

PTE-50-CE

*Single phase relay test set
Current / Voltage*



SMC
EURO

PTE-50-CE



MAIN FEATURES

- Variable current to 50 A or voltage to 150 V.
- Variable phase angle between 0 - 359.9°.
- Harmonic selection to the 7th harmonic.
- Power: 100 VA continuous duty.
- Reversible output current/voltage.
- Fully isolated outputs.
- Capability to perform dynamic tests.
- Completely programmable.
- Built-in timer with a 1 ms resolution.
- Dimensions: 200 x 300 x 200 mm / 13.5 Kg.
8 x 12 x 8 in. / 30 lb.

APPLICATIONS

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

DESCRIPCION

The PTE-50-CE equipment is a universal, portable, test system with an output to test single phase protective relays. The output channel is reversible and can be either Current or Voltage.

The unit is extremely compact and rugged. The design incorporates the latest in modern digital microprocessor technology to achieve unbeatable output characteristics in terms of power, accuracy, low distortion, and dynamic capability. This technology allows users to test many different specific functions required in relay testing, without the need of additional accessories.

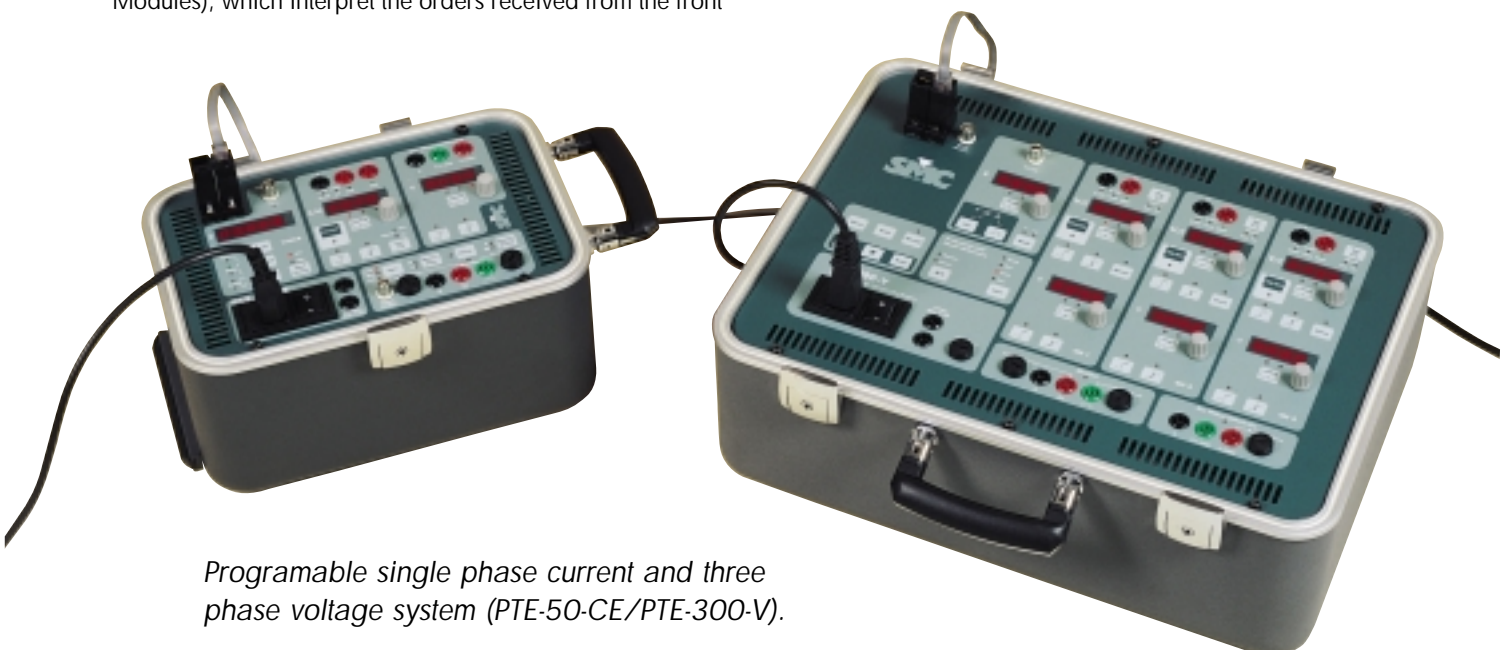
All output signals are digitally generated, amplified, and internally controlled by the IGM's (Intelligent Generator Modules), which interpret the orders received from the front

panel to produce a highly accurate, stable, and low distorted output, independent of the voltage supply.

