

True power monitoring of 1- or 3-phase loads

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 of 1- or 3-phase loads with adjustable threshold, fixeded hysteresis, timing for start-up suppression and tripping delay separately adjustable, fault latch and the following functions which are 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

Start-up suppression time:

Only

3. Indicators

Green LED ON: indication of supply voltage
Green LED flashes: indication of start-up supression 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 1.5mm 2 with/without multicore cable end 2 x 2.5mm 2 flexible without multicore cable end

5. Input circuit Supply voltage:

12 to 440V AC terminals A1-A2 (galvanically separated)
24V DC selectable via power modules TR2 or

switching power supply SNT2
Tolerance: according to specification of power module or switching power supply
Rated frequency: according to specification of power

module or switching power supply
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: 20×10^6 operations
Electrical life: 2×10^5 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

Measuring range PN: 0.75, 1.5, 3 and 6kW 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 480V AC
3-phase mains 3~ 0 to 480/277V

Overload capacity:

 $\begin{array}{lll} \text{1-phase mains} & 550 \text{V AC} \\ \text{3-phase mains} & 3 \sim 550/318 \text{V} \\ \text{Input resistance:} & 2M\Omega \\ \text{Measuring-input current:} & \text{terminals i-k} \\ \text{Power range 0.75, 1.5kW:} & 0 \text{ to 6A} \\ \end{array}$

Power range 3, 6kW: 0 to 12A (for I>8A distance >5mm)

 $\begin{array}{lll} \text{Overload capacity:} & 12\text{A permanently} \\ \text{Input resistance:} & <10\text{m}\Omega \\ \text{Switching threshold:} & 5\% \text{ to } 120\% \text{ of } P_{_N} \\ \text{Hysteresis:} & \text{fixed, approx. } 3\% \text{ of } P_{_N} \\ \end{array}$

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: -25 to +70°C
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

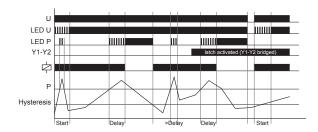
(in accordance with IEC 60068-2-27)

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.

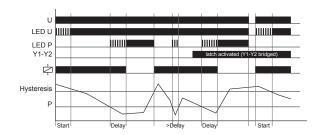
Overload monitoring (OVER)

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 fixeded 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 fixeded 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 fixeded 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 fixeded 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)

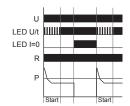
Overview:

Function	OVER		UNDER	
	0+l<	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

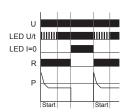
When the current flow between i and k is interrupted and no fault has been stored, the output acts as shown in the table.

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

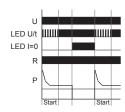




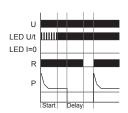
OVER + I<



UNDER + I<

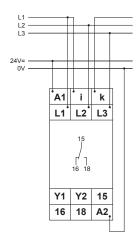


UNDER

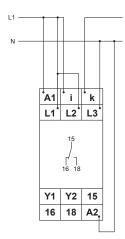


Functions

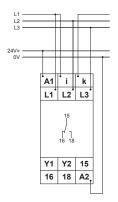
Connected to 3~ 400V mains with power module 24V AC without fault latch $\mathbf{l_{u}} \mathbf{<} 12\mathbf{A}$



Connected to 1~ 230V mains with power module 230V AC without fault latch $\rm I_{N}{<}12A$

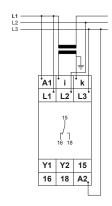


Connected to 3~ 400V mains with power module 400V AC without fault latch $\mathbf{I_{N}} \!\!<\! \mathbf{12A}$

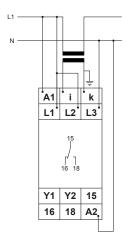


Connections

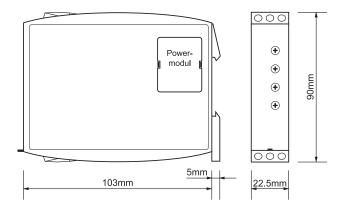
Connected to 1~ 230V mains with power module 230V AC without fault latch $\mathbf{I_{u}} \mathbf{>} 12\mathbf{A}$



Connected to 1~ 230V mains with power module 230V AC without fault latch $\rm I_{\rm N}{>}12A$



Dimensions



RELEASE 2010/01

Subject to alterations and errors

