

ENERPAC 

E-410

Bolting Solutions

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



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

Joint Assembly

From simple pipe alignment to complex joint positioning of large structural assemblies, our comprehensive line of joint assembly products range from hydraulic and mechanical alignment tools to PLC-controlled multi-point positioning systems.

Controlled Tightening

Enerpac offers a variety of controlled tightening options to best meet the requirements of your application. From mechanical torque multipliers to hydraulically driven square drive wrenches, and from low profile torque wrenches to inter-connectable bolt tensioning tools; we offer the products you need for accurate and simultaneous tightening of multiple bolts.

Joint Separation

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

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



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



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ATM – Flange Alignment Tools



Misaligned joints

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

Solution: Flange Alignment Tools

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

E-Series, Manual Torque Multipliers



Controlled tightening when external power is unavailable

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

Solution: Manual Torque Multipliers

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

S and W Series Torque Wrenches



Industrial 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 aluminum tools for controlled bolting.



Controlled Bolting

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

Solution: **Bolt Tensioners**

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

GT Series – Bolt Tensioners



Frozen or Corroded Nuts

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

Solution: **Hydraulic Nut Cutters**

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

NC – Hydraulic Nut Cutters



Joint Separation

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

Solution: **Parallel Wedge Spreaders**

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

FSH, FSM – Parallel Wedge Spreaders



Pumps and Accessories

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

Pumps and Accessories



For Bolting Solutions Think Enerpac

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



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



◀ Enerpac Reaction Bar Torque Multiplier E393 used to manually torque bolts up to 4340 Nm.

Accurate, Efficient Torque Multiplication

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



Typical Torque Multiplier Applications

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



MTW-250 Manual Torque Wrench

Available to power manual torque multipliers.

Technical information:

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

▼ SELECTION CHART

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

Manual Torque Multipliers



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 4340 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:

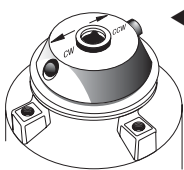
1017-10848 Nm

Torque Ratio:

3.3:1-52:1

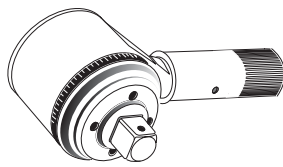
Multiplier Output Ratio Accuracy:

± 5 %



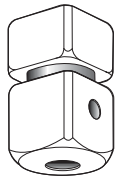
Selector Pawl

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



Angle-of-Turn Protractor

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



Shearable Square Drive

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



CAUTION!

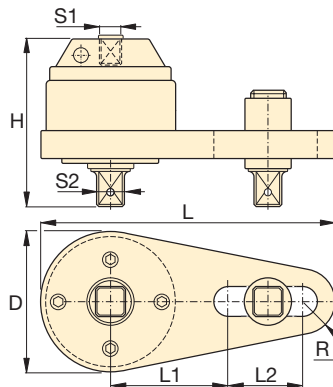
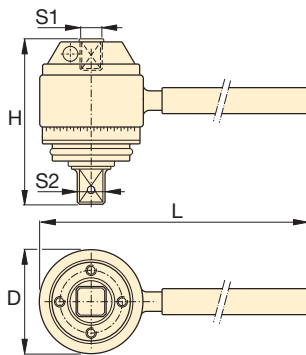
Never use impact type air tools for power driving torque multipliers. Torque multiplier drive train damage will occur.



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) (Ft.lbs)	Torque Ratio	Input Female Square Drive S1 (in)	Output Male Square Drive		Over-load Protection	Anti-Back-lash	Dimensions (mm)						Wt. (kg)	Model Number
			Replaceable Shear Drive Model No.	S2 (in)			D	H	L	L1	L2	R		
227 308	3.3 : 1	1/2	3/4	—	No	No	71	84	218	—	—	—	1.8	E290PLUS
303 411	3.3 : 1	1/2	3/4	—	No	No	71	84	442	—	—	—	2.5	E291
200 271	6 : 1	1/2	3/4	E391SDK	Yes	No	100	102	498	—	—	—	4.1	E391
162 220	13.6 : 1	1/2	1	E392SDK	Yes	Yes	103	146	498	—	—	—	6.9	E392
173 235	18.5 : 1	1/2	1	E393SDK	Yes	Yes	103	165	498	—	—	—	8.3	E393
162 220	13.6 : 1	1/2	1	E392SDK	Yes	Yes	124	140	356	140	124	32	7.8	E492
173 235	18.5 : 1	1/2	1	E393SDK	Yes	Yes	124	163	356	140	124	32	8.9	E493
189 256	26.5 : 1	1/2	1 1/2	E494SDK	Yes	Yes	143	222	378	178	89	41	15.4	E494
154 209	52 : 1	1/2	1 1/2	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).

²⁾ 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

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

Design

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

Reliability

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

Accuracy

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



S-Series, Square Drive Wrenches

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



TSP - Pro Series Swivel

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

How to Order

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

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

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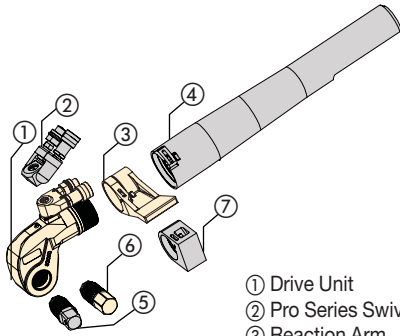


Torque Wrench Hoses

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

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

Double-Acting Square Drive Hydraulic Torque Wrenches



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



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

S Series

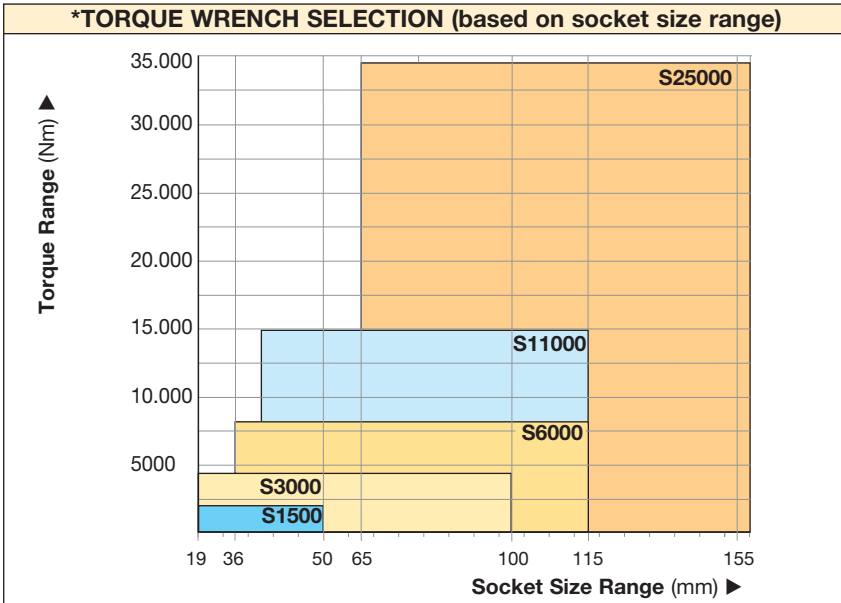


Maximum Torque at 700 bar:
34.079 Nm

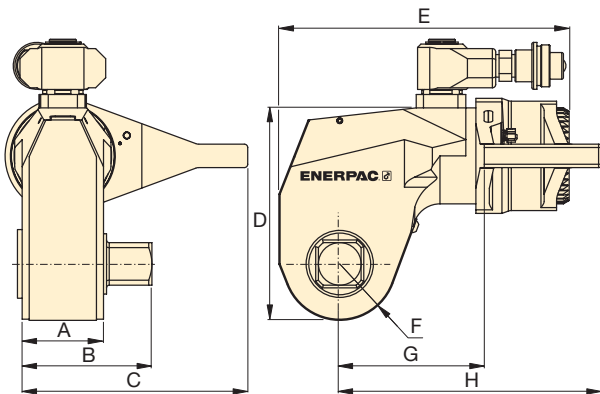
Square Drive Range:
3/4-2 1/2 inches

Nose Radius:
25.0-63.5 mm

Maximum Operating Pressure:
700 bar



*Additional socket sizes available upon request.



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





Torque Wrench and Pump Selection Matrix

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

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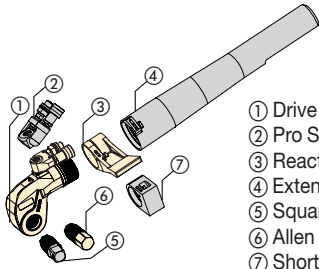


Torque Wrench Model No.	Square Drive		Maximum Torque ¹⁾ at 700 bar	Dimensions (mm)								Weight (kg)
	Size (in)	Model No. (included with wrench)		A	B	C	D	E	F	G	H	
	3/4"	SD15-012	1898	39	63	110	95	136	25,0	69	119	2,7
	1"	SD30-100	4339	48	77	134	126	172	33,0	90	159	5,0
	1 1/2"	SD60-108	8144	57	90	179	162	201	42,0	112	187	8,5
	1 1/2"	SD110-108	14.914	71	111	196	185	226	49,5	132	227	15,0
	2 1/2"	SD250-208	34.079	87	143	244	240	292	63,5	182	292	31,0

¹⁾ Determine maximum torque according to the bolt (nut) size and grade. See "Yellow Pages" section for torque conversions.

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

SDA-Series, Allen Drives



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

Maximum Torque at 700 bar:

34.079 Nm

Square Drive Range:

3/4-2 1/2 inches

Hexagon Size Allen Drive:

14-85 mm

For
S
Series



▼ SELECTION CHART

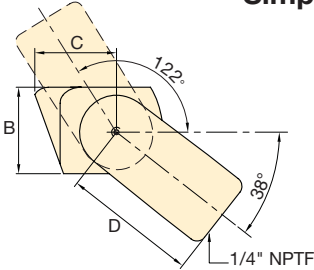
TORQUE WRENCH	OPTIONAL ALLEN DRIVES, IMPERIAL				OPTIONAL ALLEN DRIVES, METRIC				SHORT REACTION ARM FOR ALLEN DRIVES			
	Model Number	Hexagon Size (in)	Maximum Torque ¹⁾ (Nm)	Model Number	Dim. B1 (mm)	Hexagon Size (mm)	Maximum Torque ¹⁾ (Nm)	Model Number	Dim. B1 (mm)	Model Number	Dimensions (mm)	
S1500 (1898 Nm)		1/2	481	SDA15-008	66	14	644	SDA15-14	66	SRA15	67,5	65
		5/8	935	SDA15-010	67	17	1152	SDA15-17	68			
		3/4	1619	SDA15-012	71	19	1606	SDA15-19	70			
		7/8	1897	SDA15-014	74	22	1897	SDA15-22	73			
		1	1897	SDA15-100	77	24	1897	SDA15-24	74			
S3000 (4339 Nm)		5/8	935	SDA30-010	77	17	1152	SDA30-17	77	SRA30	80,0	74
		3/4	1619	SDA30-012	80	19	1606	SDA30-19	79			
		7/8	2568	SDA30-014	83	22	2486	SDA30-22	82			
		1	3828	SDA30-100	86	24	3232	SDA30-24	84			
		1 1/8	4336	SDA30-102	88	27	4336	SDA30-27	85			
		1 1/4	4336	SDA30-104	89	30	4336	SDA30-30	87			
		-	-	-	-	32	4336	SDA30-32	88			
S6000 (8144 Nm)		5/8	935	SDA60-010	85	17	1152	SDA60-17	86	SRA60	91,5	89
		3/4	1619	SDA60-012	89	19	1606	SDA60-19	88			
		7/8	2568	SDA60-014	92	22	2486	SDA60-22	91			
		1	3828	SDA60-100	95	24	3232	SDA60-24	93			
		1 1/8	5454	SDA60-102	97	27	4600	SDA60-27	94			
		1 1/4	7480	SDA60-104	98	30	6308	SDA60-30	96			
		-	-	-	-	32	7656	SDA60-32	97			
S11000 (14.911 Nm)		1 1/4	7480	SDA110-104	115	30	6308	SDA110-30	112	SRA110	127,5	106
		1 3/8	9953	SDA110-106	117	32	7656	SDA110-32	114			
		1 1/2	12.920	SDA110-108	118	36	10.894	SDA110-36	117			
		1 5/8	14.905	SDA110-110	122	41	14.905	SDA110-41	121			
		1 3/4	14.905	SDA110-112	125	46	14.905	SDA110-46	127			
S25000 (34.079 Nm)		1 1/2	12.920	SDA250-108	141	36	10.894	SDA250-36	140	SRA250	158,5	135
		1 5/8	16.423	SDA250-110	145	41	16.098	SDA250-41	144			
		1 3/4	20.508	SDA250-112	148	46	22.730	SDA250-46	148			
		1 7/8	25.230	SDA250-114	149	50	29.194	SDA250-50	151			
		2	30.617	SDA250-200	151	55	34.079	SDA250-55	154			
		2 1/4	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			

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

W-Series Accessories

TSP Series

- Pro Series Swivel featuring Tilt and Swivel technology
- 360 x 160 degree rotation
- 700 bar maximum working pressure
- Increases tool fit in restricted access areas
- Simplifies hose placement



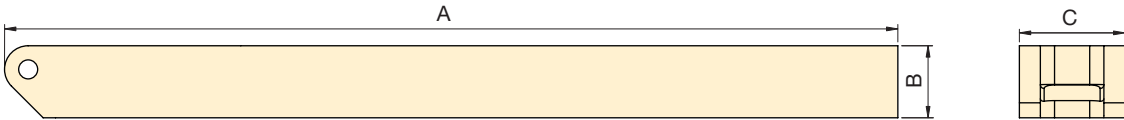
Wrench Model	Model Number	Dimensions (mm)				Weight (kg)
		A	B	C	D	
W2000, W4000	TSP100	64,0	26,9	23,1	40,6	0,19
W8000, W15000	TSP200	67,1	26,9	25,9	41,9	0,20

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

WTE Series

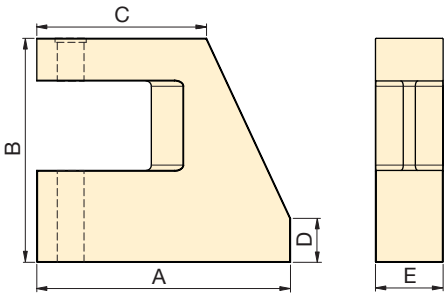
- Extended reaction arm for W-series wrench
- Full torque rated
- Increases tool fit in restricted access areas

Wrench Model	Model Number	Dimensions (mm)			Weight (kg)
		A	B	C	
W2000	WTE20	472,5	38,1	55,8	2,6
W4000	WTE40	526,7	50,8	65,7	4,6
W8000	WTE80	545,6	63,5	85,2	7,6
W15000	WTE150	616,4	76,2	101,6	12,0



WRP Series

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

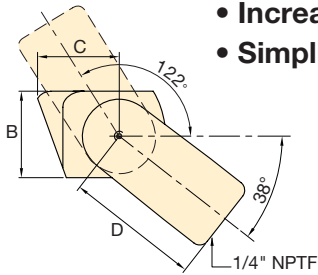


Wrench Size	Model Number	Dimensions (mm)					Weight (kg)
		A	B	C	D	E	
W2000	WRP20	84,0	16,0	34,5	45,0	148,0	0,37
W4000	WRP40	109,0	21,0	46,5	59,0	190,0	0,83
W8000	WRP80	136,5	56,0	57,0	69,0	223,0	0,83
W15000	WRP150	65,0	32,0	68,5	87,0	257,0	0,83

S-Series Accessories

TSP Series

- Pro Series Swivel featuring Tilt and Swivel technology
- 360 x 160 degree rotation
- 700 bar maximum working pressure
- Increases tool fit in restricted access areas
- Simplifies hose placement

