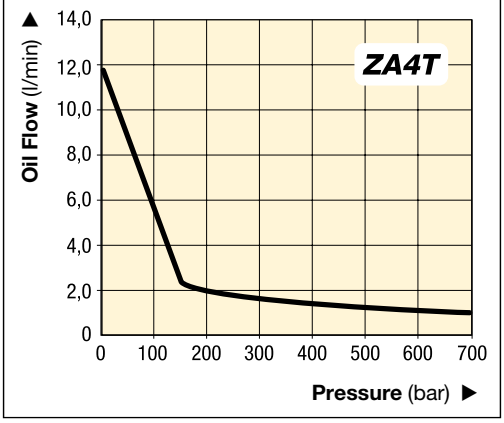
OIL FLOW VERSUS PRESSURE

6,9 bar dynamic air pressure at 2840 l/min



▼ **COMMON PUMP MODELS**

For Use With Torque Wrenches	Maximum Operating Pressure (bar)	Model Number	Usable Oil Capacity (litres)	(kg)
All S and W-Series	**700**	**ZA4204TX-Q**	3,2	42
	700	**ZA4208TX-Q**	6,8	47
	700	**ZA4204TX-QR**	3,2	46
	700	**ZA4208TX-QR**	6,8	51
All SQD and HXD-Series	**800**	**ZA4204TX-E**	3,2	42
	800	**ZA4208TX-E**	6,8	47
	800	**ZA4204TX-ER**	3,2	46
	800	**ZA4208TX-ER**	6,8	51

Skid Bar

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

Accessory Kit * Model Nr.	Can be used on ZA4T-Series torque wrench pumps
SBZ-4	04 and 08 reservoir

* Add suffix **K** for factory installation.
Weight skid bar 2,2 kg.
Ordering Example: ZA4208TX-QK

4-Wrench Manifold

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

Accessory Kit * Model Nr.	Can be used on ZA4T-Series torque wrench pumps
ZTM-E	for 800 bar wrenches
ZTM-Q	for 700 bar wrenches

* Add suffix **M** for factory installation.
Weight manifold 4,5 kg.
Ordering Example: ZA4208TX-QM

Roll Cage

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

Accessory Kit * Model Nr.	Can be used on ZA4T-Series torque wrench pumps
ZRC-04	04 and 08 reservoir

* Add suffix **R** for factory installation.
Roll cage weight 3,4 kg.
Ordering Example: ZA4208TX-QR

700 bar Spin-on Couplers

Model-Nr: TH-630 male coupler
TR-630 female coupler

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

800 bar Lock-ring Couplers

Model-Nr: CMF-250 male coupler
CFF-250 female coupler

- **Mounted on:**
  - **Torque wrench pumps with suffix "E"**
  - **HXD and SQD-Series wrenches**
  - **THC-Series hoses**
  - **4-Wrench manifold ZTM-E.**

Torque Wrench Hoses

Use Enerpac twin safety hoses to connect your torque wrench to the pump.

For 700 bar	Model Nr.
6 m long, 2 hoses	**THQ-706T**
12 m long, 2 hoses	**THQ-712T**
For 800 bar	
6 m long, 2 hoses	**THC-7062**
12 m long, 2 hoses	**THC-7122**

ZA4T-Series, Ordering Matrix and Specifications

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

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

1 Product Type
Z = Pump series

2 Motor Type
A = Air motor

3 Flow Group
4 = 1,0 l/min @ 700 bar

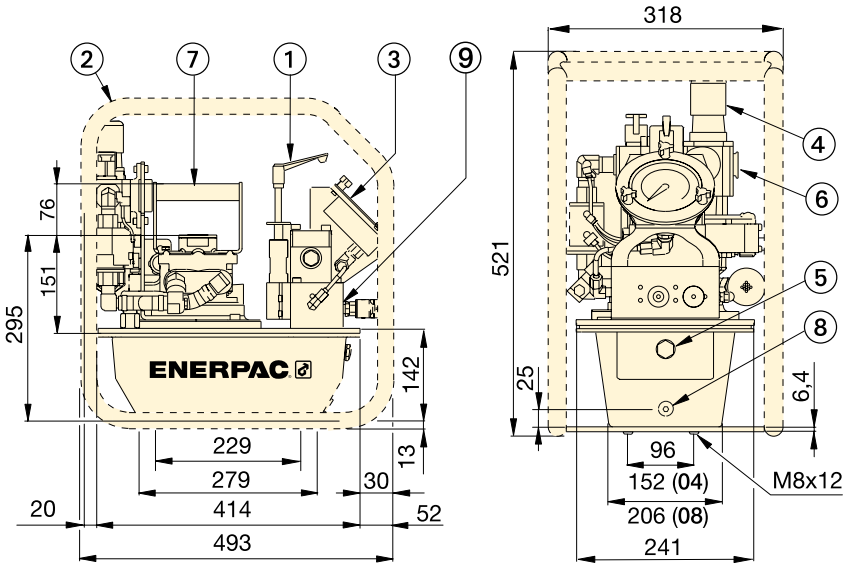
4 Valve Type
2 = Torque Wrench Valve

5 Reservoir Size
04 = 3,2 litres useable oil
08 = 6,8 litres useable oil

6 Valve Operation
T = Air operated valve with pendant

7 Voltage
X = Not applicable

8 Options
E = **800 bar couplers** for use with HXD and SQD-Series or other wrenches
Q = **700 bar couplers** for use with S and W-Series or other wrenches
K = Skid bar
M = 4-wrench manifold
R = Roll cage



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

ZA4T-Series Performance							
Output Flow Rate (l/min)				Dynamic Air Pressure Range	Air Consumption	Sound Level	Relief Valve Adjustment Range
7 bar	50 bar	350 bar	700 bar	(bar)	(l/min)	(dBA)	(bar)
11,5	8,8	1,2	1,0	4,0 - 6,9	600 - 2840	85-90	124-700 *

* Pump type (-Q) shown, (-E) range is 124-800 bar.

ZA4T Series

Reservoir Capacity:
4,0 - 8,0 litres

Flow at Rated Pressure:
1,0 l/min

Air Consumption:
600 - 2840 l/min

Maximum Operating Pressure:
700 - 800 bar

How to order your ZA4T-Series torque wrench pump

Model No. ZA4208TX-QMR

700 bar pump for use with Enerpac S- and W-Series and other 700 bar torque wrenches, 8 litres reservoir, 4-wrench manifold, and roll cage.

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

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

▼ Shown: **GT-Series Bolt Tensioners**

Accurate & Reliable

Extreme Performance Bolt Tensioner

Tensioning Pumps, Hoses and Couplers

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

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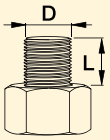
Minimum Stud Protrusion



L min = 1 x D

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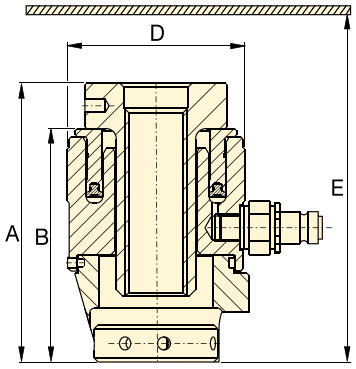
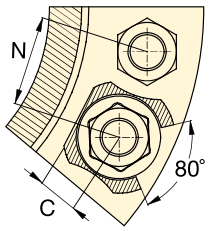
- **Six load cells from M16 to M95 or from ⅝" to 3¾"**
- **Twin ports for quick connection of multiple tools**
- **Only one size of bridge per size of load cell**
- **Detachable and rotational bridge simplifies tool positioning**
- **Full bridge window**
- **Piston stroke indicator**
- **Black surface treatment protects against corrosion**
- **Anti-slip grip for more secure handling**
- **Universal and multi-use tool.**

Nearest obstruction





▼ *GT-Series bolt tensioner used for tightening blade bolts of wind turbine.*

Bolt Range (mm)	Bolt Range (inch)	Load Cell and Bridge Reference	Technical Data: Cylinder Effective Area (mm²)	Technical Data: Load Capacity (kN)	Technical Data: Stroke (mm)	Dimensions (mm): A	B	C	D	(kg)
M16-M30	⅝"-1"	**GT1-LCB**	1495,4	224,3	10	135	113	27	86	3,0
M30-M39	1⅛"-1½"	**GT2-LCB**	2677,2	401,5	10	136	111	35	107	4,1
M39-M52	1½"-2"	**GT3-LCB**	5127,1	768,9	10	160	126	46	138	7,0
M52-M68	2"-2½"	**GT4-LCB**	9782,1	1466,9	10	180	141	62	174	12,2
M68-M80	2½"-3¼"	**GT5-LCB**	15079,7	2261,4	10	202	157	78	210	18,7
M80-M95	3¼"-3¾"	**GT6-LCB**	18972,1	2845,1	10	219	173	82	240	27,8

