

Please read these Operational Instructions carefully and follow them accordingly!

Ignoring these Instructions may lead to malfunctions or to clutch failure, resulting in damage to other parts.

Safety Regulations

These Installation and Operational Instructions (I + O) are part of the clutch delivery. Please keep them handy and near to the ROBA®-contitorque at all times.



It is forbidden to start use of the product until you have ensured that all applicable EU directives and directives for the machine or system into which the product has been installed have been fulfilled. At the time these Installation and Operational Instructions go to print, the ROBA®-contitorque clutches accord with the known technical specifications and are operationally safe at the time of delivery. Without a conformity evaluation, this product is not suitable for use in areas where there is a high danger of explosion. This statement is based on the ATEX directive.



Danger!

This warning applies if:

- the ROBA®-contitorque couplings are modified.
- the relevant standards for safety and / or installation conditions are ignored.



User-implemented Protective Measures

- Cover all moving parts to protect against seizure, dust or foreign body impact.
- The ROBA®-contitorque heats up during slipping operation. Do not touch the ROBA®-contitorque housing! => Danger of burns
- The ROBA®-contitorque works using strong magnetic fields which can disturb or destroy electronic or mechanical devices. This is particularly the case for cardiac pacemakers. Data saved on credit cards, hard drives or disks can be deleted by the magnetic fields. In order to prevent such occurrences, please keep to the safety distance of more than 0,2 metres away from the ROBA®-contitorque.
- The ROBA®-contitorque must not be subjected to impact stresses, as the magnets break into slivers and can injure personnel.
- The ROBA®-contitorque must not come into contact with metal chips.
- The ROBA®-contitorque must not be dismantled. Due to the strong magnetic fields, clutch parts or other elements may be pulled towards the magnet, causing crush injuries.



To prevent injury or damage, only professionals and specialists should work on the devices, following the relevant standards and directives. Please read the Installation and Operational Instructions carefully before installation and initial operation of the device.

These Safety Regulations are user hints only and may not be complete!

Safety, Guideline and Prohibitory Signs



Danger!

Danger of injury to personnel and damage to machines.



Danger!

Danger of injury to personnel, in particular due to hot surfaces.



Please Observe!

Guidelines on important points.



Danger!

Danger for people with heart pacemakers.

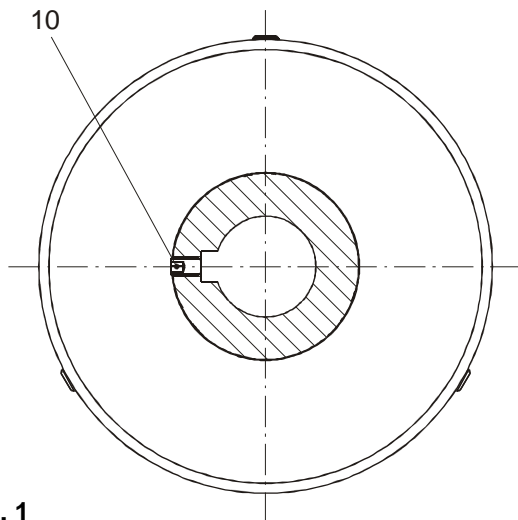
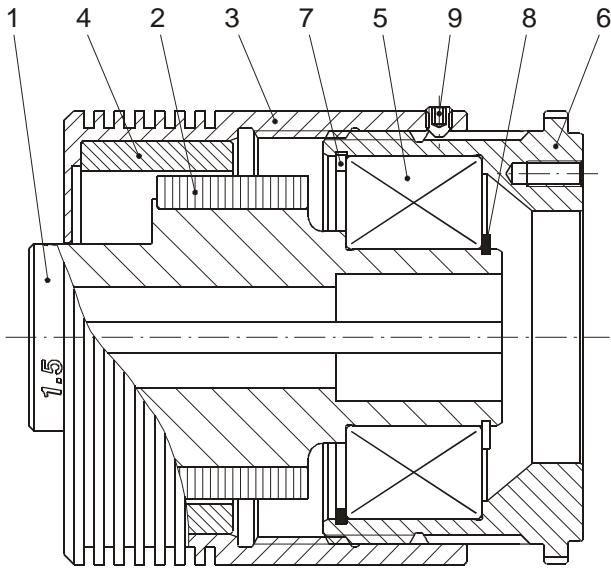


Fig. 1

Parts List (Only use mayr® original parts)

| Item | Name |
|------|--------------------------------------|
| 1 | Hub |
| 2 | Magnetic part with permanent magnets |
| 3 | Set collar |
| 4 | Hysteresis material |
| 5 | Roller bearing |
| 6 | Flange |
| 7 | Snap ring |
| 8 | Locking ring |
| 9 | Socket set screw |
| 10 | Adjusting screw |

Construction and Function

The ROBA®-contitorque can be used as a load holding overload clutch or brake in machine drives.

