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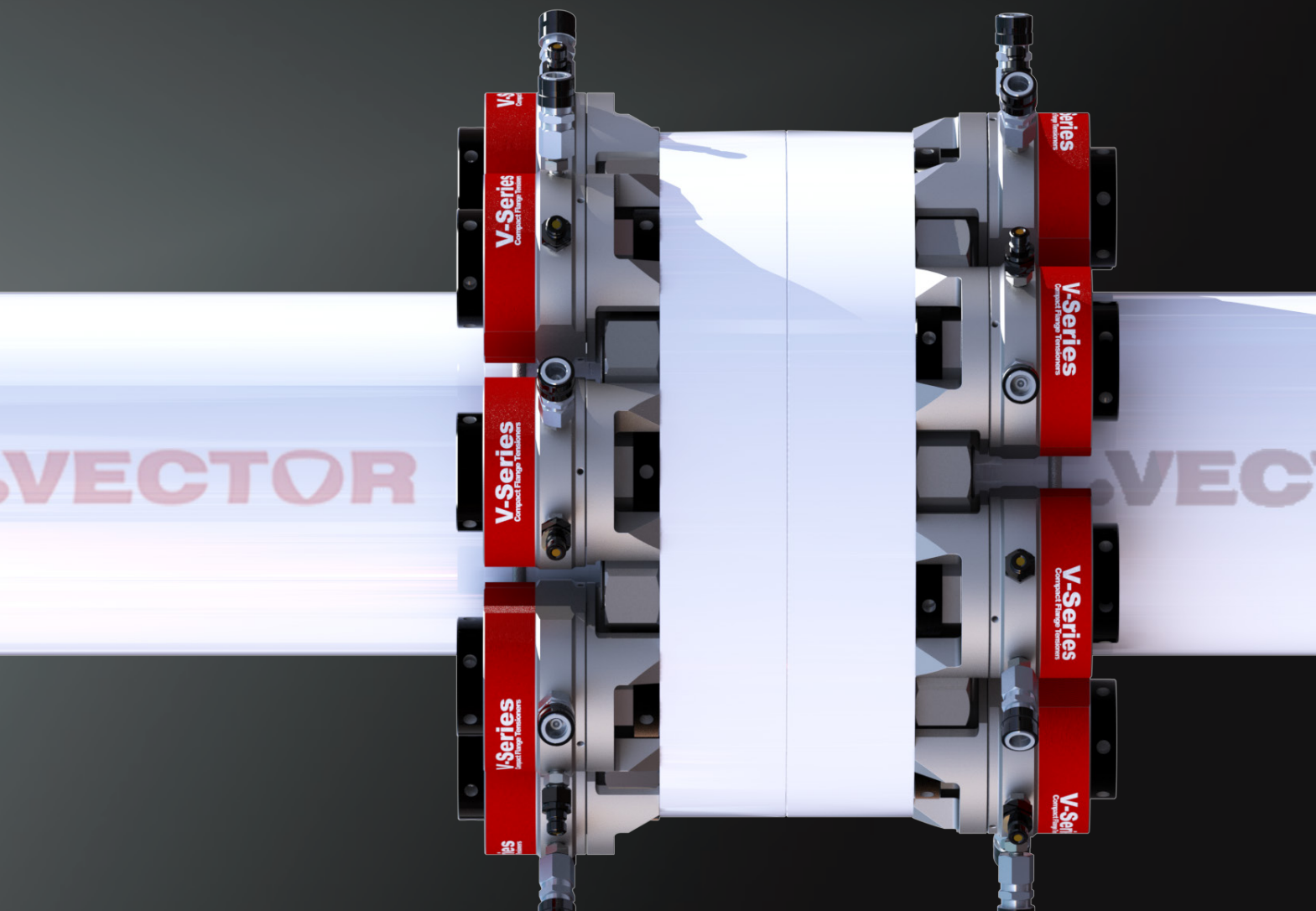
Custom Tensioners  
Available on Request.

## V-Series

Compact Flange Tensioners

Next Generation Topside Tensioners for  
Next Generation Flanges.

