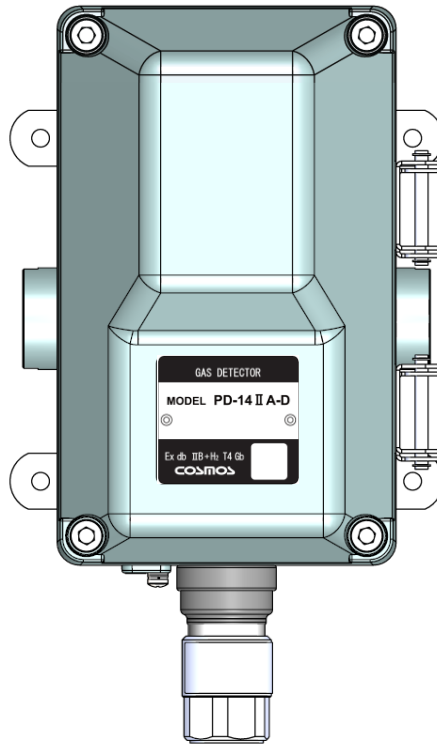


Extractive type Gas Detector

Model PD-14 II

Instruction Manual



- Keep this instruction manual where it is readily accessible.
- Thoroughly read this instruction manual before using the equipment so it can be used safely and correctly.
- This manual provides information concerning standard specifications. If the specifications of your model are nonstandard, refer to the delivery specifications.



NEW COSMOS ELECTRIC CO., LTD.

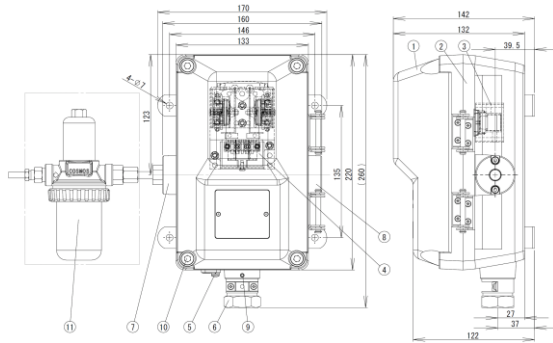
Instruction Manual No.

GAE-195-00

October 2026

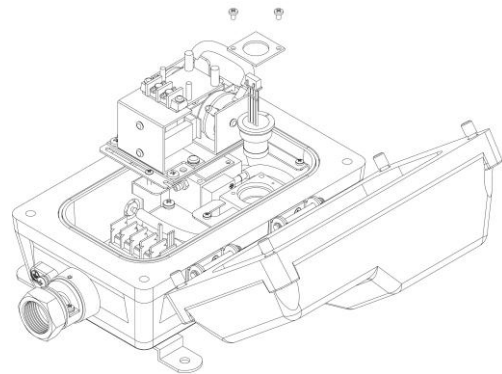
· External Dimensions and Part Names

⇒Page 5 to Page 7



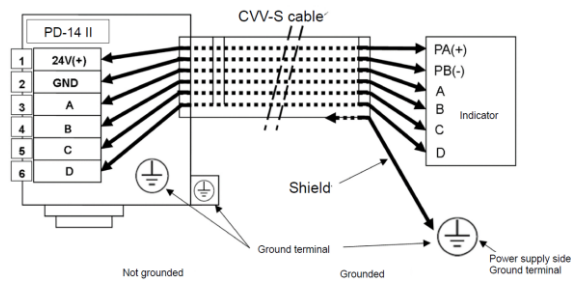
· Replacement of Sensor Unit

⇒Page 23 to Page 24



· Wiring Method

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· Maintenance Check and Operation Method

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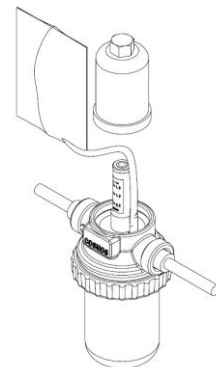


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1. Introduction

- Thank you for purchasing PD-14 II Extractive Type Gas Detector.
- To ensure the correct use of this product, be sure to read this manual before use and follow the instructions to prevent accidents and ensure safe operation.
- This product detects various types of gas including combustible gas and detects gas leakage at an early stage in industrial facilities (e.g., gas manufacturing facilities, storage facilities, chemical plants, paint factories, and power plants).
- Refer to this manual together with the manual for the indicator unit when using this product.
- This product is categorized as follows according to detection principle of the gas sensor, which is tailored to the customer's specifications.

Corresponding sensor type	Detection principle
PD-14 II A-D	Hot wire semiconductor
PD-14 II B-D	Catalytic combustion

- Maintenance and inspection are indispensable to the reliable performance of the Gas Detection/Alarm System.
Be sure to perform the maintenance checks described in this manual.

Explanation of Symbols

The following symbols are used to indicate and classify precautions in this manual.

 DANGER	Indicates information which, if not heeded, may result in a hazardous situation that is likely to lead to death or serious injury.
 WARNING	Indicates information which, if not heeded, may result in a hazardous situation that could possibly lead to death or serious injury.
 CAUTION	Indicates information which, if not heeded, may result in a hazardous situation that leads to minor injury or property damage.
MEMO	Indicates advice on handling the product.

2. To Ensure Correct Use

- Read this manual completely and be sure you understand the information provided herein before attempting to use the product.
- Abide by all applicable laws and regulations when using this product.
- Any explosion proof work should be carried out by suitably trained personnel in accordance with applicable code of practice.

DANGER

- If there is a gas leak alarm, take the necessary measures specified by your company.
- Operation checks with actual gas are extremely dangerous because they involve the use of combustible gas, toxic gas, or other hazardous gas. For this reason, operation checks should only be carried out by personnel who have acquired sufficient experience and specialized technical knowledge or by New Cosmos.

WARNING

- Be sure to ground the product to prevent electric shocks.
- When connecting a cable to the equipment, be sure to use a cable gland (CG-15).
- For all hexagon socket bolts, use the bolts specified by New Cosmos. Not using the specified bolts will result in a loss of explosion-proof performance.
- The bolts used for the pressure-tight enclosure must have a yield point of 450 N/mm² or higher.
- Never open the cover while power is being supplied. Be sure to check that the power supply is turned off before performing the wiring and other installation work. There is a risk of electric shock or damage to the equipment.
- All necessary work for this product including wiring and installation should be carried out by suitably trained personnel in accordance with applicable code of practice.
- Any explosion proof work should be carried out by suitably trained personnel in accordance with applicable code of practice.

CAUTION

- Do not install the product in places or near places where silicone sealant or gas is used. Otherwise, the performance of the product may be adversely affected.
- Be sure to provide a protection cover (optional) if the product is installed outdoors.
- To ensure safety, use the product within the ranges of the specifications.
- Use the product in accordance with applicable laws and regulations.
- Do not use devices that emit radio waves, such as a high-power transceiver, radio, or mobile phone, near (within 30 cm of) this product.
- The inspection of alarm-related circuits at least once a month and the inspection of detection and alarm functions at least once a year are stipulated in the exemplified standards related to the liquefied petroleum gas safety regulations and the exemplified standards related to the general high-pressure gas safety regulations.

Information related to explosion protection

Check the following information related to explosion protection before using this product.

Conditions of Use for Explosion Protection

Electrical specifications

- Maximum ratings: (Detector) 1.5 to 2.5 VDC, 0.15 A
(Pump) 18 to 30 VDC, 0.25 A
- Maximum flow rate: 2.2 L/min

Explosion-proof class: Ex db IIB+H₂ T4 Gb

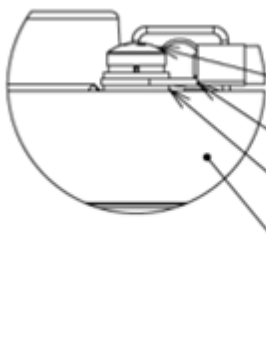
Ambient temperature: -10°C to +50°C

Standards: JNIO SH-TR-46-1:2020
JNIO SH-TR-46-2:2018

Certificate No.: CML 21JPN11247

Conditions of use

- When connecting a cable to the equipment, be sure to use the cable gland specified by New Cosmos.
- The bolts used for the pressure-tight enclosure must have a yield point of 450 N/mm² or higher.
- Do not open the cover while power is being supplied.
- When connecting an external ground terminal, place the terminal between flat washers as shown in the figure below. If the terminal comes into direct contact with the main unit, the explosion-proof performance will be lost.
- Use a cable with a conductor cross-sectional area of 4 mm² or greater for grounding the equipment.



