Instruction Manual

Jumbo LCD Digital Thermometer
Model SK-1120
(2-channel)

SATO KEIRYOKI MFG. CO., LTD.
3-4, Kanda-kajicho, Chiyoda-ku, Tokyo 101-0045 Japan
https://www.sksato.co.jp/en/

M.11

Thank you for purchasing the SK-1120 Jumbo LCD Digital Thermometer.

- This product is designed to measure temperature. Do not use it for other purposes.
- Read this manual thoroughly before using the digital thermometer. Keep the manual in a safe place for future references whenever necessary.

Warning

The SK-1120 is not explosion-proof. Never use it in an atmosphere containing flammable gases.

Beware of explosion!

There is a risk of explosion. Take extreme care.

Warnings on Usage

For your safety and proper use of the SK-1120, be sure to observe the following:

- Do not use the SK-1120 as clinical thermometers.
- Never disassemble or alter the SK-1120, which may cause malfunctions.
- Do not drop, vibrate or apply shock to the SK-1120. They are precision instruments.
- Make sure the SK-1120 operate under an ambient temperature of 0 to 50°C and a relative humidity of not more than 80%. Otherwise, malfunctions may occur.
- Avoid using the SK-1120 in a place exposed to direct sunlight or near heating equipment. Doing so may result in measurement errors or deformation/discoloring of the casing.
- Do not use the SK-1120 in an environment where electrical noise is generated. Doing so may result in unstable display or lower accuracy.
- Never use the SK-1120 out of the measurement range, as this may cause malfunctions.
- Never wet or use the SK-1120 underwater. They are not of waterproof construction.
- When used outdoors, keep the SK-1120 out of rain or water splashes. If it becomes wet, the unit may fail.
- If the unit is not to be used for a long time, always remove the batteries which may otherwise leak fluid and cause failure.
- Do not dispose of the used batteries in a fire.
- Keep the batteries out of the reach of children. If a battery is swallowed accidentally, consult a doctor immediately.
- Dispose of used batteries according to your local waste disposal regulations for environmental conservation.
- Do not wash or wipe the SK-1120 with alcohol, thinner or other solvents. If the unit becomes dirty, wipe it with a tightly-wrung towel or the like that has been dipped in warm water with a neutral detergent.
- Do not alter, pull forcibly, bend or bind the sensor probe(s), as doing so may break the probe. Also, do not place heavy objects on the cord or heat it, as doing so damage the cord.
- To prevent injury, be careful of the sharp tip of the sensor especially when cleaning the sensor after taking measurements, and take care not to drop the sensor.
- Ask either your local Sato sales representative or our Service Network for repair and calibration of your SK-1120.

Overview

The SK-1120 is handy type digital thermometer with 2 channels to measure temperature with connected K type thermocouple sensor probes.

Jumbo LCD display makes easier to read temperature values.

Features

- Large LCD for easy reading
  The temperature is indicated on a large liquid crystal display (LCD). The seven-segment characters on the large LCD (upper display) are as high as 18 mm for easy reading.

- Maximum or minimum value display function
  The highest or lowest temperature measured after pressing the MX/MN key can be displayed.

- Indication holding function
  Pressing the HOLD key holds the indication on the LCD.

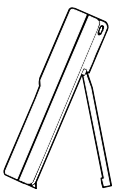
- Two probes connectable
  Two probes can be connected to the two connectors of the main unit. The temperatures (T1 and T2) measured via these two probes are displayed on the upper display and the lower display, and the difference between them (T1 - T2) can also be displayed on the upper display.

- Average temperature display function
  The average value of the temperatures measured after pressing the AVG key can be displayed.

- OFFSET key
  The offset value relative to the temperature when this key was pressed is displayed.

- Backlight function
  The backlit LCD facilitates reading of the indication even in dark places.

- Flip-up stand
  A flip-up stand on the back of the main unit permits hands-free operation.



CAUTIONS

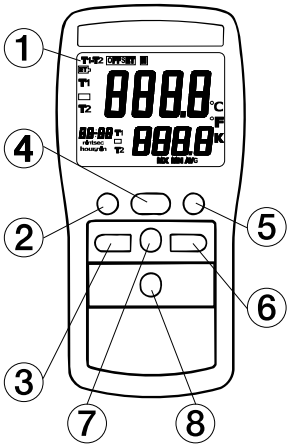
- When first turning on the power or switching the resolution, the display may momentarily show values other than the measurement values. This is not a defect.

