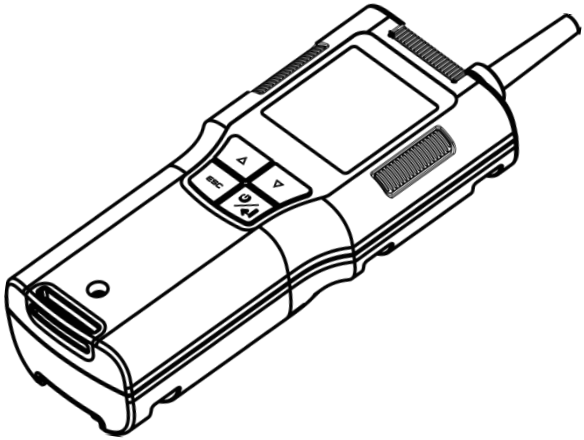
V-PRO

PORTABLE VOC GAS DETECTOR

INSTRUCTION MANUAL



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SAFETY WARNING

⚠ Warning

- Please do not replace or change the parts. In this case, we do not guarantee the warranty and safety even though it is under warranty.
- Please remove any debris on the surfaces of the sensor, LED or buzzer / pump hole before use.
- Test the performance of the gas sensor through the gas beyond the alarm level regularly.
- Test the device on a regular basis whether its LED, alarm and vibration function properly.
- Use the device under the conditions instructed, including the temperature, humidity and pressure range. The use environment outside the instruction may cause malfunction or failure.
- The sensors inside the device may indicate the gas concentration differently according to the environment such as temperature, pressure and humidity. Please make sure to calibrate the detector under the same or similar environment to the specification.
- Extreme changes in temperature may cause drastic changes of the gas concentration. (e.g. using the detector where there is a huge gap between the inside and outside temperature) Please use the device when the concentration becomes stable.
- Severe pressure or impact may cause drastic changes of the gas concentration. Therefore, please use the device when the concentration is stable. Severe pressure or impact may cause also malfunction in the sensor or the device.
- The alarms are set according to the international standard and must be changed by an authorized expert.
- Charging or replacing the battery should be done in a safe area where there is no risk of explosion or fire. Changing the sensor or battery with improper replacements, which are not authorized by the manufacturer, may invalidate the warranty.
- IR communication should be done in a safe area where there is no risk of explosion or fire.
- Do not expose the detector to poisons such as alcohol and citrus based products, as poisons may damage device's accuracy and response time.
- If you suspect sensor poisoning, please check such as calibration and bump.
- The detector is designed for use only in potentially explosive atmospheres where oxygen concentrations do not exceed 20.9% (v/v). Oxygen deficient atmospheres (<10% v/v) may suppress some sensor outputs.
- Recharge the battery before it is discharged.
- Charge the detector in temperature ranged from 0°C to 40°C
- The efficiency of the rechargeable battery decreases by approximately 20% after two years of normal use.
- Do not use any other charging adapter.
- Do not calibrate the device while or immediately after charging the battery.
- Do not calibrate if exposed to the condition representative of the IP rating.

SAFETY WARNING

- Do not perform the calibration in the stabilization process after turning on the device.
- Sudden change in atmospheric pressure may cause oxygen concentration unstable temporarily.
- Before daily use, check the pump port is clear of any obstructions, debris, or blockage.
- If the pump port is blocked by any pollutants, the measured reading may be measured lower than the actual concentration.
- The equipment must be always carried and should not be left unattended.
- If there is a charging mechanism, the exposed metal parts of the enclosure may store electrostatic charges that could pose an ignition risk to IIC gases. Therefore, users must implement measures, as listed above, to prevent the accumulation of electrostatic charges. This is especially important when the equipment is brought into a Zone 0 location.
- The equipment must only be charged in non-hazardous areas and must be used with a charger specifically provided for use with units approved as SELV or Class 2 equipment in accordance with IEC 60950, IEC 61010-1, or equivalent IEC standards (e.g., part number ICP12-060-1200D manufactured by Shen Zhen Shi Ying Yuan Electronics Co, LTD). The maximum voltage and current of the charger must not exceed 6.2 Vdc and 1.2 A, including tolerances, and should be further limited to Um = 6.2 Vdc. The ambient temperature during charging must be between 0°C and 45°C.
- The battery and sensors should only be replaced by SENKO authorized service providers in a safe zone, free of hazardous gases.

