Frequency- and voltage monitoring

G4PF33-1

1. Functions
Frequency monitoring in Phase L1 in accordance with VDE AR-N 4105 with adjustable ON-Delay. Fixed threshold \( f_{\text{min}} \) and adjustable threshold \( f_{\text{max}} \).

\[ \text{WIN}_{f} (\text{Frequency}) \text{ Monitoring the window between Min and Max} \]

Voltage monitoring in 3-phase mains in accordance with VDE AR-N 4105 with adjustable ON-Delay, adjustable thresholds and detection of off-grid operation.

\[ \text{WIN}_{V} (\text{Voltage}) \text{ Monitoring the window between Min and Max} \]

Adjustable 10-minutes average threshold \( (U_{\text{max}}) \) in accordance with VDE AR-N 4105.

Volt-free safe error message memory (of the last 5 errors) including data stamp in accordance with to VDE AR-N 4105. Integrated test function of contacts in accordance with VDE AR-N 4105. Password protected in accordance with VDE AR-N 4105.

2. Time ranges
ON-Delay: \( 60\times 1 \) to 10 min
OFF-Delay: \( < 100 \) ms

3. Thresholds
- \( U_{1} > 85\% U_{N} \) to \( U_{2} < 110\% U_{N} \)
- \( f \geq 50.2 \text{ Hz to 51.5 Hz} \)
- \( f > 47.54 \text{ Hz} \)
- \( f \leq 47.5 \text{ Hz to 47.9 Hz} \)

*) Mark preset values

4. Indicators
See display specification.

5. Mechanical design
Shockproof terminal connection according to VBG 4 (P21 required). 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

6. Input circuit
Supply voltage: 230V a.c.
Tolerance: -20% to +15%
Rated frequency: 50Hz
Rated consumption: 6VA (4W)
Duty cycle: 100%
Reset time: 500ms
Drop-out voltage: 30% of nominal supply voltage
Overvoltage category: III (in accordance with IEC 60664-1)
Rated surge voltage: 4kV

A failure of the auxiliary voltage leads to an immediate switch-off of the relay contacts.

7. 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 10⁶ operations
Electrical life: at 1000VA resistive load
Overvoltage category: III (in accordance with IEC 60664-1)
Rated surge voltage: 4kV

8. Load for external feedback contacts
Voltage: 12V d.c.
Current: 1mA d.c.

9. Measuring circuit
Frequency monitoring
Measured variable: frequency of phase L1
Terminals: N+L1a & N+L1b
Switching threshold:
Max: 50.1 to 50.2Hz
Min: fixed 47.5Hz

Read and understand these instructions before installing, operating or maintaining the equipment.

Danger:
Never carry out work on live parts! Danger of fatal injury! The product must not be used in case of obvious damage. To be installed by an authorized person.

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DSL-electronic GmbH, Germany
Subject to change
Technical data

Voltage monitoring $U_{m}$

Measurement variable: voltage, a.c. sinus
Measurement input: 3x 460 V a.c.
Terminals: NaL1a-L2a-L3a & NbL1b-L2b-L3b
Overload capacity: 3N~ 480 V/230 V
Input resistance: 3N~ 600 V/340 V

Switching threshold $U_c$
Max: fixed 115% of $U_m$ (460 V)
Min: fixed 80% of $U_m$ (340 V)

Voltage monitoring $U_{a}$
Measurigles: voltage, a.c. sinus
Measuring input: 3x 230 V a.c.
Terminals: NaL1a-L2a-L3a & NbL1b-L2b-L3b
Input resistance: 3N~ 480 V/230 V
Switching threshold $U_c$
Max: fixed 115% of $U_a$ (284.5 V)
Min: fixed 80% of $U_a$ (184 V)

10-minutes-average $U_{avg}$: max: 1/10% to 115% of $U_a$
Overvoltage category: III (in accordance with IEC 60064-1)
Rated surges voltage: 4kV

Accuracy
Base accuracy voltage measurement: 1% of $U_a$
Temperature influence voltage measurement: 0.05%/°C
Accuracy frequency measurement: ±0.02 Hz

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 60068-2-6)
Vibration resistance: 10 G ±4 Hz 0.55 mm (in accordance with IEC 60068-2-27)
Shock resistance: 15 G 11 ms

Functions

If a failure already exists when the device is activated, the output relay R remains in off-position and the failure is displayed.

The monitoring of frequency and voltage works in parallel.

Window function $W_{m}$ (Frequency):
When the supply voltage $U$ is applied, the output relay R switches into on-position on 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 off-position.

The output relay R switches into on-position again after the frequency reenters the acceptance region and the tripping delay (ON-Delay) has expired.

Window function $W_{a}$ (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 voltage is within the adjusted window. As soon as the voltage leaves the acceptance region, the output relay R switches into off-position.
The output relay R switches into 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 off-position if the floating average is exceeded. The output relay R switches into off-position again after the floating average reenters the acceptance region and the tripping delay (ON-Delay) has expired.

These functions are implemented twice for fail-safe operation.

Relay test
The relay test is executed:
- after powering up
- after manual resetting an error
- after each parameter change
- after manual initiation of a self test

During the relay test a question mark is displayed at the bottom left corner of the display.

No relay test is executed when the input is deactivated!

The following list shows causes and display for this error states:

<table>
<thead>
<tr>
<th>Definition</th>
<th>Display</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>incorrect combination of SW</td>
<td>ERROR1 VERSION</td>
<td>Enter to quit and reset device</td>
</tr>
<tr>
<td>versions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>communication error</td>
<td>ERROR1 INTERCOM</td>
<td>Enter to quit and reset device</td>
</tr>
<tr>
<td>unacceptable deviation</td>
<td>ERROR1 CHA&lt;CHB</td>
<td>Enter to quit and reset device</td>
</tr>
<tr>
<td>between measured values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of channel A and B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>although the relay outputs</td>
<td>ERROR1 CONTACT</td>
<td>Enter to quit and reset device</td>
</tr>
<tr>
<td>are „off“ the auxiliary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>contact of the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>disconnect device signals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>„on“ (after expiring of a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>delay)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>inconsistent data and/or</td>
<td>ERROR1 DATA</td>
<td>Enter to quit and reset device</td>
</tr>
<tr>
<td>checksums</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Display specification

### Measured Values

- **U1**: 223V, 49.8Hz
- **U2**: 224V, 49.8Hz
- **U3**: 225V, 49.8Hz
- **U12**: 308V, 49.8Hz
- **U23**: 400V, 49.8Hz
- **U31**: 390V, 49.8Hz
- **U1**: 230V, 49.8Hz
- **U2**: 230V, 49.8Hz
- **U3**: 230V, 49.8Hz

### Parameter

- **U0 max**: 480.0 V
- **U0 min**: 320.0 V
- **U1 max**: 264.5 V
- **U1 min**: 184.0 V
- **U max**: 253.0 V
- **f max**: 51.50 Hz
- **f min**: 47.50 Hz
- **OnDel.**: 60s
- **Input n.opened**:
- **Set Pass**: 0000
- **Set PW**: 0000

### Programming

- **PROGMEM ENT**:
  - **ENT**: change value
  - **ESC**: save changes
discard changes

In this mode, „ESC“ activates the automated unit test

* mark pre-set values
Connection

G4PF33-1

Output (communal grid)

Input (Inverter)

contactor with potential free, forced operated, auxiliary contacts

internal connected

 auxiliary voltage 230VAC 50Hz

Remark, the terminals A1-A1 and A2-A2 are internal connected. The maximum permissible load of this connection is 100mA.

Dimensions