Cross-recessed pan head machine screws with washers
(spring washer and flat washer)
Size: M4×8, material: stainless steel

Crimped terminal (minimum 4 mm²)

Flat washer

Nominal diameter: 4 mm, material: stainless steel

Casing

- Since the dimensions of the pressure-tight explosion-proof joints between the cover and bottom of the pressure-tight explosion-proof enclosure are smaller than the minimum requirements, please contact the manufacturer regarding inspection, repair, and/or adjustment of the pressure-tight explosion-proof joints.

3. Contents of Package

- The product is provided with the following items. Make sure that none of these items is missing.
- Although the product is packed and shipped with the utmost care, contact your New Cosmos representative if there should be any damage or missing items.

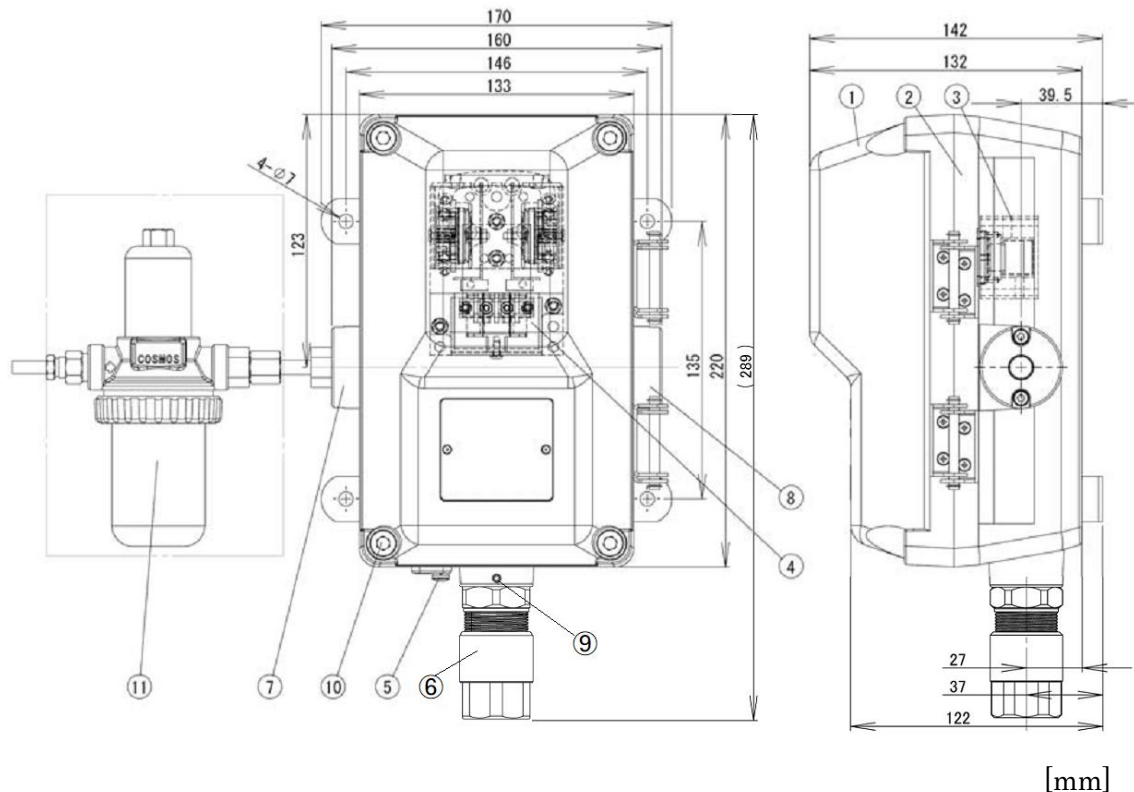
Accessory	Optional item
Detector head Cable gland (CG-15) (see note 1) Gas collector (PF-N3) (see note 2) Flow checker (FC-32) (see note 3) Attachment set (see note 4) (One packing each of diameter 11 to 12, 12 to 13, and 13 to 14 mm) (One washer (diameter 14 mm)) (Four M6 screws) (Two joints) Hexagon wrench (one each of nominal diameter 2 and 6 mm) (see note 5) Instruction manual (see note 4)	Protective cover (PW-41A) (see note 6) Auto drain (AD-40) (see note 7)

Note 1. This is attached to the detector head.

2. This is attached to the tip of the sampling hose and is used for draining rain water and splashed water. Do not use the collector when the sampling is made inside ducts, furnaces, equipment, or other closed containers.
3. Specifications of the flow checker FC-32 vary according to the requirement. Refer to the specification sheets for the details.
4. A pressure-tight-packing of diameter 14 to 15 mm and a washer of diameter 15 mm are built into the product as standard.
5. A pair of hexagon wrenches and an instruction manual are provided for each order.
6. It is used when the detector is installed outdoors.
7. The auto drain is designed to automatically discard the accumulated moisture from gas sampling hose from pits/furnaces.
8. The optional items are designed specifically for use with this product (PD-14 II).

4. External Dimensions and Part Names

4-1. Main Unit



Number	Name	Description
1	Casing cover	
2	Casing	
3	Sensor unit	Incorporates a gas sensor.
4	Pump unit	Draws sample gas and exhausts it.
5	Ground terminal	Used when grounding the frame.
6	Cable gland	Used for securing the cable. (Size: G 3/4)
7	Gas inlet	Inlet for sampled gas. (Size: Rc 1/4)
8	Gas outlet	Exhaust outlet for sampled gas. (Size: Rc 1/4)
9	Hexagon socket locking screw	Used for securing the cable gland with a hexagon wrench of nominal diameter 2 mm.
10	Hexagon socket bolt	Used for securing the casing cover with a hexagon wrench of nominal diameter 6 mm.
11	Flow checker FC-32	Used to check the flow rate and prevent dust and foreign matter from entering the equipment. (Size: Rc 1/4)



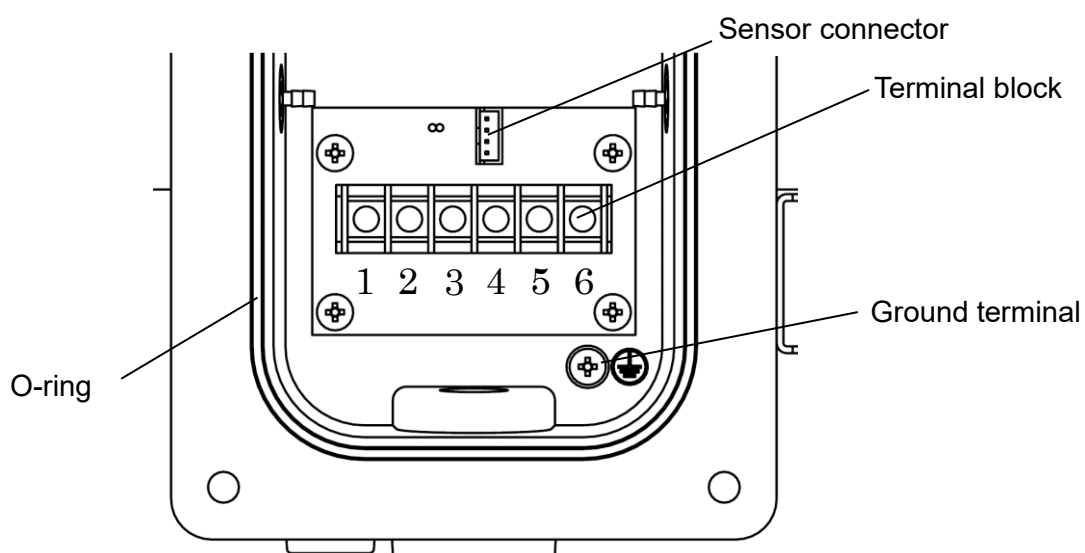
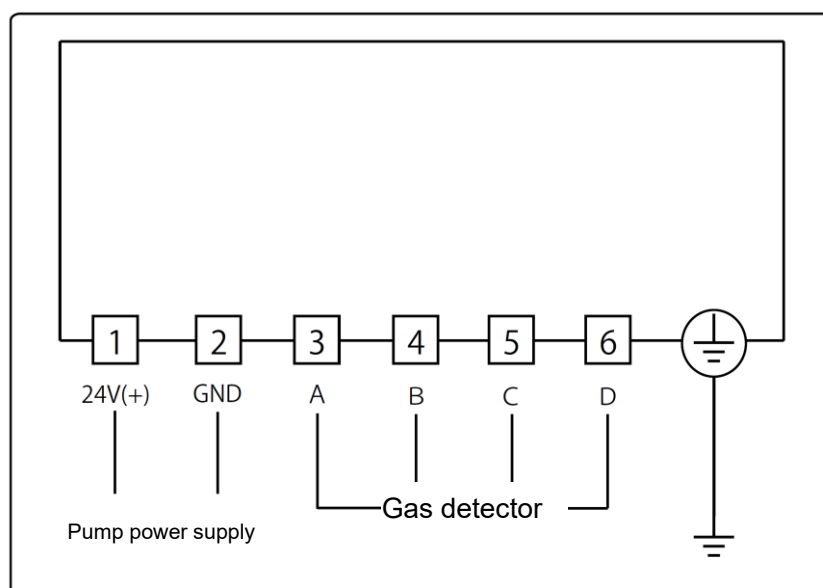
WARNING

