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Producer of Measuring Instruments

Instruction and Maintenance Manual

GRYF OXY ZM 02/100/2 E

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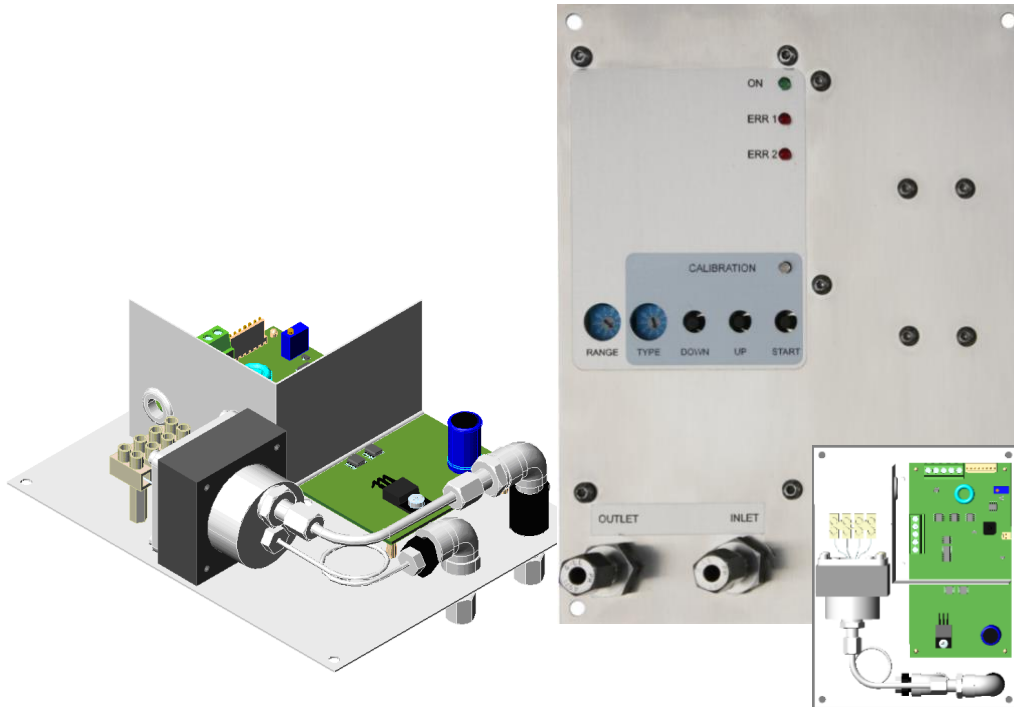




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OEM module for measuring oxygen concentration with the ZrO₂ sensor



| Technical parameters | |
|--|---|
| Supply voltage | 24 V/dc \pm 10% |
| Supply current | 500 mA |
| Output signal | 4 \div 20 mA |
| Oxygen concentration range | 0.2 \div 100% |
| Sensitivity | 0.01% (0.2 \div 5%) 0.1% (0.2 \div 100%) |
| Accuracy | \pm 0.5 % (0.2 \div 100%) \pm 0.2 % (0.2 \div 5%) |
| Warm-up time | 60 s |
| Temperature stabilization after start-up | min. 5 minutes |
| Signal READY | 24V, max. 100mA |
| Measured gas flow | 0.2 \div 0.3 l / min |
| Inlet pressure | 1 Barg \pm 0.1 Bar |
| Maximum allowable pressure - PS | 2 Bar |
| Operating temperature | -10 $^{\circ}$ C \div 50 $^{\circ}$ C [14 $^{\circ}$ F \div 122 $^{\circ}$ F] |
| Dimensions | 167 x 130 x 65 mm |



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This device is designed to detect oxygen concentration levels in gas. The device is designed to be incorporated into the oxygen gas concentrators. This device will be installed in a control cabinet. For this reason, the device does not have a separate box, only a front panel on which buttons, switches and lights are located. The output measurement is in a 4-20mA current loop. The measured gas is fed through a tube into the measuring chamber with the sensor (the sensor and chamber are included). The inlet pressure is about 1 bar, in the measuring chamber pressure is comparable to the atmospheric pressure, the measured gas is then discharged into the atmosphere. The gas flow is about 0.3l/min.

Sensor must be used only for clean, dry gases and gas mixtures. Sensor is not suitable for measurements of mixtures containing flammable gases such as H₂, CO, CH₄, NH₃. Sensor is also not suitable for mixtures containing halogen and sulfur compounds, such as F₂, Cl₂, HCl, HF, SO₂, H₂S, CS₂, Freon. Note: also pay close attention to the silicone seals which are not to be in contact with the measured gas. This will all reduce the life of the sensor.

