



INSTRUCTION MANUAL
CO2 Monitor Model SK-50TCH
No. 1737-00

SATO KEIRYOKI MFG. CO., LTD.

Introduction

Thank you for purchasing the CO₂ Monitor Model SK-50CTH.

This product measures indoor carbon dioxide concentration ("CO₂ level"), temperature, and humidity to serve as a reference to observe the necessity of ventilation. Do not use it for other purposes. Read this manual thoroughly before use and keep the manual for future reference.



PRECAUTION

SK-50CTH is designed to be used in ambient atmosphere. Do not use it to monitor the CO₂ level as high as being harmful to life.

Also, check if it is not damaged or is lacking of accessories before use. Contact a dealer or us in case of such problems.



WARNING



Never use this instrument in an atmosphere exposed to inflammable gases as it may explode.

If there is anything you are not clear about the safety, contact a dealer or us.



CAUTION

Keep the followings for proper use of the instrument:

- DO NOT USE THE INSTRUMENT IN THE AIR OTHER THAN AMBIENT ATMOSPHERE.
- SK-50TCH is a precision instrument. Do not drop or give shocks to it.
- Do not disassemble or alter the instrument to avoid any malfunctions and damages.
- This instrument is not waterproof. Never let it get wet.
- If the instrument gets condensed with moisture, turn the power off immediately and dry it naturally under room temperature before use.
- If you store or transport the instrument, use packing materials which are originally contained when you have purchased it. Using bubble buffers or antistatic bags, which have a distinctive color such as blue, pink, or rose pink in general, may damage the membranes of the humidity sensor.
- Dusty environment damages the CO₂ sensor and the humidity sensor.
- Electrically noisy environment may cause unstable measured values and errors in accuracy.
- Use of the instrument out of its measuring range can cause malfunctions.
- Do not wash or wipe the instrument with alcohol, thinner, or any other solvents. If the instrument gets dirty, wipe it with a tightly wrung towel that has been dipped in warm detergent water.
- Contact a distributor or us for repairs.

Overview of CO₂ Level

CO₂ level stands for density of CO₂ in the air by volume, and is expressed in units of ppm (parts per million). The global average CO₂ level in 2019 was 410 ppm, and is estimated to be several tens of

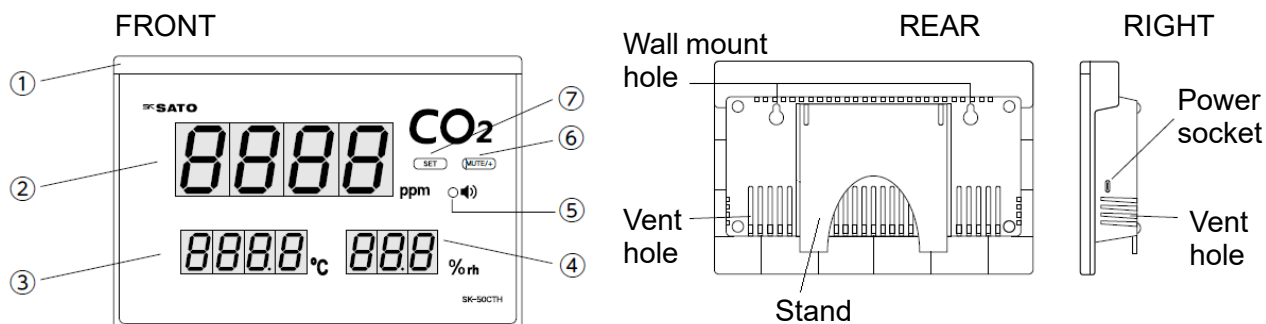
ppm higher in urbanized areas. Each breath exhaled from a person contains around 40000 ppm of CO₂ thus the level in a closed room increases in general. If the level in the whole air exceeds approximately 30000 ppm, it can be harmful to life.