- The SK-1120 is powered off 30 minutes after power-on (This automatic power-off function cannot be released). Noted that this auto power-off function is not active when the maximum, minimum or average value is being displayed.

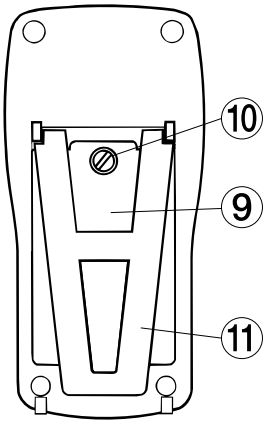
2. Names and Functions of Components

2.1 Main unit

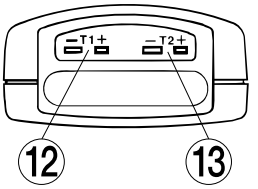
Front View



Rear View



Upper View



① Display section

The temperature reading and characters that indicates the current state of settings are displayed.

② POWER key (PWR)

Press this key to turn the main unit on (measurement mode). - Press this key again to turn off.

③ MX/MN key (MAX MIN)

Press the MAX/MIN key in normal measurement mode to enter maximum/minimum storage mode.
Press the MAX/MIN key in storage mode to switch the display of MAX and MIN.
Press the MAX/MIN key in MAX and MIN. display mode for 2 sec. or more to return to normal measurement mode.

④ HOLD/REL key (HHOLD)

Press the HOLD/REL key in normal measurement mode to hold (freeze) temperature readings.
Press this key again to return to normal measurement mode.

⑤ Backlight switch key

Turns on or off the backlight

⑥ TIME key (Time)

The time elapsed since this key was pressed is displayed in the lower left on the LCD.

⑦ OFFSET key (△)

The offset value relative to the temperature when this key was pressed is displayed.

⑧ Sensor switch key : (T1 / T1-T2 / T2)
Displays, when pressed, the temperatures (T1 and T2) measured via the two probes, and their difference (T1 - T2) in sequence.

⑨ Battery cover : Six "AAA" size batteries are installed in the battery compartment.

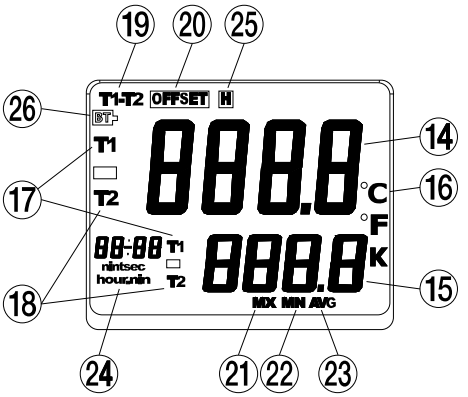
⑩ Battery cover setscrew : Fixes the battery cover on the main unit.

⑪ Flip-up stand : Enables the model to rest against it and stand up on desks.

⑫ Sensor connector 1 : Connects sensor probe 1 with a type "K" thermocouple connector.

⑬ Sensor connector 2 : Connects sensor probe 2 with a type "K" thermocouple connector.

2.2 Display section



⑭ Seven-segment display (upper display):
Displays the temperature measured via sensor probe 1 (T1), the temperature measured at sensor probe 2 (T2) or the difference (T1 - T2), in sequence, every time the sensor switch key is pressed.

⑮ Seven-segment display (lower display):
Displays the temperature measured via the other sensor probe when the sensor switch key is pressed. When the upper display shows T1, this display shows T2, or vice versa.

⑯ **°C** : Indicates that the display unit is centigrade.

⑰ **T1** : Lights when the temperature measured via probe which is connected to the connector (T1) of the main unit is displayed.

⑱ **T2** : Lights when the temperature measured via probe which is connected to connector (T2) of the main unit is displayed.

⑲ **T1 - T2** : Lights when the difference of the temperatures (T1 - T2) measured via probes 1 and 2 is displayed on the seven-segment upper display.