Lifetime

The zirconia sensor lifetime should be at least 3 years if it is fully used in accordance with this manual. Also the sensor lifetime is strongly affected should it not be used in specified oxygen concentrations. The sensor is covered by a 6 months manufacturer's warranty.

Controls:

| | |
|------|---|
| ON | operation signal |
| ERR1 | sensor heater failure |
| ERR2 | measurement error |
| CAL | (oxygen concentrations too low or sensor failure) calibration process signalization |

Buttons:

| | |
|-------|---|
| DOWN | change of calibration constant |
| UP | change of calibration constant |
| START | calibration initiation and confirmation |

Rotary switches:

| | |
|-------|---|
| RANGE | change of the measuring range, test codes |
| TYPE | calibration type setting |



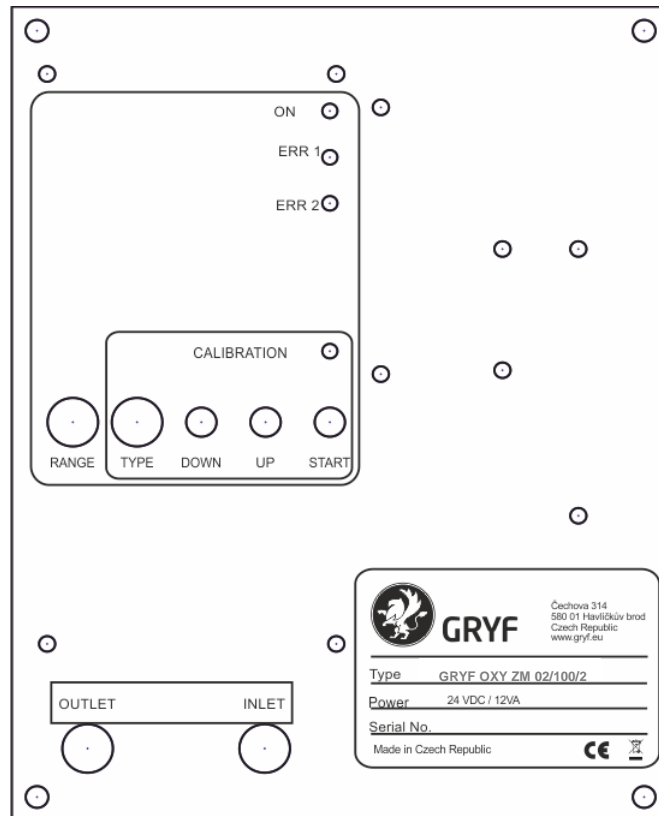
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Measurements can be performed in four predefined measuring ranges. This corresponds to the current output signal 4-20mA. Setting the measurement range is performed by the rotary switch (RANGE) which is located on the front panel.

Position 1 example: 4 mA ... 0 % 20 mA ... 100 %

Description of the rotary switch codes RANGE:

- 1 - range 0 – 100.0%
- 2 - range 0 – 25.0%
- 3 - range 0 – 8.00%



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4 - range 0 – 5.00%

Test codes:

| | |
|----------------|-----------------|
| 0 - output 0mA | 7 - output 10mA |
| 5 - output 4mA | 8 - output 16mA |
| 6 - output 8mA | 9 - output 20mA |

Function: After turning on the power supply, the power supply indicator light (ON) will start flashing at 0.5 sec. intervals. This indicates the warming of the sensor which lasts 60 seconds. When the sensor reaches the correct temperature, the light will stay lit and will turn off each time the oxygen concentration level is being measured. This period lasts about 0.5 -20 sec. and is proportional to the oxygen concentration (2-100%). The NO FAULT signal indicates measuring readiness. When the device is ready for measuring and není detekována porucha, the NO FAULT signal value is 24V DC (same value as the supply voltage).

Calibration

Calibration can be performed on pre-selected concentration of oxygen. The type of calibration is selected by the rotary switch (TYPE) located on the front panel. To obtain the best measuring accuracy, choose a calibration gas with oxygen concentration levels resembling the anticipated measured concentration.

Recommended calibration cycle i severly 6 months.

