

Gas Detector Head

GD-81D Series

GD-81D
GD-81D-ETD

Quick Reference Guide

Thank you for purchasing the GD-81D Series Gas Detector Head.
This document is a quick reference guide.
Refer to the operating manual on the RIKEN KEIKI website for detailed information on operations and precautions.
<https://www.rikenkeiki.co.jp/english/>

RIKEN KEIKI Co.,Ltd.

Warranty

For warranty information, please refer to the warranty included with the product.

Before use

<Checking included items>

Check the main unit and the accessories. If any items are missing, contact our sales department.

- Main unit: 1
- Wall-mounted unit: 1
- Dust filter: 1
- Quick Reference Guide: 1
- Warranty

<Communication methods by model>

Model	Communication method	Power source	Contact output
GD-81D	4 - 20 mA	24 V DC	Yes
GD-81D-ETD	Ethernet	24 V DC/ PoE	Yes

<Supported sensors>

Sensor	Detection principle
NCF, NCU	New ceramic method
SGF, SGU	Semiconductor method
SHF, SHU	Hot-wire semiconductor method
ESF, ESU	Electrochemical method
OSU	Galvanic cell method
IRF, IRU	Non-dispersive infrared method
SSU	Pyrolysis-particle method

F sensor series: XXF, U sensor series: XXU

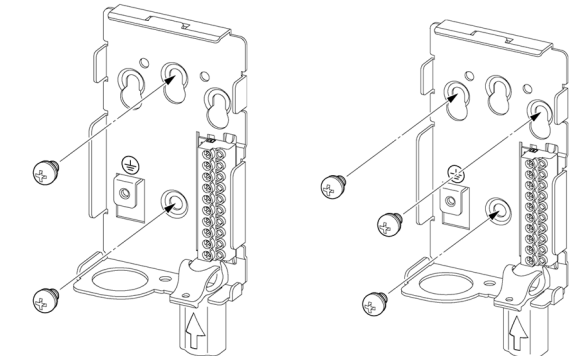
Installing the main unit

- ◎ Refer to the operating manual for installation precautions.
- ◎ Make sure there is space for maintenance.

<Installing the main unit>

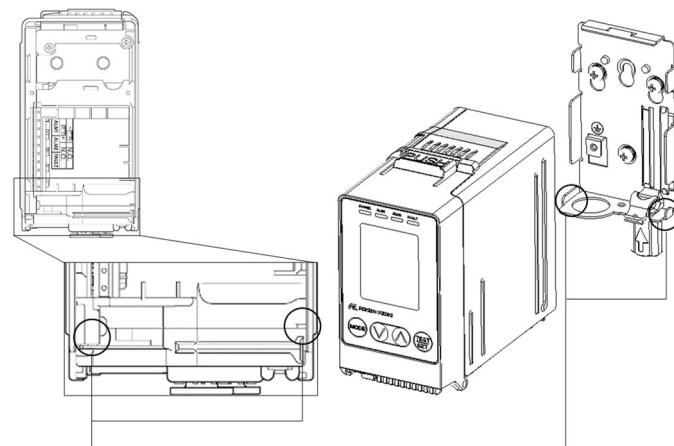
- 1 **Secure the wall-mounted unit to the installation surface with two or three M4 or M5 screws.**

<Securing with two screws> <Securing with three screws>



- 2 **Mount the main unit on the wall-mounted unit.**

Place the bottom of the main unit on the wall-mounted unit, then push in horizontally.



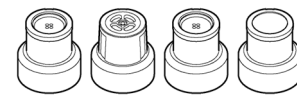
Parts mounted on wall-mounted unit Place bottom of main unit rear (see diagram on left).

<Fitting a sensor>

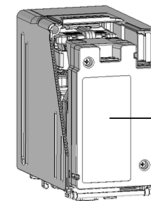
The product can be fitted with an F sensor, U sensor, or M sensor (two ESF sensors).

