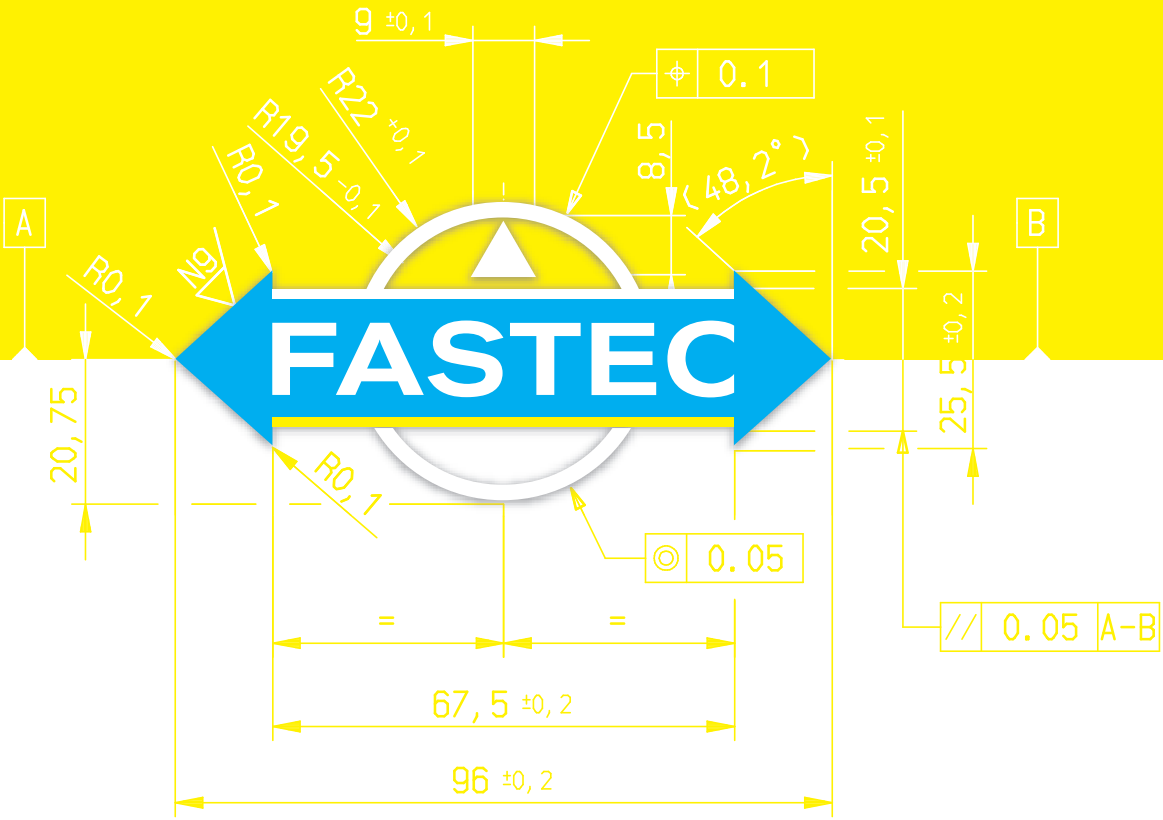


Hydraulic technology

CONTENTS

PURE AXIAL BOLT TENSIONING

FASTEC HIGH PRESSURE TOOLS OFFER YOU MANY TECHNICAL AND ECONOMIC ADVANTAGES!

WE CAN CONVINCE YOU THAT YOU CAN ALSO PROFIT FROM THIS!

MAXIMUM ACCURACY
Due to the purely axial screw tensioning force applied, which has a variation of only -4 % maximum, bolts can be tightened up to the stress limits of the material used.

TORSION-FREE TENSIONING FORCE APPLICATION
Due to the purely axial bolt tensioning force applied, the bolt is not subject to torsional stress.

NO-FRICTION TENSIONING FORCE APPLICATION
Due to the purely axial bolt tensioning force applied, the main nut or the locking nut can be threaded without effort or friction up to the flange. This completely eliminates the problem of chewing of the threads with a fine pitch or of bolt connections made of austenitic steel. The torsional moment depends for large bolt connections on the calculated total torque with more than 90 % on the amount of friction. Estimated coefficients of friction for torque from $\mu = 0.08$ to $\mu = 0.35$ (a tensioning difference of around 400 %) are now a thing of the past.

