ALAT UJI
Products, Solution, Services

User's Guide

HH376
Data Logger, RTD Thermometer

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TITLE PAGE

1. INSTRUCTION

This instrument is a digital thermometer for use with platinum-type temperature sensor.
Temperature indication follows IEC751 temperature table for PT-type sensor.

2. SPECIFICATIONS

Numerical Display: 5 digital liquid crystal displays

Measurement Range: -100°C ~ 400°C; -148°F ~ 752°F

Resolution: 0.01°C; 0.02°F;

Sensor types:
Platinum resistance temperature sensor for pt-100 4 wires.
ALPHA=0.00385

Environmental:

- Operating Temperature and Humidity:
  0°C ~50°C (32°F ~ 122°F) ; 0 ~ 80% RH
- Storage Temperature:
  -10°C to 60°C (14°F ~ 140°F); 0 ~ 80% RH
- Altitude up to 2000 meters.

Accuracy: at (23 ± 5°C)

Range	Accuracy
-100°C ~ 400°C	±(0.05% reading + 0.1°C)
-148°F ~ 752°F	±(0.05% reading + 0.2°F)

Temperature Coefficient:
For ambient temperatures from 0°C ~ 18°C and 28°C ~ 50°C, for each °C ambient below 18°C or above 28°C add the following tolerance into the accuracy spec.
0.005% of reading + 0.01°C (0.005% of reading + 0.02°F)

Note:
The basic accuracy Specification does not include the error of the probe please refer to the probe accuracy specification for additional details.

Sample Rate: 2 times per second

Dimension: 185 x 65 x 36 mm(meter only)

Weight: 360g Approx.

Power requirement:

9V Battery;

AC adapter: 9V DC(7~10V Max.)/20mA Min (Plug Diameter: 3.5mmx1.35mm)

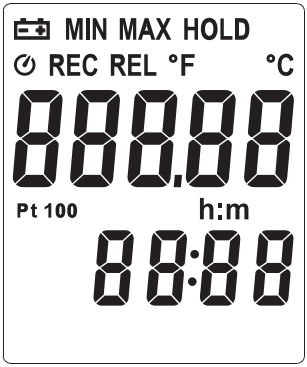
Battery Life: Approx. 100hours

Standard Accessory:

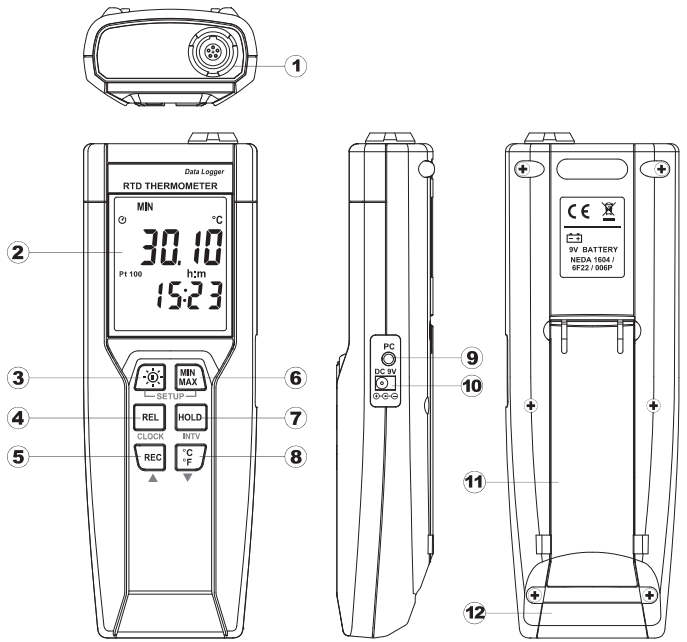
Pt-100 Probe(class A), Instruction manual, 9V Battery, windows software, carrying case, USB cable.

Optional Accessories: AC Adaptor, HH300-Adaptor & RS232 Cable, HH300-Cable.

