



## EVCA210

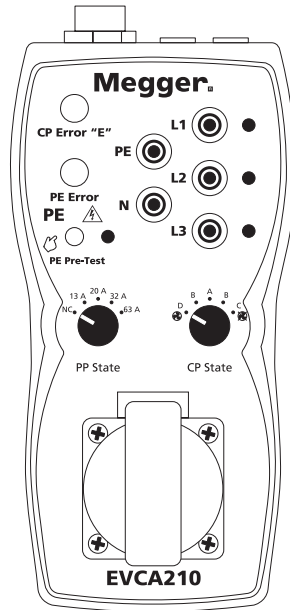
Electric vehicle charge-point adaptor

### User guide

### EN

# EVCA210 Electric vehicle charge-point adaptor

## 1. Introduction



Thank you for purchasing the Megger EVCA210 (Electric Vehicle Charge-point Adaptor).

For your own safety and to get the maximum benefit from your instrument, please ensure that you read and understand the following safety warnings and instructions before using the instrument.

This user guide describes the operation and functions of the EVCA210 Electric Vehicle Charge-point Adaptor:

Megger Limited reserves the right to change the specification of these instruments at any time without notice.

## 2. Safety Warnings

### EVCA210 Electric Vehicle Charge-point Adaptor

**Safety Warnings** and Precautions must be read and understood before the instrument is used. They must be observed during use.

**THE INSTRUMENT MUST BE USED ONLY BY SUITABLY TRAINED AND COMPETENT PERSONS.**

National Health and Safety Legislation requires users of this equipment and/or their employers to carry out valid risk assessments of all electrical work so as to identify potential sources of electrical danger and risk of electrical injury, such as inadvertent short circuits, so that safe working procedures can be followed.

## EVCA210 Electric vehicle charge-point adaptor

This instrument is internally protected against electrical damage when used for the purposes of testing electric vehicle charging points as defined herein. If used in a manner other than those defined in this user guide the protection capabilities could be impaired with potential risk to the operator and the instrument.

Circuit connections and exposed-conductive-parts and other metalwork of an installation or equipment under test must not be touched during testing.

The live phase indicators are an additional safety feature which may fail; therefore safe working practices must be observed

Check that all test leads and plugs are in good order, clean and with no broken or cracked insulation before use.

The instrument, leads and plugs should not be used if any part is damaged.

All test leads supplied with the instrument form part of the measuring circuit of the instrument. They must not be modified or changed in any way, or be used with any other electrical instrument or appliance

Replacement fuses must be of the correct type and rating. Failure to fit the correctly rated fuse may result in a safety hazard and may cause damage to the instrument in the event of an overload.

If no voltage is present between the L & N of the terminals or between the L & N of the front mains plug socket when the EVCA210 is connected to the charging point, using the appropriate charging plug and the charging point is in charging mode, this may be because the EVCA210 internal fuse has blown.

In the event of no neutral (N) connection, the phase indicator LED's will not light but phases may still be live.

The PE Pre-Test must be carried out prior to any other testing. If this test fails, further testing must cease, and faults must be investigated and rectified before continuing as there may be a potentially high voltage present within the charging point and on the output terminals and therefore a high risk of electric shock to the operator and other persons nearby.







**CATIV** Measurement category IV: Equipment connected between the origin of the low-voltage mains supply outside the building and the consumer unit.

**CATIII** Measurement category III: Equipment connected between the consumer unit and the electrical outlets.

**CATII** Measurement category II: Equipment connected between the electrical outlets and the user's equipment.

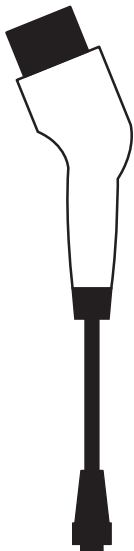
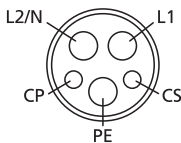
# EVCA210 Electric vehicle charge-point adaptor

## Symbols used on the instrument

-  Caution: risk of electric shock
-  Caution: risk of danger – consult the user instructions
-  Equipment protected throughout by Double Insulation (Class II)
-  Equipment complies with relevant EU Directives
-  Do not dispose of in the normal waste stream
-  Earth (ground)

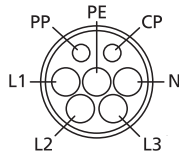
## General Description

### Type 1 Plug



EV Type 1 -Charging Plug  
(EVCA210-UK only)

### Type 2 Plug



EV Type 2  
Charging Plug

### Case contents

- 1 x EVCA210 Electric Vehicle Charge-point Adaptor
- 1 x 32A Type 2 EV charging plug
- 1 x 32A Type 1 EV charging plug (EVCA210-UK Only)
- Zip-up carry case
- Quick start guide

The Electric Vehicle Charge-point Adaptor, EVCA210, is a compact and portable unit, designed to allow the electrical contractor to test the function and safety of AC Mode 3 Electric Vehicle charge points and has been specifically designed to allow testing of charging points in accordance with the IEC/EN 62851-1 and IEC/HD 60364-7-722 standards, in combination with suitable test instruments.

