800099
12 Channel Digital Datalogging Thermometer

INSTRUCTION MANUAL

SPER SCIENTIFIC
ENVIRONMENTAL MEASUREMENT INSTRUMENTS


K
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CH5
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CH2
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Sampling time
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12 CHANNEL THERMOMETER
SD Card Datalogger
SPER SCIENTIFIC

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FEATURES

***** Real time data logger, save the 12 channels temperature measuring data along the time information (year, month, date, minute, second) onto a SD memory card and can be downloaded to the Excel, extra software is no need. User can make the further data or graphic analysis by themselves.

* Sensor type : Type J/K/T/E/R/S thermocouple.

* Auto datalogger or manual datalogger. Data logger sampling time range : 1 to 3600 seconds.

* Type K thermometer : -100 to 1300°C

* Type J thermometer : -100 to 1200°C

* Page select, show CH1 to CH8 or CH9 to CH12 in the same LCD.

* Display resolution : 1 degree/0.1 degree.

* Offset adjustment.

* SD card capacity : 1 GB to 16 GB.

* RS232/USB computer interface.

* Microcomputer circuit provides intelligent function and high accuracy.

* Jumbo LCD with green light backlight, easy reading.

* Can default auto power off or manual power off.

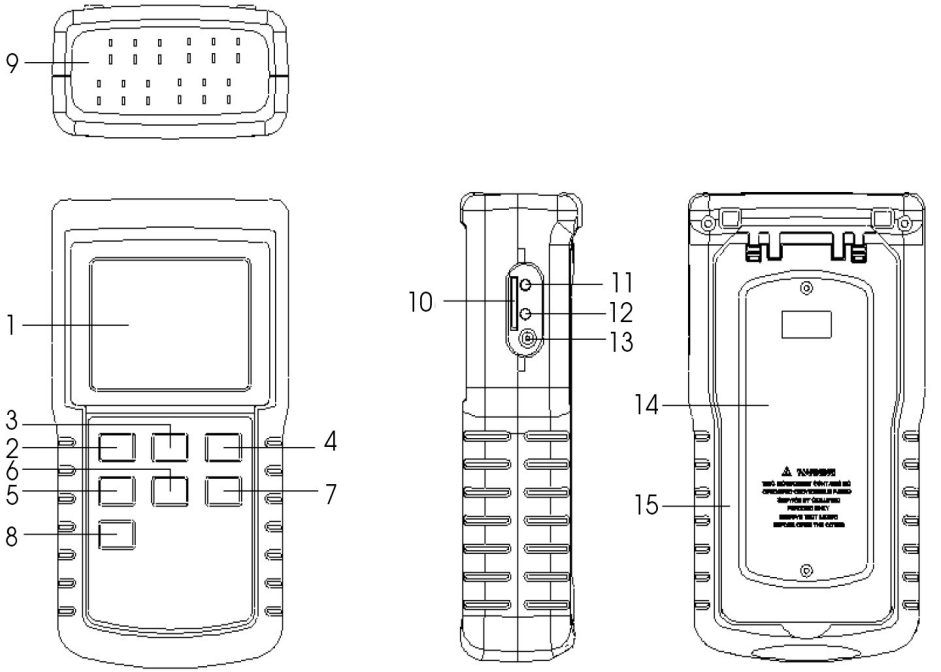
* Data hold to freeze the measurement value.

* Record function to present the max. and min. reading.

* Power by UM3/AA (1.5 V) x 8 batteries or DC 9V adapter.

* Heavy duty & compact housing case.

FRONT PANEL DESCRIPTION



1 - Display
2 - Power Button (Esc, Backlight button)
3 - Hold Button (Next Button)
4 - REC Button (Enter Button)
5 - Type Button (▲Button)
6 - Page Button (▼Button)
7 - Logger Button (Offset Button, Sampling time check button)
8 - SET Button (Time check button)
9 - T1 to T12 input socket
10 - SD Card Slot
11 - RS232 port
12 - Reset Button
13 - DC 9V power adapter socket
14 - Battery cover/Battery compartment
15 - Stand

MEASURING PROCEDURE

Type K Measurement

1) Power on the meter by pressing the “Power Button“ once.

