

EuroSMC is proud to present in this catalog the widest range of products that exist on the market for electrical test equipment in relay testing and for substations maintenance in applications for generation, distribution, transmission and industry.

The **Quality** is the base and foundations of our company in all aspects and in all our company departments; R & D, production, sales, and after sales support.

Quality in **Design**, guaranties that our equipment meets the demands that we impose and what our customers expect.

Quality in **Products**, taking care of the details during the entire production process and by selecting the best material and components that are used in the equipment.

A maximum **compliance** in the design of our products meets the needs of customers and users worldwide.

All our products are **Flexible** in their use, as we incorporate a very intuitive manual control along with software control. EuroSMC offers a range of products that meet the application required, which is reflected by our satisfied customers who use our products.



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SECONDARY INJECTION



The secondary injection equipment for relay testing has been the main activity of EuroSMC. For this reason, the extensive range of products comes from the experience obtained during the past 20 years.

Our tradition in the design and manufacturing of this type of equipment has enabled us to have complete range of equipment with different philosophies for the various applications and customers who use relay test equipment.

The **PTE-100-C** is single phase test set based on variac output regulation. The outstanding difference is; the smallest, lightest, highest power and easiest to use equipment of its kind on the market. Its versatility is an essential tool for common relay tests.



The **PTE electronic** range of equipment is designed to serve the majority of relay applications and can be combined with other equipment to expand the applications. These portable, robust, equipment have electronic generated outputs and are a favorite with service companies, along with the distribution and generation departments of the Utilities as they are adapted and designed to meet their requirements. The characteristics and the functionality of this range of products are not found anywhere else. Other unique benefit is the high power, both in current and voltage, being able to test all types of relays, including electromechanical relays. The reversibility in all output channels (current/voltage) and the external reference input, enables this range to work with other equipment, including all other brands on the market, being the most flexible test systems that can be found.

The **Mentor** incorporates the latest designs and concepts in test equipment, based on leading edge technology. This revolutionary product, the most modern equipment of its class, fulfills the requirements of the transmission departments and for the commissioning of new installations. Unlike any other test equipment, both in power and features, the Mentor can have up to two, three phase systems in one unit, with all logical inputs and outputs required when testing protection relays. This equipment continues the tradition of EuroSMC in designing the most complete equipment with sufficient and reversible power, along with independent output channels. The ability to upgrade the equipment with plug and play additions makes the Mentor the most advance equipment on the market.

PTE-100-C

Current and voltage relay testing unit up to 250A



APPLICATIONS

- Testing of single phase Current or Voltage Electromechanical and Electronic Relays.
- Current transformer Test.
- Thermal Relays.
- Measurement of different parameters such as Power, Phase Angle, Impedance, etc.

MAIN FEATURES

- Current output up to 250 A in 4 ranges.
- AC voltage output from 0 to 250 V (4 A).
- DC voltage output from 0 to 350 V (2.8 A).
- Auxiliary DC power supply up to 250 V.
- Built-in timer, 1ms resolution.
- Output power: 1000 VA.
- Electronic protection in all outputs.
- Special control functions.
- Special measurement functions.
- Case: IP-65
- Dimensions: 200 x 300 x 200 mm / 13.5 kg.
8 x 12 x 8 in / 30 lb.

OPTIONS

PTE-FCC

Load Option

Applications

- Increase load value at small currents
- Improves current regulation.
- Improves output distortion.
- Obtain different angle values up to $\pm 90^\circ$, enabling to test directional relays.

Main Features

- Resistors: 0.5, 1, 2, 25, 50, and 100 ohms.
- Mounted in top cover.



PTE-FCC

PTE-FCE

External Timer

Applications

- Starts timer with external contacts, (NO) normally open/(NC) normally closed.

Main Features

- Connected directly to monitor taps.
- Easily mounted and transported inside the unit.



PTE-FCE

PTE-FCL

Variable Voltage, Frequency and Phase Shifter Option

Applications

- Relay test which require variable frequency and phase angle.
- Can be used with any existing PTE-100-C.

Main Features

- AC voltage output to 140 V.
- Frequency output from 40-70 Hz.
- Variable phase angle 0-360°.
- Easily mounted in the top cover.



PTE-FCL

PTE-OCT

Overcurrent relay test software

Applications

- Software performs tests for overcurrent relays.
- Generates test reports.

Main Features

- The test is directed by software, including the test current values.
- The test values and test sequence is automatically transmitted to the equipment.
- Results in MS Excel and can be compared to a timing curve.



PTE-OCT

Refer to the software section (page 15) for more information.

PTE-100-C Plus



Single Phase Relay testing unit



The PTE-100-C Plus can test all single phase relays, electromechanical to digital.

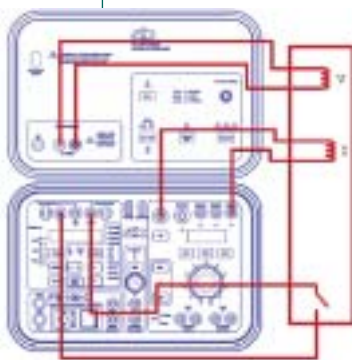
APPLICATIONS

- Single-phase testing of relays:
 - Definite and inverse time overcurrent.
 - Min/max AC / DC voltage.
 - Directional overcurrent
 - Frequency
 - Distance
 - Synchronizing
 - Directional power
 - Loss of Field
 - Reverse Phase
 - Negative sequence overcurrent
 - Reverse phase / voltage
 - Thermal
 - Power factor
 - Overvoltage
 - Earth detection
 - Phase angle, Out of Step
 - AC / DC reclosing
 - Directional voltage
 - Directional voltage and power
- Moulded Case Breakers (MCB, MCCB) testing.
- CT Knee-point analysis and many other accurate electrical measurements.
- Three-phase testing when combined with other PTE-range equipment.

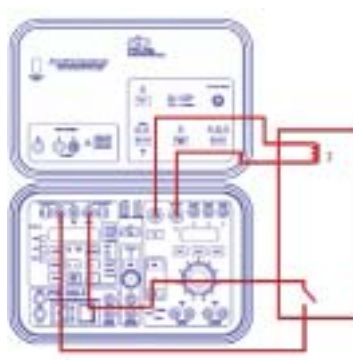
MAIN FEATURES

- Selectable power outputs:
 - Variable AC current output up to 0-250 A.
 - Variable AC voltage output up to 0-250 V.
 - Variable DC voltage output up to 0-350 V.
- Variable auxiliary voltage supply 0-250 V DC.
- Variable AC voltage 0-140 V.
- Variable Frequency 40-70 Hz.
- Variable Phase Angle 0-360°.
- Isolated and electronically protected outputs.
- 1ms resolution chronometer.
- External and internal signal measurement: voltmeter, ammeter, frequency meter, power meter, impedance meter and phase meter.
- Elapsed injection time limit control.
- Maximum current output limit control.
- Output current preset function.
- RS-232 communications port.
- Interconnection with EuroSMC exclusive PTE-BUS.
- Case: IP-65.
- Dimensions:
 - 200 x 300 x 200 mm / 15.5 kg.
 - 8 x 12 x 8 in / 35 lb.

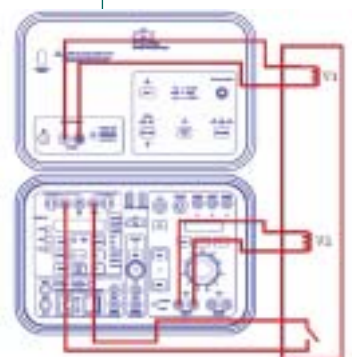
Testing distance relays



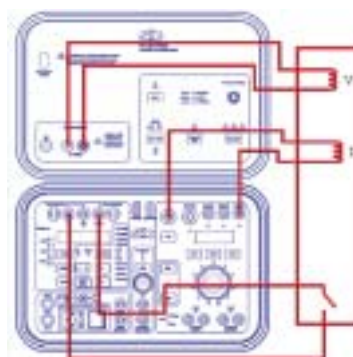
Testing over current relays



Testing synchronizing relays



Testing directional relays



PTE-100-V

Single phase relay test set Voltage / Current



The equipment has reversible outputs with a power of 100 VA for relay test in AC voltage or current with frequency and phase angle.

APPLICATIONS

- Testing of single phase Generation and Interconnection Relays, such as Frequency, Synchronizing, and Phase Angle.
- In combination with a current injector, forms a complete test in complete single phase test set (Current Voltage, phase angle) to test directional, power, etc., relays.
- Manual and/or software control.

MAIN FEATURES

- Output power 100 VA
- Variable voltage up to 300 V
- Variable current up to 8 A
- Variable phase angle between 0 - 360°
- Variable frequency from 40 to 420 Hz

- Internal program to ramp frequency
- External current or voltage reference input
- RS-232 and PTE-BUS Connections
- External timer control output
- Monitor input to detect relay trips, dry or wet contact.
- Internal program to perform dynamic pre-fault and fault in both output level and phase angle.
- Electronic generation up to 3 kHz isolated from the main supply.
- Output stabilized by microprocessor
- Overload and thermal alarms, electronically protected
- Case: IP-65
- Dimensions:
 - 200 x 300 x 200 mm / 13.5 kg.
 - 8 x 12 x 8 in / 30lb.

PTE-50-CE

Single phase relay test set Current / Voltage



The equipment has reversible outputs with a power of 100 VA for relays test in AC current or voltage with a built-in timer and harmonic generator.

