



Installation and operating instructions Liquid Conductivity Limiter FLB1

his high-quality IGEMA product was designed, manufactured and tested with the application of the QM System guidelines in accordance with DIN EN ISO 9001.

If the device supplied shows transport damage or gives cause for complaint in spite of our final quality control please contact our SERVICE department by return:
Phone 0241- 56 87-0.

**The device is presented in the enclosed data sheet / project sheet.
The data sheet / project sheet is an integral part of these installation and operating instructions.**

1. Risks and Safety precautions

1.1 Avoidance of risks to persons and property

- 1.1.1 Only use the device supplied in accordance with the intended planning.
- 1.1.2 Do not carry out additions and changes to the device without our approval.
- 1.1.3 Observe accident prevention regulations and system-specific safety instructions.
- 1.1.4 Read and observe fitting and operating instructions.

1.2 Limitations of use

The device must only be used in accordance with the details in these operating instructions or for the parameters agreed in the supply contract (see name plate) and the application.

1.3 Avoidance of risks and damage

- 1.3.1 Disseminate the assembly and operating instructions to the departments responsible for "goods in, transport, assembly, commissioning and maintenance".
- 1.3.2 If this device is passed on to third parties, these assembly and operating instructions in the relevant language of the country must accompany it.
- 1.3.3 Work on the device should only be carried out by trained staff specially commissioned and exclusively with the power supply disconnected.
- 1.3.4 Read and observe the assembly and operating instructions carefully and keep them in a safe place.
- 1.3.5

It is essential to take note of and follow the safety instructions printed in bold and highlighted in the individual sections.

- 1.3.6 When transporting, avoid e.g. knocks and putting down heavily, this can lead to damage.
- 1.3.7 For intermediate storage ensure that the storage location is suitable for the device.
The storage location must be dry and the devices secured against damage.

