# Voltage monitoring in 3-phase mains

**G2PU400SY10**

Monitoring relays - GAMMA series

Undervoltage monitoring

Monitoring of phase sequence, phase failure and asymmetry

Connection of neutral wire optional

Detection of loss of neutral wire

Supply voltage fixed 230V a.c.

1 change over contact

Width 22.5mm

Industrial design


## Technical data

**1. Functions**
Undervoltage monitoring in 3-phase mains with adjustable thresholds, fixed tripping delay, monitoring of phase sequence, phase failure and asymmetry with adjustable asymmetry.

**2. Time ranges**

| | Adjustment range |
|---|---|
| Start-up suppression time: | - |
| Tripping delay: | approx. 0.1s |

**3. Indicators**

| | |
|---|---|
| Red LED ON/OFF: | indication of failure of the corresponding threshold |
| 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
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: | |
| 230V a.c. | terminals A1-A2 (galvanically seperated) |
| Tolerance: | -15% to +15% |
| Rated frequency: | 50/60Hz |
| Rated consumption: | 2VA (1.5W) |
| Duration of operation: | 100% |
| Reset time: | 500ms |
| Residual ripple for d.c.: | - |
| Drop-out voltage: | >30% of the supply voltage |
| Overvoltage category: | III (in accordance with IEC 60664-1) |
| Rated surge voltage: | 4kV |

**6. Output circuit**
1 potential free change over contact

| | |
|---|---|
| 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 of 100VA resistive load<br>max. 6/min of 1000VA resistive load<br>(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) |
| Measuring variable: | AC Sinus (48 to 63Hz) |
| Measuring input: | |
| 3(N)~ 400/230V | terminals (N)-L1-L2-L3 |
| Overload capacity: | |
| 3(N)~ 400/230V | 3(N)~ 600/346V |
| Input resistance: | |
| 3(N)~ 400/230V | 1MΩ |
| Switching threshold | |
| Max: | -20% to +30% of $U_N$ |
| Min: | -30% to +20% of $U_N$ |
| Asymmetrie: | 5% to 25% |
| Overvoltage category: | III (in accordance with IEC 60664-1) |
| Rated surge voltage: | 4kV |

**8. Accuracy**

| | |
|---|---|
| Base accuracy: | ±5% (of maximum scale value) |
| Frequency response: | - |
| Adjustment accuracy: | ≤5% (of maximum scale value) |
| Repetition accuracy: | ≤2% |
| Voltage influence: | ≤0.5% |
| Temperature influence: | ≤0.1% / °C |

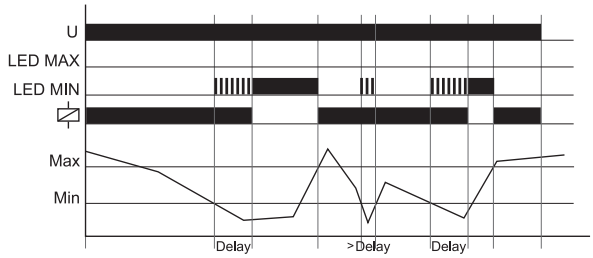
**9. Ambient conditions**

| | |
|---|---|
| Ambient temperature: | -25 to +55°C (in accordance with IEC 60668-1)<br>-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%<br>(in accordance with IEC 60721-3-3 Class 3K3) |
| Pollution degree: | 3 (in accordance with IEC 60664-1) |
| Vibration resistance: | 10 to 55Hz 0.35mm<br>(in accordance with IEC 60668-2-6) |
| Shock resistance: | 15g 11ms<br>(in accordance with IEC 60668-2-27) |

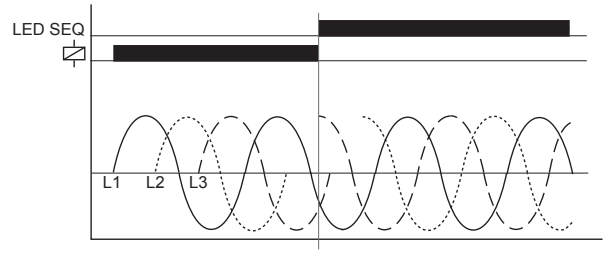
# Functions

The LEDs MIN and MAX are flashing alternating, when the minimum value for the measured voltagee 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.

