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MARSENERGO
INSTRUMENTS FOR POWER INDUSTRY

Russian ideas of engineering:
turning a concept into creation

CATALOG 2026

Instruments for Power Industry

Reference
instruments
and test systems for

- Energy meters
- Instrument transformers
- EV charging stations

THREE-PHASE SECONDARY STANDARD OF ELECTRICAL POWER AND POWER QUALITY

PCS-ME 3.0

Accuracy class 0.004

Purpose

The system is a secondary standard of AC power applied for accuracy testing (calibration) of:

- Single- and three-phase active and reactive energy meters (up to 120 A, 100...400 V, accuracy class 0.02, or less accurate)
- Single- and three-phase meters of accuracy class 0.02 used to measure active, reactive, and apparent power/energy
- Voltmeters (up to 500 V), ammeters (up to 120 A) operating in the frequency range of up to 450 Hz
- Instruments measuring power quality as applied to IEC 61000-4-30.

No	Product name	Description, specifications
1.	Reference multimeter 3458A (3 pcs) 	Analog-to-digital voltage converters U_{nom} = 0.1, 1.0, 10 V Range: from 0.001 to 10.0 V ±0.0015 %
2	Single-phase inductive voltage dividers DNI-500 (3 pcs) 	Primary converters of AC voltage Range: 5 to 500 V 100:1, 10:1 ±0.002 % ±0.05 min
3	Three-phase instrument electronic current transformer EMT-3.100 (1 pc) 	Primary AC current-to-voltage converters I_{nom} = 0.1, 1.0, 10, 100 A Range: from $0.1 \cdot I_{nom}$ to $1.2 \cdot I_{nom}$ Secondary voltage U_2 from 0.01 to 1.0 V Current sensor ratio (A/V): I_{nom}/U_2 ±0001% ±0.05 min
4	Waveform generator 33522V 	• Precision source of reference frequency 1 Hz and 10/20 MHz ±1.0·10-6 (ADC synchronization) • Reference frequency output for error calculation
5.	Phantom power source:	
5.1	6-channel waveform generator Energoforma 3.1E 	AC voltage 3 × 0.01 to 576 V / 50 VA AC current 3 × 5 mA to 120 A / 120 VA Phase angles 3 × –180 ° to +180 ° Fundamental frequency 16 to 450 Hz Harmonic (interharmonic) order 2 to 50 (50.5) Dips, swells, flicker, unbalance IEC61000-4-30
5.2	Single-phase current amplifier CA-3.1 (3 pcs)	
5.3	Three-phase voltage amplifier VA-3.1	

REFERENCE-CLASS REACTANCE-FREE CURRENT SHUNTS

AC Current Shunts

Rated current: 1 mA to 100 A

History

The first prototype was manufactured at the D.I. Mendeleev All-Russian Institute for Metrology (VNIIM) in the late 1970s. Nowadays similar shunts are serially produced by Fluke Corporation (USA) under the brand «A40B Current Shunts» (No. 51518-12).

Mars-Energo manufactures sets of reference-class reactance-free AC Current Shunts in various configurations depending on the rated current and resistance.

General specifications

Parameter	Value
Rated current (I_{nom}), A	0.001, 0.02, 0.1, 0.5, 1, 2.5, 5, 10, 50, 100
Limits of permissible error in measuring the difference between the values of AC and DC current within the operating frequency range, %	±0.005...0.015
Operating AC frequency range, kHZ	from 0.02 to 100
Relative change in resistance due to self-heating, %	±0.003 or less
Temperature Coefficient of Resistance (TCR), K^{-1}	$1.0 \cdot 10^{-6}$ or less
Rated voltage, V	0.8 or 1

0.1 A 10 A 100 A

MULTI-PURPOSE TEST SYSTEM

MTS-ME21

National Registry # 94696-25, calibration interval 1 year

Purpose

MTS-ME21 is used to test, verify, or calibrate a variety of energy meters and measuring instruments.

Highlights

- ✓ Expanded measurement ranges: 1 mV ... 960 V (1000 V DC); 1 mA ... 120 (3000) A
- ✓ Measurement of signals with a fundamental frequency of up to 400 Hz
- ✓ Reference standard of the 1st (2nd) grade according to the State Verification Schedule (order # 1932 (A-E))
- ✓ Multi-position rack equipped with error calculators

Tested devices

1 Single- and three-phase active and reactive energy meters (accuracy class 0.05 or less accurate) including smart meters with integrated power quality measurement function (class S)

2 Single- and three-phase devices measuring active power, reactive power, phase angles, frequency, voltage, and current (accuracy class 0.05 or less accurate) up to 120 A, 997 V

Energomonitor-3.3T1

3 Measuring converters of voltage, current, active power, and reactive power (accuracy class 0.2) with unified low-voltage output (within industrial frequency range)

4 Power quality analysers (compliant with IEC 61000-4-30) equipped with AC current probes up to 3000 A

Energotester PQP-A

Delivery set

DC source (optional)

