
**GWR 3**

## Shaft Current Transformer Type GWR3

### Requirements

Magnetic asymmetries in the setup of a generator induce voltage across the shaft ends. Because one of the generator bearings is insulated, no current flow is possible in spite of an orderly grounding of the shaft. A decrease of bearings insulation due to a fault in the system leads to a bearings current, which may cause the destruction of the bearing. The current transformer accompanied with the relay can detect leakage currents already from 1 A, thus preventing damage and destruction. These shaft current transformers can be constructed in accordance with a generator frequency of 16 2/3, 50, and 60 Hz. Their output signal is used to trigger the corresponding protection circuit.

### Technical data

The two wound core halves are incorporated into an aluminum casing. To protect the core system against generator stray fields, appropriate magnetic shielding are built into the casing and sealed in there. The shaft current transformer can be specified for generator shafts from 200 to 1650 mm.

Primary winding turns:	1
Secondary winding turns:	1000
Secondary test windings:	2
Insulation level:	0.72/3 kV
Operating frequency:	16 2/3, 50, 60 Hz
Power output:	adjusted to the shaft current relay
Standards:	ÖVE-P20/1994-11 VDE 0414 IEC 44-1 IEEE C57.31

Circuit diagram: JW 658/55

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### Installation

For installation of the shaft current transformer around the generator shaft, the two halves of the transformer must be separated. To do so, the connection a - b must be disconnected, and the metal brackets opened by releasing the plastic screws.

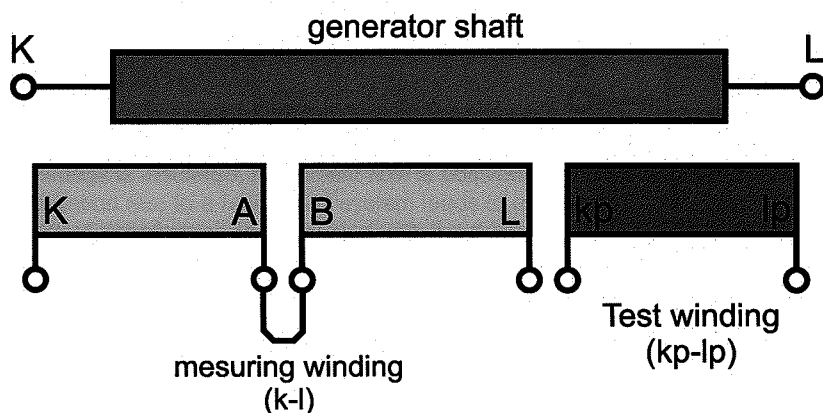
The transformer halves with identical transformer numbers are placed around the generator shaft (make sure the transformer halves fit accordingly). Fix the core halves with the metal brackets and the plastic screws. Connect a - b (establishes a connection between the two winding parts). Screw the transformer on to the bearing shield, using the set of six screws. Please be careful not to expose the transformer to great mechanical tensions that might displace the core halves.

Check both core halves (metal brackets and plastic screws). The transformer output (k - l, 1000 windings) is connected to the input of the shaft current relay. The test winding is connected to the terminals (kp - lp, 2 windings).

**Please note** that the following mistakes will cause malfunction of the transformer system:

1. When replacing the plastic screws by metal screws, there will be a short-circuited turn via the metal brackets.
2. The test winding only serves to adjust the shaft current relay and must remain open during operation.

### Circuit arrangement



### Description

The shaft current transformer GWR3 is a low-voltage ring type current transformer in a parted form of construction. It was designed for installation at the bearing shield, around the generator shaft. Thus, the transient current of the generator shaft can, in connection with the shaft current relay, be detected.

The shaft current transformer was developed in co-operation with ELIN-UNION AG and adjusted for faultless operation together with the shaft current relay. Shaft currents as small as 0.5 A can already be detected.

