User's
Manual

IR800G, IR810G
Infrared Gas Analyzer
Start-up and Safety Precautions

IM 11G06A01-01EN

YOKOGAWA
Yokogawa Electric Corporation

IM 11G06A01-01EN
4th Edition

PREFACE

We are grateful for your purchase of Yokogawa's Infrared Gas Analyzer, Model: IR800G/IR810G. Read this instruction manual carefully.

The related documents are as follows.

General Specifications:	GS 11G06A01-01EN	
User's Manual:	IM 11G06A01-01EN	IR800G, IR810G Start-up and Safety Precautions (this manual)
	IM 11G06A01-02EN	IR800G, IR810G Operation and Installation
	TI 11G06A01-01EN	Communication Functions (MODBUS)
	IM 11M12G01-02EN	ZR22G and ZR802G Zirconia Oxygen/ Humidity Analyzer

The "EN" in the document number is the language code, meaning English

An exclusive User's Manual might be attached to the products whose suffix codes or option codes contain the code "Z" (made to customers' specifications). Please read it along with this manual.

For the latest User's Manual, download it from our website or scan the QR code.

Search by product model name (IR800G or IR810G).

https://www.yokogawa.com/library/

Inspection of product

On receipt of the product, inspect the package and note it has no damage caused by the delivery. Confirm the specification of the product conforms with your order and accessories are all delivered. Check the product code labeled on a model plate is correct. See Model and Suffix Code and chapter 1 of this manual.

Notes on Handling User's Manuals

- Please hand over the user's manuals to your end users so that they can keep the user's manuals on hand for convenient reference.
- Please read the information thoroughly before using the product.
- The purpose of these user's manuals is not to warrant that the product is well suited to any particular purpose but rather to describe the functional details of the product.
- No part of the user's manuals may be transferred or reproduced without prior written consent from YOKOGAWA.
- YOKOGAWA reserves the right to make improvements in the user's manuals and product at any time, without notice or obligation.
- If you have any questions, or you find mistakes or omissions in the user's manuals, please contact our sales representative or your local distributor.
- This manual is an essential part of the product ; keep it in a safe place for future reference.

Drawing Conventions

Some drawings may be partially emphasized, simplified, or omitted, for the convenience of description.

Some screen images depicted in the user's manual may have different display positions or character types (e.g., the upper / lower case). Also note that some of the images contained in this user's manual are display examples.

Trademark policy

- All names of company, brand of product used in this manual are registered trademarks.
- TM or ® to signify brand or trademarks are not used in this manual.

Copyright

Product Disposal

The instrument should be disposed of in accordance with local and national legislation/ regulations.

IR800G, IR810G Fonts

Adobe-Helvetica

◆ CE/UKCA marking products

■ Authorized Representative in EEA and the Importer into the EU/EEA Market

The Authorized Representative for this product in the EEA and the importer for this product into the EU/EEA market via Yokogawa sale channel is:

Yokogawa Europe B.V.
Euroweg 2, 3825 HD Amersfoort, The Netherlands

■ Importer for This Product into the Great Britain Market

In relation to UKCA marking, the importer for this product into the Great Britain market via the YOKOGAWA sales channel is:

Yokogawa United Kingdom Limited
Stuart Road Manor Park Runcorn, WA7 1TR, United Kingdom

■ Identification Tag

This manual and the identification tag attached on a packing box are essential parts of the product. Keep them together in a safe place for future reference.

■ Users

This product is designed to be used by a person with specialized knowledge.

■ How to dispose the batteries

(Only valid in the EU for EU Battery Directive/Regulation and in the UK for UK Battery Regulation)

Batteries are included in this product. This marking indicates they shall be sorted out and collected as ordained in the EU battery Directive/Regulation and UK battery Regulation.

When you need to replace batteries, contact your local Yokogawa office in the EEA and/or UK respectively.

Do not dispose them as domestic household waste.

Battery type : Manganese dioxide lithium battery

Notice:
The symbol (see above) means they shall be sorted out and collected as ordained in the EU Battery Directive.

■ Information of the WEEE Directive

This product is purposely designed to be used in a large scale fixed installations only and, therefore, is out of scope of the WEEE Directive. The WEEE Directive does not apply. This product should be disposed in accordance with local and national legislation/regulations.

The WEEE Directive is only valid in the EU and UK.

◆ Control of Pollution Caused by the Product

This is an explanation for the product based on “Control of Pollution caused by Electronic Information Products” in the People’s Republic of China.

产品中有害物质的名称及含量

部件名称	有害物质									
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)	邻苯二甲酸二正丁酯 (DBP)	邻苯二甲酸二异丁酯 (DIBP)	邻苯二甲酸丁基苄酯 (BBP)	邻苯二甲酸二(2-乙基)己酯 (DEHP)
外壳(金属)	×	×	×	×	○	○	○	○	○	○
外壳(塑料)	×	×	×	×	○	○	○	○	○	○
印刷电路板组件	×	×	×	×	○	○	○	○	○	○
电池	○	○	○	○	○	○	○	○	○	○

注1： ○：表示该有害物质在该部件所有均质材料中的含量均不超出电器电子产品有害物质限制使用国家标准要求。
×：表示该有害物质至少在该部件的某一均质材料中含量超出电器电子产品有害物质限制使用国家标准要求。
注2： 以上未列出的部件，表明其有害物质含量均不超出电器电子产品有害物质限制使用国家标准要求。

环保使用期限：这个标志是基于SJ/T11364，在中国（不包括台湾，香港，澳门）贩售的电器电子产品所适用的环保使用期限。

只要遵守产品上关于安全及使用上的注意事项，从制造之日起计算在该年限内，不会发生制品内的有害物质外泄，突然变异，对环境或人体以及财产产生重大影响的情况。

（注） 该年限是《环境保护使用期限》，不是产品的保质期限。
另外，关于替换部件的推荐替换周期，请阅读使用说明书。

Safety Precautions

Safety, Protection, and Modification of the Product

- This manual is intended for the following personnel :
  - Engineers responsible for installation, wiring, and maintenance of the equipment
  - Personnel responsible for normal daily operation of the equipment.
- In order to protect the system controlled by the product and the product itself and ensure safe operation, observe the safety precautions described in this user's manual. We assume no liability for safety if users fail to observe these instructions when operating the product.
- If this instrument is used in a manner not specified in this user's manual, the protection provided by this instrument may be impaired.
- If any protection or safety circuit is required for the system controlled by the product or for the product itself, prepare it separately.
- Be sure to use the spare parts approved by Yokogawa Electric Corporation (hereafter simply referred to as YOKOGAWA) when replacing parts or consumables.
- Modification of the product is strictly prohibited.
- The following safety symbols are used on the product as well as in this manual.

WARNING

This symbol indicates that an operator must follow the instructions laid out in this manual in order to avoid the risks for the human body and health including risk of injury, electric shock, or fatalities. or the damages to instruments. The manual describes what special care the operator must take to avoid such risks.

CAUTION

This symbol indicates that the operator must refer to the instructions in this manual in order to prevent the instrument (hardware) or software from being damaged, or a system failure from occurring.

The following are signal words to be found only in our instruction manuals.

CAUTION

This symbol gives information essential for understanding the operations and functions.

NOTE

This symbol indicates information that complements the present topic.

This symbol indicates Protective Ground Terminal.

Warning and Disclaimer

The product is provided on an "as is" basis. YOKOGAWA shall have neither liability nor responsibility to any person or entity with respect to any direct or indirect loss or damage arising from using the product or any defect of the product that YOKOGAWA cannot predict in advance.

All rights reserved

WARNING

This unit is not explosion-proof type. Do not use it in a place with explosive gases to prevent explosion, fire, or other serious accidents.

CAUTION

- For installation, observe the rule on it given in the instruction manual and select a place where the weight of gas analyzer can be endured. Installation at an unsuited place may cause turnover or fall and there is a risk of injury.
- During installation work, care should be taken to keep the unit free from cable chips or other foreign objects. Otherwise, it may cause fire, trouble, or malfunction of the unit.

WARNING

In piping, the following precautions should be observed. Wrong piping may cause gas leakage. If the leaking gas contains a toxic component, there is a risk of serious accident being induced. Also, if combustible gas is contained, there is a danger of explosion, fire or the like occurring.

- Connect pipes correctly referring to the instruction manual.
- Exhaust should be led outdoors so that it will not remain in the locker and installation room. Exhaust from the analyzer should be relieved in the atmospheric air in order that an unnecessary pressure will not be applied to the analyzer. Otherwise, any pipe in the analyzer may be disconnected to cause gas leakage.
- For piping, use a pipe and a pressure reducing valve to which oil and grease are not adhering. If such a material is adhering, a fire or the like accident may be caused.

CAUTION

- Wiring work must be performed with the main power set to OFF to prevent electric shocks.
- Enforce construction of class-D grounding wire by all means. If the specified grounding construction is neglected, a shock hazard or fault may be caused.
- Wires should be the proper one meeting the ratings of this instrument. If using a wire which cannot endure the ratings, a fire may occur.
- Be sure to use a power supply of correct rating. Connection of power supply of incorrect rating may cause fire.

WARNING

- Do not smoke nor use a flame near the gas analyzer. Otherwise, a fire may be caused.
- Do not allow water to go into the gas analyzer. Otherwise, hazard shock or fire in the instrument may be caused.

WARNING

- Purge not only inside of IR800G/IR810G but all measuring gas lines with zero gas sufficiently, when you provide maintenance or inspection on IR800G/IR810G with its cover or door open. Otherwise, it may cause hazardous accidents such as gas leakage, fire, and explosion.

CAUTION

- Do not operate the analyzer for a long time with its cover or door left open. Otherwise, dust, foreign matter, etc. may stick on internal walls, thereby causing faults.

CAUTION

Be sure to observe the following for safe operation avoiding the shock hazard and injury.

- Do not touch the instrument with wet hands.
- Replacement parts such as a maintenance part should be disposed of as incombustibles. For details, follow the local ordinance.

■ Other cautions

Operation of this instrument is performed on a touch panel. Pressing the appropriate part of the display screen will expand the screen, and calibration operations and setting changes can be easily executed, so please be careful not to operate it incorrectly.

◆ Compliant Standards

Safety, EMC, and RoHS conformity standards

Safety:

CE/UKCA:
EN 61010-1, EN 61010-2-030
UL:
UL 61010-1, UL 61010-2-030
CSA:
CAN/CSA-C22.2 No.61010-1
CAN/CSA-C22.2 No.61010-2-030
GB:
GB30439
Installation altitude: 2000 m or less
Category based on IEC 61010: II (Note1)
Pollution degree based on IEC 61010: 2 (Note2)

Note1
Installation category, called over-voltage category, specifies impulse withstand voltage.
Category II is energy-consuming equipment to be supplied from the fixed installation.

Note2
Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which may reduce dielectric strength.
Degree 2 is the normal indoor environment.

