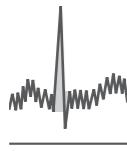


NATURE'S POWER FOR A GREENER TOMORROW

Solar parks represent a pivotal aspect of renewable energy infrastructure, varying in scale and application to meet diverse energy demands. Together, these solar park configurations play a vital role in driving the transition towards sustainable energy systems.

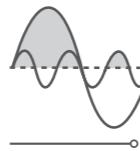


FLUCTUATIONS OF VOLTAGE AND FREQUENCY

Voltage and frequency fluctuations at the interconnected power grid are caused by the volatility of renewable energy resources, due to ever-changing weather conditions.

- May lead to significant operational disruptions, reducing efficiency and lifespan of electrical equipment, and potentially causing system-wide instability in the power grid
- Could result in light flicker that can cause annoyance and health problems for people who are exposed to it

Due to their dependency on weather conditions such as shading, temperature, or even rain or snow, the energy output of solar parks varies over time. To ensure a stable power grid, it is inevitable to closely monitor and analyze energy supply as well as power quality.

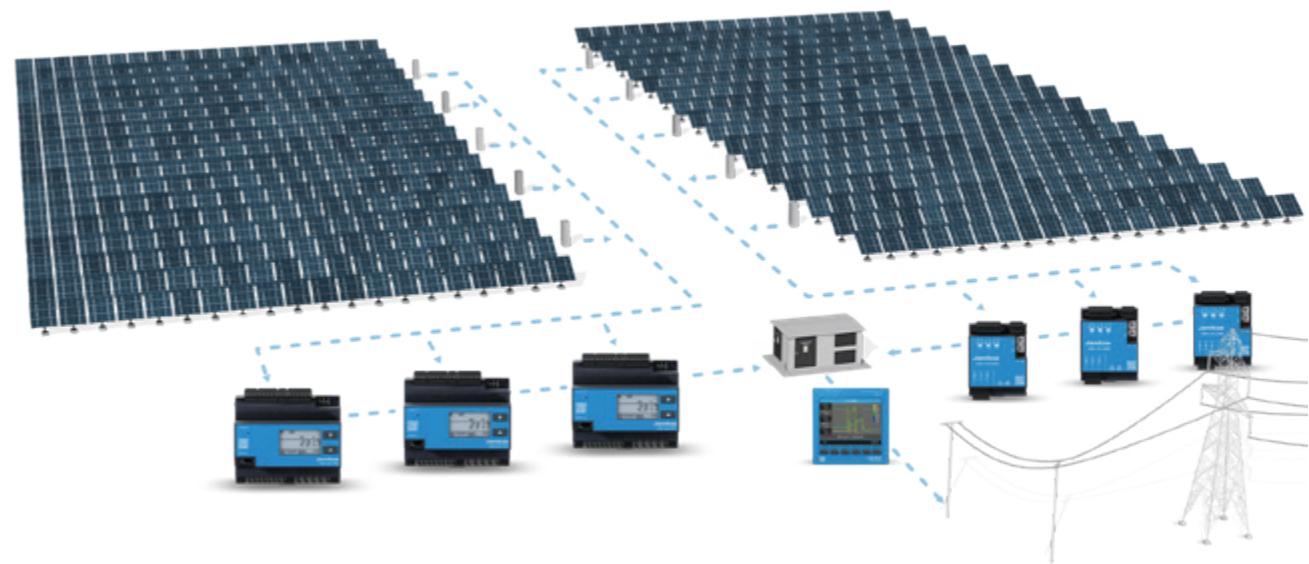


HARMONICS AND TRANSIENTS

In PV parks, harmonics and transients can result in inefficiencies and potentially cause damage to the electrical systems, impacting overall performance.

- Possible excessive heating in electrical components induced by harmonics, reducing the efficiency of solar inverters, and causing premature aging of infrastructure
- Potential instabilities caused by transients, disrupted sensitive equipment, and power quality issues that might affect the PV park and also the wider grid to which it is connected

HOLISTIC ENERGY TRANSPARENCY IN PV PARKS WITH JANITZA MEASUREMENT TECHNOLOGY



ACTIVE AND REACTIVE ENERGY MONITORING

Effective monitoring and management of both active and reactive energies are key to optimizing performance and ensuring economic viability of PV parks as both directly influence grid stability and efficiency.

- Active energy monitoring: crucial for measuring the actual power generated, which impacts revenue and operational efficiency
- Managing reactive energy: essential for maintaining power quality and voltage stability within the grid as inadequate control of reactive power can lead to increased power losses, potential penalties from grid operators, and challenges in complying with grid codes



CRITICAL INSTRUMENTS AND ENVIRONMENTAL CONDITIONS

Integrating a PV system to the utility grid increases the risk of a short circuit in the grid. To identify and analyze potential causes for a short circuit may avoid major damage and downtime.

- Monitoring the status of critical instruments like inverters, transformers, and meters to quickly detect and address faults quickly, preventing downtime and costly repairs
- Tracking environmental conditions such as temperature, humidity, and solar irradiance that directly impact the efficiency and output of solar panels



UMG 604-PRO



UMG 512-PRO



UMG 103 CBM



GRIDVIS ®

Comprehensive measurement with Janitza measuring devices in PV systems

BENEFITS OF PV MONITORING

Photovoltaics serve as a renewable source of energy. Yet, in order to maximize the efficiency and quality of the energy produced by PV systems, close monitoring of the entire system is essential.