***Note**: Pressing the “Power button“ > 2 sec continuously will turn off the meter.*

2) The meter’s default temperature sensor type is Type K, the display will show “K“ indicator.

3) Insert the Type K probes into the T1 through T12 input sockets. The LCD will show the 8 channels (CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8) temperature value at the same time.

To show the other 4 channels (CH9, CH10, CH11, CH12) temperature value, press the “Page Button“ once. The display will show those channel’s temperature value. Press the “Page Button“ once again and the display will revert to the 8 channels (CH1, CH2, CH3, CH4, CH6, CH7, CH8) screen.

***Note**: The CHx (1 to 12) value is the measurement temperature value sense from the temperature probe that plug into the input socket Tx (1 to 12). For example, the CH1 value is the measurement value sense from the temperature probe that plug into the input socket T1.*

***Note**: If the input socket does not have temperature probes inserted, the relative channel display will show over range “ - - - - - “.*

Type J/T/E/R/S Measurement

All the measuring procedures are same as the Type K, except to change the temperature Sensor type to “Type J, T, E, R, S“, press the “Type Button“ once in sequence until the up LCD display show the “J, K,T, E, R, S“ indicator.

Data Hold

During the measurement, pressing the “Hold Button“ once will hold the measured value & the LCD will display a “HOLD“ symbol. Press the “Hold Button“ once again will release the data hold function.

Data Record (Max., Min. reading)

1) The data record function records the maximum and minimum readings. Press the “REC Button“ once to start the data record function and there will be a REC symbol on the display.

2) With the “REC“ symbol on the display :

a) Press the “REC Button“ once, the “REC MAX“ symbol along with the maximum value will appear on the display.
To delete the maximum value, press the “Hold Button“ once, the display will show the REC symbol only.

b) Press the “REC Button“ again, the “REC MIN“ symbol along with the minimum value will appear on the display.
To delete the minimum value, just press the “Hold Button“ once, the display will show the REC symbol only.

c) To exit the memory record function, just press the “REC button” > 2 seconds. The display will revert to the current reading.

LCD Backlight ON/OFF

After power ON, the LCD Backlight will light automatically. During the measurement, pressing the “Backlight Button“ once will turn OFF the LCD Backlight. Pressing the “Backlight Button“ once again will turn ON the LCD Backlight.

DATALOGGER

Preparation before execute datalogger function

a. Insert the SD card

Insert the SD card (4 GB to 16 GB) into the “SD card socket“.

***Note**: Please plug the SD card in the right direction, the front name plate of the SD card should face against the up case.*

b. SD card Format

If it is the SD Card’s first time use in the meter, it is recommended to perform the “SD card Format“ first.

***Note**: We strongly recommend not to use SD cards that have been formatted by other meter or by a computer. Reformat the SD card with your meter.*

c. Time setting
Confirm time is accurate. If not, adjust the clock time settings.

d. Decimal format setting
The numerical data structure of SD card is default used the “ . “ as the decimal, for example “20.6” “1000.53”. In certain countries, like Europe, use the “ , “ as the decimal point.
For example, “ 20, 6 “ or “1000,53”.

Auto Datalogger (Set sampling time ≥ 1 second)
a. Start the datalogger
Press the “REC Button” once and there will be a REC symbol on the display. Then press the “Logger Button“ and the REC will start flashing and beeper will sound. The measuring data and time information will be saved into the memory circuit.

b. Pause the datalogger
During execution of the datalogger function, pressing the “Logger Button“ once will pause the datalogger function. The REC will stop flashing.

***Note** : If your press the “Logger Button“ once again will resume the datalogger again, the text of “ REC “ will start flashing .*

c. Finish the Datalogger
Pause the datalogger, then press the “REC Button“ continuously at least two seconds, the “REC“ indicator will be disappeared and finish the Datalogger.