The risk of occurrence of a cluster of infection disease arises in closed, poorly ventilated spaces. Measurement of CO₂ level is thus an effective method to discover bad ventilation. The WHO (World Health Organization) recommends that the indoor CO₂ level should not exceed 1000 ppm, and many governments such as those of the USA and Japan issue the same level of regulations. For a detail safety standard, refer to a guideline instructed by your local authorities.

Features

- Precise NDIR sensor
An NDIR (non-dispersive infrared) gas detector serves as a CO₂ sensor to achieve long life and eliminate the influence of other gases.
- Vivid 7-segment LED
A clear green digital display enables easy reading of measured values.
- CO₂ level alert
Notifies of CO₂ level by an LED light lit in three colors and a buzzer.
- Self-recalibration of CO₂ sensor
The sensor can be recalibrated at your site to help stable measurement for a long time.

Names of Components



- | | |
|-------------------------|---|
| ① LED light: | Changes its color corresponding to CO ₂ level. |
| ② CO ₂ level | |
| ③ Temperature: | Shows set values in setting mode. |
| ④ Humidity: | Shows setting items in setting mode. |
| ⑤ Buzzer sign: | Turns on when the buzzer is valid. |
| ⑥ MUTE/+ key: | Tap to stop beeping when it is activated, or to increase the set value in setting mode. |
| ⑦ SET key: | Tap to move to setting mode. In setting mode, tap to fix the set value. |

Installation

Do not install SK-50CTH in the following locations to avoid incorrect measurement in an indoor environment:

- near air conditioners, heaters, vent holes, windows, or doors
- where is exposed to direct sunlight, wind, or an exhaled breath

Note: Keep 50 cm (2 ft) away from a nearby person at least.

Flip up the stand in the rear side and put the instrument on a flat surface for table use.

To mount on a wall, use the hole in the rear side to hook up the device.



CAUTION

- Be sure to confirm that the instrument will not drop when mounted on a wall.
- Do not block the vent hole.

How to Measure

1. Insert the Type-C end of the USB cable into the power socket of the instrument.
2. Insert the other end of the cable into the attached AC adapter, then connect it to an AC inlet.
3. Measured values are shown after warm-up operations.



CAUTION

- Do not handle the USB cable or AC adapter with a wet hand, or it can cause electric shock or a short circuit.
- The attached USB cable is only for power supply. Do not use it for other purposes.
- Measurement accuracy can be worsened the ambient environment changes drastically. Let it warm up for a while.

● CO₂ Alert

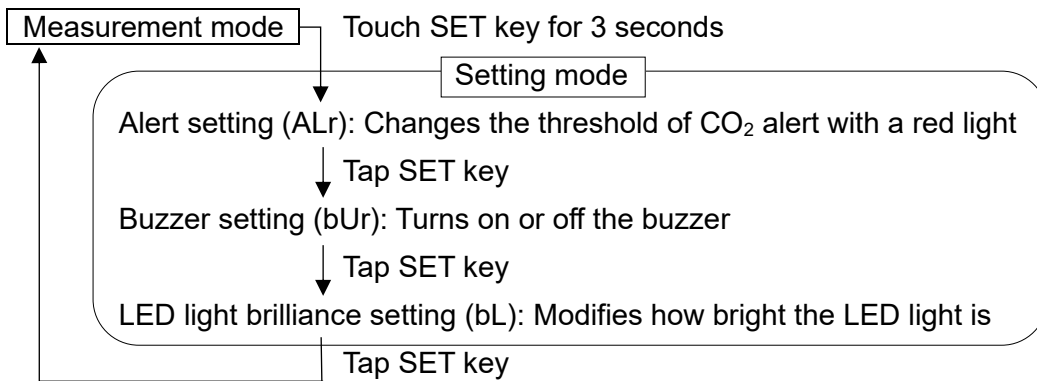
CO ₂ level	LED light	Buzzer
800 ppm or less	Lighting in green	None
800 to <u>1000</u> ppm	Lighting in amber	None
Over <u>1000</u> ppm	Blinking in red	<u>Off</u>

Underlined parts can be modified in setting mode. The left shows factory setting. Refer to “Settings” for details.

