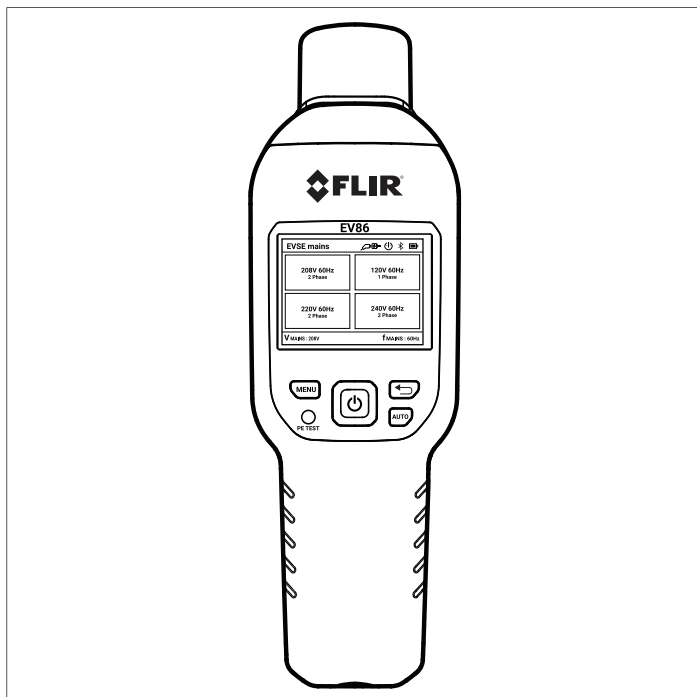


## EV Charger Analyser with Meterlink® EV86-NACS, EV86-T2



# Introduction

Thank you for your purchase of the Flir EV86 EV Analyser. The EV86 performs EV safety and operational checks on charging stations and AC wall outlets and includes tests for insulation integrity and earth loop resistance.

The EV86 is rated CAT II 300 V and is compliant with IEC 61851-1 (EV Safety). The EV86 offers wireless connectivity, for use with the Meterlink® mobile app.

This Quick Start provides brief information, please download the User Manual from the Flir website for complete instructions.

## EV86-NACS

The EV86-NACS is designed to test NACS charging stations and AC wall outlets in North American commercial and residential installations. It is equipped with a built-in NACS plug and is compatible with SAE J1772 Type 1 stations. A NACS to Type 1 converter is included.

## EV86-T2

The EV86-T2 is designed to test EV charging stations (Modes 1, 2, 3) and AC wall outlets outside North America. It is equipped with a built-in IEC 62196-2 Type 2 plug for Type 2 charging stations and is compatible with SAE J1772 Type 1 charging stations. A Type 2 to Type 1 converter is included.

