Art. Nr. 33.03.338

01/2024

Dok Nr. 2.033.140.2.i

www.janitza.com

Power Analyser

UMG 604-PRO

Installation manual

Deutsche Version: siehe Vorderseite

- Installation
- Device settings



User manual:

Janitza electronics GmbH
Vor dem Polstück 6
35633 Lahnau, Germany
Support tel. +49 6441 9642-22
info@janitza.com |www.janitza.com

Janitza®

1 General

Disclaimer
The observance of the information products for the devices is a prerequisite for safe operation and to achieve the stipulated performance characteristics and product characteristics. Janitza electronics GmbH accepts no liability for injuries to personnel, property damage or financial losses arising due to a failure to comply with the information products. Ensure that your information products are accessible and legible.

Further information can be found on our website www.janitza.com at Support > Downloads.

Copyright notice
© 2017 - Janitza electronics GmbH - Lahnau. All rights reserved. Duplication, editing, distribution and any form of exploitation, also as excerpts, is prohibited.

Subject to technical amendments
- Make sure that your device agrees with the installation manual.
- Read and understand first product-related documents.
- Keep product supporting documentation throughout the life available and, where appropriate, to pass on to subsequent users.
- Please inform yourself about device revisions and the associated adjustments to the product-related documentation on www.janitza.com.

Disposal
Please observe national regulations!
If disposing of individual parts, please dispose of them in accordance with their nature and existing country-specific regulations, for example as:
- Electrical scrap
- Plastics
- Metals

Or, task a certified disposal business with the scrapping.

Relevant laws, applied standards and directives
The laws, standards and directives for the device applied by Janitza electronic GmbH can be found in the declaration of conformity on our website.

2 Safety

Safety information
The installation manual does not represent a full listing of all necessary safety measures required for safe operation of the device.
Certain operating conditions may require further measures. The installation manual contains information that you must observe for your own personal safety and to avoid damage to property.

Symbols used:

⚠	This symbol is used as an addition to the safety instructions and warns of an electrical hazard.
⚠	This symbol is used as an addition to the safety instructions and warns of a potential hazard.
☞	This symbol with the word **NOTE!** describes: • Procedures that do not entail any danger of injury. • Important information, procedures or handling steps.

Safety instructions are highlighted with a warning triangle and shown as follows, depending on the degree of hazard:

⚠ **DANGER!**	Indicates an immediately threatening hazard that leads to serious or even fatal injuries.
⚠ **WARNING!**	Indicates a potentially hazardous situation that could lead to serious or even fatal injuries.
⚠ **CAUTION!**	Indicates a potentially hazardous situation that could lead to minor injuries or damage to property.

Measures for safety
When operating electrical devices certain parts of these devices inevitable carry dangerous voltages. This could result in serious bodily injury or damage to property if not handled properly:
- De-energise your device before starting work! Check that it is de-energised.
- Before establishing electrical connections to the device, earth it at the ground wire connection if there is one.
- Hazardous voltages may arise in all circuit parts that are connected to the power supply.
- Even after disconnecting the supply voltage, there may still be hazardous voltages present in the device (capacitor storage).
- Do not operate equipment with current transformer circuits when open.
- Do not exceed the limit values stipulated in the user manual and on the rating plate - even during testing or commissioning.
- Observe the safety and warning information in the documents that belong to the devices!

Qualified personnel
In order to avoid injuries to personnel and property damage, only qualified personnel with electrical training are permitted to work on the devices with knowledge
- of the national regulations for accident prevention
- of safety standards
- of installation, commissioning and operation of the device.

Proper use
The device is
- intended for installation in switch cabinets and small installation distributors (please observe step 3 “Assembly”).
- not intended for installation in vehicles! The use of the device in mobile equipment is considered to be non-standard environmental conditions and is therefore only permitted after separate agreement.
- not intended for installation in environments with hazardous oils, acids, gases, vapours, dusts, radiation, etc.

The prerequisites of faultless, safe operation of this device are proper transport and proper storage, set-up, installation, operation and maintenance.

3 Device short description

The device is a multifunctional network analyser that measures and calculates electrical variables such as voltage, current, power, energy, harmonics, etc. in building installations, on distribution units, circuit breakers and busbar trunking systems.

Prerequisite:
Measured voltages and measured currents come from the same network.

The devices supply measurement results that can be displayed, saved and transmitted via interfaces.

Assembly

The device is installed in switching cabinets or in small installation distributors in accordance with DIN 43880 on a 35 mm mounting rail (DIN EN 60715). It can be mounted in any position.