Description of the rotary switch codes TYPE:

0. Calibration ban
1. Dry air, concentration 20.9% - slope
2. concentration 97% - slope
3. concentration 80% - slope
4. concentration 5% - slope
5. edit slope with buttons Down, Up
6. concentration 0.5% - zero
7. edit zero with buttons Down, Up



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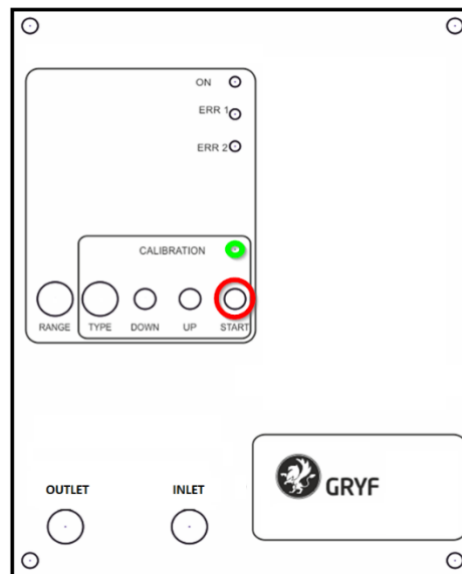


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Calibration steps for points 1, 2, 3, 4, 6:

- Use rotary switch code TYPE to match the calibration gas value.
- Let the chosen gas flow to analyser inlet. The gas inlet pressure should be 1bar.
- The gas should be flowing through the analyser chamber for at least 2 minutes.
- Calibration is started by pressing START. After pressing the button, the CALIBRATION indicator light will light up green.



- After the signal has stabilized, the result can be confirmed by pressing START. After pressing START, the CALIBRATION light will flash green to confirm. Should the CALIBRATION light start flashing red, the calibration has been performed incorrectly or other calibration problems occurred. The calibration constants are out of range. This can be due to attendant error or sensor failure.

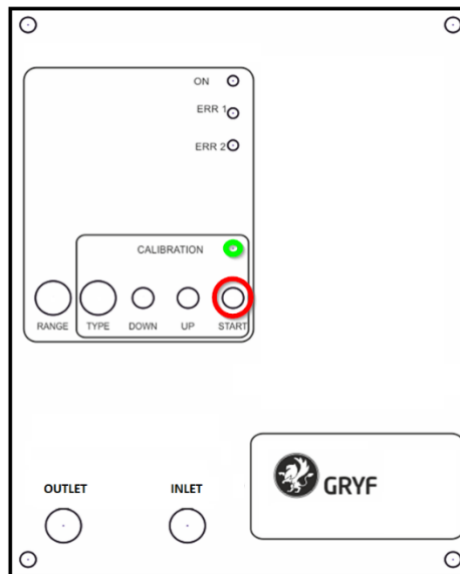
Calibration steps for points 5, 7:

- Use rotary switch to edit the „Slope” or „Zero”.
- Let the chosen gas flow to analyser inlet. The gas inlet pressure should be 1bar.
- The gas should be flowing through the analyser chamber for at least 2 minutes.
- Calibration is started by pressing START. After pressing the button, the CALIBRATION indicator light will light up green.

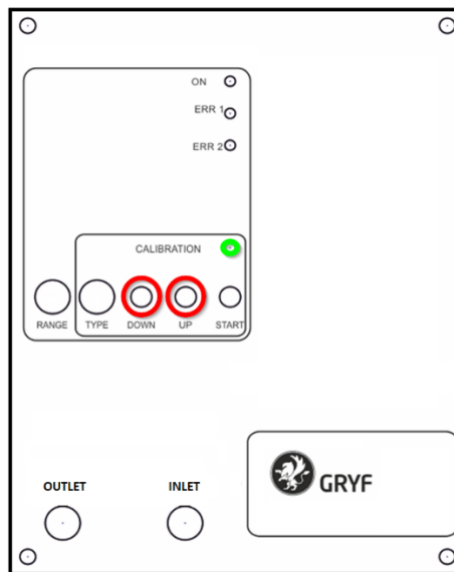


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- E. By using the UP and DOWN buttons change the concentration to desired value. Faster changes can be achieved by pressing and holding the buttons DOWN or UP for several seconds.



- F. Then confirm with the START button the result. After pressing START, the CALIBRATION light will flash green to confirm. Should the CALIBRATION light start flashing red, the calibration has been performed incorrectly or other calibration problems occurred. The calibration constants are out of range. This can be due to attendant error or sensor failure.



