# Subject to alterations and errors

## Monitoring relays - GAMMA series

- ▼ Voltage monitoring in 3-phase mains for 500V resp. 690V
- Multifunction, fault latch
- Monitoring of phase sequence and phase failure
- Monitoring of asymmetry selectable
- Connection of neutral wire optional
- Detection of loss of neutral wire
- Supply voltage selectable via power modules
- 2 change-over contacts
- Width 45 mm
- Industrial design



>30% of the supply voltage

1250VA (5A/250V AC)

at 1000VA resistive load

AC Sinus (48 to 63Hz)

terminals (N)-L1-L2-L3

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3(N)~ 700V

5% to 25%

1MO

 $1M\Omega$ 

6kV

3(N)~ 950/550V

-20% to +30% of U<sub>N</sub>

-30% to +20% of  $U_N$ 

max. 60/min at 100VA resistive load

max. 6/min at 1000VA resistive load

(in accordance with IEC 60947-5-1)

III (in accordance with IEC 60664-1)

max. 20A (in accordance with UL 508)

(G4PM500VSYL20)

(G4PM690VSYL20)

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(G4PM690VSYL20)

20 x 106 operations

2 x 10<sup>5</sup> operations

III (in accordance with IEC 60664-1)

## Technical data

#### 1. Functions

Voltage monitoring in 3-phase mains with adjustable thresholdes, adjustable tripping delay, monitoring of phase sequence and phase failure, monitoring of asymmetry with adjustable threshold and the following functions which are selectable by means of rotary switch:

**UNDER** Undervoltage monitoring

UNDER+SEQ Undervoltage monitoring and monitoring of

phase sequence

WIN Monitoring the window between min and max WIN+SEQ Monitoring the window between min and max and monitoring of phase sequence

Undervoltage monitoring with fault latch UNDFR+Latch UNDER+SEQ+Latch Undervoltage monitoring and monitoring of

phase sequence with fault latch

WIN+Latch WIN with fault latch

WIN+SEQ+Latch Monitoring the window between min and max

and monitoring of phase sequence

with fault latch

#### 2. Time ranges

Adjustment range

Start-up suppression time:

Tripping delay: 0.1s10s

3. Indicators

Red LED Asym ON: indication asymmetry failure Ree LED max/min ON/OFF: indication of failure of the corresponding threshold

Red LED max/min flashes: indication of tripping delay of the

corresponding threshold

Red LED SEQ ON: indication phase sequence failure Yellow LED ON/OFF: indication of relay output

4. Mechanical design

Self-extinguishing plastic housing, IP rating IP40 Mounting on DIN-Rail TS 35 according to EN 60715

Mounted position: anv

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 2.5mm² flexible without multicore cable end

#### **►** 5. Input circuit

Supply voltage:

12 to 500V AC

selectable via power modulesTR3

Tolerance: according to specification of power module Rated frequency: according to specification of power module

Rated consumption: 4VA (3W) Duration of operation: 100% Reset time: 500ms

terminals A1-A2 (galvanically seperated)

Frequency response: Adjustment accurary: ≤5% of maximum scale value Repetition accurary: <2%

±5% of maximum scale value

III (in accordance with IEC 60664-1)

≤0.5% Voltage influence: Temperature influence: ≤0.1% / °C

#### 9. Ambient conditions

Drop-out voltage:

Rated voltage:

Mechanical life:

Flectrical life:

Fusing:

Fusing:

Switching capacity:

Switching frequency:

Overvoltage category:

7. Measuring circuit

3(N)~ 690/400V

3(N)~ 690/400V

3(N)~ 690/400V

Rated surge voltage:

Measured variable:

Measured input:

3 ~ 500V

Overload capacity: 3(N)~ 500V

Input resistance:

3~ 500V

Max:

Min:

Asymmetry:

8. Accurary

Base accurary:

Switching threshold

Overvoltage category:

Rated surge voltage:

Overvoltage category:

6. Output circuit

2 potential free change-over contacts

250V AC

6kV

5A fast acting

Rated surge voltage:

-25 to +55°C (in accordance with IEC 60068-1) Ambient temperature:

-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)

Residual ripple for DC:

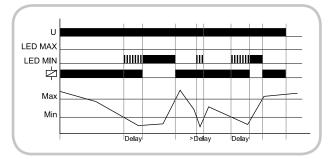
### Functions

For all the functions the LEDs Min and Max are flashing alternating, when the minimum value for the measured voltage was chosen to be greater than the maximum value.

If a failure already exists when the device is activated, the output relay remains in off-position and the LED for the corresponding threshold is illuminated.

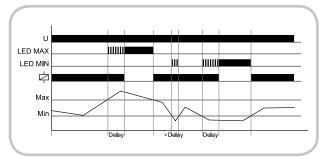
#### Under voltage monitoring (UNDER, UNDER+SEQ)

When the measured voltage (mean value of phase-to-phase voltages) 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 not illuminated), the output relay again switches into on-position (yellow LED illuminated), when the measured voltage exceeds the value adjusted at the MAX-regulator.



