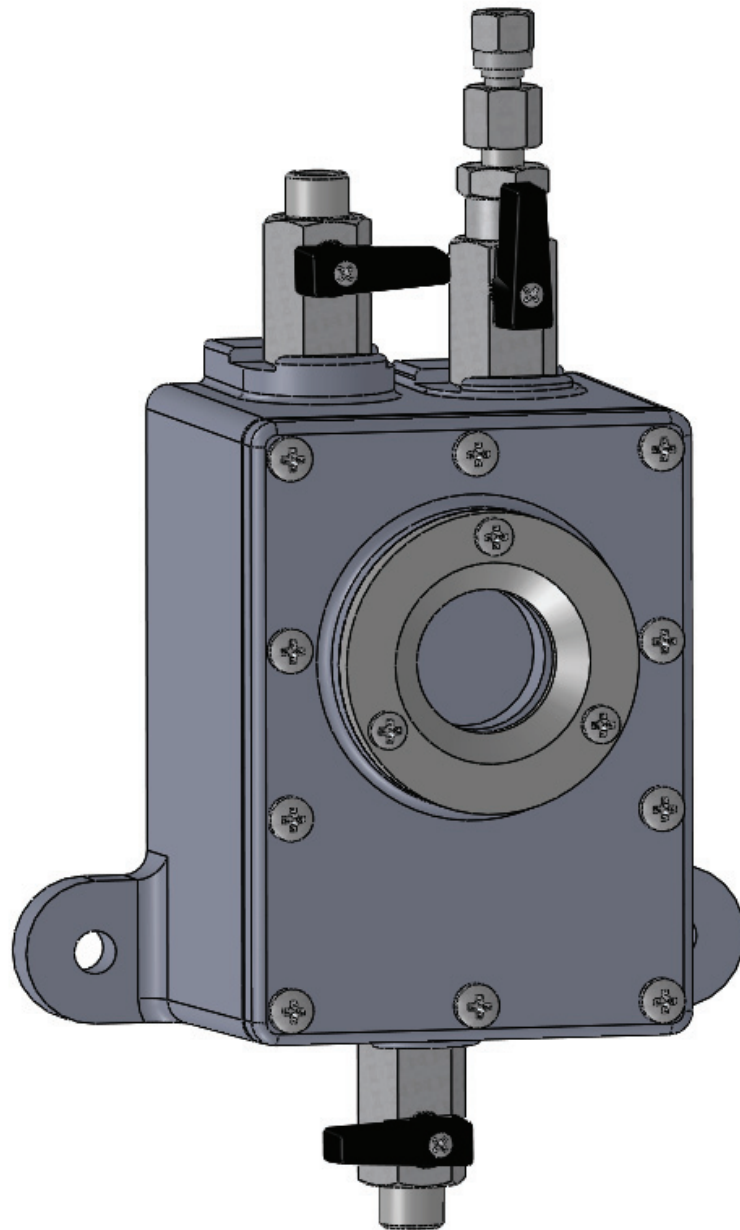




*Elektromotoren und
Gerätebau Barleben GmbH*



**OPERATING INSTRUCTIONS
Gas Sampling Device ZG 1.2.**

Table of contents

	Page
1. Safety instructions	3
2. Use	4
3. Mode of operation	4
4. Scope of supply	5
5. Installation (Fig. 1, Fig. 3)	5
6. Taking into Operation	6
7. Gas sampling	8
8. Functional test of Buchholz relay by means of test pump on ZG 1.2.	9
9. Technical data	10
10. Additional devices	11

1. Safety instructions

Make sure that any persons installing, taking into operation, operating and maintaining the gas sampling device

- are qualified and competent, and
- fully comply with these operating instructions.

Improper operation or misuse might cause danger to

- life and limb,
- the device and any other property of the operator, and
- the device's proper function.

Opening the device will void your warranty.

Safety instruction in this manual are presented in three different forms to emphasize important information:



NOTE

This symbol refers to important information on a specific subject.



CAUTION

This symbol indicates risks for the device and other property of the operator. Danger to life and limb cannot be excluded.



WARNING

This symbol indicates serious danger to life and limb. Non-observation of this safety warning may result in serious or even fatal injuries.

2. Use

The gas sampling device connected with the Buchholz relay through a tube is provided on the transformer. It allows sampling of gases accumulated in the Buchholz relay at normal service height, hence improving safety when sampling gas. Easy use of the device reduces or even avoids transformer downtime when gas accumulation in the Buchholz relay is indicated.

