TECHNICAL DATA

# Fluke FEV500 Fast DC EV Charging Station Analyzer

## Test, validate, and document Fast DC charging stations with one portable analyzer.

The Fluke FEV500 is a field-ready, advanced analyzer that streamlines the testing of Fast DC EV charging stations by combining essential safety and performance checks into a single device. Designed for ease of use, it simplifies the evaluation process without the need for additional test and measurement equipment, ensuring that EVSE (Electric Vehicle Supply Equipment) remains safe and operational. The FEV500 has an intuitive interface and features seamless software integration, making it easier for technicians to troubleshoot, manage data, and maintain EVSE uptime with confidence and efficiency.

The FEV500 is compliant with ISO 15118 and DIN SPEC 70121 international standards for the digital communication between electric vehicles and electric vehicle supply equipment. It has been tested for compatibility with major EVSE manufacturers.

### ALL-IN-ONE FAST DC TESTING

Combines performance, interoperability and safety measurement features into a single, portable device, no need for multiple tools or complex setups.

### BUILT-IN EV SIMULATION

Simulates real EV charging up to 2kW. No external load banks or vehicles required, enabling complete station validation anytime, anywhere.

### RUGGED, FIELD-READY DESIGN

Engineered for durability and portability with integrated wheels and handle, ideal for demanding on-site testing. The battery is removable for easy airline transport.

### VIEW REAL TIME REPORTS ON THE FEV500

Seamless integration with Fluke TruTest™ software for instant documentation, compliance reporting, and actionable maintenance insights.

### BATTERY-POWERED FOR TRUE MOBILITY

No wall outlet required. The battery recharges via energy harvesting during EVSE load tests for extended field use.

Fluke FEV500 Fast DC EV Charging Station Analyzer

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## Performance and Safety Tests:

Communication & Performance:

- CCS Charge State Verification
- Signal Level Attenuation Characterization (SLAC)
- Low-Level Communication Testing for CCS
- Power Line Communication (PLC) Testing
- Load Testing (Voltage & Current during simulated charging)

Electrical Safety:

- Insulation Resistance (IEC 61557-2)
- Low Impedance Measurement (IEC 61557-4)
- IMD Test (Insulation Monitoring Device, IEC 61557-8)
- Residual Voltage Measurement (IEC 61851-1)

## Key Features

- Comprehensive Testing: Performance and safety testing combined in one device.
- EV Simulation, No External Equipment Needed: Simulates electric vehicle charging during testing, eliminating the need for additional load banks, electric vehicles or multifunction testers. Verifies charging station operability and performance by simulating a kW load to mimic real charging sessions.
- Autotest Feature: Run pre-configured test sequences with automatic execution and clear pass/fail results. No need to use other equipment or reconfigure test leads.
- User-Friendly Interface: Intuitive touchscreen display visible in bright sunlight with guided workflows and for easy operation and interpretation of results.
- CCS Connectivity: Supports CCS connectors for widespread compatibility. Available in CCS1 or CCS2 models.
- Portable and Durable: Rugged design ideal for field use, with a removable, rechargeable battery, no outlet required.
- Automatic Data Management: Tracks and stores unique EVSE and connection point IDs for streamlined asset management.
- TruTest™ Software: Facilitates documentation and reporting of results.

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## Streamline Fast DC EV Charging inspections using one integrated tool

Other EVSE test tools often only support vehicle simulation and require other test equipment to perform a full inspection. This requires reconfiguration of test leads and the need to bring multiple devices on-site. Managing multiple devices can lead to inefficiencies, increased test time and higher likelihood of human error. The FEV500 consolidates all recommended electrical inspection steps into a single portable device. Technicians can test continuity, insulation, check IMDs (insulation monitoring devices), and residual voltage all through the EVSE connector without the need to use other devices.

## EVSE Validation: Independent, Precise Testing Without an EV On-Site

As electric vehicles become the norm, ensuring the reliability and performance of EV charging infrastructure is more critical than ever. Traditional validation methods often rely on the presence of an actual EV, which can limit flexibility and delay testing—especially in remote areas or during maintenance windows.