◎ For instructions on fitting an F sensor to the F sensor unit or ESF sensors to the M sensor unit, refer to the operating manual.

- F sensors



Mount in the F sensor unit for use.



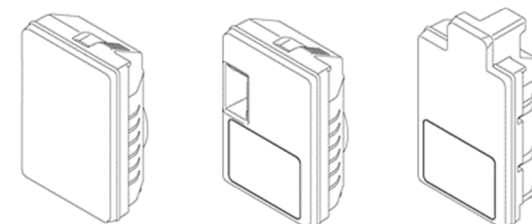
F sensor unit

⚠ CAUTION

- Do not remove the IRF sensor from the F sensor unit.

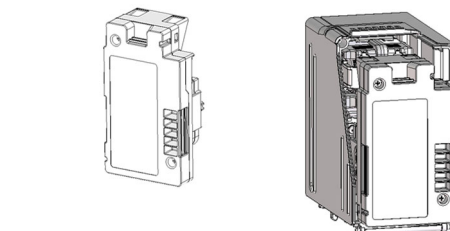
- U sensors

Any one of the U sensor units below can be used.



- M sensors

The M sensor unit can be used with two ESF sensors.



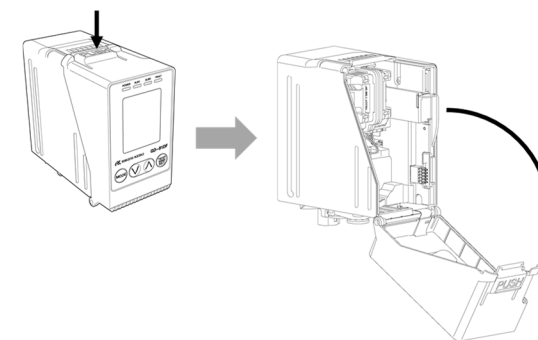
- 1 **Press the projection on the top of the main unit, then pull toward you to open the front cover.**

- 2 **Attach the sensor unit.**

Match the direction of the connector and push in firmly.

- 3 **Close the front cover on the main unit.**

Close the front cover firmly so that it clicks back into place.



⚠ CAUTION

- Handle the sensors with care.
- As a general rule, do not remove the sensor from the main unit yourself. Contact RIKEN KEIKI to have it removed.
- Be careful to fit the correct sensor. [C-02] will appear on the LCD when the sensor fitted relies on a different principle or has different specifications from the sensor fitted when the product was shipped.
- Be sure to perform gas adjustment (zero adjustment, span adjustment) after sensor replacement.

<Wiring>

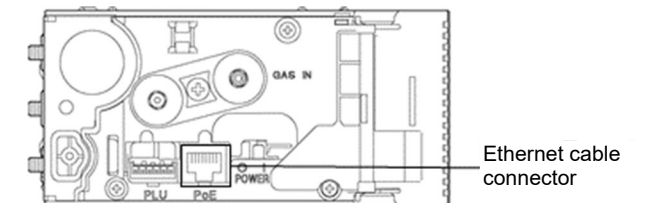
- ◎ Refer to the operating manual for wiring precautions.
- ◎ Refer to the operating manual for the specifications for cables and the terminal plate.
- ◎ Refer to the operating manual for recommended cables.

- 1 **Connect the power and communication cables to the product.**

- 2 **Connect the cables to the terminal plate.**

- 3 **Connect the grounding wire to the grounding terminal.**

(The diagram illustrate an ETD model.)



Ethernet cable connector

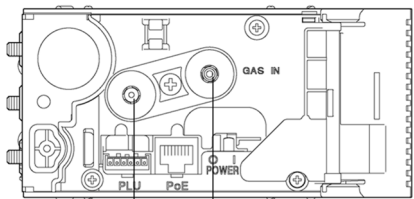
⚠ WARNING

- Be sure to ground the product before supplying power.
- Never connect grounding wires to gas pipes.
- Perform grounding work equivalent to Class D (grounding resistance not exceeding 100 Ω).
- Use cable lugs on the grounding wire to ensure safe grounding free of slack and twisting.

