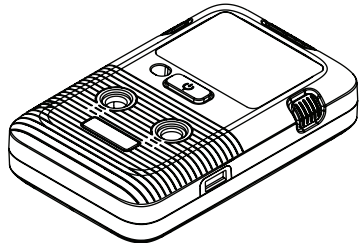


PS DUO

PORTABLE DUAL GAS DETECTOR

INSTRUCTION MANUAL



TELEDYNE
GAS MEASUREMENT INSTRUMENTS
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Avertissements de Sécurité

- Remplacez la batterie auprès des prestataires de service agréés Teledyne avant qu'elle ne soit complètement déchargée.
- Ne calibrez pas si vous êtes exposé à des conditions représentant le degré de protection IP.
- Utilisez le capuchon ou l'appareil de calibration exclusif pour le calibrage.
- Ne procédez pas à la calibration pendant le processus de stabilisation après avoir allumé l'appareil.
- Les changements soudains de pression atmosphérique peuvent entraîner une instabilité temporaire de la concentration en oxygène.
- Avant chaque utilisation, vérifiez que les ouvertures des capteurs ne sont pas obstruées par des débris ou des blocages.
- Si les ouvertures des capteurs sont obstruées par des polluants, une concentration de gaz inférieure à la normale peut être mesurée.
- L'équipement doit toujours être transporté et ne doit pas être laissé sans surveillance.
- En cas de présence d'un mécanisme générateur de charge, la partie métallique exposée du boîtier peut accumuler une charge électrostatique suffisante pour enflammer des gaz de type IIC. Par conséquent, l'utilisateur ou l'installateur doit prendre des précautions pour éviter l'accumulation de charge électrostatique, en particulier dans les zones de type O.
- La batterie et les capteurs doivent être remplacés par des prestataires de service agréés Teledyne dans une zone de sécurité exempte de gaz dangereux.

⚠ Prémcaution

- Veuillez lire attentivement le manuel avant utilisation.
- L'appareil n'est pas un dispositif de mesure, mais un détecteur de gaz.
- Veuillez arrêter l'utilisation et consulter le fabricant en cas d'échec répété de la calibration.
- Testez l'appareil tous les 30 jours dans un environnement atmosphérique exempt de gaz.
- Nettoyez l'extérieur de l'appareil avec un chiffon doux et évitez d'utiliser des détergents chimiques.

⚠ Conditions spéciales d'utilisation en sécurité

- Ne pas ouvrir ni remplacer la batterie en présence d'une atmosphère explosive. La batterie ne peut être remplacée que dans une zone sécurisée.
- Seule la batterie SB-AA02(P) (Vitzrocell) est autorisée.
- L'écran LCD est recouvert d'un film dissipant les charges électrostatiques et doit être inspecté régulièrement pour vérifier l'absence de dégradation, de délamination ou d'abrasion. Si le film ne respecte pas les conditions d'inspection, il doit être remplacé selon les instructions du fabricant. Évitez toute exposition à une chaleur excessive, à des produits chimiques agressifs, à des solvants, à des bords tranchants ou à des surfaces abrasives.

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.
- Do not open or replace battery when an explosive atmosphere is present. The battery can only be replaced in safe area.
- Please remove any debris on the surfaces of the sensor, LED or buzzer 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.
- 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.
- Do not charge because of primary cell battery.
- Replace the battery from Teledyne authorized service providers before it is discharged.
- Do not calibrate if exposed to the condition representative of the IP rating.

Product Overview

PRODUCT INTRODUCTION

The PS DUO is a portable gas detector with the diffusion method that warns of dangerous environment related to the gases. The detector indicates the concentration of oxygen, explosive or toxic 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 IR LINK (optional).