3. SYMBOL DEFINITION & BUTTON LOCATION



	: The Battery is not sufficient for proper operation.
MIN	: The Minimum value is now being displayed
MAX	: The Maximum value is now being displayed
HOLD	: This indicates that the display data is being hold.
	: This indicates Auto Power Off is enabled.
REC	: Readings are being logged.
REL	: The reading is now under Relative Mode.
°C °F	: Centigrade and Fahrenheit indication.
-	: This indicates that the minus temperature is sensed.
h:m	: hours; minute



① Pt type temperature sensor connector	⑦ HOLD button
② LCD display	⑧ °C , °F control button
③ Power ON/OFF and Back light button	⑨ PC Interface
④ Relative readout button	⑩ External DC 9V power supply jack
⑤ REC button	⑪ Tilt stand
⑥ MAX MIN control button	⑫ Battery Compartment

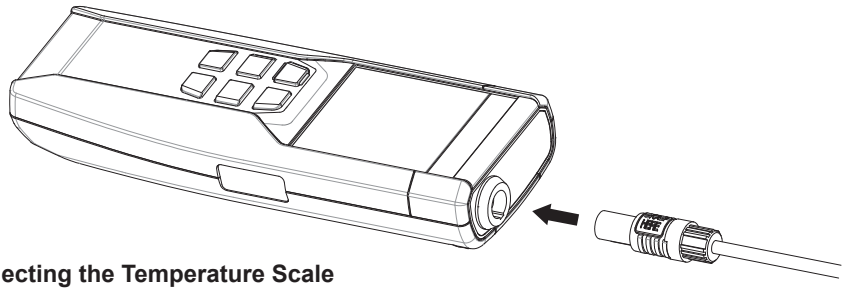
4. OPERATION INSTRUCTIONS

4.1 Power-Up

Press the " ☼ " key to turn **ON** the thermometer and Press and hold " ☼ " buttons for 3 seconds to **OFF**.

4.2 Connection the Temperature Pprobe

For measurement, plug the temperature probe into the input connectors.



4.3 Selecting the Temperature Scale

When the meter is first powered on, the default scale setting is set at Celsius (°C) scale. The user may change it to Fahrenheit (°F) by pressing [°C °F] button and vice versa to Celsius and change the default scale.

4.4 Data-Hold Operation

The user may hold the present reading and keep it on the display by pressing the [HOLD] button. When the hold data is no longer needed, one may release the data-hold operation by pressing [HOLD] button again.

When the meter is under Data Hold operation, the [REL], [MIN MAX] and [°C °F] button are disabled.

4.5 Back light Operation:

Press the ☼ button will turn the back light on and Pressing it once again will it turn off.

The meter will turn the back light off if there is no push ☼ button for 30 seconds.

4.6 Relative Operation:

When one presses the [REL] button, the meter will memorize the present reading and the difference between the new reading and the memorized data will be shown on the display. Press the [REL] button again to exit the Relative operation.

4.7 Record Operation:

Starting and Stopping Logging Setup, memory clear, and PC communications are inaccessible during logging.

Set the logging interval. (See "Changing the Logging Interval.")

Press [REC] button to start logging. The display shows "**REC**".

Press [REC] button again to stop logging.

4.8 MAX/MIN Operation:

When one presses the [MIN MAX] button the meter will enter the MAXMIN mode. Under this mode the maximum value, minimum value is kept in the memory simultaneously and updated with every new data.

When the **MAX** symbol is displayed, the Maximum reading is shown on the display.

Press MIN MAX button again, then the **MIN** symbol is on the display and also the minimum reading.
Press MIN MAX button again, **MAX** and **MIN** will blink together. This means that all these data is updated in the memory and the reading is the present temperature.
One may press MIN MAX to circulate the display mode among these options.
When the meter is under MAXMIN operation, REL and °C °F button is disabled.
To exit the MAX/MIN mode, one may press and hold MIN MAX button for two seconds.

4.9 Auto Power Off:

By default, when the meter is powered on, it is under auto power off mode. The meter will power itself off after 30 minutes if there is no key operation.
One may press and hold REL button and then power on the meter: there will be two successive beeps to indicate that the auto power off is disabled.

