

- ▶ Power factor monitoring ($\cos\varphi$) in 1- or 3-phase mains
- ▶ Underload monitoring
- ▶ 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

Underload monitoring ($\cos\varphi$) in 1- or 3-phase mains with adjustable threshold, fixed hysteresis, timing for start-up suppression and tripping delay separately adjustable and the following functions (selectable by means of rotary switch)

UNDER Underload monitoring
 UNDER+LATCH Underload monitoring with fault latch

2. Time ranges

	Adjustment range	
Start-up suppression time:	1s	100s
Tripping delay:	0.1s	40s

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
Red LED flashes:	of the corresponding threshold
	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

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 10⁶ operations
 Electrical life: 2 x 10⁵ 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)
 Overvoltage category: III (according to IEC 60664-1)
 Rated surge voltage: 4kV

7. Measuring circuit

Measured variable: AC Sinus (10 to 100Hz)
 Measuring-input voltage:
 1-phase mains 40 to 415V AC (max. 300V against ground) terminals L1i-L2/L3
 3-phase mains 3~ 40/23 to 415/240V, terminals L1i-L2-L3
 Overload capacity:
 1-phase mains 500V
 3-phase mains 3~ 500/289V
 Input resistance: ≥1MΩ
 Measuring-input current: 0.5 to 10A, terminals L1i-L1k (for I>8A distance >5mm)
 12A permanently
 Overload capacity: 5mΩ
 Input resistance: 0.1 to 1.0
 Switching threshold $\cos\varphi$: fixed, approx. 3°
 Hysteresis: (equivalent to 3% at $\cos\varphi = 0.8$)
 Overvoltage category: III (according to IEC 60664-1)
 Rated surge voltage: 4kV

8. Accuracy

Base accuracy: ±5% (equivalent to 5% at $\cos\varphi = 0.8$)
 Frequency response: -
 Adjustment accuracy: ≤5% (at $\cos\varphi = 0.8$)
 Repetition accuracy: ±1.8° (equivalent to 1.8% at $\cos\varphi = 0.8$)
 Voltage influence: -
 Temperature influence: ≤0.1% / °C

9. Ambient conditions

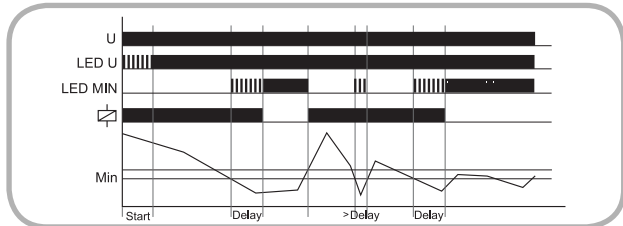
Ambient temperature: -25 to +55°C (according to IEC 68-1)
 -25 to +40°C (according to UL 508)
 Storage temperature: -25 to +70°C
 Transport temperature: -25 to +70°C
 Relative humidity: 15% to 85% (according to IEC 721-3-3 class 3K3)
 3 (according to IEC 60664-1)
 Pollution degree: 10 to 55Hz 0.35mm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

Functions

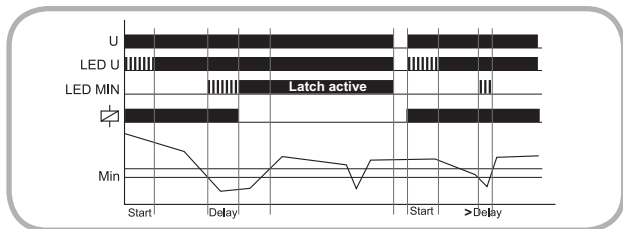
When the supply voltage U is applied, the output relay switches into on-position (yellow LED R and I=0 illuminated) and the set interval of the start-up suppression (START) begins (green LED U flashes). Changes of the measured power factor ($\cos\phi$) during this period do not affect the state of the output relay. After the interval has expired the green LED U is illuminated steadily and the yellow LED I=0 is not illuminated.

Underload monitoring (UNDER, UNDER+LATCH)

When the measured power factor 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 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 power factor exceeds the value adjusted at the MIN-regulator by more than the fixed hysteresis.



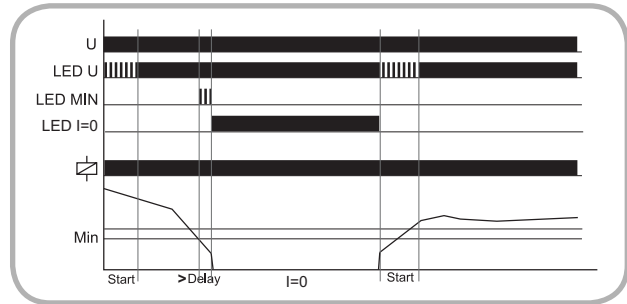
If the fault latch is activated (UNDER+LATCH) and the measured power factor remains below the MIN-value longer than the set interval of the tripping delay, the output relay remains in the off-position even if the measured power factor exceeds the value adjusted at the MIN-regulator by more than the fixed 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.



