

Thermocouple Calibrator



OPERATING
INSTRUCTION

Table of Content

Introduction1

Safety Information3

Explanation of International Symbols4

Operation 5

Measuring a Thermocouple5

Simulating a Thermocouple6

Specifications.....7

General Specifications8

Maintenance9

Introduction

The Thermocouple Calibrator is a precise source and measurement tool for calibrating thermocouple instruments. The calibrator sources or measures in units of °C, °F, or mV, through a thermocouple minijack.

If the calibrator is damaged or something is missing, contact the place of purchase immediately. Contact your distributor for information about accessories.

The following tables list the thermocouple types supported by the calibrator, the standards and scales used for each type, the thermocouple properties, and calibrator resolution.

Note

Since mV input and output units are available, you can use the calibrator for any thermocouple type by making manual calculations or referring to tables.

Thermocouple Standards and Scales

Thermocouple Type	Standard	Scale
J, K, T, E, R, S, B, N	NIST 175	ITS-90

Thermocouple Properties

Thermocouple Type	Temperature Ranges	Display Resolution
J	-200~1200°C / -328~2192°F	0.1°C or °F
K	-200~1370°C / -328~2498°F	0.1°C or °F
T	-200~400°C / -328~752°F	0.1°C or °F
E	-200~950°C / -328~1742°F	0.1°C or °F
R	-20~1750°C / -4~3182°F	1°C or °F
S	-20~1750°C / -4~3182°F	1°C or °F
B	600~1800°C / 1112~3272°F	1°C or °F
N	-250~1300°C / -418~2372°F	0.1°C or °F

Millivolt Range and Resolution

Mode	Range	Display Resolution
mV	-10mV~75mV	0.01mV

Safety Information



Warning

To avoid possible electric shock or personal injury:




- Never apply more than 30 V between the TC terminals, or between either TC terminal and earth ground.
- Make sure the battery door is closed and latched before you operate the calibrator.
- Remove an attached thermocouple miniplug 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.

When servicing the calibrator, use only specified replacement parts.

Explanation of International Symbols

The following symbols are used on the calibrator or in this instruction sheet. The table below explains their meaning.

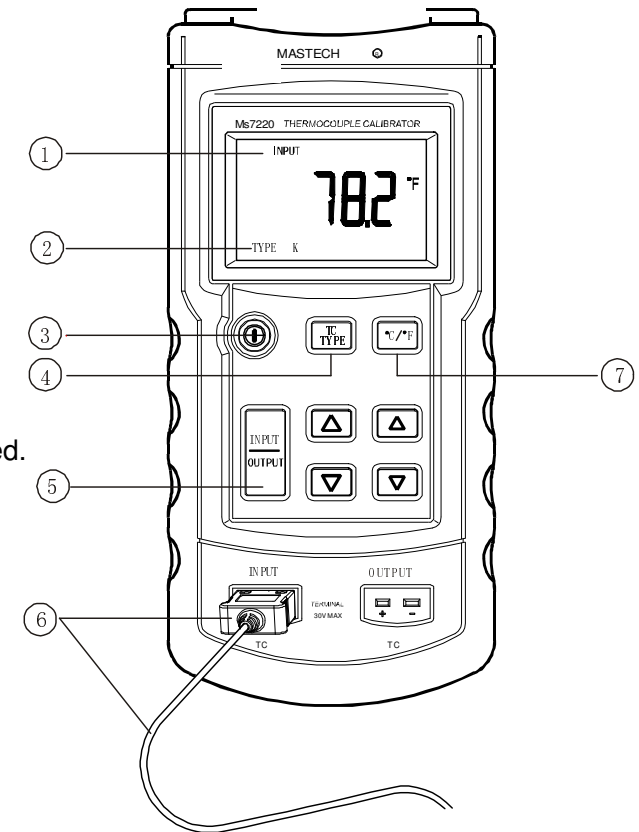
International Symbols

Symbol	Meaning
	Earth ground
	Conforms to European Union directives
	Refer to this instruction manual for information about this feature