INCREASED SAFETY
Due to the purely axial bolt tensioning force applied and as the safety factors given in bolt calculation instructions no longer apply, bolts can be tensioned to a greater degree for the same bolt thread cross section. The connection is more secure.

CAPABILITY TO START SIMULTANEOUS TENSIONING AT MULTIPLE POINTS
«Crossover» tightening of several bolts at several points is no longer necessary since FASTEC bolt tensioning tools offer the possibility of tightening all bolt connections simultaneously with exactly the same tensioning force. This also applies when increasing the tensioning force.

START OF TENSIONING INDEPENDENTLY OF TENSIONING PATH
As opposed to thermal screw starting procedures, FASTEC bolt tensioning tools make it possible to eliminate different gaps between individual components. Each bolt can be tensioned with exactly the same force and not with the same distance!

QUICKEST TEST CAPABILITY AT ANY TIME
FASTEC bolt tensioners and hydraulic nuts make it possible to apply a residual tensioning force by means of test force stress application in order to determine if any settling of the screw may occur, and if so, to eliminate it.

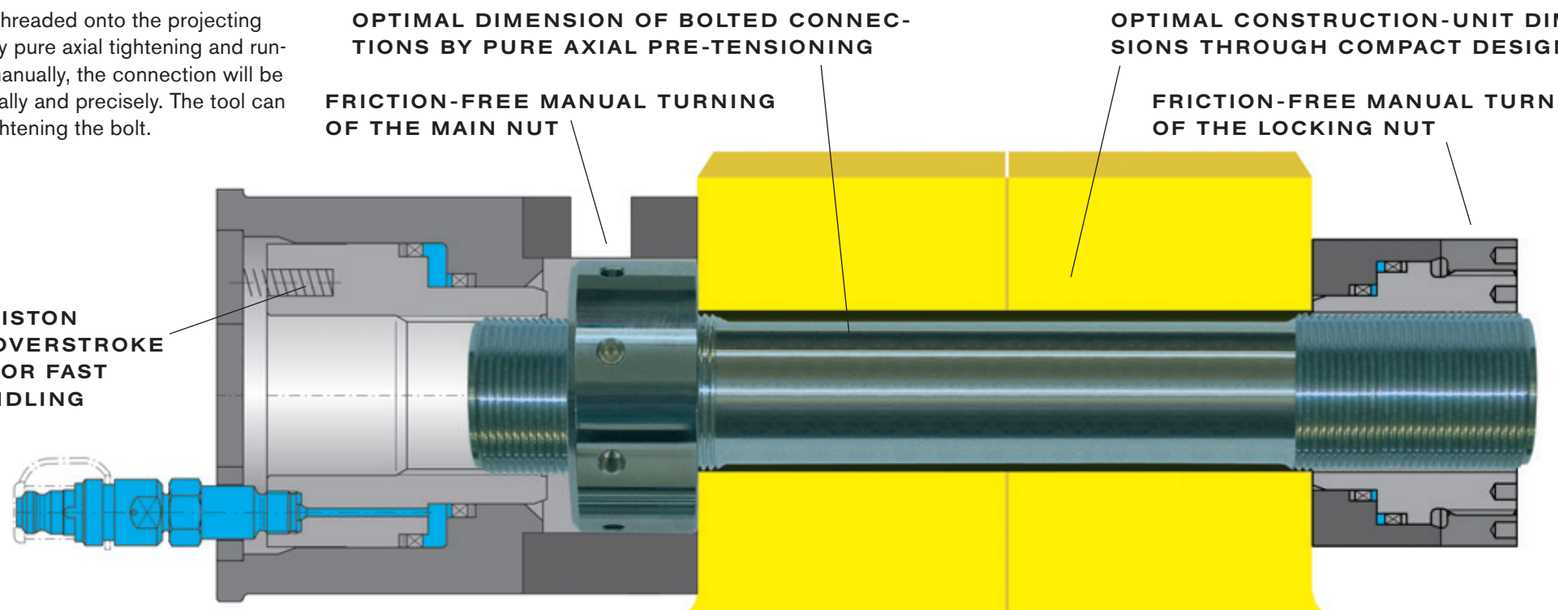
UNIVERSAL APPLICATION
With a compact unit and the ability to interchange the component parts relating to the size of the bolt, FASTEC bolt tensioners can also be used for other thread sizes.

