



Instruction Manual

RS-136

Temperature Calibrator (RTD + TC)





EN 61326-1 : 2013

WARNING

Please read the statement thoroughly to prevent injury or loss of life, and prevent damage to this product.



Earth (ground)



Conforms to relevant European Union directives.



Do not dispose of this instrument as unsorted municipal waste. Contact a qualified recycler for disposal.



Please remove all the test leads before performing maintenance, cleaning and battery replacement, etc.



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I. Features

1. High precision and combination of RTD and Thermocouple (TC) calibration
2. Source and measure 14 types of RTD and resistance
3. Source and measure 11 types of thermocouples (TC)
4. 4W, 3W, and 2W connections for RTD simulation and measurement
5. Current calibration of 4 fixed values (100 μ A, 250 μ A, 1mA, and 2mA)
6. $^{\circ}$ C and $^{\circ}$ F selectable
7. Accept wide range of excitation current (0.05mA to 5mA) for RTD simulation
8. Individual Thermocouple cold junction compensation (CJC) for simulation and measurement of thermocouples. CJC can be used to fine tune temperature calibration.
9. Easy 0% and 100% setup and operation
10. Easy 25%▲ (up) and 25▼ (down) for temperature calibration.
11. Individual memory of 0% and 100% setup for different RTD types and thermocouple types
12. Auto step and auto ramp for easy linear calibration
13. Detection of too low or too high excitation current (LO or HI) from the measurement device
14. Warning of exceeding calibrator driving current (IEX)
15. Memory of last setup when power off
16. Easy numerical keypad for input
17. Dot Matrix LCD with backlight
18. Very low power consumption of 30mA with backlight off
19. 15 minutes smart auto-power-off. 15 minutes timer resets itself when any input changes
20. 2 minutes smart auto-backlight-off. 2 minutes timer resets itself when any input changes

II. PANEL DESCRIPTION



1. ON/OFF button.
2. Backlight
3. SETUP button.
4. M/S button to select Measure or Source
5. Shift button to select sub-functions defined for source. Or enable thermocouple

detection (TCD) for the TC MEASURE mode. In the SETUP, press SHIFT button to clear the field for the new data entry.

6. Thermocouple (TC) input and output.
7. Sliding switch for selecting RTD connection 4W, 3W, 2W or thermocouple.
8. Auto step and auto ramp function for source. Press Shift first to select.
9. Offset function to recalibrate calibrator's offset value.
10. 25%▲(5):

In the SOURCE mode, press SHIFT then 25%▲, calibrator increases output by 25% of predefined span of 0% to 100%

In the SETUP, press ▲ to select previous item

25%▼(0):

In the SOURCE mode, press SHIFT then 25%▼, calibrator decreases output by 25% of predefined span of 0% to 100%.

In the SETUP, press ▼ to select next item

0 %◀ (7):

In the SOURCE mode, press SHIFT then 0%, calibrator outputs predefined 0%.

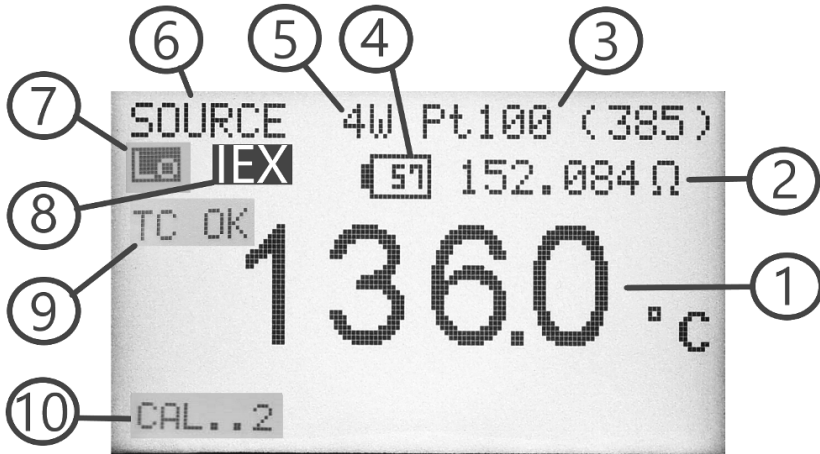
In the SETUP, press ◀ to select the previous option of the item (e.g. RTD or TC type).

100 %▶ (9):

In the SOURCE mode press SHIFT then 100%, calibrator outputs predefined 100%.

In the SETUP, press ▶ to select the next option of the item (e.g. RTD or TC type).

