EUROPE'S LARGEST SELECTION OF TEST & MEASUREMENT EQUIPMENT FOR HIRE

INLEC.COM

DATASHEET

Nationwide Low Call
0333 6000 600

WHY BUY
WHEN YOU CAN HIRE

PTE-50-CET

Three phase relay test set
Current/Voltage

SMC
EURO

PTE-50-CET

MAIN FEATURES

– Variable three phase Current up to 3 x 50A or Voltage up to 3 x 150V.
– Variable phase angle between 0 - 359.9° (Single or three phase).
– Harmonic selection independent by phase, up to the 7th harmonic.
– Output power: 3 x 100VA.
– Reversible outputs.
– Outputs are fully isolated and electronic.
– Dynamic capability.
– Completely programmable.
– Built-in Timer, 1ms resolution.
– Dimensions: 200 x 442 x 327 mm/25 Kg
8 x 18 x 13 in./ 52 lb.

APPLICATIONS

– Testing of three phase motor protection relays.
– Testing of three and single phase overcurrent and differential protection relays.
– Can be used as a complete single phase unit in voltage, current, and phase as outputs are reversible (V, I, φ).

DESCRIPTION

The PTE-50-CET equipment is a universal, portable, test system with three outputs to test single and three phase protective relays.

The equipment comprises of three independent output channels that can be selected as current or voltage. This enables the unit to be used as a complete single-phase equipment (voltage, current, and phase angle between them) or, with channels synchronised, as a three phase current or three phase voltage generator from a single phase mains input.

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 manual hardware setting. (Closed Case Calibration)

In summary, the PTE-50-CET 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.

FEATURES

The PTE-50-CET was designed as a unit able to test relay applications which do not require three-phase voltage and three phase currents at the same time. This is generally the situation in relays installed in distribution or in medium voltage installations.

Obviously there is a wide range of relay types and relay functions in this scenario, such as Overcurrent, Directional, Motor Protection, Differentials, etc. Not only can these types of relays be found, but also the generations of relays designs (Electromechanical, Electronic, and Digital) which all need to be tested.

Each relay designs demands differing requirements of the testing equipment, not only related to power and accuracy, (which normally determines the selected tester), but also design concepts. Design concepts such as various control modes, size, modularity, etc. properly developed can notably improve the application of the equipment.

In the following sections are the details which makes the PTE-50-CET your practical choice above all the other test equipment in the market.

USER FLEXIBILITY

Any type of test equipment should be flexible in a way that it should perfectly preform and adapt from one relay test to another. Thus the PTE-50-CET offers complete flexibility:

- *Due to the Reversible channels of current and voltage, the unit can be use as a stand-alone unit for single phase testing.*
- *Can be combined to operate with any other equipment from the PTE range, or other complementary equipment 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. Particularly during commissioning work, the major part 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-CET.

The following describes these features:

- *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.*
- *A single control step-knob can simultaneously change values in one or more channels. This allows, for example, the use of paralleled channels as if there were one, with greater power and reach.*
- *Programming pre-fault and fault conditions, either as a single parameter change or by changing all available outputs at the same time (3 output channels in current or voltage)*
- *Total system status display enables the user to view outputs status, alarms, monitor signals, phase angle, etc. in real time.*

REVERSIBLE OUTPUTS

The three channels of the PTE-50-CET are reversible in their function, this means that they can be used either as current or voltage generators completely independent from each other. This provides applications as follows:

- *Up to 3 Currents or 3 Voltages are available simultaneously.*
- *Converts the PTE-50-CET into a complete single-phase unit in voltage and current with their corresponding phase angle.*
- *Numerous combinations of voltage and current in the three channels are available.*
- *Creating outputs by linking channels with identical parameters to sum the power and reach available*

The PTE-50-CET unit permits the connection of all outputs in parallel, which practically covers all the secondary relay testing requirements. The following are the output ranges that can be obtained.

- *0 - 1 A 150 V max.*
- *0 - 24 A 12.5 V max.*
- *0 - 75 A 4 V max.*
- *0 - 150 A 2 V max.*

PTE-50-CET

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 ***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.

4 ***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-CET and contains all the required inputs and outputs to start and stop the timer whether by the signal monitors or via the BUS-PTE.

5 ***POWER OUTPUTS***

There are three output channels, that can operate simultaneously or independently. Each Channel may be used in Voltage or Current mode up to 50 A in 4 ranges or 150 V in 2 ranges.

All output regulation including the phase angle can be independent by phase, or linked in a three-phase regulation, all linked channels can be changed simultaneously.

Any combination of voltage and current channels can be selected.

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. This Dynamic capability can work independently in each channel or linked in a three-phase system, in a way which allows for an easy and flexible method to preform any type of fault simulation.

