www.mars-energo.com

MARSENERGO

INSTRUMENTS FOR POWER INDUSTRY

Making energy visible

STATIONARY TEST SYSTEM

MTS-ME 3.1KM-S

ACCURACY CLASSES 0.02; 0.05

Application

General-purpose semi-automatic test system MTS ME 3.1KM-S (stationary) is applied for accuracy testing and calibration of energy meters and instruments measuring electrical quantities.

The system is applied as a ***working standard of AC power.***

The Following Instruments Can Be Tested

1 Single- and three-phase active and reactive energy meters of accuracy classes up to 0.05 with/without power quality metering function

Energy meter

2 Single- and three-phase wattmeters, varmeters, voltmeters, amperemeters, phase- and frequency meters of accuracy classes up to 0.05

Energomonitor 3.3T1

3 Measuring converters of voltage, current, active and reactive power (accuracy class 0.05 or less accurate) having standard low-voltage outputs and operating within the commercial frequency range

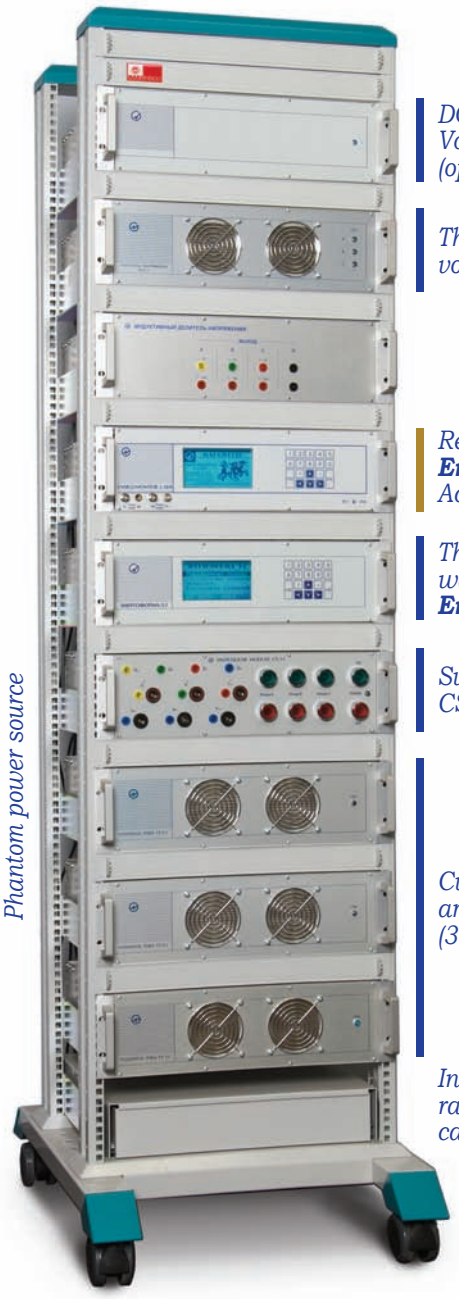
Instrument converter

4 Power quality meters compliant with: IEC 61000-4-30; IEC 61000-4-7; IEC 61000-4-15 (with AC current probes rated up to 3000 A)

Marsen PQP

PQP-A Energotester

Basic Delivery Set



DC Current/ Voltage amplifier (optional)

Three-phase voltage amplifier

Reference standard ***Energomonitor 3.1KM*** *Accuracy classes 0.02; 0.05*

Three-phase waveform generator ***Energoforma 3.1***

Switchgear unit CS-3.1

Current amplifiers (3 units)

Instrument rack and cables

Phantom power source

Basic specifications for the reference standard

		0.02	0.05
Voltage	0.1÷960 V	±0.01 %	±0.02 %
Current (AC/DC)	5 mA÷120 A	±0.01 %	±0.02 %
Angles U-I, U-U	0÷360°	±0.01°	±0.03°
Active power		±0.015%	±0.05 %