- For all hexagon socket bolts, use the bolts specified by New Cosmos. Not using the specified bolts will result in a loss of explosion-proof performance.
- The bolts used for the pressure-tight enclosure must have a yield point of 450 N/mm² or higher.

4-2. Terminal Block Connection Part Names

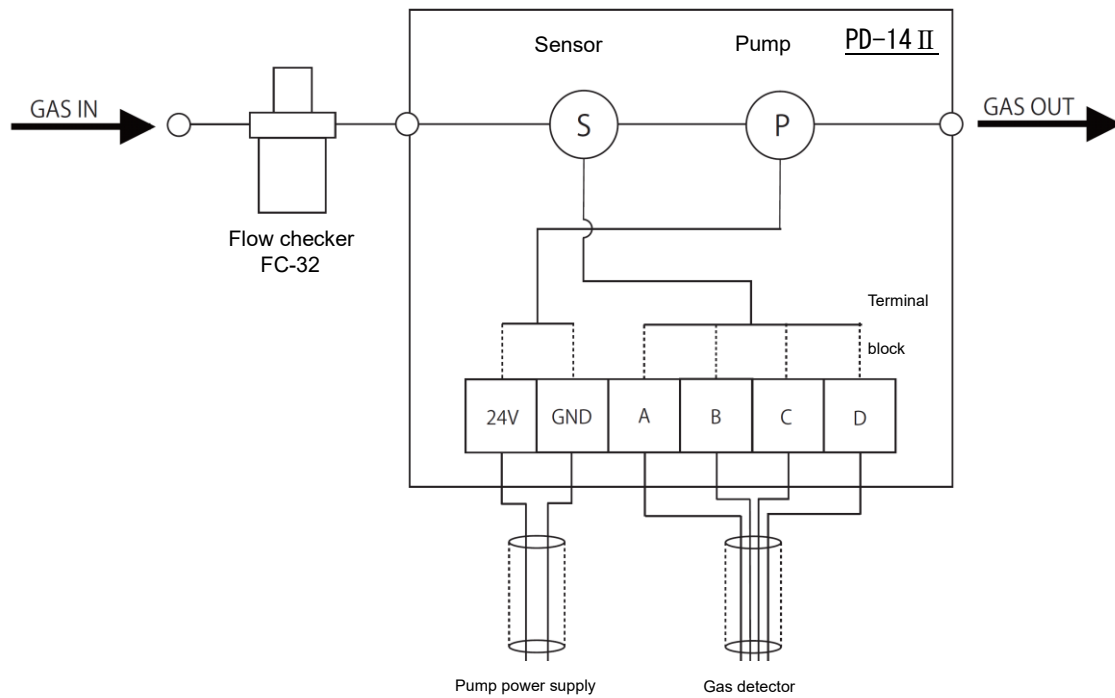
[DC power supply specifications]

Terminal block



Number	Name	Description
1	24 V (+)	Pump power supply PA (+)
2	GND	Pump power supply PB (-)
3	A	Gas detector
4	B	
5	C	
6	D	
	Ground terminal	Used to ground the frame

4-3. Flow Diagram



Main components and functions

- 1) Sensor : Converts gas concentration detected to an electrical signal. Depending on the specifications, this product is equipped with either a hot-wire semiconductor sensor or a catalytic combustion sensor.
- 2) Pump : Draws the sample gas through sampling pipe from the detection point.
- 3) Terminal block : Terminal block for external connection.
Refer to 6. Wiring Method for details.

5. Installation

5-1. Installation Method



WARNING

- Be careful not to damage the gas detector when installing. Otherwise, the explosion-proof performance of the gas detector will be lost.
- Do not damage the mating surface of the main unit. If the mating surface is damaged, the explosion-proof performance may be lost.
- Do not open the cover while power is being supplied.
- Be sure to ground the product to prevent electric shocks.



CAUTION

- Use appropriate piping material considering type of gas to be detected.
- As a guideline, the piping length should be no more than 20 m. Pay attention that the response time of the detector shall be delayed when the length of the piping is longer due to transport time of sampled gas. And the length of the piping should be as short as possible when the target gas is readily adsorbed.
- Do not install the product in the following places.
 - Places where the ambient temperature exceeds the operating temperature range (-10°C to 50°C)
 - Places where condensation occurs or water is directly sprayed
 - Places subject to corrosive gas
 - Places exposed to direct sunlight
 - Places subject to vibrations or impacts
 - Places close to equipment that generates high frequencies or a magnetic field
 - Places where silicone sealant is used or likely to be used
 - Places where silicone gas is used or likely to be used
- Do not install the gas detector and gas inlet (tip of pipe) in places where vapor containing a silicone compound is present. The gas sensor may be adversely affected.
- Install the gas detector in places where it can be maintained and inspected with ease.
- Install the gas detector in places free from vibration.
- Install the gas detector in places free from sudden temperature changes.
- Keep the gas detector free from impacts.
- When installing the gas detector outdoors, be sure to install the protective cover (optional).
- Install auto drain (option) when the gas is sampled near the outlet of steam or where likely to suck the water.
- The pressure of gas inlet port should be plus or minus 1 kPa.
- The pressure of outlet port should be 1 kPa or less.

5-1. Installation Method (Continued)

- 1) Locate the tip of gas sampling pipe to be appropriate for the specific gravity of gas to be detected.

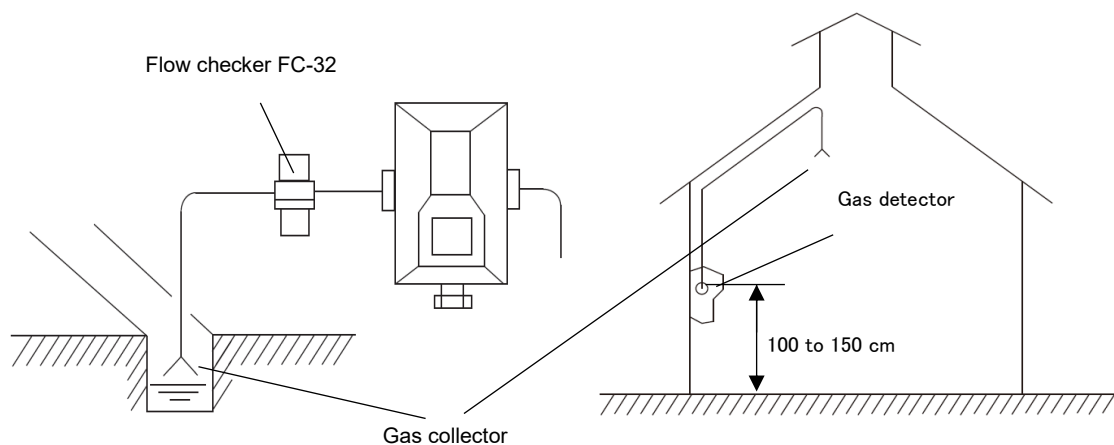
It must also be placed in a location where the target gases are likely to accumulate. Refer to the following and then install the gas inlet (tip of pipe) in accordance with the applicable laws and regulations.