# EVCA210 Electric vehicle charge-point adaptor

## Required electrical tests are as follows:

1. Visual Inspection
2. Continuity of protective conductors and bonding
3. Insulation resistances
4. Earth loop impedance
5. RCD operation
6. Phase sequence (on 3-phase systems)

## Required function tests to include:

1. Error handling (Earth fault)
2. Communication
3. Vehicle state
4. Mechanical locking of plug
5. Other tests as appropriate

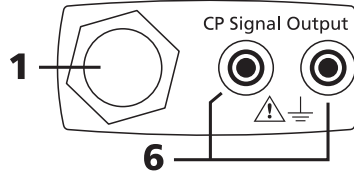
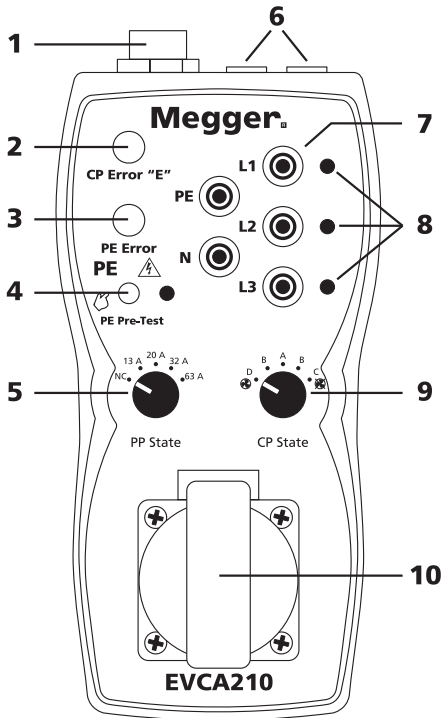
All leads supplied with the EVCA210 form part of the measuring circuit of the adaptor and must not be modified or changed in any way.

## The EVCA210 has the following operational features:

- PE Pre-Test to test for the presence of dangerous voltages at the PE terminal, prior to undertaking any testing, via a touch button electrode with LED lamp indication.
- Live phase-neutral indication of all three phases via LED lamps.
- Rotary switch providing PP State (Proximity Pilot) for EV vehicle presence and current state simulation - NC, 13 A, 20 A, 32 A & 63 A.
- Rotary switch providing CP State (Control Pilot) for simulation of EV status - A, B, C & D (C & D both vented & un-vented).
- Push button for CP (Control Pilot) Error "E" simulation (CP signal short-circuited to PE)
- Push button for PE Error (Earth Fault) simulation.
- Five 4 mm ports for connection of suitable test instrument leads (PE, N, L1, L2 & L3)
- 13A socket for simple test instrument lead connection.
- CP (Control Pilot) signal test sockets. Two 4 mm ports for connection to an oscilloscope.
- Both Type 1 and Type 2 charging plugs

# EVCA210 Electric vehicle charge-point adaptor

## General operating instructions



1. EV test cable connector
2. CP Error "E" button
3. PE Error (Earth fault) button
4. PE Pre-Test touch pad and PE Pre-Test warning LED
5. PP State rotary selector switch
6. CP Signal output terminals (4 mm)
7. Measuring terminals PE, N, L1, L2, L3 (4 mm)
8. Phase indicator LEDs for L1, L2, L3 terminals
9. CP State rotary selector switch
10. Mains plug socket\* (Test purposes only / Maximum 10 A)

\*EVCA210-UK Front mains socket = UK 13A socket

\*EVCA210 Front mains socket = Schuko socket (CEE 7/3)

The EVCA210 is designed to test the function and safety of charging points mode 3 for AC charging. This adaptor allows you to conduct tests using appropriate test instruments such as appropriate Megger MFT Multifunction testers. With this adaptor, charging points can be tested in accordance with IEC/EN 62851-1 and IEC/HD 60364-7-722.

Before carrying out testing with this adaptor, the operator should be familiar with all relevant standards associated with the tests being undertaken.

The Megger EVCA210 test adaptor is designed to simulate the connection of an electrical vehicle to the charging point under test.

Connection of the EVCA210 adaptor to a charging point triggers the charging process in the charging point with the Control Pilot (CP) switch on the adaptor selecting the appropriate charging mode.

# EVCA210 Electric vehicle charge-point adaptor

The following charging capabilities can be simulated: N/C (No Connection), 13 A, 20 A, 32 A and 63 A, as well as all the possible electrical vehicle modes A, B, C (un-vented) & D (vented), via the selection switches.

Also provided are 4 mm connection ports L1, L2, L3, N, PE and CP signal terminals to which appropriate measuring equipment can be connected for further testing. Charging points should be tested as part of the initial installation and checked periodically.