⑳ OFFSET : Lights wn the offset (REL) display function is active.

㉑ MX : Lights when the highest temperature (maximum value) is displayed.

㉒ MN : Lights when the lowest temperature (minimum value) is displayed.

㉓ AVG: Lights when the average temperature (average value) is displayed.

㉔ Time display
Displays the time elapsed since the TIME key was pressed. When the MAX/MIN key is pressed, the time elapsed since the occurrence of the highest or lowest temperature and its occurrence time can be displayed together with the maximum or minimum or average value.

㉕ H : Lights when temperature value is held.

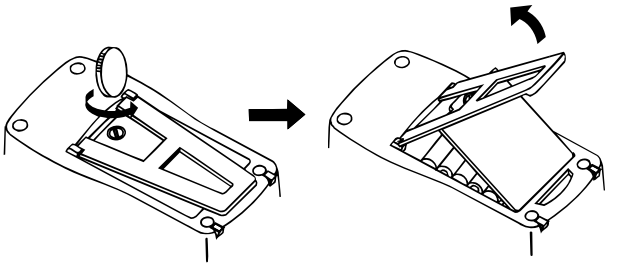
㉖ BT Low battery mark:
Lights when battery power is insufficient. Replace the batteries with new ones.

3. Storage

- Store the SK-1120 in an environment where the temperature range is within -10°C to 60°C, and the relative humidity is not more than 80%. Avoid hot and humid places.

- Never leave the SK-1120 inside a car under the full sun in a hot climate. Doing so will cause the instrument to become extremely hot, possibly resulting in failure. Do not leave it in a hot place.

4. Installing and replacing the batteries



(1) Turn the setscrew on the battery cover counterclockwise with a flat-head screwdriver or a coin to remove it. Flip up the stand and remove the battery cover.

(2) In case of replacement, remove all six old batteries.

(3) Insert six new "AAA" batteries in the battery cabin properly as illustrated in the bottom of the cabin (check the polarity of each battery matches the illustration).

(4) Install the cover and fix it with the setscrew in the reverse order of removal.

Note: When "BAT" is lit on the LCD, immediately replace all the batteries with new ones of the same type. If not, the measurement accuracy may be affected or malfunctions may occur. The batteries provided as standard accessories are six LR03s ("AAA" alkaline batteries)

5. Fitting the vinyl cover over the unit

The SK-1120 comes with a vinyl cover that fits on the unit. With the cover in place, the thermometer can be used even when your hands are wet. The cover also keeps the unit clean and dry.

Cautions

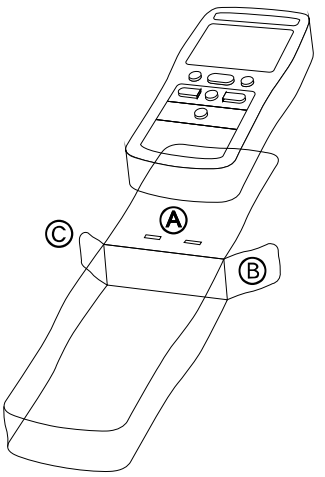
- SK-1120 is not waterproof. Do not place it in water or use it where it may be splashed with water. Otherwise, it will fail.
- If water enters the vinyl cover, immediately turn off the unit. Make sure that no water enters the cover while the unit is being used.
- The measurement readings may become unstable if static electricity builds up inside the vinyl cover while in use. If this happens, remove the vinyl cover and use the unit without it.

(1) Bend the (B) flap into the vinyl cover.

(2) Insert the unit fully into the cover, aligning the display of the unit and (A) of the figure on the right.

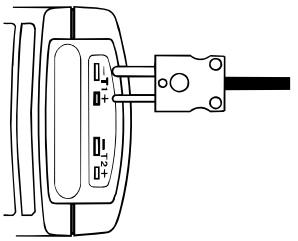
(3) Bend the (C) flap to the main unit.

(4) Fold back the (A) part so that the cover wraps around the upper and rear of the unit.



6. Measurements

(1) Connect the sensor probe(s) with a type "K" thermocouple connector to the main unit.