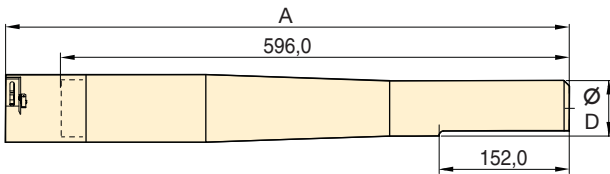


Wrench Model	Model Number	Dimensions (mm)				Weight (kg)
		A	B	C	D	
S1500, S3000	TSP100	64,0	27,0	23,0	40,5	0,18
S6000, S11000, S25000	TSP200	67,0	27,0	26,0	42,0	0,19

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

RTE Series

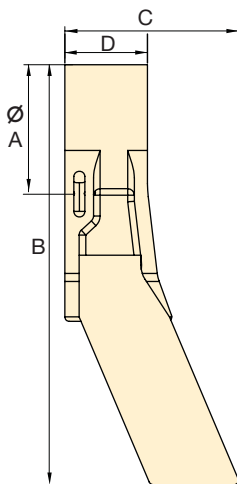
- Reaction Tube Extension for S-Series Wrenches
- Full torque rated
- Increases tool fit in restricted access areas



Wrench Model	Model Number	Dimensions (mm)		Weight (kg)
		A	D	
S1500	RTE15	636	58,0	4,62
S3000	RTE30	647	57,0	5,45
S6000	RTE60	659,1	65,0	7,71
S11000	RTE110	675,1	76,0	11,21
S25000	RTE250	685,3	100,0	17,29

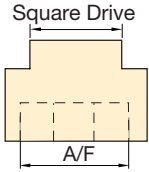
SRS Series

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



Wrench Size	Model Number	Dimensions (mm)				Max. Torque (Nm)	Weight (kg)
		A	B	C	D		
S1500	SRS151	57,0	141,9	49,4	37,5	1800	0,56
	SRS152		167,3			1640	0,70
	SRS153		192,7			1533	0,85
S3000	SRS301	65,3	168,0	73,3	48,0	3918	1,08
	SRS302		193,4			3712	1,33
	SRS303		218,8			3574	1,55
S6000	SRS601	79,0	205,0	99,4	58,5	7842	1,90
	SRS602		230,3			7454	2,24
	SRS603		255,7			7175	2,50
S11000	SRS1101	94,0	232,4	133	72,7	14650	3,44
	SRS1102		257,8			13957	3,95
	SRS1103		283,2			13391	4,46
S25000	SRS2501	123,0	287,0	147,8	87,5	33538	6,19
	SRS2502		312,3			32049	6,97
	SRS2503		337,7			30750	7,74

BSH-Series Sockets



BSH Series Sockets

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

IMPERIAL SOCKETS													
3/4" Square Drive		1" Square Drive				1 1/2" Square Drive				2 1/2" Square Drive			
Part Number	A/F (in)	Part Number	A/F (in)	Part Number	A/F (in)	Part Number	A/F (in)	Part Number	A/F (in)	Part Number	A/F (in)	Part Number	A/F (in)
BSH7519	3/4"	BSH1019	3/4"	BSH10231	2 5/16"	BSH15144	1 7/16"	BSH15281	2 13/16"	BSH25244	2 7/16"	BSH25419	4 13/16"
BSH75088	7/8"	BSH10088	7/8"	BSH10238	2 3/8"	BSH1538	1 1/2"	BSH15288	2 7/8"	BSH25250	2 1/2"	BSH25425	4 1/4"
BSH75094	15/16"	BSH10094	15/16"	BSH10244	2 7/16"	BSH15156	1 9/16"	BSH1575	2 15/16"	BSH2565	2 9/16"	BSH25110	4 5/16"
BSH7527	1 1/16"	BSH1027	1 1/16"	BSH10250	2 1/2"	BSH15163	1 5/8"	BSH15300	3"	BSH25263	2 5/8"	BSH25438	4 3/8"
BSH7530	1 3/16"	BSH1030	1 3/16"	BSH1065	2 9/16"	BSH1543	1 11/16"	BSH15306	3 1/16"	BSH25269	2 11/16"	BSH25450	4 1/2"
BSH75125	1 1/4"	BSH10125	1 1/4"	BSH10263	2 5/8"	BSH15175	1 3/4"	BSH15313	3 1/8"	BSH2570	2 3/4"	BSH25463	4 5/8"
BSH75131	1 5/16"	BSH10131	1 5/16"	BSH10269	2 11/16"	BSH1546	1 13/16"	BSH15319	3 3/16"	BSH25281	2 13/16"	BSH25475	4 3/4"
BSH7535	1 3/8"	BSH1035	1 3/8"	BSH1070	2 3/4"	BSH15188	1 7/8"	BSH15325	3 1/4"	BSH25288	2 7/8"	BSH25488	4 7/8"
BSH75144	1 7/16"	BSH10144	1 7/16"	BSH10281	2 13/16"	BSH15194	1 15/16"	BSH15338	3 3/8"	BSH2575	2 15/16"	BSH25500	5"
BSH7538	1 1/2"	BSH1038	1 1/2"	BSH10288	2 7/8"	BSH15200	2"	BSH15350	3 1/2"	BSH25300	3"	BSH25513	5 1/8"
BSH75156	1 9/16"	BSH10156	1 9/16"	BSH1075	2 15/16"	BSH15206	2 1/8"	BSH15363	3 5/8"	BSH25306	3 1/16"	BSH25519	5 3/16"
BSH75163	1 5/8"	BSH10163	1 5/8"	BSH10300	3"	BSH15213	2 1/8"	BSH1595	3 3/4"	BSH25313	3 1/8"	BSH25525	5 1/4"
BSH7543	1 11/16"	BSH1043	1 11/16"	BSH10306	3 1/16"	BSH15219	2 3/16"	BSH15388	3 7/8"	BSH25319	3 3/16"	BSH25538	5 3/8"
BSH75175	1 3/4"	BSH10175	1 3/4"	BSH10313	3 1/8"	BSH15225	2 1/4"	BSH15100	3 15/16"	BSH25325	3 1/4"	BSH25140	5 1/2"
BSH7546	1 13/16"	BSH1046	1 13/16"	BSH10319	3 3/16"	BSH15231	2 5/16"	BSH15400	4"	BSH25338	3 3/8"	BSH25575	5 3/4"
BSH75188	1 7/8"	BSH10188	1 7/8"	BSH10325	3 1/4"	BSH15238	2 3/8"	BSH15105	4 1/8"	BSH25350	3 1/2"	BSH25150	5 7/8"
BSH75194	1 15/16"	BSH10194	1 15/16"	BSH10338	3 3/8"	BSH15244	2 7/16"	BSH15419	4 3/16"	BSH25363	3 5/8"	BSH25600	6"
BSH75200	2"	BSH10200	2"	BSH10350	3 1/2"	BSH15250	2 1/2"	BSH15425	4 1/4"	BSH2595	3 3/4"	BSH25613	6 1/8"
		BSH10206	2 1/16"	BSH10363	3 5/8"	BSH1565	2 9/16"	BSH15110	4 5/16"	BSH25388	3 7/8"		
		BSH10213	2 1/8"	BSH1095	3 3/4"	BSH15263	2 5/8"	BSH15438	4 3/8"	BSH25100	3 15/16"		
		BSH10219	2 3/16"	BSH10388	3 7/8"	BSH15269	2 11/16"	BSH15450	4 1/2"	BSH25400	4"		
		BSH10225	2 1/4"			BSH1570	2 3/4"	BSH15463	4 5/8"	BSH25105	4 1/8"		

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



Optional Allen Drives

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

Page: 10



Pin and Ring

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



Select the Right Torque

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

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

S3000 Square Drive Torque Wrench on Wind Tower erection and maintenance

S3000 used to connect wind tower segments during assembly and maintenance. A robust but compact solution is required for tightening of bolts on wind tower sections. Large numbers of fasteners require precise application of torque to ensure joint integrity is achieved and maintained. The Enerpac S-Series wrench was selected as it offers simple and reliable operation while providing accurate and repeatable results.



W4000 Low Profile Torque Wrench on an ANSI Pipe Flange

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

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

S6000 on a High Volume Pump Unit

High vibration requires long studs to be accurately tightened to the calculated preload. During maintenance quick turnaround times are essential; S Series wrenches are chosen as they provide a large angle of nut rotation per stroke, offering speed and accuracy in compact ergonomic tool.



▼ Shown: Drive units with interchangeable cassettes



Rigid Steel Design

The *Professional* Low Profile Solution



W-Series, Low Profile Torque Wrenches

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

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

Simplicity

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

Design

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

Reliability

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

Accuracy

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



TSP - Pro Series Swivel

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

How to Order

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

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

Page:  19

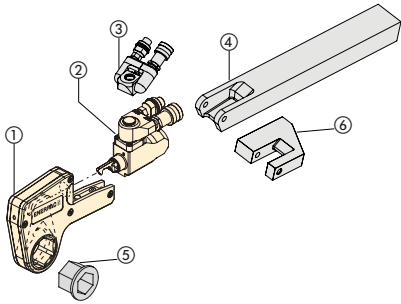


Torque Wrench Hoses

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

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

Double-Acting Hydraulic Hexagon Torque Wrenches



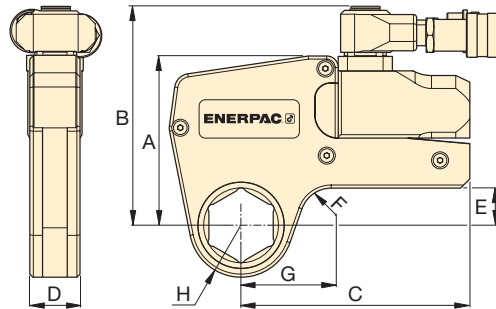
Hexagon Cassettes and Reducer Inserts

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

Page: 14

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

DRIVE UNIT AND INTERCHANGEABLE CASSETTE SELECTION



W Series



Maximum Torque at 700 bar:
20.337 Nm/15,000 Ft.lbs

Hexagon Range:
30-115 mm/1 1/8-4 5/8 in.

Nose Radius:
31-87.5 mm

Maximum Operating Pressure:
700 bar



Torque Wrench Pump Selection Matrix

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

Page: 28

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



▼ SELECTION CHART

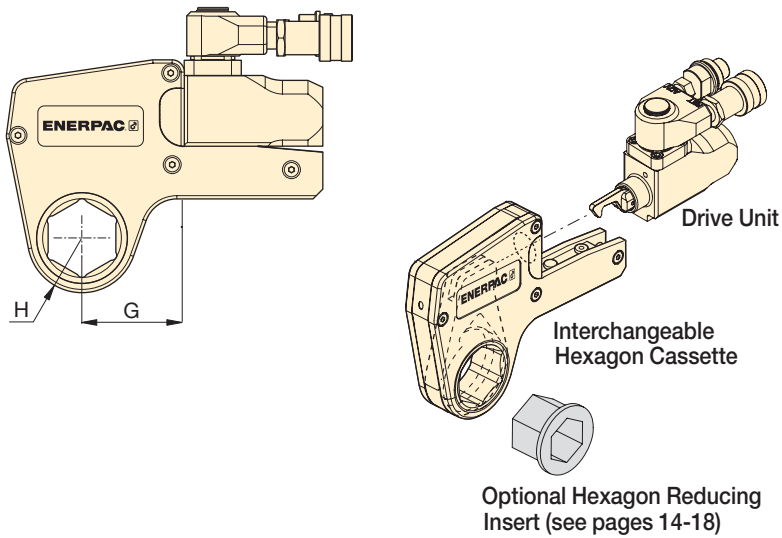
Hexagon Range *		Maximum Torque at 700 bar (Nm)	Drive Unit Model Number	Minimum Torque (Nm)	Dimensions (mm)						Weight Drive unit without hexagon cassette (kg)
(mm)	(in)				A	B	C	D	E	F	
30 - 60	1 1/8 - 2 3/8	2712	W2000	271	109	141	148	32,0	24,0	20	1,4
36 - 85	1 5/16 - 3 3/8	5423	W4000	542	136	167	178	41,0	32,8	20	2,0
50 - 105	1 7/8 - 4 1/8	10.846	W8000	1084	172	205	208	52,5	41,9	25	3,0
65 - 115	2 7/16 - 4 5/8	20.337	W15000	2033	207	240	253	63,0	50,0	20	5,0

* With in-line reaction foot.

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

See pages 14-18 for dimensions H and G.

W2000 Series Imperial Cassettes & Reducer Inserts



W Series



Maximum Torque at 700 bar:
2712 Nm

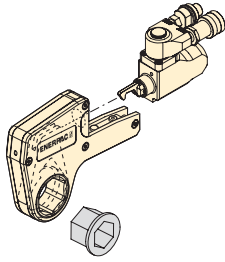
Hexagon Range:
1 1/8-2 3/8 inches

Maximum Operating Pressure:
700 bar

▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius H	G	Model Number	Weight						
						Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
W2000	1 1/8	31,0	53,7	W2102	2,1	-	-	-	-	-	-
	1 3/16	31,0	53,7	W2103	2,1	-	-	-	-	-	-
	1 1/4	31,0	53,7	W2104	2,1	-	-	-	-	-	-
	1 5/16	31,0	53,7	W2105	2,1	-	-	-	-	-	-
	1 3/8	31,0	53,7	W2106	2,1	-	-	-	-	-	-
	1 7/16	31,0	53,7	W2107	2,1	1 7/16 - 1 1/4	-	1 7/16 - 1 3/16	-	1 7/16 - 1 1/8	W2107R102
	1 1/2	33,5	58,2	W2108	2,2	1 1/2 - 1 5/16	-	-	-	-	-
	1 9/16	33,5	58,2	W2109	2,2	-	-	-	-	-	-
	1 5/8	33,5	58,2	W2110	2,2	1 5/8 - 1 7/16	-	1 5/8 - 1 1/4	W2110R104	1 5/8 - 1 3/16	W2110R103
	1 11/16	36,5	60,5	W2111	2,2	-	-	-	-	-	-
	1 3/4	36,5	60,5	W2112	2,2	-	-	-	-	-	-
	1 13/16	36,5	60,5	W2113	2,2	1 13/16 - 1 5/8	-	1 13/16 - 1 7/16	W2113R107	1 13/16 - 1 1/4	W2113R104
	1 7/8	39,0	63,1	W2114	2,2	-	-	-	-	-	-
	1 15/16	39,0	63,1	W2115	2,2	-	-	-	-	-	-
	2	39,0	63,1	W2200	2,2	2 - 1 13/16	-	2 - 1 5/8	W2200R110	2 - 1 7/16	W2200R107
	2 1/16	41,8	68,6	W2201	2,3	-	-	-	-	-	-
	2 1/8	41,8	68,6	W2202	2,3	-	-	-	-	-	-
	2 3/16	41,8	68,6	W2203	2,3	2 3/16 - 2	-	2 3/16 - 1 13/16	W2203R113	2 3/16 - 1 5/8	W2203R110
	-	-	-	-	-	-	2 3/16 - 1 7/16	W2203R107	-	-	-
	2 1/4	44,5	64,8	W2204	2,2	-	-	-	-	-	-
2 5/16	44,5	64,8	W2205	2,2	-	-	-	-	-	-	
2 3/8	44,5	64,8	W2206	2,2	2 3/8 - 2 1/4	-	2 3/8 - 2 3/16	-	2 3/8 - 2 1/8	-	
-	-	-	-	-	-	2 3/8 - 2	W2206R200	2 3/8 - 1 7/8	W2206R114	2 3/8 - 1 13/16	W2206R113
-	-	-	-	-	-	2 3/8 - 1 5/8	-	2 3/8 - 1 1/2	W2206R108	2 3/8 - 1 7/16	W2206R107

W4000 Series Imperial Cassettes & Reducer Inserts



Maximum Torque at 700 bar:

5423 Nm

Hexagon Range:

1⁵/₁₆-3³/₈ inches

Maximum Operating Pressure:

