

**Repower BMS-6V3A-36S-600A  
Technical Specification**

**Model: BMS-6V3A-36S-600A**

**Shenzhen RePower Technology Co., Ltd**

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## 1. BMS Battery Management System Test Platform

### 1.1. Overview

The Ruineng BMS test system comprises high - precision analog cell units, programmable resistance units, signal simulation and detection units, charge - discharge current signal simulation units, high - voltage programmable DC power supplies, high - power programmable resistance units, digital and analog I/O modules, communication units, and software control systems. It enables the testing of BMS functions and parameters via upper - computer software control, and also allows for the storage of test results.

This equipment boasts remarkable expandability and excellent compatibility. It supports the functional testing of battery management systems (both integrated and master - slave distributed BMS) based on various materials, including lithium iron phosphate, ternary materials, lithium cobaltate, lithium manganate, and lithium titanate. It is extensively utilized in the research, development, testing, and production quality control of power battery management systems, and is applicable to sectors such as university scientific research and testing institutions.

### 1.2. Features

#### **Product Design:**

Modular design

Bidirectional design for simulating battery current, supporting active and passive balancing functions

Independent power supply and communication for each module

High precision output and measurement

Reserved upgrade expansion interface

High voltage signal simulation, capable of real output of 1000V voltage

High current signal simulation,

#### **Product Operation:**

High integration, flexible and convenient usage

Software-controlled, supporting one-key start test

Universal plug terminal, quick replacement

#### **Product Reliability:**

Multiple protections to ensure safe use of the equipment

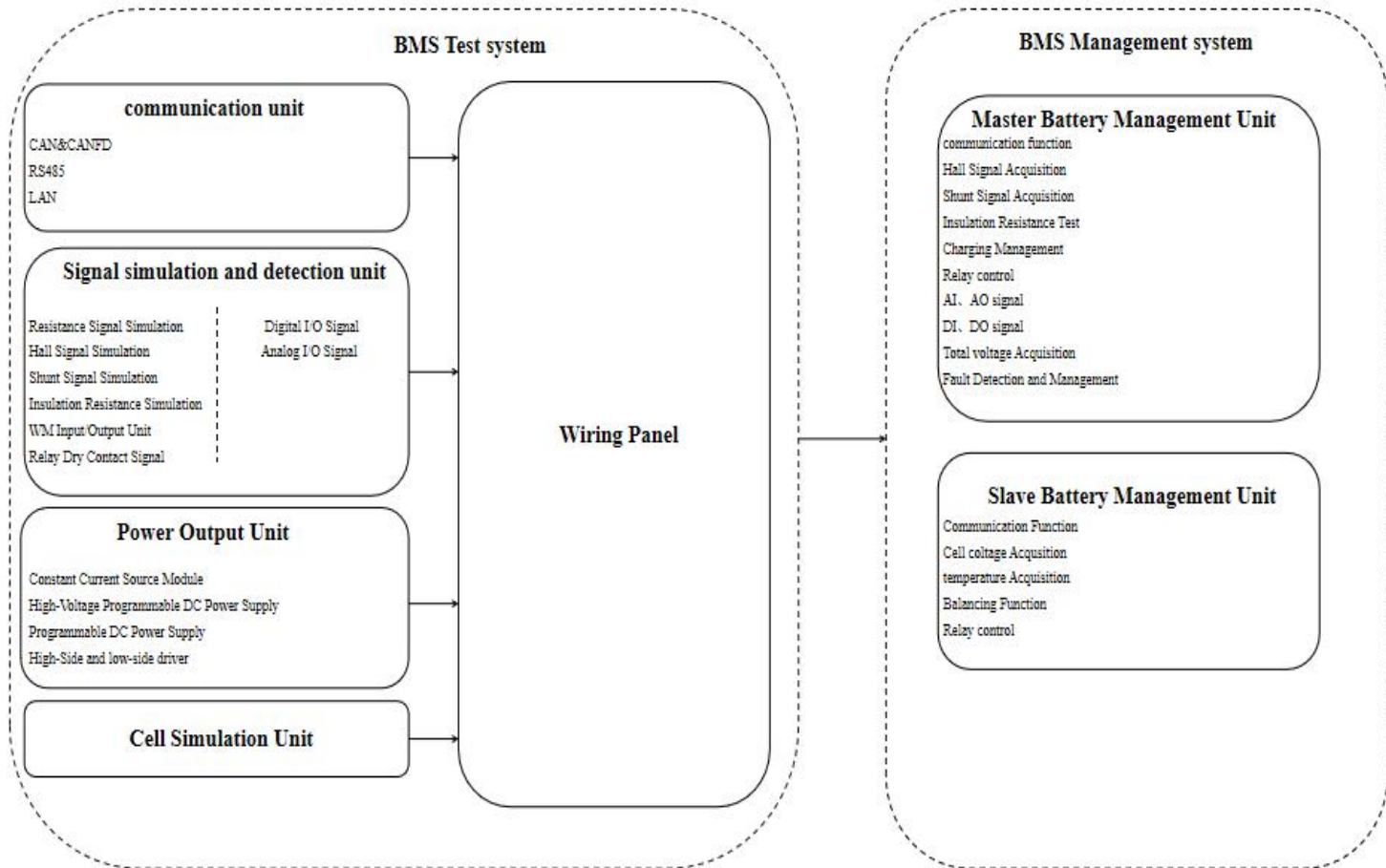
Supports long-term working conditions, aging, and reliability tests

