Testing whole measurement system!

Accuracy of all kind of Electricity Meters ε[%]

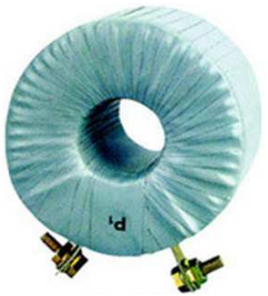
Electromechanical Meters

Electronic (static) Meters

4-Quadrants Meters

Max Demand Meters

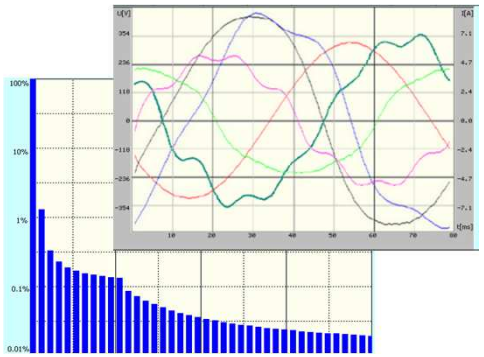
CT/PT burden, ratio, phase shift error



TE30

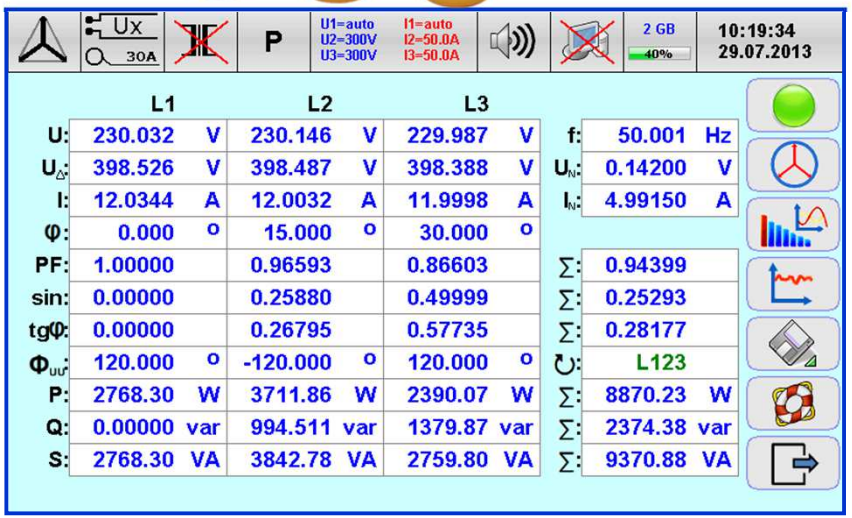
Connection errors

Power Quality in point of measurement

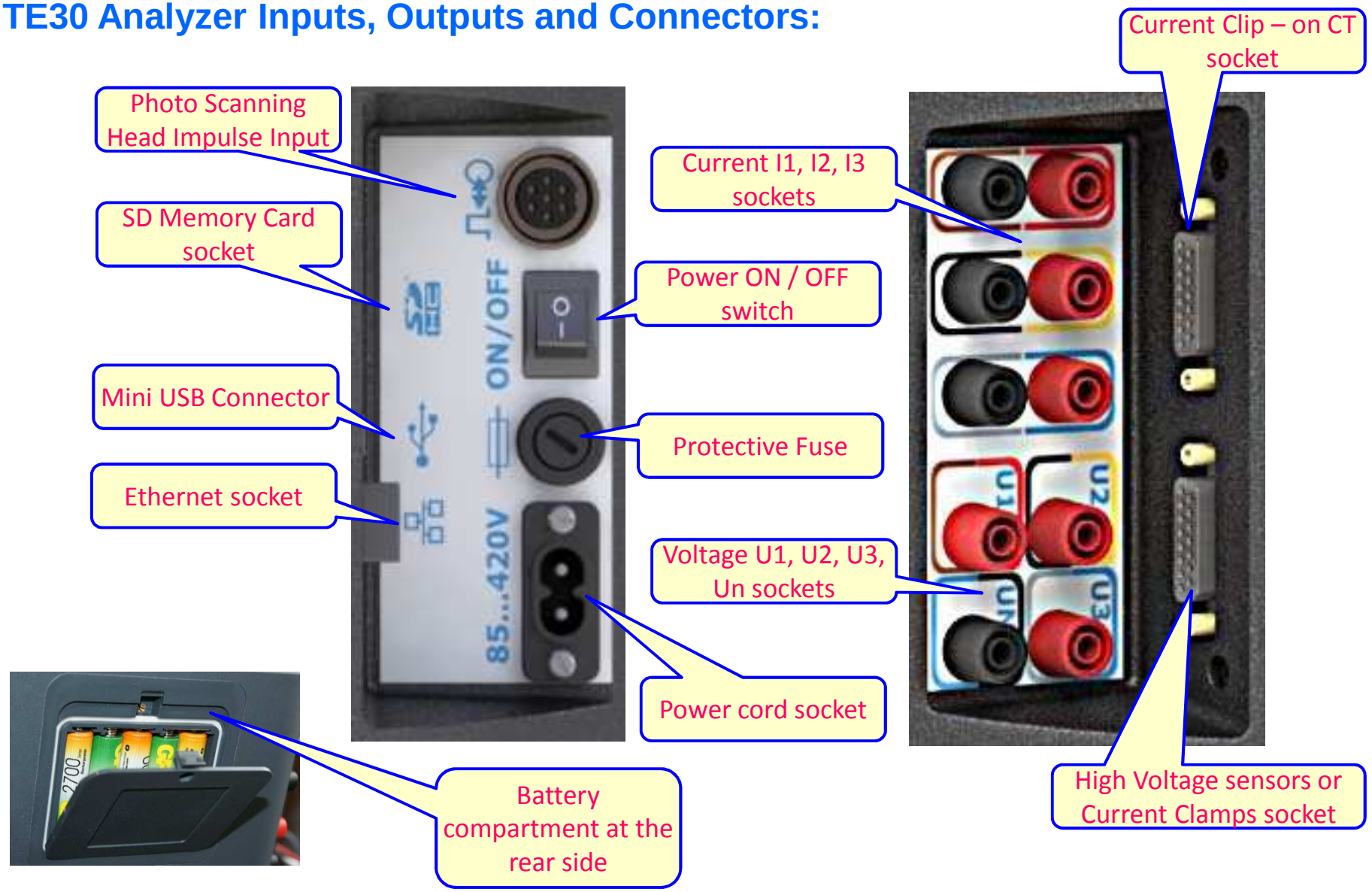


TE30 Electricity Meter Tester and Power Quality Analyzer

- Measure of power network parameters and Meters testing in accuracy class **0,05** or **0,1**
- Voltage range **0,05**…**300V**
- Current range **0,001**…**12**(100)(1000)(30/300/3000)**A**
- Testing of energy meters, potential and current transformers (**CT / PT**)
- Recording and analyse of **Power Quality**
- **Vector**, **oscilloscope**, bar and trend charts of three phase network
- Automatic Meter Constant recognition
- Automatic setting of measurement conditions
- Powering from measurement network 50…450V AC and from internal battery with its own charger
- Big 7-inch full colour touch screen and computer software Calmet TE30 PC soft
- Reading data and remote controlled via **USB**, **Ethernet**, **Bluetooth**
- Recording data on flash memory SD card up to **32GB**
- Calibration Certificate

