



THE EASTERN SPECIALTY COMPANY

SET UP GUIDE

ELECTRIC VEHICLE SERVICE EQUIPMENT (EVSE) TEST SYSTEM

PRODUCT:

CATALOG NO. TS400

**ELECTRIC VEHICLE SERVICE EQUIPMENT
(EVSE) TEST SYSTEM
QUICK SETUP GUIDE
CATALOG NO. TS400**



THE EASTERN SPECIALTY COMPANY

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1.1 Introduction

TESCO's **CAT. TS400 Electric Vehicle Service Equipment (EVSE) Test System** is a complete system that consists of the **CAT. T4000** EVSE Tester and the **CAT. PL4000** Programmable Load, which tests the accuracy of energy delivery using a transactional mode compatible with HB44 provisions both for AC and DC.

For complete freedom and test automation, add the PL4000 Programmable Load, a dedicated load emulator solution providing no-load and adjustable-load modes. Any compatible EV can also be used as the test load by using the appropriate optional cable. The Proximity and Pilot Control signal exchanges are fully verified for compliance with protocol requirements. The EVSE's GFCI can also be tested by applying a programmable line-earth fault current up to 200mA.

1.2 Contacting TESCO

For Technical Support or Calibration/Repair, please call 215.228.0500.

You can also send an email to support@tescometering.com with any questions.

To view, print, or download the latest manual supplement, visit www.tescometering.com.

1.3 General Safety Summary

This manual contains information and warnings that must be observed to ensure safe operation and keep the TS400 in a safe condition. Operation or service in conditions or in a manner other than specified could compromise safety. For the correct and safe use of this device, **it is essential that both operating and service personnel follow accepted safety procedures in addition to the safety precautions specified**, including PPE guidelines.



In this manual, a **WARNING** identifies conditions and actions that pose hazard(s) to the user, while a **CAUTION** identifies conditions and actions that may damage the T4000 or the test equipment.

WARNING

To avoid electrical shock, personal injury, or fire hazard:

- Both devices, T4000 and PL4000 must not be switched ON if it is damaged or suspected to be faulty.
- Do not operate the device in wet, condensing, dusty, or explosive gas conditions.
- If the equipment is used in a manner not specified in this manual, the protection provided by the T4000 and the PL4000 may be impaired.
- Whenever it is likely that safety protection has been impaired, the devices must be made inoperative and be secured against any unintended operation. Inform qualified maintenance or repair personnel.
- Safety protection is likely to be impaired if, for example, the T4000 displays visible damage or fails to operate normally.

1.4 Description of Safety-related Icons

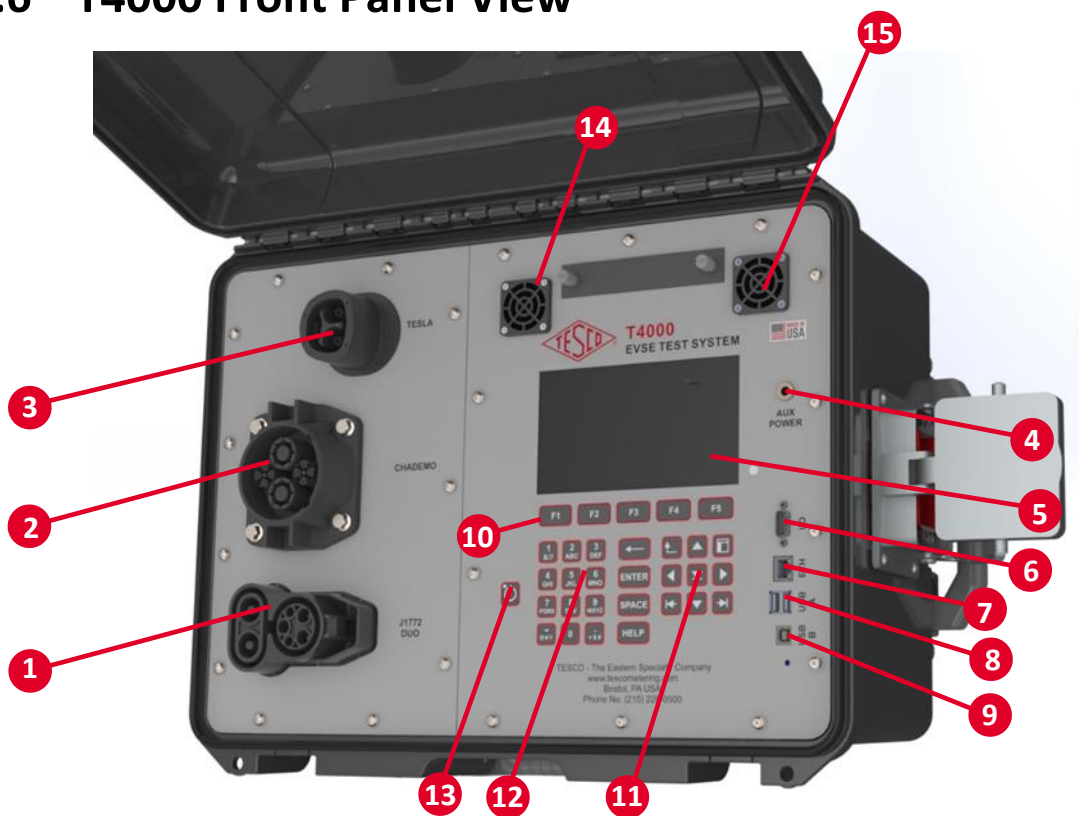
ICONS	DESCRIPTION
	Risk of danger. Important information. See manual.
	Hazardous voltage. Risk of electrical shock.