Load Cell and Bridge Reference	Thread Size	Adaptor Kit Model Number	Pitch Between Bolts N (mm)	Minimum Height E (mm)	(kg)
GT1-LCB (224 kN)	M16 x 2	GT1PM-NRS01620	55	169	1,6
	M18 x 2,5	GT1PM-NRS01825	56	165	1,5
	M20 x 2,5	GT1PM-NRS02025	57	165	1,4
	M24 x 3	GT1PM-NRS02430	59	164	1,3
	M27 x 3	GT1PM-NRS02730	62	167	1,2
	M30 x 3,5	GT1PM-NRS03035	65	170	1,0
	5/8"-11UN	GT1P-NRS0625U11	55	169	1,6
	3/4"-10UN	GT1P-NRS0750U10	56	165	1,4
	7/8"-9UN	GT1P-NRS0875U09	59	164	1,3
	1"-8UN	GT1P-NRS1000U08	62	167	1,2
	1 1/8"-8UN	GT1P-NRS1125U08	65	170	1,0
GT2-LCB (401 kN)	M30 x 3,5	GT2PM-NRS03035	71	173	2,6
	M33 x 3,5	GT2PM-NRS03335	74	174	2,4
	M36 x 4	GT2PM-NRS03640	77	177	2,2
	M39 x 4	GT2PM-NRS03940	80	180	1,9
	1 1/8"-8UN	GT2P-NRS1125U08	71	173	2,6
	1 1/4"-8UN	GT2P-NRS1250U08	74	174	2,4
	1 3/8"-8UN	GT2P-NRS1375U08	77	177	2,2
	1 1/2"-8UN	GT2P-NRS1500U08	80	180	2,0
GT3-LCB (769 kN)	M39 x 4	GT3PM-NRS03940	92	212	5,7
	M42 x 4,5	GT3PM-NRS04245	96	215	5,4
	M45 x 4,5	GT3PM-NRS04545	99	218	5,0
	M48 x 5	GT3PM-NRS04850	105	216	4,7
	M52 x 5	GT3PM-NRS05250	108	220	4,2
	1 1/2"-8UN	GT3P-NRS1500U08	92	212	5,7
	1 5/8"-8UN	GT3P-NRS1625U08	96	215	5,3
	1 3/4"-8UN	GT3P-NRS1750U08	99	218	5,0
	1 7/8"-8UN	GT3P-NRS1875U08	105	216	4,6
	2"-8UN	GT3P-NRS2000U08	108	220	4,2
GT4-LCB (1467 kN)	M52 x 5	GT4PM-NRS05250	118	240	10,7
	M56 x 5,5	GT4PM-NRS05655	121	244	10,1
	M60 x 5,5	GT4PM-NRS06055	124	248	9,4
	M64 x 6	GT4PM-NRS06460	127	252	8,8
	M68 x 6	GT4PM-NRS06860	130	256	8,1
	2"-8UN	GT4P-NRS2000U08	118	240	10,7
	2 1/4"-8UN	GT4P-NRS2250U08	121	244	9,7
	2 1/2"-8UN	GT4P-NRS2500U08	127	252	8,5
GT5-LCB (2261 kN)	M68 x 6	GT5PM-NRS06860	145	278	17,3
	M72 x 6	GT5PM-NRS07260	149	282	16,4
	M76 x 6	GT5PM-NRS07660	152	286	15,5
	M80 x 6	GT5PM-NRS08060	162	293	14,6
	2 1/2"-8UN	GT5P-NRS2500U08	144	274	17,8
	2 3/4"-8UN	GT5P-NRS2750U08	149	282	16,3
	3"-8UN	GT5P-NRS3000U08	152	286	14,8
	3 1/4"-8UN	GT5P-NRS3250U08	162	293	13,1
GT6-LCB (2845 kN)	M80 x 6	GT6PM-NRS08060	169	312	22,3
	M85 x 6	GT6PM-NRS08560	169	312	21,0
	M90 x 6	GT6PM-NRS09060	178	317	19,4
	M95 x 6	GT6PM-NRS09560	181	322	18,0
	3 1/4"-8UN	GT6P-NRS3250U08	169	312	20,7
	3 1/2"-8UN	GT6P-NRS3500U08	178	317	18,8
	3 3/4"-8UN	GT6P-NRS3750U08	181	322	16,8

GT Series

Bolt Range:
M16 - M95, 5/8" - 3 3/4"

Maximum Load:
2845 kN

Maximum Operating Pressure:
1500 bar

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 M36 x 4 threaded bolt order:

1 x Load Cell and Bridge: **GT2-LCB**

1 x Adaptor Kit: **GT2PM-NRS03640**

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

▼ ZUTP-1500E

Reliability, Power and Precision

- **Two-stage pump design provides high flow at low pressure for fast system fills and controlled flow at high pressure for safe and accurate operation**
- **Z-Class high-efficiency pump design runs cooler and requires less current draw which is especially helpful in remote locations**
- **6 m pendant cord enables motor control from a distance**
- **Angled 153 mm pressure gauge, with polycarbonate cover, built into a protective metal shroud for improved visibility and protection**
- **Safety relief valve limits output pressure**
- **Compact, lightweight and rugged aluminium frame for increased durability and ease of handling.**

Applications

The Enerpac ZUTP-Series electric pump is ideally suited for use with hydraulic bolt tensioning tools and hydraulic nuts.

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Bolting Integrity Software

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

Bolting Theory

See our 'Yellow Pages' for information on torque tightening and tensioning.

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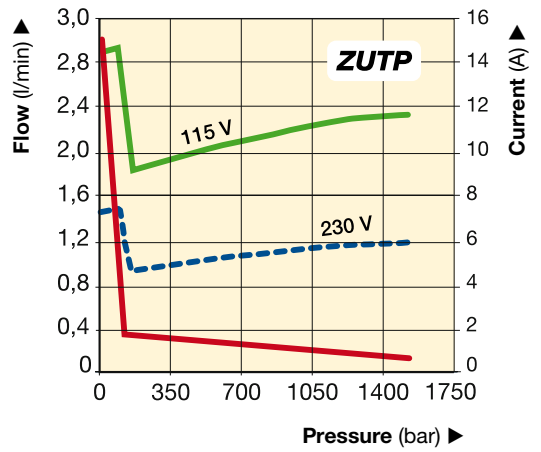
◀ *The ZUTP-1500 pump is rugged, lightweight, compact for tight openings, and delivers hassle-free operation of bolt tensioning in remote locations with up to two times the speed of competitive pumps.*

OIL FLOW & CURRENT VS PRESSURE



Current (Ampère at 115 V)
Current (Ampère at 230 V)
Oil Flow

ZUTP Series

Reservoir Capacity:
4,0 litres

Flow at Rated Pressure:
0,13 l/min

Motor Size:
1,25 kW

Maximum Operating Pressure:
1500 bar

Ultra-high pressure
This pump operates at ultra-high pressure, use only the specified fittings and hoses designed for these pressures.

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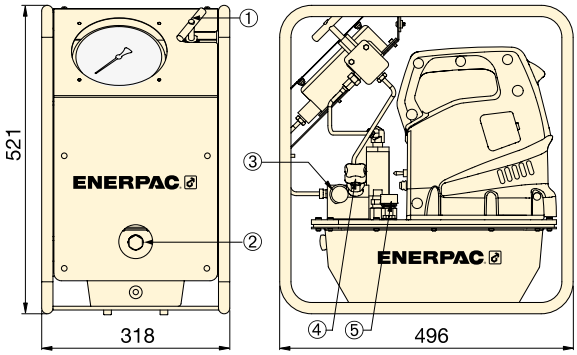

① Release Valve
② Sight Glass
③ Out Port 1/4" BSPM und BR-150 female coupler
④ User Adjustable Relief Valve
⑤ Breather

1500 bar HIGH PRESSURE PUMP

Pump Type	Useable Oil Capacity (litres)	Model Number [1]	Pressure Rating (bar)	Output Flow Rate at 0 bar (l/min)	Output Flow Rate at 1500 bar (l/min)	Motor Electrical Specification	Motor Size (kW)	Sound Level (dBA)	(kg)
Two speed	4,0	**ZUTP-1500B**	1500	2,90	0,13	115 VAC, 1-ph	1,25	89	29,5
	4,0	**ZUTP-1500E** [2]	1500	2,90	0,13	230 VAC, 1-ph [2]	1,25	89	29,5
	4,0	**ZUTP-1500I** [3]	1500	2,90	0,13	230 VAC, 1-ph [3]	1,25	89	29,5

[1] All models meet CE safety requirements and all TÜV requirements.
[2] European plug and CE EMC directive compliant.
[3] With NEMA 6-15 plug.

▼ ATP-1500

ATP Series

Reservoir Capacity:
3,8 litres

Flow at Rated Pressure:
0,07 l/min

Maximum Operating Pressure:
1500 bar

This pump operates at ultra-high pressure, use only the specified fittings and hoses designed for these pressures.

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- **General purpose, high pressure air driven two speed pump unit for products requiring up to 1500 bar hydraulic pressure**
- **Compact, lightweight, rugged steel frame for protection and easy handling**
- **Prelubricated pump element, does not require an airline lubricator**
- **Easily adjustable output pressure control**
- **Integrated and protected easy to read glycerin filled gauge**
- **Safety relief valve limits output pressure.**

Applications

The Enerpac ATP-Series air pump is ideally suited for use with hydraulic bolt tensioning tools and hydraulic nuts.

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ATEX Certified

The ATP-Pump is tested and certified according ATEX.

Ex II 2 GD ck T4

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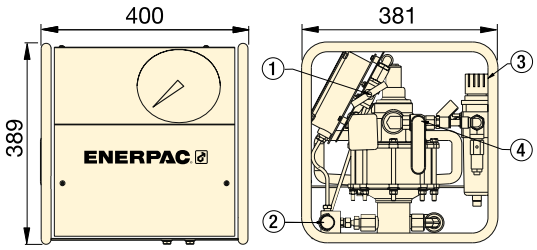
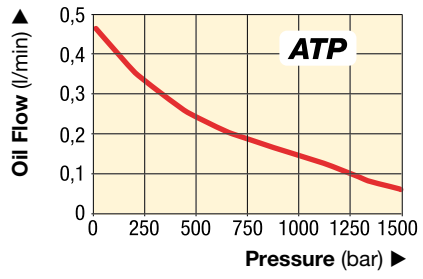


① Shut-off Valve
② Outlet Port 1/4" BSPM with BR-150 female coupler
③ Filter/Regulator
④ Air On/Off Valve
Air Inlet 1/2" NPTF

OIL FLOW VERSUS PRESSURE

Flow (l/min) at 6,2 bar air input



1500 bar HIGH PRESSURE AIR PUMP

Pump Type	Useable Oil Capacity (litres)	Pressure Rating (bar)	Model Number	Output Flow Rate at 0 bar (l/min)	Output Flow Rate at 1500 bar (l/min)	Air Pressure Range (bar)	Air Consumption (l/min)	Sound Level (dBA)	(kg)
Two speed	3,8	1500	**ATP-1500**	0,43	0,07	5,5 - 6,2	594	70	32

High Pressure Hand Pump and Accessories

▼ HPT-1500

HPT, HT, B Series

Reservoir Capacity:
2,5 litres

Flow at Rated Pressure:
0,61 cm³/stroke

Maximum Operating Pressure:
1500 bar

This pump operates at ultra-high pressure, use only the specified fittings and hoses designed for these pressures.