⚠ Caution

- Please use after reading the manual carefully.
- The device is not a measurement device, but a gas detector.
- Please stop using and consult the manufacturer if the calibration fails continuously.
- Please test the device every 30 days under the atmospheric environment of clean air without gases.
- Clean the exterior of the device with soft cloth and do not clean it with chemical detergent.

Avertissements de Sécurité

⚠ Avertissement

- Veuillez ne pas remplacer ou modifier les pièces. Dans ce cas, nous ne garantissons pas la garantie et la sécurité même si elle est sous garantie.
- Veuillez retirer tous les débris sur les surfaces du capteur, de la LED ou du trou du buzzer avant utilisation.
- Testez régulièrement les performances du capteur de gaz au-delà du niveau d'alarme.
- Testez régulièrement l'appareil pour savoir si sa LED, son alarme et ses vibrations fonctionnent correctement.
- Utilisez l'appareil dans les conditions indiquées, y compris la plage de température, d'humidité et de pression. L'environnement d'utilisation en dehors des instructions peut provoquer un dysfonctionnement ou une panne.
- Les capteurs à l'intérieur de l'appareil peuvent indiquer la concentration de gaz différemment selon l'environnement comme la température, la pression et l'humidité. Veuillez vous assurer de calibrer le détecteur dans un environnement identique ou similaire aux spécifications.
- Des changements extrêmes de température peuvent entraîner des changements drastiques de la concentration du gaz. (par exemple en utilisant le détecteur là où il y a un énorme écart entre la température intérieure et extérieure) Veuillez utiliser l'appareil lorsque la concentration deviant stable.
- Une pression ou un impact important peut provoquer des changements drastiques de la concentration du gaz. Par conséquent, veuillez utiliser l'appareil lorsque la concentration est stable. Une pression ou un impact important peut également entraîner un dysfonctionnement du capteur ou de l'appareil.
- Les alarmes sont réglées selon la norme internationale et doivent être changées par un expert agréé.
- Le chargement ou le remplacement de la batterie doit être effectué dans une zone sûre où il n'y a aucun risque d'explosion ou d'incendie. Le remplacement du capteur ou de la pile par des remplacements inappropriés, non autorisés par le fabricant, peut annuler la garantie.
- La communication IR doit être effectuée dans une zone sûre où il n'y a aucun risque d'explosion ou d'incendie.
- N'exposez PAS le détecteur à des poisons tels que des produits à base d'alcool et d'agrumes, car les poisons peuvent endommager la précision et le temps de réponse de l'appareil.
- Si vous soupçonnez un empoisonnement du capteur, veuillez vérifier l'étalonnage et le test.
- Le détecteur est conçu pour être utilisé uniquement dans des atmosphères potentiellement explosives où les concentrations d'oxygène ne dépassent pas 20,9 % (v/v). Les atmospheres déficientes en oxygène (<10 % v/v) peuvent supprimer certaines sorties du capteur.
- Rechargez la batterie avant qu'elle ne soit déchargée.
- L'efficacité de la batterie rechargeable diminue d'environ 20 % après deux ans d'utilisation normale.

