Technical specification
Mobile Power-Quality Analyser for Low, Medium and High Voltage networks

Pos.	Specification
Pos. 1	- The mobile Power-Quality Analyser must be made for measuring 4 voltages and 4 currents in low voltage range and for measurements in medium and high voltage range via instrument transformers. - The device must be compliant to IEC61000-4-30 Ed.3 (2015) and fulfil the requirements for “Class A”. - A fault record can be triggered via external trigger input (AC/DC signals from 0 V to 250 V). - For the measurement of 0-1000 mV signals, an AUX input is required. Units and scaling must be freely configurable. (E.g. simultaneous measurement of temperature and 4x voltage, current) - The accuracy limit of voltage- and current inputs must be < 0,1 %. - Voltage and current inputs must be able to measure AC and DC values. - Voltage range should be P-P: 0-830V for AC and 1000V for DC measurements, appropriate for measurements in LV systems and at instrument transformers in MV/HV systems. - For the measurement of transient values, the device must contain a measuring card with a sample ratio of at least 2 MHz and a measuring range of -5.000 V to 5.000 V. - Measurement range current: up to 3000 A with flexible current clamps, optional up to 6000 A and mini current clamps for 1A/5A instrument transformers. The analyser must detect the connected clamps by coding and the settings must be set automatically. - The measuring channels must have a sampling rate of at least 40 kHz and a resolution of 24 bit. - The online measurement data (voltage, current, power, power consumption, THD, information about the number of PQ-events and fault records) can be viewed at a colour display. - The analyser must be equipped with a memory of min. 4 GB. The memory card must be easily replaceable by the user. - The system must provide the monitoring of the threshold values of the following standards: EN50160; IEC61000-2-2; IEC61000-2-4 (class 1, 2, 3); NRS048; IEEE519 - The threshold values of EN50160/IEC must be fully configurable. - The device must measure the angle of current- and voltage-harmonics according to IEC61000-3-12 standard. - The flicker measurement must be class F1 according to IEC61000-4-15 standard. - Settings like nominal voltage, transformer ratio, measurement range are able to be set via display control (no pc required) - The measuring interval must be freely programmable in range of 1 sec to 30 min. - The following measuring intervals must be recordable without restriction to the number of values: 200 ms; 3 sec; 1 sec to 30 min (variable); 2 h. - The evaluation of standards with 10 min data must be recordable up to 1 year without any loss of data. - No pre-selection of measurement values has to be made. The device must be able to compute and record all 3800 parameters for voltage quality and load analyses simultaneously - The FFT calculation and visualisation of harmonics and interharmonics must provide the spectrum from DC to 20.000 Hz with a resolution of 5 Hz. - The device must be able to calculate and permanently record voltages and current with frequencies of 2 kHz to 9 kHz according to IEC61000-4-7 standard. - Long term data and all triggered events must be measured and recorded simultaneously as phase-to-ground and phase-to-phase values.

	- Event type, measurement channel, onset, duration and extreme values must be recorded for each type of event. Events are triggered by limit-value violations of EN50160 standard or various trigger options. - The trigger thresholds must be fully configurable by the user and independent of the EN50160 settings. - For each trigger event, oscilloscope data and 10 ms RMS data must be recorded. The following trigger types must be provided: a.) Under- or overshoot of a predefined RMS value (voltage or current) b.) Frequency trigger (frequency hopping, under- or overshoot) c.) Envelope curve trigger d.) Effective value hopping (voltage or current) e.) Phase jump (°) f.) Automatic trigger (trigger values are automatically adjusted by the device) - Trigger events must be recorded as RMS and oscilloscope values. Duration and prehistory can be fully parameterised by the user. - ½ period sampling – recording duration min. 600 sec. - 20 kHz sampling – recording duration min. 4.000 msec. - In case of supply disruption, an intern UPS (uninterruptable power supply) must supply the device for up to 4 hours. - The possibility of an external time synchronisation via DCF77 and GPS is necessary. - The display and all interfaces must be protectable against unauthorized access by a password. - The device must provide theft protection via Kensington lock. - The evaluation software must be suitable for Windows 7; 8; 10 and enable graphical representation and prints of continuous measurement data and trigger events. - The software should be provided as 64-bit version. The following measurement variables must be representable as continuous values: - Effective values as minimal, mean and maximum value of 10 min interval - Short- and long-time flicker - Recorded trigger events must be represented as table or graphic - Triggered events should be evaluable as effective value and/or as oscilloscope curve depending on previous parameterisations. In the graphic view, zoom and cursor functions must be available. Reports according to EN50160; IEC61000-2-2, IEC61000-2-4 and NRS048 should be generated automatically. - Effective values, spectral display of harmonics, signal level diagrams and oscilloscope data may be analysed online. - Data export format should be Comtrade; CSV and XML. - A description in English must be attached to the hard- and software. The user interface of the analysing and operating software must be in English. - The software and all updates have to be provided for free and without licenses or dongle. - The device has a three-year warranty.