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Applications

The hand pump is ideally suited for use with hydraulic bolt tensioning tools and hydraulic nuts.

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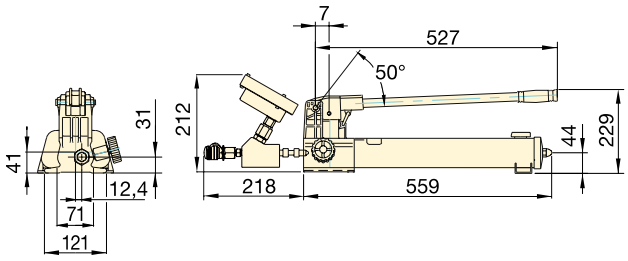
- **Lightweight and portable high-pressure hand pump**
- **Two-speed operation displaces a larger volume of oil per stroke, reducing cycle times for many testing applications**
- **Includes a pressure gauge and coupler for direct connection to GT-Series bolt tensioners**
- **Integrated relief valve set at 1500 bar.**



1500 bar ULTRA-HIGH PRESSURE PUMP

Pump Type	Useable Oil Capacity (litres)	Model Number	Pressure Rating (bar) 1st stage	Pressure Rating (bar) 2nd stage	Oil Displacement per Stroke (cm^3) 1st stage	Oil Displacement per Stroke (cm^3) 2nd stage	High Pressure Oil Port with female coupler	(kg)
Two Speed	2,54	**HPT-1500**	14	1500	16,22	0,61	1/4" BSPP + BR-150	9,0

1500 bar HOSES

Model Number		Hose End 1	Hose End 2	Length (m)
HT-1503		1/4" BSPM 120° Cone	1/4" BSPM 120° Cone	1,0
HT-1510		1/4" BSPM 120° Cone	1/4" BSPM 120° Cone	3,0
HT-1503HR*		**BH-150**	**BR-150**	1,0
HT-1510HR*		**BH-150**	**BR-150**	3,0

* Includes dust caps.

1500 bar COUPLERS

Description		Complete Set	Female Half	Male Half
Quick Disconnect Coupler*		**B-150**	**BR-150**	**BH-150**
Quick Disconnect Coupler and Adaptor Kit*		**BW-150AW**	–	–
Quick Disconnect Blanking Coupler Set*		**B-150B**	–	–

* Includes dust caps.

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

The Quickest and Easiest Way to Start Working Right Away

LW-16 Lifting Wedge

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

The LW-16 only requires an access gap of 10 mm. See our "Specialty Tools" section on **www.enerpac.com.**

- **Optimum match of individual components**
- **All sets are ready-for-use and include single-acting cylinder, two-speed pump, 1,8 m safety hose and gauge and adaptor**
- **RC-Series DUO, General Purpose Cylinders: for maximum versatility**
- **RCS-Series, Low Height Cylinders: ideal where space is restricted**
- **RCH-Series, Hollow Cylinders: for pushing and pulling applications.**

▼ *Cylinder-Pump Sets – optimum match of components. The quickest and easiest way to start working right away.*

1 Cylinder Selection	Set Capacity ton (kN)	Cylinder Model Number	Stroke (mm)	Collapsed Height (mm)
	**5** (45)	RC-55	127	215
	10 (101)	RC-102	54	121
		RC-106	156	247
		RC-1010	257	349
	15 (142)	RC-154	101	200
		RC-156	152	271
	25 (232)	RC-252	50	165
		RC-254	102	215
		RC-256	158	273
		RC-2514	362	476
	50 (498)	RC-506	159	282
	**10** (101)	RCS-101	38	88
	20 (201)	RCS-201	45	98
	30 (295)	RCS-302	62	117
	45 (435)	RCS-502	60	122
	90 (887)	RCS-1002	57	141
	**13** (125)	RCH-121	42	120
	20 (215)	RCH-202	49	162
	30 (326)	RCH-302	64	178
	60 (576)	RCH-603	76	247
	95 (933)	RCH-1003	76	254

Single-Acting Cylinder-Pump Sets

SET SELECTION:

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

SELECTION EXAMPLE

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

Selected pump:
- P-392, Lightweight hand pump

Set model number:
- SCR-106H

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

SC Series

Capacity:
5 - 95 ton

Stroke:
38 - 362 mm

Maximum Operating Pressure:
700 bar

2 Pump selection (See **enerpac.com** for full product descriptions)					Accessories included		
Hand Pump P-142	**Hand Pump P-392**	**Hand Pump P-80**	**Foot Pump P-392FP**	**XA-Series Air Pump XA-11**	**Hose Model Number**	**Gauge Model Number**	**Gauge Adaptor Model Nr.**
							
3 **SCR-55H**	–	–	–	–	HC-7206	GP-10S	GA-4
–	**SCR-102H**	–	**SCR-102FP**	**SCR-102XA**	HC-7206	GF-10B	GA-2
–	**SCR-106H**	–	**SCR-106FP**	**SCR-106XA**	HC-7206	GF-10B	GA-2
–	**SCR-1010H**	–	**SCR-1010FP**	**SCR-1010XA**	HC-7206	GF-10B	GA-2
–	**SCR-154H**	–	**SCR-154FP**	**SCR-154XA**	HC-7206	GP-10S	GA-2
–	**SCR-156H**	–	**SCR-156FP**	**SCR-156XA**	HC-7206	GP-10S	GA-2
–	**SCR-252H**	–	**SCR-252FP**	**SCR-252XA**	HC-7206	GF-20B	GA-2
–	**SCR-254H**	–	**SCR-254FP**	**SCR-254XA**	HC-7206	GF-20B	GA-2
–	**SCR-256H**	–	**SCR-256FP**	**SCR-256XA**	HC-7206	GF-20B	GA-2
–	–	**SCR-2514H**	–	**SCR-2514XA** [1]	HC-7206	GF-20B	GA-2
–	–	**SCR-506H**	–	**SCR-506XA** [1]	HC-7206	GF-50B	GA-2
–	**SCL-101H**	–	**SCL-101FP**	**SCL-101XA**	HC-7206	GF-10B	GA-2
–	**SCL-201H**	–	**SCL-201FP**	**SCL-201XA**	HC-7206	GF-230B	GA-2
–	**SCL-302H**	–	**SCL-302FP**	**SCL-302XA**	HC-7206	GF-230B	GA-2
–	**SCL-502H**	–	**SCL-502FP**	**SCL-502XA**	HC-7206	GF-510B	GA-2
–	–	**SCL-1002H**	–	–	HC-7206	GF-510B	GA-2
SCH-121H	–	–	–	–	HB-7206	GF-120B	GA-4
–	**SCH-202H**	–	**SCH-202FP**	**SCH-202XA**	HC-7206	GF-813B	GA-3
–	**SCH-302H**	–	**SCH-302FP**	**SCH-302XA**	HC-7206	GF-813B	GA-3
–	–	**SCH-603H**	–	**SCH-603XA** [1]	HC-7206	GF-813B	GA-3
–	–	**SCH-1003H**	–	–	HC-7206	GP-10S	GA-2

[1] With XA-12 air pump.

ATM-Series, Flange Alignment Tools

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ From left to right: **ATM-4, ATM-9, ATM-2** (ATM-9 shown without pump and hose)

The faster, simpler and safer way to align flanges.

- **Enerpac ATM-Series tools rectify twist and rotational misalignment quickly, safely and without the need for an external power source**
- **Appropriate for use on most ANSI, API, BS and DIN flanges**
- **Reduces set-up time: no need for chains, pulleys or rigs**
- **Safety strap helps provide secure operation**
- **Can be installed and used in any position**
- **Stays stable in position under full load**
- **Portable, lightweight design enables easy transport and use, even in remote locations**
- **Each ATM-model contains a tool and kit box.**

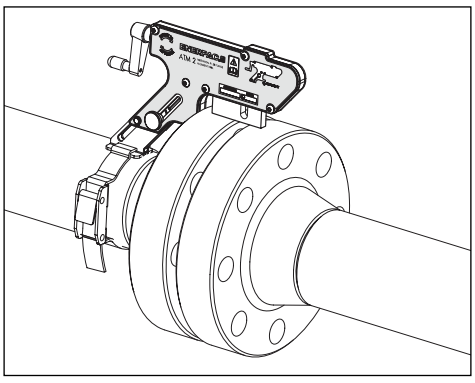
Adjustable Reach

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

Gauge and Adaptor

The ATM-9 includes P-142 hand pump and HC-7206C 1,8 m long hose. Enerpac recommend the use of the pressure gauge **GP-10S** and gauge adaptor **GA-4** for easy mounting of the gauge onto your system.

▼ *The compact ATM-2 is actuated by simply hand turning the crank.*



▼ *The ATM-9 is shown here with optional pressure gauge and gauge adaptor.*

Flange Alignment Tools

Applications

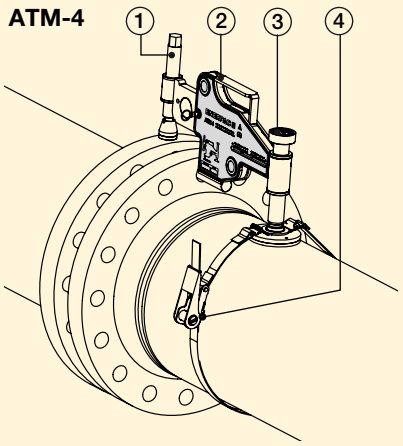
Enerpac ATM-Series Tools help correct flange misalignment, and allow bolts to be placed into joints. This alignment takes place during pipework construction, or maintenance.

These tools provide pipe installers and maintenance personnel with some of the simplest, safest and most productive solutions available for flange alignment in the market today.

