

"Cost effective tools & equipment solutions offered quality products & service."

SAIVS

SAIVS

**Bolting Tools Manufacturer
Tighten the Safety**

BOLTING SOLUTION



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INTRODUCTION

Established in Ningbo, China in 1990, SAIVS began as a manufacturer and exporter of investment casting, sand casting, die-casting and CNC machining parts(eg. Cylinder ends, valve bodies, screw cylinder, auto parts, marine parts etc.). In 2002, hydraulic tools research department was settled and company developed its first lines of hydraulic tools and equipment. Today SAIVS is reckoned as one of the most preferred experienced manufacturers and exporters of hydraulic tools and equipment in the industrial market.



Our team

In SAIVS, over 30 engineers ensured our design capability, technical support capability and problem solving capability to provide best support to our clients. Production quality is guaranteed by 20 years production experience and 300 skilled workers. We are ready to assist you.

Our mission

At SAIVS, our focus is to provide our customers with the reliable products and integrity service - to support their business to be more successful.

Our products

Our hydraulic tools and equipment deliver reliable and dependable performance. It includes hydraulic bolting tools, hydraulic cylinder, hydraulic pump and hydraulic heavy lifting solution etc.. Our products are widely used in industry field of steel, shipbuilding, electric power, chemical, metallurgic, construction and many others. SAIVS quality management system is approved by ISO 9001 and offered one year warranty for all range products.

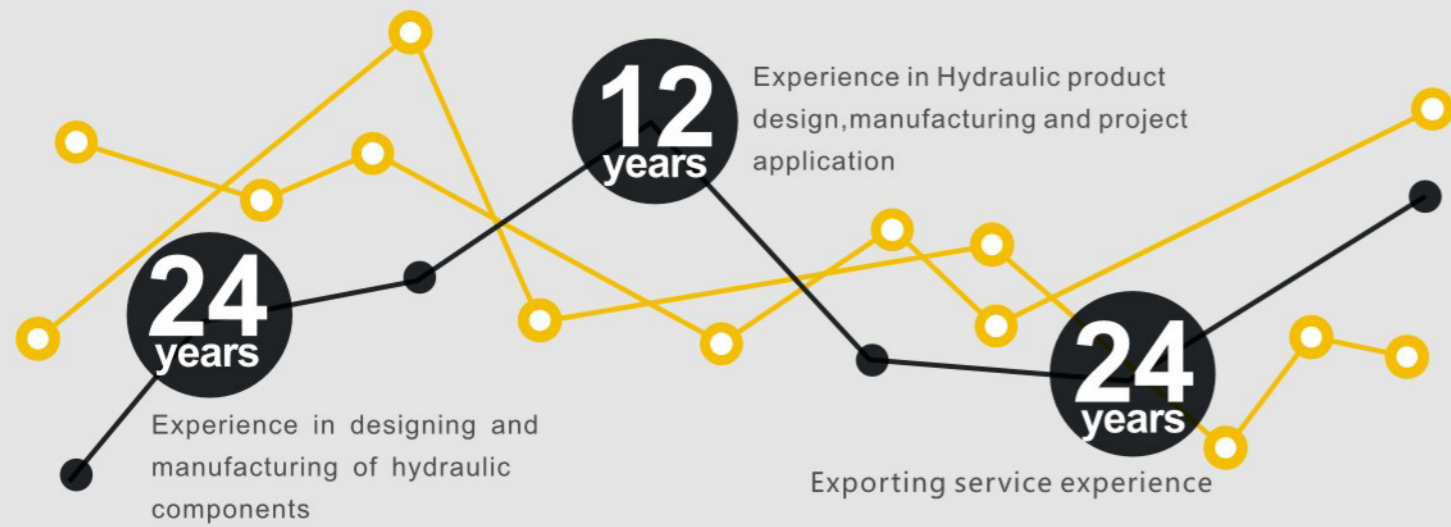


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Hydraulic Torque Wrench

SHW series, Low profile hexagon hydraulic torque wrench
SDW series, Square drive hydraulic torque wrench

SHW Series Low Profile Hexagon Hydraulic Torque Wrench



Features

- The low profile design is made to fit in small spaces.
- Rigid steel design – durability, reliability and safety.
- Interchangeable head design, no tools needed for changing.
- Versatility: one hydraulic drive unit per torque capacity can be used to drive any hexagon head within that range.
- Constant torque output accuracy up-to ±3%.
- Dual rotation direction (360°X-axis * 180°Y-axis) hydraulic swivel manifold, connect with screw quick couplings (available in models of SHW40, SHW50 & SHW60).

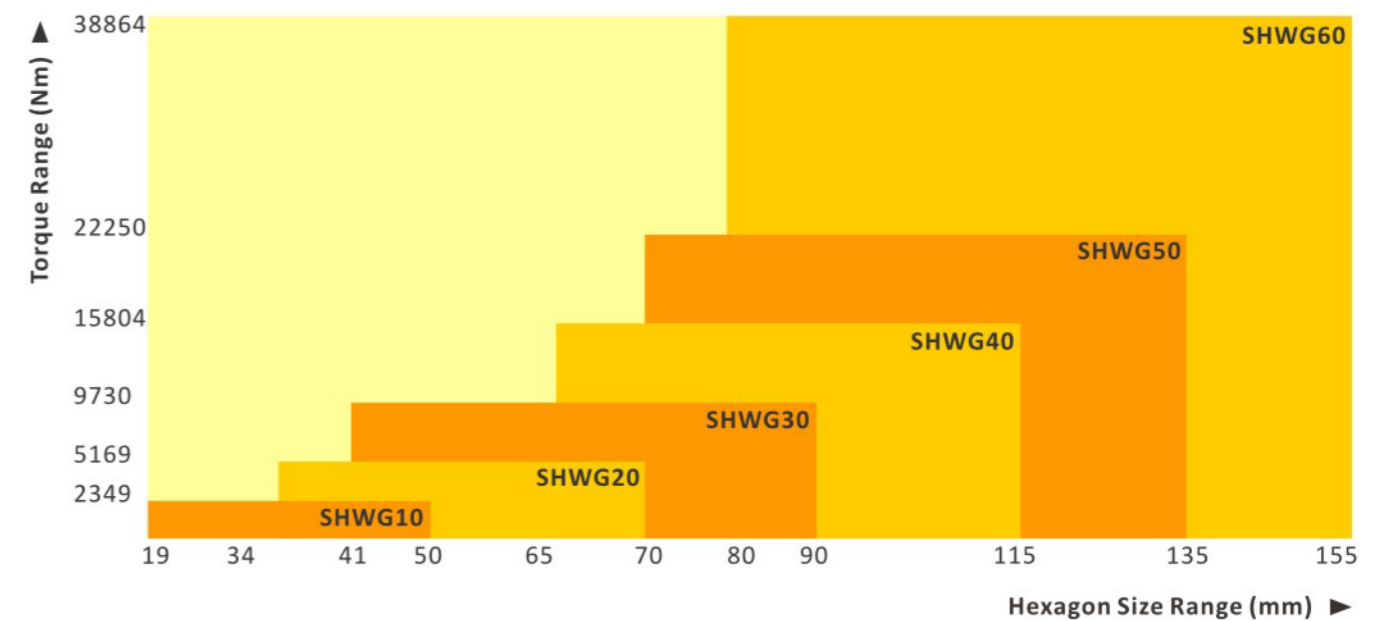
Maximum Torque: 38854 Nm
Hexagon Range: 19-155 mm, 1¹/₈-6¹/₈"
Nose Radius: 19.6-117.8 mm
Maximum Operating Pressure: 700 bar

Select the Right Torque

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



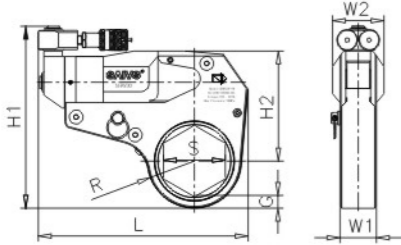
Drive Unit and Interchangeable Hexagon Head Selection Chart



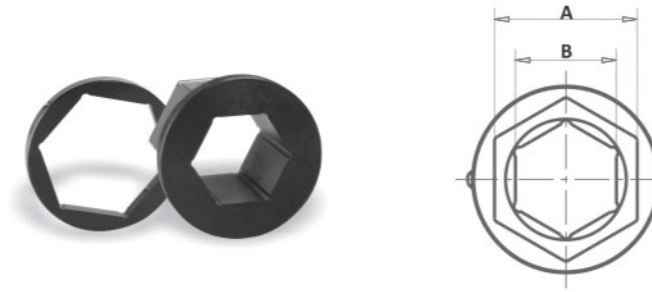
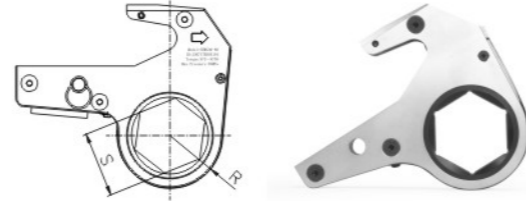
SELECTION CHART