The ROBA®-contitorque input side consists of a hub (1) with permanent magnets (2).

The drive shaft is connected to the hub (1) via a key.

The clutch output side consists of a set collar (3) with hysteresis material (4) and a flange (6). The set collar (3) is screwed onto the flange (6) and secured with the socket set screws (9). The output elements can be screwed onto the flange (6) and centred.

The input and output side are rotatably connected using the roller bearing (5). The roller bearing (5) is held axially with the snap ring (7) and the locking ring (8).

In normal operation, the torque is transmitted contactlessly and synchronously via magnetic forces from the input side to the output side. On overload, the clutch slips, meaning that input and output sides move together at a relative speed (the slipping speed). On overload, the clutch torque is equal to the set torque.



Please Observe!

If the relative speed n_s increases, the set clutch torque T_g also increases (see Diagram 1). Please contact the manufacturer for the exact torque characteristic values.

Torque characteristics

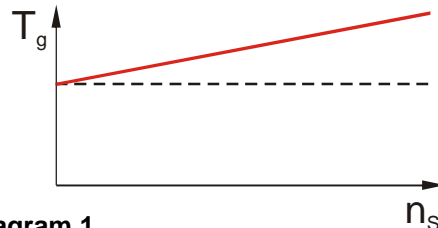


Diagram 1

The hysteresis material (4) is constantly reversed and back again by the permanent magnets (2). This causes performance loss, which must be released into the surrounding area in the form of heat.

Please contact the manufacturers for precise details.



Please Observe!

If the permitted performance loss is exceeded, the ROBA®-contitorque overloads.
=> Destruction of the permanent magnets
=> The clutch must be thermally dimensioned (see section "Thermal Dimensioning" Page 3).

State of Delivery

The ROBA®-contitorque Type 150._00 is delivered manufacturer-assembled.

The torque adjustment depends on Type and accords with the values requested by the customer on order.

The ROBA®-contitorque is delivered with a finish bore as part of the standard delivery.

The hub (1) bore tolerance is standard H7.

The hub keyway width (1) at DIN6885/1 has a tolerance of JS9, at DIN6885/3 a tolerance of J9.

k6 tolerances are specified for the shafts.

Clutch Thermal Dimensioning

$$P_V = \frac{T \cdot n_S}{9,55} \cdot V \leq P_{V,Permitted}$$

with $V = \frac{t_s}{t_{Zykl}}$ and $t_s^{1)}$

- ≤ 30 s for Size 1
- ≤ 25 s for Size 2
- ≤ 20 s for Size 3
- ≤ 15 s for Size 4
- ≤ 10 s for Size 5

P_V = Clutch/brake performance loss [W]
 $P_{V,Permitted}$ = Permitted clutch/brake performance loss [W]
 T = Clutch/brake torque [Nm]
 n_S = Slipping speed [rpm]
 = Reduction ratio [-]
 t_s = Slipping duration [s]
 t_{Cycle} = Cycle duration [s]

1) Applies for maximum torque adjustment for Type 150.200 and a slipping speed of $n_S = 3000$ rpm. Please contact the manufacturer for other torques, slipping speeds and values for t_s .

Cont. slipping operation: $V = 1$

The following Diagram shows the ROBA®-contitorque clutch and brake operating characteristic curve.

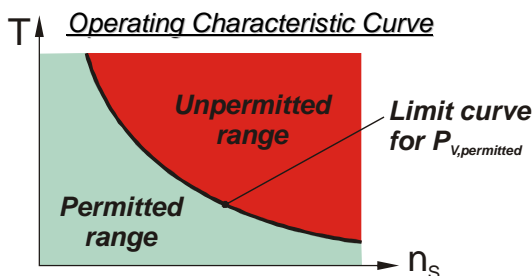


Fig. 2

The green area below the limit curve $P_{V,Permitted}$ shows the permitted range. If the operating point lies in the red area (above the limit curve), the clutch will be destroyed by overload.