① Extendable wing provides usage on wide variety of flanges.

② Portable, light weight design enables easy transport and use.

ATM-4



③ Hand-adjustable base for easy positioning by a single operator.

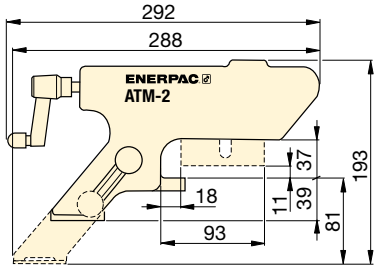
④ Safety strap helps provide secure operation from a horizontal or vertical position.

ATM Series

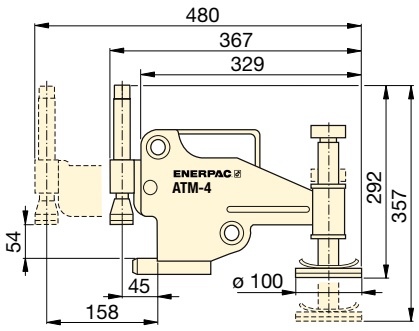
Minimum Bolt Size:
16 - 31,5 mm

Flange Wall Thickness:
14 - 228 mm

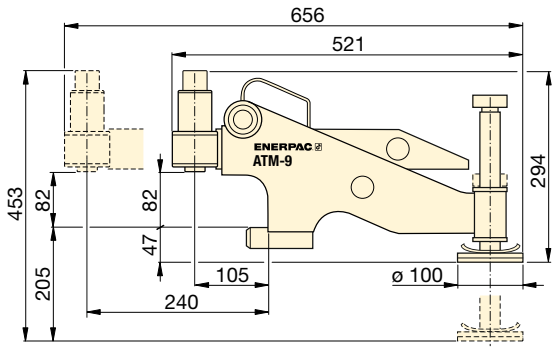
Maximum Lifting Force:
1 - 9 ton (10 - 90 kN)



ATM-2



ATM-4



ATM-9

Maximum Lifting Force		Model Number	Minimum Bolt Size		Flange Wall Thickness		
ton	kN		(mm)	(inch)	(mm)	(inch)	(kg)
1	10	**ATM-2**	16	.63	14 - 82	.55 - 3.29	1,6
4	40	**ATM-4**	24	.95	30 - 133	1.18 - 5.23	8,6
9	90	**ATM-9 ***	31,5	1.24	93 - 228	3.66 - 9.00	14,5

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

Cylinder-Pump Sets

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

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Pipe Flange Face Tool

The portable, hand powered tool **FF-120** makes even the hardest to reach pipe flanges resurfaceable in a safe and convenient way.

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▼ *The ATM-Series – the faster, simpler and safer way to align flanges.*

▼ **FSH-14** and **FSM-8** with safety blocks **SB-1**

Hydraulic and Mechanical Wedge Spreaders

Portable tools to safely spread flange joints.

- **For maintenance, commissioning, shutdowns, testing and valve change outs**
- **Integrated wedge concept: Friction-free, smooth and parallel wedge movement eliminates flange damage and spreading arm failure**
- **Unique interlocking wedge design - no first step bending and risk of slipping out of joint**
- **Requires very small access gap of only 6 mm**
- **Stepped spreader arm design - each step can spread under full load**
- **Few moving parts mean durability and low maintenance**
- **Safety block SB-1 and ratchet spanner SW-22 included with FSM-8 mechanical wedge spreader**
- **Safety block SB-1 and Enerpac RC-102 single-acting cylinder included with FSH-14 hydraulic wedge spreader.**

Stepped Blocks FSB-1

Use stepped blocks to increase wedge opening up to 80 mm. Fits both FSH-14 and FSM-8.

Control Manifolds

For simultaneously and even spreading of flange joints, 180° apart with FSH-14 use **AM-21** or **AM-41** manifolds. See our System Components on **www.enerpac.com.**

Cylinder-Pump Sets

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

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◀ *Two FSH-14 spreaders used simultaneously with Enerpac handpump, hoses and AM-21 control manifold.*

Hydraulic and Mechanical Wedge Spreaders

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.

Parallel Wedge Spreaders

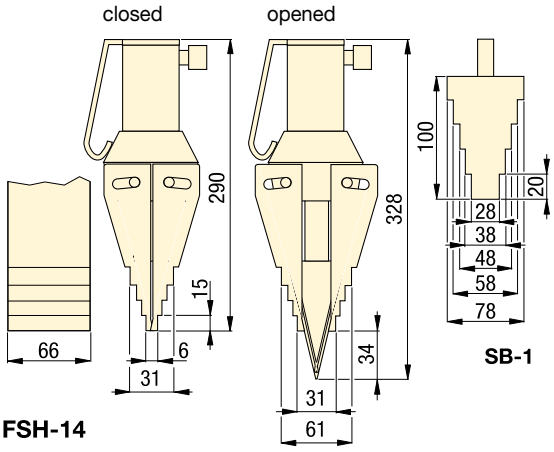
The FSH, FSM-Series parallel wedge spreaders offer controlled separation without bending or risk of slipping from the joint. These spreaders are ideally suited to flanged joint applications.

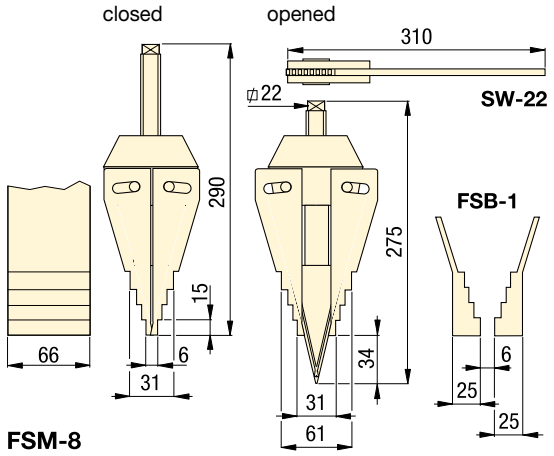
FSH FSM STF Series

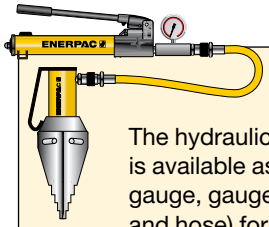
Tip Clearance / Maximum Spread [1]:
6 mm / 80 mm

Maximum Spread Force:
8 - 14 ton

Maximum Operating Pressure:
700 bar (FSH-14)







Tool-Pump Sets

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

Spreader Model Nr.	Handpump Model Nr.	Set Model Number
FSH-14	P-392	**STF-14H**

Maximum Spreading Force ton (kN)	Model Number	Tip Clearance (mm)	Maximum Spread [1] (mm)	Spreader Type	Oil Capacity (cm^3)	(kg)
14 (125)	**FSH-14***	6	80	Hydraulic	78	7,1
8 (72)	**FSM-8**	6	80	Mechanical	–	6,5

[1] Using stepped blocks FSB-1
* Available as pump-tool set, see note on this page.

▼ *Flange maintenance and joint separation with FSH-14 Hydraulic Wedge Spreader.*

Pin-Type Hydraulic Flange Spreaders

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

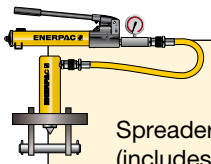
▼ Shown: **FS-56**

FS Series

Capacity:
5 - 10 ton

Maximum Operating Pressure:
700 bar

- **Lightweight, ergonomic design for ease of use**
- **Adjustable jaw widths from 70 to 216 mm for a wide range of applications**
- **Single-acting, spring return RC-Series DUO cylinder for fast trouble-free operation.**



Flange Spreader Sets

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

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

Wedge Spreaders

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

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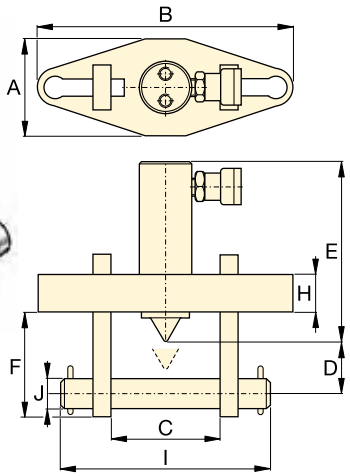


Flange Spreader Matching Chart

ASA Rating (bar)	Pipe Size (mm)	
	FS-56	FS-109
10	127 - 508	558 - 1066
20	63 - 355	406 - 711
27	63 - 304	355 - 609
35	63 - 254	304 - 508
62	12 - 152	203 - 406
103	12 - 88	101 - 203
172	12 - 63	76 - 101

Max. Flange Thickness (mm)	Stud Size (mm)	Standard Wedge (mm)	Capacity ton	Stroke (mm)	Oil Cap. (cm^3)	Model Number	Dimensions (mm) A	B	C Min.	C Max.	D	E	F	H	I	J	(kg)
2 x 57	19 - 28	3 - 28	**5**	38	24,6	**FS-56**	76	209	70	155	32	196	88	25	206	19	11,5
2 x 92	31- 41	3 - 28	**10**	54	78,7	**FS-109**	108	279	104	216	50	152	114	38	273	31	18,1

Single-Acting Hydraulic Nut Splitters

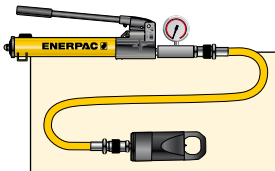
▼ Shown from left to right: **NC-3241, NC-1319, NC-1924**

NC, STN Series

Hexagon Nut Range:
10 -75 mm

Bolt Range:
M6 - M48

Maximum Operating Pressure:
700 bar



Tool-Pump Sets

Hydraulic Nut Splitters are available as **sets** (pump, tool, gauge, gauge adaptor, couplers and hose) for your ordering convenience.

Nut Splitter Model Nr.	Hand Pump Model Nr.	Set Model Nr
NC-1924	P-392	**STN-1924H**
NC-2432	P-392	**STN-2432H**
NC-3241	P-392	**STN-3241H**

NS-Series, Nut Splitters

For splitting hexagon nut sizes from 70 - 130 mm see our high performance nut splitters.