Hexagon Range		Maximum Torque		Drive Unit Model Number	Weight	Dimensions						
mm	inch	Nm	Ft.lbs			L	H1	H2	W1	W2	G	R
19-50	¾-2	2349	1733	SHWD10	2.2	198	173	96	32	50	12	41
34-65	1 ⁵ / ₁₆ -2 ⁹ / ₁₆	5169	3813	SHWD20	4.9	246	212	124	42	64	15	52
41-90	1 ⁵ / ₈ -3 ⁹ / ₁₆	9730	7177	SHWD30	9.6	303	265	160	53	75	17	69
65-115	2 ⁹ / ₁₆ -4 ¹ / ₂	15804	11657	SHWD40	16	332	329	191.5	64	87	20	87
75-135	2 ¹⁵ / ₁₆ -5 ⁵ / ₁₆	22250	16412	SHWD50	24	382	366	215	73	97	23	101
80-155	3 ¹ / ₂ -6 ¹ / ₈	38854	28665	SHWD60	39.8	449	423	255	85	120	28	118

*Weight & Dimension of drive unit and hexagon head together



Interchangeable Hexagon Cassettes
Maximum versatility with full range of interchangeable hexagon cassettes available in metric and inch size. (Please contact us for inch size copy)



Optional Hexagon Reducer Inserts
Optional hexagon reducing inserts are also available for selection.

Drive Unit Model Number	SHWD10		
Maximum Torque	2349 N.m		
Hexagon Head	S	R	Weight
	(mm)	(mm)	(Kg)
SHWG10-50	50	40.8	1.5
SHWG10-46	46	38.1	1.5
SHWG10-41	41	35.1	1.4
SHWG10-36	36	31.6	1.36
SHWG10-34	34	31.6	1.3
SHWG10-32	32	30.6	1.4
SHWG10-30	30	30.6	1.4
SHWG10-27	27	29.6	1.4
SHWG10-24	24	19.6	1.4
SHWG10-22	22	29.6	1.4
SHWG10-19	19	19.6	1.4

Drive Unit Model Number	SHWD20		
Maximum Torque	5169 N.m		
Hexagon Head	S	R	Weight
	(mm)	(mm)	(Kg)
SHWG20-65	65	52.3	4.4
SHWG20-60	60	50.6	4.4
SHWG20-55	55	47.6	4.2
SHWG20-50	50	45.6	4.2
SHWG20-46	46	43.6	4.0
SHWG20-41	41	43.6	4.1
SHWG20-36	36	37.6	3.8
SHWG20-34	34	37.6	3.9

Drive Unit Model Number	SHWD30		
Maximum Torque	9730 N.m		
Hexagon Head	S	R	Weight
	(mm)	(mm)	(Kg)
SHWG30-90	90	68.6	6.5
SHWG30-85	85	67.6	6.5
SHWG30-80	80	64.6	6.3
SHWG30-75	75	61.6	6.3
SHWG30-70	70	59.6	6.1
SHWG30-65	65	56.6	5.9
SHWG30-60	60	53.6	5.8
SHWG30-55	55	51.6	5.6
SHWG30-50	50	47.6	5.3
SHWG30-46	46	47.6	5.5
SHWG30-41	41	47.6	5.5

Drive Unit Model Number	SHWD40		
Maximum Torque	15804 N.m		
Hexagon Head	S	R	Weight
	(mm)	(mm)	(Kg)
SHWG40-115	115	86.8	11.9
SHWG40-110	110	84.6	11.6
SHWG40-105	105	80.6	11.4
SHWG40-100	100	77.6	11.3
SHWG40-95	95	74.6	11.0
SHWG40-90	90	72.6	11.0
SHWG40-85	85	69.6	10.8
SHWG40-80	80	66.6	10.7
SHWG40-75	75	63.6	10.7
SHWG40-70	70	58.6	10.5
SHWG40-65	65	58.6	10.6

Drive Unit Model Number	SHWD50		
Maximum Torque	22250 N.m		
Hexagon Head	S	R	Weight
	(mm)	(mm)	(Kg)
SHWG50-135	135	100.8	18.0
SHWG50-130	130	100.8	18.2
SHWG50-125	125	95.6	17.8
SHWG50-120	120	95.6	17.9
SHWG50-115	115	88.6	17.6
SHWG50-110	110	85.6	17.4
SHWG50-105	105	85.6	17.5
SHWG50-100	100	78.6	17.1
SHWG50-95	95	76.6	16.9
SHWG50-90	90	73.6	16.8

Drive Unit Model Number	SHWD60		
Maximum Torque	38854 N.m		
Hexagon Head	S	R	Weight
	(mm)	(mm)	(Kg)
SHWG60-155	155	117.8	29.5
SHWG60-150	150	115.6	29.1
SHWG60-145	145	111.6	28.9
SHWG60-140	140	107.6	28.9
SHWG60-135	135	105.6	28.8
SHWG60-130	130	102.6	28.5
SHWG60-125	125	100.5	28.5
SHWG60-120	120	95	28.3
SHWG60-115	115	92	28.3
SHWG60-110	110	90	28.3
SHWG60-105	105	87	27.9
SHWG60-100	100	83	27.9
SHWG60-95	95	80	27.5
SHWG60-90	90	78	27.5
SHWG60-85	85	75	27.1
SHWG60-80	80	70	27.1

Drive Unit Model Number	Hexagon Head Model Number	Hexagon Size	Model Number Reducer	Hexagon Reducer	Model Number Reducer	Hexagon Reducer	Model Number Reducer	Hexagon Reducer	Reducer Lock Model	
				A/B(mm)	Model Number Reducer	A/B(mm)	Model Number Reducer	A/B(mm)		
SHWD10	SHWG10-50	50	2SH5041	50 / 41	2SH5036	50 / 36	2SH5032	50 / 32	H-50	
	SHWG10-46	46	2SH4636	46 / 36	2SH4632	46 / 32	2SH4630	46 / 30	H-46	
	SHWG10-41	41	2SH4132	41 / 32	2SH4130	41 / 32	2SH4127	41 / 27	H-41	
	SHWG10-36	36	2SH3630	36 / 30	2SH3627	36 / 27			H-36	
	SHWG10-32	32	2SH3227	32 / 27					H-32	
SHWD20	SHWG20-65	65	4SH6555	65 / 55	4SH6550	65 / 50	4SH6546	65 / 46	H-65	
	SHWG20-60	60	4SH6050	60 / 50	4SH6046	60 / 46	4SH6041	60 / 41	H-60	
	SHWG20-55	55	4SH5546	55 / 46	4SH5541	55 / 41	4SH5536	55 / 36	H-55	
	SHWG20-50	50	4SH5041	50 / 41	4SH5036	50 / 36	4SH5032	50 / 32	H-50	
	SHWG20-46	46	4SH4636	46 / 36	4SH4632	46 / 32	4SH4630	46 / 30	H-46	
	SHWG20-41	41	4SH4132	41 / 32	4SH4130	41 / 30	4SH4127	41 / 27	H-41	
	SHWG20-36	36	4SH3630	36 / 30	4SH3627	36 / 27			H-36	
	SHWG20-34	34	4SH3427	34 / 27					H-34	
	SHWD30	SHWG30-90	90	8SH9080	90 / 80	8SH9075	90 / 75	8SH9070	90 / 70	H-90
SHWG30-85		85	8SH8575	85 / 75	8SH8570	85 / 70	8SH8565	85 / 65	H-85	
SHWG30-80		80	8SH8070	80 / 70	8SH8065	80 / 65	8SH8060	80 / 60	H-80	
SHWG30-75		75	8SH7565	75 / 65	8SH7560	75 / 60	8SH7555	75 / 55	H-75	
SHWG30-70		70	8SH7060	70 / 60	8SH7055	70 / 55	8SH7050	70 / 50	H-70	
SHWG30-65		65	8SH6555	65 / 55	8SH6550	65 / 50	8SH6546	65 / 46	H-65	
SHWG30-60		60	8SH6050	60 / 50	8SH6045	60 / 45			H-60	
SHWG30-55		55	8SH5546	55 / 46	8SH5541	55 / 41			H-55	
SHWD40		SHWG40-115	115	14SH115105	115 / 105	14SH115100	115 / 100	14SH11595	115 / 95	H-115
		SHWG40-110	110	14SH110100	110 / 100	14SH11095	110 / 95	14SH11090	110 / 90	H-110
	SHWG40-105	105	14SH10595	105 / 95	14SH10590	105 / 90	14SH10585	105 / 85	H-105	
	SHWG40-100	100	14SH10090	100 / 90	14SH10085	100 / 85	14SH10080	100 / 80	H-100	
	SHWG40-95	95	14SH9585	95 / 85	14SH9580	95 / 80	14SH9575	95 / 75	H-95	
	SHWG40-90	90	14SH9080	90 / 80	14SH9075	90 / 75	14SH9070	90 / 70	H-90	
	SHWG40-85	85	14SH8575	85 / 75	14SH8570	85 / 70	14SH8565	85 / 65	H-85	
	SHWG40-80	80	14SH8070	80 / 70	14SH8065	80 / 65			H-80	
	SHWG40-75	75	14SH7565	75 / 65					H-75	
	SHWD50	SHWG50-130	130	18SH130120	130 / 120	18SH130115	130 / 115	18SH130110	130 / 110	H-130
SHWG50-120		120	18SH120110	120 / 110	18SH120105	120 / 105	18SH120100	120 / 100	H-120	
SHWG50-115		115	18SH115105	115 / 105	18SH115100	115 / 100	18SH11595	115 / 95	H-115	
SHWG50-110		110	18SH110100	110 / 100	18SH11095	110 / 95	18SH11090	110 / 90	H-110	
SHWG50-105		105	18SH10595	105 / 95	18SH10590	105 / 90	18SH10585	105 / 85	H-105	
SHWG50-100		100	18SH10090	100 / 90	18SH10085	100 / 85	18SH10080	100 / 80	H-100	
SHWG50-95		95	18SH9585	95 / 85	18SH9580	95 / 80	18SH9575	95 / 75	H-95	
SHWG50-90		90	18SH9080	90 / 80	18SH9075	90 / 75			H-90	
SHWG50-85		85	18SH8575	85 / 75					H-85	
SHWD60		SHWG60-155	155	30SH155145	155 / 145	30SH155130	155 / 130	30SH155120	155 / 120	H-155
	SHWG60-145	145	30SH145130	145 / 130	30SH145120	145 / 120	30SH145115	145 / 115	H-145	
	SHWG60-130	130	30SH130120	130 / 120	30SH130115	130 / 115	30SH130110	130 / 110	H-130	
	SHWG60-120	120	30SH120110	120 / 110	30SH120105	120 / 105	30SH120100	120 / 100	H-120	
	SHWG60-115	115	30SH115105	115 / 105	30SH115110	115 / 110	30SH115095	115 / 95	H-115	
	SHWG60-110	110	30SH110100	110 / 100	30SH11095	110 / 95	30SH11090	110 / 90	H-110	
	SHWG60-105	105	30SH10595	105 / 95	30SH10590	105 / 90	30SH10590	105 / 90	H-105	
	SHWG60-100	100	30SH10090	100 / 90	30SH10085	100 / 85	30SH10080	100 / 80	H-100	
	SHWG60-95	95	30SH9585	95 / 85	30SH9580	95 / 80			H-95	
	SHWG60-90	90	30SH9080	90 / 80					H-90	

