

hydratight[®]

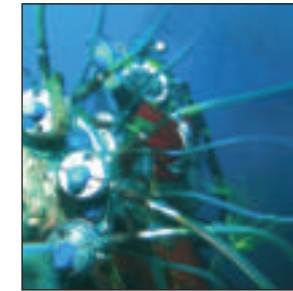
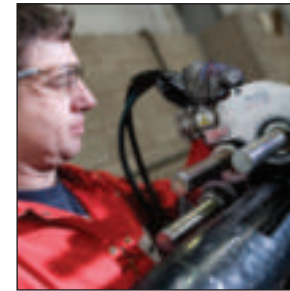
TECHNICAL DATA



Who we are

One Company, Total Support, Complete Solutions

Over many years, Hydratight has provided world-class bolted joint solutions and continues to set international standards in joint integrity for its customers on a global scale.



Hydratight works in partnership with the world's leading OEMs using the latest computer technology and market leading development facilities. We continue to push back the boundaries of technology to provide fast, accurate and reliable solutions to critical assembly problems.

Our people are the key to our success: qualified, competent and innovative people, working closely with our customers ensures a total understanding of their requirements.

One Company - Meets Standards

Totally committed to safety and quality, all Hydratight products and services are designed, manufactured and carried out within a management system in accordance with ISO 9001: 2000 (Quality Management); ISO 14001: 2004 (Environmental Management); OHSAS 18001:1999 (Occupational Health and Safety)

One Company

Our extensive bolting and machining services include:

- Torque and Tension bolting equipment
- Portable machining equipment
- Product sales, rental and technical support
- Product service and training

Non Standard Tooling

Special designs and alternative sizes are available upon request

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Compact Bolt Tensioners - TS Series

The TS range of tensioners have been designed to fit all compact flanges based on Norsok L-005. The tools have been designed to generate the high bolt loads associated with compact flanges (SPO-Vector) while providing versatility for maximum bolt coverage and including the latest user friendly features.



Why use hydraulic bolt tensioners?

Specifying the use of hydraulic bolt tensioners has many benefits when compared to other tightening methods. These include:

- **Accuracy** - Tensioners do not require the bolt or nut to be lubricated. Lubrication often introduces unknowns that can impact accuracy which can increase bolt load scatter
- **Multiple bolts tightened simultaneously** - This ensures the joint is evenly closed and the gasket evenly loaded. Even gasket load significantly improves gasket performance
- **Speed** - Because it is common to simultaneously tension multiple groups of bolts, joints can be tensioned very quickly
- **Reliability** - Tensioning only requires a robust hydraulic cylinder to be pressurised
- **Quality assurance** - Bolt tensioning process is very reliable and repeatable
- **Environmental considerations** - Uniform bolt loading gives even gasket loads minimising risk of emissions from bolted joints

Features

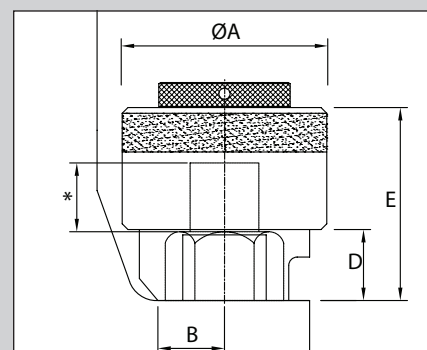
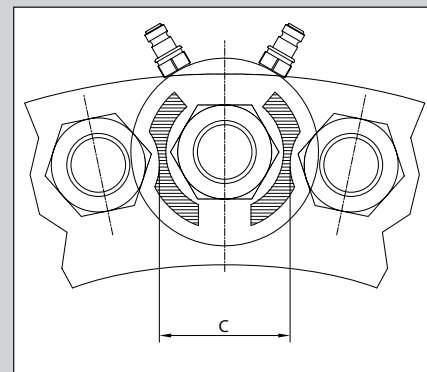
- High load capacity • Rapid spring return • Quick release bridge
- Stroke indicator • Overstroke elimination • Misalignment compensation
- Interchangeable adaptor kits • Quick, simple hose connection

Simplicity

- Dual port design simplifies hose connection eliminating the need for complicated tee block arrangements
- Quick-release bridge, offers tool free bridge changes

Design

- Fits all standard flanges including ANSI, API, Taperlok and Compact Flanges
- All tools offer 15mm stroke (except TS01 which is 10mm)
- Interchangeable adaptor kits include puller sleeve with visible stroke indicator and bridge with retained socket
- High power spring return system reduces operator fatigue and reduces operation time
- Safe overstroke prevention system
- Unique floating piston design allows tilt in any direction without loss of load
- Anti-slip tool surfaces improve operators grip



TS Tensioner Technical Data

Tool Ref	Bolt Diameter		Tool HYD Area		Max Load		Weight		A	B	C	D	E			
	in	mm	in ²	mm ²	Tonf	KN	lb	Kg	mm	mm	mm	mm	mm			
TS01	3/4"	M20	1.39	894	13.4	134.0	4.54	2.06	61.0 ⁽⁵⁾	15.0	48.0	27.5	96.3			
TS02	3/8"	M20	1.92	1240	18.7	186.0	5.56	2.52	69.0 ⁽⁵⁾	15.0	48.0	27.5	103.3			
	7/8"	M22					5.47	2.48						18.4	55.0	27.5
TS03	3/4"	M20	2.52	1628	24.5	244.1	6.88	3.12	77.0 ⁽⁵⁾	15.0	48.0	27.5	104.8			
	7/8"	M22					6.77	3.07						18.4	55.0	27.5
	1"	M24					6.97	3.16						20.0	59.5	32.5
TS04	7/8"	M22	3.35	2159	32.5	323.8	9.04	4.10	89.5	18.4	55.0	27.5	112.3			
	1"	M24					9.15	4.15						20.0	59.5	32.5
	1 1/8"	M30					9.15	4.15						23.4	67.2	35.5
TS05	1"	M24	4.27	2752	41.4	412.7	11.46	5.20	99.0	20.0	59.5	32.5	119.2			
	1 1/8"	M30					11.42	5.18						23.4	67.2	35.5
	1 1/4"	M33					11.55	5.24						27.3	74.0	38.5
TS06	1 1/8"	M30	6.45	4162	62.6	624.1	15.59	7.07	117.5	23.4	67.2	35.5	125.0			
	1 1/4"	M33					15.67	7.11						27.3	74.0	38.5
	1 3/8"	M36					15.96	7.24						31.8	86.4	41.5
TS07	1 1/2"	M39	7.72	4980	74.9	746.8	16.20	7.35	127.0	33.2	86.4	44.5	134.0			
	1 3/4"	M42					18.89	8.57						33.2	86.4	44.5
	1 5/8"	M45					19.05	8.64						34.0	96.0	47.5
TS08	1 3/8"	M36	9.10	5869	88.3	880.1	21.96	9.96	136.5	31.8	86.4	41.5	132.5			
	1 1/2"	M39					22.16	10.05						33.2	86.4	44.5
	1 5/8"	M42					22.31	10.12						34.0	96.0	47.5
TS09	1 3/4"	M42	10.59	6834	102.9	1024.9	23.08	10.47	144.5	39.3	96.8	50.5	141.5			
	1 5/8"	M45					25.82	11.71						43.0	108.4	53.5
	1 7/8"	M48					25.86	11.73						43.0	108.4	53.5
TS10	1 5/8"	M42	12.20	7868	118.4	1179.8	30.36	13.77	156.0	34.0	96.0	47.5	142.5			
	1 3/4"	M45					30.14	13.67						39.3	96.8	50.5
	1 7/8"	M48					31.02	14.07						43.0	108.4	53.5
TS11	2"	M52	15.74	10152	152.8	1522.5	31.64	14.35	174.5	44.1	116.6	57.5	152.5			
	1 7/8"	M48					38.78	17.59						39.3	96.8	50.5
	1 5/8"	M42					39.62	17.97						43.0	108.4	53.5
TS12	2 1/4"	M56	19.72	12722	191.5	1907.7	41.76	18.94	193.5	49.5	130.3	65.5	164.5			
	1 7/8"	M48					49.56	22.48						43.0	108.4	53.5
	2 1/2"	M64					50.07	22.71						44.1	116.6	57.5
TS13	3"	M72	26.29	16964	255.3	2544.0	51.37	23.30	218.5	56.0	143.5	69.5	172.2			
	2 3/4"	M68					52.40	23.77						56.0	143.5	69.5
	2"	M52					52.40	23.77						56.0	143.5	69.5
TS14	3 1/4"	M85	36.35	23451	352.9	3516.7	72.77	33.01	259.0	69.0	176.0	81.7	184.5			
	3"	M72					71.41	32.39						69.0	176.0	81.7
	3 1/2"	M90					105.98	48.07						69.6	186.0	90.5
TS15	3 1/2"	M90	48.06	31008	466.7	4650.0	108.62	49.27	295.5	78.6	200.0	95.5	199.3			
	3 3/4"	M95					139.55	63.30						78.6	200.0	95.5
	4"	M100					150.44	68.24						80.7	217.4	100.8
							145.46	65.98		89.9	232.0	107.1	210.9			

Notes:

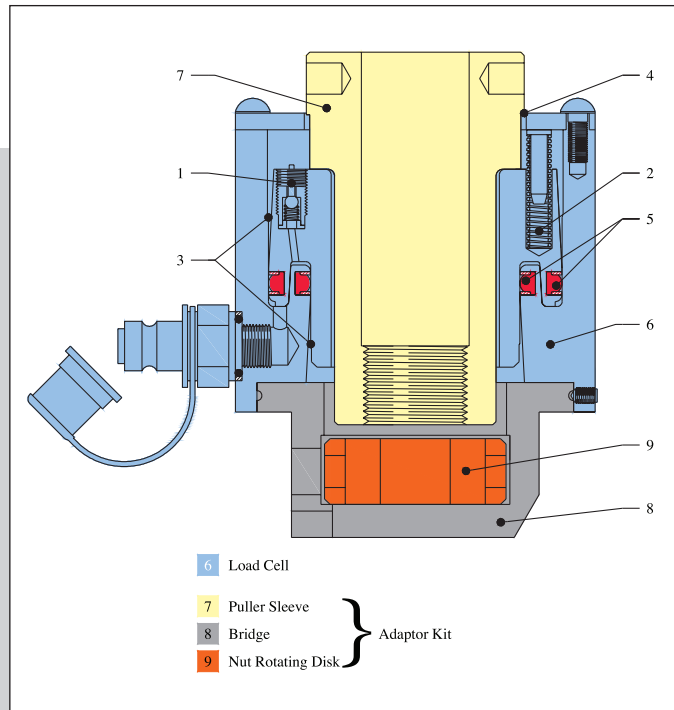
1. Alternative size adaptor kits can be supplied on request.
2. Maximum Working Pressure 21750 psi (1500 Bar).
3. Weight includes head, bridge, socket and puller sleeve.
4. Product development is continually taking place and therefore certain dimensions could be subject to change.