Type of gas	Installing height	Remarks
Gas heavier than air (example: LPG)	A maximum of 10 cm above the floor (Height to the bottom of the gas inlet)	Keep a space for maintenance and inspection.
Gas nearly equal to air (example: carbon monoxide)	75 to 150 cm above the floor (Height to the bottom of the gas inlet)	Decide the height by considering the specific gravity and mounting environment.
Gas lighter than air (example: hydrogen)	Near the ceiling	Decide the height by considering arrangements for maintenance.

- 2) Places to install the gas detector

Install the gas detector in places where it can be maintained and inspected with ease. Following are locations where leaked gas may accumulate and appropriate locations for installation of gas detectors.

- Examples of installation places



Example of detection in pipe and pit

Example of detection at high altitude



CAUTION

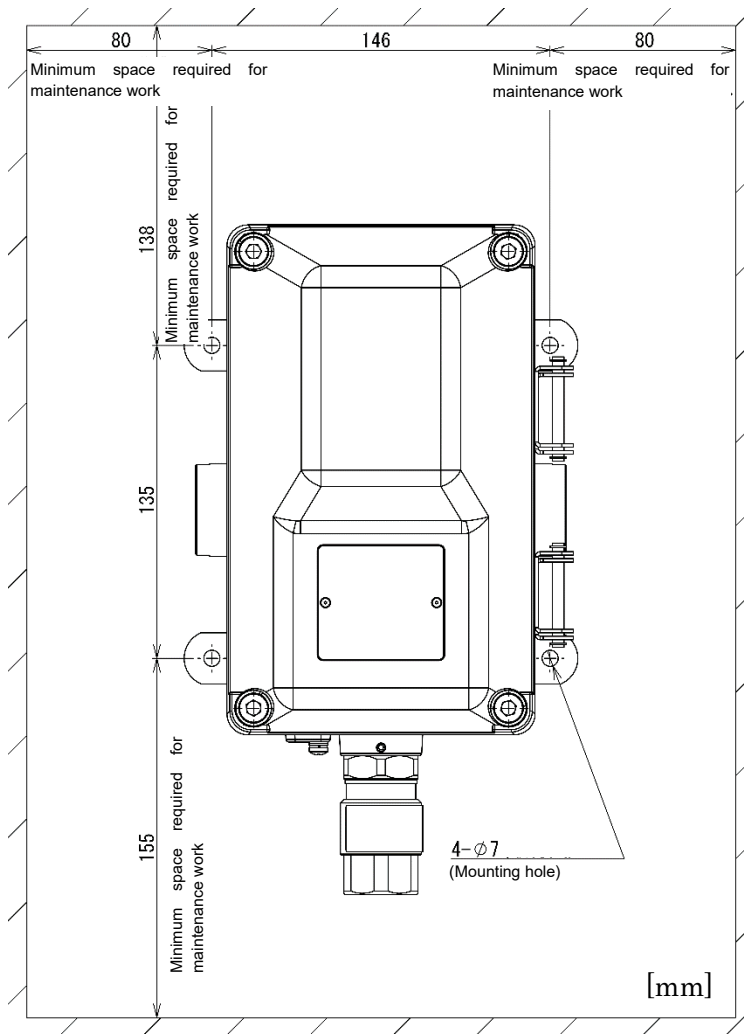
- Place the gas collector above the water level.

5-1. Installation Method (Continued)

3) Installing the main unit

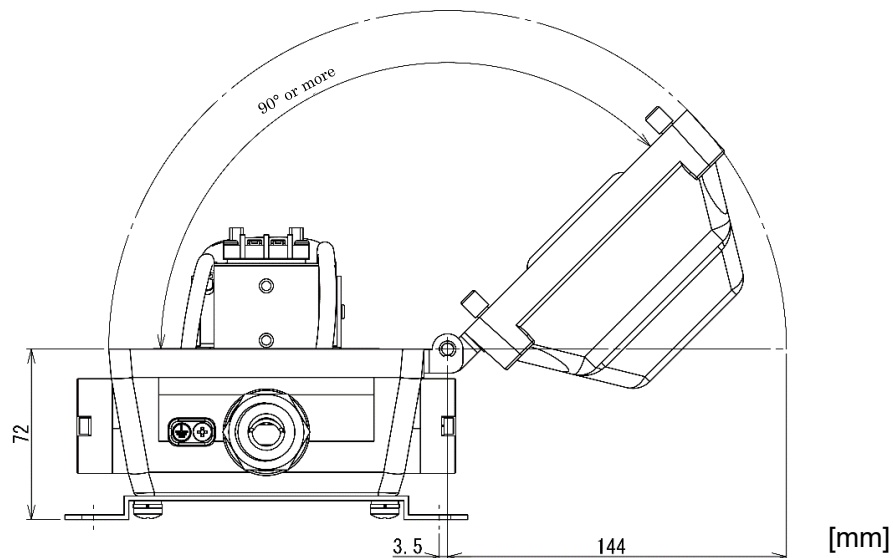
Install the main unit by fixing it to a wall or other surface with the supplied M6 screws. It is necessary to open the casing cover at the time of wiring and replacing sensor. Install the gas detector in places where the cover opening angle can be more than 90 degrees. Be sure to install the protective cover (optional) when mounting the main unit outdoors.

(For details on the optional items, refer to 5-2. *Mounting of Optional Items* on page 12.)



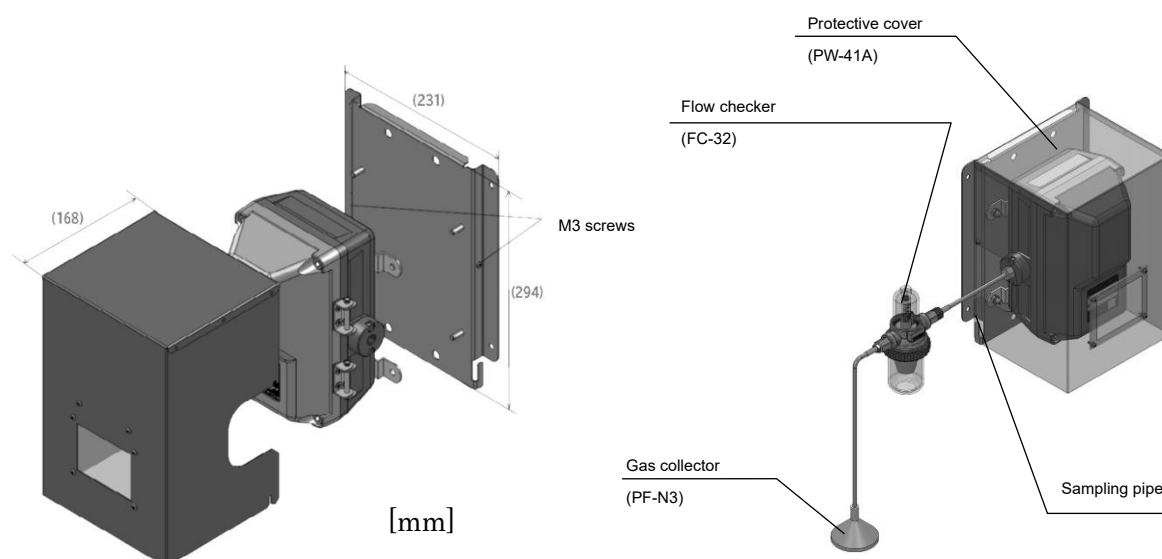
CAUTION

- The minimum space required for maintenance work does not include the minimum bending radius of the cable and gas pipe. Ensure the necessary space according to the specifications and routing of the cables and piping to be used.



5-2. Mounting of Optional Items

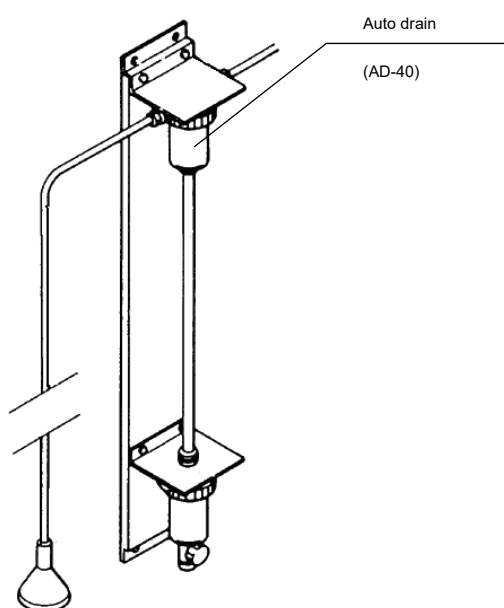
- Protective cover



CAUTION

- Secure the protective cover with M3 screws if strong winds are expected.

