PC0E-1072

RIKEN KEIKI


MODEL:
GX-9000

MODEL:
GX-9000H

## Portable Multi Gas Detector
## MODEL:
# GX-9000 SERIES

## Detects up to 6 different gas types simultaneously.

A single unit suitable for all kinds of marine/onshore/underground work situations.
Innovative new gas detector

- Detects up to six different gas types simultaneously (HC/$CH_4$/$H_2$, $O_2$, CO, $H_2S$, $CO_2$, $NH_3$, VOCs, etc.
- Features a wide range of handy functions, including multilingual display and a combustible gas conversion function.
- Bluetooth® equipped! Easy data management via smartphone (option)
- Up to three-year sensor warranty
- Passes 1.5 m drop testing
- Protection rating equivalent to IP66/68

CE marking compliant
MED application scheduled

CE

RIKEN KEIKI Co.,Ltd.

# Portable Multi Gas Detector
# MODEL:
# GX-9000 SERIES


General-purpose type for measuring up to six different gas types

**Model: GX-9000**


High concentration $H_2S$ type for measuring up to four different gas types

**Model: GX-9000H**

Allows switching between high concentration $H_2S$ and other sensors to avoid poisoning of other sensors by high concentration $H_2S$.

LEDs on left and right light up to indicate selected mode at a glance. (High concentration $H_2S$ measurement mode shown selected in example below)


**Low concentration $H_2S$/other gas measurement mode** and **high concentration $H_2S$ measurement mode**
Easily selected using buttons

Next-generation high-performance sensor

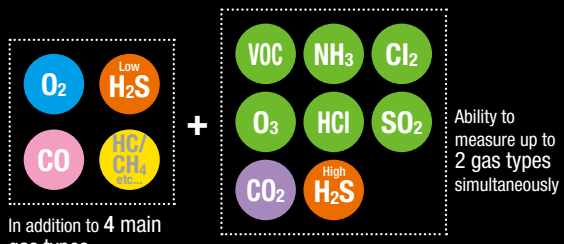
## Features "R Sensors" and "F Sensors"

Next-generation high-performance sensor offering smaller size and significantly better performance and durability than previous sensors


Simultaneous target gases **6** types (Max)

## Greater number of gases with a single unit

Allows simultaneous detection of multiple gases using a single-unit instead of requiring multiple gas detectors and detector tubes.




In addition to 4 main gas types

Ability to measure up to 2 gas types simultaneously

Sensor combinations **1000** Approx.

## Optimum solutions to suit customers' needs

Single unit measures up to six different gas types and detects $CO_2$ and a broad range of toxic gases, including VOC and $NH_3$. Ideal gas detector for customer needs.

Sensor warranty **3** years (Max)

## Longer warranty for peace of mind

Utilizes R/F Sensor for outstanding long-term stability. Up to three-year sensor warranty*. Allows use with peace of mind.

* $NH_3$ sensor: two years; $O_3$/VOC sensor: one year

# [ Handy features for ease of use ]

## Choice of 16 different language displays

English
Cantonese (Traditional Chinese)
Czech
French
German
Italian
Japanese
Korean
Mandarin (Simplified Chinese)
Polish
Portuguese
Russian
Slovak
Spanish
Turkish
Vietnamese

## USB Type-C charging and data transfer

Uses USB Type-C cable for both charging and PC interface. Recorded measurement data can be uploaded to PC software (sold separately), reducing the time required.

AC adapter for charging

USB PC communication cable (sold separately)

## Combustible gas conversion function (when new ceramic type sensor is installed)

Models that include combustible gas among their detection target gases can be used to directly read off up to 27 different types of combustible gas.
*Available only with i-$C_4H_{10}$ and $CH_4$ models when using new ceramic type sensor, provided no thermal conductivity sensor is installed.

| Gas name | Display name | Conversion from i-$C_4H_{10}$ models | Conversion from $CH_4$ models |
|---|---|---|---|
| Methane | $CH_4$ | × | – |
| Isobutane | i-$C_4H_{10}$ | – | ○ |
| Hydrogen | $H_2$ | ○ | ○ |
| Methanol | $CH_3OH$ | ○ | ○ |
| Acetylene | $C_2H_2$ | ○ | ○ |
| Ethylene | $C_2H_4$ | ○ | ○ |
| Ethane | $C_2H_6$ | × | ○ |
| Ethanol | $C_2H_5OH$ | ○ | ○ |
| Propylene | $C_3H_6$ | ○ | ○ |

| Gas name | Display name | Conversion from i-$C_4H_{10}$ models | Conversion from $CH_4$ models |
|---|---|---|---|
| Acetone | $C_3H_6O$ | ○ | ○ |
| Propane | $C_3H_8$ | × | ○ |
| Butadiene | $C_4H_6$ | ○ | ○ |
| Cyclopentane | $C_5H_{10}$ | ○ | ○ |
| Benzene | $C_6H_6$ | ○ | ○ |
| n-hexane | n-$C_6H_{14}$ | ○ | ○ |
| Toluene | $C_7H_8$ | ○ | ○ |
| Heptane | n-$C_7H_{16}$ | ○ | ○ |
| Xylene | $C_8H_{10}$ | ○ | ○ |

