



PASS PPC-24 VOLTAGE/CURRENT PROCESS-SIGNAL CALIBRATOR

OPERATING MANUAL & SPECIFICATIONS

PLEASE READ BEFORE SWITCHING ON THE UNIT, IMPORTANT SAFETY INFORMATION INSIDE

Safety Information

To avoid possible electric shock or personal injury:

- Never apply more than 30V between any two terminals, or between any terminal and earth
- Make sure the battery door is closed and latched before you operate the calibrator
- Remove test leads from the calibrator before you open the battery door
- Do not operate the calibrator if it is damaged
- Do not operate the calibrator around explosive gas, vapour, or dust

To avoid possible damage to the calibrator:

- Use only the terminals corresponding to the function chosen
- Do not apply a voltage or current to the calibrator when it is not in operation

Introduction

This Calibrator is used to measure or output 0 to 24 mA DC current loop, and 0 to 20 V DC voltage. The calibrator cannot be used to measure and source simultaneously.

Included Accessories

- Carry Case
- Pair of Test Leads and Clips
- 6x AAA 1.5 V Batteries
- Operating Manual

Input/Output Voltage Parameters

Function	Range	Resolution
DC V mV Input	0 ~ 100 mV	0.01 mV
	0 ~ 20 V	0.001 V
DC V mV Output	0 ~ 100 mV	0.01 mV
	0 ~ 20 V	0.001 V
Loop Power Output	24V DC	N/A

Input/Output mA Parameters

Function	Range	Resolution
DC mA Input	0 ~ 24 mA	0.001 mA
DC mA Output	0 ~ 24 mA	0.001 mA

Specification

Specifications are valid for one year and apply between temperatures of +18 and +28°C. 'Counts' refers to increments or decrements of the least significant digit.

DC V Input/Output

Function	Range	Accuracy± (% of reading + Counts)
100 mV	0.01 mV	0.02 % + 3
20 V	0.001 V	0.02 % + 3
Input Impedance	2MΩ (nominal), < 100pF	
Over Voltage Protection	30 V	
Voltage Driver Capability	1 mA	

DC mA Input and Output

Function	Range	Accuracy± (% of reading + Counts)
24 mA	0.001mA	0.015 % + 3
Overload Protection	125 mA, 250V fast-acting fuse	
Percent Display	0%=4mA, 100%=20mA	
Source Mode	When output is more than 15mA @500Ω, change the power supply to external power. The Max load is 24mA @700Ω when using external power.	
Simulate Mode	External loop voltage requirement: 24V nominal, 30V maximum, 12V minimum.	




Loop Power

24 V ± 10%

General Specifications

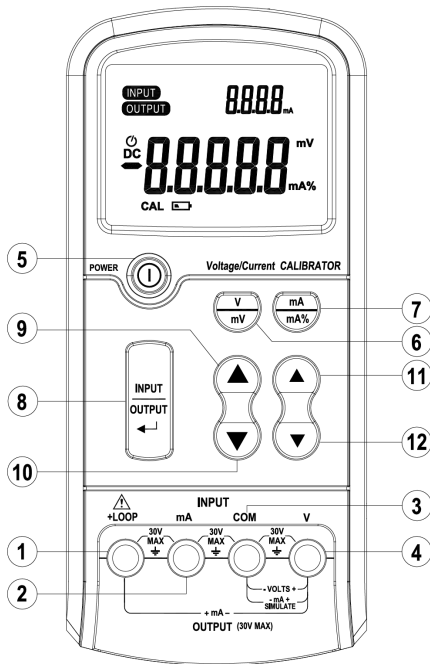
30 V Max. Voltage applied between a terminal and earth or between two terminals	
Storage Temperature	-40°C ~ 60°C
Operating Temperature	-10°C ~ 55°C
Operating Altitude	3000 meters maximum
Temperature Coefficient	±0.005% of range per °C for the temperature range -10°C to 18°C and 28°C to 55°C
Relative Humidity	95% up to 30°C, 75% up to 40°C, 45% up to 50°C, 35% up to 55°C
Shock	Random, 2g, 5Hz to 500Hz
Safety	1 meter drop test
Power Requirements	6x AAA 1.5 V Batteries
Size (LxWxH)	204mm× 99mm × 46mm, 460g (with batteries)

