User Manual

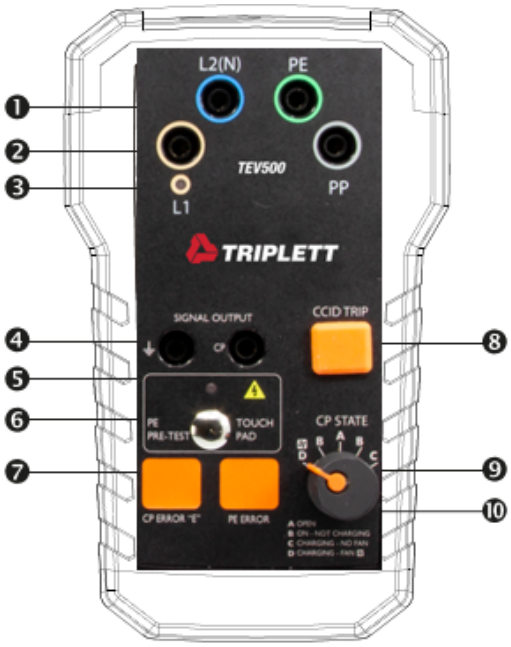
TRIPLETT

TEV500

PRO Electric Vehicle Charger Test Kit

CE

Operation Elements and Connectors



1. Measuring terminals L2 (N), PE
2. Measuring terminals L1, PP
3. Phase indicators LED for L1
4. PE and CP Signal output terminals
5. PE Pre-Test warning light indicator
6. PE Pre-Test touch probe
7. “E” - CP Error simulation button
8. CCID TRIP test button
9. CP (Control Pilot) State rotary switch selector (A, B, C, D)
10. PE Error (Earth Fault) simulation button

Adapter is equipped with 25 cm cable with type 1 EVSE connector.

Content

References marked on instrument or in instruction manual

⚠ Warning of a potential danger, follow with instruction manual.

☞ Reference! Please use utmost attention.

⚠ Caution! Dangerous voltage. Danger of electrical shock.

Ground terminal

Continuous double or reinforced insulation category II IEC 536 / DIN EN 61140.

CE Conformity symbol, the instrument complies with the valid directives. It complies with the EMC Directive (2014/30/EU), Standard EN 61326 is fulfilled. It also complies with the Low Voltage Directive (2014/35/EU) Standards EN 61010-1 and EN 61010-031.

Instrument fulfils the standard (2012/19/EU) WEEE. This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

Safety references

⚠ The respective accident prevention regulations established by the professional associations for electrical systems and equipment must be strictly met at all times.

⚠ In order to avoid electrical shock, the valid safety and VDE regulations regarding excessive contact voltages must receive utmost attention, when working with voltages exceeding 120V (60V) DC or 50V (25V)rms AC. The values in brackets are valid for limited ranges (as for example medicine and agriculture).

⚠ Measurements in dangerous proximity of electrical systems are only to be carried out in compliance with the instructions of a responsible electronics technician, and never alone.

⚠ If the operator's safety is no longer ensured, the instrument is to be put out of service and protected against use. The safety is no longer insured, if the instrument:

- shows obvious damage
- does not carry out the desired measurements
- has been stored for too long under unfavorable conditions
- has been subjected to mechanical stress during transport.

⚠ The instrument may only be used within the operating ranges as specified in the technical data section.

☞ Avoid any heating up of the instrument by direct sunlight to ensure perfect functioning and long instrument life.

⚠ The opening of the instrument for fuse replacement, for example, may only be carried out by professionals. Prior to opening, the instrument has to be switched off and disconnected from any current circuit.

⚠ The instrument may only be used under those conditions and for those purposes for which it was conceived. For this reason, in particular the safety references, the technical data including environmental conditions and the usage in dry environments must be followed.

When modifying or changing the instrument, the operational safety is no longer ensured.

Testing of the charging station

PE Pre-Test

Prior all other tests PE pretest must be successfully carried out.

The PE Pre-Test allows the operator to test the PE conductor for possible presence of dangerous voltage against earth.

Normally the PE conductor is connected to earth and has no voltage against earth.

In the case when PE conductor is not connected to earth (mistakenly connected to phase or possibly broke) it can bring operator or users into the life hazard situation.

Test procedure:

- Connect the test adapter to the charging station.
- Touch the probe (no. 5 on the picture) with a bare finger.
- If light indicator (no. 6 on the picture) is illuminated, then dangerous voltage is present at PE conductor. Stop further testing immediately and check for a possible wiring fault.

