

# Three phase network analyzer and energy meter tester

Analyzer Caltest 300 is used for testing of single and three phase energy meters and current transformers:

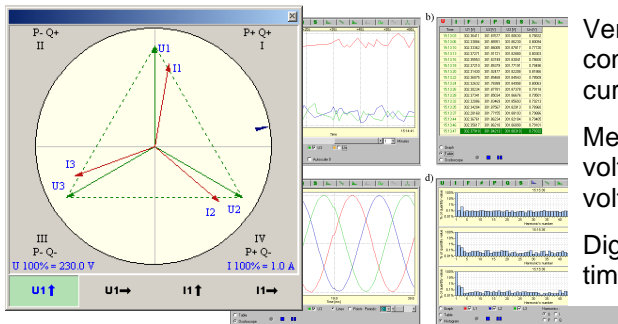
- in accuracy class 0.05 and 0.1,
- in current range 0.001...3000A, with additional functions:
- verification of power network wiring,
- measure, recording and analyze of power network parameters and power quality,
- multi-variant data entering – digital and graphical display, internal memory, local printing, transmission by interface and analysis on PC computer.



## Caltest 300

### Caltest 300 Portable Analyzer and Tester

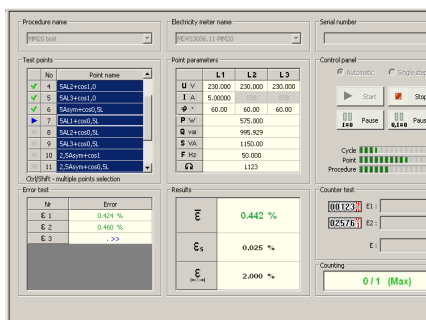
- Measure of power network parameters (class 0.05 or 0.1)
- Voltage range 0.5...300V and 0.1...40kV
- Current range 0.001...10(100)(1000)(2000)(30/300/3000)A
- Testing of energy meters
- Testing of Current and Potential Transformer
- Vector and oscilloscope charts of three phase network
- Recording and analyse of power quality
- Powering from measurement network
- Calibration Certificate



Verification of power network wiring in "star" and "delta" connection – graphical display of three phase voltage and current vector and direction of vector rotation.

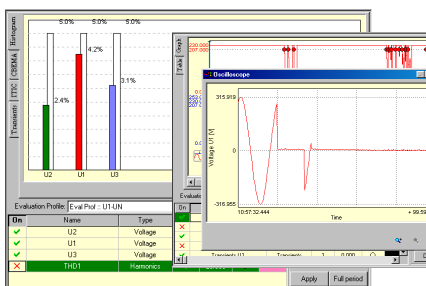
Measure and recording of power network parameters – voltages, currents, frequency, phase shifts, angles between voltages, power factors, active, reactive and apparent powers.

Digital and oscilloscope measurements with possibility of long time recording.



Energy meter testing on site – functions of computing meter error directly in percentages with method of setting time of measurements or number of impulses and functions for verification of energy meter counters. Input in S0 standard is used for testing energy meters with impulse output. Miniature photo head CF101 is used for automatic counting of meter rotor turns for testing Ferrari meters. Photo head CF100 is used for automatic testing of meters with LED indicator and manual counting of rotor turns with using "start/stop" button.

Testing of LV and MV instrument transformers directly on site: functions of computing transformer ratio error directly in [%], phase error and burden measurements of transformer.



Measure of power quality according to IEC 61000-4-30:

- for voltage: voltage short/long interruptions, voltage dips, over voltage, harmonics, THD, interharmonics TID, signal voltage, flicker Pst i Plt, voltage asymmetry,
- for current: inrush current, harmonics, THD, interharmonics TID,
- for power: harmonics.

Recording and analyzing of power quality according to the EN50160.

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Caltest300 data sheet 2013-12