International Symbols

Symbol	Meaning
 The symbol for Earth Ground, consisting of a vertical line with three horizontal bars of decreasing width at the top, resembling a stylized T-shape.	Earth Ground
 The CE marking symbol, consisting of the letters 'C' and 'E' in a stylized, bold font.	Conforms to European Union Directives (CE marking)
 The warning symbol, consisting of a black triangle with a white exclamation mark inside.	Warning! Take note of Safety Recommendations

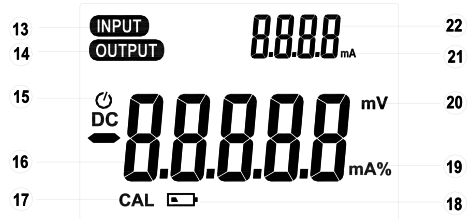
Explanation of the Front Panel

1. Terminal for 24 V Loop
2. Terminal for mA Measurement
3. Input/Output Negative Terminal (Earth)
4. V ,mV Input/Output Terminal
5. On/Off button
6. V, mV selection
7. mA and mA% selection
8. Input/output selection
9. High value incrementation
10. High value decrementation
11. Low value incrementation
12. Low value decrementation



Explanation of the Display Screen

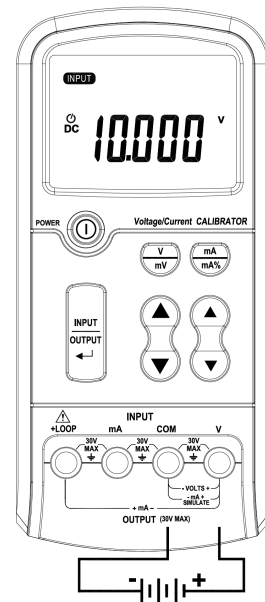
13. Indication of operation in Input Measurement Mode
14. Indication of operation in Output Mode
15. Indication of activation of Auto Power Off
16. Display of the values measured or generated
17. Indicates Calibration Mode
18. Indicates battery life
19. Current (mA / mA%) indication
20. Voltage (V/mV) indication
21. Current (mA) indication
22. Secondary display



Operating Instructions

DC V Measurement

1. Turn the calibrator on **(5)**
2. Press the input/output selection button **(8)** to display "INPUT" **(13)**
3. Press the V mV selection button **(6)** to select V DC or mV DC **(20)** according to the desired measurement range
4. Connect the red test lead to the V terminal **(4)** and the black lead to the COM terminal **(3)**
5. Connect the other end of the red test lead to the positive pole of the voltage to be measured and the black lead to the negative pole (earth)
6. The result is displayed on **(16)**

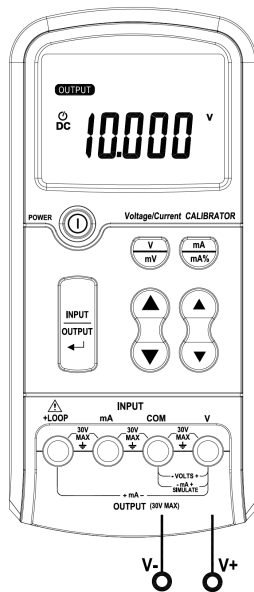


The numbers in brackets refer to the [EXPLANATION OF THE FRONT PANEL](#) and the [EXPLANATION OF THE DISPLAY SCREEN](#)

Operating Instructions

DC Voltage Output

1. Turn the calibrator on **(5)**
2. Press the input/output selection button **(8)** to display **(14)** “OUTPUT”
3. Press the V mV selection button **(6)** to select V or mV **(20)** according to the desired output voltage
4. Press the adjustment buttons **(9), (10), (11), (12)**, to set the desired value
5. Connect the red test lead to the V terminal **(4)**, and the black lead to the COM terminal **(3)**
6. Connect the other end of the red test lead to the positive pole of the voltage to be measured and the black lead to the negative pole (earth)
7. If you want to change the output value or range, press the setting adjustment buttons **(9), (10), (11), (12)** or the V mV selection button **(6)**

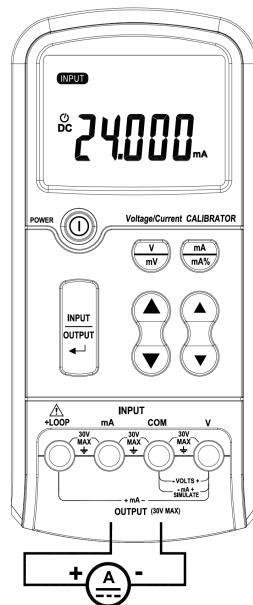


Operating Instructions

DC mA Measurement

Measurement of an external current.

