

# Multifunction Process Calibrator

Model PRC30



## Introduction

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Thank you for selecting the Extech Model PRC30. This device is shipped fully tested and calibrated and, with proper use, will provide years of reliable service. Please visit the Extech Instruments website ([www.extech.com](http://www.extech.com)) to check for the latest version of this User Guide. Extech Instruments is an ISO-9001 certified company.

## Safety

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### International Safety Symbols



This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.



This symbol, adjacent to a terminal, indicates that, under normal use, hazardous voltages may be present



Double insulation

### Safety Notes

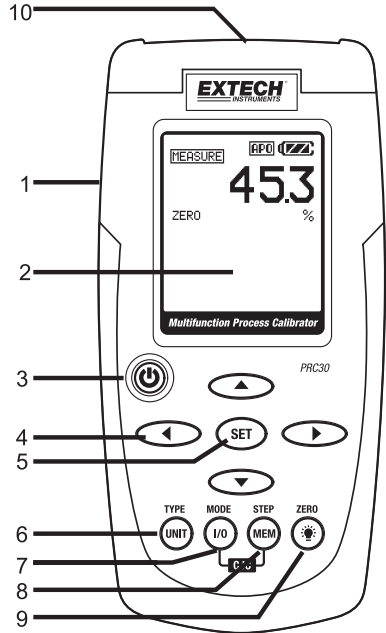
- Do not exceed the maximum allowable input range.
- Turn the unit OFF when the device is not in use.
- Remove the batteries if the device is to be stored for longer than 60 days.
- Never dispose of batteries in a fire. Batteries may explode or leak.
- Never mix battery types. Always install new batteries of the same type.

### Cautions

- Improper use of this meter can cause damage, shock, injury or death. Read and understand this user manual before operating the meter.
- Always remove the test leads before replacing the battery.
- Inspect the condition of the test leads and the meter itself for any damage before operating the meter. Repair or replace any damage before use.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

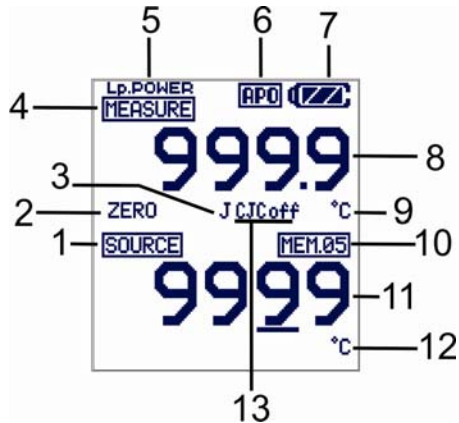
# Meter Description

- 1. AC adaptor input jack
- 2. Display
- 3. Power ON/OFF
- 4. Source output adjustment arrow buttons
- 5. Set button
- 6. Unit button (thermocouple type, °F or °C)
- 7. I/O button
- 8. MEM (memory STEP button)
- 9. Backlight/ZERO button
- 10. Input/Output jacks and Thermocouple mini-connector



## Display Layout

- 1. SOURCE mode icon
- 2. ZERO function status icon
- 3. Thermocouple type
- 4. MEASURE mode icon
- 5. Loop Power icon
- 6. Auto Power OFF active icon
- 7. Battery status icon
- 8. Measure mode value
- 9. Measure mode units icon
- 10. Datalogger memory location
- 11. Source mode value
- 12. Source mode units icon
- 13. Cold Junction Compensation (CJC) circuit status (ON or OFF)



# Keypad Descriptions and Operation

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## POWER BUTTON and AUTO POWER OFF FEATURE

1. Use the POWER button to turn the unit ON or OFF. When the unit is powered up, a short self-test will ensue after which the display will stabilize.
2. When the battery symbol flashes on the display, replace the battery as soon as possible. Low battery power may cause inaccurate readings and erratic meter operation.
3. This instrument is equipped with Auto Power OFF which turns the meter off after 10 minutes of inactivity. To override this feature; press and hold the POWER button until the display icon "ATP" turns off.