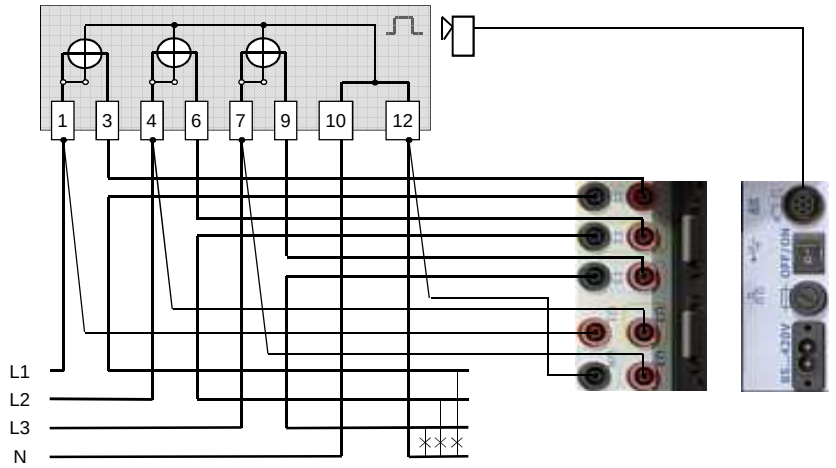


TE30 Analyzer Inputs, Outputs and Connectors:

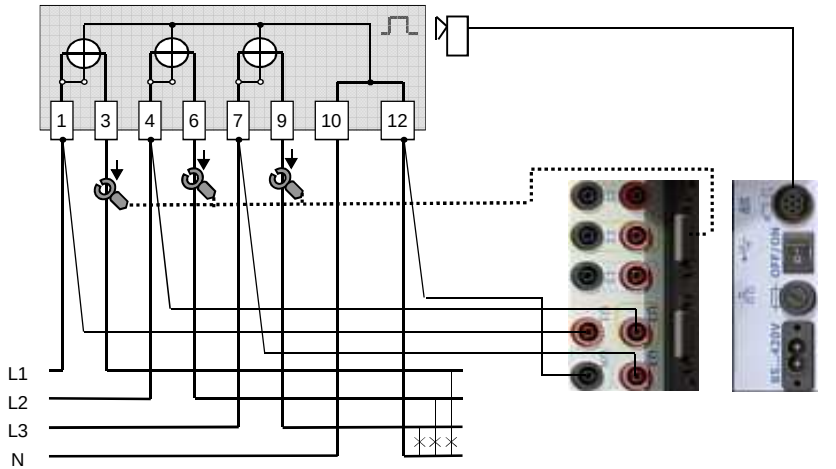


All possible types of connection: 1P2W, 3P4W, 3P3W, ... , direct or with clamps

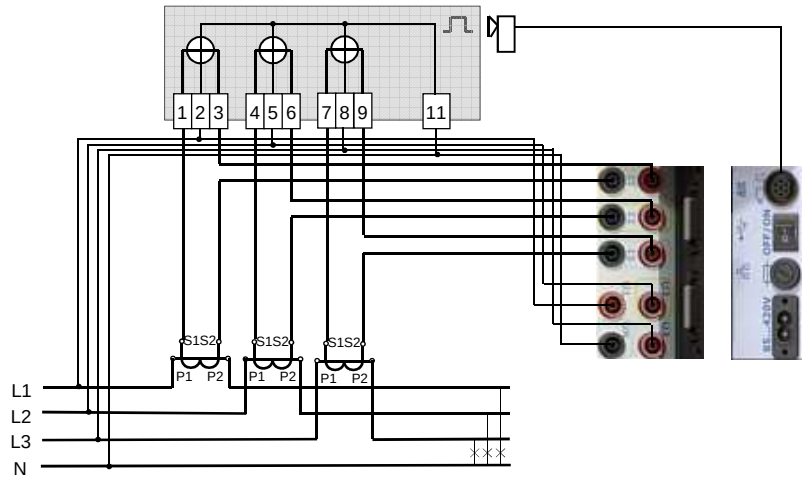
Electricity meter testing – direct connection



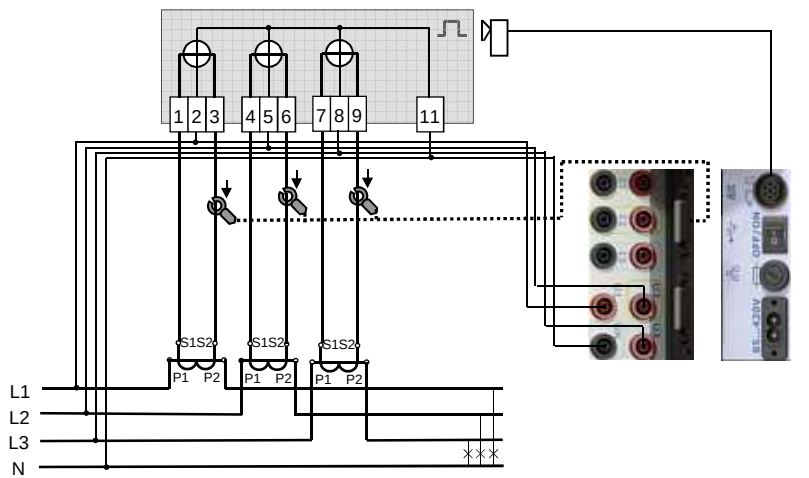
Electricity meter testing – connection with clamps



