

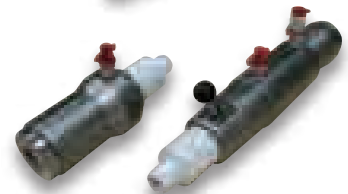
SUBSEA TOOLS

HIGH PERFORMANCE HIGH FORCE HYDRAULICS

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High Cycle Torque Wrench



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Low Clearance Torque Wrench



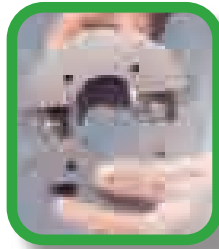
OK FOR SUBSEA



SUBSEA TENSIONER

STUD TENSIONER - SST

Bolt coverage from 3/4" to 3-1/2"
only 7 tools, SST1 to SST7



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 3/4" to 4" (M20 to M100)
- Designed to fit BS1560/ANSI B16.5/API flanges, as well as most compact flange designs

Specifications and Dimensional Data

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

In order to form a complete tensioner, order a load cell (SSTAS0#0001) and an adapter kit (QRNAS0#00##).

Specifications and Dimensional Data

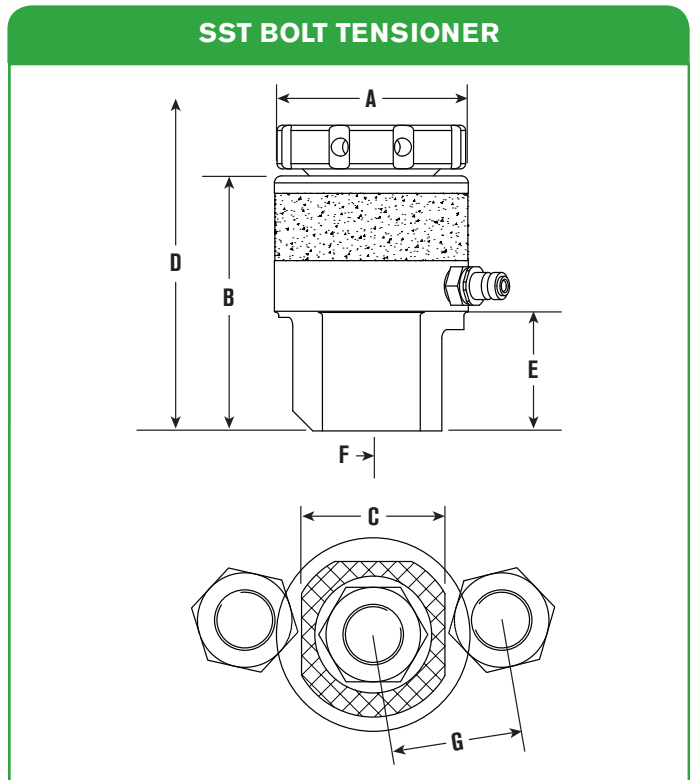
Piston stroke: 30mm except for SST1 - 20mm

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

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

'D' includes an allowance for tool removal after bolt tightening with 30mm tool stroke

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



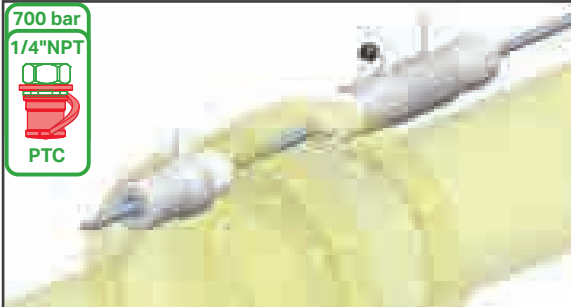
	A		B		C		D				E		F		G				Stud Diameter		(Tool Reference)
	in	mm	in	mm	in	mm	Imp bolts		met bolts		in	mm	in	mm	in	mm	in	mm	Imperial	Metric	Load Cell Order No.
	2.6	66	3.8	97	1.9	48	9	228	9	228	1.6	40	0.7	19	1.7	44	1.7	44	3/4"	M20	(SST1)
															1.8	46	1.8	45	7/8"	M22	SSTAS010001
	3.2	82	5	127.5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