## UNIT BUTTON

Momentarily press the **UNIT** button to select °F or °C in the temperature function, to select mA or % in the current function or to select mV/V in the voltage function (voltage is autoranging in the MEASURE mode)

## TYPE BUTTON

Press and Hold for 1 second the TYPE/UNIT button to change the thermocouple type (J, K, T, E, C, R, S, N or mV) in the temperature function.

## I/O BUTTON

Momentarily press the **I/O** button to select either SOURCE (output) or MEASURE (input).

## MODE BUTTON

Press and Hold the MODE / I/O button for 1 second in the MEASURE mode to select the measurement function (temperature, voltage, current, or current with loop power).

## CJC ON/OFF

In the temperature function, simultaneously press the IO and MEM buttons to turn the CJC (cold junction compensation) on or off. The CJC icon will indicate the status.

Note: CJC should normally be ON.

## (Backlight) BUTTON

Momentarily press the Backlight button to turn the backlight on or off.

## **ZERO** BUTTON

In the MEASURE mode, Press and Hold the **ZERO**  button for 1 second to zero the meter.

## OFFSET ADJUSTMENT

The offset adjustment can be used to correct any known linearity errors with the thermocouple.

1. Select the measure mode and a thermocouple type (J/K/T/E/C/R/S/N).
2. Press and Hold the SET button for 1 second to enter the offset adjust mode.
3. Press the ▲ or ▼ button to change the offset value.
4. Press and Hold the SET button for 1 second to zero the offset value.
5. Momentarily press the SET button to save the change and exit the function.

## ► ◀ ▼ and ▲ BUTTONS

The arrow buttons are used to adjust the output value in the SOURCE mode.

1. Select the SOURCE mode
2. Press the ► or ◀ button select a digit for adjustment. The blinking underline cursor identifies the digit selected.
3. Press the ▼ or ▲ button to adjust the value of the digit. Press and Hold the ▼ or ▲ button to rapidly adjust the value.

## SET BUTTON

The SET button is used to manually step through the 5 stored output values.

1. Select the SOURCE mode
2. Press the SET button and the value stored in memory location 01 will be sourced. "MEM.01" appears in the display.
3. Each press of the SET button will step through the 5 memory locations.
4. The arrow buttons can be used to adjust the value in each memory location.

## STEP/MEM BUTTON

The STEP/MEM button is used to automatically step through the 5 stored output values. The meter can be set for a single cycle of the stored values or a continuous cycle.

1. Select the SOURCE mode
2. Press and Hold the STEP/MEM button. "STEPSS" (single cycle) and "STEPSC" (continuous cycle) will alternately appear in the display. Release the button when the desired mode is displayed.
3. In single cycle mode the meter will source the value displayed in MEM01 for 5 seconds. The meter will then advance to MEM02 for 5 seconds. This will continue through MEM05 and then step down through the memory locations. The cycle will end when MEM01 has been reached.
4. In the continuous mode the cycle will continue until manually stopped.
5. Momentarily press the MEM button to stop the cycle. "END" will briefly appear in the display.

### STORING VALUES INTO MEMORY

There are 5 memory locations for each function. The default values stored in the locations are:

| Memory Location | Type<br>J, K, C, R, S, N | Type<br>T            | Type<br>E             | T/C mV  |
|-----------------|--------------------------|----------------------|-----------------------|---------|
| M1              | 0.0°C<br>(32.0°F)        | 0.0°C<br>(32.0°F)    | 0.0°C<br>(32.0°F)     | 0mV     |
| M2              | 100.0°C<br>(212.0°F)     | 100.0°C<br>(212.0°F) | 100.0°C<br>(212.0°F)  | 10.00mV |
| M3              | 500.0°C<br>(932.0°F)     | 200.0°C<br>(392.0°F) | 200.0°C<br>(392.0°F)  | 25.00mV |
| M4              | 750.0°C<br>(1382.0°F)    | 300.0°C<br>(572.0°F) | 500.0°C<br>(932.0°F)  | 40.00mV |
| M5              | 1000.0°C<br>(1832.0°F)   | 400.0°C<br>(752.0°F) | 750.0°C<br>(1382.0°F) | 50.00mV |

