

# Power Analyzer Accessories

## PA4000 & PA1000



### Fixed core Hall-effect transducers

Tektronix provides a variety of fixed core and split core current transducers matched to our power analyzers to fit your application and measurement needs. Fixed core transducers provide the highest accuracy available for both AC and DC current measurements, whilst the split core devices are ideally suited to making measurements in less accessible applications.

#### CT-xxxx-S Series



The CT-xxxx-S series offer the highest accuracy and linearity when uncompromised measurements are required. These transducers are sourced from LEM, a high-quality component company.

#### Features –

- Very high accuracy (<0.035%)
- Excellent linearity (<20 ppm)
- Extremely low temperature drift (<2.5 ppm/K)
- Wide frequency bandwidth (DC to 100 kHz)
- Closed loop (compensated) current transducer using an extremely accurate zero flux detector
- Electrostatic shield between primary and secondary circuit

- No insertion losses
- High immunity to external electrostatic and magnetic fields interference
- Low noise on output signal
- Tektronix custom cable assembly included for easy connection to the PA4000 power analyzer
- Compatible with optional PA4000 internal transducer supply (except CT-1000-S; order optional external power supply, Keithley model 2220)

#### Applications –

- Calibration
- Precision and high-stability inverters
- Energy measurement

#### CT-xxxx-M Series



The CT-xxxx-M series are designed for general purpose measurement applications where accuracy requirements are less stringent. These transducers are sourced from LEM, a high-quality component company.

#### Features –

- Very good accuracy (0.4 to 0.6%)
- Very good linearity (<0.1%)
- Wide frequency bandwidth (DC to 150 kHz)
- Closed loop (compensated) current transducer using the Hall Effect
- Insulated plastic case recognized according to UL 94-V0.
- Low temperature drift
- Compatible with optional PA4000 internal transducer supply
- Tektronix custom cable assembly included for easy connection to PA4000

- No insertion losses
- High immunity to external interference

### Applications –

- AC variable speed drives and servo motor drives
- Static converters for DC motor drives
- Uninterruptible Power Supplies (UPS)
- Switched Mode Power Supplies (SMPS)

## Current clamps



For quick connections in an environment where it is not possible to break the current path, a current clamp offers an easy way to measure AC current. The CL series current clamps are sourced from AEMC.

### CL200

The CL200 is the latest in compact AC current probes. It is designed to provide quick connection to medium current circuits often found in industrial applications.

### Features –

- 0.5 A<sub>RMS</sub> to 240 A<sub>RMS</sub> measurement range
- 1000:1 transform ratio
- 40 Hz to 10 kHz response
- 1.0% to 3.0% accuracy, based on primary signal level
- Small, compact size
- Connects directly to Tektronix power analyzers
- Large jaw opening accommodates conductors up to 250 MCM
- Designed to EN61010, 600 V Cat. III safety standard

### Applications –

- Measuring in breaker panels
- Low-power industrial loads
- HVAC

### CL1200

The CL1200 is an AC current clamp designed for use in industrial and higher power environments. The ergonomic design allows it to easily clamp onto cables or small bus bars.

### Features –

- 100 mA<sub>RMS</sub> to 1200 A<sub>RMS</sub> measurement range
- 1000:1 transform ratio
- 30 Hz to 5 kHz response
- 0.5% to 1.5% accuracy, based on primary signal level
- Conforms to EN61010, 600 V Cat. III safety standard
- Low phase shift for power measurements

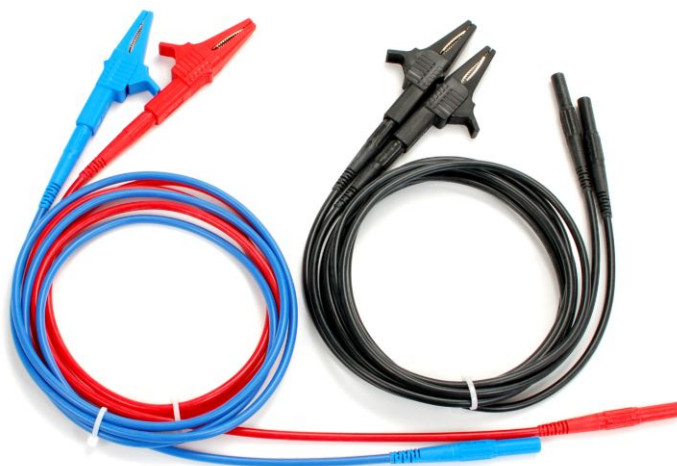
### Applications –

- Motor drive measuring
- Industrial loads
- Waveform analysis

## Measurement accessories

These accessories help to simplify your circuit connections and make your measurement tasks easier.

### Test Leads



**PA-LEADSET** Replacement lead set for Tektronix power analyzers. This insulated test lead set is rated for 1000 V, 32 A, CAT II, and is UL61010 compliant.

