

Please read these Installation Instructions carefully and follow them accordingly!
Ignoring these Instructions may lead to malfunctions or to brake failure, resulting in damage to other parts.

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Declaration of Conformity

A conformity evaluation for the applicable EU directives has been carried out for this product.
The conformity evaluation is set out in writing in a separate document and can be requested if required.
It is forbidden to start use of the product until the machine or system into which it should be built is operating in accordance with all applicable EU directives.
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.



Please Observe!

According to German notation, decimal points in this document are represented with a comma (e.g. 0,5 instead of 0.5).

Safety Regulations

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



Danger!
Danger of death! Do not touch
voltage-carrying cables and components.

To prevent injury or damage, only professionals and specialists should work on the devices.

Danger!

This warning applies if:

- the electromagnetic brake is used incorrectly.
- the electromagnetic brake is modified.
- the relevant standards for safety and / or installation conditions are ignored.



Warning!
Before product installation and initial operation, read the Installation and Operational Instructions carefully and observe the Safety Regulations. Incorrect operation can cause injury or damage. The electromagnetic brakes have been developed in accordance with the latest technology regulations and are, at the point of delivery, operationally safe.

Please Observe!

- Only specialists who are trained in the transport, installation, initial operation, maintenance and general operation of these devices and who are aware of the relevant standards should be allowed to carry out this work.
- Technical data and specifications (Type tags and documentation) must be followed.
- The correct connection voltage must be connected according to the Type tag.
- Never loosen electrical connections or carry out installations, maintenance or repairs while the voltage connection is energised!
- Cable connections must not be placed under mechanical strain.
- Check electrical components for signs of damage before putting them into operation. Never bring them into contact with water or other fluids.
- The braking torque is lost if the friction lining and / or the friction surface come into contact with oil or grease.

Appointed Use

mayr[®]-brakes are for use in machines and systems and must only be used in the situations for which they are ordered and confirmed.

Using them for any other purpose is not allowed!

Guidelines for Electromagnetic Compatibility (EMC)

In accordance with the EMC directives 89/336/EEC, the individual components produce no emissions. However, functional components e.g. rectifiers, phase demodulators, ROBA[®]-switch devices or similar controls for mains-side energisation of the brakes can produce disturbance which lies above the allowed limit values. For this reason it is important to read the Installation and Operational Instructions very carefully and to keep to the EMC directives.

Device Conditions



Please Observe!

The catalogue values are standards, which can, in certain cases, vary. When dimensioning the brakes, please remember that the installation situation, brake torque fluctuations, permitted friction work, run-in behaviour and wear as well as general ambient conditions can all affect the given values. These values should therefore be carefully assessed, and alignments made accordingly!

Please Observe!

- Mounting dimensions and connecting dimensions must be adjusted according to the size of the brake at the place of installation.
- The brakes are designed for a relative duty cycle of 100 %.
- The brakes are only designed for dry running. The torque is lost if the friction surfaces come into contact with oil, grease, water or similar substances.
- The braking torque is dependent on the present run-in condition of the brakes.
- Manufacturer-side corrosion protection of the metal surface is provided.

Protection Class I

This protection can only be guaranteed if the basic insulation is intact and if all conductive parts are connected to the PE conductor. Should the basic insulation fail, the contact voltage cannot remain (VDE 0580).

Protection IP 54:

Dust-proof and protected against contact as well as against splashing water from all directions.

Ambient Temperature –20 °C up to +40 °C

Warning!

At temperatures of around or under freezing point, condensation can strongly reduce the torque, or the rotors can freeze up. The user is responsible for taking appropriate countermeasures.

Insulation Material Class F (+155 °C)

The magnetic coil and the casting compound are suitable for use up to a maximum operating temperature of +155 °C.

Safety Regulations

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

User-implemented Protective Measures:

- Please cover moving parts to protect against injury through seizure.
- Place a cover on the magnetic part to protect against injury through high temperatures.
- Protect against electric shocks by installing a conductive connection between the magnetic component and the PE conductor on the permanent installation (Protection Class I) and by carrying out a standardised inspection of the continuous PE conductor connection to all contactable metal parts.
- Protect against highly inductive switch-off peaks by installing varistors, spark quenching units or similar devices according to VDE 0580/2000-07, Paragraph 4.6, to prevent damage to the coil insulation or switch contact consumption in extreme conditions (this protection is contained in *mayr*[®] rectifiers).
- Install additional protective measures against corrosion if the brake is subject to extreme ambient conditions or is installed in open air conditions, unprotected from the weather.
- Take precautions against freeze-up of the friction surfaces in high humidity and at low temperatures.