The equipment also allows optional connection to a computer for either automatic testing of relays or control of the equipment using Windows compatible software.

Even the adjustment and calibration of the equipment is made by software, supplied with the units, which permits calibration and/or adjustments in the outputs, without any intervention in the hardware. (Closed Case Calibration)

In summary, the PTE-50-CE is an equipment which offers all the characteristics and functions needed for protective relay testing, in a manual or automatic mode, and in laboratory and/or for on site testing.



Programmable single phase current and three phase voltage system (PTE-50-CE/PTE-300-V).

FEATURES

The PTE-50-CE was designed as a unit capable to test relay applications, which require a variable current, variable phase angle, harmonics or variable voltage. This is generally the case in relays installed in Distribution or in medium voltage installations.

In the last years there has been a growing number of digital overcurrent relays, which contain a wide variety of functions. This makes it necessary to have a precise test system with dynamic capabilities in the output to adequately test these new relays and also to test in a reduced time period.

The equipment can also work with other single or three phase voltage units such as the PTE-100-V or the PTE-300-V via the BUS-PTE or any other test equipment made by another manufacture via the external reference input.

In the following sections are the details, which makes the PTE-50-CE, your practical choice from all the other test equipment with this application, which exist in the market.

USER FLEXIBILITY

Any type of test equipment should be flexible in a way that it should perfectly cover and adapt from one relay test to another. Among the many special characteristics of the PTE-50-CE the following covers the flexibility of the equipment.

- Due to the Reversible channels the unit can be use as a voltage generator for maximum and/or minimum relays.
- Can be combined to operate with any other complimentary equipment, PTE range equipment or even to any other relay test equipment from any other manufacture.

MANUAL CONTROL

The need for a manual control mode, even when testing the most sophisticated relay, lies at the core of efficient testing. In effect, often commissioning work, the larger parts of the tests are not systematic, but depend on the installation and the functions assigned to the relay under test. This implies that the manual control must be intuitive, easy to use, understandable by any operator, without the need of special training and without the need of any external elements from the system. This and other functions are included in the PTE-50-CE.

- The manual controls are clearly arranged for the user. There is a control step-knob beside the display of each parameter, whether it is output level or phase angle, which sets the display value in real time.
- Programming pre-fault and fault conditions, by the corresponding front panel controls, by individual parameter change or by changing all available.



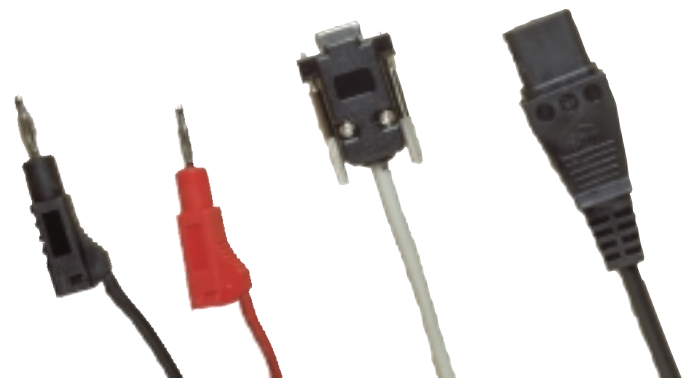
- Built-in timer is incorporated in the equipment which enables all combinations of start and stop signals.
- Selection up to the 7th harmonic of the referenced frequency.
- Total system status display enables the user to view outputs status, alarms, monitor signals, phase angle, etc. in real time.

INTERCONEXION CAPABILITY

By simply connecting a cable, via the PTE-BUS, the PTE-50-CE can be interconnected to any other equipment in the PTE range, including another PTE-50-CE. This capability widens the application scope of the PTE units, in that to the test system and be up dated and amplified by simply adding units via the BUS interconnection. In this way, three PTE-50-CE can be interconnected to form a three phase current or three phase voltage outputs with three single phase units.

Furthermore incorporated in the PTE-50-CE is a frequency and phase external reference will allows interconnection with other test equipment including relay test equipment from other manufacturers.

When connecting the PTE-50-CE to our PTE-100-V a complete single phase system is obtained, which we call UNO. When the equipment is connected to our PTE-300-V it forms a system with 3 voltages and 1 current, which allows testing of relays which require 3 voltages and the corresponding phase angle to function correctly.



PTE-50-CE

1 RS-232 COM PORT

User to control and communicate with external hardware to perform the following:

- Connected to an computer
 - Calibration and default values
 - Automatic testing and fault simulation.
- Connection to a printer to directly print test results.