700 bar

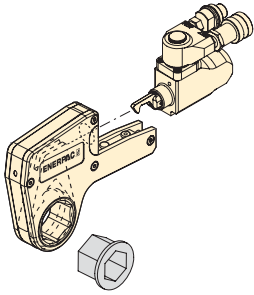
W
Series



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius H	G	Model Number	Weight	Hexagon Reducer		Hexagon Reducer		Hexagon Reducer	
						Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
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 ¹³ / ₁₆	-	2 - 1 ⁵ / ₈	-	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 - 2	-	2 ³ / ₁₆ - 1 ¹³ / ₁₆	-	2 ³ / ₁₆ - 1 ⁵ / ₈	W4203R110
	-	-	-	-	-	2 ³ / ₁₆ - 2 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 ³ / ₁₆	-	2 ³ / ₈ - 2	W4206R200	2 ³ / ₈ - 1 ¹³ / ₁₆	W4206R113
	-	-	-	-	-	2 ³ / ₈ - 1 ⁷ / ₁₆	W4206R107	2 ³ / ₈ - 1 ³ / ₈	R4206R106	-	-
	2 ⁷ / ₁₆	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 - 1 ¹ / ₄	-	2 ¹ / ₂ - 2 ³ / ₁₆	-	2 ¹ / ₂ - 2	W4208R200
	-	-	-	-	-	2 ¹ / ₂ - 1 ¹³ / ₁₆	W4208R113	-	-	-	-
	2 ⁹ / ₁₆	49,5	76,2	W4209	4,1	2 ⁹ / ₁₆ - 2 ³ / ₈	-	2 ⁹ / ₁₆ - 2 ¹ / ₄	-	2 ⁹ / ₁₆ - 2 ³ / ₁₆	W4209R203
	-	-	-	-	-	2 ⁹ / ₁₆ - 2 ¹ / ₈	W4209R202	2 ⁹ / ₁₆ - 2 ¹ / ₁₆	W4208R201	2 ⁹ / ₁₆ - 2	W4209R200
	-	-	-	-	-	2 ⁹ / ₁₆ - 2 ¹³ / ₁₆	W4209R113	-	-	-	-
	2 ⁵ / ₈	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 ⁹ / ₁₆	-	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 ³ / ₄	-	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 ¹⁵ / ₁₆	-	3 ¹ / ₈ - 2 ³ / ₄	W4302R212	3 ¹ / ₈ - 2 ⁹ / ₁₆	W4302R209	
-	-	-	-	-	3 ¹ / ₈ - 2 ³ / ₈	W4302R206	3 ¹ / ₈ - 2 ⁵ / ₁₆	W4302R205	3 ¹ / ₈ - 2 ¹ / ₄	W4302R204	
-	-	-	-	-	3 ¹ / ₈ - 2 ³ / ₁₆	W4302R203	3 ¹ / ₈ - 2 ¹ / ₈	W4302R202	3 ¹ / ₈ - 2	W4302R200	
3 ³ / ₁₆	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	-	-	-	-	-	-	

W8000 Series Imperial Cassettes & Reducer Inserts



Maximum Torque at 700 bar:

10.846 Nm

Hexagon Range:

1⁷/₈-4¹/₈ inches

Maximum Operating Pressure:

700 bar

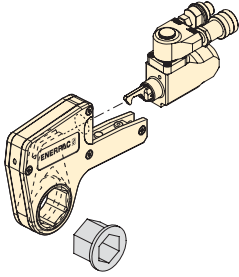
W
Series



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius H	G	Model Number	Weight	Hexagon Reducer		Hexagon Reducer		Hexagon Reducer		
						Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	
W8000	1 ⁷ / ₈	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	-	-	-	-	-	-	
	2 ¹ / ₈	48,0	80,0	W8202	8,1	-	-	-	-	-	-	
	2 ³ / ₁₆	48,0	80,0	W8203	8,1	-	-	-	-	-	-	
	2 ¹ / ₄	51,0	82,5	W8204	8,1	-	-	-	-	-	-	
	2 ⁵ / ₁₆	51,0	82,5	W8205	8,1	-	-	-	-	-	-	
	2 ³ / ₈	51,0	82,5	W8206	8,1	-	-	-	-	-	-	
	2 ⁷ / ₁₆	52,5	85,9	W8207	8,1	-	-	-	-	-	-	
	2 ¹ / ₂	52,5	85,9	W8208	8,1	-	-	-	-	-	-	
	2 ⁹ / ₁₆	52,5	85,9	W8209	8,1	2 ⁹ / ₁₆ - 2 ³ / ₈	-	2 ⁹ / ₁₆ - 2 ³ / ₁₆	-	2 ⁹ / ₁₆ - 2	-	W8209R200
	2 ⁵ / ₈	56,0	84,8	W8210	8,1	-	-	-	-	-	-	
	2 ¹¹ / ₁₆	56,0	84,8	W8211	7,9	-	-	-	-	-	-	
	2 ³ / ₄	56,0	84,8	W8212	7,9	2 ³ / ₄ - 2 ⁹ / ₁₆	-	2 ³ / ₄ - 2 ³ / ₈	-	2 ³ / ₄ - 2 ³ / ₁₆	-	W8212R203
	2 ¹³ / ₁₆	58,0	85,0	W8213	7,9	-	-	-	-	-	-	
	2 ⁷ / ₈	58,0	85,0	W8214	7,9	-	-	-	-	-	-	
	2 ¹⁵ / ₁₆	58,0	85,0	W8215	7,9	2 ¹⁵ / ₁₆ - 2 ³ / ₄	-	2 ¹⁵ / ₁₆ - 2 ⁹ / ₁₆	-	2 ¹⁵ / ₁₆ - 2 ³ / ₈	-	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	-	-	-	-	-	-	
	3 ¹ / ₈	60,5	89,5	W8302	8,0	3 ¹ / ₈ - 2 ¹⁵ / ₁₆	-	3 ¹ / ₈ - 2 ³ / ₄	-	3 ¹ / ₈ - 2 ⁹ / ₁₆	-	W8302R209
	-	-	-	-	-	-	3 ¹ / ₈ - 2 ³ / ₈	W8302R206	3 ¹ / ₈ - 2 ³ / ₁₆	W8302R203	3 ¹ / ₈ - 2	W8302R200
	3 ³ / ₁₆	66,0	92,2	W8303	8,2	-	-	-	-	-	-	
	3 ¹ / ₄	66,0	92,2	W8304	8,2	-	-	-	-	-	-	
	3 ⁵ / ₁₆	66,0	92,2	W8305	8,2	-	-	-	-	-	-	
	3 ³ / ₈	66,0	92,2	W8306	8,2	-	-	-	-	-	-	
	3 ⁷ / ₁₆	66,0	92,2	W8307I	8,2	-	-	-	-	-	-	
	3 ¹ / ₂	66,0	92,2	W8308	8,2	3 ¹ / ₂ - 3 ¹ / ₈	-	3 ¹ / ₂ - 3	-	W8308R300	3 ¹ / ₂ - 2 ¹⁵ / ₁₆	W8308R215
	-	-	-	-	-	-	3 ¹ / ₂ - 2 ³ / ₄	W8308R212	-	-	-	-
	3 ⁹ / ₁₆	74,0	102,9	W8309	8,8	-	-	-	-	-	-	
	3 ⁵ / ₈	74,0	102,9	W8310	8,8	-	-	-	-	-	-	
	3 ¹¹ / ₁₆	74,0	102,9	W8311	8,8	-	-	-	-	-	-	
	3 ³ / ₄	74,0	102,9	W8312	8,8	3 ³ / ₄ - 3 ¹ / ₂	-	3 ³ / ₄ - 3 ¹ / ₈	-	W8312R302	3 ³ / ₄ - 2 ¹⁵ / ₁₆	W8312R215
	-	74,0	-	-	-	-	3 ³ / ₄ - 2 ³ / ₄	W8312R212	-	-	-	-
	3 ¹³ / ₁₆	74,0	102,9	W8313	8,8	-	-	-	-	-	-	
3 ⁷ / ₈	74,0	102,9	W8314	8,8	3 ⁷ / ₈ - 3 ¹ / ₂	-	3 ⁷ / ₈ - 3 ¹ / ₈	-	W8314R302	3 ⁷ / ₈ - 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	-	-	-	-	-	-		
4 ¹ / ₈	79,5	110,0	W8402	9,3	-	-	-	-	-	-		

W15000 Series Imperial Cassettes & Reducer Inserts



Maximum Torque at 700 bar:

20.337 Nm

Hexagon Range:

2⁷/₁₆-4⁵/₈ inches

Maximum Operating Pressure:

700 bar




W
Series



▼ SELECTION CHART

Drive Unit Model Number	Hexagon Size	Nose Radius H	G	Model Number	Weight (kg)	Hexagon Reducer		Hexagon Reducer		Hexagon Reducer	
						Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number	Hexagon Reducer (in)	Model Number
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 ¹⁵ / ₁₆	-	3 ¹ / ₈ - 2 ³ / ₄	-	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 - 3 ¹ / ₈	-	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 / ₂	-	3 ³ / ₄ - 3 ⁵ / ₁₆	-	3 ³ / ₄ - 3 ¹ / ₄	-
	-	-	-	-	-	-	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 ³ / ₄	-	3 ⁷ / ₈ - 3 ¹ / ₂	-	3 ⁷ / ₈ - 3 ¹ / ₈	W15314R302
	-	-	-	-	-	-	3 ⁷ / ₈ - 2 ¹⁵ / ₁₆	W15314R215	-	-	-
	3 ¹⁵ / ₁₆	80,5	103,1	W15315	14,8	3 ¹⁵ / ₁₆ - 3 ³ / ₄	-	-	-	-	-
	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 ¹⁵ / ₁₆	-	4 ¹ / ₈ - 3 ⁷ / ₈	-	4 ¹ / ₈ - 3 ¹³ / ₁₆	-
	-	-	-	-	-	-	4 ¹ / ₈ - 3 ³ / ₄	-	4 ¹ / ₈ - 3 ¹¹ / ₁₆	-	4 ¹ / ₈ - 3 ¹ / ₂
	-	-	-	-	-	-	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 ¹⁵ / ₁₆	-	4 ¹ / ₄ - 3 ⁷ / ₈	-	4 ¹ / ₄ - 3 ³ / ₄	-
	-	-	-	-	-	-	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 - 4 ¹ / ₄	-	4 ⁵ / ₈ - 4 ¹ / ₈	-	4 ⁵ / ₈ - 3 ¹⁵ / ₁₆	W15410R315	
-	-	-	-	-	-	4 ⁵ / ₈ - 3 ⁷ / ₈	W15410R314	4 ⁵ / ₈ - 3 ³ / ₄	W15410R312	4 ⁵ / ₈ - 3 ¹ / ₂	
-	-	-	-	-	-	-	-	-	-	W15410R308	

W Series Metric Cassettes and Reducer Inserts

Drive Unit Model Number	Hexagon Size	Nose Radius H	G	Model Number	Weight						
						Hexagon Reducer (mm)	Model Number	Hexagon Reducer (mm)	Model Number	Hexagon Reducer (mm)	Model Number
	(mm)	(mm)	(mm)		(kg)						
W2000	30	31,0	53,7	W2103	2,1	-	-	-	-	-	-
	32	31,0	53,7	W2104	2,1	-	-	-	-	-	-
	36	31,0	53,7	W2107	2,1	36 - 32	-	36 - 30	-	-	-
	38	33,5	58,2	W2108	2,2	-	-	-	-	-	-
	41	33,5	58,2	W2110	2,2	41 - 36	-	41 - 32	W2110R104	41 - 30	W2110R103
	-	-	-	-	-	41 - 24	W2110R024M	-	-	-	-
	46	36,5	60,5	W2113	2,2	46 - 41	-	46 - 36	W2113R107	46 - 32	W2113R104
	50	39,0	63,1	W2200	2,2	50 - 46	-	50 - 41	W2200R110	50 - 36	W2200R107
	55	41,8	68,6	W2203	2,3	55 - 50	-	55 - 46	W2203R113	55 - 41	W2203R110
	-	-	-	-	-	55 - 36	W2203R107	-	-	-	-
	60	44,5	64,8	W2206	2,2	60 - 55	-	60 - 50	W2206R200	60 - 46	W2206R113
-	-	-	-	-	60 - 41	W2206R110	60 - 36	W2206R107	-	-	
W4000	36	37,0	61,0	W4107	3,7	-	-	-	-	-	-
	41	37,0	61,0	W4110	3,7	-	-	-	-	-	-
	46	39,5	64,0	W4113	3,8	-	-	-	-	-	-
	50	41,5	66,7	W4200	3,9	50 - 46	-	50 - 41	-	50 - 36	W4200R107
	55	44,0	73,4	W4203	4,0	55 - 50	-	55 - 46	-	55 - 41	W4203R110
	-	-	-	-	-	55 - 36	W4203R107	55 - 32	W4203R104	-	-
	60	46,5	70,6	W4206	4,1	60 - 55	-	60 - 50	W4206R200	60 - 46	W4206R113
	-	-	-	-	-	60 - 36	W4206R107	-	-	-	-
	65	49,5	76,2	W4209	4,1	65 - 60	-	65 - 55	W4209R203	65 - 50	W4209R200
	-	-	-	-	-	65 - 46	W4209R113	-	-	-	-
	70	52,5	78,3	W4212	4,2	70 - 65	-	70 - 60	W4212R206	70 - 55	W4212R203
	75	55,3	81,6	W4215	4,3	75 - 70	-	75 - 65	W4215R209	75 - 60	W4215R206
	-	-	-	W4215	-	75 - 55	W4215R203	75 - 50	W4215R200	-	-
	80	58,5	83,5	W4302	4,4	80 - 75	W4302R215	80 - 70	W4302R212	80 - 65	W4302R209
	-	-	-	W4302	-	80 - 55	W4302R203	80 - 50	W4302R200	-	-
85	62,0	85,5	W4085M	4,5	-	-	-	-	-	-	
W8000	50	45,0	78,2	W8200	8,1	-	-	-	-	-	-
	55	48,0	80,0	W8203	8,1	-	-	-	-	-	-
	60	51,0	82,5	W8206	8,1	-	-	-	-	-	-
	65	54,0	85,9	W8209	8,1	65 - 60	-	65 - 55	-	65 - 50	W8209R200
	70	57,0	89,3	W8212	7,9	70 - 65	-	70 - 60	-	70 - 55	W8212R203
	75	60,0	92,7	W8215	7,9	75 - 70	-	75 - 65	-	75 - 60	W8215R206
	-	-	-	-	-	75 - 55	W8215R203	-	-	-	-
	80	63,0	96,1	W8302	8	80 - 75	-	80 - 70	-	80 - 65	W8302R209
	-	-	-	-	-	80 - 60	W8302R206	80 - 55	W8302R203	80 - 50	W8302R200
	85	66,0	99,5	W8085M	8,2	85 - 80	-	85 - 75	-	85 - 70	W8085R070M
	-	-	-	-	-	85 - 65	W8085R065M	85 - 60	W8085R060M	85 - 55	W8085R055M
	90	69,0	102,9	W8090M	8,8	90 - 85	-	90 - 80	-	90 - 75	W8090R075M
	95	72,0	106,3	W8312	8,8	95 - 90	-	95 - 85	-	95 - 80	W8312R302
	-	-	-	-	-	95 - 75	W8312R215	-	-	-	-
	100	75,0	110,0	W8315	9,3	-	-	-	-	-	-
105	78,0	113,4	W8402	9,3	-	-	-	-	-	-	
W15000	65	59,0	88,6	W15209	13,6	-	-	-	-	-	-
	70	59,0	88,6	W15212	13,6	-	-	-	-	-	-
	75	62,0	90,5	W15215	13,7	-	-	-	-	-	-
	80	64,5	92,9	W15302	13,8	80 - 75	-	80 - 70	-	80 - 65	W15302R209
	85	69,5	96,6	W15085M	14,1	85 - 75	-	85 - 70	W15085R070M	-	-
	90	75,0	101,8	W15090M	14,5	90 - 85	-	90 - 80	-	90 - 75	W15090R75M
	95	75,0	101,8	W15312	14,6	95 - 90	-	95 - 85	-	95 - 80	W15312R302
	-	-	-	-	-	95 - 75	W15312R215	-	-	-	-
	100	80,5	103,1	W15315	14,8	100 - 95	-	-	-	-	-
	105	80,5	103,1	W15402	14,8	105 - 100	-	105 - 95	-	105 - 90	W15402R090M
110	87,5	114,8	W15405	15,1	110 - 105	-	110 - 100	-	110 - 95	W15110R095M	
115	87,5	114,8	W15115M	15,1	115 - 110	-	115 - 105	-	115 - 100	W15115R100M	