6 ***INTERNAL HARMONICS GENERATOR***

In the unit PTE-50-CET, 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. These Harmonics can be different in each Output Channel. By paralleling the three outputs, any combination of Harmonics can be easily obtained.

7 ***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).

8 ***MASTER/SLAVE CONTROL***

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

9 ***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.

10 ***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.

11 ***SIGNAL MONITOR***

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

12 ***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.

13 ***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.

SERIAL CONNECTION CAPABILITY

The PTE-50-CET outputs can be serial connected, thus expanding the maximum voltage output.

This is an optional feature and is supplied with 3 serial plugs to enable various voltage ranges.

The serial plugs are easil installed when required and are designed to avoid any misconnection.

This serial option can be used when is equipment is used manually or by software control with the EUROTEST software.

The following ranges can be obtained:

	0.33 A	*450 V*
• *Plug 1*	*8 A*	*37 V*
	25 A	*12 V*
• *Plug 2*	*50 A*	*6 V*
	0.33 A	*300 V*
• *Plug 3*	*8 A*	*25 V*
	25 A	*8 V*

INTERCONNECTION CAPABILITY

By simply connecting a cable via the BUS-PTE, the PTE-50-CET can be interconnected to any other equipment in the PTE range, including another PTE-50-CET. This capability widens the application scope of the PTE units as combinations of units can be made to match the requirements of the relay. An example is our three phase system TRES.

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

STANDARD ACCESSORIES

- Instruction Manual.
- 1 Voltage supply cable with earth, 1.5 m length.
- 4 Connection Adapters, 4 mm / Flat Terminal.
- 12 Crocodile clips, input 4 mm.
- 9 Connection Cables, 2.5 mm section 2 meters length.
- 1 RS-232 Cable.
- 2 BNC cables with Banana terminals, 4 mm.
- 1 Interconnection Cable BUS-PTE.
- Complete set of fuses.
- Nylon protection bag.

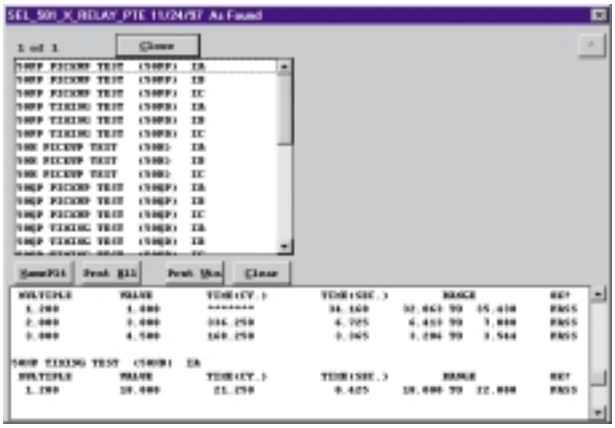
PTE-50-CET and PTE-100-V which supplies a variable frequency reference.

COMPUTER CONTROL

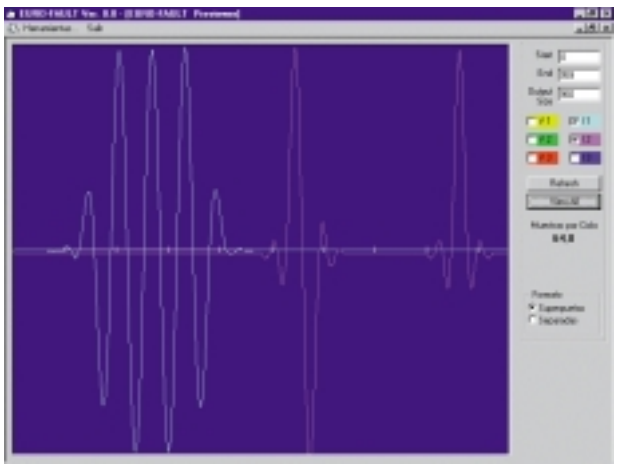
The PTE-50-CET can be completely controlled by an external computer, along with its corresponding software programs. The PTE-50-CET uses the PTE-12 adapter, which connects to the RS 232 serial port of the computer to the BUS-PTE port on the unit.

