



**PHENIX**  
TECHNOLOGIES

# AUTOMATIC 3 PHASE TRANSFORMER TURNS RATIO TEST SET

## Application

Phenix Technologies' Model PATTR-03 is a microprocessor-based, automatic, single and three phase transformer-turns-ratio tester. The unit is portable, lightweight and ruggedly built for testing transformers in the field or in a laboratory setting.

THE PATTR-03 determines transformer turns ratio by precisely measuring the voltages across unloaded transformer windings and then displays the ratio of these voltages (ratios range from 0.8 to 15,000). The unit self-calibrates before each measurement to ensure turns-ratio accuracy. The PATTR-03 requires no calibration or temperature compensation.

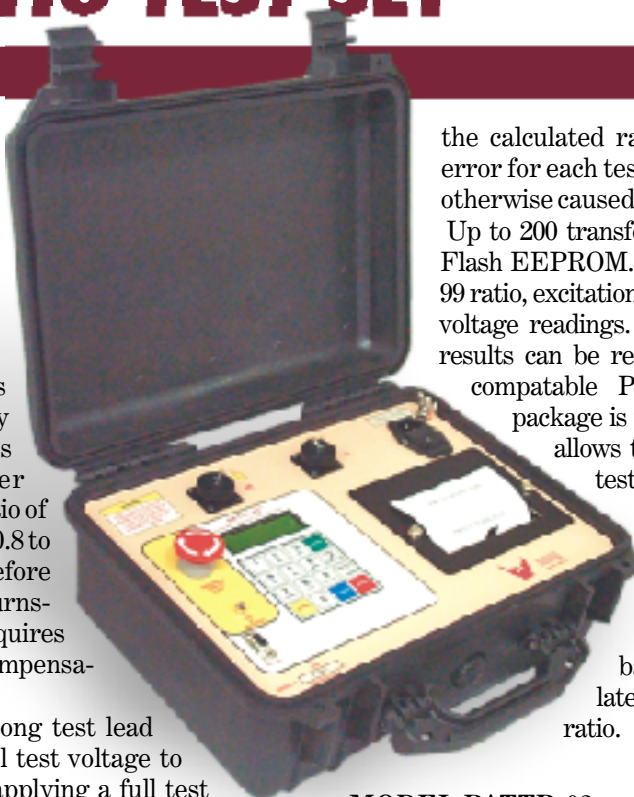
To prevent an accidental wrong test lead hook-up, the unit uses a low level test voltage to verify hook-up condition before applying a full test voltage to the test specimen. The unit will run a specific test for each transformer type (ie: single phase, delta to Y, Y to delta, delta to delta or Y to Y) without the need to switch test hook-up cables.

In addition to measuring a transformer's turns ratio, the PATTR-03 also measures a transformer's excitation current and its phase angle. It displays the turns-ratio, excitation current and turns ratio accuracy on a 20 character by 4 line back-lighted LCD display. Test results can be immediately printed on a built in 4.5 inch, thermal printer. The PATTR-03 lets users enter a transformer's nameplate voltages for the turns-ratio calculation and also compares the test result with

the calculated ratio and prints out the percent of error for each test. This feature eliminates any error otherwise caused by manual calculation.

Up to 200 transformer test records can be stored in Flash EEPROM. Each test record may contain up to 99 ratio, excitation current, phase angle and nameplate voltage readings. Through the RS232 interface, test results can be recalled and downloaded to an IBM-compatible PC. A Windows® based software package is included with the unit. The software allows the operator to test, store and print test results.

Users can also create a test plan for a specific transformer. The test plan comprises transformer nameplate voltages for each tap setting. Computed turns ratio is based on nameplate voltages and used later to compare with measured turns ratio.



**MODEL PATTR-03**

## Sample Built-In Printout

### TRANSFORMER TEST RESULTS

DATE: 04/01/00 TIME: 15:20:38

COMPANY:  
STATION:  
CIRCUIT:  
MFR.:  
MODEL:  
S/N:  
OPERATOR:

TYPE: SINGLE PHASE XFORMER

TEST H1-H2 AND X1-X2

NAME PLATE VOLTAGE:

H VOLTAGE: 002,200.00  
H TAP SETTING:

X VOLTAGE: 000,100.00  
X TAP SETTING:

CALCULATED RATIO: 25.00

MEASURED RATIO: 25.009  
% DIFF. 00.036%

MEASURED PHASE ANGLE: 000.3 DEG

MEASURED CURRENT: 000.0 MIL-AMP

A standard feature of the PATTR-03 is the built-in printer for hard copy of test results. A sample printout is displayed here.

Windows-based interface program is also provided. See other side for details.