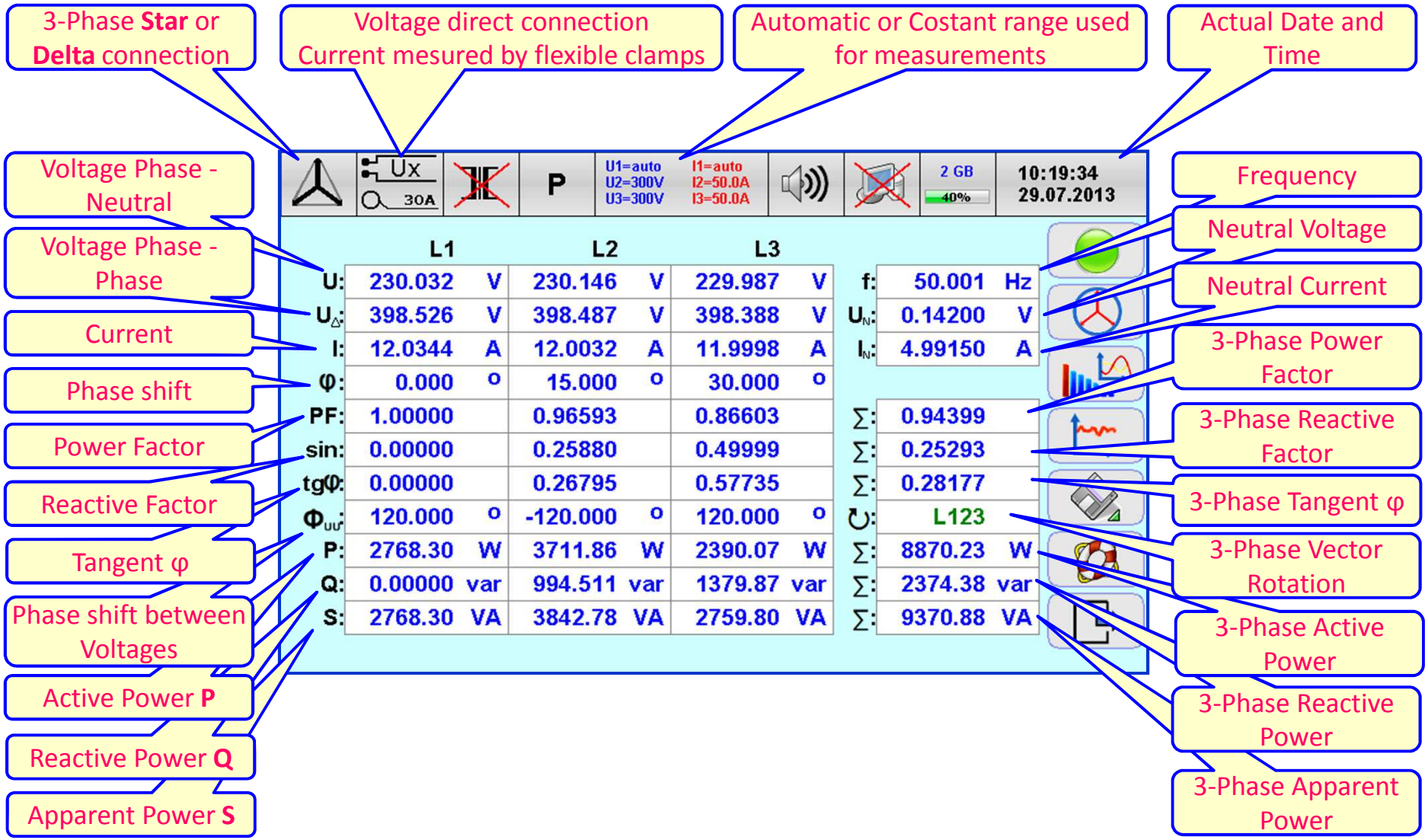
Electricity meter (CT) testing – direct connection



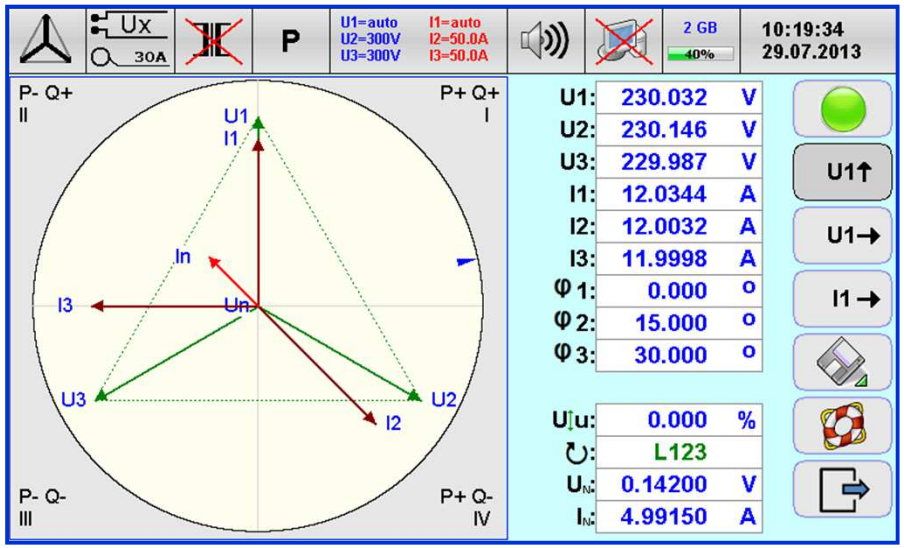
Electricity meter testing (CT) – connection with clamps



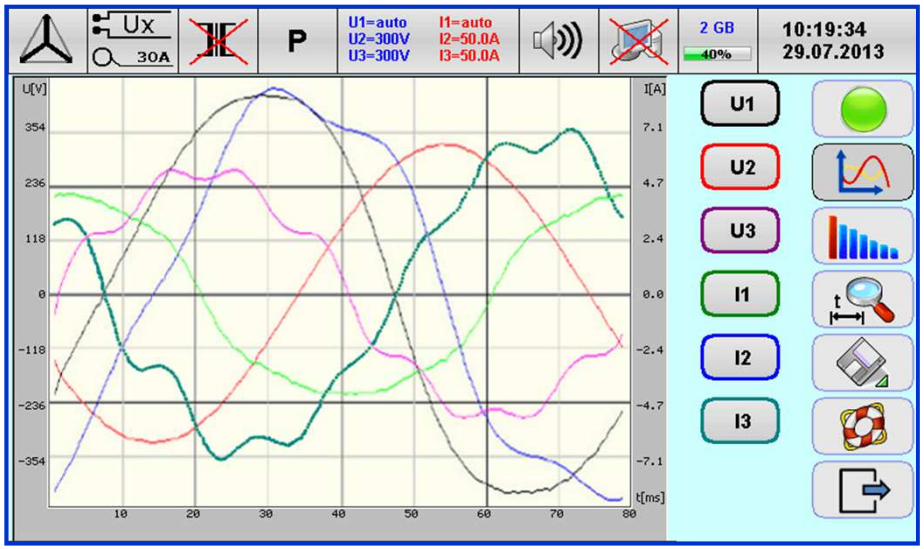
RMS measurement results and TE30 Analyzer configuration:



