

PQ1 Power Quality Sensor



OVERVIEW

Immediately detect if power disturbances occur during your production process, so you can prevent downtime.

Avoid costly damage to your product or manufacturing process with a graceful shutdown.

PQ1 notifies you in real-time via relay contacts when a power outage, voltage sag or swell, high frequency impulse, or power interruption occurs on the mains.

Fast, reliable, PQ1 is easy to integrate with your existing power control scheme.

FEATURES

- Installs easily with an ultra-compact footprint (size of a deck of cards)
- No computer, software, network or phone line required
- Connects directly to voltages (100 - 240 VAC)
- Front panel LED's and button for simple user interface
- Automatically adapts to 50 Hz, 60 Hz, and 400 Hz
- Three relay contact outputs
 - Swell/impulse contact
 - Minor sag contact
 - Major sag contact: application specific depth-duration curves (ITIC/CBEMA, SEMI F47, IEC 61000-2-4, and more)

APPLICATIONS

- Data Servers
- Elevator controls
- Health care and medical laboratory equipment
- Machine tools and HVAC controls
- SCADA
- Semiconductor manufacturing
- Substations

PQ1 GENERAL SPECIFICATIONS	
INPUT	List of Nominal Voltages: 100 / 110 / 120 / 200 / 208 / 220 / 230 / 240 Vrms
Nominal AC Voltage	Full Scale: 300 Vrms May be installed phase-to-neutral or phase-to-phase, provided nominal voltage is in range Installation Category: CAT II Note: Higher voltages possible with external step-down transformer*
Frequency	List of Nominal Frequencies: 50 Hz / 60 Hz / 400 Hz
Nominal AC Current	Minimum < 10 mA Maximum < 100 mA Note: Maximum current occurs during rapid voltage increase Current is non-sinusoidal and non symmetrical
RELAY OUTPUT	Relay Contact Outputs Relay outputs are dry contacts Contacts open when a power disturbance is detected Minimum duration that contacts will be open is 3 seconds, regardless of the event duration
Relay Contact Isolation from AC Input	Provides "Basic Insulation" per IEC 61010 Measured between AC input terminals (1 and 2 connected together) and all relay contact terminals (3, 4, 5, 6, 7, and 8 connected together)
ENVIRONMENTAL	Designed for indoor use (Install fully enclosed in a grounded (earthed) recognized metal enclosure) Transient overvoltage Category II: local level, appliances, portable equipment, etc.
Temperature	0 °C ~ 50 °C (32 °F ~ 122 °F)
Maximum Relative Humidity	80% at 31 °C*
Pollution Degree	No pollution or only dry, non-conductive pollution occurs
PQ1 ACCURACY	
RMS Voltage Thresholds	Typical: Accuracy $\pm 0.5\%$ FS Maximum: $\pm 1.5\%$ FS (Specified at 50 / 60 / 400 Hz) Sensed differentially as digital positive-peak-sense-equivalent, referenced to Terminal 1 Voltage harmonics may affect RMS accuracy, but any effect mimics the effect on an electronic load
Duration Thresholds	Typical: Accuracy ± 0.5 cycle Maximum: ± 1.5 cycle (Applies to sag and swell thresholds) Duration thresholds are specified in milliseconds, but uncertainty is specified in cycles, e.g. a 100 millisecond duration threshold at 50 Hz (20 millisecond cycle) is 100 milliseconds ± 20 milliseconds
Impulse Thresholds	Minimum: 400 Vpk Typical: 450 Vpk Maximum: 500 Vpk Nominal impulse threshold is fixed at 450 Vpk, regardless of nominal voltage, unlike sag and swell thresholds which are expressed in percent of nominal Specified for positive 1.2 x 50 us impulse, per IEC 61000-4-5 Note: useful response from 500x10 ⁻⁹ seconds to 200x10 ⁻⁶ seconds. Sensed differentially as positive peak, referenced to Terminal 1, through high-pass filter, i.e. the impulsive difference from the fundamental sine wave is sensed
Frequency Auto Detection	Typical: ± 0.05 Hz Maximum: ± 0.1 Hz Measured by timing successive zero-crossings through an 800 Hz 1-pole low-pass filter Frequency is measured only during start-up, clear event, and test event 400 Hz = 1-3 ms period; 60 Hz = 15-18 ms period; 50 Hz = 19-22 ms period Any other period duration causes frequency initialization to repeat
PQ1 IMMUNITY	
RMS Voltage Immunity: Sags, Swells, Interruptions	Minimum: 0 Vrms (500 ms), 70 Vrms (continuous) Maximum: 300 Vrms The same immunity level applies regardless of the setting on the Nominal Voltage switch At approximately 350 Vrms for more than 100 milliseconds, a factory-replaceable fuse may open Hold-up time: continues to operate properly at 0 Vrms for a minimum of 500 ms (100Vrms) to 3 seconds (240Vrms) When power is removed for longer than the hold-up time, all relay outputs will show an event* Exceeds the requirements of IEC 61000-6-2, Table 4, Section 4.4 and 4.5
Fast Transient Immunity	Minimum: ± 2 kV, 5 / 50 ns, 5 kHz repetition Test standard IEC 61000-4-4 Exceeds the requirements of IEC 61000-6-2, Table 4, Section 4.2
Surge Immunity	Minimum: ± 2 kV, 1.2 / 50 us Typical: ± 4 kV, ± 500 A, 100 kHz ring wave Test standard IEC 61000-4-5 Line-to-earth surge requirements do not apply Exceeds the requirements of IEC 61000-6-2, Table 4, Section 4.3 Line-to-earth surge requirements do not apply
Radio Frequency Common Mode Immunity	Minimum: 10 V, 105 kHz ~ 80 MHz, 1 kHz AM Test standard IEC 61000-4-6 Exceeds the requirements of IEC 61000-6-2, Table 4, Section 4.1 Note: May cause variations in RMS reading

*See full specification sheet for details