Three-phase AC voltage amplifier ***VA-3.1***

Reference standard of ***Energomonitor series*** *Accuracy classes 0.02, 0.05*

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

Switchgear unit ***CS-3.1***

AC Current amplifiers ***CA-3.1*** *(3 pcs)*

Instrument rack and cables

5 test positions

10 test positions

Racks for testing 3-phase meters

Scope of supply

#	Product name	Description, specifications
1.	Reference device of the «Energomonitor» series	
1.1.	Energomonitorop 3.1KM-S 	0.02 / 0.05 Voltage 0.1÷960 V ±0.01 % ±0.02 % Current (AC/DC) 1 mA÷120 A ±0.01 % ±0.02 % Angles U-I, U-U –180°..+180° ±0.01° ±0.01° Active power ±0.015% ±0.05 % Reactive power ±0.03 % ±0.1 % Frequency 42÷70 Hz ±0.001Hz ±0.003 Hz Harmonics (interharmonics) 2÷50 (50.5) IEC 61000-4-7 Flicker IEC 61000-4-15 Power quality parameters IEC 61000-4-30
1.2.	Energomonitor 3.1KM-E-S 	0.02 / 0.05 Voltage 0.001÷960 V ±0.01 % ±0.02 % Current (AC/DC) 1 mA÷120 A ±0.01 % ±0.02 % Angles U-I, U-U –180°..+180° ±0,01° ±0,01° Active power ±0.01% ±0.05 % Reactive power ±0.03 % ±0.1 % Frequency 40÷450 Hz ±0.0004 Hz ±0.001 Hz Harmonics (interharmonics) 2÷50 (50,5) IEC 61000-4-7 Flicker IEC 61000-4-15 Power quality parameters IEC 61000-4-30
1.3.	Energomonitor 61850-S 	0.02 / 0.05 Voltage 0.1÷960 V ±0.01 % ±0.02 % Current (AC/DC) 10 mA÷120 A ±0.01 % ±0.02 % Angles U-I, U-U –180°..+180° ±0.01° ±0.01° Active power ±0.01% ±0.05 % Reactive power ±0.03 % ±0.1 % Frequency 40÷70 Hz ±0.0002 Hz ±0.001 Hz
2.	Phantom power source	
2.1.	6-channel waveform generator Energoforma-3.1E 	AC voltage 3 × 1 mV...576 V / 200...400 VA AC current 3 × 5 mA...120 A / 150...1200 VA Angles 3 × 0 ... 360° Fundamental frequency 40 ... 450 Hz Harmonic (interharmonic) order 2...50 (50.5) Flicker, dips, swells IEC 61000-4-30, IEC 61000-4-15 DC voltage* 0 ... 1000 V (DC) / 600 W DC current* 0 ... 100 A / 600 W *with DC Current Source
2.2.	Current amplifier CA-3.1 (3 pcs) 	
2.3.	Voltage amplifier VA-3.1 	
3.	Switchgear unit SC-3.1 (comes in 2 modules in AC/DC modification) 	Incorporates commutation circuits and circuit breakers, applies current and voltage signals from the phantom power source to the reference and tested devices (in either AC or DC test modes)
4.	Software Enform EnfCalibrationRig 	▪ Reads test results and stores them on a PC ▪ Sets up test signals in the waveform generator ▪ Provides for testing in both automatic and manual modes ▪ Creates test reports

#	Product name	Description, specifications
1.	STB 	STB is a meter suspension rack designed to position 1, 3, 5, or 10 three-phase meters, or up to 30 single-phase meters to a test system. The rack provides quick connection of tested meters to a meter test system.
2.	Error calculator VP-3.1 	VP-3.1 provides for automatic testing of energy meters on a multi-position test bench.
3.	TTR-3.100 	TTR-3.100 is an isolating current transformer used to test three-phase energy meters with closed links between current and voltage circuits on a 3, 5, or 10-position test bench (National Registry number 85612-22).
4.	Error calculator Calmar-S 	Calmar-S converts DC voltage and current into frequency (national Registry number 69182-2017), thus making it possible to perform: - automatic testing of meters (as an error calculator) - testing of measuring transducers with standard DC current or voltage outputs.
5.	SH-E, SH-I, PF 	SH-E is a scanning head for reading LED pulses, SH-I detects disc marks of induction meters, PF (Pulse Former) is used to adjust pulses from tested meters to the input of the reference meter or to generate pulses manually by pressing the button (e.g., when disc marks are unreadable).
6.	KT (10, 20, 100, or 300-turn coils) 	Calibrated coils of KT series are used to multiply test current when testing AC current probes (rated at 100 A, 1000 A, or 3000 A), or when testing the devices equipped with such current probes.
7.	DC current source	DC current source produces DC voltage and current test signals.
8.	Time Correction Module TCM-02C	TCM-02C produces UTC correction signals that may be used to align the clocks of computers and meters to Coordinated Universal Time (National Registry number 44097-10).
9.	Laptop and printer	Accessories for automatic testing and printing calibration reports
10.	Energoforma-1.1T single-phase generator of AC current 	AC current 1 × 0.1 mA ... 120 mA

DESIGNED FOR TESTING OF LPIT-COMPATIBLE ELECTRONIC ENERGY METERS

MTS-ME21

Accuracy classes: 0.02, 0.05

Modification of Test System MTS-ME21 intended for testing the following meters:

Electronic energy meters with analogue inputs of accuracy class 0.5S (or less accurate) compatible with low-power transformers (LPITs).