| Gas name | Display name | Conversion from i-$C_4H_{10}$ models | Conversion from $CH_4$ models |
|---|---|---|---|
| n-nonane | n-$C_9H_{20}$ | ○ | ○ |
| Ethyl acetate | EtAc | ○ | ○ |
| IPA | IPA | ○ | ○ |
| MEK | MEK | ○ | ○ |
| Methyl methacrylate | MMA | ○ | ○ |
| Dimethyl ether | DME | ○ | ○ |
| Methyl isobutyl ketone | MIBK | ○ | ○ |
| Tetrahydrofuran | THF | ○ | ○ |
| n-pentane | n-$C_5H_{12}$ | ○ | ○ |

## Alarm setpoint setting function

Use the setup program to change/edit settings. Supports management and operation in accordance with the customer's own criteria.

## Confirmation beep function

Indicates that the gas detector is functioning normally. The buzzer sounds at preset intervals while measurement is underway.

## Calibration notification function

Indicates the number of days until recommended regular maintenance when the power is turned on. Reminds the user to perform maintenance to ensure safe use.

# [ Outstanding durability for greater peace of mind ]

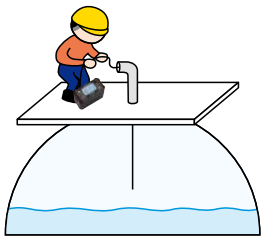

**1.5 m**
Drop testing passed


Protection level
**IP66/68**
equivalent


Operating temperature range
**-40 – +60 °C**
(temporary use environment)

# [ Suitable for use even with large tanks! Features high-power pump ]

Includes a high-power pump allowing use even for large tanks. Capable of aspirating and assessing gases from up to 45 m away using the optional sampling tube.

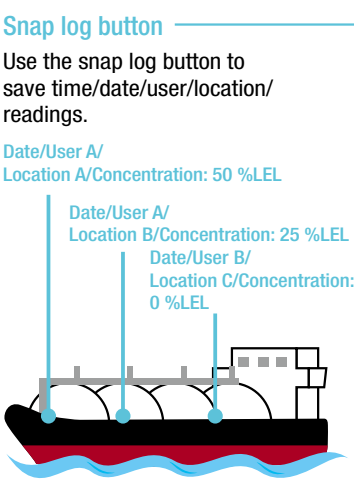


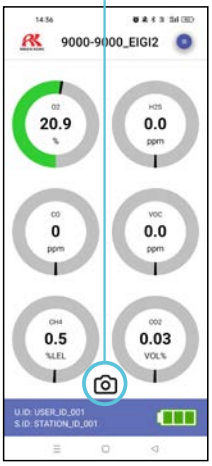
# [ Bluetooth® equipped!* Easy data management via smartphone ]

Can communicate with smartphones and tablets via Bluetooth. The dedicated RK Link app can be used to store and email measurement results and easily manage data. A function also allows automated email generation to registered addresses when an alarm occurs to share details of emergencies remotely and in real time.
*Specify whether you require Bluetooth capability at the time of purchase.

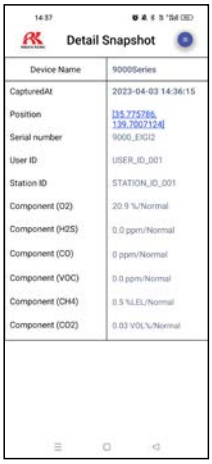
## Snap log button

Use the snap log button to save time/date/user/location/readings.




Save






The 'RK Link' app can be downloaded from Google Play or Apple Store free of charge!

GET IT ON Google Play

Download on the App Store

iOS version shown here

# [ Accessories ]

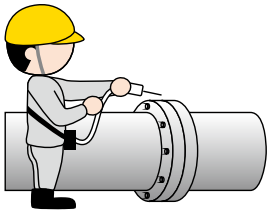
## Tubes/belts

### Gas sampling rod
Part No.: 0904 0275 00

### Gas sampling tube
(Gas sampling tube length: approx. 75 cm)
Part No.: 0914 0135 30

### Shoulder strap
Part No.: 4777 4592 10

Appearance with accessories attached



For measurements in specific locations within reach

## Batteries and other accessories

### AC adapter
Part No.: 2594 1342 30
*Included with rechargeable battery models (converter plug (Type C) bundled with ATEX/IECEx models)

### AA alkaline battery ×6
Part No. (×1): 2753 3007 80
*Included with dry battery models

### Fresh air adjustment filters

### Filter cylinder retaining belt for shoulder strap
Allows fresh air adjustment filter to be attached to shoulder strap.
Part No.: 4777 4572 20

*The particular type and whether or not the fresh air adjustment filter and filter cylinder retaining belt are included vary depending on the individual model.

