SUBSEA TOOLS

HIGH PERFORMANCE HIGH FORCE HYDRAULICS

Page
SST...60-61
Subsea Stud Tensioner

Page
SFP...62-65
Subsea Flange Pullers

Page
SUBSEA ACCESSORIES...66-67

OTHER TOOLS FOR SUBSEA

Page
ENS...48-49
Hydraulic Nut Splitters

Page
TWHC...14-15
High Cycle Torque Wrench

Page
TWLC...24-29
Low Clearance Torque Wrench

OK FOR SUBSEA

SUBSEA TENSIONER

STUD TENSIONER - SST

Bolt coverage from 3/4" to 4"
only 8 tools, SST1 to SST8

Patented Quick Reaction Nut

SST STUD TENSIONER

Quick Reaction Subsea Tensioner

Our Subsea stud tensioner incorporating the quick reaction nut feature reduces diver fatigue, improving diver safety and productivity.

- Visible piston stroke indication
- Positive 'over-stroke' stop to prevent piston expulsion/ seal damage.
- Piston/cylinder misalignment compensation
- Anti-slip cylinder surface for improved handling
- Low friction seals
- Anti-corrosion coating
- Bolt coverage from M20 to M100 (3/4" to 4")
- Designed to fit BS1560/ANSI B16.5/API flanges, as well as most compact flange designs

Made to Order, Consult Factory

Specifications and Dimensional Data

(Tool Reference) Load Cell Order No.	Stud Diameter Metric	Quick Reaction Nut Order No.	3/4" to 4" Imperial	Quick Reaction Nut Order No.	Tool Load Ton	kN	Lbf	Hydraulic Area mm²	in²	Approx Wt. kg	lb	Minimum Bolt Protrusion Above Nut Imp bolts mm	Imp bolts in	met bolts mm	met bolts in
(SST1)	M20	QRNAS010004	3/4"	QRNAS010001	15.7	140	31,500	934	1.45	1.50	3.30	104	4.09	107	4.21
SSTAS010001	M22	QRNAS010005	7/8"	QRNAS010003								101	3.98	105	4.13
(SST2)	M24	QRNAS020004	1"	QRNAS020001	27	240	53,900	1,600	2.48	2.80	6.16	133	5.24	139	5.47
SSTAS020001	M27	QRNAS020005	1-1/8"	QRNAS020003								130	5.12	136	5.35
	M30	QRNAS020006	-	-								-	-	134	5.28
(SST3)	M33	QRNAS030005	1-1/4"	QRNAS030003	43	380	85,400	2,534	3.928	4	8.80	136	5.35	142	5.59
SSTAS030001	M36	QRNAS030006	1-3/8"	QRNAS030004								133	5.24	139	5.47
(SST4)	M39	QRNAS040005	1-1/2"	QRNAS040003	62	550	123,700	3,668	5.685	6	13.20	140	5.51	147	5.79
SSTAS040001	M42	QRNAS040006	1-5/8"	QRNAS040004								136	5.35	144	5.67
(SST5)	M45	QRNAS050005	1-3/4"	QRNAS050001	99	880	197,800	5,868	9.095	9	19.80	151	5.94	160	6.3
SSTAS050001	M48	QRNAS050006	1-7/8"	QRNAS050003								148	5.83	158	6.22
	M52	QRNAS050007	2"	QRNAS050004								145	5.71	154	6.06
	M56	QRNAS060005	2-1/4"	QRNAS060001	175	1,560	351,000	10,411	16.137	14.7	32.34	166	6.54	178	7.01
(SST6)	M60	QRNAS060006	2-1/2"	QRNAS060003								160	6.30	175	6.89
SSTAS060001	M64	QRNAS060007	2-3/4"	QRNAS060004								154	6.06	172	6.77
	M68	QRNAS060008	-	-								-	-	169	6.65
	M70	QRNAS060009	-	-								-	-	165	6.5
	M76	QRNAS070005	3"	QRNAS070001	289	2,575	579,000	17,176	26.623	25	55	181	7.13	195	7.68
(SST7)	M80	QRNAS070006	3-1/4"	QRNAS070003								175	6.89	192	7.56
SSTAS070001	M85	QRNAS070007	3-1/2"	QRNAS070004								169	6.65	188	7.40
	M90	QRNAS070008	-	-								-	-	184	7.24
(SST8)	M95	QRNAS080004	3-3/4"	QRNAS080001	388	3,447	775,300	22,997	35.645	39.1	86.02	205	8.07	224	8.82
SSTAS080001	M100	QRNAS080005	4"	QRNAS080003								199	7.83	220	8.66

In order to form a complete tensioner, order a load cell (SSTAS0#0001) and a Quick Reaction Nut (QRNAS0#00##).

