

# EV Charging Tester





## EV Charging Tester



The EV charging tester is an equipment that determines the status of rapid/standard charges, high-voltage relay, and the presence of any abnormality in rapid and high-voltage charging path of the electric vehicle.



**Precautions when handling high-voltage parts**

- Before inspecting or repairing high-voltage system, make sure to separate the safety plug to cut off the high voltage.
- Make sure to remove metal substances (watch, ring, and other metal products, etc.) from your body as they may cause high-voltage short circuit, which causes human and vehicle damages.
- Before starting any operation related to high voltage, please wear personal protective equipment for safety accident prevention.
- Please make sure that persons other than the operator wearing the protective equipment are prohibited from touching any part related to high-voltage parts.

**Precautions when utilizing the product**




- Remove foreign substances from the component and keep its cleanliness before and after using the equipment.
- Make sure you familiarize yourself with contents of the manual before use, in order to follow the procedures and instructions.
- Before using the equipment, please familiarize yourself with safety instructions for vehicle management, which were issued by the manufacturer of the vehicle.
- Use the equipment only in a well-ventilated space, and make sure to wear protective equipment (protective glasses and gloves, etc.).
- If the equipment is damaged by external shock, immediately stop using the equipment. If the equipment needs to be repaired, make sure to request the equipment manufacturer to perform the repair work. (Abnormal repair may become the cause of equipment damage)
- The equipment must not be exposed to rain or snow.
- The equipment must not be used for purposes other than the purpose of its manufacture.
- Do not leave the equipment being installed in the vehicle.
- If you do not use the equipment within its operating temperature range (0 – 40 °C), it may become the cause of its breakdown.



**These connectors are used for CP/PD voltage check and only trained professionals should use (or access).**



## EV charging test components

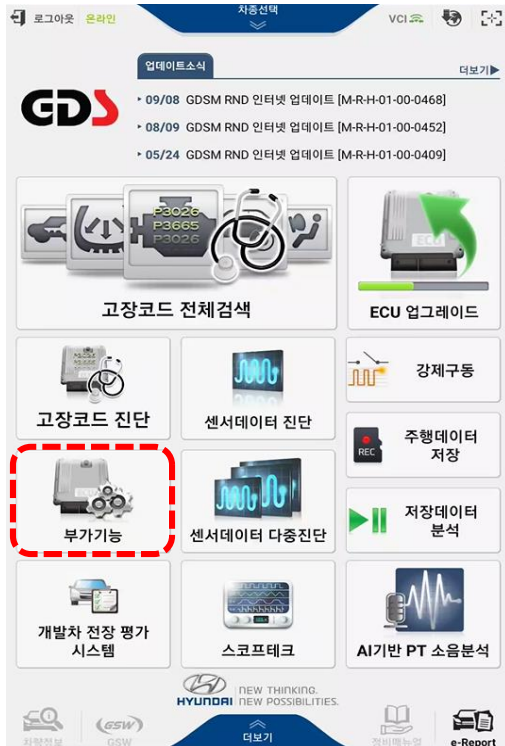
Name	Component	Major function
EV charging tester		<ol style="list-style-type: none"> <li>1. Controls the conditions for the charging test.</li> <li>2. Measures high voltage/current.</li> </ol>
GDS-Mobile		<ol style="list-style-type: none"> <li>1. Performs the test sequence.</li> <li>2. Indicates the test measured values.</li> </ol>
VCI II		<ol style="list-style-type: none"> <li>1. Performs the vehicle diagnostic communication. (Connects the OBD terminal of the vehicle.)</li> </ol>

## Detailed description of the EV Charging Tester LED



Name	Major function	LED status	
DC LINE	Indicates the test results on rapid charging line.	 OK	 NG
AC LINE	Indicates the test results on standard charging line.	 OK	 NG
ERROR	Indicates the occurrence of system error.	 OK	 NG
BT/Power	<ul style="list-style-type: none"> <li>- Indicates the power.</li> <li>- Indicates the connection status between the diagnostic apparatus and the test equipment.</li> </ul>	 Connected	 Not connected (the light flickers once a second)

## Entering into the function screen



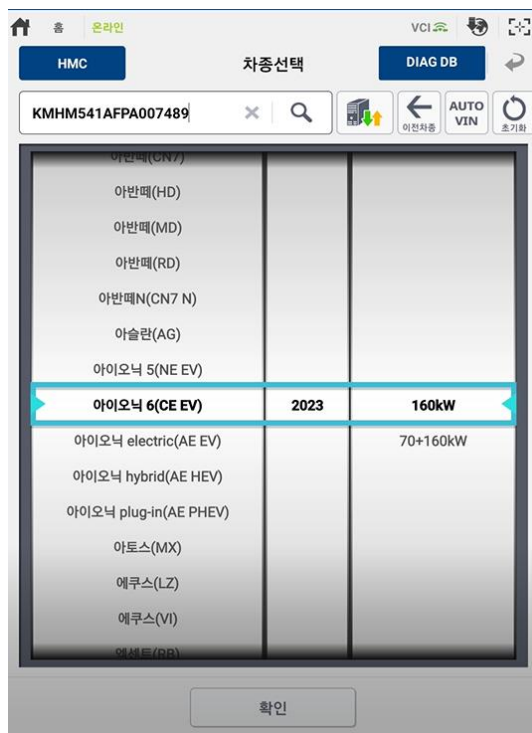
### Phase 1

Select [S/W Management].