| Memory Location | mA      | %    | mV     | V   |
|-----------------|---------|------|--------|-----|
| M1              | 4.00mA  | 0.0% | 0mV    | 0V  |
| M2              | 8.00mA  | 25%  | 500mV  | 5V  |
| M3              | 12.00mA | 50%  | 1000mV | 10V |
| M4              | 16.00mA | 75%  | 1500mV | 15V |
| M5              | 20.00mA | 100% | 2000mV | 20V |

To change the values in memory:

1. Select the SOURCE mode
2. Press the SET button to select the memory location to be changed.
3. Press the arrow buttons to adjust to the new value
4. Momentarily press the MEM button to store the value. The memory location icon will blink while the value is being stored..

### **Temperature**

#### **MEASURE (Input) Mode of Operation**

1. Turn the meter ON.
2. "MEASURE" will appear in the display.
3. Press and Hold the MODE button for 1 second to select the temperature function.
4. Press and Hold the TYPE button to select the thermocouple type.
5. Momentarily press the UNIT button to select °F or °C.
6. Connect the thermocouple to the meter.
7. Read the measurement on the display.

Note: See the keypad description section to turn CJC on/off.

#### **SOURCE (Output) Mode of Operation**

In this mode, the unit can source the equivalent mV value for the temperature and the thermocouple type selected. The values can be output either manually or stepped from memory as described earlier.

1. Turn the meter ON
2. MEASURE" will appear in the display.
3. Press and Hold the MODE button to select the temperature function.
4. Press and Hold the TYPE button to select the thermocouple type.
5. Momentarily press the UNIT button to select °F or °C.
6. Momentarily press the "I/O" button to select SOURCE.
7. Connect the Calibration Cable from the meter to the device to be calibrated.
8. Use the ▲ and ▼ buttons to set the desired output value in the lower display. The upper display indicates the actual temperature or voltage value being sourced. If the upper display does not match the set value, check the batteries or the connections to the device being calibrated.

## Current and Voltage

### MEASURE (Input) Mode of Operation

In this mode, the unit will measure up to 50mADC or 20VDC

1. Turn the meter ON.
2. "MEASURE" will appear in the display.
3. Press and hold the MODE button for 1 second to select mA, mA with loop power or mV
4. Connect the Calibration Cable to the meter.
5. Connect the Calibration Cable to the device or circuit under test.
6. Read the measurement on the LCD display.

### SOURCE (Output) Mode of Operation

In this mode, the unit can source current up to 24mADC at 1000 ohms or voltage up to 20.00V. The current or voltage can be output either manually or stepped from memory as described earlier.

1. Turn the meter ON
2. "MEASURE" will appear in the display.
3. Press and Hold the MODE button for 1 second to select a current or voltage function.
4. Momentarily press the "I/O" button to select SOURCE.
5. Momentarily press the UNIT button to select % / mA or mV / V.
6. Connect the Calibration Cable to the meter
7. Connect the Calibration Cable to the device or circuit under test
8. Use the **ARROW** buttons to set the desired output value in the lower display. The upper display indicates the actual current or voltage value being sourced. If the upper display does not match the set value, either the batteries need to be replaced or the load impedance is beyond the specified range.

## ***Tilt Stand / Hanger***

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The rear stand is provides two methods for convenience in viewing.

1. Pull the bottom portion of the stand out to place the unit on a flat surface for viewing.
2. Pull the bottom and top portions of the stand out, and then rotate the stand to allow the unit to be hung.

## ***Battery Replacement***

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When the battery icon appears on the display, the six AA batteries must be replaced.

The battery compartment is located on the rear of the meter.