- Auto drain



6. Wiring Method

6-1. Wiring Work

- Be sure to provide explosion-proof wiring if the product is used in hazardous places.
- Read this section together with the manual for the cable gland (CG-15).



WARNING

- All necessary work for the product including wiring and installation should be carried out by suitably trained personnel in accordance with applicable code of practice.

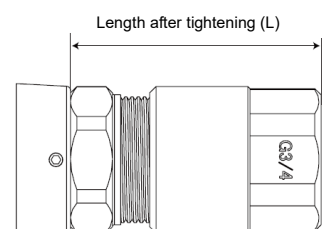
Cable work

- Use shielded cables, such as CVV-S (1.25 to 2.00 mm²), and install the cables inside protective conduits such as steel electrical conduits or carbon steel pipes for piping or in the protective structure of metal or concrete ducts as needed to protect against external damage.
- When using the pressure-tight packing lead-in method, use a cable with a finished outer diameter matching the inner diameter of the packing (refer to the table below). To prevent the spread of explosive gas or fire, sufficiently and securely tighten the cable gland with a hexagon wrench or similar tool so that it falls within the range of the length after tightening given in the table below.
- It is recommended not to connect two cables together. If it is unavoidable, however, connect them or branch them within the explosion-proof casing of main unit.

Cable outer dia.	Mark on packing	Washer	Length after tightening (L) (mm)	Accessory
		Inner dia.		Optional item
10 to 11	10 to 11 mm	12	55.1 (cable diameter 10) to 58.1 (cable diameter 11)	Optional item
11 to 12	11 to 12 mm	14	55.0 (cable diameter 11) to 58.1 (cable diameter 12)	Accessory
12 to 13	12 to 13 mm	14	54.8 (cable diameter 12) to 58.0 (cable diameter 13)	
13 to 14	13 to 14 mm	15	54.5 (cable diameter 13) to 58.0 (cable diameter 14)	
14 to 15	14 to 15 mm	15	54.3 (cable diameter 14) to 57.9 (cable diameter 15)	Built-in accessory

* A packing of diameter 14 to 15 mm and washer of diameter 15 mm to support a cable of outer diameter 14 to 15 mm are built into the standard model.

One packing each of diameter 11 to 12, 12 to 13, and 13 to 14 mm and one washer of diameter 14 mm are provided with the standard model to support a cable of outer diameter 11 to 14 mm.



6-2. Wiring and Connection



WARNING

- Before opening the casing cover of the gas detector, be sure to turn off the product and all devices (e.g. indicator unit and signal converter) connected to the product. If power is supplied, it may become a source of ignition or cause electric shock.
- When connecting a cable to the equipment, be sure to use a cable gland (CG-15).
- Be sure to ground the product to prevent electric shocks.
- Do not damage the mating surface of the main unit. If the mating surface is damaged, the explosion-proof performance may be lost.



CAUTION

- Wire the connecting terminals correctly.
- Separate connection cables from other power lines as far as possible.

Connecting power supply and signal wires

1) Connecting power supply

Provide dedicated breakers, if needed, to lines that are connected to peripheral devices, such as indicator units and signal converters.

2) Connecting between indicator unit and gas detector

Use an appropriate cable for the installation site, such as 600 V vinyl insulated wire (IV), VCT, or CVV-S (1.25 to 2.00 mm²).

MEMO

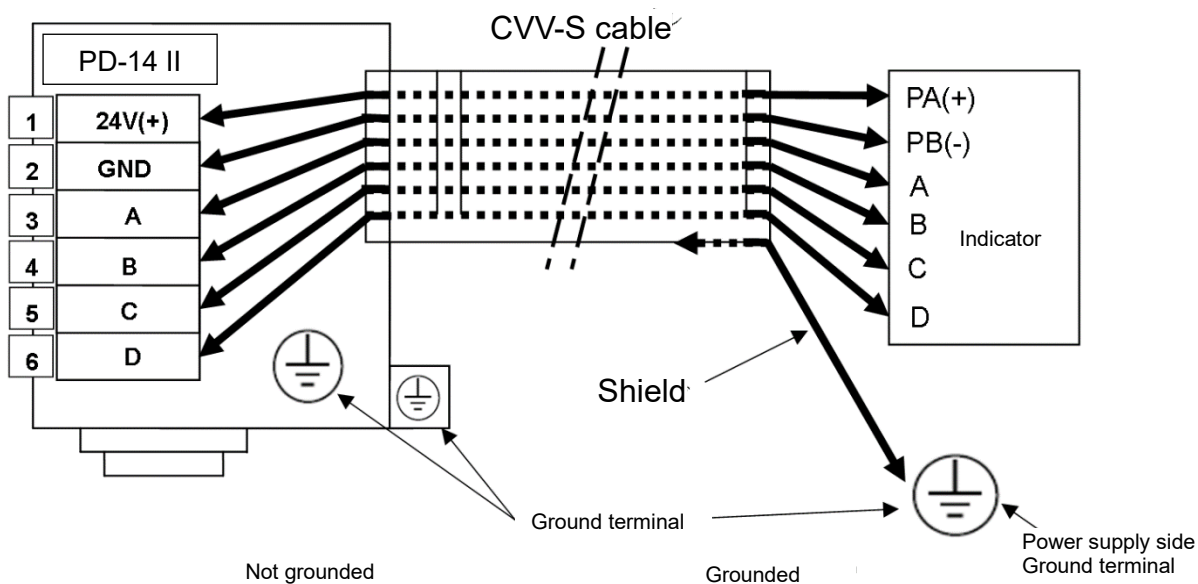
- The one-way line resistance of the wiring should be 10 ohms or less. The following are the examples.
 - 1.25 mm² wire: within 600 meter
 - 2.00 mm² wire: within 1 kilometer

6-2. Wiring and Connection (Continued)

MEMO • If the main unit is grounded on the power supply side, do not connect a shielded cable to the ground terminal (⊥) in the gas detector, or otherwise two-point grounding will result.

[Example of connecting equipment when grounding on power supply side]

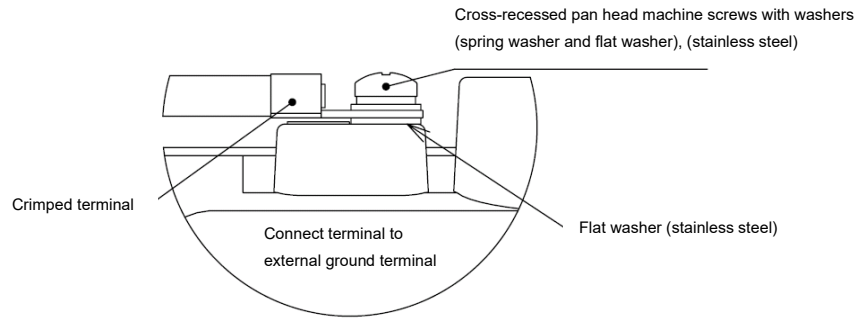
[When connecting to DC power supply]



· Refer to the Instruction Manual on each device for details.

6-2. Wiring and Connection (Continued)

Example of connecting external ground terminal



Example of connecting external ground terminal



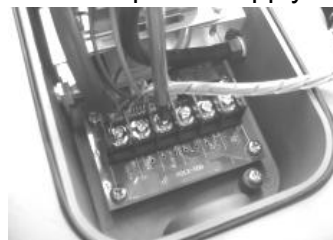
WARNING

- When connecting an external ground terminal, place the terminal between flat washers in the same way as the connection example and make sure that the terminal will not directly touch the main unit. If the terminal comes into direct contact with the main unit, the explosion-proof performance will be lost.
- Use a cable with a conductor cross-sectional area of 4 mm² or greater for grounding the equipment.

Example of connection procedure

[When connecting to DC power supply]

- 1) Prepare a power supply which can provide 24 VDC.
(Do not turn on the power supply before wiring the main unit.)
- 2) Loosen the hexagon socket bolts on the four corners of the equipment with the provided hexagon wrench of nominal diameter 6 mm, and open the casing cover.
- 3) Loosen the screw of the cable gland and pass the cables through it.
- 4) Remove the screws on the terminal block.
- 5) Connect the positive electrode of power supply to 24 V + terminal.
- 6) Connect the negative electrode of power supply to GND terminal.



