

 <b>BAUMÜLLER</b>	<b>Technical Manual</b> <b>Commissioning and Service Instructions</b>	<b>TA EMO</b> <b>00 015</b> Page 1/11
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**Achtung ! unterliegt nicht dem Änderungsdienst**

**Important:** The following Technical Manual may only be used in conjunction with the associated motor commissioning and maintenance instructions!

**Commissioning and Service Instructions  
for Tachometer generator  
Types: GHTS 42, 44, 46; GHT 612/42, 612/44, 612/46**

As of 01.06.2001

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## 1. General

The tachometer generator was specially developed as an actual-value encoder for control problems. Its task is to convert a drive speed to a low-harmonics, proportional DC voltage, the polarity of which is dependent on the direction of rotation. As opposed to conventional tachometer generators the extremely short hollow-shaft design creates substantial advantages due to the torsionally rigid, low-vibration connection between the tachometer rotor and motor shaft. The GHT is therefore especially suited for drives that are subjected to very high dynamic loads.

## 2. Design

The hollow-shaft rotor is simply mounted on a journal of the drive shaft by means of push-on fit and fastened in place axially with two ring clamping springs. In B 14 mounting the stator is mounted and centred directly on the end shield of the motor or indirectly using an adaptor flange.

When attaching to an electromagnetic brake the tachometer must be protected against the direct influence of the electromagnetic field of the brake. This is generally achieved by decoupling the field using an integrated aluminium adaptor flange and an antimagnetic connecting journal in the shaft (see Fig. 1).

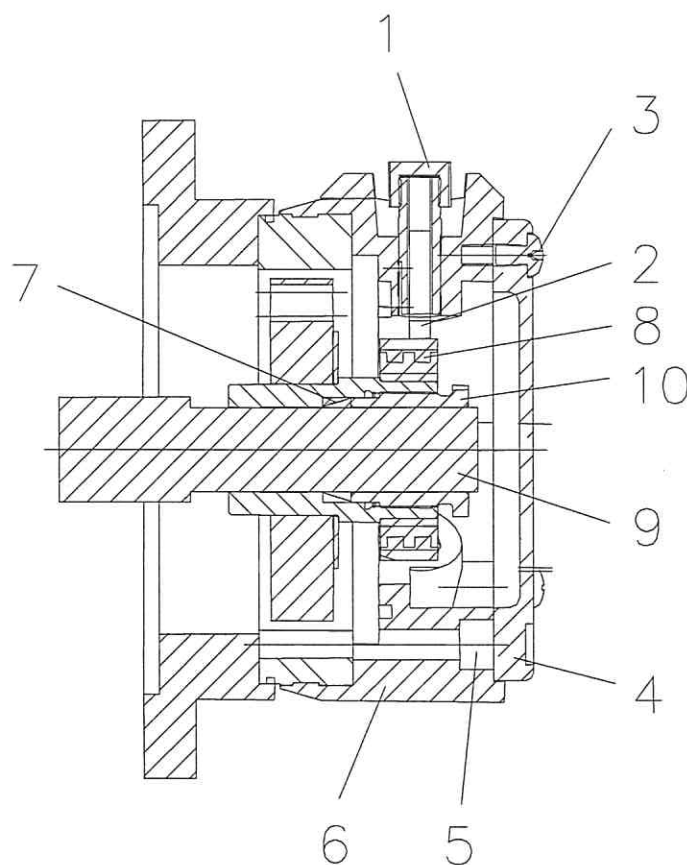
Other encoders such as pulse encoders or incremental shaft encoders can be attached to the tachometer generator (see Fig. 2).

In the attached state the tachometer generator has IP 44 protection.

### 3. Installation (see Figs. 3 and 4)

3.1 Make sure the tachometer connecting journal is free of dust and grease (Item 9).

Fig. 3



3.2 Push on the tachometer rotor (Item 8)

a) until the dimension of 35 mm has been reached in accordance with the drawing (see Fig. 4) or