Fig. Device on mounting rail in accordance with DIN EN 60715.

CAUTION!

Damage to property due to disregard of the installation instructions

Disregard of the installation instructions can damage or destroy your device.
Ensure that you have enough air circulation in your installation environment and in the event of high environmental temperatures, provide cooling if necessary.

NOTE!
For further information on device functions, data and assembly, see the user manual.

4 Connecting the supply voltage

The supply voltage level for the device is specified on the rating plate.
After connecting the supply voltage, an indication is shown on the display. If no display appears, check whether the supply voltage is within the rated voltage range.

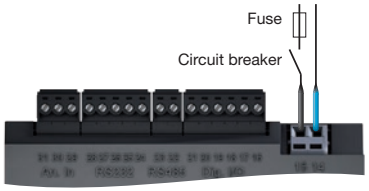


Fig. Connecting Uh supply voltage.

WARNING!

Risk of injury due to electric voltage!

Severe bodily injuries of death can occur due to:
- Touching bare or stripped wires that are live.
- Device inputs that are dangerous to touch.

De-energise your device before starting work! Check that it is de-energised.

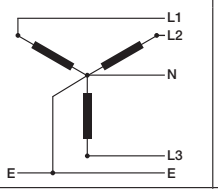
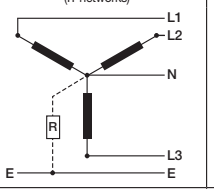
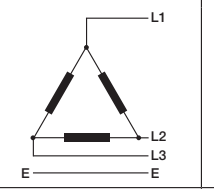
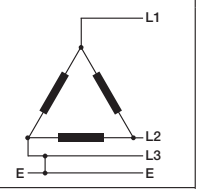
CAUTION!

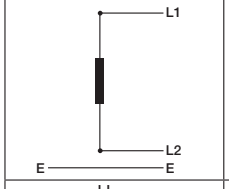
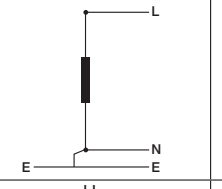
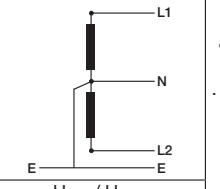
Damage to property due to not observing the connection conditions or impermissible overvoltages

Failure to observe the connection conditions or exceeding the permissible voltage range can damage or destroy your device.
Before connecting the device to the supply voltage, note the following:
- **The voltage and frequency must meet the specifications on the rating plate! Adhere to the threshold values as described in the user manual!**
- **When installing in a building, protect the supply voltage with a UL/IEC listed line safety switches/a fuse!**
- **The circuit breaker**
  - **must be easily accessible for the user and be installed close to the device.**
  - **must be labelled for the relevant device.**
- **Do not connect the supply voltage to the voltage transformers.**

5 Network systems

Network systems and maximum rated voltages (DIN EN 61010-1/A1):

Three-phase four-conductor systems with earthed neutral conductor	Three-phase four-conductor systems with non-earthed neutral conductor (IT networks)	Three-phase three-conductor systems not earthed	Three-phase three-conductor systems with earthed phase
			
U_{L-N} / U_{L-L} 277 VLN / 480 VLL	U_{L-N} / U_{L-L} 277 VLN / 480 VLL	U_{L-L} 480 VLL	U_{L-L} 480 VLL

Dual-phase two-conductor systems not earthed	Single-phase two-conductor systems with earthed neutral conductor	Separated single-phase three-conductor system with earthed neutral conductor
		
U_{L-L} 480 VLL	U_{L-N} 480 VLN	U_{L-N} / U_{L-L} 277 VLN / 480 VLL

The device can be used in
- 2-, 3- and 4-conductor networks (TN, TT and IT networks)
- Domestic and industrial settings

.

6 Voltage measurement

The device only determines measured values if measured voltage of >10 Veff is present on at least one voltage measurement input.

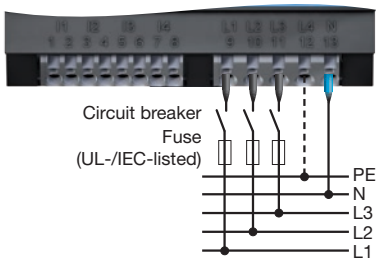
CAUTION!