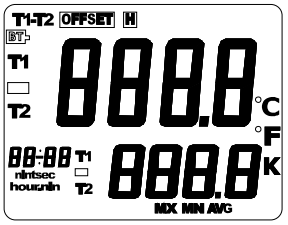


Fully insert plug

Align the positive (+) and negative (-) sides of the plug of the sensor probe with those of the connector receptacle on the main unit. The sensor probe SK-K010 provided as a standard accessory is designed to measure a temperature within the range of -50°C to 300°C. Make sure to use the probes within this range of measurement temperature.

NB. Be sure to use a type "K" thermocouple sensor and its proper connector. Do not use other types of thermocouple sensor proves to ensure accurate temperature measurements.

(2) Press the PWR key to turn on the main unit.
Upon initial power-on of the SK-1120, the LCD displays all the elements for about one second before the measurement mode starts.



SK-1120
All the elements are displayed

NB: When the sensor is not connected to the main unit, the LCD displays an "OL" or "-OL" to warn that the sensor is overrange.

(3) You can avoid the influence of ambient temperature around the protection tube by inserting the sensor probe into the target (regardless of whether gas, liquid or solid) to approximately “15 times the diameter of the protection tube” from the end of the sensor protection tube (approximately 35 mm for the SK-K010).

CAUTIONS

- Take care not to get burned when measuring high temperatures.
- The measurement accuracy may be affected when the ambient temperature is abruptly changed. Allow the SK-1120 to acclimatize to the ambient temperature before starting the measurements. When precision measurements are required and if the SK-1120 is brought into an atmosphere with a temperature difference of 10°C or more, leave them in the new atmosphere for at least 30 minutes before starting the measurements.

(4) Pressing the PWR key in the measurement mode turns off the main unit.

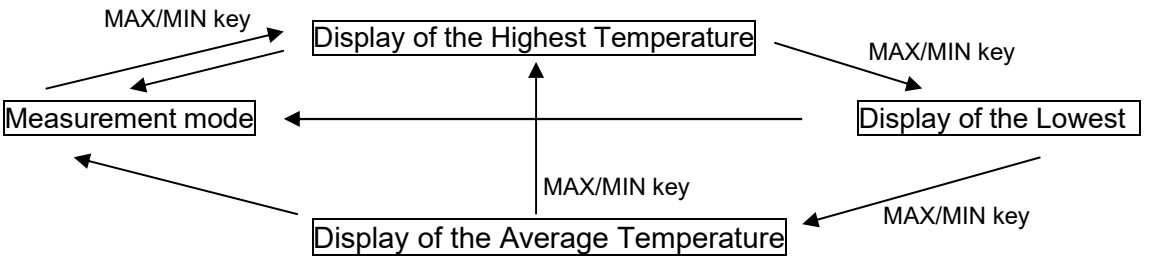
- - When first turning on the SK-1120, the LCD may display all the elements momentarily. This is not a defect.

7. Indication hold function

Pressing the HOLD key, (H), holds the indication. This is useful for easy reading when the indication changes rapidly during measurements. Pressing the HOLD key again will release the indication hold function.

8. Maximum or minimum value display function

The SK-1120 can display the highest temperature (maximum value) or the lowest temperature (minimum value) measured after the MAX/MIN key is pressed. During this time, the label "MAX" or "MIN" is lit accordingly. To return to the normal measurement mode, keep pressing the MAX/MIN key for at least two seconds. The relationships between the maximum and minimum value display functions and the MAX/MIN key operations are shown below:



To return to the normal measurement mode from either the maximum, minimum or average value display mode, keep pressing the MAX/MIN key for at least two seconds. The time when the latest maximum or minimum value is recorded can be displayed in the time display area on the LCD.

***Other uses**

Unless the normal measurement mode is restored, the maximum or minimum value display mode continues, keeping the latest maximum or minimum value on the display. In this way, the peak or valley hold function (indication of the maximum or minimum temperature measured during the time duration) of the peak/valley hold meter can be used.

CAUTIONS

- If the SK-1120 has no sensor probe connected, "OL" (over-range) is recorded as the maximum value and the minimum value. If the sensor probe is connected after being turned on, the maximum value is still recorded as "OL." To release this condition, first turn off and connect the sensor probe before turning on the power again, or restore the normal measurement mode by pressing the MAX/MIN key for at least two seconds.

