
**User's
Manual**

**MODEL IR100
Universal Infrared
Gas Analyzer**

EXAIR

IM 11G2L1-01E

vigilantplant.®

INTRODUCTION

Thank you for purchasing the IR100 Universal Infrared Gas Analyzer.

Before using this manual, thoroughly read it for correct use instructions.

■ DO NOT store or install the stack gas analyzing system in the following locations:

- Areas subject to vibration. Vibration may loosen tubing connections.
- Areas with high temperatures and humidity. The IR100 gas analyzer main units are designed for use in areas where the ambient temperature is -5 to 45 °C (-15 to 45 °C for cold-climate specifications) and the maximum ambient humidity is 90% RH. The allowable storage temperature ranges from -20 to 60 °C.
- Areas where corrosive gases are present. Also avoid storage in dusty locations. While the system is in storage, keep the sample gas inlet closed to prevent dust from entering the connection.

Thank you for selecting our Model IR100 Universal Infrared Gas Analyzer.

User's Manual, IM 11G2L1-01E, 5th Edition, supplied with the product, some revisions/additions have been made. Please replace the corresponding pages in your copy with the attached, revised pages.

Revisions:

- Page 1-4, Section 1.6.1, "IR100A, IR100B (horizontal type)," Fuse (provided as a standard accessory): Changed of Parts Number.
- Page 1-6, Section 1.6.2, "IR100TA, IR100TB (vertical type)," Fuse (provided as a standard accessory): Changed of Parts Number.
- CMPL "CMPL 11G2L1-01E," Fuse: Changed of Parts Number.
CMPL No. revised to 4th edition.

1.6 Model and Suffix Codes

1.6.1 IR100A, IR100B (horizontal type)

1. Single-gas analyzer (IR100A)

Model	Suffix code	Option code	Description
IR100A	.....	.....	Single-gas analyzer
Measured gas	-1..... -2..... -3.....	..... ..... .....	CO CO ₂ CH ₄
Primary range	A..... B..... C..... D..... E..... F..... G..... H..... J..... K..... L..... M..... P..... Q..... R..... S.....	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	0 to 500 ppm (not available for CH ₄) 0 to 1000 ppm 0 to 2000 ppm 0 to 2500 ppm 0 to 5000 ppm 0 to 1 % 0 to 2 % 0 to 5 % 0 to 10 % 0 to 20 % 0 to 50 % 0 to 100 % 0 to 3 % 0 to 30 % 0 to 40 % 0 to 70 %
Secondary range	A..... B..... C..... D..... E..... F..... G..... H..... J..... K..... L..... M..... N.....	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	0 to 500 ppm (not available for CH ₄) 0 to 1000 ppm 0 to 2000 ppm 0 to 2500 ppm 0 to 5000 ppm 0 to 1 % 0 to 2 % 0 to 5 % 0 to 10 % 0 to 20 % 0 to 50 % 0 to 100 % Not available
Power supply	-5..... -6..... -7..... -8..... -3..... -4.....	..... ..... ..... ..... ..... .....	100V AC 50Hz 100V AC 60Hz 115V AC 50Hz 115V AC 60Hz 220V AC 50Hz 220V AC 60Hz
Construction	A... B... C...	..... ..... .....	Desk top 19-inch rack-mounted Panel-mounted
Piping	J.. A..	..... .....	Rc1/4 1/4NPT
Panel	-J -E	..... .....	Japanese English
Additional functions		/P..... /J.....	Automatic calibration Remote range switching function and range identification functions

Fuse (provided as a standard accessory)

Part number	Specification
K9358DP	125/250 V, 500 mA

2. Dual-gas analyzer (IR100B)

Model	Suffix code	Option code	Description
IR100B	.....	.....	Dual-gas analyzer CO ₂ + CO
Measured gas	-G.....	.....	CO ₂ / CO (Primary gas / secondary gas)
Primary range of CO ₂	E.....	.....	0 to 500 ppm (0 to 500 ppm cannot be specified for CO)
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
Secondary range of CO ₂	1.....	.....	x2
	2.....	.....	x2.5
	N.....	.....	Not available
Primary range of CO	A.....	.....	0 to 500 ppm
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	Secondary range of CO	1.....	.....	x 2
2.....		.....	x 2.5
N.....		.....	Not available
Power supply	-5.....	.....	100 V AC 50 Hz
	-6.....	.....	100 V AC 60 Hz
	-7.....	.....	115 V AC 50 Hz
	-8.....	.....	115 V AC 60 Hz
	-3.....	.....	220 V AC 50 Hz
	-4.....	.....	220 V AC 60 Hz
Construction	A...	.....	Desk top
	B...	.....	19-inch rack-mounted
	C...	.....	Panel-mounted
Piping	J..	.....	Rc1/4
	A..	.....	1/4NPT
Panel	-J	.....	Japanese
	-E	.....	English
Additional functions	/P.....	.....	Automatic calibration (for both gases)
	/J.....	.....	Remote range switching function and range identification functions

