



Monitoring relays - GAMMA series
Multifunction
16.6 to 400Hz
Fault latch
Zoom voltage 24 to 240V a.c./d.c.
2 change-over 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 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 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: | 24 to 240V a.c./d.c. | terminals A1-A2 (galvanically separated) |
| Tolerance: | 24 to 240V d.c. | -20% to +25% |
| | 24 to 240V a.c. | -15% to +10% |
| Rated frequency: | 24 to 240V a.c. | 48 to 400Hz |
| | 48 to 240V d.c. | 16 to 48Hz |
| Rated consumption: | | 4.5VA (1W) |
| Duration of operation: | | 100% |
| Reset time: | | 500ms |
| Wave form for a.c.: | | Sinus |
| Residual ripple for d.c.: | | 10% |
| Drop-out voltage: | | >15% of the supply voltage |
| Overvoltage category: | | III (in accordance with IEC 60664-1) |
| Rated surge voltage: | | 4kV |

6. Output circuit

| | |
|---------------------------------------|--|
| 2 potential free change-over 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 a.c. Sinus (16.6 to 400Hz) |
| Input: | |
| 100mA a.c./d.c. | terminals K-1(+) |
| 1A a.c./d.c. | terminals K-2(+) |
| 10A a.c./d.c. | terminals K-3(+) |
| | (distance >5mm) |
| Overload capacity: | |
| 100mA a.c./d.c. | 800mA |
| 1A a.c./d.c. | 3A |
| 10A a.c./d.c. | 12A |
| Input resistance: | |
| 100mA a.c./d.c. | 470mΩ |
| 1A a.c./d.c. | 47mΩ |
| 10A a.c./d.c. | 5mΩ |
| 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: | ≤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

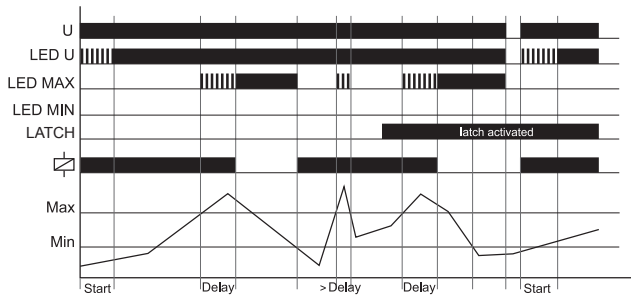
| | |
|------------------------|---|
| Ambient temperature: | -25 to +55°C (in accordance with IEC 60068-1) |
| | -25 to +40°C (in accordance with UL 508) |
| Storage temperature: | -25 to +70°C |
| Transport temperature: | -25 to +70°C |
| Relative humidity: | 15% to 85% |
| | (in accordance with IEC 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 6068-2-27) |

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.

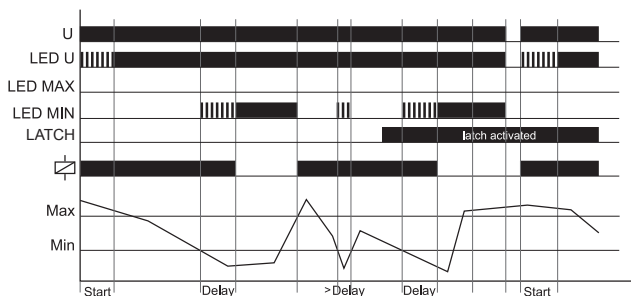
Overcurrent monitoring (OVER, OVER+LATCH)

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).



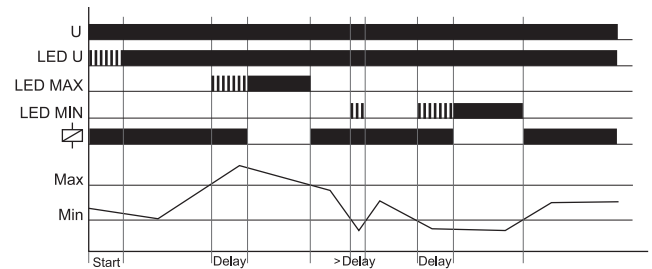
Undercurrent monitoring (UNDER, UNDER+LATCH)

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).

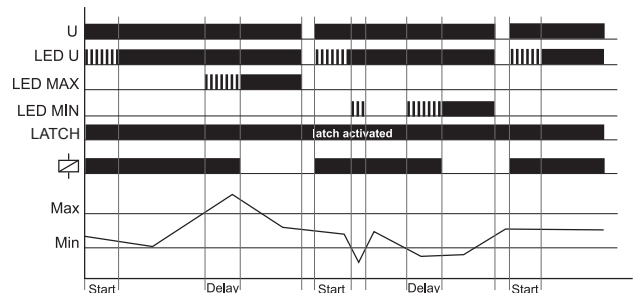


Window function (WIN, WIN+LATCH)

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).

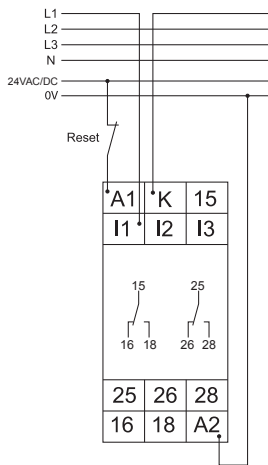


If the fault latch is activated (WIN+LATCH) and the measured current remains below the MIN-value longer than the set interval of the tripping delay, the output relays remain in the off-position even if the measured current exceeds the value adjusted at the MIN-regulator. If the measured current remains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

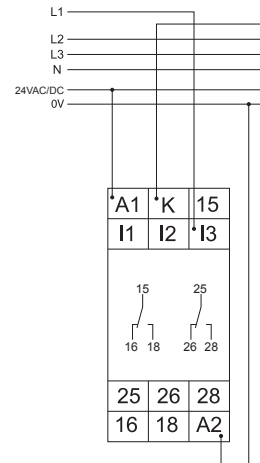


Connections

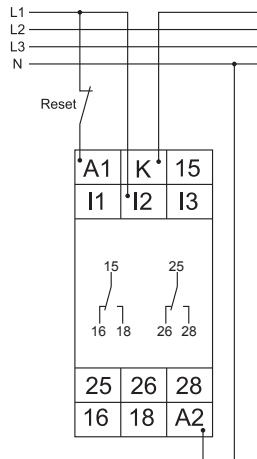
Range 100mA, supply voltage 24V a.c./d.c. and fault latch



Range 10A, supply voltage 24V a.c./d.c. without fault latch



Range 1A, supply voltage 230V a.c. and fault latch



Dimensions