- 7) Check the power supply cords are securely connected to terminals to complete the preparation of power supply.
- 8) Wire the sensor output terminals.
- 9) Tighten the hexagon socket bolts on four corners of the equipment with the hexagon wrench of nominal diameter 6 mm, and close the casing cover.

MEMO

- When closing the casing cover, make sure not to catch the power supply cord, harness, or O-ring in the casing cover.

7. Precautions before Use



CAUTION

- Before turning ON any devices (e.g., indicator unit, signal converter) connected to the product, double check all the connections are correct. Make sure that the gas detector and indicator unit or signal converter, in particular, are properly connected.

• In Case of Gas Leakage



DANGER

- Without panicking, check that there is no fire around the product. Do not touch any electric switches under any conditions. Sparks from turning electric switches ON or OFF may cause ignition.
- If there is a gas leak alarm, take the necessary measures specified by your company.
- If a gas leak occurs indoors, open the windows and doors to ventilate the room.
- Check the gas leakage location and promptly take the necessary measures.

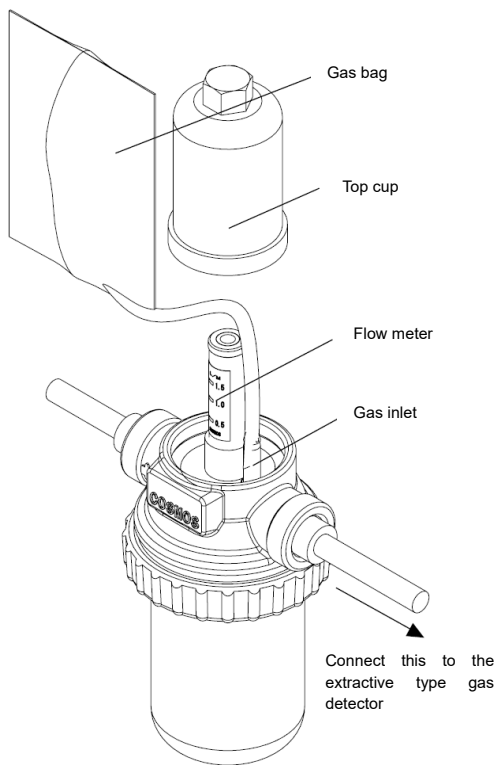
8. Maintenance Check and Operation Method

8-1. Daily Inspection and Periodical Inspection

· Daily inspections are conducted by the user, while periodical inspections are conducted by your local representative.

	Frequency	Checking item	Contents of inspection
Daily inspection	At least once a month	Visual inspection	· Corrosion of the gas detector · Corrosion of mounting screws If a failure is found, replace the parts. · Flow rate Check the flow rate by reading the scale on flow checker FC-32. The normal flow rate is 0.5 L/min or higher. If the flow rate is decreased, check the following possible causes. After performing the check, clean or replace the parts. If there is no improvement in the flow rate by replacing filters, replace suction pump after checking sampling tip and pipe. · Clogging of sampling tip/gas collector · Clogging of sampling pipe · Clogging of filter

8-1. Daily Inspection and Periodical Inspection (Continued)

	Frequency	Checking item	Contents of inspection
Daily inspection	At least once every 2 to 3 months	Alarm operation check with real gas	· Apply inspection gas to the gas detector and check the alarm activation. · Remove the top cup of flow checker FC-32 and connect to a gas bag as below, and apply inspection gas. 
Periodical inspection	At least once a year	Consult your local representative.	

Periodical Inspections

In order to maintain the reliability of the gas detection/alarm system, it is extremely important to conduct maintenance and inspections.

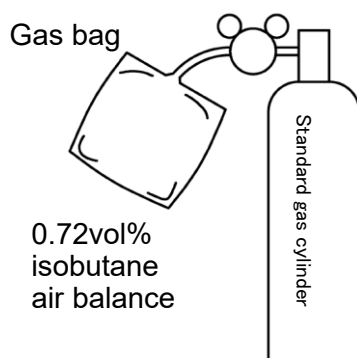
Moreover, it is necessary to use actual gas (combustible gas or toxic gas), to carefully conduct inspection and calibration. It is highly recommended that you consider periodical inspections under a maintenance contract with your local representative.

8-2. Preparing Calibration Gas

- Calibration gas is used for actual gas inspection.
- The following example shows how to prepare a standard gas of 0.72vol% (40%LEL) isobutane.

With standard gas cylinder

- Fill a gas bag with standard gas as shown in the figure below. However, sufficiently evacuate the air before filling it with gas because air remaining in the gas bag will cause an error.



MEMO

- Use urethane gas bag. Leave for about 30 minutes after filling gas to bring humidity in gas bag close to the ambient condition before use.

8-2. Preparing Calibration Gas (Continued)

Without standard gas cylinder

- Use Gas Calibration Kit (optional item) and pure gas cylinder (isobutane 99 vol% or more). Dilute isobutane with air to produce calibration gas of 0.72 vol% (40%LEL).

MEMO

- This calibration gas can be used to check the alarm function. Check the concentration by Gas Detector XP-3310 II or a similar device before using for calibration.

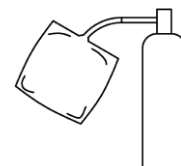


DANGER

- Make sure that there are no ignition sources nearby when handling combustible gas.

- 1) Connect gas bag to pure gas cylinder and fill with gas slightly more than necessary.

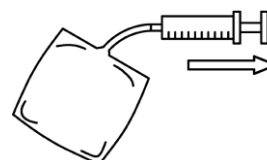
Bend back the hose and clamp by pinchcock to prevent the gas from leaking.



1) Pure gas cylinder
(Keep it upright)

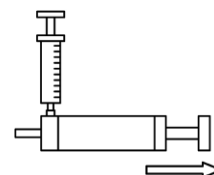
- 2) Connect 10 mL syringe to gas bag and take 7.2 mL of raw gas.
(Take the gas slightly more than necessary and then carefully discharge the excess gas.)

- 2) Take 7.2 mL of raw gas

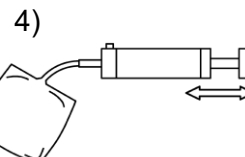


- 3) Connect syringe to the inlet of quantitative pump, and pull the piston to fill pump with raw gas in the syringe.
Then, remove the syringe and pull the piston all the way out (100 mL).

- 3) Quantitative pump



- 4) Connect empty gas bag to the outlet of the quantitative pump and push the piston of the quantitative pump.
Move the piston back and forth for 9 times to add air and make dilute gas.



Gas bag with diluted gas

If you take 7.2 mL of raw gas and move the quantitative pump's piston back and forth 10 times (one back-and-forth motion: 100 mL), the result will be 0.72vol%, so a diluted gas with a 40% lower explosive limit (LEL) will have been prepared ($0.72 / 1.8 * 100 = 40$ since the LEL of isobutane is 1.8 vol%).

