

PQM-K MEDIUM-VOLTAGE POWER QUALITY ANALYZER



- Compact design - measurement, powering and communication in a single unit
- Measurement of networks with a selectable nominal voltage of 11, 22 or 35 kV
- Real-time clock synchronized to a time server
- Local data storing of 365+ days
- High data security - secured remote data access only
- Replaceable LTE/NB-IoT/Cat-M/2G communication module
- Large LCD display

GENERAL DESCRIPTION

The COMTECH PQM-K is a compact device designed for power quality measurement in medium-voltage networks. It can be used both for permanent installation and for on-site, ad hoc measurements. Voltage transformers with any desired transformation ratio can be connected to its inputs, which have a nominal phase-to-neutral input voltage of 57.7 V. The nominal voltage of the network under test can be set to 11, 22 or 35 kV. In addition to measuring line-to-line voltages, the device is capable of real-time determination of voltage unbalance, flicker, THD and individual harmonic components, all expressed as line-related parameters. These functions are complemented by recording the minimum and maximum values within each measurement period and by classified storage of the number of rapid voltage changes.

Independently of the measurement cycle time, the PQM-K can register voltage dips and voltage swells using an event recording function that can be configured for immediate data transmission. It can also indicate power outages and loss of the supply voltage, as well as detect earth faults. In addition to standard-defined events, alarms can be generated when a freely configurable two-day voltage variation limit is exceeded, or when the lower or upper voltage limit is crossed.

The recorded data are transmitted to a local or Azure cloud-based database via a communication module supporting LTE, NB-IoT, Cat-M and 2G, using standard TCP/IP or MQTT protocols. For flexible deployment, the communication module can be replaced with another type if required. If the telecommunications network becomes temporarily unavailable for any reason, the measured values are stored locally and transmitted once the connection is restored. To facilitate installation and commissioning, the PQM-K features a large LCD display, allowing the measured line-to-line voltages, phase sequence and key administrative parameters to be checked without accessing the database. The transmission of individual measured data items to the database can be enabled or disabled independently, allowing telecommunications costs to be optimized.

Simple installation is supported by an integrated 230 V power supply that is independent of the measured network, while optional GNSS positioning facilitates and speeds up post-installation administration.

The devices are available with a wide range of options, as can be seen in the chart below.

Specifications are subject to change without notice!

OPTION CHART

Voltage measurement

One cycle RMS refreshed each half cycle (per line-to-line)	✓
10 cycle RMS (per line-to-line)	✓
Voltage average for 1-10 minutes (per line-to-line)	✓
THD average for 1-10 minutes (per line-to-line)	✓
Harmonics analysis	✓
Voltage unbalance averaged for 1 sec...60 min	✓
Flicker measurement (PST) per line-to-line	✓
Minimum, maximum voltage measurement (RMS, within averaging period)	✓
Alarm function for exceeding customer defined U_{max} , U_{min} , ΔU_{2nap} limits	✓
Classified recording of rapid voltage change events for 1 sec...60 min, per line-to-line ⁽¹⁾	✓
Recording of dip and swell events per line-to-line	✓
Dip, swell and rapid voltage change triggered disturbance recording per line-to-line	✓
Event recording in case of fallout of 1 or 2 phases (instantaneous alarm)	✓
Event recording in case of power outage (instantaneous alarm)	✓
Earth-fault event logging	✓
Fault-current estimation from voltage drop	✓

(1) 6 or 2 classes depending on the settings

Further, customer specified functions not listed in this table can be implemented by a firmware upgrade!

TECHNICAL SPECIFICATIONS

Voltage measurement

Nominal input voltage (U_n - line-to-neutral / line-to-line) [VAC]	57.7 / 100
Nominal voltage level of the measured MV network (line-to-line) [VAC]	11000, 22000, 35000
Frequency range [Hz]	45...65
Measurement accuracy in accordance with 61000-4-30 [%]	±0.5
Accuracy of measuring dips and swells [%]	<1
RMS averaging period [sec]	1...3600
Measurement sample rate [Hz]	6400
Classified storing of rapid voltage changes [%]	0,7-1,5 / 1,5-2,5 / 2,5-5 / 5-7,5 / 7,5-10 / >10 vagy 4-6 / >6
Overload capacity [U_n]	>1.2 (1 min)
Rated insulation voltage [kV_{eff}]	2
Pulse withstand [kV]	>6 (8/20 jelalak)
Measuring harmonics	up to 50th harmonics
Measurement method	IEC 61000-4-30:2026

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Communication parameters

Modem construction	Pluggable, replaceable
Antenna connector	SMA
Supported SIM-cards	LTE / NB-IoT / Cat-M / 2G (GSM) ⁽¹⁾
Protocol set for forwarding events	TCP/IP, MQTT v3.1.1 (QoS 0,1,2), IEC 61850-90-17
Protocol set for downloading firmware or settings	TCP/IP, HTTPS / Mender.io
Communication security	TLS 1.2, 1.3; X.509 certificates
Storing usernames and passwords	AES256 algorithm
Method for setting up the IP-address (for downloading fw. and settings)	Dedicated DNS
Method for synchronizing real-time clock	GNSS, Time server
Accuracy of real-time clock [s/day]	<1
Positioning systems	GPS / BeiDou / GLONASS / Galileo
Local storage medium (replaceable SD-card) capacity [GB]	16

General parameters

Powering source	Separate 230 V network
Power consumption [W]	4
Restart cycle after power outage [s]	<20
Dimensions [mm]	200x120x80
Phase marking	Text
Degree of protection	IP42
Operating temperature range [°C]	-25...+75
Weight [kg]	2.6

(1) The actually available communication solutions are depending on the type of the mounted modem!

ORDERING INFORMATION

