



- *Parts-Per-Million accuracy*
- *CT and PT testing*
- *Automatic balancing operation*
- *Large easy-to-read backlit numeric displays*
- *Colour TFT graphic display*
- *Extended low current excitation operation to less than 1%*
- *Measures true test circuit burden*

## ***PMT20010 Instrument Transformer Comparator***

### **DESCRIPTION**

The PMT20010 ITC (Instrument Transformer Comparator) is an auto-balancing bridge designed to determine the accuracy of instrumentation current and potential transformers.

Measurements of transformer excitation, ratio error, phase defect and accuracy class are displayed on large, easy-to-read, backlit numeric displays.

The instrument also incorporates a graphical colour LCD to render several views of the data which include measurement status, polarity, test circuit burden and accuracy class parallelograms. Additional information related to instrument configuration, test parameters and test transformer nameplate information are also displayed.

Operation of the instrument is simple and intuitive requiring only the membrane keypad selection of CT or PT testing. Instrument configuration settings are retained in non-volatile memory which are restored

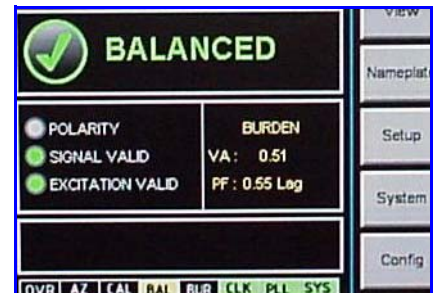
during subsequent operating sessions.

Transformer excitation can be displayed as secondary or primary values or displayed as a percentage of a user-defined value.

The DUT (Device-Under-Test) ratio error can be displayed as a percentage or displayed as Ratio Correction Factor. The phase defect can be displayed in centiradians or minutes, DUT accuracy class can be calculated based upon ANSI or IEC specifications.

As a result of industry interest in the accuracy of metering current transformers operating at very light load, the instrument dynamic range has been extended to include excitation values approaching 0.1%.

A further current transformer testing enhancement relates to the connection of two-stage reference CT's while maintaining separation of the secondary and tertiary windings. This connection eliminates the common burden presented by the Comparator therefore extracting the maximum available accuracy of the reference CT.



The instrument also measures the true test circuit burden as seen by the transformer-under-test. Knowing the true burden can facilitate a resolution to commonly encountered measurement anomalies and also ensure that the transformer is being tested at the appropriate burden operating point. The burden is displayed as VA (volt-amperes) and PF (power factor).

The instrument provides several peripheral ports comprised of one parallel port, two serial ports and one USB port. The parallel and serial ports are isolated to prevent currents circulating between the instrument measurement circuits and the connected peripheral.

Test results can be transferred to an externally connected parallel or

serial printer. Instrument data can also be uploaded to a host computer over the serial or USB ports. The instrument also features remote operation by a hosting computer in conjunction with the optional ITC Assist application.

## APPLICATION

The PMT20010 Instrument Transformer Comparator measures the accuracy of potential and current instrumentation transformers. Measurement of these errors facilitate the classification of the instrumentation transformer in accordance with industry standards.

Accuracy measurements are expressed in terms of ratio and phase defect and are acquired at specified levels of transformer excitation and burden.

In addition to the Comparator, a source of excitation, reference standard and burdens are required. Refer to the accessories section of this brochure for additional information.

## FEATURES

- Combined current and potential transformer testing in one instrument.
- Up to 1 ppm resolution and 10 ppm accuracy.
- Automatic self-balancing operation and fast balancing time.
- Three current ranges 1 Amp, 5 Amp, 10 Amp (2A, 10A, 20A Max.).
- Wide dynamic current operation (0.1% to 200%).
- Connection to two-stage Reference CT's.
- Measures true test circuit burden (VA and Power Factor).
- Reverse polarity detection.