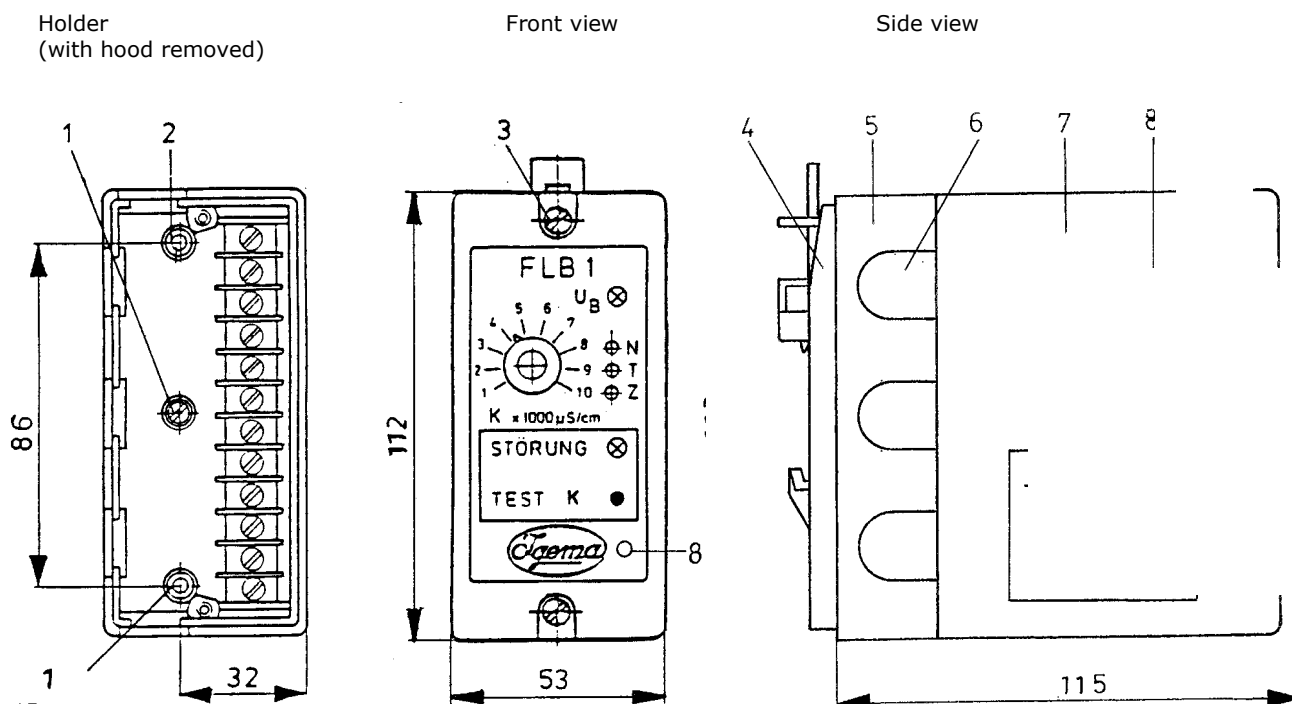
1.4 Exclusion of liability

IGEMA GmbH Mess- und Regelsysteme will assume no liability if the above-mentioned regulations, instructions and safety precautions are not noted and followed.



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2. Construction dimensions / Designation



3. Installation

Secure with protection class in accordance with current regulations!

3.1 With snap fastening (4) for standard DIN46277 35 mm carrier rail

- Snap the device on the standard carrier rail.
- Release fixing screws (3) and pull hood (7) from holder (5).

Connect to power supply.

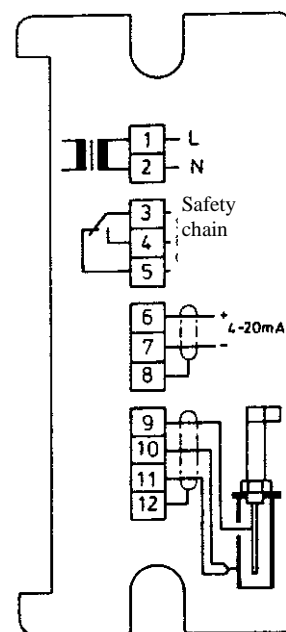
3.2 Without snap fastening

- Release fixing screws (3) and pull hood (7) from holder (5).

Release screws (1) and remove snap fastening (4).

- Drill through the marked points (2) in the holder (5) with $\varnothing 4.3$ mm drill.
- Fit base (5) on base plate with 2 M4 screws.

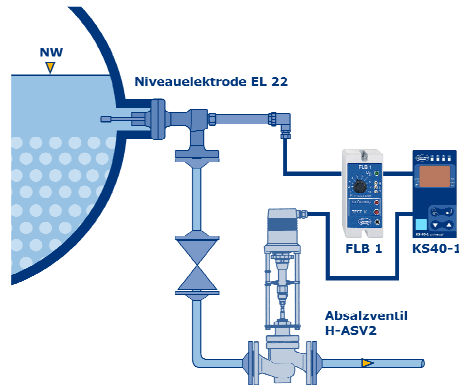
Back plate





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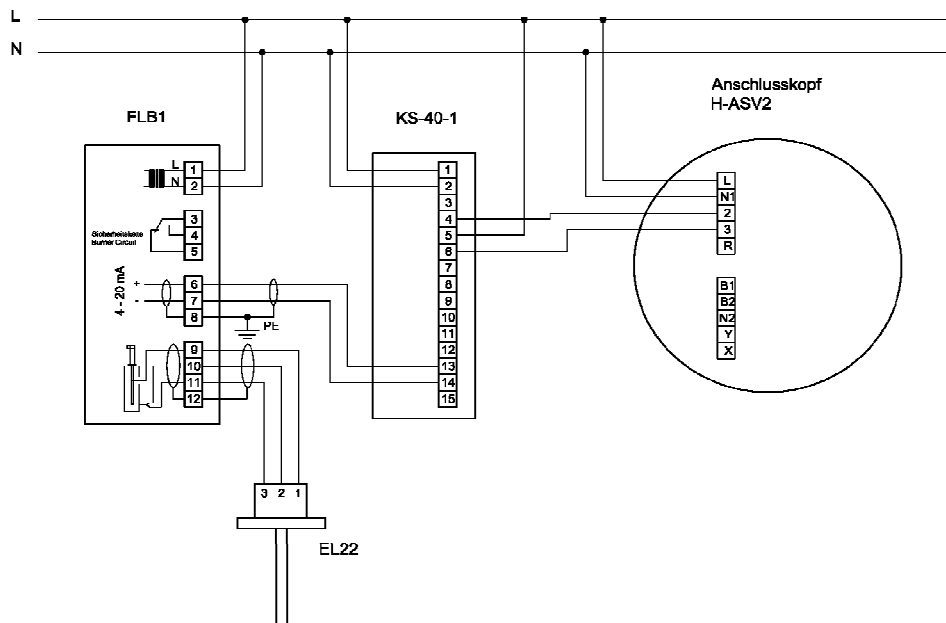
3.3. Example of installation



4. Power connection

Carry out connection according to the FLB1 wiring diagram on the back plate of the hood (7) or see below.