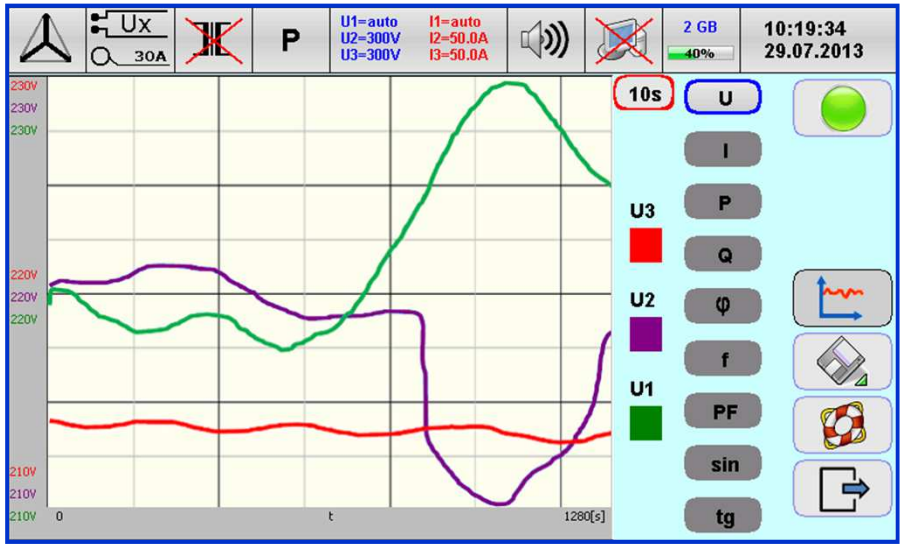
Vector diagram with calculated Un & In



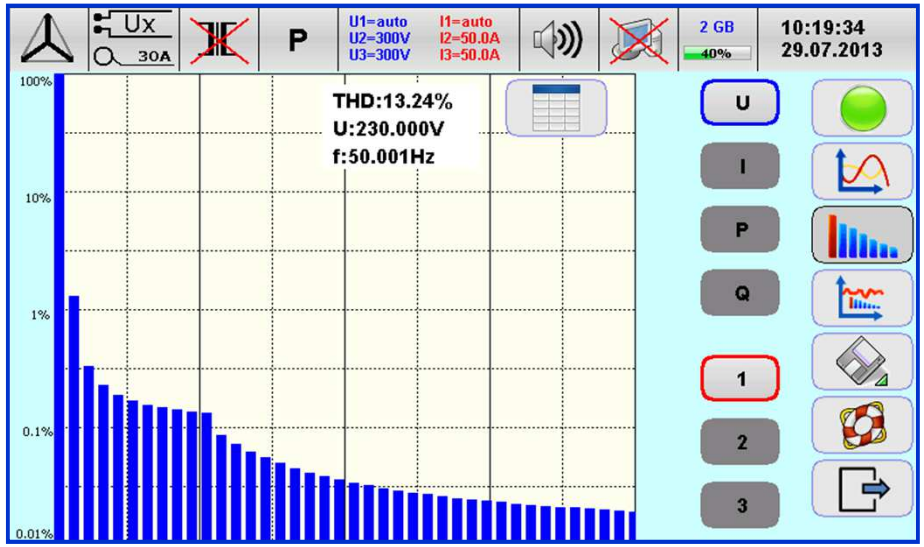
Oscilloscope of U1, U2, U3, I1, I2, I3



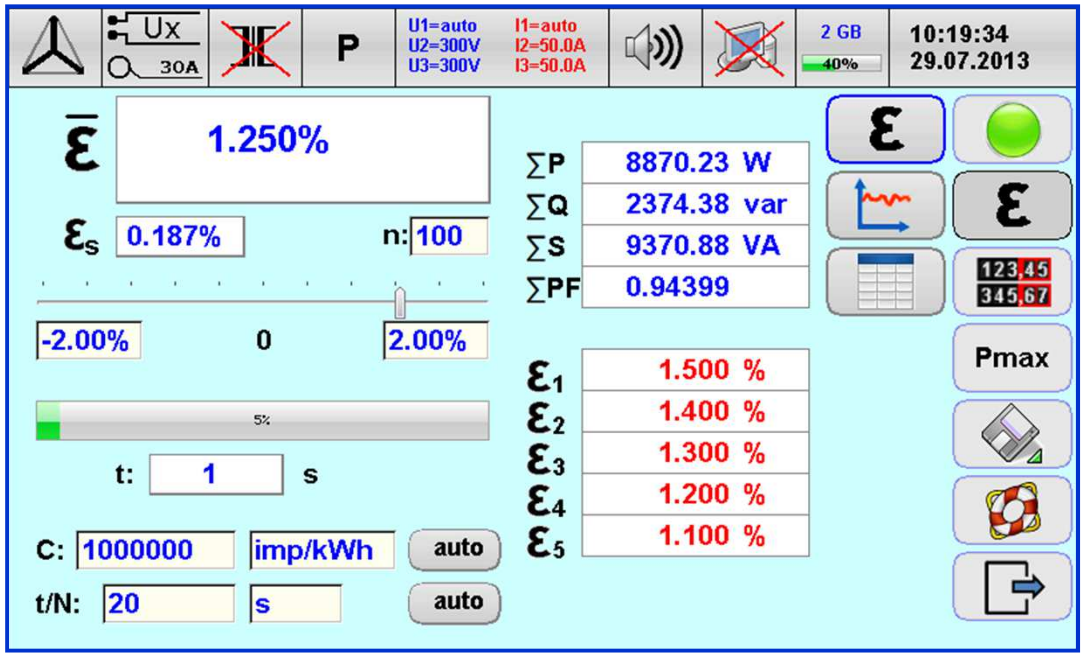
Time trend of U, I, P, Q, φ, f, PF, ….



Harmonics table & bar diagram



Energy meter testing on site and laboratory

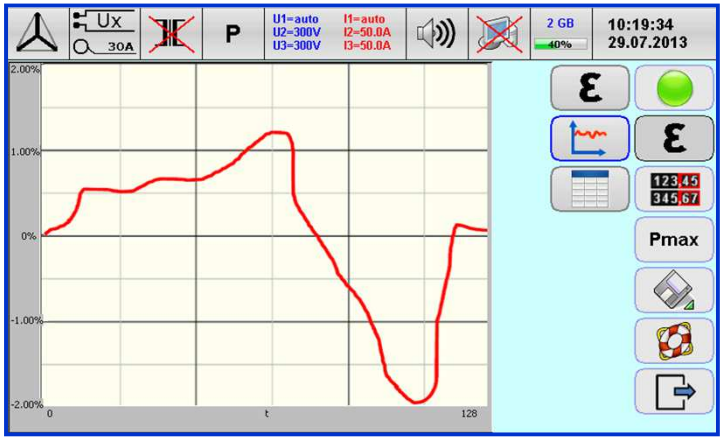


- function of computing meter error (partial errors, average errorr, standard deviation) directly in percentages [%] with method of setting time of measurement or number of impulses,
- function of automatic identification energy meter constant,
- function of automatic determining measurement time or number of pulses.

Results of testing are presented as:

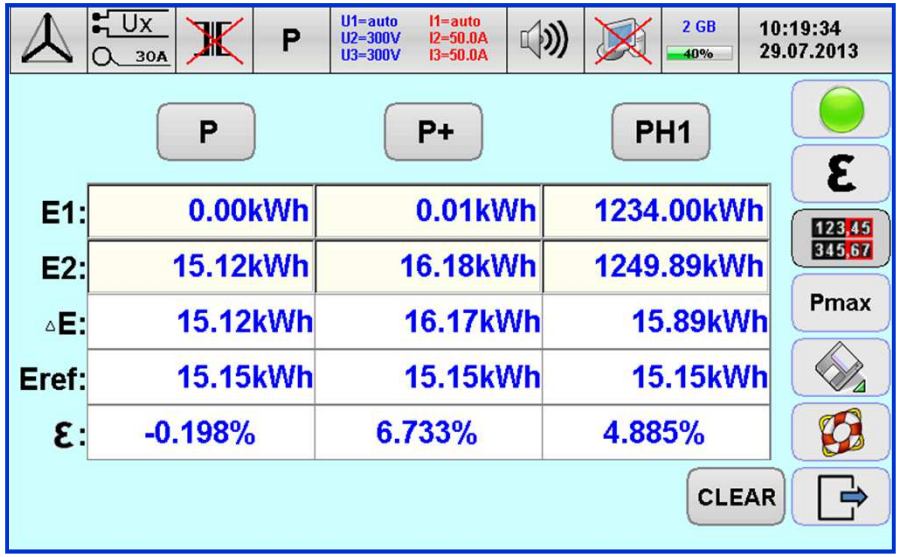
← TABLE

CHART →

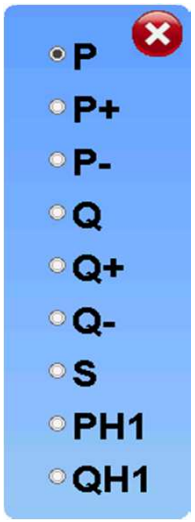


TE30 Electricity Meter Tester and Power Quality Analyzer

Energy meter Register testing on site and laboratory



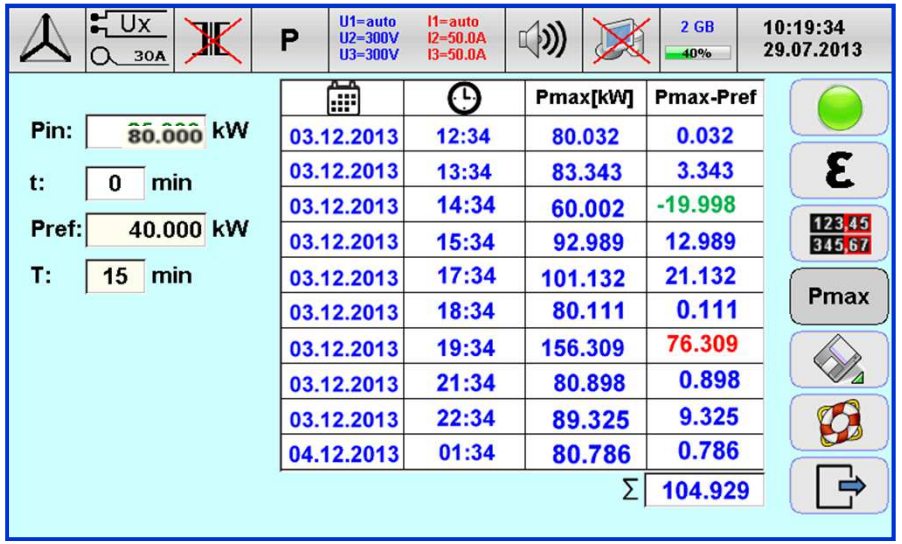
- function of energy measurement with method of setting time periods for verification of energy meter Register directly in percent [%],



- function of energy measuremnt for power P, P+, P-, Q, Q+, Q-, S,
- function of energy measurement for the first (fundamental) harmonic of active power PH1 and reactive power QH1

IEC 62053-24/Ed.1 Static meters for reactive energy at fundamental frequency (classes 0,5 S, 1 S and 1)

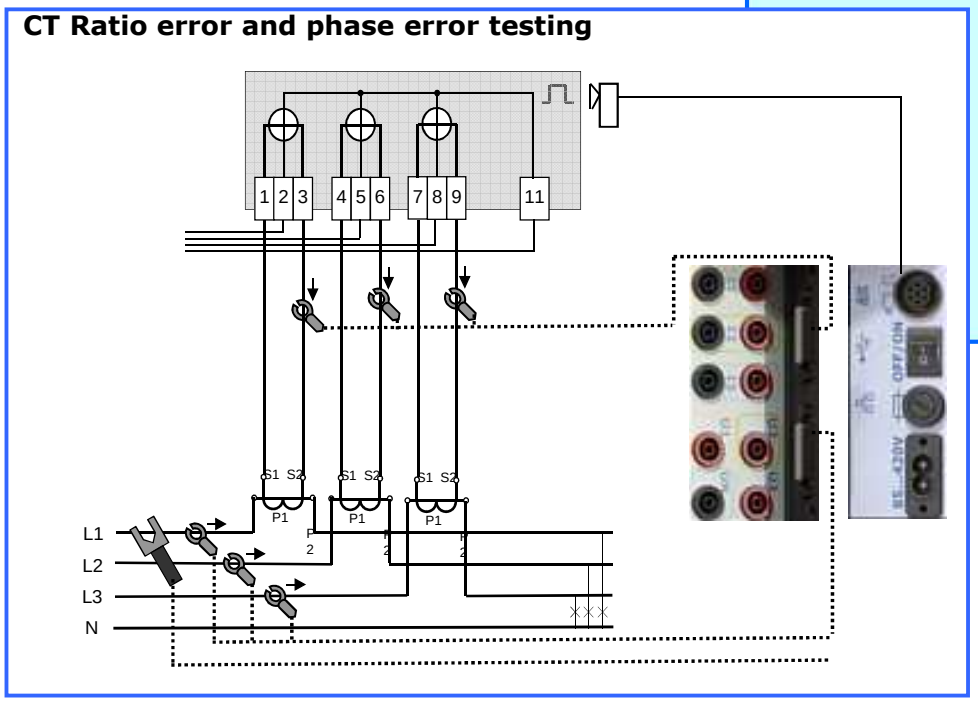
Maximum Demand Energy meter testing

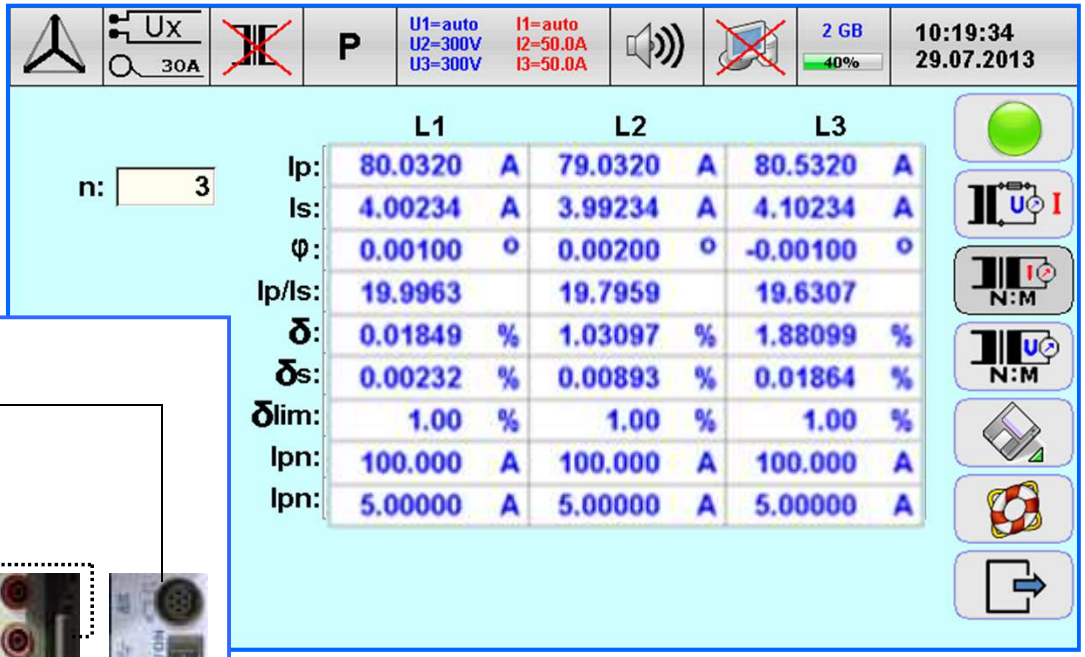


- function of maximum power measuring for testing of maximum demand energy meters,

CT, PT Transformers testing (LV & MV, voltage and current, simultaneously in three phases) directly on site: ratio error and phase shift error testing

