POWER MEASUREMENTS
A TESCO COMPANY

OPERATIONAL MANUAL

THE EASTERN SPECIALTY COMPANY

FIELD TEST EQUIPMENT

CAT. NO. 1047

CT RATIO/BURDEN TESTER

A lightweight, portable, and highly accurate rate in-service test set to assist in finding lost revenue by testing the accuracy of your meter circuits.

THE EASTERN SPECIALTY COMPANY

TESCO AROUND THE GLOBE

Tested. Trusted. TESCO.

The trusted source for meter testing instruments and accessories since 1904. Our company is growing and working to serve **YOU**!

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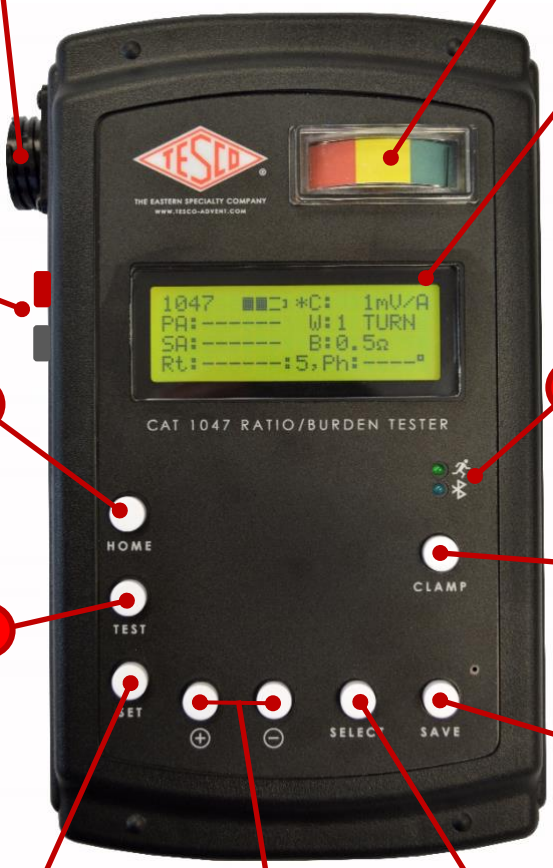
QUICK GUIDE: FRONT PANEL

CT SECONDARY CURRENT INPUT CONNECTOR
Top connector is a 9-pin circular connector (compatible with Tesco CAT J-1044-50T duck bill cable) for CT secondary current input. The range for this input is 0.1 – 20 Amps.
CAUTION: this input is a current loop and normally short circuited inside the unit.
DO NOT connect a Voltage (potential) source to this input as it will result to immediate damage. Prolonged currents greater than 27.5A may damage the unit.

EASY PASS/FAIL INDICATOR
The analog meter movement at the top of the panel moves left to indicate % secondary current change. For example, if secondary current does not change during the burden test, the needle does not move (staying fully in the green). If secondary current changes by 5% during the burden test, the needle will deflect leftward by an amount determined by the meter full scale % parameter which is adjustable in the settings menu.

CT PRIMARY CURRENT INPUT CONNECTOR
Center connectors (red and black) are safety banana connectors for a primary current Amp-clamp or similar probe having a Voltage interface of 0.1, 1, 10, or 100 mV/A. The signal level range for this input is 10mV – 3Vrms. Signal levels greater than 5V may damage the unit.

MAIN DISPLAY
The display is a 4-line, 2-column LCD. Upon power up, the main display shows the HOME screen. See section Main Display Screen for the description of each row of the display.



FRONT PANEL INDICATORS
RUNNING MAN: Activates blinking green LED when the unit is performing some actions such as displaying results and ratio/burden/demag testing. If it's a continuous glow, the unit's battery is charging.
BLUETOOTH: Activates blue LED when paired with a Bluetooth device. **THIS FUNCTION IS CURRENTLY DISABLED.**

HOME & POWER ON BUTTON
Press and hold to turn the unit on/off. Press briefly to take the screen to HOME screen (instantaneous values displayed) at any time. The unit always powers up in the HOME screen.

CLAMP BUTTON
Press to adjust the current probe scale factor or number of wraps on the current probe. Use the SELECT button to choose which parameter to adjust.

TEST BUTTON
While in the home screen, press this button to run the selected test such as a single burden test of the indicated burden value, scan all the values, or show a DEMAG sequence. The test selection is shown after "B:" on the third row

SAVE BUTTON
Press to save the burden test result to internal memory. Results may be pushed to a Bluetooth enabled android cell phone or Bluetooth USB dongle.

SET BUTTON
Moves to the settings adjustment screen to make changes on: a) analog meter full scale %; b) auto-power down (sleep timer) duration; c) screen brightness; and d) date and time (necessary for time-stamping saved test results).

+/- BUTTON
While in the HOME screen, these two buttons adjust the selected test to be performed when the TEST button is pressed. In other menus, these buttons navigate up and down.

