

- ▶ True power monitoring in 1- or 3-phase mains
- ▶ 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 flashing:	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 flashing:	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 2.5mm<sup>2</sup> with/without multicore cable end  
 1 x 4mm<sup>2</sup> without multicore cable end  
 2 x 0.5 to 1.5mm<sup>2</sup> with/without multicore cable end  
 2 x 2.5mm<sup>2</sup> flexible without multicore cable end

### 5. Input circuit

Supply voltage: 12 to 400V AC terminals A1-A2 (galvanically separated) selectable via power modules TR2 according to specification of power module  
 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

1 potential free change-over contact  
 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<sup>6</sup> operations  
 Electrical life: 2 x 10<sup>5</sup> operations at 1000VA resistive load  
 max. 60/min at 100VA resistive load  
 max. 6/min at 1000VA resistive load (according to IEC 947-5-1)  
 Switching frequency: III (according to IEC 60664-1)  
 Overvoltage category: III (according to IEC 60664-1)  
 Rated surge voltage: 4kV

### 7. Measuring circuit

Measuring range P<sub>N</sub>: 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<sub>N</sub>  
 Hysteresis: fixeded, approx. 3% of P<sub>N</sub>  
 Overvoltage category: III (according to 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 (according to IEC 68-1)
	-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% (according to IEC 721-3-3 class 3K3)

Pollution degree:	3 (according to IEC 60664-1)
Vibration resistance:	10 to 55Hz 0.35mm (according to IEC 68-2-6)
Shock resistance:	15g 11ms (according to IEC 68-2-27)

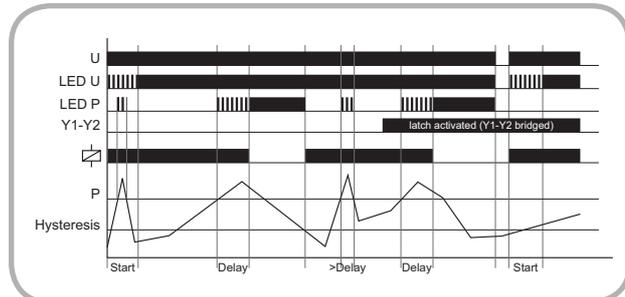
## Functions

When the supply voltage U is applied, the output relays switch into on-position (yellow LED 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  $P_N$ -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  $P_N$ -regulator by more than the fixed hysteresis (red LED P not illuminated).

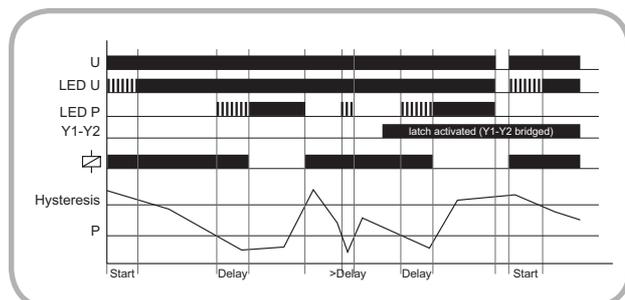
If the fault latch is activated (bridge Y1-Y2) and the measured true power remains above the MAX-value longer than the set interval of the tripping delay, the output relay remains in the off-position even if the measured true power falls below the value adjusted at the  $P_N$ -regulator by more than 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  $P_N$ -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  $P_N$ -regulator by more than the fixed hysteresis.

If the fault latch is activated (bridge Y1-Y2) and the measured true power remains below the  $P_N$ -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  $P_N$ -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).



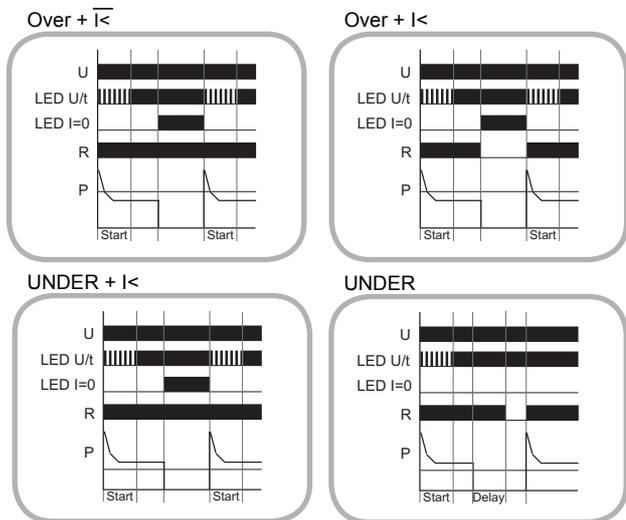
### Recognition of disconnected consumers (I=0)

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

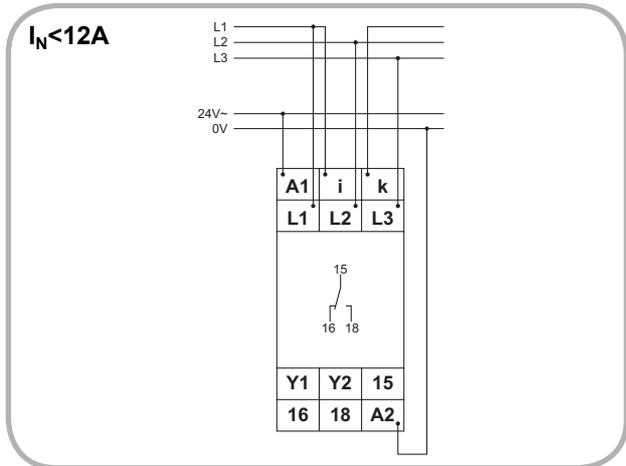
When the current flow between i and k is interrupted and no fault has been stored, the output acts as shown in the table.