2 PTE-BUS

Allows the interconnection with any other unit in the PTE RANGE, allowing an easy access for references, controls, etc.

3 POWER OUTPUTS

The unit has an output channel which may be used in Current or Voltage mode up to 50 A in 4 ranges or up to 150 V in 2 ranges.

All the outputs have a Dynamic Capability, which means that any combination of Dynamic steps to 2nd values, can be selected in amplitudes and phase angles.

4 EXTERNAL REFERENCE INPUT

The equipment can be synchronized, in terms of frequency and phase, with any external signal from 0.1 to 25A or in voltage from 5 to 300V.

This feature enables the equipment to work with any other test equipment.

5 BUILT-IN TIMER

The built-in timer can measure the time delay of the Relays under test with a 1ms resolution. It is a digital timer incorporated in the PTE-50-CE and contains all the required inputs and outputs to start and stop the timer whether by the signal monitors or via the BUS-PTE.

6 OUTPUTS PROTECTION

The outputs and the unit are electronically protected against overload, short-circuit and over temperature. The appropriate alarm is indicated on the front panel, as well as the channel where it occurs. The outputs are fuse protected.

7 MAINS VOLTAGE SUPPLY

The voltage is supplied to the equipment by a standard SCHUKO male plug with ground. Contain in this is a main filter to eliminate possible perturbations from entering the equipment. Standard 5 x 20 mm. fuses protects the input circuits.

8 AUXILIARY VOLTAGE OUTPUT

The auxiliary voltage output has a nominal voltage of 110V ac with a maximum current of 0.3 A. This output is fuse protected.



9 SELECTABLE REFERENCES

The power outputs can be synchronized to three different references in both frequency and phase.

- The main supply phase (Line).
- The BUS-PTE, when working with other PTE equipment (Bus).
- External Phase Reference (Ext).

10 MASTER/SLAVE CONTROL

Enables the controls of two or more units, such as outputs ON/OFF and change to a 2nd value in the different units by one control.



11 INTERNAL HARMONICS GENERATOR

In the unit PTE-50-CE, it is possible to select any Harmonic of the fundamental or reference Frequency. The 1st, 2nd, 3rd, 4th, 5th, 6th and 7th harmonic can be selected.

12 EVENT OUTPUT

Normally used to start an external timer, this output produces a voltage free, closed contact type pulse with a 20ms duration each time the ON/OFF key or any of the step to 2nd value keys are pressed on the front panel.

13 SIGNAL MONITOR

The signal monitor informs the state of the relay under test. These inputs can work with Dry Contacts (voltage free) or with Voltage Signals from 5 to 250 V ac or dc. There are two signal monitors.

COMPUTER CONTROL

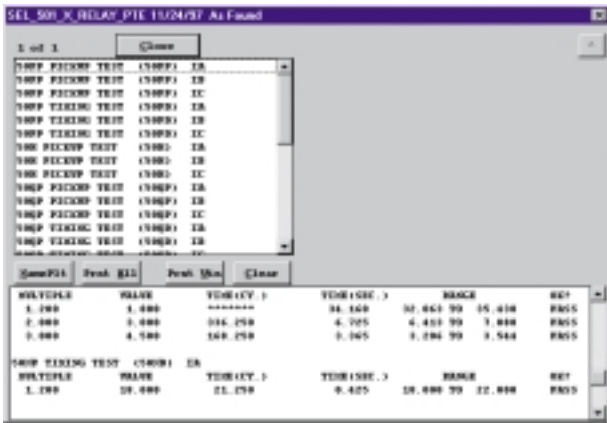
The PTE-50-CE can be completely controlled by an external computer, along with its corresponding software programs with various levels and objectives.

The PTE-50-CE uses the PTE-12 adapter, which connects to the RS 232 serial port of the computer to the BUS-PTE port on the unit.

The corresponding software of the PTE-50-CE is divided in various packages and optional programs which gives a variety of application use. These are:

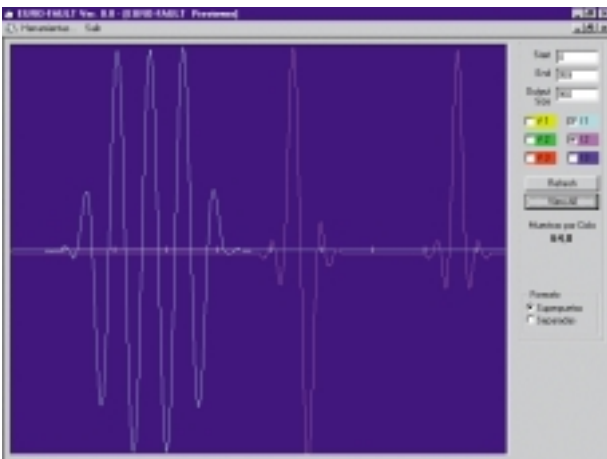
EUROTEST ERTST-11

This software enables automatic and systematic tests routines, with standard routine tests for each type of relays. There is also a library of routine tests supplied with the software. These can easily be edited to adapt to the application desired or the user can create new routines.



