

POWER ANALYSER

UMG 801

Data sheet

UMG 801

Multifunctional measurement device for recording energy measured values

Doc. no.: 2.053.012.1.c

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The German version is the original version of the documentation

Subject to technical changes.

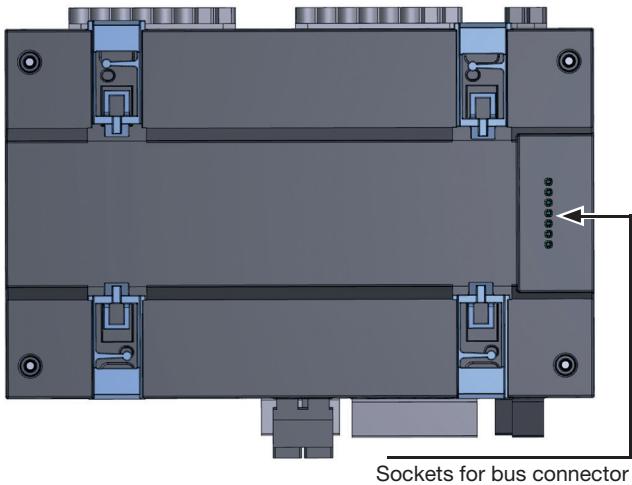
The content of our documentation has been compiled with the utmost care and is based on the latest information available to us. Nevertheless, we would like to point out that the updating of this document cannot always be performed simultaneously with the further technical development of our products. Information and specifications can be changed at any time.

Please consult www.janitza.com for information on the current version.

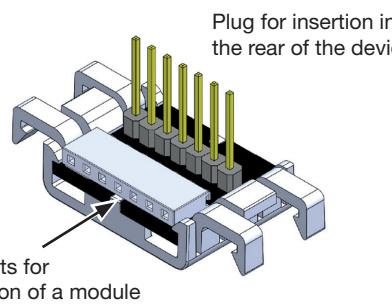
DEVICE VIEWS

- The figures serve as illustrations and are not true to scale.
- Specifications in mm (in).