The Megger EVCA210 has available two connection cables with the following plug options:

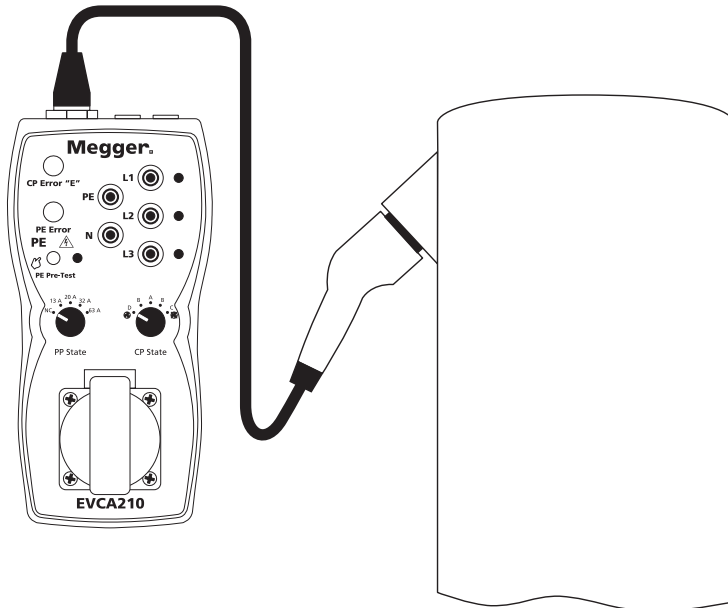
Type 2 connector plug - for charging points with panel mounted socket outlet or fixed cable with Type 2 vehicle socket connector

Type 1 connector plug\* - for charging points with fixed cable and Type 1 vehicle socket connector (Example Mitsubishi PHEV).

\*Note: Only the EVCA210-UK is supplied with the Type 1 charging plug as standard

## Connecting the EVCA210 test adaptor to the charging Point:

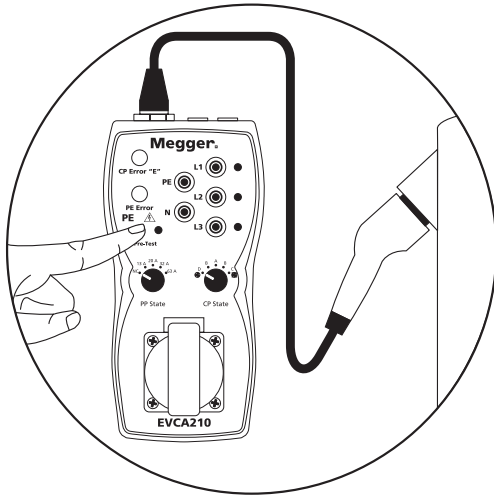
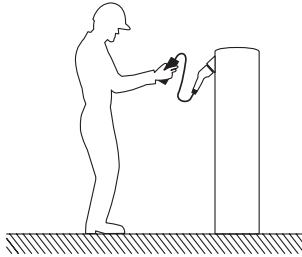
1. Connect corresponding test cable Type 1 or Type 2 to the test adaptor EVCA210
2. Connect EVCA210 to the charging point to be tested using chosen charging plug cable.



EVCA210 adaptor connection to the charging point.

# EVCA210 Electric vehicle charge-point adaptor

## Testing a Charging Point



The PE Pre-Test is an integral safety feature of the EVCA210 adaptor. It allows the operator to test the PE conductor for possible presence of a dangerous voltage, prior to testing the charge point.

Under normal conditions, the PE conductor is connected to earth and therefore no hazardous voltage should be present. Should a fault condition occur e.g. if the PE conductor is connected to a phase or any insulation within the EVCA210 or associated plugs and cables has been damaged, then a hazardous situation may arise.

With the EVCA210 adaptor connected to the charging point, touch the PE Pre-test button with a bare finger. If the LED indicator illuminates, then there is a dangerous voltage present on the PE conductor. Stop testing immediately and investigate the circuit and rectify before continuing. Do not touch any metal parts while performing this test.

Possible faults are:

Voltage present on PE (e.g. connected to phase)

PE Missing or disconnected

If the operator is isolated from ground through rubber matting or wearing gloves etc. the touch-test result will be unreliable and an alternative method should be employed to confirm the PE connection.

## Electrical Testing

The EVCA210 gives the operator the ability to connect their electrical test equipment to the charging point under test, in a controlled and safe manner, and to undertake the electrical safety testing of the charge point and its associated circuits. With the correct cable connected and the EVCA210 CP and PP settings correctly set (see below for details), the operator can connect either single or multifunction test equipment to the adaptor to undertake the following live tests:

- Earth loop impedance
- RCD operation
- Phase sequence
- Proximity Pilot - PP State



## EVCA210 Electric vehicle charge-point adaptor

With the EVCA210 adaptor connected to the charging point, use the PP State rotary switch to simulate any of the listed current capabilities of a charging cable. Different resistances between the PP and PE conductors define the current value, as listed in the following table:

Selection of cable current capability	Resistance between PP and PE
NC (No Cable)	Open - Infinity
13 A	1.5 k $\Omega$
20 A	680 $\Omega$
32 A	220 $\Omega$
63 A	100 $\Omega$

Note: The EVCA210 does load the circuit and will not draw significant current for this measurement.