A Range of Topside Bolt Tensioning Tools for use on Standard Vector  
Technology Group\* Compact Flanges and Norsok L-005† Compact Flanges.



**V-Series**

SPO-S CF

SPO-CF

Norsok L-005

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# V-Series

## Compact Flange Tensioners

### Next Generation Topside Tensioners for Next Generation Flanges.

The SPO Compact Flange has been used across the globe since 1989, offshore, onshore and subsea, offering significant weight and space savings over conventional flanges, leak-free joint integrity and therefore is the most effective environmentally friendly piping joint available today.

The preferred method of tightening the SPO compact flange bolts is with the use of bolt tensioning tools. Due to the compact size and relatively high bolt load requirements of the flanges, most conventional bolt tensioners either do not physically fit onto the flanges or do not have enough bolt load capacity.

The V-Series tensioners are a purpose designed range of tools designed specifically for use on SPO Compact flanges. The range consists of 11 powerful bolt tensioning tools covering bolt sizes from 3/4" to 4"

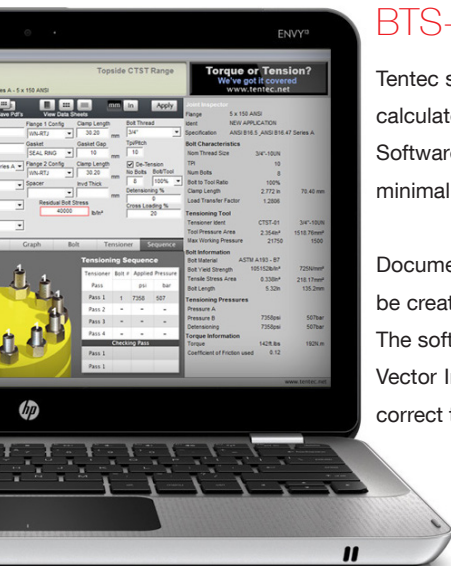
### Pressure Class.

The V-Series range of tensioners have been designed for use on the following flange classes. Starting from 3/4" bolt diameter.

- 150 Lbs
- 300 Lbs
- 600 Lbs
- 900 Lbs
- 1500 Lbs
- 2500 Lbs
- 7500 Lbs 520bar (Formerly 4500i)
- 5000 psi **New**
- 10000 psi **New**
- 15000 psi **New**



To convert a V-Series tensioner to suit an alternative thread size, conversion kits are available. V-Series conversion kits consist of a new puller and nut rotating socket.

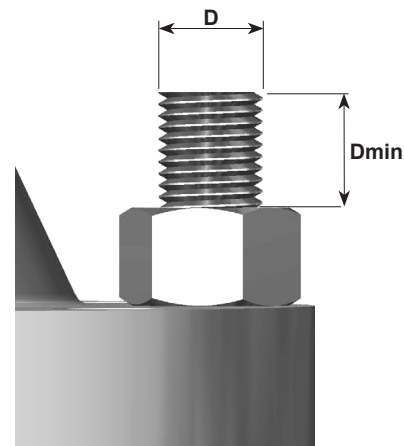


### BTS-Bolt Tightening Software

Tentec software allows users to manage and rapidly calculate bolt tensioner pressures. Tentec Bolt Load Software has been designed with the philosophy of minimal input, maximum output.

Documentation for multiple bolted joint projects can be created very quickly with minimal operator input. The software package contains data for all standard Vector International compact flanges along with the correct tensioner pressures to apply.

The software contains bolt tightening data for all standard SPO Compact Flanges.



