Operating instructions mechanical clamping nut ESG

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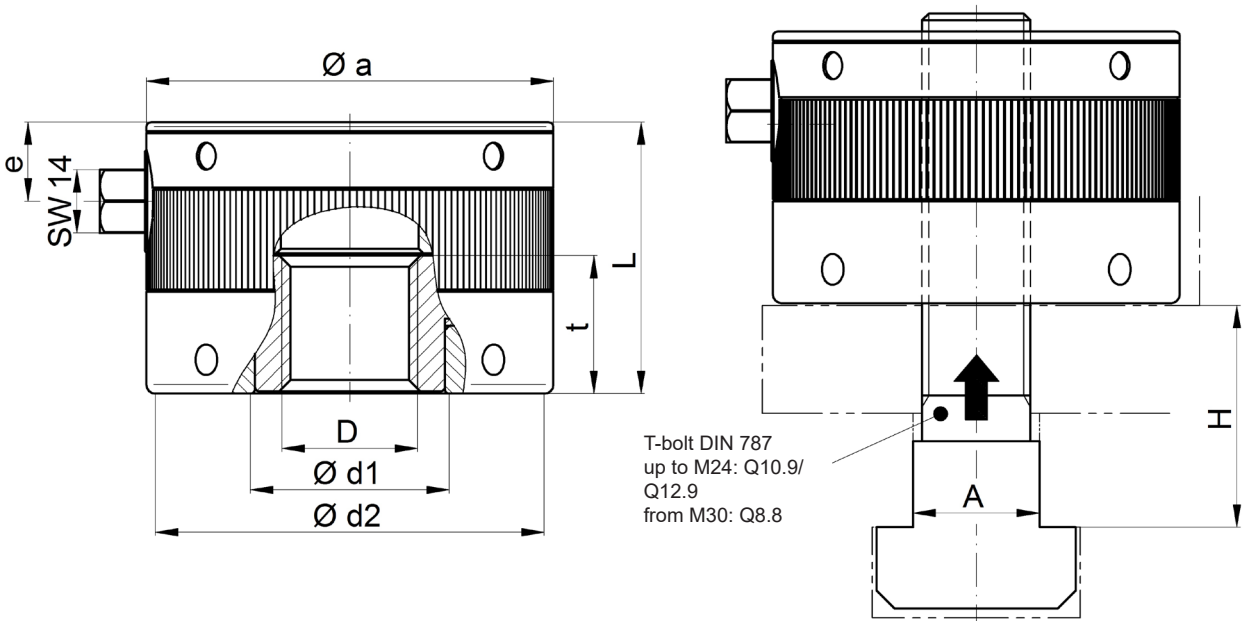
1. Assembly drawing



Clamping nut ESG

2. Construction and function

2.1 Construction

The main feature of the mechanical power clamping nut is an integrated crown gear to multiply the manual tightening torque. This provides the user with a robust and flexible clamping element which enables the highest clamping forces with simple manual operation and maximum operational safety. The corrosion-protected mechanical power clamping nut type ESG can be used for a wide range of clamping tasks in the entire mechanical engineering sector, in particular for tool clamping in presses and punching.

2.2 Function

Firstly the clamping nut gets manually screwed onto the bolt up to the contact surface, then the drive pinion is activated by turning the operating hexagon ‚SW14'. The direction of rotation of ‚SW14' corresponds to the direction of the pitch of the thread (i.e. clockwise rotation with clockwise thread), for infeed and for clamping. The standard version is supplied with a right-hand thread, for rotating shafts, left-hand threads can also be manufactured on customer request.

The tightening torque is multiplied by the gear ratio and transferred to the actual ‚mother'-part with a through thread, the rotary movement of this causes the tensioning stroke of the screwed-in tension bolt. Depending on the operating torque, the clamping force is now safely built up. **The mechanical power clamping nut is self-locking in every clamping position.**
Based on the diameter dimensions Ød1 / Ød2 of the clamping nut (see data sheet), sufficient support on the clamping surface must be checked.

3. Dimensioning

3.1 Dimensioning of the clamping nut size

The nominal clamping force is the force that is generated by the planetary gearset at the specified 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 threated 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 fail, 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 the 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 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** (min. 10.9) and **minimum strength class 8.8 for threaded bolt ≥ M30** to ensure the specified data**.**

4. Checking screw-in depth

In order to safely transfer the clamping force, a minimum screw-in length „tmin" of the tension bolt (thread pin, t-slot screw, etc.) into the clamping nut thread has to be guaranteed.

It is generally recommended to use the complete thread length „t" of the clamping nut when screwing in the tension bolt (see data sheet).

To check the correct minimum screw-in length, there is an annular groove on the outer surface of the clamping nut housing, which at the same time corresponds to the lower edge of the knurling (see assembly drawing).

Due to the through hole thread of the nut part, larger thread lengths are no problem; however, they lengthen the assembly time when screwing on, or can represent an interfering edge if they protrude.

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 it's 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

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 themselves. 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 GmbH products assumes 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

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7.4 Spare Parts

Only spare parts, which correspond to the requirements specified by ENEMAC 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.

Enclosure: Data-sheet