With Janitza energy measurement technology you gain several advantages:

SOLAR ENERGY PRODUCTION MONITORING

- Provides insights into the electricity output of solar panels (kWh)
- Enables historical performance analysis and comparisons

SOLAR ENERGY CONSUMPTION MONITORING

- Allows tracking consumption patterns throughout the day
- Adjusting utilization habits optimizes the self-consumption and reduces costs

GRID EXPORT AND IMPORT MONITORING

- Enables precise tracking of power allocation, which ensures accurate billing and optimal energy use during each billing period
- Allows to effectively balance and account for the energy they generate and consume, enhancing financial and operational efficiency

ADVANCED SYSTEM MONITORING

- Uses smart algorithms to interpret consumption and performance data and deliver it in a practical, actionable way
- Allows you to get more value from your solar system and gives you a more comprehensive view of your energy profile.
- Determine the expected performance of your panels and inverters and – by utilizing local weather data – detect poor or nil output from the solar system, promptly notifying the operator

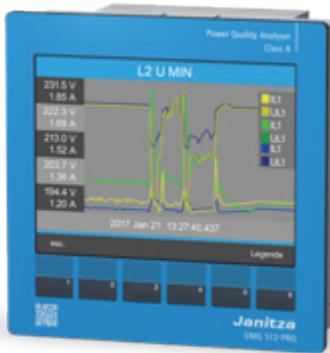


TARIFFS ANALYSIS

- Advanced monitoring systems offer comprehensive user input options for electricity rates and might analyze available energy plans in the market and automatically identify the optimal plan for your needs

JANITZA SOLUTIONS FOR THE SOLAR INDUSTRY

GridVis® – POWER GRID MONITORING SOFTWARE



Product no.: 52.17.003 48 ... 110 V AC / 24 ... 150 V DC*
52.17.011 95 ... 240 V AC / 80 ... 300 V DC*

UMG 512 CLASS A POWER QUALITY ANALYZER

- Certified according to IEC 61000-4-30, IEEE19 and EN 50160/61000-2-4
- Recording, analysis and documentation of interferences such as harmonics, unbalance, transients
- Integrated energy meter (kWh, kvar), status monitoring
- Built-in webserver in order to easily access current and historical data
- In conjunction with the data manager and the inverter manager it can be used to measure and control the grid connection point.



Product no.: 52.16.202 (UL) 95...240 V AC / 135...340 V DC*
52.16.012 50 ... 110 V AC / 50 ... 155 V DC*
52.16.222 (UL) 20 ... 50 V AC / 20 ... 70 V DC*

UMG 604 PRO FUNCTIONALLY EXPANDABLE POWER ANALYZER

- Holistic view of power quality and energy consumption
- Recording, analysis and documentation of interferences, such as harmonics, unbalance, transients
- Energy meter (kWh, kvar), peak load optimization, PLC, state monitoring, event recording, data logger
- Data easy to be analyzed via integrated homepage and via power grid monitoring software GridVis
- With attached RCM 202 AB additional RCM measurement type B+ can be enabled via RS 485 interface and managed directly via homepage.



Product no.: 52.28.001 (UL) 240 / 415 V AC**

UMG 103-CBM UNIVERSAL DIN RAIL MEASUREMENT DEVICE

- Compact and cost-efficient energy meter for DIN rails with clock, battery and memory
- Suitable for measurement and monitoring of electrical parameters, e.g. energy consumption and power quality
- Communication with Modbus RTU via Ethernet



Product no.: 52.32.004 90 ... 277 V AC / 90 ... 250 V DC*

UMG 96-PA-MID+ MODULAR EXPANDABLE POWER ANALYZER

- Recording of billing-relevant energy values
- Tamper-proof and MID-certified according to 2014/32/EU
- Detailed analysis of the electrical grid possible
- RCM and temperature measurement (with module)
- Ethernet, master function for Modbus RTU (with module)

The solar industry has to overcome numerous challenges. The use of the GridVis® power grid monitoring software for photovoltaics offers several distinct advantages that enhance both the operational efficiency and financial performance of solar energy systems.

Its real-time monitoring and control of photovoltaic systems allows operators to instantly detect and address operational issues, thereby maintaining peak efficiency. The advanced software provides effective data analysis for maintenance and upgrades and pinpoints inefficiencies in power generation.

Additionally, predictive maintenance capabilities preempt equipment failures, reducing downtime and costs, while integration features ensure scalability and adaptability to changing energy demands.

ADVANTAGES

- POWER CONSUMPTION ANALYSIS**
Single or total consumptions of selected meter points
With direct costs and billing information
- VISUALIZATION**
Monitoring of sags, swells, transients, harmonics and distortion
Event browser, utilization report and availability report
- OBLIGATION TO PROVIDE PROOF**
EN 50160 power quality report
- SAFETY**
Alarm management, threshold value monitoring
- ENERGY MANAGEMENT**
Acc. to DIN ISO 50001, GridVis® KPIs
- CONNECTIVITY**
OPC UA, CSV, REST API
- REPORTING & DOCUMENTATION**
Reports optimized for energy management, power quality and RCM



These products only represent a selection. For a complete overview of measurement technology please visit www.janitza.com or contact us.

*Supply voltage

**Measuring voltage

ABOUT JANITZA

Janitza is a German manufacturer of energy measurement technology, specializing in improving energy efficiency and ensuring a secure energy supply. The company offers tailored solutions designed to meet individual customer requirements across a wide range of industries, such as data centers, manufacturing, buildings & infrastructure, utilities and renewable energy.

PRODUCT RANGE

Janitza's portfolio includes innovative measuring devices and the perfectly integrated Power Grid Monitoring Software GridVis®, complemented by high-quality components. Customers worldwide benefit from solutions in energy data management, power quality monitoring, and residual current monitoring, all within a unified system environment – Made in Germany.

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Further information about solutions
for photovoltaic systems:



Janitza®