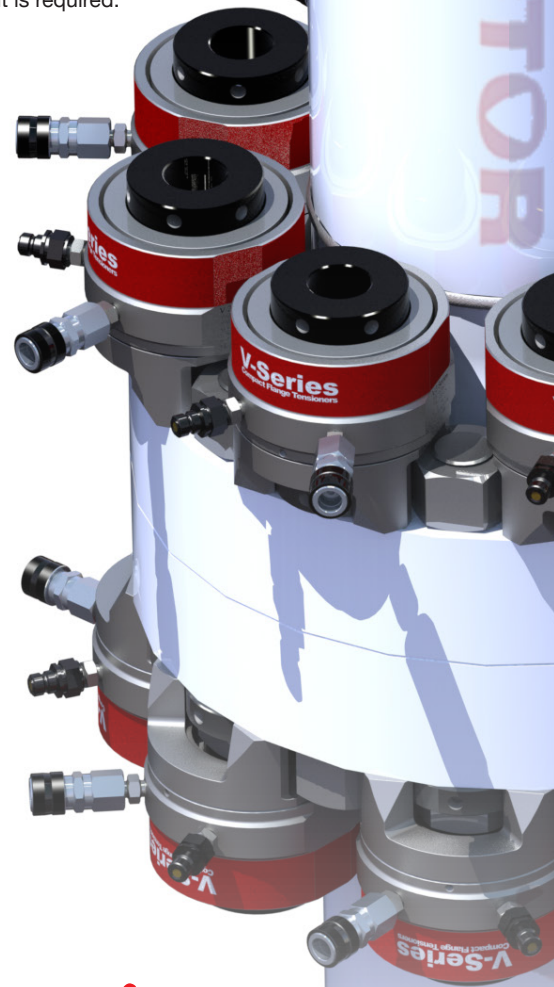
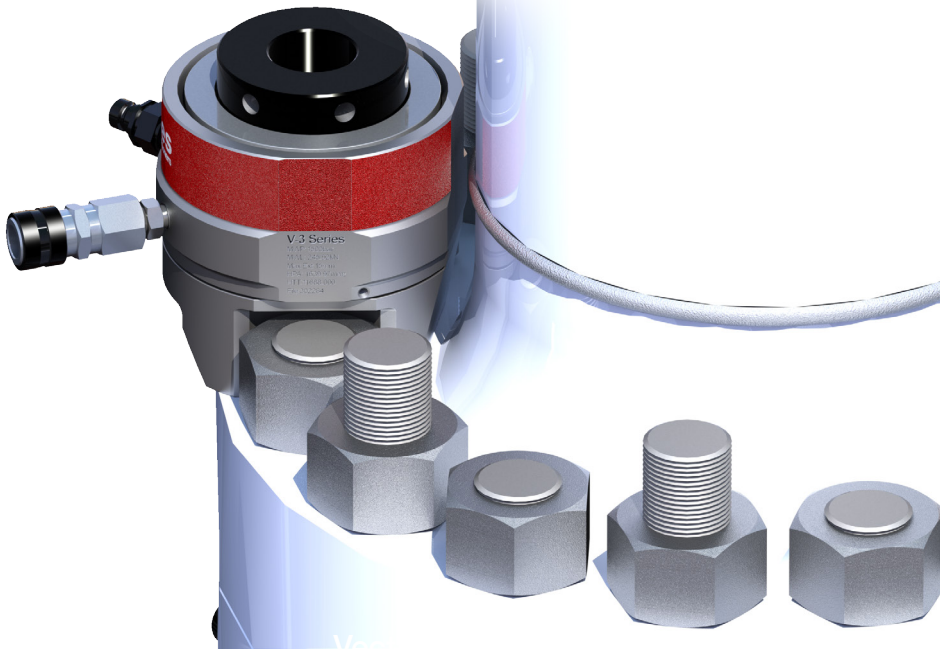
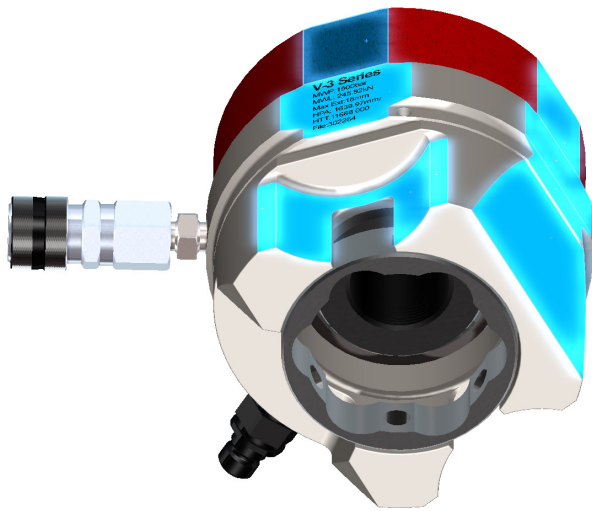
V-Series tensioners need a minimum of 1 x bolt diameter protruding above the hexagon or round nut.

