

Inline Oxygen Monitor PNA

■ Gas generator



C O N T E N T S

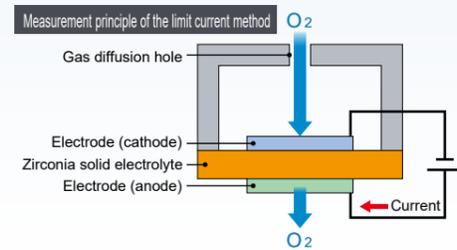
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Oxygen concentration under pressurization can be known.



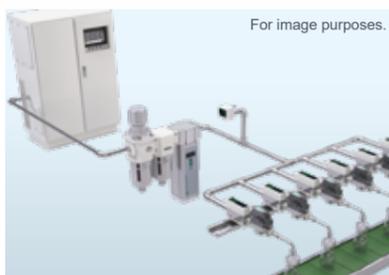
Limit current method

The PNA Series uses the limit current method. When voltage is applied to the zirconia element, an ion current flows with oxygen ions as carriers. When the oxygen concentration changes, the current characteristics change proportionally, enabling detection of the oxygen concentration. Durability and a long service life can be expected from this method.



Examples of applications

Terminal concentration check



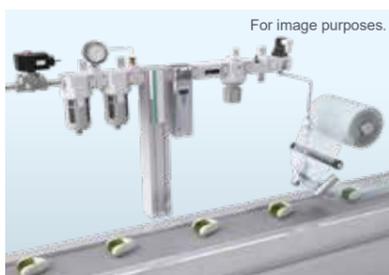
- Concentration check at start of work
- Normal concentration check
- Understanding maintenance timing

Gas concentration check in explosion-proof areas



- Concentration check at start of work
- Normal concentration check
- Alarm for hazardous concentrations

Nitrogen filling concentration check



- Concentration check when filling nitrogen
- Concentration setting

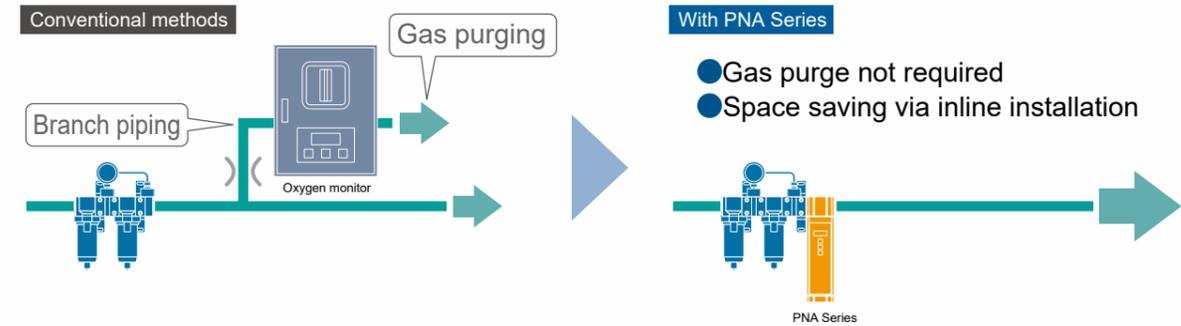
Checking gas for remaining oxygen removal



- Oxygen concentration check of removal gas
- Status monitoring

Saves energy, piping, and space

Realized pressure resistant structure for inline use. Modular structure saves piping space. Conventional gas purging is no longer necessary.



Easy to use

Oxygen/inert gas concentration display is switchable

With 100-oxygen concentration, the inert gas concentration is clear at a glance.

Upper/lower limit switch output setting and analog output are available

Alarms can be set for concentration changes, and status monitoring is possible.

With self-diagnostic function

Keeps you posted about abnormalities in the detector element.

Degree of protection IP65 or equivalent

Wet or dry, it still functions.

Pressure-resistant structure

Usable at pressures from atmospheric pressure through 1.0 MPa.