When the buzzer is turned on, the instrument continues beeping as long as the CO₂ level exceeds the set value. Tap MUTE/+ key to stop it. Blinking of a red light will remain regardless of the key. After the beeping stops, it beeps again if the level falls below the threshold and exceeds it again.

Settings

● Flowchart



* Letters in parentheses above are indicated on the humidity segment.

1. Touch the SET key for 3 seconds or more to enter setting mode when the instrument is connected to power.
2. Change set values by tapping the MUTE/+ key.
3. Fix the set value by tapping the SET key. The display shows a next item.
4. After all of three settings are configured, the display indicates “END/ESC” then the device switches to measurement mode. Also, it automatically fixes the set value and turns back to measurement mode if no key is tapped for 25 seconds in setting mode.

Note: Every set value is maintained even if disconnected from power.

● **Alert Setting** (Factory setting: 1000 ppm)

1. Move to the alert setting (ALr).
2. Change the threshold CO₂ level by tapping the MUTE/+ key.
Available range: 800 to 3000 ppm in steps of 100 ppm
Note: The LED light is not lit in amber if the value is set to be 800 ppm.
3. Fix the set value by tapping the SET key.

● **Buzzer Setting** (Factory setting: Off)

1. Move to the buzzer setting (bUr).
2. Turn on or off the CO₂ alert buzzer by tapping the MUTE/+ key.
3. Tap the SET key. The buzzer sign is lit if the buzzer is turned on.

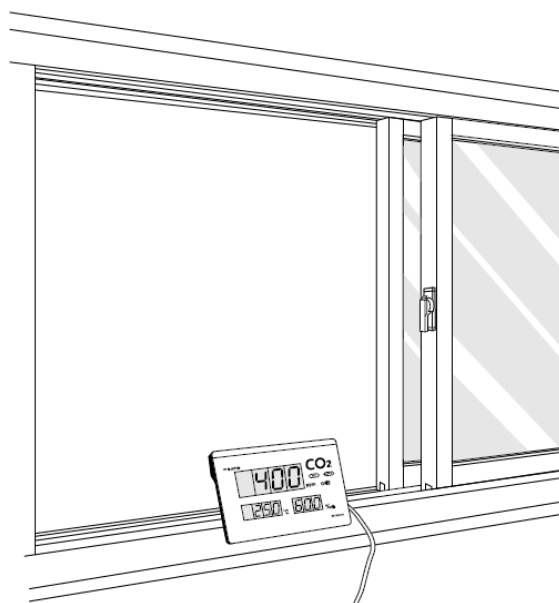
● **LED Light Brilliance Setting** (Factory setting: 1)

1. Move to the LED light brilliance setting (bL).
2. Change the brightness of the LED light by tapping the MUTE/+ key.
Available range: 0 (see below), from 1 (darkest three colors) to 10 (brightest)
Note: If set as “0” the light is not lit in green or amber, and only blinks in red.
3. Fix the set value by tapping the SET key.

Recalibration of CO₂ Sensor

Accuracy of the CO₂ sensor gets gradually worsened due to the contamination of dust and aged deterioration. For a stable long-term measurement, it is advised to recalibrate it once in six months.

1. Be sure to follow the conditions below:
 - the room must be unmanned, well-ventilated with a window open;
 - the device is placed aside the window where wind blows;
 - not to touch the rear side, or breathe upon the instrument.
2. Let the device stay still for around 10 minutes to stabilize the measured value.
3. Touch both the SET key and the MUTE/+ key simultaneously for more than 3 seconds until the letters of "CAL" blinks on the display.
4. Tap the SET key. Countdown from 300 begins on the display.