Connection diagram

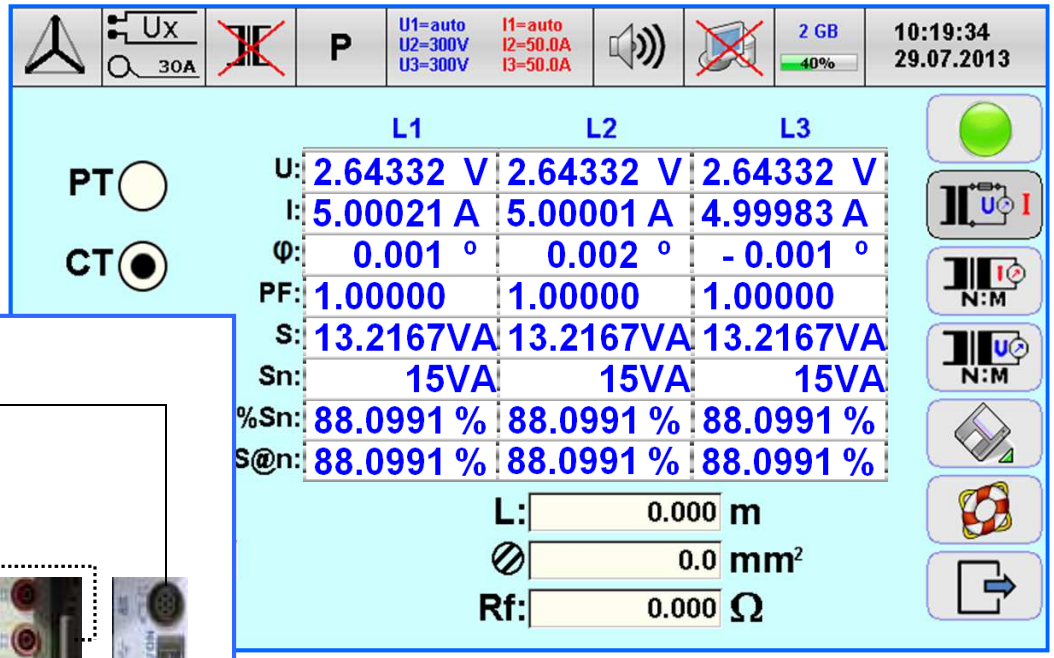


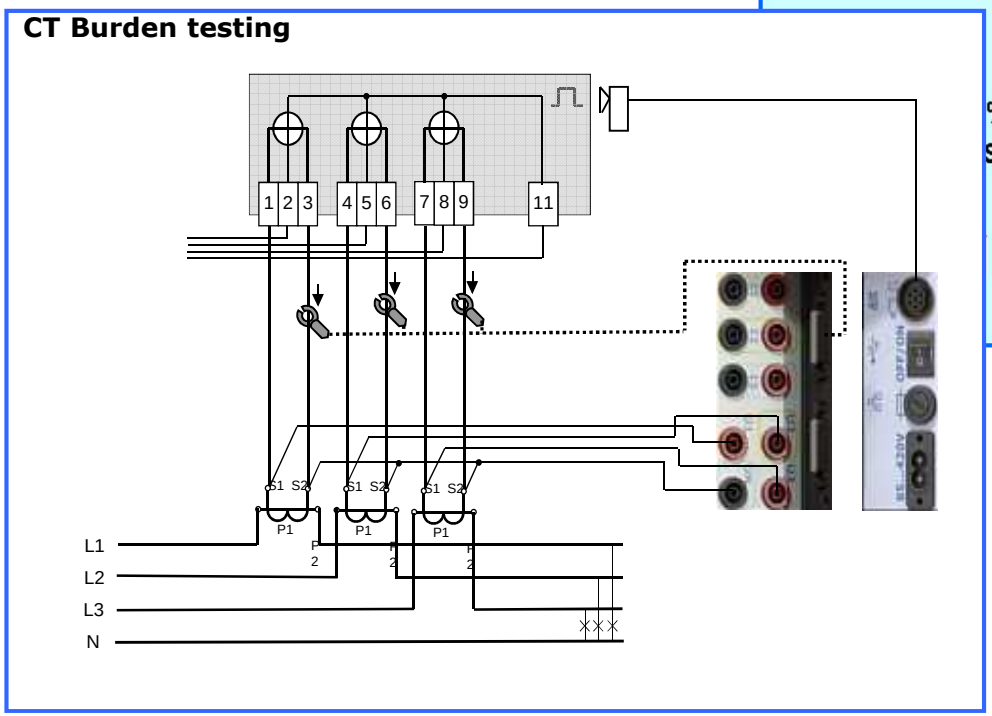


- function of computing transformer ratio error directly in percent [%]
- function of computing phase shift error [°]

CT, PT Transformers testing (LV i MV, voltage and current, simultaneously in three phases) directly on site: CT / PT burden testing

Test can be done by taking into account the length (L) and cross-section of connection wires and serial fuse (Rf) resistance

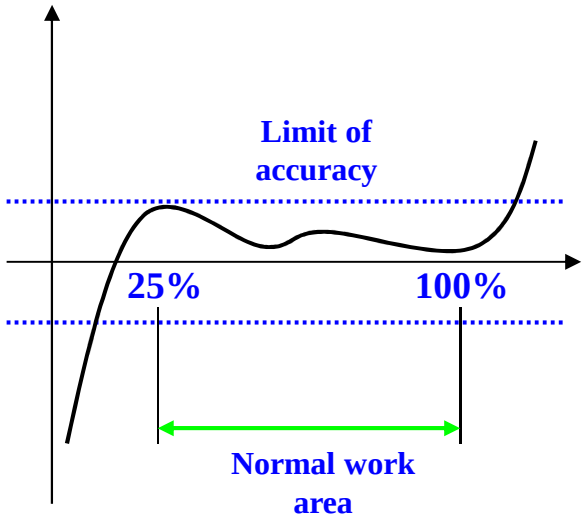




Why the tranformer burden (load) is so important?!

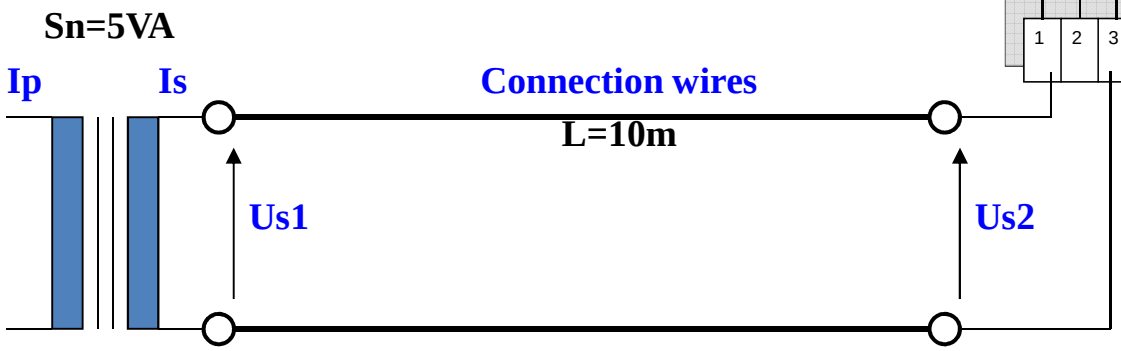
CT Transformer testing: burden testing

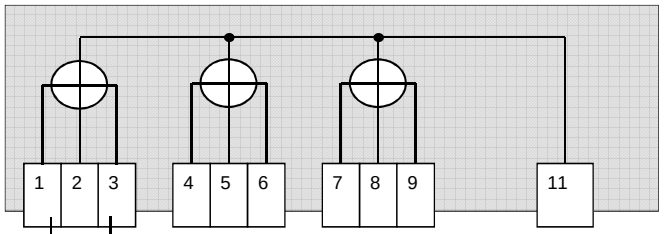
ε – ratio error [%]