Regulations, Standards and Directives Used:

DIN VDE 0580	Electromagnetic devices and components, general directives
2006/95/EC	Low voltage directive
98/37/EC	Machine directive
89/336/EEC	EMC directive

Please Observe the Following Standards:

DIN EN ISO 12100-1 and 2	Machine safety
DIN EN 61000-6-4	Noise emission
DIN EN 61000-6-2	Interference immunity
EN 60204	Electrical machine equipment

Liability

- The information, guidelines and technical data in these documents were up to date at the time of printing. Demands on previously delivered brakes are not valid.
- Liability for damage and operational malfunctions will not be taken if
 - the Installation and Operational Instructions are ignored or neglected.
 - the brakes are used inappropriately.
 - the brakes are modified.
 - the brakes are worked on unprofessionally.
 - the brakes are handled or operated incorrectly.

Guarantee

- The guarantee conditions correspond with the Chr. Mayr GmbH + Co. KG Sales and Delivery Conditions.
- Mistakes or deficiencies are to be reported to *mayr*[®] at once!

Conformity Markings

The product conforms to the CE according to the low voltage directives 2006/95/EC.

Identification

mayr[®] components are clearly marked and described on the Type tag:

Manufacturer

***mayr*[®]**

Name / Type

Article number

Serial number

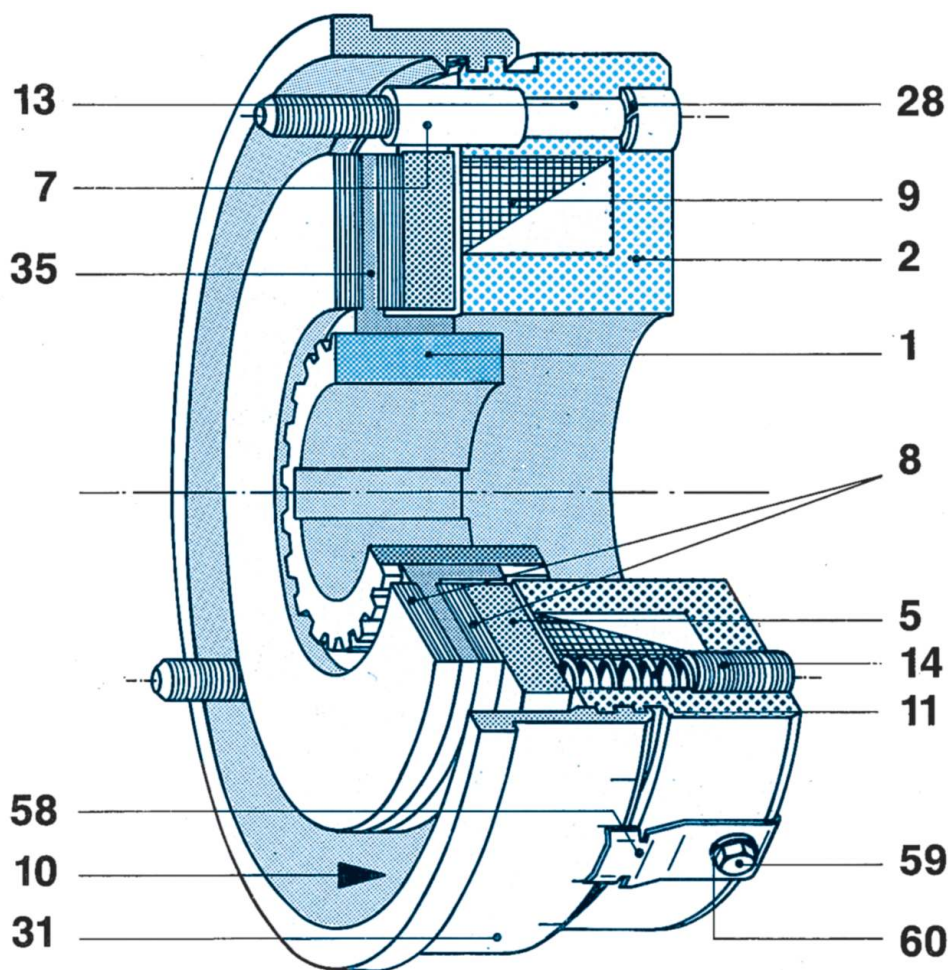


Fig. 1

Parts List

1 Gear hub	13 Fixing screw
2 Coil carrier assembly with coil (9) and guide bushings (7)	14 Set screw
5 Armature disk	28 Spring ring
7 Guide bushing	31 Threaded distance ring
8 Friction lining	35 Rotor with friction linings (8)
9 Coil	58 Lock washer
10 Shoulder screw	59 Clamping bolt
11 Helical spring	60 Spring ring

State of Delivery

Please check the state of delivery immediately!
mayr[®] will take no responsibility for belatedly returned goods.
Please report transport damage immediately to the deliverer.
Please report incomplete delivery and obvious defects to the manufacturer.

Function

The braking torque is produced by the pressure force of several spring rings (11) via frictional locking between the rotor friction linings (35), the armature disk (5) and the machine wall. The brake is released electromagnetically or mechanically via a hand release (see page 6).

Installation Conditions

Before mounting the brake, please observe the following points:

- ❑ The eccentricity of the shaft end against the mounting pitch circle may not exceed 0,2 mm (on sizes 3 – 6), or 0,4 mm on larger brakes.
- ❑ The positioning tolerance of the thread for the cap screws (13) may not exceed 0,2 mm.