3. Mode of operation

The gas collected in the Buchholz relay is pressed downwards, via a tube, to the gas sampling device by the oil in the conservator. Correct operation of the gas sampling device requires therefore that the oil level in the conservator is at least 100 mm above the highest point of the tube (Fig. 3). When operating the cocks of the gas sampling device as specified herein (see sections 6-8), the gas sampling device is initially filled completely with oil. Once the upper switching system of the Buchholz relay is operated, the gas in the relay flows to the gas sampling device as described (section 7), and the relay is filled again with oil. The relay gas can now be analysed via the gas outlet cock by the gas tester or sampled for laboratory analysis by means of a gas sampling cartridge or similar device. Gas sampling or testing is by screwing the relevant devices onto the gas outlet cock (same procedure as for the test valve of the Buchholz relay).

The gas sampling process can be interrupted by closing the gas outlet cock.

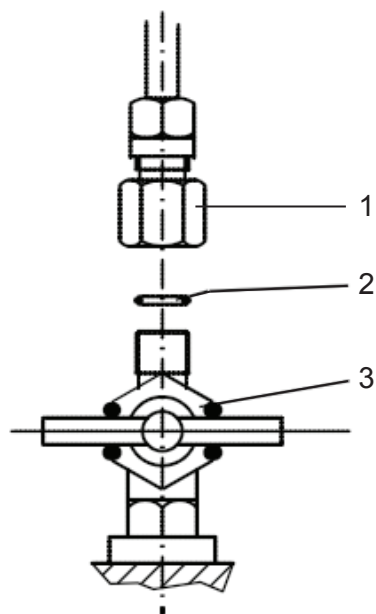
Once the gas has escaped, the tube and the gas sampling device will be filled again with oil.

4. Scope of supply

The scope of supply of the ZG 1.2 gas sampling device with tube includes the following:

- ZG 1.2 gas sampling device
- Tube, rolled up, length as requested by customer
- Screw-type adapter for test valve
- Gasket, test valve/screw-type adapter

5. Installation (Fig. 1, Fig. 3)



Install the gas sampling device with 2x M8 screws on a straight and vertical surface approx. 1.4 m above ground.

Screw the screw-type adapter (**Fig. 1/1**) on the test valve (**Fig. 1/3**) of the Buchholz relay and fit the gasket supplied (**Fig. 1/2**) (**Fig. 1**). Roll out the tube and connect one end to the Buchholz relay using the cutting ring fitting.

Fasten the tube with suitable clamps not included in the scope of supply. Over a length of max. 1.2 m the tube can be routed at a minimum gradient of 15°, provided the remaining tube length runs vertically.

Connect the tube to the gas sampling device with another cutting ring fitting. Tighten the screwed connections at a max. torque of 15 Nm.

Fig. 1 - Test valve connection

6. Taking into Operation

On completion of installation fill the gas sampling device completely with insulating liquid to ensure readiness for service.

