Z-Wave CO Sensor PSG04

Introduction

The Z-Wave CO Sensor PSG04 is designed to give early warning of developing fires by giving off the alarm sounds from its build-in alarm horn, based on Z-Wave™ technology.

It is the Z-Wave™ plus product, it support the security, OTA. Those newest features of the Z-Wave™ technology. Z-Wave™ is a wireless communication protocol designed for home automation, specifically to remotely control applications in residential and light commercial environments. The technology uses a low-power RF radio embedded or retrofitted into home electronics devices and systems, such as lighting, home access control, entertainment systems and household appliances.

This product can be included and operated in any Z-Wave™ network with other Z-Wave™ certified devices from other manufacturers and/or other applications. All non-battery operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.

The device adopt the Z-Wave™ 500 series chip, when your Z-Wave™ network system is all made by Z-Wave™ 500 series devices. The network system will have the advantages as below.

- Concurrent multi-channel support reduces external interference.
- Better RF range, improve about 10 meters in indoor.
- Support 100 Kbps transmit speed, speed up communication.

WARNING AND LIMITATION

！ *WARNING!!* This product is intended for use in ordinary indoor locations of family living units. **It is not designed to measure compliance with Occupational Safety and Health Administration (OSHA) commercial or industrial standards.** It is designed to detect carbon monoxide gas from any source of combustion, it is **NOT** designed to detect CO, fire or any other gas.

Individuals with a medical problem may consider using warning devices which provide audible and visual signals for carbon monoxide concentrations under 30ppm.

This CO sensor is not suitable to install in a hazardous location, as defined in the National Electrical Code.

This CO alarm will not work without power. Philio's PSG04 Carbon

Monoxide sensor will not work if the battery power is disconnected or cut off for any reason. Additionally, carbon monoxide must reach the CO alarm unit for the proper performance of CO gas detection.

Carbon monoxide alarms may wear out because they contain electronic parts that fail at any time. Test your CO alarm at least every week (see the section "TEST AND SILENCE YOUR CO ALARM").

Add to/Remove from Z-Wave™ Network

There is one button on the device. It can be used to add, remove, reset or association from Z-Wave™ network.

In the first time, add the device into the Z-Wave™ network. First, make sure the primary controller is in the add mode. And then insert battery to power on the device. Press the button once to start the NWI (Network Wide Inclusion) mode. And it should be added in 5 seconds.
Notice: Including a node ID allocated by Z-Wave™ Controller means "**Add**" or "**Inclusion**". Excluding a node ID allocated by Z-Wave™ Controller means "**Remove**" or "**Exclusion**".

Function	Description
Add	1. Have Z-Wave™ Controller entered inclusion mode. 2. Pressing button three times within 1.5 seconds to enter the inclusion mode. 3. After add successful, the device will wake to receive the setting command from Z-Wave™ Controller about 20 seconds.
Remove	1. Have Z-Wave™ Controller entered exclusion mode. 2. Pressing button three times within 1.5 seconds to
	enter the exclusion mode. Node ID has been removed.
Smart Start	1. Product has a DSK string , you can key in first five digit to increment smart start process,or you can scan QR code. Ex:mydsk 10209-46687-52248-13629-04783-07465-15776-56519 2. SmartStart enabled products can be added into a Z-Wave network by scanning the Z-Wave QR Code present on the product providing SmartStart inclusion. No further action is required and the SmartStart product will be added automatically within 10 minutes of minutes On in the network vicinity.
Reset	**Notice: Use this procedure only in the event that the primary controller is lost or otherwise inoperable.** 1. Pressing button four times within 1.5 seconds and do not release the button in the 4th pressed, and the red LED will light ON. 2. After the red LED flash 9 times, release the button within 2 seconds. 3. IDs are removed and all settings will reset to factory default.
Association	1. Have Z-Wave™ Controller entered association mode. 2. Pressing button three times within 1.5 seconds to enter the association mode. Note: The device support 1 groups. This group is for receiving the report message, like triggered event etc. This group support 8 nodes maximum.

> • Failed or success in add/remove the node ID can be viewed from Z-Wave™ Controller.

Notice 1: Always RESET a Z-Wave™ device before trying to add it to a Z-Wave™ network

Z-Wave™ Notification

After the device adding to the network, it will wake-up once per day in default. When it wake-up it will broadcast the "Wake Up Notification" message to the network, and wake-up 10 seconds for receive the setting commands.

The wake-up interval minimum setting is 30 minutes, and maximum setting is 120 hours. And the interval step is 30 minutes.

If the user want to wake-up the device immediately, please press the button once. The device will wake-up 10 seconds.