Notes:

5. Eccentric shaped tool.
6. All tools have 15mm stroke except TS01 Stroke = 10mm.
7. TS0 - TS05 have a mechanical overstroke prevention and no spring return.
8. TS06 - TS15 have a relief valve overstroke prevention and spring return.
9. Dimension 'C' measured across tool centerline.

Rev E

Topside Bolt Tensioners - PS Series

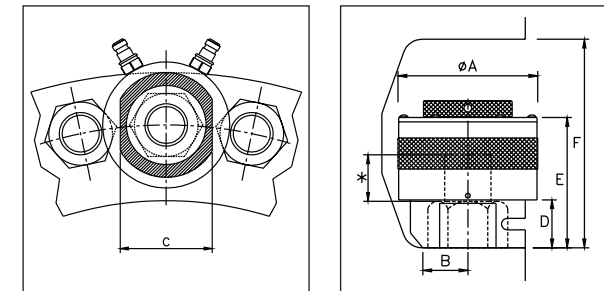


The PS range of tensioners has been designed using state-of-the-art CAD techniques to bring you the most advanced bolt tensioner on the market. Safety, quality, toughness and reliability are incorporated as standard.

To ensure the tools you buy meet our own exacting requirements, every prototype, during the design process, is put through finite element stress analysis, rigorous cyclic testing and strain gauging.

- Superior sealing ability
- Overstroke elimination
- Piston stroke indication
- Misalignment compensation
- Rapid power return stroke
- Interchangeable adaptor kits

Nom Bore	Flange Rating					
	150 [#] (PN20)	300 [#] (PN50)	600 [#] (PN100)	900 [#] (PN150)	1500 [#] (PN250)	2500 [#] (PN420)
1/2 (15)	4 x 1/2" (M14)	4 x 1/2" (M14)	4 x 1/2" (M14)	4 x 3/4" (M20)	4 x 3/4" (M20)	4 x 3/4" (M20)
3/4 (20)	4 x 1/2" (M14)	4 x 5/8" (M16)	4 x 5/8" (M16)	4 x 3/4" (M20)	4 x 3/4" (M20)	4 x 3/4" (M20)
1 (25)	4 x 1/2" (M14)	4 x 5/8" (M16)	4 x 5/8" (M16)	4 x 7/8" (M24)	4 x 7/8" (M24)	4 x 7/8" (M24)
1 1/2 (40)	4 x 1/2" (M14)	4 x 3/4" (M20)	4 x 3/4" (M20)	4 x 1" (M27)	4 x 1" (M27)	4 x 1 1/8" (M30)
2 (50)	4 x 5/8" (M16)	8 x 5/8" (M16)	8 x 5/8" (M16)	8 x 7/8" (M24)	8 x 7/8" (M24)	8 x 1" (M27)
3 (80)	4 x 5/8" (M16)	8 x 3/4" (M20)	8 x 3/4" (M20)	8 x 7/8" (M24)	8 x 1 1/8" (M30)	8 x 1 1/4" (M33)
4 (100)	8 x 5/8" (M16)	8 x 3/4" (M20)	8 x 7/8" (M24)	8 x 1 1/8" (M30)	8 x 1 1/4" (M33)	8 x 1 1/2" (M39)
6 (150)	8 x 3/4" (M20)	12 x 3/4" (M20)	12 x 1" (M27)	12 x 1 1/8" (M30)	12 x 1 1/2" (M36)	8 x 2" (M52)
8 (200)	8 x 3/4" (M20)	12 x 7/8" (M24)	12 x 1 1/8" (M30)	12 x 1 1/2" (M36)	12 x 1 5/8" (M42)	12 x 2" (M52)
10 (250)	12 x 7/8" (M24)	16 x 1" (M27)	16 x 1 1/4" (M33)	16 x 1 3/8" (M36)	16 x 1 7/8" (M48)	12 x 2 1/2" (M64)
12 (300)	12 x 7/8" (M24)	16 x 1 1/8" (M30)	20 x 1 1/4" (M33)	20 x 1 3/8" (M36)	16 x 2" (M52)	12 x 2 3/4" (M68)
14 (350)	12 x 1" (M27)	20 x 1 1/8" (M30)	20 x 1 3/8" (M36)	20 x 1 1/2" (M39)	16 x 2 1/4" (M56)	
16 (400)	16 x 1" (M27)	20 x 1 1/4" (M33)	20 x 1 1/2" (M39)	20 x 1 5/8" (M42)	16 x 2 1/2" (M64)	
18 (450)	16 x 1 1/8" (M30)	24 x 1 1/4" (M33)	20 x 1 5/8" (M42)	20 x 1 7/8" (M48)	16 x 2 3/4" (M68)	
20 (500)	20 x 1 1/8" (M30)	24 x 1 1/4" (M33)	24 x 1 5/8" (M42)	20 x 2" (M52)	16 x 3" (M76)	
24 (600)	20 x 1 1/4" (M33)	24 x 1 1/2" (M39)	24 x 1 7/8" (M48)	20 x 2 1/2" (M64)	16 x 3 1/2" (M90)	
26 (650)	24 x 1 1/4" (M33)	28 x 1 5/8" (M42)	28 x 1 7/8" (M48)	20 x 2 3/4" (M68)		
28 (700)	28 x 1 1/4" (M33)	28 x 1 5/8" (M42)	28 x 2" (M52)	20 x 3" (M76)		
30 (750)	28 x 1 1/4" (M33)	28 x 1 3/4" (M45)	28 x 2" (M52)	20 x 3" (M76)		
32 (800)	28 x 1 1/2" (M39)	28 x 1 7/8" (M48)	28 x 2 1/4" (M56)	20 x 3 1/4" (M85)		
34 (850)	32 x 1 1/2" (M39)	28 x 1 7/8" (M48)	28 x 2 1/4" (M56)	20 x 3 1/2" (M90)		
36 (900)	32 x 1 1/2" (M39)	32 x 2" (M39)	28 x 2 1/2" (M64)	20 x 3 1/2" (M90)		



*Bolt protrusion above head of nut

Should you have an application where it is not possible to use our standard range of tools, then we invite you to draw on our extensive experience in providing tailor-made solutions to problems involving bolted joints, visit www.hydratight.com for more info.

Equals 1 x bolt diameter (minimum)

■ = Primary Tool

To cover a wide range of bolts with the minimum number of tools (4 load cells cover 15 bolt sizes).

■ = Secondary Tool

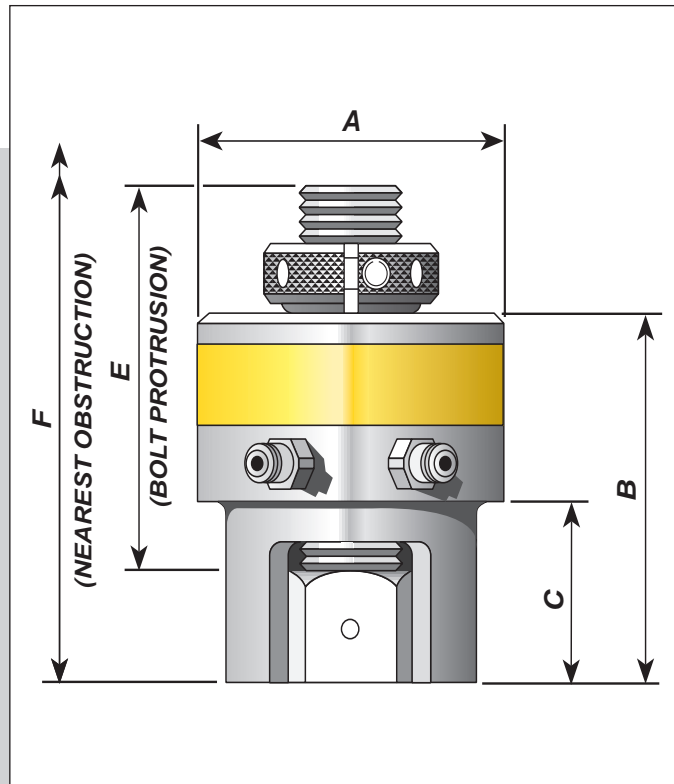
To provide the smallest possible tool for a particular bolt size, thus making it the most economic.

■ = Sizes available upon request

Tensioner Ref	Bolt Dia.	Tool Hyd Area		Max Load		Weight		A	B	C	D	E	F
		in ²	mm ²	TONF	KN	lb	Kg						
PS0	3/4" M20	1.48	954	14.4	143.5	2.9	1.3	66.0	25.0	62.0	34.5	91.5	133.5
	7/8" M22								25.0	62.0	34.5	91.5	136.5
PS1	1" M24	2.95	1903	28.6	285.0	7.7	3.5	90.0	28.5	75.0	43.0	123.0	172.4
	1 1/8" M27								31.7	80.0	46.0	126.0	178.5
PS2	1" M24								30.0	75.0	38.0	128.6	178.0
	M27												
	1 1/8" M30	4.74	3058	46.0	458.3	12.1	5.5	109.0	30.2	80.0	41.0	131.6	184.0
	M33								35.0	88.0	44.0	134.6	190.5
PS3	1 3/8" M36								38.3	96.0	47.0	137.6	197.0
	1 1/2" M39	6.90	4452	67.0	667.8	15.4	7.0	126.0	35.0	88.0	44.0	137.0	193.0
	M42								42.0	96.0	50.4	143.4	206.0
PS4	1 5/8" M42								41.1	108.0	53.5	146.5	212.0
	M45								42.0	113.0	50.0	149.0	212.0
	M48	10.41	6716	101.1	1007.3	22.1	10.0	146.0	45.5	113.0	53.5	152.5	218.0
	2"								52.1	118.0	57.0	156.0	224.5
									51.0	114.0	60.0	159.0	231.0
PS5	2 1/4" M56								52.0	132.0	63.0	164.0	247.5
	M60	13.45	8677	130.6	1301.2	33.1	15.0	174.0	58.0	138.0	69.5	170.5	255.0
PS6	M64												
	M68	15.71	10135	152.5	1514.5	37.5	17.0	184.0	63.2	153.0	76.0	176.0	267.0
									76.0	164.0	82.0	181.9	280.0
PS7	3" M76	21.67	13980	210.5	2097.3	57.3	26.0	220.0	85.0	157.0	82.0	182.0	280.0
	M80								80.0	180.0	89.0	189.0	292.5
PS8	M85												
	M90	25.49	16445	247.5	2466.0	65.0	29.5	240.0	80.0	180.0	89.0	192.5	296.0
									95.0	190.0	95.0	198.5	308.5
PS9	M95								102.5	205.0	101.0	204.5	321.5
	M100	34.09	21991	331.0	3297.9	86.0	38.0	271.0	93.6	200.0	107.0	211.0	308.0
PS10	M105								103.0	210.0	114.0	218.0	346.0
	M110	40.15	25935	389.9	3884.8	108.0	49.0	282.0	124.5	218.0	121.0	238.0	387.0
	M115												
	4 1/2"								130.0	229.0	127.0	234.0	394.0

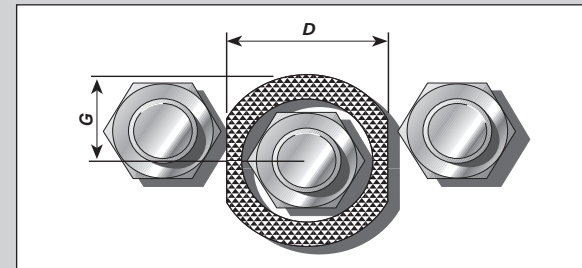
Please note: 1. Product development is constantly taking place and details may alter without prior notice.
2. Weight includes load cell, bridge and nut rotating disk.
3. Max tool operating pressure – 21,750 Psi (1,500 bar).