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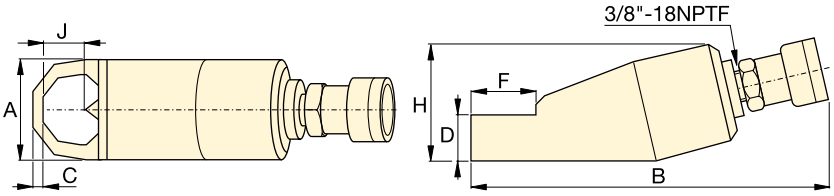
- **Compact and ergonomic design, easy to use**
- **Unique angled head design**
- **Single-acting, spring return cylinder**
- **Heavy duty chisels can be reground**
- **Nut Splitters include spare chisel, spare set screw and wrench used to secure the chisel. A CR-400 coupler is standard.**
- **Applications include service trucks, piping industry, tank cleaning, petrochemical, steel construction, mining, etc.**

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



Bolt Range (mm)	Hexagon Nut Range (mm)	Capacity ton (kN)	Oil Capacity (cm³)	Model Number	Dimensions (mm) A	B	C	D	F	H	J	(kg)	Replacement Chisel Model Number
M6 - M12	10 - 19	**5** (49)	15	**NC-1319**	40	170	7	19	28	48	21	1,2	**NCB-1319**
M12 - M16	19 - 24	**10** (98)	20	**NC-1924 ***	54	191	10	26	40	62	25	2,0	**NCB-1924**
M16 - M22	24 - 32	**15** (147)	60	**NC-2432 ***	64	222	13	29	51	72	33	3,0	**NCB-2432**
M22 - M27	32 - 41	**20** (196)	80	**NC-3241 ***	75	244	17	36	66	88	43	4,4	**NCB-3241**
M27 - M33	41 - 50	**35** (343)	155	**NC-4150**	94	288	21	45	74	105	54	8,2	**NCB-4150**
M33 - M39	50 - 60	**50** (490)	240	**NC-5060**	106	318	23	54	90	128	60	11,8	**NCB-5060**
M39 - M48	60 - 75	**90** (882)	492	**NC-6075**	156	393	26	72	110	181	80	34,1	**NCB-6075**

Ordering Notes: Maximum allowable hardness to split is HRc-44. Not to be used on square nuts.
* Available as Tool-Pump Set, see note on this page.

▼ Shown: **NS-Series Hydraulic Nut Splitters**

Power and Precision High Performance Nut Splitter

- **Specially designed to suit standard ANSI B16.5 / BS1560 flanges**
- **Single-acting (spring return) or cylinder**
- **Tri-blade technology provides three cutting surfaces on a single blade**
- **Interchangeable heads provide maximum nut range flexibility**
- **Preset scale allows controlled blade extension, which avoids damage to bolt threads**
- **Grip tape and handle included for more secure manoeuvrability**
- **Nickel-plated cylinder body for excellent corrosion protection and improved durability in harsh environments**
- **Internal pressure relief valve for overload protection**
- **CR-400 coupler and dustcap included on all models.**

◀ *Heavily corroded and weathered nuts are quickly split and removed using a NS-Series Nut Splitter.*

Blade Cutting Depth Scale

Adjustable cutting depth scale for controlled blade extension, which avoids damage to bolt threads. The scale indicates the bolt range in metric and imperial values on each cutting head.

NC-Series, Hydraulic Nut Cutters

The NC-Series models are available featuring an angle-head design for 10 - 75 mm hexagon nuts.

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Joint Separation Tools

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

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Flange Alignment Tools

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

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Hydraulic Nut Splitters

Nut Splitter Sets

To provide maximum flexibility, NS-Series Nut Splitters can also be ordered in sets (NS-xxxSy). Select Nut Splitter size and pump style from the chart below. To order additional Cutting Heads (NSH-xxxxxx), Cylinders (NSC-xxx) or Replacement Blades (NSB-xxx), see Selection Chart below.

SET SELECTION:

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

NS Series

Capacity:
917 - 1711 kN

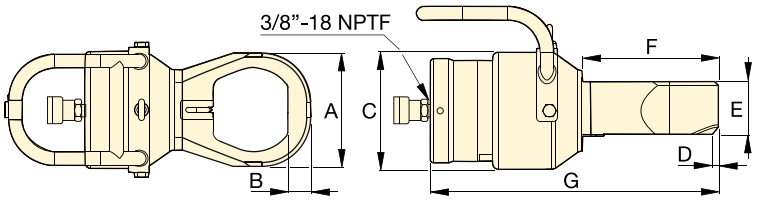
Hexagon Nut Size:
70 - 130 mm

Bolt Range:
M45 - M90

Maximum Operating Pressure:
700 bar

1 Nut Splitter Model Nr.	Tool-Pump Set Model Nr.	2 Pump Selection			Accessories Included			
		Hand Pump Model Nr.	Air Pump Model Nr.	Electric Pump Model Nr.	Pressure Gauge Model Nr.	Gauge Adaptor Model Nr.	Hydraulic Hose Model Nr.	Storage Case Model Nr.
								
NS-70105	**NS-70105SH**	P-392	–	–	GP-10S	GA-2	HC-7206	CM-4
NS-70105	**NS-70105SA**	–	XA-11G *	–	[2]	–	HC-7206	CM-4
NS-70105	**NS-70105SEE**	–	–	PUD-1100E	GP-10S	GA-2	HC-7206	CM-7
NS-110130	**NS-110130SH**	P-802	–	–	GP-10S	GA-2	HC-7206	CM-4
NS-110130	**NS-110130SA**	–	XA-11G *	–	[2]	–	HC-7206	CM-4
NS-110130	**NS-110130SEE**	–	–	PUD-1100E	GP-10S	GA-2	HC-7206	CM-7

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



▼ SELECTION CHART

Bolt Range (mm)	Hexagon Nut Range [1] (mm)	Capacity ton (kN)	Oil Capacity (cm³)	Model Number [2] 	Dimensions (mm) A	B	C	D	E	F	G	(kg)	Cylinder [3] 	Cutting Head [3] 	Replacement Blade 
M45 - M52	70 - 80	**103** (917)	377	**NS-7080**	132	28	180	8,0	81	186	412	37,0	NSC-70	NSH-7080	NSB-70
M45 - M56	70 - 85	**103** (917)	377	**NS-7085**	145	30	180	8,0	81	196	422	37,0	NSC-70	NSH-7085	NSB-70
M45 - M64	70 - 95	**103** (917)	377	**NS-7095**	160	32	180	8,0	81	201	432	38,5	NSC-70	NSH-7095	NSB-70
M45 - M72	70 - 105	**103** (917)	377	**NS-70105**	174	35	180	9,0	81	209	443	39,5	NSC-70	NSH-70105	NSB-70
M76 - M80	110 - 115	**193** (1711)	819	**NS-110115**	189	36	234	3,7	111	234	472	69,0	NSC-110	NSH-110115	NSB-110
M76 - M90	110 - 130	**193** (1711)	819	**NS-110130**	219	41	234	2,5	111	242	493	71,5	NSC-110	NSH-110130	NSB-110

[1] Maximum allowable hardness to split is HRc-44. See page 76 for hexagon bolt and nut sizes and related thread diameters.
[2] NS-Series Nut Splitters ship in two cases: One containing the NSC-Cylinder and one containing the NSH-Cutting Head. Assembly required.
[3] Both, the NSH-head and the NSC-cylinder include a cutting blade.

Mechanical Pipe Flange Face Tool

ENERPAC
POWERFUL SOLUTIONS. GLOBAL FORCE.

▼ Shown: **FF-120**

Safe, efficient and accurate refacing of flat pipe flange surfaces

- **Makes refacing easy – hand operated machine tool can be set up anywhere without the need for air, electric or hydraulic power**
- **Lightweight and portable (15 kg in storage box)**
- **Adjustable cutting head for reface of flat flange surfaces of pipes with flange OD facing range 25,4 - 304,8 mm [1 - 12 inch]**
- **Interchangeable collets for ID mounting range 25,4 - 152,4 mm [1-6 inch] allow the user to work on many different flanges with minimal time between set-ups**
- **Interchangeable lead screws suitable for refacing damaged raised-face (RF), flat-face (FF) or lens-ring joint flanges**
- **Tool body with expanding collets centers itself providing real concentric operation**

▼ *The Enerpac FF-120 used to face a pipe flange.*

Complete in Wheeled Carrying Case

The **FF-120** comes as portable set (15 kg). Can be transported, easy set-up and operated by a single technician. Set includes:
FFL-kit with locators, O-Rings and extensions;
FSS-kit with feed screw and nut ½"-20 UN for surface roughness Ra 1,6 - 2,4 µ.
FSF-kit with feed screw and nut ½"-11 UNF for surface roughness Ra 3,2 - 6,3 µ.

Joint Separation Tools

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

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Flange Alignment Tools

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

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Controlled Tightening and Loosening

Use Enerpac Bolting Tools to seal the joint to the precise torque or tension required: E-Series manual torque multipliers, S and W-Series hydraulic torque wrenches or GT-Series hydraulic bolt tensioners.

Page: 1

QuickFace – Mechanical Pipe Flange Face Tool

QuickFace, Mechanical Flange Face Tool
Portable, hand powered tool makes even the hardest to reach pipe flanges resurface-able in a safe and convenient way.

Makes refacing easy
A simple and cost effective solution – the FF-120 turns a two man operation with heavy equipment, compressors and portable generators into a one man job.
The FF-120 has interchangeable lead screws that make it suitable for resurfacing damaged flat-faced, raised-face or lens-ring joint flanges to the high safety standards required. After selecting the correct lead screw for the operation, the tool body is inserted in the pipe end and centres itself with adjustable locators to provide real concentric operation.
The tool arm is then rotated by hand using a worm-gear mechanism to provide a perfect spiral "gramophone" finish.
The tool can be adjusted with a calibrated slide to define cut depth and the correct finish.

