



**HIGHLIGHTS:**

- ❑ Measure of power network parameters in class 0.05 or 0.1
- ❑ Voltage ranges 0.05...600V and 0.1...40KV
- ❑ Current ranges 0.001...12(120)(1200)(30/300/3000)A
- ❑ Testing of electricity meters and CT/PT Transformers
- ❑ Recording and analyze of power quality
- ❑ Vector, oscilloscope, bar and trend charts of three phase network
- ❑ Powering from 50...450V AC power network and internal battery with charger
- ❑ Large 7" color Touchscreen
- ❑ Data readout and meter control via USB, Ethernet and Bluetooth
- ❑ Data storage in SD flash memory card up to 32GB

# TE30 THREE-PHASE NETWORK ANALYSER AND TESTER OF ELECTRICITY METERS AND INSTRUMENT TRANSFORMERS

**INTRODUCTION**

The TE30 Analyser and Tester is used for:

- verification of power network wiring with measure and recording of power network parameters,
- calibration and testing of **electricity meters** and **instrument transformers** (CT Current Transformers and PT Potential Transformers) directly on site
- measuring, recording and analyzing of power quality.

**Large Touchscreen** with display and keyboard functions for easy operation enables:

- measure of power network parameters: voltages U1, U2, U3, U12, U23, U31, UN; currents I1, I2, I3, IN; frequency; phase angles  $\varphi_1, \varphi_2, \varphi_3$ ; power factors PF1, PF2, PF3,  $\Sigma PF$ ; factors  $\sin\varphi_1, \sin\varphi_2, \sin\varphi_3, \Sigma \sin\varphi, \text{tg}\varphi_1, \text{tg}\varphi_2, \text{tg}\varphi_3, \Sigma \text{tg}\varphi$ ; angles between voltages U12, U23, U31; powers P1, P2, P3,  $\Sigma P, Q_1, Q_2, Q_3, \Sigma Q, S_1, S_2, S_3, \Sigma S$
- visualization of measurement results in form of table, vectors, trend chart, oscilloscope (waveform) or bar chart (harmonics of U, I, P, Q).

**Testing of electricity meters** directly on site:

- function of calculating meter error (partial errors, average error, standard deviation) directly in [%] with method of settings time of measurements or number of impulses,
- function of automatic identification meter constant,

- function of automatic determining measurement time or number of pulses,
- function of measuring energy with method of setting time for verification of meter counters directly in [%],
- function of maximum power measuring for testing of maximum power meters,
- visualization in form of table or trend chart,
- function of measuring energy for power P, P+, P-, Q, Q+, Q-, S,
- function of measuring energy for the first harmonic of active power PH1.

**Testing of instrument transformers** (LV and MV current CT and potential PT simultaneously in three phases) directly on site:

- functions of calculating transformer ratio error directly in [%],
- functions of calculating phase error,
- functions of burden measurements of transformer.

**Power quality analyser** function enables:

- measuring of power quality parameters according to IEC 61000-4-30 class A with visualization of measurement results in the real time mode,
- recording of power network parameters in the SD Flash 4-32GB memory, which gives  $(8..64) \times 10^6$  sets of network parameters or long-term registration of power quality (option),
- analyzing of measurement results for EN 50160 compatibility or individual requirements of user (option).

## POWER NETWORK ANALYZER

Parameter	Range	Error limits <sup>(1)(2)(3)(4)</sup>			
		class 0.05		class 0.1	
Voltage (Direct)	0.05...600V	±0.05% <sup>(5)</sup>		±0.1% <sup>(5)</sup>	
Voltage (VoltLiteWire 40kV)	0.1...40kV	±0.1%±E <sub>m</sub>			
Current	0.01...12A	±0.05%		±0.1%	
Direct connection	0.001...0.01A	±0.05%*		±0.1%*	
Current thru clamps	0.1...12A / 0.1...120A / 10...1200A	±0.2%			
CT10AC/ Clamps CT100AC/ Clamps CT1000AC	0.003...0.1A / 0.01...0.1A / 0.3...10A	±0.2%*			
Current (Flexible Clamps FCT3000AC)	0.3...30A/3...300A/30...3000A	±0.1%±E <sub>m</sub>			
Current (AmpLiteWire 2000A)	30...2000A	±0.1%±E <sub>m</sub>			
Power and energy (Direct)	0.01...12A / 10...600V	0.001...0.01A/10...600V	±0.05%	±0.05%*	±0.1% ±0.1%*
Power and energy (Clamps CT10AC)	0.1...12A / 10...600V	0.01...0.1A / 10...600V	±0.2%		
Power and energy (Clamps CT100AC)	0.1...120A / 10...600V	0.01...0.1A / 10...600V	±0.2%		
Power and energy (Clamps CT1000AC)	10...1200A / 10...600V	1...10A / 10...600V	±0.2%		
Power and energy (Flexible Clamps FCT3000AC)	0.3...30A/3...300A/30...3000A / 10...600V		±0.1%±E <sub>m</sub>		
Power and energy (VoltLiteWire 40kV + AmpLiteWire 2000A)	30...2000A / 0.5...40kV		±0.1%±E <sub>m</sub>		
Frequency	40...70Hz		±0.01Hz		
Phase shift (Direct)	-180...+180°		±0.02° <sup>(5)(6)</sup>		±0.04° <sup>(5)(6)</sup>
Phase shift (Clamps)	-180...+180°		±0.1° <sup>(5)(7)</sup>		
Power factor cosφ and sinφ	0...±1		±0.001 <sup>(5)(6)(7)</sup>		
Temperature coefficient (Direct)	0.005% per 1°C in range -10...+50°C				
Time stability (Direct)	Short term [1h] = 0.01%, long term [1 year] = 0.03%				