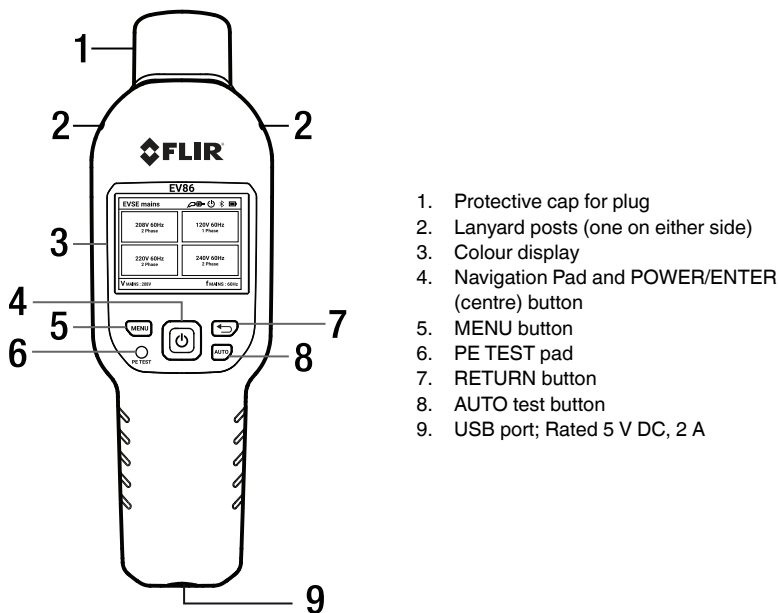
# Safety Warnings

## WARNING! ⚠

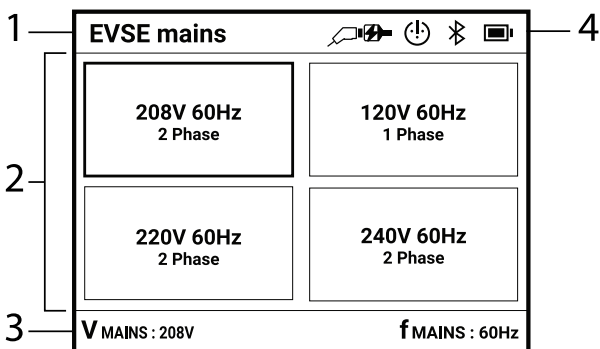
- Read and understand all safety instructions before use.
- Connect this device to charging stations only as indicated.
- Operate this device only at the specified measurement category, voltage, and current.
- Do not use the device if it behaves abnormally or has obvious physical damage.
- Do not use any cable assemblies if they appear damaged.
- Use care when working with voltages > 30 V AC RMS, 42 V AC peak, or 60 V DC; there is a risk of electrical shock.
- Do not use in direct sunlight for extended periods.
- Do not use in damp or wet environments.

# Descriptions

## METER DESCRIPTION



## BASIC DISPLAY DESCRIPTION



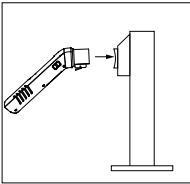
1. Title of current screen
2. Main display area
3. Footer for additional data. Mains voltage and frequency shown here.
4. Status icons (left to right): Charging status, APO, Bluetooth, battery status.

## BUTTON DESCRIPTIONS

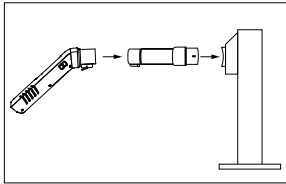
|                                                                                              |                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | Press to show the operation menu.                                                                                                                                  |
| <br>PE TEST | Place and remove finger on pad as prompted, for protective earth test.                                                                                             |
|             | RETURN button. Press to return to previous screen.                                                                                                                 |
| <br>AUTO    | Automatic test. Long press to start automatic testing. To choose the tests that will run when auto testing is started, go to the Settings menu and open Auto Test. |
|             | Navigation pad (left, right, up, down perimeter buttons) and centre ENTER/POWER button.                                                                            |

## Connect Tester to the Charger

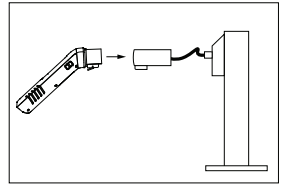
- As shown below, connect directly to the charging station socket (1), connect to the supplied converter, and then to the charging station socket (2), or connect to the charging station's cable socket (3).
- Initialize charging. For commercial chargers, this is typically done by scanning a QR code using a charging mobile app.



1



2



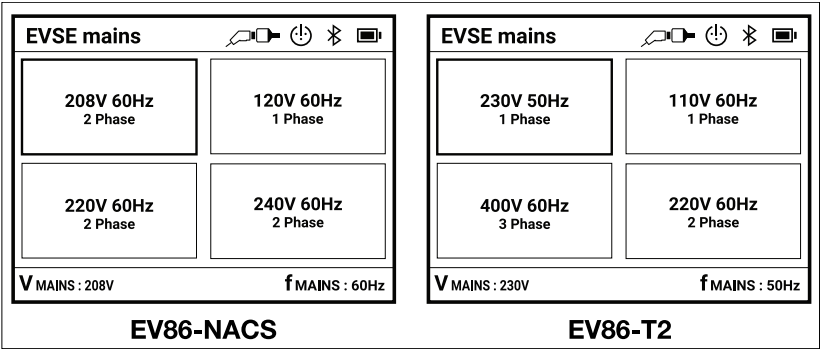
3

## Meter Power

The EV86 is powered by a rechargeable lithium battery. Long press  to switch ON. The unit will beep and the display will switch ON. To recharge the battery, connect the supplied USB cable to the port on the bottom of the unit (under the flap) and to an AC power source. The battery is not user-serviceable.