Surface finish & accuracy
A serrated finish with 30-55 grooves per inch and a resultant roughness of between Ra 3,2-12,5 µ (125-500 micro inches).
The FF-120 has same precision and quality of finish as a lathe.

Cost effective solution
Small and portable enough to be a permanent addition to your equipment range, Enerpac's FF-120 is the perfect solution to all of your small diameter facing problems.

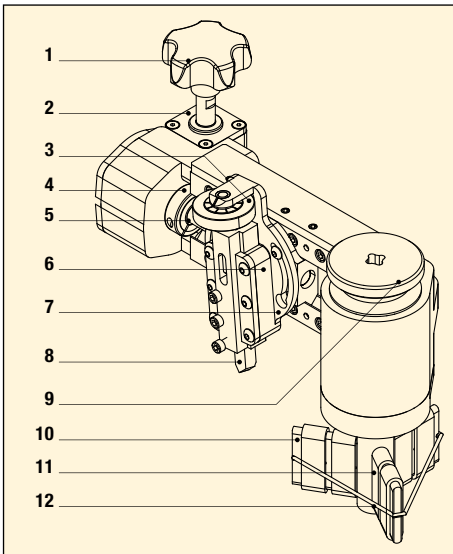
FF Series

Pipe Flange Cutting Diameter Range:
ø 25-305 mm / 1-12"

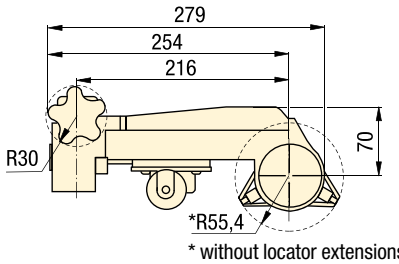
Internal Pipe Mounting Range:
ø 25-152 mm / 1-6"

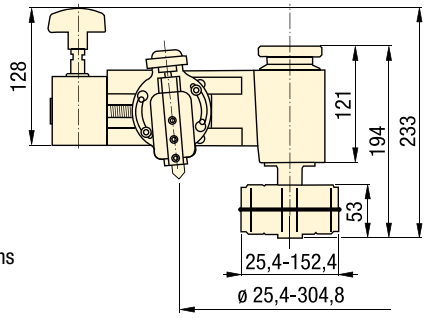
Cutting Resultant Roughness:
Ra 3,2 - 12,5 µ

1. Hand-operated cold work tool – no need for external power and hot work permits.
2. Calibrated cross slide for accurate cutting control.
3. Adjustable cutting head for reface of flat flange surfaces of pipes with flange OD facing range ø 25,4-304,8 mm [1-12 inch].
4. Interchangeable lead screws enable selection of surface finish between Ra 3,2-12,5 µ.
5. Utilizes standard 3/8 inch or 10 mm tool steel.
6. Range of interchangeable collets allow the tool to accommodate ø 25,4 - 152,4 mm (1 - 6 inch) pipe ID.
7. Tool body with expanding collets centers in the bore ensuring concentric and accurate set-up.



1. Feed Knob
2. Gear Box
3. Cutting Depth Adjustment with indicator: 0,127 mm (.005 inch) per mark
4. Locking Collar
5. Lead/Feed Screw
6. Tool Block
7. Swivel Slide
8. HSS 3/8" Tool Bits
9. Mandrel Locking Knob
10. Locator Extensions
11. Adjustable Locators
12. O-Ring





▼ *The Enerpac FF-120 QuickFace has same precision and quality of finish as a lathe.*

▼ **SELECTION CHART**

Pipe Flange Cutting Diameter Range		Internal Pipe Mounting Diameter Range		Cutting Resultant Roughness	Model Number	
(mm)	(inch)	(mm)	(inch)	(Ra µ)		(kg)
25,4 - 304,8	1,0 - 12,0	25,4 - 152,4	1,0 - 6,0	3,2 - 12,5	**FF-120**	6,8

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

A, WR
Series

Capacity:
0,75 - 1,0 ton

Tip Clearance:
12,8 - 35,0 mm

Maximum Spread:
94 - 292 mm

Maximum Operating Pressure:
700 bar

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

RC-Series DUO Cylinders

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

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Best Match Hand Pump

To power your WR-5, WR-15 and A-92 Spreader attachment the **P-392** Hand Pump is an ideal choice.

See **www.enerpac.com or** the Enerpac **E326e** catalogue for the full range of hand pump options.

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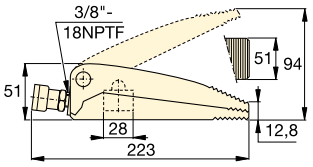
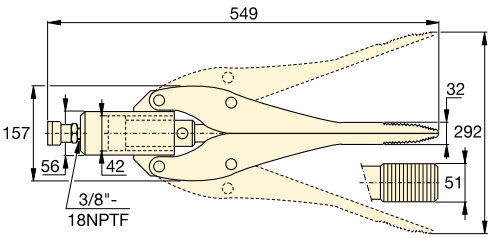
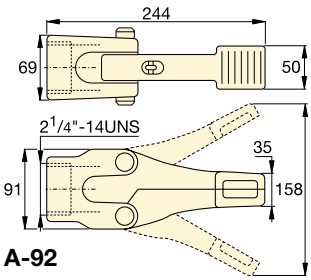


WR-5



WR-15



A-92

Cylinder Capacity ton (kN)	Tip Clearance (mm)	Model Number	Maximum Spread (mm)	Cylinder Effective Area (cm^2)	Oil Capacity (cm^3)	(kg)
1,0 (8,9)	12,8	**WR-5**	94	6,5	10	2,3
0,75 (6)	32,0	**WR-15**	292	14,5	64	11,3
1,0 (8,9)	35,0	**A-92**	158	–	–	3,6

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

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

Flange maintenance and joint separation with FSH-14 Hydraulic Wedge Spreader ▶

Enerpac hydraulic spreading tools for joint separation during inspection, maintenance and decommissioning operations.

◀ Remove nuts in seconds for Joint Separation

Enerpac also provides NS-Series high performance hydraulic nut splitters for joint separation during inspection, maintenance and decommissioning operations.

S3000P Square Drive Torque Wrench on ▶ on Wind Tower Erection and Maintenance

Steel wrenches for tough and controlled bolting jobs. The TSP-Pro Swivel coupler allows X- and Y-axis rotation increases tool fit in restricted access areas.

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.

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

ISO 9001 REGISTERED
ENERPAC, 720 W. James St., Columbus, WI 53925 USA

Ex II 2 GD ck T4

ATEX 95 Certified
The ATP, ZA XA-Series air pumps and S- and W-Series torque wrenches are tested and certified according to the Equipment Directive 94/9/EC "ATEX Directive".

Product Design Criteria
All hydraulic components are designed and tested to be safe for use at maximum 700 bar (10.000 psi) pressure unless otherwise specifically noted.

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

Where specified, Enerpac electric power units meet the design, assembly and test requirements of the Standards Council of Canada (CAN C22.2 No. 68-92), and UL73 for the United States. Units were tested and certified for both USA and Canada by TÜV, a nationally recognized testing laboratory.

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

CE **CE Marking & Conformity**
Enerpac provides a Declaration of Conformity and CE marking for products that conform with the European Community Directives.

ASME B30.1
Our cylinders fully comply with the criteria set forth by the American National Standards Institute (except 'BRD', 'CLL' and CLS series).

Bolting Solution and Application Worksheet

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

Requested By: _____

Requested Date: _____

Company: _____

Industry: _____

Contact: _____

Title: _____

Phone: _____

Fax: _____

Email: _____

Description of Application (provide drawings if possible)**:**

_____

_____

_____

_____

Type of Application:

_____

_____

APPLICATION TECHNICAL DATA

Bolt Quantity: _____

Bolt Diameter: _____

Bolt Threads per Inch/Pitch: _____

Bolt Grade: _____

Bolt Coating: _____

Gasket Type: _____

App. Operating Temp., °C or °F:

_____

Known Bolting Values:

☐ **Load**

(kN / lbs)_____ % of Yield (N/mm² /psi)

☐ **Stretch-Bolt Length**

(mm / inch)_____

☐ **Turn of Nut**

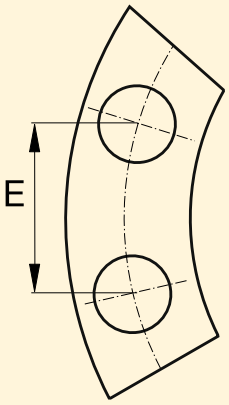
(Preload / Degrees) _____

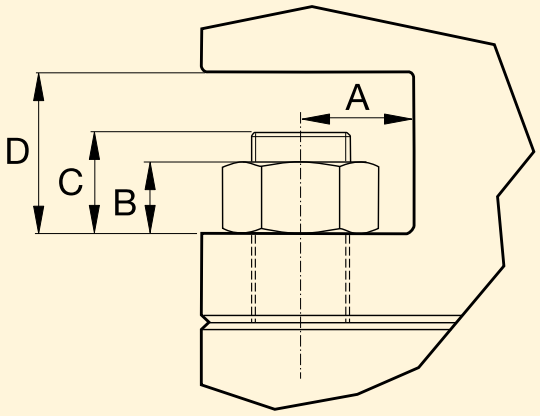
☐ **Torque**

(Nm / Kgm / Ft.lbs)_____

Application Position:

☐ Top-side ☐ Vertical ☐ Inverted





Specify Dimensions: **INCH** **MM (Metric)**

A _____ **B** _____ **C** _____ **D** _____ **E** _____

Distance to Closure: _____

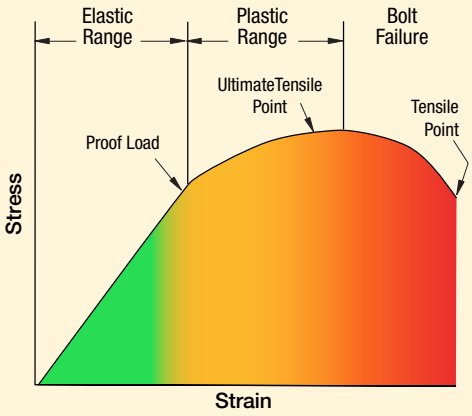
Current Lubrication: **Type** _____ **Brand** _____

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

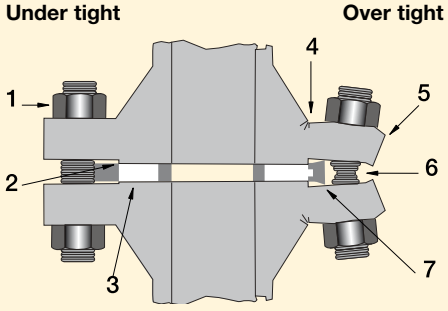
Elasticity is defined in Hooke's Law of physics: The stress in a bolt is directly proportional to its strain. The stress-strain of a bolt has an **elastic range** and a **plastic range**. In the elastic range Hooke's Law is true.

