Frequency- and voltage monitoring

G2PM400VFA02 50Hz

Monitoring relays - GAMMA series

in 3 phase mains following EN50438

Detection of off-grid operation

Quick net error recognition

Connection of neutral wire necessary

Supply voltage selectable via power modules or switching power supply

2 change over contacts

Width 22.5mm

Industrial design

Technical data

1. Functions
Frequency monitoring in Phase L1 with fixed ON-Delay and adjustable thresholds.

WIN_F (Frequency)	Monitoring the window between Min and Max

Voltage monitoring in 3 phase mains with fixed ON-Delay, adjustable thresholds and detection of off grid operation.

WIN_V (Voltage)	Monitoring the window between Min and Max

Adjustable 10 minutes average threshold.

2. Time ranges

	Adjustment range
ON-Delay:	fixed, 1s
OFF-Delay:	
U ≤ Umin	< 200ms
U ≥ Umax	< 200ms
f ≤ Fmin	< 200ms
f ≥ Fmax	< 200ms

3. Indicators
3.1 Indicators for voltage monitoring

Red LED $U_{Average}$ ON:	One of the 3 phases (L-N) has exceeded the 10 minutes-average
Red LED $U_{Failure}$ ON:	One of the 3 phases (L-N) has exceeded the adjusted threshold

3.2 Indicators for off grid operation

Red LED Loss of mains ON:	indication of failure

3.3 Indicators for frequency monitoring

Red LED $f_{Failure}$ ON:	The frequency has exceeded the adjusted threshold

3.4 Indicators for relay outputs

Yellow LED ON/OFF:	indication of relay output

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
Terminals 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:

12V to 400V a.c.	terminals A1-A2 (galvanically separated) selectable via power module type TR2
Tolerance:	according to specification of power module
Rated frequency:	according to specification of power module

Supply voltage:

24V DC	terminals A1-A2 (galvanically separated) selectable via switching power supply type SNT2
Tolerance:	according to specification of switching power supply
Rated frequency:	according to specification of switching power supply
Rated consumption:	2VA (1.5W)
Duty cycle:	100%
Reset time:	85ms
Residual ripple of DC:	-
Drop-out voltage:	>30% of 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

Fusing:	max. 20A (in accordance with UL 508)
Frequency monitoring	
Measured variable:	frequency of phase L1
Measurement input:	
50Hz	terminal N-L1
Switching threshold:	
Max:	50.2, 50.3, 50.5, 51.0, 51.5, 52.0, 52.5, 53.0Hz
Min:	47.0, 47.5, 48.0, 48.5, 49.0, 49.5, 49.7, 49.8Hz
Voltage monitoring	
Measured variable:	a.c. Sinus
Measured input:	
230V a.c.	terminals N-L1, N-L2, N-L3
Overload capacity:	
230V a.c.	440V a.c.
Input resistance:	
3N~ 400/230V	1MΩ
Switching threshold U_S:	
Max:	105, 107.5, 110, 112.5, 115, 117.5, 120, 122.5, 125, 127,5% of U_N
Min:	72.5, 75, 77.5, 80, 82.5, 85, 87.5, 90, 92.5, 95% of U_N

Technical data

10 minutes average:	OFF, 110, 111, 112, 113, 114, 115, 120% of U_N
Off-grid operation	
Measured variable:	a.c. Sinus
Measured input:	
3N~ 400/230V	terminals N-L1-L2-L3
Overload capacity:	
3N~ 400/230V	3N~ 600/346V
Input resistance:	
3N~ 400/230V	1MΩ
Switching threshold U_S:	
Max:	105, 107.5, 110, 112.5, 115, 117.5, 120, 122.5, 125, 127,5% of U_N
Min:	72.5, 75, 77.5, 80, 82.5, 85, 87.5, 90, 92.5, 95% of U_N
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

8. Accuracy

Base accuracy:	≤2%
Adjustment accuracy:	-
Repetition accuracy:	≤1%
Voltage influence:	-
Temperature influence:	≤0.05% / °C ≤0.001Hz / °C

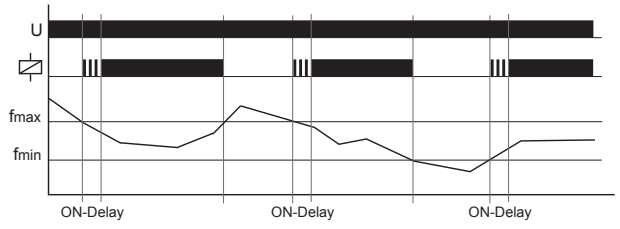
9. Ambient conditions

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 bis 55Hz 0.35mm (in accordance with IEC 60068-2-6)
Shock resistance:	15g 11ms (in accordance with IEC 60068-2-27)

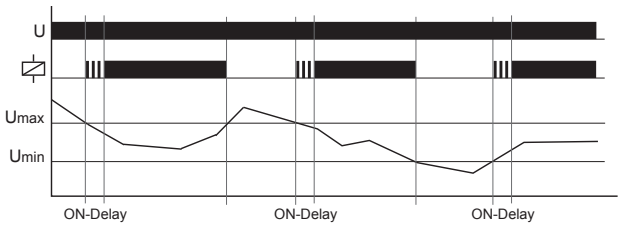
Functions

If a failure already exists when the device is activated, the output relay R remains in the OFF position and the red LEDs $U_{Failure}$, $f_{Failure}$, $U_{Loss\ of\ mains}$ illuminate. The monitoring of frequency and voltage works parallel. In addition, the voltage quality is measured too.

