



- Loadmonitors - GAMMA series
- Multifunction
- Fault latch
- Recognition of disconnected consumers
- Suitable for VFI (10 to 100Hz)
- Supply voltage selectable via power modules
- 1 change-over contact
- Width 22.5mm
- Industrial design



Technical data

1. Functions

True power monitoring in 1- or 3-phase mains with adjustable threshold, fixed hysteresis, timing for start-up suppression and tripping delay separately adjustable, fault latch and the following functions (selectable by means of rotary switch)

OVER+I=0	Overload monitoring with recognition of disconnected consumers (Rel.ON if I=0)
OVER+I=0	Overload monitoring with recognition of disconnected consumers (Rel.OFF if I=0)
UNDER	Underload monitoring
UNDER+I=0	Underload monitoring with recognition of disconnected consumers (Rel.ON if I=0)

2. Time ranges

	Adjustment range
Start-up suppression time:	0.1s 2s
Tripping delay:	0.1s 2s

3. Indicators

Green LED ON:	indication of supply voltage
Green LED flashes:	indication of start-up suppression time
Yellow LED R ON/OFF:	indication of relay output
Yellow LED I=0 ON/OFF:	indication of disconnected consumers
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 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 (in accordance with IEC 60664-1)
 Rated surge voltage: 4kV

6. Output circuit

1 potential free change-over contact
 Rated voltage: 250V AC
 Switching capacity: 750VA (3A / 250V AC)
 If the distance between the devices is less than 5mm!
 Switching capacity: 1250VA (5A / 250V AC)
 If the distance between the devices is greater than 5mm!
 Fusing: 5A fast acting
 Mechanical life: 20 x 10⁶ operations
 Electrical life: 2 x 10⁵ 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)
 III (in accordance with IEC 60664-1)
 4kV
 Overvoltage category:
 Rated surge voltage: 4kV

7. Measuring circuit

Measuring range P_N: 0.5, 1, 2 and 4kW selectable
 Wave form
 AC Sinus: 10 to 400Hz
 Sinus-weighted PWM: 10 to 100Hz
 Measuring-input voltage: terminals L1-L2-L3
 1-phase mains 0 to 230V AC
 3-phase mains 3~ 0 to 415/240V
 Overload capacity:
 1-phase mains 300V AC
 3-phase mains 3~ 500/289V
 Input resistance: 2MΩ
 Measuring-input current: terminals i-k
 Power range 0.5, 1kW: 0 to 6A
 Power range 2, 4kW: 0 to 12A (for I>8A distance >5mm)
 Overload capacity: 12A permanently
 Input resistance: <10mΩ
 Switching threshold: 5% to 120% of P_N
 Hysteresis: fixed, approx. 3% of P_N
 Overvoltage category: III (in accordance with IEC 60664-1)
 Rated surge voltage: 4kV

8. Control contact Y (equipotential with measuring circuit)

Function: fault latch (Y1-Y2 bridged)
 Loadable: No
 Line length Y1-Y2: max. 10m (twisted pair)
 Control pulse length: -
 Reset: normally closed contact in the input circuit

9. Accuracy

Base accuracy: ±2% (of maximum scale value)
 Frequency response: ±0.025% / Hz
 Adjustment accuracy: ≤5% (of maximum scale value)
 Repetition accuracy: ±2%
 Voltage influence: -
 Temperature influence: ≤0.2% / °C

Technical data

10. Ambient conditions

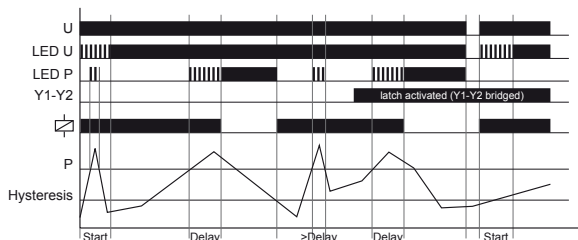
Ambient temperature:	-25 to +55°C (in accordance with IEC 60068-1)
	-25 to +40°C (in accordance with UL 508)
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85%
	(in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	3 (in accordance with IEC 60664-1)
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 R and LED I=0 illuminated) and the set interval of the start-up suppression (START) begins (green LED U flashes). Changes of the measured true power during this period do not affect the state of the output relay. After the interval has expired the green LED is illuminated steadily.