SDW Series Square Drive Hydraulic Torque Wrench



Features

- Compact, uni-body designed to give housing maximum strength with minimum weight. It was made of durable, high-strength, light weight aircraft alloy.
- Dual rotation direction (360°X-axis x 180°Y-axis) hydraulic swivel manifold, connect with screw quick couplings.
- Available to bolt tightening or loosening with automatic pump.
- Accurate anti- reverse pawl improved the preload accuracy, and could be quick released
- Constant torque output accuracy up-to ±3%
- High speed, double-acting operation
- Oxidation treatment provide excellent corrosion protection and durability in harsh environment

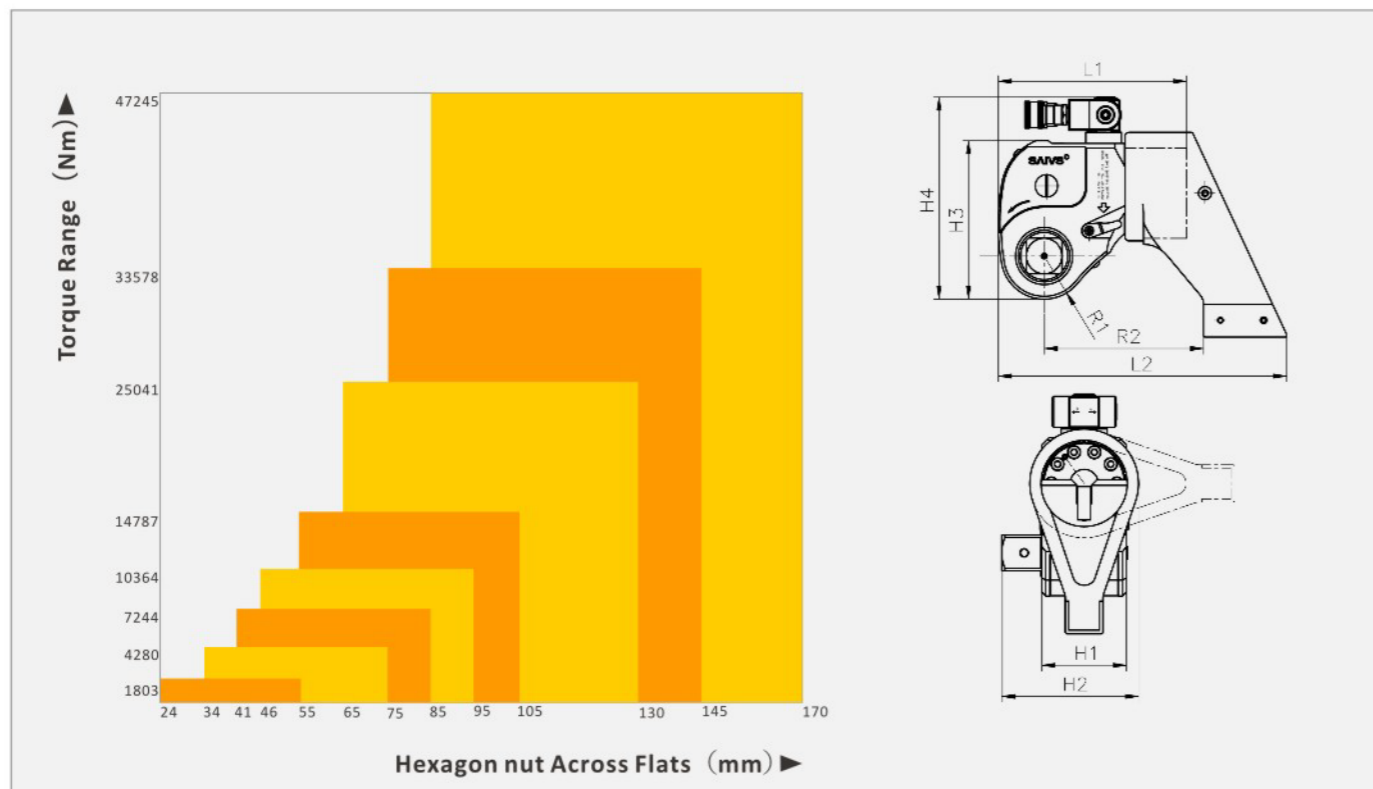
Maximum Torque: 47245 Nm
Square Drive Range: 3/4 - 2 1/2 inch
Hexagon Nut AF Range: 24 - 170 mm
Maximum Operating Pressure: 700 bar

Select the Right Torque

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



TORQUE WRENCH QUICK SELECTION CHART



SELECTION CHART

Maximum Torque		Square Drive Size	Hexagon Nut Across Flats	Torque Wrench Model Number	Weight	Dimensions							
Nm	Ft.lbs					L1	L2	H1	H2	H3	H4	R1	R2
		inch	mm	mm									
1803	1330	3/4"	24-55	SDW1	2.5	130	184	51	72	97	145	25	97
4280	3157	1"	34-75	SDW2	4.8	168	243	67	95	126	174	33	130
7244	5343	1 1/2"	41-85	SDW3	8.7	200	287	78	122	152	199	39	155
10364	7644	1 1/2"	46-95	SDW4	11.4	213	308	90	133	169	216	46	170
14787	10907	1 1/2"	55-105	SDW5	15.4	244	352	100	142	189	236	50	193
25041	18470	2 1/2"	65-130	SDW6	26.8	284	413	120	183	223	270	59	224
33578	24767	2 1/2"	75-145	SDW7	37	314	457	135	200	250	296	66	250
47245	34848	2 1/2"	85-170	SDW8	53.6	358	517	153	215	287	332	76	270

*Minimum output torque is 10% of maximum torque



Heavy-duty impact Sockets

For power driven torquing selection, see the table below. For Imperial Socket table, please contact Saivs.