Manual Datalogger (Set sampling time = 0 second)

a. Set sampling time is to 0 second

Press the “REC Button“ once, the LCD will show the text REC, then press the “Logger Button“ once. The REC will flash once and Beeper will sound once, The measuring data, time information and the position number will be saved into the memory circuit.

Note*: When make the manual datalogger measurement, the left display will show the Position/Location no. (P1, P2... P99) and the CH4 measurement value alternately.*

Note*:During execute the Manual Datalogger, pressing the “▲ Button“ once will enter the Position/Location number setting. Use the “▲ Button“ or “▼Button“ to select the measuring location number (1 to 99, for example room 1 to room 99) to identify the measurement location. After the position no. is selected, press the “Enter Button“ once will save the Position/Location number automatically.*

b. Finish the Datalogger

Press the “REC Button“ continuously at least two seconds, the REC indication will be disappeared and finish the Datalogger.

Loop Datalogger (Scheduled records)

The record time can set for the certain period every day.

For example, the user can set the record time from the 2:00 to 8:15 every day or record time 8:15 to 15:15...

Check time information

During the normal measurement (not during Datalogging), press “Time check Button“ once, the left lower LCD display will present the time information of Year/Month, Date/Hour, Minute/Second in sequence.

SD Card Data structure

1) When the SD Card is used for the first time, the meter will generate a folder: **TMB01**

2) Datalogger will generate a new file name TMB01001.XLS. Data will save to the TMB01001.XLS until data column reach to 30,000 columns, then will generate a new file, for example TMB01002.XLS

3) Under the folder TMB01\, if the total files more than 99 files, the meter will generate a new route, such as TMB02\ .....

READING SD CARD DATA

1) After execute the datalogger function, take out the SD Card out from the “SD Card socket“.

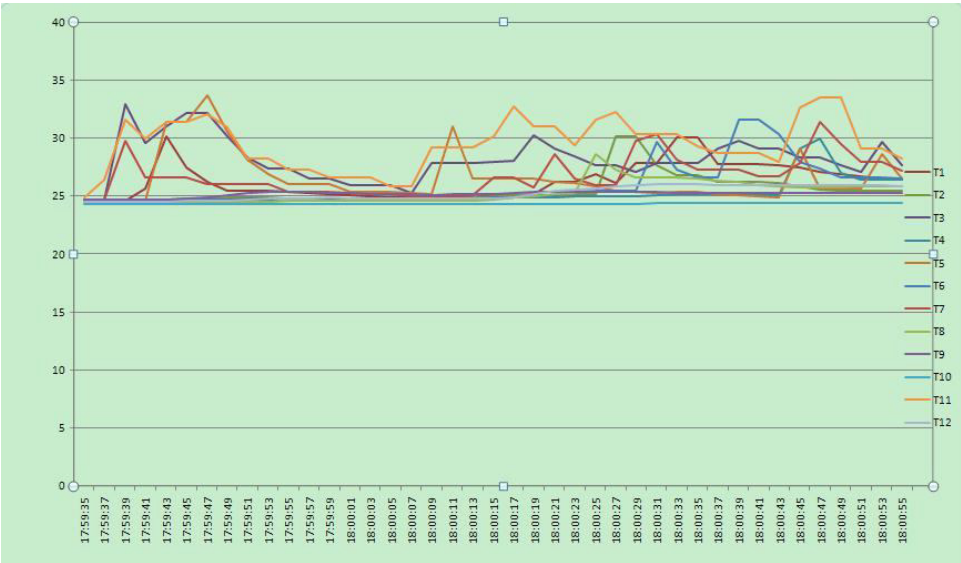
2) Plug in the SD Card into the computer’s SD Card reader.

3) Open Microsoft Excel or comparable software. Open the saved data file (for example the file name : TMB01001.XLS, TMB01002. XLS) from the SD Card.