LCD Display



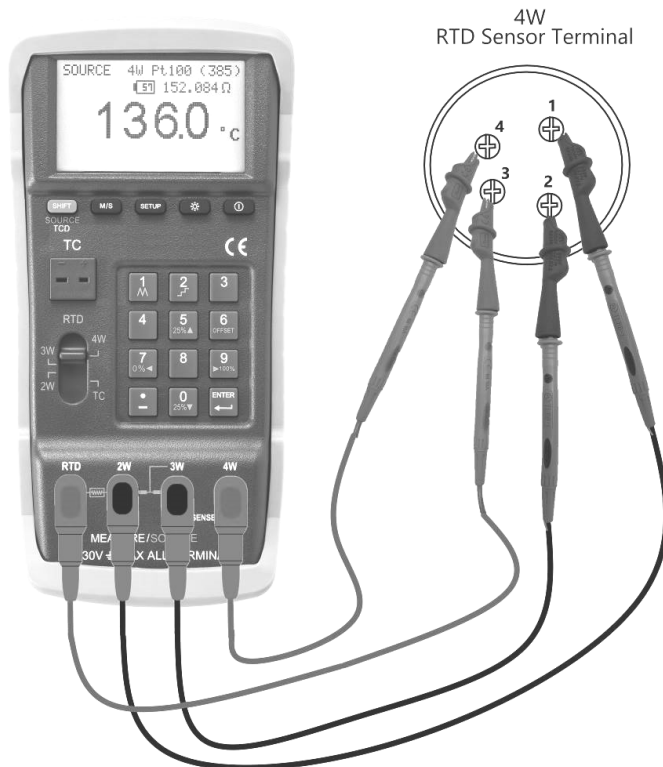
1. Temperature in °C or °F
2. Corresponding Ohm
3. RTD, Resistance or TC type
4. Battery capacity in % (e.g. 57%)
5. RTD connection (4W, 3W, or 2W)
6. SOURCE or MEASURE
7. Lo : Excitation current from the measuring instrument is too low
Hi: Excitation current from the measuring instrument is too high
8. IEX: Exceeding calibrator's driving current
9. TC OK: In MEASURE mode, press SHIFT to enable Thermocouple Detection (TCD). "TC OK" means no broken wire of thermocouple or the thermocouple is connected.
TC OPEN: In MEASURE mode, press SHIFT to enable Thermocouple Detection (TCD). "TC OPEN" means broken wire of thermocouple or thermocouple is not connected.
10. The calibrator is calibrating itself. Wait until it is done.

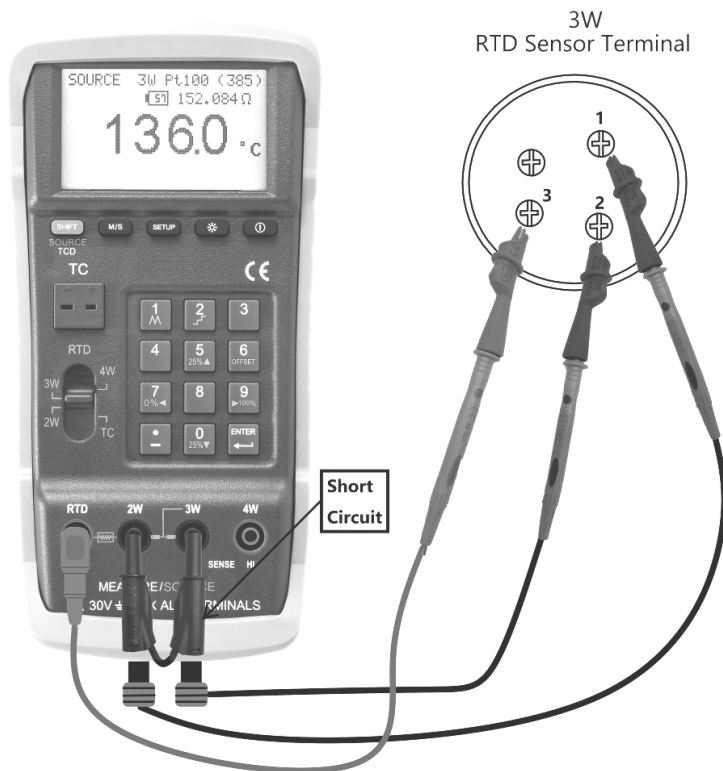
III. OPERATION

3.1 Source RTD signals (4W, 3W, 2W)



- Step 1: Press M/S button to select SOURCE
- Step 2: Move sliding switch to select RTD connection (4W, 3W, or 2W)
- Step 3: Press SETUP button to select RTD type. Then press SETUP button again to exit SETUP
- Step 4: Enter value of temperature
- Step 5: Connect the calibrator to the instrument under test as shown in the Figure following





Note: For the **SOURCE RTD 3W** connection, the two sockets (LO and sense LO) need to be shorted by the stackable black test leads with banana plugs (provided). Then plug the test leads with prods into the stackable test leads.

3.2 Source Thermocouple Signals



Step 1: Press M/S button to select SOURCE

Step 2: Move sliding switch to select TC (Thermocouple)

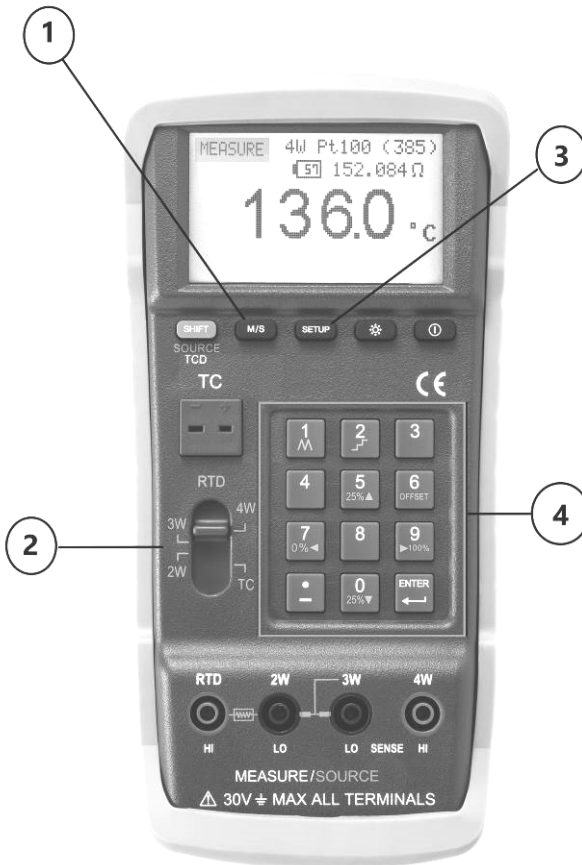
Step 3: Press SETUP button to select TC type. Then press SETUP button again to exit SETUP