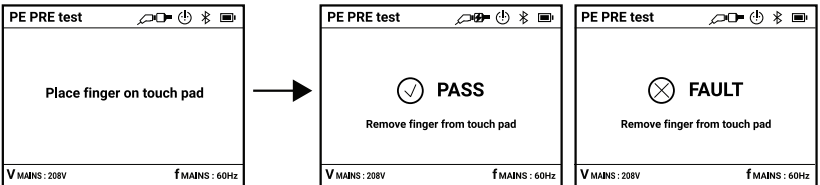
# Select Mains Voltage, Frequency, Phase

Navigate to the appropriate configuration, using the navigation buttons, and press ENTER to confirm. Perform the PE test when prompted.



## Protective Earth (PE) Test

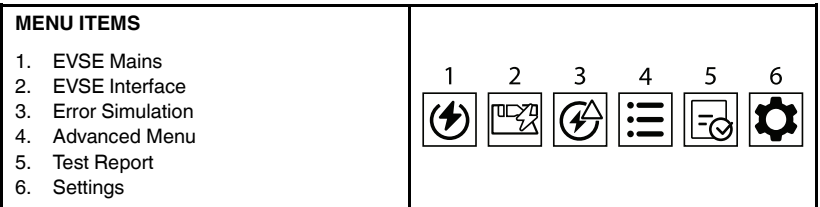
1. When prompted, place finger on the PE TEST pad; release, when prompted.
2. If the test fails, the charger's ground system may be malfunctioning. Correct the issue before proceeding.
3. If the test passes, the display will show the selected voltage and frequency (bottom).
4. Press the MENU button twice to show the operation menu.



## Operation Menu

After the PE test, press the MENU button twice to show the menu icons.

Use the navigation pad to scroll through the menu options. Use the ENTER button to select an option or to respond to a prompt. Use the RETURN button to return to the previous screen.



**EVSE Mains**

As explained above, use the navigation pad to select the EV charger’s mains voltage, frequency, and phase. Press ENTER to confirm.

**EVSE Interface**

The EVSE interface dashboard will appear, as shown in example image, below. The flashing display prompt (lower right) will instruct you to press the centre key to begin testing. The colour-coded circles next to the display fields indicate test status: green (pass), red (fail), and yellow (warning).

To change the CP state, use the navigation pad. The selected state letter (B, C, D, etc.) appears boxed on the lower right display corner.

EVSE interface

L1 - L2

0.0 V

L1 - PE

0.0 V

L2 - PE

0.0 V

L3 - PE

0.0 V

f

0.0 Hz

CP state

I<sub>max</sub>

0 A

+0.0 V

0.0 %

0V

0.0 V

0.00 kHz

Press center key to test

Control Pilot:

B

C

D

**Error Simulation (PE and CP)**

Select the PE (protective earth) or CP (control pilot) error simulation using the navigation pad. The display will prompt you to press ENTER to start the test. The display will show PASS or FAULT when the test is complete.

Error simulation

PE Error

CP Error

V MAINS : 208V

f MAINS : 60Hz

Error simulation

PE Error

✓ PASS

CP Error

✓ PASS

V MAINS : 208V

f MAINS : 60Hz

## Advanced Menu

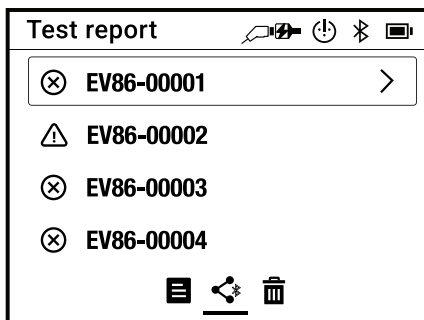
Use the navigation pad, Enter button, and Return button to navigate and select options for the items below. For complete information, refer to the User Manual.

- Auto Test: Automatically run the tests specified in the Settings menu.
- CP Waveform: View the Control Pilot waveform and other CP data.
- Loop Impedance: Test the resistance of the charging system.
- CCID or RCD: Test the ground trip circuit.

## Test Report

After a test, save or discard a report when prompted. In the test report menu, the list of saved reports will appear, as shown below. Scroll to a report and press ENTER to highlight its filename.