Example data

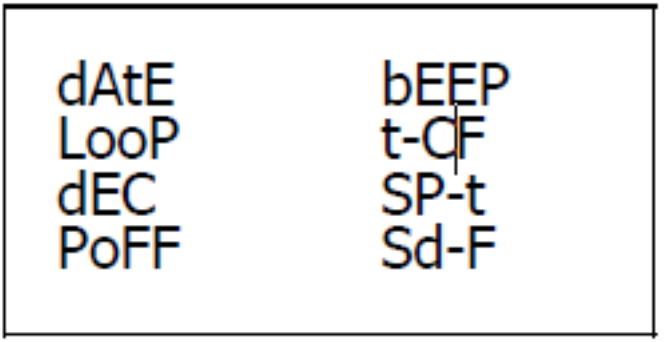
Place	Date	Time	T1	Unit	T2	Unit	T3	Unit	T4	Unit
1	2009/11/16	17:59:35	24.6	T1KTemp C	24.6	T2KTemp C	24.7	T3KTemp C	24.6	T4KTemp C
2	2009/11/16	17:59:37	24.6	T1KTemp C	24.6	T2KTemp C	24.7	T3KTemp C	24.6	T4KTemp C
3	2009/11/16	17:59:39	24.6	T1KTemp C	24.6	T2KTemp C	32.9	T3KTemp C	24.6	T4KTemp C
4	2009/11/16	17:59:41	25.7	T1KTemp C	24.6	T2KTemp C	29.6	T3KTemp C	24.6	T4KTemp C
5	2009/11/16	17:59:43	30.2	T1KTemp C	24.7	T2KTemp C	31	T3KTemp C	24.6	T4KTemp C
6	2009/11/16	17:59:45	27.5	T1KTemp C	24.8	T2KTemp C	32.1	T3KTemp C	24.7	T4KTemp C
7	2009/11/16	17:59:47	26.2	T1KTemp C	24.8	T2KTemp C	32.1	T3KTemp C	24.7	T4KTemp C
8	2009/11/16	17:59:49	25.5	T1KTemp C	24.9	T2KTemp C	30.1	T3KTemp C	24.7	T4KTemp C
9	2009/11/16	17:59:51	25.5	T1KTemp C	24.9	T2KTemp C	28.3	T3KTemp C	24.7	T4KTemp C
10	2009/11/16	17:59:53	25.5	T1KTemp C	24.9	T2KTemp C	27.4	T3KTemp C	24.7	T4KTemp C
11	2009/11/16	17:59:55	25.4	T1KTemp C	24.8	T2KTemp C	27.4	T3KTemp C	24.8	T4KTemp C
12	2009/11/16	17:59:57	25.3	T1KTemp C	24.8	T2KTemp C	26.5	T3KTemp C	24.8	T4KTemp C
13	2009/11/16	17:59:59	25.2	T1KTemp C	24.8	T2KTemp C	26.5	T3KTemp C	24.8	T4KTemp C
14	2009/11/16	18:00:01	25.1	T1KTemp C	24.8	T2KTemp C	25.9	T3KTemp C	24.8	T4KTemp C
15	2009/11/16	18:00:03	25	T1KTemp C	24.8	T2KTemp C	25.9	T3KTemp C	24.8	T4KTemp C
16	2009/11/16	18:00:05	24.9	T1KTemp C	24.8	T2KTemp C	25.9	T3KTemp C	24.8	T4KTemp C
17	2009/11/16	18:00:07	24.9	T1KTemp C	24.7	T2KTemp C	25.3	T3KTemp C	24.8	T4KTemp C

Example Graph



ADVANCED SETTINGS

Press the “SET Button“ continuously at least two seconds will enter the “Advanced Setting“ mode, then press the “Next Button“ once a while in sequence to select the eight main function, the display will show :



dAtE.....*Set clock time (Year/Month/Date, Hour/Minute/ Second)*
LooP....*S.e..t loop time of recorder*
dEC.....*Set SD card Decimal character*
PoFF.....*A. uto power OFF management*
bEEP.....*S..et beeper sound ON/OFF*
t-CF.....*Select the Temp. unit to °F or °C*
SP-t.....*Set sampling time*
Sd-F..... *SD memory card Format*