Calculation Example:

Screwing open screw caps
(Application as clutch in an assembly cycle)

- Given:

$T = 2,5$ Nm (Torque to open screw cap)
 $n_S = 300$ rpm (Speed to open screw cap)
 $t_s = 5$ s (Slipping duration)
 $t_{cycle} = 10$ s (Cycle duration)
 Operating temperature 40°C

- Required:

$P_V = ???$ (Clutch performance loss)

$$\underline{V} = \frac{t_s}{t_{Cycle}} = \frac{5s}{10s} = 0,5$$

$$\underline{P_V} = \frac{T \cdot n_S}{9,55} \cdot V = \frac{2,5Nm \cdot 300rpm \cdot 0,5}{9,55} = 39,3W$$

- Selected:

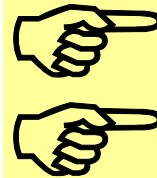
ROBA®-contitorque Size 3 Type 150.200
with $T_g = 1,5 \div 3$ Nm and $P_{V,Permitted} = 62$ W > $P_V = 39,3$ W
(data from the catalogue)



Fig. 3

Important Installation Guidelines

- The bores, threads and all mounting parts must be free of grease and oil.
- The inner and outer threads of the mounting parts must be burr and chip-free.
- The adjusting screw (10) must be loosened whilst the clutch is being mounted onto the shaft.



Please Observe!

Please install the ROBA®-contitorque so that any heat produced can dissipate into the surrounding area.

The ROBA®-contitorque must not be removed!

Installation

a) Radial securement of the clutch onto the shaft

1. Set the clutch to the required torque (see page 4).
2. Mount the key onto the cleaned shaft.
3. Only loosen the adjusting screw (10) if this is being used to secure the clutch axially (see below). If not, completely remove the adjusting screw (10).
4. Mount the clutch onto the shaft using a suitable device, for which the hub keyway (1) must align axially with the key on the shaft.

b) Axial securement of the clutch onto the shaft

ROBA®-contitorque Type 150._00 can be axially fixed onto the shaft in two different ways:

With an adjusting screw (10).
Fig. 4

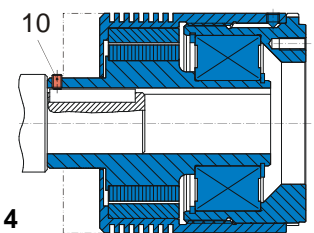


Fig. 4

Tighten the adjusting screw (10) to the tightening torque, see Table 1

With a screw and press cover
(not included in delivery).
Fig. 5

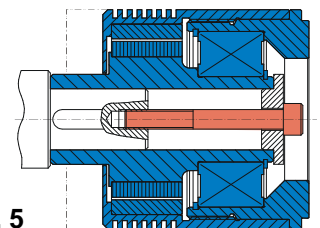


Fig. 5

Table 1

| | Size | 1 | 2 | 3 | 4 | 5 |
|----------------------------------|------|-----|-----|-----|-----|-----|
| Key width (Item 10) | SW | 2 | 2 | 2 | 2,5 | 3 |
| Tightening torque (Item 10) [Nm] | | 1,5 | 1,5 | 1,5 | 2,2 | 2,9 |

c) Securement of output elements

Output elements can be screwed to the flange (6) and either centred on the inner tolerated diameter H7 or on the outer tolerated diameter h6.

For the output elements, we recommend bore tolerances of H7 or pin tolerances of h6, each with a finely ground or polished surface ($R_a = 0,8 \mu m$).

Installation and Operational Instructions for ROBA®-contitorque Type 150._00 Sizes 1 – 5

(B.150.00.GB)

Torque Adjustment

If no particular torques were specified on the order, the ROBA®-contitorque is set manufacturer-side to the maximum torque.

Please Observe!
The set torque on the ROBA®-contitorque can be read using a graduation scale, to be found on the hub (1) (see Fig. 6).

The torque on the ROBA®-contitorque must only be adjusted step-wise (for max. step widths, see Tables 3 and 4). After each step-wise adjustment, the clutch must slip, so that no pulsating torque occurs. Should intermittent torque occur, the clutch must be set to maximum torque and the hub (1) must be turned by 2 turns relative to the flange (3).

Procedural method (see Figs. 6 and 7):

- 1) Turn three socket screws (9) back until the set collar (3) can be turned.
- 2) **The torque must only be adjusted step-wise. The maximum step width is defined in Tables 3 and 4 and is dependent on the torque adjustment range and the clutch Type.**
- 3) Hold the flange (6) on the knurl and turn the set collar (3) by hand, either up to the maximum step width according to Tables 3 and 4, or until the required torque is reached.
- 4) If necessary, finely adjust the set collar (3) until the marking grooves on the flange (6) align axially with the socket screws (9).
- 5) Tighten the three socket screws (9) by hand.
- 6) After each step-wise adjustment, the hub (1) must be turned about two turns (= 720° angle of rotation) relative to the flange (6), so that the hysteresis material (4) is remagnetised.
In order to do this, please hold the flange (6) to prevent it from turning and turn the hub (1) with an adjustable face wrench (not included in delivery). The face wrench is inserted into the hub (1) axial bores (see Fig. 7).
If the ROBA®-contitorque is already installed into a system, then the hub (1) is turned mechanically instead of using a face wrench.
- 7) Repeat the previous steps 1) to 6) until the required clutch torque is reached.
- 8) Tighten the three socket screws (9) to the torque values (see Table 2).