APPLICATIONS

- Testing of current or voltage relays, especially numerical relays with manual or software control.
- Combined with another current generator, can test differential relays, including harmonic restraint up to the 7th harmonic.
- In combination with the PTE-100-V forms a complete test in complete single phase programmable test set (Current Voltage, phase angle) to test single phase directional, power inverse, distance, differential, etc., relays.
- Manual and/or software control.

MAIN FEATURES

- Output power 100 VA
- Variable current up to 50 A
- Variable voltage up to 150 V
- Variable phase angle between 0 - 360°
- Built-in timer with a 1 ms resolution
- External timer control output
- External current or voltage reference input
- Harmonic generator
- RS-232 and PTE-BUS Connections
- Monitor input to detect relay trips, dry or wet contact.
- Internal program to perform dynamic pre-fault and fault in both output level and phase angle.
- Electronic generation up to 3 kHz isolated from the main supply
- Output stabilized by microprocessor
- Overload and thermal alarms, electronically protected
- Case: IP-65
- Dimensions:
 - 200 x 300 x 200 mm / 13.5 kg.
 - 8 x 12 x 8 in / 30lb.

PTE-300-V



Three phase relay test set Voltage / Current

The equipment has 3 reversible outputs with a power of 100 VA for relays test in AC voltage or current with frequency and phase angle.

APPLICATIONS

- Testing of three and single phase Generation and Interconnection Relays.
- Testing of directional, differential, and power relays.
- Combined with a single phase Current injection set, enables relay tests which require three phase voltage.
- Reversible outputs (Current Voltage, phase angle) make a complete single phase unit.
- Manual and/or software control.

MAIN FEATURES

- Output power 100VA x 3
- Output power 300 VA single phase

- Variable voltage up to 300 V x 3
- Variable current up to 8 A x 3
- Up to 900 V or 24 A single phase
- Variable phase angle between 0 - 360°
- Variable frequency from 40 to 420 Hz
- Internal program to ramp frequency.
- External current or voltage reference input.
- RS-232 and PTE-BUS Connections.
- External timer control output.
- Monitor input to detect relay trips, dry or wet contact.
- Internal program to perform dynamic pre-fault and fault in both output levels and phase angles.
- Electronic generation up to 3 kHz isolated from the main supply.
- Output stabilized by microprocessor.
- Overload and thermal alarms, electronically protected.
- Case: IP-65
- Dimensions:
 - 200 x 442 x 327 mm / 22 kg.
 - 8 x 18 x 13 in / 48lb.

PTE-50-CET



Three phase relay test set Current / Voltage

The equipment has 3 reversible outputs with a power of 100 VA for relays test in AC current or voltage with built-in timer and harmonic generator.

APPLICATIONS

- Testing three phase relays used in distribution networks and industry.
- Testing of three and single phase motor protection and Thermal Image relays.
- Reversible outputs (Current Voltage, phase angle) make a complete single phase unit.
- Combining with other equipment can generate a complete three phase system.
- Testing of directional, differential, and power relays.
- Manual control or software controlled.

MAIN FEATURES

- Output power 100 VA x 3
- Output power 300 VA single phase*
- Variable voltage up to 150 V x 3
- Variable current up to 50 A x 3
- Up to 150 A or 450 V single phase
- Variable phase angle between 0 - 360°
- Built-in timer with a 1 ms resolution
- External timer control output

- External current or voltage reference input
- Harmonics generator
- RS-232 and PTE-BUS Connections
- Monitor input to detect relay trips, dry or wet contact.
- Internal program to perform dynamic pre-fault and fault in both output levels and phase angles.
- Electronic generation up to 3 kHz isolated from the main supply
- Output stabilized by microprocessor
- Overload and thermal alarms, electronically protected
- Case: IP-65
- Dimensions:
 - 200 x 442 x 327 mm / 24 kg.
 - 8 x 18 x 13 in / 52 lb.

PTE-SER SERIAL OPTION

This option enables to connect 2 or 3 output channels of the PTE-50-CET in series to increase the voltage and power in the current output taps.

* In current mode, the optional connector PTE-SER is required to achieve more than 100 VA.



PTE-SER

PTE COMBINATIONS

TRES



The combination of PTE-50-CET and PTE-300-V is used for testing three phase relays and are interconnected via the PTE-BUS. To control both units simultaneously the equipment incorporates master/slave control for all outputs and levels. Each of this equipment conserves their individual characteristics and can be used together or separately for single and three phase tests.

APPLICATIONS

Testing of all types of relays either manually or by software via computer.

MAIN FEATURES

- 6 reversible output channels in current or voltage, completely isolated, with phase angle control.
- Output power 100VA x 6
- Output power 300 VA* single phase both in current and voltage
- Variable voltage up to 300 V x 3

- Variable current up to 50 A x 3
- Up to 150 A or 900 V single phase
- Variable phase angle between 0 - 360°
- Variable frequency from 40 to 420 Hz
- Internal program to ramp frequency
- External current or voltage reference input
- RS-232 and PTE-BUS Connections
- Manual control or software control of the 6 output channels
- Overload and thermal alarms, electronically protected
- Case: IP-65
- Dimensions:
 - 200 x 442 x 327 mm x 2 / 22 +24 kg.
 - 8 x 18 x 13 in x 2 / 48lb + 52 lb.

See the specifications of each unit in this catalog.

* More than 100VA in current can be achieved using the PTE-SER option.

UNO



The combination of PTE-50-CE and PTE-100-V is used for testing single phase relays and are interconnected via the PTE-BUS. To control both units simultaneously the equipment incorporates master/slave control for all outputs and levels. These small, lightweight units incorporate a built-in timer (PTE-50-CE) and a frequency generator (PTE-100-V). Each of this equipment conserves their individual characteristics and can be used together or separately for single and three phase tests.

APPLICATIONS

Testing of all types of single phase relays whether they be electromechanical or digital, including differential, synchronizing, directional, current and voltage.

MAIN FEATURES

- 2 reversible output channels in current or voltage, completely isolated, with phase angle control.
- Output power 100 VA x 2

- Variable voltage up to 300 V and variable current up to 50 A
- Variable phase angle between 0 - 360°
- Variable frequency from 40 to 420 Hz
- Internal program to ramp frequency
- Built-in timer with a 1 ms resolution
- Manual control or software control of the 2 output channels
- Overload and thermal alarms, electronically protected
- Case: IP-65
- Dimensions:
 - 200 x 300 x 200 mm x 2 / 13.5 +13.5 kg.
 - 8 x 12 x 8 in x 2 / 30lb + 30 lb.

See the specifications of each unit in this catalog.

PTE-300-V+PTE-100-C

This combination is formed by a single phase unit with voltage and current, and a three phase output unit. The flexibility and accuracy of the PTE-300-V, along with a high power (1000 VA) of the PTE-100-C, with current and voltage, a built-in timer, and special measurement functions.

Each of this equipment conserves their individual characteristics and can be used together or separately.

APPLICATIONS

- To test virtually any type of single phase or three phase relays*, whether it be electromechanical, electronic, or digital, and including protections which require DC current or voltage.
- Test the saturation in CTs
- Test of MCBs
- Manual Control and/or software control**

MAIN FEATURES

- 4 reversible voltage or current outputs with phase angle, 0 -360°
- 1000VA + 3 x 100 VA of power
- up to 250 A and 900 V simultaneously
- DC injection up to 350 V
- A variable DC auxiliary output up to 250V
- Internal program to ramp frequency
- Built-in timer with a 1 ms resolution
- Dimensions:
 - 200 x 442 x 327 and 200 x 300 x 200 mm.
 - 8 x 18 x 13 and 8 x 12 x 8 in
- Weight: 22 + 13.5kg / 48 + 30lb.

See the specifications of each unit in this catalog.

* Some three phase test must be made phase by phase.

** Optional Software allows control of each unit separately.



PTE-300-V+PTE-50-CE

This combination is formed by 3 +1 amplifier outputs, with a built-in timer and a frequency generator. This combination serves as an economic alternative to a complete three phase system and with software and/or manual control.

Each of this equipment conserves their individual characteristics and can be used together or separately.

APPLICATIONS

- To test virtually any type of single phase or three phase relays, whether it be electromechanical, electronic, or digital, and can test differential, directional, synchronizing, impedance, voltage and current protection relays.

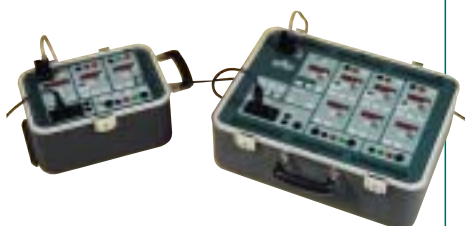
MAIN FEATURES

- 4 reversible floating voltage or current outputs with individual phase angle regulation.

- 100 VA of power in each output
- Up to 50 A and 900 V in single phase and 50 A and 300V x 3 in three phase*
- A variable frequency output between 40 - 420 Hz
- Internal program to ramp frequency
- Built-in timer with a 1 ms resolution
- Manual and/or software control
- Dimensions:
 - 200 x 442 x 327 and 200 x 300 x 200 mm.
 - 8 x 18 x 13 and 8 x 12 x 8 in.
- Weight: 22 + 13.5kg / 48 + 30lb.

See the specifications of each unit in this catalog

* Having 3 phase in voltage and one current.



PTE COMBINATIONS

PTE-50-CET+PTE-100-V



This combination is formed by 3 +1 amplifier outputs, with a built-in timer and a frequency generator. This combination serves as an economic alternative to a complete three phase system and with software and/or manual control.