### Product Application:

Good compatibility, capable of detecting various BMS

Wide application, suitable for R&D, production, scientific research/testing institutions

### 1.3. BMS Battery Management System Test Platform Block Diagram



## 2. BMS Battery Management System Test Function

| Slave - controll test items |  |
|-----------------------------|--|
| No.                         | Items                                      |
| 1                           | Single cell quiescent current measurement  |
| 2                           | Power-on power consumption measurement     |
| 3                           | Power-off power consumption measurement    |
| 4                           | Sleep mode power consumption measurement   |
| 5                           | Voltage measurement of balanced on & off   |
| 6                           | Current measurement balanced on & off      |
| 7                           | Single cell voltage comparison measurement |

|                                    |   |
|------------------------------------|---|
| 8                                  | Single cell temperature comparison measurement            |
| Master control test items          |   |
| <b>No.</b>                         | <b>Items</b>  |
| 1                                  | Total Power Consumption Test                              |
| 2                                  | Total voltage comparison measurement                      |
| 3                                  | Total current comparison measurement                      |
| 4                                  | SOC calibration and measurement                           |
| 5                                  | Insulation impedance comparison test                      |
| 6                                  | Relay on-off test   |
| 7                                  | PWM signal test   |
| 8                                  | Alarm test for high voltage of single cell                |
| 9                                  | Alarm test for low voltage level of single cell           |
| 10                                 | Alarm test for high temperature of single cell            |
| 11                                 | Alarm test for low temperature of single cell             |
| 12                                 | Alarm test for overcurrent level of Charge and discharge  |
| 13                                 | Alarm test of Insulation level                            |
| 14                                 | Alarm test of SOC too high or too low level               |
| 15                                 | Relay adhesion simulation test                            |
| 16                                 | Test of high and low level alarm of total voltage         |
| 17                                 | Collision signal warning test                             |
| 18                                 | Alarm Test for single Cell Voltage Differential Level     |
| 19                                 | Alarm Test for single Cell temperature Differential Level |
| 20                                 | Communication open Circuit Fault Simulation Test          |
| Free debugging for 2 BMS protocols |   |