EMC:

CE, UKCA:
EN 61326-1 Class A, Table 2 (For use in industrial locations)
EN 61326-2-3
EN 61000-3-2
EN IEC 61000-3-2
EN 61000-3-3
RCM: EN 61326 Class A, Table2
KC: 한국 전자파적합성 기준 Class A

A급 기기 (업무용 방송통신기자재)
이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는
사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서
사용하는 것을 목적으로 합니다.

Note: · This instrument is a Class A product, and it is designed for use in the industrial environment. Please use this instrument in the industrial environment only.
· Influence of immunity environment (Criteria A): Output shift is specified within ±15% of F.S.

Environmental regulation:

RoHS Directive: EN IEC 63000
Waste Electrical and Electronic Equipment (WEEE) Directive:
This product is purposely designed to be used in a large scale fixed installations only and, therefore, is out of scope of the WEEE Directive. The WEEE Directive does not apply.
The WEEE Directive is only valid in the EU and UK.
REACH: Regulation(EC) 1907/2006

After-Sales Warranty

Do not modify the product.

Yokogawa warrants the product for the period stated in the pre-purchase quotation. Yokogawa shall conduct defined warranty service based on its standard. When the customer site is located outside of the service area, a fee for dispatching the maintenance engineer will be changed to the customer.

During the warranty period, for repair under warranty carry or send the product to the local sales representative or service office. Yokogawa will replace or repair any damaged parts and return the product to you.

- Before returning a product for repair under warranty, provide us with the model name and serial number and a description of the problem. Any diagrams or data explaining the problem would also be appreciated.
- If we replace the product with a new one, we won't provide you with a repair report.

In the following cases, customer will be charged repair fee regardless of warranty period.

- Failure of components which are out of scope of warranty stated in instruction manual.
- Failure caused by usage of software, hardware or auxiliary equipment, which Yokogawa did not supply.
- Failure due to improper or insufficient maintenance by user.
- Failure due to misoperation, misuse or modification which Yokogawa does not authorize.
- Failure due to power supply (voltage, frequency) being outside specifications or abnormal.
- Failure caused by any usage out of scope of recommended usage.
- Any damage from fire, earthquake, a storm and flood, lightning, disturbance, riot, warfare, radiation and other natural changes.

Yokogawa does not warrant conformance with the specific application at the user site. Yokogawa will not bear direct/indirect responsibility for damage due to a specific application.

Yokogawa will not bear responsibility when the user configures the product into systems or resells the product.

Maintenance service and supplying repair parts will be covered for five years after the production ends. For repair this product, please contact the nearest sales office described in this instruction manual.

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IR800G, IR810G
Infrared Gas Analyzer
Start-up and Safety Precautions

IM 11G06A01-01EN 4th Edition

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1. Inspection of product

On receipt of the product, inspect the package and note it has no damage caused by the delivery. If damage is found, do not discard the product's original packaging (including the outer box) upon arrival, immediately contact our sales department. Confirm the specification of the product conforms with your order and accessories are all delivered. Check the product code labeled on a model plate is correct. Also, please make sure that you have all the accessories.

■ Model and Suffix Code

IR800G

Model	Suffix code	Option code	Description
IR800G	---------- ---------- ----------	-------	Rack Type Infrared Gas Analyzer
Type	-AJ	------	General (Japan)
	-AB	------	General (CE, UKCA, RCM, GB)
	-AD	------	General (CSA)
	-AG	------	General (KC)
Measuring Components	-A1	-------	NO
	-A2	-------	SO_2
	-A3	-------	CO
	-A4	-------	CO_2
	-A5	-------	CH_4
	-B1	-------	$NO+SO_2$
	-B2	-------	NO+CO
	-B4	-------	$CO+CO_2$
	-B5	-------	$CO+CH_4$
	-B6	-------	CO_2+CH_4
	-C1	-------	$NO+SO_2+CO$
	-C4	-------	$CO+CO_2+CH_4$
	-D1	-------	$NO+SO_2+CO+CO_2$
O_2 Analyzer	-N	-------	None
	-1	-------	ZR802G+ZR22G (*1)
	-2	-------	4–20mA input (*1)
	-3	-------	Build-in paramagnetic O_2
	-4	-------	Build-in paramagnetic O_2 (H_2 background) (*2)
NO Measuring Range	- □□	-------	See "■ Measuring gas range on pange 4"
SO_2 Measuring Range	- □□	-------	
CO Measuring Range	- □□	-------	
CO_2 Measuring Range	- □□	-------	
CH_4 Measuring Range	- □□	-------	
O_2 Measuring Range	- □□	-------	
Digital Communication	-N	-------	None
	-R	-------	RS-485
Automatic Validation	-N	-------	None
	-V	-------	Automatic Validation
Gas connection	-R	-------	Rc1/4
	-T	-------	1/4NPT
Display Language	-J	-------	Japanese
	-E	-------	English
	-C	-------	Chinese
Mount Type	-S	-------	Rack with slide rail
	-R	-------	Rack without slide rail
—	-NN	-------	Always "-NN"
—	-NN	-------	Always "-NN"
Option Code		/U	Unit change (mg/m3, g/m3) (*3)
		/P	Air purging inlet
		/A	Peak alarm (*4)
		/K	O_2 compensation (*5)
		/NX	Display NOx instead of NO (*6)
		/PR	Pressure Regulator (For Sample/Reference gas line, Pair) (*7)

(*1) Oxygen analyzer is not included. Please arrange it separately.
(*2) If the sample gas contains more than 100 ppm hydrogen, select the "-4" specification for H_2 background.
(*3) Select this option when one or more of NO, SO_2, or CO is included in the measuring component.
(*4) Available when CO is included in the measuring component.
(*5) Available when the O_2 analyzer specification is other than "-N" and one or more of NO, SO_2, or CO is included in the measuring component.
(*6) NOx converter is not included. Provide K9350LE or a compliant product. K9350LF is not available as a CE compliant product.
(*7) One pressure regulator valve for the sample gas and one for the reference gas are included. Select this option if input pressure is not stable.

Accessories

Name	Qty	Code Specification	Description
Fuse	2	Pre-installed in equipment	250 V/5 A delay type 5×20 mm IEC 60127-2 sheet 3
Slide rail	2	Mount type "-S"	For 19-inch rack mounting
Thread conversion connector	4	Gas connection "-T"	Rc 1/4 male to 1/4 NPT female
Thread conversion connector	5	Gas connection "-T" and "/P" (Air purging inlet)	Rc 1/4 male to 1/4 NPT female
Pressure Regulator	1	"/PR" For Sample/Reference gas line, Pair	Pressure Regulator (Stainless)
	1		Pressure Regulator (Aluminium)

Spare Parts

Name	Part No.	Qty	Name	Part No.	Qty
C-type snap ring	Y9011EV	1 (*1)	Filter	K8020PW	1
Plate	K9213FB	1	Snap ring plier	K9643ZE	1

*1: The minimum purchase quantity is 10 per order.

IR810G

Model	Suffix code	Option code	Description
IR810G	------------------ ------------------ ----------	-------	Wall and Panel Mount Type Infrared Gas Analyzer
Type	-AJ	-------	General (Japan)
	-AB	-------	General (CE, UKCA, RCM, GB)
	-AD	-------	General (CSA)
	-AG	-------	General (KC)
Measuring Components	-A1	-------	NO
	-A2	-------	SO_2
	-A3	-------	CO
	-A4	-------	CO_2
	-A5	-------	CH_4
	-B1	-------	NO+SO_2
	-B2	-------	NO+CO
	-B4	-------	CO+CO_2
	-B5	-------	CO+CH_4
	-B6	-------	CO_2+CH_4
	-C1	-------	NO+SO_2+CO
	-C4	-------	CO+CO_2+CH_4
	-D1	-------	NO+SO_2+CO+CO_2
O_2 Analyzer	-N	-------	None
	-1	-------	ZR802G+ZR22G (*1)
	-2	-------	External O_2 analyzer (*1)
	-3	-------	Build-in paramagnetic O_2
	-4	-------	Build-in paramagnetic O_2 (H_2 background) (*2)
NO Measuring Range	-□□	-------	See "■ Measuring gas range on panege 4"
SO_2 Measuring Range	-□□	-------	
CO Measuring Range	-□□	-------	
CO_2 Measuring Range	-□□	-------	
CH_4 Measuring Range	-□□	-------	
O_2 Measuring Range	-□□	-------	
Digital Communication	-N	-------	None
	-R	-------	RS-485
Automatic Validation	-N	-------	None
	-V	-------	Automatic Validation
Gas connection	-R	-------	Rc1/4
	-T	-------	1/4NPT
Display Language	-J	-------	Japanese
	-E	-------	English
	-C	-------	Chinese
Mount Type	-P	-------	Panel mount
	-W	-------	Wall mount
—	-NN	-------	Always "-NN"
—	-NN	-------	Always "-NN"

Option Code	/U	Unit change (mg/m^3, g/m^3) (*3)
	/P	Air purging inlet
	/CG1	Cable Glands for wiring x 6 (*4)
	/CG2	Cable Glands for wiring x 10 (*4)
	/CG3	Cable Glands for wiring x 12 (*4)
	/CG4	Cable Glands for wiring x 16 (*4)
	/A	Peak alarm (*5)
	/K	O_2 compensation (*6)
	/NX	Display NOx instead of NO (*7)
	/RP	IR202-B compatible wall mount conversion plate (*8)
	/PR	Pressure Regulator (For Sample/ Reference gas line, Pair) (*9)

(*1) Oxygen analyzer is not included. Please arrange it separately.
(*2) If the sample gas contains more than 100 ppm hydrogen, select the "-4" specification for H2 background.
(*3) Select this option when one or more of NO, SO_2, or CO is included in the measuring component.
(*4) Select the amount you need. The following is for reference only.
/CG1: Wiring only RS-485 and power supply
/CG2: 1-2 Component measurement
/CG3: Three or more component measurements without RS-485 or without external zirconia (ZR802G+ZR22G)/external oxygen analyzer
/CG4: Other than the above
When using cable glands other than /CG1 to /CG4, prepare ones with high flame retardant of UL94 V-2 or higher, heat resistance temperature of 85°C or higher, and thread size of M20 x 1.5.
(*5) Available only when CO is included in the measuring component.
(*6) Available when the O_2 analyzer specification is other than "-N" and one or more of NO, SO_2, or CO is included in the measuring component.
(*7) NOx converter is not included; provide K9350LE or a compliant product. K9350LF is not available as a CE compliant product.
(*8) Available when the mount type is "-W" wall mount.
(*9) One pressure regulator valve for the sample gas and one for the reference gas are included. Select this option if input pressure is not stable.
See <Items specified at order IR800G, IR810G>

Accessories

Name	Qty	Code Specification	Description
Fuse	2	Pre-installed in equipment	250 V/5 A delay type 5×20 mm IEC 60127-2 sheet3
Ferrite Cores for Power Cable	1	—	—
Panel mounting bracket	4	Mount type "-P"	—
Cable clip	2	none	—
Screw for fixing cable clip	2	none	M5, 8 mm length
Bolt	4	"-W"	M8, 35 mm length
Washer	8	"-W"	M8
Nut	4	"-W"	M8
Thread conversion connector	4	Gas connection "-T"	Rc 1/4 male to 1/4 NPT female
Thread conversion connector	5	Gas connection "-T" and "/P" (Air purging inlet)	Rc 1/4 male to 1/4 NPT female
Cable glands	6	"/CG1" Cable Glands for wiring x6	Applicable cable diameter: Ø6.5 to Ø12mm Connecting thread : M20×1.5
Cable glands	10	"/CG2" Cable Glands for wiring x10	
Cable glands	12	"/CG3" Cable Glands for wiring x12	
Cable glands	16	"/CG4" Cable Glands for wiring x16	
Bracket	1	"/RP" IR202-B compatible wall mount conversion plate	IR202-B compatible wall mount conversion plate
Screw	4		M6, 10mm length
Pressure Regulator	1	"/PR" For Sample/Reference gas line, Pair	Pressure Regulator (Stainless)
Pressure Regulator	1		Pressure Regulator (Aluminium)

Spare Parts

Name	Part No.	Qty	Name	Part No.	Qty
C-type snap ring	Y9011EV	1 (*1)	Filter	K8020PW	1
Plate	K9213FB	1	Snap ring plier	K9643ZE	1

1: The minimum purchase quantity is 10 per order.