Note: *During execute the “Advanced Setting“ function, if press “ESC Button“ once will exit the “Advanced Setting“ function, the LCD will return to normal screen.*

Set clock time (Year/Month/Date,Hour/Minute/ Second)
When the display’s text “dAtE“ is flashing,
1) Press the “Enter Button“ once, Use the “▲ Button“ or “▼ Button“ to adjust the value (Setting start from Year value). After the desired year value is set, press the “Enter Button“ once will going to next value adjustment (for example, first setting value is Year then next to adjust Month, Date, Hour,Minute, Second value).

2) After set all the time value (Year, Month, Date, Hour, Minute, Second), will jump to “Set loop time of recorder“ setting screen.

***Note**: After the time value is setting, the internal clock will run precisely even Power is off (The battery is under normal condition, no low battery condition).*

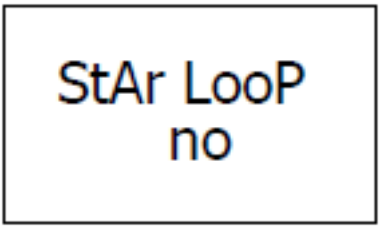
Set loop time of recorder

The record time can set for the duration every day.
For example the user intend set the record time from the 2:00 to 8:15 every day or record time 8:15 to 14:15....

When the Display’s text “ LooP “ is flashing

1) Press the “Enter Button“ once, Use the “▲ Button“ or “▼ Button“ to adjust the record loop time value (setting hour of “Start time“ first). After the desired value is set, press the “Enter Button“ once will going to next value adjustment (minute/Start time, hour/End time, then minute/End time).

2) After set all time value (Start time, End Time) press the “Enter Button“ once will jump to following screen



3)Use the “▲ Button“ or “▼ Button“ to select the upper value to “yES“ or “no“.

yES - Record the data during the Loop time duration.
no - Disable to record the data during the Loop time duration.

4) After select the upper text to “yES“ or “no“, press the “Enter Button“ will save the setting function with default.

5) The procedures to execute the Loop time record function :
a. For the above point 4) should select “ yES “

b. Press the “REC Button“ the “REC“ symbol will show on the Display.

c. Now the meter will ready for recoding the data within the Loop time period, start to record from the “Start time“ and end to record on the “ End time “.

d. Pause the Loop record function :
During the Loop time. meter already execute the record function, if press the “Logger Button“ once will pause the Datalogger function (stop to save the measuring data into the memory circuit temporally). In the same time the text of “REC“ will stop flashing.

Note: If press the “Logger Button“ once again will execute the Datalogger again, the text of “ REC “ will flashing.

Finish the Loop Datalogger :
During pause the Datalogger, press the “REC Button“ continuously at least two seconds, the “ REC “ indicator will be disappeared and finish the Datalogger.

e. Screen text description for the Loop Datalogger :

StAr = Start
-t- = Time
End = End

Decimal point of SD card setting
The numerical data structure of SD card is default used the “ . “ as the decimal, for example “20.6” “1000.53”. But in certain countries (Europe ...) is used the “ , “ as the decimal point, for example “ 20,6 “ “1000,53”. Under such situation, it should change the Decimal character at first.

When the Display's text " dEC " is flashing
1) Press the "Enter Button" once, use the "▲ Button" or "▼ Button" to select the upper value to "USA" or "Euro".

USA - Use " . " as the Decimal point with default.
Euro - Use " , " as the Decimal point with default.

2) After select the upper text to "USA" or "Euro", press the "Enter Button" will save the setting function with default.

Auto power OFF management
When the Display's text " PoFF " is flashing
1) Press the "Enter Button" once, use the "▲ Button" or "▼ Button" to select the upper value to "yES" or "no".

yES - Auto Power Off management will enable.
no - Auto Power Off management will disable.