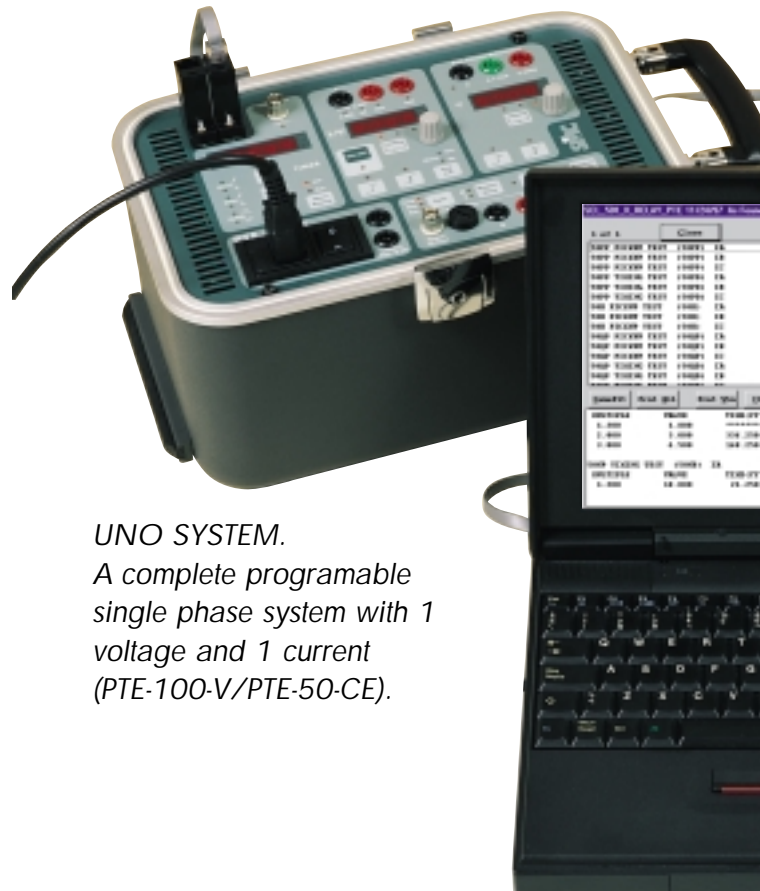
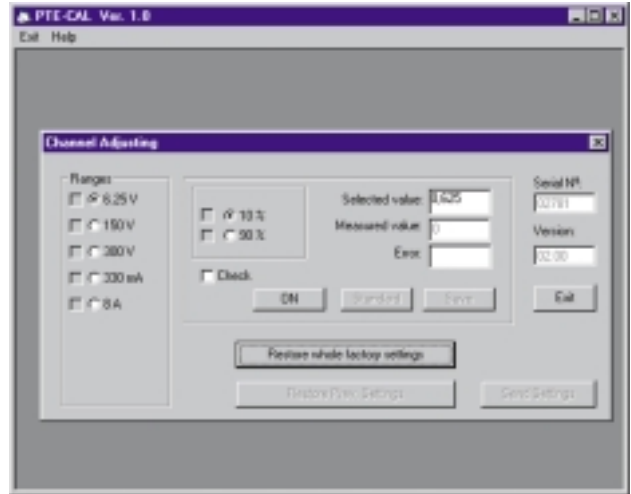
EUROFAULT

Enables the playback of any previously registered or calculated fault in COMTRADE format. The bandwidth is 0.5 to 5000 Hz.



PTE-CAL

Enables the adjustment and calibration of the unit, without the need of any intervention inside the equipment. (Closed Case Calibration)



UNO SYSTEM.
A complete programmable single phase system with 1 voltage and 1 current (PTE-100-V/PTE-50-CE).

STANDARD ACCESORIES

- Instruction Manual.
- 1 Voltage supply cable with earth, 1.5 m length.
- 4 Connection Adapters, 4 mm / Flat Terminal.
- 4 Crocodile clips, input 4 mm.
- 6 connection Cables, 2 meters length and 1.5 mm² section.
- 2 connection cables, 1.5 meters length and 6 mm² section.
- 1 RS-232 Cable.
- 1 BNC cable with Banana terminals, 4 mm.
- 1 Interconnection Cable BUS-PTE.
- 1 complete set of fuses.
- 1 Nylon protection bag.