Each of this equipment conserves their individual characteristics and can be used together or separately.

APPLICATIONS

- To test virtually any type of single phase or three phase relays, whether it be electromechanical, electronic, or digital, and can test differential, directional, synchronizing, impedance, voltage and current protection relays.

MAIN FEATURES

- 4 reversible floating voltage or current outputs with individual phase angle regulation

- 100 VA of power in each output
- Up to 150 A and 300 V in single phase and 50 A x 3 and 300V in three phase*
- A variable frequency output between 40 - 420 Hz
- Internal program to ramp frequency
- Built-in timer with a 1 ms resolution
- Manual and/or software control
- Dimensions:
 - 200 x 442 x 327 and 200 x 300 x 200 mm.
 - 8 x 18 x 13 and 8 x 12 x 8 in.
- Weight: 22 + 13.5kg / 48 + 30lb.

See the specifications of each unit in this catalog.

*Having 3 phase in current and one voltage

PTE-IOLogic

Control Logic Simulator



APPLICATION

The use of the PTE-IOLOGIC is extremely wide, as it is capable of simulating any control situation, particularly for the following applications:

- Simulation and analysis of logic controls in protection relays.
- Simulation, analysis, and verification of the control system in substations.
- Simulation of any breaker system.
- Simulation and analysis of traffic control systems.
- Analysis of logical programs in automatic remote systems (SCADA).
- In general, to reproduce and to analyze any sequential programmed logic system.

A system with these features saves time and can prevent damage in primary equipment especially during commissioning process.

CHARACTERISTICS

- 16 Inputs in 8 groups galvanically isolated.
- 8 isolated outputs.
- Inputs and Outputs are configured with the software EURO-IOLog.
- Dimensions:
 - 150 x 340 x 300 mm / 5.4 kg.
 - 6 in x 13 in x 12 in / 12 lbs

PTE-FCF



Variable Voltage Option



APPLICATION

- Enables to regulate the fixed voltage output of 110 V AC which is common in all the PTE-Range.

CHARACTERISTICS

- Regulation range: 10 to 120 V.
- Maximum current: 0.3 A.
- Designed to be connected directly.
- Dimensions:
 - 90 x 120 x 60 mm / 0.8 kg.
 - 3.5 x 5 x 2.5 in / 2 lb.

PTE-12

RS-232 Interface / PTE BUS



APPLICATION

- Enables the control of the PTE equipment from a RS-232 serial port.
- Extraordinary flexibility as it can control up to 6 PTE units.

CHARACTERISTICS

- Power is automatically supplied by the connected equipment.
- Includes all cables and connectors required.
- Includes the PTE-COM control command manual.
- Dimensions:
 - 90 x 120 x 60 mm / 0.5 kg.
 - 3.5 x 5 x 2.5 in / 1 lb.

PTE-GPS

GPS Synchronizer



APPLICATION

- This option allows the initial synchronization of faults, previously recorded to be played back by the PTE equipment, with an accuracy of less than 1 microsecond.
- To establish the moment of injection, the EUROFAULT software can be programmed to begin the test at the required time.

CHARACTERISTICS

- Accuracy: $\leq \pm 1\mu s$.
- Time until ready for operation: typically 3 min.
- Power supply: via PTE-BUS.
- Power consumption: 2W.
- Accessories: GPS antenna, PTE cable, box.
- Dimensions:
 - 9 X 120 x 60 mm / 0.5 Kg.
 - 3.5 x 5 x 2.5 in / 1 lb.

Universal Relay Test equipment



The Mentor is the result of the wide range of experience EuroSMC has in the protection relay test field and this has led to the main philosophies incorporated in this equipment:

- The parameters and methods which new technology demands and the older systems which still exist today.
- To achieve the reliability, accuracy, and the efficiency with the best technology now available.
- The ergonomics and the adaptability of different work situations and the different types of users worldwide.

POWER

The control capacity of the Mentor has allowed us to remain true to our traditional philosophy in equipment which has sufficient power to test all types of relays, while maintaining the accuracy and quality, thanks to a hardware control, completely new on the test market today. The unique design has been made specifically to cover all functions required in today's market and with firmware and software easily upgraded for the future. The equipment is completely and automatically protected with alarms against any misuse in the most rugged working conditions.

The AIC (Adaptive Integrated Control) enables the use and powerfulness of the equipment to be within the reach of any user and the complete use of the equipment for the experienced user. The 100 VA outputs in continuous duty, reversible channels in voltage/current, auxiliary DC voltage, highly accurate built-in timer, binary inputs and outputs, electronic GPS incorporated, communications ports... and many other abundance features at your reach, ensuring efficient and reliable test results.

ACCURACY

With the success of the PTE Range equipment, EuroSMC has gone one step ahead in insuring reliability and accuracy. The technology used in the MENTOR both in construction and design has set a new precedent in equipment for Relay Testing, now being the first in technology and innovation.

FLEXIBILITY

It is now not necessary to purchase and connect the PC to the test equipment. The

MENTOR has incorporated the Standard Windows® platform into the unit.

The equipment is configured to preserve the applications and avoid the problems the normal PC has. All this with the routine test required at your disposition.

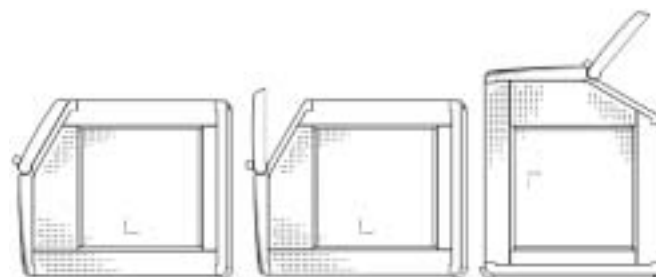
The human interface of the MENTOR enables routine testing and specialized testing. If the relay does not perform as expected during a test, you can suspend and investigate the problem and once solved return to the point where this occurred. Settings and routines can be saved and used again in another moment.

The Mentor concept enables users to widen the capabilities of the equipment without purchasing other units or add-ons. More output channels and internal software can be added at any time, without returning your equipment. Thanks to the system of auto detection, additional amplifiers can be added with the plug and play system incorporated. Internal software can be easily upgraded via Internet with the RJ-45 Ethernet Port.

COMMON CHARACTERISTICS OF THE POSSIBLE CONFIGURATIONS

- Auxiliary DC output: 48, 125 y 250 V (60 W)
- Analog measuring inputs: 0-10 V DC, 0-20 mA DC, Accuracy: $\pm 0.02\%$
- Binary inputs: 12. Up to 400 V or dry contact. Resolution: 0.1 ms.
- Binary Outputs: 8. Capacity up to 8 A or 250 V. Resolution: 0.1 ms.
- Low level outputs: 6. Range: 0 a ± 10 V.
- Frequency generator: DC from 0.1 to 2,000 Hz and up to 3,000 Hz in transient.
- Phase Angle: 0.00 a 359.99°
- Connections: RS-232, CENTRONICS, ETHERNET, USB, VGA, keyboard/mouse PS2, Digital I/O, GPS antenna (optional).
- Voltage supply: 100 - 240 V, 50/60 Hz
- Dimensions: 422 (height) x 254 (width) x 511 mm. (depth)
- Weight: 22 - 33 kg. Depending on the output channels installed.
- Working temperature: 0 - 55 °C
- Storing temperature: -40 - 70 °C
- Humidity: up to 95% non condensing.

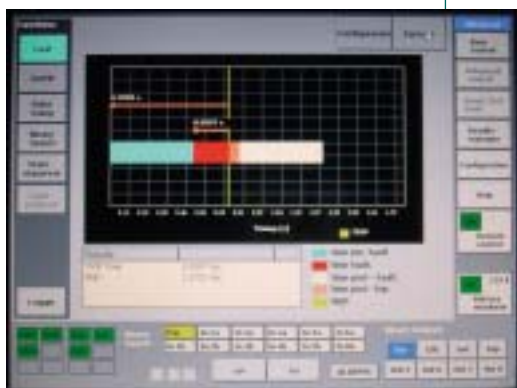




Connectivity Block



Dual Ramp Setup



Fault Execution



Basic Control Screen

CONFIGURACIONES Y APLICACIONES DEL MENTOR 12

	1 PHASE	3 PHASE	APPLICATIONS
3vi + 3i	450 V 75 A	150 V 25 A	Single and Three phase tests for all types of relays, transducers, and energy meters. Up to 600 VA of output power with Touch screen TFT with Windows® CE.
4vi + 3i	600 V 75 A	150 V 25 A	Adequate for synchronizing relays. Direct three phase test with neutral element and a current up to 5 A. Capable for tests of three phase differential relays. Testing low voltage line relays.
4vi + 4i	600 V 100 A	150 V 25 A	A fourth current supply up to 25 A for devices with neutral. Single phase test up to 100 A with 400 VA of power. Testing single phase differential relays up to 25 A.
3vi + 6i	450 V 150 A	150 V 50 A	Three phase electromechanical relays. Direct test on differential relays with triple windings.
6vi + 3i	900V 75 A	300 V 25 A	Calibration of measurement converters and energy meters. Fault tests of high impedance relays, detection of differential neutral with high voltage and sufficient current.
4vi + 6i	600 V 150 A	150 V 50 A	Single and three phase test with high current.
6vi + 6i	900 V 150 A	300 V 50 A	Testing of 2 relays simultaneously. Complete transient simulation. Three phase differential testing with quadruple windings.