#### Reference

Before performing the function, VCI II must be connected to OBD connector on the vehicle.



### Phase 2

Select the type of vehicle to be measured.



### Phase 3

Select [Vehicle Charging Controller] -> [Charging Line Test] menu.

## Connection of the equipment

진단 종료 부가기능 ↻


### • 전기차 충전 검사

검사목적	전기차 내 완속/급속 충전 라인의 이상 유/무를 간접적으로 확인하는 기능
검사조건	1. IGN ON 2. EV Not ready 3. 전기차 충전검사 장비 연결
연계단품	VCMS(Vehicle Charging Management System)
연계DTC	-
불량현상	-
기타	-

확인

! 기능 수행 중에는 다른 기능이 동작되지 않도록 주의하십시오.

### Phase 1

After checking the purpose and condition of the EV charging test, press  button at the bottom of the screen.

진단 종료 부가기능

### ■ 충전 라인 검사

#### • [전기차 충전 라인 검사]

##### [충전 검사 장비 연결]

충전 검사 장비 전원을 켜십시오.

충전 검사 장비 연결이 완료되면 [확인] 버튼을 누르십시오.

\* CMI-M100 : 충전 검사 장비

연결 상태 : 연결 해제됨

현재 연결된 장비

검색


검색된 장비 목록

다음

취소

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### Phase 2

Press  button to connect the charging test equipment.



진단 종료

부가기능

충전 라인 검사

• [전기차 충전 라인 검사]

[충전 검사 장비 연결]

충전 검사 장비 전원을 켜십시오.  
충전 검사 장비 연결이 완료되면 **[확인]** 버튼을 누르십시오.  
\* CMI-M100 : 충전 검사 장비

연결 상태 : 연결 시도 중

현재 연결된 장비

검색된 장비 목록

CMI\_EBD50001 74:F0:7D:B3:44:23

다음

취소

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### Phase 3

Select the equipment in the research result.

진단 종료

부가기능

충전 라인 검사

• [전기차 충전 라인 검사]

[충전 검사 장비 연결]

충전 검사 장비 전원을 켜십시오.  
충전 검사 장비 연결이 완료되면 **[확인]** 버튼을 누르십시오.  
\* CMI-M100 : 충전 검사 장비

연결 상태 : 연결됨

현재 연결된 장비

검색된 장비 목록

CMI\_EBD50001 74:F0:7D:B3:44:23

다음

취소

! 기능 수행 중에는 다른 기능이 동작되지 않도록 주의하십시오.

### Phase 4

After the selected equipment is registered in "equipment currently being connected", press **다음** button at the bottom of the screen.



### **Phase 5**

Once the BT signal of the equipment is connected normally, "BT/Power" LED of the equipment main body will be turned on with blue light.

### Main screen

It shows major functions of the EV charging line test, and the users can run a desired function by touching it.

진단  
종료

부가기능

■ 충전 라인 검사

● [전기차 충전 라인 검사]

충전라인 검사

① PRA(급속충전 릴레이 검사)  
② 급속 충전라인 검사  
③ 완속 충전라인 검사

검사 장비 셀프 테스트

검사조건 : 검사 장비 미연결 상태

충전건 체결검사

CP / PD

종료

! 기능 수행 중에는 다른 기능이 동작되지 않도록 주의하십시오.

## Self-test on the test equipment

Menu	Description of function
<div>검사 장비 셀프 테스트</div> <div>검사조건 : 검사 장비 미연결 상태</div>	<p>This is a function for checking whether there is abnormality in the charging gun when an error occurs while the main test function is being operated, or if there is no change in voltage in connection test.</p>

진단 종료 부가기능

■ 충전 라인 검사

● 【전기차 충전 라인 검사】 검사 장비 셀프 테스트

본 기능은 검사 장비를 셀프 테스트 하는 기능입니다.  
테스트는 약 20초 정도 소요됩니다.

**[확인]** 버튼 : 초기 메뉴

**[취소]** 버튼 : 검사 종료

100%

항목	값
Self Test 전압 측정	PASS
Self Test 전류 측정	PASS

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### Description

Once you enter into the function screen, the self-test will be run right away, and the results will be shown on the screen after approximately 20 seconds.



#### Reference

Please run the corresponding function **only after removing the charging test gun** from the inlet.



#### Notification

The message below will appear when NG occurs.

검사 장비 셀프 테스트에 실패하였습니다.  
지속적인 문제 발생 시 구매처에 문의 하시기 바랍니다.

확인

## Charging gun connection test

Menu	Description of function
<div>충전선 체결검사</div> <div>CP / PD</div>	This is a function that measures CP/PD voltage value to check whether the charging test equipment is normally connected to the inlet.