Risk of injuries or damage to the device

Failure to observe the connection conditions for the voltage measurement inputs can cause injuries to you or damage to the device.
Therefore, note the following:
- **The voltage measurement inputs**
  - **must not be occupied with DC voltage.**
  - **must be provided with a suitable, labelled fuse that is positioned close by and a circuit breaker (alternatively: a line safety switch).**
  - **are dangerous to touch.**
- **Voltages that exceed the permissible network rated voltages must be connected via a voltage transformer.**
- **Measured voltages and currents must derive from the same network.**

NOTE!
As an alternative to the fuse and circuit breaker, you can use a line safety switch.

"Voltage measurement in three-phase four-conductor system", without voltage transformer ***(addr. 111 = 0, default setting)****.*

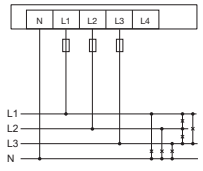
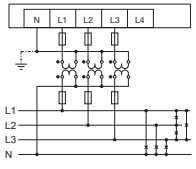
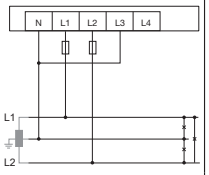


The voltage measurement inputs are designed for measurements in low voltage networks, in which rated voltages of up to
- 277 V phase to earth and 480 V phase to phase in the 4-conductor system or
- 480 V phase to phase in the 3-conductor system occur.

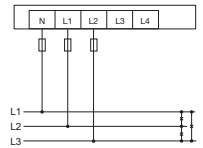
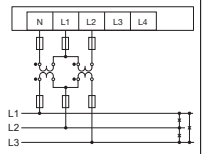
The measurement and surge voltages meet overvoltage category 300 V CATIII.

7 Voltage measurement connection variants

Voltage measurement L1, L2, L3 (baseline measurement)

Three-phase four-conductor system		Single-phase three-conductor system
Addr. 111 = 0, default setting (see step 13)		
		
Three-phase four-conductor system without voltage transformer.	Three-phase four-conductor system with voltage transformer.	

NOTE!
If the metering range is exceeded, the measurement device display shows "*EEEE*". For further information, see the user manual.

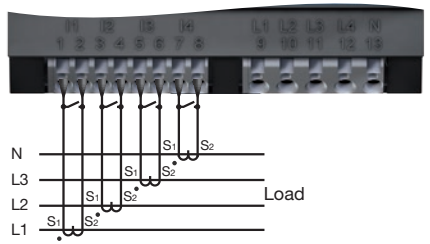
Three-phase three-conductor system	
Addr. 111 = 1 (see step 13)	
	
Three-phase three-conductor system without voltage transformer.	Three-phase three-conductor system with voltage transformer.

NOTE!
It is not necessary to configure a connection schematic for measurement input L4 (supporting measurement)! For further information on the supporting measurement, see the user manual.
RECOMMENDATION
Connect the protective earth (PE) to measurement input L4 for a PE/N measurement. Do not use a green and yellow wire for this as the phase does not have a protective function!
(See fig. "Connection variant in three-phase four-conductor system" in step 6).

8 Current measurement

The device
- is only approved for measuring current with a current transformer.
- is intended for connecting current transformers with secondary currents of ../1 A and ../5 A.
- has the current transformer ratio 5/5 A set as standard.

"Current measurement in three-phase four-conductor system" and additional current measurements in the neutral conductor ***(addr. 110 = 0, default setting).***



NOTE!
If the metering range is exceeded, the measurement device display shows "*EEEE*". For further information, see the user manual.

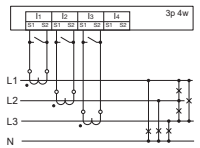
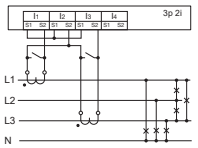
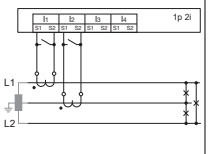
WARNING! **Risk of injury due to electric voltage!**
Severe bodily injuries of death can occur due to:
- Touching bare or stripped wires that are live.
- Current measurement inputs that are dangerous to touch on the device and on the current transformers

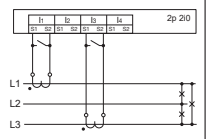
De-energise your device before starting work! Check that it is de-energised. Earth the system. To do this, use the earth connection points with the earthing symbol.

WARNING! **Risk of injury due to large currents and high electric voltages!**
Current transformers that are operated open in the secondary side (high voltage peaks) can cause severe bodily injuries or death.
Avoid operating current transformers when open, short circuit transformers that are unloaded!