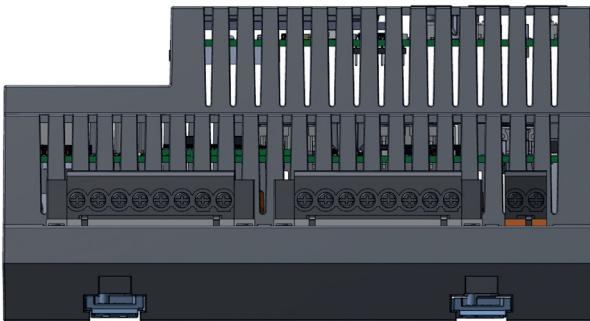
Rear view



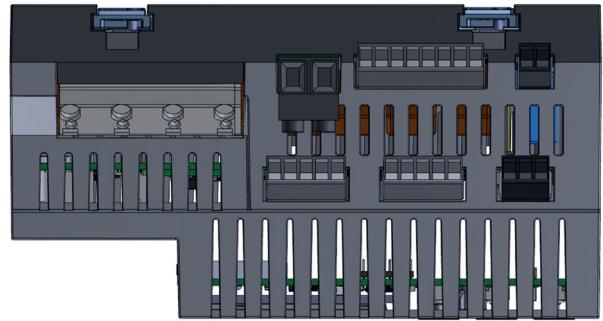
Bus connector



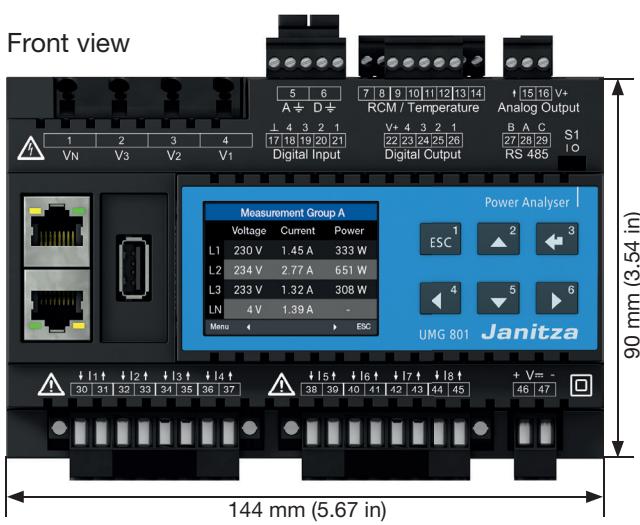
View from below



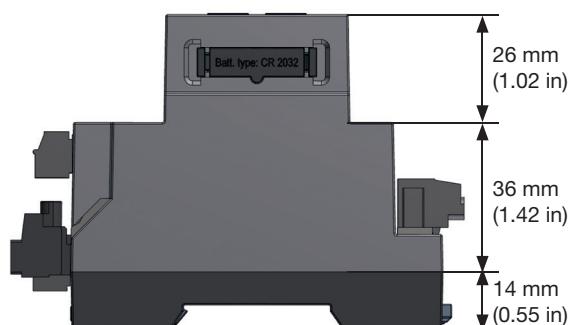
View from above



Front view



View from the left



TECHNICAL DATA

| General information | |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Net weight | 420 g (0.926 lb) |
| Device dimensions | approx. w = 144 mm (5.67 in), h = 90 mm (3.54 in), d = 76 mm (2.99 in) |
| Battery | Type lithium CR2032, 3 V (UL1642 approval) |
| Integrated memory | 4 GB |
| Service life of the backlight | 40000 h (50% of the starting brightness) |
| Installation position | discretionary |
| Mounting/assembly - suitable DIN rails - 35 mm (1.38 in) | <ul style="list-style-type: none"> • TS 35/7.5 according to EN 60715 • TS 35/10 • TS 35/15 x 1.5 |

| Transport and storage | |
|----------------------------------------------------------------------------------------------------------|---------------------------------------|
| The following information applies to devices which are transported and stored in the original packaging. | |
| Free fall | 1 m (39.37 in) |
| Temperature | -25 °C (-13 °F) up to +70 °C (158 °F) |
| Relative humidity (non-condensing) | 0 to 95% RH |

| Ambient conditions during operation | |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The device | <ul style="list-style-type: none"> • must be used in a weather-protected, stationary application. • fulfills the operating conditions according to DIN IEC 60721-3-3. • possesses protection class II according to IEC 60536 (VDE 0106, Part 1), a ground wire connection is not required! |
| Measurement temperature range | -10 °C (14 °F) .. +55 °C (131 °F) |
| Relative humidity | 5 to 95% at 25 °C (77 °F) without condensation |
| Operating height/overvoltage category | <p>2000 m (1.24 mi) above sea level Voltage measurement: 1000 V CATIII; 600 V CATIV Current measurement: 300 V CATII</p> <p>4000 m (2.49 mi) above sea level Voltage measurement: 600 V CATIII; Current measurement: 300 V CATII</p> |
| Pollution degree | 2 |
| Ventilation | No external ventilation required. |
| Protection against foreign bodies and water | IP20 according to EN60529 |

| Supply voltage | |
|-------------------------------------------------------------------|-----------------------------|
| Nominal range | DC: 24 V - 48 V, PELV |
| Operating range | +/-10% of the nominal range |
| Power consumption | max. 4 W |
| Recommended overcurrent protection device for the line protection | 2-6 A (char. B) |

| Voltage measurement | |
|------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Three-phase 4-conductor systems with rated voltages up to | 480 VLN / 830 VLL (+/-10%) acc. IEC 347 VLN / 600 VLL (+/-10%) acc. UL |
| Three-phase 3-conductor systems (grounded) with rated voltages up to | 830 VL-L (+/-10%) acc. IEC 600 VL-L (+/-10%) acc. UL |
| Three-phase 3-conductor systems (ungrounded) with rated voltages up to | 690 VL-L (+/-10%) acc. IEC 600 VL-L (+/-10%) acc. UL |
| Overvoltage category | · 1000 V CAT III acc. IEC · 600 V CAT III acc. UL |
| Rated surge voltage | 8 kV |
| Fuse for the voltage measurement | 1 - 10 A tripping characteristic B (with IEC/UL approval) |
| Metering range L-N | 0 ¹⁾ .. 720 Vrms (max. overvoltage 1000 Vrms) |
| Metering range L-L | 0 ¹⁾ .. 1000 Vrms (max. overvoltage 1000 Vrms) |
| Metering range N-PE | up to 100 V |
| Resolution | 16 bit |
| Crest factor | 1.6 (based on the metering range 600 V L-N) |
| Impedance | 4 MΩ/phase |
| Power consumption | Approx. 0.1 VA |
| Sampling frequency | 51.2 kHz |
| Frequency of the basic oscillation - resolution | 40 Hz .. 70 Hz 0.01 Hz |
| Harmonics | 1 .. 127. |