Step 4: Connect the calibrator to the thermometer under test as shown in the Figure following

Step 5: Enter value of temperature



3.3 Measure RTD Temperature and Resistance



Step 1: Press M/S button to select MEASURE

Step 2: Move sliding switch to select RTD connection (4W, 3W, or 2W)

Step 3: Press SETUP button to select RTD type. Then press SETUP button again to exit SETUP

Step 4: Connect the calibrator to the RTD or resistance under test as shown in the Figure following

Step 5: Read value of temperature or resistance from LCD

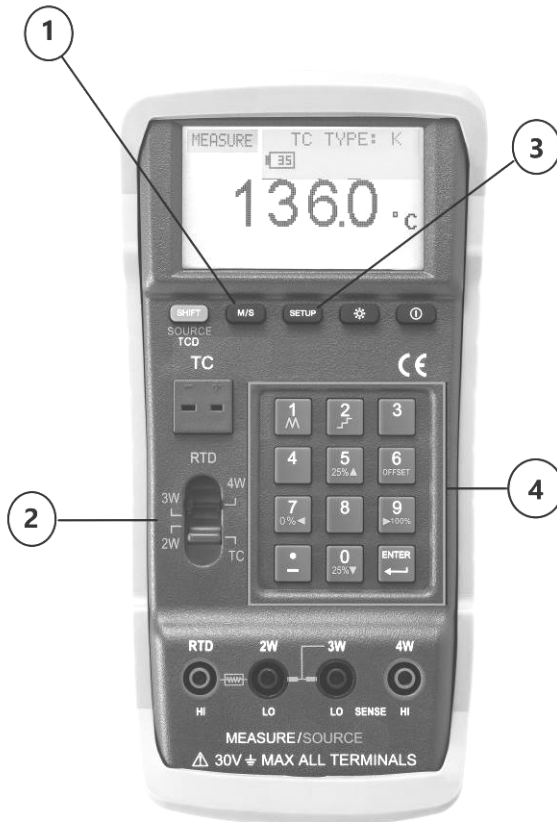






Note: The inaccuracy caused by the test leads resistance is not included in the source or measure accuracy.

3.4 Measure Thermocouple Temperature



Step 1: Press M/S button to select MEASURE

Step 2: Move sliding switch to select TC (Thermocouple)

Step 3: Press SETUP button to select TC type. Then press SETUP again to exit SETUP

Step 4: Connect the calibrator to the thermocouple under test as shown in the Figure following

Step 5: Read the value of temperature from LCD

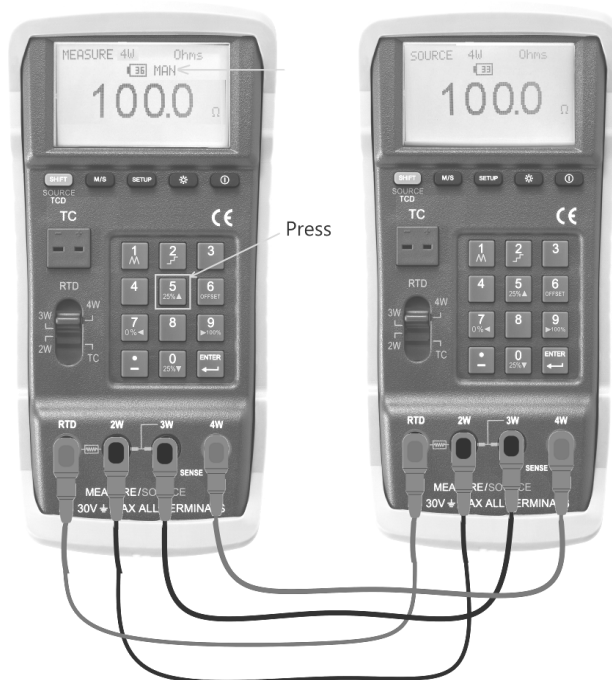


3.5 Optimal OHM measurement (4W, 3W, and 2W)



Step 1: Follow the steps stated in section 3.3 and select OHM in the setup. The calibrator will automatically output optimal current for measurement of resistance. Users can also press button 5 to enter manual mode and change the output current (100 μ A, 250 μ A, 1mA, and 2mA).

Step 2: If the other end is another calibrator connected to the calibrator. The other calibrator might not be able to sense the current outputted from the calibrator. Users can press button 5 to enter manual mode and change the output current. The symbol MAN will be displayed once button 5 is pressed.



Step 3: Press button 5 repeatedly to change the output current until the other calibrator can sense it. The calibrator will circulate through 4 values of current (100 μ A, 250 μ A, 1mA, and 2mA)

Note: The value of current is displayed at the upper right corner of LCD next to the MAN symbol.

3.6 DC Current calibration using OHM measurement setup (4, 3, and 2W)



The calibrator can also be used to calibrate 4 values of current (100 μ A, 250 μ A, 1mA, and 2mA). Users can enter the mode of OHM measurement and press button 5 to enter manual mode with MAN displayed on LCD. Connect the instrument to be calibrated. Press the button 5 repeatedly to circulate through 4 fixed values (100 μ A, 250 μ A, 1mA, and 2mA). The accuracy of these values of current is $\pm 0.015\% \pm 0.05 \mu$ A.

Note: The value of DC current is displayed at the upper right corner of LCD next to the MAN symbol.

3.7 Ramp and Step in SOURCE mode

This calibrator provides RAMP (keypad 1) and STEP (keypad 2) functions for RTD and TC in SOURCE mode.