### 3. Composition and Technical Solutions of the BMS Testing Equipment

#### 3.1. Detailed Composition

| No. | Names of Parts (description)              | Specification/code | Quantity | Unit    | Remack   |
|-----|---|--------------------|----------|---------|--|
| 1   | RePower Virtual Battery Cell              | VBS-6V3A           | 36       | channel | Provide CELL (10mV - 6000mV) voltage simulation, with each CELL independently isolated                     |
| 2   | Programmable resistor unit                | RP-RES-CK-01       | 8        | channel | NTC resistance simulation  |
| 3   | High voltage programmable DC power supply | 1000V0.9A 900W     | 1        | pcs     | The voltage can be adjusted from 10V to 1000V, serving for total votage teat and Insulation impedance test |

|    |   |                   |   |         |  |
|----|---|-------------------|---|---------|--|
| 4  | Constant Current Source Module          | CCS-600A          | 1 | pcs     | Current signal, the real current but not simulate  |
| 5  | Programmable DC power supply            | 36V15A            | 1 | pcs     | Power supply for BMS; measurement of power consumption   |
| 6  | High-Low Side Driver Test Module        | 36V3A             | 4 | channel | High-Low Side Drive: Send a drive signal to the BMS or work as a linear load   |
| 7  | High power programmable resistance unit | RP-HPRES-CK-01    | 2 | channel | Insulation resistance simulation   |
| 8  | Signal simulation and detection unit    | RP-ADPIO          | 1 | pcs     | Input and output with 0.1Hz to 100 KHz : AI, AO, DI, DO  |
| 9  | Hall analogue and shunt simulation unit | 5V/200mV 200mA    | 1 | Channel | It is divided into two ranges. The first range is 200mV, which serves as a shunt simulation unit; the second range is 5V, which serves as a Hall analogue unit |
| 10 | CAN communication unit                  | /                 | 1 | pcs     | Interface of CAN Communication for Data Exchange Between Host Computer and BMS   |
| 11 | RS485 Communication unit                | RP-RS485          | 1 | pcs     | Interface of RS485 Communication for Data Exchange Between Host Computer and BMS   |
| 12 | Cabinet                                 | RP-39U            | 1 | pcs     |  |
| 13 | Computer                                | I5/16G/500G       | 1 | pcs     |  |
| 14 | Software System                         | BMS test software | 1 | pcs     |  |

### 3.2. BMS Testing Platform Specifications

| 1、Virtual Battery Cell |  |
|------------------------|--|
| Number of channels     | 36 Channels  |
| Work Model             | Bidirectional current, output (Source) / absorption (Sink) |
| Voltage range          | 0.05~6V  |

|  |                   |
|--|-------------------|
| Voltage resolution                                 | 0.01mV            |
| Voltage output accuracy (@25±5°C)                  | ±1mV              |
| Voltage acquisition accuracy (@25±5°C)             | ±1mV              |
| 3A current range                                   | ±3000mA           |
| 3A current resolution                              | 0.01mA            |
| 3A current output accuracy (@25±5°C)               | ±0.7mA            |
| 3A current acquisition accuracy (@25±5°C)          | ±0.7mA            |
| 200mA current range                                | ±200mA            |
| 200mA current resolution                           | 0.01mA            |
| 200mA current output accuracy (@25±5°C)            | ±0.06mA           |
| Current acquisition accuracy at 200mA (@25±5°C)    | ±0.06mA           |
| 2mA Current ranges                                 | 0~2mA             |
| The current resolution of 2mA                      | 0.01uA            |
| 2mA current output accuracy (@25±5°C)              | ±1uA              |
| 2mA current acquisition accuracy (@25±5°C)         | ±1uA              |
| <b>2、Programmable resistor unit</b>                |                   |
| Number of channels                                 | 8 channels        |
| Signal type  | Resistance signal |
| Resistance range                                   | 10Ω~12MΩ          |
| Resistance resolution                              | 1Ω                |
| Resistance accuracy (@25±5°C)                      | ±0.15%+1Ω         |
| Simulated temperature range                        | -50°C~150°C       |
| <b>3、High voltage programmable DC power supply</b> |                   |
| Number of channels                                 | 1 channel         |
| Voltage range                                      | 10~1000V          |
| Voltage resolution                                 | 100mV             |
| Voltage output accuracy (@25±5°C)                  | ±0.1%FS           |
| Voltage acquisition accuracy (@25±5°C)             | ±0.1%FS           |
| Current range                                      | 0~900mA           |
| Current resolution                                 | 1mA               |
| Output power                                       | 900W              |
| <b>4、Constant Current Source Module</b>            |                   |
| Number of channels                                 | 1 channels        |
| Voltage range                                      | MAX 5V            |
| Current range                                      | ±600A             |
| Current resolution                                 | 10mA              |
| Current output accuracy (@25±5°C)                  | ±0.05%FS          |
| Current acquisition accuracy (@25±5°C)             | ±0.05%FS          |

