


Operating manual / technical data

for limit value relay with display of type GMA-2

| | | | |
|------------------------------|---|---|-----------------------------------|
| General information | This operating manual is included with the equipment as standard. It contains the information required for correct usage. It is aimed at trained personnel and specialist staff who are familiar with the assembly, installation and commissioning of the product described here. If additional information is required, further details can be requested by the address given below. | | |
| Conformity | This equipment conforms to the requirements of the Directive from the Council of the European Community on the harmonisation of the member states regarding electromagnetic compatibility, EMC Directive 2004/108/EC, as well as Low Voltage Directive 2006/95/EC. | | |
| Applications | The electronic limit value relay GMA-2 with display is used to monitor alternating current or direct current as well as alternating voltage or direct voltage. The alternating current values are measured as an effective value with any waveform. The measured value or limit value are displayed on a 2-digit LED display. | | |
| Function | The limit values can be set using buttons on the front of the unit in increments of 1%. Hysteresis, switch-on and switch-off delay, closed-circuit or open-circuit current principle and min or max principle can also be set using the buttons. If the limit values are exceeded, this is indicated via light-emitting diodes. The limit value relay are installed in a housing of 22,5 mm of breadth and can be attached to a top hat rail in snapping them on. | | |
| Technical data | | | |
| Input | Input value | Direct current or direct voltage, alternating current or alternating voltage, the periodic quantities are measured as effective values (up to crest factor 4) with any waveform in the DC and AC range of 40 – 1000 Hz | |
| | Limit value setting | 0 – 99 %, can be set in 1 % increments | |
| | Display | 2-digit LED display measured value 0 – 99 % of the measurement range limit value, 2 red LEDs for exceeded limit values | |
| | Overflow | LED display indicates  | |
| | Accuracy | ± 1 % of the measurement range limit value | |
| | Test voltage | 4 kV between measurement input and relay contacts as well as auxiliary voltage | |
| Switching performance | Switching accuracy | ± 1 % of the measurement range limit value | |
| | Hysteresis | can be set from 0 – 10 % of the limit value | |
| | Switching time | < 400 ms at 10 % exceeding of limit value | |
| | Switch delay | can be set from 0 – 99 sec | |
| | Switching status | closed-circuit or open-circuit current principle can be selected | |
| | Relay contact | 2 change-over contacts | |
| | Temperature range | -15 to +20 to +30 to +55 °C | |
| | Influence of temperature | < 0.1 % at 10 K | |
| | Overload capacity | 10 x voltage, max. 1000 V, 10 x current up to 20 mA, multiple of 2 above that | |
| | Switching capacity | max. 5 A, 250 V, 1250 VA | |
| Regulations | EMC | DIN EN 61326 | |
| | Mechanical strength | DIN EN 61 010 Part 1 | |
| | Electrical safety | DIN EN 61010 Part 1 | |
| | | Housing fully insulated, safety class II, at working voltages up to 300V (mains to neutral conductor) contamination level 2, measurement category CAT III | |
| | | at working voltages up to 600V (mains to neutral conductor) contamination level 2, measurement category CAT II | |
| Auxiliary voltage | | 230 V AC ± 15 %, 45-65 Hz, 2 VA | |
| | Options | <ul style="list-style-type: none"> • 110 V AC ± 15 %, 45-65 Hz, 2 VA • 24 V DC, -15 % to +25 %, 2.5 W, (EMC DIN EN 61326 class A) • 6-30 VAC+DC or 36-265 VAC+DC, 2 VA, (EMC DIN EN 61326 class A) | |
| Weight | | 200g | |
| Measuring ranges | Alternating current | can be set | Internal resistance |
| | AC+DC effective | from | to |
| | | 0.1 A | 9.9 A |
| | or | 0.05 A | 4.95 A (5 A corresponds to 100 %) |
| | or | 0.01 A | 0.99 A |
| | or | 1 mA | 99 mA |
| | or | 0.1 mA | 9.9 mA |
| | Alternating voltage | | |
| | AC+DC effective | 10 V | 990 V (max. 600 V) |
| | or | 1 V | 99 V |
| | or | 0.1 V | 9.9 V |
| | or | 0.01 V | 0.99 V |
| | | | 1 MOhm |
| | | | 1 MOhm |
| | | | 100 kOhm |
| | | | 10 kOhm |



