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5 or 10 Position Universal Meter Test Benches TST 3/5 Universal or TST 3/10 Universal

Meter Testing with Closed U-I Links without need of ICTs!



General

The Test Bench is designed in an innovative way and is able to test meters with closed U-I link without Isolating CTs. It can test all types of meters – mechanical or electronic, single-phase or three-phase; for active, reactive or apparent energy; Tests – Error, Register, Starting Current, No Load, Meter Constant. Pre-defined Test Plans can be executed manually or fully automatic.

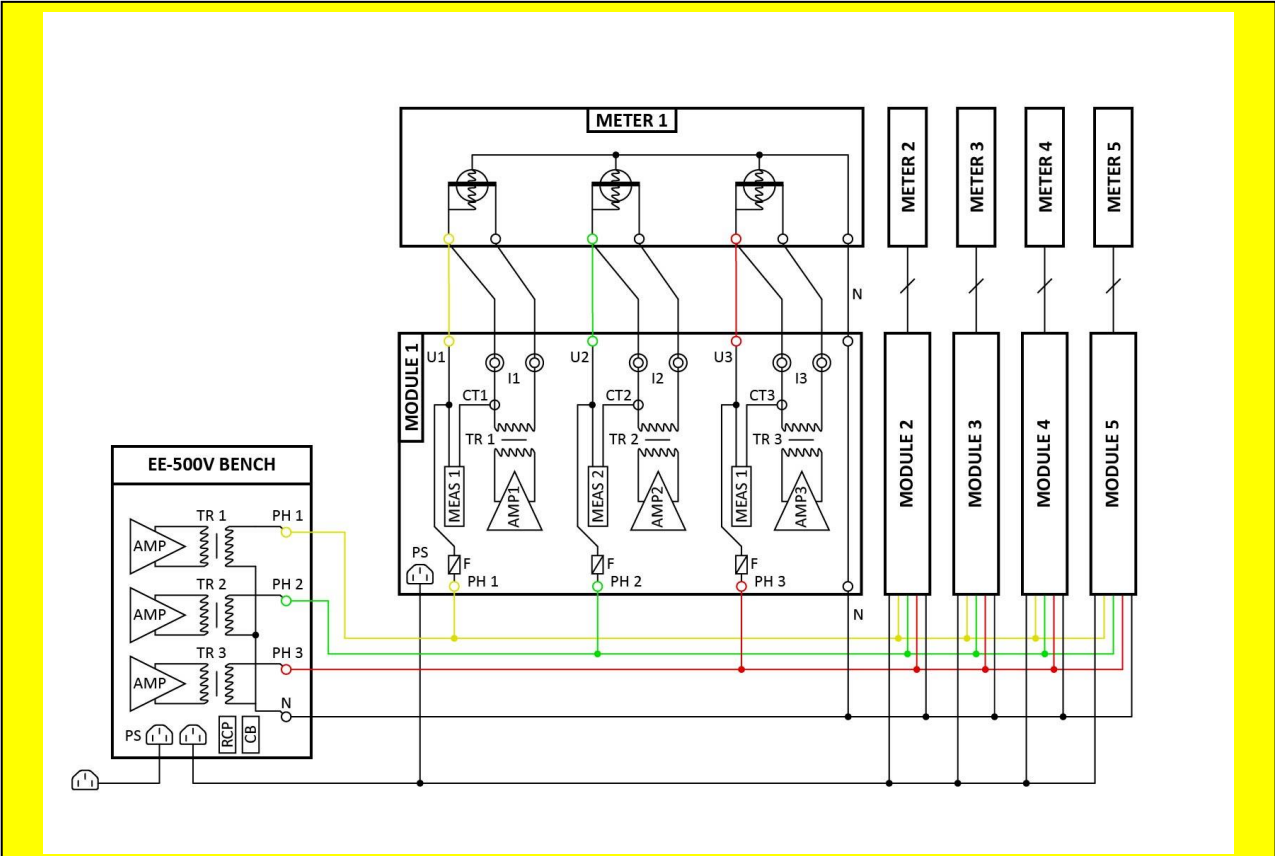
The Test Bench consists of the following components:

- A Three-Phase Voltage Generator EE-500V / 400VA for each 5-position suspension rack;
- 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 adjustable Mechanical Support, Electronic Port Readers, Tariffs, Panic Button, Lamp;
- PC with EE Software for automatic control, search in Data Base and print of Reports, Data export.