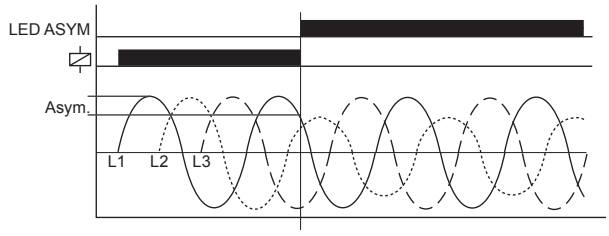
**Undervoltage monitoring (UNDER+SEQ)**
When the measured voltage (mean value of phase-to-phase voltages) falls below the value adjusted at the MIN-regulator, the output relay switches into off-position (yellow LED not illuminated, red LED MIN illuminated). The output relay switches into on-position again, when the measured voltage exceeds the value adjusted at the MAX-regulator (yellow LED illuminated, red LED MIN not illuminated).



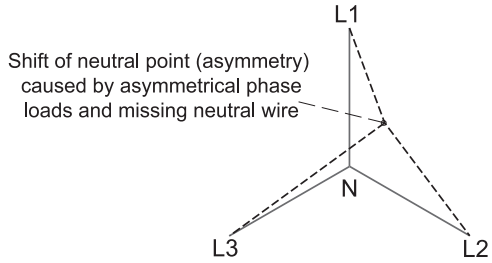

**Phase sequence monitoring**
If a chance in phase sequence is detected (red LED SEQ illuminated), the output relay switches into off-position immediately (yellow LED not illuminated).




**Asymmetry monitoring**
If the asymmetry of the phase-to-phase voltages exceeds the value set at the ASYM-regulator, the output relay switch into off-position (yellow LED not illuminated, red LED ASYM 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 output relay switch into off-position (yellow LED not illuminated, red LED ASYM illuminated).

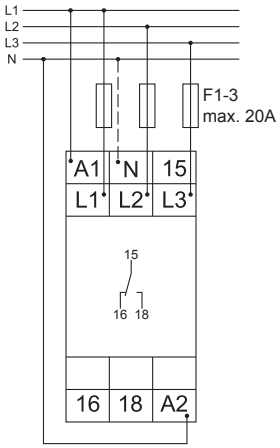



**Loss of neutral wire by means of evaluation of asymmetry**
A break of the neutral wire between the power line and machinery is detected as soon as asymmetry between phase-to-phase voltage and neutral wire occurs. The output relay switches into off-position (yellow LED not illuminated, red LED ASYM illuminated). A break of the neutral wire between the device and the machinery can not be detected.

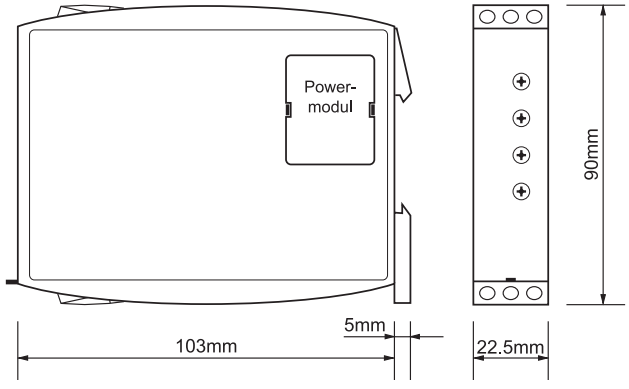



# Connections

G2PU400VSY10, supply voltage 230V a.c.




# Dimensions

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