Specifications and Dimensional Data

Piston stroke: 30mm (1.2") except for SST1 - 20mm (0.8")

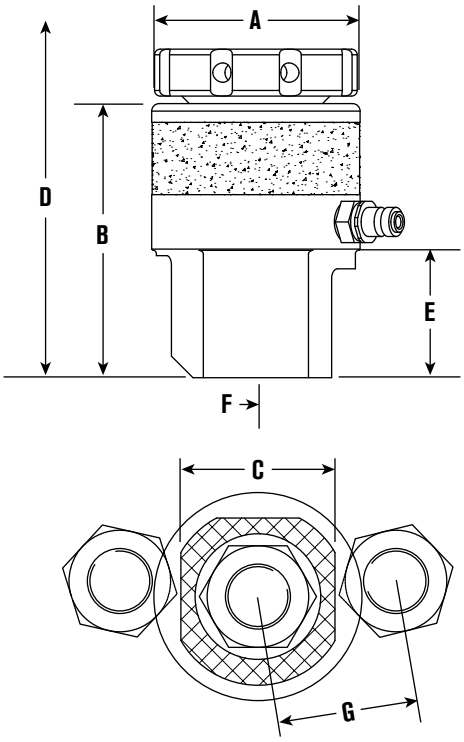
Max tool pressure: 1,500 bar (21,750 psi)

Bolt protrusion above nut: refer to chart below for stud protrusion requirements

'D' includes an allowance for tool removal after bolt tightening with 30mm (1.2") tool stroke

Product development is constantly taking place and dimensions may change without notice

SST BOLT TENSIONER

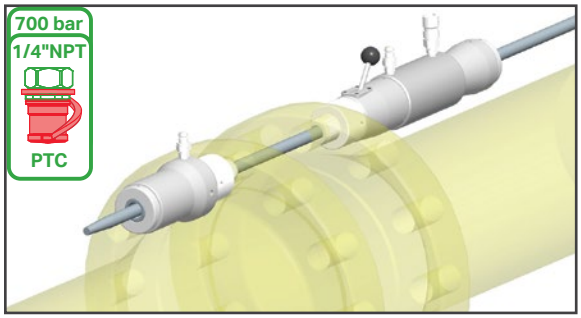


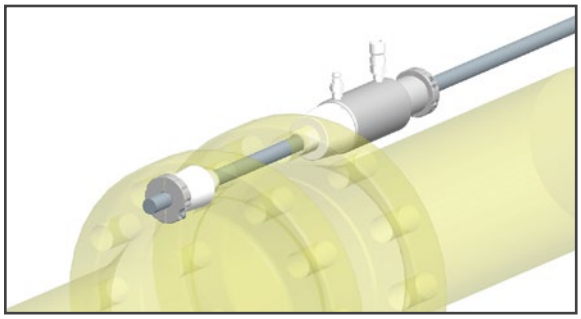
A		B		C		D				E		F		G				Stud Diameter		(Tool Reference)
						Imp bolts		met bolts						Imp bolts		met bolts				
mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	Metric	Imperial	Load Cell Order No.
66	2.6	97	3.8	48	1.9	228	9	228	9	40	1.6	19	0.7	44	1.7	44	1.7	M20	3/4"	(SST1)
														46	1.8	45	1.8	M22	7/8"	SSTAS010001
82	3.2	127.5	5	60	2.4	296	11.7	296	11.7	56.5	2.2	24.5	1	55	2.2	54	2.1	M24	1"	(SST2)
														58	2.3	56	2.2	M27	1-1/8"	SSTAS020001
														-	-	58	2.3	M30	-	
97	3.8	137	5.4	77	3	309	12.2	309	12.2	63	2.5	28	1.1	69	2.7	68	2.7	M33	1-1/4"	(SST3)
														72	2.8	71	2.8	M36	1-3/8"	SSTAS030001
111	4.4	146	5.7	90	3.5	322	12.7	322	12.7	68	2.7	33.5	1.3	81	3.2	81	3.2	M39	1-1/2"	(SST4)
														84	3.3	84	3.3	M42	1-5/8"	SSTAS040001
136	5.4	158	6.2	114	4.5	342	13.5	342	13.5	77.5	3.1	40	1.6	98	3.9	98	3.9	M45	1-3/4"	(SST5)
														101	4	101	4	M48	1-7/8"	SSTAS050001
														104	4.1	104	4.1	M52	2"	
177	7	180.5	7.1	140	5.5	374	14.7	374	14.7	97	3.8	53	2.1	122	4.8	120	4.7	M56	2-1/4"	
														128	5	123	4.8	M60	2-1/2"	(SST6)
														133	5.2	126	5	M64	2-3/4"	SSTAS060001
														-	-	129	5.1	M68	-	
														-	-	132	5.2	M70	-	
217	8.5	202	8	180	7.1	409	16.1	409	16.1	117.5	4.6	88	3.5	159	6.3	155	6.1	M76	3"	
														164	6.5	157	6.2	M80	3-1/4"	(SST7)
														170	6.7	160	6.3	M85	3-1/2"	SSTAS070001
														-	-	166	6.5	M90	-	
248	9.8	230	9.1	210	8.3	480	18.9	480	18.9	128	5	85	3.3	190	7.5	184	7.2	M95	3-3/4"	(SST8)
														196	7.7	190	7.5	M100	4"	SSTAS080001