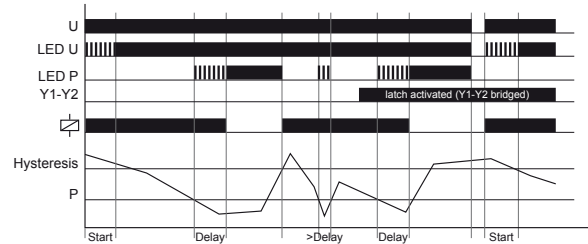
Overload monitoring (OVER)

When the measured true power exceeds the value adjusted at the PN-regulator, the set interval of the tripping delay (DELAY) begins (red LED P flashes). After the interval has expired (red LED P illuminated), the output relay switches into off-position (yellow LED R not illuminated). The output relay again switches into on-position (yellow LED R illuminated), when the measured true power falls below the value adjusted at the PN-regulator by more than the fixed hysteresis (red LED P not illuminated). If the fault latch is activated (bridge Y1-Y2) and the measured true power remains above the MAX-value longer than the set interval of the tripping delay, the output relay remains in the off-position even if the measured true power falls below the value adjusted at the PN-regulator by more than the fixed hysteresis. After resetting the failure (interrupting and re-applying the supply voltage), the output relay switches into on-position and a new measuring cycle begins with the set interval of the start-up suppression (START).



Underload monitoring (UNDER)

When the measured true power falls below the value adjusted at the PN-regulator, the set interval of the tripping delay (DELAY) begins (red LED P flashes). After the interval has expired (red LED P illuminated), the output relay switches into off-position (yellow LED R not illuminated). The output relay again switches into on-position (yellow LED R illuminated), when the measured true power exceeds the value adjusted at the PN-regulator by more than the fixed hysteresis. If the fault latch is activated (bridge Y1-Y2) and the measured true power remains below the PN-value longer than the set interval of the tripping delay, the output relay remains in the off-position even if the measured true power exceeds the value adjusted at the PN-regulator by more than the fixed hysteresis. After resetting the failure (interrupting and re-applying the supply voltage), the output relay switches into on-position and a new measuring cycle begins with the set interval of the start-up suppression (START).



Recognition of disconnected consumers (I=0)

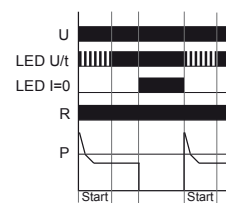
Overview:

Function	OVER		UNDER	
	O+I<	O+I<	U+I<	U
Detection I=0	yes	yes	yes	no
Relais if I=0	on	off	on	off
LED I=0 if I=0	on	on	on	off

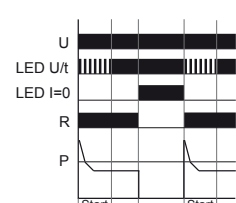
When the current flow between i and k is interrupted and no fault has been stored, the output acts as shown in the table.

When the current flow is restored, the measuring cycle is restarted with the set interval of the start-up suppression (START).

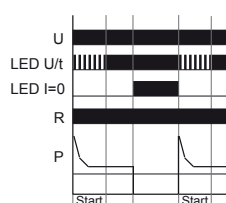
OVER + I<



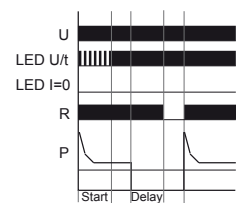
OVER + I<



UNDER + I<

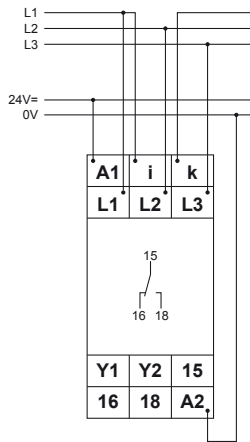


UNDER

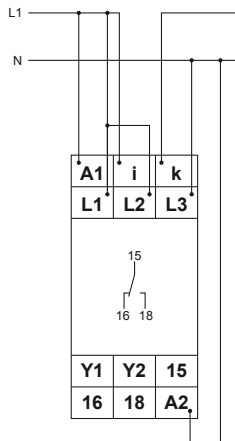


Functions

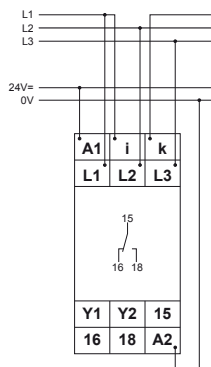
Connected to 3~ 400V mains with power module 24V AC without fault latch
 $I_N < 12A$



Connected to 1~ 230V mains with power module 230V AC without fault latch
 $I_N < 12A$

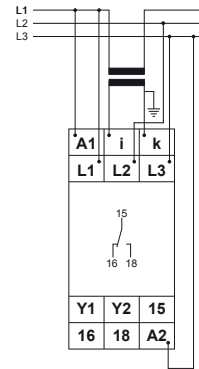


Connected to 3~ 400V mains with power module SNT2 24V DC without fault latch
 $I_N < 12A$

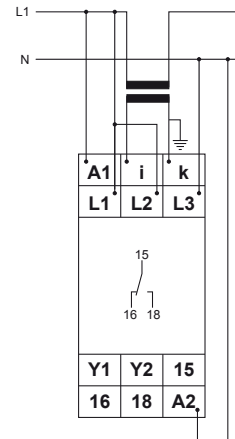


Connections

Connected to 1~ 230V mains with power module 230V AC without fault latch
 $I_N > 12A$



Connected to 1~ 230V mains with power module 230V AC without fault latch
 $I_N > 12A$



Dimensions