Toggle Bar	6mm x 200mm	SST1, SST2	INTTB000006
	8mm x 200mm	SST3	INTTB000008
	10mm x 200mm	SST4, SST5 (up to 1-7/8"-M48)	INTTB000010
	12mm x 200 mm	SST5 (2" - M52), SST6 (2-1/4" - M56)	INTTB000012
	14mm x 200mm	SST6 (2-1/2" - M60 and above)	INTTB000014
	16mm x 250mm	SST7, SST8	INTTB000016

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 Retract 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: 20.0 tonf (199.3 kN)

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

Max stroke of cylinder: 4.0" (102 mm)

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

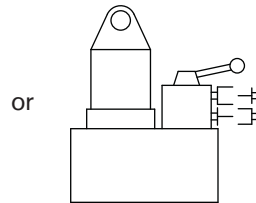
Specified minimum breaking load of rope: 19.0mm - 307 kN (30.8 tonf), 22mm - 415 kN (41.6 tonf)

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

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



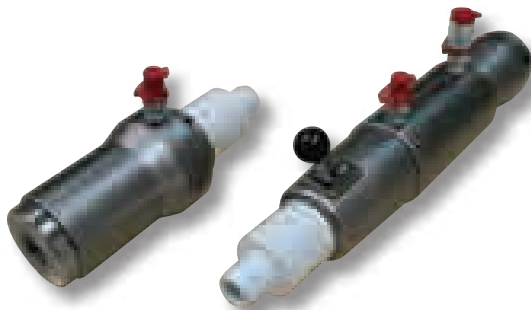
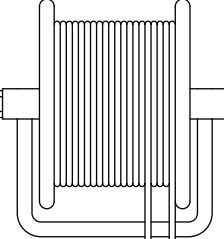
Pump Unit
(PA60A)
See pages
74-75



or
Pump Unit
(HPUWP070010K)

Twin-Line Hose with
Screw-On Couplings

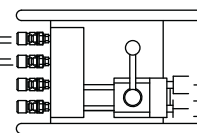
Hose Reel
(SHRAS010002)



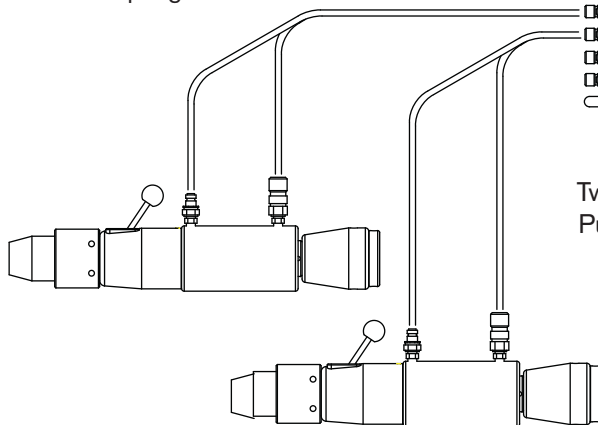
Twin-Line Hose with
Push-On Couplings

30 m Twin Downline
Hose/s with Screw-On
Couplings
Select Quantity of Hoses Based
on Water Depth.