The Fluke FEV500 empowers technicians with a smarter approach: it simulates an EV, enabling comprehensive testing of charging and communication protocols without needing a vehicle on-site. This independence streamlines workflows, reduces downtime, and allows for repeatable diagnostics under controlled conditions. Technicians can replicate specific charging scenarios, verify protocol compliance, and troubleshoot issues with precision—anytime, anywhere.

By decoupling EVSE validation from vehicle availability, the FEV500 supports proactive infrastructure readiness for a fully electric future.

## Simplify Every Step of Fast DC Charger Testing

The Fluke FEV500 streamlines Fast DC EVSE testing by combining safety, performance, and interoperability checks into one compact, field-ready tool. Its guided testing workflow walks technicians step-by-step through each protocol, ensuring consistency, confidence, and faster results, no matter what their experience level is. The FEV500 delivers EV-free validation, simulating real charging sessions and communication without needing a vehicle on-site, while error simulation verifies that safety systems respond correctly to faults. Designed for the field, it is portable, durable, and battery operated, with wheels and a handle for easy transport and no need for external power. The analyzer also consolidates multiple instruments— EV, protocol analyzer, low-ohm meter and oscilloscope —into a single device for complete non-invasive testing without opening the charger. Test data is automatically captured and transferred to TruTest™ software, eliminating manual entry and simplifying documentation for compliance and reporting. With the FEV500, technicians can test smarter, safer, and faster, anywhere the job takes them.

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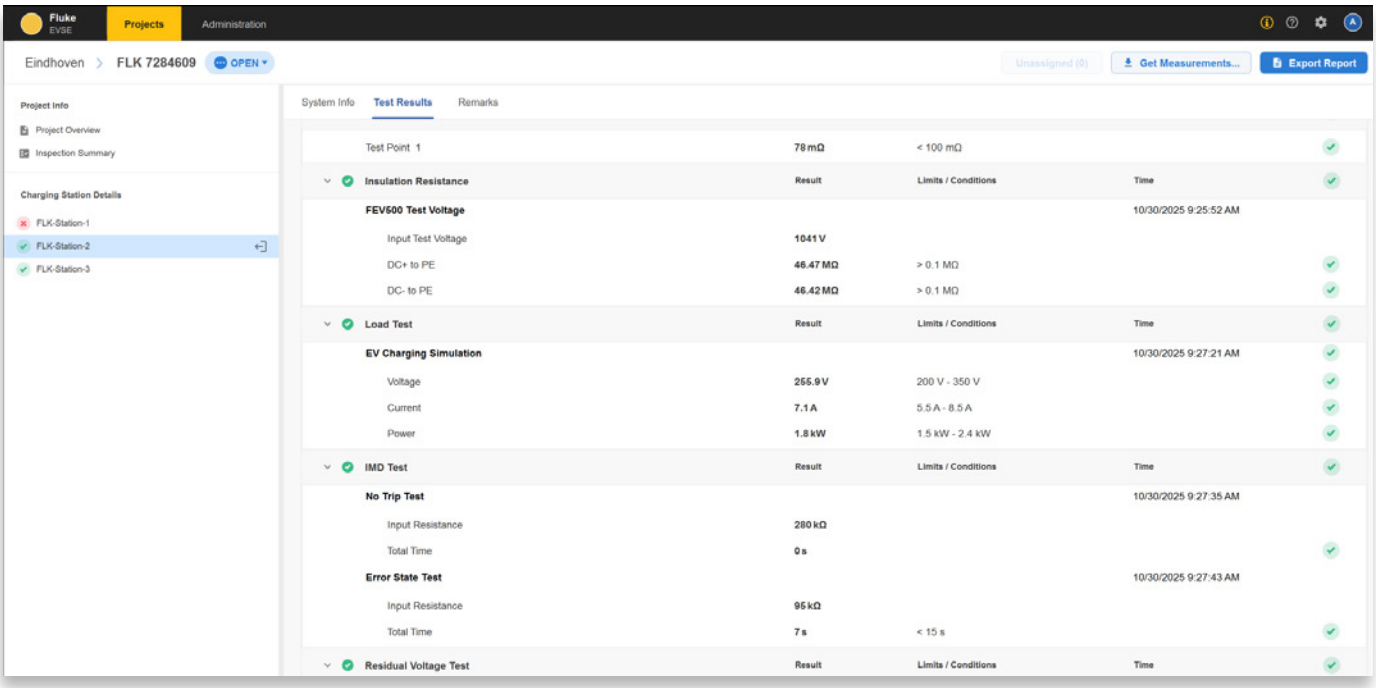
## Automated Documentation: Removes the Need for Manual Data Entry

Manual data entry is a time-consuming and error-prone process that can lead to inaccuracies in test documentation, complicating maintenance records and compliance reporting. Technicians must often transcribe test results by hand from multiple test tools, which not only slows down the workflow but also increases the risk of data loss or incorrect entries.