### Control Pilot - CP State

With the EVCA210 adaptor connected to the charging point, use the CP State rotary switch to select different simulated vehicle states. Different resistances between the CP and PE conductors define the

Selection of Vehicle State	Vehicle State	Resistance between CP and PE	Voltage at CP terminal
A	Electric vehicle not connected	Open - Infinity	$\pm 12$ V 1 kHz
B	Electric vehicle connected, not ready to charge	2.74 k $\Omega$	+9 V / -12 V 1 kHz
C	Electric vehicle connected – ready to charge (ventilation not required)	882 $\Omega$	+6 V / -12 V 1 kHz
D	Electric vehicle connected – ready to charge, (ventilation required)	246 $\Omega$	+3 V / -12 V 1 kHz

different vehicle states, as per the table below:

4mm CP Signal output ports are located on the top of the EVCA210.

These terminals are connected to the CP and PE conductors of the charging point. The green 4mm terminal is connected to PE.

The Control Pilot function uses Pulse Width Modulation (PWM) to simulate communication between a vehicle and charging point. The duty cycle of the PWM signal defines the possible available charging current.

For details of the communication protocol please refer to IEC 61851-1 and any documentation provided by the manufacturer of the charging point under test.

## EVCA210 Electric vehicle charge-point adaptor

### CP Error "E"

With the CP state set to either C or D (EV connected and ready to charge) and the PP state set to any setting except NC, by pressing the CP Error "E" button, a CP error is safely simulated. The pending charging process should stop immediately and new charging processes prevented.

### PE Error - Earth Fault simulation:

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With the CP state set to either C or D (EV connected and ready to charge) and the PP state set to any setting except NC, by pressing the PE Error button, a disconnection of the PE conductor is simulated. The pending charging process should stop immediately and new charging processes are prevented.

### Phase indicators:

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There are three LED lamps (L1, L2 & L3), one for each phase. When the EVCA210 adaptor is connected to the charging point using one of the two available charging plugs, the LED indicators will illuminate when phase voltages are detected with respect to neutral.

Notes:

In the case of no neutral (N) conductor the LED indicators will not indicate voltage on the L1, L2 or L3 conductors.

LED indicators cannot be used for phase sequence testing or indication.

If the charging point has a single-phase output, only one LED (L1) will illuminate.

### Plug socket:

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The mains plug socket on the EVCA210 is intended for measuring purposes only. It is connected to the L1, N and PE terminals of the charge point, so appropriate test instruments may be connected to the mains plug socket for testing. In addition, this socket gives the ability to check any electric power meter monitoring the charge point is working and/or counting correctly (load test). Therefore, an external load may be connected, but for measuring purposes only. The maximum current is limited to 10 A. The EVCA210 is protected against overload with a 10 A fuse.

With the EVCA connected to the charging point using one of the two available charging plugs:

- Line – Provides connection to L1 phase of charging point output plug/socket only
- Neutral – Provides connection to Neutral pin charging point output plug/socket
- Earth – Provides connection to Earth pin of charging point output plug/socket

The type of mains socket depends on the version of the EVCA210 Adaptor purchased:

- EVCA210-UK Front mains socket = UK 13A socket
- EVCA210 Front mains socket = Schuko socket (CEE 7/3)

### 4 mm Measuring Terminals L1, L2, L3, N and PE

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These are directly connected to the L1, L2, L3, N and PE conductors of the tested charging point via the connection cable. These ports are to be used ONLY for measuring purposes using an appropriate test instrument. No load should be connected across any of the terminals.

# EVCA210 Electric vehicle charge-point adaptor

With the EVCA connected to the charging point using one of the two available charging plugs:

- L1 – Provides connection to L1 phase of the charging point output plug/socket
- L2 – Provides connection to L2 phase of the charging point output plug/socket
- L3 – Provides connection to L3 phase of the charging point output plug/socket
- N – Provides connection to Neutral of the charging point output plug/socket
- E – Provides connection to Protective Earth of the charging point output plug/socket

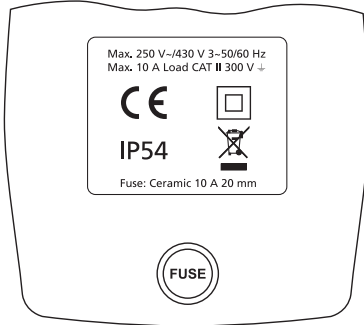
## Load Test

The front mounted mains plug socket can be used to provide a load to check any energy measuring equipment monitoring the electric vehicle charging point under test is working/counting correctly. With the CP state set to either C or D (EV connected and ready to charge) and the PP state set to any setting except NC, an external load may be connected to the mains plug socket, with a maximum current of 10A, for short durations. The EVCA210 is protected against overload by a 10 A fuse.