Ramp: Press SHIFT first, then press number 1. Once Ramp is selected, RAMP icon will be displayed on LCD. The calibrator will output signals from 0% to 100% in around 20 seconds.

To exit, press SHIFT again.



Step: Press SHIFT first, then press number 2. Once STEP function is selected, STEP icon will be displayed on LCD. The calibrator will output 5 levels of signals (0%, 25%, 50%, 75%, and 100%) in around 20 seconds.

To exit, press SHIFT again.



3.8 Remove Inaccuracy caused by the resistance of test leads in 2W

In the 2W connection, the resistance of test leads would add inaccuracy to the measurement or simulation of temperature or resistance. To remove the inaccuracy caused by the resistance of test leads, users can perform the OFFSET function in the 2W connection.

MEASURE

Step 1: Move the sliding switch to 2W position, and press M/S button to select MEASURE.

Step 2: Connect the test leads and short the two leads (black and red) together (Make sure two test leads are firmly contacted and the reading is stable)



Step 3: Press the SHIFT button, then the OFFSET (6) button. A delta (Δ)

symbol appears on LCD to indicate the value of test leads resistance is subtracted for any subsequent measurement.

With the SHIFT symbol displayed on the LCD, users can press the OFFSET (6) button to toggle the state of OFFSET function between “ENABLE” and “DISABLE” indicated by the delta (Δ) symbol.



New Measurement with Offset Removed



Note: The limit of the offset function is 60 Ω . If the resistance measured exceeds 60 Ω , a beep sound will be heard to warn the users. Then the offset function is cancelled and the delta symbol Δ will not be shown on LCD.

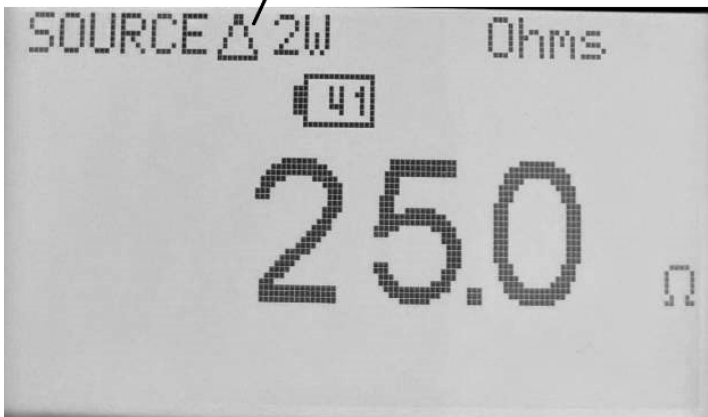
SOURCE

Step 1: Users must perform the OFFSET function in the MEASURE mode first.

Step 2: Then press the M/S button to select SOURCE mode.

Example: Source 25Ω with test leads resistance compensated

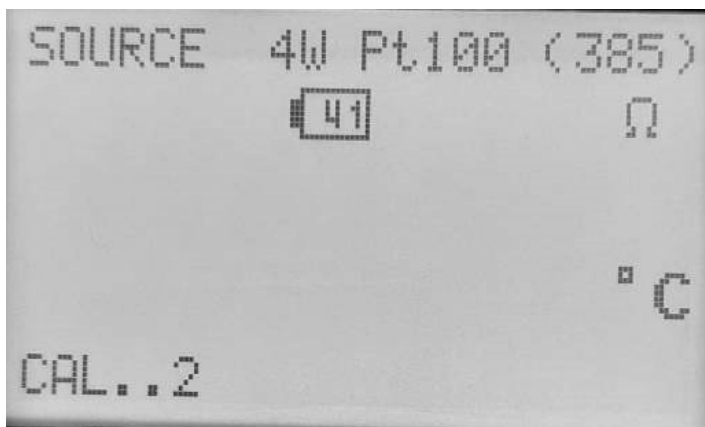
Delta symbol displayed



WARNING: Once the OFFSET function is performed in 2W connection, **DO NOT CHANGE** the test leads used or the RTD type or resistance selected. If users change the test leads used or select a different type of RTD or resistance, please perform the OFFSET procedures again to insure the correctness in MEASURE or SOURCE mode.

3.9 Auto Calibration

Whenever users move the sliding switch (RTD 4W, 3W, 2W, TC), enter and exit from SETUP, or press M/S button to change MEASURE or SOURCE mode, the calibrator will always re-calibrate itself to ensure the accuracy. Users shall see the text of “CAL..1 ...” displayed at the left bottom corner of LCD.



At this moment, the calibrator does not response to any input until calibration is done.

IV. SETUP

Press SETUP button to enter setup pages. There are two pages of setup
Page 1:

```

RTD TYPE:  Pt100 (385)
TC TYPE:   K
UNIT:     °C
C.J.C.(S): 0.00 °C
C.J.C.(M): 0.00 °C
RTD 0%:    - 200.0 °C
RTD 100%:  800.0 °C
    
```

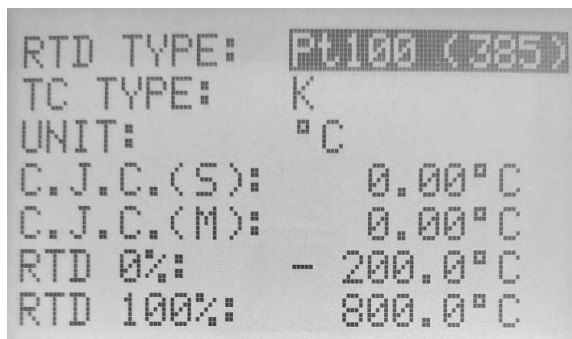
Page 2:

```

TC 0%:      - 200.0 °C
TC 100%:    1370.0 °C
AutoPowerOff: Enabled
Restore Factory
Settings(1234: YES)
                                     NO
    
```