The Fluke FEV500 automates the documentation process. Test results are automatically recorded and stored within the device and can be easily transferred to TruTest™ software via USB-C for further analysis and report generation. This automation eliminates the need for manual data entry, ensuring that all test results are accurately captured and documented. It also streamlines compliance reporting and maintenance planning, providing reliable, traceable records that can be accessed and shared as needed. This not only saves time but also enhances the overall efficiency and accuracy of the testing process.

TruTest

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## General Specifications

| Specification | Characteristic |
|---|---|
| Display | 7-inch capacitive touchscreen (1024 x 600) Brightness up to 1,700 cd/m² (auto-adjusted) |
| Keys | Power on/off, Backlight, Stop Test |
| LED Indicators | Green: Power on<br>Red: Low battery<br>Blue: Charging<br>Amber: Fan active when device is off |
| USB-C Ports | USB-C power delivery charging, Flash drive TruTest™ connection, Calibration |
| GNSS | Global navigation satellite receiver with internal antenna for time synchronization |
| Dimensions | 650 × 508 × 300 mm (25.6 × 20 × 11.8 in) |
| Weight | 26 kg (57.3 lb) |
| Battery Type | Li-ion RRC2040-2 (customer replaceable) |
| Battery Capacity | 10.8 V, 6.8 Ah, 73.44 Wh |
| Battery Runtime | 10 hours (recharges during test) |
| Charging Time | 3 hours (with 65W USB-C PD) |
| Battery Backup Time Before Recharging Required | 6 months |
| Fuse | 11 A (not customer replaceable) |
| Warranty | 2 years |

## Environmental Specifications

| | |
|---|---|
| **Operating Temperature** | -20 °C to 50 °C (-4 °F to 122 °F) |
| **Storage Temperature** | -20 °C to 60 °C (-4 °F to 140 °F)<br>0 °C to 30 °C (32 °F to 86 °F) recommended |
| **Operating Humidity** | IEC 60721-3-3: 3K6<br>-25 °C to 30 °C (-13 °F to 86 °F): ≤100 %<br>40 °C (104 °F): 55 %<br>50 °C (122 °F): 35 % |
| **Operating Altitude** | 3000 m |
| **Storage Altitude** | 12000 m |
| **Vibration** | IEC 60721-3-3 / 3M2 |
| **Ingress Protection** | IEC 60529 |
| **Ingress Protection, Lid Closed** | IP54 |
| **Safety** | IEC 61010-1: Pollution Degree 2 |
| **Charging Temp (Battery)** | 0 °C to 45 °C (32 °F to 113 °F) |

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## Electrical Specifications