Subsea Bolt Tensioners - AQUAJACK® Range



AQUAJACK is a registered trademark of Hydratight Limited

- Unique reaction nut design allows rapid tool removal and application to long bolts and damaged threads
- 30mm maximum piston stroke for tools AJ2 to AJ8. 20mm maximum for tools AJ0 and AJ1. All tools incorporate visible piston stroke indicators
- Innovative tool design ensures maximum tool strokes can be used without overstroking the piston or oil spillage
- Maximum tool operating pressure 21,750 psi (1500 bar)



Tensioner Ref		Tool Hyd Area	Max Load	A	B	C	D	E	F	G
Bolt Dia.	Tool No.	in ²	LBS	in	in	in	in	in	in	in
5/8"	AJ0	0.748	16,269	2.05	3.70	1.27	1.85	3.94	8.74	0.79
3/4"	AJ1	1.55	33,713	2.60	3.50	1.37	2.36	3.78	8.54	1.00
7/8"	AJ1	1.55	33,713	2.60	3.50	1.37	2.36	3.78	8.54	1.00
1"	AJ2	2.56	55,680	3.23	4.72	1.97	2.95	4.92	11.37	1.20
1 1/8"	AJ2	2.56	55,680	3.23	4.72	1.97	2.95	4.92	11.37	1.20
1 1/4"	AJ3	3.90	84,825	3.86	5.16	2.28	3.62	5.12	12.09	1.50
1 3/8"	AJ3	3.90	84,825	3.86	5.16	2.28	3.62	5.12	12.09	1.50
1 1/2"	AJ4	5.69	123,758	4.49	5.35	2.48	3.78	5.31	12.55	1.77
1 5/8"	AJ4	5.69	123,758	4.49	5.35	2.48	3.78	5.31	12.55	1.77
1 3/4"	AJ5	9.13	198,578	5.47	5.75	2.76	4.49	5.51	13.4	2.05
1 7/8"	AJ5	9.13	198,578	5.47	5.75	2.76	4.49	5.51	13.4	2.05
2"	AJ5	9.13	198,578	5.47	5.75	2.76	4.49	5.51	13.4	2.05
2 1/4"	AJ6	12.86	279,705	6.46	6.34	3.23	5.43	5.91	14.45	2.48
2 1/2"	AJ6	12.86	279,705	6.46	6.34	3.23	5.43	5.91	14.45	2.48
2 3/4"	AJ7	19.14	416,295	7.56	7.01	3.74	6.18	6.19	15.74	2.99
3"	AJ7	19.14	416,295	7.56	7.01	3.74	6.18	6.19	15.74	2.99
3 1/4"	AJ8	23.94	520,695	8.50	7.60	4.29	7.18	6.5	16.22	3.35
3 1/2"	AJ8	23.94	520,695	8.50	7.60	4.29	7.18	6.5	16.22	3.35

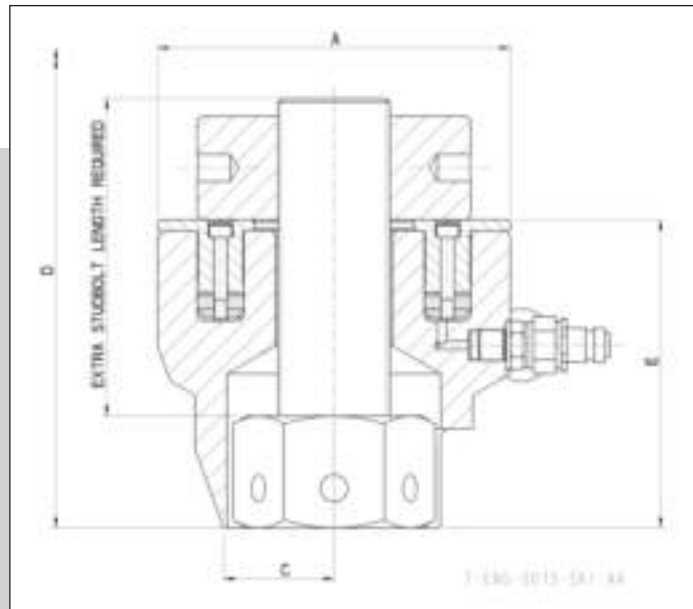


- Compact tool design allows easier access into restricted applications and low head clearances
- Unique floating piston design allows tilt in any direction without loss of load, thus eliminating piston seizure and aiding tool retraction
- Special anti-slip tool surface improves operator grip, thus easing maneuverability and application
- Integral manifold design simplifies hose connection eliminating complicated tee-block arrangements

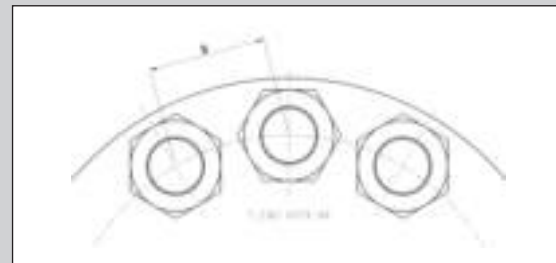
Tensioner Ref		Tool Hyd Area	Max Load	A	B	C	D	E	F	G
Bolt Dia.	Tool No.	mm ²	LBS	in	in	in	in	in	in	in
M16	AJ0	483	16,269	2.05	3.70	1.85	1.85	3.94	8.74	0.79
M20	AJ1	1001	33,713	2.60	3.50	1.37	2.36	3.78	8.54	1.00
M22	AJ1	1001	33,713	2.60	3.50	1.37	2.36	3.78	8.54	1.00
M24	AJ2	1649	55,680	3.23	4.72	1.97	2.95	4.92	11.37	1.20
M27	AJ2	1649	55,680	3.23	4.72	1.97	2.95	4.92	11.37	1.20
M30	AJ2	1649	55,680	3.23	4.72	1.97	2.95	4.92	11.37	1.20
M33	AJ3	2513	84,825	3.86	5.16	2.28	3.62	5.12	12.09	1.50
M36	AJ3	2513	84,825	3.86	5.16	2.28	3.62	5.12	12.09	1.50
M39	AJ4	3674	123,758	4.49	5.35	2.48	3.78	5.31	12.55	1.77
M42	AJ4	3674	123,758	4.49	5.35	2.48	3.78	5.31	12.55	1.77
M45	AJ5	5893	198,578	5.47	5.75	2.76	4.49	5.51	13.4	2.05
M48	AJ5	5893	198,578	5.47	5.75	2.76	4.49	5.51	13.4	2.05
M52	AJ5	5893	198,578	5.47	5.75	2.76	4.49	5.51	13.4	2.05
M56	AJ6	8294	279,705	6.46	6.34	3.23	5.43	5.91	14.45	2.48
M60	AJ6	8294	279,705	6.46	6.34	3.23	5.43	5.91	14.45	2.48
M64	AJ6	8294	279,705	6.46	6.34	3.23	5.43	5.91	14.45	2.48
M68	AJ7	12346	416,295	7.56	7.01	3.74	6.18	6.19	15.74	2.99
M72	AJ7	12346	416,295	7.56	7.01	3.74	6.18	6.19	15.74	2.99
M76	AJ7	12346	416,295	7.56	7.01	3.74	6.18	6.19	15.74	2.99
M80	AJ8	15447	520,695	8.50	7.60	4.29	7.18	6.5	16.22	3.35
M85	AJ8	15447	520,695	8.50	7.60	4.29	7.18	6.5	16.22	3.35
M90	AJ8	15447	520,695	8.50	7.60	4.29	7.18	6.5	16.22	3.35

Subsea Bolt Tensioners - SEA SERPENT I® Range

Specifically designed for use by divers and proven worldwide in the most hostile offshore environments the tool provides the most cost effective solution to subsea bolting problems. Available with standard or split reaction nuts.



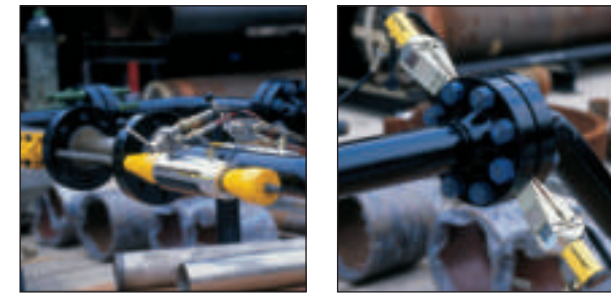
SEA SERPENT is a registered trademark of Hydratight Limited



- The proven solution to subsea bolting problems
- Compact lightweight diver friendly
- Maximum Ram Stroke is 20mm (3/4")
- Maximum Tool Operating Pressure 1034 bar (15,000psi)