Scope of supply

#	Product name	Description, specifications
1.	Reference standard **Energomonitor-3.1KM-E**  Voltage amplifier **VA-6.1** 	▪ 0.1 mV ... 12 V ▪ Accuracy classes: 0.02 or 0.05 ▪ Fundamental frequency 40...400 Hz
2.	Test signal source: Generator **Energoforma-3.1E** 	▪ From 1 mV to 10 V ▪ Test signal is set in increments of 0.0001 V ▪ 3-phase voltage signal (Uu) and 3-phase current signal (Ui) ▪ 50 harmonics ▪ 0.05 VA
3.	**Software EnfCalibrationRig-E** 	▪ Reads test results and saves them on a PC ▪ Specifies test signals in the Generator ▪ Performs testing in automatic and manual modes ▪ Creates test reports

Meters under test:

LPIT-compatible electronic meters

PORTABLE TEST SYSTEM

MTS-MONO-ME

Accuracy class 0.05
National Registry # 89778-23, calibration interval 2 years

Specifications for generator and reference meter

Parameter (generation and measurement)	Modification		
	3.120	1.120	3.12
AC current	3 x 5 mA ÷ 120A	1 x 10 mA ÷ 120A	3 x 10 mA ÷ 12A
AC voltage	3 x 6 ÷ 576 V	1 x 6 ÷ 576 V	3 x 6 ÷ 300 V
Harmonics	up to 50		
Interharmonics	up to 50.5		
DC current and voltage	±30 mA; ±15 V (with DC function available)		

1. MTS-MONO-ME 3.120

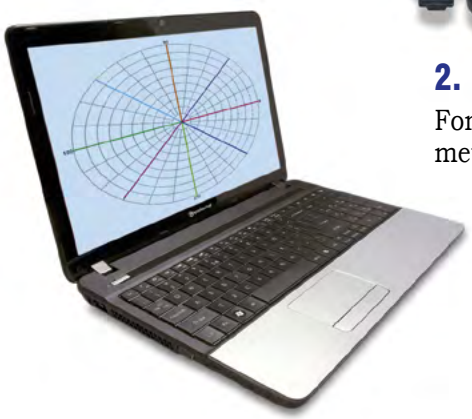
For testing of single- and 3-phase meters connected directly or via transformers

2. MTS-MONO-ME 1.120

For testing of single-phase meters connected directly

3. MTS-MONO-ME 3.12

For testing of single- and 3-phase meters connected via transformers



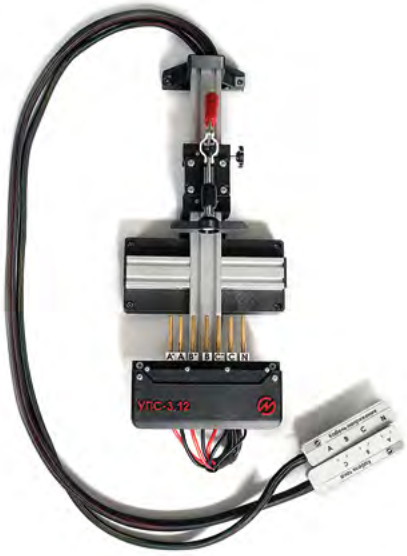
Software EnfCalibrationRig ensures automatic control of test procedures (for testing energy meters of class 0.2S or less accurate)

METER CONNECTION DEVICES FOR QUICK CONNECTION OF METERS TO TEST SYSTEMS MTS-MONO-ME

MCD

1. Single-position

MCD-1.120
For MTS-MONO-ME 1.120

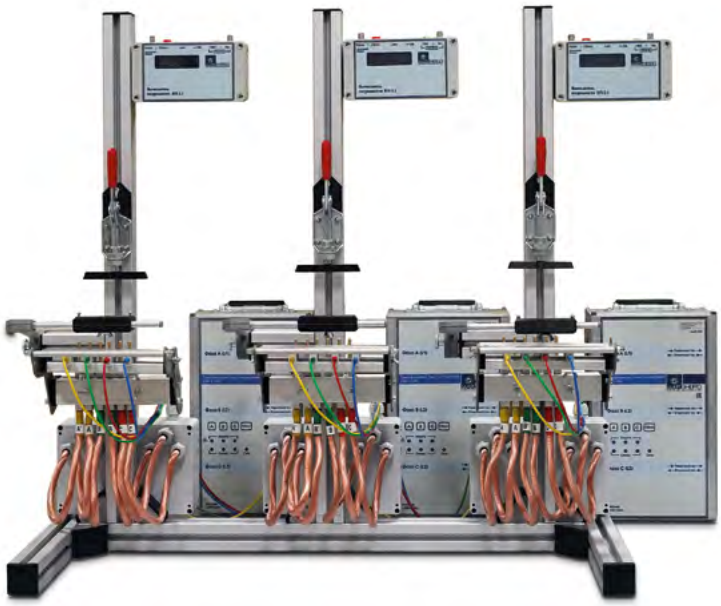


MCD-3.12
For MTS-MONO-ME 3.12

MCD-3.120
For MTS-MONO-ME 3.120

2. Three-position

MCD-1.120-3
For single-phase meters
(including meters with closed U-I links)