## Maintenance:

Should the EVCA210 adaptor be used as detailed in this user manual, no special maintenance is required. However, if functional errors occur during normal operation, contact your local Megger Repair Centre for assistance.

## Fuse Replacement:



If no voltage is present between the L & N of the 4mm terminals or between the L & N of the front mains plug socket when the EVCA210 is connected to the charging point using the appropriate charging plug and the charging point is in charging mode, this may be because the EVCA210 internal fuse has blown.

Prior to replacement of the defective fuse, the EVCA210 adaptor must be disconnected from all measuring circuits and the connection cable must be disconnected from the charging point.

Use only fuses specified and rated as follows: Ceramic 10 A/250 V (5 mm x 20 mm).

Use of uncertified fuses is prohibited.

If a fuse has blown (due to overload, fault or misconnection) follow the steps below for replacement:

1. Unscrew the fuse holder cap using an appropriate screwdriver.
2. Remove the fuse and replace it with a new one.
3. Replace the fuse holder cap.

If new fuses continue to blow, this may indicate a fault within the EVCA210 adapter; contact your local Megger Repair Centre for service.

## Specification

## EVCA210 Electric vehicle charge-point adaptor

<b>Input voltage</b>	Up to 253 V (single phase system) / up to 440 V (three phase system),
<b>Input Frequency</b>	50/60 Hz,
<b>Type 1 Charging Plug</b>	Type 1 AC charging mode 3, suitable to IEC 62196-2 type 1 or SAE J1772 with vehicle connector (Type 1, 5P single-phase)
<b>Type 2 Charging Plug</b>	Type 2 AC charging mode 3, suitable to IEC 62196-2 type 2 socket outlet or fixed cable with vehicle connector (Type 2, 7P three-phase)
<b>PE Pre-Test</b>	Yes - Button
<b>PP Simulation</b>	NC, 13 A, 20 A, 32 A, 63 A
<b>CP States</b>	A, B, C, D
<b>CP Error "E"</b>	Yes
<b>PE Error (Earth fault)</b>	Yes
<b>Measuring Ports L1, L2, L3, N and PE</b>	Max. 253/440 V AC, CAT II 300 V, max. 10 A
<b>Mains socket</b>	Max. 253 V AC, CAT II 300 V, max. 10 A,
<b>Note:</b>	Do not load mains socket simultaneously with measuring ports!
<b>CP Signal output Ports</b>	Approx. +/-12 V, CAT 0 (under normal condition)
In case of wrong wiring or error of the charging station these terminals	
<b>Measurement category</b>	CAT II 300 V
<b>Altitude above sea level.</b>	2000 m max.
<b>Dimensions (W × H × L)</b>	109 mm x 227 mm x 63 mm (without connection cable and test cable)
<b>Weight</b>	Approx: 780 g
<b>IP-rating</b>	IP54
<b>CE directive</b>	Low Voltage Directive LVD 2014/35/EU
<b>Safety</b>	IEC/EN 61010-1:2010 IEC/EN 61010-2-030:2010
<b>Working temperature range</b>	0 °C to +40 °C
<b>Storage temperature range</b>	-10 °C to +50 °C
<b>Working humidity range</b>	10 % to 85% relative humidity w/o condensation
<b>Fuse Rating</b>	Ceramic 10 A/250 V (5 mm x 20 mm)

Product manufactured in China

### Maintenance

Do not open the adapter case. It contains no user-serviceable parts. Repair or servicing should be performed only by qualified personnel.

# EVCA210 Electric vehicle charge-point adaptor

## Cleaning

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Should the EVCA210 or charging plugs require cleaning they can be wiped down using a damp cloth and mild detergent.

Never clean the adaptor or plugs when connected to any measurement circuit.

Never clean the adaptor or plugs when connected to any test equipment.

Never use a solvent based cleaner.

Never use the adaptor or plugs until they have dried completely.

## WEEE Directive

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The crossed out wheeled bin symbol on the instrument is a reminder not to dispose of the product with general waste at the end of life.

Megger is registered in the UK as a Producer of Electrical and Electronic equipment. The registration No is; WEE/DJ2235XR.

Users of Megger products in the UK may dispose of them at the end of their useful life by contacting B2B Compliance at [www.b2bcompliance.org.uk](http://www.b2bcompliance.org.uk) or by telephone on 01691 676124.

Users of Megger products in other regions should contact their local Megger office or distributor.

## Warranty (3 years)

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This product is warranted to the original purchaser against defects in material and workmanship for three years from the date of purchase. During this warranty, the manufacturer will either replace or repair the defective unit, subject to verification of the defect or malfunction.