- ❑ The axial eccentricity deviation of the screw-on surface to the shaft may not exceed the permitted axial eccentricity tolerance according to DIN 42955 R.
The related diameter is the pitch circle diameter of the brake attachment.
Larger deviations can lead to a drop in torque, to permanent slipping on the rotor and to overheating.
- ❑ The tolerances of the hub and the shaft must be selected so that the hub toothing is not widened (please observe the maximum joint temperature of 200 °C). Widening the toothing leads to the rotor clamping on the hub and therefore to brake malfunctions.
(Recommended hub - shaft tolerance H7/k6).
- ❑ The hub (1) must be positioned so that the rotor toothing (35) carries holohedrally.
- ❑ The rotor and the brake surfaces must be free of oil and grease.
- ❑ A suitable counter friction surface (steel or cast iron) must be used. Sharp-edged interruptions on the friction surface are to be avoided. Recommended surface quality in the friction surface area: Ra = 1,6 µm.

Friction surfaces made of grey cast iron are to be rubbed down with fine sandpaper (grain ≈ 400).

Installation

- ❑ Mount the gear hub (1) onto the shaft and secure it axially. Please avoid damage to the toothing. Mount the gear hub (1) so that the rotor (35) toothing stays in complete contact even after the friction linings (8) have become worn.
- ❑ Push the rotor (35) by hand onto the gear hub (1). The rotor collar should be facing in the direction of the brake. Make sure that the toothing moves easily.
Do not cause damage.
- ❑ Screw on the brake using the fixing screws included in delivery (13), and secure using spring rings (28).
Check the nominal air gap „a“ according to Table 1. The nominal air gap must be present.
Observe the screw tightening torques according to Table 1.
The shoulder screws (10) prevent the individual parts from falling apart. They do not affect the brake function and should not be removed during installation.

Table 1

ROBA-stop® size	3	4	5	6	7	8	9	10	11
Screw tightening torque (pos. 13) [Nm]	3	3	6	8	8	10	10	10	40
Nominal air gap „a“ [mm]	0,20	0,20	0,25	0,25	0,35	0,35	0,40	0,40	0,50
Max. permitted working air gap* [mm]	0,30	0,30	0,40	0,45	0,50	0,50	0,50	0,50	0,70

* as the operating temperature increases, the max. air gap can decrease.

Air Gap Adjustment

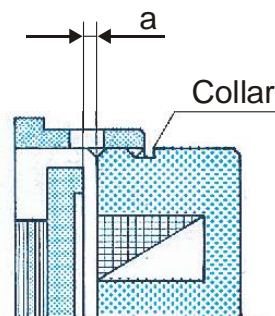
The working air gap „a“ between the armature disk (5) and the coil carrier (2) is set manufacturer-side to the nominal dimension, see Fig. 2 and Table 1.