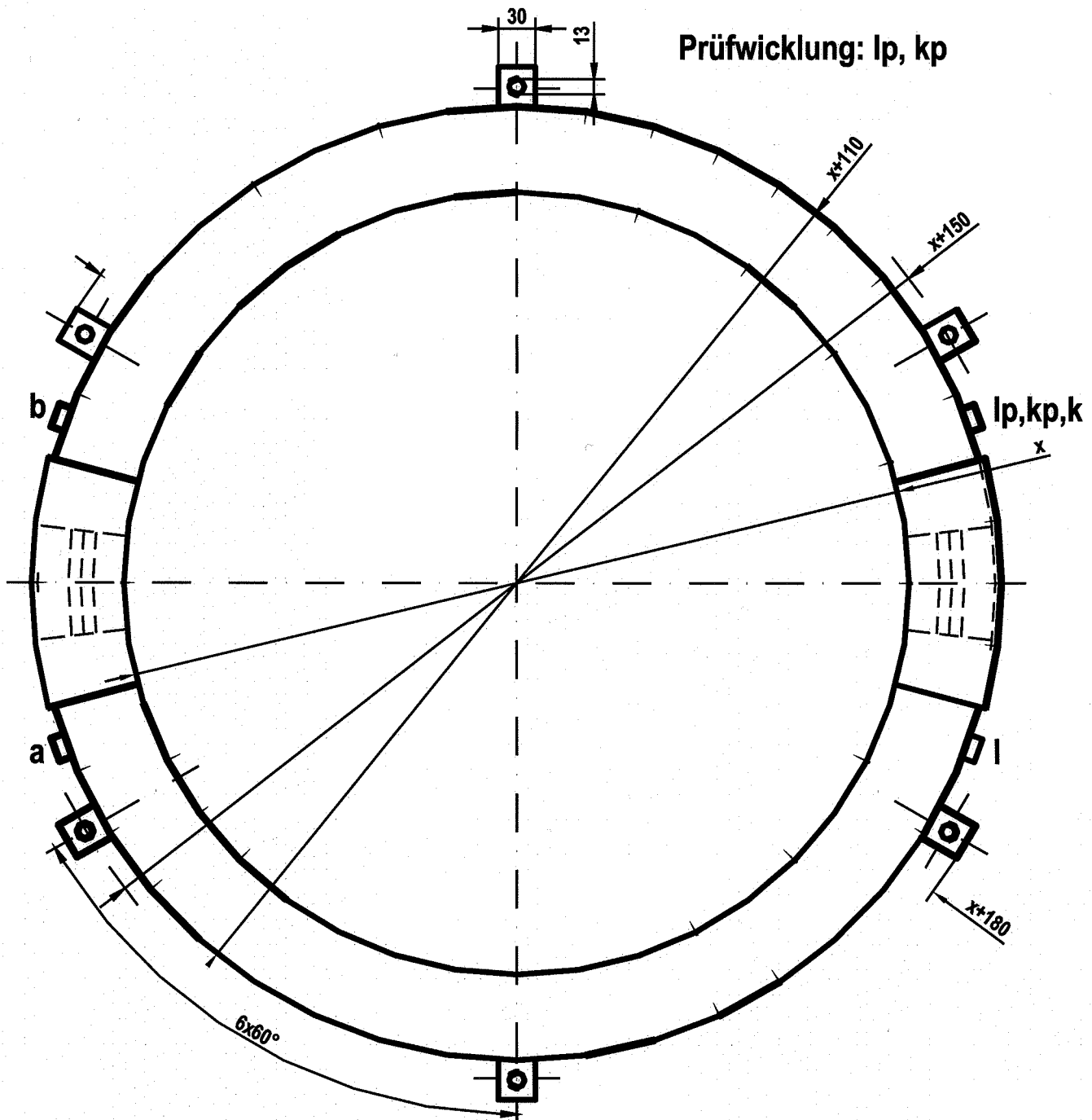
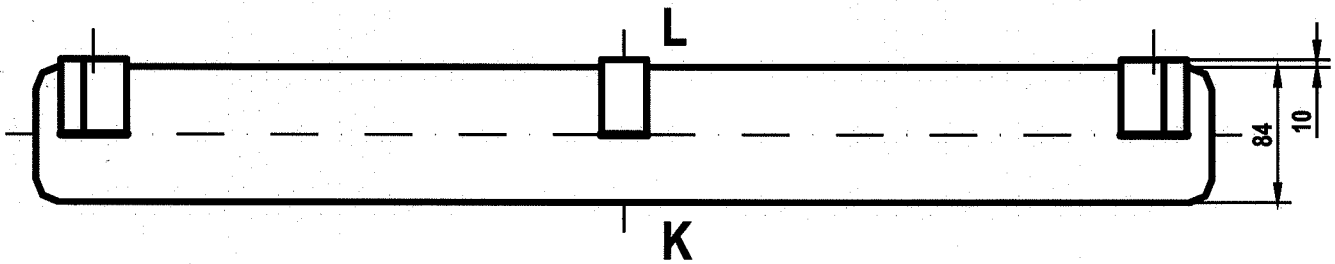
During the last 16 years, about 75 pieces of GWR3 specified for generator shafts from 200 to 1620 mm were produced and delivered.

The shaft current transformer has a split (double "C") core on which the secondary winding is symmetrically applied to the circumference. The function of the protective relay can be checked via the test winding.

Function: To protect the core system (secondary winding, test, winding) against the generator's stray fields, it is cast into a parted aluminum casing, together with a magnetic shielding.

**Wellenstromwandler Type GWR 3    Shaft Current Transformer Type GWR3**

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