

5 or 10 Position Universal Meter Test Benches TST 3/5 Universal or TST 3/10 Universal Meter Tests with Closed U-I Links - without need of ICTs!



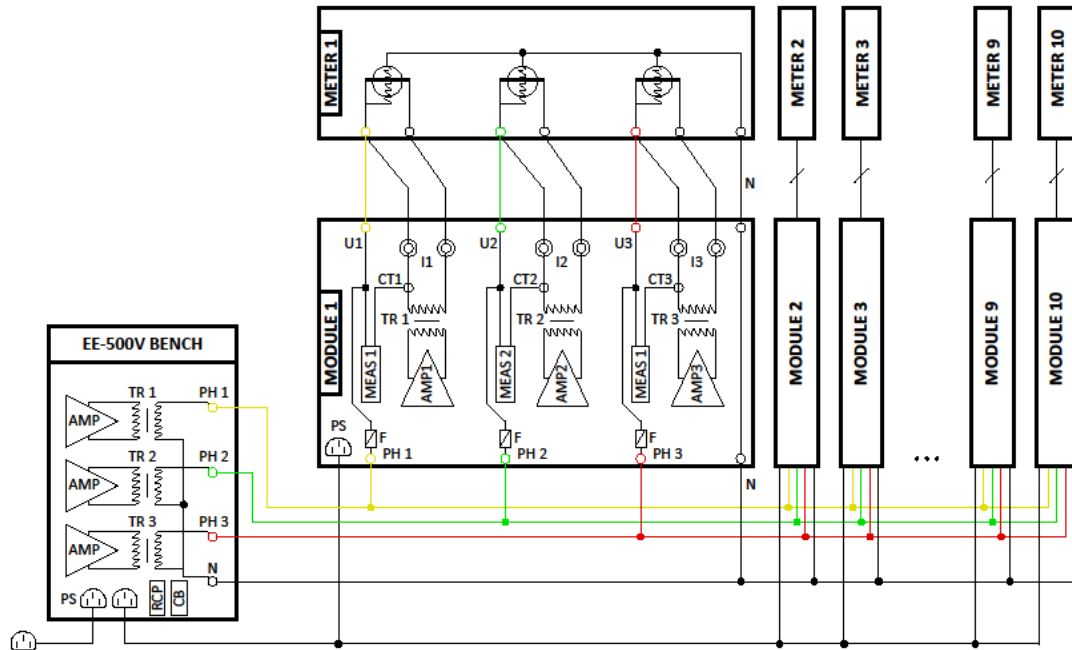
The Test Bench is designed in an innovative way and is able to test meters with closed U-I link without Isolating CTs. Each test position has its own current generator and Energy Standard. The Test Bench can test all types of electricity meters of accuracy class 0.2 or worse – mechanical or electronic, single-phase or three-phase (Wye or Delta), for active, reactive or apparent energy. Tests – Error, Register, Starting Current, No-Load, Meter Constant, Harmonics, Maximum Demand. The Test Bench consists of the following components:

- A Three-Phase Voltage Source "EE-500V" with up to 500 Vac generation per phase ;
- Five or ten identical Modules "EE-120A", each comprising a three-phase current generator in the range 1 mA to 120A (100 VA per phase each) and a three-phase **Energy Standard Class 0.04 or 0.02**;
- Meter Suspension Rack with 5 / 10 positions for hanging the meter, Scanning Heads with 3D Mechanical Support, IR Optical Reader, Tariffs, Panic Button, Lamp, Error Indicator;
- PC with EE Software for automatic control, search in Data Base, print of Reports, export in Excel.