Diver Control Valve
(HCUCV070001)



Twin-Line Hose with
Push-On Couplings

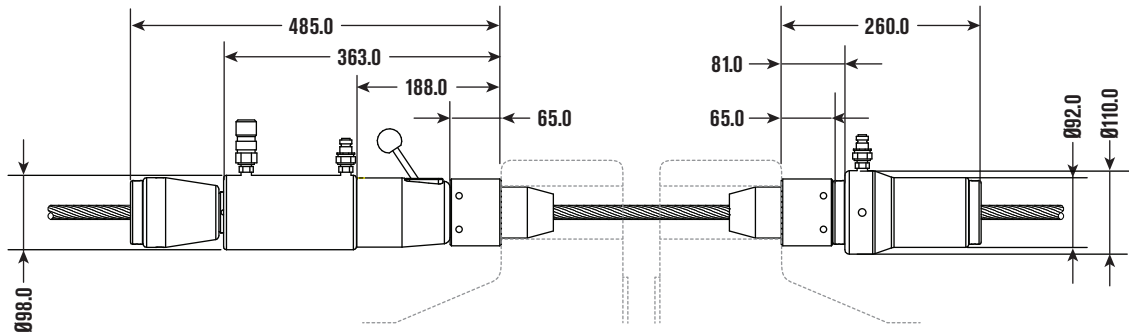
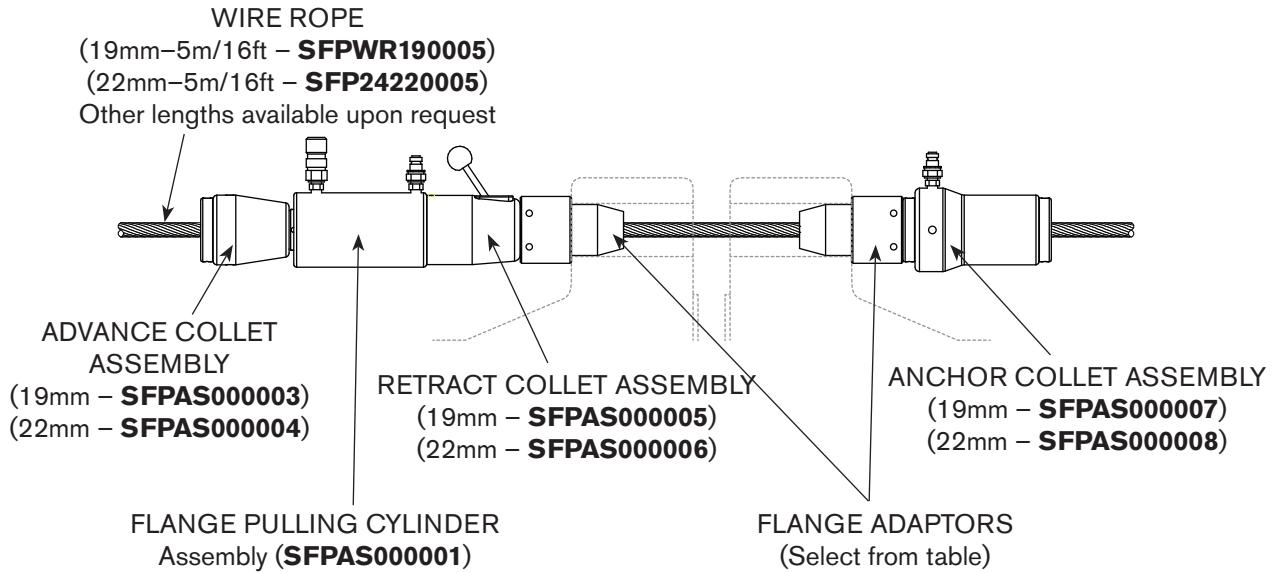


When using the PA60A pump, the couplers may need to change and the Diver Control Valve may not be necessary. Contact factory or an authorized distributor for details.