1.5 Unpacking and Inspection

The Instruments are shipped in a container designed to prevent damage during shipping.

Inspect the Instruments carefully for damage, and immediately report any damage to the shipper. A packing list is included in the packaging. When you unpack the Instruments, check for all the standard equipment listed and check the shipping order for any additional items ordered. Report any shortage to the place of purchase, to your distributor, or directly to TESCO.












1.6 T4000 Front Panel View



#	NAME
1	J1772 DUO Inlet
2	CHADEMO Inlet
3	TESLA Inlet
4	Auxiliary Power
5	7", 1024x600, high brightness, daylight readable LCD
6	RS232 Com Port
7	Ethernet Com Port
8	USB A Port
9	USB B Port
10	Function Keys
11	Navigation Keys
12	Alphanumeric Keys
13	Power Button
14	Air Inflow
15	Air Outflow

Table 1.0 T4000 Front Panel Sections

Navigation Keys

SYMBOL	DESCRIPTION
	<ul style="list-style-type: none"> • Selects the NEXT or PREVIOUS menu item • Moves the SELECTED LINE UP or DOWN • Selects an Item from a dropdown menu
	<ul style="list-style-type: none"> • Moves the cursor left/right of the current character in text boxes • Moves the selection left/right of the current selected cell in tables
	Selects the NEXT or PREVIOUS TAB item
	Moves the focus from one section of the screen to another
	Deletes the previous character
	Returns to the previous screen
	Function keys
	Power button. Hold down to turn the device on until the LED lights up and wait for a few seconds for the screen to load.
	Selects a response
	Enters a space
	Provides context-sensitive help

1.7 T4000 Side Panel (Load Control)



#	NAME
1	AC Connectors
2	DC Connectors

Table 1.1 T4000 Side Panel View

1.7.1 PL4000 Front Panel



#	NAME
1	Power Status Indicator
2	Communication Status Indicator
3	Load Status Indicator
4	Left Fan for Load Heaters (Big Fan 1)
5	CombiTac Connector
6	CombiTac Park Station Holder
7	Strap Handle
8	CombiTac Conduit Holder
9	Right Fan for Load Heaters (Big Fan 2)
10	Fan for Variable Load (VL) Controller (Small Fan)

Table 1.2 PL4000 Front Panel Sections

1.7.2 PL4000 Rear Panel



#	NAME
1	DC Circuit Breaker
2	AC Circuit Breaker
3	Air Exhaust of Variable Load
4	Left Exhaust for Load Heaters (Big Fan 1)
5	Right Exhaust for Load Heaters (Big Fan 2)

Table 1.3 PL4000 Rear Panel Sections

WARNING

PL4000 air outflow can be extremely hot particularly when testing at higher load current or power. Please allow back space of at least 6.5 feet (2 meters) for the PL4000 air outflow.

1.8 Set up, Airflow and Cooling Considerations

1.8.1 Setup and Placement

The Instruments are designed to be used sitting on the ground, as long as there is sufficient space to allow adequate ventilation.

