Operating Manual Clamping Nut ESD

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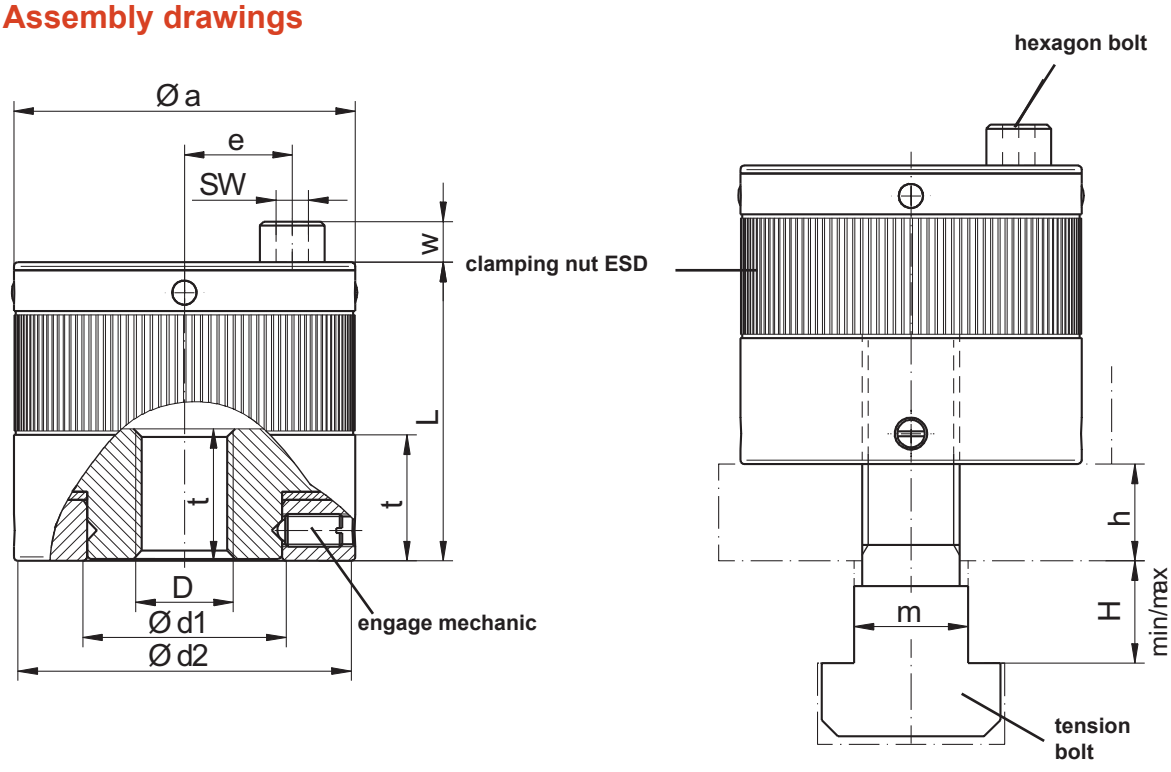
1. Assembly drawings



2. Construction and function

2.1 Construction

The essential design feature of the mechanical clamping nut is an integrated transmission gear to multiply the manual torque. This provides a robust and flexible clamping element to the user, which enables highest forces with simple manual operation and maximum safety. The mechanical clamping nut type ESD can be used for a variety of clamping tasks in mechanical engineering, in particular for tool clamping in presses and punches. By using gas nitrided steels the clamping nut is adequately protected against corrosion for conventional applications. If the operating conditions require, a sealed version with increased protection is also available.

2.2 Function

After manually serving the clampig nut onto the bearing surface, the internal gear gets activated by turning the hexagonal bolt. When serving as well as when clamping the direction of rotation of the hexagonal bolt corresponds with the hand of helix of the thread (e. g. right rotation on right-hand thread). By default, right-hand threads are used; as a special version (eg. for use on rotating shafts) left-hand threads are also available. Resulting of the gear transmission, the tightening torque is multiplied several times and transferred to the nut part with through hole thread.The rotation of the nut part causes the clamping stroke of the screwed in tension bolt. Depending on the operating torque, the clamping force is built up safely.

Self-locking is ensured in each clamping position.

Based on the diameter measurements Ød1/Ød2 of the clamping nut (see datasheet) a suffictient clamping surface has to be considered.

3. Dimensioning

3.1 Dimensioning of the clamping nut type

The nominal clamping force is the force that generated by the planetary gearset at the specie-fied nominal torque and transferred onto the threaded bolt (= preload)

Mainly through occuring operating forces (weights of tools, cutting forces,...) the load, which pulls on the threaded bolt of the clamping nut, can increase significantly. The maximum static load, which has to be withstand by the clamping nut and/or the threaded bolt without fails, is therefore higher, and may be up to a multiple of the nominal clamping force.