Oxygen concentration display



Inert gas concentration display

Compatible with FP Series for secure food manufacturing processes

For Safe and Secure Food Manufacturing Processes.

Food Sanitation Act
Compliant Materials
Wetted parts
resin/rubber



This logo represents our commitment to support food manufacturing processes with safe CKD products.

*Refer to catalog No.CC-1271AA for details.

CKD after-sales service

Calibration certificates (with traceability series variation diagram) can be issued.

The sensor of the oxygen monitor may deteriorate depending on the working conditions. Therefore, regular inspection and adjustment is required to maintain stable performance. To maintain performance longer, we recommend an annual inspection and adjustment service (with calibration certificate).



Inspection / Calibration / Repair Feel free to contact CKD for details.



Inline oxygen monitor

PNA Series

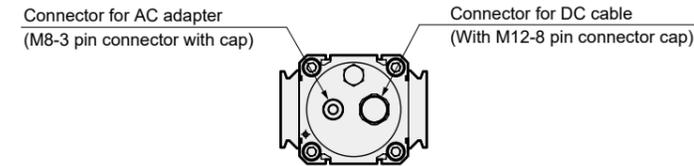
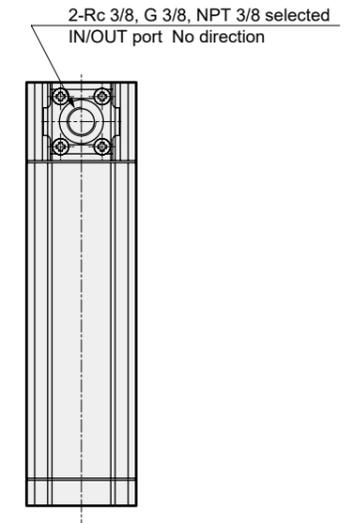
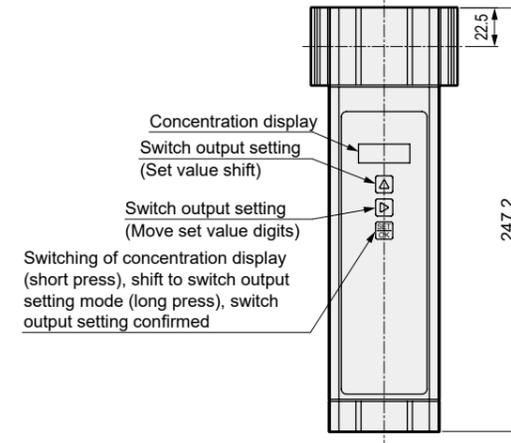
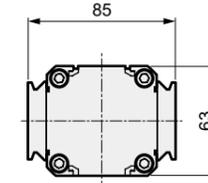
Purging not required due to the inline pressure resistant structure
A modular structure that can be connected to the Nitrogen Gas Extraction Unit NS Series and F.R unit



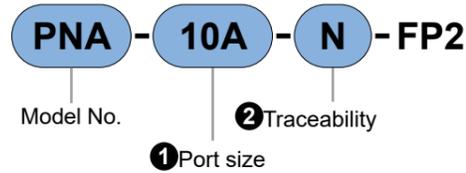
Refer to the CKD website for detailed compatible model Nos.

Dimensions

Do not disassemble



Model No. Notation



Note: Connector cable is not included.

① Port size

Code	Description
10A	Rc3/8
10B	G3/8
10C	NPT3/8

② Traceability

Code	Description
N	None
M	Traceability certification with series variation diagram and company certification

Connector Cable Standalone Model No.

● DC cable

● AC adapter single unit

● AC adapter + conversion plug set



① Cable length

Code	Description
1D	1000 mm
3D	3000 mm
5D	5000 mm

PNA-A

PNA-AG

For Dimensions diagrams, refer to P. 51.