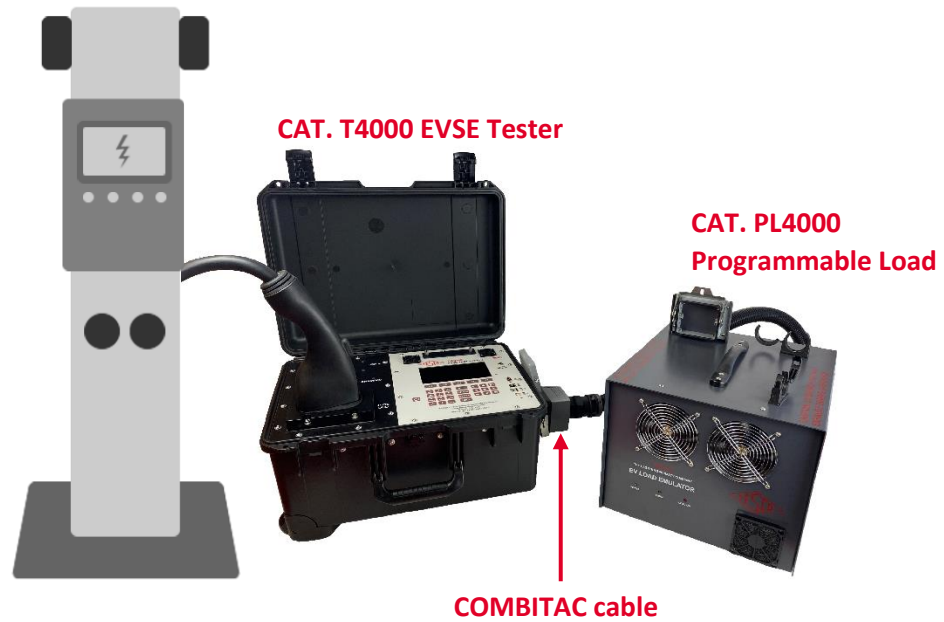


Figure 1.0 Suggested TS400 Setup sitting on the ground.

WARNING

PL4000 air outflow can be extremely hot particularly when testing at higher load current or power. Please allow a separation distance between the T4000 and PL4000 of at least 2 feet (0.7 meters) making sure that the COMBITAC cable doesn't obstruct air outlet.

1.8.2 Airflow

WARNING

Note of the Instrument's airflow as indicated in the illustration below. This is applicable for both bench top and rack-mounted use.

PL4000 air outflow can be extremely hot particularly when testing at higher load current or power. Please allow back space of at least 6.5 feet (2 meters) for the PL4000 air outflow.



Figure 1.1 TS400 Airflow

1.8.3 Cooling Considerations

CAUTION

Damage caused by overheating may occur if the area around the air intake is restricted, the intake air is too warm, or the air filter becomes clogged.

The inlet and exhaust holes must be clear of obstruction. The air entering the instrument must be between -4°F (-20°C) and 122°F (50°C). Make sure that exhaust from another instrument is not directed into the fan inlet. Check and clean the air filter every 30 days or more frequently if the Instrument is operated in a dusty environment.

1.9 Main and Auxiliary Power Supply

The Instrument is powered by an internal rechargeable battery. The battery charge status icon can be seen in the top right corner of the T4000 LCD screen. The battery can be easily removed and replaced in the field with a spare one (sold separately).

The battery can be charged in the unit using the provided auxiliary power supply which requires a 120 VAC outlet. A car charger and a desktop charger (for external charging) are available as additional accessories.

WARNING

To avoid electrical shock, personal injury, or fire hazard, connect the factory supplied power cord to a properly grounded AC power outlet to charge the unit when not being used with an EVSE charger.

Do not charge the unit when it is connected to an EVSE charger.

CAUTION! Only charge the unit with approved power supplies.

1.10 Connection and Power-Up

The instrument’s connector employs a “make first, break last” system where upon insertion, the ground connection is established first before making power connection and maintain ground until after power connections are broken. This system helps ensure a safer connection.

1.10.1 Sequence of Test Connection and Power-Up



Figure 1.2 T4000 Connection and Power-Up

- 1- Connect the COMBITAC of PL4000 to the LOAD & CONTROL connector of T4000.
- 2- If connected, unplug the AUX power supply. Then, connect the Coupler of EVSE to the J1772 connector of T4000.
- 3- To Power ON, press the POWER button for at least 2 seconds.