	Stud Size		Total Load Capacity			Hydraulic Pressure Area		Effective OD		Min CLD		Base Clearance		Min Headroom		Tool Height		Extra studbolt length required		Total Tool Weight			
	Metric	Imperial	kN	tonf	lbf	mm ²	in ²	A	B	C	D	E	F	G	H	I	J	K	L	M	N		
	mm	in						mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	kg	lbs		
Y	M20	3/4"	173.8	17.44	39059	1680	2.60	72	2.83	22.5	0.89	296	11.61	115	4.53	135	5.31	2.89	6.37	3.13	6.90		
	M22	7/8"																				2.89	6.37
Z	M24	1"	235.6	23.64	52956	2278	3.53	80	3.15	33.0	1.30	300	11.79	113	4.45	133	5.24	3.81	8.40	3.77	8.31		
	M27	1 1/8"																				3.81	8.40
	M30	-																				3.77	8.31
A	M33	1 1/4"	355.1	35.63	79817	3433	5.32	113	4.45	35.0	1.38	322	12.68	122	4.80	142	5.59	6.83	15.1	6.93	15.3		
	M36	1 3/8"																				6.83	15.1
B	M39	1 1/2"	491.3	49.30	110440	4750	7.36	129	5.08	41.0	1.61	344	13.54	130	5.12	150	5.91	9.32	20.5	9.45	20.8		
	M42	1 5/8"																				9.32	20.5
C	M45	1 3/4"	657.6	66.00	147837	6359	9.86	150	5.91	101	3.96	45.0	1.77	358	14.09	134	5.28	154	6.06	13.2	29.1		
D	M48	1 7/8"	702.8	70.53	157990	6795	10.53	160	6.30	50.0	1.97	373	14.69	140	5.51	160	6.30	15.4	33.9	15.5	34.1		
	M52	2"																				15.4	33.9
E	M56	2 1/4"	1041	104.5	234009	10065	15.60	174	6.85	121	4.78	58.0	2.28	424	16.70	161	6.34	181	7.13	16.4	36.2		
F	M60	-	1269	127.4	285303	12271	19.02	197	7.76	64.0	2.52	441	17.36	168	6.61	188	7.40	19.9	43.9	20.5	45.1		
	M64	2 1/2"																				19.9	43.9
G	M68	2 3/4"	1547	155.2	347681	14954	23.18	211	8.31	68.0	2.68	457	17.99	171	6.73	191	7.52	23.9	52.8	23.8	52.4		
	M72	-																				23.8	52.4
H	M76	3"	1863	186.9	418751	18011	27.92	220	8.66	159	6.25	78.0	3.07	513	20.20	196	7.72	216	8.50	33.5	73.8		
I	M80	-	2476	248.5	556673	23943	37.11	257	10.12	89.0	3.50	535	21.06	205	8.07	225	8.86	40.5	89.2	41.8	92.2		
	M85	3 1/4"																				40.5	89.2
	M90	3 1/2"																				41.8	92.2

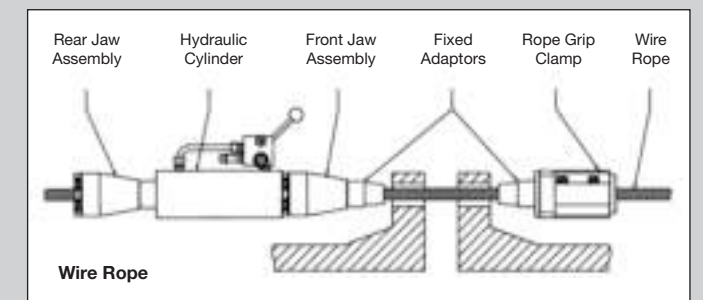
Flange Pulling & Spreading



Flange Pulling System

The system utilises a 6" (150mm) stroke, double acting hollow cylinder, together with wire rope or threaded bars. A unique design jaw assembly is used to grip and release the rope. A four-way valve is incorporated into the unit to provide fast and simple operation and close operator control. Any number of cylinders can be used individually or simultaneously to provide constant load or controlled displacement.

- Fast, powerful and controllable pulling and alignment for flanges and heavy equipment
- Lightweight and self contained

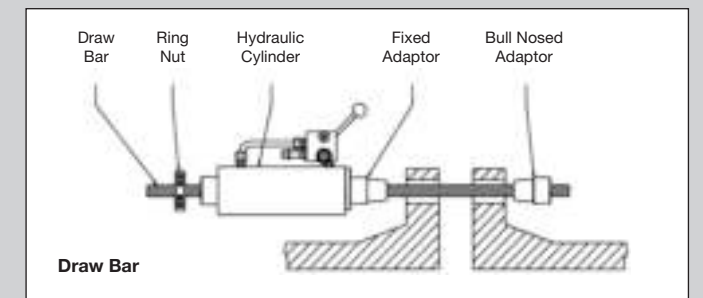


Cylinder Model	Load Capacity		Max. Operating Pressure		Use with wire rope				Use with drawbar				
	tons	kN	psi	bar	Rope dia.	Specified Minimum Breaking Load of Rope	Weight	Weight	Weight	Weight			
Standard Model	12.7	127	5500	380	3/4"	19	30.41	303	84	38	1" UNC	48	22
					1"	25	52.75	525					

Flange Spreading System

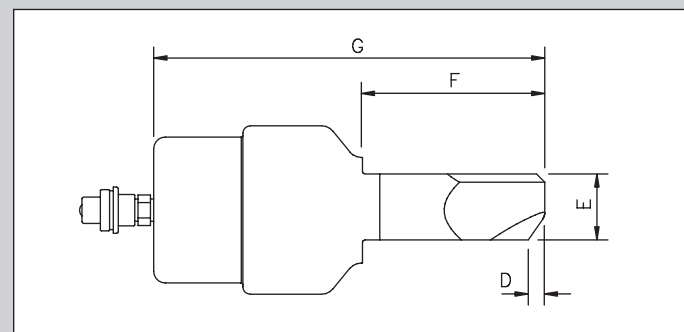
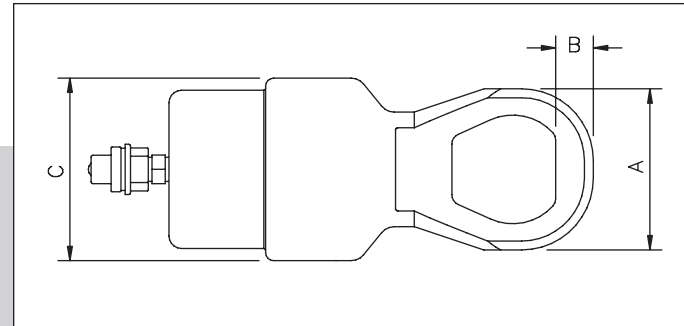
The tool utilises a high load compact hydraulic cylinder, together with a unique design wedge and retaining mechanism to smoothly and evenly force open the flanged joint. A minimum of two flange spreaders should be used simultaneously for effective operation. Unique interlocking first step enhances safety, giving secure holding at the tips.

- Suitable for subsea and topside operations
- Robust, lightweight tool - 13.23 lbs
- Spring return
- 40mm stroke
- 6,500 psi (450 bar) generates 10 tons (100 KN) of separating force



Hypur-Mate Nut Splitter

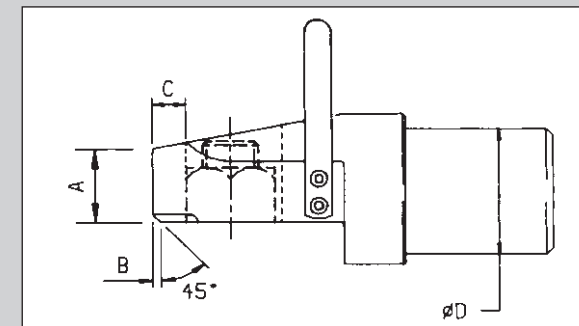
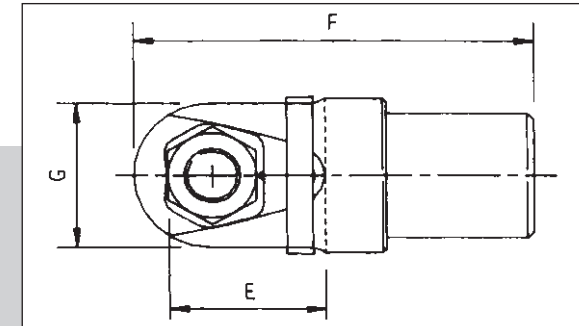
- Designed to suit standard ANSI B16.5/BS1560 flanges (1/2" NB up to 36" NB). See flange fit chart to determine compatibility of flanges with individual heads
- Common detachable hydraulic cylinders with interchangeable heads
- Alternative cylinder designs on all models:
 - Spring return: Suitable for land-based use only
 - Double acting: Hydraulic return can be used land-based or subsea
- Bolt diameters covered: 3/4" up to 3 1/2" imperial, M20 up to M90 metric
- 3-point interchangeable blade, replaceable in seconds without tool assembly
- Cutting blade can be easily pre-set to prevent damage to bolt threads
- Bolt diameter scale to aid setting of cutting blade
- Integral pressure relief valve to prevent over pressurisation
- Designed to cut hexagonal engineering nuts only
- Heads not designed with API flanges in mind, therefore advisable to perform tooling access check if tool is required for use with such flanges
- Cyclically tested to ensure improved safety and reliability



Cylinder Ref	Head Ref	Bolt Size		A	B	C	D	E	F	G (max)	WEIGHT
		IMP	MET								
H3	1	3/4" 7/8" 1"	M20 M22 M24 M27	76.0	18.0	102.0	10.0	40.0	106.0	226.0	6.25
	2	7/8" 1" 1 1/8" 1 1/4"	M22 M24 M27 M30 M33	90.0	21.0	102.0	10.0	40.0	111.0	237.0	6.5
H5	3	1 1/8" 1 1/4" 1 3/8" 1 1/2"	M30 M33 M36 M39	102.0	22.0	136.0	6.0	57.0	134.0	311.0	15.5
	4	1 1/8" 1 1/4" 1 3/8" 1 1/2" 1 5/8" 1 3/4"	M30 M33 M36 M39 M42 M45	114.0	23.0	136.0	6.0	57.0	141.0	320.0	16.0
H10	5	1 3/4" 1 7/8" 2"	M45 M48 M52	132.0	28.0	180.0	8.0	81.0	186.0	412.0	37.0
	6	1 3/4" 1 7/8" 2" 2 1/4"	M45 M48 M52 M56	145.0	30.0	180.0	8.0	81.0	196.0	422.0	37.5
H10	7	1 3/4" 1 7/8" 2" 2 1/4" 2 1/2"	M45 M48 M52 M56 M60 M64	160.0	32.0	180.0	8.0	81.0	201.0	432.0	38.5
	8	1 3/4" 1 7/8" 2" 2 1/4" 2 1/2" 2 3/4"	M45 M48 M52 M56 M60 M64 M68 M72	174.0	35.0	180.0	9.0	81.0	209.0	443.0	39.5
H17	9	2 3/4" 3"	M76 M80	189.0	36.0	234.0	4.0	111.0	234.0	472.0	68.75
	10	2 3/4" 3" 3 1/4" 3 1/2"	M76 M80 M85 M90	219.0	41.0	234.0	2.5	111.0	242.0	493.0	71.75

Product development is constantly taking place and specifications may change without prior notice.