CT – current transformer can operate with stated accuracy only between 25% - 100% of burden (load). In case of too long, or too thin wire dimension or too small load, the result, secondary current can be out of accuracy limits

[%] transformer power rating Sn



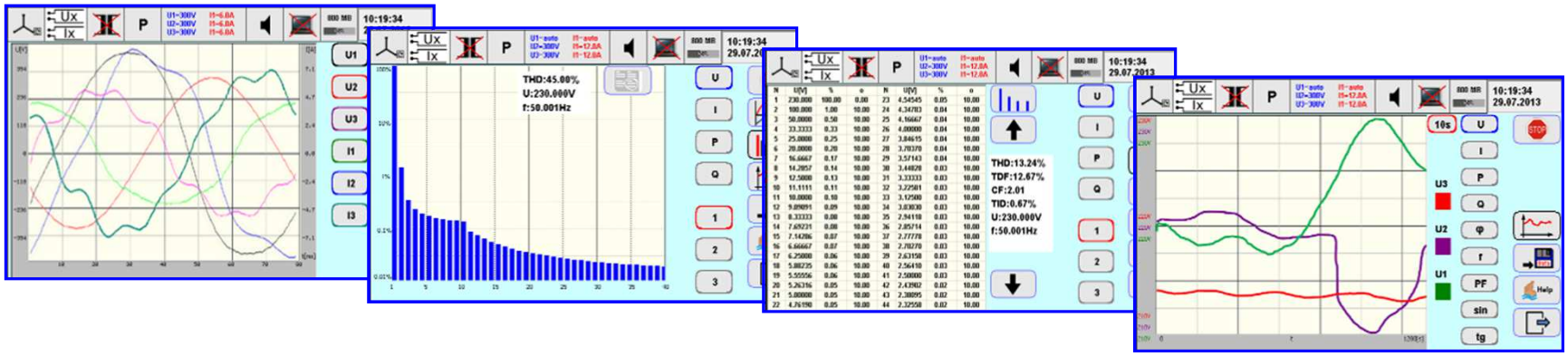


Example (power loss in cables):

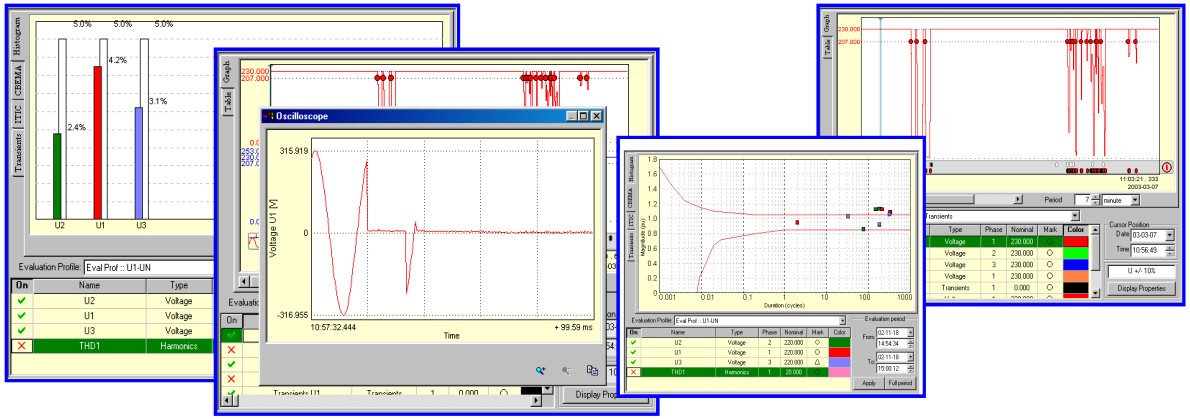
$$R_P = \frac{\rho_{CU} \cdot l}{S} = \frac{0,0175\Omega \frac{mm^2}{m} \cdot 2 \cdot 10m}{1mm^2} = 0,35\Omega$$

$$P_P = I_2^{\,2} \cdot R_P = 5^2 A \cdot 0,35\Omega = 8,75VA$$

Function of power quality analyser + recording



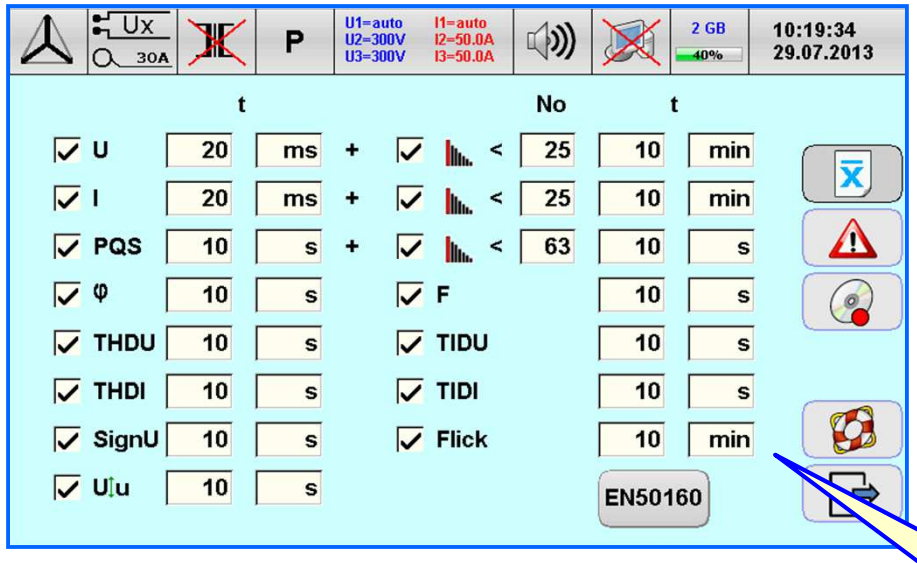
- measuring of power quality parameters according to IEC 61000-4-30 class A with visualization of measurement results in the real time mode