This warranty does not cover fuses, disposable batteries, or damage from abuse, neglect, accident, unauthorised repair, alteration, contamination, or abnormal conditions of operation or handling.

Any implied warranties arising out of the sale of this product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. The manufacturer shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expense or economic loss. Some states or countries laws vary, so the above limitations or exclusions may not apply to you.

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## EVCA210 Electric vehicle charge-point adaptor





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Part No: EVCA\_A5\_UG\_en\_V01



## MFT1711, MFT1721, MFT1731 and MFT1741 Multifunction Tester



- Two and three wire non-trip loop testing for RCD protected circuits
- Type-B RCD and 3-phase RCD testing for industrial applications with no Earth
- 3-terminal earth test and stakeless testing for electrode resistance measurement
- Internal memory and Bluetooth® communications
- EN61010 CAT IV safety rating and tough IP54 case
- Megger Loop impedance "Confidence meter"
- RCD coil impedance immunity

### DESCRIPTION

The MFT1701 series is a range of 4 instruments for testing low voltage electrical installations to BS7671. They provide all the tests required to complete the necessary electrical certification for industrial, commercial and domestic fixed wiring installations, including:

- TRMS System voltage and frequency measurement
- Insulation test at 100 V\*, 250 V, 500 V and 1000 V Including input protection against live circuits up to 600 V even when insulation test is locked-on
- Continuity resistance at 200 mA or 15 mA
- Automatic start - no need to press TEST so leaving both hands free to hold probes
- Resistance range up to 100 kΩ with fast continuity buzzer at selectable thresholds
- Earth loop test
- 2 and 3 wire non-trip range
- 2 wire Hi current including phase to phase
- Prospective fault current measurement up to 20 kA
- RCD testing including:
  - Type AC, A, S, B\* and programmable RCDs
  - 3-phase RCDs\*
  - Auto-test routine
  - Fault (Touch) voltage display
- Earth spike testing
  - 2-pole/3-pole\*\*
  - ART\*\*
  - Stakeless techniques \*\*

\* Model dependent

\*\* Optional accessories required

The MFT1701 series has now been augmented with the addition of the MFT1741 model. This model include:

- Confidence meter – An adaptive loop test and display method for electrically noisy circuits
- Enhanced loop testing hardware – To remove the effects of RCD on loop impedance values

The new "Confidence Meter" technology is ideal for enhanced Earth Loop Impedance testing in electrically noisy environments. Traditional Loop Impedance methods are susceptible to circuit noise during the measurement phase. If the AC waveform changes during this period, from noise or harmonics, the distortion can create significant variation from test to test.

The new "Confidence Meter" analyses and adjusts for these variations and provides a far more stable result every time, removing the need for repeated tests.

In addition, the new MFT1741 also supports a new hardware measurement technique, removing the influence of any RCD or RCBO on the measured loop impedance value.

All instruments are IEC 61010 CAT IV 300 V rated for connection to low voltage systems with no protective device, so safe for connection anywhere on the system right up to the source transformer without risk of damage from large transient spikes.

The unique modern styling allows it to be operated while stood on the floor, a ladder-shelf or platform, hung around the neck or handheld. Dual TEST and LOCK buttons - one pair at each end - makes the testers easy to operate left or right handed.

## MFT1711, MFT1721, MFT1731 and MFT1741 Multifunction Tester

Quick to pick up and use, the controls are colour coded to make range selection easy and fast. They also reduce the chance of using the wrong function or range. The large crystal clear backlit display uses the patented Megger digital/analogue arc, providing indication of fluctuating readings while the dual digital readout shows precise values of key measurements simultaneously with the test parameters, such as the output voltage on insulation testing as well as the resistance value in MΩ.

Visible and audible safety warnings are paramount when testing high-energy systems and the MFT1701 series includes full input protection and safety warnings when a hazardous voltage is present. If live voltages exist on a circuit during insulation or continuity testing, the voltage is displayed on the screen. If this voltage exceeds a safe level, further testing is inhibited and a warning beep sounds.

The MFT1731 features internally rechargeable batteries and charger with a charge time of less than 4 hrs, so reducing the cost of ownership.

Fully compliant with all requirements of IEC 60364 derived standards including VDE 0100 and BS 7671, the new MFT includes all the latest measurement technology in a light-weight compact design, fully protected and usable on single phase and 3 phase installations.

Key measurement functions include two and three wire non-trip loop test technology for fast repeatable results, comprehensive testing of RCDs including type B, and integrated 3-terminal and stakeless clamp techniques for earth electrode testing.

The MFT1731 and MFT1741 includes built in memory and Bluetooth® communications for downloading test results using Megger Download Manager (supplied).

The new MFT1701 series has been designed for tough environments and ultimate reliability. Features include a rubber over mould for extra protection and grip, IP54 protection against dust and water and an EN61010 CAT IV safety rating. Its class leading input protection ensures the MFT can withstand accidental misuse and voltage transients when other testers can't.