However, as the rotor (35) wears down, the air gap increases. By turning the threaded distance ring, (31) it is possible to reset the nominal air gap. Adjustment must take place at the latest when the maximum permitted working air gap (acc. Table 1) has been reached.

Adjustment

1. Take a screw plug out of the threaded distance ring (31). Measure the air gap before adjustment in de-energised conditions using a sensor gauge. The difference between the measured air gap and the nominal air gap „a“ must be readjusted according to Table 1.
2. Loosen the fixing screws (13).
3. Loosen the clamping bolt (59) and the lock washer (58).
4. Turn the threaded distance ring (31) anti-clockwise (facing the rear side of the brakes). Turn the distance ring (31) one graduation line on the imprinted scale. This equals an air gap adjustment of 0,05 mm on sizes 3 to 6 and of 0,1 mm on sizes 7 to 11.
5. Tighten the fixing screws (13) and observe the tightening torques according to Table 1.
6. Tighten the clamping bolt (59).
7. Check the air gap. The nominal air gap „a“ according to Table 1 must be present.

Re-adjustment can be repeated until the threaded distance ring (31) lies against the coil carrier (2) collar, see Fig. 2. This contact prevents unpermitted wear on the rotors (35). If no more re-adjustment is possible, the rotor (35) must be replaced.



Braking Torque Adjustment

ROBA-stop® brakes are set manufacturer-side to the braking torque requested on order. By turning the set screws (14) to the left, the braking torque is reduced. By turning them to the right, the braking torque is increased.

During braking torque adjustment, all the set screws (14) must be adjusted evenly.



Warning!

Do not confuse the set screws (14) with the fixing screws (13)!

Brake Inspection

Full braking torque is not reached until the run-in procedure has been completed.

The braking torque (switching torque) is the torque acting on the shaft train when the brakes slip at a sliding speed of 1 m/s in relation to the mean friction radius (DIN VDE 0580/10.94).

Replacing Worn Parts

Parts which are subject to wear are the rotor (35), the armature disk (5) and the gear hub (1). Screw off the brake (by removing the fixing screws (13)) and replace the rotor (35). If there is excessive backlash in the toothing between the rotor (35) and the gear hub (1), please pull the gear hub from the shaft and replace it.

Please also check the armature disk (5) for axial parallelism and wear and replace if necessary.

Re-adjust the nominal air gap via the distance ring (31).

In order to replace the armature disk (5) the shoulder screws (10) and, if present, the hand release must be removed. Please make sure that the helical springs (11) do not fall out.

Hand Release Installation

The hand release can be installed onto every holding brake Type. However, due to the high spring forces, mounting a standard hand release onto sizes 9 – 11 is not possible (special hand release available on request).

In order to install the hand release, the brake must be removed and must be in a de-energised condition.

- Push the return spring (19) onto the restoring bolts (17).
- Take the plastic plugs out of the bores at the back of the coil carrier (2).
- Put the restoring bolts (17) through the armature disk (5) recesses and through the bores in the coil carrier (2).
- Screw the hand release bracket (22) using the locking nuts (21) onto the restoring bolts (17).

Hand Release Adjustment

The restoring bolts (17) limit the armature disk (5) stroke in the direction of the brake, see Figs. 3 and 4.



Warning:

The restoring bolts (17) may only be pulled over the locking nuts (21) so far that at least the adjustment dimension „X“ (acc. Table 2 and Fig. 3) remains between the armature disk (5) and the coil carrier.

Table 2

ROBA-stop® size	Adjustment dimension "X" [mm]
3	1,0
4	1,1
5	1,2
6	1,6
7	1,4
8	1,5

Hand Release Parts List

- 10 Shoulder screws
- 16 Threaded bolts
- 17 Restoring bolts
- 18 Spherical button
- 19 Return spring
- 21 Locking nut
- 22 Hand release bracket