FLANGE PULLERS

SUBSEA - SFP

700 bar/10,000 psi





WIRE ROPE FLANGE PULLING SYSTEM

- Compact design
- Long Piston Stroke - 102mm (4")
- Self activating collet design
- Auto grab Anchor Collet with hydraulic release
- Manually releaseable Retract Collet prevents lock on
- High strength, low rotation wire rope
- Anti-Slip surfaces
- Operated via separate diver control valve providing precise control for up to 4 pullers

THREADED BAR FLANGE PULLING SYSTEM

- Compact design
- Long Piston Stroke - 102mm (4")
- 700 bar (10,000 psi) systems
- Rapid assembly using Quick Release Reaction Nuts
- High strength threaded bar
- Anti-Slip surfaces
- Operated via separate diver control valve providing precise control for up to 4 pullers

FEATURES

Compact Design
Designed to fit ANSI B16.5, MSS SP44, API 6A and most other flange applications dedicated flange hole adaptors.

Hydraulic Anchor Collet Release
Anchor collet automatically grips wire rope (without hydraulic pressure). Collets can be fully released by applying hydraulic pressure.

Auto Advance Collet Release
Advance collet fully disengages when the pulling cylinder is fully retracted

Manual Retract Collet Release
Retract collet can be manually disengaged, allowing the pulling cylinder (including Advance and Retrace collets) to be removed from the wire rope while the rope is installed in the flanges. Also allows the pulling system to be removed when pipe spring is evident (pipe spring makes the Anchor collet difficult to release).

Low Rotation Wire Rope
Special high load, 19mm and 22mm low rotation, steel wire rope ensure effective collet grip and reduces bird caging effects and strand unwinding.

Remote Diver Control Valve
Pulling Cylinders are controlled via a separate Valve Control Console allowing the diver to control the pullers remote from the work site. This eliminates bulky cylinder mounted control valves and negates constant diver intervention between pullers when advancing and retracting the cylinders.

Drawbar System Conversion with Quick Release Nuts
Pulling Cylinders can be simply converted to use a 1-1/8" threaded drawbar instead of wire ropes. The system utilizes Quick Release Reaction nuts for speed and versatility.

Flexible Design
Two or more cylinders can be linked together to cater for larger flange sizes/loads.

Specifications and Dimensional Data

Max capacity of cylinder: 199.3 kN (20.0 tonf)

Max operating pressure of cylinder: 700 bar (10,000 psi)

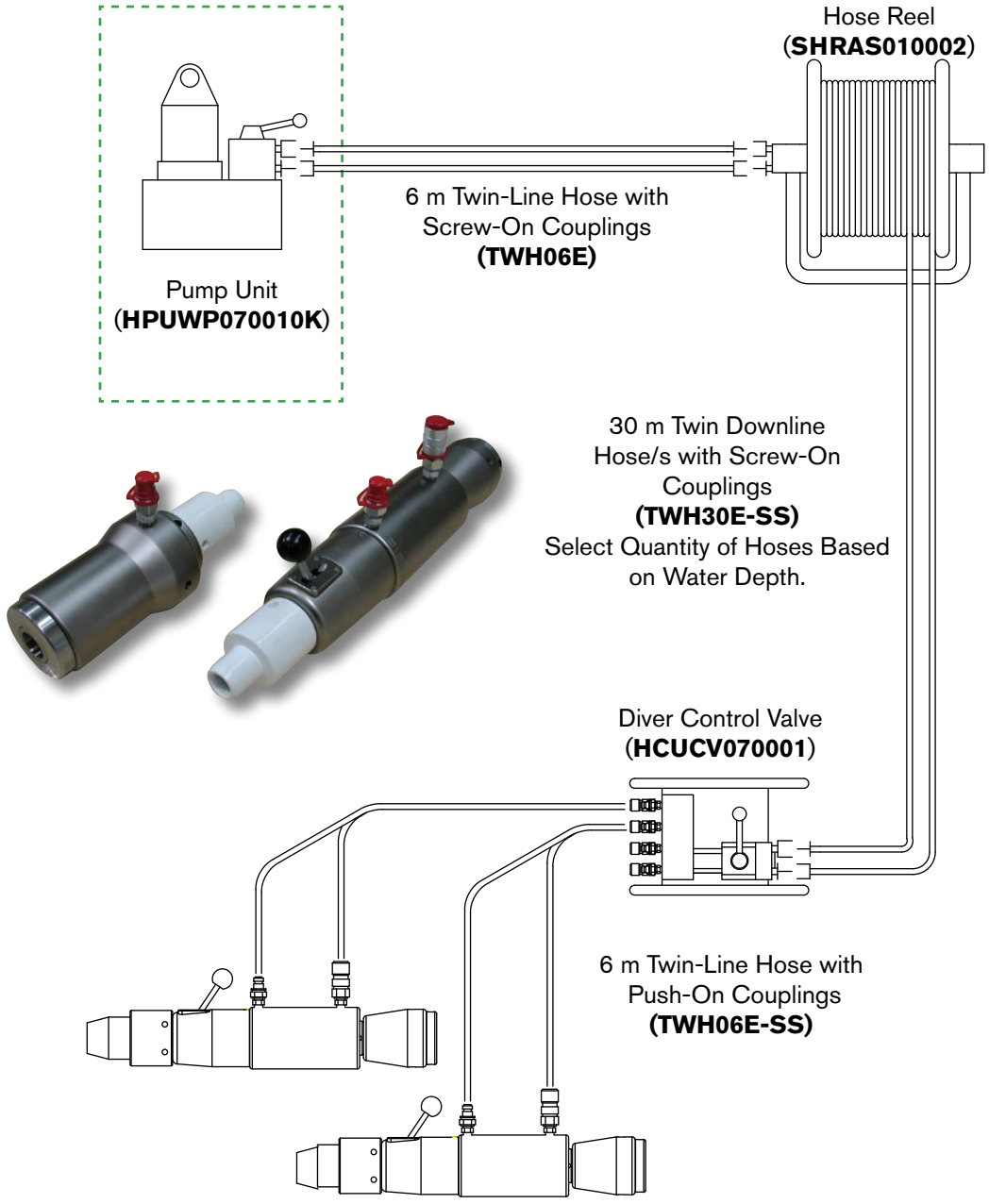
Max stroke of cylinder: 102 mm (4.0")