SELECT BUTTON
While in the HOME screen, this toggles the clamp selector function on the screen between W (wraps) and C (current probe scale factor). The CLAMP selector function is displayed with an asterisk preceding parameter to be changed, such as "*C" to change the current probe scale factor or "*W" to change the number

CAT. NO. 1047: CT RATIO/BURDEN TESTER

The CAT. 1047 is a hand-held CT tester instrument capable of testing % change of secondary current with applied burden. Available burdens are 0.1, 0.2, 0.5, 1.0, 2.0, 4.0, and 8.0 Ohms. With a suitable current transducer, such as an Amp-clamp having a standard voltage interface of 0.1mV/A through 100 mV/A, the unit also displays the instantaneous ratio of the CT in the unburdened state. Additionally, the instrument displays instantaneous primary current to five digits (30,000 Amps maximum reading) and secondary current to five digits (20.000 Amps maximum). The display is RMS reading.

FEATURES

- Lightweight, portable & easy-to-use
- Works with any CT, as long as the secondary current is less than 20A
- Easy Pass/Fail indicator
- Instantaneous Ratio Test Result
- Auto burden scan
- Demagnetization Test
- Internal memory to store test results (up to 500 tests)

Additional features include internal storage of test results, and wireless Bluetooth interface for pushing saved data to Android cellphones or to Bluetooth dongles in CSV format. A standard DEMAG sequence is also provided which gradually ramps the burden from 0 to 10 Ohms and back to 0. The unit is powered by an internal rechargeable battery pack which provides for about 10 hours of run time per charge.

SPECIFICATIONS

- Current Range: CT Secondary input, 20A full scale max reading, +/- 0.25% (+/- 2 LSD), 0.1-20A
- Burden Values: 0.1, 0.2, 0.5, 1.0, 2.0, 4.0, 8.0 Ohms
- Operating Environment: 0-100° F
- Batteries: Internal, Rechargeable (will operate for 10 hours on full charge)
- Dimensions: 7.5" x 3.75" x 4.25"
- Weight: 2.5 lbs.

ACCESSORIES

- Product package inclusion:
  - Secondary Current Test Cable (Catalog No. J-1044-50T) with Test Plug connector
  - Soft Case
  - Battery Charger
  - 3.5mm Jack-to-USB cable
  - TESCO USB thumb drive containing the PC App and Operating Instruction Manual
- Optional current probes (sold separately)
  - Current Probe Extension Cable, Catalog No. C-1047-20 (20') & C-1047-50 (50')
  - Field Bag (Catalog No. 1048)
  - AC Current Probe (Catalog No. 411) - 600V/600A
  - AC Current Probe (Catalog No. 752) - 600V/1,000A
  - AmpFlex Flexible Current Probe (Catalog No. 361) - 600V/3,000A
  - Amp Litewire Fiber Optic Coupled Ammeter (Catalog No. 801) - 1-2000A

CAT.1048: Field Bag

CAT.411: AC Current Probe

CAT.752: AC Current Probe

CAT.361: AmpFlex Current Probe

CAT.801: Litewire Fiber Optic Coupled Ammeter

SIDE PANEL CONNECTIONS

LEFT SIDE PANEL

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CT PRIMARY CURRENT INPUT CONNECTOR
Center connectors (red and black) are safety banana connectors for a primary current Amp-clamp or similar probe having a Voltage interface of 0.1, 1, 10, or 100 mV/A. The signal level range for this input is 10mV - 3Vrms. Signal levels greater than 5V may damage the unit.

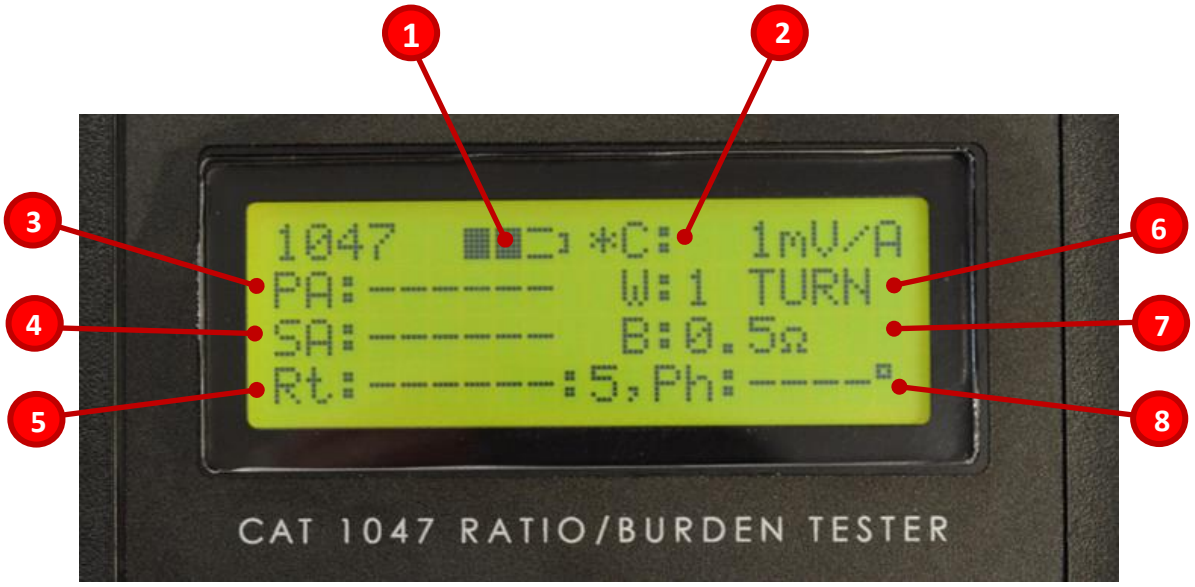
CHARGING PORT
The bottom most connector is a barrel connector for the 9.6V lithium battery pack charger supplied with the unit. Charging a fully depleted pack takes 4-5 hours. Use of any charger not specified or supplied from Tesco is prohibited, as other chargers may destroy the internal battery pack.