All this in an intuitive and easy to use instrument with no hidden menus or complicated screens. Tests are easily selected using the colour coded rotary switches with results clearly displayed on the high contrast, dual measurement, backlit display.

Included with the instrument: standard 3-wire leadset and a mains test lead, a switched probe for fast and easy testing\*, a full 12-month calibration certificate and warranty upgradeable to 3 years. The MFT1711 and MFT1721 are supplied in a robust moulded case, and the MFT1731 and MFT1741 is supplied in a large soft pouch with plenty of additional space for optional extras like a few tools and the earth electrode test kit, comprising 2 spikes and 3 long test leads.

\* model dependant

\*\* requires optional accessory

### PRODUCT SELECTION CHART

	MFT1711	MFT1721	MFT1731	MFT1741
<b>Insulation ranges</b>				
100 V		n	n	n
250 V, 500 V	n	n	n	n
1000 V	n	n	n	n
Test voltage display	n	n	n	n
Adjustable buzzer threshold		n	n	n
<b>Continuity and resistance ranges</b>				
200 mA test	n	n	n	n
15 mA test		n	n	n
Adjustable buzzer threshold	n	n	n	n
<b>Loop testing</b>				
2 and 3 wire non-tripping L-PE 50 V ~ 280 V	n	n	n	n
2 wire Hi current L-N 50 V ~ 280 V	n	n	n	n
2 wire phase to phase L-L 50 V ~ 500 V		n	n	n
PSCC and PFC (20 kA max.)	n	n	n	n
Max. Zs display	n	n	n	n
R1 + R2 value		n		
Touch voltage display on faulty earth	n	n	n	n
<b>Earth electrode test</b>				
2 and 3 pole **			n	n
3 pole ART and Stakeless method **			n	n
<b>RCD tests</b>				
1/2, 1, 5 x I and ramp RCD test	n	n	n	n
Auto RCD test	n	n	n	n
Type AC, A and S RCDs	n	n	n	n
Type B (pure DC) RCDs		n	n	n
Programmable RCD	n	n	n	n
3-phase RCD (no earth)		n	n	n
30, 100, 300 and 500 mA RCD	n	n	n	n
10 mA and 1000 mA RCD	10mA	n	n	n
<b>Other features</b>				
Supply measurement	n	n	n	n
True RMS	n	n	n	n
Leakage current measurement **		n	n	n
Phase rotation		n	n	n
Calibration certificate	n	n	n	n
Rechargeable batteries (charger included)			n	n
SP5 Switched probe included		n	n	n
Warranty upgradeable to 3 years FREE	n	n	n	n
On board memory with Bluetooth® download			n	n
CAT IV 300 V / CATIII 600 V	n	n	n	n
Hard moulded case	n	n		
Soft pouch with additional storage			n	n
Confidence meter noise reduction				n
New hardware loop test platform				n

# MFT1711, MFT1721, MFT1731 and MFT1741 Multifunction Tester

## SPECIFICATIONS

### Insulation test

Output voltage	-0% +20% at rated load or less	
Voltage display	±3% ±3 digits ±0.5% of rated voltage	
Short circuit current	1.5 mA nominal test current	
Test current on load	1 mA at min pass values of insulation	

### Insulation accuracy

1000 Volts	10 kΩ ~ 999 MΩ	±3% ±2 digits
500 Volts	10 kΩ ~ 500 MΩ	±3% ±2 digits
	>500 MΩ	±10% ±4 digits
250 Volts	10 kΩ ~ 250 MΩ	±3% ±2 digits
	>250 MΩ	±10% ±4 digits
100 Volts	10 kΩ ~ 100 MΩ	±3% ±2 digits
	>100 MΩ	±10% ±4 digits

### Resistance and continuity

	0.01 Ω ~ 99.9 Ω	±2% ±2 digits
	100 Ω ~ 99.9 kΩ	±5% ±2 digits
Open circuit voltage	5 V ±1 V	
Test current	(0 Ω ~ 2 Ω)	
	205 mA ±5 mA	
	15 mA ±5 mA	
	(user selectable)	

### Loop test

Live to earth/neutral supply	48 V ~ 280 V (45 Hz ~ 65 Hz)	
Live to live supply (not MFT1711)	48 V ~ 500 V <sup>††</sup> (45 Hz ~ 65 Hz)	
L-N/L-L tests	±5% ±5 digits	
L-E tests <sup>†</sup>		
0.1 Ω ~ 39.9 Ω	±5% ±5 digits ± noise margin	
40.0 Ω ~ 1000 Ω	±10% ±5 digits	
Display range	0.01 Ω ~ 1000 Ω	
Live to earth PFC range	20 kA	
Live to live PSCC range	20 kA	