## Description

The table at the top of the screen shows voltage value per operation and test results. The graph in the middle of the screen shows change in CP/PD voltage values of the controller, which are measured in real time through the diagnostic communication.



### Determination condition

Korea /North America (CCS1)	Measured Value	Determination
CP	9V±0.3	OK
PD	1.5V±0.3	NG

Europe (CCS2)	Measured Value	Determination
CP	9V±0.3	OK
PD	3V±0.3	NG

## Charging line test

Menu	Description of function
<p><b>충전라인 검사</b></p> <ul style="list-style-type: none"> <li>● PRA(급속충전 릴레이 검사)</li> <li>● 급속 충전라인 검사</li> <li>● 완속 충전라인 검사</li> </ul>	<p>The following 3 different functions will be performed as the main test functions:</p> <ol style="list-style-type: none"> <li>1. Rapid charge relay test</li> <li>2. Rapid charging line test</li> <li>3. Standard charging line test</li> </ol>



### 1. Rapid charge relay test

This is a test that checks if there is abnormality in the rapid charge relay operation through a high-voltage rapid charge port.



#### Determination condition

Measured Value	Determination
0V	OK
exceeds 0V	NG



## 2. Rapid charging line test

This is a test that checks whether there is abnormality in the rapid charging line that goes through [high-voltage battery -> inverter -> charge port] through the path of the high-voltage rapid charge port.



### Determination condition

Comparison between \*the charging equipment measured values and \*diagnostic communication values

Deviation	Determination
Less than 10%	OK
0V or 10% or more	NG

- ※ Charging equipment measured value: BMU controller's diagnosis communication voltage value
- ※ Diagnostic communication value: actually measured voltage value of the high-voltage rapid charge port



### Reference

If the test result is NG, it will receive the breakdown status from the vehicle to indicate the problematic part as red light on the screen, and display the AS response method. (Only the vehicle models after IONIC 6 can operate this function)

진단 종료

부가기능

충전 라인 검사

급속 충전 릴레이

충전 라인(급속)

충전 라인(완속)

전기차 충전 라인 검사

완속 충전 라인 검사

항목

값

검사 결과

완속 충전 라인 검사

8A

OK

6A

8A

10A

12A

충전구인렛

AC(완속)

DC(급속)

AWD ONLY

전통 모터

감속기

인버터 (FRT)

고전압 장전블록 (FRT)

VCMS

고전압 배터리

BMU

PRA

고전압 장전블록 (RR)

감속기

후륜 모터

인버터 (RR)

절단인버터 (RR)

다음

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### 3. Standard charging line test

This is a test that checks whether there is abnormality in the standard charging line, which goes through [high-voltage battery -> \*ICCU -> charge port] through the path of standard charge port.

※ ICCU : Integrated Charging Control Unit

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When you enter into the function screen, the test will be run with a fixed default value of 8A. Then, the user can change the current value to be measured by touching a desired current value (6, 8, 10, or 12 A) to proceed the measurement.



#### Determination condition

The standard charging will be initiated and the running current value (A) will be measured.

(Error range 15%)

Measured Value	Determination
6A or more	OK
Less than 6A	NG



#### Notification

In the case of 12 A, using a power strip may lead to causing a safety accident. Thus, the following notification will be shown, and the test will be conducted only when the user approves it.

알림

12A 사용 시 다른 전원과 혼용하여 사용하지 마십시오.  
과전 전류로 인하여 전원이 차단될 수 있으므로 주의가 필요합니다.

확인

취소





### Notification

Battery charging current is adjusted to 90% - 60% depending on the user's charging environment and battery life. (The current values between 3 and 5 A can also be charged)

진단 종료

부가기능

■ 충전 라인 검사

급속 충전 릴레이

충전 라인(급속)

충전 라인(완속)

■ [전기차 충전 라인 검사] 완속 충전 라인 검사

항목	값	검사 결과
완속 충전 라인 검사	12A	OK

6A

8A

10A

12A

충전구인렛

AWD ONLY

전륜 모터 감속기 인버터 (FR)

고전압 장신블록 (FR)

VCMS

ICCU

AC(완속)

DC(급속)

후륜 모터 감속기 인버터 (RR)

고전압 장신블록 (RR)

멀티인버터 (RR)

고전압 배터리

BMU

PRA

VOA

다음

취소

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2

Once the measurement is completed, click 

다음

 button to close the test.

진단  
종료

부가기능

■ 충전 라인 검사

● 【전기차 충전 라인 검사】

항목	값	검사 결과
급속 충전 릴레이 검사	0V	OK
급속 충전 라인 검사	736V	OK
완속 충전 라인 검사(6A)	6A	OK
완속 충전 라인 검사(8A)	8A	OK
완속 충전 라인 검사(10A)	10A	OK
완속 충전 라인 검사(12A)	12A	OK

종료

! 기능 수행 중에는 다른 기능이 동작되지 않도록 주의하십시오.

## Test results

After the test is closed, you can check the entire test results that were measured.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.