| <b>5、Programmable DC power supply</b>            |                   |
|--|-------------------|
| Number of channels                               | 1 channels        |
| Voltage range                                    | 0.1~36V           |
| Voltage resolution                               | 1mV               |
| Voltage output accuracy (@25±5°C)                | ±0.05%FS          |
| Voltage acquisition accuracy (@25±5°C)           | ±0.05%FS          |
| 15A Current range                                | 0~15A             |
| 15A Current resolution                           | 0.1mA             |
| 15A Current output accuracy (@25±5°C)            | ±0.05%FS          |
| 15A Current acquisition accuracy (@25±5°C)       | ±0.05%FS          |
| 3A Current range                                 | 0~3A              |
| 3A Current resolution                            | 0.01mA            |
| 3A Current output accuracy (@25±5°C)             | ±0.05%FS          |
| 3A Current acquisition accuracy (@25±5°C)        | ±0.05%FS          |
| 10mA Current range                               | 0~10mA            |
| 10mA Current resolution                          | 0.1uA             |
| 10mA Current output accuracy (@25±5°C)           | ±0.05%FS          |
| 10mA Current acquisition accuracy (@25±5°C)      | ±0.05%FS          |
| Maximum output power                             | 540W              |
| <b>6、High-Low Side Driver Test Module</b>        |                   |
| Number of channels                               | 4 channels        |
| Voltage range                                    | 0.1~36V           |
| Voltage resolution                               | 10mV              |
| Voltage output accuracy (@25±5°C)                | ±0.1%FS           |
| Voltage acquisition accuracy (@25±5°C)           | ±0.1%FS           |
| Current range                                    | ±3A               |
| Current resolution                               | 1mA               |
| Current output accuracy (@25±5°C)                | ±0.1%FS           |
| Current acquisition accuracy (@25±5°C)           | ±0.1%FS           |
| Single channel power                             | 108W              |
| <b>7、High power programmable resistance unit</b> |                   |
| Number of channels                               | 2 channels        |
| Signal type                                      | Resistance signal |
| Resistance range                                 | 100Ω~100MΩ        |
| Resistance resolution                            | 10Ω               |
| Resistance accuracy                              | ±1%+10Ω           |
| <b>8、Signal simulation and detection unit</b>    |                   |
| Number of PWM output channel                     | 4 channels        |