<Piping>

- ◎ Use 6 mm or 1/4 in diameter Teflon tubes.
- ◎ Do not lay piping with U or V shaped angles.
- ◎ Contact RIKEN KEIKI for tube lengths.

1. Insert the tubes into the sampling pipe openings (GAS IN and GAS OUT) on the underside of the product.



GAS OUT GAS IN

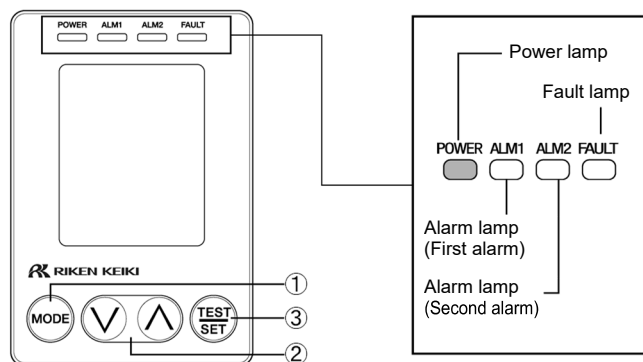
2. Pull gently on the tubes to confirm that they do not come loose.



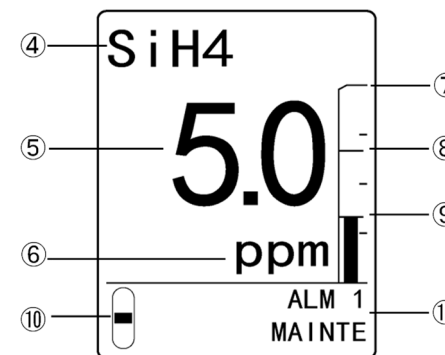
WARNING

- Cut the ends of the tubes at a right angle to prevent them from being inserted at an angle. Otherwise there is a risk of leakage due to damage to joint seals.
- Failure to completely insert the tubes may result in leaks.
- Avoid applying excessive pressure to the sampling pipe openings.
- Discharge exhaust gas after detection to a location determined to be safe by connecting an exhaust pipe to GAS OUT.

Front panel and LCD screen displays



- ① MODE key
Hold down in detection mode to switch to user mode.
Hold down in user mode or maintenance mode to return to detection mode.
- ② ▲ key and ▼ key
Used to select a sensor or adjust values.
- ③ TEST/SET key
Hold down in detection mode to switch to alarm test mode.
Used in each mode to confirm values or select settings.



- ④ Gas name display
- ⑤ Gas concentration display
- ⑥ Units display (ppm, ppb, vol%, %, %LEL, etc.)
- ⑦ Concentration bar display
The segmented detection range (full scale) displays gas concentrations as ratios of the full scale
- ⑧ First alarm setpoint display
- ⑨ Second alarm setpoint display
- ⑩ Flow rate display
The suction flow rate for the product is 0.5 L/min (standard flow rate) when the suction flow rate indicator bar is positioned in the middle.
- ⑪ Maintenance display section
◎ Alarm contacts are disabled when [MAINT] appears in the maintenance display section.
◎ The suction flow rate for the product is automatically adjusted by the automatic flow adjuster function, so in principle, no flow rate adjustment is required even if the flow rate display varies from the stipulated flow rate. If automatic adjustment is not possible due to a blockage or leak in the piping, adjust manually until the flow rate reaches the stipulated value. Refer to the operating manual for manual adjustment.