Specifications

Item	PNA
Measuring method	Zirconia solid electrolyte method
Sampling method	Natural diffusion
Indicator	Can be switched between oxygen concentration display and nitrogen concentration display (100 - oxygen concentration)
Working fluid	Nitrogen-rich compressed air
Working pressure	MPa 0 to 1.0
Proof pressure	MPa 1.5
Ambient temperature, humidity	0 to 50°C, 80%RH or less (no condensation)
Fluid temperature	0 to 50°C (no condensation)
Storage ambient temperature, humidity	-10 to 60°C, 80%RH or less (no condensation)
Max. flow rate	L/min(ANR) 500 (*1)
Measured range	% O ₂ 0.00 to 25.00
Accuracy	±0.05% O ₂ ±1digit (For 0.00 to 1.00% O ₂)
	±0.10% O ₂ ±1digit (For 1.01 to 2.50% O ₂)
	±0.5% O ₂ ±1digit (For 2.51 to 10.00% O ₂)
	±1.0% O ₂ ±1digit (For 10.01 to 25.00% O ₂)
Response time	90% response within 20 seconds (*3)
Analog output	4 to 20 mA current output (for 0.00 to 25.00% O ₂)
Load resistance of analog output	0 to 400 Ω
Analog output accuracy	0.064 mA/0.1% O ₂
Switch Output	Setting value and detection element abnormality: 1 (relay output)
Switch output capacity	24 VDC, 1A (*4)
Power supply voltage	24 VDC ±15% (when AC adapter is used: 100 to 240 VAC)
Power consumption	10 W or less
Degree of Protection	IP 65 or equiv.
EMC Directive	EN61326-1
Weight	kg 1.6
Warmup time	Approx. 5 minutes after power ON (*5)

*1: For 500 L/min (ANR) or more, contact CKD.

*4: Switch output capacity is DC only. Cannot be used with AC.

*2: Value in dry gas composed of oxygen and nitrogen.

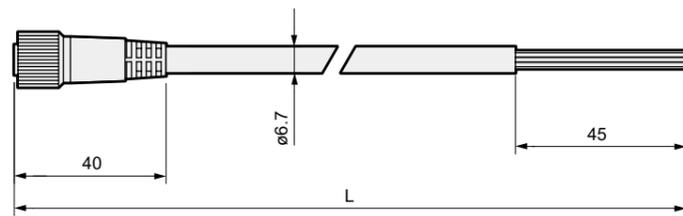
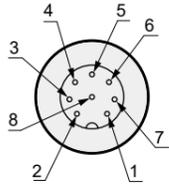
*5: Analog output and switch output are not output while warming up.

*3: The response time is a value at a flow rate of 5 L/min (ANR) and over.

Model No. notation of connector cable / Dimensions Note: The connector cable is sold separately from the main body.

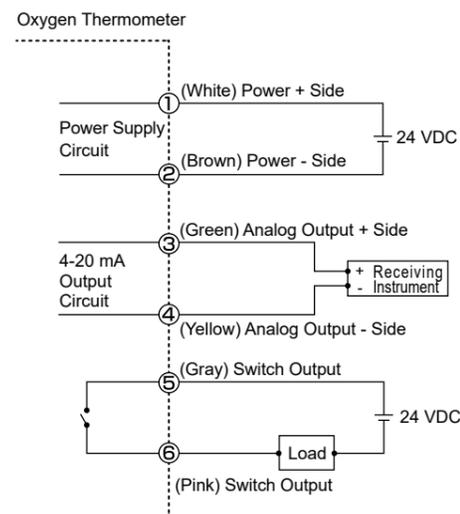
- DC cable
Use this cable when driving with a DC power supply or when using analog output or switch output.

Model No.	Dimension L
PNA-1D	1000
PNA-3D	3000
PNA-5D	5000



No.	Cable color	Description
1	White	Power supply +
2	Brown	Power supply -
3	Green	Analog output +
4	Yellow	Analog output -
5	Gray	Contact output (relay output)
6	Pink	-
7	Blue	-
8	-	-

Wiring Example

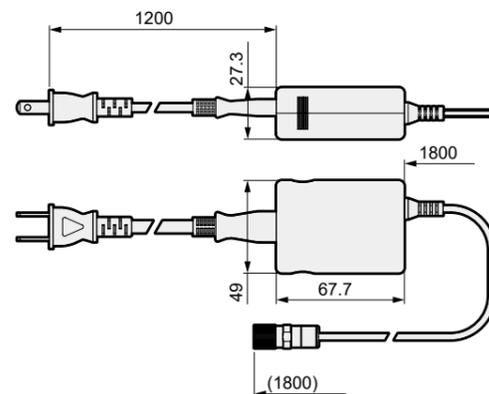


- AC adapter
Use when driving with an AC power supply.

