

# Operating Manual for Redox-Measuring transducer

# GRMU 2000 MP



## Specification:

|                                           |                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Measuring range:</b>                   | -2000 ... 2000mV or refer to type plate                                                                                                                                                                                                                                                           |
| <b>Accuracy:</b>                          | ±0,2% (at nominal temperature)                                                                                                                                                                                                                                                                    |
| <b>Output signal:</b>                     | refer to type plate                                                                                                                                                                                                                                                                               |
| <b>Connection:</b>                        | 4 - 20 mA (2-wire)<br>Voltage (3- resp. 4-wire)                                                                                                                                                                                                                                                   |
| <b>Electric isolation:</b>                | input electrically isolated                                                                                                                                                                                                                                                                       |
| <b>Auxiliary energy:</b> (supply voltage) | U <sub>v</sub> = 12 - 30 V DC (4-20mA)<br>U <sub>v</sub> = 18 - 30 V DC (0-10V)<br>or refer to type plate                                                                                                                                                                                         |
| <b>Reverse voltage protection:</b>        | 50V permanent                                                                                                                                                                                                                                                                                     |
| <b>Perm. impedance</b> (at 4-20mA):       | $R_A(\text{Ohm}) < (U_v - 12V) / 0.02A$<br><i>Example: for U<sub>v</sub> = 18V: <math>R_A &lt; (18V - 12V) / 0.02A \Rightarrow R_A &lt; 300 \text{ Ohm}</math></i>                                                                                                                                |
| <b>Permissible load</b> (at 0-...V):      | $R_L(\text{Ohm}) > 3000 \text{ Ohm}$                                                                                                                                                                                                                                                              |
| <b>Electrode:</b>                         | any Redox-Electrode of our program is suitable.<br>(electrode not included in scope of supply!)                                                                                                                                                                                                   |
| <b>Input resistance:</b>                  | 10 <sup>12</sup> Ohm                                                                                                                                                                                                                                                                              |
| <b>Electrode socket:</b>                  | Cinch-socket (standard), optionally available with BNC- and DIN-socket                                                                                                                                                                                                                            |
| <b>Display:</b>                           | none                                                                                                                                                                                                                                                                                              |
| <b>Optional display:</b>                  | approx. 10 mm high, 3½-digit LCD-display                                                                                                                                                                                                                                                          |
| <b>Nominal temperature:</b>               | 25 °C                                                                                                                                                                                                                                                                                             |
| <b>Operating temperature:</b>             | 0 ... 50 °C                                                                                                                                                                                                                                                                                       |
| <b>Relative humidity:</b>                 | 0 ... 95 % r.F. (non-condensing)                                                                                                                                                                                                                                                                  |
| <b>Storage temperature:</b>               | -20 ... 85 °C                                                                                                                                                                                                                                                                                     |
| <b>Housing:</b>                           | ABS (IP65 - with the exception of electrode)                                                                                                                                                                                                                                                      |
| <b>Dimensions:</b>                        | 82 x 80 x 55 mm (without elbow-type plug and sensor sockets)                                                                                                                                                                                                                                      |
| <b>Mounting:</b>                          | With fixing holes for wall mounting (in housing - accessible after cover has been removed).                                                                                                                                                                                                       |
| <b>Mounting distance:</b>                 | 50 x 70 mm, max. shaft diameter of mounting screws is 4 mm.                                                                                                                                                                                                                                       |
| <b>Electric connection:</b>               | elbow-type plug conforming to DIN 43650 (IP65),<br>max. wire cross section: 1.5 mm <sup>2</sup> , wire/cable diameter from 4.5 to 7 mm                                                                                                                                                            |
| <b>EMC:</b>                               | The device corresponds to the essential protection ratings established in the Regulations of the Council for the Approximation of Legislation for the member countries regarding electromagnetic compatibility (2004/108/EG). In accordance with EN50081-1 and EN50082-1<br>Additional error: <1% |

## Disposal notes

This device must not be disposed as 'residual waste'.

To dispose this device, please send it directly to us (adequately stamped). We will dispose it appropriately and environmentally friendly.



