HTU HydraulicTensioningUnit

HMTU HydraulicMechanicTensioningUnit

BT BoltTensioner

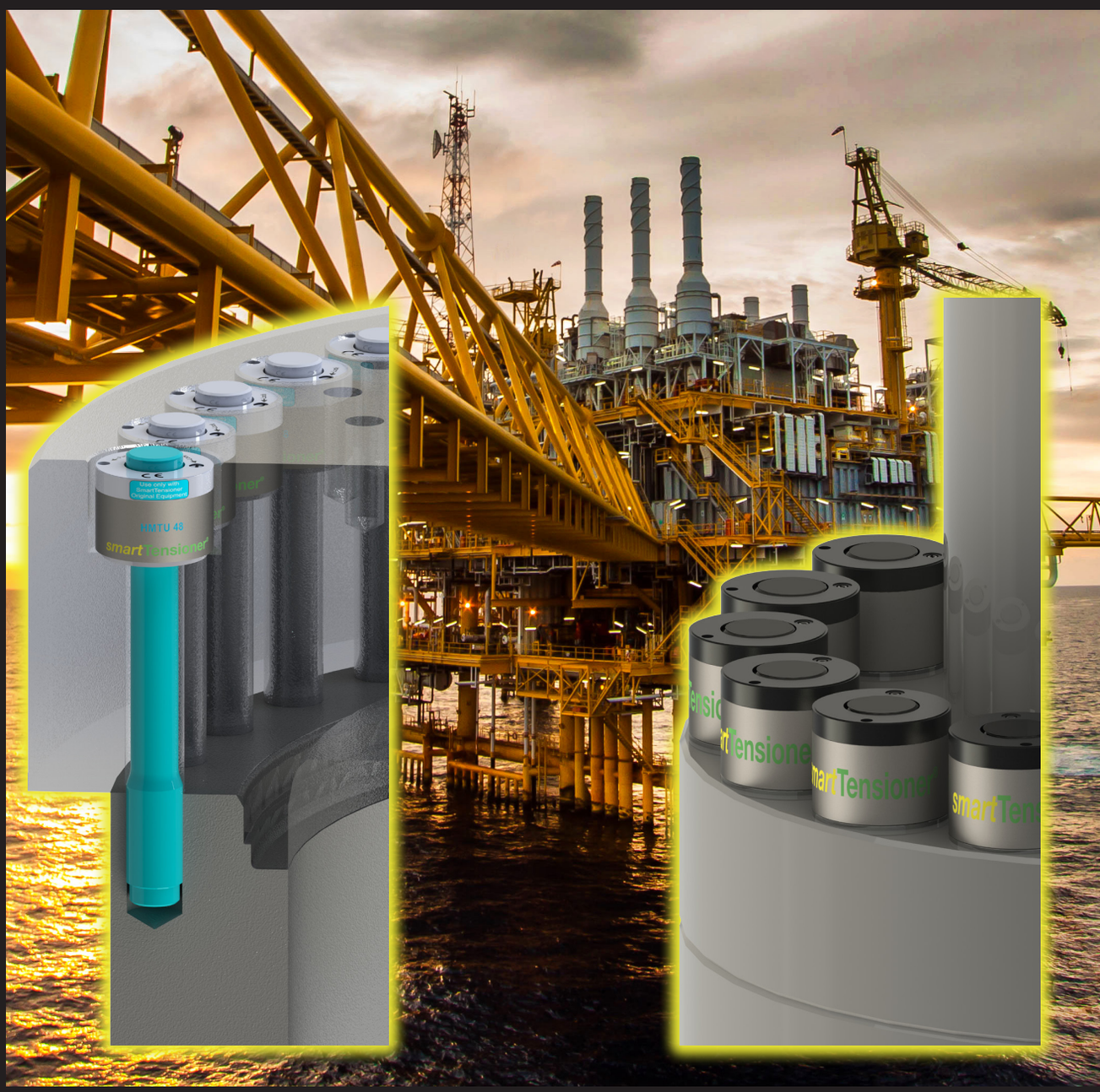
IBT IntegratedBoltTensioner

STD SubseaTensioningDevices

HP HydraulicPump

smartTensioner®
Hamburg · Germany

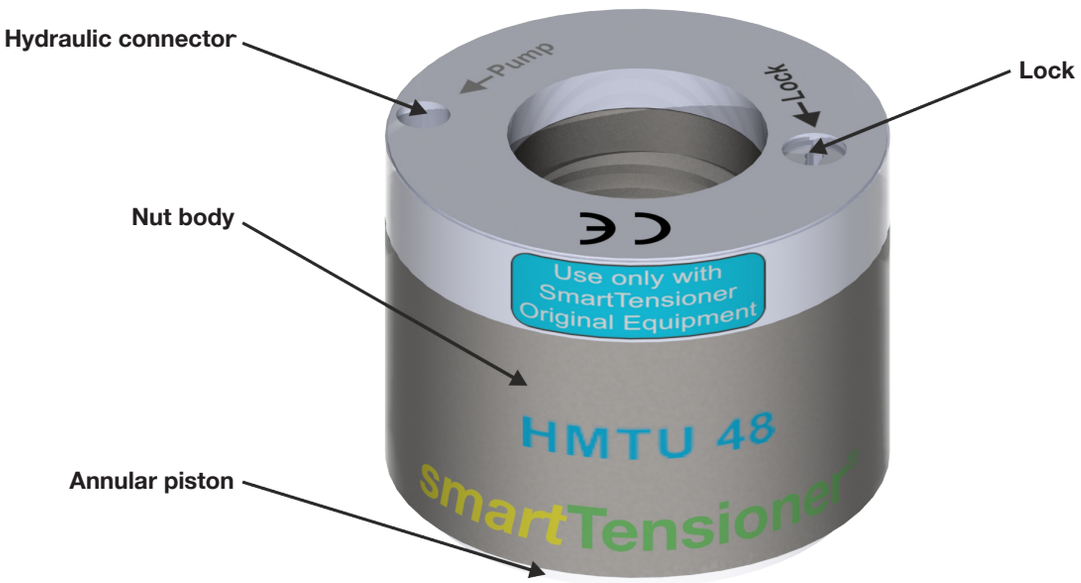
HydraulicMechanicTensioningUnit



Tools for highly loaded bolted connections

HMTU

HydraulicMechanicTensioningUnit



smartTensioner HMTU is used instead of a conventional hexagon nut.

Multiple HMTUs are often mounted on a multi-stud flange connection. All HMTUs are synchronously pressurized using the smartTensioner HydraulicPump HP. Each HMTU is supplied by its own HP.

The very high hydraulic pressure (up to 300 MPa) moves an annular piston against the flange and leads to a defined elongation of the bolt. After reaching the targeted pressure, the bolt elongation is secured permanently by turning the HMTU lock. The hydraulic pressure is released.

What are the smartTensioner HMTU innovations?

Higher tensioning forces with lower diameters

HMTUs operate with high pressure, allowing small cylinder diameters. The force/diameter ratio is unique on the market. It allows design engineers to use more capable materials for their bolts. Flange parts can be pressed together with more pressure, improving overall tightness.

Low setting losses

The setting loss of smartTensioner HMTUs is less than 15%, independent of the load. Other products on the market that use different mechanical locking systems suffer from setting losses of up to 60%.

Normally, setting losses occur in all tensioning systems that use hydraulics to stress bolts and use mechanics to ensure the bolt stress: the bolt force after hydraulic prestressing is higher than the remaining force after mechanical locking. The reason for this is the change of force flow within the hydraulic nut.

Our HMTU uses several locking bolts to lock the annular piston (patents pending). These bolts are very precisely machined and move against the annular piston by fine-threaded screws. The height of the locking bolts and screws is as low as possible to avoid any losses in stress due to the straining of the bolt and screw. Moreover, the change of the force flow within the nut body has been optimized by comprehensive FEA analyses to minimize setting losses.

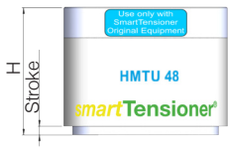
smartTensioner®

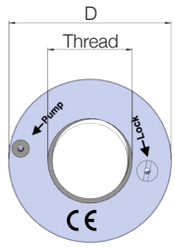
- **High tensioning forces!**
- **Low setting losses!**
- **More effective mechanical locking!**