<Items specified at order IR800G, IR810G>

TAGNO. (only if necessary)
You can create TAGNO. (tag number) with alphanumeric characters described in the next table. 16 characters at maximum can be used.
If you specify TAGNO., it is printed on the stainless name plate/tag label affixed to the instrument.

Symbol (Note)	-	Hyphen		Underscore
	=	Equal	+	Plus
	/	Slash	:	Colon
	(	Left parenthesis	)	Right parenthesis
	#	Hash	!	Exclamation mark
	.	Period		
Number	0, 1, 2, 3, 4, 5, 6, 7, 8, 9			
Upper case alphabetics	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z			
lower case alphabetics	a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z			

(Note): The spaces specified for the TAGNO. are removed. The string is left-squeezed.

Measuring gas range

Select the range for the sample gas selected under "Measuring Component". Select "None (-NN)" for gases not included in the measurement component. This unit is free-range. You can set the range within the selected measurement range. The measurement accuracy varies when the measurement range is set within the optional range. For details, refer to the general specification GS 11G06A01-01EN.

For multi-component meters, the measurement ranges for NO/SO_2/CO/CH_4 measurement cannot be combined with "-E□" and "-P□" together.

(Example) Measuring component code - B1 (NO+SO_2 meter)
NO measurement range: -E3 (0-200/2000 ppm), SO_2 measurement range: -E6 (0-500/5000 ppm)
=> Both are -E ranges, so they can be combined.
NO measurement range: -E3 (0-200/2000 ppm), SO_2 measurement range: -P1
=> Not possible due to a mix of -E and -P ranges

/U: See Table 3 for unit conversion options.

Table 1 NO

Range	Code	Note
None	-NN	—
0–50/500 ppm	-E1	Optional range
0–100/1000 ppm	-E2	Optional range
0–200/2000 ppm	-E3	—
0–250/2500 ppm	-E4	—
0–300/3000 ppm	-E5	—
0–500/5000 ppm	-E6	—

Table 2 SO_2

Range	Code	Note
None	-NN	—
0–50/500 ppm	-E1	Optional range
0–100/1000 ppm	-E2	Optional range
0–200/2000 ppm	-E3	—
0–250/2500 ppm	-E4	—
0–300/3000 ppm	-E5	—
0–500/5000 ppm	-E6	—
0–2/10 vol%	-P1	—

Table 3 CO

Range	Code	Note
None	-NN	—
0–50/500 ppm	-E1	Optional range
0–100/1000 ppm	-E2	Optional range
0–200/2000 ppm	-E3	—
0–250/2500 ppm	-E4	—
0–300/3000 ppm	-E5	—
0–500/5000 ppm	-E6	—
0–2/20 vol%	-P1	—
0–3/30 vol%	-P2	—
0–5/50 vol%	-P3	—
0–10/100 vol%	-P4	Optional range

Table 4 CO_2

Range	Code	Note
None	NN	—
0–1000/5000 ppm (*1)	-C1	Optional range
0–2000/10000 ppm (*1) (*2)	-C2	Optional range
0–0.5/2.5 vol% (*1) (*3)	-C3	—
0–1/5 vol% (*1)	-C4	—
0–5/25 vol%	-C5	—
0–20/100 vol% (*4)	-C6	Optional range

(*1) For multi-component meters, other components can only be selected from "-E□".
Always use N2 for reference gas.
(*2) Measured values exceeding 9999 ppm are displayed as ++++.
(*3) Measurements are displayed in vol% only.
(*4) For multi-component meters, other components can only be selected from "-P□".

Table 5 CH_4

Range	Code	Note
None	-NN	—
0–2/20 vol%	-P1	—
0–3/30 vol%	-P2	—
0–5/50 vol%	-P3	—
0–10/100 vol%	-P4	Option range

Table 6 O_2

Range	Code	Note
None	-NN	—
0–5/25 vol% (*1)	-M1	for built-in paramagnetic O_2 analyzer
0–25/100 vol% (*2)	-M2	for built-in paramagnetic O_2 analyzer
0–5/100 vol% (*3)	-R1	For ZR802G and other external O_2 analyzers

(*1) Available when the O_2 Analyzer is "-3".
(*2) Available when the O_2 analyzer is "-3" or "-4".
(*3) Select this option when the O_2 Analyzer is "-1" or "-2".

2. INSTALLATION

WARNING

IR800G/IR810G is a non-explosion-proof type. Do not use it in a place with explosive gases to prevent explosion, fire, or other serious accidents.

CAUTION

- Inappropriate installation may cause a hazardous accident such as a tip-over, electric shock, fire, and injury.
- IR800G/IR810G is a heavy product. It should be handled carefully to install. Otherwise, it may cause tip-over, fall, injury, and hazardous accidents.
- During installation work, care should be taken to keep the unit free from cable chips or other foreign objects. Otherwise, it may cause fire, trouble, or malfunction of the unit.

2.1 Installation requirements

Install in a location that satisfies the following conditions:

- The product is for indoor use. Avoid exposure to direct sunlight, weather, and radiant heat from hot substances. If exposure to such conditions is unavoidable, a protective hood or cover should be prepared.
- Vibration-free environment
- A clean atmosphere

<Operation conditions>

Ambient conditions:

Ambient temperature:	IR800G; 0 to 40°C
	IR810G; 0 to 45°C
Ambient humidity:	10 to 90%RH (at 40°C, no condensation)
Storage temperature:	-10 to +50°C
Storage Humidity:	35 to 85% RH (no condensation)

Power supply voltage:

Voltage rating;	100 to 240 V AC
Allowable range;	85 to 264 V AC

Power supply frequency

Rated frequency;	50/60 Hz
Allowable range;	47 to 63 Hz

Analog output signal:

Isolated output:	4-20 mA DC
Maximum load capacity:	550 Ω
Number of outputs:	4
Output Item:	NAMUR NE43 burnout
Hold function:	available

Analog input (when O_2 analyzer: -1 or -2 is selected)

Number of input points; 1 point (for connection to external oxygen analyzer)

Input signal; 4-20 mA DC (Max40 mA)
When connecting an external oxygen analyzer, 4-20 mA DC must be set to 0-100 vol%.

Functions: Oxygen concentration display, oxygen concentration conversion

Contact output

Contact type; 1a relay contact, 1c relay contact

Maximum output points

1a; 11 points

1c; 6 points

Contact capacity;

250 V AC, 2A (resistance load)

24 V DC, 1A (resistance load)

AC/DC power sources cannot be mixed.

Insulation; Internal circuit: Reinforced insulation

Between contacts: Basic insulation

Function; Instrument error, Calibration error, Automatic calibration in progress, Solenoid valve drive CH1 to CH5 for automatic calibration, Range identification CH1 to CH5, Blowback, alarms 1 to 6, Peak alarm output, Maintenance in progress, Power status

Contact input

Contact type; no-voltage or voltage contact input

Maximum input points; 8 points

On/Off;

No-voltage contact input

Resistance value below 200 Ω; closed

Resistance value of 100 kΩ or more; open

Voltage contact input

Voltage -1 to +1 V DC; closed

Voltage value +4.5 to +25 V DC; open

Contact capacity: Leakage current 3 mA or less when OFF

Insulation

Contacts mutual; non-insulating

Internal circuit; transformer isolation

Function; Remote hold, average value reset, automatic calibration start, simple zero calibration start, automatic validation start, remote range changeover, blowback contact for ZR802G, calibration error for ZR802G

Digital Communications:

RS-485 (Modbus RTU): 115200/38400/9600 bps

Cable length: Up to 600 m (115200 bps)

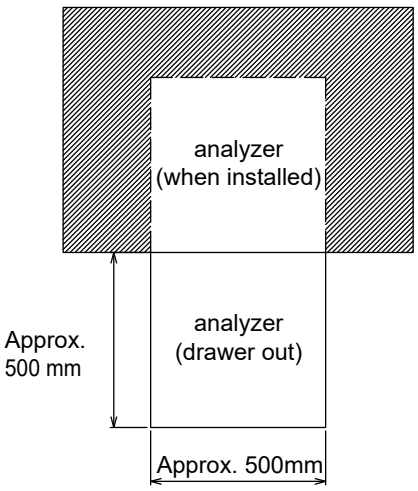
Up to 1200 m (38400/9600 bps)

shield ground

<Maintenance space>

Clear the space as below if the analyzer is installed by itself.

<IR800G>



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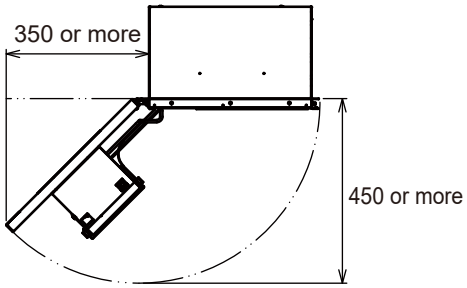


Figure 1 Maintenance space

To install the analyzer for optimum performance, select a location that meets the following conditions;

- IR800G/IR810G is system built-in type, embedded in a steel rack, or enclosure of steel sheet.

  Keep a minimum clearance of 10 cm above the analyzer for heat dissipation. The same size of clearance is required for each analyzer when you install several units on a multistage rack.
- Install the external switch or the Circuit breaker in the same room where the IR800G/ IR810G is installed. Place it where the operator can access and indicate that it is the power switch of the IR800G/IR810G.

2.2 How to install

The next table shows the type of mounting and its code of equipment.

Rack-mounting type of equipment can be installed with sliding rails.