In dynamic processes, for example during clamping of press tools, the sum of all operating forces should always be less than the applied preload (=nominal clamping force), otherwise the clamped parts could ‚lift' from each other and the clamping nuts could be ‚shaken loose'

Because the operating forces which occur are usually unknown, a sufficient safety factor should be taken into account of the selection of the clamping nut size. If the selected size does not fit for dimensional reasons or if you expect an high personal injury or property damage when miscalculating, the actual operating forces should be determined by experiment!

3.2 Dimensioning of thread size

Often the size of thread is already specified by the application, whereby you may have to avoid the chosen clamping nut size and choose another one. For bigger threads thats normaly not a problem as long the specified mounting room is sufficient. But if you need to choose a big size with a smaller thread you'll have to ensure that the maximum tensile load of the threaded bolt is lower than the clamping force of the clamping nut and thus can not be used with the maximum tightening torque.

We therefore recommend for **threaded bolt ≤ M24 strength class 12.9** (mind. 10.9) and for **threaded bolt ≥ M30 minimum strenght class 8.8** to ensure the specified data.

4. Checking the screw in depth of the tension bolt

To safely transfer the clamping forces, a minimum thread lenght ‚tmin' of the tension bolt (mandrel, etc.) into the thread of the clamping nut must be guaranteed.

It is generally recommended to use the full thread lenght ‚t' (see datasheet) of the clamping nut when screwing the tension bolt in.

To check the correct screw-in depth of tension bolt there is an anullar groove on the housing of the clamping nut, which also represents the bottom of the knurl (see assembly drawings). Due to the through hole tread of the female part greater thread length won't be a problem; However, they extend the installation time when screwing or may also act as a spoiler edge when overlapping.

5. Usage

5.1 Tightening

Firstly, the clamping nut gets manually screwed onto the bolt by turning the housing until the housing of the clamping nut is seated. The clamping nut is held by friction when its solid on the seating, then the clamping force can be initiated by turning the hexagonal bolt ‚SW1'.

5.1.1 Possible problems

1. When turning on it is necessary to ensure that the bolt CAN NOT rotate
2. Stiff and/or damaged threads may cause that the integrated threaded nut stops and inlaying gear rotates backwards.

5.1.2 Solution options on 2.)

a.) Better lubrication of the thread
b.) Holding the drive pinion with a wrench and turning the housing manually
c.) Holding the housing by hand, turning on with wrench via gear mechanism.

*If this also fails, the bolt must be replaced, or in case of a damaged thread in the clamping nut, the nut itself'

!ATTENTION! The tightening torque specified in the data sheet is sufficient to ensure the appropriate clamping force reliably. To protect the drive and tensioning mechanism against overload, or increased abrasion, the default tightening torque should be exceeded in any case by more than 25 %!

->!!The operation of the clamping nut should be carried out exclusively at room temperature!!<-

5.2 Releasing

Firstly, loosen the tension by turning on the control-hexagon SW1 against the stretching direction (usually right-hand thread), thus the clamping mechanism is relieved. Now the housing can be manually rotated from the bolt.

5.3 Utilities

1. Ring spanner or socket key with ratchet for small clamping nut sizes
2. Torque wrench for all clamping nut sizes

6. Maintenance

Under conventional operating conditions, the clamping nuts are maintenance-free. The thread of the clamping nut, however, should be lubricated at regular intervals with a suitable grease paste. The ESD is by default allowed for operating temperatures up to 473 K, special versions up to 673 K are available. Also, clamping nuts with grease nipples in the cap are available for special demands, so a lubrication of the planetary gear can be done.

7. Supplements

7.1 Warranty

The warranty period is 12 months starting with date of delivery when used in the intended one-shift operation, or max. 10,000 tensions. The warranty does not cover damage caused by improper operation. Any warranty claims are determined by repair or intervention, carried out by unauthorized persons and the use of utilities and spare parts, which aren‘t matching our power clamping nut.

7.2 Safety regulations

Regardless of the instructions listed in this manual, the german statutory safety and accident prevention regulations are valid. Any person who is responsible for the operation, maintenance and repair of the clamping nut must have read and understood the operating instructions before commissioning. Repairers of the clamping nut are basically responsible for workplace safety themeselves. Following all valid safety and regulatory instructions is an requirement to prevent damages to persons and the product during maintenance and repair work. Proper repair of ENEMAC products asumes accordingly trained staff. The duty of training is up to the operator or repairer. It is to ensure that the operator and future repairer are properly trained for the product.

7.3 Copy right

7.4 Spare parts

Only spare parts, which correspond to the requierements specified by ENEMAC GmbH or supplier are allowed. This is always guaranteed with original spare parts. Improper repairs, as well as incorrect spare parts lead to the exclusion of product liability or warranty. When ordering spare parts it is essential to specify type, size and the identification number of the clamping nut to avoid incorrect deliveries

7.5 Proviso

We reserve the right for technical changes. Changes, errors and misprints shall not justify any titles of indemnity.