



Monitoring relays - GAMMA series

in 3-phase mains in accordance with VDE 0126-1-1/A1 VFR13

Quick net error recognition

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 in accordance with VDE 0126-1-1/A1 VFR13 with fixed ON-Delay and fixed thresholds.

WIN_f (Frequency) Monitoring the window between Min and Max

Voltage monitoring in 3-phase mains in accordance with VDE 0126-1-1/A1 VFR13 with fixed ON-Delay, fixed thresholds and adjustable 10-minutes-average.

WIN_v (Voltage) Monitoring the window between Min and Max

2. Time ranges

	Adjustment range
ON-Delay:	fixed, 30s
OFF-Delay:	
$U \leq 80\%$ of UN	< 200ms
$U \geq 115\%$ of UN	< 200ms
$f \leq 47.5$	< 200ms
$f \geq 50.4$	< 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 $U_{Average}$ flashes: One of the 3-phases current values (L-N) has exceeded the adjustable threshold

Red LED $U_{Failure}$ ON: One of the 3-phases (L-N) is beyond the fixed voltage thresholds

3.2 Indicators for frequency monitoring

Red LED $>f$ ON: indication of failure for maximum threshold

Red LED $<f$ ON: indication of failure for minimum threshold

Red LED $>f$ and $<f$ ON: invalid measurement voltage to phase L1

3.3 Indicators for relay outputs

Yellow LED ON/OFF: indication of relay output

Yellow LED flashes: indication of ON-Delay

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 d.c.	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 AC
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:	terminal N-L1
50Hz	
Switching threshold:	
Max:	50.4Hz
Min:	47.5Hz
Voltage monitoring	
Measured variable:	a.c. Sinus
Measurement input:	terminals N-L1, N-L2, N-L3
230V a.c.	
Overload capacity:	440V a.c.
230V a.c.	
Input resistance:	1M Ω
3N~ 400/230V	
Switching threshold U_s :	
Max:	115% of U_N (264.5V)
Min:	80% of U_N (184V)
10-minutes-average:	+10% to +15% of U_N
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

Technical data

8. Accuracy

Base accuracy:	≤2%
Adjustment accuracy:	-
Repetition accuracy:	≤1%
Voltage influence:	-
Temperature influence:	≤0.05% / °C
	≤0.01Hz / °C

9. Ambient conditions

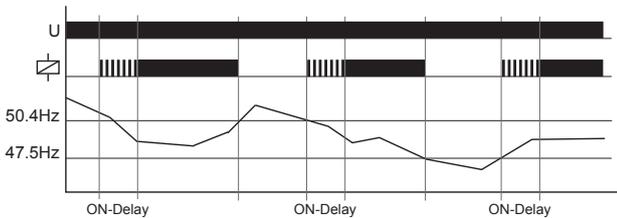
Ambient temperature:	-25 to +55°C (in accordance with IEC 60068-1)
	-25 to +40°C (in accordance with UL 508)
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	3 (in accordance with IEC 60664-1)
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 off-position and the red LEDs $>f$, $<f$ and $U_{Failure}$ illuminate. The monitoring of frequency and voltage is parallel to the fixed thresholds of the window function. In addition, the voltage quality is measured too.

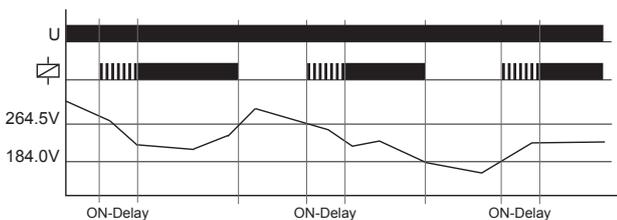
Window function WIN_f (Frequency):

When the supply voltage U is applied, the output relay R switches into on-position after the set interval of the tripping delay (ON-Delay) has expired and if the frequency is within the fixed adjusted window. As soon as the frequency exceeds or leaves the adjusted range, the output relay R switches into off-position. The output relay R switches into on-position again (yellow LED illuminated), after the frequency reenter the adjusted window and interval of 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 on-position after the set interval of the tripping delay (ON-Delay) has expired and if the measured voltage is within the fixed adjusted window. When the measured voltage leaves the window between the fixed adjusted range, the output relay R switches into off-position. As soon as the voltage reenter the adjusted window, the output relay R switches into on-position after the set interval of the tripping delay (ON-Delay) has expired.

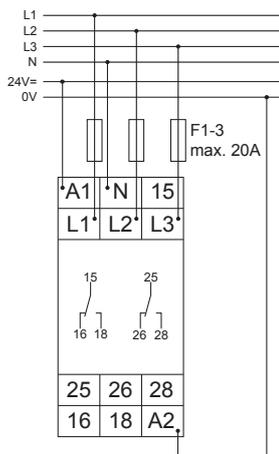


10-minutes-average

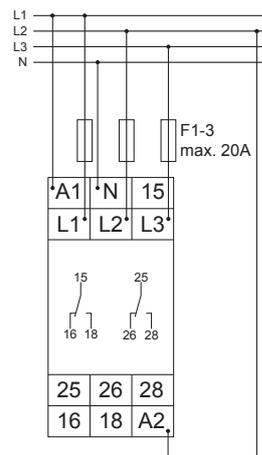
The 10-minute average value is used for monitoring the voltage quality. A floating average over 10 minutes will be measured at each input voltage. The output relay R switches into off-position if the floating average is exceeded.

Connections

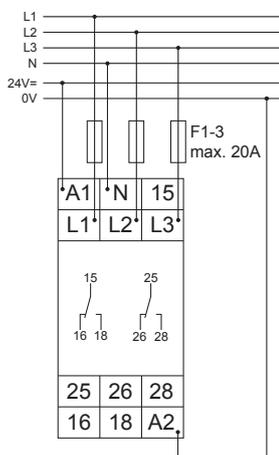
G2VFR13 with power module TR2 24V a.c.



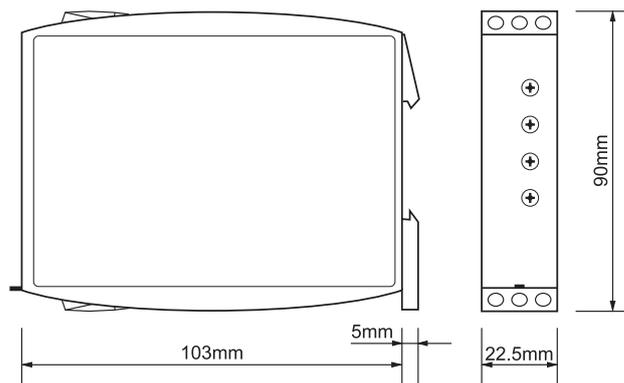
G2VFR13 with power module TR2 400V a.c.



G2VFR13 with switching power supply SNT2 24V a.c.



Dimensions



G2VFR13 with power module TR2 230V a.c.