## GENERAL PARAMETERS

Weight and dimensions (width x height x depth)	2kg (with internal battery) and (270x245x90)mm
Power supply	50...450V / 47...63Hz / 15VA or replaceable batteries Ni-MH 5xAA 1.2V / 2600mAh / 2h
Safety: Isolation protection and Measurement Category	IEC 61010-1 and 300V CAT III
Degree of protection	IP-40 (device) / IP-67 (ET30 transportation case)
Operation / storage temperature	-10...+50°C / -20...+60°C
Operation / storage relative humidity	<90% @ +0...+30°C and <75% @ +30...+50°C / <95% @ 0...+50°C

## AUTOMATIC TEST OF ELECTRICITY METERS

Parameter	Voltage and current range	Frequency range	Resolution
Input impulses	0...2V/4...30V	0.00001Hz...200kHz	0.0001%@t≥1s
Impulse Output for TE30 testing <sup>(8)</sup>	28V/100mA open collector	0.0001Hz...210kHz	

## BURDEN MEASUREMENT OF CT AND PT TRANSFORMERS

Parameter	Current range		Voltage range		Error limits <sup>(1)(2)</sup>	
CT Burden	0.01...12A (Direct)		1...10V (Direct)	0.05...1V (Direct)	±0.2%	±0.2%*
PT Burden	0.01...12A (Direct)	0.001...0.01A (Direct)	10...600V (Direct)	10...600V (Direct)	±0.1%	±0.1%*

## RATIO MEASUREMENT OF CT AND PT TRANSFORMERS

Parameter	Primary current/voltage range	Secondary current/voltage range		Error limits <sup>(1)(2)(3)</sup>	
CT Ratio	0.2...120A (Clamps CT100AC)	0.01...12A (Direct)	0.001...0.01A (Direct)	±0.2%	±0.2%*
CT Ratio	10...1200A (Clamps CT1000AC)	0.01...12A (Direct)		±0.2%	
CT Ratio	0.3...30A/3...300A/30...3000A	0.01...12A (Direct)		±0.1%±E <sub>m</sub>	
CT Ratio	30...2000A (AmpLiteWire 2000A)	0.01...12A (Direct)		±0.1%±E <sub>m</sub>	
PT Ratio	0.5...40kV (VoltLiteWire 40kV)	10...600V (Direct)		±0.1%±E <sub>m</sub>	

## POWER QUALITY PARAMETERS

Parameter	Range		Error limits <sup>(2)</sup>
Harmonics in voltages, currents, P and Q powers	amplitude	0...100% of input	±0.1% <sup>(9)</sup>
	phase	-180...+180°	±0.5° <sup>(10)</sup>
Total harmonic distortion THD in voltages and currents	0...100% of input		±0.1% <sup>(9)</sup>
Total inter-harmonic distortion TID in voltages and currents	0...15% of input		±0.2% <sup>(11)</sup>
Signal voltage <sup>(5)</sup>	0...15% of input		±5%
Flicker Pst and Plt (option)	0...40	0.000833...33.33Hz	±5%
Voltage asymmetry	0...100%		±2%

(1) % - related to the measuring value, %\* - related to the measuring range final value (is underlined)

(2) error limits include reference standard uncertainty, 12 mo. stability, influence quantities (ambient temp. +20...+26°C, humidity, power supply 50...450V, freq. 45...65Hz)

(3) E<sub>m</sub> - sensor basic error, E<sub>m</sub>=1%+0.1%\* (Flexible Clamps FCT3000AC), E<sub>m</sub>=2%+0.2%\* (VoltLiteWire 40kV and AmpLiteWire 2000A)

(4) power and energy errors related to apparent power

(5) in voltage range 10...600V (Direct)

(6) in current range 0.01...12A (Direct)

(7) in current range: 0.1A...12A (Clamps CT10AC), 0.1A...120A (Clamps CT100AC), 10A...1200A (Clamps CT1000AC)

(8) Programmable constant of Impulse Output - preferred value: C = 30 000 [imp/Wh(varh,Vah)]

(9) of input for 80-140Hz frequency range of harmonics with linear rise to 0.4% of input for 3200Hz

(10) for 80-140Hz freq. range of harmonics with linear rise to 8° for 3200Hz of input for 80-140Hz freq. range of inter-harmonics with linear rise to 5% of input for 3200Hz

(11) the highest non-harmonic amplitude and frequency

For additional technical details, please contact our sales department ([sales@metertest.eu](mailto:sales@metertest.eu))

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MeterTest Sp. z o.o. | Lukasinskiego St. 26 b. 21, 58-100, Swidnica, Poland



[meter-test-equipment.com](http://meter-test-equipment.com)



+48 74 856 63 92



[sales@metertest.eu](mailto:sales@metertest.eu)

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