Model No.	Description
PNA-A	AC adapter single unit A
PNA-AG	AC adapter + conversion plug set *Global power supply conversion plug B, C, O, BF included

• Plug shape

B-type	C-type	O-type	BF-type



Pneumatic components (oxygen monitor)

Safety Precautions

Be sure to read this section before use.
For general precautions for pneumatic equipment, please refer to Intro 15.

Product-specific cautions: Oxygen Sensor PNA Series

Design / Selection

CAUTION

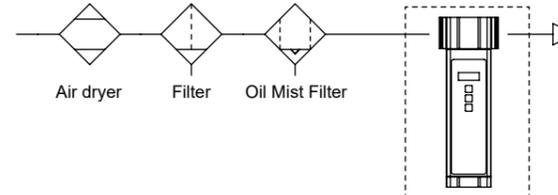
Working environment

- Avoid installing this product where it will be subject to direct sunlight or rain.
- In the following atmospheres, the oxygen concentration monitor may generate measurement errors, or the performance of the components or oxygen detection element may suffer.
 - Use outside the 0 to 50°C temperature range or with elements other than air causes significant measurement errors. Avoid using in such conditions.
 - Air containing freon gas, silicon-based gas, SOx (sulfur oxide), H2S (hydrogen sulfide) or other corrosive gases, Cl2 (chlorine), F2 (fluorine), Br2 (bromine) or other halogen gases, or air that separates into these gases at high temperatures of approx. 500°C cannot be used.
 - If used in air containing flammable gases, the flammable gas will burn and the results will decrease.
 - Use in air containing large quantities of dust or oil mist will lead to element deterioration.
 - The element will be damaged if the sensor is exposed to liquids such as water drops or liquid solutions.
 - The element will be damaged if used in locations with strong impacts or vibrations.
 - Avoid use in locations with strong magnetic fields or significant electrical noise.
 - The results will fail to stabilize in environments where the pressure pulses (changes continuously) in a short cycle. Static pressure is required for stable measurements.

- Use after confirming the structure and material, valve structure, working fluids, and working atmospheres of each component carefully for yourself.

Check the working circuit and working fluid.

To prevent decreased oxygen concentration monitor performance, install the dryer, air filter and oil mist filter on the primary side, and remove water or oil.



- This product does not have explosion-proof specifications. Since the detection element is heated by the heater, it may lead to an explosion if used in an explosive atmosphere.

- This product is not an oxygen detector. Do not use it as an oxygen concentration monitor in accordance with the Industrial Safety and Health Laws.

- When using this product as a CE compliant product, prepare a dedicated power supply.

CE-compliance working conditions

This product is CE-marked, indicating conformity with the EMC Directives. The standard for the immunity for industrial environments applied to this product is EN61326-1. The following stability is applicable in an EMC Directive demand test environment.

Stability $\pm 0.5\% \text{ O}_2 \pm 1\text{digit}$ (For 0.00 to 10.00% O_2 .)
 $\pm 1.0\% \text{ O}_2 \pm 1\text{digit}$ (For 10.01 to 25.00% O_2 .)

- Do not disassemble or modify the product as this may cause malfunctions.

- The sensor may deteriorate depending on the working conditions. Calibration once a year is recommended for maintaining long-term performance.

For precautions during mounting, installation, adjustment, use and maintenance, refer to the CKD Components Product Site (<https://www.ckd.co.jp/kiki/en/>) → "Model No. → Instruction Manual