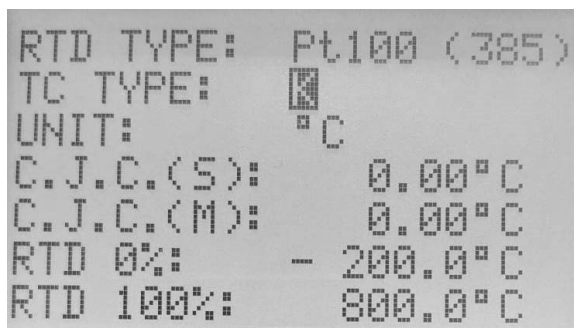
- Press ▲(5) or ▼(0) to select item
- Once selected, the item is displayed in reverse video
- Press ◀(7) or ▶(9) to change RTD type, TC type, UNIT (°C or °F), or Auto-power-off (Enable or Disable)
- To enter values (for CJC (S), CJC (M), RTD 0%, RTD 100%, TC 0%, TC 100%, or Restore Factory Settings), press **the SHIFT button first**, then the entry will be clear for users to type in numbers.

4.1 Select RTD type or resistance



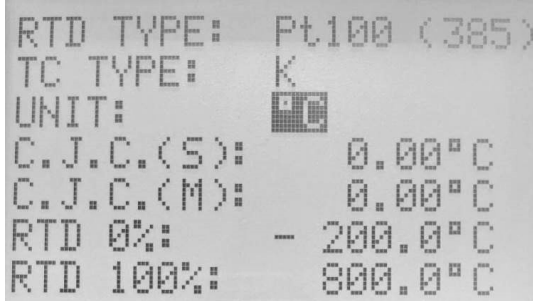
- Step 1: press SETUP to enter SETUP
- Step 2: press ▲ ▼ to select the item of RTD type
- Step 3: press ◀▶ to select desired RTD type
- Step 4: press SETUP again to exit

4.2 Select TC type



- Step 1: press SETUP to enter SETUP
- Step 2: press ▲ ▼ to select the item of TC type
- Step 3: press ◀▶ to select desired TC type
- Step 4: press SETUP again to exit

4.3 Select UNIT (°C or °F)



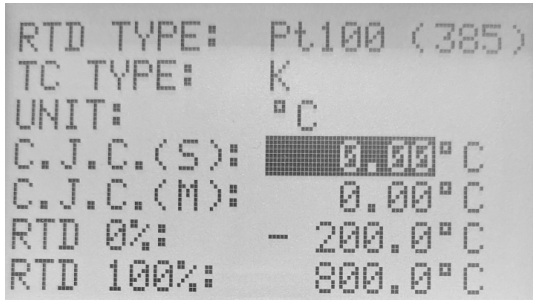
Step 1: press SETUP to enter SETUP

Step 2: press ▲ ▼ to select the item of UNIT

Step 3: press ◀▶ to select desired unit of °C or °F

Step 4: press SETUP again to exit

4.4 Enter the values of Cold Junction Compensation



Step 1: press SETUP to enter SETUP

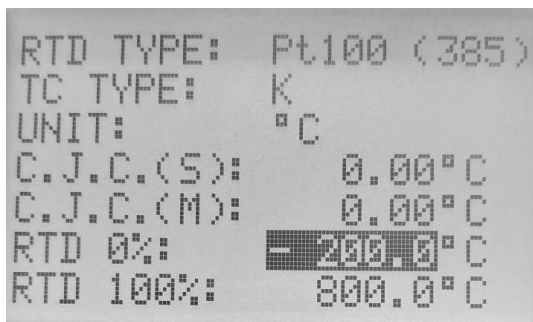
Step 2: press ▲ ▼ to select the item of C.J.C (S) or C.J.C (M)

Step 3: press SHIFT to clear input field

Step 4. press numerical key pad to enter numbers

Step 5: press SETUP again to exit

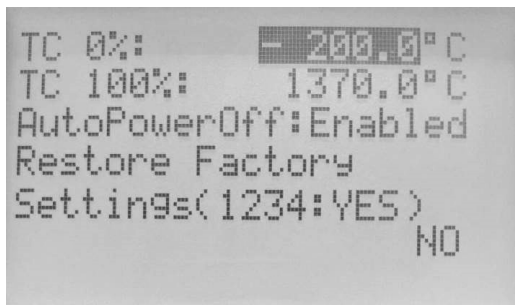
4.5 Enter the values of RTD 0% and 100%



```
RTD TYPE: Pt100 (385)
TC TYPE: K
UNIT: °C
C.J.C.(S): 0.00°C
C.J.C.(M): 0.00°C
RTD 0%: -200.0°C
RTD 100%: 800.0°C
```

- Step 1: press SETUP to enter SETUP
- Step 2: press ▲ ▼ to select item of RTD 0% or 100%
- Step 3: press SHIFT to clear input field
- Step 4. press numerical key pad to enter numbers
- Step 5: press SETUP again to exit

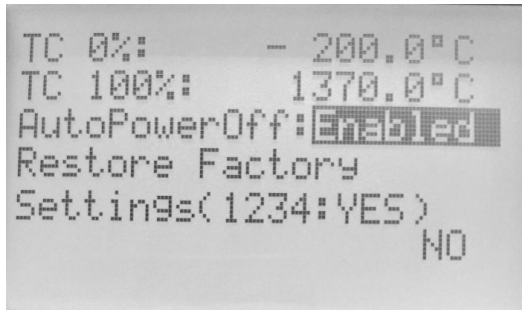
4.6 Enter the values of TC 0% and 100%



```
TC 0%: -200.0°C
TC 100%: 1370.0°C
AutoPowerOff: Enabled
Restore Factory
Settings(1234: YES)
NO
```