▼ Shown: SQD-50-I



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



Lightweight Aluminum High-Power Wrench for Sockets or Allen Drives



Swivel Hose Connection

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



Twin 3.5:1 Safety Hoses

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

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Optional Allen Drives

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

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

Double-Acting, Square Drive Wrenches



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

SQD Series



Maximum Torque:
27.000 Nm

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

Maximum Operating Pressure:
800 bar



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

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Torque Wrench Pumps and Hoses

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

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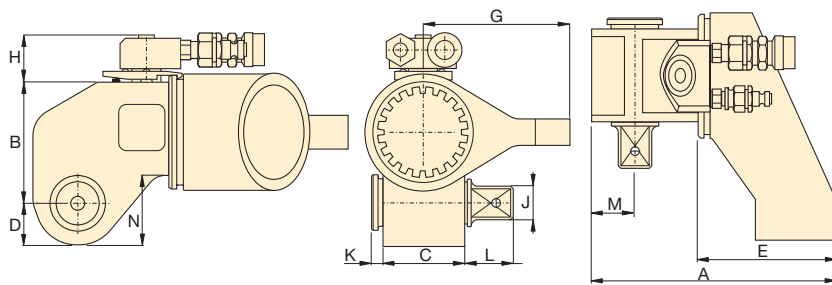
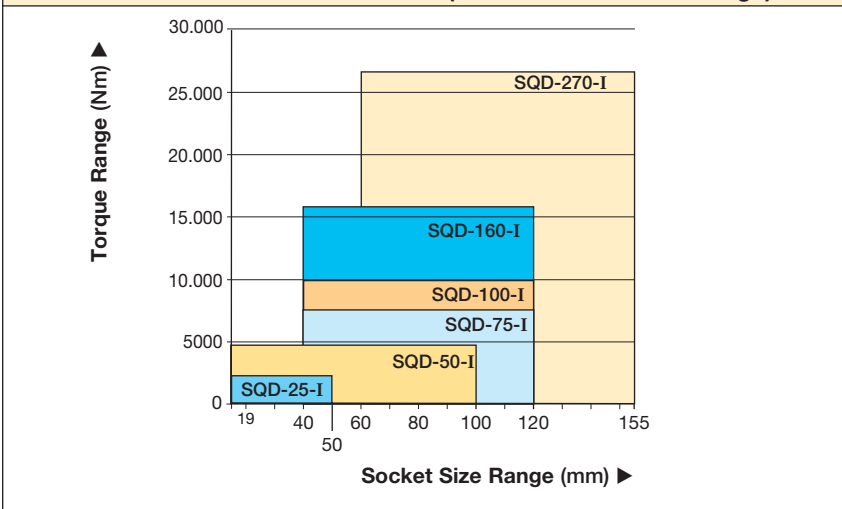


Hexagon Bolt and Nut Sizes

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

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TORQUE WRENCH SELECTION (based on socket size range)



Typical Socket Size Range*		Square Drive (in)	Max. Torque** @ 800 bar (Nm)	Torque Wrench Model No.	Dimensions (mm)												Weight (incl. reaction arm and square drive) (kg)
(mm)	(in)				A	B	C	D	E	G	H	J	K	L	M	N	
15 - 50	1/16 - 1 7/8	3/4	2350	SQD-25-I	167	72	53	24	108	95	35	3/4	6	28	27	36	2,5
20 - 100	7/8 - 3 7/8	1	4800	SQD-50-I	204	92	68	31	135	115	35	1	15	33	34	52	4,3
30 - 110	1 1/8 - 4 3/8	1 1/2	7560	SQD-75-I	226	107	76	36	153	122	35	1 1/2	12	43	39	64	6,7
40 - 120	1 5/8 - 4 3/4	1 1/2	10.000	SQD-100-I	253	115	84	39	164	130	35	1 1/2	13	39	43	68	8,0
60 - 155	2 3/8 - 6 1/8	1 1/2	16.000	SQD-160-I	272	134	100	48	178	150	50	1 1/2	11	45	54	81	12,0
80 - 255	3 1/8 - 10	2 1/2	27.000	SQD-270-I	342	164	119	59	218	200	50	2 1/2	18	76	63	99	24,5

* Contact ENERPAC for socket specifications.

** Determine maximum torque according to the bolt (nut) size and grade.

▼ SELECTION CHART

TORQUE WRENCH		OPTIONAL ALLEN DRIVES, IMPERIAL			REACTION ARM FOR ALLEN DRIVE
Model Number <small>(max. capacity)</small>	Nose Radius D <small>(mm)</small>	Hexagon Size <small>(in)</small>	Maximum Torque ¹⁾ <small>(Nm)</small>	Model Number	Model Number
SQD-25-I (2350 Nm)	24	1/2	530	25A-050	RAH-25
		5/8	1000	25A-063	
		3/4	1800	25A-075	
		7/8	2350	25A-088	
		1	2350	25A-100	
SQD-50-I (4800 Nm)	31	5/8	1000	50A-063	RAH-50
		3/4	1800	50A-075	
		7/8	2800	50A-088	
		1	4200	50A-100	
		1 1/8	4800	50A-113	
		1 1/4	4800	50A-125	
		-	-	-	
SQD-75-I (7560 Nm)	31	5/8	1000	75A-063	RAH-75
		3/4	1800	75A-075	
		7/8	2800	75A-088	
		1	4200	75A-100	
		1 1/8	5900	75A-113	
		1 1/4	7560	75A-125	
SQD-100-I (10.000 Nm)	39	7/8	2800	100A-088	RAH-100
		1	4200	100A-100	
		1 1/8	5900	100A-113	
		1 1/4	8500	100A-125	
		1 3/8	10.000	100A-138	
SQD-160-I (16.000 Nm)	48	1 1/4	8500	160A-125	RAH-160
		1 3/8	10.500	160A-138	
		1 1/2	14.000	160A-150	
		1 5/8	16.000	160A-163	
		1 3/4	16.000	160A-175	
SQD-270-I (27.000 Nm)	59	1 1/2	14.000	270A-150	RAH-270
		1 5/8	18.000	270A-163	
		1 3/4	22.000	270A-175	
		1 7/8	27.000	270A-188	
		2	27.000	270A-200	
		2 1/4	27.000	270A-225	
		-	-	-	
		-	-	-	

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

For
SQD
Series



Maximum Torque at 800 bar:

27.000 Nm

Allen Drive Range:

1/2-2 1/4 inches

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.

Page: **28**



Nut Cutters

Remove rusted or corroded nuts easily with Enerpac Nut Cutters. Hexagon nut capacities up to 75 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 ¹⁾ (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	
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	
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			

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

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.



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



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

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



Aluminum, Low Profile



Twin 3.5:1 Safety Hoses

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

integrity of your system.

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Nut Cutters

Remove rusted or corroded nuts easily with Enerpac Nut Cutters. Hexagon nut capacities up to 75 mm.

Page: 48



Select the Right Torque

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

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

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



Double-Acting Hydraulic Torque Wrenches

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



Torque Wrench Selection in 2 steps:

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

HXD Series



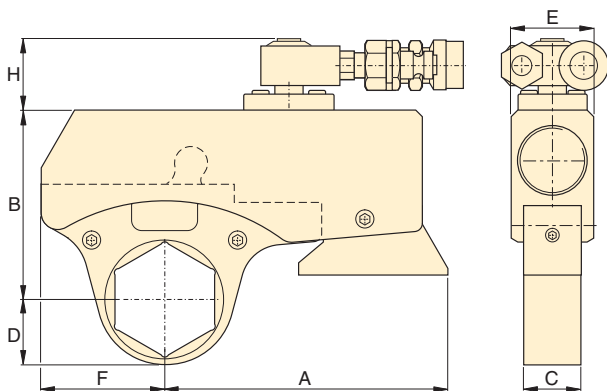
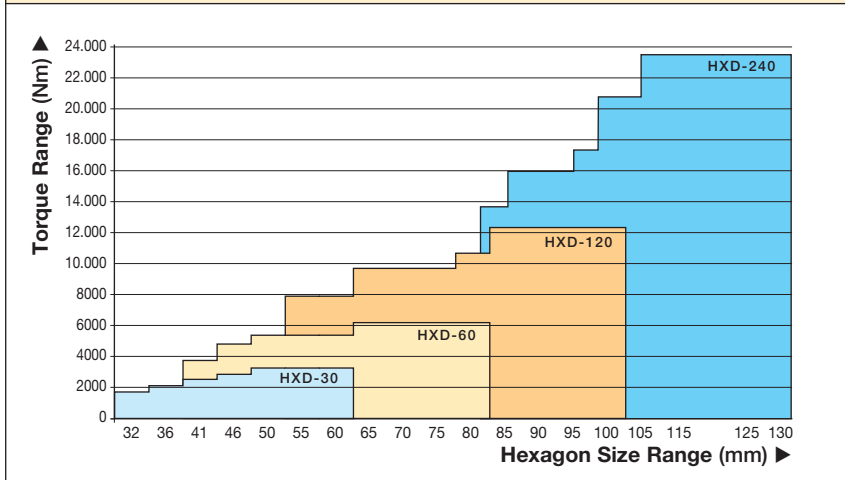
Maximum Torque:
24.000 Nm

Hexagon Range:
32-130 mm

Nose Radius:
28-96 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: 12



Hexagon Bolt and Nut Sizes

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

Page: 60



Torque Wrench Pumps

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

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▼ QUICK SELECTION CHART

Cassette Range		Maximum Torque at 800 bar (Nm)	Drive Unit * Model Number	Drive Unit and Cassette Dimensions (mm)							Weight (including smallest cassette) (kg)
(mm)	(in)			A	B	C	D	E	F	H	
32 - 60	1¼ - 2¾	3290	HXD-30	135	91 - 103	28	28,5 - 47,5	40	60	38	1,6
41 - 80	1⅝ - 3⅛	6190	HXD-60	156	115 - 130	35	34,5 - 60,5	50	75	38	2,5
55 - 100	2⅞ - 3⅞	12.500	HXD-120	200	141 - 156	47	46,5 - 73,5	65	96	38	4,8
80 - 130	3⅜ - 5	24.210	HXD-240	259	182 - 202	56	62,0 - 96,0	82	125	50	8,2

* With integrated reaction arm.

HXD-Series, Imperial Cassettes and Inserts



Maximum Torque at 800 bar:
24.000 Nm

Hexagon Range:
1.25-5 inches



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

**CC
IN
HR
Series**



▼ SELECTION CHART

DRIVE UNIT	INTERCHANGEABLE CASSETTE, IMPERIAL					OPTIONAL ADD-ON REDUCER INSERTS, IMPERIAL				HOLDING RINGS	
	Model Number (max. capacity)	Max. Torque ¹⁾ (Nm)	Hex. Size ²⁾ (in)	Nose Radius D (mm)	Model Number	Weight (kg)	Hexagon Size (in)	Model Number	Hexagon Size (in)	Model Number	Model Number
HXD-30 (3290 Nm)	1700	1 1/4	28,5	CC-3125	0,6	-	-	-	-	-	-
	2100	1 7/16	31,5	CC-3144	0,7	1 7/16 - 1 1/4	IN3144-125	-	-	-	HR-36
	2500	1 5/8	34,5	CC-3163	0,7	1 5/8 - 1 7/16	IN3163-144	1 5/8 - 1 1/4	IN3163-125	-	HR-41
	2890	1 13/16	38,5	CC-3181	0,8	1 13/16 - 1 5/8	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 - 1 5/8	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
	2 3/8	47,5	CC-3238	1,1	2 3/8 - 2 3/16	IN3238-219	2 3/8 - 2	IN3238-200	-	HR-60	
HXD-60 (6190 Nm)	3840	1 5/8	34,5	CC-6163	1,2	-	-	-	-	-	-
	4805	1 13/16	39,5	CC-6181	1,3	1 13/16 - 1 5/8	IN6181-163	-	-	-	HR-46
		2	43,5	CC-6200	1,4	2 - 1 13/16	IN6200-181	2 - 1 5/8	IN6200-163	-	HR-50
	5410	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
		2 3/8	48,5	CC-6238	1,6	2 3/8 - 2 3/16	IN6238-219	2 3/8 - 2	IN6238-200	-	HR-60
	6190	2 9/16	52,5	CC-6256	1,8	2 9/16 - 2 3/8	IN6256-238	2 9/16 - 2 3/16	IN6256-219	-	HR-65
		2 3/4	55,5	CC-6275	1,9	2 3/4 - 2 9/16	IN6275-256	2 3/4 - 2 3/8	IN6275-238	-	HR-70
		2 15/16	57,5	CC-6293	2,0	2 15/16 - 2 3/4	IN6293-275	2 15/16 - 2 9/16	IN6293-256	-	HR-75
		3 1/8	60,5	CC-6313	2,1	3 1/8 - 2 15/16	IN6313-293	3 1/8 - 2 3/4	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	-
2 3/8			48,5	CC-12238	2,7	2 3/8 - 2 3/16	IN12238-219	2 3/8 - 2	IN12238-200	-	HR-60
9800		2 9/16	52,5	CC-12256	2,7	2 9/16 - 2 3/8	IN12256-238	2 9/16 - 2 3/16	IN12256-219	-	HR-65
		2 3/4	55,5	CC-12275	2,8	2 3/4 - 2 9/16	IN12275-256	2 3/4 - 2 3/8	IN12275-238	-	HR-70
		2 15/16	57,5	CC-12293	2,9	2 15/16 - 2 3/4	IN12293-275	2 15/16 - 2 9/16	IN12293-256	-	HR-75
10.860		3	57,5	CC-12300	2,9	3 - 2 3/4	IN12300-275	3 - 2 9/16	IN12300-256	-	HR-75
		3 1/8	60,5	CC-12313	3,0	3 1/8 - 2 15/16	IN12313-293	3 1/8 - 2 3/4	IN12313-275	-	HR-80
12.500		3 3/8	64,5	CC-12338	3,5	3 3/8 - 3	IN12338-300	3 3/8 - 2 15/16	IN12338-293	-	HR-85
		3 1/2	67,5	CC-12350	3,6	3 1/2 - 3 1/8	IN12350-313	3 1/2 - 3	IN12350-300	-	HR-90
		3 3/4	70,5	CC-12375	3,7	3 3/4 - 3 1/2	IN12375-350	3 3/4 - 3 3/8	IN12375-338	-	HR-95
		3 7/8	73,5	CC-12388	3,8	3 7/8 - 3 1/2	IN12388-350	3 7/8 - 3 3/8	IN12388-338	-	HR-100
HXD-240 (24.210 Nm)	14.000	3 1/8	62,0	CC-24313 ³⁾	5,1	3 1/8 - 2 15/16	IN24313-293	3 1/8 - 2 3/4	IN24313-275	-	HR-80
	15.840	3 3/8	66,0	CC-24338	5,2	3 3/8 - 3 1/8	IN24338-313	3 3/8 - 3	IN24338-300	-	HR-85
	16.570	3 1/2	69,0	CC-24350	5,2	3 1/2 - 3 1/8	IN24350-313	3 1/2 - 3	IN24350-300	-	HR-90
	17.320	3 3/4	72,0	CC-24375	5,4	3 3/4 - 3 1/2	IN24375-350	3 3/4 - 3 3/8	IN24375-338	-	HR-95
	18.050	3 7/8	76,0	CC-24388 ⁴⁾	5,6	4 1/8 - 3 7/8	IN24413-388	3 7/8 - 3 3/8	IN24388-338	-	HR-100
	21.000	4 1/8	80,0	CC-24413	5,7	4 1/4 - 3 7/8	IN24425-388	4 1/8 - 3 3/4	IN24413-375	-	HR-105
	24.210	4 1/4	84,0	CC-24425	6,8	4 5/8 - 4 1/4	IN24463-425	4 1/4 - 3 3/4	IN24425-375	-	HR-110
		4 5/8	90,0	CC-24463	7,3	5 - 4 5/8	IN24500-463	4 5/8 - 4 1/8	IN24463-413	-	HR-120
		5	96,0	CC-24500	7,4	-	-	5 - 4 1/4	IN24500-425	-	HR-130

¹⁾ Determine maximum torque according to the bolt (nut) size and grade. Other Reducer Insert dimensions available upon request.