1.10.2 Power-Down and Sequence of Disconnection

WARNING

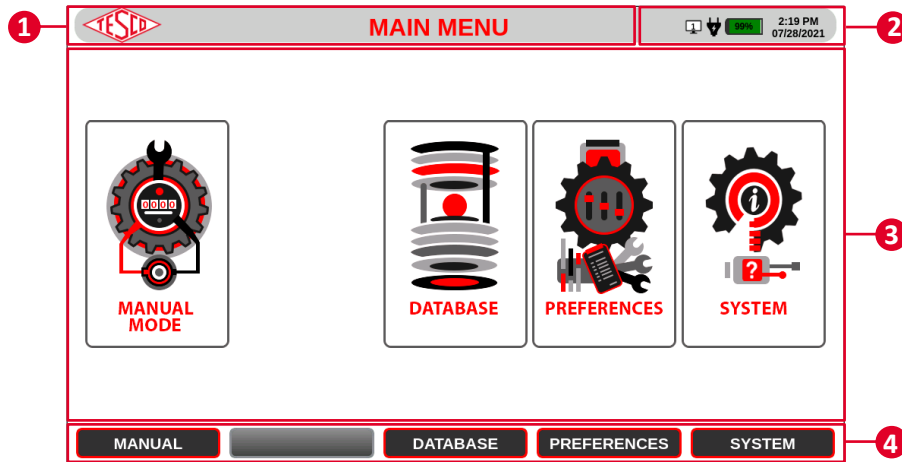
T4000 must be turned off properly before the connectors are disconnected.

- 1-** To turn off T4000, return to Main Menu and press the power button for at least 2 seconds. A dialog box appears to confirm shutdown.
- 2-** Disconnect the Coupler of EVSE to the J1772 connector of T4000.
- 3-** Disconnect the CombiTac of PL4000 to the LOAD & CONTROL connector of T4000.

1.11 GUI Screen Sections

Upon powering on the T4000, you will find the following Graphical User Interface.

The user interface is divided into four sections. In the screen, any field or button that is grayed out cannot be changed or accessed by the user.



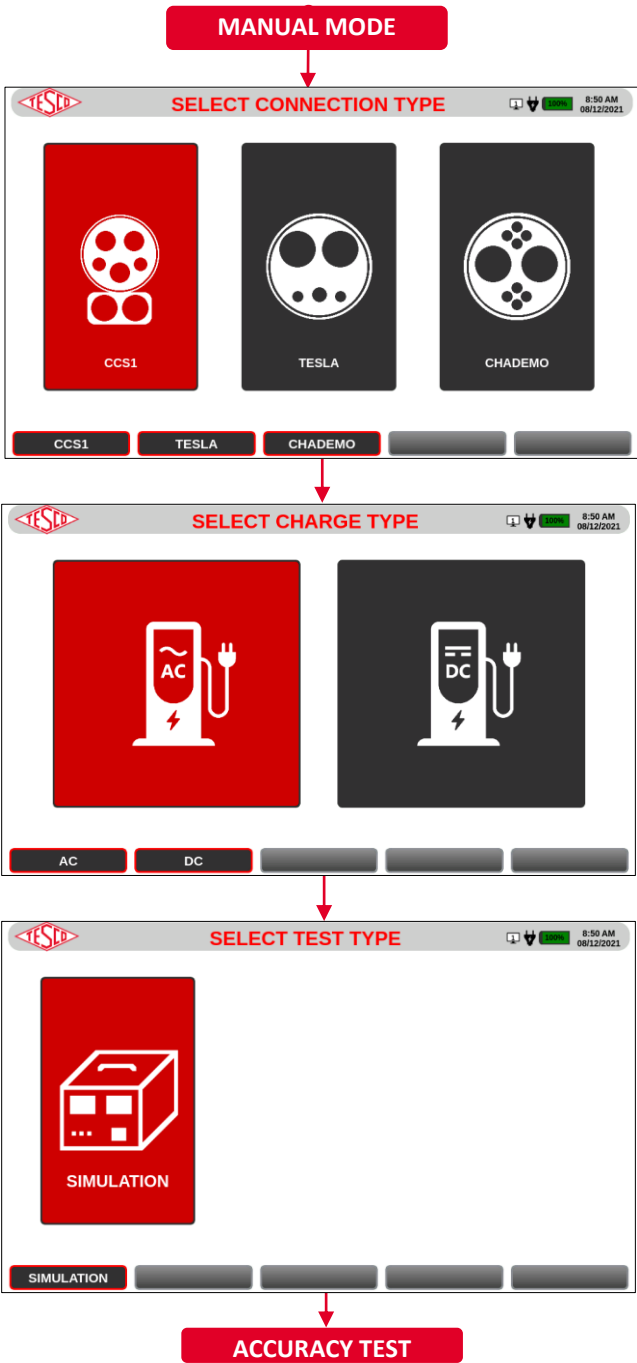
NUMBER	DESCRIPTION
1	Screen Title
2	Status Bar
3	Screen Data
4	Function Buttons