MCD-3.120-3
For 3-phase meters
(including meters with closed U-I links)

PORTABLE TEST SYSTEM

MTS-ME 3.3T1-P (3.1KM-P)

Accuracy class 0.1 (0.02, 0.05)

Application

Designed for on-site or in-lab automatic testing/calibration of:

- Single/three-phase energy meters
- Watt meters, varmeters, phase-angle and frequency meters, voltmeters, ammeters
- Power quality meters (IEC61000-4-30, IEC61000-4-7)

MTS-ME 3.3T1-P-10	MTS-ME 3.1KM-P-05	MTS-ME 3.1KM-P-02
accuracy class 0.1	**accuracy class 0.05**	**accuracy class 0.02**
*Testing of instruments of **0.5S accuracy** class or less accurate* (excluding power quality meters)	*Testing of instruments of **0.2S accuracy class** or less accurate*	*Testing of instruments of **0.05 accuracy class** or less accurate*

Reference meter

Energomonitor 3.3T1
accuracy class 0.1

Energomonitor 3.1KM-P-05
accuracy class 0.05

Energomonitor 3.1KM-P-02
accuracy class 0.02

Three-phase phantom power source

Energoforma 3.3-12M
12 A, 300 V

or

Energoforma 3.3-120M
120 A, 480 V

SW Enform

Components for hardware-software setup ME-Service-P

Error calculator Calmar-S

Time Correction Module TCM-02C

Adapter USB-4RS232

SW EnfCalibrationRig

Environment monitor

AUTOMATED (PC-CONTROLLED) TEST SIGNAL SOURCES

MARS-AIT

Test current source

Purpose

Mars-AIT designed to operate either as an independent stand-alone current source or as part of a transformer test/verification/ calibration setup can be used for testing of the following instrument current transformers (CTs):

- Conventional CTs (IEC 61869-1, IEC-61869-2)
- Low-power CTs with low-voltage analogue output (1mV...10V LPCTs according to IEC 61869-10:2017)
- Electronic CTs (IEC 61869-8) with digital interface according to IEC 61869-9 (digital IEC 61850-9-2LE output)

Specifications

- Output current range: 0.5-6000 A
- Limit of permissible relative error in setting output current: 10%
- Max output power: no less than 5 kVA
- Total mains consumption: no more than 5.5 kVA

Components

① Variable-ratio transformer LATR-AIT

② Generating current transformer GT-IT5000

③ Software E-TransformerTest CT

MARS-AIN

Test voltage source

Purpose

Mars-AIN designed to operate either as an independed stand-alone voltage source or as part of a transformer test/verification/ calibration setup can be used for testing of the following instrument voltage transformers (VTs):

- Conventional VTs (IEC 61869-1, IEC-61869-3, IEC 61869-5)
- Low-power VTs with low-voltage analogue output (1mV...10V LPVTs according to IEC61869-11:2017)
- Electronic VTs (IEC 61869-7) with digital interface (digital 61850-9-2LE output)

Specifications

- Output voltage ranges: from 340 V to 10√3 (35√3 or 110√3) kV
- Range of adjustment of the output voltage for the variable ratio transformer LATR-AIN: 5-250 V
- For LATR-AIN, increments of output voltage setting: 1-3 V
- Voltage setting error: ±3%
- Max output power: 3 kVA
- Capacitance of high-voltage load: 150 pF, or less

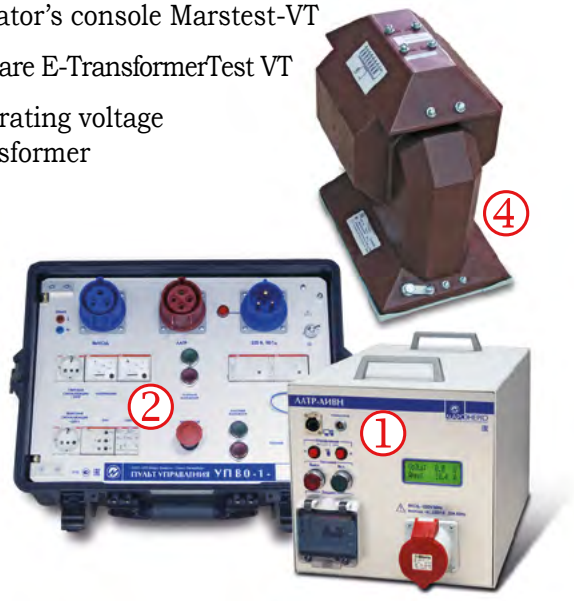
Components

① Variable-ratio transformer LATR-AIN

② Operator's console Marstest-VT

③ Software E-TransformerTest VT

④ Generating voltage transformer



Test systems and reference equipment for instrument transformer testing

High-Voltage Mobile Test Lab
(6 to 330 kV, 500kV, 5 kA, 30 kA)

MarsLab-CT/VT

Accuracy classes: 0.05, 0.1

Purpose

MarsLab-CT/VT is a test system used to verify/calibrate conventional instrument voltage transformers ranging from 6 to 330 kV, or to 500 kV and instrument current transformers rated up to 5 kA (or up to 30 kA) in either laboratory or field conditions.