HS Nut Splitter



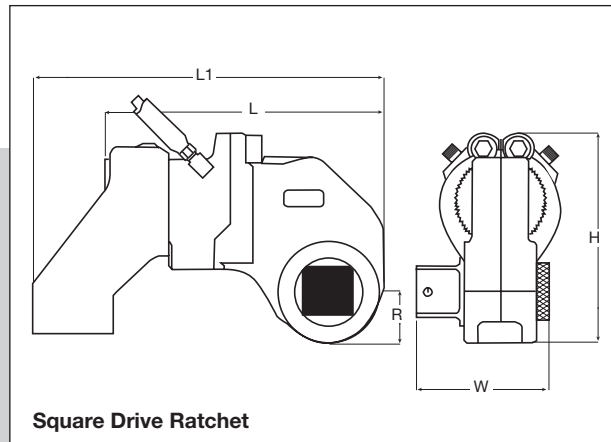
The tools utilise powerful, lightweight hydraulic cylinders to drive a precision engineered cutting wedge into the flat of the nut.

The cutting wedge, with three cutting edges, has been designed for maximum life and minimum installation time. Wedges can be changed in seconds. Spring retract on the hydraulic cylinder ensures fast and effective cutting, while the wedge design allows the nut to be split without damage to the threads on the bolt or stud.

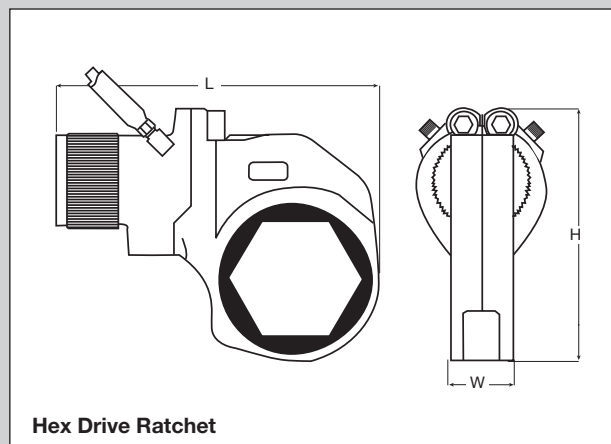
- The fast, sure and safe method to remove corroded or seized nuts
- No need for hot cutting, chiselling or grinding
- Fits standard ANSI flanges
- Maximum tool operating pressure 20,000 psi (1400 bar)

Tool No.	Bolt Size	Nut Size - A/F	A		B		C		D		E		F		G		Wt.			
			in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg		
HTC - A	HTNS-1	3/4" (M20)	1 1/4"	30mm	1.61	41	0.16	4	0.55	14	3.00	76	2.20	56	8.27	213	2.52	64	13.2	6
	HTNS-2	3/4"-7/8" (M20-M22)	1 1/4"-1 7/16"	30mm-32mm	1.61	41	0.16	4	0.59	15	3.00	76	2.36	60	8.58	218	2.60	66	13.6	6.2
	HTNS-3	7/8"-1" (M22-M24)	1 1/8"-1 5/8"	32mm-36mm	1.61	41	0.16	4	0.63	16	3.00	76	2.56	65	8.78	223	2.91	74	14.3	6.5
	HTNS-4	1"-1 1/8" (M24-M27)	1 5/8"-1 13/16"	36mm-41mm	1.61	41	0.16	4	0.73	18.5	3.00	76	2.95	75	9.09	231	3.15	80	15.4	7
HTC - B	HTNS-5	1 1/8"-1 1/4" (M27-M33)	1 13/16"-2"	41mm-50mm	2.20	56	0.24	6	0.77	19.5	3.74	95	4.05	103	10.86	276	3.39	86	17.6	8
	HTNS-6	1 1/4"-1 3/8" (M33-M36)	2"-2 3/16"	50mm-55mm	2.20	56	0.24	6	0.83	21	3.74	95	4.25	108	11.10	282	3.62	92	19.8	9
	HTNS-7	1 3/8"-1 1/2" (M36-M39)	2 1/16"-2 1/8"	55mm-60mm	2.20	56	0.24	6	0.88	22.5	3.74	95	4.37	111	11.30	287	4.01	102	24.2	11
HTC - C	HTNS-8	1 1/2"-1 5/8" (M39-M42)	2 3/8"-2 3/16"	60mm-65mm	2.20	56	0.24	6	0.94	24	3.74	95	4.53	115	11.57	294	4.33	110	30.8	14
	HTNS-9	1 5/8"-1 3/4" (M42-M45)	2 5/16"-2 1/4"	65mm-70mm	2.20	56	0.24	6	1.00	25.5	3.74	95	4.80	122	11.81	300	4.49	114	41.8	19
HTC - D	HTNS-10	1 3/4"-1 7/8" (M45-M48)	2 3/4"-2 5/16"	70mm-75mm	3.07	78	0.31	8	1.06	27	5.63	143	5.39	137	14.72	374	4.88	124	56.2	25.5
	HTNS-11	1 7/8"-2" (M48-M52)	2 5/16"-3 1/8"	75mm-80mm	3.07	78	0.31	8	1.14	29	5.63	143	5.55	141	14.88	378	5.16	131	70.5	32
	HTNS-12	2"-2 1/4" (M52-M56)	3 1/8"-3 1/2"	80mm-85mm	3.07	78	0.31	8	1.20	30.5	5.63	143	5.90	150	15.35	390	5.67	144	87.1	39.5
	HTNS-13	2 1/4"-2 1/2" (M56-M64)	3 1/2"-3 3/8"	85mm-95mm	3.07	78	0.31	8	1.24	31.5	5.63	143	6.30	160	15.79	401	6.22	158	103.6	47
HTC - E	HTNS-14	2 1/2"-2 3/4" (M64-M72)	3 7/8"-4 1/4"	95mm-105mm	3.07	78	0.31	8	1.30	33	5.63	143	6.65	169	16.22	412	6.69	170	122.3	55.5
	HTNS-15	2 3/4"-3" (M72-M76)	4 1/8"-4 5/8"	105mm-110mm	4.29	109	0.40	10	1.55	39.5	6.93	176	7.64	194	19.56	497	7.56	192	141.1	64
	HTNS-16	3"-3 1/4" (M76-M80)	4 5/8"-5"	110mm-120mm	4.29	109	0.40	10	1.61	41	6.93	176	8.03	204	20.00	508	7.99	203	160.9	73
	HTNS-17	3 1/4"-3 1/2" (M80-M90)	5"-5 5/8"	120mm-130mm	4.29	109	0.40	10	1.67	42.5	6.93	176	8.35	212	20.39	518	8.50	216	182.9	83

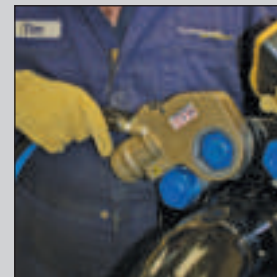
Torque Wrenches - RSL™ Series



Square Drive Ratchet



Hex Drive Ratchet



- Low maintenance tool with only three moving parts
- 10000 psi (700 bar) max operating pressure
- Compact lightweight design
- Versatile interchangeable square drive and hexagon cassettes
- Reliable rugged design with all components made from high strength alloy steels
- Simple effective ratchet design
- High power to weight ratio
- Designed to work continuously and efficiently at full capacity

Model	Torque		SQ Drive	AF Cassette		W		H		L		L1		R		Weight					
	FT-LB	NM		in	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	Power Head*	Reaction Arm	SQ Drive		
																LB	KG	LB	KG	LB	KG
RSL2	SQ Drive	123-1408	167-1909	3/4		2.30	58	4.48	114	6.29	160	7.35	187	0.94	23.9	3.98	1.81	0.50	0.23	2.53	1.15
	Cassette			7/8 - 2 1/2	22-60	1.25	32	4.33	110	6.00	153										
RSL4	SQ Drive	290-3080	393-4176	1		2.88	73	5.57	142	6.83	173	8.76	222	1.19	30.2	6.12	2.78	1.40	0.63	4.75	2.15
	Cassette			1 1/4 - 2 1/2	27-75	1.38	35	5.35	136	7.45	190										
RSL6	SQ Drive	457-5325	619-7190	1 1/2		3.71	94	6.42	164	9.27	235	11.67	296	1.52	38.6	8.61	3.90	3.96	1.80	9.08	4.10
	Cassette			1 1/2 - 3 1/4	50-80	1.75	45	6.52	166	9.08	231										
RSL8	SQ Drive	725-7860	984-10660	1 3/4		4.14	105	6.65	169	9.47	241	11.56	294	1.52	38.6	10.60	4.81	3.62	1.64	11.25	5.10
	Cassette			2 1/4 - 3 1/4	55-80	2.25	58	6.84	174	9.37	238										
RSL14	SQ Drive	961-11150	1303-15123	1 3/4		4.63	118	7.93	202	11.26	286	12.49	317	1.88	47.8	12.75	5.78	3.81	1.73	16.62	7.54
	Cassette			2 1/4 - 4 1/4	65-115	2.50	64	8.03	204	10.00	254										
RSL20	SQ Drive	1957-18843	2654-25170	2 1/2		6.38	162	9.48	241	13.46	342	18.97	482	2.50	63.5	19.70	8.93	15.30	6.94	29.04	13.17
	Cassette			3 1/4 - 4 1/4	80-115	2.75	70	9.44	240	12.72	323										
RSL30	SQ Drive	2298-28000	3116-37965	2 3/4		6.64	164	10.35	263	13.72	348	17.19	437	2.50	63.5	21.34	9.69	11.00	4.99	36.75	16.67
	Cassette			3 1/4 - 6 1/4	85-155	3.00	76	10.54	268	14.26	363										

Notes * Weight with lead hoses. Additional weights and sizes of hex heads are available on request. Tool accuracy +/- 3%.