1) ... The device only measures if a voltage L-N of >10 V_{eff} or a voltage L-L of >18 V_{eff} is present on at least one voltage measurement input.

| Current measurement ../5 A | |
|-------------------------------------------|-----------------------------------------------------------|
| Rated current | 5 A |
| Channels | 8 · 2 systems (L1, L2, L3, N) · Individual channels |
| Metering range | 0 .. 6 Arms |
| Crest factor (based on the rated current) | 1.98 |
| Overload for 1 sec. | 120 A (sinusoidal) |
| Resolution | 0.1 mA (color graphic display 0.01A) |
| Overvoltage category | 300 V CATII |
| Rated surge voltage | 2 kV |
| Power consumption | approx. 0.2 VA ($R_i = 5 \text{ m}\Omega$) |
| Sampling frequency | 25.6 kHz |
| Harmonics | 1 .. 63. |

The device optionally has 4 multifunction channels for use as

- residual current measurement inputs and/or temperature measurement inputs (mixed),
- additional system inputs (L1, L2, L3, N)

| Residual current monitoring (RCM) | |
|------------------------------------------|------------------------------------------------|
| Rated current | 60 mA _{rms} |
| Metering range | 0 .. 80 mA _{rms} |
| Response current | 100 µA |
| Resolution | 1 µA (color graphic display 0.01 A) |
| Crest factor | 1.414 (based on 80 mA) |
| Load | 4 Ω |
| Overload for 20 ms | 50 A |
| Overload for 1 s | 5 A |
| Permanent overload | 1 A |
| Standard | IEC/TR 60755 (2008-01), type A + type B and B+ |

| Temperature measurement | |
|--------------------------------|---------------------------------------------------------------|
| Update time | 1 s |
| Total burden (sensor and lead) | max. 4 kΩ |
| Lead | <= 30 m (32.81 yd.) unshielded > 30 m (32.81 yd.) shielded |
| Suitable sensor types | KTY83, KTY84, PT100, PT1000 |

| Digital inputs | |
|------------------------------------------------------------------|---------------------------------------|
| 4 digital inputs, semiconductor relays, not short-circuit proof. | |
| Maximum counter frequency | 20 Hz |
| Input signal present | 18 .. 28 V DC (typical 4 mA) |
| Input signal not present | 0 .. 5 V DC, current less than 0.5 mA |

| Digital outputs | |
|-------------------------------------------------------------------|------------------------------|
| 4 digital outputs, semiconductor relays, not short-circuit proof. | |
| Switching voltage | max. 60 V DC |
| Switching current | max. 50 mA _{eff} DC |
| Response time | Approx. 500 ms |
| Pulse output (energy pulse) | Max. 20 Hz |