OUTPUT CHANNELS	VOLTAGE OUTPUT REVERSIBLE VOLTAGE/CURRENT	CURRENT OUTPUT
AC Range:	0 - 150 V / 0 - 5 A	0 - 25 A
DC Range:	0 - 212 V / 0 - 7 A	0 - 9 A
Resolution:	0.5 mV / 0.5mA	
Output channel installed:	3, 4 ó 6	
Power:	100 V A / 100 W	
Accuracy:	±0.1%	
Distortion:	±0.1%	
Protection:	All outputs are electronically protected both thermal and overload	

SECONDARY INJECTION

CHARACTERISTICS SELECTION CHART

DEVICE IEEE	RELAY TYPE	PTE-20-FA	PTE-100-C	PTE-100-C PLUS	PTE-50-CE	PTE-100-V	PTE-300-V	PTE-50-CET	PTE-100-V PTE-50-CE	PTE-100-V PTE-100-C	PTE-300-V PTE-50-CE	PTE-300-V PTE-100-C	PTE-50-CET PTE-100-V	TRES	MENTOR
2	Time-Delay Starting Relay	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
21	Distance 1Ø			✓			✓	✓	✓	✓	✓	✓	✓	✓	✓
21	Distance (open triangle)						✓	✓	✓	✓	✓	✓	✓	✓	✓
21	Distance 3Ø						✓		✓	✓	✓	✓	✓	✓	✓
24	Volts / Hertz			✓		✓	✓		✓	✓	✓	✓	✓	✓	✓
25	Synchronizing			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
27	Undervoltage Relay AC/DC		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
32	Directional Power Relay 1Ø		✓ ☆	✓	✓ ☆	✓ ☆	✓	✓	✓	✓	✓	✓	✓	✓	✓
32	Directional Power Relay 3Ø										✗	✗	✓	✓	✓
37/76	DC Under/Over Voltage Relay	✓	✓	✓						✓		✓		✓	✓
40	Loss of Field Relay		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
46	Reverse Phase Relay			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
46N	Negative Sequence Overcurrent Relay		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
47	Reverse Phase Relay-Voltage			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
49	Thermal Relay		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
50	Instantaneous Overcurrent Relay		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
51	Overcurrent Relay AC		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
55	Power Factor Relay				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
59	Overvoltage Relay		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
60	Balance Relay-Voltage					✓	✓	✓			✓	✓	✓	✓	✓
64	Ground Detection Relay		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
67	Directional Overcurrent Relay		✗	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
67N	Ground Directional Overcurrent Relay		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
78	Phase Angle measuring or Out of Step Protective Relay			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
79	Reclosing Relays		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
81	Frequency Relay			✓		✓	✓		✓	✓	✓	✓	✓	✓	✓
82	DC Reclosing Relay	✓	✓	✓											✓
85	Carrier or Pilot Wire Relay		✗ ☆	✗ ☆	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
87	Differential Relay		✗ ☆	✗ ☆	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
91	Voltage Directional Relay		✗ ☆	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
92	Voltage and Power Directional Relay		✗ ☆	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
94	Tripping Relay	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- ✓ Complete, does not need other equipment nor accessories
- ☆ Needs additional options available
- ✗ Not all functions

CHARACTERISTICS SELECTION CHART

	PTE-100-C	PTE-100-C PLUS	PTE-50-CE	PTE-100-V	PTE-300-V	PTE-50-CET	UNO	PTE-100-V PTE-100-C	PTE-300-V PTE-50-CE	PTE-300-V PTE-100-C	PTE-50-CET PTE-100-V	TRES	MENTOR
Number of output channels	1	2	1	1	3	3	2	2	4	4	4	6	6 up to 12
Reversible outputs (voltage or current)	X	-	X	X	X	X	X	1	X	3	X	X	3 up to 6
Voltage outputs	1	2	1	1	3	3	2	2	4	4	4	6	6
Current outputs	1	1	1	1	3	3	2	2	4	4	4	6	12
Maximum voltage reached	250V	250V	150V	300V	300V	150V	300V	300V	300V	300V	300V	300V	150V
Maximum current reached	250A	250A	50A	8A	8A	50A ⁽¹⁾	50A	250A	50A	250A	50A ⁽¹⁾	50A ⁽¹⁾	25A
Possibility to synchronize to an external phase	-	-	X	X	X	X	X	Only PTE-100-V	X	Only PTE-300-V	X	X	-
Isolated outputs	X	X	X	X	X	X	X	X	X	X	X	-	X
Manual control	X	X	X	X	X	X	X	X	X	X	X	X	X
Software control	X	X	X	X	X	X	X	-	X	X	X	X	X
Output power per phase	100VA	40/1000VA	100VA	100VA	10VA	100VA ⁽²⁾	100VA	100VA	100VA	100VA	100VA ⁽²⁾	100VA ⁽²⁾	100VA
Harmonic generator	-	-	up to 7th	up to 7th	up to 7th	up to 7th	up to 7th	up to 7th	up to 7th	up to 7th	up to 7th	up to 7th	up to 350
Frequency generator	-	40-70	-	40-420Hz	40-420Hz	-	40-420Hz	40-420Hz	40-420Hz	40-420Hz	40-420Hz	40-420Hz	0,1 a 2kHz
Fault & Transient playback	-	-	x	X	X	X	X	-	X	-	X	X	X
On-board dynamic faults	-	-	x	X	X	X	X	Only PTE-100-V	X	Only PTE-300-V	X	X	X
On-board frequency ramp	-	-	-	X	X	-	X	X	-	X	X	X	X
Auxiliary AC Voltage Output	X	X	x	X	X	X	X	X	X	X	X	X	-
Auxiliary DC Voltage Output	X	X	.(2)	.(2)	.(2)	.(2)	.(2)	X	.(2)	X	.(2)	.(2)	X
Number of Inputs	1	1	2	1	1	2	3	2	3	2	2	3	12
Phase Angle Range	0-180° ⁽³⁾	0-360°	0-360°	0-360°	0-360°	0-360°	0-360°	0-360°	0-360°	0-360°	0-360°	0-360°	0-360°
Phase Angle Resolution	0,2°	0,1°	0,1°	0,1°	0,1°	0,1°	0,1°	0,1°	0,1°	0,1°	0,1°	0,1°	0,01

- X Available
- ⁽¹⁾ 150 A with 3 channels in parallel
- ⁽³⁾ With PTE-FCC option

- Not available
- ⁽²⁾ With PTE-FCG option

SOFTWARE



The software used by EuroSMC for our test equipment are designed using the concepts of flexibility, compatibility, and expandability with a varied application, depending on the hardware it controls.

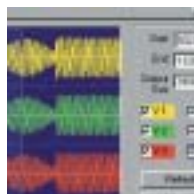
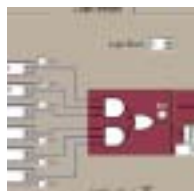
Various software applications are available for single phase equipment. The PTE-100-C software, simplifies the use of the equipment and acquires test results. The rest of the software for the PTE Range of products, incorporates a strong power control with numerous applications in Windows®:

The playback of pre-recorded relay faults in COMTRADE format, as well as fault editing and the generation of faults, by the user.

Automatic test of relays and a data base, not found in other relay software packages, to manage a group of relays in any facility. The modularity and compatibility of this software, makes the EuroTEST RTS® a complete programming tool for today and for the future.

The Mentor platform has been designed and constructed with software in mind. From the high electronic output power to the communications sub-system are designed to be continually adapted to user requirements. There are distinctive human interface levels which are implemented in the Mentor equipment; the maximum sophistication internally, with a simple and intuitive use externally, reaching the dynamic and flexible adaptation to the experience of the operator and the complexity of the test required.

Also the EuroSMC relay test equipment are supplied with the calibration software required to adjust and calibrate the equipment on a periodical bases, with the need of only Standard instrument to verify the calibration.



EUROTEST RTS

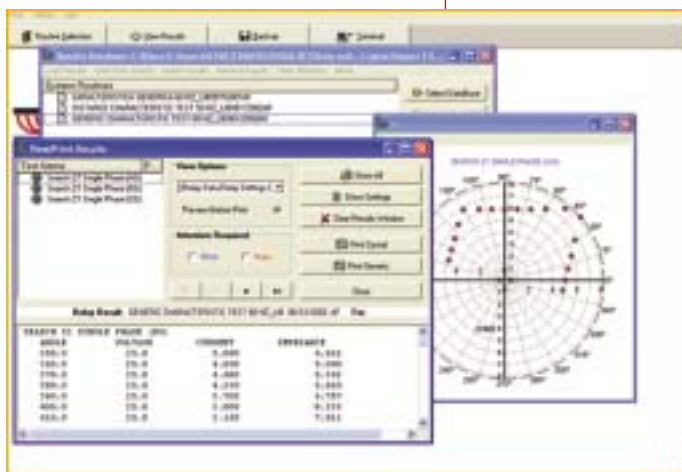
Software to test protective relays automatically

APPLICATION

- EuroTest RTS software can test any kind of protective relay automatically.
- The test reports are automatically generated and these can be edited and customized.
- The test wizard, FastTest, creates new test routines without the need of programming.
- The possibility to organize a data base with all the test routines of the protective relays, in any facility, with the particular settings and the test results of each individual relay.