2) After select the upper text to "yES" or "no", press the " Enter Button " will save the setting function with default.

Set beeper sound ON/OFF
When the Display's text " bEEP " is flashing
1) Press the " Enter Button " (3-4, Fig. 1) once,
use the " ▲ Button " (3-5, Fig. 1) or " ▼ Button " (3-6, Fig. 1) to select the upper value to "
yES " or " no ".

yES - Meter's beep sound will be ON with default.
no - Meter's beep sound will be OFF with default.

2) After select the upper text to "yES" or "no", press the "Enter Button" will save the setting function with default.

Select the temperature unit to °F or °C
When the Display text " t-CF " is flashing

1) Press the "Enter Button" once, use the "▲ Button" or "▼ Button" to select the upper Display text to "C" or "F".

C - Temperature unit is °C
F - Temperature unit is °F

2) After Display unit is selected to "C" or "F", press the "Enter Button" will save the setting function with default.

Set sampling time (Seconds)
When the Display's text " SP-t " is flashing
1) Press the "Enter Button" once, use the "▲ Button" or "▼ Button" to adjust the value (0, 1, 2, 5, 10, 30,60, 120, 300, 600, 1800,3600 seconds).

Note : If select the sampling time to " 0 second ", it is ready for manual Datalogger.

2) After the Sampling value is selected, press the "Enter Button" will save the setting function with default.

SD memory card Format
When the Display's text " Sd-F " is flashing
v1) Press the "Enter Button" once, use the "▲ Button" or "▼ Button" to select the upper value to "yES" or "no".

yES - Intend to format the SD memory card
no - Not execute the SD memory card format

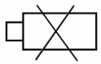
2) If select the upper to "yES", press the "Enter Button" once again, the Display will show text "yES Ent" to confirm again, if make sure to do the SD memory card format, then press "Enter Button" once will format the SD memory clear all the existing data that already saving into the SD card.

POWER SUPPLY

The meter also can supply the power supply from the DC 9V Power Adapter (optional). Insert the plug of Power Adapter into “DC 9V Power Adapter Input Socket”.

Note: The meter will permanent power ON when use the DC ADAPTER power supply (The power Button function is disable).

BATTERY REPLACEMENT

1)When the left corner of LCD display show “  “, it is necessary to replace the battery. However, in-spec measurements may still be made for several hours after low battery indicator appears before the instrument become inaccurate.

2) Loose the “Battery Cover Screws“, take away the “Battery Cover “ from the instrument and remove the battery.

3) Replace with DC 1.5 V battery (AA, Alkaline/heavy duty) x 8 PCs, and reinstate the cover.

4) Make sure the battery cover is secured after changing he battery.

WARRANTY

Sper Scientific warrants this product against defects in materials and workmanship for **one (1) year** from the date of purchase, and agrees to repair or replace any defective unit without charge. If your model has since been discontinued, an equivalent Sper Scientific product will be substituted if available. This warranty does not cover damage resulting from accident, misuse, or abuse of the product. To obtain warranty service, contact SPER SCIENTIFIC at support@sperdirect.com or call (480) 948-4448.

Register your product online at www.sperwarranty.com within 10 days of purchase.

SPECIFICATIONS

Circuit	Custom one-chip of microprocessor LSI circuit
Display	LCD size : 82 mm x 61 mm
Channels	12 Channels: T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11 and T12
Sensor Types	Type J/T/E/R/S thermocouple probe
Resolution	0.1°C / 1°C (0.1°F / 1°F)
Sample Rate	**Auto** - 1 second to 3600 seconds **Manual** - Push the data logger button once will save data one time
Loop Datalogger	The record time can set for the duration every day
Memory Card	SD memory card. 1 GB to 16 GB
Advanced Settings	*Set clock time *Set loop time of recorder *Decimal point of SD card setting *Auto power OFF management *Set beep Sound ON/OFF *Set temperature unit to °C or °F *Set sampling time *SD memory card Format
Temperature Compensation	Automatic temp. compensation for the type K/J/T/E/R/S thermometer
Linear Compensation	Linear Compensation for the full range
Offset Adjustment	To adjust the zero temperature deviation value
Probe Input Socket	2 pin thermocouple socket
Over Indication	Show “ - - - - “
Data Hold	Freeze the display reading
Memory Recall	Maximum & Minimum value
Sampling Time of Display	Approx. 1 second.

