Torque Limiter Assembly

1. General Information

These installation instructions are an integral part of the delivery. They provide information on the correct installation, commissioning and maintenance of the torque limiter (safety coupling) supplied. Failure to observe these instructions can lead to significant malfunctions or failure of the coupling and resultant damage.
The installation instructions must be kept easily accessible at the place of use of the coupling at all times.

Safety Note:

- Rotating components are sources of danger. The user must always take appropriate protective measures.
- The machine must be secured against unintentional switching on during installation and maintenance of the torque limiter.
- Installation and commissioning may only be carried out by trained and qualified personnel.
- ENEMAC safety couplings are not safety devices for protecting persons from moving parts.
- When using the torque limiter in vertical axes, additional safety devices must be installed to prevent the carriage from sagging when the coupling is disengaged. This can be realised by brakes or weight compensation, for example.

Manufacturer's Declaration:

ENEMAC safety couplings are not machines in the sense of the Machinery Directive 2006/42/EC Annex iiB, but components for installation in machines and systems. Commissioning is prohibited until the requirements of the Machinery Directive are fulfilled by or after integration into the end product.

Disclaimer:

The torque limiter may only be used in accordance with the technical data (see data sheet). Unauthorised structural modifications to the coupling are not permitted and will result in the exclusion of any liability claims.
We expressly reserve the right to make technical changes without prior notice as part of continuous product development.

2. Function

ENEMAC safety couplings work according to the ball detent principle and protect downstream components in the drive train from overload and the resulting damage. During normal operation of the machine, engagement balls are pressed into recesses in the flange ring (spherical caps) by pre-tensioned disc springs and thus transmit the torque from the hub to the flange ring and vice versa without backlash.
In the event of an overload, the hub rotates in relation to the flange ring and presses the balls out of their recesses against the disc spring - the coupling disengages - (once per revolution as standard), thus separating the drive and output sides. The switching path of the springs can be queried by means of a proximity switch and the motor can thus be switched off.
The torque limiter is only designed for short-term disengagement!
Once the fault has been rectified, the safety coupling is turned at low speed or by hand, regardless of the direction of rotation. It audibly re-engages automatically in the synchronised position.
The torque limiter is ready for operation and the set disengagement torque is effective again.

3. Assembly Preparations

- The shaft(s) on which the coupling is to be mounted and the hub bore(s) of the coupling must be free of dirt and burrs.
- The fit between the hub(s) and shaft(s) must be selected as a sliding fit, e.g. H7/j6 or G7/k6.
- The shaft journals can be oiled to facilitate assembly/disassembly.

4. Mounting Torque Limiters

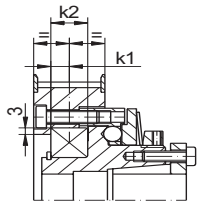
A distinction is made between safety couplings for indirect drives (drive and output shafts are offset in parallel and torque is transmitted via chains, belts or gears) and safety couplings for direct drives (drive and output shafts are on the same level).

4.1 Assembly / Disassembly
Torque Limiters for indirect Drives

Output element:

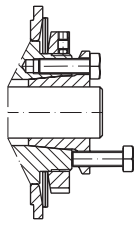
Depending on the series, the output element (pulley, sprocket, etc.) is flanged directly to the torque limiter on deep groove ball bearings or mounted / centred on the bearing seat of the coupling or directly on the output shaft using plain bearings.
For versions with deep groove ball bearings (ECA, ECP, ECU, ECV, ECW), ensure that the resulting radial force of the output element is approximately in the centre of the bearing and that the maximum permissible lateral load is not exceeded (see data sheet). The output element is then screwed to the flange ring / spherical cap ring (‚Øg' / ‚Øp'). ATTENTION: Observe the maximum screw-in depth (‚i' / ‚f')! (see data sheet)

The fit between the output element and the ball bearing must be H7/h5. The manufacturing tolerance +0.1 mm on dimension ‚k2' must be observed. In addition, the stop collar on the outer ring ball bearing must have a width of at least 3 mm.
For type ECB, the entire surface of the attachment part on the coupling side must be flat. The torque limiter and attachment part (with plain bearing) are centred on the shaft.



1. Torque Limters with Conical Bushing (ECA, ECB, ECL)

When the coupling is delivered, the screws of the conical bushing are slightly tightened. Before installation, loosen the screws and the conical bushing so that the coupling can be pushed onto the shaft. During assembly, tighten the screws of the conical bushing evenly crosswise to prevent tilting.
When dismantling, loosen the fastening screws and the conical bushing from the hub using the three forcing-off threads.



2. Torque Limiters with Clamping Hub (ECOL, ECP, ECW)

The hub and clamping ring must be completely slackened before installation (loosen clamping screw).
During installation, tighten the clamping screw to the specified tightening torque using a torque spanner (see data sheet)

3. Torque Limiters with Keyway (ECA, ECE, ECG, ECH, ECI, ECR, ECU, ECV, ECFS)

Keyways are manufactured in accordance with DIN 6885 sheet 1. The ECE/ECG ‚L', ECH and ECR series are fitted with grub screws for axial locking. In types ECA, ECE/ECG ‚K', ECI, ECU and ECV, the hubs are secured by a stop collar and output element. For type ECE, the coupling and attachment (with plain bearing) are centred on the shaft. For types ECG, ECI and ECR, the plain bearing is integrated into the attachment part and the unit is centred directly on the hub. The bearing clearance of the plain bearing must be less than 0.03 mm. This also applies to type ECB.