²⁾ See the table of hexagon bolt and nut sizes and related thread diameters on page 60.

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

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

HXD-Series, Metric Cassettes and Inserts



Maximum Torque at 800 bar:

24.000 Nm

Hexagon Range:

32-130 mm

**CC
IN
HR
Series**



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

▼ SELECTION CHART

DRIVE UNIT	INTERCHANGEABLE CASSETTES, METRIC					OPTIONAL ADD-ON REDUCER INSERTS, METRIC						HOLDING RINGS
	Max. Torque ¹⁾ (Nm)	Hex. Size ²⁾ (mm)	Nose Radius D (mm)	Model Number	Weight (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
		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	–	–	–	–	–	–	–
		50	43,5	CC-650	1,4	50/46	IN6-5046	50/41	IN6-5041	50/36	IN6-5036	HR-50
	5410	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
		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	

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










Other Reducer Insert dimensions available upon request.

²⁾ See the table of hexagon bolt and nut sizes and related thread diameters on page 60.



Optimum Torque Wrench and Pump Combinations

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

	ELECTRIC PUMPS				AIR DRIVEN PUMPS		TWIN HOSES	
	PMU-Series		ZU4-Series		PTA-Series	ZA4T-Series	THQ-Series THC-Series	
								
	Page: 29		Page: 30		Page: 34	Page: 36		
700 bar Torque Wrenches	Flow at rated pressure: 0.75 l/min 115V, 1 ph	Flow at rated pressure: 0.75 l/min 230V, 1 ph	Flow at rated pressure: 1.0 l/min 115V, 1 ph	Flow at rated pressure: 1.0 l/min 230V, 1 ph	Flow at rated pressure: 0.75 l/min	Flow at rated pressure: 1.0 l/min		
Model No.								
 2	S1500 S3000	PMU-10427-Q PMU-10422-Q	Any ZU4-Series pump may be used.		PTA-1404-Q	Any ZA4T-Series pump may be used.	THQ-706T (6m) THQ-712T (12m)	
	S6000 S11000 S25000	-			-			-
 6	W2000 W4000	PMU-10427-Q PMU-10422-Q			PTA-1404-Q			
	W8000 W15000	-	-	-				
800 bar Torque Wrenches								
Model No.								
	SQD-25-I SQD-50-I SQD-75-I SQD-100-I SQD-160-I SQD-270-I	PMU-10427	PMU-10422	Any ZU4-Series pump may be used.		PTA-1404	Any ZA4T-Series pump may be used.	THC-7062 (6m) THC-7122 (12m)
		-	-			-		
	HXD-30 HXD-60 HXD-120 HXD-240	PMU-10427	PMU-10422			PTA-1404		
		-	-	-				



Select the right torque

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

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

Conditions of bolted joints

- For fully threaded UNC nuts and bolts do not exceed **1½ times** nominal torque for a friction coefficient of 0,1.
- Humidity corrosion (rust) requires up to **2 times** the torque required for tightening.
- Sea water and chemical corrosion requires up to **2½ times** the torque required for tightening.
- Heat corrosion requires up to **3 times** the torque required for tightening.



IMPORTANT!

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



Call Enerpac!

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

Portable Electric Torque Wrench Pumps

▼ Shown: **PMU-10427**



PMU Series

Reservoir Capacity:

2 liters

Flow at 700 bar:

0.3 l/min.

Motor Size:

0.5 hp

Maximum Operating Pressure:

700-800 bar

- Powerful two-speed pump is lightweight and easy to carry
- Standard heat exchanger package keeps pump cool under extreme use
- Glycerin filled gauge with scales reading in psi and bar
- Transparent overlays in 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



Pump Ratings

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



Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 700 bar pumps, or use THC-700 series twin hoses with 800 bar pumps.

700 bar	
6 m long, 2 hoses	THQ-706T
12 m long, 2 hoses	THQ-712T
800 bar	
6 m long, 2 hoses	THC-7062
12 mt long, 2 hoses	THC-7122

▼ PERFORMANCE CHART

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

ZU4 Electric Torque Wrench Pumps

▼ ZU4204TB-EHK (shown with optional heat exchanger and skidbar), ZU4204BB-QH



Z Tough.
Dependable.
Innovative.
CLASSIC

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

Pro Series pump only

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



Classic Electrical

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



Pro Series

Back-lit LCD and pressure transducer featuring AutoCycle 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 ZU4-Series torque wrench pump.

ZU4 Torque Wrench Pumps



Z-CLASS – A Pump For Every Application

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

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

Classic Electric Torque Wrench Pump

- The Classic has 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!
- AutoCycle feature provides continuous cycle operation of the torque wrench as long as the advance button is pressed. (Pump can be used with or without AutoCycle feature).

ZU4 Series



Reservoir Capacity:

4.0 and 6.6 liters

Flow at 700 bar:

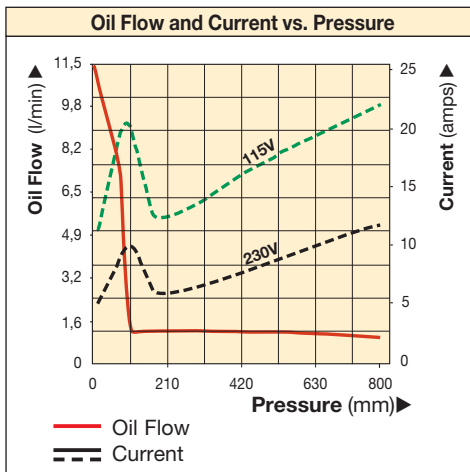
1.0 l/min

Motor Size:

1.7 hp

Maximum Operating Pressure:

700 and 800 bar



Torque Wrench Pump Selection Matrix

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

Page: **28**



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.

COMMON PUMP MODELS

	For Use With Torque Wrenches	Model Number ^{1) 4)}	Motor Electrical Specification	Usable Oil Capacity (l)	Weight with Oil (kg)
Pro Series	All wrenches	ZU4204TB-Q	115 VAC, 1-ph	4,0	32
		ZU4208TB-Q	115 VAC, 1-ph	6,6	34
		ZU4204TE-Q ²⁾	208-240 VAC, 1-ph	4,0	32
		ZU4208TE-Q ²⁾	208-240 VAC, 1-ph	6,6	34
		ZU4204TI-Q ³⁾	208-240 VAC, 1-ph	4,0	32
		ZU4208TI-Q ³⁾	208-240 VAC, 1-ph	6,6	34
Classic	All wrenches	ZU4204BB-QH	115 VAC, 1-ph	4,0	37
		ZU4204BB-Q	115 VAC, 1-ph	4,0	33
		ZU4208BE-QH ²⁾	208-240 VAC, 1-ph	6,6	38
		ZU4204BE-Q ²⁾	208-240 VAC, 1-ph	4,0	34
		ZU4208BI-QH	208-240 VAC, 1-ph	6,6	40
		ZU4208BI-Q	208-240 VAC, 1-ph	6,6	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



Gauge Overlay Kit

Gauge overlay kits are also available separately.

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

ZU4 Ordering Matrix and Specifications

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

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

1 Product Type

Z = Pump series

2 Motor Type

U = Universal electric motor

3 Flow Group

4 = 1 l/min @ 700 bar

4 Valve Type

2 = Torque wrench valve

5 Reservoir Size (useable capacity)

04 = 4 liters

08 = 6.6 liters

6 Valve Operation

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

B = Solenoid valve with pendant, classic electrical

7 Voltage

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

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

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

8 Factory installed features and options

E = 800 bar coupler for use with HXD-, SQD-Series or other wrenches

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

H = Heat exchanger

K = Skidbar

M = 4-wrench manifold

R = Roll cage



How to order your ZU4-Series torque wrench pump

Ordering Example 1

Model No. ZU4208TB-QMHK

700 bar pump for use with Enerpac S- and W-Series and other 700 bar torque wrenches, 115V motor, 6.6 liters reservoir, 4-wrench manifold, heat exchanger and skidbar.

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

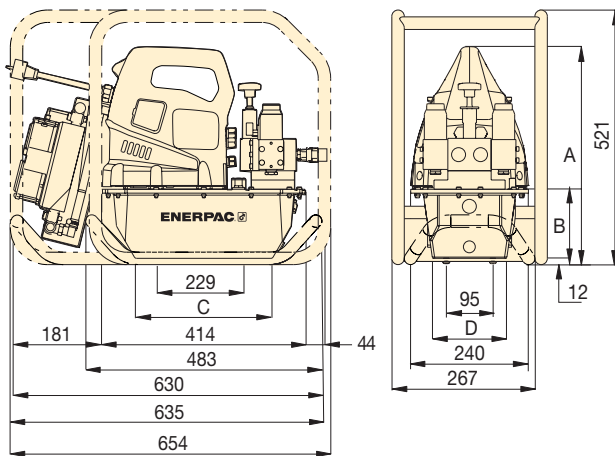
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Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 10,000 psi pumps, or use THC-700 series twin hoses with 800 bar pumps.

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



ZU4-Series Torque Wrench Pumps

Reservoir Size (useable liters)	A (mm)	B (mm)	C (mm)	D (mm)
4,0	432	142	279	152
6,6	432	142	206	167

Dimensions shown in mm.

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

ZU4 Performance							
Motor Size (hp)	Output Flow Rate (l/min)				*Motor Electrical Specification	Sound Level (dBA)	Relief Valve Adjustment Range (bar)
	7 bar	50 bar	350 bar	700 bar			
1.7	11,5	8,8	1,2	1,0	115 VAC, 1-ph 208-240 VAC, 1-ph	85-90	124-700**

* 50/60 hz

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



ZU4 Torque Wrench Pump Options



Heat Exchanger

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

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
ZHE-U4	4 and 6.6 liter reservoir

* Add suffix **H** to pump model number for factory installation.
Heat Exchanger adds 4.13 kg to pump weight.

Ordering Example:
Model No. ZU4208TE-H

Thermal Transfer *	Max. Pressure	Max. Oil Flow	Voltage
Btu/h	(psi)	(gpm)	(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.



Skidbar

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

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
SBZ-4	4 and 6.6 liter ¹⁾
SBZ-4L	4 and 6.6 liter ²⁾

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

¹⁾ Without heat exchanger 2.22 kg

²⁾ With heat exchanger 3.18 kg

Ordering Example:
Model No. ZU4208TB-QK



Roll Bar Cage

- Protects pump
- Provides greater pump stability

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
ZRC-04	4 and 6.6 liter reservoir ¹⁾
ZRC-04H	4 and 6.6 liter reservoir ²⁾

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

¹⁾ Without heat exchanger

²⁾ With heat exchanger

Ordering Example:
Model No. ZU4208BB-QR

ZU4 Series



Reservoir Capacity:
4 and 6.6 liters

Flow at 700 bar:
1.0 l/min.

Motor Size:
1.7 hp

Maximum Operating Pressure:
700 and 800 bar



4-Wrench Manifold

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

Accessory Kit No. *	Can be used on ZU4-Series torque wrench pumps
ZTM-UE	for 800 bar torque wrenches
ZTM-U4Q	for 700 bar torque wrenches

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

Ordering Example:
Model No. ZU4208TB-QM

▼ Shown: PTA-1404



Two-Stage Power in a Portable Design



Pump Ratings

-Q suffix pumps are for 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 locking safety couplers.

- 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
- 5m air pendant assembly enables easy maneuvering at the job site
- Fitted with polarized safety lock-ring couplers



Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 700 bar pumps, or use THC-700 series twin hoses with 800 bar pumps.

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

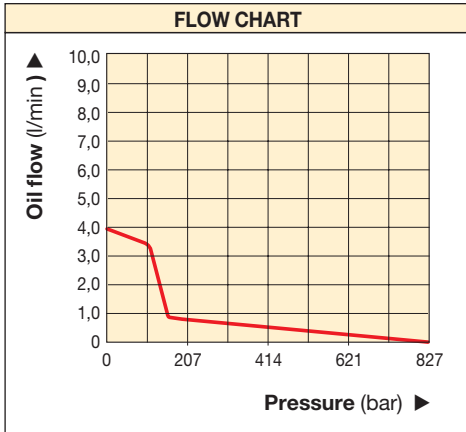


Gauge Overlay Kit

Gauge overlay kits are also available separately.

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

Compact Pneumatic Torque Wrench Pump



PTA Series



Reservoir Capacity:

4 liters

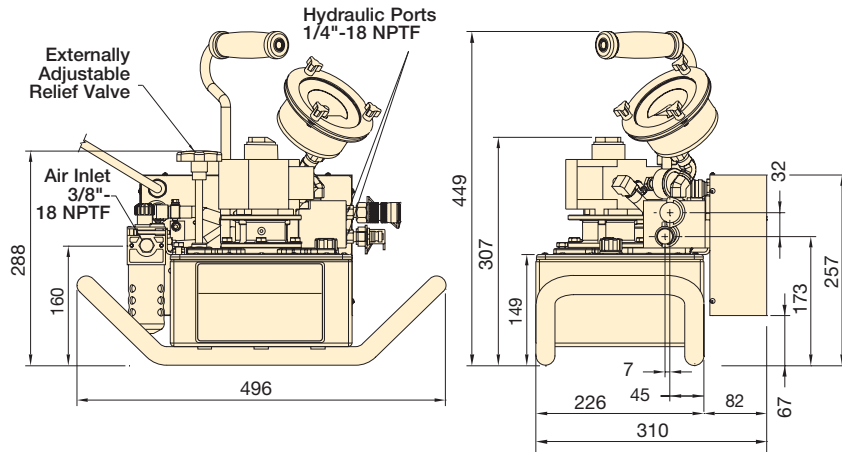
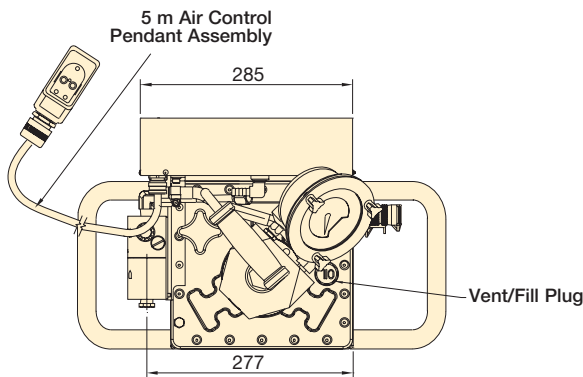
Flow at 10,000 psi:

0.3 l/min.

Maximum Operating Pressure:

700 and 800 bar

Dimensions shown in mm.