Z-Wave™ Message Report

When CO Sensor detects, the device will report the trigger event and also report the battery status.

In default the device will using Notification Report to represent the trigger event, it can be changed to Sensor Binary Report by setting the configuration NO. 7 Bit4 to 1.

* CO Detected/Test Report:
When the CO Sensor detects CO, the device will unsolicited to send the CO detected (0x02) report to the nodes in the group 1. When the device is in alarm test mode, the device will unsolicited to send the CO Sensor test (0x03) report to the nodes in the group 1.

Notification Report (V4)
Notification Type: CO (0x02) Event: CO detected, Unknown Location (0x02) 　　　CO Alarm Test (0x03)
Sensor Binary Report (V2)
Sensor Type: CO (0x03) Sensor Value: 0xFF

* Tamper Report:

When the tamper is pressed, the device will into the alarm state. In that state, if tamper is released, the yellow LED will light on and the device will unsolicited to send the report to the nodes in the group 1.

Notification Report (V4)
Notification Type: Home Security (0x07) Event: Tampering. Product covering removed (0x03)
Sensor Binary Report (V2)
Sensor Type: Tamper (0x08) Sensor Value: 0xFF

Notice : When the event triggered, the device will report the messages to the nodes in the group 1. The messages also include the tamper status.

Power Up Procedure

* Wake
When the device power on, the device will wake about 20 seconds. In

this duration, the controller can communicate with the device. Normally the device is always sleeping to save the battery energy.

Over The Air (OTA) Firmware Update

The device support the Z-Wave firmware update via OTA.

Let the controller into the firmware update mode, and then press the button once to start the update.

Please don't remove the battery, otherwise it will cause the firmware broken, and the device will no function.

After update finish, it is recommended that the user power up the device. Caution: After remove the battery, please wait about 30 seconds, and then re-install the battery.

INSTALLING YOUR CO Sensor
Philio Carbon Monoxide Sensor PSG04 is easy to install to protect you and your family in your home, cottage, cabin and office.

To install the CO Sensor (See figure 2 as below):

1. At the place where you are going to install the alarm, draw a horizontal line six (6) inches long.

2. Remove the mounting bracket from your unit by rotating it counterclockwise.

3. Place the bracket so that the two longest hole slots are aligned on the line. In each of keyhole slots, draw a mark to locate a mounting plug and screw.

4. Remove the bracket.

5. Using a 3/16-inch (5mm) drill bit, drill two holes at the marks and insert wall plugs.

6. Using the two screws and wall plugs (all supplied), attach the bracket to the wall.

7. Line up the side slot of the bracket and the alarm. Push the alarm onto the mounting bracket and turn
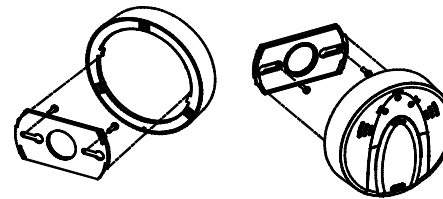
INSTALLING / REPLACING BATTERY
To install or replace the batteries in your CO Sensor PSG04, please perform the following steps:

1. Gently press the transparent locker (see figure 3 as below) and flip

open the battery cover to expose the battery compartment.

2.Remove the old batteries and properly dispose of them as recommended by the battery manufacturer.
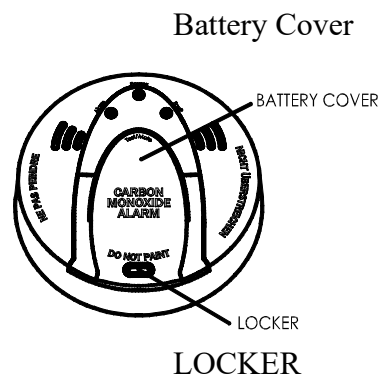
Battery Cover

Figure 3.

3.When reinstall the new batteries, note the polarity illustration in the bottom of the battery compartment.

4.Reinstall the new batteries, make sure to carefully seat the red battery warning flags in the recess of the battery well.

5.Gently close the battery cover. The battery cover of your CO Sensor will not close if all three AA batteries are not properly installed.

6.The unit will chirp for approximately 0.5 second and all the LED will flash for 0.5 second. after batteries are properly installed.

Recommended battery:

Three AA batteries have been included with your purchase. When replacing the batteries, we recommend use of following mentioned type of batteries:
3 pieces of AA 1.5V Energizer # E91 Alkaline battery; the battery life is at least one year under normal operation condition.
or 3 pieces of AA 1.5V Energizer #L91 lithium battery; the battery life is at least one year under normal operation condition.
or 3 pieces of AA 1.5V GP #LR6 lithium battery; the battery life is at least one year under normal operation condition.