| Line length (digital inputs/outputs) | |
|---------------------------------------------------------------------------|-------------------------------------------------------------|
| Up to 30 m (32.81 yd.) | Unshielded |
| Greater than 30 m (32.81 yd.) | Shielded |
| Analog output | |
| 1 channel | |
| External power supply | max. 33 V DC |
| Current | 0/4...20 mA DC |
| Update time | 0.2 s |
| Load | Max. 300 Ω |
| Resolution | 10 Bit |
| RS485 interface | |
| 3-wire connection with A, B, GND | |
| Protocol | Modbus RTU/slave Modbus RTU/master Modbus RTU/gateway |
| Transmission rate | 9.6 kbps, 19.2 kbps, 38.4 kbps, 57.6 kbps, 115.2 kbps |
| Termination | DIP switch |
| Ethernet interfaces | |
| Connection | 2 x RJ45 |
| Function | Modbus gateway |
| Protocols, services and time synchronization | OPC UA, REST/HTTP (S), Modbus/TCP, NTP |
| Terminal connection capacity (supply voltage) | |
| Connectable conductors. Only one conductor can be connected per terminal. | |
| Single core, multi-core, fine-stranded | 0.2 - 4 mm ² , AWG 24-12 |
| Cable end sleeve (not insulated) | 0.2 - 4 mm ² , AWG 24-12 |
| Cable end sleeve (insulated) | 0.2 - 2.5 mm ² , AWG 26-14 |
| Tightening torque | 0.4 - 0.5 Nm (3.54 - 4.43 lbf in) |
| Stripping length | 7 mm (0.2756 in) |
| Terminal connection capacity (current measurement) | |
| Connectable conductors. Only one conductor can be connected per terminal. | |
| Single core, multi-core, fine-stranded | 0.2 - 4 mm ² , AWG 24-12 |
| Cable end sleeve (not insulated) | 0.2 - 4 mm ² , AWG 24-12 |
| Cable end sleeve (insulated) | 0.2 - 2.5 mm ² , AWG 26-14 |
| Tightening torque | 0.4 - 0.5 Nm (3.54 - 4.43 lbf in) |
| Stripping length | 7 mm (0.2756 in) |

Terminal connection capacity (voltage measurement)

Connectable conductors. Only one conductor can be connected per terminal.

| | |
|--------------------------------------------|----------------------------------------|
| Single core, multi-core, fine-stranded | 0.08 - 4 mm ² , AWG 28-12 |
| Cable end sleeve (insulated/not insulated) | 0.25 - 2.5 mm ² , AWG 24-14 |
| Stripping length | 8-9 mm (0.3150 - 0.3543 in) |

Terminal connection capacity (A/D functional ground)

Connectable conductors. Only one conductor can be connected per terminal.

| | |
|----------------------------------------|---------------------------------------|
| Single core, multi-core, fine-stranded | 0.2 - 4 mm ² , AWG 24-12 |
| Cable end sleeve (not insulated) | 0.2 - 4 mm ² , AWG 24-12 |
| Cable end sleeve (insulated) | 0.2 - 2.5 mm ² , AWG 26-14 |
| Tightening torque | 0.4 - 0.5 Nm (3.54 - 4.43 lbf in) |
| Stripping length | 7 mm (0.2756 in) |

Terminal connection capacity - multifunction channels (RCM, temp.)

Connectable conductors. Only one conductor can be connected per terminal.

| | |
|----------------------------------------|---------------------------------------|
| Single core, multi-core, fine-stranded | 0.2 - 1.5 mm ² , AWG 24-16 |
| Cable end sleeve (not insulated) | 0.2 - 1.5 mm ² , AWG 26-16 |
| Cable end sleeve (insulated) | 0.2 - 1 mm ² , AWG 26-18 |
| Tightening torque | 0.2 - 0.25 Nm (1.77 - 2.21 lbf in) |
| Stripping length | 7 mm (0.2756 in) |

Terminal connection capacity (digital inputs/outputs, analog output)

| | |
|----------------------------------------|---------------------------------------|
| Single core, multi-core, fine-stranded | 0.2 - 1.5 mm ² , AWG 24-16 |
| Cable end sleeve (not insulated) | 0.2 - 1.5 mm ² , AWG 26-16 |
| Cable end sleeve (insulated) | 0.2 - 1 mm ² , AWG 26-18 |
| Tightening torque | 0.2 - 0.25 Nm (1.77 - 2.21 lbf in) |
| Stripping length | 7 mm (0.2756 in) |

Terminal connection capacity (RS485)

| | |
|----------------------------------------|---------------------------------------|
| Single core, multi-core, fine-stranded | 0.2 - 1.5 mm ² , AWG 24-16 |
| Cable end sleeve (not insulated) | 0.2 - 1.5 mm ² , AWG 26-16 |
| Cable end sleeve (insulated) | 0.2 - 1 mm ² , AWG 26-18 |
| Tightening torque | 0.2 - 0.25 Nm (1.77 - 2.21 lbf in) |
| Stripping length | 7 mm (0.2756 in) |