Torque Wrench Pump Selection Matrix

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

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▼ PERFORMANCE CHART

For Use With Torque Wrenches		Pressure Rating (bar)	Model Number	Reservoir Capacity (l)	Useable Oil Capacity (l)	Pump Flow Rates (l)		Air Consumption @ 7 bar (l/min)	Air Pressure Range (bar)	Weight with Oil (kg)
						1 st stage	2 nd stage			
S1500 S3000	W2000 W4000	700	PTA-1404-Q	3,8	1,9	3,90	0,33	1133	3,4-7,0	24,5
SQD-25-I SQD-50-I	HXD-30 HXD-60	800	PTA-1404	3,8	1,9	3,90	0,33	1133	3,4-7,0	24,5

ZA4T Air Driven Torque Wrench Pumps

▼ Shown from left to right: ZA4204TX-ER, ZA4204TX-Q




Z Tough.
Dependable.
Innovative.
CLASS

- Features **Z-CLASS** high-efficiency pump design; higher oil flow and bypass pressure
- Two-speed operation and high by-pass pressure reduces cycle time for improved productivity
- Heat exchanger warms exhaust air to prevent freezing and cools the oil
- Ergonomic pendant allows remote operation up to 6 m
- 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 removeable bowls and auto drain is standard

i **Pump Ratings**

-**Q** suffix pumps are for 700 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.

 **Twin Torque Wrench Hoses**

Use Enerpac THQ-700 series twin hoses with 700 bar pumps, or use THC-700 series twin hoses with 800 bar pumps.

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



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

ZA4T Specifications



ZA4T-Series Pump Applications

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

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

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

For further application assistance contact your local Enerpac office.

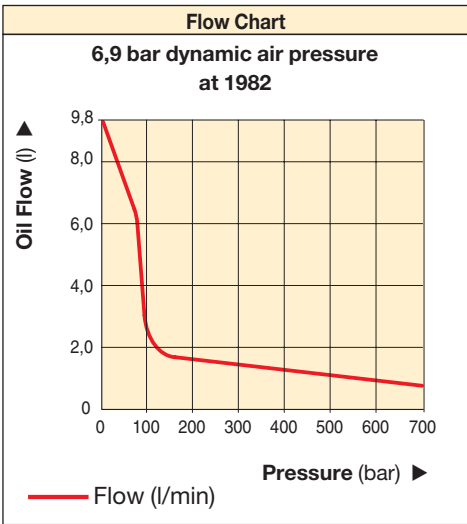
ZA4T Series



Reservoir Capacity:
4 and 6.6 liters

Flow at 700 bar:
1.0 l/min.

Maximum Operating Pressure:
700 and 800 bar



ATEX Certified

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



COMMON PUMP MODELS

For Use With Torque Wrenches		Maximum Operating Pressure (bar)	Model Number ¹⁾	Usable Oil Capacity (l)	Weight with Oil (kg)
S1500 S3000 S6000 S11000 S25000	W2000 W4000 W8000 W15000	700	ZU4204TX-Q	4	42.1
		700	ZU4208TX-Q	8	46.8
		700	ZU4204TX-QR	4	45.5
SQD-75-I SQD-100-I SQD-160-I SQD-270-I	HXD-120 HXD-240	800	ZU4204TX-E	4	42.1
		800	ZU4208TX-E	8	46.8
		800	ZU4204TX-ER	4	45.5

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



Torque Wrench Pump Selection Matrix

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

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Accessory Options

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

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

ZA4T Ordering Matrix and Specifications

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



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 (useable capacity)

04 = 4 liters

08 = 6.6 liters

6 Valve Operation

T = Air operated valve with pendant

7 Voltage

X = Not applicable

8 Factory installed features and options

E = 800 bar coupler for use with HXD- and SQD-Series wrenches

Q = 700 bar coupler for use with S- and W-Series or other wrenches

K = Skidbar

M = 4-wrench manifold

R = Roll cage



How to order your ZA4T-Series torque wrench pump

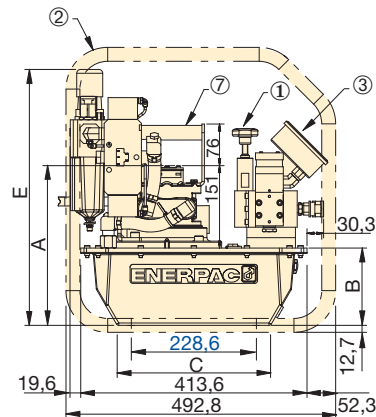
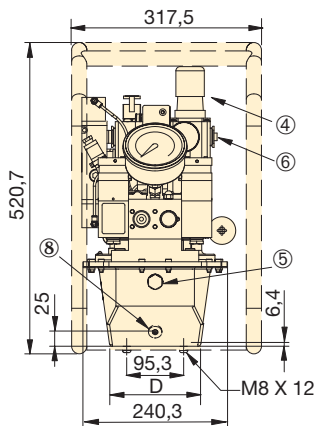
Ordering Example 1

Model No. ZA4208TX-QMR

700 bar pump for use with Enerpac S- and W-Series and other 700 bar torque wrenches, 6.6 liters reservoir, 4-wrench manifold, and roll cage.

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

Dimensions shown in mm.



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

ZA4T-Series Torque Wrench Pumps

Reservoir Size (useable liters)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
4,0	292	142	279	152	467
6,6	292	142	287	206	528

ZA4T Performance							
Output Flow Rate (l/min)				Dynamic Air Pressure Range (bar)	Air Consumption	Sound Level at 100 psi Dynamic (dBA)	Relief Valve Adjustment Range (bar)
7 bar	50 bar	350 bar	700 bar				
11,5	8,8	1,2	1,0	4-6,9	20-100	80-95	97-700*

* Pump type (-Q) shown.

ZA4T Torque Wrench Pump Options



Skidbar

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



4-Wrench Manifold

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

ZA4T Series



Reservoir Capacity:

4 and 6.6 liters

Flow at 10,000 psi:

1.0 l/min.

Maximum Operating Pressure:

700 and 800 bar

Accessory Kit No. *	Can be used on ZA4T-Series torque wrench pumps
SBZ-4	4 and 6.6 liters reservoir

* Add suffix **K** for factory installation. Skidbar weight 2.3 kg.

Ordering Example:

Model No. **ZA4208TX-QK**

Accessory Kit No. *	Can be used on ZA4T-Series torque wrench pumps
ZTM-UE	for 800 bar torque wrenches
ZTM-U4Q	for 700 bar torque wrenches

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

Ordering Example:

Model No. **ZA4208TX-QM**



Gauge Overlay Kit

Gauge overlay kits are also available separately.

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



Roll Bar Cage

- Protects pump
- Provides greater pump stability

Accessory Kit No. *	Can be used on ZA4T-Series torque wrench pumps
ZRC-04	4 and 6.6 liters reservoir

* Add suffix **R** for factory installation. Roll bar cage weight 3.4 kg.

Ordering Example:

Model No. **ZA4208TX-QR**



Twin Torque Wrench Hoses

Use Enerpac THQ-700 series twin hoses with 700 bar pumps, or use THC-700 series twin hoses with 800 bar pumps.

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

▼ Shown: GT-Series bolt tensioners



Accurate & Reliable Extreme Performance Bolt Tensioner



Pumps and accessories

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

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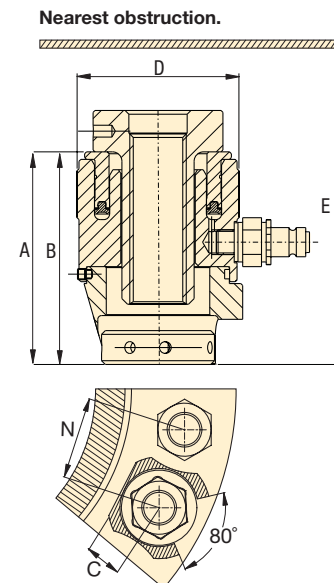


Minimum stud protrusion



= 1x nut height
minimum

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



▼ GT2 Bolt Tensioner on a flange joint.



Load Cell and Bridge Reference	Range		Technical Data			Dimensions (mm)				Weight (kg)
	(mm)	(in)	Cylinder Effective Area (mm ²)	Load Capacity (kN)	Stroke (mm)	A	B	C	D	
GT1-LCB	M16-M30	5/8"-1"	1495,40	224,30	10	135	113	27	86	3
GT2-LCB	M30-M39	1 1/2"-1 1/2"	2677,20	401,50	10	136	111	35	107	4.1
GT3-LCB	M39-M52	1 1/2"-2"	5127,10	768,90	10	160	126	46	138	7.0
GT4-LCB	M52-M68	2"-2 1/2"	9782,10	1466,90	10	180	141	62	174	12.2
GT5-LCB	M68-M80	2 1/2"-3 1/4"	15079,70	2261,40	10	202	157	78	210	18.7
GT6-LCB	M80-M95	3 1/4"-3 3/4"	18972,10	2845,10	10	219	173	82	240	27.8

GT-Series Hydraulic Bolt Tensioners

Load Cell and Bridge Reference	Thread Size	Adaptor Kit	Pitch Between Bolts N (mm)	Minimum Height E (mm)	Weight (kg)
GT1-LCB	M16 x 2	GT1PM-NRS01620	55	169	1.58
	M18 x 2.5	GT1PM-NRS01825	56	165	1.51
	M20 x 2.5	GT1PM-NRS02025	57	165	1.43
	M24 x 3	GT1PM-NRS02430	59	164	1.31
	M27 x 3	GT1PM-NRS02730	62	167	1.16
	M30 x 3.5	GT1PM-NRS03035	65	170	1.01
	5/8" 11UN	GT1P-NRS0625U11	55	169	1.57
	3/4" 10UN	GT1P-NRS0750U10	56	165	1.44
	7/8" 9UN	GT1P-NRS0875U09	59	164	1.30
	1" 8UN	GT1P-NRS1000U08	62	167	1.22
1 1/8" 8UN	GT1P-NRS1125U08	65	170	1.05	
GT2-LCB	M30 x 3.5	GT2PM-NRS03035	71	173	2.58
	M33 x 3.5	GT2PM-NRS03335	74	174	2.37
	M36 x 4	GT2PM-NRS03640	77	177	2.17
	M39 x 4	GT2PM-NRS03940	80	180	1.93
	1 1/8" 8UN	GT2P-NRS1125U08	71	173	2.64
	1 1/4" 8UN	GT2P-NRS1250U08	74	174	2.42
	1 3/8" 8UN	GT2P-NRS1375U08	77	177	2.20
	1 1/2" 8UN	GT2P-NRS1500U08	80	180	1.95
GT3-LCB	M39 x 4	GT3PM-NRS03940	92	212	5.68
	M42 x 4.5	GT3PM-NRS04245	96	215	5.35
	M45 x 4.5	GT3PM-NRS04545	99	218	4.98
	M48 x 5	GT3PM-NRS04850	105	216	4.66
	M52 x 5	GT3PM-NRS05250	108	220	4.18
	1 1/2" 8UN	GT3P-NRS1500U08	92	212	5.71
	1 5/8" 8UN	GT3P-NRS1625U08	96	215	5.32
	1 3/4" 8UN	GT3P-NRS1750U08	99	218	4.95
	1 7/8" 8UN	GT3P-NRS1875U08	105	216	4.59
	2" 8UN	GT3P-NRS2000U08	108	220	4.17
GT4-LCB	M52 x 5	GT4PM-NRS05250	118	240	10.74
	M56 x 5.5	GT4PM-NRS05655	121	244	10.10
	M60 x 5.5	GT4PM-NRS06055	124	248	9.44
	M64 x 6	GT4PM-NRS06460	127	252	8.78
	M68 x 6	GT4PM-NRS06860	130	256	8.09
	2" 8UN	GT4P-NRS2000U08	118	240	10.74
	2 1/4" 8UN	GT4P-NRS2250U08	121	244	9.65
2 1/2" 8UN	GT4P-NRS2500U08	127	252	8.47	
GT5-LCB	M68 x 6	GT5PM-NRS06860	145	278	17.28
	M72 x 6	GT5PM-NRS07260	149	282	16.39
	M76 x 6	GT5PM-NRS07660	152	286	15.47
	M80 x 6	GT5PM-NRS08060	162	293	14.55
	2 1/2" 8UN	GT5P-NRS2500U08	144	274	17.80
	2 3/4" 8UN	GT5P-NRS2750U08	149	282	16.29
	3" 8UN	GT5P-NRS3000U08	152	286	14.75
GT6-LCB	3 1/4" 8UN	GT5P-NRS3250U08	162	293	13.12
	M80 x 6	GT6PM-NRS08060	169	312	22.28
	M85 x 6	GT6PM-NRS08560	169	312	21.00
	M90 x 6	GT6PM-NRS09060	178	317	19.35
	M95 x 6	GT6PM-NRS09560	181	322	18.04
	3 1/4" 8UN	GT6P-NRS3250U08	169	312	20.71
	3 1/2" 8UN	GT6P-NRS3500U08	178	317	18.83
3 3/4" 8UN	GT6P-NRS3750U08	181	322	16.79	

GT Series



Bolt Range:

M16-M95 | 5/8"-3 3/4"

Load:

0-2845.1 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 1" threaded bolt order:

1 x Load Cell and Bridge: **GT1-LCB**

1 x Adaptor Kit: **GT1P-NRS1000U08**



Bolting Integrity Software

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

Integral databases hold data for:

- BS1560, MSS SP44, API 6A and 17D flanged joints
- Common gasket materials and configurations
- Comprehensive range of bolt materials
- Comprehensive range of lubricants
- Enerpac's Controlled Bolting Equipment including: Torque Multipliers, Hydraulic Wrenches and Bolt Tensioning tools

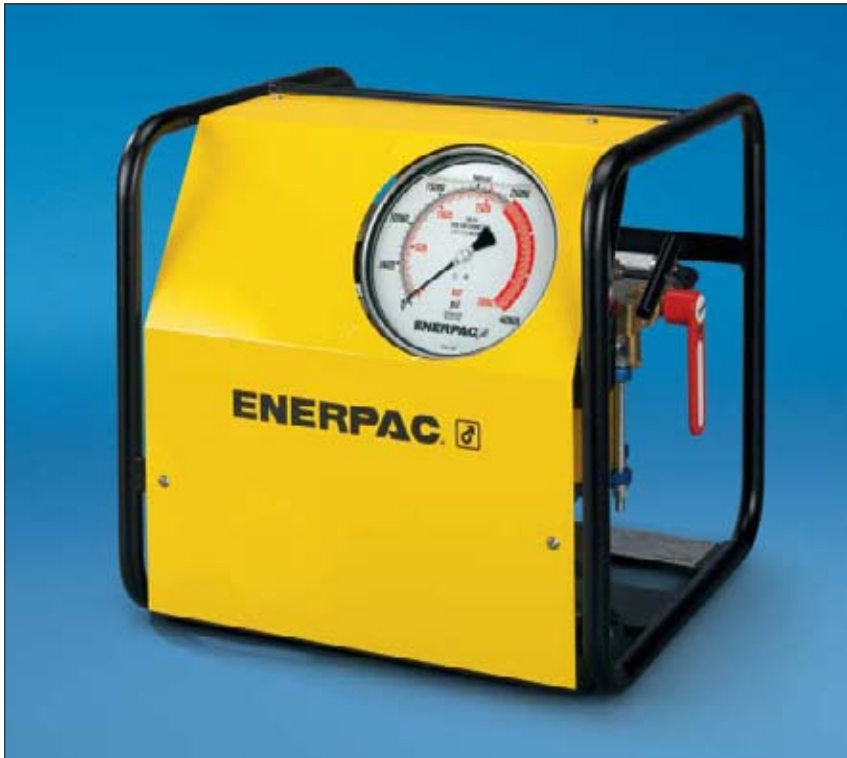
Custom Joint information can also be entered.

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

www.enerpac.com

ATP-Series Air Pump

▼ Shown: ATP-1500



ATP Series

Reservoir Capacity:
3.8 liters

Flow at Rated Pressure:
.06 l/min.

