

## FEATURES

- Continuously Variable Output From Zero to Full Output Voltage
- Waveform Distortion - < 4%
- On/Off Push-button Control
- Portable Roll-Around Cart with 4½" Diameter Wheels and Cable Storage Provision (Except TTS-20)
- Main Power Circuit Breaker with Indicating Light
- Motorized Output Tap Selector Switch
- Solid State Digital Voltmeter, Ammeter and Wattmeter with Hold Feature
- Solid State Digital Temperature Meter with Probe
- "Zero Start" Interlock
- High Voltage "On" Flashing Warning Light
- Emergency Off Mushroom Switch
- "Foot Switch" Safety Interlock
- External Interlock Provision for Test Cage or Other Safety Interlock
- Slow and Fast Acting Resettable Overload Protection
- 15 Foot Two Conductor Voltmeter Leads for Voltage Sensing at the Transformer Terminals
- 15 Foot Three Conductor Flexible Input and Output Cable with Heavy Duty Alligator Clips on Output Cable
- Measure
  - Excitation Current
  - Excitation Losses, no load
  - Full Load Current
  - Impedance Voltage
  - Impedance Loss

## APPLICATIONS

- Verify Loss Data
- Evaluate Transformer Stockpile
- Verify Performance

## DESCRIPTION

The Single Phase TTS Series consists of a self-contained test set incorporating all features necessary for testing single-phase distribution transformers. These units, except for the Model TTS-20, are equipped with 4½" casters for mobility.

To perform tests, the output leads of the test set are connected to the secondary terminals (low voltage winding) of the transformer under test. The rated secondary voltage is then applied to the transformer. At rated voltage, excitation current and excitation losses are measured.

Impedance loss, impedance voltage and full load current tests are performed by reconnecting the output of the test set to the primary of the transformer and shorting the secondary terminals. The test set is then used to circulate rated current.



**HIPOTRONICS**<sup>®</sup>  
THE MEASURE OF A LEADER

# Single Phase Transformer-Loss Test Sets



Model TTS7.5

## METERING

Solid state precision instrumentation is provided to accurately measure all transformer test parameters. All meters feature LED readout and memory ("hold" reading) with manual reset by operator. All metering and relays are protected by surge protection devices.

<b>VOLTMETER</b>	Digital meter with readout selectable in true rms or average Range 0 - 199.9 V ac 0 - 1999 V ac Accuracy $\pm 0.5\%$ full scale
<b>AMMETER</b>	Digital meter true rms responding Range 0 - 1.999 A ac 0 - 19.99 A ac 0 - 199.9 A ac Accuracy $\pm 0.5\%$ full scale
<b>WATTMETER</b>	Direct reading digital wattmeter for core and conductor loss measurements Range 0 - 199.9 W 0 - 1999 W 0 - 19.99 kW Accuracy $\pm 0.5\%$ full scale NOTE: On Model TTS-20, wattmeter has fourth range, 0 - 199.9 kW
<b>THERMOMETER</b>	Digital with fast response probe and 15 feet of thermocouple wire Range 0 - 100° C Accuracy $\pm 1^\circ$ C

## SPECIFICATIONS

Input Voltage on all units listed below is 208/230 V ac single phase, 50/60 Hz. Consult Sales Department for other optional inputs.

MODEL	OUTPUT <sup>1</sup>	DUTY		TOTAL CAPABILITY	
		CONTINUOUS	5 MIN ON 15 MIN OFF	EXCITATION LOSS <sup>2</sup>	FULL LOAD CURRENT IMPEDANCE LOSS <sup>3</sup>
TTS-7.5	0-150 V ac	50 A	100 A	750 k VA	500 k VA
	0-300 V ac	25 A	50 A	750 k VA	500 k VA
	0-600 V ac	12.5 A	25 A	750 k VA	500 k VA
TTS-20	0-240 V ac	42 A	83 A	1000 k VA	666 k VA
	0-480 V ac	21 A	42 A	1000 k VA	666 k VA
	0-600 V ac	17 A	33 A	1000 k VA	666 k VA
	0-1000 V ac	10 A	20 A	1000 k VA	666 k VA
	0-1400 V ac	7 A	14 A	1000 k VA	666 k VA

- NOTES: 1. Higher Output Voltage Taps are available, consult Sales Department  
2. Based on excitation current of 2%.  
3. Based on 3% impedance and maximum primary voltage of 20 kV, (34.5 kV for TTS-20).

Hipotronics, Inc. offers a complete line of test equipment for liquid and dry type distribution and power transformers. Please consult Sales Department for further information and available options.

## OPTIONS AVAILABLE

- Applied Potential
- Induced Potential
- Data Acquisition System
- Ratio Testing / Two Voltmeter Method
- Single Phase Ratiometer (external)

For further information, contact:

### Hipotronics, Inc.

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NOTE: Because Hipotronics has a policy of continuous product improvement, it reserves the right to change design and specifications without notice.



