Portable Test Equipment

Multifunction portable signal source with integrated working standard of power and energy

⇨ Highlights

- Laboratory and on-site meter measurements
- Easy evaluation of meters under precise load conditions, using the built-in compact current and voltage source
- Testing of meters with closed I-P links
- Automatic operation with predefined load points without the need for an external computer
- Each source channel can be programmed with user defined harmonic content or standardized signal test shape
- Each source channel can be modulated with programmable Ripple control telegram
- Independent generation of single or three-phase loading conditions for testing, calibration and verification of meters
- Active, reactive and apparent energy measurement with integrated error calculator and pulse output
- Capable to test the ratio and burden of CT/PT

⇨ Description

The **Portable Test Equipment** consists of an integrated current and voltage source and electronic reference standard of accuracy class 0.05% or 0.02%. Device is available in three-phase version PTE 2300 or single phase version PTE 2100.

Portable Test Equipment

⇨ Available Models

Model	Phases	Class	Max. Output Power (per phase)	
			Voltage	Current
PTE 2100A	1	0.05	30 VA	60 VA
PTE 2100E	1	0.02	30 VA	60 VA
PTE 2300A	3	0.05	30 VA	60 VA
PTE 2300E	3	0.02	30 VA	60 VA

Applied Precision s.r.o.
Stavitelska 1, 83104 Bratislava, Slovakia
Tel: +421 2 3266 2301
Web: www.appliedp.com, **E-mail:** info@appliedp.com

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⇨ Technical Specification

Power Source (built-in / specification per phase)		
Voltage		
Range		3 ... 300 V (phase to neutral)
Output Power		30 VA
Accuracy		0.015 % (PTE 2x00E), 0.035 % (PTE 2x00A)
Distortion Factor		< 0.3 %
Resolution		0.01 V
Stability		< 0.005 % (within 60 min period @ time base 150 s)
Current		
Range		1 mA ... 120 A
Output Power	120 A output	60 VA max *@ 60-120 A* / 1 V max *@ 0-60 A*
	12 A output	42 VA max *@ 12 A* / 5 V max
Accuracy *1		0.015 % (PTE 2x00E), 0.035 % (PTE 2x00A)
Distortion Factor		< 0.3 %
Resolution		min. 100 uA
Stability		< 0.005 % (within 60 min period @ time base 150 s)
Phase Angle		
Range		0 .. 360 °
Resolution		0.001 ° (45 … 100 Hz)
Harmonics		
Fundamental Frequency Range		45 ... 70 Hz
Bandwidth		30 … 2800 Hz
Phase Shift		0 ° … 360 °
Max. Amplitude		50 % (2^{nd} ... 6^{th} harmonics) 15 % (7^{th} ... 50^{th} harmonics)
Ripple Control		
Frequency Range		100 ... 1600 Hz
Modulation		0 … 15 %
Channels Selection		any combination of Voltage and Current channels

Reference Meter (built-in / specification per phase)		
Measurement Range		
Voltage	30 V ... 300 V (phase to neutral)	
Current	1 mA ... 120 A	
Power Factor	-1.000 … +1.000 (with 0.001 step)	
Measurement Accuracy	**PTE 2x00E**	**PTE 2x00A**
Voltage	0.015 %	0.035 %
Current *1	0.015 %	0.035 %
Power *1 *2	0.02 %	0.05 %
Frequency	40 Hz … 70 Hz	
Phase Angle	0.02 °	
Temperature Coefficient	0.0025 (0°C ... +40°C) 0.0040 (-10°C ... +50°C)	

*1 *in range 1 mA ... 30 mA related to 30 mA*
*2 *related to apparent power*

⇨ Measurement Accuracy of Power with External Accessories

Current Transducer CT 3x20		
Basic Error (10 mA – 20 A)	CT 3x20E	0.02 %, 0.02 ° (with PTE 2x00E)
	CT 3x20A	0.05 %, 0.05 ° (with PTE 2x00A/E)
Current Clamps CC 2x12B /16		
Basic Error (20 mA – 100 A)	CC 2x12B /16	0.1 %, 0.1 °
Flexible Current Probe FCP 3x21 /WS		
Basic Error (6 A – 6000 A)	FCP 3x21D /WS	0.5 %, 0.3 °
	FCP 3x21C /WS	0.2 %, 0.2 ° (on special request)

General Specifications	
Operat. Temperature	-10 ... +50 °C
Storage Temperature	-20 ... +60 °C
Operating Humidity	≤ 85% at Ta ≤ 21°C ≤ 95% at Ta ≤ 25°C *30 days / year spread*
Power Consumption	approx. 550 VA
Power Supply	100 VAC ... 240 VAC
Degree of Protection	IP-67 (closed case)
Safety Requirements	Isolation protection: EN 61010-1:2001 Measurement category: 300 V CAT IV, 600 V CAT III
Dimensions *(W x D x H)*	470 x 370 x 180 mm (device)
Weight *(approx.)*	17 kg (device) / 7.5 kg (accessories) – PTE 2300 12 kg (device) / 3 kg (accessories) – PTE 2100

Impulse Output	
Type	LED or 5 V
Impulses Assigned to	Active, Reactive, Apparent Energy or programmable constant frequency
Meter Constant	programmable
Max. Imp. Frequency	70 kHz

Impulse Input	
Suitable for	• Optical Sensor OPTS 2100 • Snap Switch • Impulse SO

Basic Accessories

- Optical Sensor OPTS 2100 /WS, Fixing Clamp OPFC 1000
- Optical Sensor Cable WSSC 2000
- Voltage Cables PTEVS 2x60, Voltage Clips VC 2x60
- Current Cables PTECS 1x12
- USB Cable CCU 1000, Power Supply Cord, Spare Fuses
- Software for PC (Installation USB key) PTESW 1000
- Printed User's Guide PTEUG 1000
- Calibration Certificate PTECC 1000

Optional Accessories

- Software Package ELMA for full control of PTE (SPE 1001)
- Current Transducer CT 3x20E or CT 3x20A
- Current Clamps CC 2x12B /16
- Flexible Current Probe FCP 3x21D /WS (or FCP 3x21C /WS)
- Voltage Transducer VT 2x60E or VT 2x60A
- Voltage Clips (various types) VC 2x00, VC 2x20, VC 2x30
- Snap Switch WSSS 3000, Impulse S0 cable OPTI 2000
- RS232 cable CCR 1000, Portable Printer PP 2000
- Optical Communication Head OPTH 1200

⇨ Current Output Limit Values

Output 120A

Output 12A