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MARSENERGO
INSTRUMENTS FOR POWER INDUSTRY

Making energy visible

Saint-Petersburg, Russia, 199034
Tel./fax: +7 812 327-21-11, +7 812 331-87-36
E-mail: mars@mars-energo.com

Volt/mA CALIBRATOR

CALMAR-S

Accuracy classes 0.01; 0.02; 0.05

Calmar-S

Measurement and generation of:

- *Direct voltage, V*: 0.2; 5; 10
- *Direct current, mA*: 5; 20
- *Pulses with repetition frequency, Hz*: 0 ÷ 22 500.

Testing and calibration of:
Electric energy meters and instrument-class trancducers.

Field of Application

Portable Design: CALMAR-SP

On-site testing of energy meter and process control systems

Instrument transducers under test with standardized signals

Energoforma 3.3

Desktop Design: CALMAR-SL

A stand-alone testing instrument or test system component for laboratory applications

MTS ME 3.1KM

Energomonitor 3.1KM

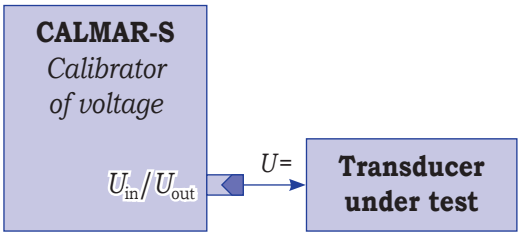
1 Calibrator

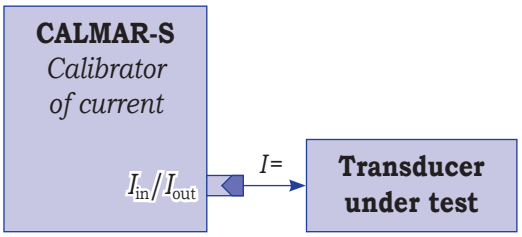
1.1 Generates DC voltage, DC current and frequency signals according to a user-specified model.

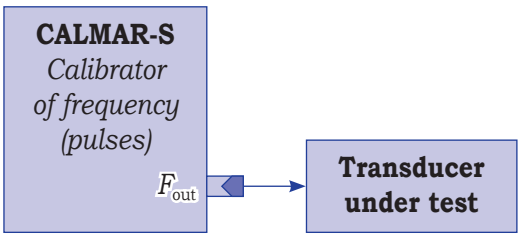
Ranges of output signals:

- DC voltage U_{out}: –10.5...+10.5 V
- DC current I_{out}: –24...+24 mA
- Pulse repetition frequency F_{out}: 0...22 500 Hz.

The signals are used to test and calibrate instrument trancducers, thermocouple converters and other electrical measurement devices with standard DC current and voltage outputs.



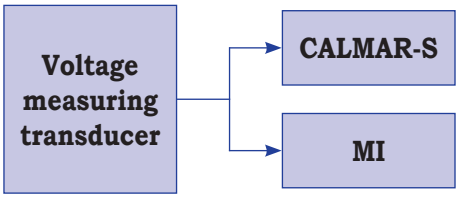




2 Measurement functions

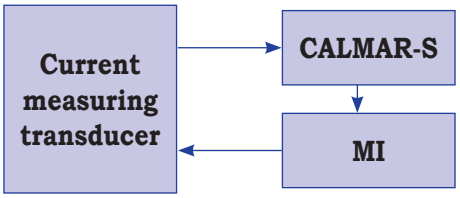
2.1 DC voltage measurement.

Voltage and frequency measuring transducers with standard outputs (0...0.3 V, 0...7.5 V, 0...15 V, –7.5...7.5 V, and –15...15 V) can be calibrated in this mode.



2.2 DC current measurement.

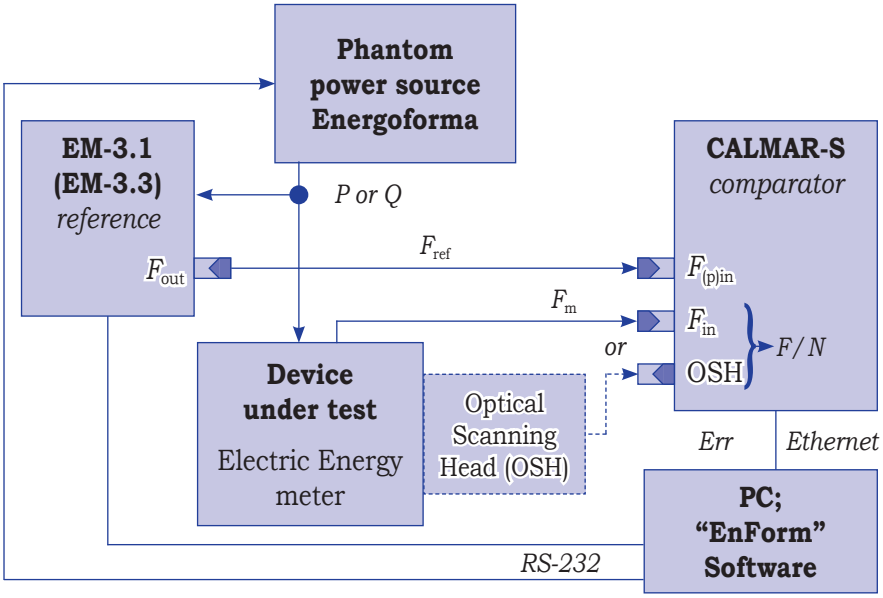
The mode provides for calibration of instruments maesuring DC current within 0...30 mA range.