！ *WARNING!!* Use only Batteries specified in manual. Use of a different battery may have a detrimental effect on alarm operation.

Caution!! Constant exposures to high or low temperatures or high humidity may reduce battery life.

TEST AND SILENCE YOUR CO ALARM

The test/silence button is used to test if the CO sensor is working properly and to mute the unit during alarm.

Test the unit:
Press the test button and you should hear 4 short beeps with a corresponding three LED flashes in 5 seconds, this cycle will repeat one more time.
Familiarize yourself and your family members with this alarm pattern as this testing simulates a actual CO sensor condition.

Silence the unit :
If the CO sensor is sounding, pressing the test/Mute button will have the alarm muted while at the same time red LED keeps flashing. After

4 minutes, if the CO concentration caused the alarm still remains at alarming condition, the CO sensor will reactivate.

Test Key / Mute Key

TAKING CARE OF YOUR CO ALARM
You have to maintain the CO sensor frequently to ensure it working properly. Few tips are provided for you to take care of your CO sensor PSG04:

(a)Use a vacuum cleaner to clean the CO sensor cover once a month, using the soft brush attachment, never use water, cleaners as they may damage the unit.

(b)Press the Test/Mute button to test its operating function once every week.

MEANING OF LED LIGHT & SOUND

The red, green, yellow LED light and sound turn on and/or off to indicate various situations. There are a few different LED light and sound operations:

Power on mode: Three LEDs blink and buzzer beeps for 0.5 second as soon as the batteries are installed.

Stand-by mode: green LED flashes once in every 60 seconds, which means the unit is receiving power and also indicates it is functioning properly.

CO Alarm mode: When the unit sensors CO which is at alarming level , the red LED light flashes rapidly and buzzer sounds loudly with repeating 4 quick beeps and pause 5 seconds and then 4 quick beeps.

Low battery warning mode: The yellow LED flashes once in a minute and the buzzer chirps also once in a minute. This warning should last for up to 30 days, but please replace the battery asap before battery power is completely exhausted.

Malfunction (Error) mode: The yellow LED flashes three times in a minute and buzzer chirps once in a minute. This indicates the unit is malfunctioned and needs to be replaced.

Low sensitivity (Aging) mode: The yellow LED flashes twice in a minute and buzzer chirps once in a minute. This means unit needs to be replaced.

End of life signal mode: The yellow LED flashes four times in a minute and buzzer chirps once in a minute. This indicate the CO alarm unit is reaching the end of this useful life (around 5 years after the unit is purchased), please replace with the new CO alarm.

Tamper mode: The buzzer chirps once in a minute and the yellow LED is steadily on .until the CO alarm unit is mounted back to the bracket properly.

ACTIONS TO TAKE WHEN CO ALARM SOUNDING

! *WARNING!!* **Actuation of your CO alarm indicates the presence of carbon monoxide (CO) which can kill you. If alarm sounds :**

1.Operate Mute button
2. Call your emergency services or fire department or 911

3. Immediately move to the fresh air –outdoor or by an open door window.

In case of harmful levels of CO gas being detected, your CO sensor PSG04 will go into a CO alarm mode as mentioned above. in " CO Alarm Mode" Try to take the following necessary actions immediately:

(a) If there is anyone experiencing the effects of carbon monoxide poisoning such as headache, dizziness, nausea or other flu-like symptoms, call your fire department right away or 911. You should evacuate all the people in the premises immediately. Do a head count to check that everybody is accounted for.

(b) Do not re-enter the premises until the problem has been corrected and the CO gas has been dispersed out and a safe level is reached.

(c) If no symptoms exist, immediately ventilate the home by opening windows and doors. Turn off fuel burning appliances and call a qualified technician or your utility company to inspect and repair your problem before restarting appliances.

Normally an activation of the CO alarm indicates the presence of CO gas. However, the CO gas can be extremely fatal, if it is not detected. The source of the CO gas may come from several possible situations, please refer to the list of sources of carbon monoxide in page 1.

CAUTION!! This CO alarm will only indicate the presence of CO gas at the sensor. However, you have to be aware that the CO gas may be present in other areas in the premises.