Avertissements de Sécurité

- N'utilisez aucun autre adaptateur de charge.
- Ne calibrez pas l'appareil pendant ou juste après avoir chargé la batterie.
- Ne pas calibrer s'il est exposé à des conditions représentatives de l'indice IP.
- Chargez le détecteur à une température comprise entre 0°C et 40°C.
- N'effectuez pas d'étalonnage pendant le processus de stabilisation après avoir allumé l'appareil.
- Un changement soudain de la pression atmosphérique peut rendre temporairement instable la concentration en oxygène.
- Avant une utilisation quotidienne, vérifiez que le port de la pompe est exempt de toute obstruction, de tout débris ou de tout blocage.
- Si l'orifice de la pompe est bloqué par des polluants, une concentration de détection réelle peut être mesurée inférieure à la concentration normale.
- Le matériel doit être transporté et ne doit pas être laissé sans surveillance.
- Si un mécanisme générateur de charge est présent, la partie métallique exposée du boîtier est capable de stocker un niveau de charge électrostatique qui pourrait devenir un stimulant pour les gaz IIC. Par conséquent, l'utilisateur/installateur doit mettre en œuvre des précautions, par exemple celles énumérées ci-dessus, pour éviter l'accumulation de charge électrostatique. Ceci est particulièrement important si l'équipement est amené dans un endroit de zone 0.
- L'équipement ne doit être chargé que dans une zone non dangereuse, à l'aide d'un chargeur spécialement fourni pour une utilisation avec l'appareil (par exemple, numéro de pièce ICP12-060-1200D, fabriqué par Shenzhen Shi Ying Yuan Electronics Co, LTD), approuvé comme équipement SELV ou de classe 2 selon les normes IEC 60950, IEC 61010-1 ou une norme IEC équivalente. La tension et le courant maximum du chargeur ne doivent pas dépasser respectivement 6.2Vdc plus les tolérances et 1,2 A, et doivent être en outre limités par le système de charge à Um = 6.2Vdc. La température ambiante pendant la charge doit être comprise entre 0 °C et 45 °C.
- La batterie et les capteurs doivent être remplacés par des prestataires de service agréés SENKO dans la zone de sécurité exempte de gaz dangereux.

⚠ Prudence

- Veuillez l'utiliser après avoir lu attentivement le manuel.
- L'appareil n'est pas un appareil de mesure, mais un détecteur de gaz.
- Veuillez arrêter d'utiliser et consulter le fabricant si l'étalonnage échoue continuellement.
- Veuillez tester l'appareil tous les 30 jours dans un environnement atmosphérique d'air pur et sans gaz.
- Nettoyez l'extérieur de l'appareil avec un chiffon doux et ne le nettoyez pas avec un detergent chimique.

PRODUCT OVERVIEW

PRODUCT INTRODUCTION

V-PRO is a portable VOC gas detector with built-in pump that warns of dangerous environment related to the gases. The detector indicates the concentration of VOC gases on the LCD monitor. It is easy and simple to operate. The device alerts the workers of the danger by alarm, LED, vibration when the concentration exceeds the safety gas levels. The device shows the gas concentration in real time and identify the maximum and minimum concentration. Settings can be modified via Wireless or Senko IR-LINK (optional).

SPECIFICATION

Model	**V-PRO**
Size	70(W) x 215(H) x 43(D) mm
Weight	360g
Case	Rubber type polycarbonate (Orange or Yellow)
Handling	A strap that can be worn around the user's neck can be attached so that the user can easily carry the detector.
Environmental condition	- Pollution Degree: "2" - Pressure : 80 ~ 120KPa
Accessories Available	Charger, Particulate filter, VOC Zeroing Filter, Sensor Changing Tools, Benzene Filter Case & Tube(Only Benzene)
Operating Temperature	-20°C to +50°C (Standard) / 0°C to +40°C (HS)
Operating Humidity	10% to 90% RH (Non-condensing)
Management System	The management system displays each test result.
Run Time	> 24 hours
IP Rating	IP68
Electrical ratings	3.7VDC Battery Powered
Battery Specification	- System : Lithium-ion battery - Nominal voltage : 3.7V / Nominal capacity : 4,400mAh
Calibration Frequency	On demand, the detectors can be calibrated in appropriate environment.
Battery	No part of the detector should be replaced by the user and must be replaced by the manufacturer.

GAS TYPE AVAILABLE

The detector can monitor a wide range of organic and some inorganic gases and volatile chemicals ('volatiles').

PRODUCT DESCRIPTION



INTERFACES

VISUAL DISPLAY

The detector must have a LCD (liquid crystal display) that advises.

- Gas type monitored
- Alarm level encountered: low or high, including level as ppm or %vol concentration
- Alarm set points: low and high
- Peak (maximum) alarm exposure

DISPLAY ICONS

The detector's LCD shall also include icons that clearly advise:

- Alarm type and alarm level
- Diagnostic warning

FOUR-BUTTON OPERATION

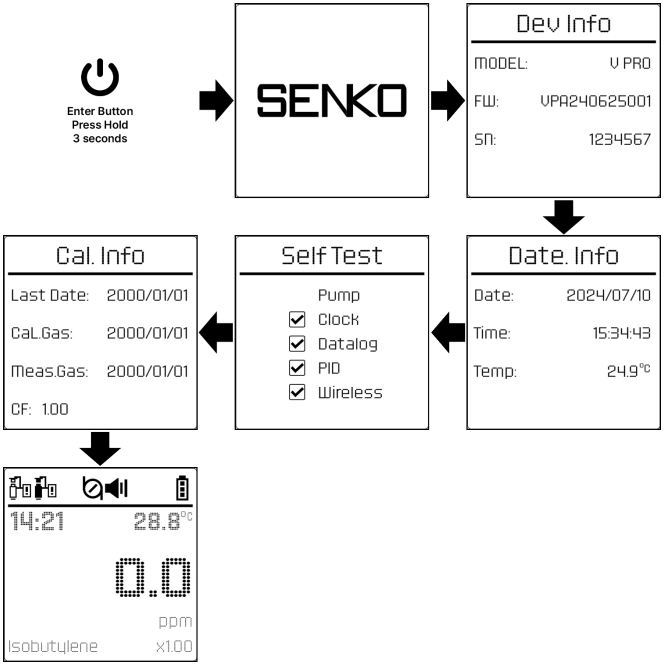
- Activate the detector
- Display alarm set points
- Display peak gas exposures
- Display remaining days for bump test.
- Display remaining days for Calibration.
- Display Firmware version
- Display concentration of the gas applied for calibration.
- Display all icons on the LCD
- Detector Setting
- Deactivate the detector

BASIC OPERATION

ACTIVATION

The detector has one button for user interface including the activation of the detector.

1. Before use, check the activation due date. If the activation date is past, do not activate this product.
2. Move to a safety environment.
3. Press and hold Enter button until a 3 second countdown is displayed.
4. After the logo is displayed, the type of measurement gas and firmware version date and time and system test, calibration, alarm value will be displayed.
5. The detector can operate in normal mode.



BASIC OPERATION

SYSTEM OFF

Press and hold the Enter button for 3 seconds.

The LCD counts down from 3 to 1, displays “Unit Off”, and then the detector powers off.

CONFIGURATION MODE

From the main reading display, press and hold the Up key and Down key until the Configuration screen is shown. The screen on the down will be displayed. The Calibration Icon is shown, and its Outline is highlighted. Use the Up key or Down key to move through the menu until the desired item is reached and use the Enter key to select it. To Exit Config Mode and return to normal operation, press the Esc key repeatedly from any of the Configuration Mode displays.



Calibration	Measurement	Alarm	Datalogging	Monitor	Wireless
Zero Cal Span Cal Set Cal Gas Set Span 3-Point Cal	Meas.Unit Meas.Gas	Limits Mode Beep/Light	Clear Log Interval Set	Display Pump Speed Set Pump Stall Self-Zeroing Temp Unit Site ID User ID Factory Reset	Power Enable

CALIBRATION

- Zero Calibration: fresh air correction.
- Span Calibration: standard gas concentration correction.
- Span2 Calibration: standard gas high concentration correction

BASIC OPERATION

PEAK(MAX) VALUE

The detector will record MAX exposure concentration when a gas occurred.
And the recorded values are able to clear.

INDICATING ALARM

The detector must monitor the gas concentration when a gas concentration exceeds alarm set-points and indicate the alarm state.

ACQUIRING ALARM EVENTS

The stored data in memory of the detector can be downloaded via IrDA.

The stored information are calibration event, LOW, and HIGH alarm(including occurred time, duration time and the concentration of the gas).

LOGGING

During the operation, data, event, calibration, and bump logs will be stored and then stored data can be downloaded via SENKO IR LINK with PC program.

Log interval time is max 3,600 sec. Provides log erase function.

The default status is to have datalogging on, at 60-second intervals, which allows up to one year of data storage.

Categories	Details
Event Alarms (High, Low, TWA, STEL)	Occurrence time, Duration, Alarm Type, Gas Concentration, Serial Number
BUMP TEST Log	Test date, Pass/non-pass, Calibration Gas Concentration, Detected Concentration
Calibration Log	Date of the Calibration, Type, Calibration Gas Concentration, Detected Concentration
Data Log	Time, Date of executing IR-LINK, Concentration, Alarm Types, Options

ALARM

ALARM FUNCTIONS

When a gas concentration exceeds alarm set points, alarm state will be displayed on the LCD and the device will vibrate, flash (LED), and beep. To remove alarms, move to the location at clean air, then the alarms will be automatically stopped.