## TECHNICAL PARAMETERS OF CALTEST 300

Function / parameter	Range	Error <sup>1)2)3)7)</sup>	
		class 0.05	class 0.1
Direct voltage	30...300V 0.5...30V	±0.05% ±0.05%*	±0.1% ±0.1%*
Voltage with VoltLiteWire	0.1...40kV	±0.1%±Em	±0.1%±Em
Direct current	0.1...120A 0.001...0.1A	±0.05% ±0.05%*	±0.1% ±0.1%*
Current with clamps 10A	0.05...10A	±0.5%	±0.5%
Current with clamps 100A	0.5...100A 0.05...0.5A	±0.2% ±0.2%*	±0.2% ±0.2%*
Primary current with clamps 100A of CT ratio function	0.5...100A 0.05...0.5A	±0.5% ±0.5%*	±0.5% ±0.5%*
Current with clamps 1000A	5.0...1000A	±0.5%	±0.5%
Current with flexible clamps	0...30A/300A/3000A	±0.1%±Em	±0.1%±Em
Current with AmpLiteWire	10...2000A	±0.1%±Em	±0.1%±Em
Power and energy direct measure	0.1...120A / 30...300V 0.001...0.1A / 30...300V	±0.05% ±0.05%*	±0.1% ±0.1%*
Power and energy measured by clamps 10A	0.05...10A / 30...300V	±0.5%	±0.5%
Power and energy measured by clamps 100A	0.5...100A / 30...300V 0.01...0.5A / 30...300V	±0.2% ±0.2%*	±0.2% ±0.2%*
Power and energy measured by clamps 1000A	5...1000A / 30...300V	±0.5%	±0.5%
Power and energy measured by clamps LiteWire sensors	0.02...2000A / 0.004...40kV	±0.1%±Em	±0.1%±Em
Resolution of energy meter error measurement "e"		0.001%	0.001%
Phase shift direct connection with clamps	0.0...±360.0°	±0.1° <sup>4)</sup> ±0.5° <sup>5)</sup>	±0.1° <sup>4)</sup> ±0.5° <sup>5)</sup>
Power factor cos φ and sin φ	0.00...±1.00	±0.002	±0.002
Angle between voltages	0.0... ±360.0°	±0.1° <sup>6)</sup>	±0.1° <sup>6)</sup>
Frequency	45.00...65.00Hz	±0.05Hz	±0.05Hz
Measurement stability	Short term [1h] 0.25 of error, long term [1 year] 0.5 of error – Normal distribution with 99.73% probability		
Ambient temperature	–5...+50°C operating, –25...+60°C transportation		
Power supply	85..230..265 / 45..65Hz / 10VA		
Dimensions and weight of analyzer	270 / 240 / 180 mm / 3.6 kg		
Dimensions and weight of analyzer set	420 280 / 370 mm		

1) % - related to the measuring value, %\* - related to the measuring range final value  
Error covers reference uncertainty of standards, stability in 12 months, influence of ambient temperature in range +20...+26°C, humidity and power supply voltage in utilization conditions  
2) Em - sensor basic error, Em=1%+0.1%\* for Flex flexible clamps and Em=2%+0.2%\* for LiteWire sensors  
3) Power and energy errors related to apparent power  
4) In current range 0.1...120A and in voltage range 30...300V  
5) From 10% of current range and in voltage range 30...300V  
6) In voltage range 30...300V  
7) Power and energy errors is doubled for input wiring 3 phase 3 wire (Aron measuring system)

## SOFTWARE CALSOFT 300

- Readout of actual measured values from the Caltest 300 using RS232 interface and their visualisation on PC screen. The Readout can be done automatically by user's defined period of time,
- readout of data, earlier stored in analyzer's memory and their visualisation on PC screen,
- export of measured data to Microsoft Excel, which enables their processing according to user's requirements,
- printing data and charts on the printer,
- saving and reading data to and from files for making archives of measurement's results.



## Caltest 300 ANALYZER'S EQUIPMENT

The Caltest 300 set is placed in the plastic case for carrying in close state and for working in open state with analyzer in hard conditions on the site. The Caltest 300 set consists of:

- Caltest 300 analyzer class 0.05 or 0.1,
- power cord,
- extension for powering from measurement network,
- Calsoft 300 PC software,
- RS232 cable,
- USB-RS232 adapter,
- fuse T0.25A, 250V, 5x20 (2pcs),
- voltage safety measurement cables (4pcs),
- current up to 20A safety measurement cables (6pcs),
- handlers and terminals for safe cables (Ø4 banana plug 10pcs, flexible Cu adapter 10pcs, clip Kleps 4pcs),
- user's manual,
- guarantee certificate,
- manufacturer's calibration certificate.

Optionally Caltest 300 set may be equipped in:

- computer Laptop,
- CT10A miniature electronic compensated clamps up to 10A (3pcs),
- CT100A miniature electronic compensated clamps up to 100A (3pcs),
- CT1000A electronic compensated clamps up to 1000A (3pcs),
- FCT3000A electronic compensated flexible clamps in ranges 30/300/3000A (3pcs),
- AmpLiteWire 2000A primary current sensors up to 2000A (3pcs),
- VoltLiteWire 40kV primary voltage sensors up to 40kV (3pcs),
- AKD300 current cables up to 120A (6pcs) with set (18unit) of replaceable terminals,
- CF100 photo head for counting LED flashing of meters and with "start/stop" button,
- CF101 miniature photo head for counting rotation of Ferrari meters disc,
- UCF100 holder for CF100 and CF101 photo heads,
- KAS100 transportation, plastic case for carrying and working with analyzer,
- C091A T3475-001 plug Amphenol for relay outputs.