Recognition of disconnected consumers

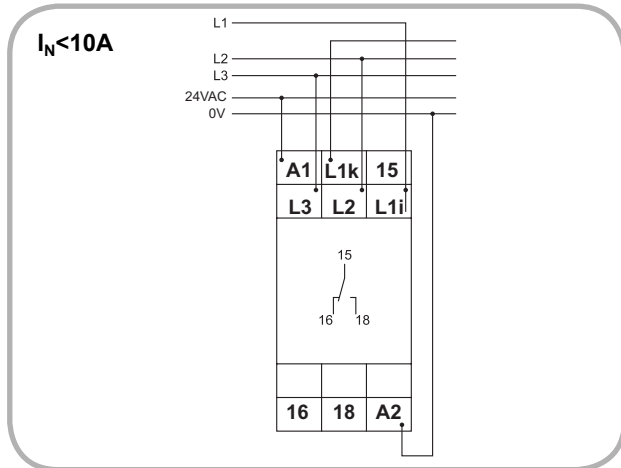
When the current flow between L1i and L1k (yellow LED I=0 illuminated) is interrupted and no fault has been stored the output relay switches into on-position resp. remains in on-position (yellow LED R illuminated).

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

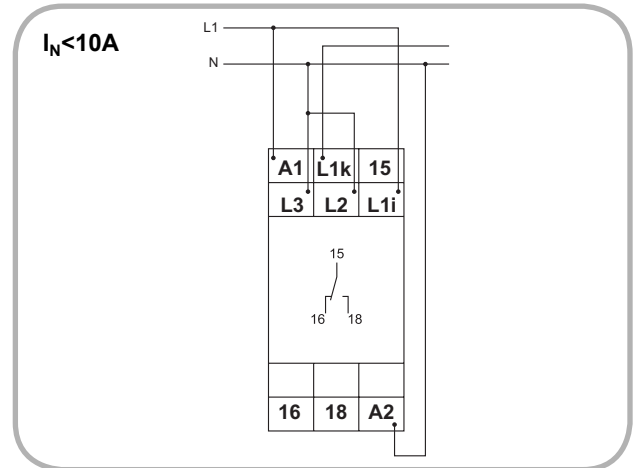


Connections

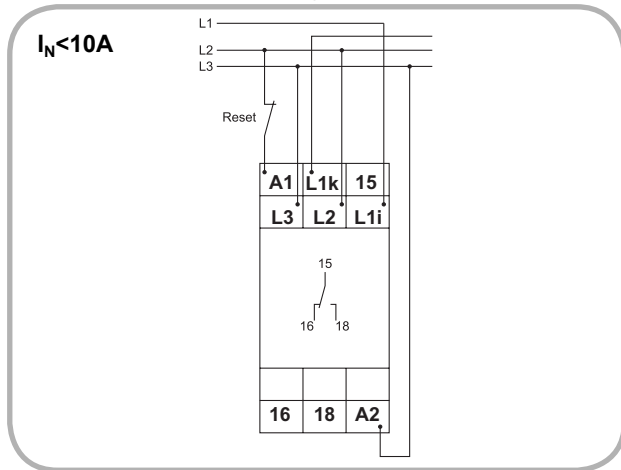
Connected to 3~ 400V mains with power module 24V AC without fault latch



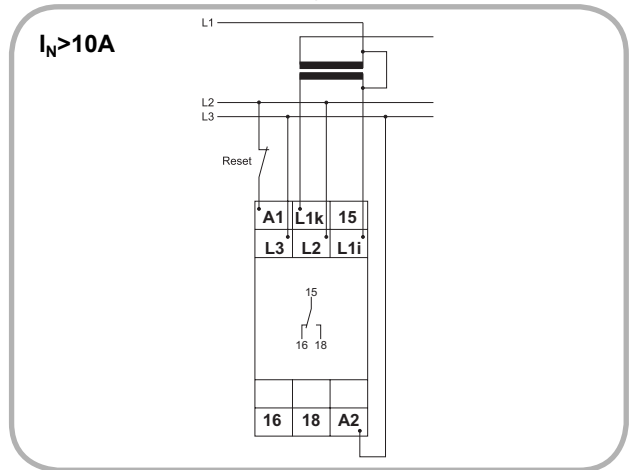
Connected to 1~ 230V mains with power module 230V AC without fault latch



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

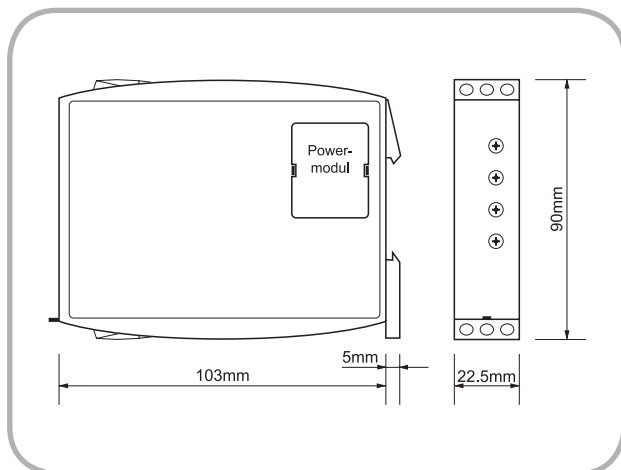


Connected to 3~ 400V mains with power module 400V AC and fault latch



Subject to alterations and errors

Dimensions



G2CU400V10AL10

 **Notes**

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