FLANGE PULLERS SUBSEA - SFP

WIRE ROPE FLANGE PULLING SYSTEM

Specifications and Dimensional Data

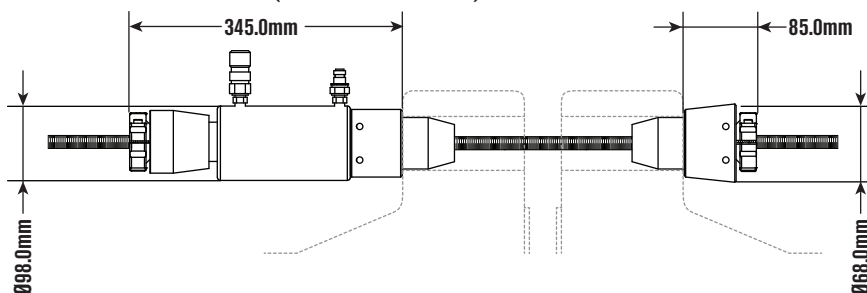
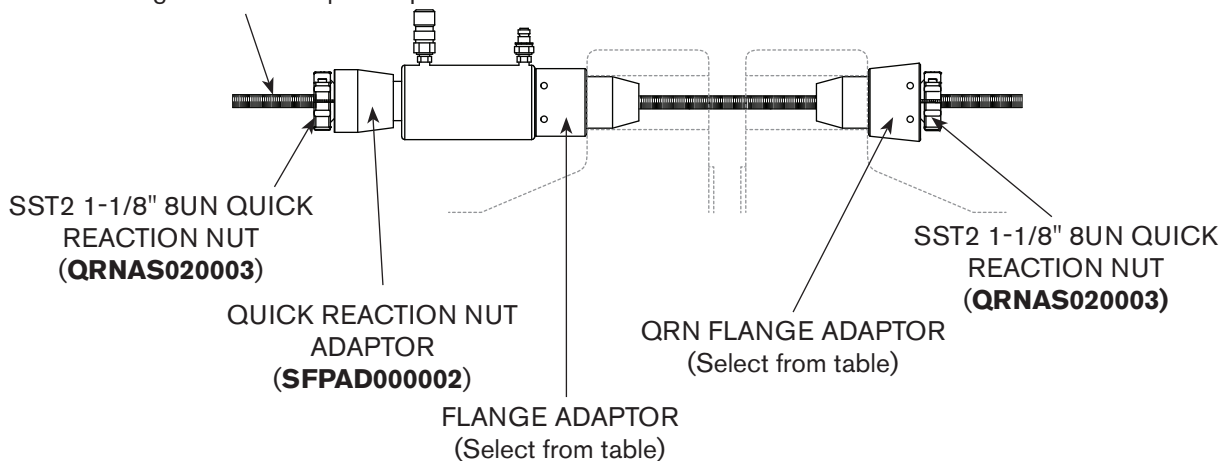


For Bolt Diameter		For Flange Hole Diameter		Wire Rope Flange Adapter Order No.
in	mm	in	mm	
3/4	M20	7/8	22.2	SFPWA000C00
7/8	M24	1	25.4	SFPWA000D00
1	M27	1-1/8	28.6	SFPWA000E00
1-1/8	M30	1-1/4	31.8	SFPWA000F00
1-1/4	M33	1-3/8	34.9	SFPWA000G00
1-3/8	M36	1-1/2	38.1	SFPWA000H00
1-1/2	M39	1-5/8	41.3	SFPWA000I00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