4.10 Low Battery Condition:

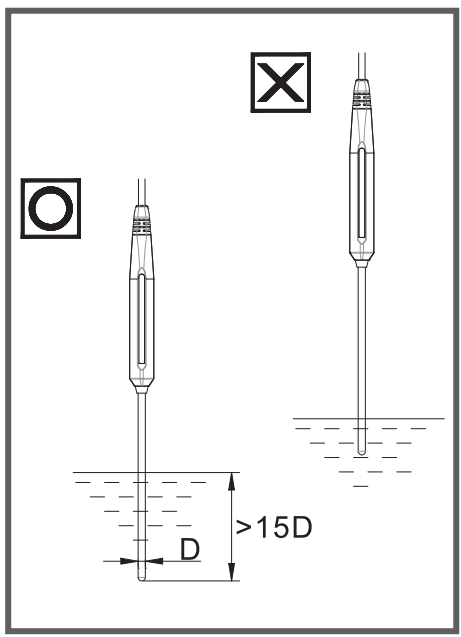
The temperature meter low battery indication shows as follows:

	Low battery. Replace the batteries.

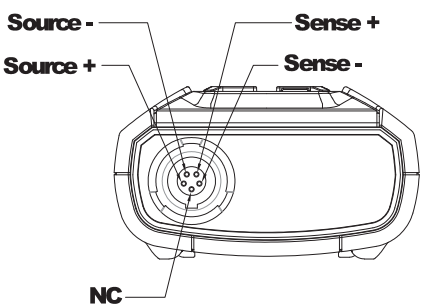
5. TEMPERATURE MEASUREMENT

5.1 Correct Measurement Method:

The temperature sensor is located at the end of the metal sheath of the sheath type TEMPERATURE PROBE. To accurately test internal temperature insert the probe into the item you want to measure to a distance of at least 15 times the diameter of the sheath.



5.2 Connector Configuration:



6. SETTING THE TIME

6.1 Press and hold [MIN MAX] button and then power on the meter to enter setup mode.

6.2 Press [REL] button to enter Time setting mode. The right two digits blink.

6.3 Press [REC] or [°C °F] button until the display shows the correct **year**, and then press [REL] button to select. The left two digits blink.

6.4 Press [REC] or [°C °F] button until the display shows the correct **month**, and then press [REL] button to select. The right two digits blink.

6.5 Press [REC] or [°C °F] button until the display shows the correct **day**, and then press [REL] button to select. The left two digits blink.

6.6 Press [REC] or [°C °F] button until the display shows the correct **hour** (24-hour format), and then press [REL] button to select. The right two digits blink.

6.7 Press [REC] or [°C °F] button until the display shows the correct **minutes**, and then press [REC] button to store the time in memory.

> ***Note:***
> Holding down "REC" or "°C/°F" causes the number to change more quickly.

7. CHANGING THE LOGGING INTERVAL

The logging interval determines how often the thermometer stores logged readings in memory.

7.1 Press and hold [MIN MAX] button and then power on the meter to enter setup mode.

7.2 Press [HOLD] button to enter Interval setting mode. The left two digits blink.

7.3 Press [REC] or [°C °F] button until the display shows the correct **hour** (24-hour format), and then press [REL] button to select. The right two digits blink.

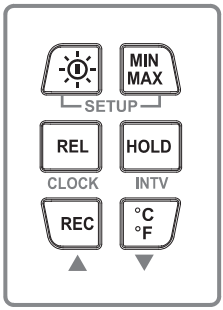
7.4 Press [REC] or [°C °F] button until the display shows the correct **minutes**, and then press [REL] button to store the time in memory.

> ***Note:***
> Holding down "REC" or "°C/°F" causes the number to change more quickly.

8. CLEARING MEMORY

When memory is full, **REC** appears and blinks on the display and logging stops.
You can clear memory in the next power on of the meter by entering the clear memory mode.
Press and hold [REC] button and then power on the meter to enter clear memory mode to delete logged readings from memory. The display shows the number from 5 and decreases to 0.

9. TEMPERATURE METER CALIBRATION SETUP

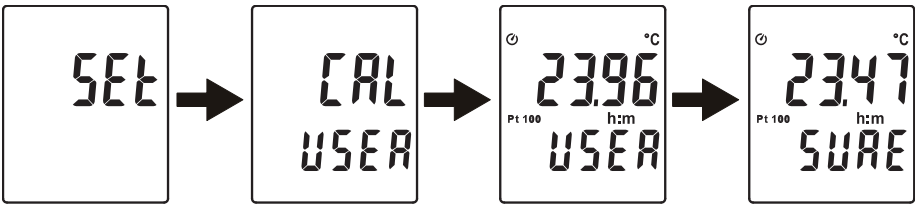


Below table diagram shows each button function when user enters into the calibration mode.

