

Q 0590

PANEL MOUNT MULTIFUNCTION DIGITAL VOLTAGE METER

INTRODUCTION

The Q 0590 is a new-type of voltage meter which can simultaneously measure voltage, current, power, charging capacity and time. The two-line LED display can display two different groups of data. The meter can switch between measurements of different parameters. It is ideal for monitoring output voltage and current, as well as the battery charge and discharge applications.

FEATURES

- Two Line LED display for voltage and current, capable for measuring other parameters like power, charge capacity and time.
- Flexible DIY calibration functions for voltage and current measurements.
- Four-bit LED digital tube, in which three bits are for measured values and one bit is for the unit marker.
- Convenient to carry, easy to operate.

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- Voltage Meter
- User Manual

INSTRUMENTATION



Function Description

1. Up, Out and Down Buttons
2. LED Digital Display
3. Display Function Legend
4. Output Negative Terminal
5. Output/Input Positive '+' Terminal
6. External Power Supply Positive '+' Terminal
7. Input Negative '-' Terminal

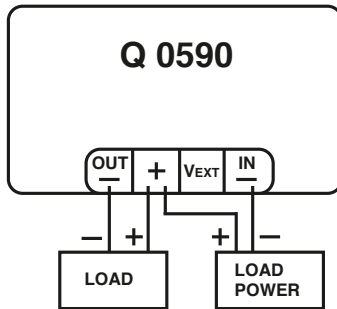
Note: This model does not have built-in protection features.

WIRING SYSTEMS:

There are four terminals on the back of the meter marked on the rear panel as follows: "INPUT -", "+", "Vext" and "OUTPUT?". The "+" is the common terminal of "INPUT +" and "OUTPUT +". The "Vext" is the positive side of the basic wiring system.

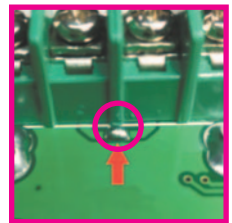
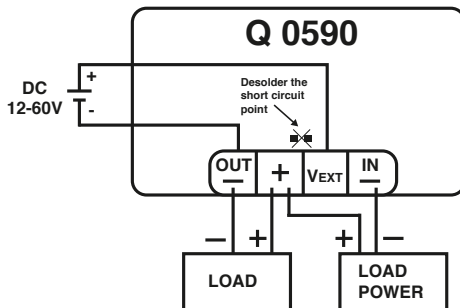
This meter offers Common (Two-wire) and Separate / Isolated (Three-wire) power supply wiring input methods. The Common Power Supply system can connect the meter directly to the circuit, and allows the load power supply to simultaneously power the meter. The Separate/Isolated Power Supply method requires an external power supply for the instrument. Please pay attention to the positive and negative when wiring.

Common Power Supply System Diagram:



This is used when the LOAD POWER supply powers both the load and the panel instrumentation. The positive side of the LOAD POWER and LOAD are connected to the "+" terminal, the negative side of the LOAD POWER is connected to the "INPUT -". The negative side of the load is connected to the "OUTPUT -". "Vext" terminal is not connected to anything.

Separate/Isolated Power Supply System Diagram:



NOTE: To operate in 3-wire mode this internal short needs to be removed.

This is used when the Load Power Supply powers ONLY the load, and the panel is powered by an external voltage source Vext. Open the back cover, as shown above, disconnecting the short circuit point with a soldering iron on the PCB near the terminal block (see arrow). Replace the rear panel.

Connect the positive pole of the external voltage source —|— "DC12V - 60V" to the "Vext". Connect the "OUT-" to the external power negative pole. The panel instrumentation is now powered externally. The positive poles of the both LOAD and LOAD POWER should be connected to the "+" terminal. The negative pole of

LOAD POWER should be connected to the "IN -". The negative pole of LOAD should be connected to the "OUT -". The LOAD is now powered by the Load Power Supply.

OPERATING INSTRUCTIONS

Wiring:

Select the appropriate wiring according to the range of the measured voltage, ensuring input voltage is within the tolerance range of the instrument.