9 Current measurement connection variants

Current measurement I1, I2, I3

Addr. 110 = 0, default setting (see step 15)		
		
Current measurement via 3 current transformers in the three-phase four-conductor system.	Current measurement via 2 current transformers in systems with the same loading.	Current measurement in single-phase three-conductor systems.

Addr. 110 = 1 (see step 15)

Current measurement via 2 current transformers (Aron circuit) in the three-phase three-conductor system

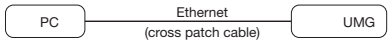
NOTE!
There is no connection variant for current measurement at I4; you do not have to configure an address!

NOTE!
For further information on the current transformer and current transformer data, see the user manual.

10 Establish an Ethernet connection

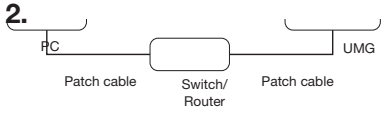
The 3 most common connections for communication between PC and device:

1.



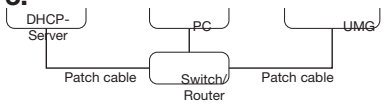
The device and PC require a static IP address.

2.



The device and PC require a static IP address.

3.



The DHCP server automatically assigns IP addresses to the device and PC.

CAUTION! **Property damage due to incorrect network settings**
Incorrect network settings can cause faults in the IT network!
Find out the correct Ethernet network settings for your device from your network administrator.



Ethernet connection
Recommendation: Use at least CAT5 cables!

ATTENTION

Property damage due to security vulnerabilities in programs, IT networks and protocols.
Security vulnerabilities can result in data misuse, faults and even cause your IT infrastructure to shut down.
To protect your IT system, network, data communications and measurement devices:
- **Notify your network administrator and/or IT manager.**
- **Always keep the measurement device firmware up to date and protect the communication to the measurement device with an external firewall. Close any unused ports.**
- **Take protective measures against viruses and cyber attacks from the Internet, e.g. through firewall solutions, security updates and antivirus programs.**
- **Eliminate security vulnerabilities and update or renew existing protection for your IT infrastructure.**

11 Operation and button functions

The device is operated using buttons 1 and 2. The service button is designated for use by trained service employees only.

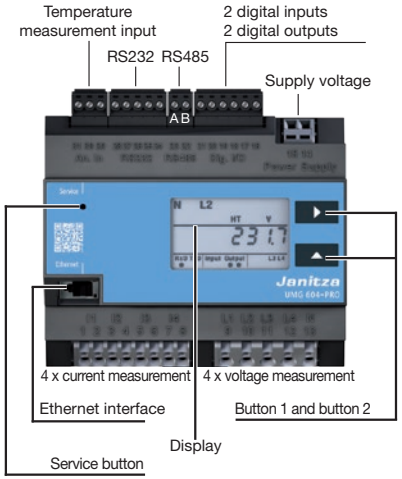
The device differentiates between **display** and **programming mode** (see step 12).
Button intervals:
Press the appropriate button for a short time:
- Scroll forwards.
- Digit/value +1.

Press the appropriate button for a long time:
- Scroll backwards.
- Digit/value -1.

To switch between **display mode** and **programming mode**, press and hold both buttons simultaneously for 1 second.

The device switches from **programming mode** to **display mode** if
- no buttons are pressed for 60 seconds.
- buttons 1 and 2 are pressed simultaneously for 1 second.

NOTE!
Changes are only applied after exiting programming mode.



NOTE!
For further information on button functions and parameter settings, see the user manual.

12 Display mode

After the power returns, the device is in **display mode**. In **display mode**:
- Use button 1 to select the phase for the measured values.
- Use button 2 to scroll between the measured values for current, voltage, power, etc.

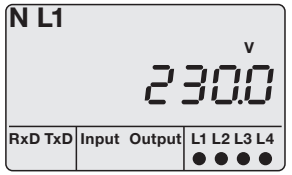


Fig. Display example for "Display mode", measured value displayed: U_{L1-N} = 230.0V.

NOTE!
For further information
- on measured value indications and the factory settings
- on parameter lists and addresses
- on the display password

is provided in the user manual.

Programming mode

The most important settings on the device are carried out in **programming mode** (**PRG**).

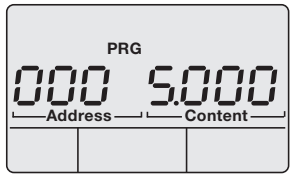


Fig. Display example for "Programming mode", address 000 with a content of 5.000.

When you press and hold buttons 1 and 2 simultaneously for approx. 1 second, the device switches to **programming mode** as long as no display password has been configured:
- The text **"PRG"** is shown on the display.
- The first digit in the address flashes.