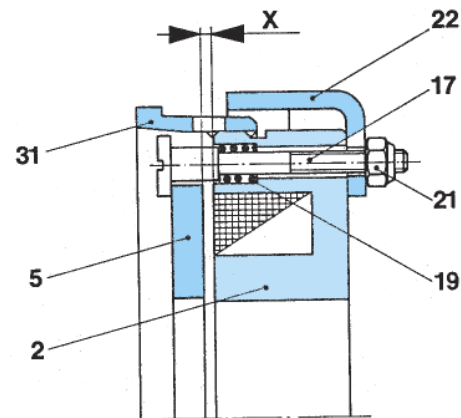


Fig. 3

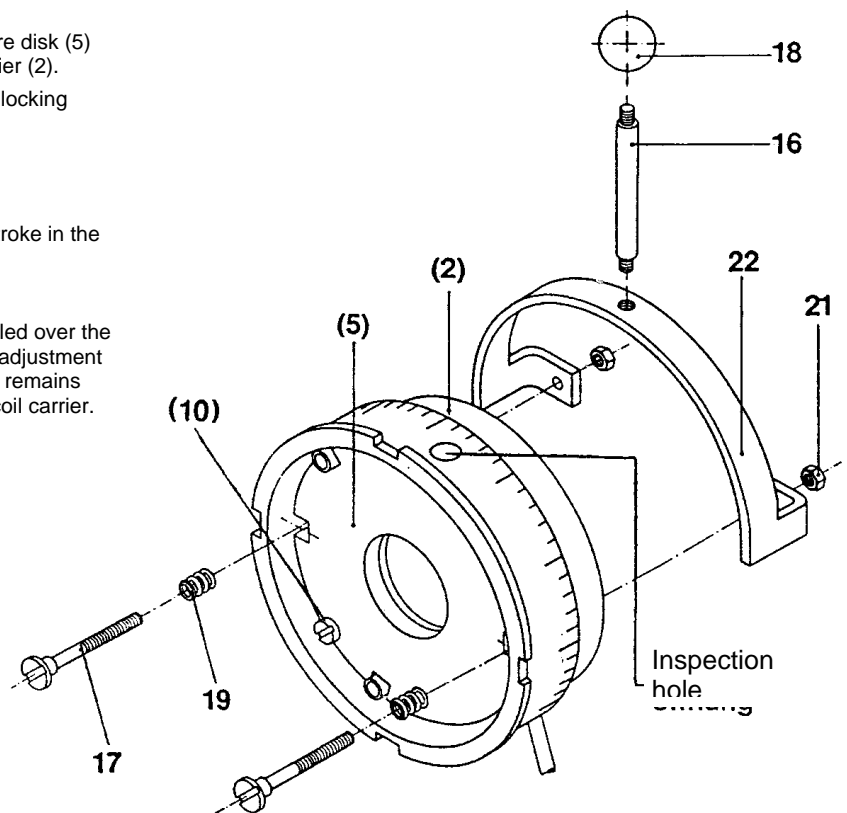


Fig. 4

Electrical Connection



Danger!

Only carry out electrical connection when the device is de-energised!
The coil voltage is clearly shown on the type tag and imprinted on the brake.

The brakes are designed according to the Euro – voltage DIN IEC 38.

DC voltage is necessary for operation.

Switching can take place DC-side or AC-side. However, DC-side switching produces a faster connection time (brake engagement).

If a faster separation time is required, a special fast acting rectifier is required.

In this case, please contact the manufacturers.

Warning!

When switching off electromagnetic devices, switch-off peaks can occur. These can lead to destruction of the device, and should therefore be damped.

This damping can have a negative effect on the connection times.

Please provide a fuse for the voltage supply according to the current values.

The brakes are designed for a relative duty cycle of 100 %.

Installation Terminal Box

Base plate (44) optionally assembled with:

1. 2-pole terminal
2. 4-pole terminal
3. 6-pole terminal
4. Half-wave rectifier
5. Bridge rectifier

Parts List Terminal Box

- 37 Holding bracket
- 38 Cap screw M3 x 12
- 39 Terminal box – lower part
- 40 O-ring
- 41 Sealing plate
- 42 Hexagon nut M3
- 43 Cable clamp
- 44 Base plate
- 45 Countersunk screw M4 x 8
- 46 Terminal
- 47 Terminal identification code
- 48 Cap screw M2.5 x 12
- 49 Cap screw M4 x 8
- 50 Terminal box - lid
- 51 Sealing ring
- 52 Cap screw M4 x 30
- 53 Sealing washer

Attachment

The parts 37 to 43 in the Parts List are partly assembled.