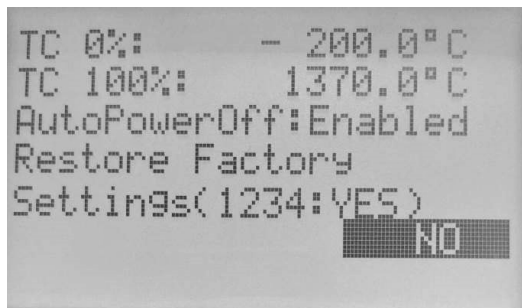
- Step 1: press SETUP to enter SETUP
- Step 2: press ▲ ▼ to select item of TC 0% or 100%
- Step 3: press SHIFT to clear input field
- Step 4. press numerical key pad to enter numbers
- Step 5: press SETUP again to exit

4.7 Auto-Power-Off



- Step 1: press SETUP to enter SETUP
- Step 2: press ▲ ▼ to select item of AutoPowerOff
- Step 3: press ◀▶ to enable or disable
- Step 4: press SETUP again to exit

4.8 Restore Factory Settings



- Step 1: press SETUP to enter SETUP
- Step 2: press ▲ ▼ to select item of TC 0% or 100%
- Step 3: press SHIFT to clear input field
- Step 4: press numerical key pad to enter numbers. If value of 1234 is entered, all the values of CJC (S), CJC (M), RTD 0%, RTD 100%, TC 0%, and 100% will be restored to factory settings.
- Step 5: press SETUP again to exit

V. ELECTRICAL SPECIFICATIONS

Specifications apply from +18 °C to +28 °C unless stated otherwise. All specifications assume a 5-minute warm-up period.

Ohm Measure:

Range(Ω)	Resolution(Ω)
0.000 Ω to 100.00 Ω	0.001 Ω
100.00 Ω to 1000.0 Ω	0.01 Ω
1000.0 Ω to 7000.0 Ω	0.1 Ω
Range(Ω)	Accuracy(% of Reading + Floor)
0.000 Ω to 400.00 Ω	0.015%+0.05 Ω
400.00 Ω to 4000.0 Ω	0.015%+0.5 Ω
4000.0 Ω to 7000.0 Ω	0.03%+1.0 Ω

Read accuracy is based on 4-wire input. For 3-wire ohm measurements, assuming all three leads are matched, add 0.05 Ω (0.00 Ω ~400.00 Ω), 0.2 Ω (400.0 Ω ~4000.0 Ω), and 1 Ω (4000.0 Ω ~7000.0 Ω) to the specifications. Temperature coefficient : (\pm 0.002% of reading \pm 0.002% of range)/°C (<18°C or >28°C)

Ohm Resolution (Source):

Range(Ω)	Resolution(Ω)
1.0 Ω to 7000.0 Ω	0.1 Ω

**Ohm Source (Accuracy is based upon 4W connection):**

Range(Ω)	Excitation Current from Measurement Device	Accuracy (% of Output + Floor)
1.0 Ω to 400.0 Ω	0.5mA to 5mA	0.015%+0.1 Ω
400.0 Ω to 1500.0 Ω	0.05mA to 5mA	0.015%+0.5 Ω
1500.0 Ω to 4000.0 Ω	0.05mA to 5mA	0.015%+0.5 Ω
4000.0 Ω to 7000.0 Ω	0.05mA to 5mA	0.03%+1 Ω

For 3W ohm source, assuming all three test leads are matched, add 0.05 Ω (0.00 Ω ~400.00 Ω), 0.2 Ω (400.0 Ω ~4000.0 Ω), and 1 Ω (4000.0 Ω ~7000.0 Ω) to the specifications.

Driving voltage<1.7V; Temperature coefficient : $\pm(0.002\%$ of reading + 0.002% of range)/ $^{\circ}\text{C}$ (<18 $^{\circ}\text{C}$ or >28 $^{\circ}\text{C}$)

RTD resolution in $^{\circ}\text{C}$:

Range	Resolution (measure)	Resolution (source)
-200 $^{\circ}\text{C}$ to 0 $^{\circ}\text{C}$	0.1 $^{\circ}\text{C}$	0.1 $^{\circ}\text{C}$
0 $^{\circ}\text{C}$ to 800 $^{\circ}\text{C}$	0.01 $^{\circ}\text{C}$	0.1 $^{\circ}\text{C}$

RTD measure in $^{\circ}\text{C}$:



Temperature Calibrator (RTD + TC) / EN

(RTD Sensor inaccuracies not included; Temperature coefficient : $\pm 0.05\text{ }^{\circ}\text{C}/^{\circ}\text{C}$ for measure, $\pm 0.05\text{ }^{\circ}\text{C}/^{\circ}\text{C}$ ($<18\text{ }^{\circ}\text{C}$ or $>28\text{ }^{\circ}\text{C}$) for source)