Diameter of wire ropes/drawbar available: 19.0mm, 22.0mm, 1-1/8" 8UN Drawbar

Specified minimum breaking load of rope: 19.0mm - 307 kN (30.8 tonf), 22mm - 415 kN (41.6 tonf)

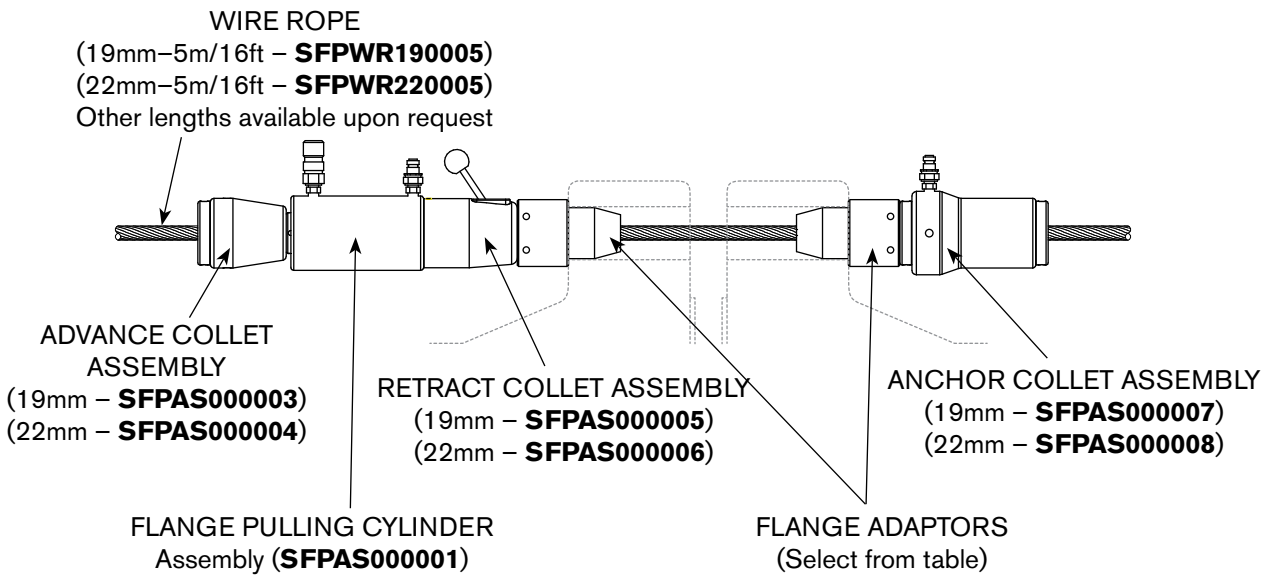
System operating pressure with 19.0/22.0 mm rope: 345 bar (5,000 psi)