RSL™ Hex Dimensions

Hex Housing	Maximum Nut Size		R - Nose Radius		L - Length		W - Width		H - Height	
	Inches	Metric, mm	Inches	Metric, mm	Inches	Metric, mm	Inches	Metric, mm	Inches	Metric, mm
RSL2H014	7/8	22	0.88	22.4	6.00	152.4	1.25	31.8	4.33	110.0
101	1 1/16	27	0.95	24.1	6.05	153.7	1.25	31.8	4.50	114.3
104	1/4	30	1.03	26.2	6.12	155.4	1.25	31.8	4.57	116.1
107	17/16	36	1.15	29.2	6.24	158.5	1.25	31.8	4.69	119.1
110	1 5/8	41	1.40	35.6	6.41	162.8	1.25	31.8	4.86	123.4
113	1 13/16	46	1.48	37.6	6.49	164.8	1.25	31.8	4.94	125.5
200	2	50	1.58	40.1	6.58	167.1	1.25	31.8	5.03	127.8
203	2 3/16	55	1.58	40.1	6.68	169.7	1.25	31.8	5.13	130.3
206	2 3/8	60	1.70	43.2	6.79	172.5	1.25	31.8	5.24	133.1
RSL4H104	1 1/4	30	1.03	26.2	7.45	189.2	1.38	35.1	5.35	135.9
107	17/16	36	1.18	30.0	7.62	193.5	1.38	35.1	5.49	139.4
110	1 5/8	41	1.32	33.5	7.77	197.4	1.38	35.1	5.63	143.0
113	1 13/16	46	1.47	37.3	7.87	199.9	1.38	35.1	5.78	146.8
200	2	50	1.60	40.6	8.04	204.2	1.38	35.1	5.92	150.4
203	2 3/16	55	1.76	44.7	8.16	207.3	1.38	35.1	6.08	154.4
206	2 3/8	60	1.84	46.7	8.25	209.6	1.38	35.1	6.15	156.2
209	2 9/16	65	1.95	49.5	8.14	206.8	1.38	35.1	6.26	159.0
212	2 3/4	70	2.04	51.8	8.23	209.0	1.38	35.1	6.36	161.5
215	2 15/16	75	2.16	54.9	8.34	211.8	1.38	35.1	6.54	166.1
RSL6H200	2	50	1.61	40.09	9.08	230.6	1.75	44.5	6.52	165.6
203	2 3/16	55	1.71	43.4	9.18	233.2	1.75	44.5	6.62	168.1
206	2 3/8	60	1.87	47.5	9.34	237.2	1.75	44.5	6.78	172.2
209	2 9/16	65	2.01	51.1	9.48	240.8	1.75	44.5	6.92	175.8
212	2 3/4	70	2.16	54.9	9.63	244.6	1.75	44.5	7.07	179.6
215	2 15/16	75	2.24	56.9	9.71	246.6	1.75	44.5	7.15	181.6
302	3 1/8	80	2.26	57.4	9.73	247.1	1.75	44.5	7.17	182.1
RSL8H203	2 3/16	55	1.71	43.4	9.37	238.0	2.25	57.2	6.84	173.7
206	2 3/8	60	1.87	47.5	9.53	242.1	2.25	57.2	7.00	177.8
209	2 9/16	65	2.10	53.3	9.67	245.6	2.25	57.2	7.13	181.1
212	2 3/4	70	2.16	54.9	9.82	249.4	2.25	57.2	7.28	184.9
215	2 15/16	75	2.24	56.9	9.90	251.5	2.25	57.2	7.36	186.9
302	3 1/8	80	2.26	57.4	9.92	252.0	2.25	57.2	7.39	187.7
RSL14H209	2 9/16	65	1.98	50.3	10.00	254.0	2.50	63.5	8.03	204.0
212	2 3/4	70	2.19	55.6	11.20	284.5	2.50	63.5	8.23	209.0
215	2 15/16	75	2.29	58.2	11.31	287.3	2.50	63.5	8.34	211.8
302	3 1/8	80	2.43	61.7	11.44	290.6	2.50	63.5	8.47	215.1
308	3 1/2	85	2.60	66.0	11.71	297.4	2.50	63.5	8.64	219.5
314	3 7/8	95	2.88	73.2	11.89	302.0	2.50	63.5	8.92	226.6
404	4 1/4	105	2.98	75.7	12.00	304.8	2.50	63.5	9.03	229.4
410	4 5/8	115	3.25	82.6	12.27	311.7	2.50	63.5	9.30	236.2
RSL20H302	3 1/8	80	2.45	62.2	12.72	323.1	2.75	69.9	9.44	239.8
308	3 1/2	85	2.77	70.4	13.04	331.2	2.75	69.9	9.76	247.9
314	3 7/8	95	2.95	74.9	13.22	335.8	2.75	69.9	9.94	252.5
404	4 1/4	105	3.30	83.8	13.57	344.7	2.75	69.9	10.28	261.1
410	4 5/8	115	3.44	87.4	13.71	348.2	2.75	69.9	10.43	264.9
RSL30H308	3 1/2	85	2.56	65.0	14.26	362.2	3.00	76.2	10.54	267.7
314	3 7/8	95	2.92	74.2	14.26	362.2	3.00	76.2	10.77	273.6
404	4 1/4	105	3.29	83.6	14.37	365.0	3.00	76.2	11.14	283.0
410	4 5/8	115	3.43	87.1	14.51	368.6	3.00	76.2	11.28	286.5
500	5	120	3.65	92.7	14.73	374.1	3.00	76.2	11.50	292.1
506	5 3/8	135	3.79	96.3	14.87	377.7	3.00	76.2	11.64	295.7
512	5 3/4	145	4.05	102.9	15.13	384.3	3.00	76.2	11.90	302.3
602	6 1/8	155	4.22	107.2	15.38	390.7	3.00	76.2	12.15	308.6

Torque Wrenches - RSL™ Series Hex sizes and Torques

RSL Hexagon Sizes	Nut Size (A/F)		Stud Size (DIA)		RSL2H (3/4" Sq Dr.) 1408/1909 lbf-ft/N-m	RSL4H (1" Sq Dr.) 3080/4180 lbf-ft/N-m	RSL6H (1-1/2" Sq Dr.) 5325/7220 lbf-ft/N-m	RSL8H (1-1/2" Sq Dr.) 7860/10660 lbf-ft/N-m	RSL14H (1-1/2" Sq Dr.) 11150/15120 lbf-ft/N-m	RSL20H (2-1/2" Sq Dr.) 19500/26442 lbf-ft/N-m	RSL30H (2-1/2" Sq Dr.) 28000/37970 lbf-ft/N-m
	INCH	mm	INCH	METRIC							
H10M		10		6BR 8F 12S							
H12MF		12		14S							
H006	1/2		1/4H 5/16BR 5/8S								
H13M		13		8BR 10L							
H14MF		14		16S							
H009	9/16		3/8BR 5/16H								
H15M		15		12F 10L							
H010	5/8		7/16B 3/4S								
H16M		16		10BR							
H17MF		17		20S							
H011	11/16		3/8H 7/16R								
H18M		18		12BR 14L							
H19MF		19		24S							
H012	3/4		7/16 1/2BR 7/8 1S								
H013	13/16		9/16B								
H21M		21		12BH 14BR 16L							
H22MF		22		30S							
H014	7/8		9/16R 1/2BH 1-1/8S 1-1/4S		320/434						
H015	15/16		5/8BR 9/16H								
H24M		24		16BRH 14BH							
H100F	1		1-3/8S 1-1/2S								
H101	1-1/16		5/8BH	36S	640/868						
H102	1-1/8RB		3/4	20RB	640/868	600/814					
H30M		30									
H104	1-1/4H		3/4								
H105	1-5/16R		7/8								
H32M		32		42S							
H34M		34		20H							
H35M		35									
H36M		36		24RB 22H 48S							
H107	1-7/16H		7/8		900/1220	900/1220					
H32MF		32		42S							
H106	1-1/2RB		1								
H40M		40									
H42M		41									
H110	1-5/8H		1	24H	1408/1909	1200/1627					
H111	1-11/16B		1-1/8								
H45M		45									
H113	1-13/16H		1-1/8	30RB 27H	1408/1909	1900/2576					
H114	1-7/8B		1-1/4								
H50M		50		30H							
H200	2H		1-1/4		1408*/1909	2600/3525	2600/3525				

H201	2-1/16B		1-3/8									
H55M		55		36RB	1408*/1909	3080*/4176	3500/4745	3500/4745				
H203	2-3/16H		1-3/8									
H204	2-1/4B		1-1/2									
H60M		60		36H	1408*/1909	3080*/4176	4500/6101	5800/7864				
H206	2-3/8H		1-1/2									
H209	2-9/16H		1-5/8	42RB			5325*/6820	5800/7864				
H210	2-5/8B		1-3/4									
H212	2-3/4H		1-3/4	42H			5325*/6820	7300/9897				
H213	2-13/16B		1-7/8									
H215	2-15/16H		1-7/8	48RB			5325*/6820	9000/12202				
H300	3B		2									
H302	3-1/8H		2				5325*/6820	11150/15120	11000/14916			
H60M		80		48H								
H85M		85		56RB								
H306	3-3/8B		2-1/4									
H306	3-1/2H		2-1/4									
H90M		90		58H								
H312	3-3/4		2-1/2	64RB								
H314	3-7/8		2-1/2									
H100M		100		64H								
H402	4-1/8B		2-3/4	72RB								
H404	4-1/4H		2-3/4									
H110M		110		72H								
H408	4-1/2B		3									
H115M		115		80RB								
H410	4-5/8		3	80H								
H120M		120										
H414	4-7/8B		3-1/4									
H500	5H		3-1/4									
H130M		130		90RB								
H504	5-1/4B		3-1/2									
H135M		135		90H								
H506	5-3/8H		3-1/2									
H510	5-5/8B		3-3/4									
H145M		145		100RB								
H512	5-3/4		3-3/4									
H150M		150		100H								
H600	6B		4									
H155M		155										
H602	6-1/8H		4									

LEGEND: R=Regular Hex H=Heavy Hex L=Flange Screw M=Metric S=Socket Head Cap Screw
 Productible Available Suggested selection Not available
 *Use 503 and reduce loosening/tightening torque, for temperatures below 650°F

Torque Multipliers SWEENEY® Range



When the accurate make-up or break-out of a stubborn fastener requires a high level of torque, Hydratight's Torque Multipliers improve the job. These easy-to-use torque multipliers enable small amounts of input torque to produce large amounts of output torque – efficiently and safely.

- Low input torque achieves high output torque
- Overload protection - protects tool from internal damage
- Anti-backlash device
- High efficiency using planetary gear sets
- Accurate
- Durable
- Input/output torque charts
- Reversible
- Angle of turn protractor
- Multiple styles of reaction
- Customised reaction anchors (available upon request)
- Application support

Hydratight Reaction Foot Torque Multipliers

Model No. Reaction Option	TM 12		TM 30		TM 70	
	TK RS*	K RS*	TK RS	K RS	TK RS	K RS
Capacity Nm (lbf.ft)	Continuous		2500 (1845)		6000 (4425)	
	Peak		3000 (2200)		7000 (5175)	
Torque ratio	3.4:1		10.5:1		33:1	
Female input sq (in)	1/2		1/2		1/2	
Male output sq (in)	3/4		1		1 1/2	
Weight (lbs) (w/o socket) ²	7.50	9.25	9.90	14.10	22.0	26.45
Weight (kg) (w/o socket) ²	3.4	4.2	4.5	6.4	10.0	12.0
Height (in) ³	7.3	4.6	8.7	6.0	10.6	8.9
Height (mm) ³	186	118	221	153	270	227
Diameter (in)	3.4	3.9	3.4	3.9	4.5	5.1
Diameter (mm)	86	100	86	100	114	130

1. POWERLOCK (RS) is standard on all tools unless denoted by *
 2. If overload protection is specified (U) increase weight by 1.2046 lbs.
 3. If overload protection is specified (U) increase height by 1.18 ins.
 4. TK RS refers to the standard model. K RS refers to low height model.
 5. Overload protection is available. When ordering specify model "U".