Fuse (provided as a standard accessory)

Part number	Specification
K9358DP	125/250 V, 500 mA

1.6.2 IR100TA, IR100TB (vertical type)

1. Single-gas analyzer (IR100TA)

Model	Suffix code	Option code	Description
IR100TA	.....	.....	Single-gas analyzer
Measured gas	-1..... -2..... -3.....	..... ..... .....	CO CO ₂ CH ₄
Primary range	A..... B..... C..... D..... E..... F..... G..... H..... J..... K..... L..... M..... P..... Q..... R..... S.....	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	0 to 500 ppm (not available for CH ₄) 0 to 1000 ppm 0 to 2000 ppm 0 to 2500 ppm 0 to 5000 ppm 0 to 1 % 0 to 2 % 0 to 5 % 0 to 10 % 0 to 20 % 0 to 50 % 0 to 100 % 0 to 3 % 0 to 30 % 0 to 40 % 0 to 70 %
Secondary range	A..... B..... C..... D..... E..... F..... G..... H..... J..... K..... L..... M..... N.....	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	0 to 500 ppm (not available for CH ₄) 0 to 1000 ppm 0 to 2000 ppm 0 to 2500 ppm 0 to 5000 ppm 0 to 1 % 0 to 2 % 0 to 5 % 0 to 10 % 0 to 20 % 0 to 50 % 0 to 100 % Not available
Power supply	-5..... -6..... -7..... -8..... -3..... -4.....	..... ..... ..... ..... ..... .....	100 V AC 50 Hz 100 V AC 60 Hz 115 V AC 50 Hz 115 V AC 60 Hz 220 V AC 50 Hz 220 V AC 60 Hz
Construction	C.... D....	..... .....	Panel-mounted Wall-mounted
Piping	J.. A..	..... .....	Rc1/4 1/4NPT
Panel	-J -E	..... .....	Japanese English
Additional functions		/P..... /J.....	Automatic calibration Remote range switching function and range identification functions

Fuse (provided as a standard accessory)

Part number	Specification
K9358DP	125/250 V, 500 mA

2. Dual-gas analyzer (IR100TB)

Model	Suffix code	Option code	Description
IR100TB	.....	.....	Dual-gas analyzer CO ₂ + CO
Measured gas	-G.....	.....	CO ₂ / CO (Primary gas / secondary gas)
Primary range of CO ₂	E.....	.....	0 to 5000 ppm (0 to 500 ppm cannot be specified for CO)
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
Secondary range of CO ₂	1.....	.....	× 2
	2.....	.....	× 2.5
	N.....	.....	Not available
Primary range of CO	A.....	.....	0 to 500 ppm
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	Secondary range of CO	1.....
2.....		× 2.5
N.....		.....	Not available
Power supply	-5.....	.....	100 V AC 50 Hz
	-6.....	.....	100 V AC 60 Hz
	-7.....	.....	115 V AC 50 Hz
	-8.....	.....	115 V AC 60 Hz
	-3.....	.....	220 V AC 50 Hz
	-4.....	.....	220 V AC 60 Hz
Construction	C....	.....	Panel-mounted
	D....	.....	Wall-mounted
Piping	J..	.....	Rc1/4
	A..	.....	1/4NPT
Panel	-J	.....	Japanese
	-E	.....	English
Additional functions	/P.....	.....	Automatic calibration (for both gases)
	/J.....	.....	Remote range switching function and range identification functions