FUNCTION PERFORMANCE CHARACTERISTICS

| Function | Symbol | Accuracy class | Metering range | Display range |
|--------------------|---------------|-----------------------|-----------------------------|----------------------|
| Frequency | f | 0.05 (IEC61557-12) | 45 .. 65 Hz | 45.00 .. 65.00 Hz |
| Voltage | U L-N | 0.2 (IEC61557-12) | 10 .. 720 V _{rms} | 0 .. 999 kV |
| Voltage | U L-L | 0.2 (IEC61557-12) | 18 .. 1000 V _{rms} | 0 .. 999 kV |
| Voltage harmonics | Uh | Cl. 1 (IEC61000-4-7) | 1 .. 127 | 0 .. 999 kV |
| THD of the voltage | THDu | 1.0 (IEC61557-12) | 0 .. 999 % | 0 .. 999 % |

| Function | Symbol | Accuracy class - 5 A rated current | Metering range | Display range |
|--------------------------------------|---------------|-------------------------------------------|-------------------------|----------------------|
| Total active power | P | 0.2 (IEC61557-12) | 0 .. 12.6 kW | 0 .. 999 GW |
| Total reactive power | QA, Qv | 1 (IEC61557-12) | 0 ... 16.6 kvar | 0 .. 999 Gvar |
| Total apparent power | SA, Sv | 0.5 (IEC61557-12) | 0 .. 12.6 kVA | 0 .. 999 GVA |
| Total active energy | Ea | 0.2 (IEC61557-12) 0.2S (IEC62053-22) | 0 .. 999 GWh | 0 .. 999 GWh |
| Total reactive energy | ErA, ErV | 1 (IEC61557-12) | 0 .. 999 Gvarh | 0 .. 999 Gvarh |
| Total apparent energy | EapA, EapV | 0.5 (IEC61557-12) | 0 .. 999 GVAh | 0 .. 999 GVAh |
| Phase current | I | 0.2 (IEC61557-12) | 0 .. 6 A _{rms} | 0 .. 999 kA |
| Calculated neutral conductor current | INc | 1.0 (IEC61557-12) | 0.03 .. 25 A | 0.03 .. 999 kA |
| Power factor | PFA, PFV | 0.5 (IEC61557-12) | 0.00 .. 1.00 | 0.00 .. 1.00 |
| Current harmonics | Ih | Cl. 1 (IEC61000-4-7) | 1 .. 63 | 0 .. 999 kA |
| THD of the current | THDi | 1.0 (IEC61557-12) | 0 .. 999 % | 0 .. 999 % |

| Function | Symbol | Accuracy class - 1 A rated current | Metering range | Display range |
|--------------------------------------|---------------|-------------------------------------------|-----------------------|----------------------|
| Total active power | P | 0.5 (IEC61557-12) | 0 .. 12.6 kW | 0 .. 999 GW |
| Total reactive power | QA, Qv | 1 (IEC61557-12) | 0 .. 16.6 kvar | 0 .. 999 Gvar |
| Total apparent power | SA, Sv | 0.5 (IEC61557-12) | 0 .. 12.6 kVA | 0 .. 999 GVA |
| Total active energy | Ea | 0.5 (IEC61557-12) 0.5S (IEC62053-22) | 0 .. 999 GWh | 0 .. 999 GWh |
| Total reactive energy | ErA, ErV | 1 (IEC61557-12) | 0 .. 999 Gvarh | 0 .. 999 Gvarh |
| Total apparent energy | EapA, EapV | 0.5 (IEC61557-12) | 0 .. 999 GVAh | 0 .. 999 GVAh |
| Phase current | I | 0.5 (IEC61557-12) | 0 .. 6 Arms | 0 .. 999 kA |
| Calculated neutral conductor current | INc | 1.0 (IEC61557-12) | 0.03 .. 25 A | 0.03 .. 999 kA |
| Power factor | PFA, PFV | 1 (IEC61557-12) | 0.00 .. 1.00 | 0.00 .. 1.00 |
| Current harmonics | Ih | Cl. 1 (IEC61000-4-7) | 1 .. 63 | 0 .. 999 kA |
| THD of the current | THDi | 1.0 (IEC61557-12) | 0 .. 999 % | 0 .. 999 % |

i INFORMATION

Detailed information on the device functions and data can be found in the usage information, which is enclosed with the device or is available as a download at www.janitza.com!

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