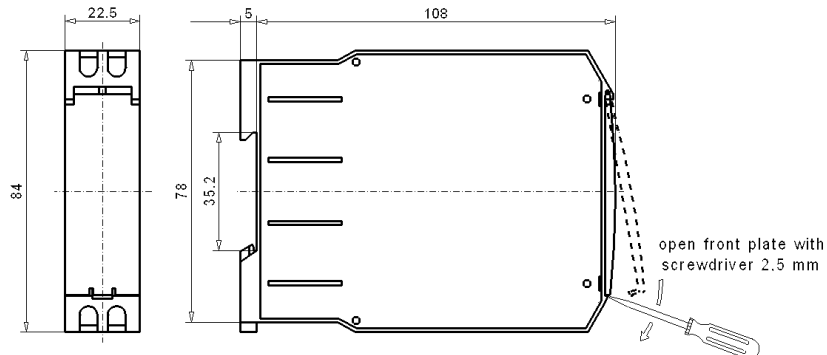
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| Measuring ranges (continued) | can be set from | to | Internal resistance |
|------------------------------|-----------------|---------------------------------------|---------------------|
| Direct current DC | 0.1 A | 9.9 A | 0.006 Ohm |
| | or 0.01 A | 0.99 A | 0.06 Ohm |
| | or 1 mA | 99 mA | 0.6 Ohm |
| | or 0.1 mA | 9.9 mA | 6 Ohm |
| | or 0.2 mA | 19.8 mA (20 mA corresponds to 100 %) | 3 Ohm |
| | or 4 mA | 19.84 mA (20 mA corresponds to 100 %) | 3 Ohm |
| Direct voltage DC | 10 V | 990 V (max. 600 V) | 1 MOhm |
| | or 1 V | 99 V | 1 MOhm |
| | or 0.1 V | 9.9 V | 100 kOhm |
| | or 0.01 V | 0.99 V | 10 kOhm |
| | or 1 mV | 99 mV | 1 kOhm |
| | or 0.6 mV | 59.4 mV (60 mV corresponds to 100 %) | 1 kOhm |

Dimensions



Mounting Snap-on fixing on standard 35 mm rail conforming to DIN EN 60715. The devices are suitable for dense pattern mounting, at ambient temperatures of $>45^{\circ}\text{C}$, however, a distance of 10 mm is recommended. The mounting site should be as free of vibration as possible and must not exceed an ambient temperature of 55°C .

Electrical Connection **The regulations on installing electrical systems must be observed.**

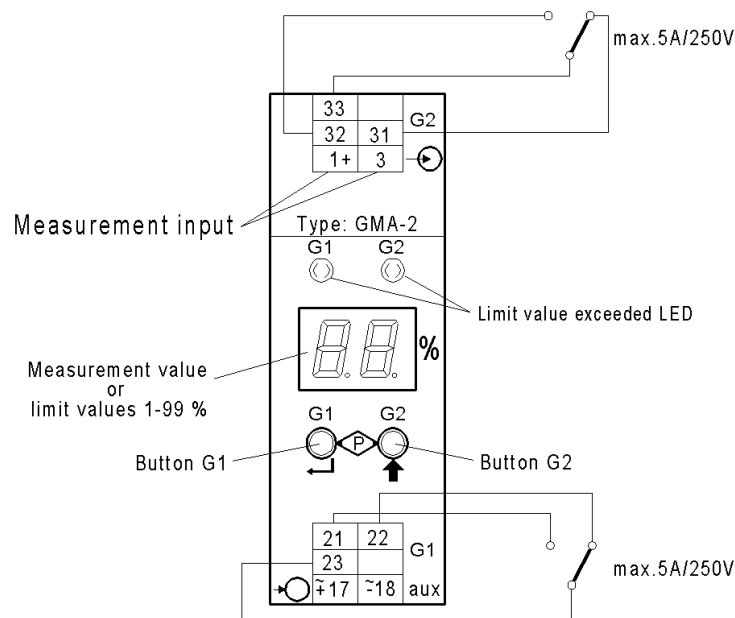
conforming to DIN 43807, via screw fitting max. 4 mm^2

Observe the correct polarity with DC versions when connecting DC as a measurement value!

The polarity must be observed when connecting DC as the auxiliary voltage!

Fuse The devices are fitted with short circuit-proof transformers; no overcurrent safety device is required for the limit value relay.

Connection



Warning! Before starting any work on or in a device, it must be disconnected from the mains or switched to a voltage-free state.

Maintenance The device is maintenance-free when used correctly.

Caution! Servicing or maintenance work must only be carried out by trained specialist personnel.

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Factory setting: **for G1**, limit value 25 %, hysteresis 1 %, switch delay if value is exceeded or undershot 0 sec., closed-circuit principle, min contact.
for G2, limit value 75 %, hysteresis 1 %, switch delay if value is exceeded or undershot 0 sec., closed-circuit principle.

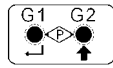
Programming



- Indicator for limit value G1, LED G1 is lit



- Indicator for limit value G2, LED G2 is lit



- press both buttons until both LEDs are flashing and the value indicator goes off to activate the programming of the limit values



- Select the limit values, button for limit value G1, button for limit value G2



- Set the limit value using button (0 – 99 %),



- Set the hysteresis using button (0 – 10 %)



- Set the switch delay if the value is exceeded using the button (0 – 99 sec)



- Set the switch delay if the value is undershot using the button (0 – 99 sec)



- Switch function of the relay ⇒ open-circuit current principle ⇒ closed-circuit principle
- can be selected using button



- ⇒ • **for limit value G2**, save the settings and return to display mode



Function only available with limit value G1!



- **for limit value G1**, select G1 = min – contact , G1 = max – contact
- can be selected using button



- ⇒ • **with limit value G1**, save the settings and return to display mode

Caution ! If no inputs are made for two minutes, the device switches back to display mode without saving the changes. The settings are retained in the event of a power failure. The limit values are not being monitored when the limit values are being displayed or in programming mode!