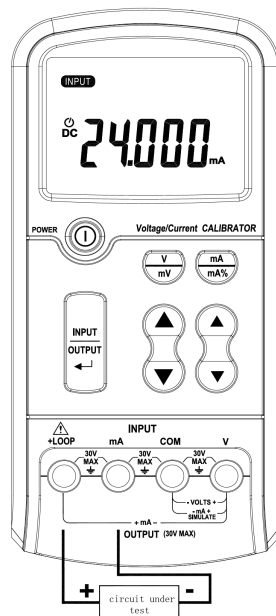
1. Turn the calibrator on (5)
2. Press the input/output selection button (8) to display (13) "INPUT"
3. Press the mA–mA% (7) selection button to select mA or mA% (19) according to the desired display. In the mA% mode, the 4-20 mA value will be displayed in the secondary display area (22)
4. Connect the red test lead to the mA terminal (2), and the black lead to the COM terminal (3)
5. Connect the other end of the red test lead to the positive pole of the current to be measured and the black lead to the negative pole (earth)
6. The result is displayed in (16)



Operating Instructions

Loop Measurement

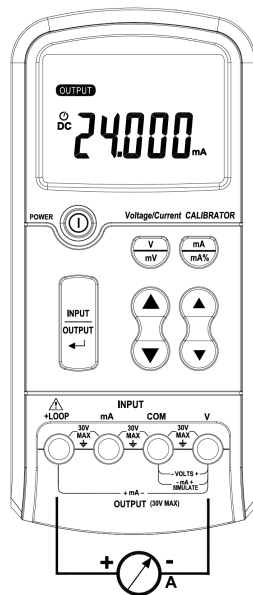
1. Turn the calibrator on **(5)**
2. Press the input/output selection button **(8)** to display **(13)** “INPUT”
3. Press the mA–mA% **(7)** selection button to select mA or mA% **(19)** according to the desired display. In the mA% mode, the 4-20 mA value will be displayed in the secondary display area **(22)**
4. Connect the red test lead to the LOOP terminal **(1)**, and the black lead to the mA terminal **(2)**
5. Connect the other end of the red test lead to the current input to be measured and the black lead to the current output
6. The result is displayed in **(16)**



Operating Instructions

DC mA Output Sourcing mA

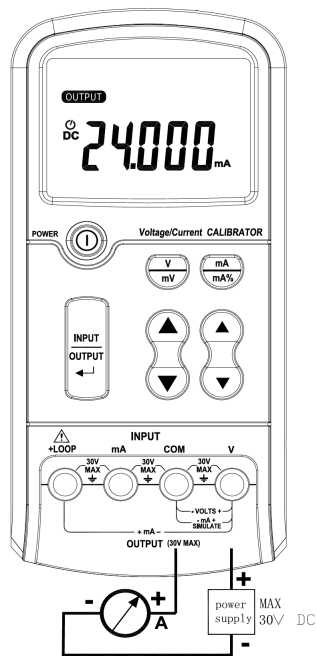
1. Turn the calibrator on **(5)**
2. Press the input/output selection button **(8)** to display **(14)** “OUTPUT”
3. Press the mA–mA% **(7)** selection button to select mA or mA% **(19)** according to the desired display. In the mA% mode, the 4-20 mA value will be displayed in the secondary display area **(22)**
4. Press the value setting buttons **(9), (10), (11), (12)**, to set the desired value
5. Connect the red test lead to the LOOP terminal **(1)**, and the black lead to the V terminal **(4)**
6. Connect the other end of the red test lead to the positive pole of the output current and the black lead to the negative pole
7. If you want to change the output value, press the value setting buttons **(9), (10), (11), (12)** or the selection button mA–mA% **(7)** to change the display.



Operating Instructions

Simulating a Transmitter

1. Turn the calibrator on **(5)**
2. Press the input/output selection button **(8)** to display **(14)** “OUTPUT”
3. Press the mA–mA% **(7)** selection button to select mA or mA% **(19)** according to the desired display. In the mA% mode, the 4-20 mA value will be displayed in the secondary display area **(22)**
4. Press the value setting buttons **(9), (10), (11), (12)**, to set the desired value
5. Connect the red test lead to the V terminal **(4)**, and the black lead to the COM terminal **(3)**
6. Connect the other end of the red test lead to the positive pole of the external power supply and the black lead to the positive pole of the current to be measured
7. If you want to change the output value, press the setting buttons **(9), (10), (11), (12)** or the mA–mA% **(7)** selection button to change the display.