Scope of supply

#	Product name	Description, specifications
1.	Vehicle 	Van-mounted mobile lab equipped with: - Shelves and cupboards for laboratory equipment - Diesel generator - Lighting and extra power points - Workplace for the operator
2.	CT Test Set for testing current transformers of accuracy classes 0.2S rated from 5 to 5000 A	Testing and verification of CTs in accordance with certified test procedures.
2.1.	Portable current transformers of reference class TTIP 	- TTIP 100/5 or TTIP 100/5(1), 5–100 A - TTIP 5000/5 or TTIP 5000/5(1), 100–5000 A Accuracy class 0.05 Rated currents: TTIP 100/5(1): 5, 10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 100 A TTIP 5000/5(1): 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1500, 2000, 3000, 4000, 5000 A.
2.2.	Adjustable current source IT 3000 IT 5000 	- IT 3000 (current rating 3000 A) - IT 5000 (current rating 5000 A)
2.3.	Automated source of test current MARS-AIT 	Output current range: 0.5-3800 A (0.5-6000 A range is available upon request)
2.4.	Software EmCalibrTrans 	Data management and creation of test reports
3.	Burden boxes of MNTT series 	Nominal current applied to MNTT: 1A and 5A Burden power steps: from 0.5 up to 100 VA Power factor: cosφ = 0.8 or 1

#	Product name	Description, specifications
3	VT Test Sets for testing voltage transformers of accuracy class 0.2S (or less accurate) rated from 0.4 to 500 kV Accuracy class of the reference transformer: 0.05 or 0.1	*Rated primary voltages* (*in kV*): $6/\sqrt{3}$; 6; $10/\sqrt{3}$; 10; $35/\sqrt{3}$; 35; $110/\sqrt{3}$; $220/\sqrt{3}$; $330/\sqrt{3}$; $500/\sqrt{3}$ (other ratings are available upon request)
3.1	Single-phase High-Voltage Test Set MarsTest-VT-1 	On-site testing (calibration) of single-phase instrument transformers of accuracy class 0.2 rated at 110, 220, 330 kV **MarsTest-VT-1-110** for testing VTs 110 kV **MarsTest-VT-1-220** for testing VTs 110, 220 kV **MarsTest-VT-1-330** for testing VTs 110, 220, 330 kV
3.1.1	Reference Capacitive High-Voltage Transducers of CHVT series: CHVT-110, CHVT-220, CHVT-330, CHVT-500	Accuracy classes: 0.1 or 0.05 Weight: 25 kg (CHVT-110), 35 kg (CHVT-220), 45 kg (CHVT-330), 120 kg (CHVT-500)
3.1.2	Adjustable high-voltage source (single-phase) MARS-AIN-100 	Voltage output: from 2 to 100 kV Rated frequency: 50 Hz Power output: up to 10 kVA
3.2	Three-phase High-Voltage Test Sets MarsTest-VT-3-10 and MarsTest-VT-3-35 	On-site testing of three-phase and single-phase instrument transformers of accuracy class 0.2 rated at 6, 10, and 35 kV **MarsTest-VT-3-10** for testing VTs 6 kV, 10 kV **MarsTest-VT-3-35** for testing VTs 15 kV, 35 kV
3.2.1	Reference Capacitive High-Voltage Transducers of CHVT series: CHVT-10-2 and CHVT-35-2 with UIN-D amplifiers	Accuracy classes 0.1 or 0.05 Weight: 4 kg (CHVT-10), 8 kg (CHVT-35)
3.2.2	Three-phase High-Voltage Source	- Set of dry-type VTs (VT-10 or VT-35) (3 pcs) or Set of IOG-type (SF_6 filled) VTs (3 pcs) - Three-phase variable-ratio transformer LATR - Three-phase console unit (PU-10 or PU-35)
3.3	Burden boxes of MNTN series 	Nominal secondary voltage of tested VTs: 110/3, 100/3, 100, and 110 V Burden power provided by the steps: up to 100 VA and up to 200 VA Power factor: cosφ 0.8 and 1.0
3.4	Comparator	- Energomonitor 3.3T1-S with CT Calibration Switch CTCS 1 A and 5 A - Energomonitor 3.1KM-P with CT Calibration Switch CTCS-3.1 - Energomonitor-61850 - MarsComp-K 1000
3.5	Software E-TransformerTest	Data management and creation of test reports

Comparator

MarsComp K-1000

Accuracy class 0.02

National Registry number 87150-22

Purpose

MarsComp K-1000 is a reference comparator intended for testing/verification/calibration of conventional and low-power instrument current and voltage transformers (LPITs).