Measuring gas concentrations

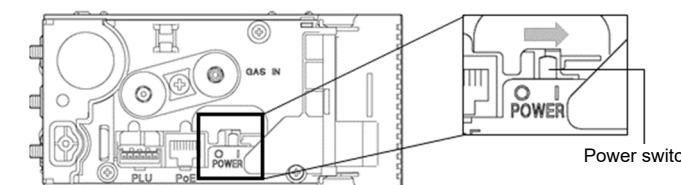
<Preparations for startup>

Perform the following checks before connecting the power supply.

- Is the product grounded?
- Is external wiring connected correctly?
- Is the power supply voltage within the rated range?
- Is the connected piping free of blockages and leaks?
- Are filters properly attached (if necessary)?

<Turning on the power>

Turn on the power switch on the underside of the main unit to start.

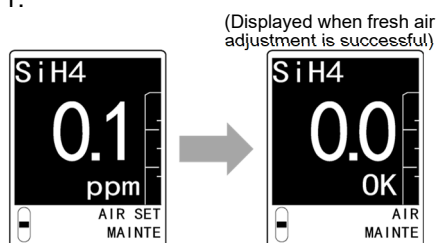
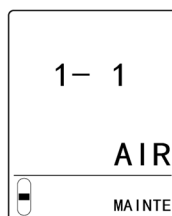


When the power switch is turned on, the initialization process including system checks and alarm activation shutoff takes place for approximately 25 seconds, after which the product enters detection mode. Do not turn the power off during initialization.

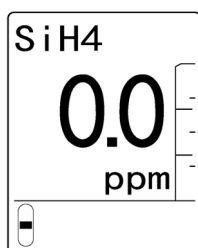
- ◎ The external contacts may operate immediately after initialization. Appropriate precautions should therefore be taken to safeguard external devices connected.

<Performing fresh air adjustment>

- 1 Hold down the MODE key and press the TEST/SET key when the screen at right appears.
- 2 Press the ▲ key or ▼ key to select the sensor to perform fresh air adjustment. Two sensors can be adjusted at the same time by fresh air adjustment. (The sensor selection screen appears only for the M sensor unit.)
- 3 Connect the gas sampling bag to the product. Connect the gas sampling bag to GAS IN.
- 4 Introduce the calibration gas for fresh air adjustment. Press the TEST/SET key when the reading has stabilized.
- 5 Check the fresh air adjustment result.
If fresh air adjustment is successful [OK] is displayed. The display reverts to the display in step 1.
If fresh air adjustment failed [NG] is displayed. The display reverts to the display in step 1.



(Displayed when fresh air adjustment is successful)



Detection mode

- 6 Disconnect the gas sampling bag for fresh air adjustment from the product.
- 7 Press the MODE key to display [1- 1 AIR].
- 8 Hold down the MODE key to switch to detection mode.

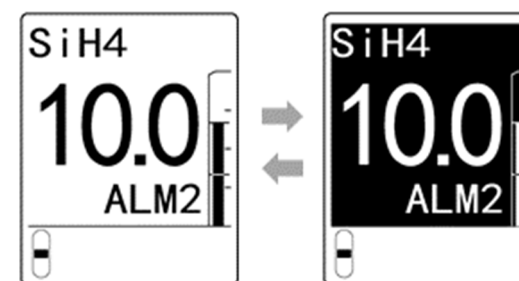
- ◎ Refer to the operating manual for more information on fresh air adjustment.
- ◎ Contact RIKEN KEIKI for calibration.

<Measuring gas concentrations>

The product measures gas concentrations in detection mode.

- ◎ Gas detection is not performed in user mode or maintenance mode. Be sure to return to detection mode after user mode or maintenance mode operations are complete.

When the detected gas or oxygen concentration reaches or exceeds the alarm setpoint, the gas concentration display blinks, the alarm lamp lights up in red and the contacts will operate.



The display blinks once every two seconds for the first alarm and once every second for the second alarm.



- When a gas alarm is triggered, respond promptly in accordance with your control rules.
- To reset an alarm, press the MODE key, TEST/SET key, ▲ key, or ▼ key in detection mode.