Note: The input voltage range of two-wire: 10V – 90V; The input voltage range of three-wire: 0V – 90V.

Output:

Please be sure that the input voltage is within the range that the meter can withstand. Power on the device and the LEDs will display voltage value as a start-up default, while the lower line will display current value.

Press the up-arrow button to select the upper line display of the LED digital tube. Press the down-arrow button to select the lower line of the LEDs on the front panel display, which has the flexibility to switch the display between these parameters: voltage (V), current (A), power (P), capacity (C) and time (H).

Debug mode:

The following settings are also needed to enter debug mode, respectively:

1. When there is a certain error of the measured voltage or current value and it needs to be calibrated.
2. When the parameters are confused, you need to restore to default factory settings.

Enter debug mode: In the normal operating state, press the **OUT** button for a few seconds until the unit enters the debug mode. This will occur when the upper row of digital tube displays "**0-U**". Press **OUT** button again and the upper row of LEDs displays alternately between these functions: "**0 - U**", "**1 - C**", "**2 - ES**" and "**3 - r**".

Exit debug mode: In the debug mode, you can exit by pressing the < OUT > button for a few seconds.

The functions of Debug mode:

- a) "**0 - U**" is the calibration of the voltage value, the voltage value displayed on the LEDs is the current measured value. We can choose two points to calibrate the voltage. Generally, we choose 32V as the high voltage point, 12V as the low voltage point. The demarcation criterion of highs and lows is 20V. Above 20V is the high point voltage in default, less than 20V is the low point voltage in default. Now we can compare to a standard voltmeter, press up-arrow button to increase the voltage measure, press down-arrow button to decrease the voltage measure. The two points will affect each other, and after adjusting back and forth two or three times, the measured values can be consistent with the values of the standard voltmeter.
- b) "**1 - C**" is the calibration of the current value, the current value displayed on the LEDs is the current measured value. We can choose two points to calibrate the current. Generally, we choose 3A as the high current point, 0.1A as the low current point. The demarcation criterion of highs and lows is 2A. Above 2A is the high point current in default, less than 2A is the low point current in default. Now we can compare to a standard ammeter, press up-arrow button to increase the current measure, press down-arrow button to decrease the current measure. The two points will affect each other, and after adjusting back and forth two or three times, the measured values can be consistent with the values of a standard ammeter.
- c) "**2 - ES**" is the function to save parameters. When you need to save parameters, adjusting to the "**2 - ES**", the digital tube displays "-n-" by default, indicating that don't save the parameters, you can adjust to

“- y -” by pressing up or down arrows , then press < OUT >. The meter will save parameters and exit the debug mode automatically.

- d) “3 - r” is to restore factory settings. If you want to return to the initial values, you can adjust to “- y -” by pressing up or down arrows, then press< OUT >. This will restore the unit to the default factory settings.

SAFETY RECOMMENDATIONS

- The module could be damaged if the range of the meter is exceeded. This model does not have built-in protection features.
- Check the polarity of the input and output connections to the meter. If wires are connected incorrectly, the unit will not measure.
- Keep the meter dry and dust free.
- Do not attempt to disassemble the instrument. There are no user-serviceable parts inside. If it needs to be repaired, please return the unit to the place of purchase for service support.
- Do not knock or shake the instrument violently as it could lead to irreparable damage to the internal circuitry.

SPECIFICATIONS

Input voltage:

Two wire system:10V–90V

Three wire system:0–90V

Output current:0–20A

Display:4 bit LED(3 bit for value and 1 bit for unit)

Display resolution:

Voltage:0.01V

Current:0.01A

Power:0.01W

Capacity:0.01AH

Time:0.01H

Accuracy:

Voltage:.....±1%+2 bytes

Current:±2%+5 bytes

Measuring rate:5 times/s

Dimensions:79W x 43H x 25D(mm)

Panel hole:76.5W x 39.2H(mm)

Operating temperature:10°C to 50°C

Storage Temperature:.....-20 to 70 degrees Celsius

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