Basic specifications for the phantom power source

AC voltage	3 × 0.1 ... 528 V / 25 VA
AC current	3 × 5 mA... 120 A / 50 VA
Angles	3 × 0 ... 360°
Fundamental frequency	42 ... 70 Hz
Order of harmonics (interharmonics)	2 ... 50 (50.5)
Voltage dips and swells, flicker	IEC
DC voltage*	0 ... 300 V / 600 W
DC current*	0 ... 100 A / 600 W

**In the presence of DC amplifier unit.*

Software

EnForm, EnForm-MTS

- Reading and recording measurement results
- Setting test signals in the waveform generator
- Testing in semi-automatic and manual modes
- Generating test reports

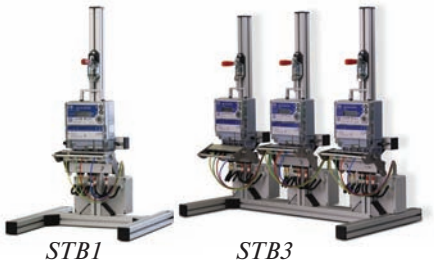
EnfCalibrationRig

- Automatic calibration of generator Energoforma 3.1

Accessories

Three-phase isolated potential transformer (SMD-3) supplies a galvanic isolation test signal to three single-phase meters with closed U-I links

One- and three-position test bench



STB1 *STB3*

Three-phase Inductive Voltage Divider (1:10, 1:100) is used to proportionally reduce the voltage taken from the amplifier (to widen the output range of the voltage source down to 0.02 V)

Set of Calibrated Coils
(*number of turns n = 10; 20; 100; 300*)
to multiply 10 A primary test current by n for testing AC current probes

KT-3-10 (20)
Output current 100 (200) A

KT-1-200 (300)
Output current 2000 (3000) A

KT-3-100
Output current 1000 A

Current/Voltage-to-Frequency Converter (CVFC)

- Provides for automated testing of energy meters (calculates meter errors)
- Turns output DC signals from measuring converters of current, voltage or power to frequency

Accessories for testing energy meters:

SH-E – scanning head for reading LED pulses

SH-I – scanning head for reading disc marks

Pulse Former – used to read pulses from telemetry outputs or enter them manually

Ethernet Switch
Connects three Current/Voltage-to-Frequency converters to a PC

PC and printer for automatic testing

Work bench, rolling table and operator chair

Converter USB - 4RS232

Amplifier VCA-DC produces DC current and voltage

ME Service – Hardware-Software Reference Setup

1 Software EnForm-MTS (version 1.9) for generation of test reports

2 IEC 1107 **optical head** for reading meter data is connected to a PC via RS-232 or USB ports

3 Time Correction Module TCM-02C (*PC-connected GPS receiver*)
UTC correction signals provided by the GPS network are used for:

- Calibration of the internal clocks of tested meters
- Receiving 1PPS timing signals

4 Environment monitor
automatically records environment data (ISO/IEC 17025-2009)

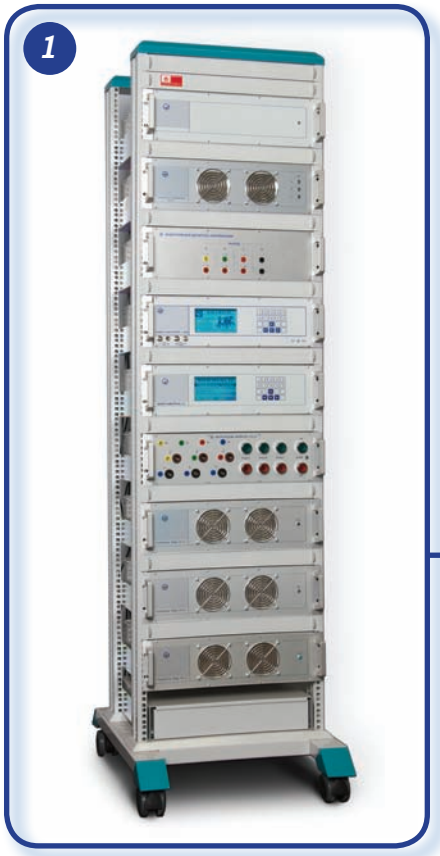
Mars-Energo
V.O. 13 Line, 6-8, office 41H
Saint-Petersburg, Russia, 199034
Tel./fax: +7 812 327-21-11, +7 812 331-87-36
www.mars-energo.com
E-mail: mars@mars-energo.com