- Displays ANSI or IEC Accuracy Class.
- Displays % Ratio Error or Ratio Correction Factor.
- Displays Phase Error in CentiRadians or Minutes.
- Excitation displayed as Secondary, Primary or Percent values.
- Backlit Colour TFT Display supporting extended functions.
- Large, easy-to-read, backlit LCD numeric displays.
- Isolated Serial Ports (2) and Parallel Port.
- USB V2.0 Full Speed Port.
- Local or Remote operation.
- Date results can be uploaded to PC hosted Excel spreadsheet.
- Field installable instrument firmware upgrades.
- Available in rack-mount or desktop versions.

## SPECIFICATIONS

### Excitation Measurements

#### Operating Range:

Mode	Min.	Max.
PT	2.4 V	270 V
CT - 1A Tap	0.002 A	2.0 A
CT - 5A Tap	0.01 A	10.0 A
CT - 10A Tap	0.02 A	20.0 A

#### Normal Operating Range:

Voltage: 10% to 200% excitation  
Current: 1% to 200% excitation

#### Extended Operating Range:

Voltage: 1% to <10% excitation  
Current: 0.1% to <1% excitation

#### Measurement Accuracy:

±0.5% RDG ±0.1% FS

## Ratio-Phase Measurements

### Measurement Ranges:

20%, 2%, 0.2%, AutoRange

### Ratio Error Measurement

#### Resolution:

Range	% Ratio Error (%)	RCF
20%	± 19.99	0.8334 to 1.2498
2%	± 1.999	0.98040 to 1.02040
0.2%	± 0.1999	0.99801 to 1.00200

### Phase Error Measurement

#### Resolution:

Range	Phase Error (CR)	Phase Error (min)
20%	± 19.99	± 687.2
2%	± 1.999	± 68.72
0.2%	± 0.1999	± 6.872

### Normal Measurement Accuracy:

Range	Accuracy
20%	±0.5% RDG ±0.1% FS
2%	±0.5% RDG ±0.1% FS
0.2%	±0.5% RDG ±0.2% FS

### Extended Measurement Accuracy:

Range	Accuracy
20%	±0.5% RDG ±0.3% FS
2%	±0.5% RDG ±0.3% FS
0.2%	±0.5% RDG ±0.5% FS

**Measurement Frequency:**

45 Hz to 65 Hz

**Time to Balance:**

Operating Range	Time (sec)
Normal	3
Extended	6

Power Factor Accuracy
$\pm 0.02 \pm 0.02 \sin(\text{True Phase})$
Power Factor Range
0 - 1.00 Lead and Lag

**Input Supply**

**Range:**

Min: 90 VAC Max: 264 VAC

**Power:**

22VA nominal

**Frequency:**

48Hz-62Hz

**Mechanical**

**Dimensions:**

432L x 330W x 178H mm

17L x 13W x 7H inches

**Weight:**

11 Kg, 24 lbs

**Burden Measurements**

Volt-Ampere	
Accuracy	$\pm 0.5\%$ Reading $\pm 0.5\%$ FS
Resolution	0.01
Range (CT)	1000 VA
Range (PT)	1200 VA

**Input Characteristics**

**Burden:**

Voltage: 0.1VA at 120 volts

Current - 1A: 0.1VA at 1 amp

Current - 5A: 0.2VA at 5 amps

Current - 10A: 0.4VA at 10 amps

**ORDERING INFORMATION**

Item	Catalog No.	Related Test Equipment
Model ITC, Rack Mount .....	PMT20010-000-00	Multi-Ratio 6KA Reference CT .....
Model ITC, Desktop .....	PMT20010-000-01	Electronic Potential Standard .....
<b>Included Accessories</b>		HV Standard Capacitors.....
Line Cord, 115VAC .....	000496	PMT10000 Series
Operating Manual .....	PMT20010-001-00	CT Burden, Metering, B0.1 to B1.8
<b>Optional Accessories</b>		PMT25140-000-00
ITC Assist Application .....	PMT20010-002-00	CT Burden, IEC, 2.5-77.5VA .....
Shipping Case.....	PMT20010-003-00	PMT25110-000-00
		PT Burden, W to ZZ .....
		PMT25071-000-00
		PT Burden, IEC, 2.5-157.5VA .....
		PMT25130-000-00
		CT Demagnetizer .....
		PMT20060-000-00

**CONTACT INFORMATION**



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