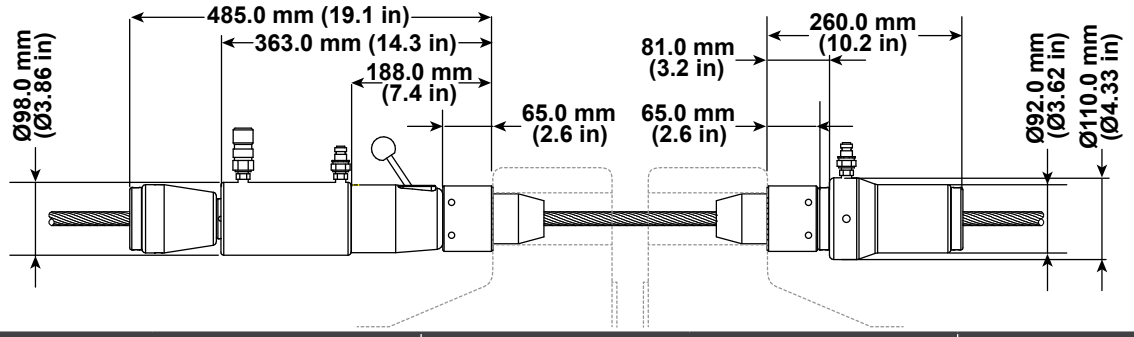
System operating pressure with 1-1/8" drawbar (Gr B7): 690 bar (10,000 psi)



