Operating manual / technical data

for limit value relay with display of type GMA-1

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-1 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 value can be set using buttons on the front of the unit in increments of 1%. Hysteresis, switch-on and switch-off delay and closed-circuit or open-circuit current 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, 1 red LED for exceeded limit value, 1 green LED for lower limit
	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	1 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	• 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 AC+DC effective		can be set from	to	Internal resistance
		0.1 A	9.9 A	0.006 Ohm
	or	0.05 A	4.95 A (5 A corresponds to 100 %)	0.012 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
Alternating voltage AC+DC effective				
		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

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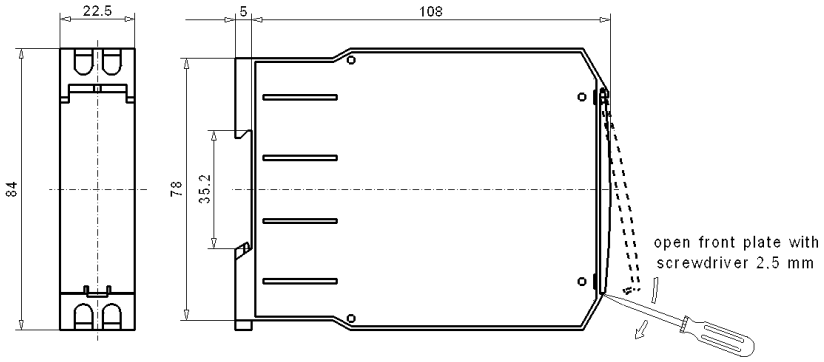
Measuring ranges (continued)

		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

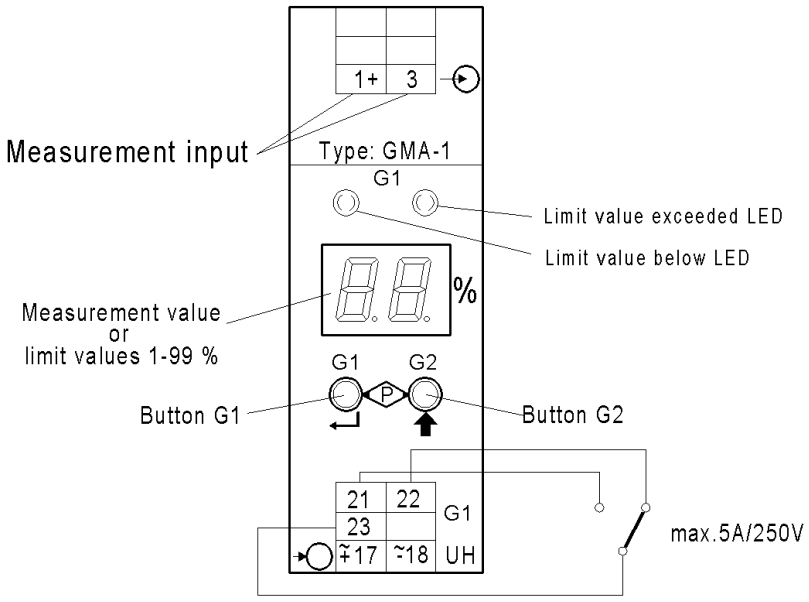


Mounting Snap-on fixing on standard 35 mm rail conforming to DIN EN 60715. The devices are suitable for dense pattern mounting, at ambient temperatures of >45 °C, however, a distance of 10 mm is recommended. The mounting site should be as free of vibration as possible and must not exceed an ambient temperature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

Electrical Connection **The regulations on installing electrical systems must be observed.**
conforming to DIN 43807, via screw fitting max. 4 mm²
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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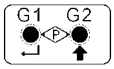
Factory setting: **for G1**, limit value 25 %, hysteresis 1 %, switch delay if value is exceeded or undershot 0 sec., closed-circuit principle.

Programming

• Indicator for limit value ,both LEDs are lights on



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

⇩

• Set the limit value using button 

(0 – 99 %), both LEDs are flashing slowly

⇩

⇩

• Set the hysteresis using button 

(0 – 10 %), both LEDs are flashing slowly

⇩

⇩

• Set the switch delay if the value is exceeded using the button 

(0 – 99 sec), both LEDs are flashing slowly

⇩

⇩

• Set the switch delay if the value is undershot using the button 

(0 – 99 sec), both LEDs are flashing slowly

⇩

⇩

• Switch function of the relay  ⇒ open-circuit current principle  ⇒ closed-circuit principle

• can be selected using button 

, both LEDs are flashing slowly

⇩

⇨ • 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!

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