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.

Uniformity of bolt loading

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

Safe operation following prescribed procedures

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

Reduces operational time resulting in increased productivity

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

Reliable and repeatable results

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

The right results first time

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

Bolting Integrity Software

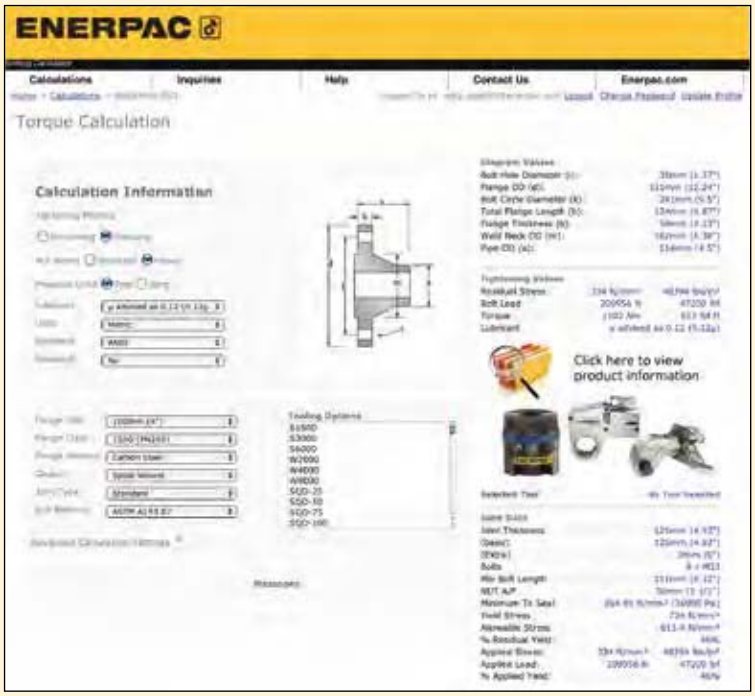
A comprehensive on-line software solution for Bolted Joint Integrity.

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.

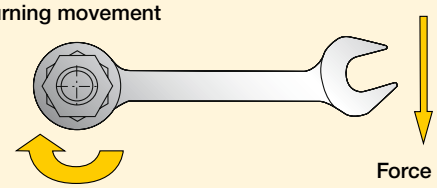
The software offers Tool selection, Bolt Load calculations and Tool pressure settings, as well as, a combined Application data sheet and Joint completion report.



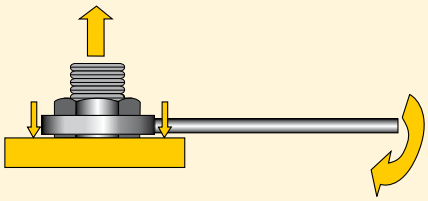
Visit **www.enerpac.com** to access our free on-line bolting software application and obtain information on tool selection, bolt load calculations and tool pressure settings. A combined application data sheet and joint completion report is also available.

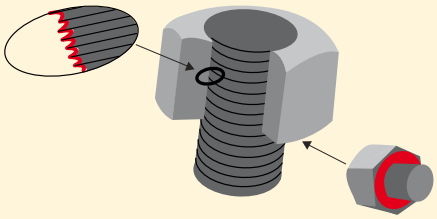
Torque Tightening

Turning movement



Stretch of Fastener (Pre-load)





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).

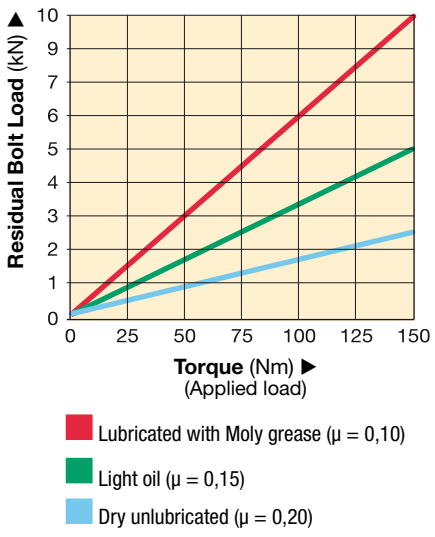
Preload (residual load) = Applied Torque *minus* Frictional Losses

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.

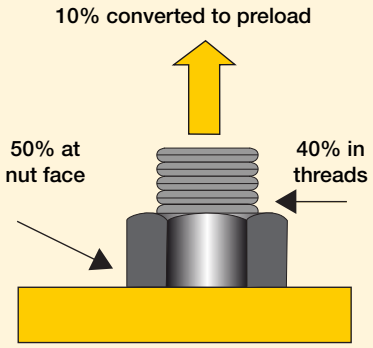
Lubricant or anti-seizure compounds should be applied to both the nut bearing surface and the male threads.

LUBRICATION REDUCES FRICTION



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

Frictional Losses



Frictional Losses (dry steel bolt)

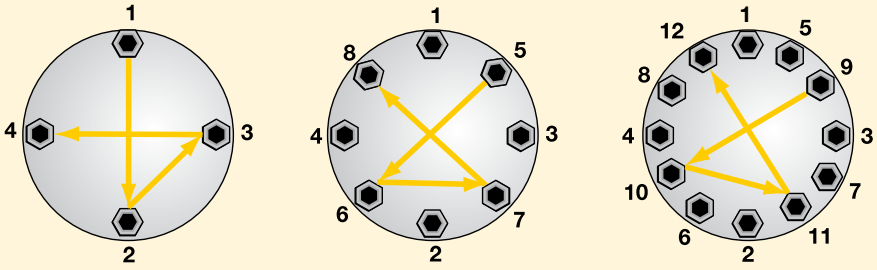
Torque Tightening

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

Torque Procedure

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

Torque Sequence



Step 1 Spanner tight ensuring that 2 - 3 threads extend above nut

Step 2 Tighten each bolt to **one-third** of the final required torque following the pattern as shown above.

Step 3 Increase the torque to **two-thirds** following the pattern shown above.

Step 4 Increase the torque to **full torque** following the pattern shown above.

Step 5 Perform one final pass on each bolt working clockwise from bolt 1, at the full final torque.

Select the 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 **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.

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.

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

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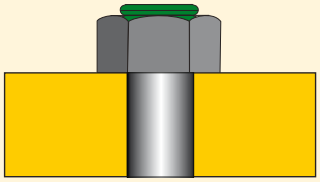
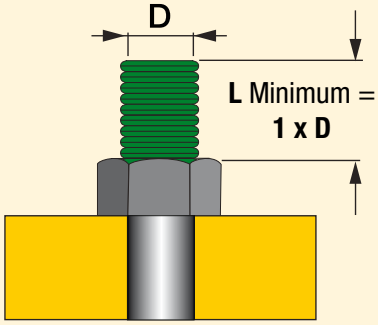
Tensioning requires longer bolts

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.

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

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.

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.

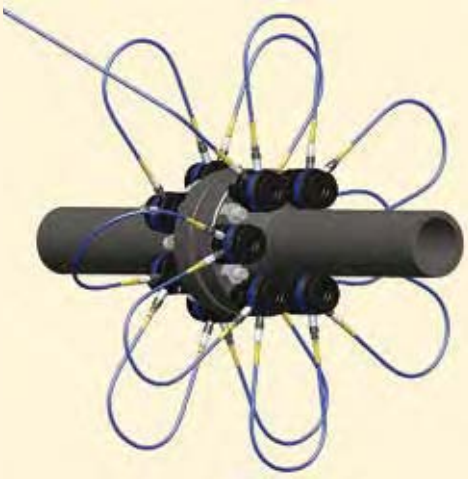
Yield Strength:
The point at which a bolt begins to plastically deform under tensile loading.

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

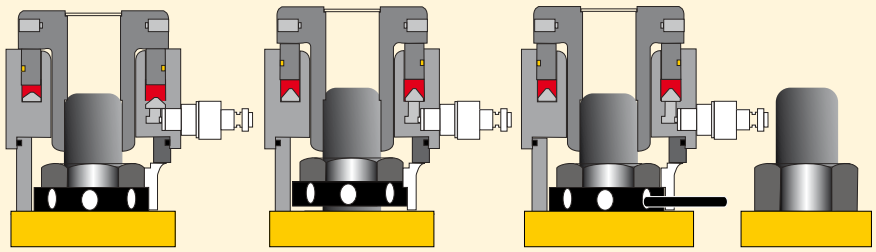
80% Manufacturer's rating of pressure and torque are maximum safe limits. Good practice encourages using only 80% of these ratings! 80%

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 Step 2 Step 3 Step 4

Step 1: The bolt Tensioner is fitted over the stud
Step 2: Hydraulic pressure is applied to the tensioner which then stretches the stud.
Step 3: The Stud's nut is wound down against the joint face
Step 4: Pressure is released and the tool removed.