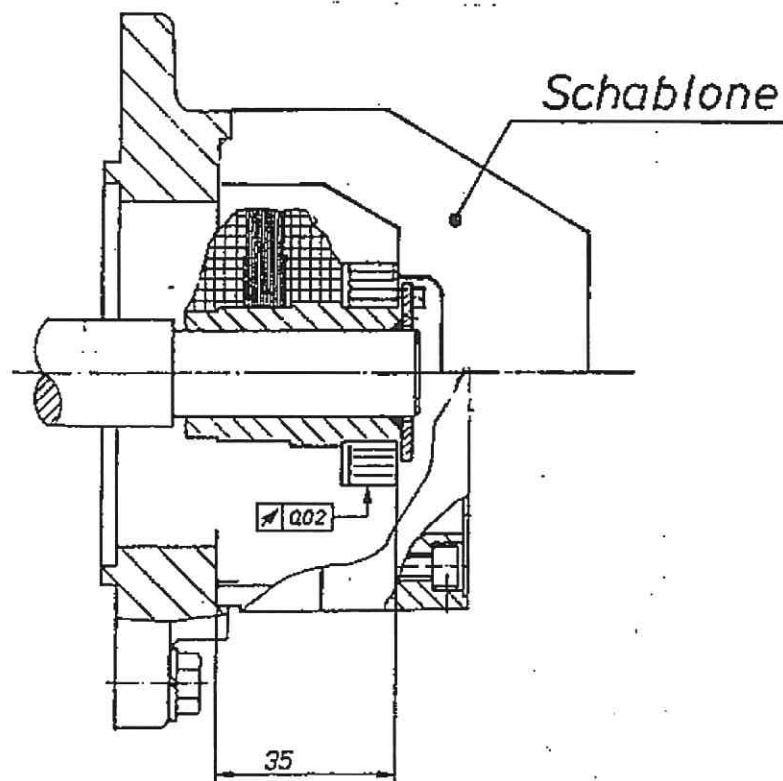
b) adjust with the template that may be enclosed (see Fig. 4)

- Insert template in the locating device of the tachometer mounting surface (e.g. tachometer mounting flange);
- Slide the tachometer rotor up to the template.

Then tighten up clamping bolt (Item 7) with at least 6 Nm and thus subject the clamping assembly (Item 7) to tension.

- 3.3 Check the true running of the tachometer commutator. Specified deviation  $\leq 0.02$  mm.
- 3.4 Remove all the carbon brushes (Item 2) from the stator (Item 6).  
Mount stator and fasten in place with 2 screws (Item 5).
- 3.5 Re-insert all the carbon brushes and undo the screw caps (Item 1).  
Check carbon brush track on the tachometer commutator (Item 8) (the gap between the carbon brush track and the end of the tachometer commutator should be approx. 1 mm (Fig. 3)).
- 3.6 Fit the end cover (Item 4) and fasten in place with 4 bolts (Item 3).

Fig. 4



#### 4. Electric wiring diagram



**! IMPORTANT !    ! RISK OF ACCIDENT !**

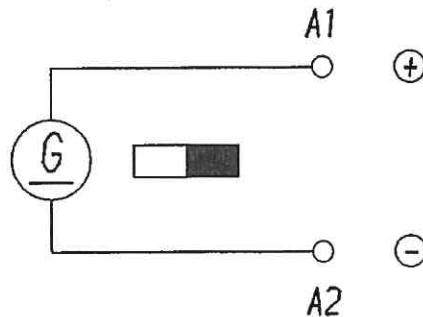
If the tachometer supply lines are not connected up properly, after a controller enable the drive will get out of control and ramp up to maximum speed, possibly in the wrong direction of rotation.

When switching on for the first time the Emergency OFF switch must be within close reach because in the event of a fault there has to be an immediate shutdown.

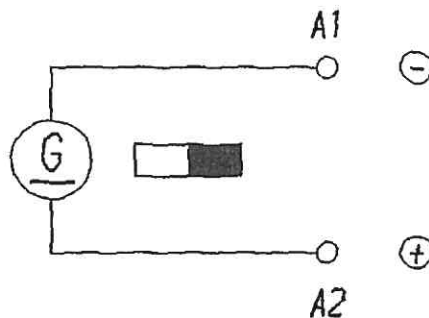
Never touch any parts of the equipment that are being driven!