# [ Optional accessories ]

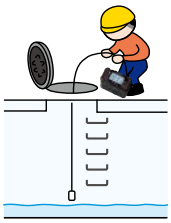
## Tubes

### Sampling tube with float
Gas can be separated from water and detected by a waterproof filter inside the float. Ideal for locations where water is present at the detection point

Tube length: **8 m**
Part No.: 4384 0430 60

Tube length: **30 m**
Part No.: 4775 9678 80

Tube length: **45 m**
Part No.: 4777 9567 60



Ensures safety before gas elimination and tank cleaning work

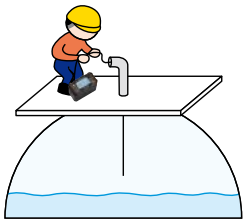
For measurements inside tanks

### Sampling tube with weight
The tube end is weighted to make it easier to lower. Ideal for use in narrow pipes and other confined locations.

*Requires use with absorbent cotton filter and connecting tube (except for models with ESF/PIF sensor installed).

Tube length: **30 m**
Part No.: 4775 9679 50

Tube length: **45 m**
Part No.: 4777 9465 80



Measuring gas concentrations inside cargo tanks

For measurements inside tanks

## Batteries

### Dry battery unit/AA alkaline batteries
Inserting batteries allows instant use in emergencies.

**Dry battery unit**
Part No.:
(Japanese explosion-proof models) **4777 9603 60**
(ATEX/IECEx models) **4777 9605 10**

**AA alkaline batteries**
Part No.: 2753 3007 80

### Lithium ion battery unit/AC adapter
The battery unit can be recharged and used repeatedly.
The AC adapter uses a USB Type-C connection.

**Lithium ion battery unit**
Part No.:
(Japanese explosion-proof models) **4777 9602 90**
(ATEX/IECEx models) **4777 9604 30**

**AC adapter**
Part No.: 2594 1342 30

## Filter

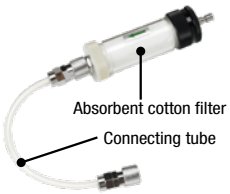
### Water trap
Connects between the sampling tube and gas detector to keep water out.
Part No.: 0904 0186 20

### Absorbent cotton filter/Connecting tube
Tube connected to waterproof filter and gas detector
*Do not use if an ESF/PIF sensor is installed.

**Absorbent cotton filter**
Part No.: 4383 0850 00

**Connecting tube**
Part No.: 4775 9617 60

**Absorbent cotton (replacement)**
Part No.: 1879 0011 10




### Diluter
Dilutes gas aspirated with air at a 1:1 ratio to allow use of new ceramic sensors with inert gases, gases ceramic sensors typically cannot detect.
*Due to explosion hazards, avoid use with highly concentrated combustible gases.
Part No.: 4775 9934 30

## Case/holder

### Leather case

Protects the product against dirt. Used to attach shoulder strap, waist belt, and absorbent cotton filter

Part No.: 4777 4593 80

### Waist belt and waist belt attachment

Allow a gas detector to be worn close to the body.

*We recommend using in conjunction with the shoulder strap to prevent the gas detector dropping.

**Waist belt**

Part No.: 4775 5653 40

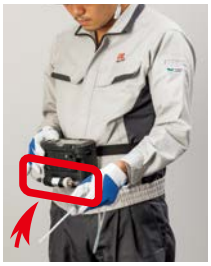
**Waist belt attachment**

Part No.: 4775 9853 10


### Filter cylinder retaining belt

Attaches to the gas detector; allows absorbent cotton filter to be attached to the gas detector. Allows the filter to be secured to the gas detector to keep it out of the way during measurements.

Part No.: 4777 9444 20



### Sampling rod holder

Attaches to the shoulder strap; allows the gas sampling rod tip to be stowed.

Part No.: 4775 5651 00

### Aluminum storage case

Houses the gas detector together with accessories and optional accessories, like sampling tubes.

Dimensions: Approx. 365 mm (W) × 236 mm (H) × 226 mm (D)*

Part No.: 4777 9579 00

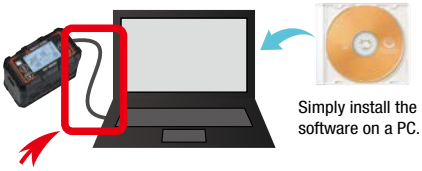
*Excluding projections

## Management software and cable

### USB cable (1 m)

Connects the gas detector to a PC. Used when using the software.