WEEE-Reg.-Nr. DE 93889386



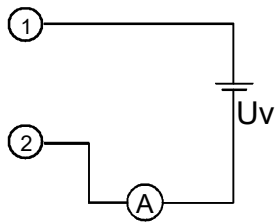
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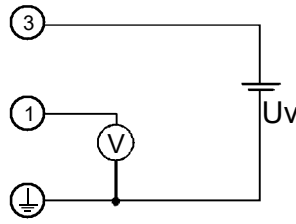
## Assignment of elbow-type plug:

2-wire connection (4-20mA)



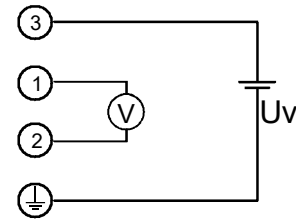
1 = supply voltage +Uv  
2 = GND / signal

3-wire connection (voltage)



1 = signal +  
3 = supply voltage +Uv  
⊥ = supply voltage -Uv  
signal -

4-wire connection (voltage)



1 = signal +  
2 = signal -  
3 = supply voltage +Uv  
⊥ = supply voltage -Uv

## General installation instructions:

To mount the connection cable (2-, 3-, or 4-wire depending on type of device) the angle plug screw has to be loosened and the coupling insert has to be removed by means of a screw driver at the position indicated (arrow). Pull out connection cable through PG glanding and connect to the loose coupling insert as described in the wiring diagram. Replace loose coupling insert onto the pins at the transmitter housing and turn cover cap with PG glanding in the direction desired till it snaps on (4 different starting positions at 90° intervals). Re-tighten the screw at the angle plug. Before connecting to supply voltage, ensure that a working electrode is connected.

## Safety instructions:

This device has been designed and tested in accordance with the safety regulations for electronic devices. However, its trouble-free operation and reliability cannot be guaranteed unless the standard safety measures and special safety advises given in this manual will be adhered to when using the device.

1. Trouble-free operation and reliability of the device can only be guaranteed if the device is not subjected to any other climatic conditions than those stated under "Specification". If the device is transported from a cold to a warm environment condensation may cause in a failure of the function. In such a case make sure the device temperature has adjusted to the ambient temperature before trying a new start-up.
2. General instructions and safety regulations for electric, light and heavy current plants, including domestic safety regulations (e.g. VDE), have to be observed.
3. If device is to be connected to other devices (e.g. via PC) the circuitry has to be designed most carefully. Internal connection in third party devices (e.g. connection GND and earth) may result in not-permissible voltages impairing or destroying the device or another device connected.
4. If there is a risk whatsoever involved in running it, the device has to be switched off immediately and to be marked accordingly to avoid re-starting.  
Operator safety may be a risk if:
  - there is visible damage to the device
  - the device is not working as specified
  - the device has been stored under unsuitable conditions for a longer time.

In case of doubt, please return device to manufacturer for repair or maintenance.

### 5. Warning:

Do not use these product as safety or emergency stop devices, or in any other application where failure of the product could result in personal injury or material damage.

Failure to comply with these instructions could result in death or serious injury and material damage.

**Important!!** redox - electrodes are very sensitive. Please read manual of the electrode carefully before usage.

### **Error and System Messages [only with option display]**

| Display | Description                                | Possible fault cause                                                                                                          | Remedy                                                                                                 |
|---------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| FE 1    | Measuring values exceeding measuring range | redox value is out of the transducers measuring range                                                                         | Replace electrode.                                                                                     |
| FE 2    | Measuring values below measuring range     | redox electrode defective                                                                                                     | Replace electrode.                                                                                     |
|         |                                            | transducer defective                                                                                                          | Return to manufacturer for repair                                                                      |
| FE 7    | System fault                               | Error in transducer                                                                                                           | Disconnect transducer from supply and reconnect. If error remains: Return to manufacturer for repair . |
| 8.8.8.8 | Segment test                               | The transducer performs a display test for 2 seconds after switch on. After that it will change the display of the measuring. |                                                                                                        |
|         | Input signal is not valid                  | redox electrode not connected                                                                                                 | Check the connection and cable.                                                                        |
|         |                                            | Permissible input range is exceeded                                                                                           | Check if not a wrong electrode (pH or others) is connected.<br>Replace electrode.                      |