3/4" Square Drive (SDW1)

Socket Model	AF	L1	L2	D1	D2
	mm	mm			
SD01001	24	54	32	40	40
SD01002	27	54	32	42	42
SD01003	30	54	33	46	44
SD01004	34	54	32	48	44
SD01005	36	57	32	53	44
SD01006	41	58	33	60	44
SD01007	46	63	38	66	44
SD01008	50	65	40	71	44
SD01009	55	70	45	77	54

1 1/2" Square Drive (SDW3,SDW4,SDW5)

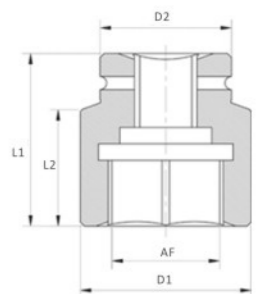
Socket Model	AF	L1	L2	D1	D2
	mm	mm			
SD03002	41	85	44	74	74
SD03003	46	85	44	74	74
SD03004	50	90	45	79	79
SD03005	55	90	45	84	84
SD03006	60	100	45	94	94
SD03007	65	100	45	98	80
SD03008	70	105	50	104	80
SD03009	75	110	50	118	85
SD03010	80	115	55	118	90
SD03011	85	125	60	128	90
SD03012	90	125	60	139	90
SD03013	95	130	65	139	90
SD03014	100	135	70	144	90
SD03015	105	135	70	149	90
SD03016	110	135	70	158	90
SD03017	115	135	70	159	90
SD03018	120	135	70	168	95
SD03019	130	155	93	189	95

1" Square Drive (SDW2)

Socket Model	AF	L1	L2	D1	D2
	mm	mm			
SD02001	30	59	32	54	54
SD02002	34	59	32	58	58
SD02003	36	62	32	59	59
SD02004	41	65	38	67	54
SD02005	46	65	38	74	54
SD02006	50	70	43	79	60
SD02007	55	80	52	84	60
SD02008	60	85	57	89	60
SD02009	65	85	58	98	70
SD02010	70	90	62	104	70
SD02011	75	95	65	108	70

2 1/2" Square Drive (SDW6,SDW7,SDW8)

Socket Model	AF	L1	L2	D1	D2
	mm	mm			
SD04001	65	100	52	119	119
SD04002	70	120	67	128	128
SD04003	75	120	67	128	128
SD04004	80	130	71	128	128
SD04005	85	130	71	129	129
SD04006	90	140	73	139	139
SD04007	95	140	73	139	139
SD04008	100	140	81	148	130
SD04009	105	150	89	149	130
SD04010	110	150	90	158	130
SD04011	115	150	98	168	130
SD04012	120	150	98	178	130
SD04013	130	170	98	188	130
SD04014	135	170	114	198	130
SD04015	145	170	122	210	152
SD04016	150	190	140	216	152
SD04017	155	190	140	229	152
SD04018	165	190	140	241	152



SWP Series Electric Pump

The SWP Series pump is ideal to work in combination with SDW & SHW series hydraulic torque wrench. More fast & easy to move around.



Hose

Saivs high quality hydraulic hoses ensured the integrity of the system. (Quick coupling available with NPT 1/4")

SWP Series Electric Hydraulic Torque Wrench Pumps



Features

- Optimized flow technology –50% more efficiency than two stage pump
- A quiet (<75 dB), lightweight pump, easy to move around
- Reliable external heat sink to assure the pump could work in a long time duration (even in 24 hours)
- Maintenance made simple with a brush-less motor designed for continuous usage
- 5m/15ft remote control.
- Ideal to work in combination with SDW&SHW series hydraulic torque wrench.

SWP6/SWP5

- Start at any time under pressure.
- Integrated manual and automatic switch control. In automatic mode, it start working after setting the pressure value.

Reservoir Capacity: 8 litres
Flow at Rated Pressure: 0.8-1.1 l/min
Motor Size: 1.1-1.5 kW
Max. Operating Pressure: 700 bar

- 1). All models meet CE safety requirement.
- 2). Different Voltage (115, 230, 380, 415 and 440 voltage) & Frequence (50/60Hz) are available.
- 3). Flow rate of the pump at 50Hz will be higher at 60Hz.

Hydraulic wrench Powerpack

Model Number	Oil Flow (L/min)			Pressure (bar)			Power KW	Oil Capacity L	Input Power	Weight Kg	Dimensions L×W×H (mm)
	High Pressure	Middle Pressure	Low Pressure	High Pressure	Middle Pressure	Low Pressure					
SWP6	0.8	1.6	7	700	280	70	1.1	8	1Ph 220V / 50HZ	32	490*305*495
SWP5	0.7	1.6	6	700	280	70	0.9	8	1Ph 110V / 60HZ	32	490*305*495

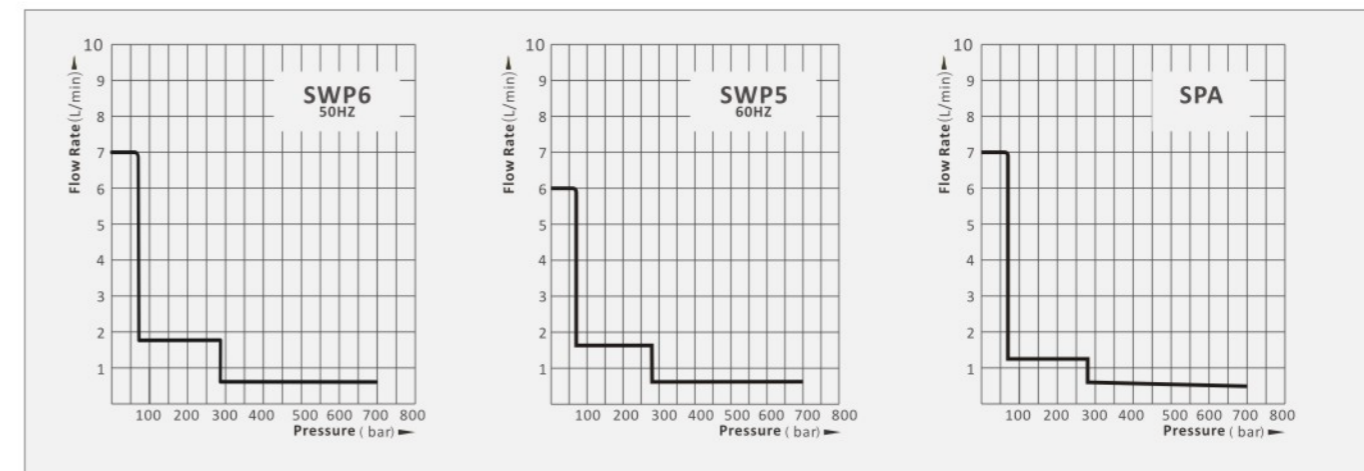
*Both series pumps adopt German HAWE valve.

Automatic Hydraulic wrench powerpack

Model Number	Oil Flow (L/min)			Pressure (bar)			Power KW	Oil Capacity L	Input Power	Weight Kg	Dimensions L×W×H (mm)
	High Pressure	Middle Pressure	Low Pressure	High Pressure	Middle Pressure	Low Pressure					
SWP6	0.8	1.6	7	700	280	70	1.1	8	1Ph 220V / 50HZ	32	490*305*495
SWP5	0.7	1.6	6	700	280	70	0.9	8	1Ph 110V / 60HZ	32	490*305*495

*Both series pumps adopt German HAWE valve.

SWP AND SPA SERIES OIL FLOW VERSUS PRESSURE



SPA Series Compact Pneumatic Torque Wrench Pump



Features

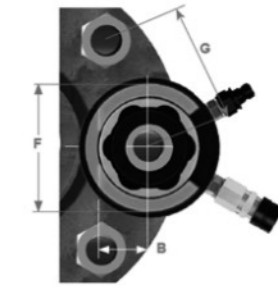
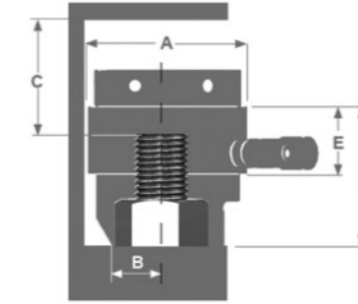
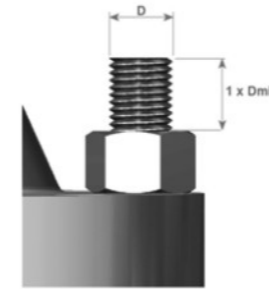
- Three stages manual pump, available for 2 wrench load
- Super lightweight (22kg), easy to move around
- Output pressure adjustable within 4 ~ 70MPa
- Reliable cooling system assure the pump adaptable in extreme environment
- Durable aluminum oil tank with excellent heat dissipation.