LOCATIONS TO INSTALL YOUR CO ALARM
Since CO gas moves freely in the air, the suggested location is in or as near as possible to sleeping areas of the home. The human body is most vulnerable to the effects of CO gas during sleeping hours. For maximum protection, a CO alarm should be located outside primary sleeping areas or on each level of your home. In the **figure 1** below, are suggested locations in the home. The electronic sensor detects carbon monoxide, measures the concentration and sounds a loud alarm before a potentially harmful level is reached.
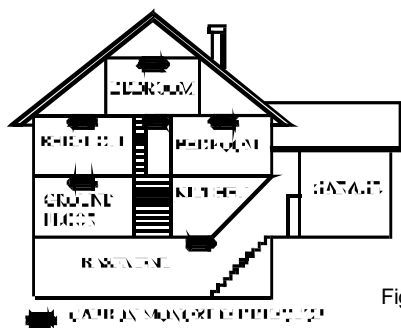
Figure 1: Location for placing CO
alarm for A multi-floor

CO alarms for minimum security

Do not place the CO alarm in the following areas:

(a) Where the temperature may drop below 40℉ (4.4℃) or exceed 100℉ (37.8℃)

(b) Near paint thinner fumes

(c) Within 5 feet (1.5 meter) of open flame appliances such as furnaces, stoves and fireplaces

(d) In exhaust streams from gas engines, vents, flues or chimneys

(e) Do not place in close proximity to an automobile exhaust pipe; this will damage the Alarm

Z-Wave Supported Command Class

COMMAND_CLASS_ZWAVEPLUS_INFO_V2
COMMAND_CLASS_BATTERY
COMMAND_CLASS_NOTIFICATION_V8

COMMAND_CLASS_ASSOCIATION_V2
COMMAND_CLASS_CONFIGURATION
COMMAND_CLASS_MANUFACTURER_SPECIFIC_V2
COMMAND_CLASS_VERSION_V3
COMMAND_CLASS_SENSOR_BINARY_V2
COMMAND_CLASS_WAKE_UP_V2
COMMAND_CLASS_ASSOCIATION_GRP_INFO
COMMAND_CLASS_POWERLEVEL
COMMAND_CLASS_DEVICE_RESET_LOCALLY
COMMAND_CLASS_SECURITY
COMMAND_CLASS_SECURITY_2
COMMAND_CLASS_FIRMWARE_UPDATE_MD_V5

Z-Wave Configuration Settings

Notice:

* All of the configuration, the data size is 1.
* The configuration mark with star (*), means after the remove the setting still keep, don't reset to factory default. Unless the user executes the "RESET" procedure.
* The reserve bit or not supported bit is allowed any value, but no effect

NO.	Name	Def.	Valid	Description
7 (*)	Customer Function	4	All	Customer function switch, using bit control.
		0		**Bit0**: Reserve.
		0		**Bit1**: Reserve.
		1		**Bit2**: Reserve.
		0		**Bit3**: Reserve.
		0		**Bit4**: Notification Type,

				0: Using Notification Report. 1: Using Sensor Binary Report.
		0		**Bit5**: Reserve.
		0		**Bit6**: Reserve.
		0		**Bit7**: Reserve.
10	Auto Report Battery Time	12	0~127	The interval time for auto report the battery level. 0 means turn off auto report battery. Each tick means 30 minutes. The default value is 12(6 hours).

	922~927MHz (Japan)
	920~924MHz (Taiwan; Korea)
	865.20 MHz (IN),
	869.00 MHz (RU),
	921.40 MHz, 919.80 MHz (ANZ),
RF Maximum Power (peak)	+5dBm (peak) For EU RED directive
RF Maximum Power (Average)	-10dBm (Average) For EU RED directive
RF Modulation Type	FSK (Frequency-Shift Keying)

Specifications

Operating Voltage	DC4.5V (3 x AA 1.5V alkaline battery)
Battery life	Up to one year
Operating Temperature	0°C ~ 50°C (85% humidity)
Storage Temperature	-20 C ~ 60°C
FCC ID	RHHPSG04
RF Range (distance)	Minimum 40M in door and 100M in outdoor, line of sight
Frequency Range	868.40MHz; 869.85MHz (EU) 908.40MHz; 916.00MHz (US) 916.00 MHz (IL), (Israel), (PSG04-IL)

Sensitivity: Comply to UL2034 and EN50291

This CO sensor PSG04 meets following mentioned response times:

UL2034

At 70ppm, the unit must alarm within 60-240 minutes

At 150ppm, the unit must alarm within 10-50 minutes

At 400ppm, the unit must alarm within 4-15 minutes

EN50291:

At 50ppm , the unit must alarm within 60-90 minutes

At 100ppm, the unit must alarm within 10-40 minutes

At 300ppm, the unit must alarm within 3 minutes

Alarm audibility: Over 85dB at 3m

For indoor use only.

Size: 12.5cm diameter x 3.5cm depth

Specifications subject to change without notice due to continuing product improvement.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Disposal

This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

Warning

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

When replacing old appliances with new once, the retailer is legally obligated to take back your old appliance for disposal at least for free of charge.

Warning

Caution, avoid listening at
high volume levels for
long periods