Icons for reading, sharing, and deleting will appear for the highlighted report. Enable Bluetooth, in the Device Settings menu, to share saved test reports with mobile devices.



## Settings

Use the navigation pad, Enter button, and Return button to navigate and select options for the items below. For complete information, refer to the User Manual.

- Auto Test Items: Select the items to run when Auto Test is initiated.
- Device Settings: Configure the local language, APO, Bluetooth, brightness, sound, and factory default utility.
- System Information: View serial number, firmware version, storage memory, and other system data.

# Specifications

## GENERAL

|                 | EV86-T2                                | EV86-NACS                |
|-----------------|----------------------------------------|--------------------------|
| Display         | 8.9 cm (3.5 in.) TFT LCD               |                          |
| Plug            | IEC 62196-2 Type 2 plug                | NACS plug                |
| Converter       | IEC 62196-2 Type 2 to SAE J1772 Type 1 | NACS to SAE J1772 Type 1 |
| Category rating | CAT II 300 V                           |                          |
| Fuse            | 250 V AC (1 A)                         |                          |
| Battery         | Rechargeable 3.7 V, 5700 mAh, LiPo     |                          |

## PHYSICAL

|                        |                                         |
|------------------------|-----------------------------------------|
| Weight                 | 760 g (1.7 lbs.)                        |
| Dimensions (L x W x H) | 296 x 94 x 50 mm (11.6 x 3.7 x 2.0 in.) |

## ENVIRONMENTAL

|                      |                                                                                                              |
|----------------------|--------------------------------------------------------------------------------------------------------------|
| Operating conditions | -10 to 30°C (14 to 86°F), <85% RH<br>30 to 40°C (86 to 104°F), <75% RH<br>40 to 50°C (104 to 122°F), <45% RH |
| Storage conditions   | -20 to 60°C (-4 to 140°F), 0 to 80% RH (without batteries)                                                   |
| EMC                  | EN 61326-1                                                                                                   |
| Drop test            | 2 m (6.6 ft.)                                                                                                |
| IP rating            | IP40                                                                                                         |

## CONNECTIVITY

|                         |               |
|-------------------------|---------------|
| Wireless technology     | Bluetooth BLE |
| Communications protocol | Meterlink     |
| Bluetooth range         | 10 m (32 ft.) |

## EVSE Supply Options

| EV86-T2                    | EV86-NACS                |
|----------------------------|--------------------------|
| 230 V, 50 Hz, one phase    | 208 V, 60 Hz, two phases |
| 100 V, 60 Hz, one phase    | 220 V, 60 Hz, one phase  |
| 400 V, 50 Hz, three phases | 120 V, 60 Hz, one phase  |
| 220 V, 60 Hz, two phases   | 240 V, 60 Hz, two phases |

## ELECTRICAL TESTS

|                               |                                                          |
|-------------------------------|----------------------------------------------------------|
| Protective Earth (PE)         | Passes when < 50 V AC/DC is detected                     |
| Proximity Pilot (PP)          | Detects 'no proximity' and 'proximity detected, latched' |
| CP error (E state) simulation | Pass / Fault (CP signal short-circuited to PE)           |
| PE error simulation           | Pass / Fault (interruption of PE conductor)              |
| RCD/CCID trip test            | Pass / Fault (Test RCD/CCID activation, when tripped)    |

## CERTIFICATIONS and COMPLIANCE

|                   |                            |
|-------------------|----------------------------|
| Certifications    | ETL, CE, RCM               |
| Environmental     | WEEE, RoHS, REACH, Prop 65 |
| Safety compliance | IEC 61010-1 CAT II-300 V   |

## Customer Support

|                                            |                                                                                 |
|--------------------------------------------|---------------------------------------------------------------------------------|
| Customer Support Telephone List            | <a href="https://support.flir.com/contact">https://support.flir.com/contact</a> |
| Repair, Calibration, and Technical Support | <a href="https://support.flir.com">https://support.flir.com</a>                 |

## Warranty

This product is protected by Flir's Limited Three-Year Warranty. Visit [www.flir.com/testwarranty](http://www.flir.com/testwarranty) to read the warranty document.







# QUICK START

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**Website**

<http://www.flir.com>

**Customer support**

<http://support.flir.com>

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