Table 2

| | Size | 1 | 2 | 3 | 4 | 5 |
|--|------|-----|-----|-----|-----|-----|
| Wrench opening (Item 9) SW | | 2 | 2 | 2,5 | 2,5 | 2,5 |
| Tightening torque (Item 9) [Nm] | | 1,5 | 1,5 | 2,2 | 2,2 | 2,2 |

Table 3

| Size | Type | Torque adjustment range | Maximum step width |
|------|---------|-------------------------|--------------------|
| 1 | 150.100 | 0,1 to 0,2 Nm | 0,05 Nm |
| | | 0,2 to 0,4 Nm | 0,1 Nm |
| | 150.200 | 0,4 to 0,8 Nm | 0,2 Nm |
| 2 | 150.100 | 0,1 to 0,3 Nm | 0,1 Nm |
| | | 0,3 to 0,8 Nm | 0,25 Nm |
| | 150.200 | 0,8 to 1,6 Nm | 0,4 Nm |
| 3 | 150.100 | 0,1 to 0,5 Nm | 0,2 Nm |
| | | 0,5 to 1,5 Nm | 0,5 Nm |
| | 150.200 | 1,5 to 3 Nm | 0,75 Nm |
| 4 | 150.100 | 0,2 to 1 Nm | 0,4 Nm |
| | | 1 to 3 Nm | 1,0 Nm |
| | 150.200 | 3 to 6 Nm | 1,0 Nm |
| 5 | 150.100 | 0,5 to 2 Nm | 0,5 Nm |
| | | 2 to 6 Nm | 1,0 Nm |
| | 150.200 | 6 to 12 Nm | 1,0 Nm |

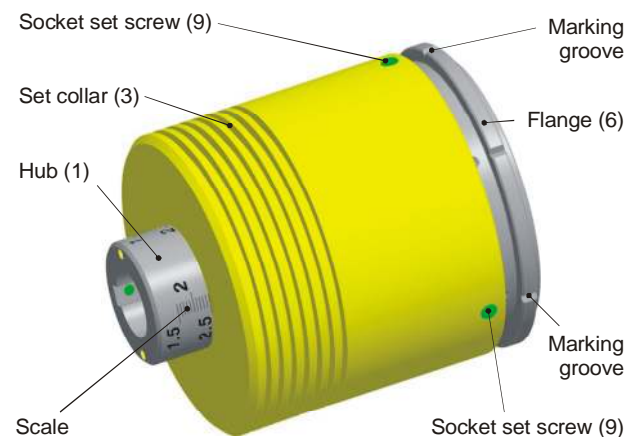


Fig. 6

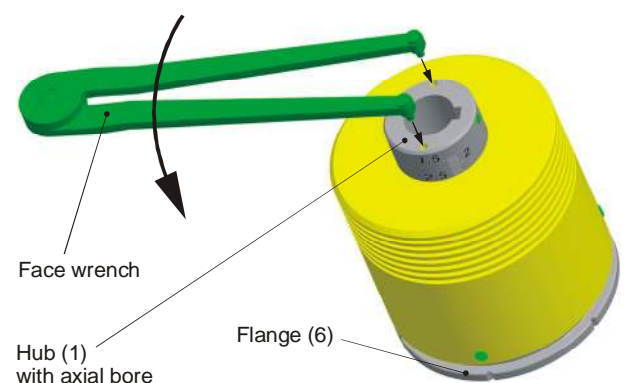


Fig. 7

Maintenance

Torque transmission takes place contactlessly, meaning that no maintenance is necessary on the ROBA®-contitorque.

The roller bearing (5) is sealed and greased with a grease filling to last for the duration of its lifetime.

Special maintenance work may be necessary, however, if the device is subject to large amounts of dirt or dust or is operating in extreme ambient conditions.

In this case, please contact the manufacturers.

Disposal

The ROBA®-contitorque components must be disposed of separately as they consist of different materials.

| | |
|----------------------------------|---|
| All steel components: | Steel scrap (Code No. 160117) |
| All aluminium components: | Non-ferrous metals (Code No. 160118) |
| All magnetic components: | Steel scrap (Code No. 160117) |