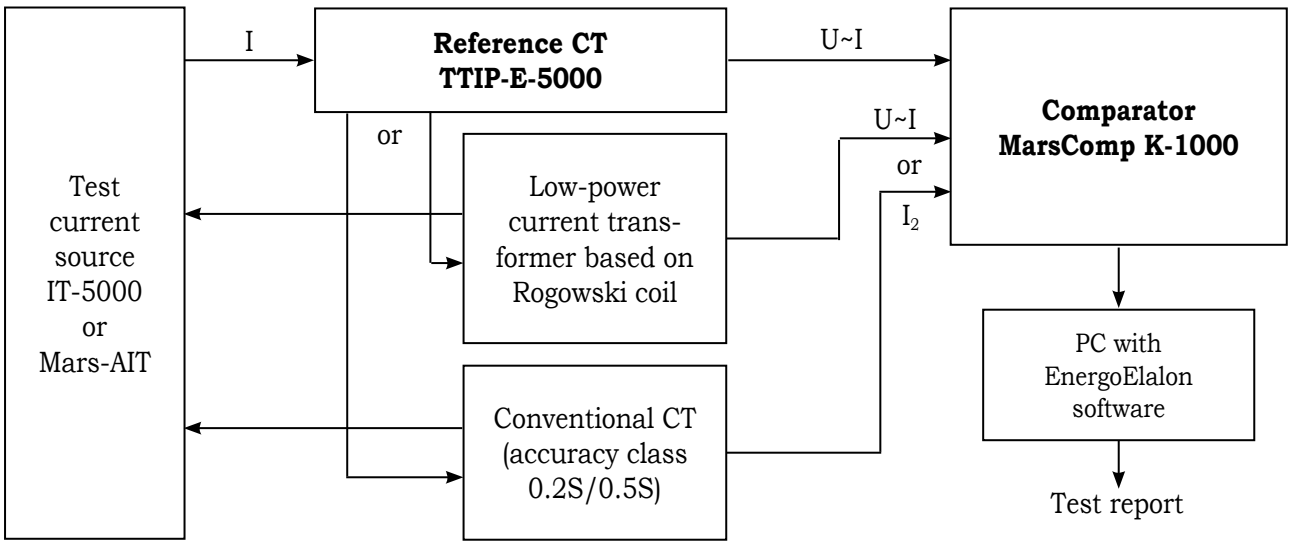
Highlights

- Conventional current transformers (1A and 5A) and conventional voltage transformers (100 V, 100/√3 V) can be used as reference devices when testing either electronic or conventional VTs/CTs.
- Either conventional or electronic voltage transformers can be tested with use of a reference device rated at other secondary voltage, or, in other words, the reference and tested devices may have different scaling factors
- MarsComp K-1000 can be used for certification of voltage transformers that measure voltage harmonics up to the 50th (VTs with frequency response according to IEC 61869-103)

Accuracy characteristics as applied to testing of low-power and conventional instrument voltage and current transfomers

Type of error (absolute)	Limits of permissible error
Voltage (current) ratio error, %	±0.02
Volatge (current) phase error, min	±0.3
Composite error, %	±0.05

Testing a low-power CT or conventional CT (accuracy class 0.2S) using MarsComp K-1000 and reference CT TTIP-E-5000



LOW-POWER INSTRUMENT CURRENT TRANSFORMERS OF REFERENCE CLASS

TTIP-E-5000/100

Accuracy classes: 0.01, 0.03, 0.04

Current range: 0.02 A ... 7500 A

Frequency range: 40 Гц ... 450 Hz

Output signal: 4 mV ... 300 mV

Inom = 0.1, 1, 10, 50, 250, 1200, 5000 A

Purpose

Low-power multi-range instrument current transformers of series TTIP-E-5000 are designed to be applied in AC circuits (0.66 kV and 50, 60, or 400 Hz) for performing electrical measurements and for verification/calibration of instrument transformers (including reference CTs) of accuracy class 0.05 or less accurate.

Components:

① Primary current transformer (5 kA)

② Primary converter of passive type (Current-to-Voltage Converter)

③ Current transformer EMT-100 (100 A)

MOBILE HIGH-VOLTAGE TEST LAB

MarsLab-61850

MarsLab-61850 is a test system intended for testing/calibration/verification) of electronic transformers with IEC 61850-9-2 digital outputs:

✓ Current transformers up to 5 kA (AC) according to IEC 60044-8-2010

✓ Voltage transformers up to AC 500/√3 kV (AC) according to (IEC 60044-7-2010.

Accuracy specifications

Accuracy class of reference current* or voltage** transformer	Limits of permissible measurement error of the test system		
	ratio, %	phase, min	composite, %
0.05	**0.056**	**3.32**	**0.12**

** Current range: 50 A ... 6 kA ** Voltage range: 6/√3 ... 500/√3 kV*

Scope of supply

#	Product name	Description, specifications
1.	Vehicle 	Van-mounted mobile lab equipped with: - Shelves and cupboards for housing laboratory equipment - Diesel generator - Lighting and extra power points - Workplace for the operator
2.	Multifunctional reference setup MarsTest-61850 	- Energomonitor-61850, accuracy class 0.02 or 0.005 - MarsGen-61850, accuracy class 0.05 - Voltage and current source Energoforma-61850 or Energoforma-3.3-120M - External time server - Laptop with software installed
3.	Adjustable high voltage source Mars-AIN-100 (single-phase) 	Output voltage: from 2 to 100 kV Rated frequency: 50 Hz Output power: up to 10 kVA
4.	Adjustable current source 	- IT-3000 (up to 3600 A) - IT-5000 (up to 6000 A)
5.	Reference voltage device of CHVT series 	Accuracy class: 0.1 or 0.05 Weight: 25 kg (CHVT-110), 35 kg (CHVT-220), 45 kg (CHVT-330), 120 kg (CHVT-500)
6.	Reference current transformer TTIP 	- TTIP 100/5 or TTIP 100/5(1), 5...100 A - TTIP 5000/5 or TTIP 5000/5(1), 100...5000 A Accuracy class: 0.05 Rated currents: TTIP 100/5(1): 5, 10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 100 A TTIP 5000/5(1): 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1500, 2000, 3000, 4000, 5000 A