PRODUCT FEATURES

- Dual gas detection
- Wireless and IR connectivity
- Real-time monitoring
- Water/dust proof (IP67)
- Compact and lightweight
- High-performance alarms
- Automatically logs up to 30 alarm events
- Easy configuration and manage data using the IR LINK
- User-friendly operation

SPECIFICATION

Model	PS DUO
Sensor Type	Electrochemical
Measuring Type	Diffusion
Case Material	Rubber type polycarbonate
Dimensions	56(W) x 89(H) x 21(D) mm / 2.2(W) x 3.5(H) x 0.83(D) inch
Weight	200g / 7.05oz
Operating Temperature	-20°C to +50°C / -4°F to +122°F
Operating Humidity	15% to 90% RH (Non-condensing)
Event Log	Most recent 30 alarms
IP	IP 67
Alarm	Visual (LCD and flashing LEDs), Audible(Buzzer), Vibration
Display	Liquid Crystal Display (LCD)
Key	One button
Battery	Replaceable Primaty cell 3.6V Thionyl chloride (Li/SOCl2) battery manufactured in Vitzrocell
Environmental Condition	Pollution Degree: "2"; Atmospheric Pressure: 80 ~ 120KPa
Accessories	Calibration Cap (Available as an option)
Attachment Method	Equipped with a clip for attachment to clothing, belts, or helmets.
Warranty	2 years from the date of purchase

- Use the exclusive calibration cap or device for calibration.
- 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 sensor vents are clear of any obstructions, debris, or blockage.
- If the sensor vents are blocked by any pollutants, a real detection concentration may be measured lower than the normal concentration.
- The equipment shall only be carried and must not be laid down unattended.
- If a charge-generating mechanism is present, the exposed metallic part on the enclosure is capable of storing a level of electrostatic charge that could become incendive for IIC gases. Therefore, the user / installer shall implement precautions, for example, those listed above, to prevent the build-up of electrostatic charge. This is particularly important if the equipment is brought into a Zone 0 location.
- The battery and sensors should be replaced by Teledyne authorized service providers in the safety zone that is 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.

⚠ SPECIAL CONDITIONS OF SAFE USE

- Do not open or replace battery when an explosive atmosphere is present. The battery can only be replaced in safe area.
- Only the battery SB-AA02(P) (Vitzrocell) can be used.
- The LCD screen is covered with an electrostatic dissipating film and must be inspected periodically if this coating is required to ensure no degradation, delamination, abrasions or other deformities to this surface. If the film is found not complying with the inspection conditions, it must be reapplied according to the manufacturer instructions. Care must be taken to avoid exposure to excessive heat, harsh chemicals or solvents, sharp edges and abrasive surfaces.

Gas Type Available

The detector can monitor various types of gases such as oxygen and toxic gases. The device is consist of oxygen and toxic type or toxic and toxic type.

Model Name	Gas Type		
	Modle	x(*)	
PS DUO-x(*)	Ch-A	3	CO
		4	H2S
		5	SO2
		6	H2
		7	NO2
		8	NH3
	O2	9	O3
		A	CO
		B	H2S
		C	SO2
	NO2	D	H2S
		E	CO
	SO2	F	NH3
	NH3		CO

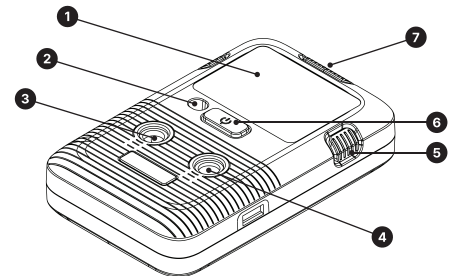
(*) x means series number for gas domination. The number is 3 to 9 or A to F.