8-3. Replacement of Sensor Unit



WARNING

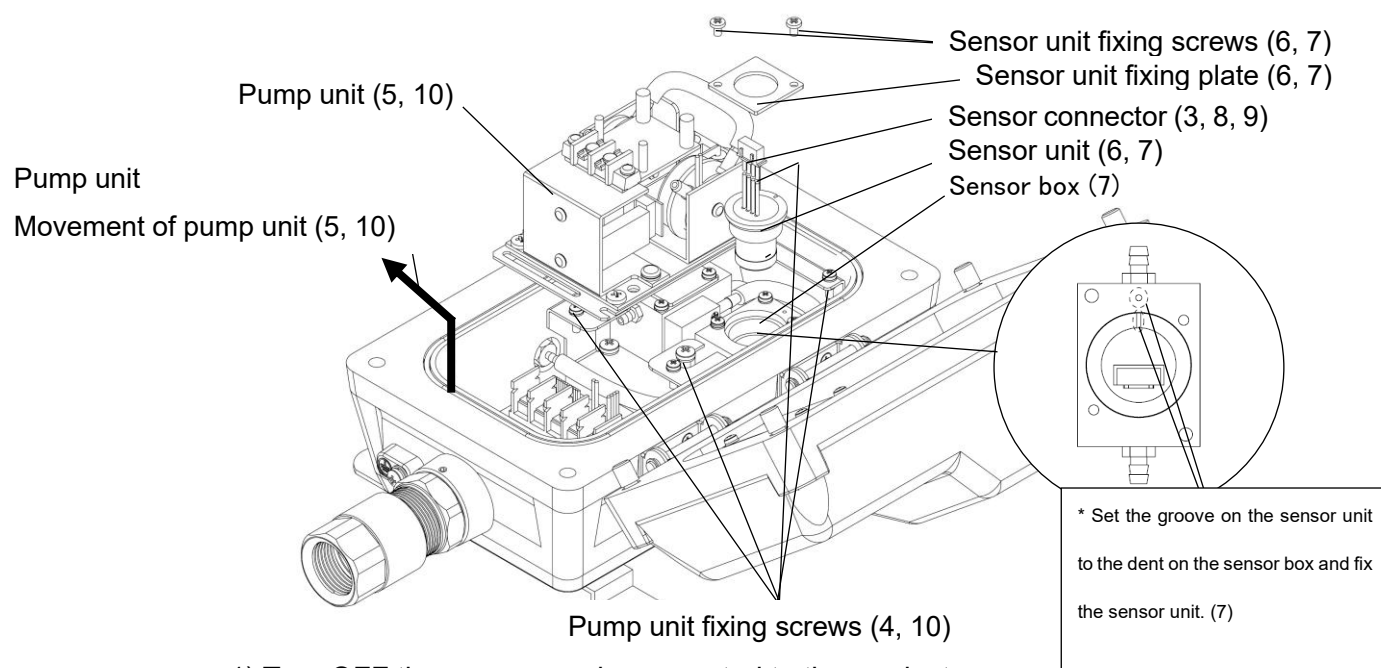
- Be sure to turn OFF the indicator unit or signal converter before replacing a sensor unit. The electric power may become a source of ignition.
- Do not damage the mating surface of the main unit when sliding the pump unit. If the mating surface is damaged, the explosion-proof performance may be lost.



CAUTION

- Depending on the sensor type, the setting data of the detector may need to be rewritten. Only your local representative's maintenance service members or personnel who have completed a maintenance seminar can replace the sensor unit.
- Be sure to handle the sensor unit with care. Do not drop or throw the sensor unit. Otherwise, the sensor wire may be disconnected or the sensor unit may be damaged.
- If the external contact function is used while the sensor has not stabilized when replacing the sensor unit, the contact may operate. Release the interlock of the external equipment if necessary.
- When removing and mounting the sensor unit, do not twist the harness of sensor connector.
- When closing the casing cover, make sure not to catch the power supply cord, harness, or O-ring in the casing cover.
- When replacing the sensor unit, make sure that the wiring and piping are not disconnected, loosened, or damaged.

8-3. Replacement of Sensor Unit (Continued)



- 1) Turn OFF the power supply connected to the product.
- 2) Loosen the hexagon socket bolts on the four corners of the equipment with the provided hexagon wrench of nominal diameter 6 mm, and open the cover. (Refer to 4-1. *Main Unit.*)
- 3) Disconnect the sensor connector.
- 4) Loosen four fixing screws of pump unit.
- 5) Pull the pump unit up and slide to left.
- 6) Remove two sensor fixing screws and remove the fixing plate and sensor unit.
- 7) Fit a new sensor unit and fix the sensor unit fixing plate, then tighten the screws.
* Set the groove on the sensor unit to the dent on the sensor box and fix the sensor unit.
- 8) Connect the sensor connector securely.
- 9) Check that the sensor connector is connected securely.
- 10) Return the pump unit to its original position and tighten four screws.
- 11) Tighten the hexagon socket bolts on the four corners of the equipment with the hexagon wrench of nominal diameter 6 mm, and close the cover.
(Refer to 4-1. *Main Unit.*) (Tightening torque: 3 N · m)
- 12) Turn ON the power supply connected to the product.
- 13) After replacing the sensor unit, it is necessary to perform zero adjustment and span adjustment again, after applying power for about one week to stabilize the sensor output.
- 14) Be sure to perform gas concentration adjustment in the order of first zero adjustment then span adjustment.

MEMO

- The pump unit can be moved without removing its screws and tubes.
- Return the used sensor unit to your local representative.
- After replacing the sensor unit, it is necessary to perform zero adjustment and span adjustment again, after applying power for about one week to stabilize the sensor output.

8-4. Replacement of Pump Unit



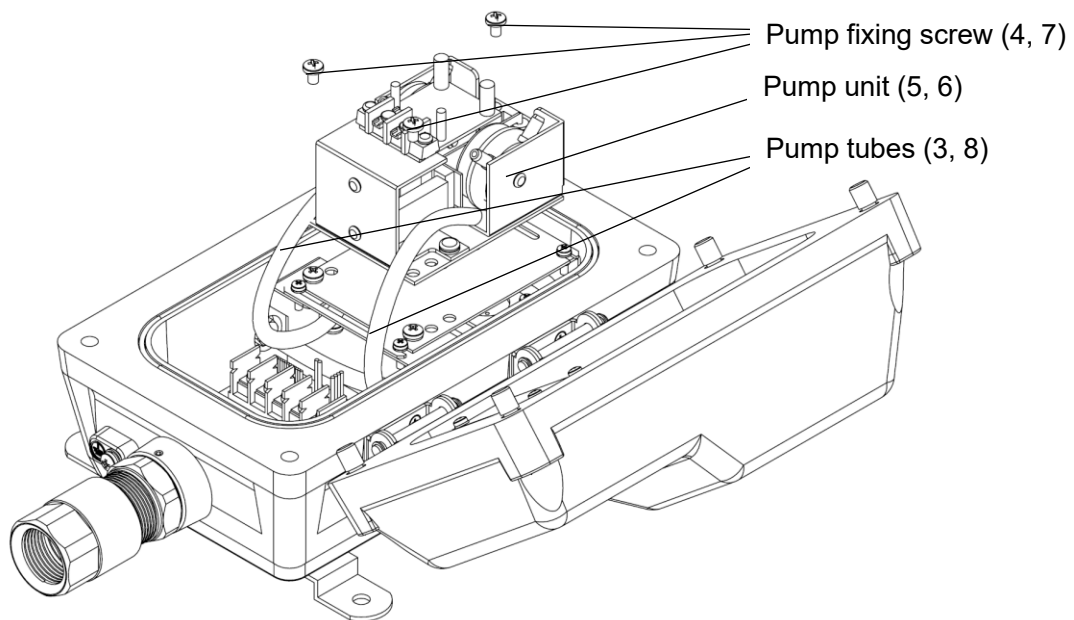
WARNING

- Be sure to turn OFF the indicator unit or signal converter before replacing a pump unit. The electric power may become a source of ignition.
- Do not damage the mating surface of the main unit when replacing the pump unit. If the mating surface is damaged, the explosion-proof performance may be lost.



CAUTION

- After replacing the pump unit, make sure that all of the wiring and piping connections are firmly connected.