RTD Type (α)	Measure ($^{\circ}\text{C}$)		Source Current
	Range	Accuracy	
10 Ω Pt(385)	-200 to 100	1.5	2mA
	100 to 800	1.8	
50 Ω Pt(385)	-200 to 100	0.4	2mA
	100 to 800	0.5	
100 Ω Pt(385)	-200 to 100	0.2	1mA
	100 to 800	0.015%+0.18	
200 Ω Pt(385)	-200 to 100	0.2	1mA
	100 to 630	0.015%+0.18	
500 Ω Pt(385)	-200 to 100	0.3	250 μ A
	100 to 630	0.015%+0.28	
1000 Ω Pt(385)	-200 to 100	0.2	100 μ A
	100 to 630	0.015%+0.18	
100 Ω Pt(3902)	-200 to 100	0.2	1mA
	100 to 500	0.015%+0.18	
100 Ω Pt(3916)	-200 to 100	0.2	1mA
	100 to 630	0.015%+0.18	
100 Ω Pt(3926)	-200 to 100	0.2	1mA
	100 to 630	0.015%+0.18	
10 Ω Cu(427)	-100 to 260	1.5	2mA
120 Ω Ni(672)	-80 to 260	0.15	1mA
50 Ω Cu(427)	-180 to 200	0.4	2mA
100 Ω Cu(427)	-180 to 200	0.2	2mA
YSI400	15 to 50	0.2	100 μ A

Read accuracy is based on 4-wire input. For 3-wire RTD measurements, assuming all three RTD leads are matched, add 1.0 $^{\circ}\text{C}$ (Pt10 and Cu10), 0.6 $^{\circ}\text{C}$ (Pt50 and Cu50), 0.4 $^{\circ}\text{C}$ (Other RTD types) to the specifications

RTD source in °C:

Accuracy is based upon 4W connection, driving voltage is less than 1.7V and the excitation current is based upon 0.5mA to 5mA (0 to 400Ω) and 0.05mA to 5mA (400Ω to 7000Ω). For 3-wire RTD source, assuming all three RTD leads are matched, add 1.0 °C (Pt10 and Cu10), 0.6 °C (Pt50 and Cu50), 0.4 °C (Other RTD types) to the specifications.

RTD Type (α)	Source (°C)	
	Range	Accuracy
10Ω Pt(385)	-200 to 100	1.5
	100 to 800	1.8
50Ω Pt(385)	-200 to 100	0.4
	100 to 800	0.5
100Ω Pt(385)	-200 to 100	0.2
	100 to 800	0.015%+0.18
200Ω Pt(385)	-200 to 100	0.2
	100 to 630	0.015%+0.18
500Ω Pt(385)	-200 to 100	0.3
	100 to 630	0.015%+0.28
1000Ω Pt(385)	-200 to 100	0.2
	100 to 630	0.015%+0.18
100Ω Pt(3902)	-200 to 100	0.2
	100 to 500	0.015%+0.18
100Ω Pt(3916)	-200 to 100	0.2
	100 to 630	0.015%+0.18
100Ω Pt(3926)	-200 to 100	0.2
	100 to 630	0.015%+0.18
10Ω Cu(427)	-100 to 260	1.5
120Ω Ni(672)	-80 to 260	0.15
50Ω Cu(427)	-180 to 200	0.4
100Ω Cu(427)	-180 to 200	0.2
YSI400	15 to 50	0.2

Temperature coefficient : (± 0.002% of reading ±0.002% of range)/°C (<18°C or >28°C)



RTD Resolution in °F:

Range	Resolution (measure)	Resolution (source)
-328°F to 32°F	0.1°F	0.1°F
32°F to 1472°F	0.1°F	0.1°F

RTD measure in °F:

RTD Type (α)	Measure (°F)		Source Current
	Range	Accuracy	
10 Ω Pt(385)	-328 to 212	2.7	2mA
	212 to 1472	3.24	
50 Ω Pt(385)	-328 to 212	0.72	2mA
	212 to 1472	0.9	
100 Ω Pt(385)	-328 to 212	0.36	1mA
	212 to 1472	0.015%+0.324	
200 Ω Pt(385)	-328 to 212	0.36	1mA
	212 to 1166	0.015%+0.324	
500 Ω Pt(385)	-328 to 212	0.54	250 μ A
	212 to 1166	0.015%+0.504	
1000 Ω Pt(385)	-328 to 212	0.36	100 μ A
	212 to 1166	0.015%+0.324	
100 Ω Pt(3902)	-328 to 212	0.36	1mA
	212 to 932	0.015%+0.324	
100 Ω Pt(3916)	-328 to 212	0.36	1mA
	212 to 1166	0.015%+0.324	
100 Ω Pt(3926)	-328 to 212	0.36	1mA
	212 to 1166	0.015%+0.324	
10 Ω Cu(427)	-148 to 500	2.7	2mA
120 Ω Ni(672)	-112 to 500	0.27	1mA
50 Ω Cu(427)	-292 to 392	0.72	2mA
100 Ω Cu(427)	-292 to 392	0.36	2mA
YSI400	59 to 122	0.36	250 μ A

Read accuracy is based on 4-wire input. For 3-wire RTD measurements, assuming all three RTD leads are matched, add 1.8°F (Pt10 and Cu10), 1.08°F (Pt50 and Cu50), 0.72°F (Other RTD types) to the specifications.

RTD source in °F

Accuracy is based upon 4W connection, driving voltage is less than 1.7V and the excitation current is based upon 0.5mA to 5mA (0 to 400Ω) and 0.05mA to 5mA (400Ω to 7000Ω). For 3-wire RTD source, assuming all three RTD leads are matched, add 1.8 °F (Pt10 and Cu10), 1.1 °F (Pt50 and Cu50), 0.7 °F (Other RTD types) to the specifications .