WIRE ROPE FLANGE PULLING SYSTEM

Specifications and Dimensional Data

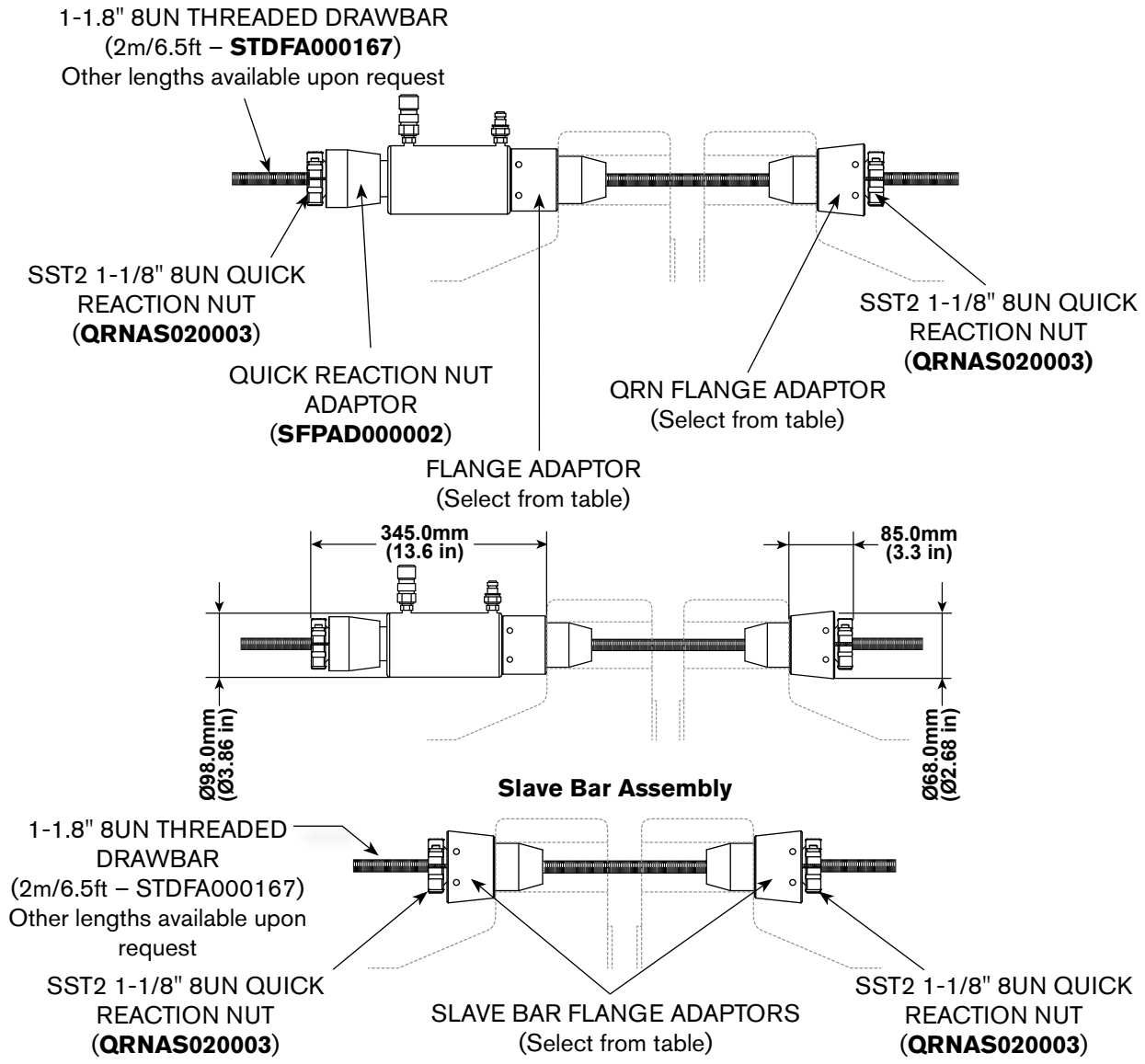




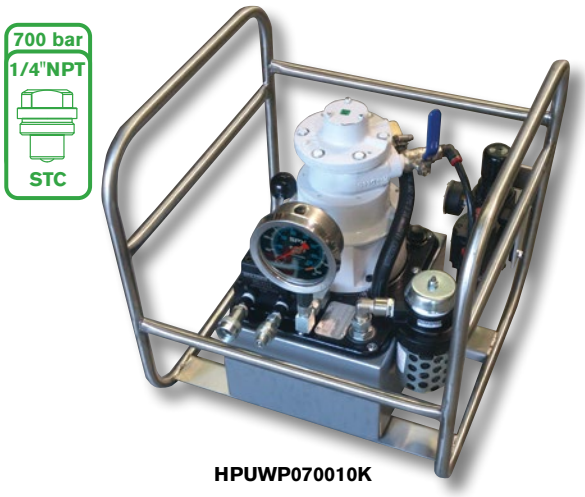
For Bolt Diameter		For Flange Hole Diameter		Wire Rope Flange Adapter Order No.
mm	in	mm	in	
M20	3/4	22.2	7/8	SFPWA000C00
M24	7/8	25.4	1	SFPWA000D00
M27	1	28.6	1-1/8	SFPWA000E00
M30	1-1/8	31.8	1-1/4	SFPWA000F00
M33	1-1/4	34.9	1-3/8	SFPWA000G00
M36	1-3/8	38.1	1-1/2	SFPWA000H00
M39	1-1/2	41.3	1-5/8	SFPWA000I00
M42	1-5/8	44.5	1-3/4	SFPWA000J00
M45	1-3/4	47.6	1-7/8	SFPWA000K00
M48	1-7/8	50.8	2	SFPWA000L00
M52	2	54	2-1/8	SFPWA000M00
M56	2-1/4	60.3	2-3/8	SFPWA000N00
M64	2-1/2	66.7	2-5/8	SFPWA000P00
M68/M70	2-3/4	73	2-7/8	SFPWA000Q00
M76	3	79.4	3-1/8	SFPWA000R00
M82	3-1/4	85.7	3-3/8	SFPWA000S00
M90	3-1/2	92.1	3-5/8	SFPWA000T00
M95	3-3/4	98.4	3-7/8	SFPWA000U00
M100	4	104.8	4-1/8	SFPWA000V00

THREADED BAR
FLANGE PULLING SYSTEM

Specifications and Dimensional Data



For Bolt Diameter		For Flange Hole Diameter		Threaded Drawbar Flange Adapter		
mm	in	mm	in	Flange Adapter	QRN Flange Adapter	Slave Bar Flange Adapter
M33	1-1/4	34.9	1-3/8	SFPTA000H00	SFPQA000H00	SFPSA000H00
M36	1-3/8	38.1	1-1/2			
M39	1-1/2	41.3	1-5/8	SFPTA000I00	SFPQA000I00	SFPSA000K00
M42	1-5/8	44.5	1-3/4	SFPTA000J00	SFPQA000J00	
M45	1-3/4	47.6	1-7/8	SFPTA000K00	SFPQA000K00	
M48	1-7/8	50.8	2	SFPTA000L00	SFPQA000L00	SFPSA000M00
M52	2	54	2-1/8	SFPTA000M00	SFPQA000M00	
M56	2-1/4	60.3	2-3/8	SFPTA000N00	SFPQA000N00	SFPSA000Q00
M64	2-1/2	66.7	2-5/8	SFPTA000P00	SFPQA000P00	
M68/M70	2-3/4	73	2-7/8	SFPTA000Q00	SFPQA000Q00	
M76	3	79.4	3-1/8	SFPTA000R00	SFPQA000R00	SFPSA000T00
M82	3-1/4	85.7	3-3/8	SFPTA000S00	SFPQA000S00	
M90	3-1/2	92.1	3-5/8	SFPTA000T00	SFPQA000T00	
M95	3-3/4	98.4	3-7/8	SFPTA000U00	SFPQA000U00	SFPSA000V00
M100	4	104.8	4-1/8	SFPTA000V00	SFPQA000V00	



