

# TRANSFORMER TEST SYSTEMS

(Transformer loss measuring system TLMS/TTS series)



## Broad Range Covers Most Applications

offers a complete line of Transformer Test Systems, from a small portable unit with a rating of 2.5 kVA to Power Transformer Testing Systems capable of testing transformers with very high voltage and power ratings. The line includes both single and three phase systems for both distribution and power transformers.

The table below lists the kVA rating of the standard systems, and the maximum kVA rating of the transformers that may generally be tested by each system. The maximum kVA rating to be tested is based on a transformer impedance of 6.25%. The power ratings are based on a 25% duty cycle (5 minutes ON/15 minutes OFF). Other duty cycles are available. ....

## Custom Built To Your Specifications

All Transformer Test Systems from ..... are built in our western Maryland facility. This includes fabrication of the cabinet, winding of the power transformer, regulator construction, assembling the components, programming, and final test. This allows us to maintain positive quality control over each step of the process, resulting in a superior test system with an extended service life.

We have the capability to offer a custom built system to each client. Our design engineers will work with you to develop a test system exactly suited to your requirements.

## Standard Voltage Outputs

Model	Input Current	(380V/50 HZ)*	(480V/60 HZ)*	Available Current/Voltage Taps						
				1	2	3	4	5	6	7
TTS30-1	80A	70A	130A	104A	65A	52A	31A	19A	N/A	
TTS50-1	135A	115A	216A	172A	108A	86A	52A	32A	N/A	
TTS100-1	265A	225A	433A	346A	216A	173A	104A	65A	N/A	
TTS35	55A	50A	86A	69A	43A	34A	20A	13A	8A	
TTS65	105A	85A	156A	125A	78A	62A	37A	23A	15A	
TTS100	175A	130A	240A	192A	120A	96A	57A	36A	24A	
TTS155	240A	200A	375A	300A	187A	150A	90A	56A	37A	

\*Note: Other input voltages are available.

## Dimensions and Weights

Model	Width	Depth	Height	Weight
TTS30-1	48"(1,220 mm)	63"(1,600 mm)	73"(1,855 mm)	2,400 lbs.(1,090 kg.)
TTS50-1	48"(1,220 mm)	63"(1,600 mm)	77"(1,960 mm)	2,700 lbs.(1,225 kg.)
TTS100-1	58"(1,474 mm)	84"(2,134 mm)	98"(2,490 mm)	5,400 lbs.(2,455 kg.)
TTS35	48"(1,220 mm)	63"(1,600 mm)	73"(1,855 mm)	2,600 lbs.(1,180 kg.)
TTS65	48"(1,220 mm)	63"(1,600 mm)	77"(1,960 mm)	3,000 lbs.(1,365 kg.)
TTS100	58"(1,474 mm)	84"(2,134 mm)	98"(2,490 mm)	5,400 lbs.(2,452 kg.)
TTS155	58"(1,474 mm)	84"(2,134 mm)	98"(2,490 mm)	6,000 lbs.(2725 kg.)K

\* Specification subject to change without notification.

## Each System Performs A Wide Variety of Tests

All test systems are designed to perform transformer tests in accordance with ANSI C57 and IEC 76 standards, latest edition. These tests include:

- Excitation current measurement
- Excitation loss (core loss)
- Impedance voltage measurement
- Full load current
- Copper loss (load loss)
- Temperature measurement

With the appropriate options additional testing capability includes:

- Applied Potential
- Induced Potential
- Winding Resistance Measurement
- Turns Ratio



Control Panel, Operator Interface

## Systems Testing Capacity

Model	Max Testing Capacity	
	1-phase	3-phase
TTS30-1	500 kVA	N/A
TTS50-1	833 kVA	N/A
TTS100-1	1,667 kVA	N/A
TTS35	333 kVA	500 kVA
TTS65	580 kVA	1,000 kVA
TTS100	833 kVA	1,500 kVA
TTS155	1,445 kVA	2,500 kVA

# TECHNICAL ADVANTAGES

## Flexibility/Reliability

The ..... Engineering staff has developed transformer test systems that offer the customer reliability and flexibility. By utilizing Programmable Logic Controllers (PLC) in the control system, the Phenix TTS allows the customer the ability to add optional features or change the test sets operating procedures by reprogramming the PLC. This is much more cost effective than rewiring the test set as was required in traditional test systems. Reliability is a top priority ... ..... We maintain our system's top performance record by adhering to our company's strict quality guidelines. Craftsmanship and the use of top quality materials and components insure the customer years of reliable service from their Phenix transformer test set.

The voltage regulating system of ..... transformer test sets will vary between three different variable transformer types. The power rating of the test system is the determining factor. The smaller systems utilize a toroidal type regulation system while the larger systems use the Phenix column type regulator. For extremely large applications a THOMA type regulator is utilized. Detailed information on all of these units can be found in brochure #70105 titled "Voltage Regulators."

## Safety Features

- Zero-start interlock
- Slow- and fast-acting protective devices on power transformer, regulator, measurement system, and other critical components
- Foot switch
- Provision for External Security Circuit with indicator
- Flashing red warning light
- EMERGENCY OFF mushroom switch
- External interlock provision
- Recessed jacks for output leads

## Instrumentation

### Voltmeter

Three 4½ digit LED displays switch selectable between RMS and Average readings.

Accuracy:  $\pm 0.5\%$  of reading + least significant digit

### Ammeter

Three 4½ digit LED displays.

Ranges: 0-1.00/10.00/100.0/1000A.

Accuracy:  $\pm 0.5\%$  of reading + least significant digit

### Wattmeter

One 4¾ digit LED display with six to eight ranges.

Accuracy:  $\pm 0.5\%$  of reading + least significant digit at 1.0 power factor

$\pm 1.5\%$  of reading + least significant digit at 0.3 power factor

$\pm 3.0\%$  of reading + least significant digit at 0.1 power factor

### Thermometer

One 4½ digit display

Range: 0-199.99 degrees C

Accuracy:  $\pm 1$  degree C

For transformers that operate at very low power factors, ..... offers high accuracy measurement systems. For these types of systems consult your Phenix Representative.

## Standard Design Features

- Control power key switch with indicator
- Main and control power circuit breakers
- Duty cycle 5 minutes ON/15 minutes OFF at rated power
- Motor-driven tap switch with indicators
- Motorized control of output voltage
- Adjustable rate of rise
- Raise and lower pushbuttons with OFF ZERO indicator
- Test mode selector switch with indicator
- Semi-automatic ranging of wattmeter and voltmeter with direct readout
- Hold feature to freeze all meter displays for recording
- RMS and Average responding voltmeters
- 3-wattmeter method of power measurement
- Voltage sensing leads
- Fork truck and overhead lifting provisions



*Transformer Test System  
with Control Console*