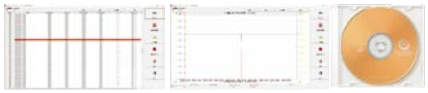
Part No.: 2440 2728 90




### Data logger management program

Software used to view and manage measurement results and logs of events like alarms and calibrations

Part No.: (Japanese explosion-proof models) 9811 0980 90
(ATEX/IECEx models) 9811 0990 80

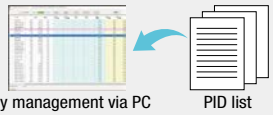


Example: Measurement results (table)

Example: Measurement results (graph)

### Setup Program

Use the Setup Program for the GX-9000 Series to configure settings and edit a list of more than 600 different VOC sensor gases. This can be downloaded free of charge from the Riken Keiki website.



Easy management via PC

PID list

## Maintenance parts and other items

### Calibration gas

Used for bump test and gas adjustment

*Please contact Riken Keiki for more information.

### Gas sampling bag

Used to draw the calibration gas into the gas detector. Available in a choice of three colors for easy differentiation when used with different gases

Part No.: 1L (green) 0904 0103 80
1L (orange) 0904 0104 50
2L (black) 0904 0288 10

### Demand flow valve and connecting tube (10 cm)

Connect to a dedicated gas cylinder to supply the required amount of gas to the gas detector.

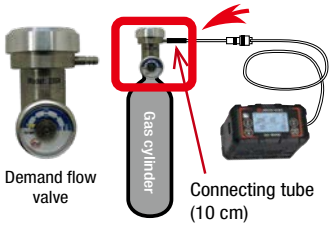
*Please contact Riken Keiki for details of the compatible gas cylinders.

**Demand flow valve**

Part No.: 1641 0190 20

**Connecting tube (10 cm)**

Part No.: 4775 5958 10




### Adapter plug

The Type A AC adapter can be converted to Type C, O, or BF.

Part No.: (Type C) 2594 1435 00
(Type O) 2594 1434 20
(Type BF) 2594 1436 70

### Protective film

(for LCD, set of 5)

Part No.: 4777 9025 70

### Filters (replacement)

Please contact Riken Keiki for more information.

# [ Sensors ]

## Sensor selection

The GX-9000 accepts up to six sensors. The GX-9000H accepts up to five. Each of the three R sensors (R1 - R3) can be selected or unselected. One sensor (or no sensors) can be selected from each box in the table below for F sensors (F1 - 3).

| R sensor slots (same for GX-9000/GX-9000H) | | |
|---|---|---|
| R1 (slot 1) | R2 (slot 2) | R3 (slot 3) |
| Oxygen | Hydrogen sulfide [low concentration] | Carbon monoxide |
| **F sensor slots** (upper: GX-9000 lower: GX-9000H) | | |
| F1 (slot 4) | F2 (slot 5) | F3 (slot 6) |
| Toxic gas (electrochemical type)<br>VOC (PID)<br>Carbon dioxide | Combustible gas (thermal conductivity type)<br>Combustible gas (non-dispersive infrared type) | Combustible gas (new ceramic type)<br>Carbon dioxide |
| Hydrogen sulfide [high concentration] | – | Combustible gas (non-dispersive infrared type) |

## Combustible gas sensor selection

Three different types of combustible gas sensors can be installed: a new ceramic type, thermal conductivity type, and/or non-dispersive infrared type. Referring to the features below, select the sensors to suit the intended purpose.

| Detection principle | New ceramic type | Thermal conductivity type | Non-dispersive infrared type |
|---|---|---|---|
| Detection range | %LEL | vol% | %LEL/vol% |
| Features | • Detects $H^2$<br>• Uses combustible gas conversion function | • Detects $H^2$ | • Detects even in inert gas<br>• Can be used even in environments where Si is present |