Mounting type (Code)	IR800G	IR810G
Rack-mounting with sliding rails (-S)	✓	—
Rack-mounting (-R)	✓	—
Panel-mounting (-P)	—	✓
Wall-mounting (-W)	—	✓

✓ indicates compatibility.

See"■ External Dimensions on pange 8"

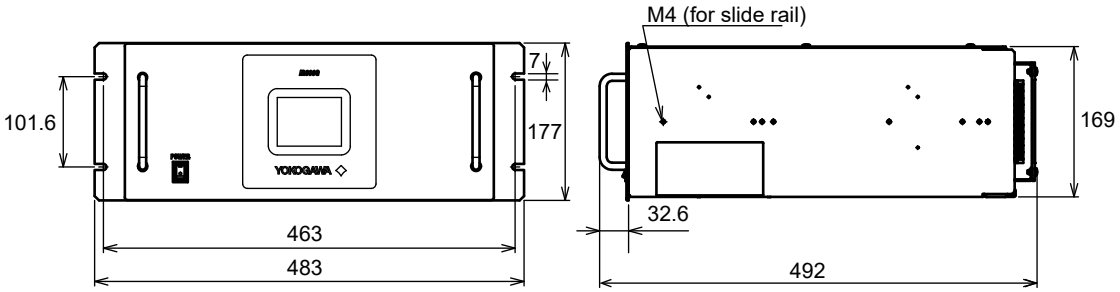
Follow the next instruction and install equipment properly.

- Front side of equipment must stand vertically.
- Support the mass of IR800G at the bottom of the case (e.g., with support).
- If installing the unit in a location where vibration is unavoidable, put rubber or other vibration-absorbing materials in the mounting area (between the support and the main unit, and at the contact area between the front perimeter and the panel).

External Dimensions

IR800G

Unit: mm



<Rear View>

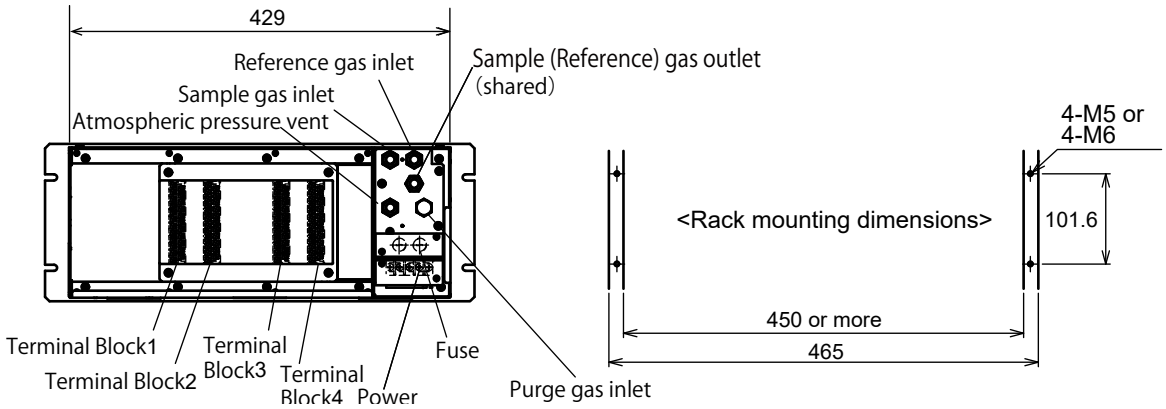


Figure 2

IR810G

Unit: mm

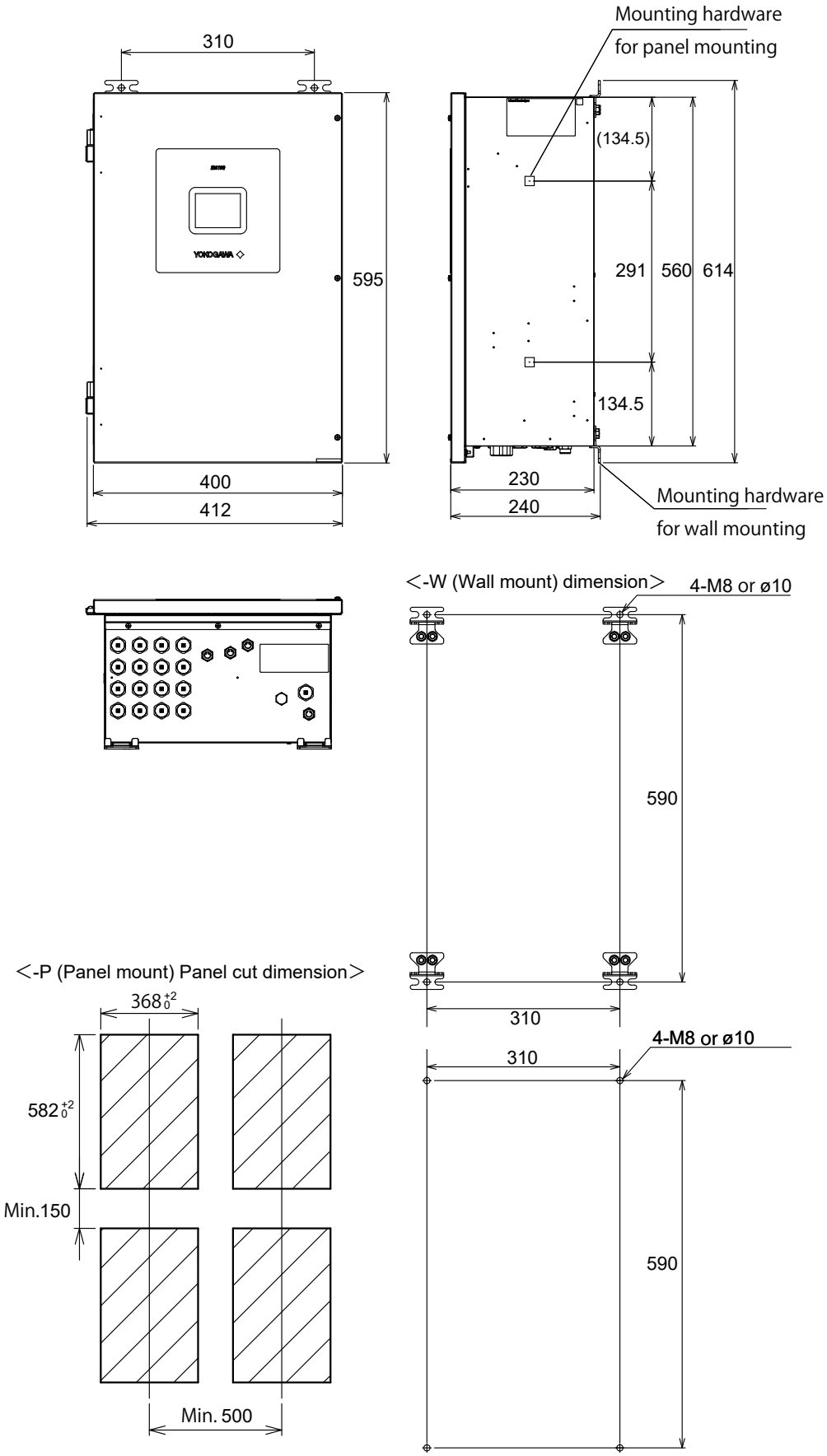


Figure 3

Installation of panel mount type

Use a steel panel of thickness 3 mm to 26 mm.
Install it on a panel that is strong enough to withstand the product weight of 17 kg.

1. Removing the Seal
   Peel off the seal that covers the holes for the mounting brackets on the case.
2. Mounting IR810G (Figure 4)
   Insert IR810G from the front side of the panel.

*: Before attaching cable glands, wiring, or piping components, make sure to insert the IR810G into the panel.

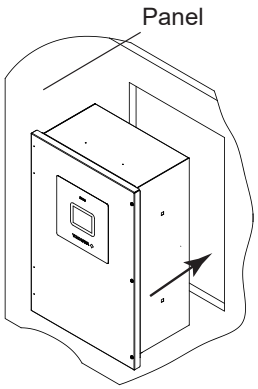


Figure 4

3. Temporary Installation of Mounting Brackets (Figure 5)
   Attach the four included mounting brackets to both sides of the case and temporarily tighten the mounting screws.

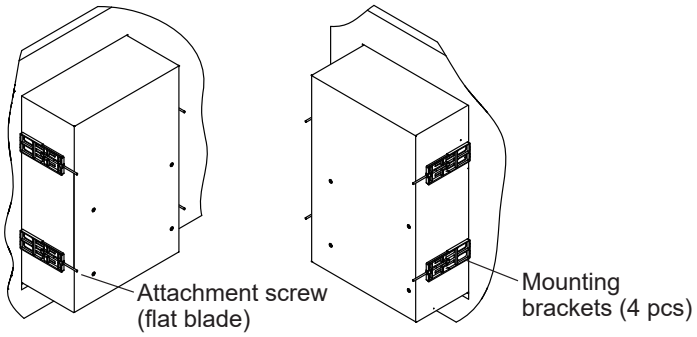


Figure 5

4. Final Tightening and Fixing (Figure 6)

Secure the IR810G by fully tightening the mounting screws (tightening torque: 0.7 to 0.9 N·m).

(1) Adjust the position so that the IR810G is approximately perpendicular to the panel.

(2) Once the IR810G is nearly perpendicular to the panel, press the mounting brackets until they are in full contact with the panel surface, and then tighten the mounting screws.