Note: Recalibration is suspended if the MUTE/+ key is touched for 3 seconds.

5. When approximately 5 minutes have passed and the countdown finishes, recalibration is complete and the device returns to measurement mode.



CAUTION

- Do not recalibrate when it rains or snows as the instrument may get wet.
- Do not get close to or breathe upon the instrument during recalibration. Otherwise, the recalibration may fail.

Troubleshooting

The instrument may be out of order if the following countermeasures do not work. Contact a dealer or us for assistance in such case.

Trouble	Possible cause	Solution
Power cannot be turned on.	The USB cable is not plugged tightly.	Insert the cable into sockets firmly.
	The USB cable is disconnected internally.	Replace with a new cable.
Measured value is not stable.	The air inside and outside the instrument is not mixed well.	Let it stay still to warm up.
	Electric noises affect the state.	Do not use the instrument where electric noises are generated.

Error Displays

Refer to the following if error codes are displayed on any segment of the panel.

If these solutions do not work, contact a dealer or us for further assistance.

Segment	Code	Description	Solution
CO ₂ Temp. Humid.	E02	Measured value is under the display range.	Use within the measuring range. If these errors occur on CO ₂ , measure the outdoor air and confirm that the indication is close to 400 ppm.
	E03	Measured value is over the display range.	
CO ₂	E17	Recalibration has ended in failure.	If the instrument is unplugged during recalibration, this error occurs and it returns to measurement mode. Refer to "Recalibration of CO ₂ Sensor" and try the processes again. If not above, the failure may be due to high CO ₂ level. Bring the device outdoors and recalibrate.
	E01	The sensor is malfunctioning.	Stop using the product and contact a dealer of your purchase or us for further assistance.
Temp.	E31		
Humid.	E34		

Specifications

Name and Cat. No.	CO ₂ Monitor Model SK-50CTH (Cat. No. 1737-00)		
Measured elements	CO ₂ level	Temperature	Humidity
Measuring range	200 to 5000 ppm	0.0 to 50.0°C	10.0 to 95.0%rh
Accuracy	±5%rdg or ±50 ppm whichever is larger (200 to 3000 ppm); ±7%rdg (other)	±0.6°C (20.0 to 40.0°C); ±1.0°C (other)	±5.0%rh (40.0 to 70.0%rh, 20 to 30°C); ±7.0%rh (other)
Resolution	1 ppm	0.1°C	0.1%rh
Sampling time	5 sec.	2 sec.	2 sec.
Buzzer volume	64 dB from 10 cm away		
Operation ambient	0 to 50°C, 95%rh or less without condensing		
Storage ambient	-10 to 50°C without condensing		
Power	5 VDC, 500 mA via USB Type-C terminal		
Materials	Case: ABS resin; Panel: acrylic glass		
Dimensions	226 (W) x 152 (H) x 45 (D) mm		
Weight	450 g		
Accessories	USB cable (Type-C to A), AC adapter (100 to 240 VAC), instruction manual		

Specifications and appearance are subject to change without notice for improvement.

Warranty Policy

Our products are warranted to be free from defects in materials and workmanship for a period of one year from the date of shipment. If repair or adjustment is necessary and has not been the result of abuse or misuse within the said period, please return the units on freight prepaid basis and correction of the defect will be made without charges. We alone will determine if the product problem is due to deviations or customer misuse.

Out-of-warranty products will be repaired on charge basis.

Warranty during transportation

The warranty during transportation only applies to the products that we arrange the shipment. The case that the products had been purchased in domestic and were sent to overseas by the purchaser is out of warranty.

Return of items

Authorization must be obtained from us before returning items for any reason. When applying for authorization, please include data regarding the reasons the items are to be returned.

SATO KEIRYOKI MFG. CO., LTD.

3-4, Kanda-kajicho, Chiyoda-ku, Tokyo 101-0045 Japan

URL: <https://www.sksato.co.jp/en>

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