## Sensor selection examples

* Four main gas types = Combustible gas/$O^2$/$H^2S$ [low concentration]/CO

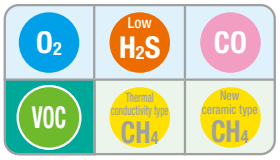
Example 1: **Four main gas types + 1**

$CH_4/O_2/H_2S/CO$ ] Four main gas types
+
VOC (10.6 eV/ppm) ] +1

Combustible gas sensor:
**New ceramic type + thermal conductivity type**

GX-9000

Product code
First 8 characters: C1P2T1N1



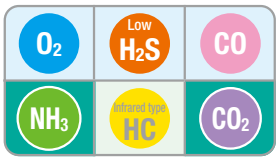

Example 2: **Four main gas types + 2**

$HC/O_2/H_2S/CO$ ] Four main gas types
+
$NH_3/CO_2$ ] +2

Combustible gas sensor:
**Non-dispersive infrared type**

GX-9000

Product code
First 8 characters: C1E1R2R5



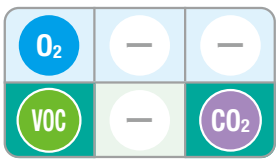

Example 3: **Main gas type + 2**

$O_2$ ] Main Gas
+
VOC (10.6 eV/ppb)/$CO_2$ ] +2

Combustible gas sensor:
**N/A**

GX-9000

Product code
First 8 characters: C4P100R5



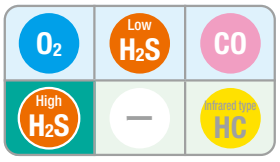

Example 4: **Four main gas types + 1**

$HC/O_2/H_2S/CO$ ] Four main gas types
+
$H_2S$ [high concentration] ] +1

Combustible gas sensor:
**Non-dispersive infrared type**

GX-9000H

Product code
First 8 characters: D1E800R2




Max. 1,000 ppm

All of these are examples. Examples 1 and 2 show sensors installed to full capacity. Note that fewer sensors can be installed. Different combinations of sensors can be installed. Refer to the 'Product code table' below to select sensors.

# [ Product code table ]

Select a GX-9000 Series product based on the sensors needed, power supply type, Bluetooth functionality, and explosion-proof specifications. Refer to the product table below to select the desired specifications.

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

- ①: Product model C: GX-9000 D: GX-9000H
- ②: R sensor combination
- ③④: F sensor (F1) combination
- ⑤ - ⑧: F sensor (F2, F3) combination
- ⑨: Battery type
- ⑩: Bluetooth compatibility
- ⑪⑫: Explosion-proof specifications

### ②: R sensor combination

| Symbol | R1 | R2 | R3 |
|---|---|---|---|
| | Sensor model | Sensor model | Sensor model |
| 0 | N/A | | |
| 1 | ESR-X13P ($O_2$) | ESR-A13i ($H_2S$) | ESR-A13P (CO) |
| 2 | ESR-X13P ($O_2$) | ESR-A13i ($H_2S$) | N/A |
| 3 | ESR-X13P ($O_2$) | N/A | ESR-A13P (CO) |
| 4 | ESR-X13P ($O_2$) | N/A | |
| 5 | N/A | ESR-A13i ($H_2S$) | ESR-A13P (CO) |
| 6 | N/A | ESR-A13i ($H_2S$) | N/A |
| 7 | N/A | N/A | ESR-A13P (CO) |

### ⑨: Battery type

| Symbol | Details |
|---|---|
| L | Lithium ion battery unit BUL-9000 |
| D | Dry battery unit BUD-9000 |

### ⑩: Bluetooth functionality

| Symbol | Details |
|---|---|
| 0 | Not Bluetooth compatible |
| 1 | Bluetooth compatible |

### ⑪⑫: Explosion-proof specifications

| Symbol | Details |
|---|---|
| 00 | Japan Ex |
| 50 | ATEX/IECEx |

### ③④: F sensor (F1) combination

**GX-9000**

| Symbol | F1 |
|---|---|
| | Sensor model |
| 00 | N/A |
| P1 | PIF-001 (VOC) 10.6 eV, units: ppb |
| P2 | PIF-002 (VOC) 10.6 eV, units: ppm |
| P3 | PIF-003 (VOC) 10.0 eV, units: ppm |
| E1 | ESF-B242 ($NH_3$) |
| E2 | ESF-C930 ($Cl_2$)*1 |
| E3 | ESF-B249 ($O_3$)*1 |
| E4 | ESF-A24E2 (HCl) |
| E5 | ESF-A24D4 ($SO_2$) |
| R5 | IRF-4443 ($CO_2$)*2 |

*1 ②: ESR-A13i ($H_2S$) cannot be selected in R sensor combination.
*2 ⑤ - ⑧: Can be selected for F sensor (F2/F3) combination, only when NCF-6322P is installed for F3.

**GX-9000H**

| Symbol | F1 |
|---|---|
| | Sensor model |
| E8 | ESF-A24R2 (high concentration $H_2S$) |

### ⑤ - ⑧: F sensor (F2, F3) combination

**GX-9000**

| Symbol | F2 | F3 |
|---|---|---|
| | Sensor model | Sensor model |
| 00 00 | N/A | |
| 00 N1 | N/A | NCF-6322P ($CH_4$) |
| T1 N1 | TEF-7520P ($CH_4$) | NCF-6322P ($CH_4$) |
| 00 N2 | N/A | NCF-6322P (i-$C_4H_{10}$) |
| T2 N2 | TEF-7520P (i-$C_4H_{10}$) | NCF-6322P (i-$C_4H_{10}$) |
| 00 N4 | N/A | NCF-6322P ($H_2$)*3 |
| T4 N4 | TEF-7520P ($H_2$)*3 | NCF-6322P ($H_2$)*3 |
| 00 N5 | N/A | NCF-6322P ($C_2H_2$)*3, 4 |
| R1 00 | IRF-4341 ($CH_4$) | N/A |
| R1 R5 | IRF-4341 ($CH_4$) | IRF-4443 ($CO_2$) |
| R2 00 | IRF-4345 (i-$C_4H_{10}$) | N/A |
| R2 R5 | IRF-4345 (i-$C_4H_{10}$) | IRF-4443 ($CO_2$) |
| 00 R5 | N/A | IRF-4443 ($CO_2$) |

*3 ②: ESR-A13P (CO) cannot be selected for R sensor combination.
*4 ③④: E5 cannot be selected for F sensor combination.