<sup>†</sup> Reference conditions apply

<sup>††</sup> MFT1711 280 V

For test environments see service data

### RCD tests

Supply up to 100 mA	48 V ~ 480 V <sup>**</sup> (45 Hz ~ 65 Hz)	
Supply up to 1 A	48 V ~ 280 V	
RCD type	Type AC, A, S	
	Type B (pure dc)	
No trip test	(1/2xl)	-10% ~ -0%
Trip test	(1xl, 2xl and 5xl)	+0% ~ +10%

### Ramp test

Touch voltage	(0 ~ 253 V)	+5% +15% ±0.5 V
Trip time		±1% ±1 ms
Trip current		±5%

### Step increments

VAR (variable RCD selection)		
10 mA ~ 50 mA		1 mA steps
50 mA ~ 500 mA		5 mA steps
500 mA ~ 1000 mA		10 mA steps

### Supply measurement

Voltage	10 V ~ 600 V	
	(15 ~ 400 Hz) True RMS	
	±3% ±1 V ±2 digits	
Phase rotation indication	L1-L2-L3 and L1-L3-L2	
Frequency	15 Hz ~ 99 Hz ±0.5% ±1 digit	
	100 Hz ~ 400 Hz ±2.0% ±2 digits	
Frequency resolution	0.1 Hz	

### Power supply

MFT1711 and MFT1721:

IEC LR6 type AA alkaline  
(6 cells - supplied)

MFT1731 and MFT1741:

1.2 V NiMH  
(rechargeable pack of 6 – supplied)

Mains charger for on-board re-charging (4 hours typical) 12 V car charger (cigar lighter lead - optional)

### Earth / ground test

Resolution	0.01 Ω	
Current	0.45 mA or 4.5 mA	
Noise rejection	20 V pk/pk (7 V rms)	
Max probe resistances	Rp and Rc	
	100 kΩ @ 50 V	
	5 kΩ @ 25 V	
2 and 3 pole method	(0.01 Ω ~ 1.999 kΩ)	
	±2.0% ±5 digits	
	ART method (1.00 Ω ~ 1.999 kΩ)	
	±5.0% ±5 digits <sup>**</sup>	
Stakeless method (1.00 Ω ~ 199 Ω)		
	±7.0% ±5 digits <sup>**</sup>	

### Current

(via optional clamp meter)  
±5.0% ±3 digits.

# MFT1711, MFT1721, MFT1731 and MFT1741 Multifunction Tester

Range 0.1 mA to 200 A ac

Resolution 0.1 mA

## MV sensor input

(NOT MFT1711 or MFT1721)

Including temperature (third party module)

±1.0% ±2 digits

Range 0.0 mV to ±199.9 mV dc

Resolution 0.1 mV

## Data storage

(MFT1731 and MFT1741)

Capacity: 1000 results

Bluetooth® communication

## Safety

IEC 61010-1:2010

IEC 61010-30:2010

IEC 61010-031:2008

600 V CAT III / 300 V CAT IV

(Max Phase to Phase 600 V)

IEC 61557:2007 parts 1 to 10

## EMC

IEC61326 edition 2 location class B

## Operating temperature range and humidity

-10 °C ~ +55 °C

90% R.H. at +40 °C max

## Storage temperature range and humidity

-25 °C ~ +70 °C

## Maximum altitude

2000 m

## Weight (instrument and case)

1 kg (with batteries, excluding case)

## Dimensions (instrument and case)

MFT1711 and MFT1721

150 mm H x 85 mm W x 235 mm D

MFT1731 and MFT1741

220 mm H x 390 mm W x 285 mm D

## IP rating

IP54

## Calibration temperature

+20 °C

## Temperature co-efficient

<0,1% per °C

For test environments see service data.

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## ORDERING INFORMATION

Description	Order Code
MFT1711-BS	1008-121
MFT1721-BS	1008-123
MFT1731-BS	1008-128
MFT1731-PS	1008-130
MFT1741-BS	1009-986
<b>Included accessories</b>	
Printed quick start guide	
Full user guide on CD	
Calibration certificate	
Switched probe SP5 (not supplied with MFT1711)	1002-774
Neck strap - Megger embroidered	2001-509
3 Wire lead set with prods and clips	1001-991
Mains plug test lead (BS1363)	6220-810
AC battery charger (MFT1731 and MFT1741 only)	1002-736
<b>Optional accessories</b>	
Fused 10 A test lead set (red/blue/green) with prods and clips	1001-975
ETL30 Extension Test Lead 30 m	1000-215
ETL50 Extension Test Lead 50 m	1000-217
Cigar lighter adapter for battery charging.	6280-332
Switched Probe SP5 (silicone)	1001-687
MCC1010 Current measuring clamp	1010-516
MVC1010 Voltage Clamp	1010-518
Electrode kit (MFT1731 & MFT 1741 only)	1001-810
Test and carry pouch	1006-408
Large soft pouch with extra storage	1007-463
3 Pole Earth Test Kit	6210-160
ETK30 (3 Pole Earth Test Kit)	1010-176

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## MFT1711-MFT1721-MFT1731-MFT1741\_DS\_en\_V06

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