- Pierce or pull out cable feedthrough (6) and feed connection cable through.
 - Check supply voltage. See name plate for allowable voltage.
 - Use shielded connection line:
e.g. Unitronic BUS Safety 3x0.75 up to a max. length of 20 m. (see instructions).
- Only connect shielding on the FLB1 control unit (terminal 12).
 - After electrical connection - with device disconnected from the mains - put hood (7) on holder (5) and tighten fastening screws (3).
 - Fit electrode according to separate assembly instructions and connect as in the wiring diagram.





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5. Calibration

Do not carry out calibration until all the assembly parts are completely fitted.

Switch on supply voltage, the green warning light "UB" lights up.

Measuring instrument required for calibration:

- Multimeter (preferably digital multimeter)
- Conductivity meter (preferably with temperature compensation).

5.1. Zero calibration

Precondition: The conductivity electrode measuring probe is not in contact with the water.

Depending on the placing of the electrode lower the water level in the boiler or empty the measuring line.

Connect the multimeter to the jack socket (8) Ø3.6 mm or to the terminals (6 and 7) and set a current of 4 mA with the potentiometer "N".

Please note:

- Moving the potentiometer clockwise results in larger values.
- If the value "4 mA" cannot be set - check the electrical lead for observance of the details as in the wiring diagram.

5.2 Sampling

Precondition:

- Boiler in operating mode
- Measuring probe of the dedicated measuring electrode is surrounded by boiler water.

Remove boiler water via the sampling cooler and with a conductivity measuring device determine the conductivity "K actual" in $\mu\text{S/cm}$, in relation to 25 °C.

5.3 Temperature calibration

Precondition:

- Boiler in operating mode
- Measuring probe of the dedicated measuring electrode is surrounded by boiler water.
- Calculate the current to be set according to the equation $I = 4 + 16 \times K \text{ actual} [\text{mA}] / K \text{ max.}$

Example: K actual = 2000 $\mu\text{S/cm}$; see point 5.2 Sampling

K max. = 10000 $\mu\text{S/cm}$; see scale value [K x 1000 $\mu\text{S/cm}$] on the front of the device.

$$I = 4 \text{ mA} + (16 \text{ mA} \times 2000 / 10000) = 7.2 \text{ mA}$$

Connect the multimeter to the jack socket (8) Ø3.6 mm or to the terminals 6 and 7 and set the calculated current with the potentiometer "T".

Please note:

- Moving the potentiometer clockwise results in smaller values.
- Up to 20 revolutions in one direction may be necessary.
 - If the calculated current cannot be set the factory-set cell constant on the device is to be corrected: set the calculated current via the potentiometer "Z".
 - Then carry out the calibration again as described under points 5.1, 5.2 and 5.3.

If in spite of following the above steps calibration is not possible, the following error eliminations are to be checked again:

- Press button "Test K".
 - If the circuit is interrupted at the terminals of the terminal block (3 and 4), a fault in the FLB1 is excluded.



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- Check the correct fitting of the conductivity electrode according to the operating instructions and the electrical connection according to the wiring diagram.

6. Limit setting (maximum value)

The limit values for conductivity corresponding to the maximum allowable working pressure are listed in the boiler water directives in accordance with the technical rules for steam boilers TRD 611.

6.1 Setting the FLB1

Set the desired limit value for the maximum conductivity taking into account the applicable directives with the limit value setter "K".

7. Note

Warning: Do not remove the hood (7) until the device has been disconnected from the mains.

The capacity of the cable must not exceed 1.2 nF.

- To extend the contact life of the relays we recommend the use of commercial RC combinations or an appropriate varistor when using inductive consumers.
(e.g. 0.1 μ F/100 ohm or S07k275 varistor).
- See data sheet for further information.