



Monitoring relays - GAMMA series

in 3-phase mains in accordance with VDE 0126-1-1

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 in accordance with VDE 0126-1-1 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 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
$f \geq 50.2$	< 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 2.5mm<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: 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 according to specification of switching power supply  
 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<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 (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: 50.2Hz  
 Min: 47.5Hz  
 Voltage monitoring  
 Measured variable: a.c. Sinus  
 Measurement input: 230V a.c.  
 terminals N-L1, N-L2, N-L3  
 Overload capacity: 230V a.c.  
 440V a.c.  
 Input resistance: 3N~ 400/230V  
 1M $\Omega$   
 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

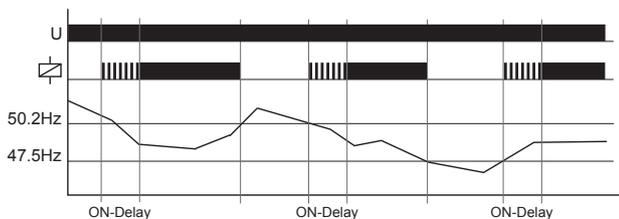
Ambient temperature:	-25 to +55°C (in accordance with IEC 60068-1) -25 to +40°C (in accordance with UL 508)
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	3 (in accordance with IEC 60664-1)
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  $U_{\text{Failure}}$  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.

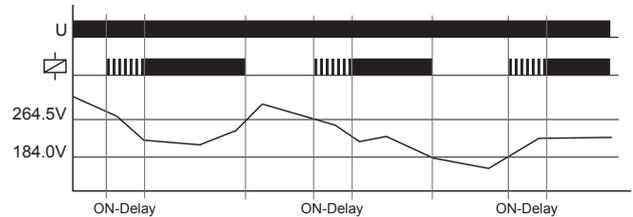
### Window function $WIN_f$ (Frequency):

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.

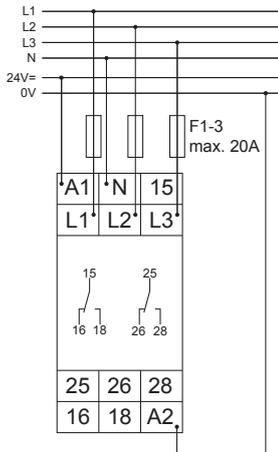


### 10-minutes-average

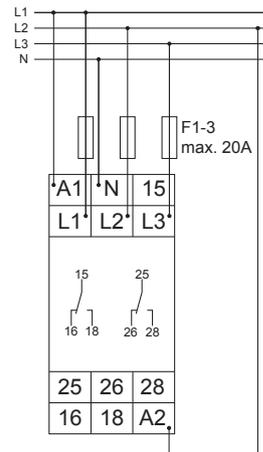
The 10-minute average value is used for monitoring the voltage quality. A floating average over 10 minutes will be measured at each input voltage. The output relay R switches into off-position if the floating average is exceeded.

## Connections

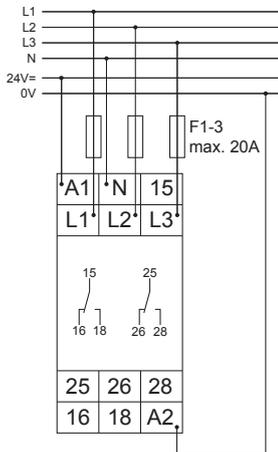
G2FW50HzYFA02 with power module TR2 24V a.c.



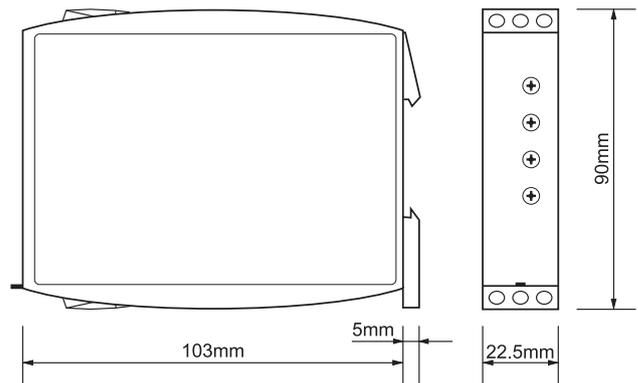
G2FW50HzYFA02 with power module TR2 400V a.c.



G2FW50HzYFA02 with switching power supply SNT2 24V a.c.



## Dimensions



G2FW50HzYFA02 with power module TR2 230V a.c.