Size Range

Stud size (mm)	12	16	20	24	27	30	33	36	39	42	45	48	52	56	60	64	68	72	80
Hex nut A/F (mm)	19	24	30	36	41	46	50	55	60	65	70	75	80	85	90	95	100	105	115
Tool Model No.																			
TM 12																			
TM 30																			
TM 70																			
TM 100																			
TM 150																			
Stud Size (in)	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/4	2 1/2	2 3/4	3	3 1/4	
Hex Nut (R)	3/4	15/16	1 1/8	1 5/16	1 1/2	1 11/16	1 7/8	2 1/16	2 1/4	2 7/16	2 5/8	2 13/16	3	3 3/8	3 3/4	3 3/4	4 1/8	4 1/2	4 7/8
Hex Nut (H)	7/8	1 1/16	1 1/4	1 7/16	1 5/8	1 9/16	2	2 3/16	2 3/8	2 9/16	2 3/4	2 15/16	3 1/8	3 1/2	3 7/8	3 7/8	4 1/4	4 5/8	5

Hydratight Reaction Bar Torque Multipliers

	290 Plus	291	292	391	392	393
Output Capacity ft-lbs [Nm]	750 [1017]	1000 [1356]	2000 [2700]	1200 [1627]	2200 [2983]	3200 [4339]
Input Capacity ft-lbs [Nm]	227 [303]	303 [411]	571 [771]	200 [271]	162 [220]	173 [235]
Torque Ratio	3.3:1	3.3:1	3.5:1	6:1	13.6:1	18.5:1
Input Square Size	1/2"	1/2"	3/4"	1/2"	1/2"	1/2"
Output Square Size	3/4"	3/4"	1"	3/4"	1"	1"
Accuracy	±5%	±5%	±5%	±5%	±5%	±5%
Overload Protection	No	No	No	Yes	Yes	Yes
Anti-Backlash	No	No	No	No	Yes	Yes
Head Diameter in. [mm]	2.8 [71]	2.8 [71]	3.8 [97]	3.94 [100]	4.06 [103]	4.06 [103]
Height in. [mm]	3.3 [84]	3.3 [84]	4.5 [114]	4 [102]	5.75 [146]	6.5 [165]
Length in. [mm]	8.6 [218]	17.4 [442]	19.5 [495]	19.6 [498]	19.6 [498]	19.6 [498]
Weight lb. [kg]	4 [1.8]	5.5 [2.5]	12 [5.5]	9.1 [4.1]	15.2 [6.9]	18.3 [8.3]

Hydratight Reaction Bar Torque Multipliers, offer torque ratios from 3.3:1 to 18.5:1, with output capacities from 750 ft.lbs. (1017 Nm) to 3200 ft.lbs. (4339 Nm).

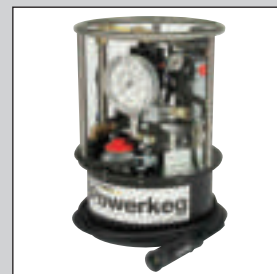
Hydratight Reaction Plate Torque Multipliers

	491	492	493	394	395	396
Output Capacity ft-lbs [Nm]	1000 [1356]	2200 [2983]	3200 [4339]	5000 [6779]	8000 [10846]	12000 [16270]
Input Capacity ft-lbs [Nm]	196 [266]	162 [220]	173 [235]	189 [256]	154 [209]	171 [232]
Torque Ratio	5.1:1	13.6:1	18.5:1	26.5:1	52:1	70:1
Input Square Size	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Output Square Size	3/4"	1"	1"	1-1/2"	1-1/2"	2-1/2"
Accuracy	±5%	±5%	±5%	±5%	±5%	±5%
Overload Protection	Yes	Yes	Yes	Yes	Yes	Yes
Anti-Backlash	Yes	Yes	Yes	Yes	Yes	Yes
Head Diameter in. [mm]	4.38" [111]	4.88" [124]	4.88" [124]	5.62" [143]	5.81" [148]	7.69" [195]
Height in. [mm]	4.5" [114]	5.5" [140]	6.41" [163]	8.75" [222]	10.75" [273]	12.38" [314]
Length in. [mm]	13.5" [343]	14.0" [356]	14.9" [356]	14.9" [378]	15.2" [387]	19.8" [504]
Weight lb. [kg]	10.5 [4.8]	17.2 [7.8]	19.5 [8.9]	34.0 [15.4]	50.3 [22.8]	74.0 [33.6]

Hydratight Plate Reaction Torque Multipliers offer torque ratios from 5.1:1 to 70.0:1, with output capacities from 1000 ft.lbs. (1356 Nm) to 12000 ft.lbs. (16270 Nm). Standard reaction plate included. Custom designs available.

Hydraulic Wrench Pumps - POWAPAK™ Range

Air Operated Consoles



PowaPak console

700 Bar high performance air powered hydraulic pump, designed specifically for hydraulic torque wrenches:

- Efficient pump design
- Ultra high performance
- Durable, lightweight and strong
- Optimum power to weight ratio
- Long life, low maintenance
- Integrated heat exchanger

(Approximate Rate of Discharge Litres per Minute/Cubic Inches per Minute)

PowaPak Console	Fluid Discharge Pressure			Empty Weight		Air Consumption @ Max		Dimensions		
	Stage 1	Stage 2	Stage 3	kgs	lbs	l/min	cfm		mm	in
Pressure Bar/psi	80/1160	290/4205	690/10000	30	66	1700	60	W	375	14.76
Flow Rate lpm/in ³ /min	7.5/457	3.8/232	1.0/61					H	466	18.35

Electrically Operated Consoles



ZU4 Digital

10,000 psi high, pressure electric powered hydraulic pump, designed specifically for bolting applications

- Efficient new pump design
- Higher flow rates
- Self-Test and diagnostic capability
- Lower power consumption
- 115V or 230V
- Sealed switches for operator safety
- Backlit LCD screen display
- Six languages
- Cooler running

(Approximate Rate of Discharge Litres per Minute/Cubic Inches per Minute)

ZU4 Digital	Fluid Discharge Pressure								Empty Weight		Power Supply	Pack Dimensions		
	bar/psi								kgs	lbs		L	mm	in
Pressure	7	101	50	725	350	5076	690	10000			110V-60Hz	W	267	10.50
Flow Rate	11.5	701	8.8	537	1.2	72	1.0	61	28	70	230V-50Hz	H	451	17.75



ZU4 Analog

10,000 psi high pressure, electric powered hydraulic pump, designed specifically for bolting applications:

- Efficient new pump design
- Higher flow rates
- Cooler running
- Lower power consumption
- 4.5" pressure gauge
- 115V or 230V
- Sealed switches for operator safety
- Torque conversion overlay ready
- Gauge reads bar and PSI

(Approximate Rate of Discharge Litres per Minute/Cubic Inches per Minute)

ZU4 Analog	Fluid Discharge Pressure								Empty Weight		Power Supply	Pack Dimensions		
	bar/psi								kgs	lbs		L	mm	in
Pressure	7	101	50	725	350	5076	690	10000			110V-60Hz	W	267	10.50
Flow Rate	11.5	701	8.8	537	1.2	72	1.0	61	28	70	230V-50Hz	H	451	17.75



ZU4 Wind

10,000 psi high pressure, electric powered hydraulic pump, designed specifically for bolting applications

(Approximate Rate of Discharge Litres per Minute/Cubic Inches per Minute)

ZU4 Wind	Fluid Discharge Pressure								Empty Weight		Power Supply	Pack Dimensions		
	bar/psi								kgs	lbs		L	mm	in
Pressure	7	101	50	725	350	5076	690	10000			110V-60Hz	W	318	12.50
Flow Rate	11.5	701	8.8	537	1.2	72	1.0	61	28	70	230V-50Hz	H	451	17.75



PowaPak Ultra and PowaPak Automatic

10,000 psi high pressure, electric powered hydraulic pump, designed specifically for bolting applications

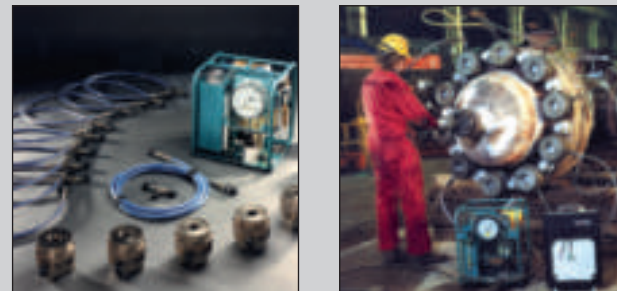
(Approximate Rate of Discharge Litres per Minute/Cubic Inches per Minute)

Smart Pump	Fluid Discharge Pressure		Empty Weight		Current Draw @ Full Load		Pack Dimensions		
	Stage 1	Stage 2	kgs	lbs	115v	230v	L	mm	in
Pressure Bar/PSI	97/1400	690/10,000	37	82	20.5A	10.5A	W	279	11
Flow Rate/in ³ /min	4.0/244	1.11/68					H	381	15

Hydraulic Tensioner Pumps

Air Operated Pump (Tensioners)

The 10-6 series pump meets the requirements of the majority of flange applications and is preferable for projects where a higher oil flow is required, such as subsea duties or where a large number of high capacity tensioners are being used.



PAMPCA106H20SS (Approximate Rate of Discharge Litres per Minute/Cubic Inches per Minute)

Air (bar/psi)		Fluid Discharge Pressure (bar/psi)															
		0	0	207	3000	414	6000	621	9000	862	12500	1034	15000	1379	20000	1724	25000
4	60	1.00	61	0.80	49	0.70	43	0.62	38	0.51	31	0.44	27	0.00	0	0.00	0
6	80	1.07	65	0.93	57	0.84	51	0.75	46	0.66	40	0.61	37	0.49	30	0.16	10
7	100	1.15	70	0.97	59	0.88	54	0.80	49	0.72	44	0.66	40	0.56	34	0.46	28
Empty Weight		Air Consumption			Pack Dimensions												
					L	mm	in										
kgs	lbs	m ³ /min	L/min	cfm	W												
31.8	70.0	1.586	1586	56	H	432	17										

PAMPCA106H40HP (Approximate Rate of Discharge Litres per Minute/Cubic Inches per Minute)

Air (bar/psi)		Fluid Discharge Pressure (bar/psi)															
		0	0	345	5000	690	10000	1034	15000	1379	20000	1724	25000	2069	30000	2758	40000
4	60	0.38	23	0.34	21	0.31	19	0.28	17	0.26	16	0.23	14	0.20	12	0.03	2
6	80	0.44	27	0.43	26	0.38	23	0.33	20	0.31	19	0.28	17	0.25	15	0.20	12
7	100	0.48	29	0.44	27	0.39	24	0.34	21	0.33	20	0.29	18	0.28	17	0.25	15
Empty Weight		Air Consumption			Pack Dimensions												
					L	mm	in										
kgs	lbs	m ³ /min	L/min	cfm	W												
31.8	70.0	1.586	1586	56	H	432	17										

Hydraulic Hand Pumps

23,000 Bar (1600 PSI) Hand Pump

23,000 psi two speed, manually operated hand pump complete with pump head, mounted pressure gauge and handle/gauge protector. The unit is fitted with a filler breather and a rear drain plug (1/4" BSP).