Advantages

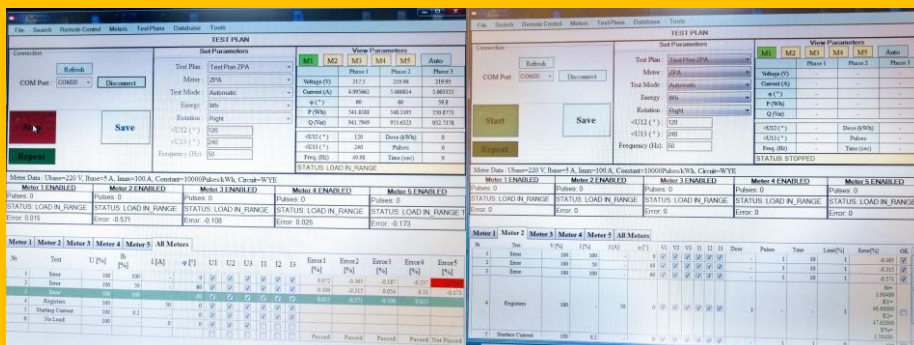
- Meter Tests with closed U-I links, no need of Isolating CTs or VTs;
- Overall Accuracy – $\pm 0.04\%$ or $\pm 0.02\%$; No additional Error from ICTs or voltage drops;
- If a meter is missing, no need of re-connections, just switch off the Module;
- Very safe, light, simple, modular construction; easy for mounting, support & calibration;
- The needed output power for the current generators is twice less compared with conventional Benches, because of the short cables and lack of Isolating Current Transformers (ICTs);
- Meters with different constant can be tested on each test position;
- Automatic reading of the meter registers with IR Head, according to IEC 62056-21 (IEC 1107 – old);
- Export of Test Results in Excel; Statistics – up to 10 repeats, Average Error, Standard Deviation.

Block Diagram of the Test Bench



Abbreviations: PS – Power Supply; RCP – Residual Current Protection; CB – Circuit Breaker;
 AMP - Amplifier; TR – Transformer; MEAS – Measuring Unit; CT – Current Transformer; F - Fuse

Software



The EE Software works under Windows, all versions, and has the following features:

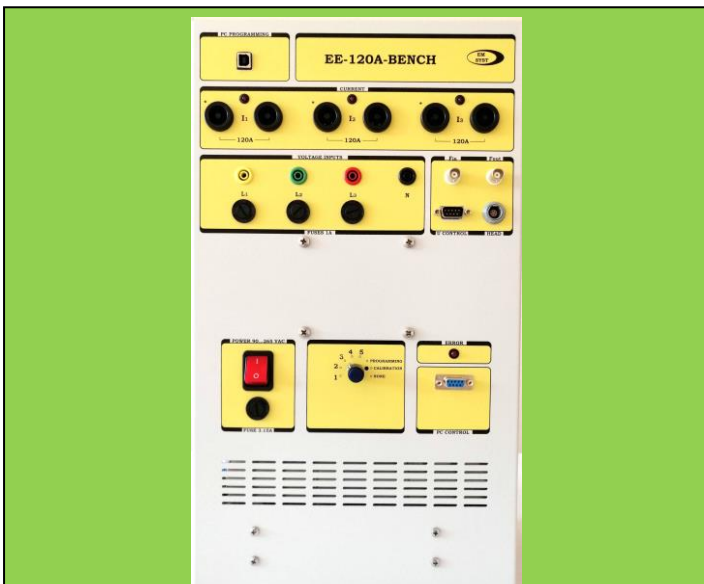
- Control of five or ten Modules EE-120A and one Module EE-500V;
- Manual Mode or Automatic Test Plans with up to 200 pre-set Test Points;
- Automatic Register reading with Communication IR Optical Heads (Port Readers);
- Memorize the Test Results in the MySQL Data Base;
- Search by ID Number, Group, Date; Create Headers and Footers;
- Print Test Reports; **Export Test Results in Excel**; Import/Export Data Base or Test Plans;
- **Statistics** – up to 10 repeats, calculation of Average Error & Standard Deviation.

Components of the Test Bench



EE-500V-3-BENCH

- Voltage generation 3 x 300 (500) Vac
- Power Supply for the Bench 3000 VA max;
- Residual-Current Protection 30 mA;
- Circuit Breaker 25 A;
- Voltage supply for the Tariffs & Lamp.



EE-120A-BENCH

- Current Generation 3 x 1mA ...120 A at 100VA;
- Energy Standard Class 0.04 or class 0.02;
- Measurement: Wh, VARh, VAh ; 2W, 3W, 4W;
- Switch with 5/10 positions for the Module No;
- Input for the Head; BNC high-frequency input;
- Pulse Output (F_{out}) proportional to Energy;
- Fuses for each voltage to the meter;
- Audible and LED signal for problem indication.