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## FEATURES

- Main Power Circuit Breaker with Indicating Light
- On/Off Push-button Control
- Emergency Off Mushroom Switch
- High Voltage "On" Flashing Warning Light
- "Foot Switch" Safety Interlock
- External Interlock Provision for Test Cage or Other Safety Interlock
- "Zero Start" Interlock
- Slow and Fast-Acting Resettable Overload Protection
- Continuously Variable Output From Zero to Full Output Voltage
- Output Tap Selector Switch (Motorized)
- Solid State Digital Voltmeter, Ammeter and Wattmeter
- Solid State Digital Temperature Meter with Probe
- 15 Foot Flexible Output Cable with Heavy Duty Alligator Clips
- Separate Voltmeter Leads for Voltage Sensing at the Transformer Terminals
- Wave Form Distortion - < 4%
- Measure
  - Excitation Current
  - Excitation Losses, no load
  - Full Load Current
  - Impedance Voltage
  - Impedance Loss

## APPLICATIONS

- Verify Loss Data
- Evaluate Transformer Stockpile
- Verify Performance

# Three Phase Transformer-Loss Test Sets



Model TTS155

## DESCRIPTION

The TTS Series are self-contained test sets incorporating all features necessary for testing single- and three-phase distribution transformers.

To perform tests, the output leads of the test set are connected to the secondary terminals (low voltage winding) of the transformer under test. The rated secondary voltage is then applied to the transformer. At rated voltage, excitation current and excitation losses are measured.

Impedance loss, impedance voltage and full load current tests are performed by reconnecting the output of the test set to the primary of the transformer and shorting the secondary terminals. The test set is then used to circulate rated current.

## METERING

### APPLIED VOLTMETERS:

Three digital meters with 3½" digits, .5" LED display monitor voltage applied to transformer under test. Average responding type calibrated in RMS or true RMS, responding switch selectable. Hold feature with reset on meter display.

Range: 0-300/600/1200/2400 V  
System Accuracy: ± 1% full scale

### AMMETERS:

Three digital meters with 3½" digits, .5" LED display. Meters are true RMS responding and monitor output current. Hold feature with reset on meter display.

Range: 0-19.99/199.9/1999 Amperes  
System Accuracy: ± 1% full scale

### WATTMETER:

Digital meter with 3½" digits, .5" LED display. Direct reading wattmeter system for core and conductor losses. Hold feature with reset on meter display.

Range: 0-199.9 W/1999 W/19.99 kW/199.9 kW  
System Accuracy: ± 1% full scale

### THERMOMETER:

Digital .5" LED display with fast response thermocouple

Range: 0° C to 100° C  
System Accuracy: ± 1° C

## SPECIFICATIONS

Input Voltage on all units listed below is 480 V ac, 50/60 Hz, 3-phase. Consult Sales Department for other inputs.

MODEL	TAP	OUTPUT VOLTAGE RATING	DUTY		TOTAL CAPABILITY	
			CONTINUOUS	5 MIN ON 15 MIN OFF	EXCITATION LOSS	FULL LOAD CURRENT IMPEDANCE LOSS
<b>TTS-90</b>	1	0-240 V	114 A	228 A	4500 k VA	1500 k VA
	2	0-300 V	91 A	182 A	4500 k VA	1500 k VA
	3	0-480 V	57 A	114 A	4500 k VA	1500 k VA
	4	0-600 V	46 A	92 A	4500 k VA	1500 k VA
	5	0-1200 V	23.5 A	47 A	4500 k VA	1500 k VA
	6	0-1800 V	15 A	30 A	4500 k VA	1500 k VA
	7	0-2400 V	11.5 A	23 A	4500 k VA	1500 k VA
<b>TTS-155</b>	1	0-240 V	190 A	380 A	7500 k VA	2500 k VA
	2	0-300 V	152.5 A	305 A	7500 k VA	2500 k VA
	3	0-480 V	95 A	190 A	7500 k VA	2500 k VA
	4	0-600 V	76.5 A	153 A	7500 k VA	2500 k VA
	5	0-1200 V	39 A	78 A	7500 k VA	2500 k VA
	6	0-1800 V	25 A	50 A	7500 k VA	2500 k VA
	7	0-2400 V	18.5 A	37 A	7500 k VA	2500 k VA

- NOTES: 1. Current ratings are for duty cycle of 5 minutes ON/15 minutes OFF. Continuous duty available at 50% of current listed.  
2. Excitation loss based on excitation current of 2%.  
3. Full load current impedance loss based on 6.25% impedance and maximum primary voltage of 34.5 kV.  
4. Other duty cycles are available, consult factory.

## OPTIONS AVAILABLE

- Applied Potential
- Induced Potential
- Data Acquisition System
- Ratio Testing / Two Voltmeter Method
- Single Phase Ratiometer (external)

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