Computer Vision Based Automatic Testing with MTS ME Test System

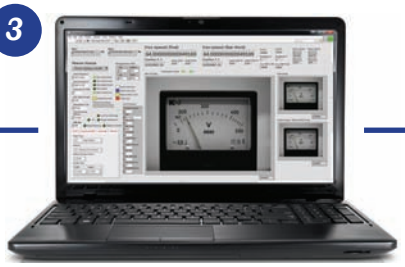
1. MTS ME 3.1 (or MTS ME 3.3)
+
2. Smart camera
3. Software MarsView

Solution for automatic testing with no need for interface connection between testing instruments and PC

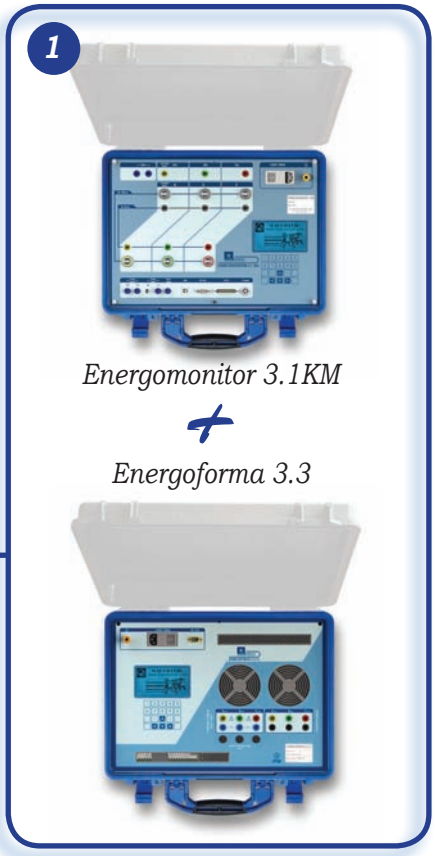
MarsView



Stationary test system MTS ME 3.1

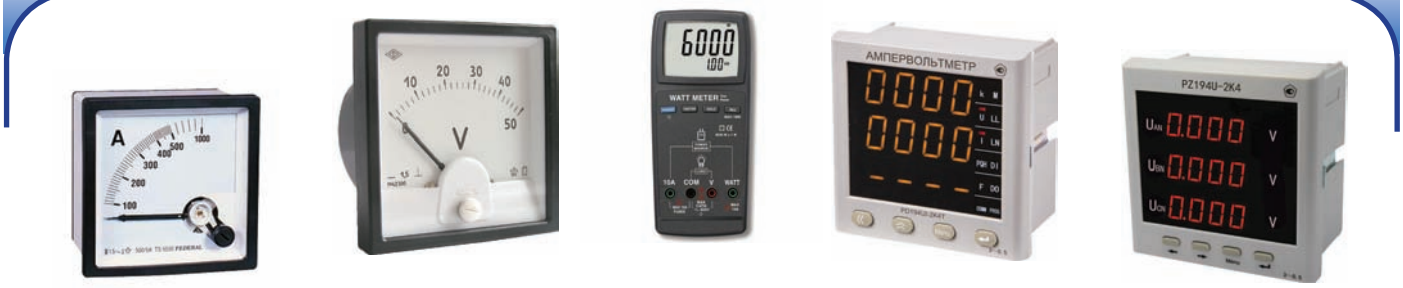


Smart Camera



Energomonitor 3.1KM
+
Energoforma 3.3

Portable test system MTS ME 3.3



Devices with no (or bad) connection ports

Potential customers: Production or power industry test labs, centers for certification and metrology etc.

Project status: R&D in cooperation with Rostest (Moscow).

Edition 27.10.2016