**BB1000 Breakout Box**

BB1000-NA Breakout Box



BB1000-EU Breakout Box



BB1000-UK Breakout Box

The BB1000 Breakout Box makes wiring connections between your device-under-test and Tektronix power analyzers easy and safe, by 'breaking out' the current flow for connection to the internal current shunt in the analyzer. It provides a line output socket to power your device under test (up to 10 A<sub>RMS</sub>) and 4 mm sockets for direct connection to the Tektronix power analyzer terminals. The BB1000 Breakout box is offered in three different versions with these receptacle styles:

- BB1000-NA: 120 V North America receptacle
- BB1000-EU: 240 V Euro receptacle
- BB1000-UK: 240 V United Kingdom receptacle

**BALLAST-CT**

BALLAST-CT

The Tektronix Ballast-CT simplifies the measurement of output power and tube current in high frequency electronic lighting ballasts. This device is specifically designed for lighting applications, and overcomes problems that are usually found when using conventional or Hall Effect current transformers. When used in conjunction with a Tektronix PA1000 or PA4000 power analyzer, the free-standing Ballast-CT accessory provides a convenient and accurate solution to taking power measurements in lighting ballast circuits.

- Convenience: No need to feed cables through a CT core
- High accuracy: Trifilar-wound toroidal design
- No cable positioning/contact error
- Wide bandwidth: High frequency design provides 5 kHz to 1 MHz bandwidth
- Wide current range: 5 mA to 1 A is compatible with many modern ballasts

# Specifications

All specifications are subject to change without notice.

## CT-xxxx-S Series

Model	Nominal primary current (rms)	Nominal primary current ( $I_p$ , DC)	Nominal secondary current ( $I_s$ , rms)	Supply voltage	Supply consumption	Transform ratio	Accuracy	Bandwidth
CT-60-S	42 A	60 A	100 mA	±15 V	80 mA + $I_s$	1:600	<270 ppm	DC to 100 kHz
CT-200-S	141 A	200 A	200 mA	±15 V	80 mA + $I_s$	1:1000	<83 ppm	DC to 100 kHz
CT-400-S	282 A	400 A	200 mA	±15 V	80 mA + $I_s$	1:2000	<43 ppm	DC to 100 kHz
CT-1000-S	707 A	1000 A	1 A	±15 V	80 mA + $I_s$	1:1000	<53 ppm	DC to 100 kHz

Notes:

The CT-1000-S transducer requires a separate power supply. We recommend the Keithley model 2220, which can supply power for up to two CT-1000-S current transducers.

The secondary current ( $I_s$ ) =  $I_{\text{measured}}$  x the transform ratio.

## CT-xxxx-M Series

Model	Nominal primary current (rms)	Nominal primary current (peak)	Nominal secondary current (rms)	Supply voltage	Supply consumption	Transform ratio	Accuracy	Bandwidth
CT-100-M	100 A	200 A	100 mA	±12 V to ±15 V	17 mA + $I_s$	1:1000	±0.5%	DC to 100 kHz
CT-200-M	200 A	420 A	100 mA	±12 V to ±15 V	17 mA + $I_s$	1:2000	±0.5%	DC to 100 kHz
CT-500-M	500 A	800 A	100 mA	±15 V to ±24 V	24 mA + $I_s$	1:5000	±0.6%	DC to 100 kHz
CT-1000-M	1000 A	1500 A	200 mA	±15 V to ±24 V	28 mA + $I_s$	1:5000	±0.4%	DC to 150 kHz

## CL Series

Model	Measurement range	Transform ratio	Supply voltage	Accuracy	Bandwidth
CL200	0.5 A - 240 A <sub>RMS</sub>	1000:1	Not needed	1.0% - 3.0%	40 Hz - 10 kHz
CL1200	100 mA - 1200 A <sub>RMS</sub>	1000:1	Not needed	0.5% - 1.5%	30 Hz - 5 kHz

## Ballast-CT

Operating current range	5 mA to 1 A <sub>RMS</sub>
Operating frequency	5 kHz to 1 MHz
Accuracy	
Amplitude	Better than 1% (up to 500 kHz)
Phase	Better than 1 degree (up to 500 kHz)
Maximum voltage, tube/ballast to output or Earth	600 V <sub>RMS</sub> , CAT II
Isolation, tube/ballast to output	1 kVAC

# Ordering Information

## Models

CT-S Series	CT-60-S, CT-200-S, CT-400-S, CT-1000-S
CT-M Series	CT-100-M, CT-200-M, CT-500-M, CT-1000-M
CL Series	CL200, CL1200
Test Leads	PA-LEADSET
Breakout Box	BB1000-NA, BB1000-EU, BB1000-UK
Ballast-CT	BALLAST-CT

## Accessories

All CT series current transducers (except for CT-1000-S) include cabling that allows easy and direct connection to the optional  $\pm 15$  V supply on the PA4000, and directly to the 1 A shunt.

The CT-1000-S transducer requires a separate power supply. We recommend the Keithley model 2220, which can supply power for up to two CT-1000-S current transducers.

## Warranty

All parts warranted for 1 year.



Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.

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\* European toll-free number. If not accessible, call: +41 52 675 3777

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For Further Information. Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit [www.tektronix.com](http://www.tektronix.com).

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