BASEWEST

Operating Manual

Model TS-421 Test Set

Escape Slide Lighting Systems

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1.0 General

1.1 Introduction

The Model TS-421 test set is a rechargeable, handheld instrument designed for testing airline escape slide lighting systems, light harnesses and batteries. The test set includes a voltmeter and ammeter with touchscreen operation, a built-in rechargeable battery, a 5VDC power supply and a removable protective cover. The unit is provided with a 120/220 VAC charger and adapter for both domestic and international use. The TS-421 replaces the original TS-420 test set which is inactive for procurement. The TS-421 duplicates the functions of the Astronics/DME Model TU-14 test set.

This release of the manual updates some touchscreen legends and provides specific instructions relating to recharging.

TS-421 Test Set (Home Screen Shown)

1.2 Function

The Model TS-421 provides the following test modes selectable at the Home Screen:

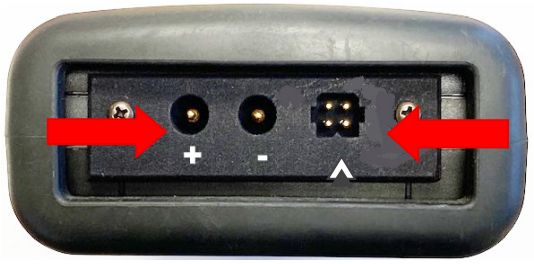
- Voltmeter Mode with built-in load bank – The Voltmeter Mode is used to test the condition of the slide lighting system battery. A touchscreen interface provides for the selection of resistive loads including an open circuit (no load) test. Testing is initiated with the RED press-to-test button.
- Ammeter Mode with regulated power supply – The Ammeter Mode verifies the electrical current draw of the slide light harness with power supplied by the test set's internal 5 VDC / 3A power supply. This test provides a built-in 30 second timer that allows a hands-free walk-around to visually confirm luminaire operation. Testing is initiated with the RED press-to-test button.

1.3 Test Connections

Test connections are made at the connector block on the top of the instrument, shown in the following image. These connections include a 4-contact receptacle to mate with the

test lead of the slide light battery and polarized contacts to test individual light harnesses. Marked polarity must be observed when testing individual LED-based harnesses.

Polarized Contacts for Individual Light Harness Connection



4-Contact Receptacle for Battery or System Testing through Battery Test Lead

Test Connections / Connector Block

1.4 Test Set Activation

The TS-421 is OFF when the Touchscreen is dark and the RED button is not illuminated. The test set is turned ON by pressing the RED button. The HOME screen appears with Voltmeter or Ammeter test selection options, shown center, below.

Inactive / OFF

HOME Screen

Charging Required

If the internal battery is not sufficiently charged for test set operation, the screen to the right, above will appear for a few seconds, warning that recharging is required. The test set will then turn OFF. Place the test set on the recharger immediately.

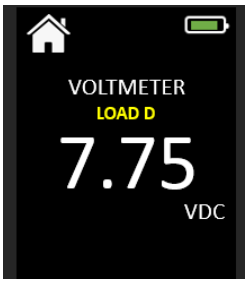
1.5 Home Icon

The HOME screen reappears at any time the HOME icon, shown below, is pressed.

1.6 Internal Battery Status

The charge status of the test set's internal battery is monitored and displayed when the test set is activated and whenever the touchscreen is active. The battery status icon is displayed in the top righthand corner of the screen. When the internal battery voltage goes lower than a predetermined level, the icon will change from Green to Yellow indicating that the unit can be used but should be recharged before next usage.

Half Charge (Yellow)



Full Charge (Green)

1.7 Recharging

Recharging of the internal battery is accomplished with the P/N 36-1019 120/220 VAC charger provided with the unit. Chargers provided with the earlier TS-420 test set may continue to be used with the TS-421. The recharging port is located at the lower right-hand side of the test set.

IMPORTANT - The TS-421 should be maintained on its recharging circuit with the P/N 36-1019 charger at all times when the test set is not in use.

1.8 Display Timing

Voltmeter and ammeter test readings remain on the screen for 30 seconds. After 30 seconds, the screen goes dark and the RED button begins to blink for 90 seconds in the Voltmeter mode and 120 seconds in the Ammeter mode. While the RED button is blinking, the last test reading can be recovered by either pressing the RED button or the touchscreen.

1.9 Automatic Time-Outs

If the test set is left ON and unattended for 90 seconds, the unit will automatically turn OFF, erasing the last reading. The unit can be manually turned OFF by returning to the Home screen and pressing the RED button or by holding the RED button for 3 seconds.

2.0 Voltmeter Mode (Battery Testing)

2.1 Connect the 4-contact test lead of the battery under test to the mating receptacle on the connector block. Note that the connector is keyed for proper alignment.

2.2 Turn the test set ON by pressing the RED button. Press the VOLTMETER icon on the HOME screen, and the load selection screen appears per figures below.

NOTE: If the battery under test is not connected, or connected improperly, pressing the RED button creates a three-pulse vibration, and a "Check Connection" prompt appears.

2.3 Select the resistive load specified by the slide manufacturer's CMM by scrolling through the loads with the left and right arrows shown in the Select Load figure, below.