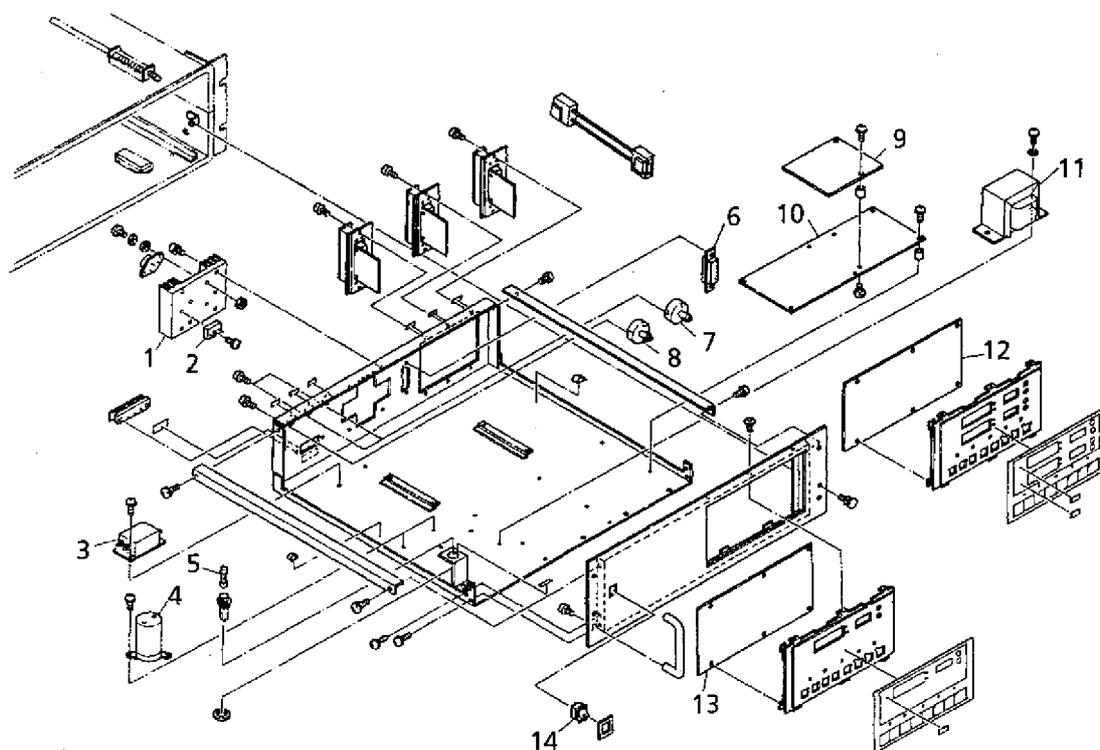
Fuse (provided as a standard accessory)