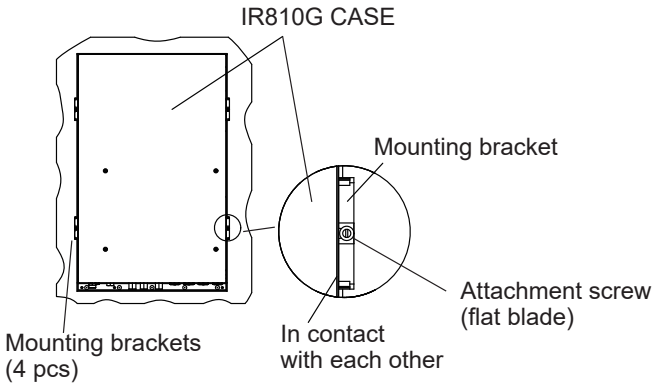
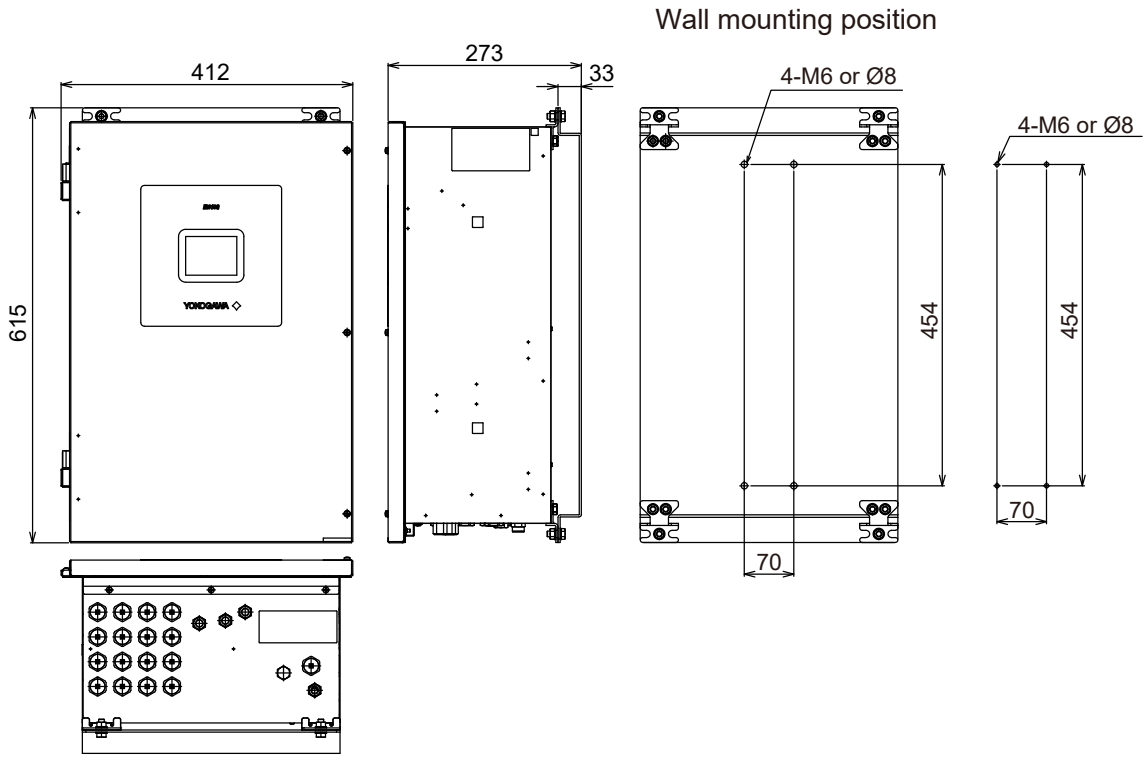


Figure 6

CAUTION

- Tightening the screws too much can deform the case or damage the bracket.
- Be careful not to insert foreign objects or tools through the holes for the mounting brackets in the case.

/RP (Option)t



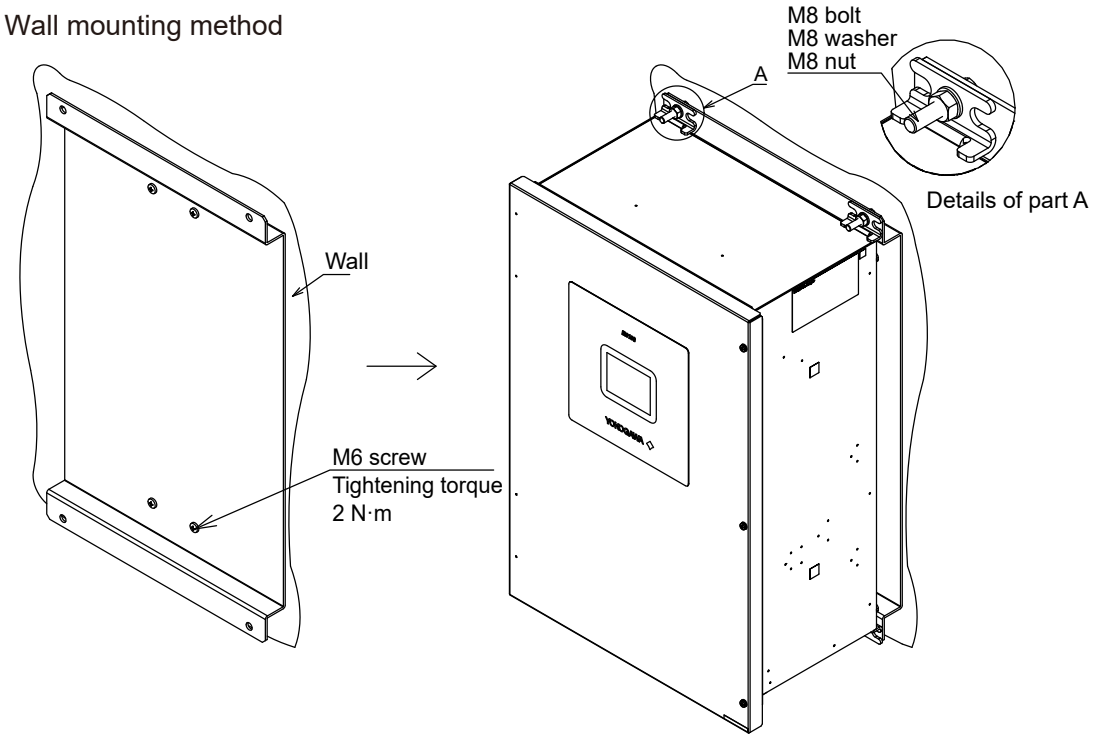


Figure 7

Accessories

Slide rail

Only included for IR800G Mount type: "-S".

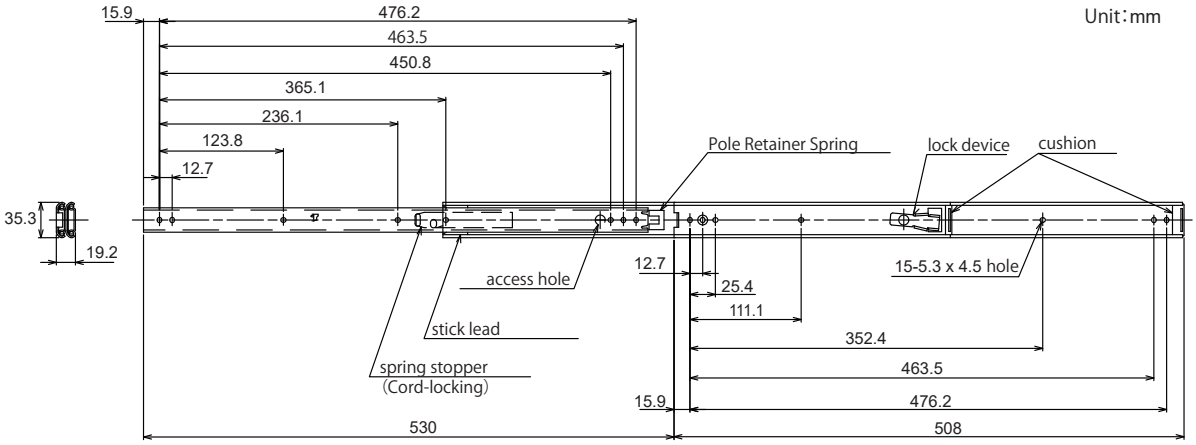
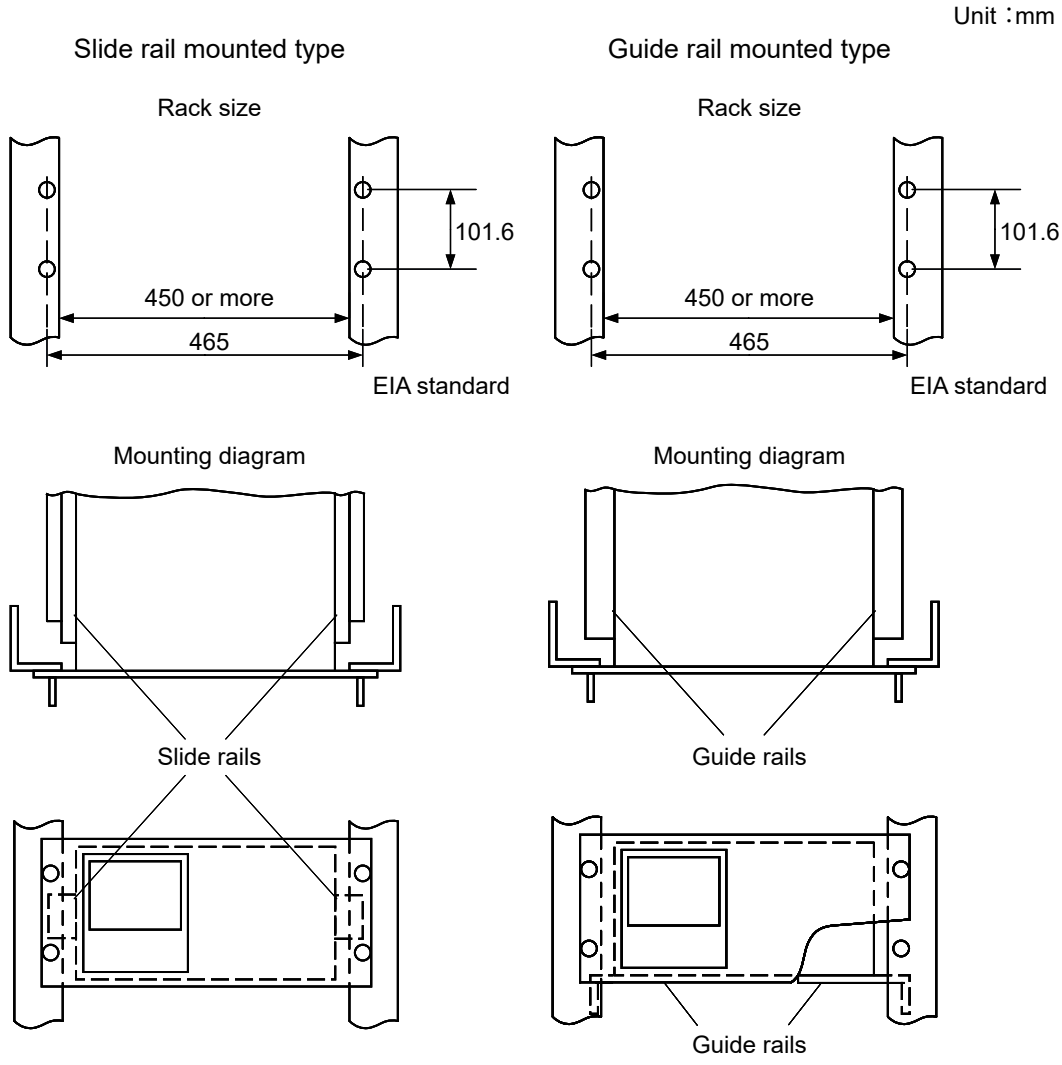


Figure 8

How to install in a 19-inch rack.

The instrument mass should be supported at the bottom of the main unit (or at the side of the main unit when mounting on a slide rail).



For the guide rail mounted type, a maintenance space (200 mm or more) should be provided on top of the main unit.

Figure 9

2.3 Piping

WARNING

In piping, the following precautions should be observed.

Wrong piping may cause gas leakage.

If the leaking gas contains a toxic component, there is a risk of serious accident being induced.

Also, if combustible gas is contained, there is a danger of explosion, fire or the like occurring.