1. a) Screw the rectifier into the terminal box lower part (39) OR
1. b) Screw the base plate (44) into the terminal box lower part (39) using the counter-sunk screws (45). Attach the 2, 4 or 6-pole terminals (46) using cap screws (48) onto the base plate (44). Stick the terminal identification code (47) onto the base plate (44) (observe the terminal identification code according to Fig. 5).
2. Cut the brake cable coil to the correct length and insulate it. Insert the cable via Parts 39, 40 and 41 into the terminal box.
3. Screw the holding bracket (37) using the cap screws (49) to the brake rear side.
4. Re-tighten the brake coil cable, and tighten the hexagon nuts (42).
5. Connect the brake according to the „Installation and Operational Instructions B.1110.4.D for ROBA-stop® Brakes / Electrical Connection“.
6. Close the terminal box, observing the sealing ring (51) and the sealing washers (53).

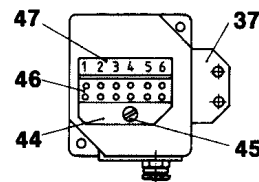


Fig. 5

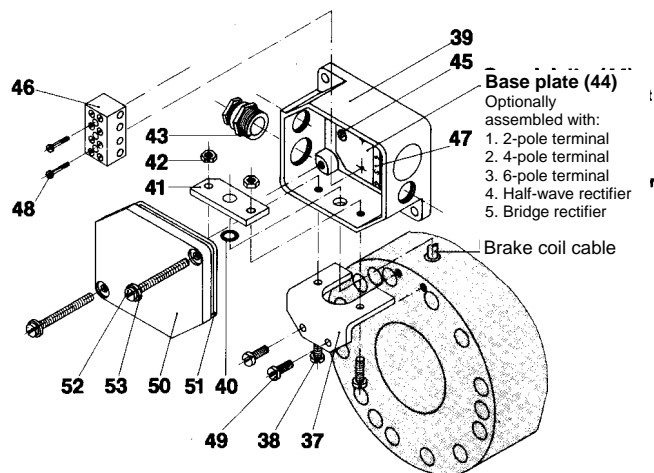


Fig. 6

Installation and Operational Instructions for ROBA-stop® Holding Brake Type 820.61__

(B.1110.6.GB)

Maintenance

ROBA-stop® brakes are mainly maintenance-free. The friction linings are robust and wear-resistant. This ensures a particularly long service lifetime. However, the gear hub (1), the armature disk (5) and the rotor with friction linings (35) are subject to functional wear. They must therefore be regularly inspected and replaced if necessary. To do this, see the section "Replacing Worn Parts".

Disposal

Our electromagnetic brake components must be disposed of separately as they consist of different materials. Please observe the relevant authority regulations. Code numbers may vary according to the dismantling process (metal, plastic and cable).

Electronic components

(Rectifier / ROBA®-switch / Microswitch):

Products which have not been dismantled can be disposed of under the Code No. 160214 (Mixed Materials) or Components under Code No. 160216; or the objects can be disposed of by a certified waste disposal firm.

Brake bodies made of steel girders with coil / cable and all other steel components:

Steel scrap (Code No. 160117)

Aluminium components:

Non-ferrous metals (Code No. 160118)

Brake rotors

(steel or aluminium girders with friction linings):

Brake linings (Code No. 160112)

Seals, O-rings, V-seals, elastomere, terminal boxes (PVC):

Plastics (Code No. 160119)

Malfunctions / Breakdowns

Malfunction	Possible Causes	Solutions
Brake does not release	<input type="checkbox"/> Incorrect voltage on rectifier <input type="checkbox"/> Rectifier failure <input type="checkbox"/> Air gap too large (worn rotor) <input type="checkbox"/> Air gap too large (metal particles between the armature disk and the coil carrier) <input type="checkbox"/> Interrupted coil <input type="checkbox"/> Overheated brake	<input type="checkbox"/> Apply correct voltage <input type="checkbox"/> Replace rectifier <input type="checkbox"/> Replace rotor <input type="checkbox"/> Clean brake <input type="checkbox"/> Replace brake <input type="checkbox"/> Use fast acting rectifier
Motor does not brake	<input type="checkbox"/> Hand release wrongly adjusted <input type="checkbox"/> Hand release backlash; (possible at decreased torque or operation with a fast acting rectifier)	<input type="checkbox"/> Re-adjust distance <input type="checkbox"/> Replace rotor
Delayed brake engagement	<input type="checkbox"/> The brake is switched AC-side	<input type="checkbox"/> Switch DC-side