Categories	Details
Gas Alarm	The factory alarm setpoints are programmed in advance (1st, 2nd alarm). When the detector is exposed over the upper limit range, it will display OL(Over Limit) alarm on the LCD.
Visual Alarm	LCD and four flashing LED are equipped. When a gas concentration exceeds alarm set points (1st, 2nd alarm), LED will flash and the reading will be displayed on the LCD.
Audible Alarm	The programmed audible alarm runs when a gas concentration exceeds alarm set points(1st, 2nd alarm) in order to warn with sound.
Vibration Alarm	The equipped vibrator runs when a gas concentration exceeds alarm set points(1st, 2nd alarm) in order to warn in the noisy area.

ALARM SET POINTS

The default alarm setpoints are stored in the factory. Alarm set points are adjustable by SP-IR LINK after the activation. All alarm value is set in advance according to the alarm standards that are required by international standards. Therefore, alarm values can be changed only under the responsibility and approval of the administration of the work site where the instrument is used.

ALARM INDICATIONS

Icon	Name	Description
LO	**Low Alarm**	LOW text LCD icon blinking.
HI	**High Alarm**	HIGH text LCD icon blinking.
TWA	**TWA Alarm**	TWA text LCD icon blinking.
STEL	**STEL Alarm**	STEL text LCD icon blinking.

FAILURE / ESCAPE

If the device is not operating properly, it will display an error code on the LCD. After noting the code number displayed on the LCD, check the status as described below and take the necessary actions.

Error Code	Description	Necessary Actions
!1	Pump Operation Error	Check for foreign substances in the air inlet
!2	Memory Operation Error	Power OFF→ON
!6	IrDA Operation Error	Check IrDA transmitter/receiver; Power OFF→ON
!7	PID Sensor Power Supply Error	Check device power status or replace the sensor
!8	PID Sensor Oscillator Overload Error	Replace PID sensor electrode or PID sensor
!9	PID Oscillator Error	Replace PID sensor electrode or PID sensor
!10	PID Sensor Lamp Error	Reassemble, clean, or replace the lamp
!11	Wireless Operation Error	Check wireless setting or power OFF→ON

The table above shows the error code details. If an error code occurs and the issue is not resolved by turning the power off and on, please contact the manufacturer.

(For pump operation, the system continuously checks from the moment the power is turned on until it is turned off, and an alarm will sound every second if an issue occurs.)

REPAIR

CAUTION

- It is absolutely forbidden to replace or recharge batteries in explosive or hazardous areas.
- Replace the battery or recharge in a clean environment, which has no hazardous gases otherwise it can lead to serious accidents. (serious injury or fatality)
- Replacement of components can invalidate the intrinsic safety function. Replacing the sensor and battery should be performed by authorized sellers, agents, distributors, or managers.
- The sensors published by SENKO should be used for replacement.
- Disassembly should be necessary only for sensors & battery replacement. After the sensor replacement, the span gas calibration should be done.
- Before disassembling, please turn off the power and remove screws.
- When replacing the Syringe Filter or Probe, take care to prevent debris from entering the Air Inlet.

SENSOR REPLACEMENT

1. Deactivate the detector.
2. Remove the three sensor cover screws on the rear case.
3. Slowly lift and remove the sensor cover.
4. Remove the old sensor and replace it with a new one.
5. Reassemble the sensor cover.
6. After assembling, perform zero calibration and span calibration according to the instructions in this user manual.

BENZENE TUBE MEASUREMENT

The Benzene Tube Measurement function allows selective detection of benzene using a benzene filter tube.

PRECAUTIONS BEFORE USE

1. For accurate measurements, perform Zero Calibration and Span Calibration before use.
2. To continuously monitor benzene without using a filter tube, use Continuous Benzene Screening Mode (Tube Main Mode).
3. If the detected gas concentration exceeds the alarm threshold, perform a single-point benzene measurement using a benzene filter tube.