LESS TIRING WORK
Manual application of heavy torques is no longer needed. Many handling aids in FASTEC bolt tensioning tools and hydraulic nuts make work much easier with large units.

SAVING TIME
Bolt tensioning tools and hydraulic nuts will dramatically save time required for tensioning applications. This effect increases for higher tensioning forces, larger bolt thread diameters and also the installation of several FASTEC bolt tensioning tools or hydraulic nuts. Time savings of up to 99 % are possible!

FASTEC BOLT TENSIONERS

are tools which are threaded onto the projecting thread of the bolt. By pure axial tightening and running down the nut manually, the connection will be pre-tensioned optimally and precisely. The tool can be removed after tightening the bolt.



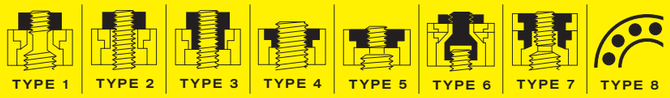
Schematic representation of a bolt tensioner type 4 with automatic piston return and overstroke protection

BOLT TENSIONER TYPE 4 M48
with automatic piston return, overstroke protection (valve) and turnable elbow connector

BOLT TENSIONER TYPE 4 M42
with turnable elbow connector (basic design)

BOLT TENSIONER TYPE 6 M80
with automatic piston return, overstroke protection (valve) and turnable elbow connector for serial connection, special spanner head for turning the main nut and lifting device with roller bearings for vertical and horizontal use in areas which are difficult to access

There are a lot of different designs possible. This page shows just a few examples.



FASTEC HYDRAULIC NUTS

Schematic representation of a hydraulic nut type 12 with internal thread and locking nut

Hydraulic nuts are machine elements which can be used on the bolt end instead of the mechanical nut. For multiple-bolt connections, the simultaneous pressurization of all hydraulic nuts (serial or parallel connection) will apply the tensioning force evenly to the whole connection. With pure axial tightening, the connection will be pre-tensioned optimally and precisely. The pre-tensioning force will be locked by integrated mechanical locking (locking nut, shims, bayonet or similar) or by hydraulic pressure.

HYDRAULIC NUTS ARE ALSO USED AS TOOLS FOR MOUNTING ANS DISMOUNTING OF BEARINGS AND HUBS.
Bearings with a tapered bore are either fitted directly on the tapered shaft journal, on an adapter sleeve or a withdrawal sleeve. Forcing the bearing onto the tapered seat expands the inner ring and reduces the radial clearance. The same works to push a tapered hub onto the tapered journal of a shaft. Hydraulic nuts and the oil injection method make the mounting and dismounting procedure of shrink fits much faster, easier and more gentle.

HYDRAULIC NUT WITH RING PISTON AND INTERNAL THREAD, PERMANETLY PRESSURISED WITHOUT MECHANICAL LOCKING (TYPE 9)
General Engineering
Mounting and dismounting of roller bearings and coupling hubs

HYDRAULIC NUT WITH RING PISTON AND BAYONET, WITH MECHANICAL LOCKING (TYPE 12)
Clamping of a Ø1800 mm saw blade on a circular saw in a rolling mill

SPLITTED MULTIPLE HYDRAULIC NUT 12 X M12, PERMANETLY PRESSURISED (TYPE 13)
Clamping of the rocket combustion chamber on a test bench

Describe your problem to us, we will offer you the most cost effective solution to meet any requirement with regard to the working environment and practical operation within shortest time.

APPLICATION AREAS

REFINERIES, CHEMICAL INDUSTRY
- Plant Construction
- Pipeline Construction
- Reactors
- Devices / Vessels
- Heat Exchangers

GENERAL ENGINEERING
- Gear boxes, Couplings
- Valves
- Generators
- Compressors
- Turbines
- Ship engines
- Transformers

BUILDING CONSTRUCTIONS AND CIVIL ENGINEERING, MINING
- Material Handling, Spreader
- Cranes
- Excavators
- Heading and Cutting Machines for Tunnels
- Shredders, Breakers

RING TENSIONING DEVICE
for simultaneous pre-tensioning of 20 bolts M120 x 6 at a chemical plant