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

- ***EUROTEST*** *ERTST-3I. 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 between 0.5 and 5000 Hz.*



OPTIONAL ACCESSORIES

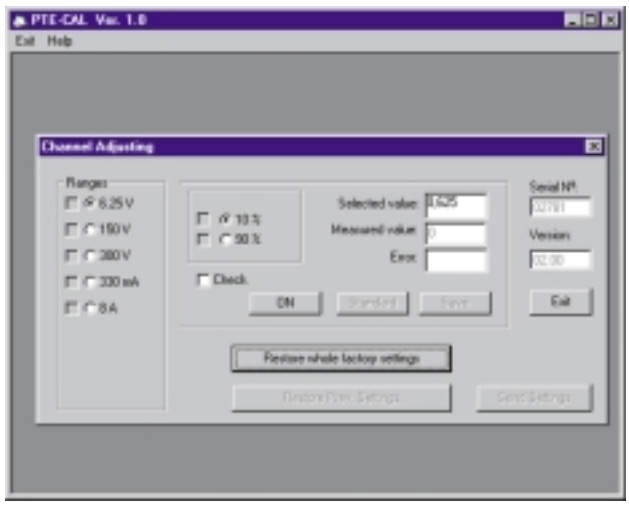
BATERY SIMULATOR (PTE-FCG)

An auxiliary DC voltage supply, which is needed for the majority of relays, the PTE-FCG has fixed outputs of 48, 125 o 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.

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



TECHNICAL SPECIFICATION

POWER OUTPUT (Each channel)

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 - 359.9º	0.1 - 1 - 10º	-	-	± 0.5º	-	-
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:	• By activation/deactivation of the power output.
		• By activation/deactivation of the change to 2nd value key.
	External Events:	• By a positive or negative event in the BUS-PTE.
		• By activation/deactivation of the external signal input.
TIMER STOP:	• 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 by channel.

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)
• Open circuit voltage: 10.2 V. D.C.
• Short-circuit current: 25 mA
• Fuse protected.
Voltage input (Monitors M2)
• 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: 442 mm 18" Depth: 327 mm 13"
Weight:	25 Kg. - 52 lb.

DISTRIBUTED BY:

EUROSMC, S.A.
Polígono Industrial P-29, Calle Buríl, 69. 28400 Collado-Villalba. Madrid (Spain). Tels: 34 - 91 - 849 89 80*. Fax: 34 - 91 - 851 25 53
www.eurosmc.com • e-mail: sales@eurosmc.com

INLEC, supporting you to deliver a world class service, every day, in every sector ...

OUR COMMITMENT TO YOU

A wealth of knowledge and experience.

You can take advantage of expert advice to ensure you get the best, most appropriate and cost effective equipment for the job. We supply a wide variety of industries, so if there is another way to do the job or save you time and money we'll pass on the benefit of our experience for free.

Honest advice, just a phone call away.

If we don't have a particular item, rather than hiring you something that won't do the job, we would rather direct you to an alternative supplier. You will always be provided with full instructions and if you still need help, call our technical team on Nationwide Low Call 0333 6000 600. Our aim is to save you time, frustration and money.

Top quality equipment from major manufacturers.

With Inlec you'll get the most accurate, reliable and well-maintained equipment available. Prices are regularly reviewed to ensure you always enjoy the best value for money. We have made a significant investment in test equipment so we ensure that it's well packed to minimise damage and delay.

We really do listen to you.

You won't waste your time contacting Inlec. Every request for equipment is logged and carefully considered. Listening to our customers helps keep our product range up to date and relevant. If you are unhappy about any aspect of our service please let us know so we can put it right.

YOUR 5 WAY GUARANTEE

❶ GUARANTEE SAME DAY DESPATCH

We understand why prompt delivery is important to you. So, if we confirm your order before 3pm, you are guaranteed same day despatch.

❷ OUR PRICE GUARANTEE

Inlec guarantee you real value for money. Our price match policy is simple - if you can hire the same product for less elsewhere, we guarantee to match that price and reduce it by a further 10% of the difference - and still deliver our industry leading technical and customer support.

For full details check our price-match guarantee online

❸ TOP QUALITY GUARANTEED

All equipment is thoroughly checked prior to dispatch to ensure you receive it in full, safe working order. Your shipment will be securely packed and include manufacturer's instructions, accessories or consumables and a valid calibration certificate where appropriate. In addition, Inlec offer a 24 hour replacement service if you decide the equipment is not suitable for your application*.

❹ FRIENDLY, KNOWLEDGEABLE ADVICE GUARANTEED

Inlec are happy to provide you with free advice, from anunbeatable team of experienced, knowledgeable and friendly engineers and hire experts.

❺ YOUR GUARANTEE OF THE BEST CUSTOMER SERVICE

Throughout your hire we will work hard to ensure you enjoy the very best in support and service from Inlec. We guarantee you won't find better service anywhere in the industry.

*subject to availability and conditions

Europe's leading Test Equipment Hire Specialist

LAB NO. 0535

Nationwide Low Call 0333 6000 600
Online: www.inlec.com
Inlec UK Ellerbeck Way, Stokesley Business Park, Stokesley N Yorkshire TS9 5JZ United Kingdom

CERT. NO. GB93/1773