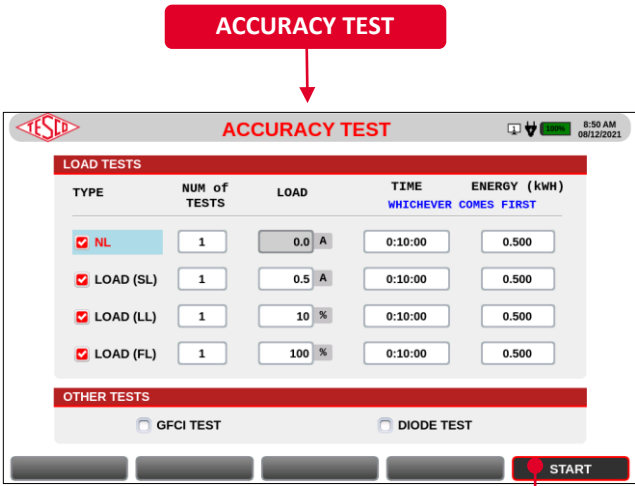
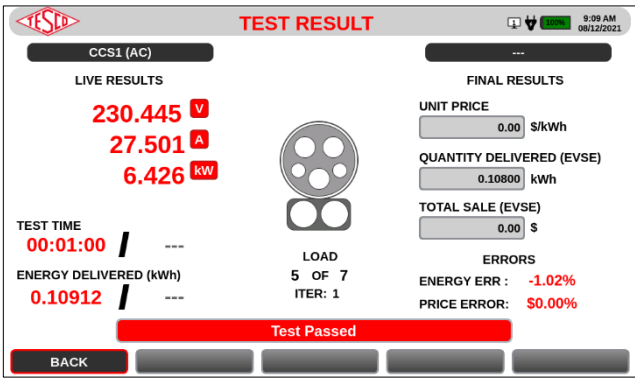
Table 3.3.1. CAT. 6330 GUI Sections

1.11.1 MAIN MENU

SCREEN	DESCRIPTION															
	<p>MAIN MENU</p> <p>The main menu contains the primary functions of the EVSE Tester. Press a function key to access a menu item.</p> <p>FUNCTION KEYS</p> <table border="1"> <tr> <td>F1</td> <td>MANUAL MODE</td> <td>Perform a manual test</td> </tr> <tr> <td>F2</td> <td></td> <td></td> </tr> <tr> <td>F3</td> <td>DATABASE</td> <td>View information on the following: <ul style="list-style-type: none"> EVSE Site Test Results Test Sequences </td> </tr> <tr> <td>F4</td> <td>PREFERENCES</td> <td>View and change system preferences</td> </tr> <tr> <td>F5</td> <td>SYSTEM INFO</td> <td>View system information</td> </tr> </table>	F1	MANUAL MODE	Perform a manual test	F2			F3	DATABASE	View information on the following: <ul style="list-style-type: none"> EVSE Site Test Results Test Sequences 	F4	PREFERENCES	View and change system preferences	F5	SYSTEM INFO	View system information
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1.11.2 MANUAL MODE

