



## NETWORK ANALYSER

### AS-3mini

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. It replaces existing analog and digital meters, and ensures high precision and effectiveness of measurements even after power supply decay. By utilising all of the AS-3mini's features, energy network services gain a diagnostic tool helpful in proper energy management.

The analysers are essential control/measurement 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

#### 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

- **small dimensions and easy mounting:**
  - modular casing easily mountable on standard DIN rail
- **internal memory:**
  - non-volatile internal memory with capacity of 12672 events, 9258 most recent periods of energy extraction, 6435 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 recording of inputs logic states
- **temperature measurement -**
  - additional PWM input for external temperature measuring
- **extensive registration of events**
- **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: 1/2 network cycle)
- power supply decays and device restarts
- configuration changes
- digital inputs and outputs state alterations

## **FUNCTIONAL QUALITY:**

**Events register** - chronological list of 12672 most recent events:

- voltages and currents overrides
- voltages and currents asymmetry
- power overrides
- cosine and tangent overrides
- harmonics overrides
- overall heat-transfer coefficient overrides
- voltage dips, decays and surges
- digital inputs state alterations
- meter power-ups and shut-downs
- meter configuration changes

**Periodic power extraction register** – 9258 periods (e.g. 15 min.):

- power consumption during a selected period
- start and end date, and duration of a selected period
- watt-hour meters state at the end of a selected period
- indicator of power excess in a selected period

### **Direct measurement:**

- connection of the analyser's current inputs directly to the supply network (without CT's)
- direct measurement on loads up to 43 kVA

### **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

**Oscilloscope** – allows recording of currents and voltages wave shapes from 10s periods with 5s pre-trigger. Releasable by:

- recorded during a disturbance
- -recorded at an input state alteration

**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

**Voltages and currents register** - independent recording of up to 6435 TrueRMS voltages and currents on all phases:

- with preset intervals
- on significant alterations
- synchronically with watt-hour meter

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## **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 indirect measurement:**

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

### **Current inputs direct measurement:**

number of inputs	3
nominal range of measured current	63 A AC
overcurrent factor	240 A AC
accuracy	0,5 %
current circuit input impedance	<0,25 mΩ

### **Digital Inputs:**

number of inputs	6
operating voltage	±24 V DC
switching threshold	1 mA/1,2 mA DC
input resistance	4 kΩ
time constant	100 ms
shared insulation	1,5 kV AC

### **Digital Outputs:**

number of outputs	3
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 (keypad, remote control)	NO

### **Power Supply:**

voltage	18 V ÷ 36 V DC
power consumption	<2 W

### **Usage:**

dimensions indirect (direct)	159 x 91 x 65 mm (229 x 91 x 65 mm)
number of modules	9 (13)
protection degree	IP20
weight	390 g (790 g)
operating temperature	-5° C ÷ 40° C
humidity	55 %

### **Certificate of Quality System:**

0929/NBR/07  
0930/NBR/07