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TST 3/20 THREE-PHASE ELECTRICITY METER TEST BENCH



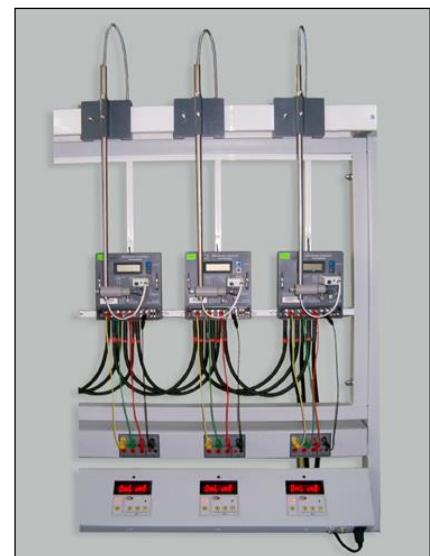
“EMSYST-6” Ltd offers a variety of **Test Benches** used for test and adjustment of all types of three-phase and single-phase electricity meters. The test stations could be with 3, 5, 10 (TST 3/10) or 20 (TST 3/20) measurement positions. The electricity meters can be tested for active, reactive or apparent energy. The following circuit types are simulated: 2-Wire, 3-Wire Delta, 4-Wire Wye. The meter test station is controlled from a PC and works in a **manual mode** or in an **automatic mode** with preset measurement parameters. An isolating current transformer can be mounted on each measuring position to test the inseparable three-phase meters. The isolating current transformer is switched off with relays controlled from the computer via RS 485.

The following tests could be performed on a test station:

- No Load test
- Starting Current test
- Error tests (with different values of U, I and $\cos\varphi$)
- Register tests
- Maximum Demand test

One test station consists of the following components:

- A three-phase energy standard
- A three-phase phantom load
- Meter suspension rack
- Universal scanning heads with mechanisms for positioning
- Error indicators
- Isolating three-phase current transformer
- Computer and printer





TST-3 FEATURES AND COMPONENTS

Three-phase Reference Energy Standard

- Accuracy class - 0.05
- Generates output pulses proportional to energy (active, reactive, apparent) for error calculation
- Realizes dosing of energy (Dial Test) for check of the registers
- Performs Maximum Demand Test
- Indicates the values of voltage, current, phase, power, frequency

Three-phase Electronic Phantom Load

- Generates independent of the mains voltage and current waves
- Output power of each phase - 600 or 1000 VA
- Output voltage - adjustable from 30V to 300V, resolution 0.1V
- Output current - adjustable from 0.001A to 120A, resolution 0.001A
- Phase shift between voltage and current - adjustable in the range 0° to 360° , resolution 0.01°
- Stability of the output waves $< 0.01\%$
- Distortion factor of the waves $< 0.5\%$

- Generation of harmonics

Universal Scanning Head

- Reads the signals from a rotating disc of Ferraris meters or the pulses of the light - emitting diodes of electronic meters
- The sensitivity of the head is regulated with a potentiometer
- Electric pulse output and light indication for the pulses available

Error Indicator

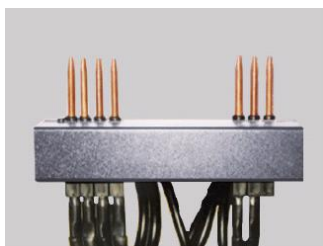
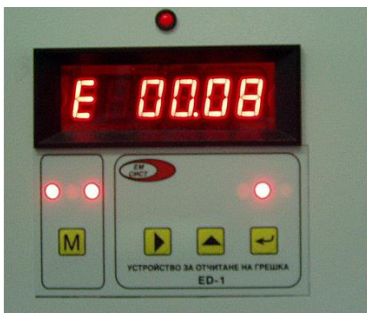
- 7 digits LED display for error indication
- Functional buttons for manual operation
- Computer interface RS 485
- Three pulse inputs - from a scanning head, an energy standard and from a SO output of a meter

Mechanical Construction

- Meter suspension rack
- Mechanisms for fixing and positioning of scanning heads
- Automatic or manual connection of the current and voltage cables
- Panic Buttons
- Tariff switching

Isolating Three-Phase Current Transformer – option

- Used when inseparable three-phase meters are tested
- Accuracy class – 0.05
- Current range – 0.02 ... 120 A
- Remote control and monitoring via RS 485
- Relays for switching to direct measurement