- Connect pipes correctly referring to the instruction manual.
- Exhaust should be led outdoors so that it will not remain inside the sampling equipment or indoor.
- Exhaust from the analyzer should be relieved in the atmospheric air in order that an unnecessary pressure will not be applied to the analyzer. Otherwise, any pipe in the analyzer may be disconnected to cause gas leakage.
- For piping, use a pipe and a pressure reducing valve to which oil and grease are not adhering. If such a material is adhering, a fire or the like accident may be caused.

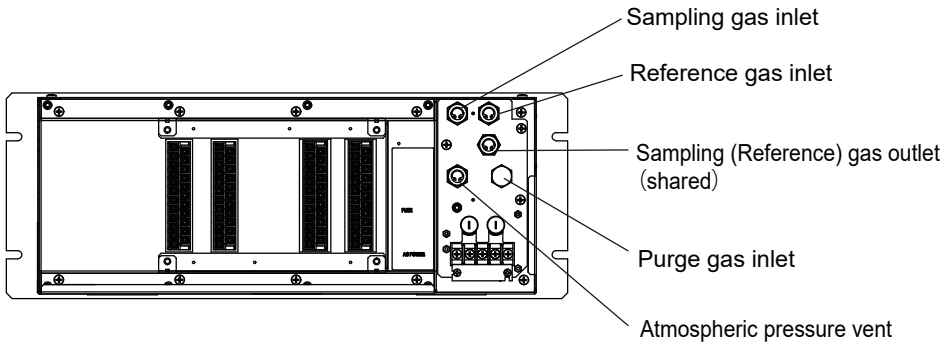
CAUTION

Piping connection must be secured. Gas inlets have several types: reference gas inlet, outlet or purge gas inlet. When the connection is insecure or wrong, combustible, toxic, explosive gas may be accumulated inside the analyzer or system.

Observe the following when connecting the gas pipes.

- The pipes should be connected to the gas inlet and outlet on the analyzer, respectively.
- Connect the sampling system to the instrument by using corrosion-resistant tube. The material should be such as Fluoropolymer (PTFE), stainless steel, or polyethylene. In case where there is no danger of corrosion, don’t use rubber or soft vinyl tube. Analyzer indication may become inaccurate due to the adsorption of gases.
- Piping connections are Rc1/4 (1/4 NPT) female-threaded. Cut the pipe as short as possible for obtaining quick response. Pipe of approx. ∅4 mm (inside diameter) is recommended.
- Entry of dust in the instrument may cause operation fault. Use clean pipes and couplings.

<IR800G>



<IR810G>

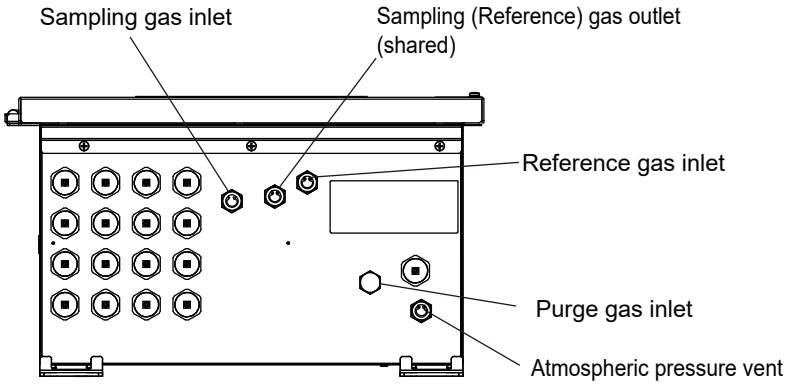


Figure 10

Sampling gas inlet: Connect the pipe so that zero/span calibration standard gas or measured gas pretreated with dehumidification is supplied properly.
Gas inlet pressure to be introduced (at the inlet of the analyzer);
4.9 to 9.8 kPa (both sample and reference). Note that the variations with respect to the set pressure are ±2%.

Sampling gas (reference gas) outlet: Measured gas is exhausted after measurement. Connect the pipe so that the gas may escape through the gas outlet into the atmosphere.

Purge gas inlet: It is used for purging the inside of the total gas analyzer. When the analyzer must be purged, use dry gas N_2 or instrumentation air for purge gas. (flow rate of approx. 1 L/min should be used and no dust or mist is contained).

Reference gas inlet: For IR800G/IR810G-C, introduce air, dry air, dry N_2 or humidified N_2 that has been pretreated with dehumidification, etc. as a reference gas for the active zero-drift cancellation mechanism.

Gas inlet pressure to be introduced (at the inlet of the analyzer);

4.9 to 9.8 kPa (both sample and reference)
Note that the variation with respect to the set pressure is ±2%.

2.4 Wiring

WARNING

- NEVER energize the product with the top cover (or front door) of the unit open.
- Turn off external switches and circuit breakers when working with the top cover (or front door) of the unit open.
- NEVER energize the converter or equipment connected to the converter until all wiring work has been completed.

CAUTION

In the case of Suffix code "-AD", the wiring material use Copper, Copper-Clad Aluminum, or Aluminum Conductors.

CAUTION

This equipment conforms to the CE marking

The following wiring installation is required when CE Mark compliant performance is required.

- An external switch or circuit breaker should be installed to power the converter.
- Use external switches or circuit breakers rated 10 A and compliant with IEC947-1 or 947-3.
- It is recommended that the external switch or circuit breaker be installed in the same room where the converter is installed
- External switches or circuit breakers should be located within reach of the operator and marked as being the power switch for this equipment.

How to wire

Signal and power lines should be installed under the following conditions.

(1) Be sure to wire the power supply line with three-pole wiring and protective grounding equivalent to JIS Class D (Class 3) grounding (grounding resistance 100 Ω or less).

(2) The shield must be connected to the FG terminal of the converter. (The object is the RS-485 cable.)

WARNING

- Use protective grounding cables with a cross-sectional area of 0.75 to 2.1 $mm^{2.}$
- Use cables with a heat resistance of 85°C or higher for wiring.

NOTE

Grounding of Shielded Cable

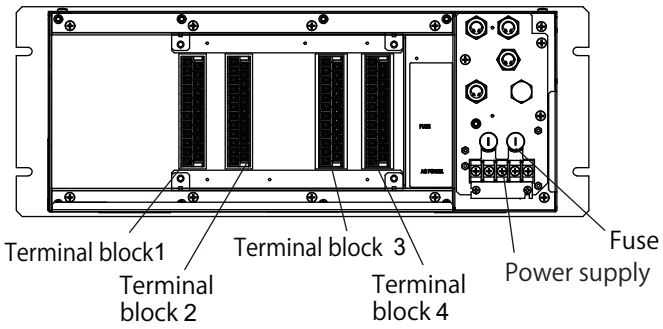
Shielded cables are very effective for noise rejection. The method of grounding the shield depends on the usage conditions.

Single-ended grounding, in which the shield is connected only to the ground of the unit, is effective for noise rejection when the cable length is long and there is a potential difference between the ground of the connection partner and the ground of the unit.

If there is no electric potential difference between the ground of the connection partner and the ground of this device, double-ended grounding may be effective by connecting to the ground of the connection partner as well. (It may also be effective to ground both ends and connect a capacitor in series to one side of the ground.)

See Figure 11 for wiring.

<IR800G>



<IR810G>

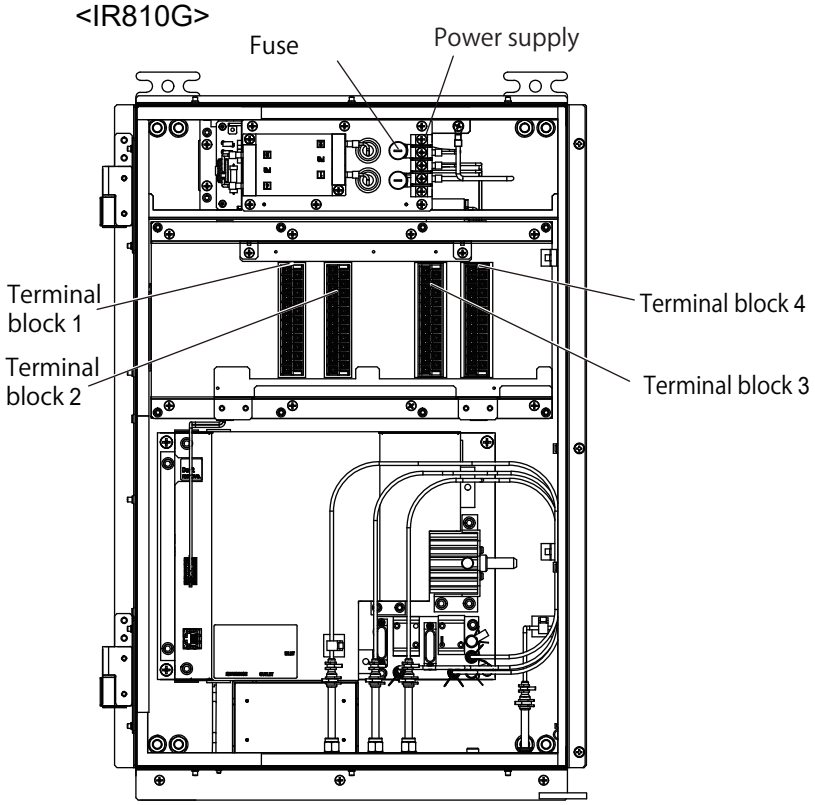


Figure 11

Installation of IR810G cable gland

WARNING

When using cable glands other than /CG1 to /CG4, prepare ones with high flame retardant of UL94 V-2 or higher, heat resistance temperature of 85°C or higher, and thread size of M20 x 1.5.

Unused wiring holes should be left as they are, with the plugs in place and not removed.
For holes used for wiring, remove the plug and install the cable gland. (Figure 12)
Make sure to tighten the cable gland securely with the specified tightening torque.

*: When using the cable gland supplied with option code /CG, the specified tightening torque is 2.2 to 3.0 N·m

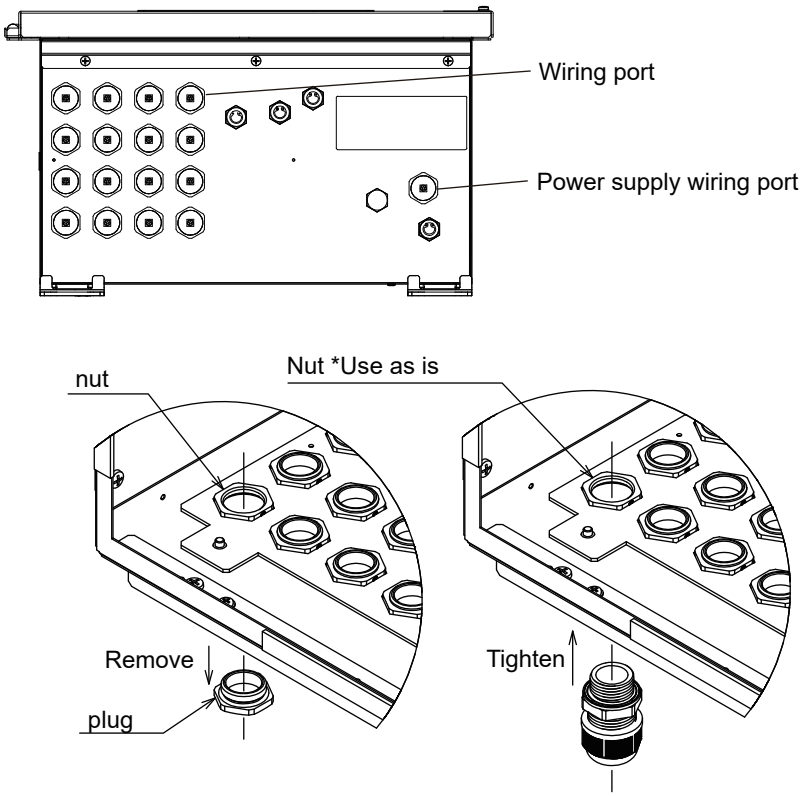


Figure 12 IR810G cable gland installation

CAUTION

Avoid injury from the edge of the housing hole, etc.