##### 4.1 Electric wiring diagram for tachometer generators with terminals and screw bolts

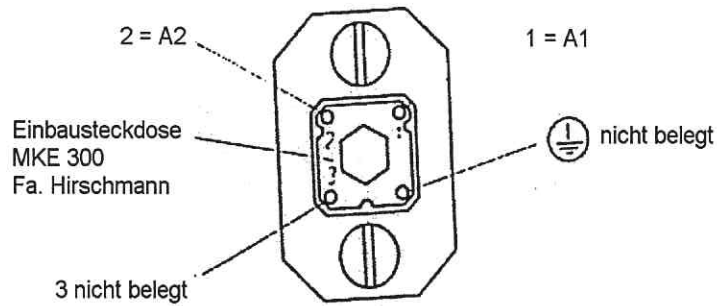
Polarity of the tachometer generator when the motor is running clockwise (VDE 0530 Part 8).



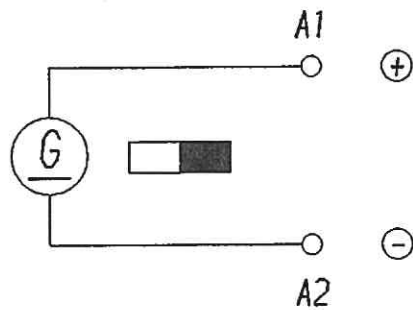
Polarity of the tachometer generator when the motor is running anti-clockwise (VDE 0530 Part 8).



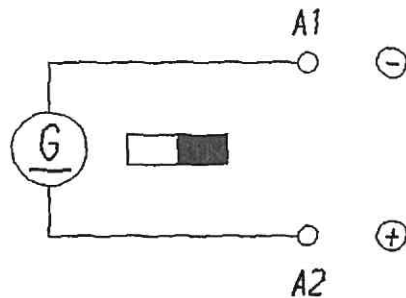
4.2 Electric wiring diagram for tachometer generators with MKE 300 flush-type socket outlet



Polarity of the tachometer generator when the motor is running clockwise (VDE 0530 Part 8).



Polarity of the tachometer generator when the motor is running anti-clockwise (VDE 0530 Part 8).



## 5. Removal (see Fig. 3)

Before removing the tachometer observe the following:

The rotor and stator are matched to one another and must not be inverted!  
The polarity (A1 and A2) of the tachometer supply lines should be marked.  
It must never be reversed!

**! IMPORTANT !    ! RISK OF ACCIDENT !**

If the tachometer supply lines are not connected up properly, after a controller enable the drive will get out of control and ramp up to maximum speed, possibly in the wrong direction of rotation.

When switching on for the first time the Emergency OFF switch must be within close reach because in the event of a fault there has to be an immediate shutdown.

Never touch any parts of the equipment that are being driven!

5.1 Disconnecting the tachometer supply lines.

5.2 Undo the screw caps (Item 1) and remove the tachometer carbon brushes (Item 2).

5.3 Undo the fastening screws (Item 3) and remove the end cover (Item 4).

5.4 Undo the 2 fillister screws (Item 5) (if a pulse encoder is attached they are also the fastening screws of the encoder adaptor flange) and withdraw the tachometer stator (Item 6).

5.5 Undo clamping bolt (Item 10) and withdraw the tachometer rotor (Item 8).

**Important:** Before refitting, check to make sure the tachometer journal is mounted firmly in the correct position.



## 6. Maintenance

Carbon brushes and the commutator are wearing parts that require regular maintenance.

The carbon brushes are designed for extremely long service lives and can easily be changed without having to dismantle the tachometer. The carbon brushes must be replaced at the latest when brush length has reached 8 mm or the total number of revolutions has reached  $1.25 \times 10^9$ . They can be accessed by undoing the plastic screw caps.

**Important!** Only use genuine replacement carbon brushes!

The contact surfaces of replacement carbon brushes are normally matched to the radius of the commutator. If this is not the case, they must be bedded in with fine emery paper (which is placed under the brushes and commutator and moved in the direction of rotation).

When reordering replacement carbon brushes always specify the serial number of the motor.

Every 5,000 running hours (at a speed of 2,000 rpm) the commutator, brush holders, and carbon brushes should be checked for wear, brush contact, and brush movement in the holders.

Any carbon brush dust should be removed using dry compressed air. Furthermore, care must be taken to ensure that the commutator is kept free of oil and grease. Damage such as rough surfaces and light scores must be removed by smoothing down several times with increasingly fine emery cloth. Remove smoothing dust carefully by blowing it out.

Light to dark browning of the carbon brush tracks (so-called skin) is a sign of normal operation and must never be smoothed off.