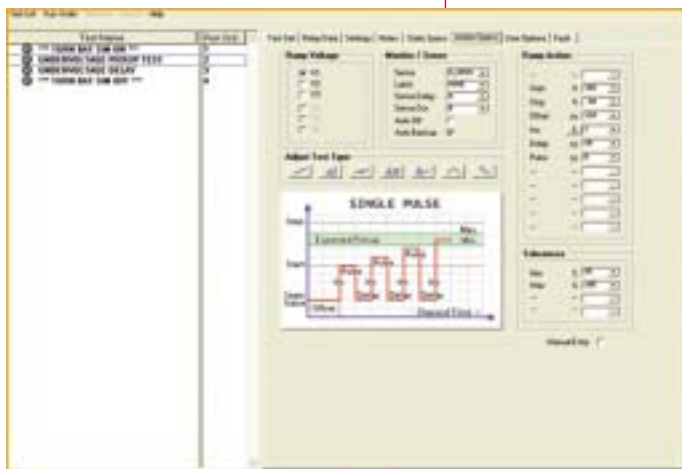
MAIN FEATURES

- Generic test routines for the following protective relay types: distance, differential, frequency, synchronism, overcurrent, thermal, instantaneous, over/undervoltage, reverse power, directional, etc... These generic routines are adapted to the particular relay models by entering the relay settings and selecting the functions to be tested.
- Test routine library for the most common relay models.
- Large and comprehensive help menus.
- Saves time in relay testing.
- Relay tests can be repeated under the same conditions.
- EuroTest RTS software is compatible with the relay test sets of many manufacturers (optional).



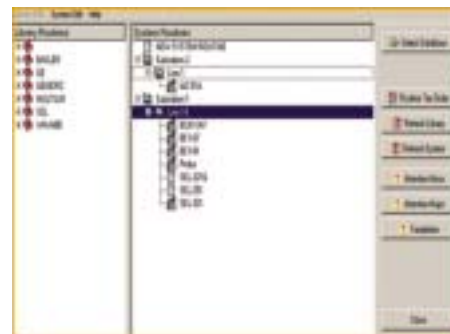
Distance relay test results

The FastTest tool enables de creation of new test routines in a intuitive manner and without the need of programming



Test routine selection

Data base of the test routines of all the relays from various substations



Transient playback software in COMTRADE format

APPLICATION

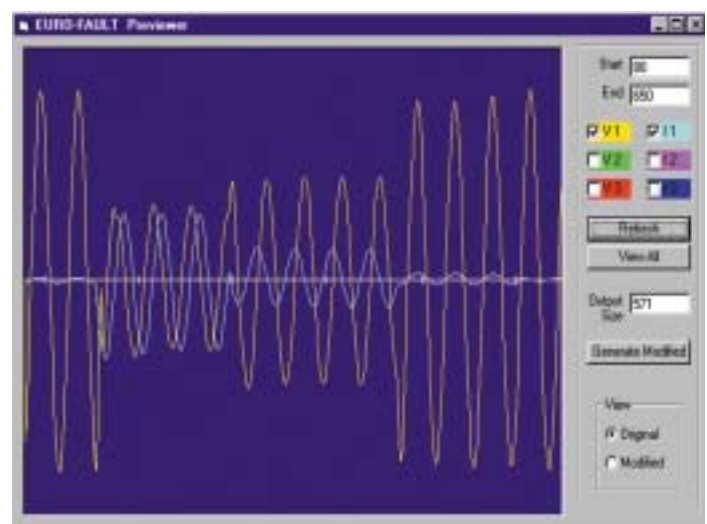
- Playback of previously registered faults and transients, or calculated by EMTP programs.
- Enables to analyze the behavior of a protection relay or system against the above mentioned.

MAIN FEATURES

- Windows based.
- Extremely easy to edit in terms of adding pre-fault cycles, adding the cycles, etc.
- Compatible with any combination of the PTE Range equipment (except PTE-100-C).

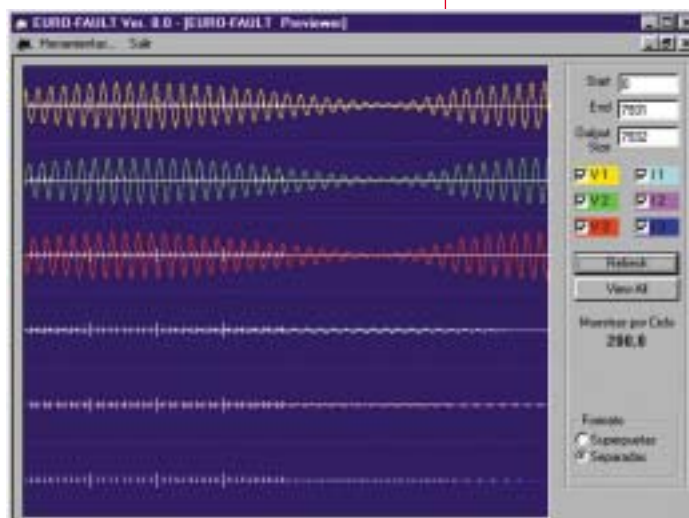


Control panel

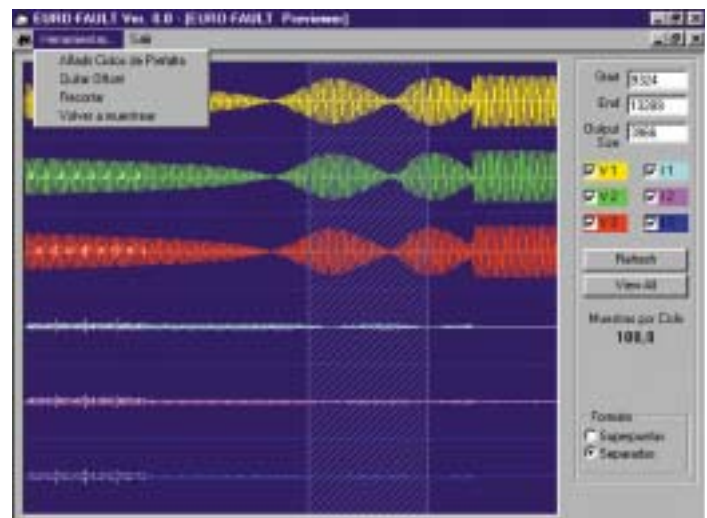


Zoom screen

Cutting a COMTRADE file and increasing the sampling rate



Preview screen



EUROVECTOR

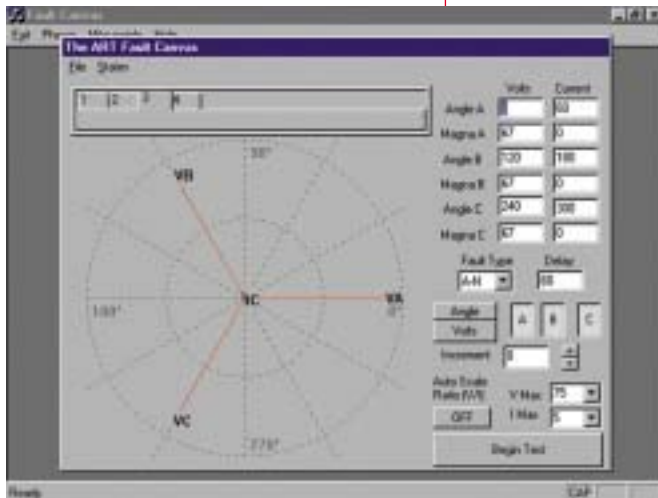
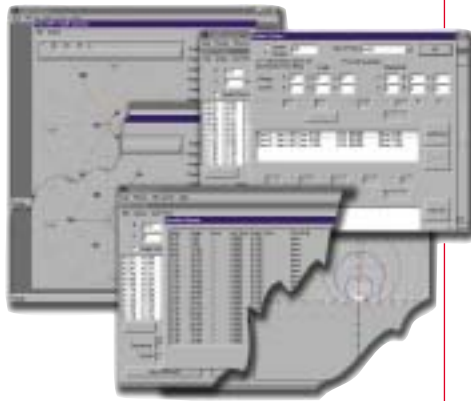
A Fault editing and generating successive faults

APPLICATIONS

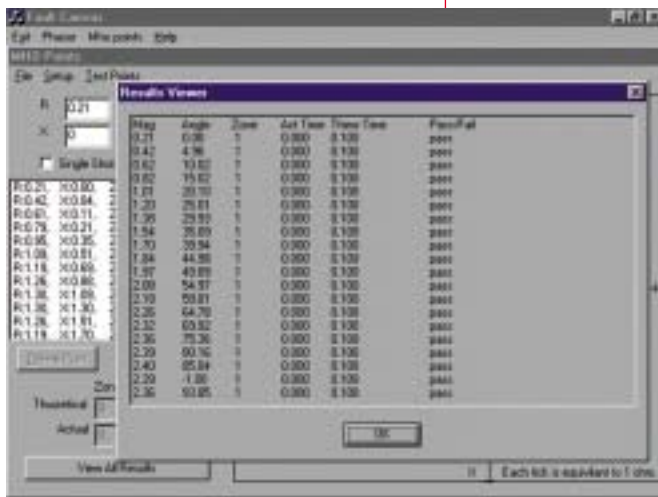
- To test the function of a protection system or relay, in situations of successive faults.
- Test distance relays in as many test points as required setting the parameters graphically over an impedance diagram.