Note:
Turn the Power "OFF" before attempting SETUP.
Setup mode is cancelled during below procedure if "POWER" button is pressed.

9.1 Temperature Calibration

Place the temperature probe in a known, stable temperature environment. Allow the readings to stabilize. In Setup, change the offset until the display reading matches the calibration temperature.



Press and hold [REL] + [HOLD] buttons and then power on the meter to enter setup mode.

Press [°C °F] button to enter calibration mode. (in 3 seconds)

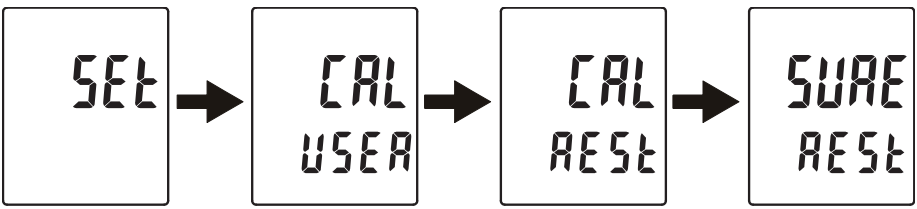
Press [HOLD] button to enter calibration mode. (in 3 seconds)

Press [REC] or [°C °F] button to confirm present Temperature value.

Press [HOLD] button twice to confirm selection.

Note: To abort during the process, press [☼] button to exit calibration mode.

9.2 Recall Default factory setting value



Press and hold [REL] + [HOLD] buttons and then power on the meter to enter setup mode.

Press [°C °F] button to enter calibration mode. (in 3 seconds)

Press [MIN MAX] button to enter recall mode. (in 3 seconds)

Press HOLD button to confirm revert back to “Default factory setting value”

Press HOLD button to confirm selection.

Note: To abort during the process, press button to exit calibration mode.

10. COMMUNICATION WITH A PC

You can transfer the contents of the temperature’s memory to a PC using **SE376** software. The communication requires USB or RS-232 serial connection.

TESTLINK SE-376 SOFTWARE

(1) The SE-376 package contains:

- 80mm CD
- Custom designed USB cable for HH376

(2) System Required:

Windows NT 4.0/ NT2000/ XP/ VISTA/ Windows 7

(3) Minimum Hardware Required:

- PC or NoteBook with Pentium 800MHz or higher, 128 MB RAM
- At least 50 MB hard disk space available to install SE376
- Recommended screen resolution 800X600 or above

(4) Install SE-376:

1. We recommend closing all other applications before installing SE376.
2. Insert setup CD disk to CD disk drive.
3. Choose the Start button on the Taskbar and select Run.
4. Type E:\SETUP and choose OK, the program will copy SE376.exe (executable file) and help file to your hard disk (default path is c:\program files\SE376).

(5) Main menu and buttons:

Open - Retrieve files from the disk

Save - Save the present data to the disk

Print - Send data in the present table to the printer

Pause - Stop data recording

Run - Start data recording

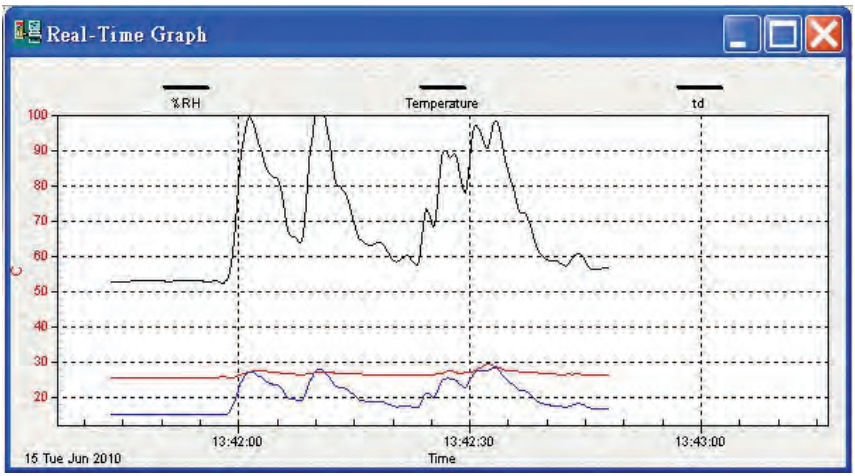
Output To Graph - Send tabular data to another graph

New - Reset all the data

Option - Setup dialog to set attributions of graph. (You can also double click on the graph.)