## Sculpted to Fit.

During the engineering development of the V-Series tensioners, over 300 different configurations of standard SPO compact flanges were 3D modelled using the latest 3D solid model cad software.

Our design team then set about designing tensioners to perfectly clear not only the elliptical hub profile of the SPO compact flanges but also the weld protrusion and the pipe diameter. Care was taken to design profile machined tensioners that also stay clear of the adjacent hexagon nuts. The resulting tools fit perfectly onto the standard SPO compact flanges.

The bolt load offered by the V-Series bolt tensioning tools offers exactly the bolt load specified by Vector International to guarantee a leak free bolted joint. A minimum of 1 x Thread diameter of stud protrusion above the joint nut is required.



## Consistent, Dependable and Safe.

**Consistent:** Using multiple bolt tensioning tools on a bolted joint gives a much improved uniform bolt load across all bolts.

**Axial Bolt Load:** Bolt load is applied axially to the bolt. Inconsistencies such as friction, bending and lubricant are not a factor when using bolt tensioners. No torsional stresses are involved.

**Rapid:** Multiple bolt tensioners offer a rapid and accurate method of tightening a bolt.

**Adaptable:** Conversion kits are available to convert a tensioner from one bolt size to another offering an economical and versatile solution.

**Accurate:** Bolt load is directly proportional to the pressure applied to the tensioner.

**Standard Fasteners:** Tensioners are mostly used with standard fasteners, no special or proprietary bolting components are required.

**Simplified Calculations:** Using the Tentec BTS-Bolt Tightening Software takes away the complexity of calculating tensioner pressures and torque values.



All V-Series tensioners have been designed without the need for small bonded seals.

Bonded seals are used by most bolt tensioning manufacturers to seal the hydraulic connections to the tensioner. These tiny seals are prone to failure and when just one of the many bonded seals used in a tensioning system fail, the whole tensioning procedure comes to a halt until the failed bonded seal is replaced. Tentec has designed out the use of these fragile seals so that this new range of tensioners no longer rely on bonded seals, improving safety and minimising downtime.

# Tool Selection Chart.

SPO Compact Flanges.  
Norsok Standard L-005.