| Value | Range | Resolution | Accuracy |
|---|---|---|---|
| **Voltage** | 1,000 V | 0.1 V | +/- (0.2% + 4 digits) |
| **Current** | 10 A | 0.01 A | +/- (0.5% + 5 digits) |
| **Power** | typ. 2 kW | 1 W | typ. ± (0.7% rdg + 2 digit) |
| | | | |
| **IMD Test** | | | |
| **No Trip Test** | 250 kΩ, asymmetric insulation resistance DC+ to PE | | |
| **Trip Test** | 95 kΩ (max. EVSE Voltage >500 V dc)<br>45 kΩ (max. EVSE Voltage ≤500 V dc), asymmetric insulation resistance DC- to PE | | |
| **Time per test** | <15s | | |
| **Standard** | IEC 61557-8 / IEC 61557-18 | | |
| **Continuity ($R_{LO}$) Test Lead to PE (CCS)** | | | |
| **Test current: max 10 A** | 2 Ω | 0.1 mΩ | ≤20 mΩ: ±(8% + 8 mΩ)<br>≤200 mΩ: ±(4% + 10 mΩ)<br>>200 mΩ: ±(4% + 40 mΩ) |
| **Standard** | IEC 61557-4 | | |
| **Insulation Resistance DC+ to PE and DC- to PE** | | | |
| **Test Voltage** | + / - | | |
| **500 V** | 10 kΩ to 20 MΩ | 0.01 MΩ | ± (5 % rdg + 2 digit) |
| **1000 V** | 10 kΩ to 20 MΩ | 0.01 MΩ | ± (5 % rdg + 2 digit) |
| **Max Short Circuit Current** | 2 mA | | |
| **Standard** | IEC 61557-2 | | |
| **CP Test (CCS 1, CCS2)** | | | |
| **Simulation of States** | A, B, C, D, E | | |
| **CP High, CP Low** | 15 V .. +15 V | 0.01 V | ± (0.4 % rdg + 2 digit) |
| **Frequency Measurement** | DC<br>900 Hz to 1100 Hz | 1 Hz | 0.1% or 1 digit |
| **Duty Cycle** | 2 ... 98 % | 0.10% | ±5 digit |
| **PP Resistor** | 50.0 .. 499.9 Ω<br>500 to 5000 Ω | 0.1 Ω<br>1 Ω | ±0.5 % |
| **Digital Protocol** | DIN 70121, ISO 15118 | | |
| **SLAC** | 0 dB to 20 dB | 1 dB | |

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# Fluke Built, Fluke Protected

## Reduce unplanned expenses and get the most out of your tools with Fluke Premium Care

When you invest in the best equipment in the industry, you want your money to go as far as possible. Fluke Premium Care provides coverage above and beyond your tool's original product warranty, so you don't need to worry about unexpected downtime caused by damaged test equipment, accessories, or tools in need of calibration or repair.

**Choose Fluke Premium Care** as a standalone plan or combine it with a product in a bundle, with flexible one-year or three-year term options.

| | Standard Warranty | Premium Care |
|---|---|---|
| Repair manufacturing defects | ✓ | ✓ |
| Accidental damage and repair | | ✓ |
| Replacement of damaged accessories | | ✓ |
| Annual calibration or performance check | | ✓ |
| Expedited calibration and repair | | ✓ |
| Priority tech support | | ✓ |
| Software updates | | ✓ |

**PremiumCare**

Uptime Protection by FLUKE

**Learn more** about Fluke Premium Care **www.fluke.com/premiumcare**

### Repair manufacturing defects
Ensuring that your equipment functions as intended maintains accuracy and reliability, thereby reducing downtime and ensuring the longevity of your Fluke product.

### Accidental damage and repair
Avoid costly repairs and rest easy knowing your test tool is covered in the event it gets damaged.

### Replacement of damaged accessories
Accessories that originally shipped with your unit, like batteries, power adapters, probes and cables, and have been qualified as defective by our technicians will be replaced, free of charge.

### Annual calibration or performance check
Ensure your test tool is providing accurate results and adheres to the recommended maintenance schedule by leaving it in the hands of our experts.

### Expedited calibration and repair
Your calibration or repair will be expedited with priority next-on-bench service and shipping so you can get back to your work faster.

### Expedited shipping
Accelerates the shipping process, reducing the time your equipment spends in transit, while minimizing the overall turnaround time to ensure that your Fluke product is back in your hands and operational as quickly as possible.

### Software updates
Maintain peak performance with firmware updates that ensure your tool remains reliable and up to date, automatically applied during equipment calibration.

### Priority tech support
Ensures prompt assistance and resolution of technical issues, minimizing downtime by quickly addressing any problems or concerns with your Fluke equipment.

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| Model – CCS1 | Description |
|---|---|
| FLK-FEV500/CCS1 | FAST DC CHARGING STATION ANALYZER, CCS1 |
| FLK-FEV500-CCS1/FPC | FLK-FEV500/CCS1 WITH 1 YR PREMIUM CARE STANDARD |
| FLK-FEV500/CCS1 PRO | FAST DC CHARGING STATION ANALYZER, CCS1 W/ TRUTEST SOFTWARE |
| FPC1S-FEV500-1 | 1 YR FLUKE PREMIUM CARE STANDARD FOR FEV500 SERIES |
| FPC3S-FEV500-1 | 3 YR FLUKE PREMIUM CARE STANDARD FOR FEV500 SERIES |

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