Sampling Rate - Time interval between each data to be recorded. If you want to change it, move mouse cursor to the digit you want to change and click, then input the new sampling rate. The change will be effective immediately. It will keep up to 5000 data points, when data points exceed this limit, the oldest 100 points will be replaced sequentially.

(6) Real Time Graph:



You can Zoom this graph by using mouse:

To Zoom:

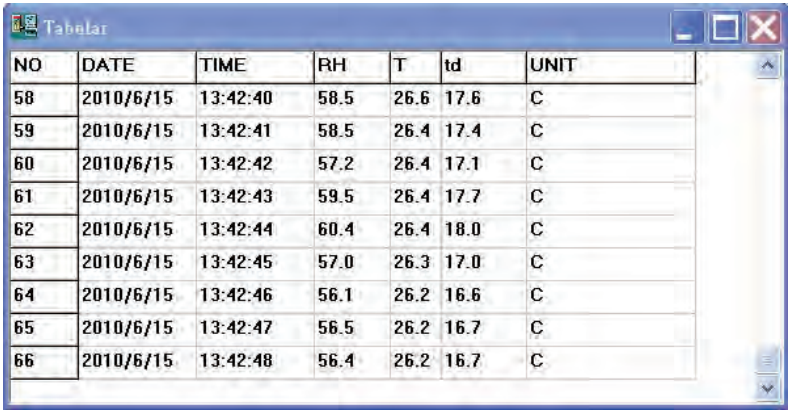
1. Press and hold the Shift key
2. Press the left mouse button and drag the cursor to select the new extents
3. Release the mouse button

To Undo the Zoom:

Press the Alt+U key or click Undo Zoom button

Note: Zooming method is not allowed in Real Time Graph Window.

(7) Tabular:



NO	DATE	TIME	RH	T	td	UNIT
58	2010/6/15	13:42:40	58.5	26.6	17.6	C
59	2010/6/15	13:42:41	58.5	26.4	17.4	C
60	2010/6/15	13:42:42	57.2	26.4	17.1	C
61	2010/6/15	13:42:43	59.5	26.4	17.7	C
62	2010/6/15	13:42:44	60.4	26.4	18.0	C
63	2010/6/15	13:42:45	57.0	26.3	17.0	C
64	2010/6/15	13:42:46	56.1	26.2	16.6	C
65	2010/6/15	13:42:47	56.5	26.2	16.7	C
66	2010/6/15	13:42:48	56.4	26.2	16.7	C

The Tabular window can be used to record real time data in a table format. The maximum number of records that the Tabular window can keep will be dependent on availability of memory and hard disk space of the connected computer.

(8) Data Logger

When you have the thermometer connected to a computer, select "Load Data" to start loading the recorded data from the thermometer. There will be a progress indicator to show the loading progress.

If error occurs, just click "Load Data" again.

After the data has been successfully loaded to a computer, the left side window will show how many data sets were loaded and their detailed information (start date, start time, recording rate, and record numbers).

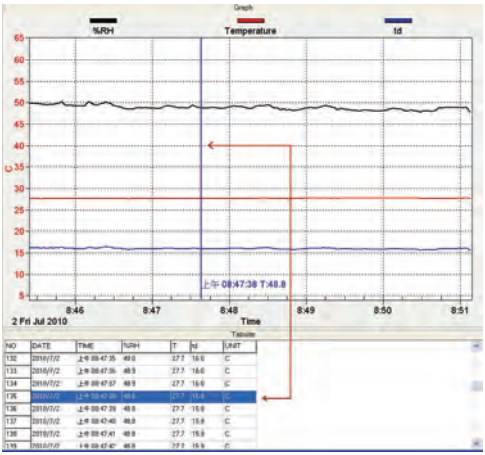
For example:

Set	DATE	TIME	Rate	Nums
1	2010/5/7	下午 07:42:18	08:33	1
2	2010/5/7	下午 07:55:39	20:59	1
3	2010/6/25	下午 01:37:57	20:59	1
4	2010/6/25	下午 01:38:01	20:59	1
5	2010/6/25	下午 01:38:03	20:59	1
6	2010/6/25	下午 01:38:05	20:59	1
7	2010/6/25	下午 01:38:07	20:59	1
8	2010/6/25	下午 01:38:14	20:59	1
9	2010/6/25	下午 01:38:17	20:59	1
10	2010/6/25	下午 01:38:30	20:59	1
11	2010/6/25	下午 01:38:32	20:59	1

SE376 will transfer the first data set to graph and tabular on the right side window once you finish loading recorded data from the thermometer. You can click on at any data set to show it's graph and tabular on the right side window.

