# AC/DC current monitoring in 1-phase mains

**G2IM10AL20**

Monitoring relays - GAMMA series

Multifunction

16.6 to 400Hz

Fault latch

Supply voltage selectable via power modules

2 change-over contacts

Width 22.5mm

Industrial design


## Technical data

**1. Functions**

AC/DC current monitoring in 1-phase mains with adjustable thresholds, timing for start-up suppression and tripping delay separately adjustable and the following functions (selectable 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 50022
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 AC | terminals A1-A2 (galvanically separated) selectable via power modules TR2 |
| 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 DC: | - |
| Drop-out voltage: | >30% of the supply voltage |
| Overvoltage category: | III (according to IEC 60664-1) |
| Rated surge voltage: | 4kV |

**6. Output circuit**

2 potential free change-over contacts

| | |
|---|---|
| Rated voltage: | 250V AC |
| Switching capacity (distance <5mm): | 750VA (3A / 250V AC) |
| Switching capacity (distance >5mm): | 1250VA (5A / 250V AC) |
| 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<br>max. 6/min at 1000VA resistive load<br>(according to IEC 947-5-1) |
| Overvoltage category: | III (according to IEC 60664-1) |
| Rated surge voltage: | 4kV |

**7. Measuring circuit**

| | |
|---|---|
| Measured variable: | DC or AC Sinus (16.6 to 400Hz) |
| Input: | |
| 100mA AC/DC | terminals K-I1(+) |
| 1A AC/DC | terminals K-I2(+) |
| 10A AC/DC | terminals K-I3(+) (distance >5mm) |
| Overload capacity: | |
| 100mA AC/DC | 800mA |
| 1A AC/DC | 3A |
| 10A AC/DC | 12A |
| Input resistance: | |
| 100mA AC/DC | 470mΩ |
| 1A AC/DC | 47mΩ |
| 10A AC/DC | 5mΩ |
| Switching threshold | |
| Max: | 10% to 100% of $I_N$ |
| Min: | 5% to 95% of $I_N$ |
| Overvoltage category: | III (according to IEC 60664-1) |
| Rated surge voltage: | 4kV |

**8. Accuracy**

| | |
|---|---|
| Base accuracy: | ≤3% (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: | ≤0.05% / °C |

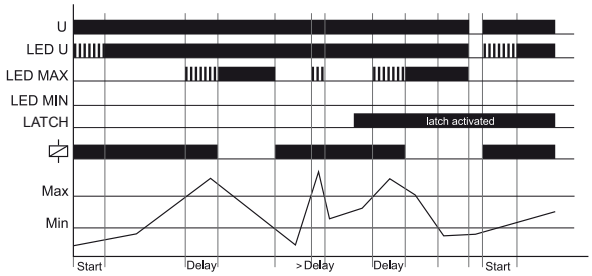
**9. Ambient conditions**

| | |
|---|---|
| Ambient temperature: | -25 to +55°C (according to IEC 68-1)<br>-25 to +40°C (according to UL 508) |
| Storage temperature: | -25 to +70°C |
| Transport temperature: | -25 to +70°C |
| Relative humidity: | 15% to 85%<br>(according to IEC 721-3-3 class 3K3) |
| Pollution degree: | 3 (according to IEC 60664-1) |
| Vibration resistance: | 10 to 55Hz 0.35mm<br>(according to IEC 68-2-6) |
| Shock resistance: | 15g 11ms (according to IEC 68-2-27) |

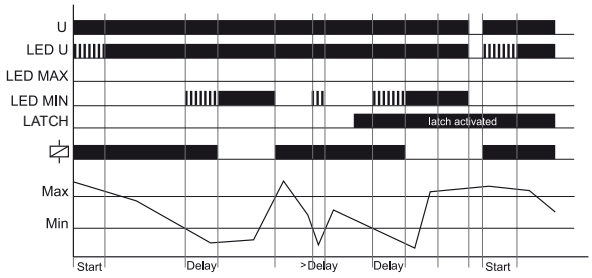
# Functions

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.

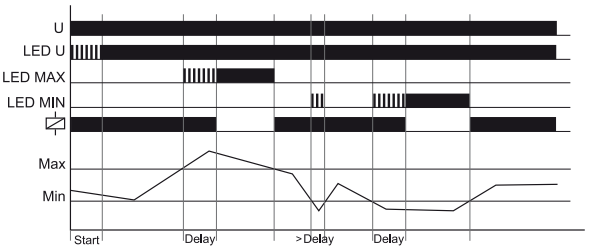
**Overcurrent monitoring (OVER, OVER+LATCH)**
When the measured current exceeds the value adjusted at the MAX-regulator, the set interval of the tripping delay (DELAY) begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated), the output relays switch into off-position (yellow 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).



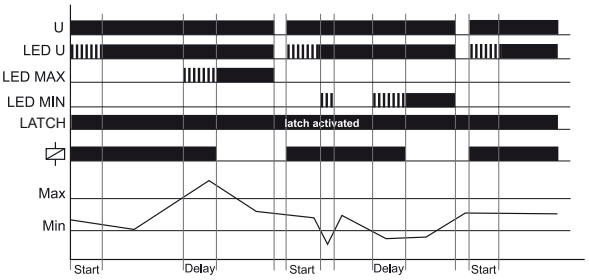

**Undercurrent monitoring (UNDER, UNDER+LATCH)**
When the measured current falls below the value adjusted at the MIN-regulator, the set interval of the tripping delay (DELAY) begins (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relays switch into off-position (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).

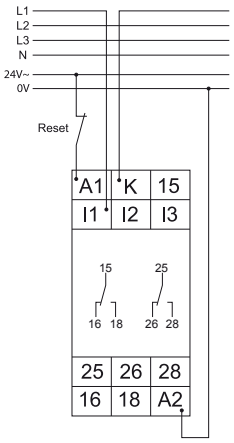



If the fault latch is activated (WIN+LATCH) and the measured current remains below the MIN-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured current exceeds the value adjusted at the MIN-regulator. If the measured current remains 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).

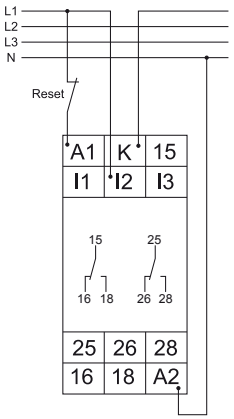


# Connections

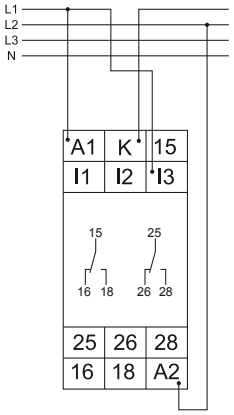
Range 100mA with power modul 24V AC and fault latch




Range 1A with power modul 230V AC and fault latch




Range 10A with power modul 400V AC without fault latch




# Dimensions