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

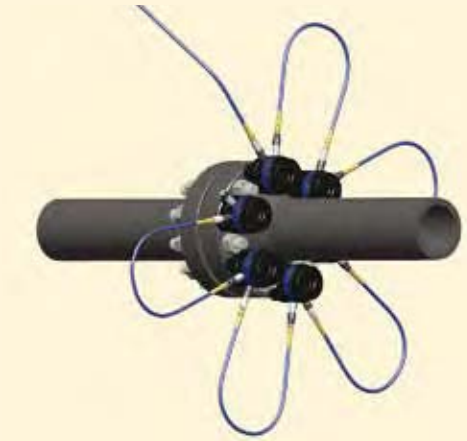
Less than 100% Tensioning

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

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

Set-up using a 100% tensioning procedure

All bolts are tensioned simultaneously.



Set-up using a 50% tensioning procedure

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

Read Instruction Manuals

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

Hexagon Nut and Bolt Sizes

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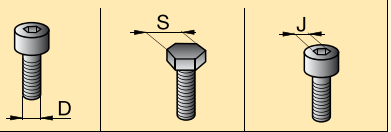
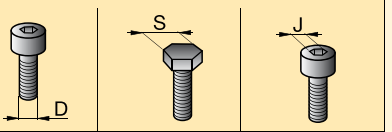
نیام صنعت

METRIC SIZES



Thread Size D (mm)	Hexagon Size S (mm)	Hexagon Size J (mm)
M10	17	8
M12	19	10
M14	22	12
M16	24	14
M18	27	14
M20	30	17
M22	32	17
M24	36	19
M27	41	19
M30	46	22
M33	50	24
M36	55	27
M39	60	27 (30)
M42	65	32
M45	70	-
M48	75	36
M52	80	36
M56	85	41
M60	90	46
M64	95	46
M68	100	50
M72	105	55
M76	110	60
M80	115	65
M85	120	70
M90	130	70 (75)
M95	135	-
M100	145	85
M105	150	-
M110	155	-
M115	165	-
M120	170	-
M125	180	-
M130	185	-
M140	200	-
M150	210	-

IMPERIAL SIZES



Thread Size D (inch)	Hexagon Size * S (inch)	Hexagon Size J (inch)
⅝	1 1/16	½
¾	1¼	⅝
⅞	1 7/16	¾
1	1⅝	¾
1⅛	1 13/16	⅞
1¼	2	⅞
1⅜	2 3/16	1
1½	2⅜	1
1⅝	2 9/16	-
1¾	2¾	1¼
1⅞	2 15/16	1⅜
2	3⅛	1⅝
2¼	3½	1¾
2½	3⅞	1⅞
2¾	4¼	2
3	4⅝	2¼
3¾	5	2¼

* Heavy hexagon nuts.

Determine the maximum torque according to the bolt (nut) size and grade. Always consult the manufacturers instructions or engineering recommendations when making bolted connections.

IMPORTANT

The hexagon sizes shown in the tables should be used as a guide only. Individual sizes should be checked before specifying any equipment.

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

Page: **10**

Key To Measurements

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

Free Conversion Calculator

Visit **enerpac.com** and download the free conversion calculator.

Pressure versus Torque

See the pressure versus torque chart for S and W-Series wrenches.

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Pressure:

1 psi = 0,069 bar
1 bar = 14,50 psi
= 10 N/cm²
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°F = (T°C x 1,8) + 32

To Convert °F to °C:
T°C = (T°F – 32) ÷ 1,8

Volume:

1 in³ = 16,387 cm³
1 cm³ = 0,061 in³
1 liter = 61,02 in³
= 0,264 gal
1 US gal = 3,785 cm³
= 3,785 l
= 231 in³

Other measurements:

1 inch = 25,4 mm
1 mm = 0,039 in
1 ft = 0,3048 m
1 m = 3,2808 ft
1 in² = 6,452 cm²
1 cm² = 0,155 in²
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

Torque Conversion Factors

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

Pressure versus Torque S-Series

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Convert pressure into torque

The function of a hydraulic Torque Wrench, is to convert hydraulic pressure into torque. This chart is a “quick-reference” to help in determining what this conversion factor is.

If you do not find your torque and pressure values in the chart, then the following conversion formulas can be used to find your theoretical torque value. The actual value may vary due to wrench condition and age.

$T = P \times T_F$

$P = T \div T_F$

Where: **T** = target torque
P = pressure
T_F = theoretical applied torque

Bolting Integrity Software

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- 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.

Pressure versus Torque – S-Series Torque Wrenches

Pump Pressure (bar)	S1500 Torque Output (T_F = 2,75) (Nm)	S3000 Torque Output (T_F = 6,29) (Nm)	S6000 Torque Output (T_F = 11,82) (Nm)	S11000 Torque Output (T_F = 21,63) (Nm)	S25000 Torque Output (T_F = 49,44) (Nm)
69	190	434	815	1491	3410
83	228	521	978	1790	4092
97	266	607	1140	2088	4774
110	304	694	1304	2386	5456
124	342	781	1467	2685	6138
138	380	868	1630	2983	6820
152	418	954	1792	3281	7502
166	456	1041	1955	3579	8184
179	494	1128	2119	3878	8866
193	531	1215	2282	4176	9548
207	569	1302	2445	4474	10.230
221	607	1388	2607	4772	10.912
234	645	1475	2770	5071	11.594
248	683	1562	2934	5369	12.276
262	721	1649	3097	5667	12.958
276	759	1735	3259	5966	13.640
290	797	1822	3422	6264	14.322
303	835	1909	3585	6562	15.003
317	873	1996	3749	6860	15.685
331	911	2083	3912	7159	16.367
345	949	2169	4074	7457	17.049
359	987	2256	4237	7755	17.731
372	1025	2343	4400	8054	18.413
386	1063	2430	4564	8352	19.095
400	1101	2516	4726	8650	19.777
414	1139	2603	4889	8948	20.459
428	1177	2690	5052	9247	21.141
441	1215	2777	5214	9545	21.823
455	1253	2863	5379	9843	22.505
469	1291	2950	5541	10.142	23.187
483	1329	3037	5704	10.440	23.869
497	1367	3124	5867	10.738	24.551
510	1405	3211	6029	11.036	25.233
524	1443	3297	6193	11.335	25.915
538	1481	3384	6356	11.633	26.597
552	1519	3471	6519	11.931	27.279
566	1556	3558	6681	12.229	27.961
579	1594	3644	6844	12.528	28.643
593	1632	3731	7008	12.826	29.325
607	1670	3818	7171	13.124	30.007
621	1708	3905	7334	13.423	30.689
634	1746	3992	7496	13.721	31.371
648	1784	4078	7659	14.019	32.053
662	1822	4165	7823	14.317	32.735
676	1860	4252	7986	14.616	33.417
690	1898	4339	8148	14.914	34.099

Pressure versus Torque W-Series

Pressure versus Torque – W-Series Torque Wrenches						
Pump Pressure (bar)	W2000 Torque Output (T_F = 3,93) (Nm)	W4000 Torque Output (T_F = 7,86) (Nm)	W8000 Torque Output (T_F = 15,72) (Nm)	W1500 Torque Output (T_F = 29,47) (Nm)	W22000 Torque Output (T_F = 44,21) (Nm)	W35000 Torque Output (T_F = 68,77) (Nm)
69	272	543	1085	2034	3051	4745
83	326	651	1302	2441	3670	5708
97	380	760	1519	2848	4289	6671
110	434	868	1736	3254	4864	7565
124	489	977	1953	3661	5483	8528
138	543	1085	2170	4068	6102	9491
152	597	1194	2387	4475	6721	10.453
166	651	1302	2604	4881	7340	11.416
179	706	1411	2821	5288	7915	12.310
193	760	1519	3037	5695	8534	13.273
207	814	1627	3254	6102	9153	14.236
221	868	1736	3471	6508	9772	15.199
234	922	1844	3688	6915	10.347	16.093
248	977	1953	3905	7322	10.996	17.055
262	1031	2061	4122	7729	11.585	18.018
276	1085	2170	4339	8135	12.204	18.981
290	1139	2278	4556	8542	12.823	19.944
303	1194	2387	4773	8949	13.398	20.838
317	1248	2495	4990	9356	14.017	21.801
331	1302	2604	5207	9762	14.636	22.764
345	1356	2712	5424	10.169	15.255	23.726
359	1411	2821	5641	10.576	15.874	24.689
372	1465	2929	5858	10.982	16.449	25.583
386	1519	3037	6074	11.389	17.068	26.546
400	1573	3146	6291	11.796	17.687	27.509
414	1627	3254	6508	12.203	18.306	28.472
428	1682	3363	6725	12.609	18.925	29.434
441	1736	3471	6942	13.016	19.500	30.328
455	1790	3580	7159	13.423	20.119	31.291
469	1844	3688	7376	13.830	20.738	32.254
483	1899	3797	7593	14.236	21.357	33.217
497	1953	3905	7810	14.643	21.976	34.180
510	2007	4014	8027	15.050	22.551	35.074
524	2061	4122	8244	15.457	23.170	36.037
538	2116	4231	8461	15.863	23.789	36.999
552	2170	4339	8678	16.270	24.408	37.962
566	2224	4448	8895	16.677	25.027	38.925
579	2278	4556	9111	17.084	25.602	39.819
593	2332	4664	9328	17.490	26.221	40.782
607	2387	4773	9545	17.897	26.840	41.745
621	2441	4881	9762	18.304	27.459	42.707
634	2495	4990	9979	18.711	28.034	43.601
648	2549	5098	10.196	19.117	28.653	44.654
662	2604	5207	10.413	19.524	29.272	45.527
676	2658	5315	10.630	19.931	29.891	46.490
690	2712	5424	10.847	20.337	30.510	47.453

Convert pressure into torque

The function of a hydraulic Torque Wrench, is to convert hydraulic pressure into torque. This chart is a “quick-reference” to help in determining what this conversion factor is.

If you do not find your torque and pressure values in the chart, then the following conversion formulas can be used to find your theoretical torque value. The actual value may vary due to wrench condition and age.

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