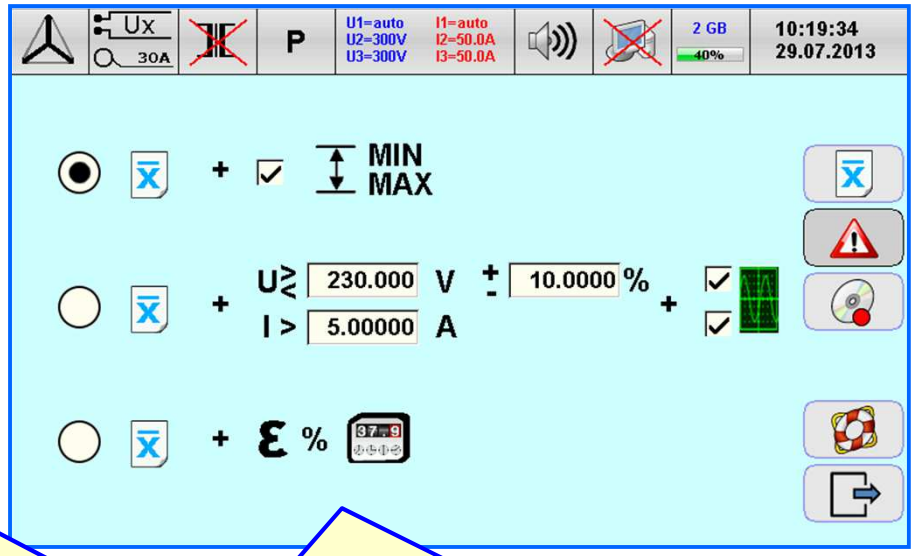


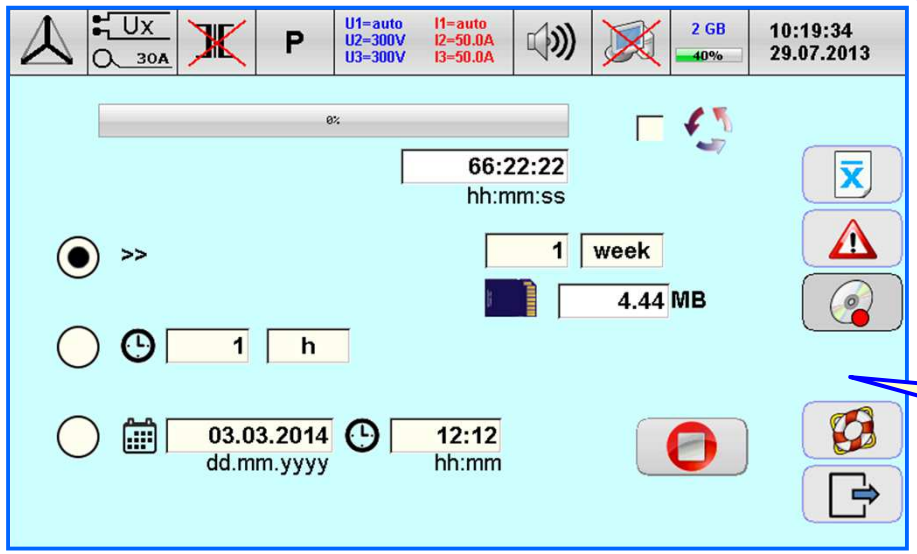
- analyzing of measurement results for EN 50160 compatibility or individual requirements of user

- recording of power network parameters in the SD Flash 4-32GB memory, which gives (8÷64)x10^6 sets of network parameters or long-term registration of power quality

Function of power quality analyser + recording







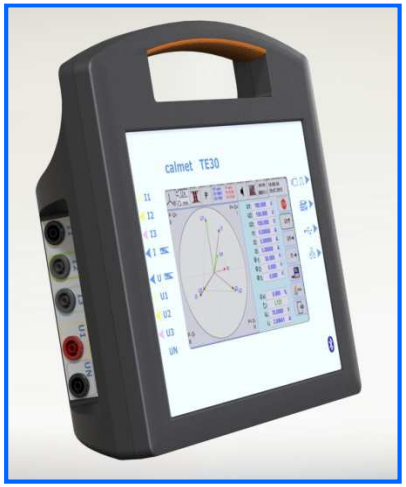
selecting recording method: average value, max / min value, outside limits, every Energy Meter error

selecting recorded parametrs and averaging times

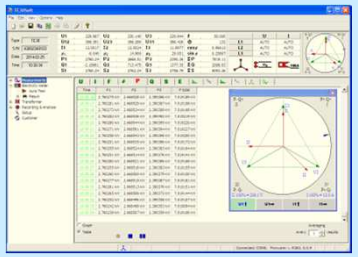
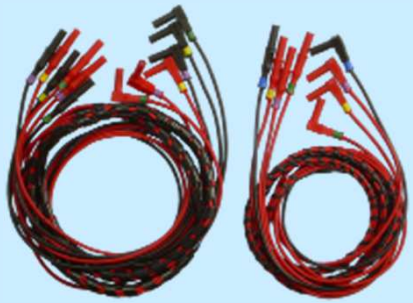
selecting time length of recording and start date & time

TE30 Analyzer's equipment delivered in price:

- TE30 Analyzer class 0.05 or 0.1;
- Power supply cord;
- Fuse T250mA@230V or T500mA@110V (2 units);
- Memory SD card (8GB);
- Operation manual of analyzer;
- Warranty card;
- Manufacturer calibration certificate;



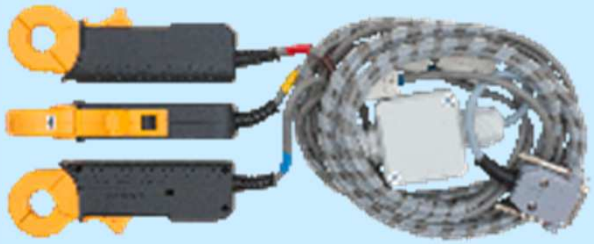
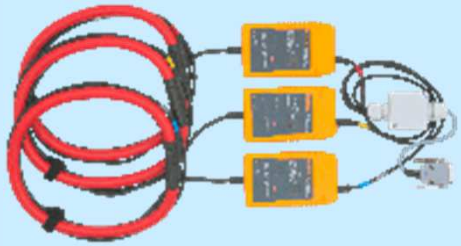
TE30 Analyzer's optional equipment:

• Calmet TE30 PC Soft with operation manual (for Windows XP and higher versions) and USB mini / USB A interface cable,	
• AD100EXT extension for powering TE30 from measurement network,	
• EA30 set of safety measurement cables (10pcs) for voltage and current,	
• AKD100 additional accessories (handlers, terminals, aligator clips, fork, banana plugs - 42pcs) for safety cables,	

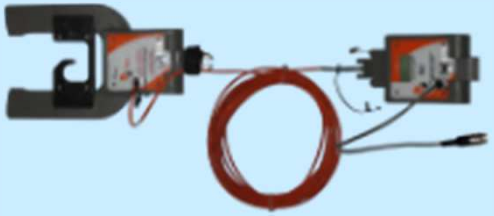
TE30 Analyzer's optional equipment:

• CF102 photo head with holder for inductive meter and meter with LED,	
• DR200B miniature thermal printer with Bluetooth,	
• ET30 transportation case,	
• ET32 transportation case for additional accessories,	

TE30 Analyzer's optional equipment:

• CT10AC electronic compensated clamps up to 10A (1compl),	
• CT100AC electronic compensated clamps up to 100A (1compl),	
• CT1000AC electronic compensated clamps up to 1000A (1compl),	
• FCT3000AC electronic compensated flexible clamps in ranges 30/300/3000A (1compl),	

TE30 Analyzer's optional equipment:

• AmpLiteWire 2000A primary current sensors up to 2000A for LV and MV nets (1pc),	
• VoltLiteWire 40kV primary sensors up to 40kV (1pc),	
• rechargeable battery NiMH AA R6 1.2V 2700mAh (5pcs),	
• TE30 option set 01 (TE30+ET30+CT100AC+ +CF102+EA30+AKD100).	

TE30 Analyzer set ready for operation

Contact:

Calmet Ltd., Kukulcza 18 Street, 65-472 Zielona Gora, Poland EU

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