a.c./d.c. current monitoring in 1-phase mains

G2IM5AL20

Monitoring relays - GAMMA series

Multifunction

16.6 to 400Hz

Fault latch

Supply voltage selectable via power modules

2 changeover contacts

Width 22.5mm

Industrial design

Technical data

1. Functions

a.c./d.c. current monitoring in 1-phase mains with adjustable thresholds, timing for start-up suppression and tripping delay separately adjustable and the following functions which are selected by means of rotary switch

OVER	Overcurrent monitoring
OVER+LATCH	Overcurrent monitoring with fault latch
UNDER	Undercurrent monitoring
UNDER+LATCH	Undercurrent monitoring with fault latch
WIN	Monitoring the window between Min and Max
WIN+LATCH	Monitoring the window between Min and Max with fault latch

2. Time ranges

	Adjustment range	
Start-up suppression time:	0s	10s
Tripping delay:	0.1s	10s

3. Indicators

Green LED ON:	indication of supply voltage
Green LED flashes:	indication of start-up suppression time
Yellow LED ON/OFF:	indication of relay output
Red LED ON/OFF:	indication of failure of the corresponding threshold
Red LED flashes:	indication of tripping delay of the corresponding threshold

4. Mechanical design

Self-extinguishing plastic housing, IP rating IP40
Mounted on DIN-Rail TS 35 according to EN 60715
Mounting position: any
Shockproof terminal connection according to VBG 4 (PZ1 required), IP rating IP20 Tightening torque: max. 1Nm
Terminal capacity:
- 1 x 0.5 to 2.5mm² with/without multicore cable end
- 1 x 4mm² without multicore cable end
- 2 x 0.5 to 1.5mm² with/without multicore cable end
- 2 x 2.5mm² flexible without multicore cable end

5. Input circuit

Supply voltage:	
12 to 400V a.c.	terminals A1-A2 (galvanically separated) selectable via power modules TR2
24V d.c.	terminals A1-A2 (galvanically separated) selectable via switching power supply type SNT2
Tolerance:	according to specification of power module
Rated frequency:	according to specification of power module
Rated consumption:	2VA (1.5W)
Duration of operation:	100%
Reset time:	500ms
Residual ripple for d.c.:	-
Drop-out voltage:	>30% of the supply voltage
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

6. Output circuit

2 potential free changeover contacts

Rated voltage:	250V a.c.
Switching capacity:	750VA (3A / 250V a.c.)
If the distance between the devices is less than 5mm.	
Switching capacity:	1250VA (5A / 250V a.c.)
If the distance between the devices is greater than 5mm.	
Fusing:	5A fast acting
Mechanical life:	20 x 10^6 operations
Electrical life:	2 x 10^5 operations at 1000VA resistive load
Switching frequency:	max. 60/min at 100VA resistive load max. 6/min at 1000VA resistive load (in accordance with IEC 60947-5-1)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

7. Measuring circuit

Measured variable:	d.c. or d.c. Sinus (16.6 to 400Hz)
Input:	
20mA a.c./d.c.	terminals K-I1(+)
1A a.c./d.c.	terminals K-I2(+)
5A a.c./d.c.	terminals K-I3(+)
Overload capacity:	
20mA a.c./d.c.	250mA
1A a.c./d.c.	3A
5A a.c./d.c.	10A
Input resistance:	
20mA a.c./d.c.	2.7Ω
1A a.c./d.c.	47mΩ
5A a.c./d.c.	10mΩ
Switching threshold:	
Max	10% to 100% of I_N
Min	5% to 95% of I_N
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

8. Accuracy

Base accuracy:	±5% (of maximum scale value)
Frequency response:	-10% to +5% (16.6 to 400Hz)
Adjustment accuracy:	≤5% (of maximum scale value)
Repetition accuracy:	≤2%
Voltage influence:	-
Temperature influence:	≤0.1% / °C

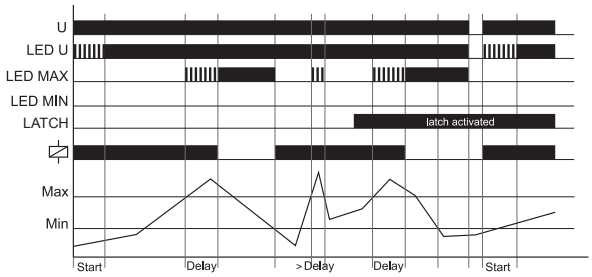
9. Ambient conditions

Ambient temperature:	-25 to +55°C (in accordance with IEC 60068-1) -25 to +40°C (in accordance with UL 508)
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	3 (in accordance with IEC 60664-1)
Vibration resistance:	10 to 55Hz 0.35mm (in accordance with IEC 60068-2-6)
Shock resistance:	15g 11ms (in accordance with IEC 60068-2-27)

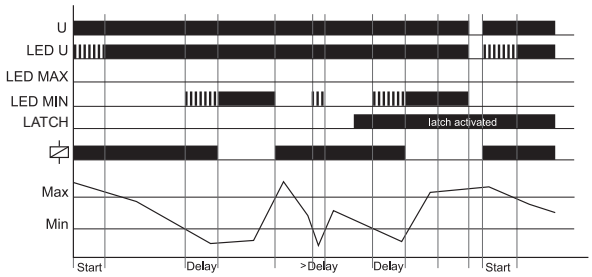
Functions

When the supply voltage U is applied, the output relays switch into on-position (yellow LED illuminated) and the set interval of the start-up suppression (START) begins (green LED U flashes). Changes of the measured current during this period do not affect the state of the output relay. After the interval has expired the green LED is illuminated steadily. For all the functions the LEDs MIN and MAX are flashing alternating, when the minimum value for the measured current was chosen to be greater than the maximum value.