NOTE!
You can make further settings in the GridVis® software.

13 Voltage transformer ratio configuration

Voltage transformer ratios can be assigned to each of the 4 voltage transformer inputs on the device.
The factory setting is 400 V/400 V (direct measurement).
In addresses 002 and 003
- program the same voltage transformer ratios for all 4 phases.
- voltage transformer ratios that are entered overwrite addresses 012 to 043.

In addresses 012 to 043
- program voltage transformer ratios individually for each phase.

The device handles programmed values in addresses 012 to 043 with priority, whereupon it sets addresses 002 to 003 to 0.

2 connection variants for measuring the device's voltage:
1. **Connection variant 0**: Voltage measurement
   - direct in 3-phase 4-conductor networks.
   - via 3 voltage transformers in 3-phase 4-conductor networks.
   - in single-phase 3-conductor systems.
2. **Connection variant 1**: Voltage measurement
   - direct in 3-phase 3-conductor networks.
   - via 2 voltage transformers (Aron circuit) in 3-phase 3-conductor networks.

Addr.	Voltage transformer values
002	L1 L2 L3 L4 (primary)
003	L1 L2 L3 L4 (secondary)
012	L1 (primary)
013	L1 (secondary)
022	L2 (primary)
023	L2 (secondary)
032	L3 (primary)
033	L3 (secondary)
042	L4 (primary)
043	L4 (secondary)

Parameter list excerpt of "voltage transformer values"

Addr.	Connection var. Voltage measurement
111	**0** = 3-phase 4-conductor networks (factory setting)
	1 = 3-phase 3-conductor networks

Parameter list excerpt of "voltage transformer connection variants"

NOTE!
For further information on voltage transformer ratios, see the user manual.

14 Sample configuration: Voltage transformer ratios

See the "*Parameter list excerpt of voltage transformer values*" table in step 13 to obtain the address for your voltage transformer measurement input and enter the voltage transformer value as follows:
1. Switch to programming mode - press and hold buttons 1 and 2 for 1 second.
2. The 1st position in the address area flashes.
3. Use button 2 to select the 1st position in the "*Address*".
4. Press button 1 to confirm the entry.
5. The 2nd position in the address area flashes.
6. Use button 2 to select the 2nd position in the "*Address*".
7. Press button 1 to confirm the entry.
8. The 3rd position in the address area flashes.
9. Use button 2 to select the 3rd position in the "*Address*".
10. Press button 1 to confirm the entry.
11. The position that is to be programmed in the content area flashes.
12. Use button 2 as described above to program the voltage value for the address area that you set. Note that the unit can also be set for the primary voltages.

Handle these in accordance with this programming procedure for each voltage transformer ratio of your voltage transformer measurement inputs.



Display example 1:
The primary voltage of each voltage transformer on the 4 voltage measurement inputs is 765 V.



Display example 2:
The secondary voltage of each voltage transformer on the 4 voltage measurement inputs is 400 V.

NOTE!
The device handles programmed values in addresses 012 to 043 with priority, whereupon it sets addresses 002 and 003 to 0.

15 Current transformer ratio configuration

Current transformer ratios can be assigned to each of the 4 current transformer inputs on the device. The factory setting is 5 A/5 A.

In addresses 000 and 001

- program the same current transformer ratios for all 4 phases.
- current transformer ratios that are entered overwrite addresses 010 to 041.

In addresses 010 to 041

- program current transformer ratios individually for each phase.

The device handles programmed values in addresses 010 to 041 with priority, whereupon it sets addresses 000 and 001 to 0.
The programming procedure for current transformer ratios works in the same way as the procedure for voltage transformer ratios (see step 14).

2 connection variants for measuring the device's current:

Connection variant 0: Current measurement

- via 3 current transformers in 3-phase 4-conductor networks.
- via 2 current transformers in networks with the same loading.
- in single-phase 3-conductor systems.

Connection variant 1: Current measurement

- via 2 current transformers (Aron circuit) in 3-phase 3-conductor networks.

Addr.	Current transformer values
000	L1 L2 L3 L4 (primary)
001	L1 L2 L3 L4 (secondary)
010	L1 (primary)
011	L1 (secondary)
020	L2 (primary)
021	L2 (secondary)
030	L3 (primary)
031	L3 (secondary)
040	L4 (primary)
041	L4 (secondary)

Parameter list excerpt of "current transformer values"

Addr.	Current measurement connection variant
110	**0** = 3 current transformers and accompanying variants (factory setting)
	1 = 2 current transformers (Aron circuit)

Parameter list excerpt of "current transformer connection variants"

NOTE!
For further information on current transformer ratios, see the user manual.