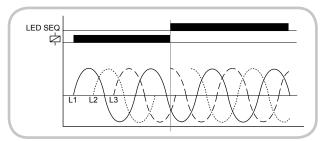
#### Windowfunction (WIN, WIN+SEQ)

The output relay switches into on-position (yellow LED illuminated) when the measured voltage (mean value of phase-to-phase voltages) exceeds the value adjusted at the MIN-regulator. When the measured voltage exceeds the value adjusted at the MAX-regulator, the set interval of the tripping delay (DELAY) begins (red LED MAX flashes). After the interval has expired (red LED MAX illuminated) the output relay switches into off-position (yellow LED not illuminated). The output relay again switches into on-position (yellow LED illuminated) when the measured voltage falls below the value adjusted at the MAX-regulator (red LED MAX not illuminated). When the measured voltage falls below the value adjusted at the MIN-regulator, the set interval of tripping delay (DELAY) begins again (red LED MIN flashes). After the interval has expired (red LED MIN illuminated), the output relay switches into off-position (yellow LED not illuminated).



#### Phase sequence monitoring (SEQ)

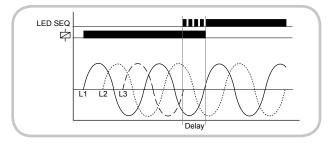
Phase sequence monitoring is selectable for all functions. If a change in phase sequence ist detected (red LED SEQ illuminated), the output relay switches into off-position immetiately (yellow LED not illuminated).



#### Phase failure monitoring (SEQ)

If one of the phase voltages fails, the set interval of the tripping delay (DELAY) begins (red LED SEQ flashes). After the interval has expired (red LED SEQ illuminated), the output relay switches into off-position (yellow LED not illuminated).

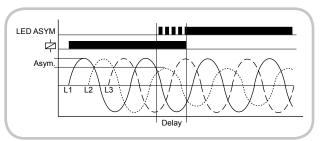
Reverse voltages of a consumer (e.g. a motor which conitnues to run on two phases only) do not effect the disconnection but can be monitoring by using a proper value for the asymmetry.



#### Asymmetry monitoring

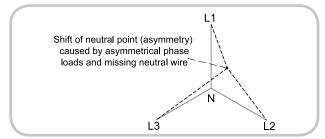
If the asymmetry of the phase-to-phase voltages exceeds the value set at the ASYM-regulator, the set interval of the tripping delay (DE-LAY) begins (red LED ASYM flashes). After the interval has expired (red LED ASYM illuminated), the output relay switches into off-position (yellow LED not illuminated).

If the neutral wire is connected to the device, the asymmetry of the phase voltages referred to the neutral wire (Y-voltage) is monitored also. In that case both values of the asymmetry are evaluated and if one of the values exceeds the value set at the ASYM-regulator, the set interval of the tripping delay (DELAY) begins (red LED ASYM flashes). After the interval has expired (red LED ASYM illuminated), the output relay switches into off-position (yellow LED not illuminated).



#### Loss of neutral wire by means of evaluation of asymmetry

A break of the neutral wire between power line and machinery is detected as soon as asymmetry between phase-to-phase voltage and neutral wire occurs. If the asymmetry exceeds the value set at the ASYM-regulator, the set interval of the tripping delay (DELAY) begins (red LED ASYM flashes). After the interval has expired (red LED ASYM illuminated). A break of the neutral wire between our device and the machinery can not be detected.



#### Fault latch

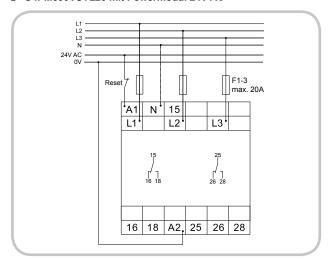
The functions UNDER+L, UNDER+SEQ+L, WIN+L and WIN+SEQ+L include a fault latch. The fault latch is active for all monitoring functions UNDER or WIN, asymmetry and phase sequence. Faults will be stored if the tripping delay has expired and the fault is effective on the output relay.

The fault latch keeps the output in off-position after a fault and freezes the LEDs for fault indication.

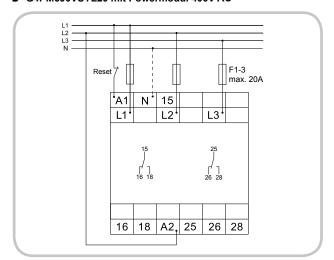
Saved faults may be reset by interruption the supply voltage.

# Connections

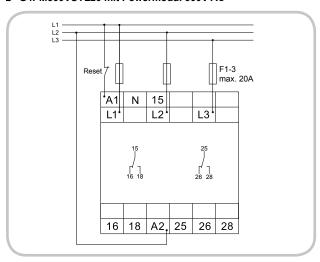
#### **■** G4PM690VSYL20 mit Powermodul 24V AC



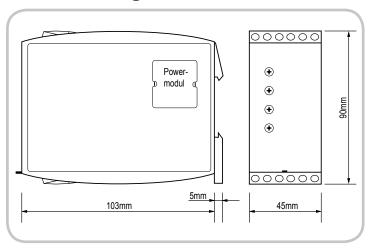
#### G4PM690VSYL20 mit Powermodul 400V AC



#### **■** G4PM500VSYL20 mit Powermodul 500V AC



# Abmessungen



G4PM...SYL20

Notes

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