Wiring power supply

Connect the specified power supply to the power terminal and connect a ground wire to the ground terminal (P). The grounding should be D-class grounding. Use crimp terminals (for M4) for the wires to be connected to the terminals. The tightening torque is 1.2 N•m. Applicable wire diameters for power supply wiring lines vary depending on the option code.

IR800G: unrestricted

IR810G: with option code /CG; ø6.5 to ø12 mm
with option codes other than /CG; use cables with diameters that match the specifications of the cable gland. However, due to the limitations of the included ferrite core, the diameter must be ø12 mm or less.

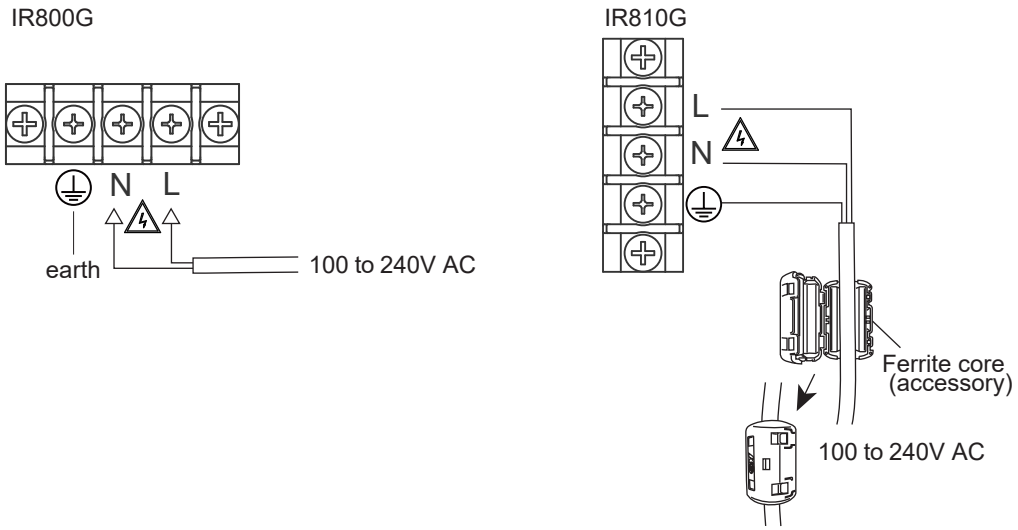


Figure 13 Wiring power supply

CAUTION

M4 screw terminals should always be covered with a terminal block protective cover after wiring for safety.

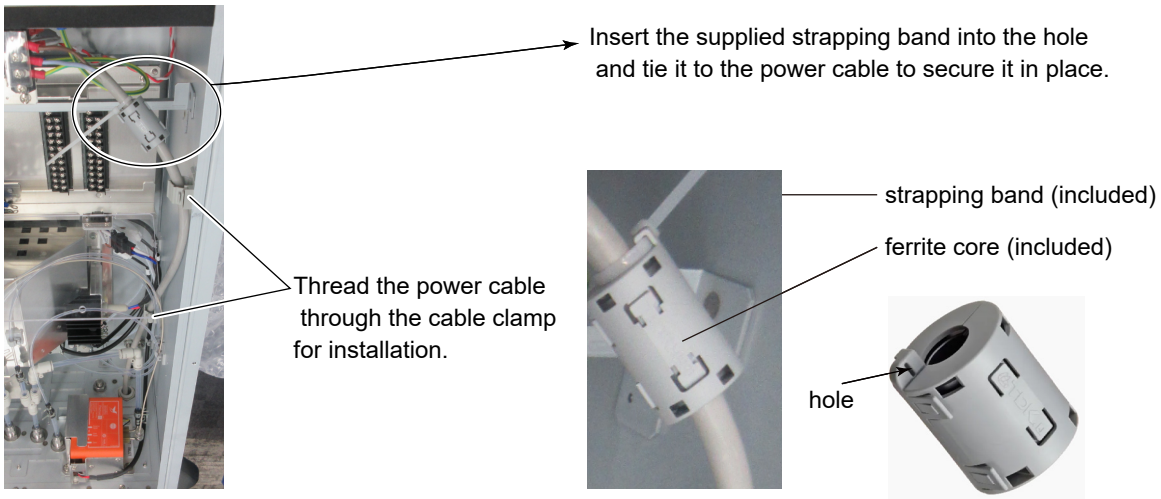


Figure 14 IR810G power cable installation

When noise source is in the vicinity

- Do not install this instrument near electrical equipment that generates power supply noise. (high-frequency furnaces, electric welding machines, etc.) Keep the power lines completely separate to avoid noise when using the instrument near such devices.
- If noise is present in a relay, solenoid valve, etc. from the power supply, attach a varistor or spark killer to the noise source as shown in Figure 3.7. Note that placing the varistor or spark killer apart from the noise source will have no effect.

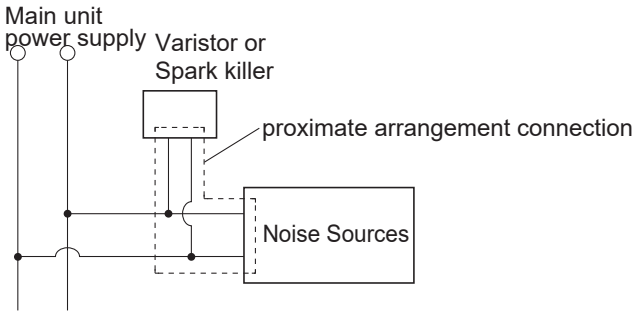


Figure 15

I/O terminals

NOTE

- Analog outputs are mutually non-isolated. We recommend that signals be isolated individually to eliminate unwanted signal wraparound and disturbance effects when drawing wiring outdoors, wiring longer than 30 m, or connecting multiple outputs to the outside.
- Isolated output (isolated between each DO and from the ground)

  To eliminate external influences on signals, separate the wiring to the power supply and contact output from the wiring to analog signals, O_2 analyzer input, and contact input.
- Be sure to earth ground the IR800G/IR810G to prevent malfunctions due to external noise, etc.

Terminal block 1

Contact input

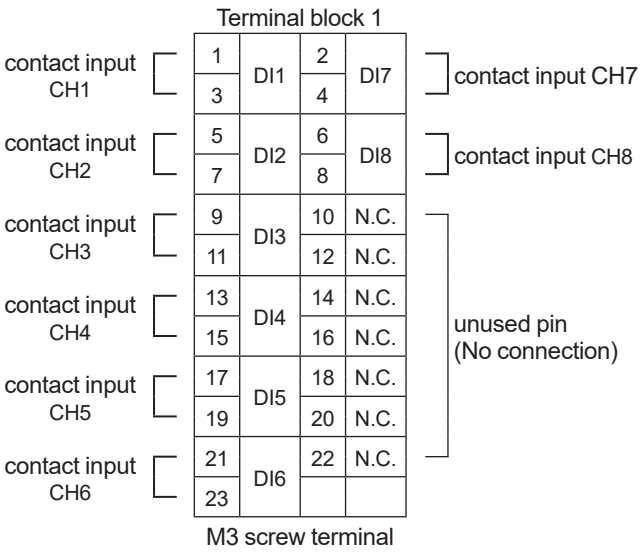


Figure 16 Terminal block 1: Contact input terminal

NOTE

After laying contact input/output signal lines, install the supplied ferrite cores for each terminal block at once.

The converter receives a contact signal and performs the configured function.

Cable specifications:

Each CH requires two cores for this wiring.

Select the number of cores according to the number of contacts to be used.

Wiring instructions:

(1) The terminal screw of the transducer is an M3 screw. The tightening torque is 0.6 N•m. Use crimp terminals compatible with these screws to terminate the cable.

(2) Resistance or voltage values determine the “ON/OFF” of this contact input. Switches must meet the conditions shown in the table below.

Table 7 ON/OFF” identification of contact input

	CLOSE	OPEN
Resistance	200 Ω or less	100 kΩ or more
Voltage value	-1 to 1 VDC	4.5 to 25 VDC

Terminal block 2

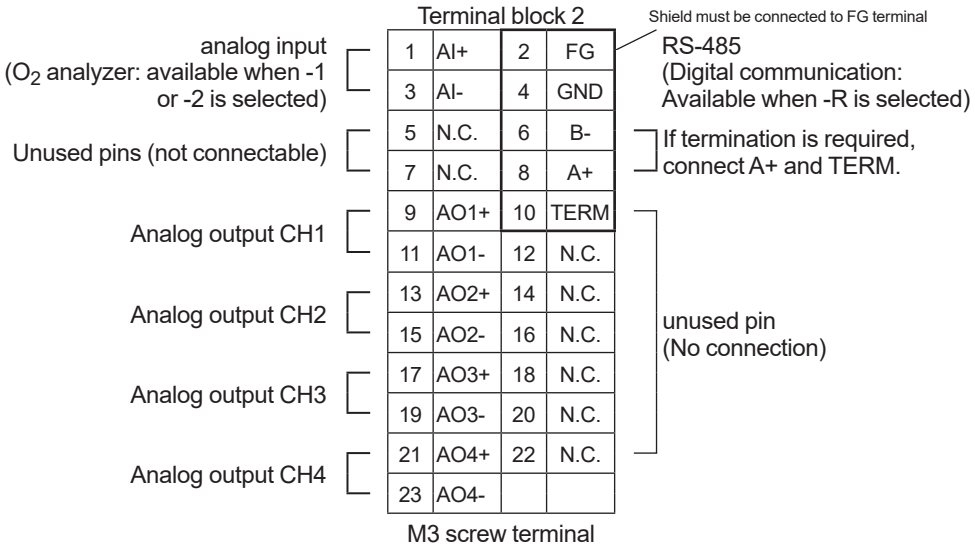


Figure 17 Terminal block 2: Analog input/analog output/RS-485

This terminal block has the following three functions.