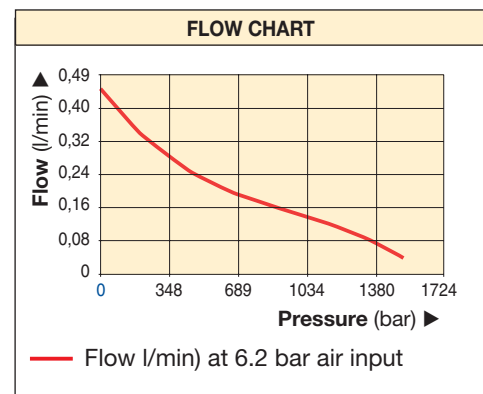
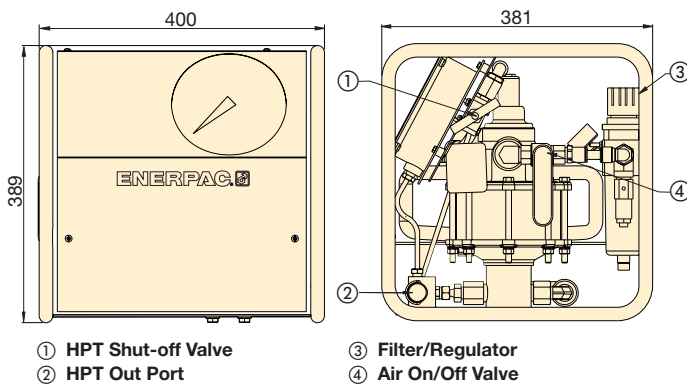
Maximum Operating Pressure:
1500 bar

- General purpose, high pressure air driven 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



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

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Pump Type	Useable Oil Capacity (l)	Model Number	Pressure Rating (bar)	Output Flow Rate at 0 psi (l/min)	Output Flow Rate at 21,750 psi (l/min)	Air Pressure Range (bar)	Air Consumption	Sound Level (dBA)	Weight (kg)
High pressure	3,8	ATP-1500	1500	0,43	0,07	5.5-6.2	113	70	31,7

HPT Pump and Accessories

▼ Shown: HTP-1500



HPT Series

Reservoir Capacity:
0.03 liters

Flow at 10,000 psi:
6.06-16.22 cm³/stroke

Maximum Operating Pressure:
1500 bar



Applications

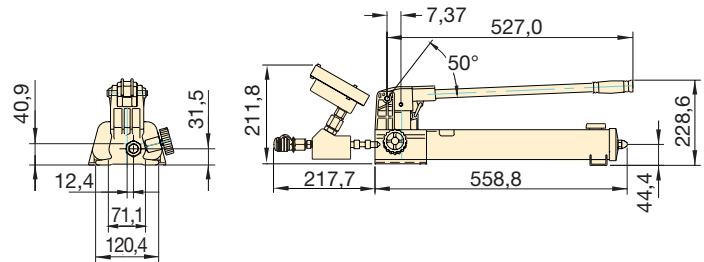
The Enerpac HPT high-pressure Hand Pump is ideally suited for use with hydraulic bolt tensioning tools and hydraulic nuts.

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

- Lightweight and portable high-pressure hand pump
- Two-speed operation displaces a larger volume of oil per stroke, reducing cycle times for many testing applications
- Includes a gauge and coupler for direct connection to GT-Series bolting tools
- Integrated relief valve set at 1522.5 bar



Model Number	Description	Usable Oil Capacity (l)	Oil Displacement per Stroke (cm ³)		Pressure Rating (bar)	
			1 st stage	2 nd stage	1 st stage	2 nd stage
HPT-1500	High Pressure Hand Pump with Gauge	0,03	16,22	0,61	13,79	1500

▼ HOSES

Model Number	End 1	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*	BH150	BR150	1,0
HT-1510HR*	BH150	BR150	3,0

* Includes dust caps

▼ FITTINGS

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



* Includes dust caps

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



Portable Hydraulic Power to Ease Joint Assembly

- Optimum match of individual components
- Sets include 1.8 m safety hose, calibrated gauge with gauge adaptor
- All hand pumps are two-speed for increased productivity

1 Cylinder Selection		Nominal Set Capacity ton (kN)	Cylinder Model No.	Stroke (mm)	Collapsed Height (mm)
 <p>RC-Series, Single-acting, General Purpose Cylinders: For maximum versatility.</p> <ul style="list-style-type: none"> • Collar and plunger threads along with base mounting holes enable easy fixturing for use on specialized positioning tools • Can be used in all positions • Heavy-duty return springs • Baked enamel finish for corrosion resistance • Multiple stroke lengths and tonnages to match many joint positioning and assembly applications 	10 (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	
50 (498)	RC-2514	362	476		
 <p>RCH-Series, Single-acting, Hollow Cylinders: For pushing and pulling applications.</p> <ul style="list-style-type: none"> • Hollow plunger design is ideal for both pull and push joint assembly applications • Heavy-duty return springs • Nickel-plated, floating center tube on models over 20 tons (215 kN) increase product life • Center-hole diameters match-up to many threaded rods and strands for use in joint assembly applications 	20 (215)	RCH-202	49	162	
	30 (326)	RCH-302	155	178	
	60 (576)	RCH-603	76	247	
	100 (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 blue field of the matrix

SELECTION EXAMPLE

Selected cylinder:

- RC-106, Single-acting cylinder with 155 mm stroke

Selected pump:

- P-392, Lightweight hand pump

Set model number:

- SCR-106H

Included:

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

SC Series



Capacity:







5-100 ton

Stroke:

38-360 mm

Maximum Operating Pressure:

700 bar

2 Pump selection			Accessories Included		
Hand Pump P-392	Hand Pump P-80	Turbo II Air Pump PATG-1102N	Hose Model No.	Gauge Model No.	Gauge Adaptor Model No.
					
SCR-102H	-	SCR-102A	HC-7206	GF-10P	GA-2
SCR-106H	-	SCR-106A	HC-7206	GF-10P	GA-2
SCR-1010H	-	SCR-1010A	HC-7206	GF-10P	GA-2
SCR-154H	-	SCR-154A	HC-7206	GP-10S	GA-2
SCR-156H	-	SCR-156A	HC-7206	GP-10S	GA-2
SCR-252H	-	SCR-252A	HC-7206	GF-20P	GA-2
SCR-254H	-	SCR-254A	HC-7206	GF-20P	GA-2
SCR-256H	-	SCR-256A	HC-7206	GF-20P	GA-2
-	SCR-2514H	SCR-2514A	HC-7206	GF-20P	GA-2
-	SCR-506H	SCR-506A	HC-7206	GF-50P	GA-2
-	-	-	HB-7206	GF-120P	GA-4
SCH-202H	-	SCH-202A	HC-7206	GF-813P	GA-3
SCH-302H	-	SCH-302A	HC-7206	GF-813P	GA-3
-	SCH-603H	SCH-603A	HC-7206	GF-813P	GA-3
-	SCH-1003H	-	HC-7206	GP-10S	GA-2
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

▼ Typical layout for a 4 point synchronous positioning system



- Multiple points, 9 to 910 tons capacity per point
- High accuracy (+/- 1-0.0 mm)
- PLC-control, user friendly touch screen
- Automatic data storage, reporting and graphical presentation
- Secure system with warning and stop features

System Options:

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



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

ESS Series



Capacity per lifting point:

9-910 tons

Maximum Stroke:

5000 mm

Accuracy:

± 1-0.1 mm

Maximum Operating Pressure:

700 bar

Precise Positioning System for Assembly and Separation of Large Structures



Synchronous Positioning Applications

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

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

Flange Alignment Tools

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



- Rectifies twist and rotational misalignment without additional stress in pipe lines
- For most commonly used ANSI, API, BS and DIN flanges
- No slings, hooks, or lifting gear. Extremely safe, high precision
- ATM-1 supplied with three bushings for different bolt hole sizes. Can be used in reversed position.
- ATM-3 fits on the following flanges:
 - Ring Type Joints: flange wall thickness minimum 29 mm and maximum 100 mm
 - Gasket Type Joints: flange wall thickness minimum 12 mm and maximum 114 mm
- ATM-5 fits when flange joint is:
 - between 96 - 229 mm apart and
 - bolt hole size 32 mm or greater
- Can be installed and used in any position and any location
- Stays stable in position under full load

ATM Series

Bolt Hole Range:
17 mm (11/16 inches)

Flange Wall Thickness:
17-203 mm (11/16 in.)

Maximum Force:
0.3-5 tons



Adjustable Reach-on ATM-3

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

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

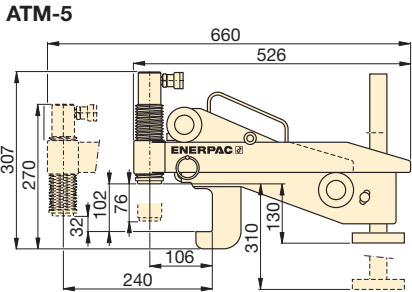
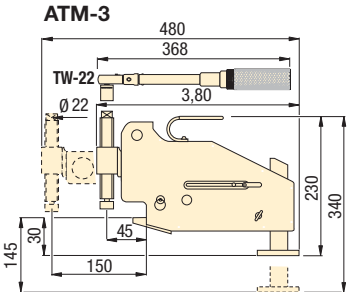
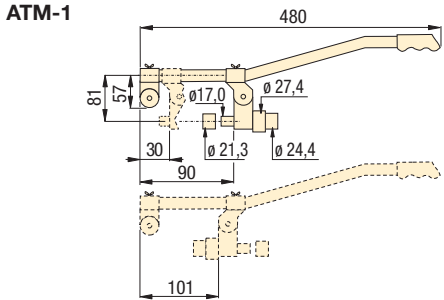


ATM-5 Including Hydraulics

Including 700 bar hydraulics: RC-53 single-acting cylinder, P-142 two-speed hand

pump and 1.85 m long safety hose (HC-7206C).

All dimensions shown in bar.



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



Maximum Lifting Force ton (kN)	Model Number	Bolt Hole Range		Flange Wall Thickness		Weight (kg)
		(mm)	(in)	(mm)	(in)	
0,3 (3)	ATM-1	17 - 27,2	11/16 - 11/8	17 - 50	11/16 - 2	2,0
3,0 (27)	ATM-3	25 - 54	1 - 21/8	30 - 115	13/16 - 41/2	9,7
5,0 (45)	ATM-5 *	≥ 31,5	≥ 11/4	80 - 203	31/8 - 8	16,2

* At 700 bar maximum operating pressure.

ATM-5 weight including hydraulic cylinder. Total set weight 28.2 kg.

Hydraulic Nut Cutters

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



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



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

NC Series



Capacity:
5-90 tons

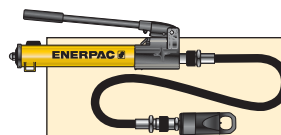
Hexagon Nut Range:
12-73 mm

Maximum Operating Pressure:
700 bar



Enerpac Nut Cutters

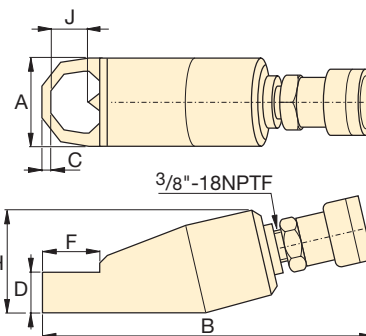
Nut Cutters include a spare chisel, a spare set screw and the wrench used to secure the chisel. A CR-400 coupler is standard.



Nut Cutter Sets

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

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



Hexagon Nut Range (mm)	Bolt Range (mm)	Capacity (ton)	Oil Capacity (cm ³)	Model Number	Dimensions (mm)							Weight (kg)	Replacement Chisel Model Number
					A	B	C	D	F	H	J		
10 - 19	M6-M12	5	15	NC-1319	40	170	7	19	28	48	21	1,2	NCB-1319
19 - 24	M12-M16	10	20	NC-1924	54	191	10	26	40	62	25	2,0	NCB-1924
24 - 32	M16-M22	15	60	NC-2432	64	222	13	29	51	72	33	3,0	NCB-2432
32 - 41	M22-M27	20	80	NC-3241	75	244	17	36	66	88	42	4,4	NCB-3241
41 - 50	M27-M33	35	155	NC-4150	94	288	21	45	74	105	54	8,2	NCB-4150
50 - 60	M33-M39	50	240	NC-5060	106	318	23	54	90	128	60	11,8	NCB-5060
60 - 75	M39-M48	90	492	NC-6075	156	393	26	72	110	181	77	34,1	NCB-6075

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

Hydraulic and Mechanical Industrial Spreaders

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



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

FSM/FSH Series

Tip Clearance / Maximum Spread*:

6 mm / 80 mm

Maximum Spread Force:

8-14 tons

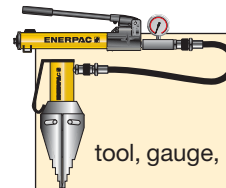
Maximum Operating Pressure:

700 bar (FSH-14)



Stepped Blocks FSB-1

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

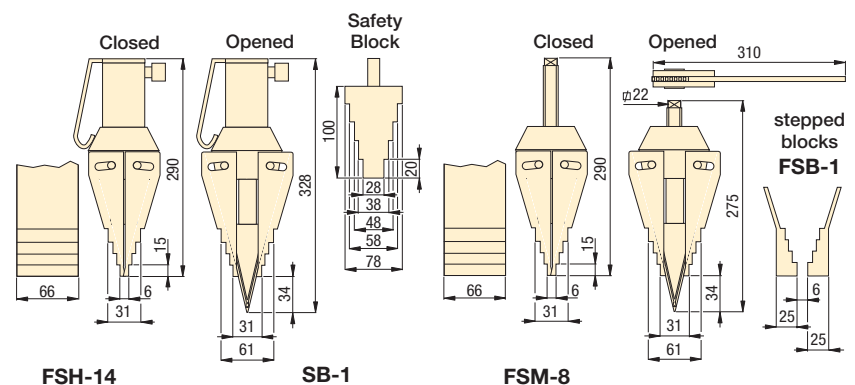


Flange Spreader Sets

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

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

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



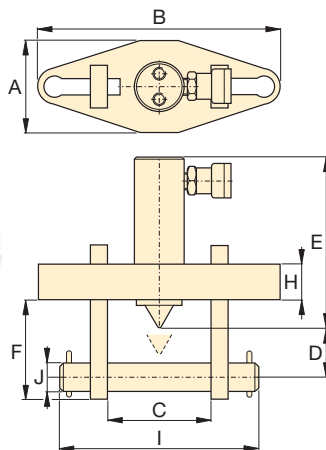
Max. Spreading Force ton (kN)	Model Number	Tip Clearance (mm)	Max. Spread* (mm)	Type	Oil Capacity (l)	Weight (kg)
8 (72)	FSM-8	6	80	Mechanical	-	6,5
14 (125)	FSH-14	6	80	Hydraulic	78	7,1

Pin Type Hydraulic Flange Spreaders

▼ Shown: FS-56



- Lightweight, ergonomic design for ease of use
- Adjustable jaw widths from 70 to 215 mm for a wide range of applications
- Single-acting, spring return RC Series cylinders for fast trouble-free operation

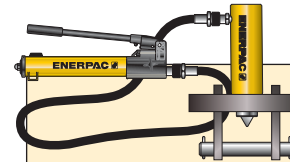


FS Series



Capacity:
5-10 tons

Maximum Operating Pressure:
700 bar



Flange Spreader Sets

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

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



Wedge Spreaders

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

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Flange Spreader Matching Chart

ASA Rating (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

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

Hydraulic Wedgie and Spread Cylinders

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



A, WR Series

Capacity:
0.75-1 ton

Tip Clearance:
12.8-35 mm

Maximum Spread Range:
94-292 mm

Maximum Operating Pressure:
700 bar

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



Nut Cutters

Remove rusted or corroded nuts easily with Enerpac Nut Splitters. Hexagon nut capacities up to 73 mm.