3 Comparator

3.1 Determines measurement errors of electric energy meters by the comparison method.
Frequencies on the reference meter and meter-under-test outputs are compared considering constants of the meters*.
Pulse repetition range: from 0.001 to 100 000 Hz;
Pulse amplitude range: 3 to 15 V;
Ratio of frequencies: 0.000001 to 1.0.

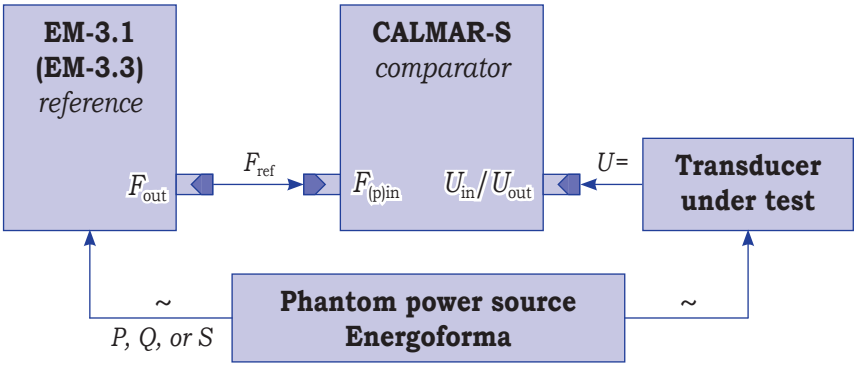
** Meter constant represents the relation between the amount of energy measured by the meter and the number of pulses on its pulse output (pulses/kW·h).*



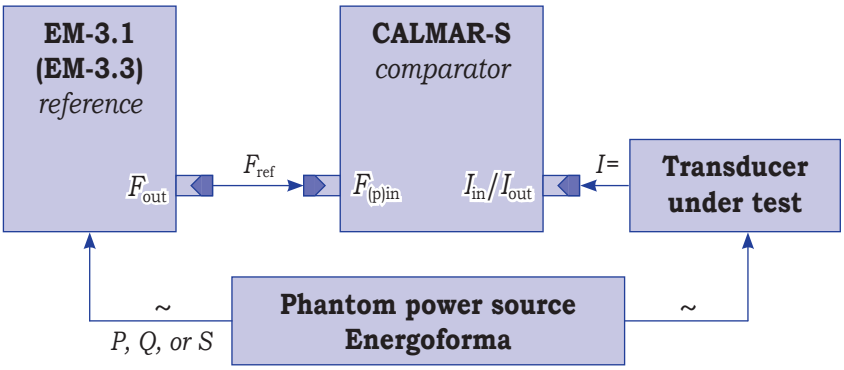
EM-3.1 – Energomonitor 3.1KM

3.2 Determines measurement errors of Electrical Power Transducers (EPT) with standard DC voltage outputs rated at 0.2 V, 5 V, 10 V.

The measurement error is determined by converting an output current (or voltage) signal of the transducer under test into the frequency signal , which is then compared with the frequency signal taken from the reference meter (e.g., Energomonitor 3.1KM) considering their pulse/energy ratios.



3.3 Determines measurement errors of Electrical Power Transducers (EPT) with standard DC current outputs rated at 5 mA, 20 mA.



Specifications

Measured or generated parameters	Ranges	Limits of intrinsic measurement error or error of output setting			Notes
		CALMAR-S–0.5	CALMAR-S–0.2	CALMAR-S–0.1	
Measurement error: reducial (ΔX/Xn, %)					
Input DC voltage U_{in}, V	0 ... ±1.5U_n	±0.05	±0.02	±0.01	U_n = 0.2; 5; 10
Input DC current I_{in}, mA	0 ... ±1.5I_n				I_n = 5; 20
Error of output setting: absolute (ΔX)					
Output DC voltage U_{out}, V	0 ... ±10.5	±5.2 mV	±2.1 mV	±1.0 mV	
Output DC current I_{out}, mA	0 ... ±24	±0.012	±0.0047	±0.0024	
Pulse repetition frequency on the pulse input F_{in}, Hz	0 ... 22 500	±(0.1 + 3 · 10$^{-5}F_{in}$)			Amplitude 3 to 15 V
Pulse repetition frequency (proportional to an analogue signal being converted) on the pulse output $F_{p.out}$, Hz	0 ... 6000				Amplitude 4 to 5.5 V
Pulse repetition frequency (related to generation of frequency signals) on the pulse output F_{out}, Hz	0 ... 22 500 in 1.0 steps	±3 · 10$^{-5}F_{out}$			Amplitude 4 to 5.5 V

CALMAR-S – Key Component of the Test System