TECHNICAL DATA

GENERAL

| | | | |
|-------------------|--|-----------------------------|------------------|
| Power supply | 3 x 230 V ± 15%, 50 Hz | Working ambient temperature | 0 °C ... 45 °C |
| Power consumption | 2000 VA per phase (TST 3/10) 4000 VA per phase (TST 3/20) | Transport temperature | -15 °C ... 60 °C |

THREE-PHASE VOLTAGE AND CURRENT LOAD

Voltage generation

| | |
|---------------------|---|
| Range | 30.0 ... 300.0 V RMS |
| Resolution | 0.1 V |
| Accuracy | < 0.05% |
| Stability | < 0.01% in relation to 1 min |
| Harmonic distortion | < 0.5 % |
| Harmonic content | programmable to 19th |
| Output power | 600 VA (TST 3/10) 1000 VA (TST 3/20) |
| Output protection | Short circuit, Overload, Thermal |

Output frequency

| | |
|------------|--------------|
| Range | 45 ... 65 Hz |
| Resolution | 0.01 Hz |
| Stability | < 0.01 Hz |

Current generation

| | |
|-----------------------------|---|
| Range (internal sub-ranges) | 0.001 ... 120 A |
| Resolution | 0.001 A |
| Accuracy | < 0.05% |
| Stability | < 0.01% in relation to 1 min |
| Harmonic distortion | < 0.5% |
| Harmonic content | programmable to 19th |
| Output power | 600 VA (TST 3/10) 1000 VA (TST 3/20) |
| Output protection | Open circuit, Overload, Thermal |

Phase-shift

| | |
|------------------------|-------------|
| Range (for each phase) | 0° ... 360° |
| Resolution | 0.01° |
| Stability | < 0.02° |

THREE-PHASE ENERGY STANDARD

General parameters

| | |
|---------------------------------|---|
| Power supply | 220 V ± 15% (auxiliary supply) |
| Power consumption | 9 VA |
| Frequency range | 45 ... 65 Hz |
| Output pulses (programmable) | min. 10 000 imp/kWh (kVarh) max. 1 000 000 imp/kWh (kVarh) |
| Temperature coefficient | < 0.0015% / °C |
| Relative humidity | < 95% non condensing |

Ranges and measurement error

| | Error [%] | Range |
|--------------------------|-----------|--------------------|
| Voltage (phase-neutral) | ± 0.05 | 30 ... 300 V |
| Voltage (phase to phase) | ± 0.05 | 52 ... 520 V |
| Current | ± 0.05 | 0.02 ... 120 A |
| | ± 0.1 | 0.005 ... 0.019 A |
| Active power/ energy | ± 0.05 | I = 0.05 ... 100 A |
| Reactive power/ energy | ± 0.05 | I = 0.05 ... 100 A |

ISOLATING THREE-PHASE CURRENT TRANSFORMER

| | | | |
|-------------------|--|--------------------------|------------------------------|
| Current range | 0.02 ... 120 A | Output power | 45 VA max |
| Accuracy class | 0.05 (0.1 ... 120A) 0.15 (0.02 ... 0.1A) | Protection | Open circuit; Overload |
| Phase angle error | 0.015° (0.1 ... 120A) 0.05° (0.02 ... 0.1A) | Remote controlled relays | Switch to direct measurement |
| Frequency | 45 ... 65 Hz | Remote monitoring | RS-485 |