Operating Instructions

Auto Shut Off

The default auto shut-off time is 30 minutes.

Setting Auto-power off option:

1. Hold **(7)**, then turn on the power
2. Release **(7)**, press **(9)** to increase or **(10)** to decrease value to adjust the time (off,15min.~60min.)
3. Then press **(7)** to finish setting auto-power off option

After changing the battery, the auto-power off setting returns to the default setting.

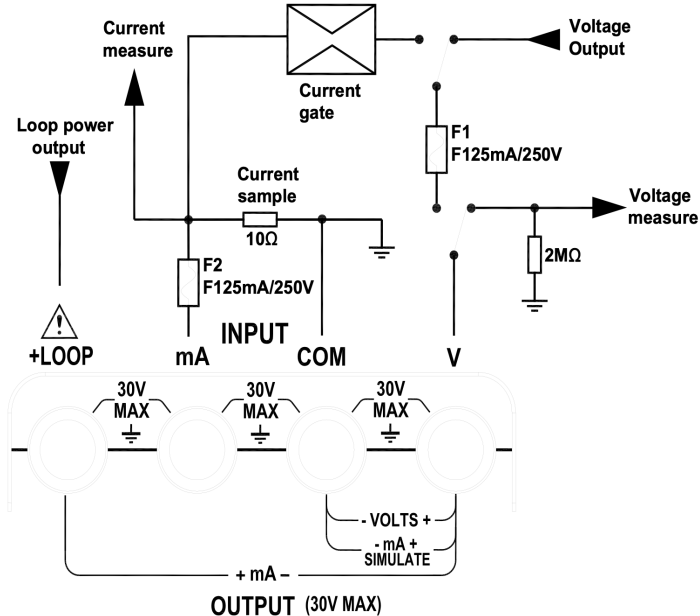
If after changing the battery, the unit no longer powers on, please remove the battery, wait 3 minutes, then try again.

Display all Symbols

Setting display all symbols:

1. Hold **(6)**, then turn on the power
2. It will display all symbols on the LCD
3. Press any button to exit

Diagram of the Terminals Circuit



Connecting a Mains Adapter (Accessory)

1. Connect the mains cord to the adapter
2. Connect the AC cord to the mains outlet (100 V–240 V)
3. Connect the DC power supply plug of the adapter to the DC terminal of the calibrator

Linear Power Adaptor Information

Input: 220V-240VAC,50-60Hz 1A

Output: DC 9V 1A MAX, $\pm 8\%$

Polarity:



Plug size: DCPLUG(Round) -5.5mm-2.1mm(hole)

Ripple: $\leq 50\text{mVpp}$

WARNING

1. Only use the original mains adapter
2. The adapter is intended for indoor use only
3. First, connect the plug of the AC cord to the mains outlet, then firmly insert the supply plug into the DC terminal of the measuring device. To disconnect it, pull the DC plug straight out, then disconnect the adapter from the mains outlet
4. Do not use the mains adapter with any other device.
5. It is normal for the mains adapter to warm up in operation
6. Do not dismantle the mains adapter
7. Do not use the adapter in an overheated or damp room
8. It is normal for the mains adapter to make noise when in operation
9. The battery symbol may appear when plugging the AC power adapter

Maintenance



Use only manufacturer-specified spare parts for maintenance. The manufacturer is not responsible for accidents resulting from repairs performed by unapproved repairers.

Cleaning

Periodically wipe the case with a damp cloth and gentle detergent; do not use abrasives or solvents.

Calibration

Calibrate your calibrator once a year to ensure that it performs according to its specifications. You can visit www.calibrate.co.uk for a quote.

Replacing the Battery

Please change the battery when the LCD indicates the battery symbol

1. Turn off the instrument
2. Remove the battery cover, discard old batteries properly and safely, and replace them with new 1.5V AAA batteries

Replacing a Fuse



Warning

To avoid personal injury or damage to the calibrator, use only a 0.125A 250V fast fuse.

Fuse 1 may be blown if:

In the V output mode, with the test leads removed from the calibrator, the display flashes OL.

Fuse 2 may be blown if:

In the mA input mode, the calibrator always reads 0.000, even with a signal applied.



TEST EQUIPMENT | TRAINING | CALIBRATION

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