Class 150						Class 300						Class 600						Class 900						Class 1500					
Nom	Bolt Dia	#	Tool	Tool		Nom	Bolt Dia	#	Tool	Tool		Nom	Bolt Dia	#	Tool	Tool		Nom	Bolt Dia	#	Tool	Tool		Nom	Bolt Dia	#	Tool	Tool	
24	3/4	24	V-1	V-2		16	3/4	24	V-1	V-2		10	3/4	20	V-1	V-2		8	3/4	20	V-1	V-2		4	3/4	12	V-1	V-2	
26	3/4	24	V-1	V-2		18	3/4	28	V-1	V-2		12	7/8	20	V-2	V-3		10	7/8	20	V-2	V-3		5	7/8	12	V-2	V-3	
28	3/4	28	V-1	V-2		20	7/8	24	V-2	V-3		14	7/8	24	V-2	V-3		12	1	20	V-3			6	1	12	V-3		
30	3/4	32	V-1	V-2		22	7/8	28	V-2	V-3		16	1	24	V-3			14	1	24	V-3			8	1	16	V-3		
32	3/4	36	V-1	V-2		24	1	28	V-3			18	1 1/8	24		V-4		16	1 1/8	24		V-4		10	1 1/4	16	V-4		
34	3/4	40	V-1	V-2		26	1	32	V-3			20	1 1/8	28		V-4		18	1 1/4	24		V-4		12	1 1/4	20	V-4		
36	7/8	32	V-1	V-3		28	1	32	V-3			22	1 1/4	24		V-4		20	1 3/8	24		V-5		14	1 3/8	20		V-5	
38	7/8	36	V-1	V-3		30	1 1/8	32		V-4		24	1 1/4	28		V-4		22	1 1/2	24		V-5		16	1 1/2	20		V-7	
40	7/8	40	V-1	V-3		32	1 1/8	32		V-4		26	1 1/4	32		V-4		24	1 5/8	24		V-6		18	1 5/8	20		V-8	
42	7/8	44	V-1	V-3		34	1 1/4	32		V-4		28	1 1/4	32		V-4		26	1 3/4	24		V-6		20	1 7/8	20		V-8	
44	7/8	44	V-1	V-3		36	1 1/4	32		V-4		30	1 3/8	36		V-5		28	1 3/4	24		V-6		22	2	20		V-8	
46	7/8	48	V-1	V-3		38	1 1/4	36		V-4		32	1 1/2	32		V-5		30	1 7/8	24		V-7		24	2 1/4	20		V-8	
48	7/8	52	V-1	V-3		40	1 1/4	40		V-4		34	1 5/8	32		V-6		32	2 1/4	24		V-8		26	2 1/4	20		V-8	
						42	1 3/8	36		V-5		36	1 5/8	32		V-6		34	2 1/4	24		V-8		28	2 1/4	20		V-8*	
						44	1 3/8	40		V-5		38	1 3/4	32		V-6		36	2 1/4	24		V-8		30	2 1/2	24		V-8	
						46	1 1/2	36		V-5		40	1 3/4	36		V-6		38	2 1/2	24		V-8		32	2 1/2	24		V-8	
						48	1 1/2	36		V-5		42	1 7/8	32		V-7		40	2 1/2	24		V-8		34	2 3/4	24		V-9*	
												44	1 7/8	36		V-7		42	2 1/2	28		V-8		36	3 1/4	20		V-10	
												46	2	36		V-7		44	2 3/4	28		V-8		38	3 1/2	20		V-10	
												48	2	36		V-7		46	2 3/4	28		V-9		40	3 1/4	24		V-10*	
																		48	3	28		V-9		42	3 3/4	20		V-11	
																								44	3 3/4	24		V-11	
																								46	3 3/4	24		V-11	
																								48	3 3/4	24		V-11	

Class 2500						Class 5000						Class 7500						Class 10000						Class 15000					
Nom	Bolt Dia	#	Tool	Tool		Nom	Bolt Dia	#	Tool	Tool		Nom	Bolt Dia	#	Tool	Tool		Nom	Bolt Dia	#	Tool	Tool		Nom	Bolt Dia	#	Tool	Tool	
2.5	3/4	8	V-1	V-2		4	3/4	12	V-1	V-2		2.5	3/4	8	V-1	V-2		2.5	3/4	8	V-1	V-2		2	3/4	8	V-1		
3	7/8	8	V-2			5	7/8	12	V-2			3	7/8	8	V-1	V-2		3	7/8	12	V-1	V-2		2.5	7/8	8	V-2		
4	1	8	V-3			6	1	12	V-3			4	7/8	12	V-2	V-3		4	7/8	12	V-2	V-3		3	7/8	12	V-2		
5	1	12	V-3			8	1	16	V-3			5	1 1/8	12		V-4*		5	1 1/8	12		V-4*		4	1 1/8	12		V-4*	
6	1 1/8	12		V-4		10	1 1/4	16	V-4			6	1 1/4	12		V-4		6	1 1/4	12		V-4		5	1 1/4	12		V-4*	
8	1 3/8	12		V-5		8	1	16	V-3			8	1 1/2	12		V-5		8	1 1/2	12		V-5		6	1 1/4	16		V-4*	
10	1 1/2	16		V-5		10	1 1/4	16	V-4			10	1 1/2	12		V-5		10	1 1/2	12		V-5		8	1 1/2	16		V-5	
12	1 3/4	16		V-6		12	1 1/4	20	V-4			12	1 7/8	16		V-7*		12	1 7/8	16		V-7*		10	1 7/8	16		V-7*	
14	1 7/8	16		V-7		14	1 3/8	20		V-5		14	2	16		V-7		14	2	16		V-7		12	2	16		V-7*	
16	2 1/4	16		V-8*		16	1 1/2	20		V-5		16	2 1/4	16		V-8*		16	2 1/4	16		V-8*		14	2 1/2	16		V-8*	
18	2 1/4	16		V-8		18	1 3/4	20		V-6		18	2 1/2	16		V-8		18	2 1/2	16		V-8		16	2 1/2	16		V-8	
20	2 1/2	16		V-8		20	1 7/8	20		V-7		20	3 1/4	12		V-10		20	2 3/4	16		V-9		18	3	16		V-9	
22	3	16		V-9		22	2	20		V-7		22	3 1/2	12		V-10		22	3	16		V-9		20	3 1/4	16		V-10	
24	3 1/4	16		V-10		24	2 1/4	20		V-8		24	4	12		V-11		24	3 1/2	16		V-10		22	3 1/2	16		V-10	
																								24	4	16		V-11	