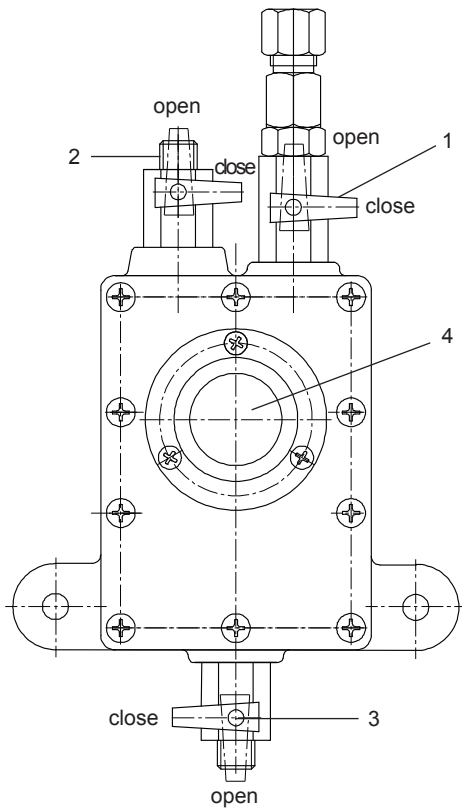


Fig 2 - Gas sampling device in as-supplied state

- Open the test valve on the Buchholz relay (turn anticlockwise) and keep it open (**see Fig. 3**).
- Remove the screw cap from the gas outlet cock (**Fig. 2/2**).
- Open the inlet cock (**Fig. 2/1**) and the gas outlet cock (turn anticlockwise).
- Keep the oil outlet cock (**Fig. 2/3**) closed.
- The pressure in the conservator causes the oil to flow through the tube and fill the gas sampling device.
- Check the oil level in the inspection glass (**Fig. 2/4**) while the sampler is filled.
- Close the gas outlet cock (turn clockwise) as soon as oil comes out of the cock.
- Perform the pressure test in accordance with the instructions of the transformer manufacturer.
- The gas sampling device is now filled completely with oil and ready for operation (**see Fig. 3**).
- Make sure that the screw caps are fitted to protect from contamination (cocks 2 and 3).
- Both the inlet cock (**Fig. 2/1**) and the test valve on the Buchholz relay **must remain open** when the sampler is filled with oil!

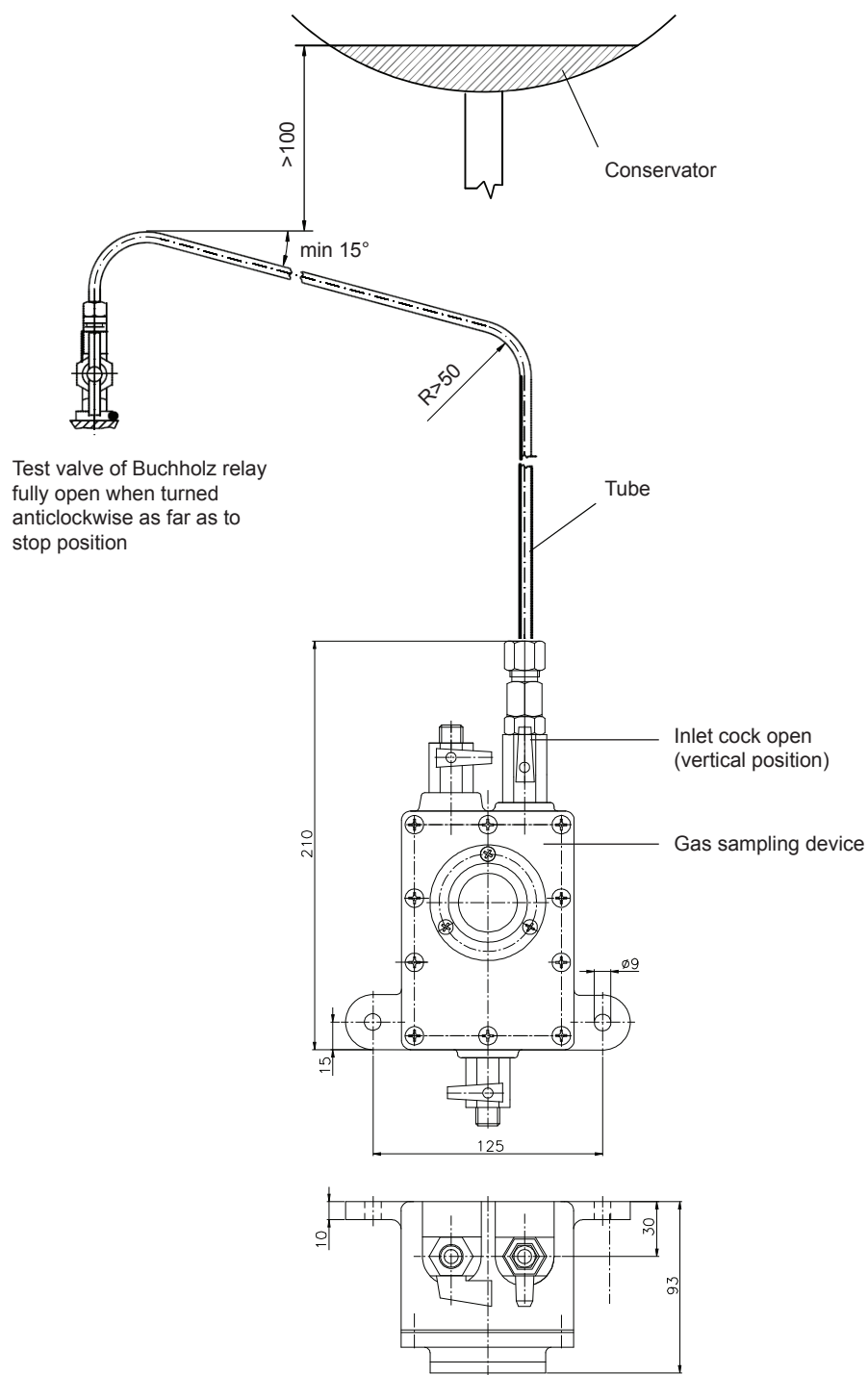


Fig. 3 – Gas sampling device in installed state

7. Gas sampling

Screw the screw cap onto the gas outlet cock.