16 Configure the Ethernet connection

Static IP address (Addr. 205, content = 0)
In networks without a DHCP server, select the network address (see table) on the device.

BootP (Addr. 205, content = 1)
BootP enables a device to be integrated into an existing network fully automatically. However, BootP is an older protocol and does not provide the scope of functions provided by DHCP.

DHCP client (Addr. 205, content = 2)
DHCP makes it possible integrate a device into an existing network automatically without the need for any additional configuration.
When started, the device automatically obtains the IP address, the subnet mask and the gateway from the DHCP server. The device's default setting is "DHCP client".

Addr.	Designation
203	RS485, Modus 0 = Modbus RTU/Slave 1 = Modbus RTU/Master 2 = Gateway-Transparent
204	RS232, mode 0 = Modbus RTU/slave (default setting) 3 = Debug 6 = SLIP
205	DHCP mode 0 = static IP address 1 = BootP 2 = DHCP client
300	IP address, xxx --- --- ---
301	IP address, --- xxx --- ---
302	IP address, --- --- xxx ---
303	IP address, --- --- --- xxx
304	IP mask, xxx --- --- ---
305	IP mask, --- xxx --- ---
306	IP mask, --- --- xxx ---
307	IP mask, --- --- --- xxx
310	IP gateway, xxx --- --- ---
311	IP gateway, --- xxx --- ---
312	IP gateway, --- --- xxx ---
313	IP gateway, --- --- --- xxx

17 Configuring the device as a "DHCP client" or with a "Static IP address"

To configure the device as a "DHCP client" or with a "Static IP address", first set **address 205 (DHCP mode)**:

1. Switch to programming mode as described (the first digit flashes).
2. Use button 2 to select the value **2**.
3. Use button 1 to move to the second digit.
4. Use button 2 to select the value **0**.
5. Use button 1 to move to the third digit.
6. Use button 2 to select the value **5**.
7. Address 205 is shown on the display.
8. Use button 1 to move to the settings for the DHCP mode content.

Then select the "DHCP client" or the "Static IP address" in DHCP mode as follows:

- **Set "DHCP client" (default setting)**
  1. Use button 2 to select value **2**, **"DHCP client"** (see table in step 16).
  2. Press button 1 to confirm your entry.
  3. The address display flashes.

You can continue to configure the addresses.

- **Setting the "Static IP address"**
  1. Use button 2 to select value 0, "Static IP" (see table in step 16).
  2. Press button 1 to confirm your entry.
  3. The address display flashes.

You can continue to configure the addresses.

NOTE!
Ensure that address 204 (RS232 mode) has the value 0 (default setting) to operate the device in DHCP client mode!

18 Configuring the "Static IP address"

If the device is accessed via a "Static IP address", the device requires settings for the:

1. **Device IP address.**
2. **Subnet mask.**
3. **Gateway address** (not required for configuration).

(see the table in step 16)

1. **Setting the device IP address**
   - Switch to programming mode (see step 12).
   - Select address 300 and enter the first 3 characters of the device IP address (see the table in step 16).
   - Select address 301 and enter the second 3 characters of the device IP address.
   - Complete the entries for addresses 302 and 303.
2. **Set the subnet mask**
   - Select the subnet mask via addresses 304 - 307 in the same way as the settings for the device IP address (see the table in step 16).
3. **Set the standard gateway**
   - Select the standard gateway (if present) via addresses 310 - 313 in the same way as the IP address (see the table in step 16).

Example:
Device IP address: 192.168.1.116
Subnet mask: 255.255.255.0

In this case, set the computer as follows:
IP address: 192.168.1.117
Subnet mask: 255.255.255.0

NOTE!
For more information about connection and communication of your device with the software, see the quick guide of software GridVis®.