**GX-9000H**

| Symbol | F2 | F3 |
|---|---|---|
| | Sensor model | Sensor model |
| 00 00 | N/A | |
| 00 R1 | N/A | IRF-4341 ($CH_4$) |
| 00 R2 | N/A | IRF-4345 (i-$C_4H_{10}$) |

Reference: Same combination of first eight character product codes as previous GX-8000/RX-8500 models
GX-8000 TYPE A (HC): C100T2N2 / GX-8000 TYPE B ($CH_4$): C10000N1 / RX-8500: C300R1R5

# [ Sensor specifications ]

## R Sensor

| Detection target gas | | Oxygen ($O_2$) | | Hydrogen sulfide ($H_2S$ [low concentration]) | | Carbon monoxide (CO) |
|---|---|---|---|---|---|---|
| Sensor model | | ESR-X13P | | ESR-A13i | | ESR-A13P |
| Detection principle | | Electrochemical type | | | | |
| Explosion-proof specifications | | Japan Ex | ATEX/IECEx | Japan Ex | ATEX/IECEx | Japan Ex and ATEX/IECEx |
| Display range | | 0 - 40.0 % | | 0 - 200.0 ppm | | 0 - 2,000 ppm |
| Detection range | | 0 - 25.0 % | | 0 - 30.0 ppm | 0 - 100.0 ppm | 0 - 500 ppm |
| Resolution | | 0.1 % | | 0.1 ppm | | 1 ppm |
| Alarm setpoints*1 | First alarm | 18.0 % | 19.5 % | 1.0 ppm | 5.0 ppm | 25 ppm |
| | Second alarm | 25.0 % | 23.5 % | 10.0 ppm | 30.0 ppm | 50 ppm |
| | TWA | – | | 1.0 ppm | | 25 ppm |
| | STEL | – | | 5.0 ppm | | 200 ppm |
| Operating temperature range | Continuous use environment | -20 °C - +50 °C | | | | |
| | Temporary use environment*2 | -40 °C - +60 °C | | | | |
| Operating humidity range | Continuous use environment | 10 %RH - 90 %RH | | | | |
| | Temporary use environment*2 | 0 - 95 %RH | | | | |

## F sensor

| Detection target gas | | Isobutane ($i\text{-}C_4H_{10}$) | Methane ($CH_4$) | Hydrogen ($H_2$) | Acetylene ($C_2H_2$) |
|---|---|---|---|---|---|
| Sensor model | | NCF-6322P | | | |
| Detection principle | | New ceramic type | | | |
| Display range/Detection range | | 0 - 100 %LEL | | | |
| Resolution | | 1 %LEL | | | |
| Alarm setpoints*1 | First alarm | 10 %LEL | | | |
| | Second alarm | 50 %LEL | | | |
| Operating temperature range | Continuous use environment | -20 °C - +50 °C | | | |
| | Temporary use environment*2 | -40 °C - +60 °C | | | |
| Operating humidity range | Continuous use environment | 10 %RH - 90 %RH | | | |
| | Temporary use environment*2 | 0 - 95 %RH | | | |

| Detection target gas | | Isobutane ($i\text{-}C_4H_{10}$) | Methane ($CH_4$) | Hydrogen ($H_2$) |
|---|---|---|---|---|
| Sensor model | | TEF-7520P | | |
| Detection principle | | Thermal conductivity type | | |
| Display range/Detection range | | 0 - 100.0 vol% | | |
| Resolution | | 0.1 vol% | | |
| Alarm setpoints*1 | First alarm | 25.0 vol% | | |
| | Second alarm | 50.0 vol% | | |
| Operating temperature range | Continuous use environment | -20 °C - +50 °C | | |
| | Temporary use environment*2 | -40 °C - +60 °C | | |
| Operating humidity range | Continuous use environment | 10 %RH - 90 %RH | | |
| | Temporary use environment*2 | 0 - 95 %RH | | |

| Detection target gas | | Isobutane ($i\text{-}C_4H_{10}$) | Methane ($CH_4$) |
|---|---|---|---|
| Sensor model | | IRF-4345 | IRF-4341 |
| Detection principle | | Non-dispersive infrared type | |
| Display range/Detection range | | 0 - 100 %LEL/100 %LEL - 100.0 vol% | |
| Resolution | | 0.5 %LEL/0.1 vol% | |
| Alarm setpoints*1 | First alarm | 10.0 %LEL | |
| | Second alarm | 50.0 %LEL | |
| Operating temperature range | Continuous use environment | -20 °C - +50 °C | |
| | Temporary use environment*2 | -40 °C - +60 °C | |
| Operating humidity range | Continuous use environment | 10 %RH - 90 %RH | |
| | Temporary use environment*2 | 0 - 95 %RH | |