To sample gas, proceed as follows:

- Check if the inlet cock (**Fig. 2/1**) is open.
- Remove the screw cap from the oil outlet cock (**Fig. 2/3**).
- Open the oil outlet cock and collect the oil coming out in a suitable container.
- Close the oil outlet cock as soon as the oil level is visible in the lower section of the inspection glass (**Fig. 2/4**).
- Screw the screw cap onto the oil outlet cock.
- Remove the screw cap from the gas outlet cock (**Fig. 2/2**).
- Screw the ZG 3.1./ZG 3.2. gas tester or the BGS Buchholz gas sampling device etc. onto the gas outlet cock.
- Open the gas outlet cock and analyse/sample the gas in accordance with the instructions of the device manufacturer.
- Close the gas outlet cock and remove the device connected.
- Open the gas outlet cock and let the residual relay gas escape from the gas sampling device.
- Close the gas outlet cock as soon as the device is filled completely with oil and oil comes out of this cock.



CAUTION

Proper function of the device requires that the screw caps are screwed on.



WARNING

**Explosion hazards and hazards due to flammable and toxic gases.
Open flames and sparks in the direct vicinity are not admissible as they represent an explosion hazard. Wait for some 10 minutes until the gases have evaporated before you start working.**

8. Functional test of Buchholz relay by means of test pump on ZG 1.2.

Proceed as follows:

- Check if the inlet cock (**Fig. 2/1**) is open.
- Remove the screw cap from the gas outlet cock (**Fig. 2/2**).
- Screw the adapter of the connecting hose of the test pump (ZG 5.1. or ZG 5.2.) onto the valve neck of the gas outlet cock.
- Open the gas outlet cock (turn anticlockwise).
- Pump air into the ZG 1.2. gas sampling device until the magnet contact tube in the Buchholz relay is operated due to lowering of the upper float (double-float Buchholz relay).
- Obtain verification of correct function from control room.
- Close the gas outlet cock (turn clockwise).
- Remove the adapter from the gas outlet cock.
- Remove the screw cap from the oil outlet cock (**Fig. 2/3**).
- Open the oil outlet cock and collect the oil in a suitable container.
- Close the oil outlet cock as soon as the oil level is visible in the inspection glass.
- Screw the screw cap onto the oil outlet cock.
- Open the gas outlet cock and let the air escape.
- Close the gas outlet cock as soon as the gas sampling device is filled completely with oil and oil comes out of this cock.
- Screw the screw cap onto the gas outlet cock



CAUTION

Proper function of the device requires that the screw caps are screwed on.



WARNING

When checking the function of the double-float Buchholz relay using the test pump, for design reasons, only the upper switching system (alarm) is checked. Use only test pumps with suitable adapter (ball valve) supplied by EMB (ZG 5.1. or ZG 5.2.).

9. Technical data

The technical data in the following table apply to any standard-design gas sampling devices manufactured by EMB.

Parameter	Data	Notes
Gas tester connection	G 1/8"	other dimensions available on request
Oil outlet opening	G 1/8"	other dimensions available on request
Temperature range: - Ambient temperature - Operating range * Insulating liquid temperature * Insulating liquid viscosity	- 40 °C to + 55 °C - 40 °F to + 131 °F - 40 °C to + 115 °C - 40 °F to + 239 °F 1 mm ² /s to 1100 mm ² /s	Climatic test acc. to DIN EN 60068-2-78: 2002-09 up to +135°C variant 21 (ester-based insulating liquid)
Weight without tube	2.2 kg	
Tube dimensions	Ø 6x1 copper tube	
Length of tube	max. 25 m	as requested by customer

Other variants and options on customer's request.

10. Additional devices

The gas sampling device is mounted on the transformer and connected to the Buchholz relay by means of a pipe (Figure 4). It allows sampling of the relay gas at normal operating level.

For protection of the gas sampling device, it will always delivered with a sightglass cover (Figure 5), and optionally with a lockable box (Figure 6).



Figure 4 - Pipe of gas sampling device ZG 1.2.



Figure 5 - Sightglass cover for gas sampling device ZG 1.2.



Figure 6 - Gas sampling device ZG 1.2. in lockable box