19

Technical data

General	
Net weight	350 g (0.771lb)
Device dimensions	Approx. l = 107.5 mm (4.23 in), b = 90 mm (3.54 in), h = 82 mm (3.23 in) (nach DIN 43871:1992)
Horizontal pitch	6 HP
Housing flammability class	UL 94V-0
Battery	Type Lithium CR2032, 3V (according to UL 1642)
Installed position	any
Fixing/mounting	35 mm top hat rail (according to IEC/EN 60999-1, DIN EN 50022)
Backlight lifetime	40000h (50% of initial brightness)

Ambient conditions during operation	
The device • weather-protected and used stationary. • fulfills conditions of use to DIN IEC 60721-3-3. • has protection class II according to IEC 60536 (VDE 0106, part 1). A PE terminal is not required!	
Operating temperature range	-10° C .. +55° C (14°F ..to 131°F)
Relative humidity	5 to 95% at 25°C (77°F) without condensation
Operating altitude	0 .. 2000 m above sea level
Degree of pollution	2
Ventilation	No forced ventilation required.
Protection against ingress of solid foreign bodies and water	IP20 according to EN 60529 Sept. 2014, IEC 60529:2013

Transport and storage The following information applies to devices which are transported or stored in the original packaging:	
Free fall	1 m (39.37 in)
Temperature	-20° C to +70° C (-4°F..to 70°F)

Supply voltage		230 V	90 V	24 V
Protection of the supply voltage		6A, line circuit breakers with tripping characteristic B (IEC / UL approval)		
Installation overvoltage category	IEC	-	300 V CAT II	-
	IEC UL	300 V CAT II	-	150 V CAT II
Nominal range		95 V - 240 V (50/60 Hz) or DC 135 V - 340 V	50 V - 110 V (50/60 Hz) or DC 50 V - 155 V	20 V - 50 V (50/60 Hz) or DC 20 V - 70 V
Operating range		+-10% of nominal range		
Power consumption		max. 3.2 W, max. 9 VA		max. 5 W, max. 8 VA

Measuring inputs voltage measurement	
3-phase 4-conductor systems	L-N/L-L: max. 277 V/480 V
3-phase 3-conductor systems	L-L: max. 480 V
Overvoltage category	300 V CAT III
Specified impulse withstand voltage	4 kV
Protection of voltage measurement	1 - 10 A (With IEC / UL approval)
Measurement range L-N [1]	0 to 600 Vrms
Measurement range L-L [1]	0 to 1000 Vrms
Resolution	0.01 V
Crest factor	2 (based on 480 Vrms)
Impedance	4 MOhm / phase
Power consumption	approx. 0.1 VA
Sampling rate	20 kHz / phase
Transients	>50 µs
Frequency of the mains frequency - resolution	45 Hz to 65 Hz 0.001 Hz

1) ... The device only measures if an L-N voltage of >10 Veff or an L-L voltage of >18 Veff is applied to at least one voltage measurement input.

Measuring inputs current measurement	
Rated current	5 A
Rated current	6 A
Protection of current measurement when measuring directly without a current transformer	6 A, char. B (approved i.a.w. UL/IEC)
Measurement range	0.005 to 7 Amps
Crest factor	2 (based on 6 Amps)
Resolution on the display	10 mA
Overvoltage category	300 V CAT III
Measurement voltage surge	4 kV
Power consumption	approx. 0.2 VA (Ri = 5 mOhm)
Overload for 1 sec.	100 A (sinusoidal)
Sampling rate	20 kHz

Digital inputs 2 digital inputs.	
Pulse input (S0):	
Maximum counter frequency	20 Hz
Switching input:	
Response time (Jasic program)	200 ms
Input signal present	18 V to 28 V DC (typical 4 mA)
Input signal not present	0 to 5 V DC, current less than 0.5 mA

Digital outputs 2 digital outputs, semiconductor relay, not short-circuit proof.	
Switching voltage	max. 30 V AC, 60 V DC
Switching current	max. 50 mA$_{RMS}$ AC/DC
Response time (Jasic program)	200 ms
Output of voltage dips	20 ms
Output of voltage exceedance events	20 ms
Pulse output (energy pulse)	max. 20 Hz

Temperature measurement input 3-wire measurement.	
Update time	approx 200 ms
Connectable sensors	PT100, PT1000, KTY83, KTY84
Total burden (sensor + cable)	max. 4 kOhm

Cable length (Residual current monitoring, digital inputs and outputs, temperature measurement input)	
Up to 30 m (32.81 yd)	Unshielded
More than 30 m (32.81 yd)	Shielded

RS232 interface 5 pin screw-type terminals.	
Protocol	Modbus RTU/slave
Transmission rate	9.6 kbps, 19.2 kbps, 38.4 kbps, 57.6 kbps, 115.2 kbps.