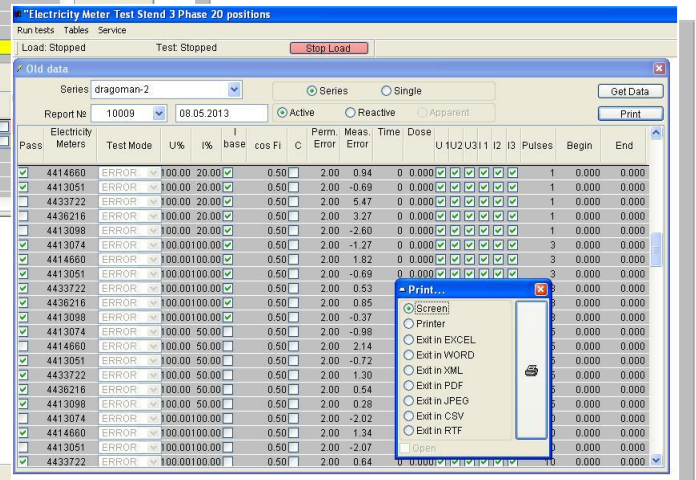
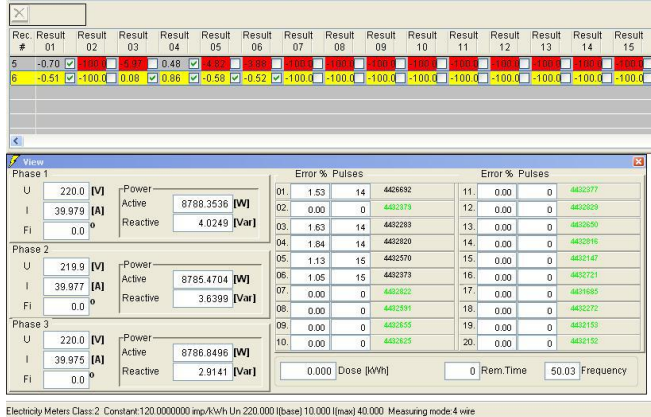
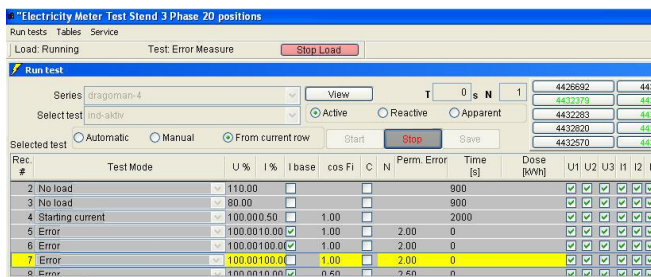
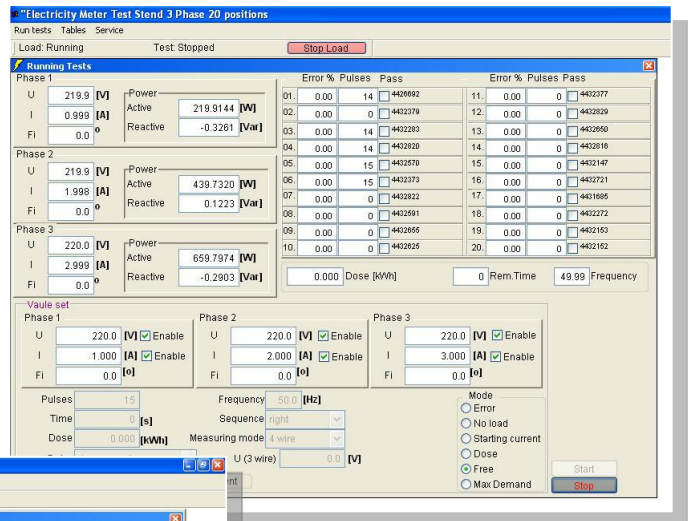
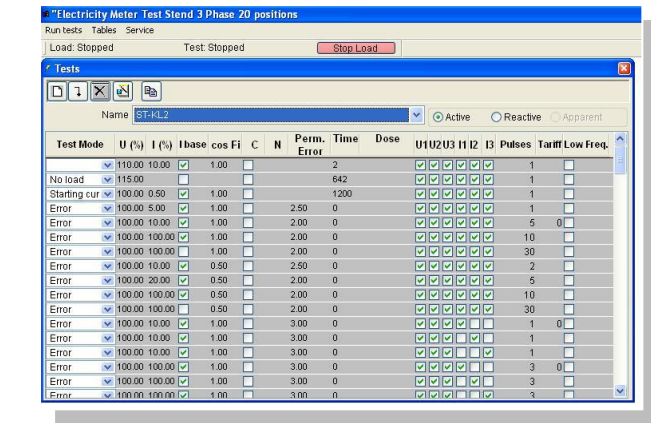
TST-3 SOFTWARE

GENERAL

- Operates under WINDOWS
- Results are stored in a database
- Search results by meter ID, meter type, test date, series
- Print of test reports and calibration certificates
- Export results to Excel, Word or PDF file
- Fields to store electricity meter technical data
- Creation and saving of test sequences for different meter types

CONTROL of TST-3 from a PC

- Control via USB and RS-485 interface
- Manual or fully automatic mode of testing
- Test Types: Meter error test, Starting current, Register test, No-load test, Maximum demand test, Warming, Pause
- Safety Stop Load button
- Always visible load values
- Indication of meter error for each position



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