Window function WIN_F (Frequency):
When the supply voltage U is applied, the output relay R switches into the ON position after the set interval of the tripping delay (ON-Delay) has expired and if the frequency is within the adjusted window. As soon as the frequency leaves the acceptance region, the output relay R switches into the OFF position.
The output relay R switches into the ON position again (yellow LED illuminated), after the frequency re-enters the acceptance region and the tripping delay (ON-Delay) has expired.



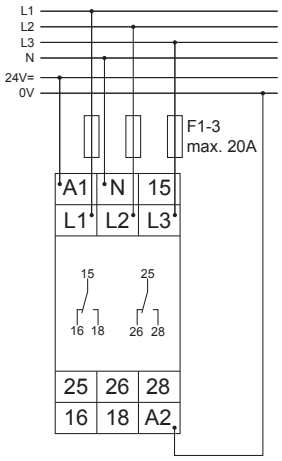
Window function WIN_V (Voltage):
When the supply voltage U is applied, the output relay R switches into the ON position after the set interval of the tripping delay (ON-Delay) has expired and if the voltage is within the adjusted window. As soon as the voltage leaves the acceptance region, the output relay R switches into the OFF position.
The output relay R switches into the ON position again after the voltage reenters the acceptance region and the tripping delay (ON-Delay) has expired.



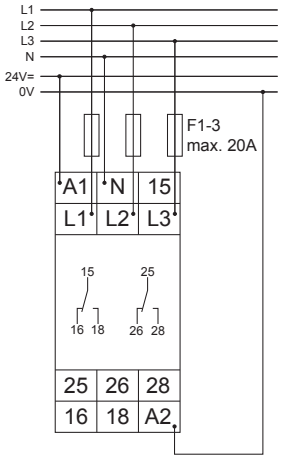
10 minutes average
The 10 minute average value is used for monitoring the voltage quality. The floating average over 10 minutes will be measured for each input phase. The output relay R switches into the OFF position if the floating average is exceeded. The output relay R switches into the ON position again after the floating average re-enters the acceptance region and the tripping delay (ON-Delay) has expired.

Connections

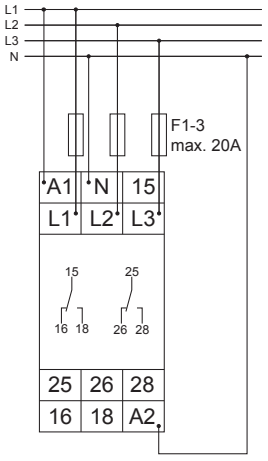
G2PM400VFA02 with power module TR2 24V a.c.



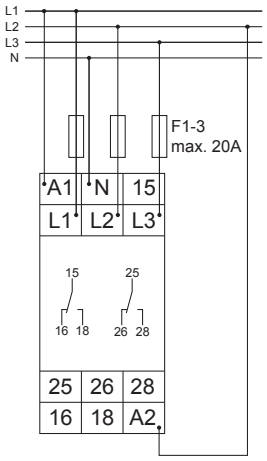
G2PM400VFA02 with switching power supply SNT2 24V d.c.



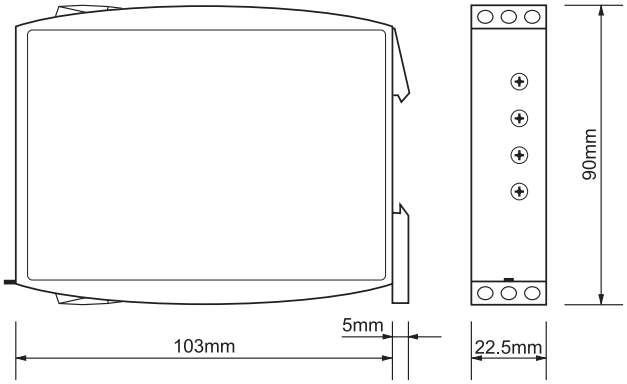
G2PM400VFA02 with power module TR2 230V a.c.



G2PM400VFA02 with power module TR2 400V a.c.



Dimensions



RELEASE 2011/03

Subject to alterations and errors

Technik Braucht Kontrolle