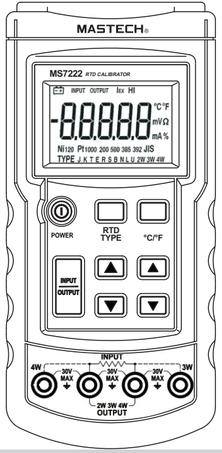
MASTECH® MS7222

RTD CALIBRATOR
OPERATING INSTRUCTION



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Introduction

RTD Calibrator is a handheld tool for calibrating RTD (Resistance Temperature Detector) transmitters, including most pulsed transmitters. It simulates and measures seven different types of RTDs, in units of °C or °F. It also simulates and measures resistance in units of ohms.
If the calibrator is damaged or something is missing, contact the place of purchase immediately. Contact your distributor for information about accessories.

Safety Information

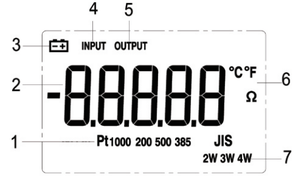
To avoid possible electric shock or personal injury:

- Never apply more than 30 V between any two terminals, or between any terminal and earth ground.
- 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, vapor, or dust.

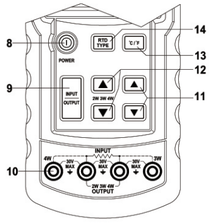
International Symbols

Symbols	Meaning
⏚	Earth ground
	Battery
⧈	Double insulated
CE	Conforms to European Union directives
⚠	Refer to this instruction sheet for information about this feature.
	Fuse

Getting Acquainted With The Calibrator



1. The RTD type annunciators show the selected RTD type.
2. Show the measured or simulated value in degrees or ohms. When OL appears, the value is out of range.
3. It will lit when the battery is low.
4. INPUT will lit when measuring an RTD or resistance.
5. OUTPUT will lit when simulating an RTD or resistance.
6. When an RTD type is selected, one of these is lit to show the selected scale.
7. When measuring an RTD, one of these is lit to indicate a two-wire, three-wire, or four-wire configuration. These annunciators are not used when simulating an RTD or resistance (output).
8. POWER ON/OFF
9. Press to select input (measure) or output (simulate) mode.
10. INPUT/OUTPUT terminals.
11. Press to scroll up or down display. Hold down to scroll faster.
12. In simulate mode, press to step up or down 10° or 10 Ω. In measurement mode, press it to select a two-wire, three-wire, or four-wire RTD input configuration.
13. °C/°F Press to toggle temperature scales between Celsius and Fahrenheit.
14. RTD TYPE Press to select a different RTD type. When you select the e type (ohms), displayed units are ohms, not degrees.



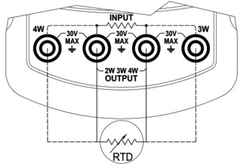
Auto Power Off function

In the process of measuring or simulating, if there is no any action on the meter within 30 minutes, the meter will be Auto Power Off. In auto power off status to press the ⏻ key, the meter will power on. The auto power off function will be cancelled such as following operation:

1. Press the ⏻ key to turn off the meter, if the meter power on.
2. Press and hold the ⏻ key to turn on the meter.
3. The auto power off function will be cancelled.
4. To resume the auto power off function, turn off the meter and turn on it again, the auto power off function will be resumed.

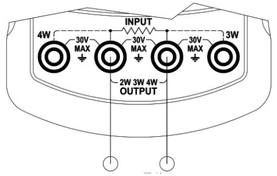
Measuring an RTD or Resistance

To measure an RTD, proceed as follows:
1. Press ⏻ to turn on the power.
2. If the calibrator is in simulate mode (OUTPUT on the display), press "INPUT/OUTPUT" once. Make sure the display shows INPUT.
3. Press RNG to select the desired RTD type.
4. Press ▲/▼ to select a two-wire, three-wire, or four wire RTD input configuration. Look for the 2W, 3W, or 4W annunciator on the display to verify that the configuration is set correctly.
5. Connect test leads to the RTD as shown up. Use two, three, or four inputs, depending on the setting of 2W, 3W, or 4W on the display.
6. Read value on the meter.