Avertissements de Sécurité

⚠ Avertissement

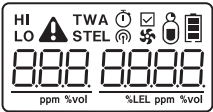
- Veuillez ne pas remplacer ni modifier les pièces. Dans ce cas, nous ne garantissons pas la sécurité ni la garantie, même si l'appareil est sous garantie.
- Ne pas ouvrir ou remplacer la batterie en présence d'une atmosphère explosive. La batterie ne peut être remplacée que dans une zone sécurisée.
- Veuillez retirer tout débris sur les surfaces du capteur, de la LED ou du buzzer avant utilisation.
- Testez régulièrement les performances du capteur de gaz en utilisant un gaz au-delà du niveau d'alarme.
- Vérifiez régulièrement si la LED, l'alarme et la fonction de vibration de l'appareil fonctionnent correctement.
- Utilisez l'appareil dans les conditions spécifiées, y compris la plage de température, d'humidité et de pression. Un environnement d'utilisation en dehors des instructions peut entraîner un dysfonctionnement ou une défaillance.
- Les capteurs à l'intérieur de l'appareil peuvent indiquer des concentrations de gaz différentes en fonction de l'environnement, comme la température, la pression et l'humidité. Veuillez calibrer le détecteur dans un environnement similaire ou identique aux spécifications.
- Des variations extrêmes de température peuvent entraîner des changements brusques de la concentration de gaz (par ex., utiliser le détecteur dans un lieu où il y a un grand écart de température entre l'intérieur et l'extérieur). Veuillez utiliser l'appareil lorsque la concentration est stable.
- Une pression ou un impact sévère peut entraîner des changements brusques de la concentration de gaz et également provoquer des dysfonctionnements du capteur ou de l'appareil. Par conséquent, utilisez l'appareil lorsque la concentration est stable.
- Les alarmes sont réglées selon les normes internationales et doivent être modifiées par un expert agréé.
- Le remplacement de la batterie doit être effectué dans une zone sécurisée sans risque d'explosion ou d'incendie. Remplacer le capteur ou la batterie par des composants non autorisés par le fabricant peut invalider la garantie.
- La communication IR doit être effectuée dans une zone sécurisée sans risque d'explosion ou d'incendie.
- N'exposez pas le détecteur à des substances toxiques telles que l'alcool ou les produits à base d'agrumes, car ces substances peuvent altérer la précision et le temps de réponse de l'appareil.
- En cas de suspicion d'empoisonnement du capteur, veuillez vérifier avec un calibrage ou un test rapide ("bump").
- Le détecteur est conçu uniquement pour une utilisation dans des atmosphères potentiellement explosives où les concentrations d'oxygène ne dépassent pas 20,9 % (v/v). Les atmosphères pauvres en oxygène (<10 % v/v) peuvent diminuer les sorties de certains capteurs.
- Ne chargez pas la batterie, car elle est non rechargeable.

Product Description



- LCD Display
- Buzzer
- Gas Inlet (Ch-A)
- Gas Inlet (Ch-B)
- Alarm LEDs
- Button
 - One-button operation must:
 - Activate the detector
 - Display alarm set points
 - Display peak gas exposures
 - 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
- IR Port

Interfaces



VISUAL DISPLAY

- The detector must have a LCD (liquid crystal display) that advises.
- Gas type monitoring
 - Alarm levels triggered: low or high (including ppm or %vol concentration levels)
 - Alarm settings: low and high
 - Peak (maximum) alarm exposure

DISPLAY ICONS

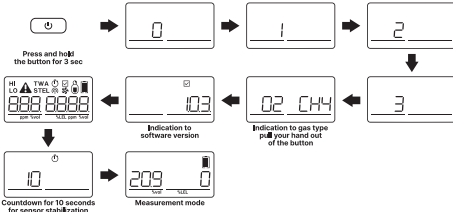
- The LCD of the detector also includes icons that clearly indicate:
- Alarm type and alarm level
 - Diagnostic warning

Icon	Name	Description
LO	Low Alarm	Low(1st) alarm
HI	High Alarm	High(2nd) alarm
▲	Alarm	Over limit indicator
STEL	STEL	STEL alarm
TWA	TWA	TWA alarm
📶	Wireless	Wireless indicator
🕒	Time Count	Calibration date check Count down for stabilization
✓	Checking	Success calibration, Software version check Device setting
🔧	Zero Cal.	Zero calibration
🔧	Span Cal.	Span calibration
🔋	Battery	Available battery
🔋		Discharge warning

Basic Operation

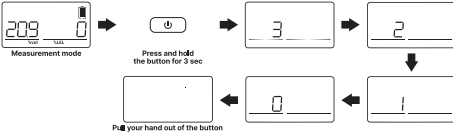
ACTIVATION

- 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 the button until a 3 second countdown is displayed.
 4. After that, The device is booting with turned on all LCD segments with short vibration.
 5. The detector can operate in measurement mode.