- With the SK-1120, if either the temperature (T1) at sensor probe 1 or the temperature (T2) at sensor probe 2 is recorded as "OL," the value "T1 - T2" is also displayed as "OL."

9. Average display function

The SK-1120 can display the average temperature (AVG). The unit displays the average temperature measured (for up to approximately 9 hours) after the MAX/MIN key is pressed. These values are obtained by summation averaging.

10. Resolution switching function

The resolution is automatically switched according to the temperature. For less than 190°C, the resolution 0.1°C is used, and for 190°C or higher temperatures, the resolution 1°C is used.

CAUTIONS

- With the SK-1120, the decimal point is displayed when the indication resolution is 1°C.

11. Backlight function

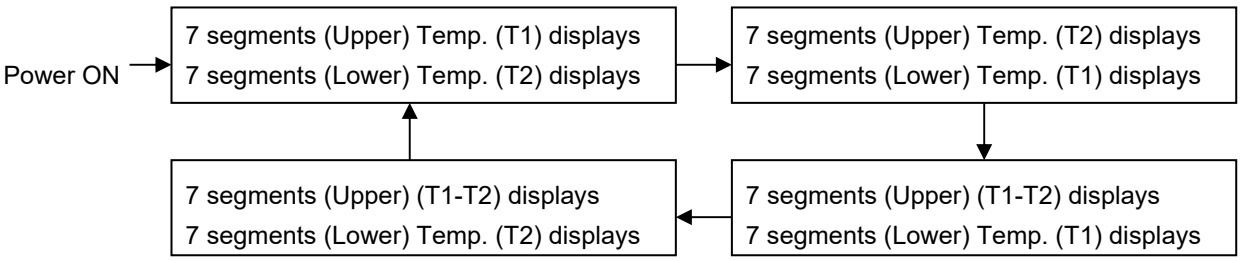
The SK-1120 is provided with a backlight function. Pressing the key lights the LCD with a green backlight. This permits the indication or other measurement data on the LCD to be read easily. The backlight can be turned off by pressing the key again, or it is automatically turned off one minute after pressing the key.

CAUTIONS

- Illuminating the backlight reduces the battery life.
- You may see a tiny spot on the polarizing plate of the backlight, but this is not a defect.

12. Temperature difference (T1 - T2) display function

Two sensor probes can be connected to connectors 1 and 2 of the SK1120 to measure temperatures through two channels. The difference of temperatures (T1 - T2) obtained through these channels can be displayed by pressing the sensor switch key. The relationships between the upper and lower displays and the sensor switch key operations are shown below. While the temperature difference, T1 - T2, is being displayed, the label "T1 - T2" is lit.



CAUTION

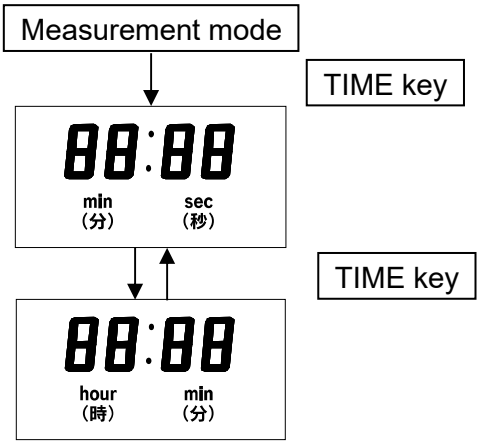
Be sure to use the sensor probe with a type K thermocouple connector. Also, make sure the sensor probes to be connected to connectors 1 and 2 on the main unit are of the same type and have the same property.

13. Offset (REL) display function

With the SK-1120, the offset value relative to the temperature measured when the OFFSET key (△) is pressed can be displayed (REL: relative value display function).

14. Time display function

With the SK-1120, the time elapsed since the TIME key was pressed is displayed on the time display. The relationships between the time displays and the TIME key operations are shown below:



If the MAX/MIN key is pressed after the TIME key was pressed, the MAX/MIN key has priority. Therefore, the time elapsed since the latest maximum or minimum value was measured is shown on the display.