BENZENE TUBE SAMPLING PROCEDURE (V-PRO Benzene Only)

Step 1. Enter Tube Sampling Mode

- In Normal Measurement Mode, press and hold DOWN (▼) and ESC simultaneously for 3 seconds.
- When the TUBE icon( ) appears, press DOWN (▼).
- When "TUBE MODE BENZENE START SAMPLING?" appears, press ENTER.



Step 2. Install the Benzene Tube

- When "INSERT TUBE PRESS ENTER KEY TO START" appears, break off both ends of the benzene filter tube using a Tube Opener.
- Insert the tube into the tube holder with the arrow pointing toward the instrument.
- Attach the tube holder to the V-PRO.
- Press ENTER to start sampling.





BENZENE TUBE MEASUREMENT

Step 3. Sample Benzene

- The instrument automatically determines the sampling time based on the ambient temperature.
- The sampling time typically ranges from 30 to 360 seconds and is approximately 45 seconds under normal ambient conditions (20–30°C).
- When sampling is complete, the measured benzene concentration is displayed.



Step 4. Perform STEL Measurement (Optional)

- When "BENZENE: X.XX PPM CONTINUE AND PERFORM STEL?" appears, press ENTER to start the 15-minute STEL measurement.
- During the measurement, the STEL indicator is displayed periodically.
  - Press and hold ENTER for 3 seconds to return to Normal Measurement Mode.
  - Press and hold ESC for 3 seconds to return to Tube Sampling Mode.
- After 15 minutes, the calculated STEL value is displayed.



Step 5. Finish the Measurement

- When the STEL measurement is complete and "Finish/STEL" is displayed, press ENTER.
- When "REMOVE TUBE AND RETURN TO MEASURING" appears, remove the tube and press ENTER again.
- After a 5-second countdown, the instrument returns to Normal Measurement Mode.



Maintenance Precautions for V-PRO Benzene (10.0 eV PID Sensor)

If the performance of the PID sensor deteriorates due to contamination of the PID lamp or electrodes during operation, do not attempt to clean the lamp or electrodes by any method. Replace the PID lamp, electrodes, or the sensor as required.

EXPLOSION PROOF CERTIFICATION

Intrinsic Safety

The detector must be certified against the following standards:

	Certifications	Standards
INMETRO	BRA 25.GE0015X	ABNT NBR ISO IEC 60079-0:2020 ABNT NBR IEC 60079-11:2013
IECEx	Ex ia IIC T4 Ga IECEx KSCP 24.0040X	IEC 60079-0:2017 Ed.7 IEC 60079-11:2011 Ed.6
ATEX	Ⓔx II 1 G Ex ia IIC T4 Ga KSCP 24 ATEX 0022X	EN IEC 60079-0:2018 EN 60079-11:2012
CSA/UL	Class I, Zone 0, AEx ia IIC T4 Ga Class I, Division 1, Groups A,B,C,D,T4 Ex ia IIC T4 Ga LC24CA22383-1	CSA C22.2 No. 60079-0:19 UL 60079-0:2019 CAN/CSA-C22.2 No. 60079-11:14 UL 60079-11:2018 CSA-C22.2 No. 61010-1:12 (June 2023) UL 61010-1:12 (June 2023)
PESO	Ex ia IIC T4 Ga	
CNEx	CNEx24.4200X	GB/T 3836.1-2021 GB/T 3836.4-2021
KCs	24-GA2BO-0667X	

Standards

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards.

Manufacturing Approval

The detector manufacturers must be certified compliant with ISO 9001:2015 provisions.

PROTECTION RATING

The IP Rating of the detector must be rated to IP68 standards.

The product is in conformance with the directive 2014/30/EC, (EMC).

WARRANTY

The warranty period is 2 years from the date of purchase from the manufacturer or from the product's authorized reseller.

The manufacturer is not liable (under this warranty) if its testing and examination disclose that the alleged defect in the product does not exist or was caused by the purchaser's (or any third party's) misuse, neglect, or improper installation, testing, or calibrations. Any unauthorized attempt to repair or modify the product, or any other cause of damage beyond the range of the intended use, including damage by fire, lightening, water damage or other hazard, voids liability of the manufacturer.

In the event that a product should fail to perform up to manufacturer specifications during the applicable warranty period, please contact the product's authorized reseller or SENKO service center at +82-31-492-0445 to repair/return information.

SENKO

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