SCREEN	DESCRIPTION																																													
 <p style="text-align: center;">MANUAL MODE</p> <p style="text-align: center;">SELECT CONNECTION TYPE</p> <p style="text-align: center;">SELECT CHARGE TYPE</p> <p style="text-align: center;">SELECT TEST TYPE</p> <p style="text-align: center;">ACCURACY TEST</p>	<p>SELECT CONNECTION TYPE</p> <p>FUNCTION KEYS</p> <table border="1" data-bbox="862 470 1487 705"> <tr> <td>F1</td> <td>CCS1</td> <td>Select CCS1 (AC & DC) connection type</td> </tr> <tr> <td>F2</td> <td>CHADEMO</td> <td>Select Chademo connection type</td> </tr> <tr> <td>F3</td> <td>TESLA</td> <td>Select Tesla connection type</td> </tr> <tr> <td>F4</td> <td></td> <td></td> </tr> <tr> <td>F5</td> <td></td> <td></td> </tr> </table> <p>SELECT CHARGE TYPE</p> <p>FUNCTION KEYS</p> <table border="1" data-bbox="862 898 1487 1121"> <tr> <td>F1</td> <td>AC</td> <td>Select AC charging type</td> </tr> <tr> <td>F2</td> <td>DC</td> <td>Select DC charging type</td> </tr> <tr> <td>F3</td> <td></td> <td></td> </tr> <tr> <td>F4</td> <td></td> <td></td> </tr> <tr> <td>F5</td> <td></td> <td></td> </tr> </table> <p>SELECT TEST TYPE</p> <p>FUNCTION KEYS</p> <table border="1" data-bbox="862 1339 1487 1562"> <tr> <td>F1</td> <td>SIMULATION</td> <td>Select SIMULATION test type</td> </tr> <tr> <td>F2</td> <td></td> <td></td> </tr> <tr> <td>F3</td> <td></td> <td></td> </tr> <tr> <td>F4</td> <td></td> <td></td> </tr> <tr> <td>F5</td> <td></td> <td></td> </tr> </table>	F1	CCS1	Select CCS1 (AC & DC) connection type	F2	CHADEMO	Select Chademo connection type	F3	TESLA	Select Tesla connection type	F4			F5			F1	AC	Select AC charging type	F2	DC	Select DC charging type	F3			F4			F5			F1	SIMULATION	Select SIMULATION test type	F2			F3			F4			F5		
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SCREEN	DESCRIPTION																														
 <p>The screenshot shows the 'ACCURACY TEST' screen. At the top, there is a red box labeled 'ACCURACY TEST'. Below it is a table with columns: TYPE, NUM of TESTS, LOAD, TIME, and ENERGY (kWh). The table lists four load tests: NL, LOAD (SL), LOAD (LL), and LOAD (FL). Each test has a 'NUM of TESTS' of 1 and an 'ENERGY (kWh)' of 0.500. The 'LOAD' column shows values: 0.0 A, 0.5 A, 10 %, and 100 %. Below the table are checkboxes for 'GFCI TEST' and 'DIODE TEST'. At the bottom right, there is a red 'START' button.</p>	<p>FUNCTION KEYS</p> <table border="1"> <tr> <td>F1</td> <td></td> <td></td> </tr> <tr> <td>F2</td> <td></td> <td></td> </tr> <tr> <td>F3</td> <td></td> <td></td> </tr> <tr> <td>F4</td> <td></td> <td></td> </tr> <tr> <td>F5</td> <td>START</td> <td>Starts the Manual Test</td> </tr> </table> <p>Wait until the test completes and the Test Results shows.</p> <p>FUNCTION KEYS</p> <table border="1"> <tr> <td>F1</td> <td>BACK</td> <td>Returns to the previous screen</td> </tr> <tr> <td>F2</td> <td></td> <td></td> </tr> <tr> <td>F3</td> <td></td> <td></td> </tr> <tr> <td>F4</td> <td></td> <td></td> </tr> <tr> <td>F5</td> <td></td> <td></td> </tr> </table>	F1			F2			F3			F4			F5	START	Starts the Manual Test	F1	BACK	Returns to the previous screen	F2			F3			F4			F5		
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F5																															
 <p>The screenshot shows the 'TEST RESULT' screen. It displays 'LIVE RESULTS' with values: 230.445 V, 27.501 A, and 6.426 kW. It also shows 'FINAL RESULTS' including 'UNIT PRICE' (0.00 \$/kWh), 'QUANTITY DELIVERED (EVSE)' (0.10800 kWh), and 'TOTAL SALE (EVSE)' (0.00 \$). There are also 'ERRORS' listed: 'ENERGY ERR : -1.02%' and 'PRICE ERROR: \$0.00%'. A red bar at the bottom says 'Test Passed'. A 'BACK' button is at the bottom left.</p>																															