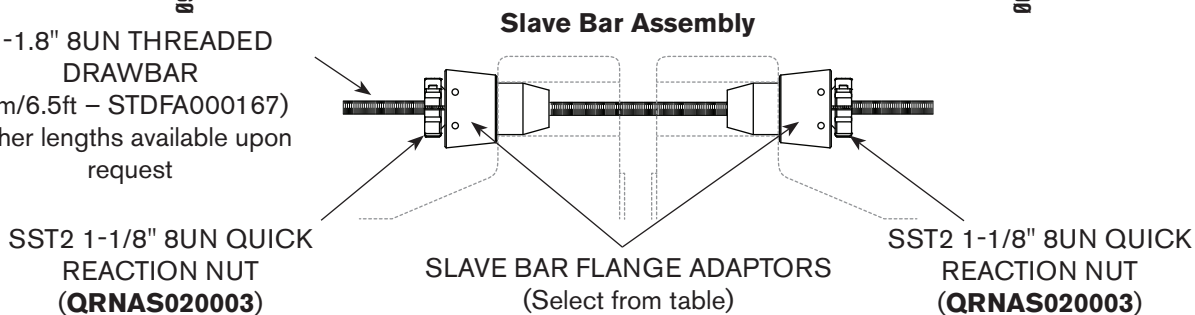
THREADED BAR FLANGE PULLING SYSTEM

Specifications and Dimensional Data

1-1.8" 8UN THREADED DRAWBAR
(2m/6.5ft – **STDFA000167**)
Other lengths available upon request



1-1.8" 8UN THREADED
DRAWBAR
(2m/6.5ft – **STDFA000167**)
Other lengths available upon
request



For Bolt Diameter		For Flange Hole Diameter		Threaded Drawbar Flange Adapter		
in	mm	in	mm	Flange Adapter	QRN Flange Adapter	Slave Bar Flange Adapter
1-1/4	M33	1-3/8	34.9	SFPTA000H00	SFPQA000H00	SFPSA000H00
1-3/8	M36	1-1/2	38.1	SFPTA000I00	SFPQA000I00	SFPSA000K00
1-1/2	M39	1-5/8	41.3			
1-5/8	M42	1-3/4	44.5	SFPTA000J00	SFPQA000J00	SFPSA000L00
1-3/4	M45	1-7/8	47.6	SFPTA000K00	SFPQA000K00	
1-7/8	M48	2	50.8	SFPTA000L00	SFPQA000L00	SFPSA000M00
2	M52	2-1/8	54	SFPTA000M00	SFPQA000M00	SFPSA000N00
2-1/4	M56	2-3/8	60.3	SFPTA000O00	SFPQA000O00	
2-1/2	M64	2-5/8	66.7	SFPTA000P00	SFPQA000P00	SFPSA000Q00
2-3/4	M68/M70	2-7/8	73	SFPTA000Q00	SFPQA000Q00	SFPSA000R00
3	M76	3-1/8	79.4	SFPTA000R00	SFPQA000R00	
3-1/4	M82	3-3/8	85.7	SFPTA000S00	SFPQA000S00	SFPSA000T00
3-1/2	M90	3-5/8	92.1	SFPTA000T00	SFPQA000T00	SFPSA000U00
3-3/4	M95	3-7/8	98.4	SFPTA000U00	SFPQA000U00	
4	M100	4-1/8	104.8	SFPTA000V00	SFPQA000V00	SFPSA000V00

SUBSEA ACCESSORIES

HIGH FLOW PUMP

Typical use: Flange Pullers, Torque Wrenches, Nutsplitters

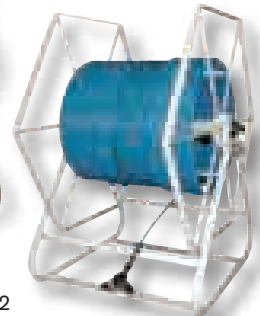
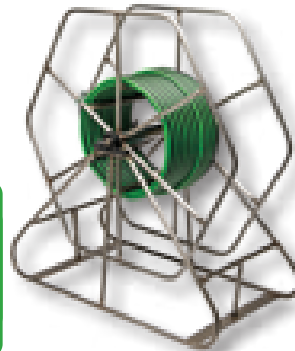
- Self priming, 2-speed operation
- 2.24 kw (3 hp) Air motor (50 CFM)
- 700 bar (10,000 psi) maximum pressure
- Calibratable 100mm (4") pressure gauge
- Adjustable pressure relief valve
- Flow rate up to 11.8 litres/min (720 cu. in/min)
- Internal oil cooler
- Low noise operation
- Pneumatic Filter/Regulator/Lubricator
- 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 **HPUWP070010K** shown. See page 74 for details.