\* Stagger bolt protrusions either side of the bolted joint.

## Technical Specifications.

Maximum Working Pressure - 1500bar : 21750psi

Tool	Part No	Thread Size		Part No	Bolt Load		Ram Area		Stroke	Weight
		Imperial	Inch		mm	Metric	Kn	Ton		
V-1	HTT.10101.034	3/4"-10UNC	M20x2.5	HTT.10101.020	135.5	13.599	1.401	903.87	10	1.37
V-2	HTT.10102.034	3/4"-10UNC	M20x2.5	HTT.10102.020	189.39	19.007	1.958	1263.22	10	1.79
	HTT.10102.078	7/8"-9UNC	M22x2.5	HTT.10102.022						1.72
V-3	HTT.10103.078	7/8"-9UNC	M22x2.5	HTT.10103.022	245.92	24.681	2.542	1640.00	15	2.72
	HTT.10103.100	1"-8UN	M24x3	HTT.10103.024						2.59
V-4			M27x3	HTT.10104.027	415.52	41.702	4.295	2770.96	15	5.23
	HTT.10104.118	1.1/8-8UN	M30x3.5	HTT.10104.030						5.1
	HTT.10104.114	1.1/4"-8UN	M33x3.5	HTT.10104.033						4.89
V-5	HTT.10105.138	1.3/8"-8UN	M36x4	HTT.10105.036	628.64	63.091	6.498	4192.25	15	7.07
	HTT.10105.150	1.1/2"-8UN	M39x4	HTT.10105.039						6.79
V-6	HTT.10106.158	1.5/8"-8UN	M42x4.5	HTT.10106.042	878.45	88.162	9.08	5858.05	15	9.44
	HTT.10106.134	1.3/4"-8UN	M45x4.5	HTT.10106.045						9.1
V-7	HTT.10107.178	1.7/8"-8UN	M48x5	HTT.10107.048	1184.49	118.877	12.243	7898.69	15	12.13
	HTT.10107.200	2"-8UN	M52x5	HTT.10107.052						11.72
V-8			M56x5.5	HTT.10108.056	1905.46	191.234	19.695	12706.43	15	20.77
	HTT.10108.214	2.1/4"-8UN	M60x5.5	HTT.10108.060						20.29
	HTT.10108.212	2.1/2"-8UN	M64x6	HTT.10108.064						19.11
V-9			M68x6	HTT.10109.068	2544.02	255.321	26.295	16964.48	15	28.87
	HTT.10109.234	2.3/4"-8UN	M72x6	HTT.10109.072						28.1
	HTT.10109.300	3"-8UN	M76x6	HTT.10109.076						26.46
V-10			M80x6	HTT.10110.080	3521.35	353.407	36.397	23481.89	15	44.66
	HTT.10110.314	3.1/4"-8UN	M85X6	HTT.10110.085						42.75
	HTT.10110.312	3.1/2"-8UN	M90X6	HTT.10110.090						40.76
V-11	HTT.10111.334	3.3/4"-8UN	M95X6	HTT.10111.095	4653.38	467.018	48.098	31030.91	15	58.07
	HTT.10111.400	4"-8UN	M100X6	HTT.10111.100						55.35

Tentec products are subject to continual development and we reserve the right to make changes in the specification and design of products without prior notice.



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