BOLT TENSIONERS
for a turbo-compressor

BOLT TENSIONER M10 X 1,25 UP TO M72 X 4
for a compressor

RING TENSIONING DEVICE
for simultaneous tensioning of 13 tie-rods M 20 x 1,5 on a gas turbine

BOLT TENSIONERS
For tensioning of tie rods on big diesel engines

HYDRAULIC NUTS M36 WITH MECHANICAL LOCKING (TYPE 12)
Cardan shaft connection at a tube rolling mill

HYDRAULIC NUTS M48 WITH MECHANICAL LOCKING (TYPE 11)
for fixing the tools on a forming press

PUMPS AND ACCESSORIES

HYDRAULIC PUMPS

FASTEC offers a wide range of manual, air or electric driven hydraulic pumps. On demand these pumps will be equipped with electronic control systems.

AIR-DRIVEN PUMPS

SHDL 1600
Because of its rugged and simple design this pump is preferred on construction sites.

HOSES, COUPLINGS, ADAPTORS

As a system supplier we always make sure that the customer gets a complete and coordinated system. This includes hydraulic pumps, hoses, couplings, adaptors, assembly aids, transport boxes and much more. We choose every suitable part for your application. You can benefit from our competence.

ELECTRIC DRIVEN PUMPS

SHDE 3000 BK

With 13 Litre additional tank volume

Max. working pressure: 4000 bar

Application: General Engineering, forging presses

SHDE 3000 BK

With PLC-control

Max. working pressure: 3000 (4000) bar

Automatic control with pre-selectable programs

Test bench for calibration of bolt tensioners on site

Application: Assembly and service of ship engines

MOBILE CONTROL UNIT
With PLC-control

Max. working pressure: 700 / 4000 bar

Automatic control with pre-selectable programs

Application: Mounting and dismounting of roll rings at wire rod mills, automatic mounting and dismounting of oil mounted interference fit assemblies

SHDE 3000

With PC-control, barcode reader, printer

Max. working pressure: 3000 (4000) bar

Automatic control with pre-selectable programs

Automatic monitoring and documentation of bolt tensioning process

Application: Production assembly of bolted connections on ship engines

ASSEMBLY AIDS, LIFTING AND TURNING DEVICES

TRANSPORT AND TOOL BOXES

DISTRIBUTOR AND VALVE BLOCKS

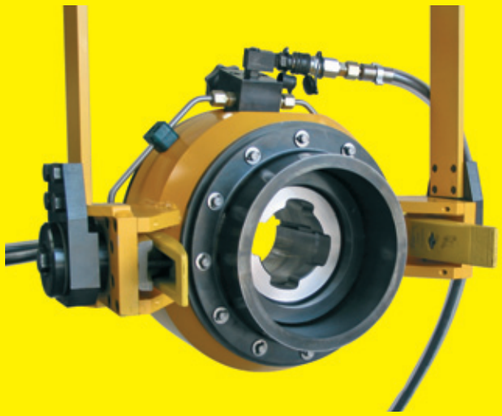
SPECIAL TOOLS AND DEVICES

We use our competence not only to tighten bolted connections. We are challenged by all problems which cannot or which can only be unsatisfactorily solved with standard tools available on the market. Based on our experience of many years, we are in a position to design, offer and manufacture the most cost effective solution to meet any requirement with regards to the working environment and practical operation within the shortest time.

In the following you will find some examples of how to solve customer's assembly problems to their fullest satisfaction.

HYDRAULIC MOUNTING DEVICE FOR MOUNTING OF ROLL RINGS Ø280 IN A WIRE ROD MILL

The hydraulic grippers and the rotatable lifting device enable the operator to pick up and move the roll rings onto the shaft end of the mill stand. Together with the hydraulic control unit the tapered connection can be mounted safely and with repeatable accuracy.