## 7. Malfunctions Due To Mounting Errors

- Axial position of the tachometer rotor is not matched to the casing so the carbon brushes do not run accurately on the contact surfaces of the commutator.

Result: Increased carbon brush abrasion or flaking of the carbon brushes and short circuits between commutator segments.

- When mounting, the casing was not centred, or it was anchored.

Result: Armature scrapes across the poles and thus damages the tachometer generator beyond repair.

- Radial eccentricity of commutator contact surface > 0.02 mm

Result: At high speeds the carbon brushes can jump so voltage dips occur.

- Contact between the commutator contact surfaces and greasy or sticky fingers.

Result: When the tachometer heats up in operation the residues of oil or grease lead to bad contact and cause increased carbon brush abrasion and smears on the contact surfaces. That in turn causes segment shorting.

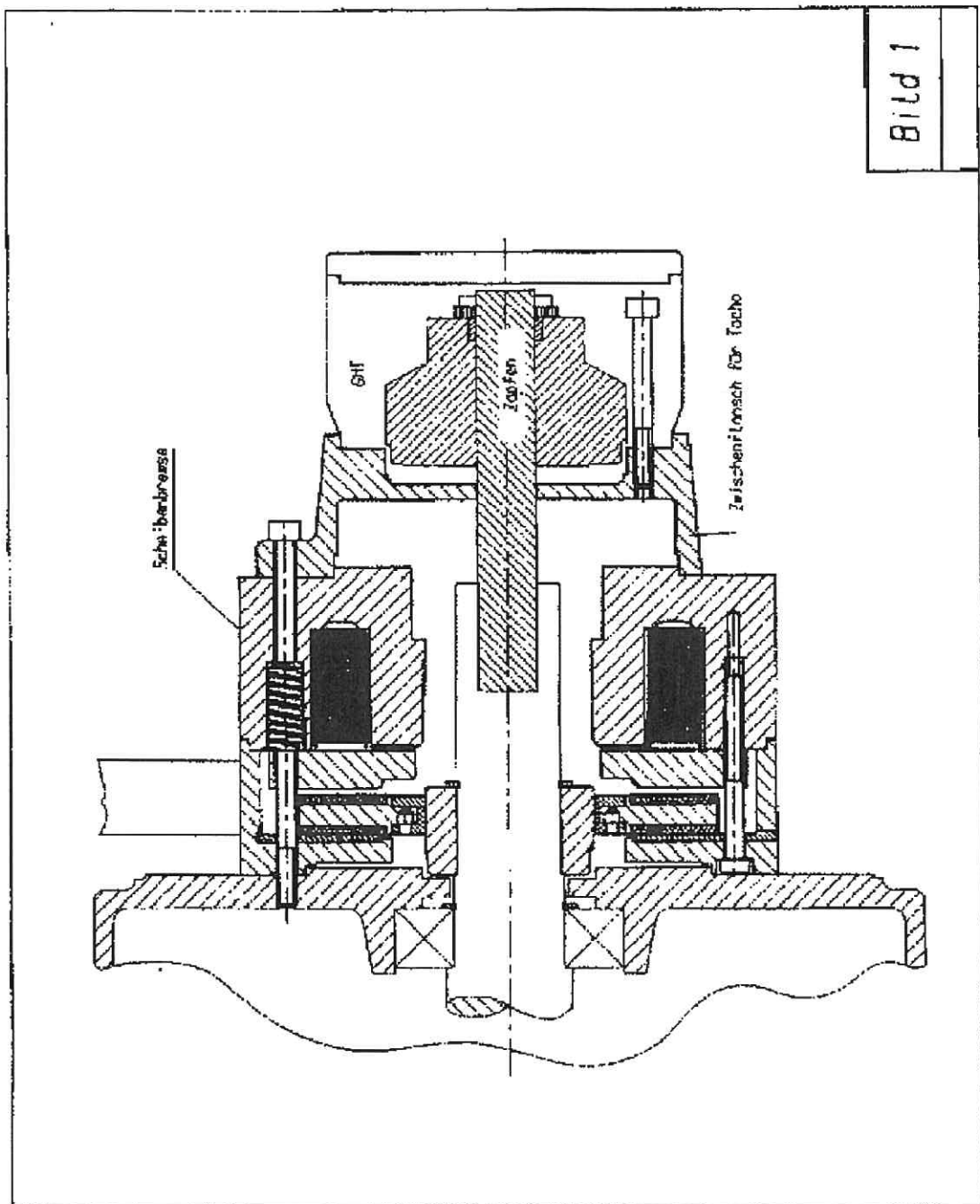
## 8. Disposal

The following materials were used to manufacture the tachometer generator:

Plastics, steel, copper, magnetic materials, potting compound.

