

## NETWORK ANALYSER

### AS-3

The analyser is destined for monitoring of power supply quality standards. It is used for measuring and recording of single- and three-phase networks' parameters. Running measurements and recorded values (with recording date and time) are viewable directly on the analyser's display.

The AS-3 analysers are essential controlling and measuring devices in Power Supply Quality Management Systems

#### APPLICATION

- measurement and quality analysis at selected checkpoints in LV, MV and HV energy networks
- remote supervision of qualitative and quantitative parameters of a network
- harmonics measurement
- loads history registration
- optimisation of energy solicitation contracts
- diagnostics of power supply systems
- As-Multi software

#### MEASURED PARAMETERS

- line-to-neutral and line-to-line voltages; voltage asymmetry
- phase currents; calculation of neutral line current
- cosine and tangent for each phase and for three phases
- frequency
- harmonics, harmonic content, power factor for each harmonic and THD (voltage and current), transformer K-factor
- powers (active, reactive, complex, apparent, deformed) four - quadrantally, on each phase and on three phases
- energies (active and reactive), four-quadrantally

#### CHARACTERISTICS

- **graphical LCD display:**
  - large, readable graphical display 5"
- **easiness of operation:**
  - remote setting and configuration with use of the remote control or via serial interface
  - fast and easy access to readings
- **small dimensions:**
  - standard 144x144mm flush-mounted casing for easy installation in switchboards and control panels
- **large internal memory:**
  - non-volatile internal memory with capacity of 12672 events, 10727 most recent periods of energy extraction, 6436 most recent average voltages and currents, allows storing of measurements and disturbances data
- **real-time monitoring**
- **DCF (option)**
  - allows automatic synchronisation with the atomic timepiece
- **four-quadrantal energy meter with Power Guard:**
  - automatic disconnection of loads when there is a risk of overriding the solicited power limit
- **communication:**
  - communication with master system via MODBUS RTU protocol
  - RS-485 or RS-232 serial transmission
- **safe measurement inputs**
  - galvanically insulated current inputs and high - impedance voltage inputs
- **digital inputs and outputs**
  - signalisation of events, detection and registration of logic states on inputs
- **temperature measurement (option)**
- **additional PWM inputs (max. 3) for external temperature measuring**
- **oscilloscope:**
  - three-phase oscilloscope recording voltages, currents and inputs and outputs states

#### EVENTS REGISTRATION

- overrides of preset min. and max. thresholds of measured parameters, average values from 200ms periods
- overrides of 2 preset levels of average voltage tolerance with simultaneous recording of power meters state
- voltage decays and surges (resolution: ½ network cycle)
- power supply decays and device restarts
- configuration changes
- digital inputs and outputs state alterations



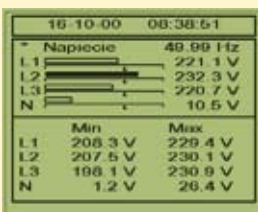
- Selected parameters pane** - parameters in conventional form
- large, readable digits
  - lucid descriptions and units of measured parameters
  - statements of arbitrary parameters



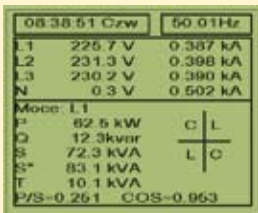
- Events register** - 12672 events:
- voltages, currents and power overrides
  - voltages and currents asymmetry
  - cosine and tangent overrides
  - harmonics overrides
  - K-factor overrides
  - voltage dips, decays and surges



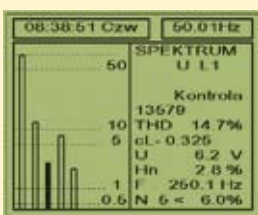
- Power guard with the control of the equipment:**
- control and signaling of the contractual capacity
  - TrueRMS power indicator
  - reserve or excess power prognosis
  - determination of safe limit of power



- Voltages and currents register** - independent recording of up to 6436 TrueRMS voltages and currents on all phases:
- with preset intervals
  - on significant alterations



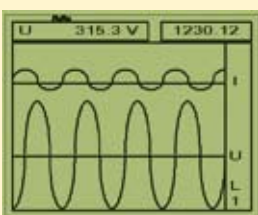
- Measured parameters:**
- voltages and currents
  - powers, cosine and tangent
  - each phase and three phases monitoring
  - four-quadrantal indicator of load characteristics



- Harmonics analysis** – content in current and voltage:
- qualitative content and percentage of harmonics
  - thresholds excess indicator
  - THDU and THDI, K-factor
  - TrueRMS voltage and current, cosine for each harmonic



- Periodic power extraction register** – 10727 periods (e.g. 15 min.):
- power consumption during a selected period
  - energy meters states
  - indicator of power excess in a selected period



- Oscilloscope** – allows recording of currents and voltages wave shapes from 10s periods with 5s pre-trigger. Releasable by:
- manually
  - input state alteration
  - event
  - master system

## TECHNICAL INFORMATION:

### Voltage inputs:

number of inputs	3
nominal range of measured voltage	230 V (100 V) AC
withstand voltage at network frequency	2,5 kV
accuracy	0,5%
voltage circuit input impedance	>1,5 MΩ

### Current inputs:

number of inputs	3
nominal range of measured current	5 A (1 A) AC
overcurrent factor	160 A AC
accuracy	0,5 %
current circuit input impedance	<5 mΩ

### Digital Inputs:

number of inputs	4
operating voltage	±24 V DC
switching threshold	1 mA/1,2 mA DC
input resistance	4,7 kΩ
time constant	100 ms
shared insulation	1,5 kV AC

### Digital Outputs:

number of outputs	4
operating voltage	30 V DC, 24 V AC
load capacity	100 mA
output resistance	10 Ω
shared insulation	1,5 kV AC

### Communication:

interface type	RS-485 (RS-232)
RS485 transmitters receiver capacity	up to 32
transmission speed	1200...57600 Bd
galvanic insulation	1,5 kV
communication protocol	MODBUS RTU

### Configuration:

remote setting	YES
local operation (remote control)	YES

### Power Supply:

voltage	85 V ÷ 265 V AC
power consumption	<10 VA

### Usage:

dimensions	144 x 144 x 60 mm
dimensions assembly hole	138 x 138 mm
protection degree	IP41 (IP20)
weight	0,9 kg
operating temperature	-5° C ÷ 40° C
humidity	55 %

### Certificate of Quality System:

0929/NBR/07  
0930/NBR/07

## Twelve Electric Sp. z o.o.

04-987 Warszawa ul. Wał Miedzeszyński 162

tel. (22) 872 20 20; fax. (22) 612 79 49

skype: t12e\_1, t12e\_2, t12e\_3

e-mail: [twelvee@twelvee.com.pl](mailto:twelvee@twelvee.com.pl)

[www.twelvee.com.pl](http://www.twelvee.com.pl)