Advantages

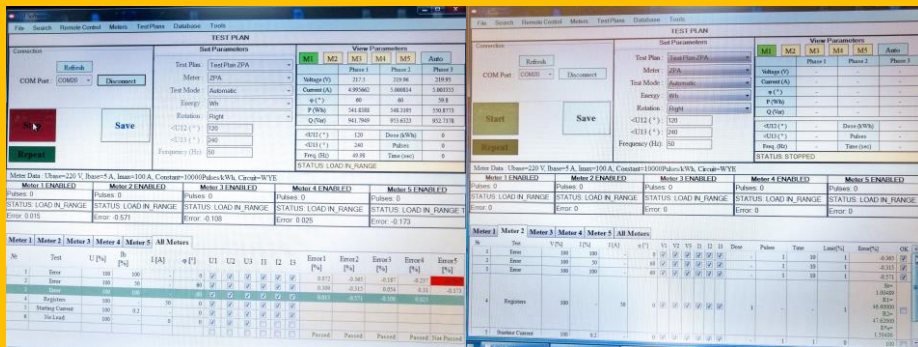
- **Meter Tests with closed U-I links, no need of Isolating CTs or VTs;**
- **Overall Accuracy – $\pm 0.04\%$ or $\pm 0.02\%$; No additional Error from ICTs or voltage drops;**
- **If a meter is missing, no need of re-connections, just switch off the Module;**
- **Very light, simple, modular construction; 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 and can be tested on each test position;**
- **Automatic reading the meter registers according to IEC 62056-21 (IEC 1107 – old);**
- **The 10-position Test Bench can function as two independent 5-position Benches.**

Block Diagram of the Test Bench



Abbreviations: PS – Power Supply; RCP – Residual Current Device; 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:

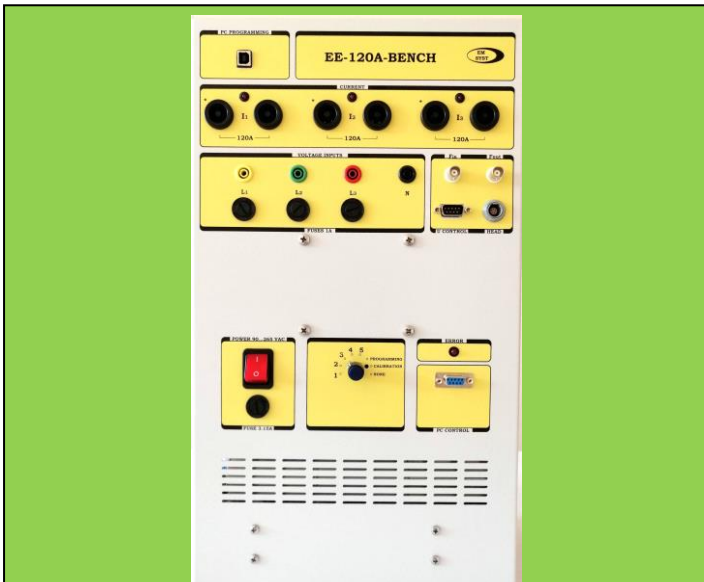
- Control of five or ten Modules EE-120A and one or two Modules EE-500V;
- Manual Mode or Automatic Test Plans with up to 200 pre-set Test Points;
- Automatic Register reading with Electronic Heads (Port Readers);
- Memorize the Test Results in the MySQL Data Base;
- Search by ID Number, Group, Date; Create Headers and Footers;
- Print Test Reports; Import / Export of Data Base or Test Plans

Components of the Test Bench



EE-500V-3-BENCH

- Voltage generation 3x500Vac
- Power Supply for the Bench - 1800VA;
- Residual-Current Device;
- Circuit Breaker;
- Voltage supply for the Tariffs & Lamp.

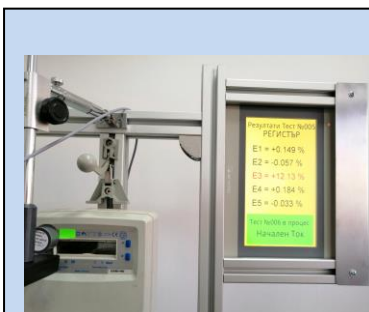


EE-120A-BENCH

- 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
- Electronic Head for automatic reading of the Registers' content;
- Tariff Sockets and Cables;
- Emergency Circuit Breaker (Panic Button) to switch off the main power supply;
- Lamp for indication of power;
- Bar-code Reader.



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

The Register values are entered and transferred to a PC. (Option)

GENERAL			
Power Supply: 85 ... 265 Vac, 47...63 Hz	Operation Temperature Range: 0°C ... 40°C		
Power Consumption: 1800VA (max. 3600VA)	Relative Humidity: <95%, Non-condensing		
Oversvoltage Category: 300V, Cat III	Safety Tests: IEC 61010-1: 2010		
Circuit Types: 4WY, 3WΔ, 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	1mA ... 120A	30Vac ... 500Vac (Ph.-N)	
Output Power	100 VA per phase, per unit	500VA / 250 W per phase	
- 5 Positions	Maximum 500 VA per phase	Maximum 500 VA per phase	
- 10 Positions	Maximum 1000 VA per phase	Maximum 1000 VA per phase	
Accuracy / Resolution	±0.10 % / 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 21 th , 0...40%, 0...360°	From 1 to 21 th , 0..40%, 0..360°	
Phase Shift	0.0° ... 359., 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 % < ±0.08 % ²⁾	< ±0.02 % ²⁾ < ±0.04 % 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
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.