Power off	Auto shut off saves battery life or manual off by push button, it can select in the inner function.
Operating Temperature	0 to 50 °C
Operating Humidity	Less than 85% R.H.
Power Supply	*8 AA Batteries, Alkaline or Heavy Duty *9V AC/DC adapter (Optional)
Power Current	Normal operation (w/o SD card save data and LCD Backlight is OFF) :Approx. DC 7.5 mA.
	When SD card save the data but and LCD Backlight is OFF) :Approx. DC 25 mA.
	If LCD backlight on, the power consumption will increase approx. 11mA.
Weight	Meter : 944 g/2.1 LB.
Dimension	225 X 125 X 64 mm (8.86 X 4.92 X 2.52 inch)
Accessories Included	*Instruction manual.....1 PC *Type K Temp. probe.....12 PC *Hard carrying case.....1 PC *SD memory card (2 GB).....1 PC
Optional Accessories	*AC/DC 9V adapter - 840097U

Sensor Type	Resolution	Range	Accuracy
Type K	**0.1 °C**	-50.1 to -100.0 °C	± (0.4%+1°C)
		-50.0 to 999.9 °C	± (0.4%+0.5°C)
	1°C	1000 to 1300 °C	± (0.4%+1°C)
	0.1 °F	-58.1 to -148.0 °F	± (0.4%+1.8°F)
		-58.0 to 999.9 °F	± (0.4%+1°F)
	1°F	1000 to 2372 °F	± (0.4%+2°F)
Type J	**0.1 °C**	-50.1 to -100.0 °C	± (0.4%+1°C)
		-50.0 to 999.9 °C	± (0.4%+0.5°C)
	1°C	1000 to 1150 °C	± (0.4%+1°C)
	0.1 °F	-58.1 to -148.0 °F	± (0.4%+1.8°F)
		-58.0 to 999.9 °F	± (0.4%+1°F)
	1°F	1000 to 2102 °F	± (0.4%+2°F)
Type T	**0.1 °C**	-50.1 to -100.0 °C	± (0.4%+1°C)
		-50.0 to 400.0 °C	± (0.4%+0.5°C)
	0.1 °F	-58.1 to -148.0 °F	± (0.4%+1.8°F)
		-58.0 to 752.0 °F	± (0.4%+1°F)
Type E	**0.1 °C**	-50.1 to -100.0 °C	± (0.4%+1°C)
		-50.0 to 900.0 °C	± (0.4%+0.5°C)
	0.1 °F	-58.1 to -148.0 °F	± (0.4%+1.8°F)
		-58.0 to 999.9 °F	± (0.4%+1°F)
	1°F	1000 to 1652 °F	± (0.4%+2°F)
Type R	**1°C**	0 to 600 °C	± (0.4%+0.5°C)
		601 to 1700 °C	± (0.4%+1°C)
	1°F	32 to 1112 °F	± (0.4%+1°F)
		1113 to 3092 °F	± (0.4%+2°F)
Type S	**1°C**	0 to 600 °C	± (0.4%+0.5°C)
		601 to 1500 °C	± (0.4%+1°C)
	1°F	32 to 1112 °F	± (0.4%+1°F)
		1113 to 2732 °F	± (0.4%+2°F)

Accuracy value is specified for the meter only.

Accuracy is tested under the meter's environment temperature within 23 ± 5°C.

Linearity Correction: Memorize the thermocouple's curve into the intelligent CPU circuit