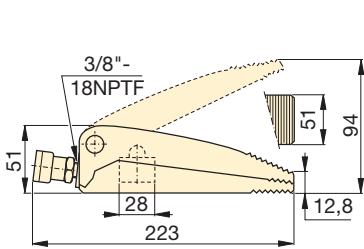
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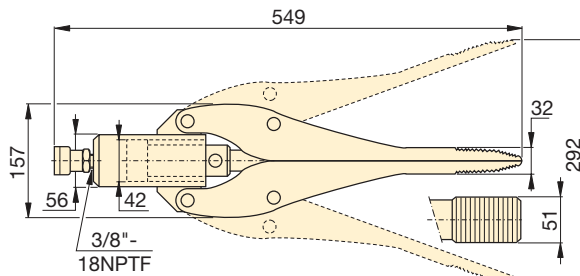
Best Match Hand Pump

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

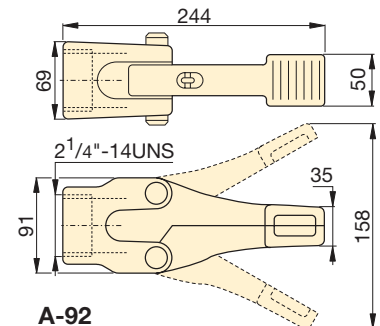
See the *Enerpac E326* catalog for the full range of hand pump options.



WR-5



WR-15



A-92

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

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





Bolting Yellow Pages

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.

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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.

ASME B30.1

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

UL approved

All electrical components used on Enerpac products carry the UL rating when possible.



ATEX 95 Certified

The ZA4-series air pumps are tested and certified according to the **Equipment Directive 94 / 9 / EC "ATEX Directive"**.

UL approved

All electrical components used on Enerpac products carry the UL rating when possible.

IP 54

All electric motors used on Enerpac power pumps meet this protection and insulation classification.

DIN 20024

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



Canadian Standards Association

Where specified, Enerpac electric pump assemblies meet the design, assembly and test requirements of the Canadian Standards Association.

Product Design Criteria

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

EMC Directive 89/336/EEC

Where specified, Enerpac electric power pumps meet the requirements for Electro-magnetic Compatibility per EMC Directive 89/336/EEC.



CE Marking & Conformity

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

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 (Nmm² / PSI)

Stretch-Bolt Length
(mm / in.) _____

Turn of Nut
(Preload / Degrees) _____

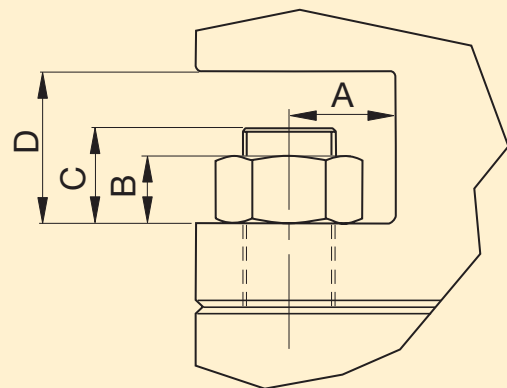
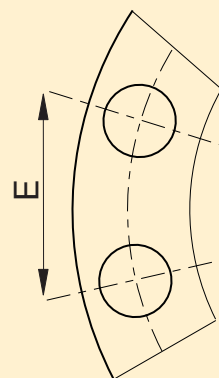
Torque
(Nm / Kgm / Ft-lbs) _____

Application Position:

Top-side

Vertical

Inverted



Specify Dimensions:

INCH

MM (Metric)

A _____ B _____ C _____ D _____ E _____

Distance to Closure: _____

Current Lubrication: Type _____ Brand _____

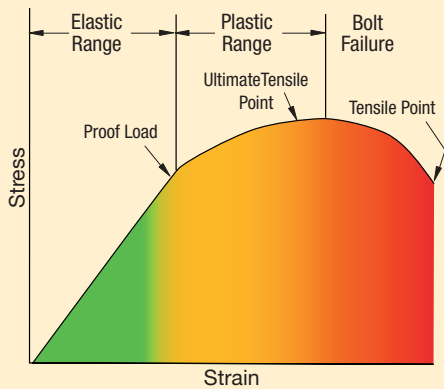


Function of Bolts and Nuts

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

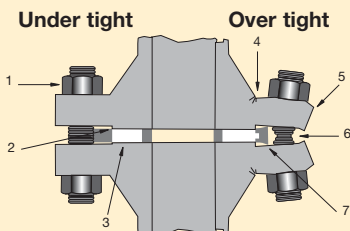
Elasticity is defined in Hooke's Law of physics: The stress in a bolt is directly proportional to its strain. The stress-strain of a bolt has an **elastic range** and a **plastic range**. In the elastic range Hooke's Law is true.

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.

Safe operation following prescribed procedures

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

Reliable and repeatable results

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

Uniformity of bolt loading

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

Reduces operational time resulting in increased productivity

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

The right results first time

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



Bolting Integrity Software

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

Integral databases hold data for:

- BS1560, MSS SP44, API 6A and 17D flanged joints
 - Common gasket materials and configurations
 - Comprehensive range of bolt materials
 - Comprehensive range of lubricants
 - Enerpac's Controlled Bolting Equipment including: Torque Multipliers, Hydraulic Wrenches and Bolt Tensioning tools
- Custom Joint information can also be entered.

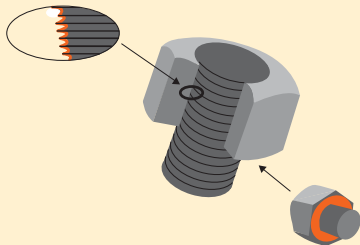
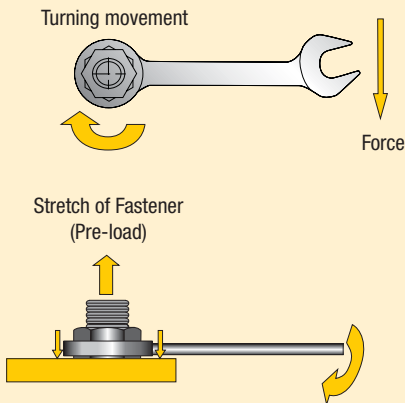
The software offers Tool selection, Bolt Load calculations and Tool pressure settings, as well as, a combined Application data sheet and Joint completion report.

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



Torque Tightening

Torque Tightening



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

What is Torque?

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

What is Torque Tightening?

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

Torque Tightening and Preload

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

Principally there are three different "torque components":

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



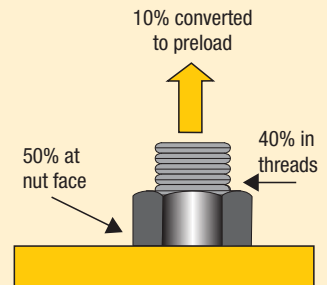
$$\text{Preload (residual load)} = \text{Applied Torque} \textit{ minus} \text{ Frictional Losses}$$

Lubrication Reduces Friction

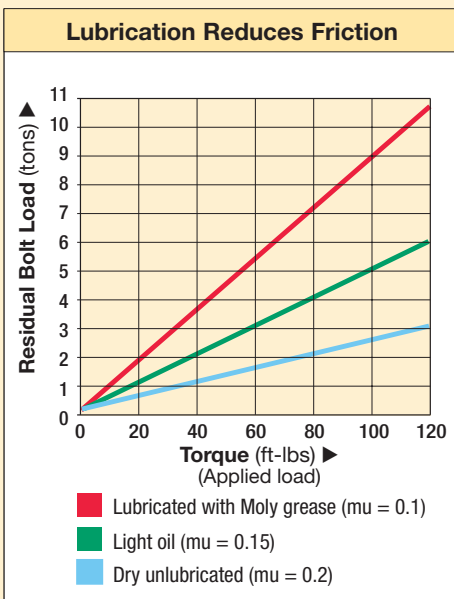
Lubrication reduces the friction during tightening, decreases bolt failure during installation and increases bolt service life. Variation in friction coefficients affect the amount of preload achieved at a specified torque. Higher friction results in less conversion of torque to preload. The value for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

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

Frictional Losses



Frictional Losses (dry steel bolt)



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

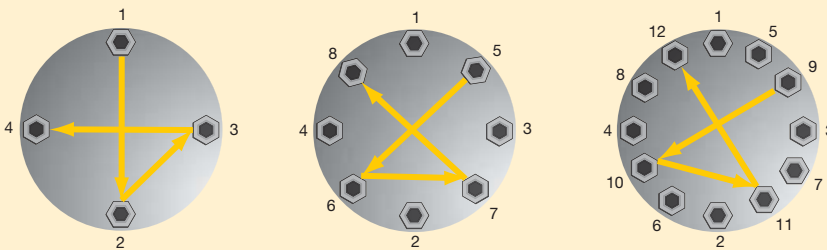


Manufacturer's rating of pressure and torque are maximum safe limits. Good practice encourages using only 80% of these ratings!

Torque Procedure

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

Torque Sequence



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

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

Breakout Torque

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

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

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



Select the Right Wrench

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

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

Conditions of bolted joints

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



Read Instruction Manuals

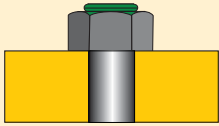
Please refer to the product Instruction Sheets for safe use guidelines and detail on the correct set up and operation of the equipment.



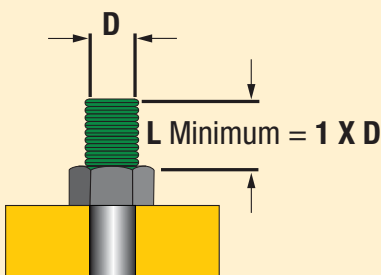
Tensioning

Tensioning requires longer bolts

INCORRECT



CORRECT



What is Bolt Tensioning

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

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



Preload (residual load) = Applied Load minus Load Losses

What is Load Loss

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

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



GLOSSARY OF TERMS

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

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

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

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

Load Loss: The losses in a bolt which occur on transfer of load from a tensioning device to the bolt assembly (these may arise from phenomena such as thread deflection and embedding of the nut to the contact area of the joint, and is calculated as a factor of the length to diameter ratio of the bolt).

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

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

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

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

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

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

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

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

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



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

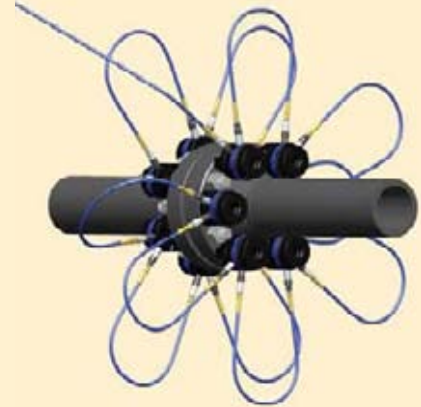
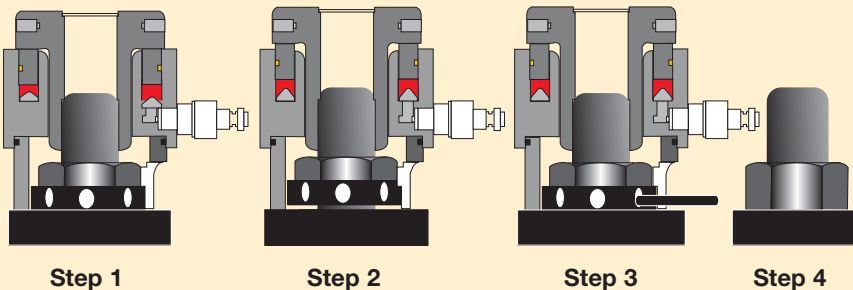
Tensioning Operation

Tensioning permits the simultaneous tightening of multiple bolts; the tools are connected in sequence via a high-pressure hose assembly to a single pump unit. This ensures each tool develops the exact same load and provides a uniform clamping force across the joint. This is especially important for pressure containing vessels requiring even gasket compression to affect a seal.

General Procedure

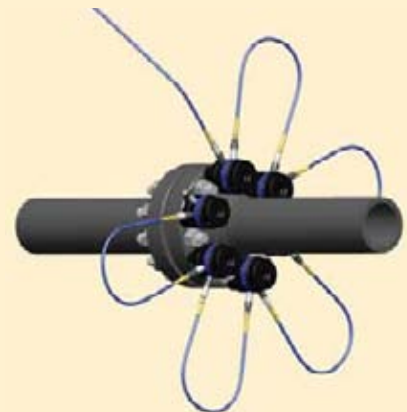
- Step 1:** The bolt Tensioner is fitted over the stud
- Step 2:** Hydraulic pressure is applied to the tensioner which then stretches the stud.
- Step 3:** The Stud's nut is wound down against the joint face
- Step 4:** Pressure is released and the tool removed.

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



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.

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.

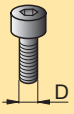
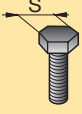



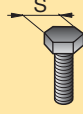
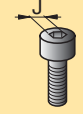
Read Instruction Manuals

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



Hexagon Nut and Bolt Sizes

METRIC SIZES		
		
Thread Size D (mm)	Hexagon Size S (mm)	Hexagon Size J (mm)
M 10	17	8
M 12	19	10
M 14	22	12
M 16	24	14
M 18	27	14
M 20	30	17
M 22	32	17
M 24	36	19
M 27	41	19
M 30	46	22
M 33	50	24
M 36	55	27
M 39	60	27 (30)
M 42	65	32
M 45	70	-
M 48	75	36
M 52	80	36
M 56	85	41
M 60	90	46
M 64	95	46
M 68	100	50
M 72	105	55
M 76	110	60
M 80	115	65
M 85	120	70
M 90	130	70 (75)
M 95	135	-
M 100	145	85
M 105	150	-
M 110	155	-
M 115	165	-
M 120	170	-
M 125	180	-
M 130	185	-
M 140	200	-
M 150	210	-

IMPERIAL SIZES		
		
Thread Size D (in)	Hexagon Size * S (in)	Hexagon Size J (in)
5/8"	1 1/16"	1/2"
3/4"	1 1/4"	5/8"
7/8"	1 7/16"	3/4"
1"	1 5/8"	3/4"
1 1/8"	1 13/16"	7/8"
1 1/4"	2"	7/8"
1 3/8"	2 3/16"	1"
1 1/2"	2 3/8"	1"
1 5/8"	2 9/16"	-
1 3/4"	2 3/4"	1 1/4"
1 7/8"	2 15/16"	1 3/8"
2"	3 1/8"	1 5/8"
2 1/4"	3 1/2"	1 3/4"
2 1/2"	3 7/8"	1 7/8"
2 3/4"	4 1/4"	2"
3"	4 5/8"	2 1/4"
3 1/4"	5"	2 1/4"

* Heavy hexagon nuts.



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



IMPORTANT

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



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

Key To Measurements



Key to measurements

All capacities and measurements in the catalog are expressed in uniform values.

The conversion chart provides helpful information for their translation into equivalent systems.

FDM Conversion Chart		
Inches	Decimal	mm
1/16	0,06	1,59
1/8	0,13	3,18
3/16	0,19	4,76
1/4	0,25	6,35
5/16	0,31	7,94
3/8	0,38	9,53
7/16	0,44	11,11
1/2	0,50	12,70
9/16	0,56	14,29
5/8	0,63	15,88
11/16	0,69	17,46
3/4	0,75	19,05
13/16	0,81	20,64
7/8	0,88	22,23
15/16	0,94	23,81
1	1,00	25,40

Pressure:

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

Force:

1 lbf	= 4.45 N
1 klbf	= 1000 lbf
1 kN	= 1000 N

Weight:

1 pound (lb)	= 0,4536 kg
1 kg	= 2,205 lbs
1 metric ton	= 2205 lbs
	= 1000 kg
1 ton (short)	= 2000 lbs
	= 907,18 kg

Temperature:

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

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

Volume:

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

Other measurements:

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



Free Conversion Calculator

Visit enerpac.com and download the free conversion calculator.

Torque Conversion Factors

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

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