|   |  |
|---|--|
| PWM output frequency                                | 0.1Hz~100KHz   |
| Duty cycle ranges                                   | 5%~95%   |
| The amplitude                                       | ±12V   |
| Number of PWM detection channels                    | 4channels  |
| PWM detection frequency ranges                      | 0.1Hz~100KHz   |
| Duty cycle ranges                                   | 5%~95%   |
| Number of analog input detection (AI) channels      | 16 channels  |
| Analog input detection (AI) range                   | ±36V   |
| Analog input detection (AI) accuracy (@25±5°C)      | ±0.1%FS  |
| Number of analog output (AO) channels               | 8 channels   |
| Analog output (AO) voltage range                    | 0.1~36V  |
| Analog output (AO) current range                    | 0~10mA   |
| Analog output (AO) voltage accuracy (@25±5°C)       | ±0.1%FS  |
| Number of digital input detection (DI) channels     | 16 channels  |
| Digital input Detection (DI) Type                   | High level (number 1) : +2.5V~30V<br>Low level (number 0) : ≤+1V |
| Digital Output (DO) channels                        | 16 channels  |
| Digital Output (DO) Type                            | Switching signal output<br>(2A/30VDC)                            |
| <b>9、Hall analogue and Shunt simulation units</b>   |  |
| Number of channels                                  | 1channel   |
| Voltage range                                       | 0.01~5V  |
| Voltage resolution                                  | 0.01mV   |
| Voltage output accuracy (@25±5°C)                   | ±0.5mV   |
| Voltage acquisition accuracy (@25±5°C)              | ±0.5mV   |
| Current range                                       | 0~200mA  |
| Current range of the shunt                          | 0.04~200mV   |
| Voltage resolution of the shunt                     | 0.01mV   |
| Voltage output accuracy (@25±5°C) of the shunt      | ±0.04mV  |
| Voltage acquisition accuracy (@25±5°C) of the shunt | ±0.04mV  |
| Current range of the shunt                          | 0~200mA  |
| <b>10、CAN Communication Unit</b>                    |  |
| Number of CAN channels                              | 4 channels   |
| CAN Communication Protocol                          | CAN2.0A 和 CAN2.0B  |

|                                    |   |
|------------------------------------|---|
| Communication baud rate            | 40Kbps~1Mbps  |
| Interface Mode                     | LAN   |
| <b>11、RS485 Communication Unit</b> |   |
| Number of channels                 | 1 channel   |
| Communication baud rate            | 2400bps~115200bps   |
| Interface mode                     | Serial port   |
| <b>12、Computer</b>                 |   |
| Number                             | 1 Unit  |
| Component configuration            | CPU i5;memory 16G;solid state drive 500G;dual network ports |
| Display                            | 21.5Inch  |
| Mouse                              | Wired mouse   |
| Keyboard                           | Wired keyboard  |

**4. Data Storage**

- a. The software at each test station can automatically save test data and results (locally and to SQL)
- b. The software at each station can connect to the customer's MES system to check the test results of the previous station before testing.
- c. The test data can be configured with customized storage paths.
- d. Test data can be queried according to specified conditions.

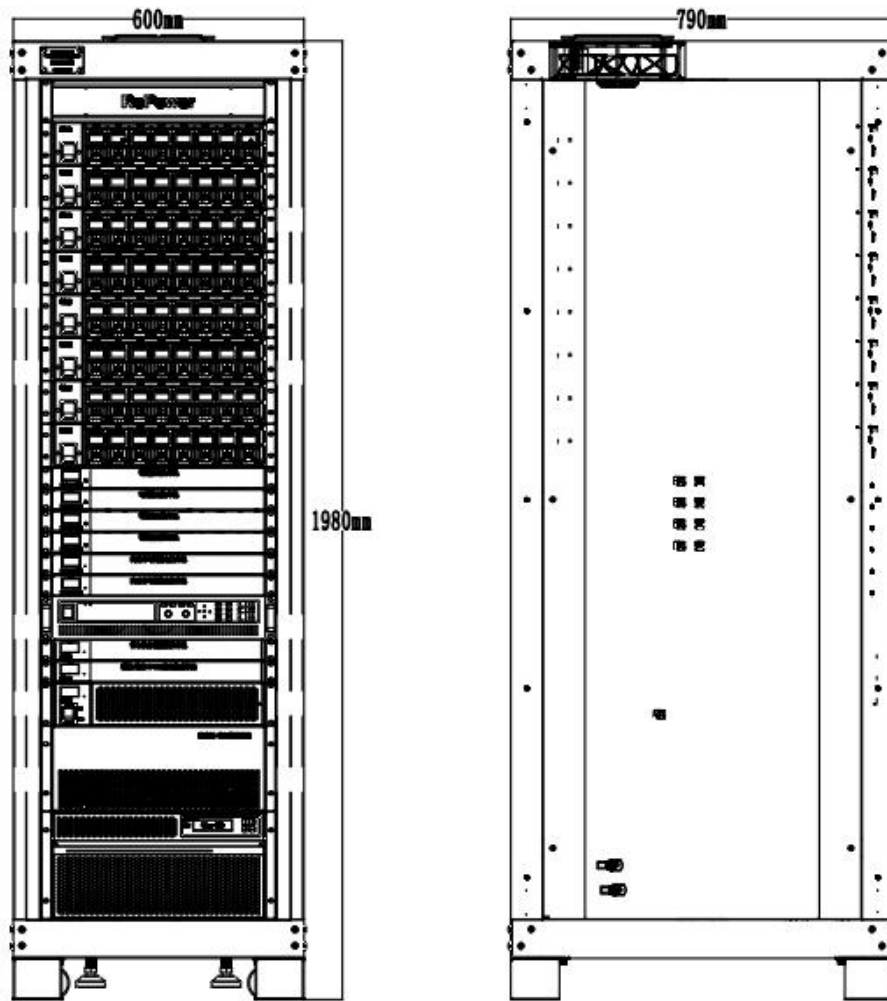
## 5. Equipment Appearance and Structure