Reservoir Capacity: 5 litres
Flow at Rated Pressure: 0.63 l/min
Max. Operating Pressure: 700 bar

Model No.	Oil Flow (L/min)			Pressure (bar)			Power kW	Oil Capacity L	Air Pressure Range bar	Weight kg	Dimensions L×W×H (mm)
	High Pressure	Middle Pressure	Low Pressure	High Pressure	Middle Pressure	Low Pressure					
SPA-70	0.63	1.26	7.0	700	300	70	1.1	5	0.4-0.8	22	490*228*463

*Different Voltage (115, 230, 380, 415 and 440 voltage) & Frequence (50/60Hz) are available

TG Series Hydraulic Bolt Tensioners



TECHNICAL SPECIFICATIONS

TG-Series tensioners need a minimum of 1xbolt diameter protruding above the hexagon or round nut.

Capacity: 3/4" - 4" (M20 - M100)
Bolt Load: 2643Kn(265Ton)
Max. Ram Stroke: 10-15mm
Max. Operating Pressure: 1500Bar

Tool Ident	Part No	Thread Size		Part No	Bolt Load		Ram Area		Stroke mm	Weight kg	A	B	C	D	E	F	G
		Imperial	Inch		mm	Metric	Kn	Ton									
TG2	TG2-N3/4	3/4"-10UNC	M20x2.5	TG2-M20	227.81	22.86	2.354	1518.76	10	2.0	73.5	21.0	67.0	71.0	45	62	49.5
	TG2-N7/8	7/8"-9UNC	M22x2.5	TG2-M22						1.9		24.0	64.0	71.0		63	53
	TG2-N1	1"-8UN	M24x3	TG2-M24						1.9		24.0	69.0	78.0		69	58.5
	TG2-N1-1/8	1.1/8"-8UN	M27x3	TG2-M27						1.9		24.0	66.0	79.0		74	63.5
TG4	TG4-N1-1/8	1.1/8"-8UN	M27x3	TG4-M27	443.00	44.46	4.578	2953.69	15	4.8	102	27.0	85.0	92.0	54	82	67.6
			M30x3.5	TG4-M30						4.9		32.0	85.0	93.0		85	69
	TG4-N1-1/4	1.1/4"-8UN	M33x3.5	TG4-M33						4.6		31.0	84.0	95.0		85	72
	TG4-N1-3/8	1.3/8"-8UN	M36x4	TG4-M36						4.6		34.0	84.0	98.0		91	78
	TG4-N1-1/2	1.1/2"-8UN	M39x4	TG4-M39						4.7		36.5	82.0	100.0		90	80
TG8	TG8-N1-1/2	1.1/2"-8UN	M39x4	TG8-M39	810.85	81.38	8.379	5405.70	15	9.5	133	36.5	98.0	109.0	56	97	83.5
	TG8-N1-5/8	1.5/8"-8UN	M42x4.5	TG8-M42						9.0		37.5	93.0	107.0		110	92.5
	TG8-N1-3/4	1.3/4"-8UN	M45x4.5	TG8-M45						9.3		40.5	98.5	116.0		115	98
	TG8-N1-7/8	1.7/8"-8UN	M48x5	TG8-M48						9.0		42.5	95.0	116.0		116	101
	TG8-N2	2"-8UN	M52x5	TG8-M52						8.6		50.0	93.5	117.0		120	106
TG12	TG12-N1-7/8	1.7/8"-8UN	M48x5	TG12-M48	1273.16	127.78	13.159	8489.96	15	16.1	163	43.5	106.0	118.0	57	130	108
	TG12-N2	2"-8UN	M52x5	TG12-M52						15.7		46.0	102.5	117.0		124	108
	TG12-N2-1/4	2.1/4"-8UN	M56x5.5	TG12-M56						15.8		55.0	103.0	123.0		134	118.5
			M60x5.5	TG12-M60						18.3		54.0	121.5	145.5		150	127
TG18	TG18-N2-1/2	2.1/2"-8UN	M64x6	TG18-M64	1828.99	183.56	18.905	12196.45	15	22.7	193	64.0	107.5	133.0	60	147	130.5
			M68x6	TG18-M68						23.6		80.0	111.0	141.0		160	138
	TG18-N2-3/4	2.3/4"-8UN	M72x6	TG18-M72						24.7		72.0	115.0	147.0		161	143
	TG18-N3	3"-8UN	M76x6	TG18-M76						22.2		77.0	108.0	146.0		170	153
TG26	TG26-N3	3"-8UN	M76x6	TG26-M76	2643.43	265.30	27.323	17627.48	15	38.5	233	77.0	120.0	153.0	64	170	153
			M80x6	TG26-M80						38.3		78.0	117.0	154.0		178	155.5
	TG26-N3-1/4	3.1/4"-8UN	M85x6	TG26-M85						38.1		78.0	114.0	154.0		182	165.5
	TG26-N3-1/2	3.1/2"-8UN	M90x6	TG26-M90						37.0		86.0	114.0	160.0		191	174.5
	TG26-N3-3/4	3.3/4"-8UN	M95x6	TG26-M95						37.0		99.0	116.0	168.0		210	183.5
TG26-N4	4"-8UN	M100x6	TG26-M100						36.4		105.0	116.0	174.0		220	200	

Features & Benefits

- Powerful and compact range of multi-purpose bolt tensioning tools
- Suit most ANSI B16.5, ANSI B16.47 Series 1, MSS-SP44, API-6A and API-17D flanges
- High quality polyurethane seals for reliable, leak free operation.
- Powerful bolt load capacity.
- 15mm Ram Stroke
- Only 6 base tools to cover bolt sizes 3/4" to 4". Supplied with Nut Rotating Sockets, no need for drilled nuts.
- Optical over stroke pressure safety device.
- Manufactured from high strength steel for long life.
- Easy Hose assembly with SAIVS Link Hose System.
- Rapid and accurate method of tightening a bolt

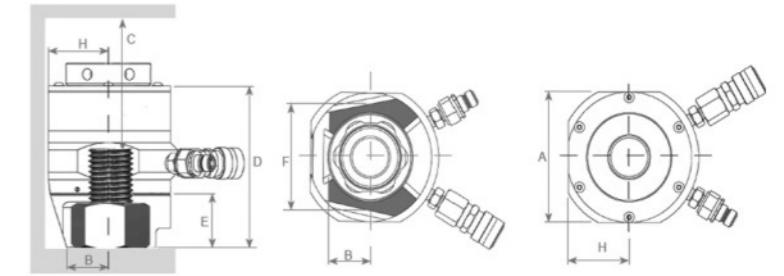
TS Series Hydraulic Bolt Tensioners



Capacity: 3/4" - 4" (M20 - M100)
Bolt Load: 3109Kn (312Ton)
Max. Ram Stroke: 15mm
Max. Operating Pressure: 1500Bar

Features & Benefits

- 10 base tools covering bolt sizes from 3/4" to 4" (M20 to M100)
- Fit on to most ANSI B16.5, ANSI B16.47 Series 1, MSS-SP44, API-6A and API-17D standard flanges
- Heavy duty integrated springs assist automatic ram reset. Reduces operation time between pressure cycles.
- Reliable, mature high pressure Seal technology
- High Pressure Quick Connect Couplings are user configurable
- Industry proven high pressure seal technology offers many 1000's of reliable and safe pressure cycles.
- A maximum ram stroke of 15mm to achieve a "One Pull" tensioning procedure.
- Knurled Puller for easy user operation
- Grip Surface & handling straps for easy user handling
- Reduced Side Profile, ensures maximum fit versatility