MAIN FEATURES

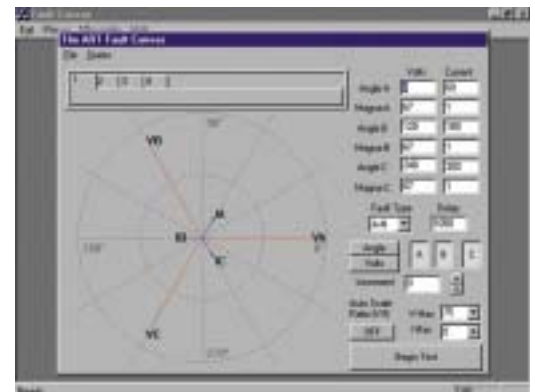
- Windows based.
- Different tests can be easily defined in vectorial or impedance plane representation, in numerical or graphic mode.
- The test routines created can be saved to a file and used when required.
- Test results and data can be stored in MS Access database.
- Drivers can be supplied to work with other types of relay test equipment now on the market (optional)



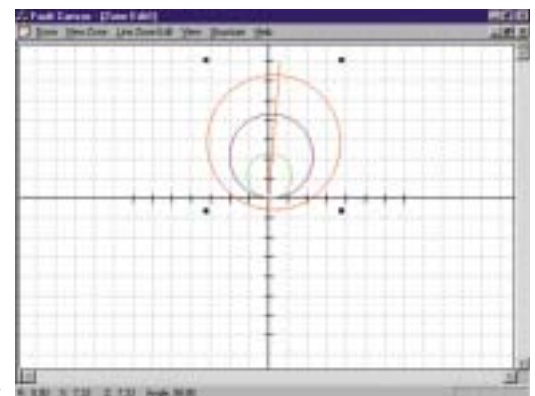
Post fault state



Results



Pre-fault state



Easily definable and editable characteristics



Numeric characteristics

PTE-CAL

Calibration software for the PTE equipment

SMC
EURO



The calibration and adjustment software enables the user to calibrate the equipment with the adequate standards required.

APPLICATIONS

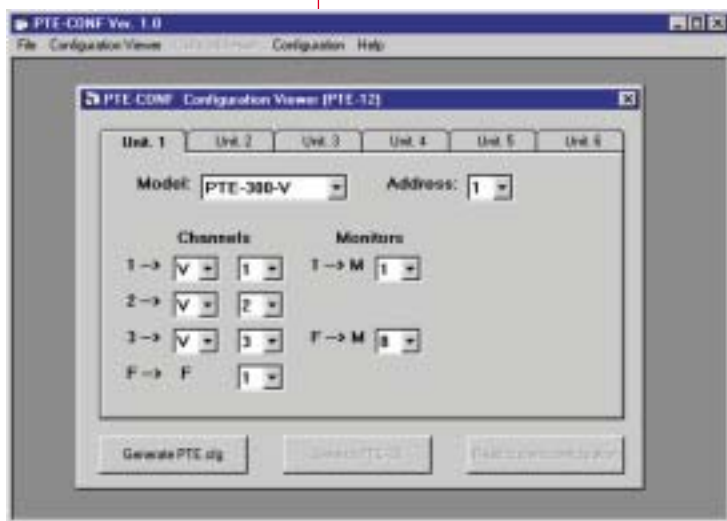
- Enables the adjustment and calibration of the PTE units without the need of any intervention inside the unit (Closed Case Calibration).

MAIN FEATURES

- Windows based.
- Reduces time in adjustment and calibration of the equipment.
- Reduces the possible errors and interior damage of the equipment.
- Enables to store different adjustment files.

PTE-CONF

Software for configuring the PTE equipment



The software program PTE-CONF was designed to configure the PTE-12 interface, enabling this to function with any test routine in the EUROTEST software.

Configuring the PTE-12, utilizes the full capacity of PTE equipment to work as current or voltage channel outputs and giving the possibility to use different configurations of the test equipment for performing complex tests and controlling them by the software.

For example, with the PTE-CONF software an automatic routine for a distance relay which requires 2 voltages and 1 current can be made with the PTE-50-CET unit.

PTE-OCT

Overcurrent relay test software used with PTE-100-C

The PTE-OCT Software is designed to perform semi-automatic overcurrent relay tests. The software is WINDOWS based, with text and graphical presentation of results, Database handling, report, etc.

The software works with Inverse Time Overcurrent Relays and Definite Time Overcurrent Relays Inverse Time Overcurrent Relays:

- Creep Current Test.
- Run Back Time Test.
- Timing Curve Test.
- Tripping Time Test.

Definite Time Overcurrent Relays:

- General Condition Test.
- Pick-Up, Drop-Out Test.
- Tripping Time Test.

All the test results are recorded and stored in MS ACCESS format.

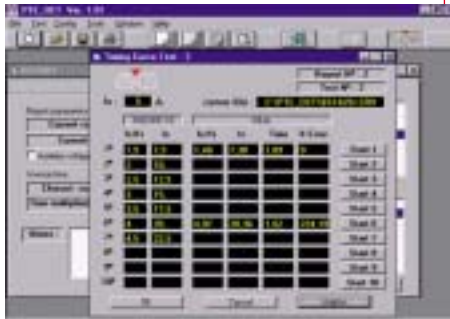
The software includes a Graphic Curve Editor that enables the user to create standard curves. These curves can be used as the comparison standard by the software, comparing results against the expected value, in the Timing Curve Tests.

APPLICATIONS

- The test is "directed" by the software, including the test current values.
- Storage of Test Results, as well as the ID data of the relay under test.
- Automatic comparison of the Test Results with the desired Standard Curve.
- Industry-standard MS Access database, allows users to create and also integrate results into planned maintenance systems.

CHARACTERISTICS

- Windows based.
- Enables the operator to create the time reference curve.
- Shows and directs the test at all times.
- Calculates the values that should be tested.
- Results in MS Excel worksheet format.



PTE-TDC

Test data capture software used with the PTE-100-C

This software is intended to acquire data from a PTE-100-C equipment, simplifying the task of acquiring an adequate data format in order to print or transfer results into a file. The file can be Microsoft Access or standard ASCII format. It is possible to store test results and retrieve to print.

The software is designed for MS Windows and is easy to use. It enables identification of results, by means of a test header where data can be introduced, such as dates, location codes, operator, device under test, etc.

The connection between PC and PTE-100-C is made by an RS-232 cable supplied with the equipment.

APPLICATIONS

- Acquires test data in order to print or transfer test results into other formats.

CHARACTERISTICS

- Windows based.
- Associates each test group result obtained with a header which identifies the relay being tested.
- The test results are obtained and stored in MS Excel worksheet format.



MEASUREMENT EQUIPMENT



In the constant search of satisfying our customer's needs and requirements, EuroSMC found that many of our customers required modern and practical measuring test equipment, especially in the maintenance and commissioning departments, incorporating these characteristics and functions required by them.

EuroSMC has been designing innovative and revolutionary products for electrical measurement tests. Our independent and traditional concepts in product and design, focuses on the needs of our customers.

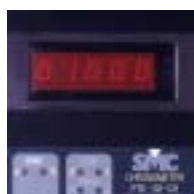
Portability. Reduced size, weight, and robust which is essential for field use.

Autonomy. Almost all this range of products has internal rechargeable batteries incorporated in the equipment. Therefore can be used without a voltage supply which is not always available in commissioning and substation work.

Integration. The use of microprocessors and other technical advances, enables the equipment to be multifunctional, avoiding errors and saving time.

Reliability and accuracy. The equipment is designed and produced with the latest technology and components, ensuring the accuracy and reliability.

The Circuit Breaker Analyzer, which incorporates a three phase contact resistance measurement, are some of the examples that EuroSMC incorporates into their designs. All the new equipment designed by us in the past years have been leaders in the market.



PME-500-TR

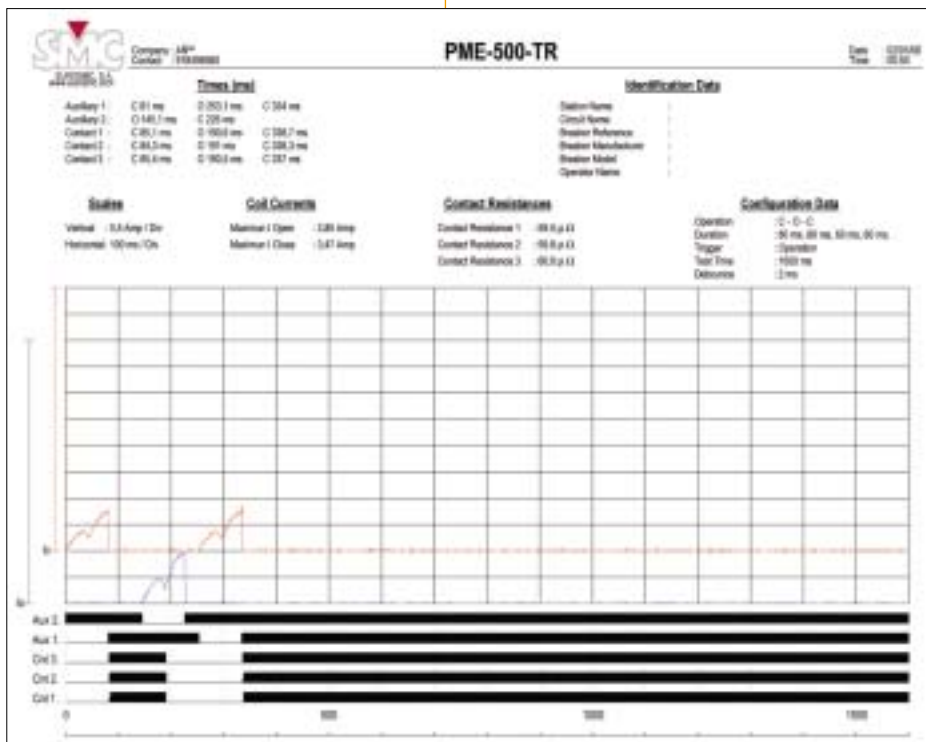
Circuit Breaker Analyzer

APPLICATIONS

- Simultaneous measurement for the 3 main contacts (open/closed) and 2 auxiliary contacts, including pre-insertion resistors.
- Evaluates the synchronism between the circuit breaker poles.
- Determines the maximum currents, opening and closing times, simultaneously in both coils.
- Evaluates the state of the substation's auxiliary batteries by graphically showing the coil consumption.
- Immediately displays and prints test results, both numerically and graphically.
- Automatically calculates the contact resistance.

