

MB 1

## LED Bargraph Display

### MB 1

#### Description

The LED bargraph display MB 1 is used in conjunction with level switch NRS 2-5.. and level controller NRR 2-50 as actual value indicator, and applied for instance in steam boilers and (pressurized) hot-water installations as second water level indicator.

The LED bargraph display can be combined with all measuring sensors that have an analogue output 4-20 mA.

The LED bargraph display MB 1 replaces the indicating unit URA 2-e.

#### Function

The LED bargraph display MB 1 processes the current signal of the level switch NRS 2-5.., the level controller NRR 2-50 or other measuring transducers and indicates the reading as an LED bargraph with a scale of 0 - 100 %.

#### Directives and standards

##### LV (Low Voltage) Directive and EMC (Electromagnetic Compatibility)

The equipment meets the requirements of the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC.

##### ATEX (Atmosphère Explosible)

According to the European Directive 94/9/EC the equipment must not be used in potentially explosive areas.

#### Technical data

##### Supply voltage

24 VDC +/- 10 %

##### Power consumption

2 VA

##### Housing:

##### Dimensions

96 x 24 x 69 mm (WxHxD) including plug-in terminal

##### Panel cut-out

96.0<sup>+0.8</sup> x 22.2<sup>+0.3</sup> mm

##### Wall thickness

up to 3 mm

##### Fixing

Screw-type elements

##### Material

PC polycarbonate, black

##### Sealing material

EPDM, 65 Shore, black

##### Protection

Standard IP 65 (front frame), IP 00 (rear panel)

##### Weight

approx. 109 g

##### Connection

Plug-in terminal, conductor size up to 2.5 mm<sup>2</sup>

##### Display:

##### Segment size

2 x 4 mm (HxW)

##### Segment colour

red

##### Indicating range

30 bargraph segments

#### Technical Data - continued -

##### Overflow indication

Top two segments flash

##### Underflow indication

Bottom two segments flash

##### Response time

(equal to measurement time) approx. 100 ms

##### Input

-22 ... 24 mA

##### Measuring range

4-20 mA, Ri ~100 Ω

##### Measuring error

0.5 % of final value, +/- 1 digit

##### Temperature drift

100 ppm / K

##### Measurement time

approx. 100 ms

##### Measuring principle

Voltage / frequency conversion

##### Resolution

14 bit (with 0.1 s response time)

##### Environmental conditions:

##### Service temperature

0 ... 60 °C

##### Storage temperature

-20 ... 80 °C

##### Climate resistance

relative humidity 0-80% of yearly mean value, without condensing

##### Adjustors

1 Code switch with 9 poles

1 Pushbutton

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## Important Notes

Make sure there are no electrostatic discharges or any magnetic or electric fields generated by, for instance, transformers, portable two-way radio receivers ("walkie-talkies") in the close vicinity of the equipment. Do not install inductive loads (relay, solenoid valves, etc.) near the equipment. To ensure interference suppression provide inductive loads with RC spark suppression combinations or surge absorber diodes.

Input and output lines must be installed separate from each other and must not run in parallel to each other. Lines going to or returning from the equipment may be run in parallel but should not be installed in the close vicinity of supply lines for consumers. Connect only one side of the screen to a suitable equipotential bonding (usually measuring earth).

Connect galvanically separated electric potentials existing within the installation to a suitable point (usually earth or zero V reference potential of the installation). In doing so the interference susceptibility to radiant energy is reduced and dangerous electric potential that could build up in long lines or be caused by faulty wiring avoided.

To connect the LED bargraph display use screened multi-core control cable with a min. conductor size 0.5 mm<sup>2</sup>, e. g. LIYCY 4 x 0.5 mm<sup>2</sup>, max. length: 100 m.

If the indicating unit URA 2 is replaced by the LED bargraph display please use the adapter plate **Fig. 5**, stock code number 1504574.

## Order & Enquiry Specification

LED bargraph display type MB1  
Front panel cut-out 24 x 96 X 69 mm (W x H x D)  
Measurement input: 4-20 mA, 0-20 mA  
Display:  
– 30 bar graph segments  
– Colour: red  
Voltage supply: 24 V DC, 2 VA  
Protection: front panel: IP65

## Using LED bargraph display MB 1 instead of indicating unit URA 2

Switch off supply voltage.

Disconnect level switch, level controller and measuring sensor.