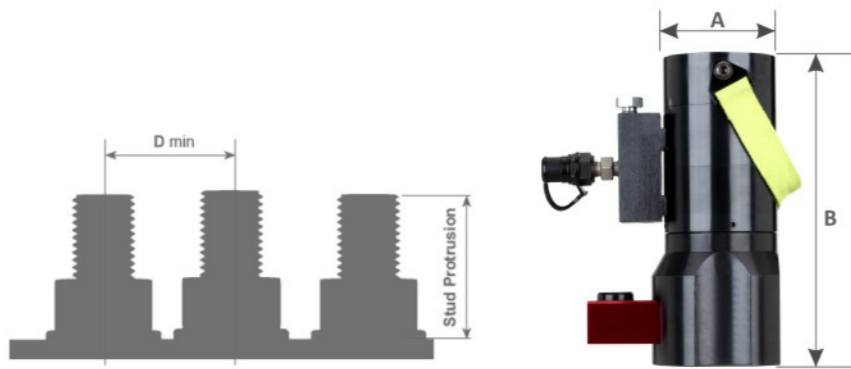
Tool Ident	Part No Imperial	Thread Size		Part No Metric	Bolt Load		Ram Area		Stroke mm	Weight kg	A	B	C	D	E	F	G	H
		Inch	mm		Kn	Ton	In ²	Ton ²										
TS1	TS1-N3/4	3/4"-10UNC	M20x2.5	TS1-M20	180.25	18.09	1.86	1201.93	15	2.62	72.00	21.50	90.00	99.50	68.50	61.75	49.00	36.00
	TS1-N7/8	7/8"-9UNC	M22x2.5	TS1-M22						2.68		24.75	89.25	100.75		72.00	57.50	
TS2	TS2-N3/4	3/4"-10UNC	M20x2.5	TS2-M20	236.06	23.69	2.44	1573.55	15	3.24	80.50	21.00	90.00	99.50	68.50	59.75	49.00	38.80
	TS2-N7/8	7/8"-9UNC	M22x2.5	TS2-M22						3.32		25.00	59.25	100.75		70.00	56.50	
	TS2-N1	1"-8UN	M24x3	TS2-M24						3.41		28.00	90.00	104.00		80.50	64.25	
TS3	TS3-7/8	7/8"-9UNC	M22x2.5	TS3-M22	380.38	38.18	3.93	2536.12	15	5.21	99.00	24.75	93.00	104.50	71.50	76.00	59.50	47.90
	TS3-N1	1"-8UN	M24x3	TS3-M24						5.25		27.50	93.00	107.00		80.50	64.25	
	TS3-N1-1/8	1.1/8-8UN	M27x3	TS3-M27						5.53		28.00	96.00	113.50		90.75	72.00	
				M30x3.5	TS3-M30					5.54		35.00	94.00	114.00		85.00	69.00	
	TS3-N1-1/4	1.1/4"-8UN	M33x3.5	TS3-M33						5.56		34.50	95.00	114.50		89.88	75.00	
TS4	TS5-N1-1/8	1.1/8-8UN	M27x3	TS5-M27	564.95	56.70	5.84	408.00	15	8.76	116.50	33.00	118.50	135.50	97.00	90.75	75.00	56.50
			M30x3.5	TS5-M30						8.71		35.00	121.00	136.00		85.00	72.00	
	TS5-N1-1/4	1.1/4"-8UN	M33x3.5	TS5-M33						9.02		35.00	122.00	140.00		89.88	77.00	
	TS5-N1-3/8	1.3/8"-8UN	M36x4	TS5-M36						9.08		42.00	121.00	142.00		95.14	83.00	
	TS5-N1-1/2	1.1/2"-8UN	M39x4	TS5-M39						9.08		39.00	121.00	145.00		93.41	85.00	
TS5	TS7-N1-3/8	1.3/8"-8UN	M36x4	TS7-M36	763.94	76.67	7.89	5092.89	15	12.71	134.75	42.00	131.50	152.50	107.50	95.14	83.00	63.38
	TS7-N1-1/2	1.1/2"-8UN	M39x4	TS7-M39						12.93		45.00	131.50	155.50		100.53	88.00	
	TS7-N1-5/8	1.5/8"-8UN	M42x4.5	TS7-M42						13.09		45.00	136.00	159.00		111.54	96.00	
	TS7-N1-3/4	1.3/4"-8UN	M45x4.5	TS7-M45						13.42		46.00	136.00	162.00		119.72	103.00	
TS6	TS9-N1-5/8	1.5/8"-8UN	M42x4.5	TS9-M42	951.41	95.49	9.83	6342.57	15	15.67	149.25	48.00	135.75	158.75	107.50	111.54	96.00	72.53
	TS9-N1-3/4	1.3/4"-8UN	M45x4.5	TS9-M45						16.07		48.00	136.00	162.00		119.72	103.00	
	TS9-N1-7/8	1.7/8"-8UN	M48x5	TS9-M48						16.01		46.50	137.50	166.50		113.52	103.00	
	TS9-N2	2"-8UN	M52x5	TS9-M52						16.00		53.50	135.00	168.50		120.47	110.00	
TS7	TS14-N1-7/8	1.7/8"-8UN	M48x5	TS14-M48	1458.89	146.42	15.08	9725.79	15	24.30	179.50	55.00	141.25	170.24	109.50	121.45	107.00	87.50
	TS14-N2	2"-8UN	M52x5	TS14-M52						24.85		55.00	142.50	176.00		128.42	114.00	
	TS14-N2-1/4	2.1/4"-8UN	M56x5.5	TS14-M56						24.89		59.00	148.25	180.75		132.61	119.00	
				M60x5.5	TS14-M60					24.26		60.00	145.50	182.00		144.80	127.00	
	TS14-N2-1/2	2.1/2"-8UN	M64x6	TS14-M64						24.81		67.00	141.50	182.00		144.80	130.00	
TS8	TS19-N2-1/4	2.1/4"-8UN	M56x5.5	TS19-M56	1989.25	199.64	20.56	13261.91	15	33.68	206.75	65.00	151.25	184.75	110.50	134.60	119.00	103.40
			M60x5.5	TS19-M60						34.60		60.00	145.50	183.00		170.00	137.00	
	TS19-N2-1/2	2.1/2"-8UN	M64x6	TS19-M64						34.64		66.00	152.50	194.00		144.80	130.00	
				M68x5.5	TS19-M68					32.83		70.00	151.00	196.50		160.00	141.00	
	TS19-N2-3/4	2.3/4"-8UN	M72x6	TS19-M72						35.08		76.00	147.75	197.25		158.23	146.00	
	TS19-N3	3"-8UN	M76x6	TS19-M76						34.73		80.50	146.75	198.75		169.93	151.00	
TS9	TS27-N2-3/4	2.3/4"-8UN	M72x6	TS27-M72	2753.32	276.33	28.45	18355.45	15	48.60	239.00	80.00	154.75	204.25	112.50	170.18	149.00	119.50
	TS27-N3	3"-8UN	M76x6	TS27-M76						48.86		81.00	160.75	211.75		169.93	151.00	
				M80x6	TS27-M80					47.70		78.00	158.50	213.50		190.00	164.00	
	TS27-N3-1/4	3.1/4"-8UN	M85x6	TS27-M85						50.82		88.00	159.00	219.00		181.37	160.00	
	TS27-N3-1/2	3.1/2"-8UN	M90x6	TS27-M90						51.08		94.00	158.50	223.50		187.38	172.00	
TS10	TS31-N3-1/4	3.1/4"-8UN	M85x6	TS31-M85	3109.94	312.12	32.14	20732.86	15	59.28	257.50	87.00	165.00	223.00	112.50	181.37	163.00	128.80
	TS31-N3-1/2	3.1/2"-8UN	M90x6	TS31-M90						60.07		95.50	166.50	229.50		187.38	171.00	
	TS31-N3-3/4	3.3/4"-8UN	M95x6	TS31-M95						58.69		100.00	157.75	225.75		209.44	185.00	
	TS31-N4	4"-8UN	M100x6	TS31-M100						56.90		105.00	152.00	223.50		215.64	194.00	

TW Series Bolt Tensioners For Wind Turbines



Features & Benefits

- Specially designed for use on Wind Turbines, suitable for a complete wind turbine bolting installation or maintenance programme
- By listening to customer requirements these feature rich, powerful bolt tensioning tools are packed full of operator requested features
- Quick release swivel fittings, automatic piston return and intuitive operation
- Compact and lightweight for ease of handling
- Interchangeable profile cut spacer gives the tensioner the flexibility to be used on many different applications



TWB Applications

- Rear Main Bearing
- Nacelle Frame
- Nacelle/Yaw Bearing
- Blade to Bearing
- Front Main Bearing
- Intermediate Tower Bolting

Model number	Bolt Diameter	Stud Protrusion		Max Stroke	Maximum Load		Hydraulic Pressure Area		Diameter		Height	D	Weight
		Min	Max		KN	lbs	mm ²	ln ²	A	B			
TW4B-M30	M30	59	69	8	517.08	116247	3447.21	5.343	72	205	64	6.16	
TW5B-M33	M33	64	73	10	639.91	143827	4266.09	6.611	79	217.5	71	7.24	
TW6B-M36	M36	71	81	10	753.61	169420	5024.05	7.787	84.5	229.5	77	8.75	
TW8B-M39	M39	76	86	10	900.63	202472	6004.2	9.307	92	263	83	11.12	
TW9B-M42	M42	83	93	10	1032.96	232221	6886.37	10.674	97	262.5	95	12.75	
TW10B-M45	M45	88	98	10	1199.42	269647	7996.12	12.394	155	275.5	94.5	15.86	
TW12B-M48	M48	94	104	10	1357.29	305133	9048.57	14.025	111	286.5	100.5	17.84	
TW16B-M56	M56	110	120	10	1873.54	421189	12490.29	19.359	132	314	115	26.5	
TW22B-M64	M64	124	134	10	2469.19	554778	16461.30	25.515	150	352	124	35	

SPS Series Hand Pumps



Features

- Light weight and compact design
- Two speed operation, increase the work efficiency
- Better portability with the handle
- Build-in safety valve inside to provides safe dual-protection
- Overflow port function could limit the stroke
- Note: SPSD7-2 is double-acting hydraulic hand pump, equipped with 4 valves

Usable Oil Capacity: 0.65-7.5 L
Max Pressure : 700-1600 bar

- 1). All models meet CE safety requirement.
- 2). Different Voltage (115, 230, 380, 415 and 440 voltage) & Frequency (50/60Hz) are available.
- 3). Flow rate of the pump at 50Hz will be higher at 60Hz.