- Scanning Head with Mechanics, accurate and stable 3D positioning
- Communication IR Optical Head for reading the Registers' content;
- Meter Hanging Facility, Lever Handle and Quick Connecting Devices;
- Tariff Sockets and Cables;
- Emergency Circuit Breaker (Panic Button) to switch off the main power supply;
- Lamp for indication of power.



ERROR INDICATOR

- Indicates the errors of all 5 meters;
- Errors above the limit are in red;
- Shows the Test type and number from the test sequence;
- The on-going test is shown in green



**HAND-HELD
TERMINAL
with WI-FI &
BAR-CODE
READER
(Option)**

TECHNICAL DATA

GENERAL			
Power Supply: 85 ... 265 Vac, 47...63 Hz		Operation Temperature Range: 0°C ... 40°C	
Power Consumption: 1800VA/5pos. (3600VA/10pos)		Relative Humidity: <95%, Non-condensing	
Overvoltage Category: 300V, Cat III		Safety & EMC: IEC61010-1, EN61000-4-4,5,8,11	
Circuit Types: 4WY, 3WA, Single Phase		Measure:Wh,varh,VAh,U,I,φ,P,Q,S,f,THD,PF	
Tests: Error, Register, No-Load, Starting Current, Meter Constant, Harmonics, Pre-heating			
Standards: IEC 736, IEC 62052-11, IEC 62053-11, 21, 22, 23, 24, EN 50470-1, 2, 3			
THREE-PHASE LOAD			
PARAMETER	CURRENT SOURCE EE-120A	VOLTAGE SOURCE EE-500V	
Range	1 mA ... 120 A	30 Vac ... 500 Vac (Ph.-N)	
Output Power - 5/10 Positions	Max. 100 VA per phase, per unit Max. 500 / 1000 VA per phase	Max. 500VA / 250 W per phase	
Accuracy / Resolution	±0.05 % / 0.01 mA	±0.05 % / 0.01 V	
Stability	<0.02 % (in 1 hour)	<0.005 % (in 1 hour)	
Harmonic Distortions	< 0.8 %	< 0.8 %	
Harmonics	From 1 to 20 th , 0...40%, 0...360°	From 1 to 20 th , 0..40%, 0..360°	
Phase Shift	0.0° ... 359.9°, step 0.1°	0.0° ... 359.9°, step 0.1°	
Frequency	45 ... 65 Hz	45 ... 65 Hz	
Dimensions [HxLxW]	480x270x150 mm	450x600x300 mm	
Weight [kg]	14.5 kg	35.8 kg	
EE-120A – THREE-PHASE STANDARD			
PARAMETER	RANGE	ERROR CL. 0.04	ERROR CL. 0.02
Voltage	30 ... 500Vac (Phase-Neutral)	< ±0.02 %	< ±0.015 %
Current	0.04 ... 120 A 0.001 ... 0.04 A	< ±0.02 % < ±0.02 % ¹⁾	< ±0.015 % < ±0.015 % ¹⁾
Active Power / Energy	0.04 ... 120 A 0.01 ... 0.04 A	< ±0.04 % < ±0.04 % ^{1) 2)}	< ±0.02 % ²⁾ < ±0.02 % ^{1) 2)}
Reactive Power / Energy	0.10 ... 120 A 0.01 ... 0.10 A	< ±0.04 % < ±0.04 % ^{1) 2)}	< ±0.02 % ²⁾ < ±0.02 % ^{1) 2)}
Phase Shift	0.00° ... 359.99°	< 0.01°	< 0.01°
Power Factor	-0.9999...+0.9999	±0.002	±0.002
Frequency	40 ... 70 Hz	0.01 Hz	0.01 Hz
Temp. Coefficient	0°C ... 40°C	< 0.003 %/K	< 0.002 %/K
Long Term Stability		≤ 0.008 %/year	≤ 0.005 %/year
METER SUSPENSION RACK FOR FIVE POSITIONS			
Dimensions: HxLxW 1900 x 1520 x 520 [mm]		Weight: 52 kg	
Material: Aluminum Profiles		Protection: Panic Button	

¹⁾ Error related to the maximum value of the range.

²⁾ Error related to apparent power – to be divided by the Power Factor.