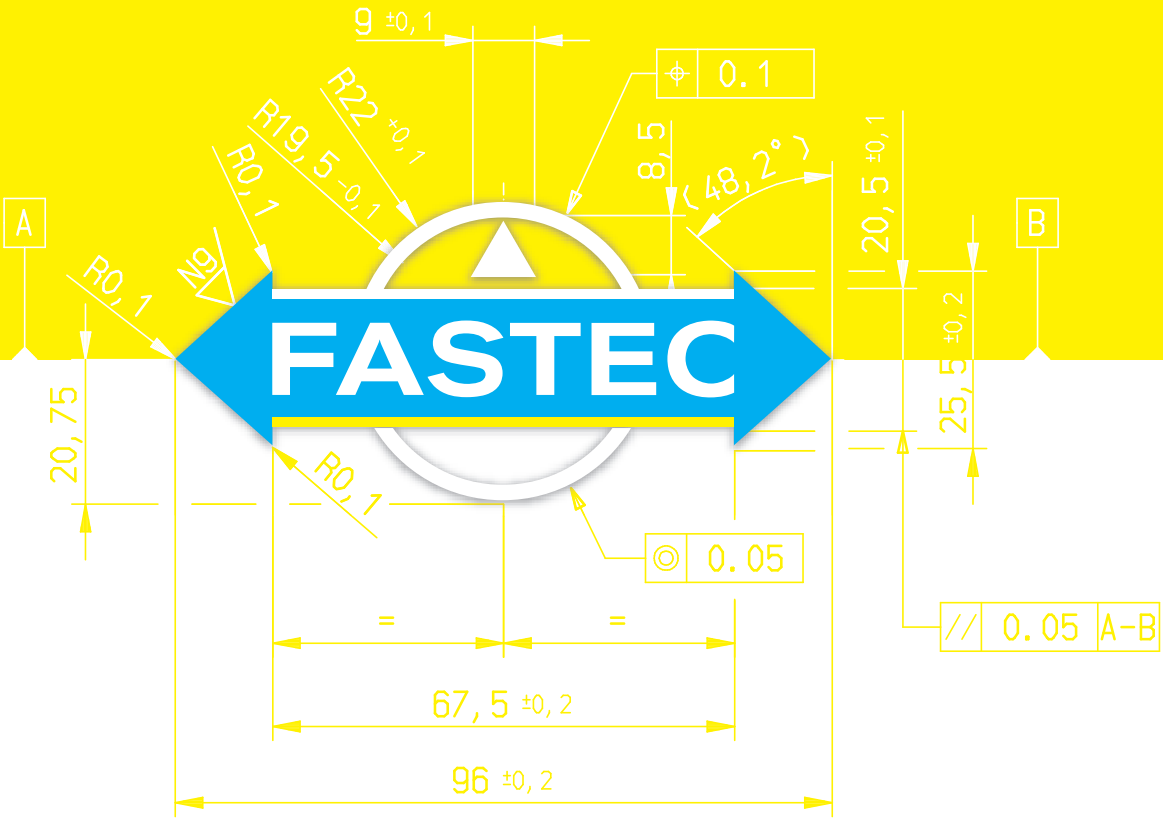
HYDRAULIC ALIGNMENT TOOLS FOR THE PROPELLER OF A 2 MW WIND POWER PLANT

At a big amount of 2 MW wind power plants the shifted propeller (Ø90m, 45 to) had to be aligned precisely. In spite of the very limited space it is possible to centre the propeller with a deviation of less than 0.2mm using a combination of 8 alignment tools. The special mega crane, which has been used before, is not longer necessary.

LIFTING DEVICE FOR HOUSING COVER

For precise setting up and lifting of a housing cover of a big turbo compressor, tools were needed which fit into the existing cover holes in spite of the very limited space. Using high pressure technology, the lifting forces of up to 40 tons per cylinder have been realised with a very compact tool (working pressure 2500 bar). With that, the service personnel has now light weight and easy to handle tools available on site.

GIVE US A TRY! WE WILL WORK OUT A COMPREHENSIVE SOLUTION FOR YOU!



FASTEC ENGINEERS AND MANUFACTURERS:

High pressure technology up to 4000 bar

- Hydraulic bolt tensioners
- Hydraulic nuts
- Hydraulic pumps (manual, air and electric-driven)
- Hydraulic accessories (high pressure hoses, couplings, adaptors)
- Special hydraulic tools

Fastening systems

- Hydraulic fitting bolts
- Friction-locked shaft couplings
- Fast-lock fasteners
- And much more …

SWISS MADE QUALITY

FASTEC products are subject to a permanent and strict quality control during manufacturing and final assembly. This guarantees that all FASTEC products meet the highest expectations for a reliable function, even after years of hardest working conditions.

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