Gauges

Minimize the risk of overloading and ensure long, dependable service from the equipment.



Hydraulic Cylinder

Saivs Hydraulic cylinder work perfectly with PE10/15 pump. (ie. SSL, SSA, SSZ, SSC/SSB etc.)



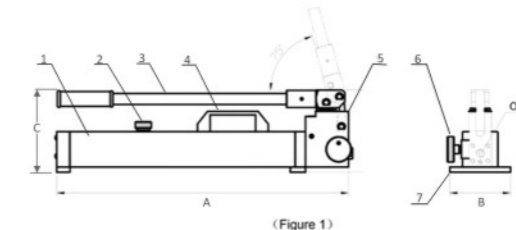
Hose

Saivs high quality hydraulic hoses ensured the integrity of the system.



Tool-Pump Sets

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



(Figure 1)

1. Reservoir
2. Oil-filling air breather
3. Handle
4. Grip
5. Pump Body
6. Unloading Valve
7. Foot

Pump Type	Usable Oil Capacity	Model Number	Pressure Rating		Output Oil Volume Each Stroke		Handle Force	Dimensions			Output Adapter	Weight		
			(Bar)		(cm ³)			(mm)						
Double Speed	1440	SPS7-1	25	700	32	2.5	300	577	120	170	NPT3/8"	6.3		
													3240	SPS7-3
	5860	SPS7-4	25	700	32	2.5								
								1440	SPS16-1	15			1600	32
	3240	SPS16-3	15	1600	32	2.5								

SFSH Series Hydraulic and Mechanical Wedge/Flange Spreaders



Features

- Portable tools to safely spread flange joints.
- Integrated wedge concept: Friction-free, smooth and parallel wedge movement eliminates flange damage and spreading arm failure
- Unique interlocking wedge design - no first step bending and risk of slipping out of joint
- Requires very small access gap of only 6mm
- Stepped spreader arm design - each step can spread under full load
- Few moving parts mean durability and low maintenance

Tip Clearance: 6 mm
Maximum Spread : 80 mm
Maximum Spread Force: 8-14 ton
Max. Pressure: 700 bar(SFSH-14)



Hose

Saivs high quality hydraulic hoses ensured the integrity of the system. (Quick coupling available with NPT 3/8")



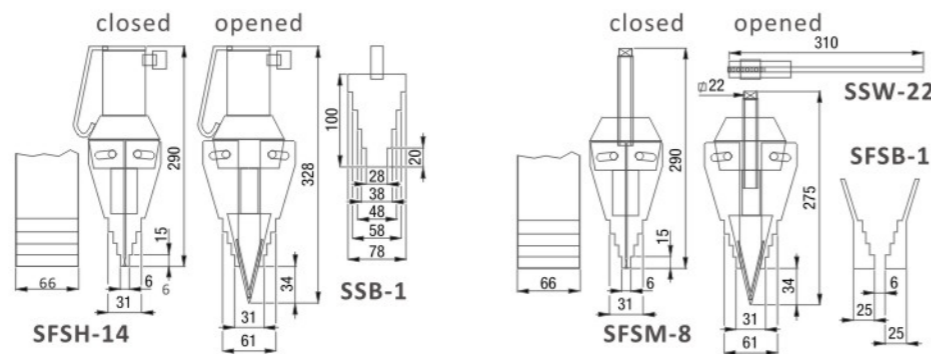
Gauges

Minimize the risk of overloading and ensure long, dependable service from the equipment.



Tool-Pump Sets

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



Maximum Spreading Force	Model Number	Tip Clearance	Maximum Spread	Spreader Type	Oil Capacity	Weight
ton (kN)		(mm)	(mm)		(cm ³)	(kg)
14(125)	SFSH-14	6	80	Hydraulic	78	7.1
8(72)	SFSH-8	6	80	Mechanical	/	6.5

SNC Series Single-Acting Hydraulic Nut Splitters



Features

- Compact and ergonomic design, easy to use
- Unique angled head design
- Single-acting, spring return cylinder
- Heavy duty chisels can be reground
- Application include service trucks, piping industry, tank cleaning, petrochemical, steel construction, mining, etc.

Hexagon Nut Range: 10-75 mm
Bolt Range: M6-M48
Max. Operating Pressure: 700 bar



Tool-Pump Sets

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



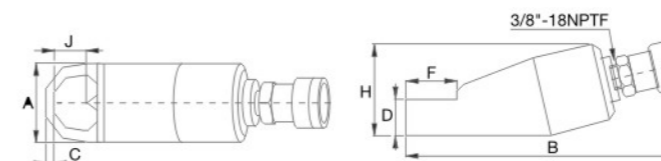
Gauges

Minimize the risk of overloading and ensure long, dependable service from the equipment.



Hose

Saivs high quality hydraulic hoses ensured the integrity of the system. (Quick coupling available with NPT 3/8")



Bolt Range	Hexagon Nut Range	Capacity	Oil Capacity	Model Number	Dimensions(mm)							Weight	Replacement Chisel Model Number	
					A	B	C	D	F	H	J			(kg)
(mm)	(mm)	ton(KN)	(cm ³)											
M6-M12	10-19	5(49)	15	SNC-1019	40	170	7	19	28	48	21	1.2	SCNB-1019	
M12-M16	19-24	10(98)	20	SNC-1924	54	191	10	26	40	62	25	2.0	SCNB-1924	
M16-M22	24-32	15(147)	60	SNC-2432	64	222	13	29	51	72	33	3.0	SCNB-2432	
M22-M27	32-41	20(196)	80	SNC-3241	75	244	17	36	66	88	43	4.4	SCNB-3241	
M27-M33	41-50	35(343)	155	SNC-4150	94	288	21	45	74	105	54	8.2	SCNB-4150	
M33-M39	50-60	50(490)	240	SNC-5060	106	318	23	54	90	128	60	11.8	SCNB-5060	
M39-M48	60-75	90(882)	492	SNC-6075	156	393	26	72	110	181	80	34.1	SCNB-6075	

Hydraulic Tools Parts & Accessories

High Pressure Hose

Inside Diameter: 6.4 mm
Length: 2-12 m
Max. Operating Pressure: 700 bar



Internal Diameter	Hose Length	Model Numbers			
		700Bar		1000Bar	
mm	m	NPT1/4"	NPT3/8"	NPT1/4"	NPT3/8"
6.4	2	SZAX-2-NPT1/4	SZAX-2-NPT3/8	SZAJ-2-NPT1/4	SZAJ-2-NPT3/8
	3	SZAX-3-NPT1/4	SZAX-3-NPT3/8	SZAJ-3-NPT1/4	SZAJ-3-NPT3/8
	6	SZAX-6-NPT1/4	SZAX-6-NPT3/8	SZAJ-6-NPT1/4	SZAJ-6-NPT3/8
	9	SZAX-9-NPT1/4	SZAX-9-NPT3/8	SZAJ-9-NPT1/4	SZAJ-9-NPT3/8
	12	SZAX-12-NPT1/4	SZAX-12-NPT3/8	SZAJ-12-NPT1/4	SZAJ-12-NPT3/8

Model Numbers	Hose Length	Internal Diameter	Pressure
SZBJ-6-NPT1/4	6m	6.4mm	1000 Bar
SZBJ-10-NPT1/4	10m		
SZBJ-15-NPT1/4	15m		

Note:

1. Rubber hose and polyurethane hose are all available for selection. Please notify in the order.
2. Length can be customized
3. SZBJ series are twin tough cover bonded hoses

Quick Coupling

Maximum Flow Capacity: 6.1-40.0 l/min
Thread: 1/4"-3/8" NPT
Max. Operating Pressure: 700-1600 bar



Pressure Rate	Model Numbers		
	Male Half	Female Half	Compleat Set
700	SFA-NPT3/8"	SMA-NPT3/8"	SA-NPT3/8"
	SFA-NPT1/4"	SMA-NPT1/4"	SA-NPT1/4"
1000	SFB-NPT3/8"	SMB-NPT3/8"	SB-NPT3/8"
	SFB-NPT1/4"	SMB-NPT1/4"	SB-NPT1/4"
1600	SFD-G1/4"	SMD-G1/4"	SD-G1/4"