• Analog input (O_2 analyzer: available when "-1" or "-2" is selected)

When using an external oxygen meter to input the O_2 analyzer, use this terminal for current input (4-20 mA).

Cable specifications:

Use two-core cables for this wiring.

Wiring instructions:

(1) Use an M3 screw for the terminal screw of the converter. The tightening torque is 0.6 N•m. Use crimp terminals compatible with these screws to terminate the cable.

(2) Do not wire with reversed polarity. Wire carefully to avoid mistaking the “+” and “-” polarity.

• Analog output

This wiring is used to transmit the 4-20mA DC signal to a recorder or other device. The load resistance including wiring resistance should be 550 Ω or less.

Cable specifications:

Each CH requires 2 cores for this wiring.

Select the number of cores according to the number of contacts to be used.

Wiring instructions:

(1) Use M3 threaded terminal screws on the converter. The tightening torque is 0.6 N•m. Use crimp terminals compatible with these screws to terminate the cable.

(2) Do not wire with reversed polarity. Wire carefully to avoid mistaking the "+" and "-" polarity.

• RS-485 communication (digital communication: available when -R is selected)

RS-485 (Modbus RTU) can be selected as an option for this product.

Use shielded cables to prevent malfunction due to external noise and to avoid radiation noise from the IR800G/IR810G from affecting other equipment.

Table 8 RS-485 terminal assignment

Terminal block 2 Terminal No.	Terminal name	Use
2	FG	Shield
4	GND	Signal GND
6	B-	Data (anode)
8	A+	Data (cathode)
10	TERM	For connecting a terminating resistor (110 Ω)

Use multi-core shielded cables with stranded (twisted pair) cores.

Connect the shield to terminal 2 on terminal block 2.

Terminate the signal with a built-in signal terminator (110 Ω resistance) according to the communication environment.

Connect terminals 8 and 10 of terminal block 2 when terminating.

Use M3 terminal screws. The tightening torque is 0.6 N•m.

Terminal block 3

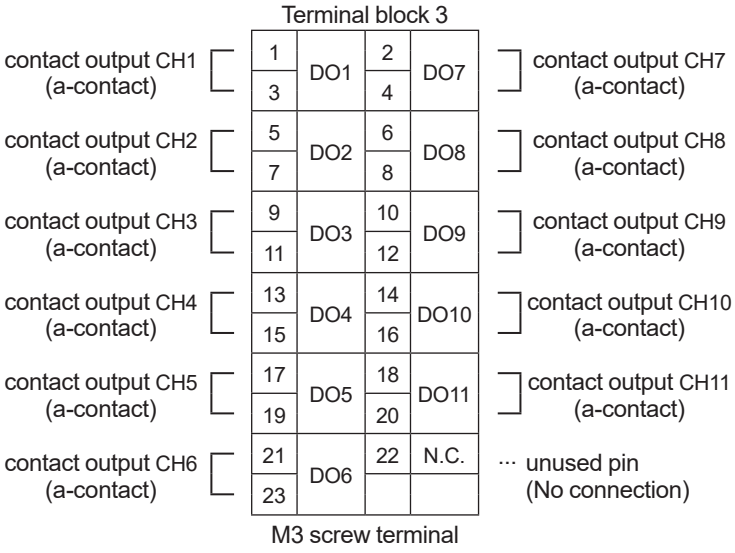


Figure 18 Terminal block 3: Contact output (a-contact)

The converter outputs up to 11 a-contact signals.

The function of contact outputs 1-4 is fixed, but the function of 5-11 is selectable (See the IM 11G06A01-02EN section 5.2.3 for details.)

Cable specifications:

Each CH requires 2 cores for this wiring.

Select the number of cores according to the number of contacts to be used.

Use a cable with a diameter that fully satisfies the current capacity of the connection point.

Wiring instructions:

(1) Use M3 screws on the converter. The tightening torque is 0.6 N•m.
Use crimp terminals compatible with these screws to terminate the cable.

(2) The contact capacity of the relay for contact output is 30V DC 1 A and 250V AC 2 A. Connect loads (indicator lights, solenoid valves, etc.) so that these values are not exceeded. AC and DC voltages cannot be used together.

Terminal block 4

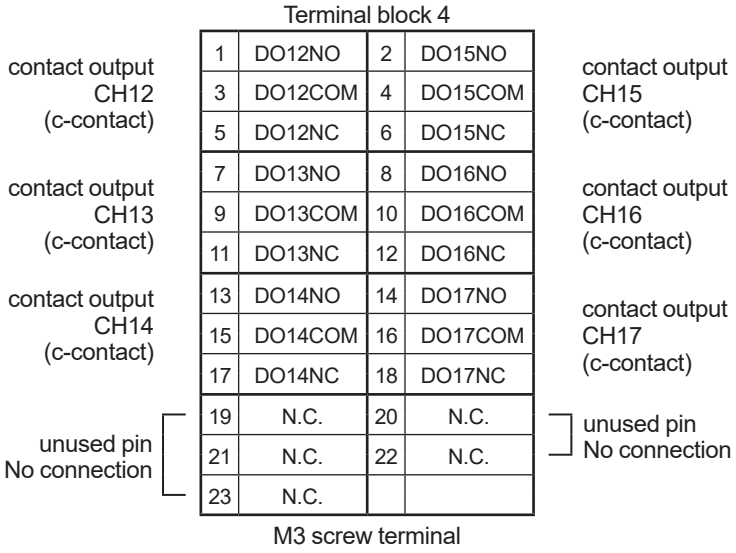


Figure 19 Terminal block 4: Contact output (c-contact)

The converter outputs up to 6 c-contact signals.
The function of contact outputs 12-17 is selectable. (See the IM 11G06A01-02EN section 5.2.3 for details.)

Cable specifications:

Each CH requires 3 cores for this wiring.

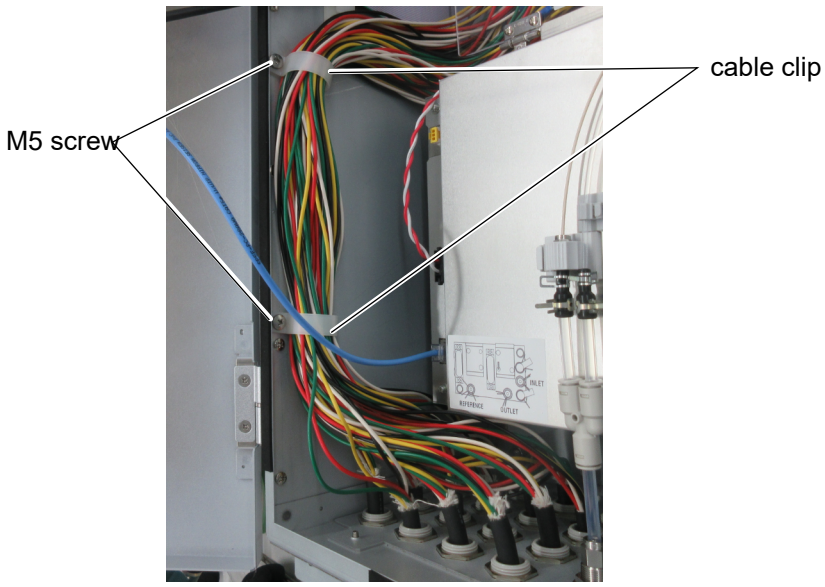
Select the number of cores according to the number of contacts to be used.

Use a cable with a diameter that fully satisfies the current capacity of the connection point.

Wiring instructions:

(1) Use M3 screws for the terminal screws of the converter. The tightening torque is 0.6 N•m.
Use crimp terminals compatible with these screws to terminate the cable.

(2) The contact capacity of the relay for contact output is 30 V DC 1 A and 250 V AC 2 A. Connect loads (indicator lights, solenoid valves, etc.) so that these values are not exceeded. AC and DC voltages cannot be used together.



Route the cable from the left side. After wiring, fasten the cable with the supplied cable clip and M5 screws. The tightening torque is 2.0 N•m.

Figure 20 IR810G Wiring

3. OPERATION

Check that the pipes are correctly connected to the gas sampling port and drain port. Check that the analyzer is correctly wired as specified.

■ Warm-up operation and regular operation

Procedure

(1) Turn ON the power.
The IR810G turns on when the power supply is connected.
The measurement screen appears on the front display panel.

(2) Warm-up operation for about 4 hours

(3) See “5. Screen Details” to make the necessary settings.

(4) Perform zero/span calibration after the warm-up operation (see “ Inspection and Maintenance”).

(5) Introduce the measurement gas into the IR800G/IR810G and start measurement.

4. MAINTENANCE

WARNING

- NEVER energize the unit with the top cover (or front door) of the unit open.
- Turn off external switches and circuit breakers when working with the top cover (or front door) of the unit open.
- Purge not only inside of IR800G/IR810G but all measuring gas lines with zero gas sufficiently, when you provide maintenance or inspection on IR800G/IR810G with its cover or door open. Otherwise, it may cause hazardous accidents such as gas leakage, fire and explosion.

4.1 Daily check and maintenance procedures

Regular maintenance

The front window should be kept clean to ensure clear visibility of the screen and proper operation of the touch panel. If dirty, wipe clean with a soft damp cloth or soft tissue.

When opening the front door or removing the cable gland and putting it back in place, clean the sealing area and fit it correctly to maintain the waterproofing of the case against water and vapor.

CAUTION

Never use potent chemicals or solvents. If the window is heavily soiled or scratched, parts may have to be replaced. Please consult our service.

Table 9 Maintenance and check list

Inspection cycle	Inspection point	Criteria	Remedy
Daily	Sample gas flow rate	0.5 to 1.0 L/min	If out of criterion, set the sample inlet pressure to 4.9 kPa to 9.8 kPa.

Inspection and maintenance should be performed once a day as needed.

Zero and span calibration

After completing zero calibration, perform span calibration. Refer to IM 11G06A01-02EN for the calibration method. Zero and span calibration should be performed once a week, or as needed.

Long-term maintenance parts

Plan the replacement of maintenance parts of this product according to the recommended replacement cycle.

The recommended replacement cycle is a standard guideline and varies depending on the site environment, measured gas conditions, and other factors.

The recommended replacement cycle does not constitute a warranty period.

Please contact us for maintenance services.

4.2 How to replace a fuse

Two fuses are used in the converter. If a fuse blows, replace it. See Figure 3 for fuse locations. Refer to IM 11G06A01-02EN for replacement details.

CAUTION

Before replacing a fuse, be sure to fully investigate the cause of the blown fuse (short circuit, etc.) and repair it.

Revision Information

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- Manual No. : IM 11G06A01-01EN

Nov. 2025/ 4th Edition
Correction of Control of Pollution Caused by the Product (Page iv)

July 2025/ 3rd Edition
Updated accessory list. (Pages 2, 3)
Miscellaneous changes and revised overall

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Added Korea Electromagnetic Conformity Standard and suffix cord "-AG". (Pages viii, 1, 2)
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