REFERENCE STANDARD FOR
DIGITAL SUBSTATION EQUIPMENT

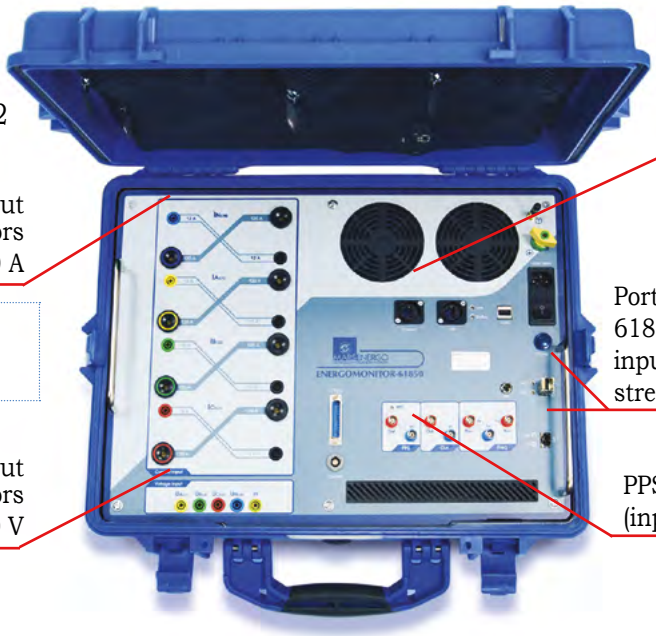
Energomonitor-61850

National Registry # 73445-18 Accuracy classes: 0.02, 0.05

INNOVATION ASSISTANCE FUND

Purpose

Testing of conventional (analogue) instrument current and voltage transformers, digital current and voltage transformers with IEC 61850-9-2 outputs, and merging units.



4 current input connectors
1 mA ÷ 12 A ÷ 120 A

4-phase current
4-phase voltage

4 voltage input connectors
0.1 V ÷ 960 V

Port for IEC 61850-9-2 input/output streams

Control terminal with EM61850ext software

PPS synchronization (input/output)

CALIBRATOR OF DIGITAL STREAMS

MarsGen-61850

National Registry number: 76741-19 Accuracy class 0.05

INNOVATION ASSISTANCE FUND

Purpose

The calibrator MarsGen-61850 synthetizes sampled value (SV) streams according to IEC 61850-9-2. It is specifically designed for direct testing/verification/calibration of electrical energy meters and PQ analyzers with 61850-9-2LE output.

Output port for digital streams

Ethernet port for connection to a PC (synthesis of digital streams and control of external devices)

PTP synchronization

Frequency inputs for connection of external synchronization sources

Ethernet

Control terminal with Signal Editor software

NEW CAPABILITIES OF APPLICATION:
MULTIFUNCTIONAL REFERENCE STANDARD

Energomonitor-3.1KM-A

Accuracy classes: 0.05, 0.1

WHEN USED TOGETHER WITH ELECTRONIC CURRENT TRANSFORMER

EMT-200
EMT-500

Provides for on-site testing (calibration) of
Electrical Vehicle Charging Stations in 2 ways:
❶ testing the station as a whole unit
❷ testing the components of the station individually

TEST SET

Energomonitor-3.1KM-A

EMT-200/500

Modification 1

Through type current transformer with GB/T connector

Modification 2

Busbar type current transformer

Devices under test

EV Charging Station

❶

Meter + shunt

❷

DC meter

200A/500A

Shunt 100A

Specifications for Energomonitor-3.1KM-A + EMT-200/500

#	Parameter	Nominal values	Range	Measurement error	Modification*
1	Voltage	10, 30, 60, 120, 240, 480, 800 V	10 ... 1000 V	±0,02 % / ±0,05 %	
2	Current*	1, 2, 10, 20, 100, 200 (500) A	0.1 ... 250 A 0.1 ... 500 A	±0,02 % / ±0,05 %	EMT-200 EMT-500
3	Power		0.01...250 kW 0.01...500 kW	±0.05 % / ±0.1 %	EMT-200 EMT-500