| Detection target gas | | Carbon dioxide ($CO_2$) |
|---|---|---|
| Sensor model | | IRF-4443 |
| Detection principle | | Non-dispersive infrared type |
| Display range/Detection range | | 0 - 20.00 vol% |
| Resolution | | 0.01 vol% (0 - 5 vol%)/0.1 vol% (5 - 20 vol%) |
| Alarm setpoints*1 | First alarm | 5.00 vol% |
| | Second alarm | 10.00 vol% |
| Operating temperature range | Continuous use environment | -20 °C - +50 °C |
| | Temporary use environment*2 | -40 °C - +60 °C |
| Operating humidity range | Continuous use environment | 10 %RH - 90 %RH |
| | Temporary use environment*2 | 0 - 95 %RH |

| Detection target gas | | Hydrogen sulfide ($H_2S$ [high concentration]) | Ammonia ($NH_3$) | Chlorine ($Cl_2$) | Ozone ($O_3$) | Hydrogen chloride (HCl) | Sulfur dioxide ($SO_2$) |
|---|---|---|---|---|---|---|---|
| Sensor model | | ESF-A24R2 | ESF-B242 | ESF-C930 | ESF-B249 | ESF-A24E2 | ESF-A24D4 |
| Detection principle | | Electrochemical type | | | | | |
| Explosion-proof specifications | | Japan Ex and ATEX/IECEx | | | | | |
| Display range/Detection range | | 0 - 1,000 ppm | 0 - 75.0 ppm | 0 - 1.50 ppm | 0 - 0.600 ppm | 0 - 6.00 ppm | 0.0 - 100.0 ppm |
| Resolution | | 1 ppm | 0.5 ppm | 0.01 ppm | 0.005 ppm | 0.05 ppm | 0.1 ppm |
| Alarm setpoints*1 | First alarm | 1,000 ppm | 25.0 ppm | 0.50 ppm | 0.100 ppm | 2.00 ppm | 2.0 ppm |
| | Second alarm | 1,000 ppm | 50.0 ppm | 1.00 ppm | 0.200 ppm | 4.00 ppm | 5.0 ppm |
| | TWA | OFF | 25.0 ppm | 0.50 ppm | 0.100 ppm | OFF | 2.0 ppm |
| | STEL | OFF | 35.0 ppm | 1.00 ppm | OFF | OFF | 5.0 ppm |
| Operating temperature range | Continuous use environment | -20 °C - +50 °C | -20 °C - +50 °C | 0 °C - 50 °C | 10 °C - 40 °C | 0 °C - 40 °C | -20 °C - +50 °C |
| | Temporary use environment*2 | -40 °C - +60 °C | -40 °C - +60 °C | -40 °C - +60 °C | 10 °C - 40 °C | 0 °C - 40 °C | -40 °C - +60 °C |
| Operating humidity range | Continuous use environment | 20 %RH - 90 %RH | 30 %RH - 80 %RH | 30 %RH - 80 %RH | 30 %RH - 80 %RH | 20 %RH - 90 %RH | 20 %RH - 90 %RH |
| | Temporary use environment*2 | 0 - 95 %RH | | | | | |

| Detection target gas | | Volatile organic compounds (VOCs) | | |
|---|---|---|---|---|
| Sensor model | | PIF-001 | PIF-002 | PIF-003 |
| Detection principle | | Photoionization detector (PID) | | |
| Ionization energy | | 10.6 eV | 10.6 eV | 10.0 eV |
| Display range/Detection range | | 0 - 40,000 ppb | 0 - 4,000 ppm | 0 - 100.0 ppm |
| Resolution | | 1 ppb (0 - 4,000 ppb)/ 10 ppb (4,000 - 40,000 ppb) | 0.1 ppm (0 - 400.0 ppm)/ 1 ppm (400.0 - 4,000 ppm) | 0.01 ppm (0 - 10.00 ppm)/ 0.1 ppm (10.00 - 100.0 ppm) |
| Alarm setpoints*1 | First alarm | 5,000 ppb | 400.0 ppm | 5.00 ppm |
| | Second alarm | 10,000 ppb | 1,000 ppm | 10.0 ppm |
| | TWA | OFF | OFF | OFF |
| | STEL | OFF | OFF | OFF |
| Operating temperature range | Continuous use environment | -20 °C - +50 °C | | |
| | Temporary use environment*2 | -40 °C - +60 °C | | |
| Operating humidity range | Continuous use environment | 10 %RH - 90 %RH | | |
| | Temporary use environment*2 | 0 - 95 %RH | | |

*1 Alarm setpoints: The above are default values. If a value is listed or OFF is listed, it can be set to any value using the setup program.

*2 Approx. 15 minutes.