## Optional Features

### TRANSFORMER TAP-CHANGING REMOTE CONTROL

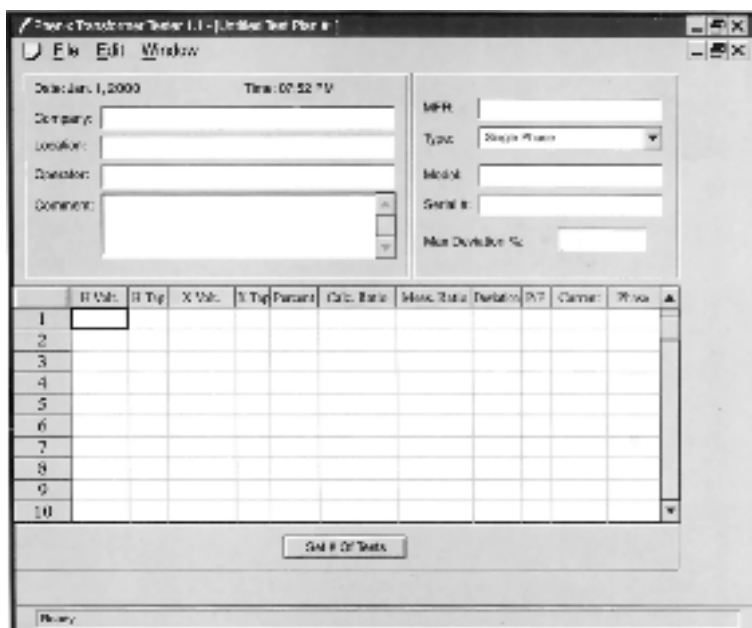
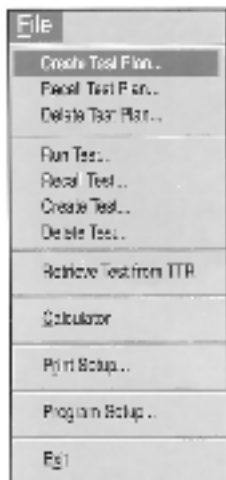
The Tap-Changer Remote-Control Box permits users to change transformer taps remotely from the PATTR-03. This eliminates the need to change the transformer's step-up and step-down taps by hand.

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## Standard Software

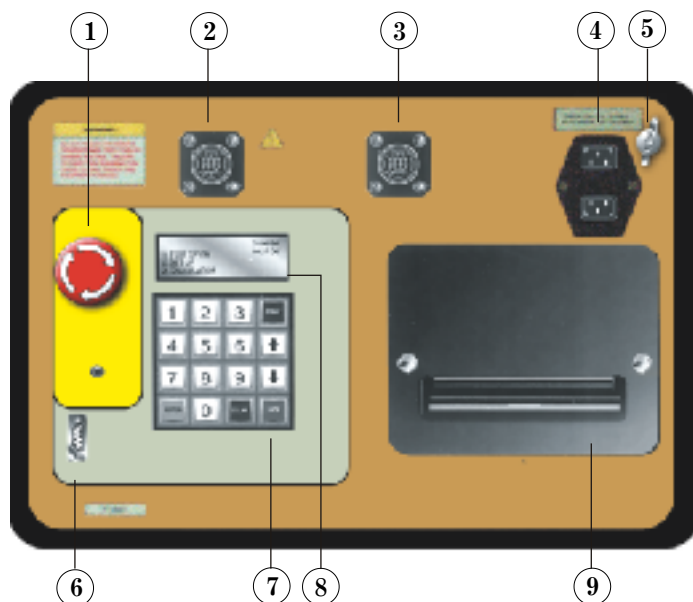
The PATTR-03 comes standard with Windows® based software. Field test results can easily be downloaded and stored. Computer generated reports are also a feature of the software.



## Specifications\*

- **Dimensions:** 17" (432mm) L x 13" (330mm) W x 7" (178mm) H
- **Weight:** 14 lbs, (6.4 kg)
- **Power:** PATTR-03—120/240VAC, 50/60 Hz
- **Ratio-Measuring Ranges:** 0.8 to 15,000
- **Turns-Ratio Accuracy:**  
 0.8-1999  $\pm 0.1\%$ , 2000-3999  $\pm 0.25\%$ , 4000-15,000  $\pm 1\%$  @ 8 VAC  
 0.8-1999  $\pm 0.1\%$ , 2000-3999  $\pm 0.20\%$ , 4000-15,000  $\pm 1\%$  @ 40 VAC  
 0.8-1999  $\pm 0.1\%$ , 2000-3999  $\pm 0.15\%$ , 4000-15,000  $\pm 1\%$  @ 100 VAC
- **Calibration:** None required
- **Excitation Voltage:** 8VAC, 40VAC, 100VAC
- **Display:** LCD Screen: 20 Characters wide by 4 lines (Viewable in bright sunlight)
- **Current Accuracy:**  $\pm 2\%$  of reading ( $\pm 1$  digit)
- **Phase Angle Measurement:** 0-360 Degrees
- **Phase Angle Accuracy:**  $\pm 0.2$  Degree ( $\pm 1$  digit)
- **Computer Interface:** RS-232C, 19,200 baud
- **PC Software:** Windows-based, included
- **Test Storage:** Stores 200 complete transformer test records. Each test record includes nameplate voltage, winding turns ratio, excitation current and winding phase angle. Data can be retained for two years
- **Temperature:** Operating:  $-10^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  ( $15^{\circ}\text{F}$  to  $+122^{\circ}\text{F}$ ); Storage:  $-30^{\circ}\text{C}$  to  $70^{\circ}\text{C}$  ( $-22^{\circ}\text{F}$  to  $+158^{\circ}\text{F}$ )
- **Cables:** One 15 ft (5m) single-phase cable set  
 One 15 ft (5m) three-phase cable set  
 One 30 ft (10m) extension cable set  
 One input power cord  
 One ground lead  
 One cable-carrying bag included

## Control Panel Layout



- |                                |                      |
|--------------------------------|----------------------|
| 1. Emergency off               | 6. RS-232C Interface |
| 2. H connection (high voltage) | 7. Keypad            |
| 3. X connection (low voltage)  | 8. LCD display       |
| 4. Input power connector       | 9. Printer           |
| 5. Ground Stud                 |                      |

\*Specifications subject to change without notice.

Your local representative is

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