After disassembling the tachometer the materials should be segregated and disposed of separately.

Bild 1



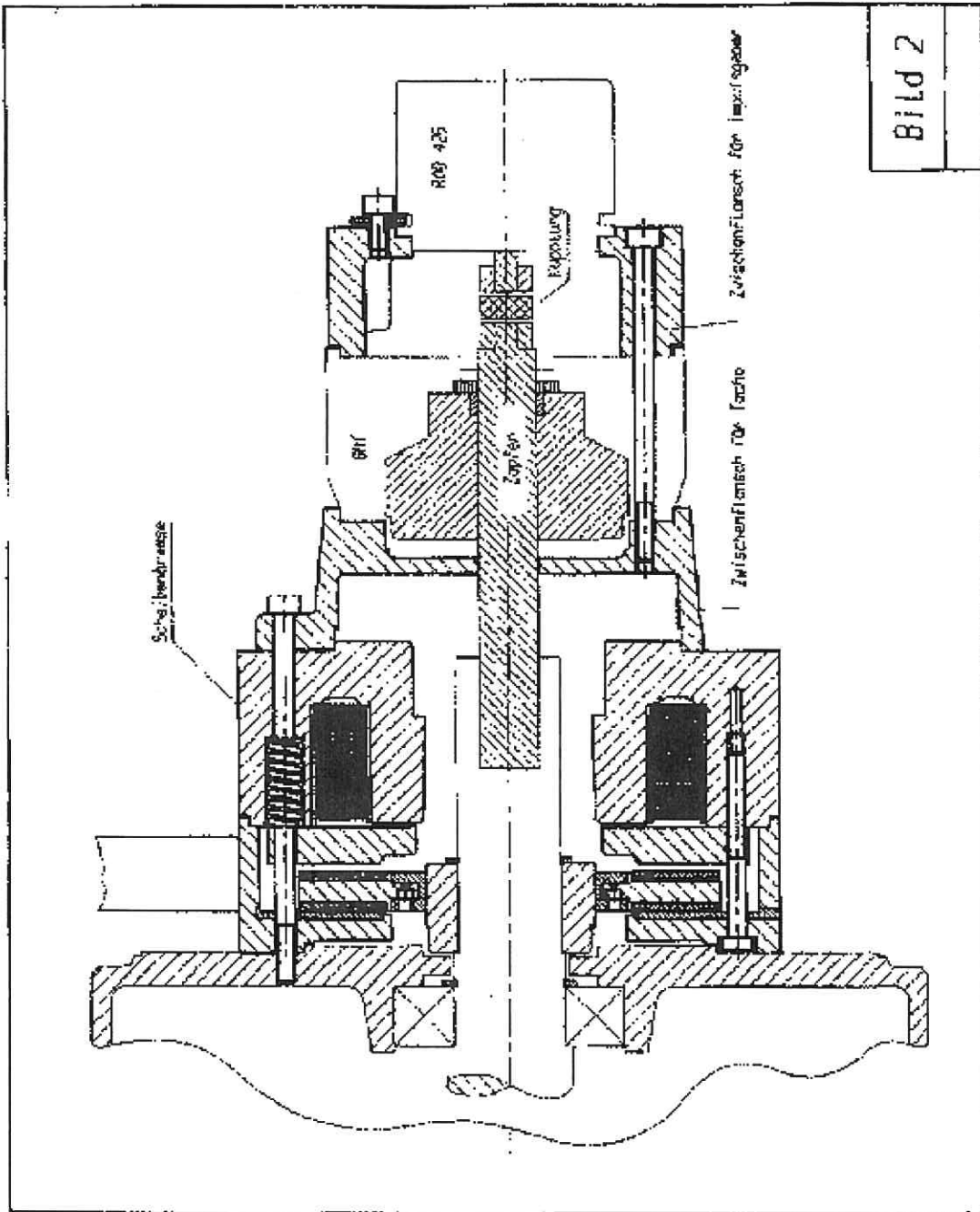


Bild 2