- NPT3/8 big flow coupling
- Suitable for SAIVS standard hydraulic cylinder
- NPT1/4 normal quick coupling
- Suitable for hydraulic pump station and other hydraulic parts

Hydraulic Gauge

Pressure Range: 600-1000 bar
Face Diameter: 63-100 mm
Accuracy, % of full scale: +1.0-1.5%



Model Numbers	Dimension	Thread	Gauge Calivration
	(mm)		(bar)
YN-63-70	63	NPT1/4"	0-700
YN-100-70	100	G1/2"	0-700
YN-100-100			0-1000
YN-100-160			0-1600

- Double scale display for PSI and Mpa
- Pressure sensor parts are sealed by silicon oil
- Durable with safety seal

Manifold

Type	Model	Quick Coupler
One For Two	SFF2-FPQ-NPT3/8-1	NPT3/8"
	SFF2-FPQ-NPT1/4-1	NPT1/4"
One For Four	SFF4-FPQ-NPT3/8-1	NPT3/8"
	SFF4-FPQ-NPT1/4-1	NPT1/4"
One For Six	SFF6-FPQ-NPT3/8-1	NPT3/8"
	SFF6-FPQ-NPT1/4-1	NPT1/4"
One For Eight	SFF8-FPQ-NPT3/8-1	NPT3/8"
	SFF8-FPQ-NPT1/4-1	NPT1/4"
One For Ten	SFF10-FPQ-NPT3/8-1	NPT3/8"
	SFF10-FPQ-NPT1/4-1	NPT1/4"



WARNING

High Pressue Hose

- 1). Do not exceed maximum pressure.
- 2). Do not handle hoses which are under pressure.

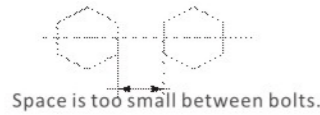
Quick Coupling

- 1). Couplers should be pressurized only when completely connected and should not be coupled or uncoupled when pressurized.

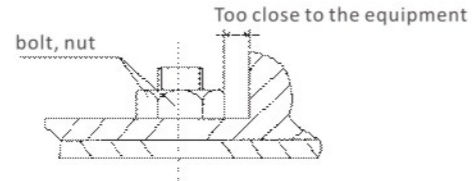
Considering the Working Space

Because of the limitation of working space, pay attention to the position of working space.

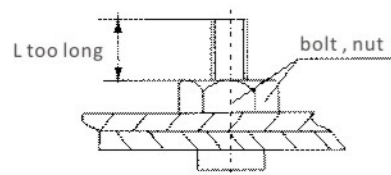
1.Space between bolts too small.



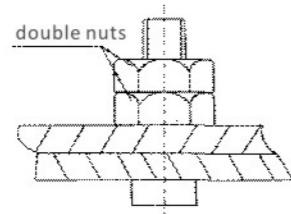
2.Space between bolts(nuts) and equipment is too small



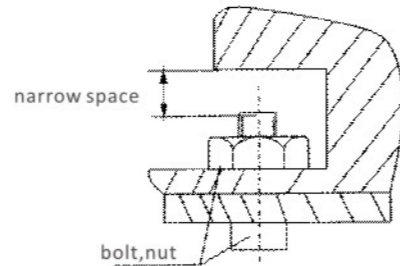
3.Bolt is too long



4.Bolts have double nuts



5.Height is too small



Except above situation, if it is still unworkable, it should use a hollow wrench, the special feature for this wrench is that it can divide the wrench to two parts: working head and driving head. Under the same driving head, it can change the working head to achieve the discharging of different bolts, in addition, it also can add different diameter socket to change the hexangular subtense to achieve the discharging. The selection for hydraulic hollow wrench is the same as hydraulic torque wrench in theory.

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.

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.

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 the first time.

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.

Reliable and repeatable results

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

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.

All ton values specified in this catalogue are metric tonnes and are for cylinder class identification only. Please refer to the kN data for calculations.

Pressure:

1 psi	= 0,069 bar
1 bar	= 14,50 psi
	= 9,8 N/cm ²
	= 100.000 Pa
1 kPa	= 0,145 psi
1 MPa	= 145 psi

Volume:

1 in ³	= 16,387 cm ³
1 cm ³	= 0,061 in ³
1 litre	= 61,02 in ³
	= 0,264 gal
1 USgal	= 3785 cm ³
	= 3,785 l
	= 231 in ³

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

Torque:

1 Nm	= 0,738 Ft.lbs
	= 0,102 kgf.m
1 Ft.lbs	= 1,356 Nm
	= 0,138 kgf.m

Temperature:

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

Other measurements:

1 in	= 25,4 mm
1 mm	= 0,039 in
1 in ²	= 6,452 cm ²
1 cm ²	= 0,155 in ²
1 hp	= 0,746 kW
1 kW	= 1,359 hp
1 kN	= 225 lbs

Imperial to metric

Inches	Decimal	mm
1/16	.06	1,59
1/8	.13	3,18
3/16	.19	4,76
1/4	.25	6,35
5/16	.31	7,94
3/8	.38	9,53
7/16	.44	11,11
1/2	.50	12,70
9/16	.56	14,29
5/8	.63	15,88
11/16	.69	17,46
3/4	.75	19,05
13/16	.81	20,64
7/8	.88	22,23
15/16	.94	23,81
1	1.00	25,40

What is Torque?

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

What is Torque Tightening?

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

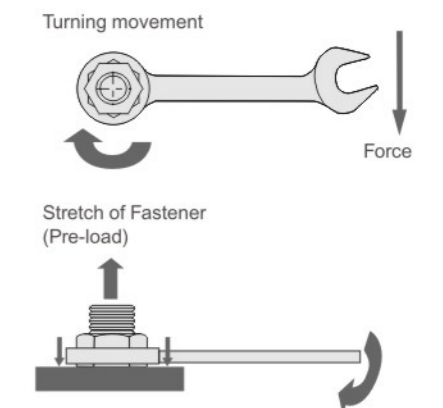
Torque Tightening and Preload

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

Principally there are three different "torque components":

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

Torque Tightening



Torque versus Pressure Table

To select the proper torque value for the bolt, please refer to the following table.

Strength Grade		4.8		6.8		8.8		10.9		12.9	
Min Break Strength		392MPa		588MPa		784MPa		941MPa		1176MPa	
Material		Normal Construction Steel		Mechanical Construction Steel		Cr.Mo.Alloy Steel		Ni.Cr.Mo.Alloy Steel		Ni.Cr.Mo.Alloy Steel	
Bolt	Nut Subtense	Torque Value		Torque Value		Torque Value		Torque Value		Torque Value	
		KGM	N.m	KGM	N.m	KGM	N.m	KGM	N.m	KGM	N.m
M	mm										
14	22	7	69	10	98	14	137	17	165	23	225
16	24	10	98	14	137	21	206	25	247	36	363
18	27	14	137	21	206	29	284	35	341	49	480
20	30	18	176	28	296	41	402	58	569	69	680
22	32	23	225	34	333	55	539	78	765	93	911
24	36	32	314	48	470	70	686	100	981	120	1176
27	41	45	441	65	637	105	1029	150	1472	180	1764
30	46	60	588	90	882	125	1225	200	1962	240	2352
33	50	75	735	115	1127	150	1470	210	2060	250	2450
36	55	100	980	150	1470	180	1764	250	2453	300	2940
39	60	120	1176	180	1764	220	2156	300	2943	370	3626
42	65	155	1519	240	2352	280	2744	390	3826	470	4606
45	70	180	1765	280	2744	320	3136	450	4415	550	5390
48	75	230	2254	350	3430	400	3920	570	5592	680	6664
52	80	280	2744	420	4116	480	4704	670	6573	850	8330
56	85	360	3528	530	5149	610	5978	860	8437	1050	10290
60	90	410	4018	610	5978	790	7742	1100	10791	1350	13230
64	95	510	4998	760	7448	900	8820				
68	100	580	5684	870	8526	1100	10780				
72	105	660	6468	1000	9800	1290	12642				
76	110	750	7350	1100	10780	1500	14701				
80	115	830	8143	1250	12250	1850	18130				
85	120	900	8820	1400	13720	2250	22050				
90	130	1080	10584	1650	16170	2500	24500				
100	145	1400	13720	2050	20090						
110	155	1670	16366	2550	24990						
120	175	2030	19894	3050	29890						

SAIVS

Above data is based on German Industry Standard, the torque value are tested when yield strength reach to 80%.

Recommend lock torque is: data (in above table) X (80-90%), eg. M52,8.8 grade bolt, the lock torque is 4707X90%=4233.6N.M.

Loosen torque is (1.5~2)X lock torque, take above lock torque for example:

lock torque is 4233.6 N.M, then the loosen torque is 4233.6X(1.5~2)=6350.4~8467.2N.M