Operation:

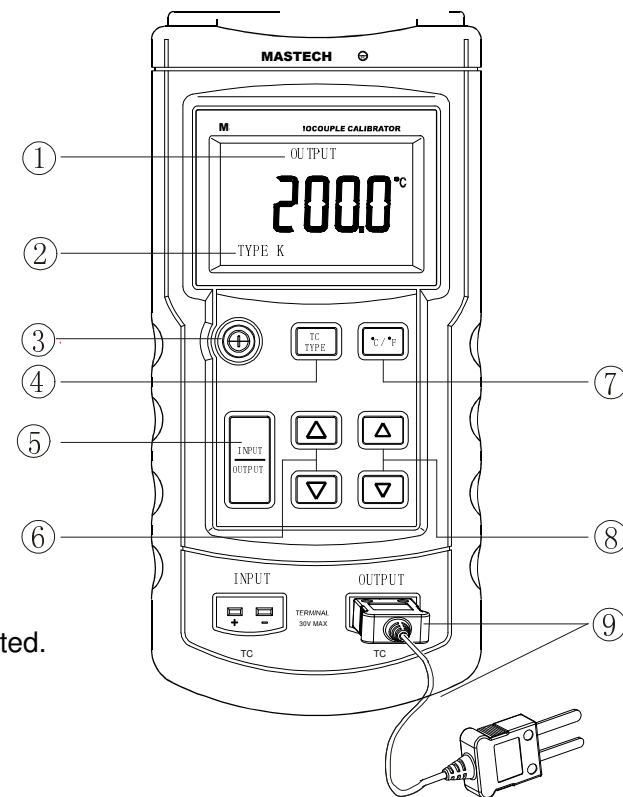
Measuring a Thermocouple

- ① INPUT.
- ② Shows TC type select.
- ③ Press to select ON or OFF.
- ④ Press to select TC type or mV.
- ⑤ Press so that INPUT is on the display.
- ⑥ TC wire and miniplug of same type as selected.
- ⑦ Press to toggle °C or °F.



Simulating a Thermocouple

- ① OUTPUT.
- ② Shows TC type select.
- ③ Press to select ON or OFF.
- ④ Press to select TC type or mV.
- ⑤ Press so that OUTPUT is on the display.
- ⑥ Press to step up/down 10° or 1mV.
- ⑦ Press to toggle °C or °F
- ⑧ Press to scroll up/down 0.1° or 0.01mV.
Hold down to scroll faster.
- ⑨ TC wire and miniplug of same type as selected.



Specifications

Specifications are based on a one year calibration cycle and apply for ambient temperature from +18°C to +28°C unless stated otherwise. “Counts” means number of increments or decrements of the least significant digit.

Temperature Measure and Thermocouple Simulate (Maximum input voltage: 30V)

Thermocouple Type	Resolution	Error	Reference Junction Error
J, K, T, E, N	0.1°C or °F	± (0.3°C+10μV)	±0.2°C
R, S, B	1°C or °F	± (0.3°C+10μV)	±0.2°C

Maximum input voltage: 30 V

Millivolt Measure and Source (Maximum input voltage: 30V)

Range	Resolution	Accuracy
-10mV~75mV	0.01mV	± (0.02%+2Dgt)

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: $0.05 \times$ 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 \times 89mm W \times 42mm H

Weight: Approx. 350g

Maintenance

If the calibrator needs repair, contact your Service. If the calibrator is under warranty, see the warranty statement for terms. If the warranty has lapsed, the calibrator will be repaired and returned for a fixed fee. Contact your Service Center for information and price.


Cleaning

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

Calibration

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

Replacing the Battery

When the  symbol appears on the display, replace the battery with a 9 V alkaline battery.

Replacing the Fuse

Fuse is probably blown if in the input mode, the calibrator always reads OL, even with a thermocouple connected.

HYS005213

Thermocouple Calibrator