15. Error Message

Display	Causes	Remedy
OL	Probe is not connected	Connect the probe. K type thermocouple is applicable
	Incorrect thermocouple sensor is connected	Connect the K type thermocouple sensor
-OL	Measured value is out of display range -50.1°C or more than 1301°C	Bring the value within the measuring range
	Short circuit inside the probe	Stop using the instrument and replace with other probe.

16. Troubleshooting

Some of the following phenomena may not be considered defective. Check the phenomena carefully before requesting repair.

Abnormal phenomenon	Possible cause(s)	Action(s) to be taken
The power is not turned on	The batteries have run out.	Replace with new batteries.
	If the power will not turn on even after properly inserting new batteries, some part(s) within the main unit may have been damaged due to improper handling such as dropping or giving strong shock to the unit.	If the parts have been damaged, ask your Sato sales representative or our Service Network for repair.
	The batteries are not properly installed.	Make sure the orientation of the batteries is correct. Installing the batteries in the wrong direction is dangerous as the batteries might explode or liquid may leak.
Indication value is abnormal.	The batteries have run out.	Replace with new batteries.
	The main unit is not accustomed to the ambient temperature.	Leave the main unit in the ambient temperature for a while before starting the measurements.
	The sensor is being disconnected or the protection tube is deformed.	Check the appearance of the sensor probe carefully. If any abnormality is found, ask us or our Service Network
	The sensor probe connector is not fully inserted.	Fully insert the sensor probe connector.
	The sensor is not fully contacting the object to be measured.	Review the sensor measurement procedures. If the object's thermal capacity is small, the indication may be affected by the protection tube size.
	The instrument is used in an environment where electrical noise is generated.	Move the device to a place away from electrical noise. Installing shields may effectively block some electrical noises; wrapping the main unit and each of the sensor grip and cord with a sheet of aluminum foil may also help.
The indication is unstable.	The batteries have run out.	Replace with new batteries
	The sensor is being disconnected or the protection tube is deformed.	Check the appearance of the sensor probe carefully. If any abnormality is found, ask us or our Service Network

The indication is unstable (continued)	The sensor probe connector is not fully inserted.	Fully insert the sensor probe connector.
The indication is unstable (continued)	The sensor is not fully contacting the object to be measured.	Review the sensor measurement procedures. If the object's thermal capacity is small, the indication may be affected by the protection tube size.
	The instrument is used in an environment where electrical noise is generated.	Move the device to a place away from electrical noise. Installing shields may effectively block some electrical noises; wrapping the main unit and each of the sensor grip and cord with a sheet of aluminum foil may also help.

17. Specifications

Name of Product	Digital Thermometer (K Type Thermocouple)
Model No.	SK-1120
Cat. No.	8014-20
Number of channel	2 channel
Functions	Automatic resolution switching function MAX/ MIN: maximum/ minimum memory data AVG: Average value HOLD: data hold OFFSET: offset value, Backlight Measurement of variation (CH1 – CH2) Auto-Power OFF (about 30 min.)
Measuring range	-50 to 1300℃
Accuracy (main body)	±(0.5%rdg + 1) ℃ at -50 to 0.0℃ ±(0.3%rdg + 1) ℃ at 0.0 to 1000℃ ±(0.5%rdg + 1) ℃ at 1001 to 1300℃
Resolution	0.1℃/1℃ (w/ resolution switching function)
Sampling time	About 0.5 sec.
Sensor	K Thermocouple, Connector: ANSI standard, Yellow
Accuracy (sensor)	K Thermocouple, class 2
Operation ambient	0 to 50℃ for temperature, less than 80%RH for humidity no condensing
Power requirements	6 AAA Alkaline batteries
Battery life	About 80 hours (Backlight OFF) About 25 hours (Backlight ON) * continuous with alkaline batteries
Materials	Main unit : ABS resin Probe : PVC resin Sensor Cable: PV resin
Dimensions	Main unit : 72(W)×151(H)×35(D) mm
Weight	approx. 255g (including batteries)
Standard Accessories	“AAA” Alkaline battery x 6, vinyl cover

SATO KEIRYOKI MFG. CO., LTD.