4.2 Assembly / Disassembly
Torque Limiters for direct Drives

Torque Limiters for direct drives are a combination of a safety part with a release mechanism (safety coupling for indirect drives) and a compensating element (elastomer or metal bellows coupling) to compensate for misalignment between the drive and output shafts. (modular principle) Example: Safety part ECU + metal bellows coupling = ECUB

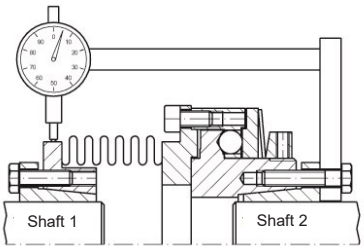
1. Torque Limiters with Elastomer Attachment (ECPD, ECUD, ECWD)

These are axially pluggable, so it may be advisable to mount both coupling parts (safety part - compensating element) separately on the respective shaft journals. The units are then pushed together axially to connect the safety coupling.

2. Torque Limiters with Metal Bellows Attachment (ECPB, ECPH, ECUB, ECUH, ECWB)

These are mounted and dismounted on the shafts according to the respective shaft connection (keyway, clamping hub, conical bushing). See 4.1.

4.3 Aligning the Shafts



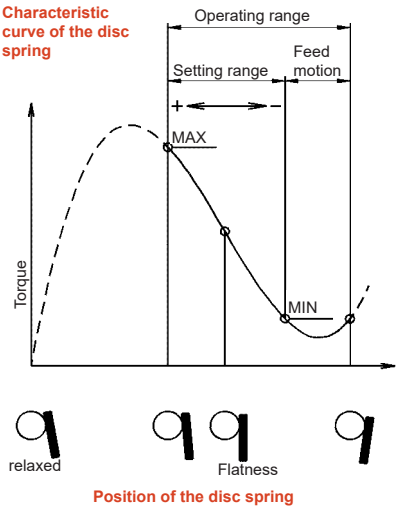
To increase the service life of the torque limiter and minimise the bearing load, the maximum permissible lateral offset must not be exceeded (see data sheet). A measuring method using a dial gauge can be used for this purpose:
Attach the dial gauge to shaft 2 and adjust the probe on the safety coupling to shaft 1. Then rotate the entire measuring arrangement through 360° and read off the deviation.
The lateral offset is 50% of the value.

5. Setting the Release Torque

The disengagement torque TA is infinitely adjustable between 40% and 100% of the nominal coupling torque without changing the disc spring.
If no setting value is specified by the customer, the factory setting is set to :

- approx. 70% of the maximum value for types ECA, ECB, ECE, ECG, ECH, ECI and ECR
- 100% of the maximum value for all other torque limiters

The set static disengagement torque can be readjusted by turning the adjusting nut or the adjusting ring on the machine using a hook spanner. The set disengagement torque (TA) as well as markings for the minimum disengagement torque (TAmin) and the maximum disengagement torque (TAmax) are lasered onto the adjusting ring.
After adjustment, the reference mark on the hub must be within the setting range between TAmin and TAmax.

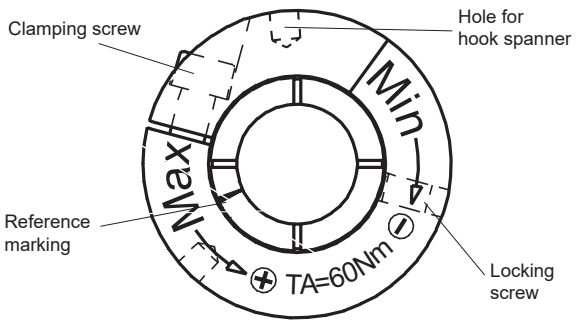


ATTENTION: In the adjustment range, the characteristic curve of the disc spring (fig. right) is degressive, i.e. contrary to normal practice:

- **Turning the adjusting nut clockwise => TA decreases (-)**
- **When the adjusting nut is turned anti-clockwise => TA increases (+)**

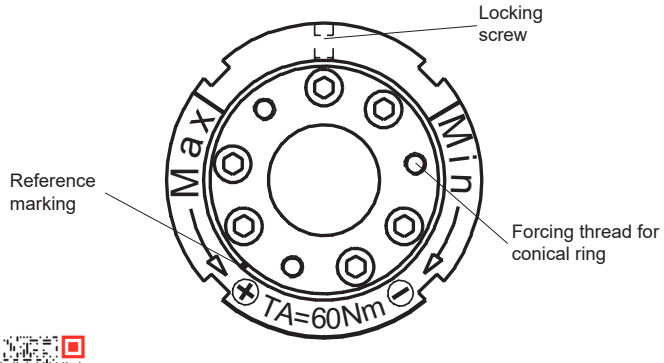
5.1 Torque Limiters with Clamping or Clamping Ring Hub

Loosen the locking screw, turn the adjusting ring with a hook spanner (note the direction of rotation and reference mark), then retighten the locking screws hand-tight. When mounted, the clamping screw of the clamping ring hub must also be loosened and then tightened again.



5.2 Torque Limiters with Keyway or Conical Bushing

Unscrew the locking screw completely and turn the adjusting nut with a hook spanner (note the direction of rotation and reference mark).
After adjustment, secure the adjusting nut against turning by screwing in the locking screw.



Detailed Operating Instructions at: enemac.eu/service/