MAIN FEATURES

- 3 timing inputs for the three main contacts, 0.1ms resolution.
- 2 isolated auxiliary binary inputs, with a capacity for dry contacts or voltage signals up to ± 360 V DC, 0.1ms resolution.
- Measures and records the Coil currents simultaneously (open and closed), with 1ms resolution up to 50 A DC (auto range).
- Connection to the breaker by means of a special simplified cable connector or by standard input taps.
- Built-in thermal paper printer, 110 mm.
- Autonomous power supply with internal rechargeable batteries, up to 10 hours.
- Programmable operating sequences C, O, C-O, O-C, C-O-C and O-C-O.
- Automatic measurement of the contact resistance, $0.1\mu\Omega$ resolution at 10 A.
- Immediate graphic display of the test results.
- A large Touch Screen panel (113 x 61 mm) displays graphic images and is also the front panel control.
- Allows the setup of the test data and test configuration from the touch screen panel (it converts into a complete keyboard).
- Software is supplied to download test results.
- Firmware can be upgraded via computer
- Reduced size and weight
- Dimensions:
 - 340 x 300 x 150 mm / 8 kg.
 - 14 x 12 x 16 in/ 17.6 lb.



PME-100

Digital Micro Ohmmeter up to 100A



APPLICATIONS

- Measures the contact resistance for circuit breakers, busbars, etc.
- Measurement is by 4 wires.

MAIN FEATURES

- Accuracy: $\pm 0.25\%$ of the scale ± 1 digit.
- Direct reading in ohms, milliohms or microohms depending on the scale selected.
- Voltage supplied by a rechargeable battery or conventional voltage supply.
- Portable: 11.5 Kg / 25 lb.

PME-10

Low resistance Ohmmeter



APPLICATIONS

- Measures the contact resistance for circuit breakers, busbars, etc.
- Measurement is by 4 wires.

MAIN FEATURES

- Accuracy: $\pm 0.25\%$ of the scale ± 1 digit.
- Direct reading in ohms and milliohms depending on the scale selected.
- Voltage supplied by a rechargeable battery or conventional voltage supply.
- Portable: 6.5 Kg / 14 lb.

PME-20-PH

Phase Angle Meter



APPLICATIONS

- Measures the phase angle between two Voltages, two Currents, or Voltage-Current.
- Measures Frequency.
- Measures Power Factor.
- Synchroscope.
- In general, for Maintenance in Transmission and Distribution Systems, as well as industrial or commercial sites.

MAIN FEATURES

- Phase angle accuracy: $\pm 0.1^\circ$
- Voltage input: 0.2 to 500 V RMS direct.
- Current input: 0.1 to 25 A RMS direct.
- Selected Measurement Modes:
 - Phase Angle displayed as $\pm 180^\circ$
 - Phase Angle displayed as 0 - 360°
 - Frequency: 40 to 500 Hz
 - Power Factor: 0 to ± 1 and indicates phase angle quadrant.
- Use as a Synchroscope.
- RS-232 port for computer connection.
- Battery Powered.
- Handheld.
- Dimensions:
 - 226 x 115 x 45 mm / 650 gr.
 - 9 x 4.5 x 1.8 in / 1.45 lb.

PTE-30-CH

Handhelp timer



APPLICATIONS

- Measures the trip time in protection relays and in general the lapse time between two events.
- Measures the time duration of electrical signals.
- Measures frequency.

MAIN FEATURES

- Measurement range: 3 modes
 - S Mode: 00.000-99999s
 - Cycle Mode: 0000.0-9999.9 Cycles
 - Frequency Mode: 20.000-4000.0 Hz
- Functions:
 - Start/Stop: time between two events.
 - Pulse: measures the time of a signal pulse.
 - Frequency: Reads the signal frequency at the input taps.
- Accuracy: $\pm 0.01\%$ ± 1 ms.
- Dimensions:
 - 190 x 100 x 40 mm / 1 kg.
 - 8 x 4 x 2 in / 2.2 lb.

PRIMARY INJECTION



The maintenance and substation departments traditionally have found limitations when selecting primary injection test equipment. Either the equipment is a home made brand with low reliability, poor accuracy at a low price, or a small selection of equipment with the accuracy and quality required, but at high price.

EuroSMC primary injection sets are the ideal solution, as the range of products are situated between the two options previously mentioned. The primary injection equipment manufactured by EuroSMC is a large range of products that meet the power, current, and accuracy required for this type of testing.

The LET range of primary injection test equipment are perfectly adequate to test; current transformers, bus bars, circuit breakers, switchboards, complete system such as transformers-relays, and interconnections with the adequate technology and accuracy at an economic price. The large product range enables the selection of appropriate equipment for the application required.



LET-400

Primary Injection Test Set up to 2,500 A



APPLICATIONS

- Primary injection tests.
- Test of measurement and protection transformers.
- In general, primary injection tests including the complete loop, such as current transformer, cables, protective relays, and circuit breakers.

MAIN FEATURES

- Permanent current up to 400 A, 1 kVA in 4 ranges.
- Maximum current output up to 2.5 kA.
- Thermal and shortcircuit protection.

LET-400-RD

Primary Injection Test Set up to 2,500 A



APPLICATIONS

- Test of the I/T curve in primary current relays test.
- Primary injection tests.
- Test of measurement and protection transformers.
- In general, primary injection tests including the complete loop, such as current transformer, cables, protective relays, and circuit breakers.

MAIN FEATURES

- Permanent current up to 400 A, 1 kVA in 4 ranges.
- Maximum current output up to 2.5 kA.
- Built-in digital ammeter 0.5% accuracy.
- Built-in digital timer resolution 1 ms.
- Thermal and shortcircuit protection.

LET-400-RDC

Primary Injection Test Set up to 2,500 A



APPLICATIONS

- Test of the I/T curve in primary current relays test.
- Primary injection tests.
- Test of measurement and protection transformers.
- In general, primary injection tests including the complete loop, such as current transformer, cables, protective relays, and circuit breakers.

MAIN FEATURES

- Permanent current up to 400 A, 1 kVA in 4 ranges.
- Maximum current output up to 2.5 kA.
- Built-in digital ammeter 0.5% accuracy.
- Built-in digital timer resolution 1 ms.
- Thermal and shortcircuit protection.
- Variable AC and DC voltage up to 220 V.
- Variable auxiliary DC power supply up to 220 V.

LET-1000-RD

Primary injection test set up to 6,500 A



APPLICATIONS

- Test of the I/T curve in primary current relay test.
- In general, primary injection tests including the complete loop, such as current transformer, cables, protective relays, and circuit breakers.

MAIN FEATURES

- Permanent current up to 1,000 A, 2 kVA in 3 ranges.
- Maximum current output up to 6.5 kA.
- Built-in digital ammeter, 0.5% accuracy.
- Built-in timer, resolution 1 ms.
- Thermal and shortcircuit protection.

LET-2000-RD

Primary injection test set up to 10,800 A



APPLICATIONS

- Direct and motor overload relay test.
- In general, primary tests including the complete loop, such as, current transformer, cables, protective relay and circuit breaker.

MAIN FEATURES

- Permanent current up to 2000 A, 4 kVA in 4 ranges.
- Maximum current output up to 10,800 A.
- Made up of two units.
- Built-in digital ammeter 0.5% accuracy.
- Built-in digital timer resolution 1 ms.
- Thermal and shortcircuit protection.

LET-2000-RDM

Primary injection test set up to 10,800 A



APPLICATIONS

- Direct and motor overload relay test.
- In general, primary tests including the complete loop, such as, current transformer, cables, protective relay and circuit breaker.

MAIN FEATURES

- Permanent current up to 2000 A, 4 kVA in 4 ranges.
- Maximum current output up to 10,800 A.
- Made up of 2 units, control and power unit.
- Built-in digital ammeter 0.5% accuracy.
- Built-in digital timer resolution 1 ms.
- Thermal and shortcircuit protection.
- Motorized Variac.

LET-2010-RD

Primary injection test set up to 13,800 A



APPLICATIONS

- Direct and motor overload relay test.
- In general, primary tests including the complete loop, such as current transformer, cables, protective relays and circuit breakers.

MAIN FEATURES

- Permanent current up to 2000 A 6 kVA in 3 ranges.
- Maximum current output up to 13,000 A.
- Made up of two units.
- Built-in digital ammeter 0.5% accuracy.
- Built-in digital timer resolution 1 ms.
- Thermal and shortcircuit protection.