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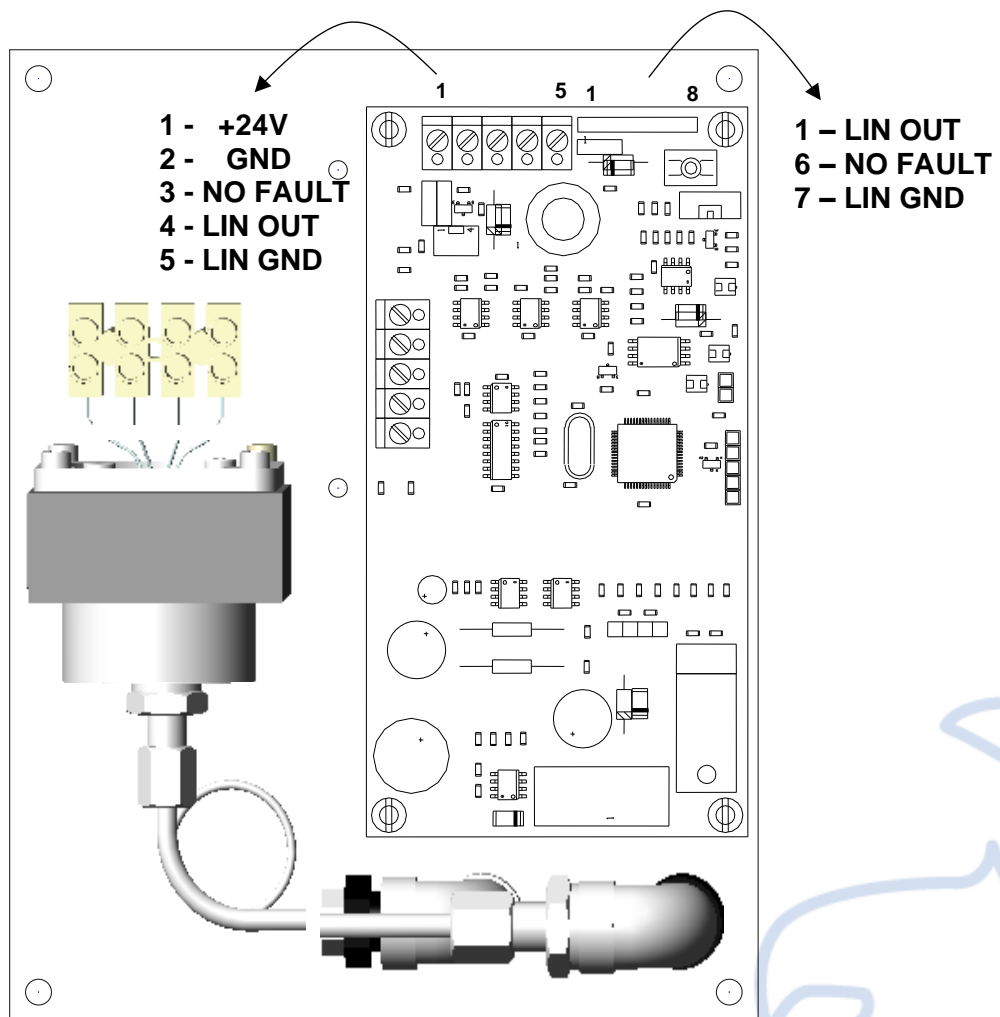
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Purity of inlet gas:

In terms of purity, the inlet gas must not carry particles larger than 10 micrometers.

Analyzer installation:

This analyzer is not equipped with IP protection and is therefore designed to be installed in a cabinet or case. This analyzer is also recommended to be installed in a vertical position, hose connection on the bottom, terminal plate for power input facing upward. Use the four holes in each corner to install the analyzer to a board or cabinet. Diameter of the holes is 4.3mm.

Connect a 4mm hose with the input gas mixture into the INLET line, located on the right side of the front panel. Output gas is diverted via a 4mm hose. The output hose is connected to the OUTLET line, located on the left side of the front panel. If the cabinet or case is well ventilated, it is not necessary to connect a hose to the OUTLET line. To ensure the instrument's correct functioning the output air flow should not be reduced. This is because of balancing the pressure level in the measuring chamber with the ambient air.

WARNING!!! The output absolute pressure cannot exceed 1.2 bar.

The terminal plate for the input voltage and the current loop is located in the upper part of the analyzer. While looking at the back of the analyzer, the following clips are numbered (from left):

- 1 - +24V
- 2 - GND
- 3 - NO FAULT
- 4 - LIN OUT
- 5 - LIN GND

The NO FAULT signal and the current loop are jointed, furthermore, they are also accessible on the 8-pin connector with a lock. The pins are also numbered from the left when looking at the back of the analyzer:

- 1 - LIN OUT
- 6 - NO FAULT
- 7 - LIN GND

The GND and LIN GND signals are connected with a front panel (ground).



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