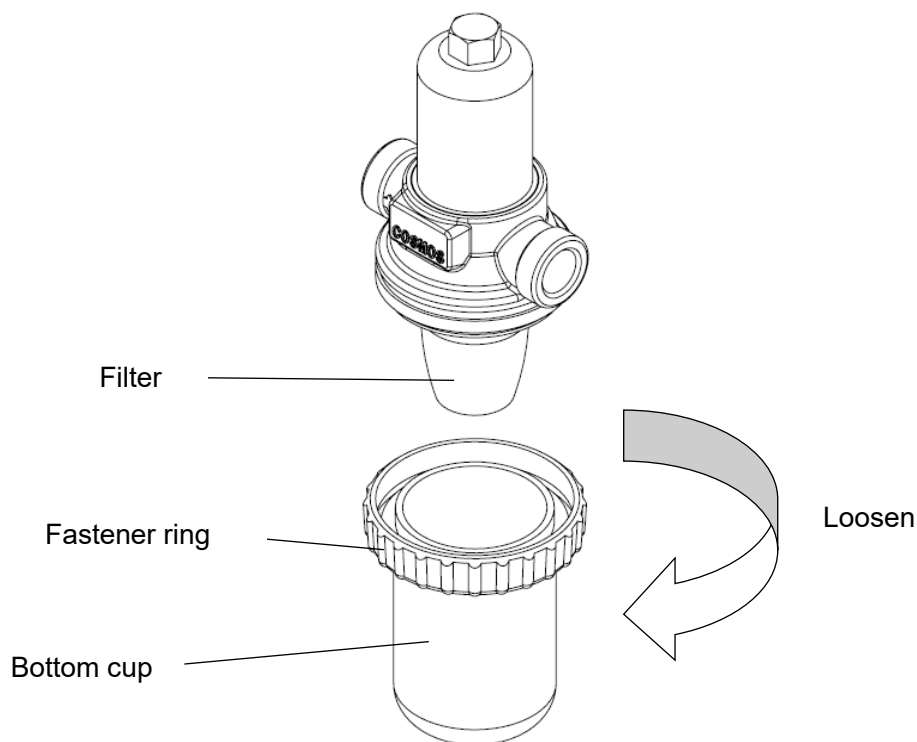
- 1) Turn OFF the power supply connected to the product.
- 2) Loosen the hexagon socket bolts on the four corners of the equipment with the provided hexagon wrench of nominal diameter 6 mm, and open the cover. (Refer to 4-1. *Main Unit*.)
- 3) Disconnect two pump tubes connected to the pump unit.
- 4) Loosen three fixing screws of pump unit.
- 5) Remove the pump unit.
- 6) Attach the new pump unit.
- 7) Secure the pump unit with three screws.
- 8) Attach two pump tubes at the front of the pump unit.
- 9) Tighten the hexagon socket bolts on the four corners with the hexagon wrench of nominal diameter 6 mm, and close the casing cover. (Refer to 4-1. *Main Unit*.) (Tightening torque: 3 N · m)
- 10) Turn ON the power supply connected to the detector.
- 11) Read the flow rate of flow checker FC-32.
The normal flow rate is 0.5 L/min or higher.

8-5. Replacement of Filter for Flow Checker (FC-32)

- If the flow rate returns to normal value (0.5 L/min or higher) by removing the bottom filter of flow checker FC-32, the filter is possibly being clogged.

Please replace the filter when necessary according to the procedure described below.

- 1) Loosen the fastener ring of flow checker to remove the bottom cup.
- 2) Pull the filter downward to remove.
- 3) Replace the filter with a new one and fix the bottom cup back on.
- 4) Confirm the flow rate is normal value (0.5 L/min or higher).



9. Specifications

9-1. Product Specifications

Model	PD-14 II A-D	PD-14 II B-D
Detection principle	Hot wire semiconductor	Catalytic combustion
Sampling method	Extractive	
Target gas	Depends on the specifications	
Detection range	Depends on the specifications	
Suction flow rate	0.5 L/min or higher	
Explosion-proof class	Ex db IIB+H ₂ T4 Gb	
Degree of protection	IP65	
Applicable cable	· Cable outer diameter: 11 to 15 mm 6-core cable (for power supply, sensor power, sensor output) CVV-S 1.25 mm ² or 2.0 mm ² * Interconnection resistance should be 10 ohms or less	
Operating temperature and humidity	· Temperature: -10°C to +50°C · Humidity: 10%RH to 90%RH (0°C to +50°C) No radical temperature or humidity changes and no condensation	
Power supply	24 VDC ± 10%	
Power consumption	4.5 W max.	
Dimensions	133 (W) x 289 (H) x 132 (D) mm (excluding protrusions)	
Weight	Approx. 6.0 kg (including cable gland)	
Mounting method	Wall mount	

The above specifications are subject to change without notice.

If the specifications of your model are nonstandard, refer to the delivery specifications.

9-2. Explosion Proof Specifications

Certificate No.	CML 21JPN11247
Explosion-proof class	Ex db IIB+H ₂ T4 Gb
Standards	JPEX: JNIO SH-TR-46-1:2020 JPEX: JNIO SH-TR-46-2:2018
Ambient temperature	-10°C to +50°C
Electrical specifications	Ratings: (Detector) 1.5 to 2.5 VDC, 0.15 A (Pump) 24 VDC (18 to 30 VDC), 0.2 A

The numerical values of the electrical specifications in this section are the maximum values permitted for explosion-proof use.

They may differ from the actual product specifications.

10. Warranty

Thank you for purchasing this New Cosmos product. In the event of a malfunction occurring under normal operating conditions during the warranty period, the warranty shall apply in accordance with the terms described below.

10-1. Scope of Warranty

The warranty period of this product is one year from the date of purchase.

If the product fails during the warranty period despite having been installed and used normally in accordance with the manual and specifications, New Cosmos will repair it in accordance with the terms stated in the warranty. Refer to the warranty for details.

10-2. Warranty Exclusions

New Cosmos assumes no warranty obligations whatsoever if this product is used in a manner not in line with its intended purpose, or if the instructions contained in this manual are not observed when this product is used.

11. Life Expectancy

· The design life expectancy under the normal environmental conditions of this product is approximately 10 years from the date of purchase.

The design life expectancy after the warranty period expires is a rough estimate made under the condition that the product is used with the specified gas calibration performed, and does not constitute a guarantee. Even if calibration is performed, the product may become inoperable before the next calibration.

· The sensor life under normal environmental conditions is the period from the date of purchase indicated in the table below. A sensor that has exceeded its life may not be able to detect correctly, so replace the sensor using the corresponding sensor life as a rough estimate.

Note that the sensor life is a rough estimate for when the sensor has not been exposed to a high-concentration gas or toxic gases and when proper maintenance has been performed, and does not constitute a guarantee.

Corresponding sensor type	Detection principle	Sensor life
PD-14 II A-D	Hot wire semiconductor	Approx. 5 years
PD-14 II B-D	Catalytic combustion	Approx. 3 years

12. Detection Principle

12-1. Catalytic Combustion

Catalytic combustion occurs on the catalyst even at gas concentrations below the lower explosive limit due to the action of catalyst coated on the platinum coil, and the resulting rise in temperature at this time increases the electrical resistance of the platinum coil.

This change is extracted as a deviation voltage using a bridge circuit.

This process enables the detection of combustible gas up to the lower explosive limit (LEL).

12-2. Hot Wire Semiconductor

· If a combustible gas or similar substance is present, an oxidation reaction with the oxygen adsorbed on the semiconductor surface occurs, increasing the number of free electrons within the semiconductor. As a result, the resistance of the semiconductor decreases.

This change in resistance is extracted as a deviation voltage from the bridge circuit, enabling the detection of the combustible gas or similar substance.

A feature of this sensor is its high gas sensitivity even at low concentrations, making it suitable for high-sensitivity detection.

13. Glossary

- Detector:** A unit that detects gas concentration and converts it to electric signals.
- Pressure-tight explosion-proof construction:** A fully enclosed structure constructed so that it can withstand the pressure from an explosion of explosive gas occurring inside of the enclosure without the risk of igniting any explosive gas outside of the enclosure.
- Gas to be detected:** The gas that is the target when detecting the gas concentration to indicate or to generate an alarm.
- Detection range:** Range of concentrations of the gas to be detected in which the gas concentration can be indicated and generate an alarm.
- Operating temperature and humidity ranges:** Ranges of temperatures and humidities in which the equipment can maintain its performance and functions during use.
- Maintenance and inspection:** Work performed to maintain the equipment in a condition in which it can fulfill its required functions.
- Calibration gas:** Gas used to calibrate the scale of the equipment.
- Hazardous location:** A location in a plant or other facility where an explosive gas in a quantity sufficient to cause an explosion or fire has mixed with air to form a hazardous atmosphere, or there is a risk of it doing so. It refers to what is commonly known as a gas/vapor hazardous location.
- Non-hazardous location:** A location where electrical equipment is installed and where it is deemed that there is no possibility of a hazardous atmosphere forming under both normal and abnormal conditions.
- Hazardous atmosphere:** Atmosphere within the explosive limit where explosive gas and air are mixed.
- LEL:** Lower Explosive Limit. The lowest concentration of flammable gas that will explode when mixed with air and ignited.

(Some of the above is excerpted from the glossary for gas detectors and alarms and the glossary for detector tube-type gas measuring instruments of Industrial Gas Detectors and Monitors Manufacturers Association and from "Recommended Practices for Explosion-Protected Electrical Installations in General Industries")

- If this manual is lost In the event that you lose this manual, contact your nearest New Cosmos branch office or sales office. A replacement can be sent to you for a fee.

Installation Contractors

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Representatives / Sales Offices

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