HPUWP070010K

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)



HCUCV070001





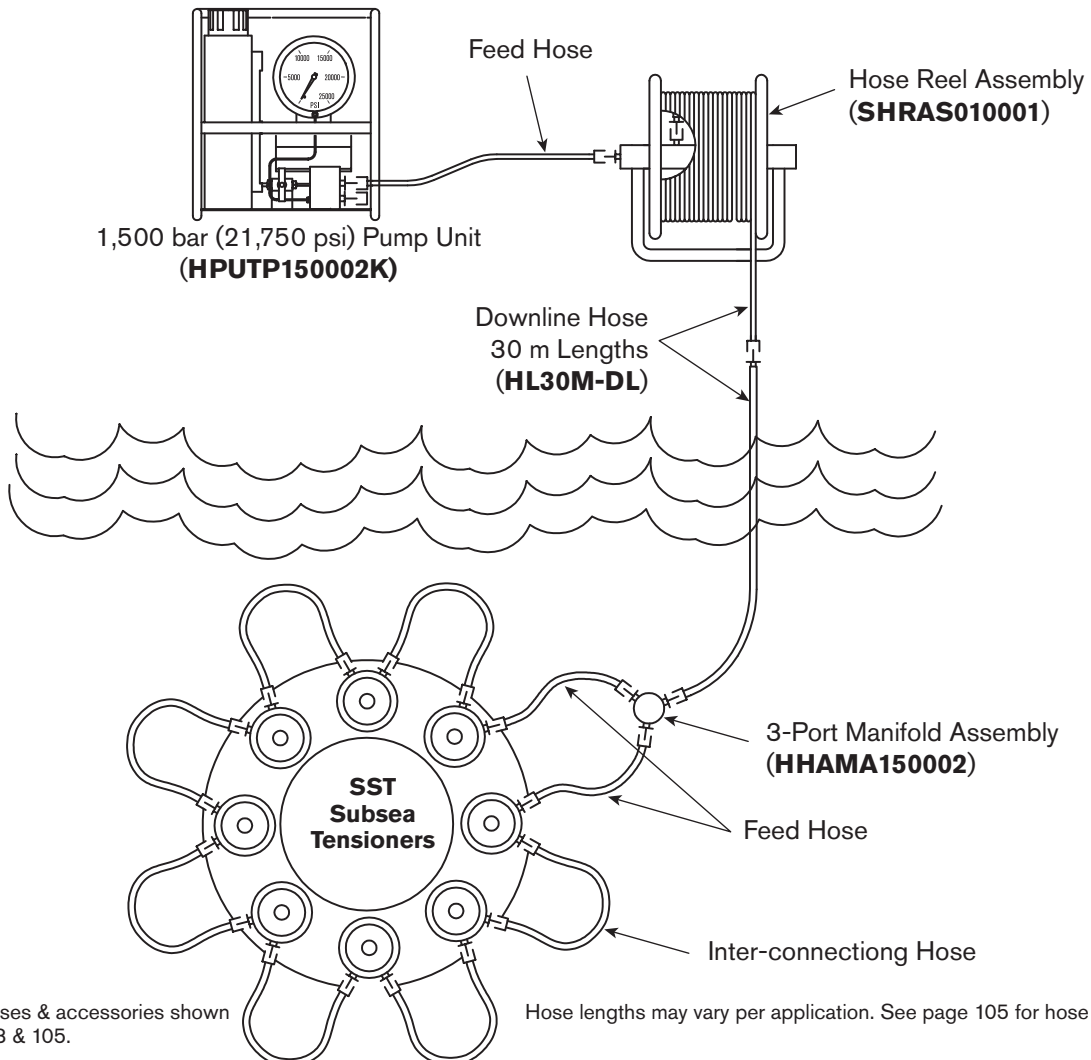
HPOTP150002K
See pages 94-97

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 103 & 105.

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