### 5.1. Appearance

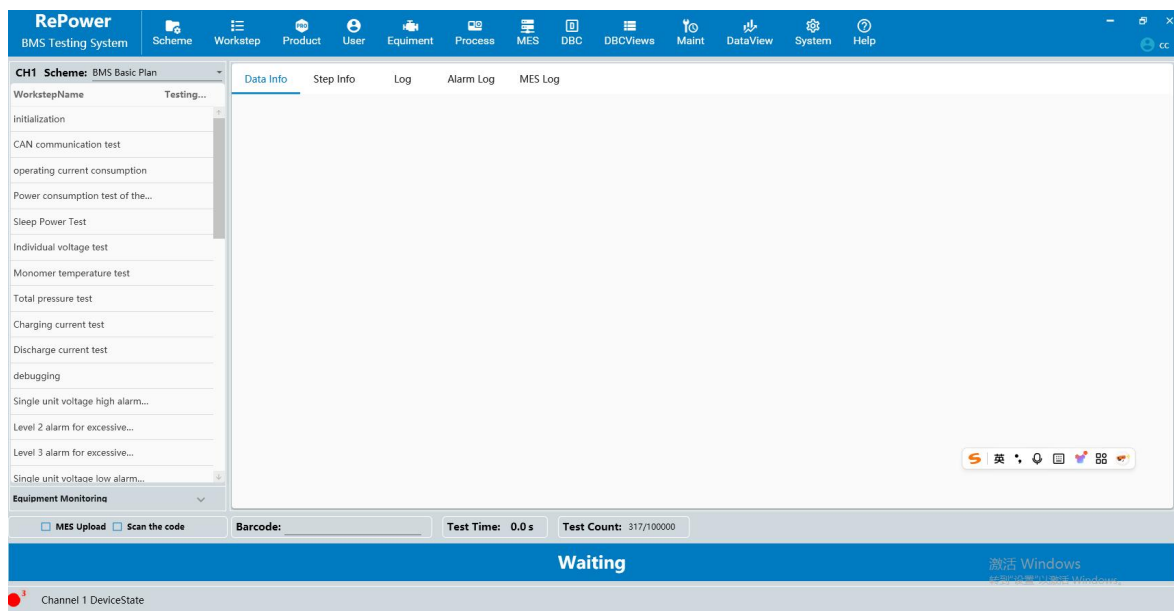
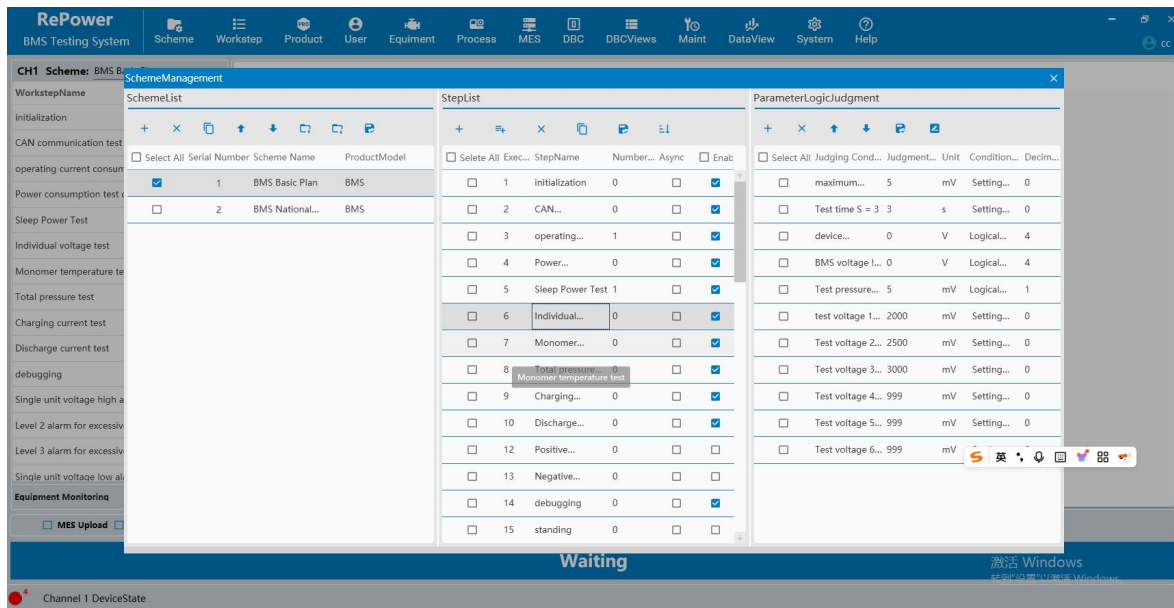