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

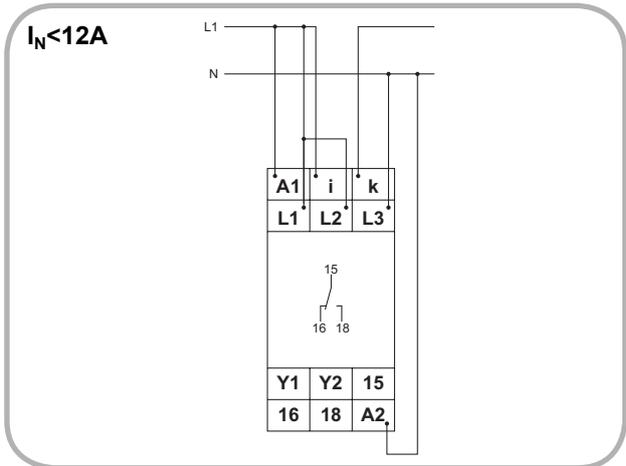


# Connections

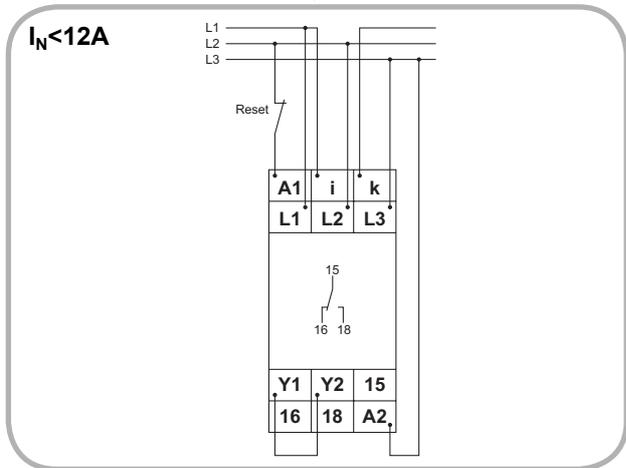
Connected to 3~ 400V mains with power module 24V AC without fault latch



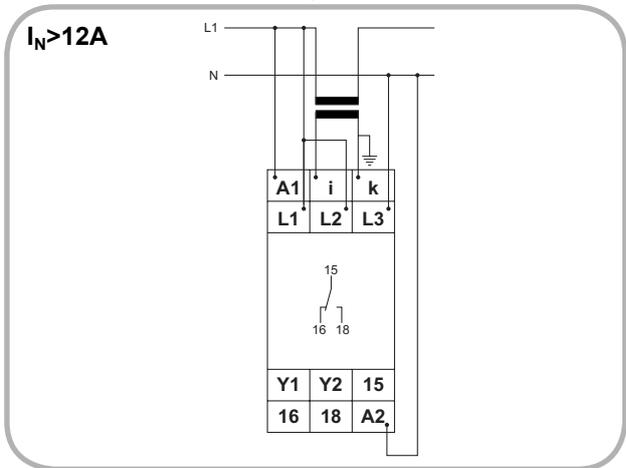
Connected to 1~ 230V mains with power module 230V AC without fault latch



Connected to 3~ 400V mains with power module 400V AC and fault latch

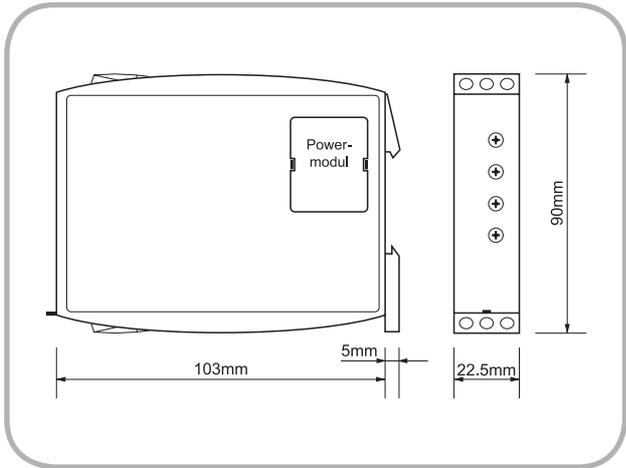
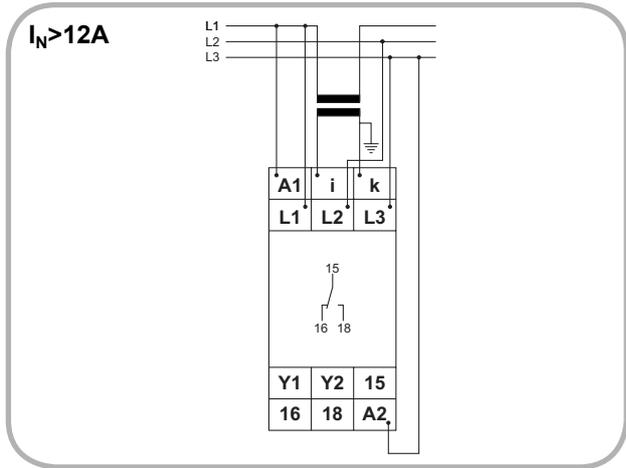


Connected to 1~ 230V mains with power module 230V AC without fault latch



# Dimensions

Connected to 3~ 400V mains with power module 400V AC without fault latch



Subject to alterations and errors

G2BM400V12AFL10

 **Notes**

Subject to alterations and errors