HPUWP070010K

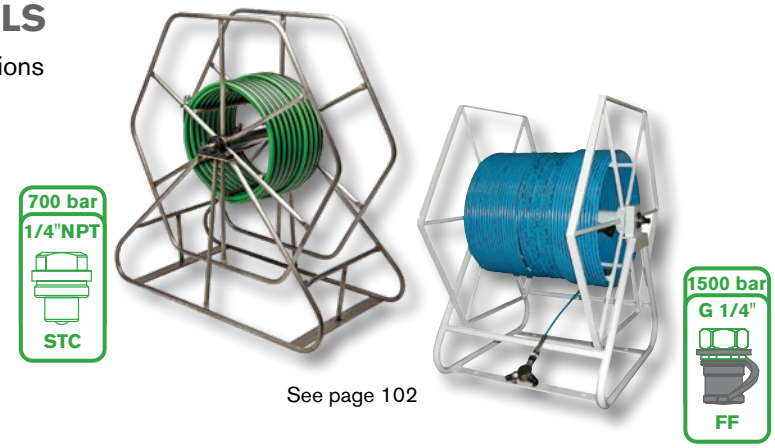
HIGH FLOW PUMP

Typical use: Flange Pullers, Torque Wrenches, Nutsplitters

- Self priming, 2-speed operation
- 2.24 kw (3 hp) Air motor (50 CFM)
- 700 bar (10,000 psi) maximum pressure
- Calibratable 100mm (4") pressure gauge
- Adjustable pressure relief valve
- Flow rate up to 11.8 litres/min (720 cu. in/min)
- Internal oil cooler
- Low noise operation
- Pneumatic Filter/Regulator/Lubricator
- 9.5 Litre (2 gal.) Reservoir (optional oil level gauge)
- Carrying frame (WxLxH): 430 x 460 x 460 (mm)
- Weight: 40 Kg (88 lb) (inc. oil)
- Alternate Pump: PA60A can be used as an alternate to the **HPUW070010K** shown. See page 74 for details.

SINGLE & TWIN-LINE HOSE REELS

- Hose reels available for tension and torque applications
- -30°C to 80°C working temperature range
- Female quick connect couplings as standard
- Hose Reel Dimensions (WxLxH): 750 x 1,000 x 1,050 (mm), 29" x 39" x 41"
- Hose Reel Weight: 65 Kg (145 lb) (without hose)

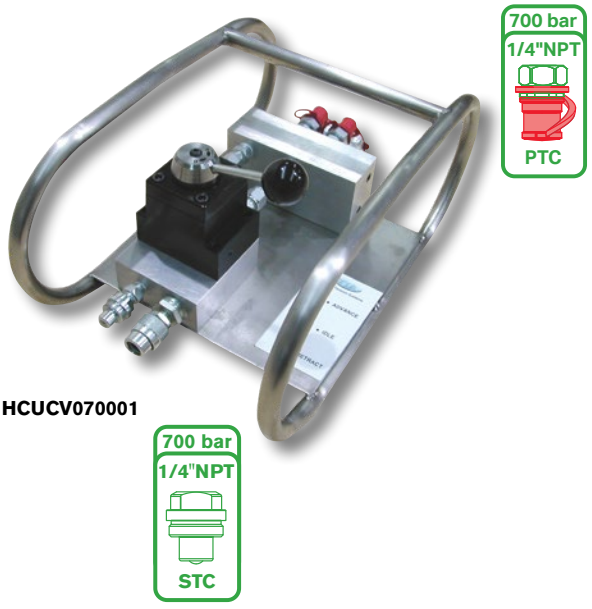


See page 102

REMOTE DIVER CONTROL VALVE

Gives diver precise control of Flange Pullers, Torque Wrenches, Nutsplitters, Jack, Cylinders, etc.

- 700 bar (10,000 psi) maximum working pressure
- Allows connection of up to 4 tools
- Stainless steel construction (rust free)
- Internal relief valve controls retract pressure
- Couplers on reel side are flat face for easy connection under water. Couplers on valve side match the required tool.
- Dimensions (WxLxH): 420 x 270 x 200 (mm)
- Weight: 9 kg (19.8 lb)



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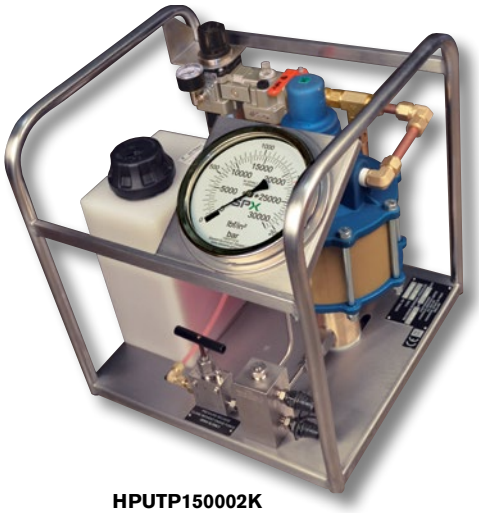