RIGHT SIDE PANEL

3.5MM PORT FOR PC CONENT
The unit has a PC application where it can generate a report from the tests performed. Through this port, the 3.5MM jack-to-USB cable that is provided, is inserted and connected to a USB port in the PC side.
The installer of the PC application is available through the USB thumb drive that is provided.

MAIN DISPLAY SCREEN

The display is a 4-line, 2-column LCD. Upon power up, the main display shows the HOME screen.



Description of each number is shown below:

1	**Battery status icon:** Empty to Full	5	**Rt:** Shows the measured ratio of the CT under test. In order to have a value shown here, both secondary current cable and the primary current probe must be connected to the CT.
2	**C:** Shows the setting of the primary current scale factor (0.1, 1, 10, or 100 mV/A)	6	**W:** Shows the setting of current probe wraps (useful for a rope style current probe).
3	**PA:** Shows the instantaneous primary Amps.	7	**B:** Shows the test which will be performed when the TEST button is pressed. Pressing the +/- buttons steps through the list of possible tests to perform.
4	**SA:** Shows the instantaneous secondary Amps.	8	**Ph:** Displays the phase shift between primary and secondary of the CT under test. Phase information is useful when measuring ratio just to be sure both the primary and secondary instrument inputs are connected to the same CT, as the value here should be within +/- 5°, or within 5° of +/-180°. Odd phase shifts such as 120°, 240°, 30°, etc. indicate either a damaged CT or a cross-phase connection where the primary and secondary inputs are accidentally connected to different CTs.

HOW TO PERFORME A BURDEN TEST

1. Press and hold the HOME button to power up the unit. The unit always powers up in the HOME screen.
2. Connect the secondary current test cable to the unit via the 9-pin circular connector.
3. Connect the duckbill end of the cable to the CT under test via a test switch.
4. Take care not to have the CT secondary open-circuited at any time. DO NOT disconnect the CT secondary test cable from the 1047 while CT current flows in the cable – doing so will result in high voltage developing on the CT terminals and may result in arcing and destruction of the CT, or worse.
5. Upon making the connections, secondary CT current will be displayed after the “SA:” label on the HOME screen. Currents less than 0.1A are not shown.
6. Press the +/- buttons to scroll through a list of the test functions. Shown after the “B:” on the display screen is the burden value to be used in the test. A value of “SCAN” indicates an auto-sequence test of all the values. “DEMAG” indicates a standard demagnetization sequence will be performed.
7. Wait for the secondary current reading to stabilize. Stability here depends on the CT primary current being stable to within about 0.5% over the testing period and may not be possible under all circumstances, such as cases where the circuit load is constantly fluctuating. Switching off loads with large intermittency or testing at particular quiet times may be necessary. Also, performing a test multiple times and averaging the results is not a bad idea.
8. Press the TEST button to initiate the test sequence.
9. Once the test is complete, results are indicated on the results screen and frozen until HOME or SAVE button is pressed.
10. Press SAVE twice to save the data to internal memory (an intermediate memory info screen is presented) or press HOME to go back to the HOME screen to repeat the test or perform a different test.

HOW TO MEASURE CT RATIO

1. Perform steps 1-5 of “How to perform a burden test”.
2. Connect the primary current probe to the unit. Press SELECT button to toggle between the current probe scale factor and number of wraps parameter. The CLAMP button increments whichever parameter is highlighted by the asterisk.
3. Once the primary current probe is attached to the primary conductor, the ratio will display (continuously updating) on the bottom row of the display to the right of the “Rt:” label. The ratio is shown in the customary manner with 5 in the denominator.