LET-4000-RD

Primary injection test set up to 21,600 A



APPLICATIONS

- Direct and motor overload relay test.
- In general, primary tests including the complete loop, such as, current transformer, cables, protective relay and circuit breaker.

MAIN FEATURES

- Permanent current up to 4000 A, 8 kVA in 4 ranges.
- Made up of two units.
- Built-in digital ammeter 0.5% accuracy.
- Built-in digital timer resolution 1 ms.
- Thermal and shortcircuit protection

LET-4000-RDM

Primary injection test set up to 21,600 A



APPLICATIONS

- Direct and motor overload relay test.
- In general, primary tests including the complete loop, such as, current transformer, cables, protective relay and circuit breaker.

MAIN FEATURES

- Permanent current up to 4000 A, 8 kVA in 4 ranges.
- Made up of 2 units, control and power unit.
- Built-in digital ammeter 0.5% accuracy.
- Built-in digital timer resolution 1 ms.
- Thermal and shortcircuit protection.
- Motorized Variac.

DC-750-T

Three Phase Shifter



APPLICATIONS

- To shift the phase angle in any phantom load application.

MAIN FEATURES

- Electromechanical based unit with a digital meter.
- 3 measurement functions:
 - Phase angle.
 - Power factor.
 - Frequency measurement.
- Resolution: $\pm 0.01^\circ$.
- Accuracy: $\pm 0.5^\circ$.

PRIMARY INJECTION

APPLICATIONS

The Primary Injection Test units offer multiple applications, they are:

- Primary injection tests including the complete loop, such as current transformer cables, protective relays, and circuit breakers.
- Test of measurement and protection transformers.
- Detection of the heating points of substation busbars.
- Testing of Low Voltage Molded Case Circuit breakers.
- Testing extra fast relays in DC current with the model LET-4000-R.

MODELS AND CHARACTERISTICS

MODEL	POWER	RANGES	MAXIMUM CURRENT						TIMER	AMMETER	MOTORIZED REGULATION	AUXILIARY DC SUPPLY
			PERMANENT	60m	15m	3m	1m	1s				
LET-400	1 kVA	10 A, 50 A, 200 A, 400 A	400 A	600 A	800 A	1,1 kA	1,4 kA	2,5 kA	-	-	-	-
LET-400-RD	1 kVA	10 A, 50 A, 200 A, 400 A	400 A	600 A	800 A	1,1 kA	1,4 kA	2,5 kA	X	X	-	-
LET-400-RDC	1 kVA	10 A, 50 A, 200 A, 400 A	400 A	600 A	800 A	1,1 kA	1,4 kA	2,5 kA	X	X	-	X
LET-1000-RD	2 kVA	250 A, 500 A, 1000 A	1 kA	1,5 kA	2,25 kA	2,25 kA	2,75 kA	6,25 kA	X	X	-	-
LET-2000-RD	4 kVA	250 A, 500 A, 1000 A, 2000 A	2 kA	2,4 kA	3,6 kA	4,8 kA	6 kA	10,8 kA	X	X	-	-
LET-2000-RDM	4 kVA	250 A, 500 A, 1000 A, 2000 A	2 kA	2,4 kA	3,6 kA	4,8 kA	6 kA	10,8 kA	X	X	X	-
LET-2010-RD	6 kVA	500 A, 1000 A, 2000 A	2 kA	2,5 kA	4 kA	5,5 kA	7 kA	13 kA	X	X	-	-
LET-4000-RD	8 kVA	500 A, 1000 A, 2000 A, 4000 A	4 kA	4,8 kA	7,2 kA	9,6 kA	12 kA	21,6 kA	X	X	-	-
LET-4000-RDM	8 kVA	500 A, 1000 A, 2000 A, 4000 A	4 kA	4,8 kA	7,2 kA	9,6 kA	12 kA	21,6 kA	X	X	X	-
LET-4000-R	8 kW	4000 A	4 kA DC			5 kA DC			X	X	-	-

X Available
- No available

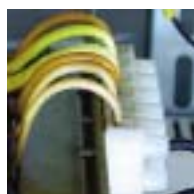
DC INJECTION EQUIPMENT



EuroSMC has designed a range of products when DC voltage or current injection applications are required.

This range includes portable battery simulators, which can be used as an accessory when testing relays and other applications which require DC injection.

Responding to specific requirements, EuroSMC offers high power DC current injection equipment designed mainly for the railway industry.



PTE-20-FA



DC voltage / current power supply

APPLICATIONS

- A highly accurate and stable DC power supply.
- Battery simulator for substations.
- Testing of seal-in units in protection relays.
- Testing of DC voltage or current relays.

MAIN FEATURES

- Voltage or current output up to 300 V or 6A respectively.
- Digital measurement reading.
- Four outputs ranges.

- Power: 150 W.
- All outputs are fully isolated.
- Completely programmable.
- Dynamic test capability.
- External timer control output.
- RS-232 serial port connector.
- Dimensions:
 - 200 x 300 x 200 mm / 12 kg.
 - 8 x 12 x 8 in / 26 lb.

PTE-FCG



Battery simulator

APPLICATIONS

- Provides an auxiliary DC voltage supply to the relay under test.

MAIN FEATURES

- Voltage output: 48/125/250 V DC
- Power: 60 W in each output.
- Designed to be mounted in the top lid of the PTE Range of equipment or can be used as an independent unit.
- Dimensions:
 - 110 x 180 x 60 mm / 2 kg.
 - 4 x 7 x 2 in / 4 lb.

LET-4000-R



High DC current injection set

APPLICATIONS

- For testing extra fast relays in DC current, mainly used in the railway industry.
- In general the use of any high DC current applications.

MAIN FEATURES

- DC Current output to 5000 A, 8000 W.
- Built in digital ammeter, 0.5% accuracy.
- Built in digital timer resolution 1 ms.
- Thermal and shortcircuit protection.

STEP AND TOUCH MEASUREMENTS



The evolution of equipment for the industrial sector and electrical utilities, has led EuroSMC to develop equipment to perform grounding circuit measurements which is known as step and touch. This range of equipment has been achieved with the collaboration of the main Spanish electrical utilities.

This range of products is designed strictly to the IEC 11-8-176 (MIERAT-13) Standards.



LET-60-VPC

Instrument for grounding circuit measurements



APPLICATIONS

- This equipment is designed to test grounding circuit measurements, in what is called step and touch voltage measurement, according to IEC standards used in some countries.
- This equipment is designed for small substations and transformer centers.

MAIN FEATURES

- Accessories for measurements incorporated.
- Inversion of current output.
- Regulation: 0-60 A / 6 kVA.
- Current measurement: $\pm 0.5\%$.
- Voltage measurement: $\pm 1\%$.

LET-500-VPC

Instrument for grounding circuit measurements



APPLICATIONS

- This equipment is designed to test grounding circuit measurements, in what is called step and touch voltage measurement, according to IEC standards used in some countries.
- This equipment is designed for substations.

MAIN FEATURES

- Accessories for measurements incorporated.
- Inversion of current output.
- Regulation: 0-50 A / 50 kVA.
- Current measurement: $\pm 0.5\%$.
- Voltage measurement: $\pm 1\%$.

MCB TEST EQUIPMENT

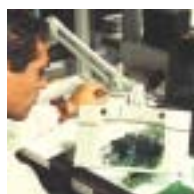


The testing of MCB's enables the detection of the deviations in the characteristics and the quality control of these devices for the companies which manufacture or sell them. Random sample testing is required for MCB manufactures and random testing is normally carried out by utilities when purchasing large quantities. Testing those already installed in Industry is also required.

A complete analysis is fundamental in determining, both independently and simultaneously, the characteristics of these devices with an equipment which reduces testing time and has a stabilized current injection source, required by international standards.

EuroSMC has found that many MCB tests are made with homemade testing equipment, with unstable current sources, connected in series, giving unreliable test results and a limited capacity in the tests which can be made.

With this situation and the experience of EuroSMC in AC current equipment, along with the demands of the market in MCB testing, the design of this range of products, required by users in this type of devices, is a product which is flexible to test various MCB's, with different nominal values and different tests at the same time. The stabilized current generator along with software control gives reliable results. The system not only is capable of meeting international standards, but also to those standards required in each country.



GAMA EMU

AC Current Power Supply



EMU-25 EMU-100 EMU-300

APPLICATIONS

- Testing of small circuit breakers.
- Calibration of shunts and measurement instruments.
- Testing of thermal relays which require a long duration.
- Overheating test.

MAIN FEATURES

- Regulation:
 - EMU-25: 0 – 25 A.
 - EMU-100: 0 – 100 A.
 - EMU-300: 0 – 300 A.
- Nominal power: 300 VA.
- Can be connected in parallel.
- Input for external phase and/or frequency reference.
- Computer controlled by RS-485 interface.
- Overload, overheating alarm leds.
- Rack mounting 19 in (482 mm), height 4 U.
- Accuracy: $\pm 1\%$.
- Distortion: < 1 .

SMC-12

Automatic Test System for Miniature Circuit Breakers - MCB's



APPLICATIONS

- Designed to test thermal and magnetic (Instantaneous) response of miniature circuit breakers (MCB's).
- Meets the IEC requirements for testing MCB's.
- Programmable testing unit, RS-485, computer controlled.
- Records, stores, and prints all test results.

MAIN FEATURES

- Pre-selected current up to 100 A in each test position.
- Can be connected in parallel to attain higher currents.
- Low current output distortion ($< 1\%$)
- Time measurement: up to 9999s, ± 1 s.