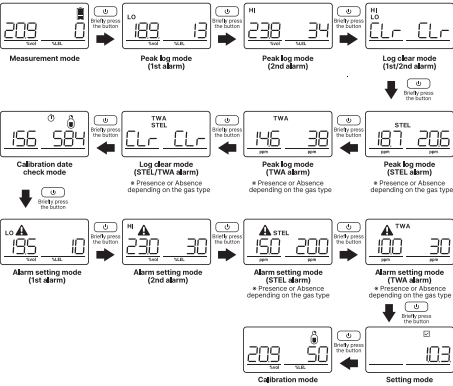
SYSTEM OFF

If you press and hold the button for 3 seconds on measurement mode, the LCD is on a numbers with countdown for system shutt down.



CONFIGURATION MODE

On the Measurement mode, press the button briefly to change the device mode. The modes are consist of several modes like figure below. Each mode is distinguished through active icons which are located on the top screen.



CALIBRATION

Zero Calibration means fresh air correction. Span Calibration means standard gas concentration correction.

PEAK(MAX) VALUE

The detector will record MAX exposure concentration when a gas occurred. And the recorded values can 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 LOW, and HIGH alarm. (including occurred time, duration time and the concentration of the gas)

LOGGING

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

Categories	Details
Event Alarms (High, Low, TWA, STEL)	Occurrence time, Duration, Alarm Type, Gas Concentration

Alarm / Test Failure

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.

Category	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 three flashing LED regions 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 is stored in the factory. Alarm set points are adjustable by 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 SOUND, VIBRATION, LED, AND DISPLAY (PER SECOND)

Icon	Name	Description
LO	Low Alarm	Low icon which is located on the top screen turn on.
HI	High Alarm	High icon which is located on the top screen turn on.
STEL	STEL Alarm	TWA icon which is located on the top screen turn on.
TWA	TWA Alarm	STEL icon which is located on the top screen turn on.

Detector Power & Maintenance

ELECTRICAL RATINGS

3.6VDC Battery Powered

BATTERY SPECIFICATION

- System : Lithium Primary (Li/SOCl2) battery
- Nominal voltage : 3.6V
- Nominal capacity : 1,200mAh

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.

Repair

CAUTION

- It is absolutely forbidden to replace or recharge batteries in explosive or hazardous areas. Replace the battery 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 Teledyne GMI 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.

SENSOR REPLACEMENT

1. Deactivate the detector.
2. Remove six screws on the rear case.
3. Remove two screws for fixing PCB.
4. After turn the PCB over, Remove the old sensor and replace it with a new one.
5. Reassemble the PCB and rear case.
6. After assembling, perform atmospheric calibration and standard calibration according to the standards in this user manual.

Explosion Proof Certification

Intrinsic Safety

The detector must be certified against the following standards:

	Certificate	Standards
IECEx	IECEx KSCP 25.0001X	PS DUO-3 to 9 PS DUO-A to F Ex ia IIC T4 Ga IEC 60079-0:2017, Ed 7 IEC 60079-11:2011, Ed 6
ATEX	KSCP 25ATEX0001X	PS DUO-3 to 9 PS DUO-A to F Ex ia IIC T4 Ga EN IEC 60079-0:2018 EN 60079-11:2012
CSA/UL	LC25 25ATEX0001X CA 22376-1ML	PS DUO-3 to 9 PS DUO-A to F Class I, Zone 0, AEx ia IIC T4 Ga Class I, Division 1, Groups A,B,C,D,T4 Ex ia IIC T4 Ga 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.60079-28:16(R2021) CSA-C22.2 No.61010-1:12 (June 2023) UL 61010-1:12 – (June 2023) UL 60079-28 Ed. 2-2017

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 IP67 standards.
The product is in conformance with the directive 2014/30/EU, (EMC).

Warranty

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

The manufacturer is not responsible for defects if, upon testing and inspection, the product is found to be free of defects or if the defect was caused by misuse, neglect, improper installation, testing, or calibration by the purchaser (or a third party). Unauthorized attempts to repair or modify the product, or damage caused by fire, lightning, water, or other hazards, are also excluded from the manufacturer's responsibility.

If the product fails to meet the manufacturer's specifications during the warranty period, please contact the authorized reseller or Teledyne GMI service center for repair/return information.



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