RTD Type (α)	Source (°F)	
	Range	Accuracy
10Ω Pt(385)	-328 to 212	2.7
	212 to 1472	3.24
50Ω Pt(385)	-328 to 212	0.72
	212 to 1472	0.9
100Ω Pt(385)	-328 to 212	0.36
	212 to 1472	0.015%+0.324
200Ω Pt(385)	-328 to 212	0.36
	212 to 1166	0.015%+0.324
500Ω Pt(385)	-328 to 212	0.54
	212 to 1166	0.015%+0.504
1000Ω Pt(385)	-328 to 212	0.36
	212 to 1166	0.015%+0.324
100Ω Pt(3902)	-328 to 212	0.36
	212 to 932	0.015%+0.324
100Ω Pt(3916)	-328 to 212	0.36
	212 to 1166	0.015%+0.324
100Ω Pt(3926)	-328 to 212	0.36
	212 to 1166	0.015%+0.324
10Ω Cu(427)	-148 to 500	2.7
120Ω Ni(672)	-112 to 500	0.27
50Ω Cu(427)	-292 to 392	0.72
100Ω Cu(427)	-292 to 392	0.36
YSI400	59 to 122	0.36

Temperature coefficient : ($\pm 0.002\%$ of reading $\pm 0.002\%$ of range)/°C (<18°C or >28°C)



Temperature of Thermocouples Source and measure, 0.1°C & 0.1°F Resolution, Internal Cold Junction Compensation, thermocouples accuracy is not included, and 3 minutes after plugging in thermocouples.

	°C		°F	
	Range	Accuracy	Range	Accuracy
K	-200 to -150	0.7	-382 to -238	1.26
	-150 to 0	0.6	-238 to 32	1.08
	0 to 1000	0.5	32 to 1832	0.90
	1000 to 1370	0.7	1832 to 2498	1.26
J	-200 to -150	1.0	-382 to -238	1.80
	-150 to 0	0.6	-238 to 32	1.08
	0 to 1050	0.7	32 to 1922	1.26
E	-200 to -150	0.8	-382 to -238	1.44
	-150 to 0	0.5	-238 to 32	0.90
	0 to 850	0.4	32 to 1562	0.72
	850 to 1000	0.4	1562 to 1832	1.26
T	-200 to -150	0.7	-382 to -238	1.44
	-150 to 0	0.6	-238 to 32	1.26
	0 to 400	0.5	32 to 752	0.54
R	0 to 500	1.5	32 to 932	2.70
	500 to 1760	1.0	932 to 3200	1.80
S	0 to 500	1.5	32 to 932	2.70
	500 to 1760	1.0	932 to 3200	1.80
N	-200 to 0	1.0	-328 to 32	1.80
	0 to 1300	0.6	32 to 2372	1.08
L	-200 to 0	0.8	-328 to 32	1.44
	0 to 900	0.6	32 to 1652	1.08
U	-200 to 0	1.1	-328 to 32	1.98
	0 to 600	0.5	32 to 1112	0.90
B	600 to 800	1.3	1112 to 1472	2.34
	800 to 1000	1.0	1472 to 1832	1.80
	1000 to 1820	0.9	1832 to 3308	1.62
C	0 to 1800	0.8	32 to 3272	1.44



	1800 to 2310	1.2	3272 to 4190	2.16
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**DC Output Current in the OHM measurement Manual mode
(Operating Voltage<2.5V , Open Circuit:3.7V)**

DC Current	Accuracy of reading
100 μ A	$\pm 0.015\%$ $\pm 0.05 \mu$ A
250 μ A	$\pm 0.015\%$ $\pm 0.05 \mu$ A
1mA	$\pm 0.015\%$ $\pm 0.05 \mu$ A
2mA	$\pm 0.015\%$ $\pm 0.05 \mu$ A

VI. GENERAL SPECIFICATIONS

Dimension:	214.0(L) x 98.7(W) x 56.0(H) mm 8.4" (L) x 3.9" (W) x 2.2" (H)
Battery Type	1.5V LR6 AA x 5
Power Consumption	30mA with backlight off
Battery Life	60 Hours with backlight off (Alkaline type)
Weight:	630g / 22.2oz (Batteries included)
Operation Environment:	0°C ~ 50°C, < 85% RH
Storage Environment:	-20°C ~ 60°C, < 75% RH
Accessories:	Carrying case x 1 User manual x 1 1.5V SUM-3 AA x 5 Test leads with prods and alligator clips x 2 sets (black and red) Test leads with banana plugs and alligator clips x 1 set (black and red) Stackable test leads for short circuit x1 (10 cm, black) K-type thermocouple (dual plugs) x 1 K-type thermocouple (single plug) x 1

VII. Battery Replacement

When the users see the battery capacity is less or equal to 3%, users should follow the following procedures to replace the used batteries with new batteries.



Step 1: Turn off the calibrator and remove all the test leads and any thermocouple from the calibrator

Step 2: Remove the holster and remove the screw of the battery compartment cover. Then remove the battery compartment cover

Step 3: Remove the used batteries starting from the second one to the left or to the right.

Step 4: Replace 5 new AA 1.5V batteries.

Step 5: Replace the battery compartment cover and secure the screw of the battery compartment cover. Then replace the holster.



Limited Warranty

This meter is warranted to the original purchaser against defects in material and workmanship for 3 years from the date of purchase. During this warranty period, RS Components will, at its option, replace or repair the defective unit, subject to verification of the defect or malfunction. This warranty does not cover fuses, disposable batteries, or damage from abuse, neglect, accident, unauthorized repair, alteration, contamination, or abnormal conditions of operation or handling.

Any implied warranties arising out of the sale of this product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. RS Components shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expense or economic loss. Some states or countries laws vary, so the above limitations or exclusions may not apply to you. For full terms and conditions, refer to the RS website.



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