1. Open the tilt stand, loosen the captive Philips head screw and remove the battery cover.
2. Remove and replace the batteries, observing polarity.
3. Replace and secure the battery cover.



All EU users are legally bound by the Battery Ordinance to return all used batteries to community collection points or wherever batteries / accumulators are sold.

Disposal in household trash or refuse is prohibited.

**Disposal:** Follow the valid legal stipulations in respect of the disposal of the device at the end of its lifecycle

### **Battery Safety Reminders**

- Please dispose of batteries responsibly; always observe local, state, and federal regulations with regard to battery disposal.
- Never dispose of batteries in a fire. Batteries may explode or leak.
- Never mix battery types or old and new batteries. Always install new batteries of the same type.

# Specifications

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|                                 |                                                                      |
|---------------------------------|----------------------------------------------------------------------|
| Display                         | Dot matrix LCD                                                       |
| Cold junction compensation      | 0.03°C per °C (0.02°F per °F)                                        |
| Thermocouple Standard and Scale | NIST 175, ITS-90                                                     |
| Current output capability       | 24mADC at 1000 ohms                                                  |
| Voltage input impedance         | 10kohms minimum                                                      |
| Meter Power                     | 6 AA batteries or AC adaptor                                         |
| Auto Power OFF                  | Meter automatically powers off after 10 minutes of inactivity        |
| Operating Temperature           | 5°C to 40°C (41°F to 104°F)                                          |
| Storage Temperature             | -20 °C to 60 °C (- 4 °F to 140 °F)                                   |
| Operating Humidity              | Max 80% up to 31°C (87°F) decreasing linearly to 50% at 40°C (104°F) |
| Storage Humidity                | <80%                                                                 |
| Operating Altitude              | 7000ft (2000meters) maximum                                          |
| Dimensions                      | 159 x 80 x 44 mm (6.3 x 3.2 x 1.7") `                                |
| Weight                          | 225g (8 oz.) without batteries                                       |

Range Specifications

| T/C Source and Measure Ranges |                                                | Resolution                      | Accuracy (% of reading)  |
|-------------------------------|------------------------------------------------|---------------------------------|--------------------------|
| Type J                        | -58 to 1832 °F (-50 to 1000 °C)                | 0.1 ° (measure)<br>1 ° (source) | ± (0.05% + 1 °C /1.8 °F) |
| Type K                        | -58 to 2498 °F (-50 to 1370 °C)                |                                 |                          |
| Type T                        | -184 to 752 °F (-120 to 400 °C)                |                                 |                          |
| Type E                        | -58 to 1382 °F (-50 to 750 °C)                 |                                 |                          |
| Type C                        | 32 to 3182 °F (0 to 1750 °C)                   |                                 |                          |
| Type R                        | 32 to 3182 °F (0 to 1750 °C)                   |                                 |                          |
| Type S                        | 32 to 3182 °F (0 to 1750 °C)                   |                                 |                          |
| Type N                        | -58 to 2372 °F (-50 to 1300 °C)                |                                 |                          |
| mV                            | Measure: -10mV to 60mV<br>Source: -5mV to 55mV | 0.01mV                          | ± (0.01% + 1digit)       |

| Mode       | Function              | Range (Resolution)   | Accuracy (% of reading) |
|------------|-----------------------|----------------------|-------------------------|
| DC Measure | Current               | 0 to 50mA (0.01mA)   | ± (0.01% + 1 digit)     |
|            | Percent (%)           | -25% to +230% (0.1%) |                         |
|            | Voltage (autoranging) | 0 to 2000mV (1mV)    |                         |
|            |                       | 2 to 20V (0.01V)     |                         |
| DC Source  | Current               | 0 to 24mA (0.01mA)   |                         |
|            | Percent (%)           | -25% to +125% (0.1%) |                         |
|            | Voltage               | 0 to 1999mV (1mV)    |                         |
|            |                       | 0 to 20V (0.01V)     |                         |
| Loop Power | Current               | 24 to 30VDC, <50mA   |                         |

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