Simulating an RTD or Resistance

To simulate an RTD, proceed as follows:
1. Press ⏻ to turn on the power.
2. If the calibrator is in input mode (INPUT on the display), press "INPUT/OUTPUT" once. Make sure the display shows OUTPUT.
3. Press RNG to select the desired RTD type.
4. Connect test leads to the terminals of the RTD measuring device as shown. Use only the two center outputs.
5. Press ▲/▼ or ▲/▼ to adjust the value for output.



RTD DEVICE INPUT

Specifications

Specifications are based on a one year calibration cycle and apply for ambient temperature from +18°C to +28°C unless stated otherwise.

RANGE	Input Accuracy 4 Wrie ± Ω	Output Accuracy ± Ω	Allowable Excitation (mA)
0.00Ω~400.00Ω	0.1	0.1	0.1~3.0
400.0Ω~1500.0Ω	0.5	0.5	0.05~0.8
1500.0Ω~3200.0Ω	1	1	0.05~0.4

Allowable Excitation is for Output mode only.
It shows the allowable excitation current from an ohmmeter or RTD measurement device connected to the calibrator.
Excitation current from Calibrator: 0.2 mA.
Maximum input voltage: 30 V

RTD Specifications

RTD TYPE	RANGE°C (°F)	Accuracy (°C)			Allowable Excitation (mA)
		INPUT		OUTPUT	
		4W	2W/3W		
Pt10 (385)	-200.0~800.0 (-328.0~1472.0)	1.5	1.5	1.5	0.1~3.0
Pt50 (385)	-200.0~800.0 (-328.0~1472.0)	0.3	0.5	0.5	0.1~3.0
Pt100(385)	-200.0~800.0 (-328.0~1472.0)	0.3	0.4	0.4	0.1~3.0
Pt200(385)	-200.0~630.0 (-328.0~1166.0)	0.2	0.4	0.4	0.1~3.0
Pt500(385)	-200.0~630.0 (-328.0~1166.0)	0.2	0.4	0.4	0.05~0.8
Pt1000(385)	-200.0~630.0 (-328.0~1166.0)	0.2	0.4	0.4	0.05~0.4
Pt100 (385)JIS	-200.0~800.0 (-328.0~1472.0)	0.3	0.4	0.4	0.1~3.0

Allowable Excitation is for Output mode only.
It shows the allowable excitation current from an ohmmeter or RTD measurement device connected to the calibrator.
Excitation current from Calibrator: 0.2 mA.
Maximum input voltage: 30 V

General Specifications

Maximum voltage applied between any terminal and earth ground or between any two terminals: 30V
Storage temperature: -40°C to 60°C
Operation temperature: -10°C to 55°C
Operation altitude: 3000 meters maximum
Temperature coefficient: 0.05×specified accuracy per °C for temperature ranges
-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,and 35% up to 55°C
Vibration: Random 2 g,5 Hz to 500 Hz
Shock: 1 meter drop test
Power requirements: Single 9 V battery (ANSI/NEDA 1604A or IEC 6LR61)
Size: 190mm L×89mm W×42mm H
Weight: Approx. 350g

Maintenance

Calibration

Calibrate your calibrator once a year to ensure that it performs according to its specifications.

Replacing the Batteries

If the meter display "🪫" on LCD, the battery must be replaced to maintain proper operation. Following procedure to replacing the battery:
1. Press POWER key to OFF. Disconnect test leads from any live source and remove the test leads from the input terminals.
2. Remove the screws on the battery cover and open the cover.

3. Remove the exhausted battery and replace with a new 9V battery.
4. Don't use the meter before the batter cover is in place and fastened fully.

Others

1. Clean your meter with a damp cloth and mild detergent. Do not use abrasives, solvents, or alcohol.
2. If any faults or abnormalities are observed, the meter can not be used any more and it has to be checked out.

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