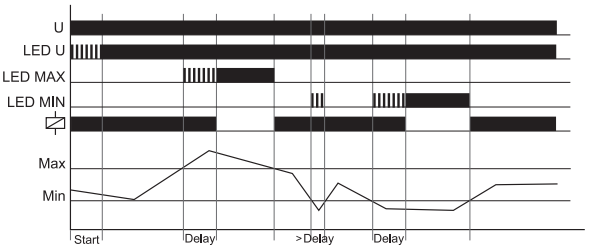
Overcurrent monitoring (OVER, OVER+LATCH)
When the measured current exceeds the value adjusted at the MAX-regulator, the set interval of the tripping delay (DELAY) begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated), the output relays switch into off-position (yellow LED not illuminated). The output relays again switch into on-position (yellow LED illuminated), when the measured current falls below the value adjusted at the MIN-regulator (red LED MAX not illuminated).
If the fault latch is activated (OVER+LATCH) and the measured current remains above the MAX-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured current falls below the value adjusted at the MIN-regulator. After resetting the failure (interrupting and re-applying the supply voltage), the output relays switch into on-position and a new measuring cycle begins with the set interval of the start-up suppression (START).



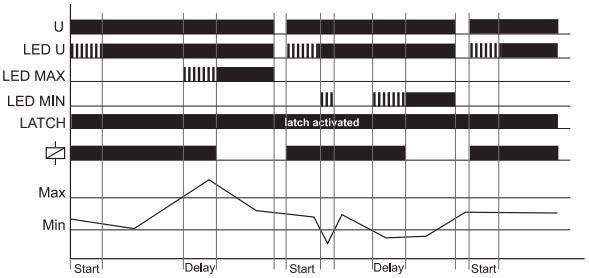
Undercurrent monitoring (UNDER, UNDER+LATCH)
When the measured current falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay (DELAY) begins (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relays switch into off-position (yellow LED not illuminated). The output relays again switch into on-position (yellow LED illuminated), when the measured current exceeds the value adjusted at the MAX-regulator.
If the fault latch is activated (UNDER+LATCH) and the measured current remains below the MIN-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured current exceeds the value adjusted at the MAX-regulator. After resetting the failure (interrupting and re-applying the supply voltage), the output relays switch into on-position and a new measuring cycle begins with the set interval of the start-up suppression (START).



Window function (WIN, WIN+LATCH)
The output relays switch into on-position (yellow LED illuminated) when the measured current exceeds the value adjusted at the MIN-regulator. When the measured current exceeds the value adjusted at the MAX-regulator, the set interval of the tripping delay (DELAY) begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated), the output relays switch into off-position (yellow LED not illuminated). The output relays again switch into on-position (yellow LED illuminated) when the measured current falls below the value adjusted at the MAX-regulator (red LED MAX not illuminated). When the measured current falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay (DELAY) begins again (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relays switch into off-position (yellow LED not illuminated).

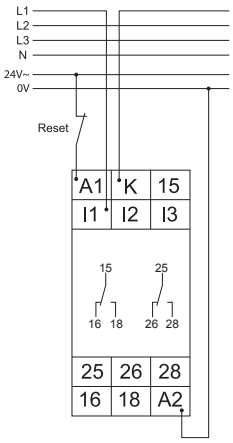


If the fault latch is activated (WIN+LATCH) and the measured current remains below the MIN-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured current exceeds the value adjusted at the MIN-regulator. If the measured current remains above the MAX-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured current falls below the value adjusted at the MAX-regulator. After resetting the failure (interrupting and re-applying the supply voltage), the output relays switch into on-position and a new measuring cycle begins with the set interval of the start-up suppression (START).

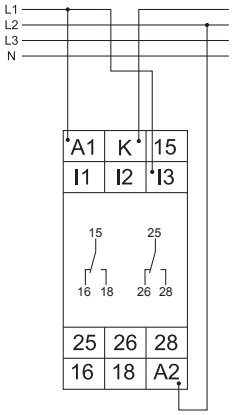


Connections

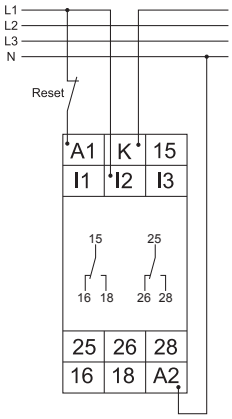
Range 20mA with power modul 24V a.c. and fault latch



Range 5A with power modul 400V a.c. without fault latch



Range 1A with power modul 230V a.c. and fault latch



Dimensions