Select Voltmeter Mode

Select Load

2.4 Once the proper load is selected, press the RED button to initiate the test. A three-dot loading icon appears momentarily until the voltage reading is presented.

Press to Test

Test In Process

Voltage Reading

NOTE: When testing battery voltage under load, output voltages vary dynamically depending on the load itself, time on load, and battery type/configuration. The TS-421 provides load selection options and a standardized 3-second test to assure a proper acceptance test voltage is

recorded for escape slide lighting batteries. Re-testing batteries prior to complete post-test recovery will result in different test voltages.

2.5 The test reading remains visible for 30 seconds after which the screen goes dark and the RED button begins to flash for 90 seconds. The test reading can be retrieved while the RED button is flashing by either pressing the RED button or the touchscreen.

3.0 Ammeter Mode (Light Harness Testing)

3.1 Connect a light harness to the test set in one of two ways:

- If testing an individual lighting harness - Connect lighting harness directly to two polarized contact pins in the connector block. Be sure to observe polarity; in most cases the BLUE wire is positive (+) and the WHITE wire is negative (-).
- If testing a lighting harness system while connected to a battery - Connect the 4-contact test lead of the battery to the mating 4-contact receptacle on the connector block.

3.2 Turn the test set ON by pressing the RED button. Press the AMMETER icon on the HOME screen, and the ammeter screen appears.

3.3 To initiate the ammeter test, press the RED button. The RED button illuminates, and a three dot loading icon appears for three seconds until the ammeter reading is presented.

NOTE: If the lighting harness is not connected, connected improperly or the load is very small (such loads as present during “Gage Tests”), pressing the RED button creates a three-pulse vibration, and a “Very Small or No Load Check Connection” prompt appears.

Select Ammeter Mode

Press to Test

Ammeter Reading

3.4 The connected lighting harness will remain illuminated for 30 seconds, allowing the test operator to conduct a walk-around, hands free, to verify that all luminaires are operating.

3.5 After the lighting harness is turned OFF, the test reading remains visible for an additional 30 seconds. At that point the test screen goes dark and the RED button flashes for 120 seconds. The test reading can be retrieved while the RED button is flashing by either pressing the RED button or the touchscreen.

4.0 Care & Maintenance

4.1 The TS-421 test set is a sensitive electronic instrument and should be handled with appropriate care. Damage from obvious abuse cannot be covered by warranty.

- The TS-421 should be maintained on its recharge circuit with the P/N 36-1019 recharger (and adapter, if necessary) at all times that the test set is not in use.
- Be particularly careful to protect the touchscreen from any physical damage (damage to the touchscreen is not covered by warranty).
- The enclosure is not completely sealed; keep the test set away from rain, spills, and fluids to prevent damage to internal electronics.
- Do not apply external electrical inputs other than the P/N 36-1019 AC charger. Prior chargers 36-1002, 36-1005 may be used.
- Protect from extreme temperatures and humidity; it is best to store the instrument in temperature-controlled spaces.
- It is recommended to keep the protective cover in place at all times except for battery replacement. (Note: the back of the protective cover is provided with a rotating stand that can be removed if it is not useful.)
- Avoid excessive exposure to sunlight and UV radiation.

4.2 Maintenance is limited to wiping the unit enclosure and touchscreen down lightly with a clean cloth moistened with alcohol. DO NOT use cleaners or solvents.

4.3 Field repairs except battery replacement are not authorized and will void warranty.

4.4 The replaceable P/N 6-1036 NiMH rechargeable battery is part of the back panel of the test set enclosure and is replaced together. The battery is on-condition and has an expected service life of 5 years.. The battery should be replaced when the charge retention level becomes unacceptable. Battery replacement can be accomplished at any time without affecting calibration. Replacement is accomplished as follows:

- Remove protective cover.
- Remove back panel/battery assembly of the test set; retain 4 attach screws.
- Disconnect the battery connection to the test set and discard the old back panel/battery assembly.
- Connect new the battery connection on the replacement back panel/battery assembly with same orientation.
- Secure new back panel/battery assembly with four attach screws.

4.5 The unit is provided with a P/N 36-1012 two-prong European-type adapter to mate with the 36-1019 AC Charger. Other adapters may be used so long as the input voltage is either 110/120 or 220/240 VAC.

5.0 Calibration

5.1 The BaseWest calibration manual, 25-60-46, is provided with each new unit, and is available on the BaseWest website under “Resources”. Calibration is recommended at one-year cycles but is dependent on user requirements and policy. Calibration can be accomplished without opening the test set enclosure. See the calibration manual for recommended calibration accessories.

5.2 If the TS-421 test set returned to BaseWest for calibration, it is first inspected for proper form, fit and function and remaining battery life. Any repairs or replacements needed are coordinated with the customer prior to calibration. NIST calibration is conducted by a local NIST-certified calibration house and calibration sticker affixed. The test set is then returned to BaseWest where it undergoes a final inspection before return to the customer along with calibration paperwork and any accessories that were sent with the unit.

6.0 Accessories

The following accessories are provided with the TS-421 unit but can be procured separately, as required.

- P/N 36-1019 – 120/220 VAC Charger
- P/N 36-1012 – 120 to 220 VAC Adapter, Two-Prong
- P/N 6-1036 Rev D – Battery, NiMH, 12VDC
- P/N 52-1027-4 – Protective Cover