* There are 2 modifications depending on the current measurement range

PORTABLE TEST SYSTEM FOR TESTING/VERIFICATION OF DC METERS INTEGRATED INTO EV CHARGING STATIONS

MTS-MONO-DC

Accuracy class 0.1

Purpose

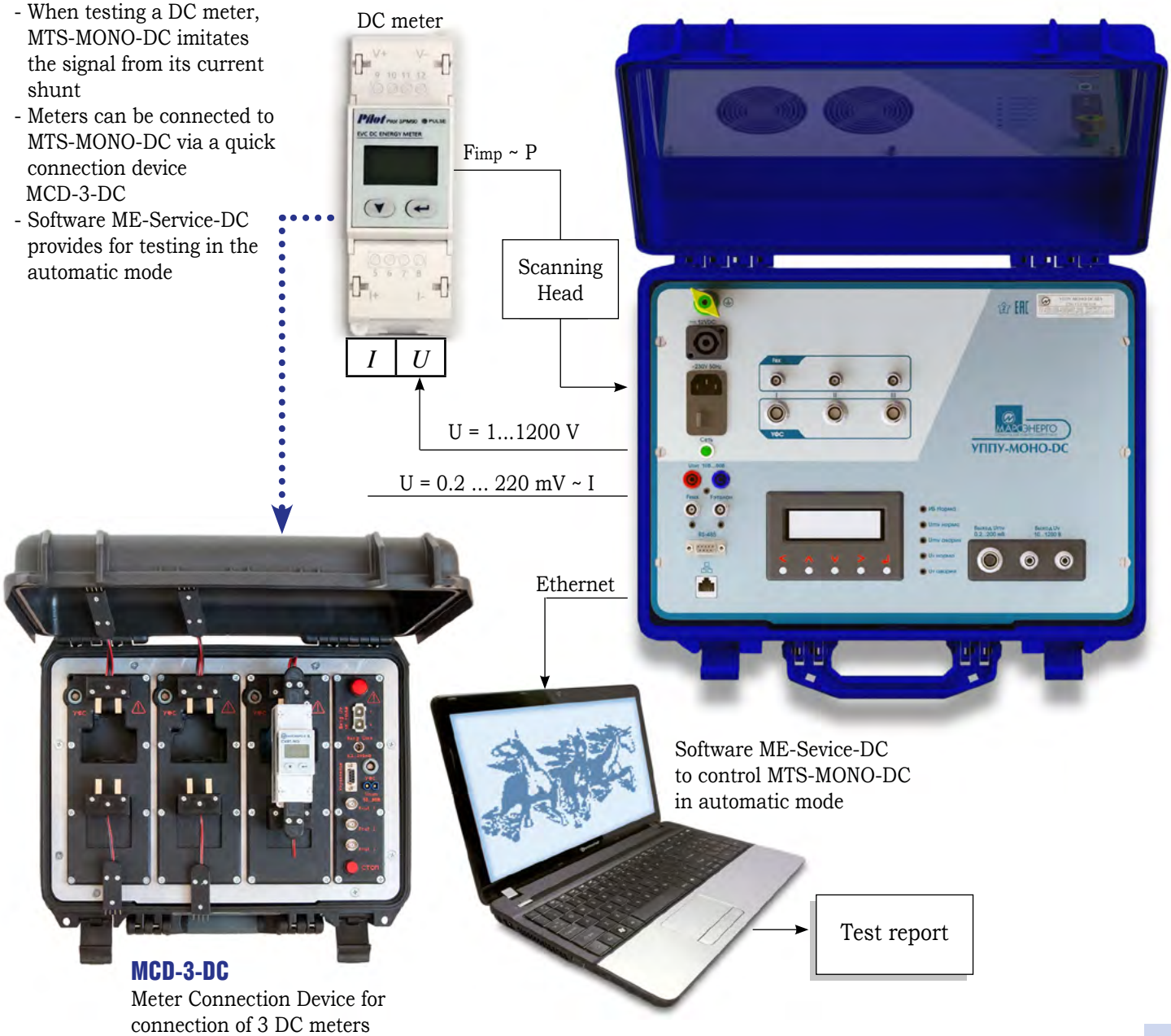
MTS-MONO-DC is intended for on-site testing of:
- DC energy meters
- DC voltmeters.

Highlights

- When testing a DC meter, MTS-MONO-DC imitates the signal from its current shunt
- Meters can be connected to MTS-MONO-DC via a quick connection device MCD-3-DC
- Software ME-Service-DC provides for testing in the automatic mode

Specifications

Parameter	Range	Measurement error	Load current
DC voltage (high)	1...15 V 50...1200 V	±0.05% + Δ	up to 2 mA
DC voltage (low)	0.2 ... 220 mV	±0.05% + Δ	up to 50 mA
DC power		±0.1% + Δ	



MCD-3-DC
Meter Connection Device for connection of 3 DC meters

MARSENERGO
INSTRUMENTS FOR POWER INDUSTRY

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MARS-ENERGO was established in 1991 to design, manufacture and provide technical support of high accuracy equipment for electrical measurements and test systems for power industry applications.

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MARS-ENERGO takes an active part in developing and maintaining the aggregate of measurement standards ranging from state primary standards to working standards and portable test equipment.

MARS-ENERGO manufactures reference devices and systems for accuracy testing, verification and calibration of instruments measuring electrical quantities: power quality meters, energy metering systems, instrument transformers forming part of conventional or digital substations, etc.

Mars-Energo operates a Quality Management System which complies with ISO 9001:2015

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