1500 bar
G 1/4"
FF

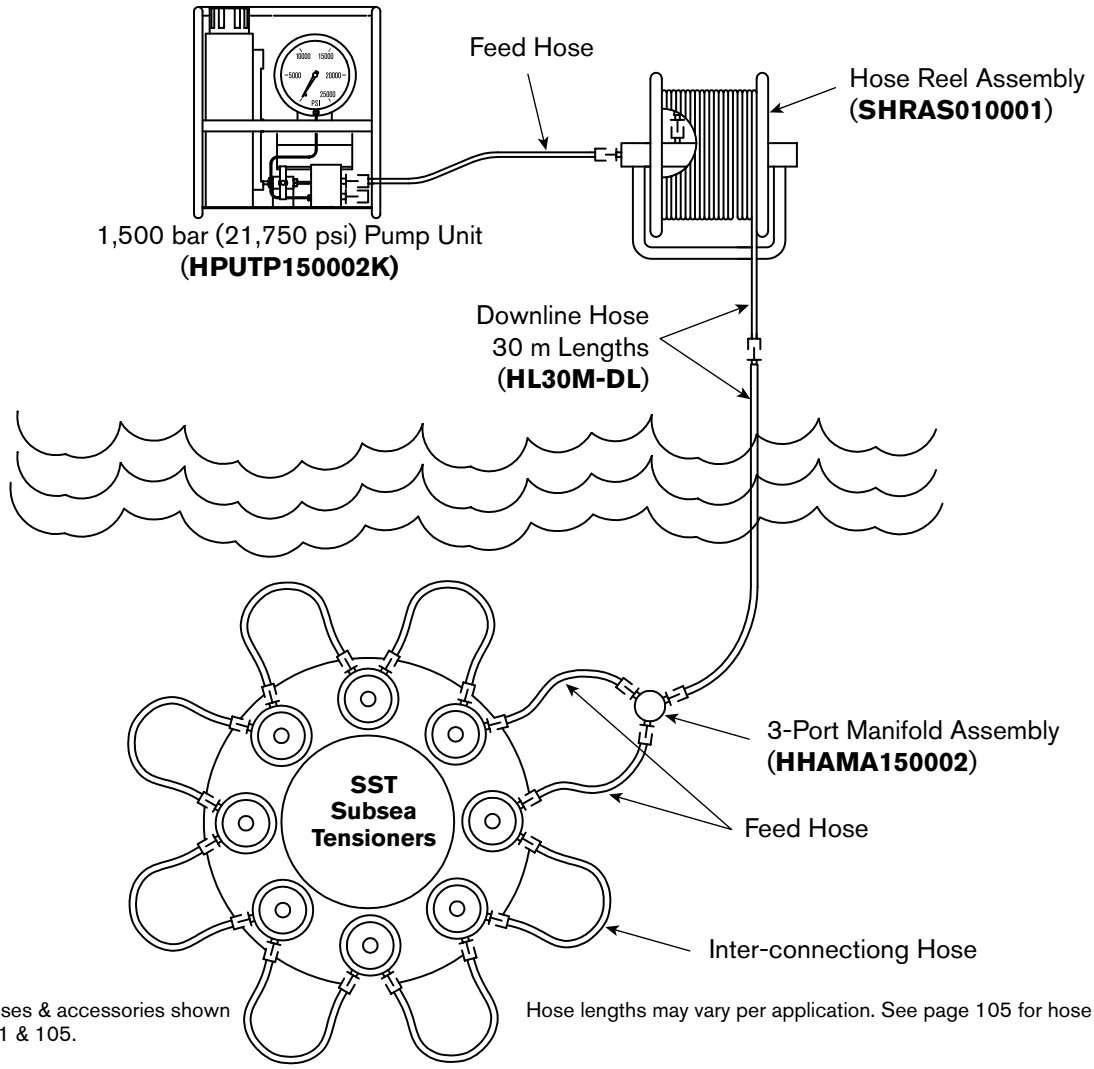
HPUTP150002K
See pages 94-97

HIGH FLOW BOLT-TENSIONING PUMP

Typical use: Subsea Bolt Tensioners, Segmented Tensioners

- 1,500 bar (21,750 psi) maximum working pressure (restricted)
- Calibrated 150mm (6") pressure gauge
- Flow rate up to 1.14 litres/min (70 cu. in/min)
- Dual oil outlets with quick-connect no spill couplings
- Pneumatic Filter/Regulator/Lubricator
- 9.5 Litre (2 gal.) polyethylene reservoir
- Dimensions (WxLxH): 465 x 530 x 515 (mm), 18" x 20" x 20"
- Approx. Weight: 23 Kg (51 lb)

OFFSHORE PUMP & HOSE ARRANGEMENT FOR SST SUBSEA TENSIONERS



1,500 bar hoses & accessories shown on pages 101 & 105.

Hose lengths may vary per application. See page 105 for hose options.