**Note: Different functional devices have different appearances; actual delivery shall prevail.**

## 5.2. Sturcture Dimensions(mm)



## 6. Software



## 7. Equipment Basic Parameters

| No. | Item | Technical parameters |
|-----|------|----------------------|
|-----|------|----------------------|

|    |                                   |   |
|----|-----------------------------------|---|
| 1  | Dimensions                        | ≤600*800*1980mm (W*D*H)   |
| 2  | Weight                            | ≤350KG  |
| 3  | Number of equipment Channal       | 1 Channel   |
| 4  | Operation mode                    | Manual wiring, automatic testing, can test one product at a time  |
| 5  | Input                             | AC220V±10%, 50HZ±5% and Current source powered AC380V±10%, 50HZ±5%  |
| 6  | Power                             | ≤8KW  |
| 7  | Dustproof, Heat Dissipation       | with dustproof and heat dissipation devices   |
| 8  | Cooling system                    | Air   |
| 9  | Working Environmental temperature | 0°C~45°C  |
| 10 | Storage Temperature               | -10°C~70°C  |
| 11 | Operational relative Humidity     | 30%~85% (RH non-condensing)   |
| 12 | Environment Requirement           | <ol style="list-style-type: none"> <li>1. The environment should be free from strong vibrations, corrosive gases, metal powders, dust, and flammable or explosive gases.</li> <li>2. The equipment should maintain an appropriate distance from walls or other objects to allow for ventilation and heat dissipation</li> </ol> |

### 8. Description of Supply Scope

| No. | Item  | Customer | Supplier |
|-----|---|----------|----------|
| 1   | BMS acquisition line, Connection line, Output line, Dedicated connector | √        |          |
| 2   | Test fixtures and jigs  | √        |          |
| 3   | Testing equipment and test cabinet (including internal circuits)        |          | √        |
| 4   | Test computer (mouse/keyboard/monitor, etc.)                            |          | √        |
| 5   | Testing software for the BMS of supplier                                |          | √        |
| 6   | Connection Services Between BMS tester of supplier and MES of customer  |          | √        |

**Note: The supply scope has been shown above. The supply scope shall be used as the basis for separate acceptance**

### 9. Contact Information

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