You can choose a rectangle area on the graph to zoom in for detail.

The vertical dash line in the graph will match the highlight row in the tabular. When clicking on another row in the tabular, the vertical dash line will move to the corresponding position to match the time.



(9) Frequently Asked Question:

Q: I have connected thermometer to computer serial port and turned thermometer on, but it still shows "NO CONNECTION" ?

A: This could be caused if all serial ports are occupied by other applications. Close all applications, restart your computer, and run SE376 again.

Q: In TABULAR window, I saved a file. Can I use EXCEL to open this file?

A: If the decimal separator is comma (,) in your area, you cannot use CSV file because CSV file uses comma to separate data. This will cause confusion (for example 23,6,C,24.6,C).

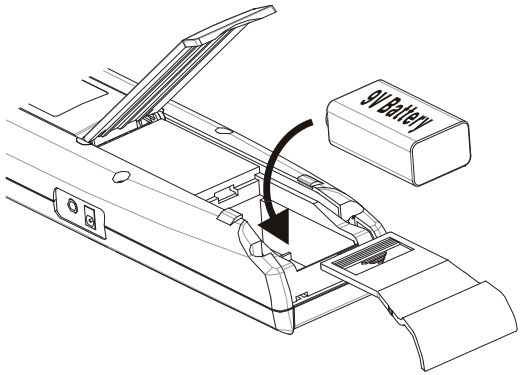
However, you can use TXT files instead. It uses tab to separate the data.

(For example: 23.6 C 24.6 C) can be accepted in EXCEL.

Q: How to uninstall SE376?

A: Uninstall SE376 by launching the Add/Remove Programs applet out of the Control Panel, highlighting the SE376, and clicking on the Add/Remove... button, this will remove the SE376 folder and files from your computer.

11. POWER PREPARATION



11.1 Battery Loading

Remove the battery cover on the back and insert one 9V battery.

11.2 Battery Replacement

When the battery voltage drops below the operating voltage, Low battery indicator will appear. Replace with 9 Volt battery immediately to ensure the unit functions properly.

11.3 AC Adapter Connection

When the AC adapter is used, insert the plugs of the adapter into the DC9V connector on the side panel.

Note:
When the AC adapter is connected while a battery is installed, the unit will be powered from the adapter (the AC adapter has priority).

12. Maintenance

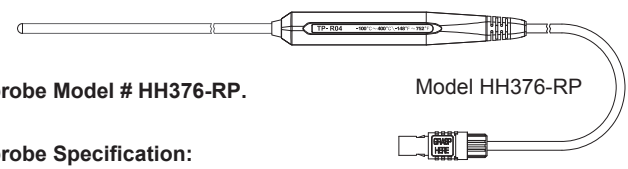
Cleaning

In order to ensure the accuracy of the thermometer for a longer period of time you should have Omega recalibrate it once a year.

Clean the device and the window of the display with a clean, lint-free, antistatic and dry cleaning cloth.

⚠ ***Do no use cleaning agents that contain carbon or benzenes, alcohol or anything similar to clean the product since these substances damage the surface of the measuring instrument. Moreover, these fumes are hazardous to health and explosive. Do not use tools with sharp edges, screwdrivers, metal brushes or anything similar to clean the device.***

13. Temperature Probe



Model HH376-RP

13.1 Piercing type temperature probe Model # HH376-RP.

13.2 Piercing type temperature probe Specification:

Sensor Type	Platinum resistance thermometer sensor Pt 100 (4 wires)
Accuracy	IEC751, class A (t: measurement temperature)
Measurement Range	-100 to 400°C
Temperature Sensor Dimensions	Approx. ∅5.0mm (∅0.2")
Temperature Sensor Length	Approx. 230mm (9.05")
Cable Length	Approx. 1500mm (59.0")