# [ Product Specifications ]

| Model | GX-9000 | GX-9000H |
|---|---|---|
| Concentration display | LCD digital (full dot) | |
| Detection target gas | **Combustible gas** ($i$-$C_4H_{10}$/$CH_4$/$H_2$/$C_2H_2$), **oxygen** ($O_2$), **toxic gas** ($H_2S$ [low concentration]/CO/$NH_3$/$Cl_2$/$O_3$/HCl/$SO_2$/VOCs), **carbon dioxide** ($CO_2$) | **Combustible gas** ($i$-$C_4H_{10}$/$CH_4$), **oxygen** ($O_2$), **Hydrogen sulfide** ($H_2S$ [low concentration] [high concentration]), **carbon monoxide** (CO) |
| Detection method | Pump suction type | |
| Suction flow rate | Minimum 0.75 L/min (open flow rate) | |
| Display items | Clock, battery level, operating status | |
| Display languages | English, Cantonese (Traditional Chinese), Czech, French, German, Italian, Japanese, Korean, Mandarin (Simplified Chinese), Polish, Portuguese, Russian, Slovak, Spanish, Turkish, Vietnamese | |
| Buzzer volume | Approx. 95 dB (mean value at 30 cm from sound source) | |
| Gas alarm indication | Lamp flashing, continuous modulating buzzer sounding, gas concentration readout blinking | |
| Gas alarm pattern | Self-latching, auto reset | |
| Fault alarm/self-diagnosis | Flow abnormality, system abnormality, sensor abnormality, low battery voltage, calibration failure, clock abnormality | |
| Fault alarm icon | Lamp flashing, intermittent buzzer sounding, detail display | |
| Fault alarm pattern | Self-latching | |
| Communication specifications | USB 2.0 Type-C (for data logger/setting), Bluetooth 4.2 (Bluetooth Low Energy) | |
| Power source | Dedicated lithium ion battery unit (BUL-9000) or dedicated dry battery unit (AA alkaline batteries × 6) (BUD-9000) | |
| Continuous operating time*1 | Lithium ion battery unit: Approx. 25 hours<br>Dry battery unit: Approx. 12 hours (at 25 °C, no alarm, no lighting) | Lithium ion battery unit: Approx. 35 hours<br>Dry battery unit: Approx. 15 hours (at 25 °C, no alarm, no lighting) |
| Operating temperature range*2 | Approx. 15-minute temporary use environment: -40 °C - +60 °C (no sudden changes)<br>Continuous use environment: -20 °C - +50 °C (no sudden changes) | Approx. 15-minute temporary use environment: -40 °C - +60 °C (no sudden changes)<br>Continuous use environment: -20 °C - +50 °C (no sudden changes) |
| Operating humidity range*2 | Approx. 15-minute temporary use environment: 0 %RH - 95 %RH (no condensation)<br>Continuous use environment: 10 %RH - 90 %RH (no condensation) | Approx. 15-minute temporary use environment: 0 %RH - 95 %RH (no condensation)<br>Continuous use environment: 10 %RH - 90 %RH (no condensation) |
| Operating pressure range | 80 kPa - 120 kPa (80 kPa - 110 kPa for explosion-proof range) | |
| Construction | Dustproof, waterproof construction equivalent to IP66/68*3, drop resistant to 1.5 m | |
| Explosion-proof construction | Intrinsically safe explosion-proof construction, flame-proof enclosures (with new ceramic type sensor)<br>Intrinsically safe explosion-proof construction (without new ceramic type sensor) | |
| Explosion-proof class | IECEx*4<br>Ex da ia IIC T4 Ga<br>(with new ceramic type sensor)<br>Ex ia IIC T4 Ga<br>(without new ceramic type sensor) | ATEX*4<br>II 1 G Ex da ia IIC T4 Ga<br>(with new ceramic type sensor)<br>II 1 G Ex ia IIC T4 Ga<br>(without new ceramic type sensor) | Japan EX<br>Ex da ia IIC T4 Ga<br>(with new ceramic type sensor)<br>Ex ia IIC T4 Ga<br>(without new ceramic type sensor) |
| Certifications | CE marking, JIS T 8201:2010 (Oxygen deficiency indicator), JIS T 8205:2018 (Hydrogen sulfide indicator/alarm) | |
| External dimensions | Approx. 158 mm (W) × 85 mm (H) × 132 mm (D) (excluding projections) | |
| Weight*5 | Approx. 1.1 kg | Approx. 1.2 kg |

*1 Continuous operating time: Varies depending on the sensor installed.
*2 Operating ambient temperature/humidity range: May vary depending on the sensor installed. Refer to 'Sensor Specifications' on P. 6.
*3 IPx8: No water penetration when submerged at depth of 2 m for 1 hour.
*4 Dry battery models when using Toshiba (LR6) or Duracell (MN1500) batteries: -40 °C - +40 °C: T4, -40 °C - +60 °C: T3.
*5 Including battery and battery unit.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