Specifications

Type	Part.-No.	Bolt load (kN)	Height H (mm)	Diameter D (mm)	Thread		Stroke (mm)	Weight (kg)
HMTU 22	102-022	222.1	39.0	53.0	M22	7/8-UNC	5	0.3
HMTU 24	102-024	264.9	39.0	57.0	M24	1-UNC	5	0.4
HMTU 27	102-027	286.5	39.0	60.0	M27		5	0.5
HMTU 30	102-030	304.0	42.0	63.0	M30	1 1/8-8UN	5	0.6
HMTU 33	102-033	347.2	45.0	67.0	M33	1 1/4-8UN	5	0.7
HMTU 36	102-036	426.9	71.0	73.0	M36	1 3/8-8UN	5	1.3
HMTU 39	102-039	495.0	74.0	78.0	M39	1 1/2-8UN	10	1.6
HMTU 42	102-042	567.9	77.0	83.0	M42	1 5/8-8UN	10	1.9
HMTU 45	102-045	547.3	80.0	86.0	M45	1 3/4-8UN	10	2.2
HMTU 48	102-048	674.0	83.0	93.0	M48	1 7/8-8UN	10	2.7
HMTU 52	102-052	851.3	87.0	102.0	M52	2-8UN	10	3.3
HMTU 56	102-056	1065.1	91.0	112.0	M56	2 1/8-8UN	10	4.1
HMTU 64	102-064	1327.3	99.0	124.0	M64	2 1/2-8UN	10	5.6
HMTU 68	102-068	1476.0	103.0	131.0	M68		10	6.6
HMTU 72	102-072	1556.5	107.0	135.0	M72	2 3/4-8UN	10	7.5
HMTU 80	102-080	2380.6	115.0	159.0	M80	3 1/8-8UN	10	10.5
HMTU 90	102-090	2837.2	125.0	176.0	M90	3 1/2-8UN	10	14.2
HMTU 95	102-095	2992.8	130.0	182.0	M95	3 3/4-8UN	10	16.2
HMTU 100	102-100	3326.2	135.0	191.0	M100	4-8UN	10	18.5
HMTU 110	102-110	4033.4	145.0	209.0	M110	4 3/8-8UN	10	24.0
HMTU 125	102-125	5291.0	160.0	237.0	M125	5-8UN	10	34.1
HMTU 140	102-140	6648.2	175.0	264.0	M140	5 1/2-8UN	10	46.5
HMTU 150	102-150	7649.1	185.0	282.0	M150	6-8UN	10	56.2

HMTU are available for other threads on request.





More effective mechanical locking

The mechanical locking in the HMTUs consists of bolts and fine-threaded screws. The cross-section area of these bolts and screws as well as the total shear area of the screws is ultimately the most important part of the HMTU since it withstands the load over infinite time.

Compared to other solutions on the market that use for example a ring nut around the annular piston, the bolts and screws of the HMTU offer a greater pressure area and a greater shear area. The parts that withstand the applying loads are fully within the nut body. The widening of loaded threads that might occur with thin rings around the annular piston is broadly excluded.

Advantages ...

High tensioning forces

smartTensioner HMTU locks the bolt force with several locking bolts within the HMTU. This design allows more piston space and higher bolt forces with smaller diameters as other solutions.

Top-side access

The unit is fully serviceable from above – difficult access from the side is not necessary.

Low setting losses

Very high remaining bolt force due to low setting losses of less than 15%. Completely new locking mechanism. Bolts distributed on the pitch diameter lock the piston movement after pressure release. Very efficient force flow inside the HMTU and more shear space of the locking screws compared to other solutions.

Easy locking

Easy locking mechanism with defined torque. No puller bars required!

Small diameter

Very high tensioning force despite small diameter. Perfect for highly loaded flanges.

Tools for highly loaded bolted connections.
Our products:

HTU
HydraulicTensioningUnit

M8 - M200 / ¼” – 8”

The HTU replaces conventional (hexagonal) nuts. The bolt force is locked hydraulically.

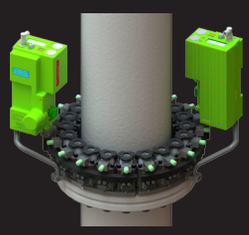
HMTU
HydraulicMechanicTensioningUnit

M22 - M200 / 7/8” – 8”

The HTU replaces conventional (hexagonal) nuts. The bolt force is locked mechanically.

BT & CFBT
BoltTensioner CompactFlangeBoltTensioner

M08 - M100 / ¼” – 4”



The conventional (hexagonal) nut remains on the bolt.
Bolt strained torque-free with Bolt-Tensioner.
Nut is turned by manually.

IBT
IntegratedBoltTensioner

M30 - M64 / 1 1/8”– 2 1/2”

Made for tensioning situations where extremely high bolt forces are needed and very little free area on the flange is available.

STD
SubseaTensioningDevices

M8 - M200 / ¼” – 8”

Made for environments where handling is very difficult, e.g. in subsea-projects.

HP
HydraulicPump

The heart of our innovations: Very high pressure, low pressurized volume.
Perfect for bolt tensioning!

smartTensioner®
Hamburg · Germany

+49 40 88187 316
contact@smartTensioner.com

Boytinstraße 25
22143 Hamburg · Germany