- **Item No.:** PMNK2064
- **Pressure Range:** 2,900 - 24,650 psi (200-1700 Bar)
- **Total Oil Capacity:** 91 in³
- **Oil Displacement:** 4.93 in³ L.P./Stroke 0.3 in³ H.P./Stroke
- **Oil Type:** ISO 10
- **Dimensions:** 23.00" L x 6.10" W x 6.30" H
- **Pressure Outlet:** 1/4" BSP fitted with a CEJN 116 coupling
- **Weight (Inc. Oil):** 20.9 lbs (9.5kg)
- **Gauge:** 3.94 in damped movement, dual scale 0-25,000 psi/0-1600 Bar graduated in 500 psi/50 Bar increments

34,800 Bar (2400 PSI) Hand Pump

34,800 psi two speed, manually operated hand pump complete with 3.94" (100mm) pump head, mounted pressure gauge and handle/gauge protector. The unit is fitted with a filler breather and a rear drain plug (1/4" BSP).

- **Item No.:** PMNK2119
- **Pressure Range:** Up to 40,600 psi (2800 Bar)
- **Total Oil Capacity:** 122 in³
- **Oil Displacement:** 7.87 in³ L.P./Stroke 0.32 in³ H.P./Stroke
- **Oil Type:** ISO 10
- **Dimensions:** 24.40" L x 7.87" W x 6.50" H
- **Pressure Outlet:** 1/4" BSP fitted with a CEJN 125 coupling
- **Weight (Inc Oil):** 30.8 lbs (9.5kg)
- **Gauge:** 3.94 in damped movement, dual scale 0-40,000 psi/0-2400 Bar graduated in 1000 psi/100 Bar increments

Flexible Hoses

- Working pressure 4 ply high pressure 26150 psi (1800 bar), 6 ply ultra high pressure 44950 psi (3100 bar)
- Min. burst pressure 4 ply high pressure 65250 psi (4500 bar), 6 ply ultra high pressure 89900 psi (6200 bar)
- Min. bend radius 4 ply high pressure 6" (150mm), 6 ply ultra high pressure 8" (200mm)
- Working temperature -22°F to 176°F (-30°C to 80°C)



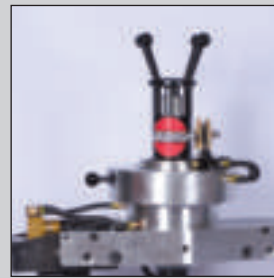
DL RICCI is a registered trademark of Hydratight Limited

Hydratight's DL Ricci brand of portable machining solutions include: Portable Boring Bars, Onsite Milling Machines, Journal Turning Lathes, End Prep Machines, Grinding Machines, Heat Treating, Pipe Cutting and Bevelling Machines.



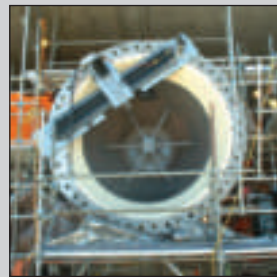
• Portable Boring Bars

Three distinct models for portable, accurate and flexible onsite boring



• End Prepping Machines

Dependable and rugged flange facers and bevellers for quick set-up and accurate weld end prep



• Milling Machines

Single and 3-Axis Milling Machines and portable Keyway Cutters



• Grinding Machines

Four different Grinding Machines for grinding of trunnions, large rollers, rotary kiln tyres, hand holes and oval manway seats



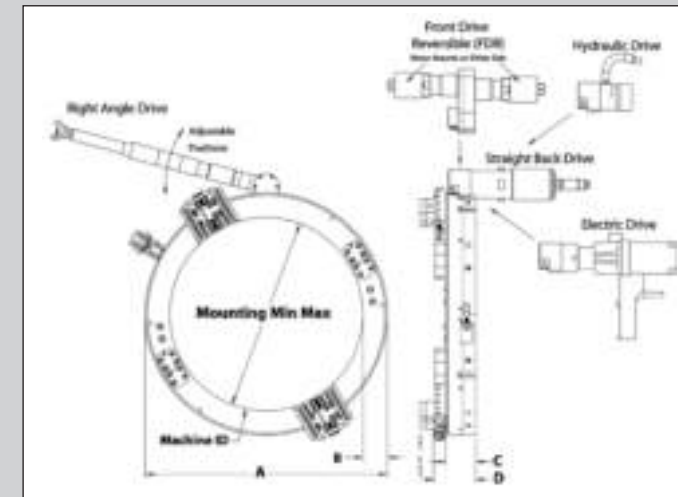
• Journal Turning Lathes

Accurate and consistent turning of bearing journals and other round surfaces



• Heat Treating

Portable Induction and Resistance Heat Treating equipment for in-place applications

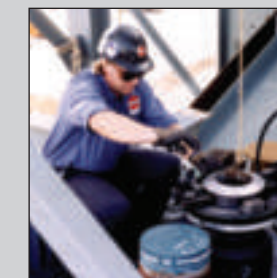


- Five models of patented portable pipe cutting and bevelling clamshells available for severing, flange facing, ID boring, and OD turning on all types of material and wall thickness
- Superior cutting strength as well as fast set-up and ease of use make these patented tools the finest on the market
- Clamshell accessories include Casing Cutters, Axial Feed Modules, Swivel Head, Single Point, Counterbores, Chipless Cutters, Out-of-Round and Low Profile Tool Block Slides



• MC Clamshell (mini clam)

Pipe sizes 0.5" to 2.5"



• NB Clamshell (narrow body)

Pipe sizes 3" to 43"



• MS Clamshell (mid size)

Pipe sizes 10" to 48"



• HD Clamshell (heavy duty)

Pipe sizes 28" to 110"



• MM180 Clamshell (mammoth)

Pipe sizes 144" to 177"



- The Bolt-Scope II™ ultrasonically measures the stress developed in fasteners and clearly displays the information on a large, easy to read screen
- The unit works with all bolt tightening systems. It monitors the fastener during the tightening process to ensure accurate initial loading
- Retained load in the fastener can be monitored at any time

Features:

- Can store up to 10,000 fastener measurements in up to 512 application groups
- Minimal application data required
- Easy to use interface, one menu deep, with direct access keys
- Measures reference length of fastener to better than four decimal places resolution
- Lightweight and compact
- Rugged design for production and site environments
- Measures fastener lengths up to 21 feet (6.4 meters)
- Simultaneous display of fastener stress, elongation, load and time of flight
- Multilingual – English, French, German, Spanish, Italian and Russian

Physical Description	
Width:	7.5" (191mm)
Height:	5.5" (140mm)
Depth:	2.2" (56mm)
Weight:	2.5 lbs (1.14kg) including batteries
Display	
Graphic Waveform LCD:	High resolution 1/4 VGA LCD display
Viewing Area:	(w x h) 3.8" x 2.8" (96 x 71mm)
Pixel Density:	(w x h) 320 x 240
Update Rate:	4Hz Adjustable contrast and backlight
Four Level zoom:	For signal enlargement
Power Supply	
	5 "AA" Alkaline or NiCad batteries
Operating Time:	40 hours minimum without backlight A.C. Power (85 to 260v)
Fastener Monitoring Temperature Range	
	+10 to +176°F (-10 to + 80°C)
Warranty	
Bolt-Scope II™ has a full two year warranty on parts and labour excluding batteries, transducers and cables.	

Nut and Thread Protection Caps

- Available in mild steel, aluminium and plastic
- Maximum stud extension is 1.5 times the diameter
- Manufactured to protect both stud and nut assembly or stud extension only
- To suit high temperature applications
- Incorporates thread detail enabling caps to be screwed onto application
- Suitable for use with heavy series hexagon nuts
- Grease nipples can be fitted

Flange Protectors

- Manufactured from Neoprene weather resistance compound
- Suitable for onshore/offshore and subsea applications
- Double/single lip of Flange Protector which locates between flange gap
- Quick disconnect (Q.D.) nipples enabling flange cavity to be filled quickly
- Ratchet fastening for quick and efficient installation
- Ratchet material available in Stainless Steel, plated carbon steel and heavy duty plastic
- When ordering flange protectors please specify flange diameter and gap to be sealed

Hydratight Lubricants

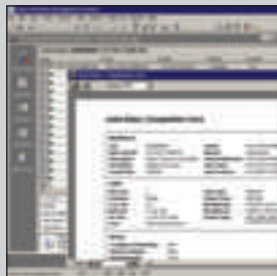
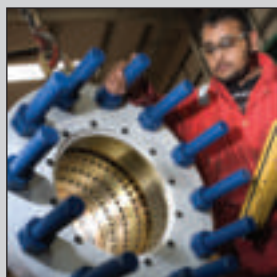
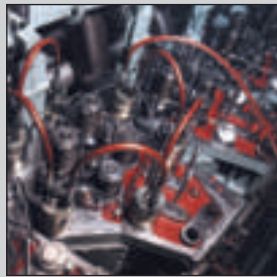
Consult with factory to select the best lubricant for your application:

- 503 = Moly Paste, temp limit 700°F
- 505 = Copper anti-seize, high purity, temp. limit 1800°F
- 507 = Copper graphite anti-seize, temp. limit 1800°F

Bolt Diameter (Metal Protection Caps)	
Metric	Imperial
M20	3/4"
M24	7/8"
M27	1"
M30	1 1/8"
M33	1 1/4"
M36	1 3/8"
M39	1 1/2"
M42	1 5/8"
M45	1 3/4"
M48	1 7/8"
M52	2"
M60	2 1/4"
M64	2 1/4"
M72	2 3/4"
M80	3"
M90	3 1/4"
M95	3 1/4"
M100	3 3/4"

Bolt Diameter (Nut & Thread Protection Caps)	
Metric	Imperial
M18	3/4"
M22	7/8"
M24	1"
M30	1 1/8"
M33	1 1/4"
M36	1 3/8"
M39	1 1/2"
M42	1 5/8"
M45	1 3/4"
M48	1 7/8"
M52	2"
M56	2 1/4"
M64	2 1/2"
M72	2 3/4"
M76	3"

Additional Products and Services



- Multi Stud Flange Tensioners
- Weld Tester
- On-Site Bolting
- On-Site Machining
- Specialised Power Tooling
- Engineering
- Training
- Custom Engineered Solutions
- Diesel Engine Tooling
- Morgrip® Mechanical Connectors
- Informat®
- Joint Data Management Services (JDMS)
- Boltup® Bolt Load Calculation Software



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