Do not wear gloves while performing this test and ensure a proper connection to earth. Never touch any metal parts during this test. In case of improper earthing (e.g., operators body isolated from the earth) this test may be not reliable.

Control Pilot (CP) State (Vehicle Simulation)

With the CP State rotary switch selector various vehicle states can be simulated. Vehicle states are simulated with different resistances connected between CP and PE conductors. Correlation between resistance and vehicle states is shown in Table below.

Vehicle State	State Description	CP-PE Resistance	CP terminal voltage
A	Electric vehicle not connected	Open (∞)	±12V @ 1KHz
B	Electric vehicle connected, not ready to charge	2.74K	+9V/-12V @ 1KHz
C	Electric vehicle connected, ready to charge, ventilation not required	882Ω	+6V/-12V @ 1KHz
D	Electric vehicle connected, ready to charge, ventilation required	246Ω	+3V/-12V @ 1KHz

CP Signal output terminals

CP output terminals are short connected to the CP and PE conductors of the tested charging station via the test cable (no.4 on the picture).

Use an oscilloscope to check the waveform and amplitude of the CP signal.

Control Pilot function uses Pulse Width Modulation (PWM) to code communication between a vehicle and charging station. The duty cycle of the PWM signal defines the possible available charging current, while amplitude defines charger state.

For details of communication protocol please refer to IEC/EN 61851-1 and the documentation of the manufacturer of the charging station.

It is allowed to use these for measuring purposes only. It is not allowed to draw current trough those sockets or supply anything else. An appropriate measurement instrument is needed.

Important note: In the case of wrong wiring of the charging station, low signal CP test terminals can get high, live hazard voltage.

CP Error "E" simulation

"E" - CP Error simulation button (no. 7 on the picture). With pushed button "E" operator can simulate behavior of the station when there is established a short circuit between CP and PE through internal diode (acc. to standard IEC/EN 61851-1). In the case of CP Error ("E" is pushed), result should be aborting of the charging process and new charging process is prevented.

PE Error (Earth Fault) simulation

With the PE Error button (no. 10 on the picture), interruption of the PE conductor is simulated. As a result, the pending charging process is aborted and new charging process is prevented.

CCID TRIP test

When the CCID TRIP button (no. 8 on the picture) is pressed, connection between L1 and PE trough 4,7K power resistor is established and CCID from the station should abort charging process.

Phase indicator

The phase indicator is LED for phase (L1) (no. 3 on the picture). When the test adapter is connected to the charging station and phase voltage on L1 is present at the charging connector, the LED indicator will illuminate.

- In the case neutral (N) conductor is not present or it is interrupted, LED indicator will not indicate possible voltage presence at L1 conductor.

Measuring terminals L1, L2(N), PE and PP

Measuring terminals (no. 1 and 2 on the picture) are directly connected to L1, L2(N), PE and PP conductors of the tested charging station. It is allowed to use these for measuring purposes only. It is not allowed to draw current over a longer period or supply anything else. An appropriate measurement instrument is needed.

Cleaning

If the instrument is dirty after daily usage, it is advised to clean it by using a humid cloth and a mild household detergent. Prior to cleaning, ensure that instrument is switched off and disconnected from external voltage supply and any other instruments connected (such as UUT, control instruments, etc.).

Never use acid detergents or dissolvent for cleaning.

Specifications

Input voltage:	max. 130V (single phase), 50/60Hz
Measurement Category:	CAT II 300V
CP simulation:	States A, B, C, D
Error simulation:	CP error "E", PE (earth fault) error

CCID TRIP simulation: Yes (>25mA @130V)

PE Pre-Test: Yes

Test connector type:	IEC62196-2 Type 1 male
Test cable length:	25 Cm
Working temperature:	0 … +40ºC
Storage temperature:	-10 … +50ºC
Humidity:	0-80% RH

Warranty

Triplett Test Equipment and Tools extends the following warranty to the original purchaser of these goods for use. Triplett warrants to the original purchaser for use that the products sold by it will be free from defects in workmanship and material for a period of (1) one year from the date of purchase. This warranty does not apply to any of our products which have been repaired or altered by unauthorized persons in any way or purchased from unauthorized distributors so as, in our sole judgment, to injure their stability or reliability, or which have been subject to misuse, abuse, misapplication, negligence, accident or which have had the serial numbers altered, defaced, or removed. Accessories, including batteries are not covered by this warranty