RS485 interface 2 pin screw-type terminals.	
Protocol	Modbus RTU/slave, Modbus RTU/master,
Transmission rate	9.6 kbps, 19.2 kbps, 38.4 kbps, 57.6 kbps, 115.2 kbps, 921.6 kbps

Ethernet interface 10/100Base-TX	
Connection	RJ45
Function	Modbus gateway, embedded Webserver (HTTP)
Protocols	TCP/IP, EMAIL (SMTP), DHCP-Client (BootP), Modbus/TCP (Port 502), Modbus RTU over Ethernet (Port 8000), FTP, ICMP (Ping), FTP, SNMP, NTP, TFTP.

Terminal connection capacity (supply voltage) Connectable conductors. Connect one conductor per terminal!	
Single core, multi-core, fine-stranded	0.08 - 2.5 mm², AWG 28-12
Cable end sleeve (not insulated)	0.20 - 1.5 mm2, AWG 24 - 16
Cable end sleeve (insulated)	0.25 - 1.5 mm², AWG 24-16
Stripping length	5-6 mm (0.2 - 0.24 in)

Terminal connection capacity (voltage measurement) Conductors to be connected. Only one conductor can be connected per terminal!	
Single core, multi-core, fine-stranded	0.08 - 4.0 mm², AWG 28-12
Cable end sleeve (not insulated)	0.25 - 2.5 mm²
Cable end sleeve (insulated)	0.25 - 2.5 mm²
Stripping length	8-9 mm (0.31 - 0.35 in)

Terminal connection capacity (current measurement) Conductors to be connected. Only one conductor can be connected per terminal!	
Single core, multi-core, fine-stranded	0.08 - 4.0 mm², AWG 28-12
Cable end sleeve (not insulated)	0.25 - 2.5 mm²
Cable end sleeve (insulated)	0.25 - 2.5 mm²
Stripping length	8-9 mm (0.31 - 0.35 in)

NOTE!
Further technical data can be found in the user manual for the device.

Terminal connection capacity: Digital inputs and outputs Connectable conductors. Connect one conductor per terminal!	
Single core, multi-core, fine-stranded	0.20 - 1.5 mm², AWG 24-16
Cable end sleeve (not insulated)	0.20 - 1.5 mm²
Cable end sleeve (insulated)	0.20 - 1.5 mm²
Tightening torque	0.25 Nm (2.21 lbf in)
Stripping length	7 mm (0.2756 in)

Terminal connection capacity (RS 232 / RS 485) Connectable conductors. Connect one conductor per terminal!	
Single core, multi-core, fine-stranded	0.20 - 1.5 mm², AWG 24-16
Cable end sleeve (not insulated)	0.20 - 1.5 mm²
Cable end sleeve (insulated)	0.20 - 1.5 mm²
Tightening torque	0.25 Nm (2.21 lbf in)
Stripping length	7 mm (0.2756 in)

Terminal connection capacity: temperature measurement input Connectable conductors. Connect one conductor per terminal!	
Single core, multi-core, fine-stranded	0.20 - 1.5 mm², AWG 24-16
Cable end sleeve (not insulated)	0.20 - 1.5 mm²
Cable end sleeve (insulated)	0.20 - 1.5 mm²
Tightening torque	0.25 Nm (2.21 lbf in)
Stripping length	7 mm (0.2756 in)

20 Procedure in the event of faults

Possible fault	Cause	Remedy
No display	External fuse for the power supply voltage has tripped.	Replace fuse.
No current display	Measured voltage is not connected.	Connect the measured voltage.
	Measurement current is not connected.	Connect measurement current.
Current displayed is too large or too small.	Current measurement in the wrong phase.	Check connection and correct if necessary.
	Current transformer factor is incorrectly programmed.	Read out and program the CT ratio at the current transformer.
"EEEE" and **"A"** in the display.	Current measurement range exceeded	Check the measuring-circuit current and if necessary install a suitable current transformer.
Voltage displayed is too large or too small.	Measurement in the wrong phase.	Check connection and correct if necessary.
	Voltage transformer incorrectly programmed.	Read out and program the voltage transformer ratio at the voltage transformer.
Voltage displayed is too small.	Measurement range exceeded.	Use voltage transformers.
	The peak voltage value at the measurement input has been exceeded by the harmonics.	**Please note!** Ensure the measurement inputs are not overloaded.
"EEEE" and **"V"** in the display.	Voltage measuring range exceeded	Check the measuring-circuit voltage and if necessary install a suitable voltage transformer.
„Error CF" in the display	The calibration data could not be read out.	Send device and error description for verification to the manufacturer.
Effective power, consumption/supply reversed.	At least one current transformer connection is mixed up/reversed.	Check connection and correct if necessary.
	A current path is assigned to the wrong voltage circuit.	Check connection and correct if necessary.

Janitza®