- 1 Detach plug-in terminal.
- 2 Unscrew screws and remove back panel.
- 3 Remove front frame.
- 4 Unscrew screws and detach front panel. Keep screws for future use.
- 5 Remove the fixing clips and put the LED bargraph display into the adapter plate. Check seat of gasket. Snap fixing clips in place and fasten tightening screws finger tight. Then use a screwdriver and tighten the screws half a turn more. Max. tightening torque 0.1 Nm
- 6 Put the LED bargraph display together with the adapter plate into the URA housing and fix it with screws. Re-attach front frame.

Wire the LED bargraph display.

Apply supply voltage. Switch on level switch, level controller and measuring sensor.

Supply in accordance with our general terms of business.

## Dimensions

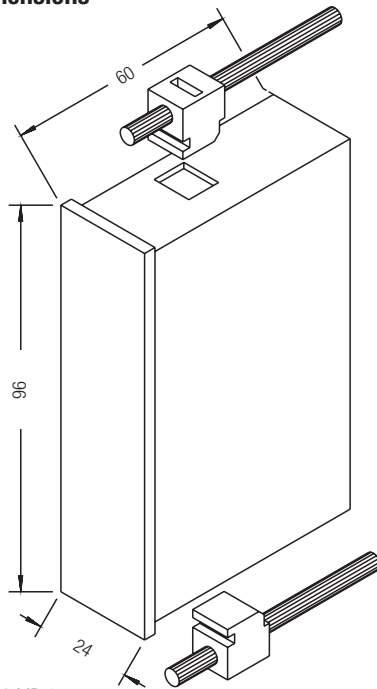


Fig. 1 MB 1

## Electrical connection

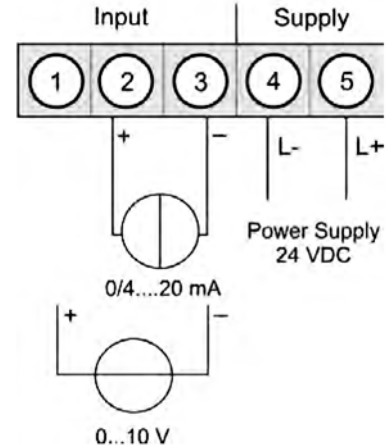


Fig. 2

## Using LED bargraph display MB 1 instead of indicating unit URA 2

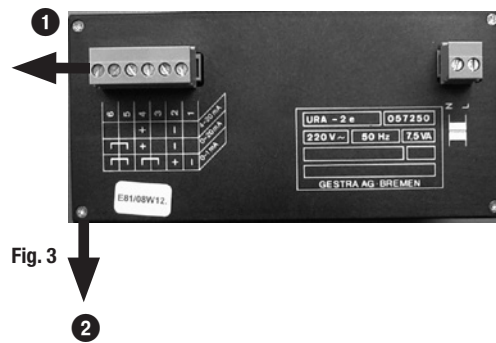


Fig. 3

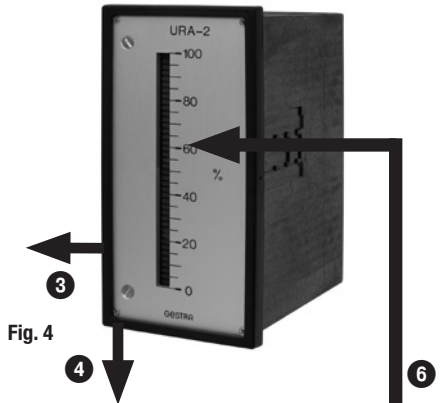


Fig. 4

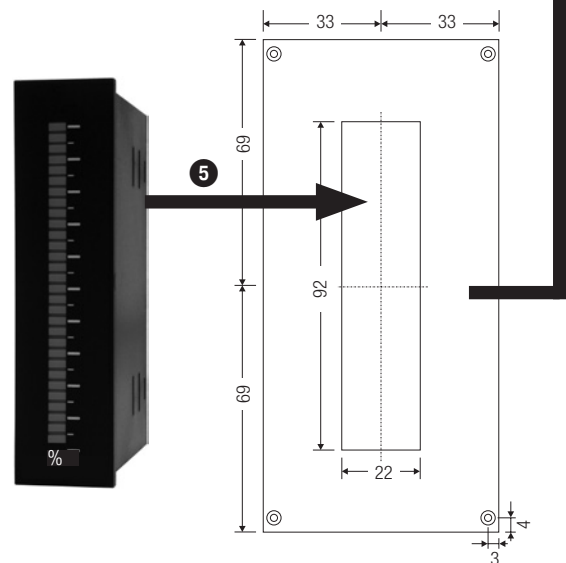


Fig. 5

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