OPTIONAL ACCESSORIES

BATTERY SIMULATOR (PTE-FCG)

An auxiliary DC voltage supply, which is needed for the majority of relays, the PTE-FCG has fixed outputs of 48, 125 or 250 V dc with 60 W in each output. This can be incorporated in the top lid of the PTE equipment.



INTERFACE RS-232/BUS-PTE (PTE-12)

Acts as the interface between the RS-232 serial port of the computer and the BUS-PTE. Includes all the adapters and cables required, along with the control command manual, PTE COM.



VARIABLE VOLTAGE (PTE-FCF)

Connected to the auxiliary voltage output, enables to regulate the fixed voltage output of 110 V between 10 and 120 V with a maximum current of 0.3 A.



TECHNICAL SPECIFICATION

POWER OUTPUT

MODE	RANGES		Permanent Current	Permanent Voltage	Accuracy	Maximum Distortion	Permanent Power
	LEVEL	RESOLUTION					
CURRENT	0 - 0.330A	0.001 - 0.01 - 0.1A	-	150V	± 0.5%	1%	100VA
	0 - 8.000A	0.001 - 0.01 - 0.1A	-	12.5V			
	0 - 25.00A	0.01 - 0.1 - 1A	-	4V			
	0 - 50.00A	0.01 - 0.1 - 1A	-	2V			
VOLTAGE	0 - 150V	0.1 - 1 - 10V	0.33A	-	±0.5%	1%	100VA
	0 - 6.25V	0.01 - 0.1 - 1V	8A	-			
PHASE ANGLE	0 - 359.9°	0.1 - 1 - 10°	-	-	± 0.5°	-	-

TRANSIENT BANDWIDTH: 0.5 - 5000 Hz

BUILT-IN TIMER

MEASURING RANGES:	Time:	0.001 to 99999 s. (autorange).
	Cycles:	000.1 to 9999.9 Cycles (referenced frequency).
ACCURACY:	±0.003% of the reading ±1 dig.	
TIMER START:	Internal Events:	<ul style="list-style-type: none"> • By activation/deactivation of the power output. • By activation/deactivation of the change to 2nd value key.
	External Events:	<ul style="list-style-type: none"> • By a positive or negative event in the BUS-PTE. • By activation/deactivation of the external signal input.
TIMER STOP:	<ul style="list-style-type: none"> • Selectable between activation or deactivation of the Signal Monitor. • By a positive or negative event in the BUS-PTE. 	

EXTERNAL REFERENCE INPUT

MODE	SIGNAL RANGE	FREQUENCY RANGE	INPUT IMPEDANCE
VOLTAGE	5 - 300 V	40 - 70 Hz	47 KΩ
CURRENT	0.1 - 25 A	40 - 70 Hz	25 mΩ

INTERNAL HARMONICS GENERATOR

HARMONICS AVAILABLE:	1st, 2nd, 3rd, 4th, 5th, 6th and 7th of the reference frequency up to 420 Hz.
ACCURACY:	±0.003 Hz.
SELECTION:	The different harmonics can be easily selected and are completely independent.

DIGITAL CONTROL OUTPUT

Maximum AC Voltage:	20 V
Maximum DC Voltage:	± 28 V
Maximum AC/DC Current:	0.5 A
AC Power:	10 VA
DC Power:	14 W

SIGNAL MONITOR

(there are two signal monitors, M1 y M2)

Dry Contact Input (Monitors M1 and M2)
<ul style="list-style-type: none"> • Open circuit voltage: 10.2 V. D.C. • Short-circuit current: 25 mA • Fuse protected.
Voltage input (Monitors M2)
<ul style="list-style-type: none"> • Level Limits: From 5 to 250 V A.C./D.C. • Input Impedance: 19 KΩ • Fuse protected.

GENERAL

Auxiliary Voltage Output:	NomV: 115 Vac/MaxI: 0.3 Aac/Fuse protected
Temperature Range:	Operation: 0 - 50° C /Storing: -20° - 70° C
Voltage supply:	230 V ± 10% (Standard version) 50-60 Hz 115 V ± 10% (upon request) 60 Hz.
Dimensions:	Height: 200 mm ⁸ Width: 300 mm ¹² Depth: 200 mm ⁸
Weight:	13,5 Kg. - 30 lb.

DISTRIBUTED BY:

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