Part number	Specification
K9358DP	125/250 V, 500 mA

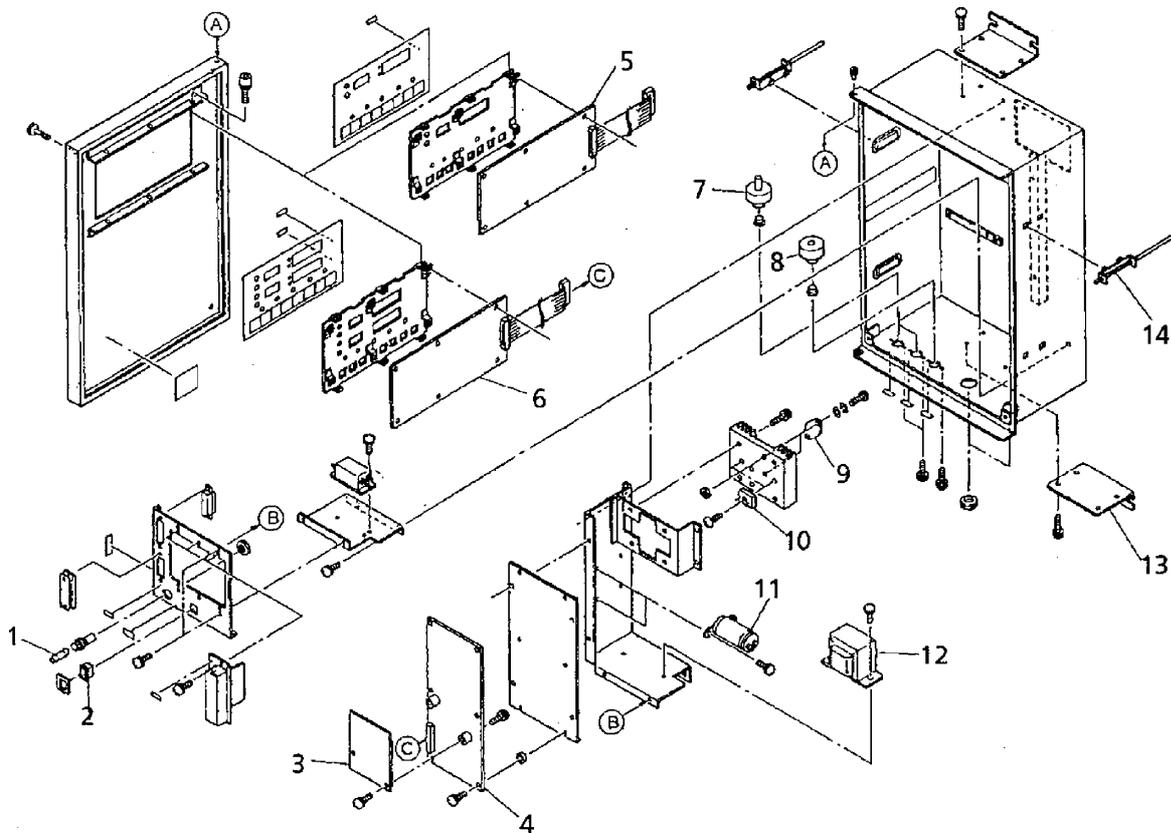
Customer Maintenance Parts List

Model IR100 Universal Infrared Gas Analyzer

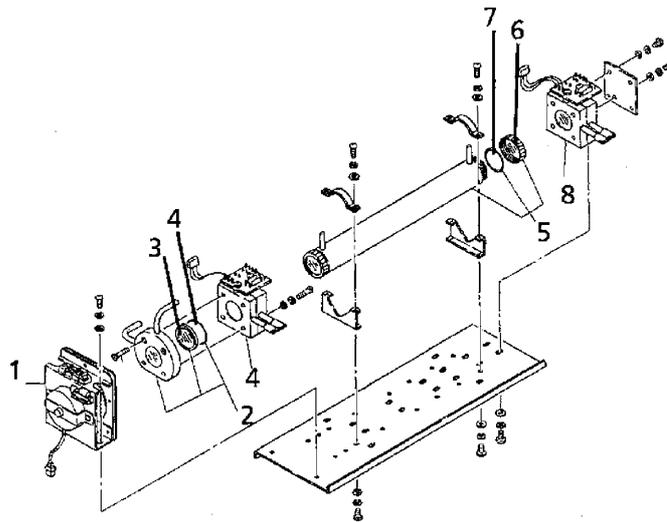
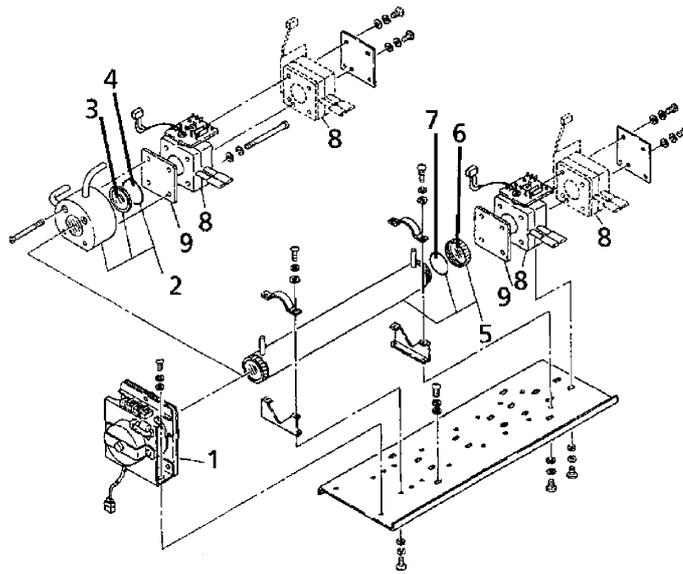
EXAIR



Item	Part No.	Qty	Description
1	K9358CK	1	Heat Sink
2	K9358CL	2	Diode
3	K9358CV	1	Noise Filter
4	K9358CW	1	Capacita
5	K9358DP	1	Fuse (125/250V, 500mA)
6	K9358CS	1	Connector
7	K9358CQ	2	Fittings
	K9358CR		1/4 NPT Rc 1/4
8	K9358CN	1	Socket
	K9358CP		1/4 NPT Rc 1/4
9	K9358DC	1	PCB (Only dual-gas analyzer IR100B)
10	K9358DB	1	PCB
11	K9358DA	1	Trans
12	K9358EK	1	Display Board PCB (For dual-gas analyzer IR100B)
13	K9358EH	1	Display Board PCB (For single-gas analyzer IR100A)
14	K9358DH	1	Switch



Item	Part No.	Qty	Description
1	K9358DP	1	Fuse (125/250V, 500mA)
2	K9358DH	1	Switch
3	K9358DC	1	PCB (Only dual-gas analyzer IR100TB)
4	K9358DB	1	PCB
5	K9358EH	1	Display Board PCB (For single-gas analyzer IR100TA)
6	K9358EK	1	Display Board PCB (For dual-gas analyzer IR100TB)
7		2	Fittings
	K9358CQ		1/4 NPT
	K9358CR		Rc 1/4
8		1	Socket
	K9358CN		1/4 NPT
	K9358CP		Rc 1/4
9	K9358CJ	2	Transistor
10	K9358CL	2	Diode
11	K9358CW	1	Condenser
12	K9358DA	1	Trans
13	K9358HE	2	Mounting Plate
14	K9358CC	4	Mounting metal fittings (Panel Type)



Item	Part No.	Qty	Description
1	K9358FA	1	IR Source Unit
2	— *	1	Cell Unit
3	K9358FK	1	Window Assembly
4	K9358FL	1	O - Ring
5	— *	1	Cell Assembly
6	K9358GM	1	Window Assembly
7	K9358GN	1	O - Ring
8	— *	1	Detector Unit Assembly
9	— *	1	Filter

* : Please consult specifying the model code because the part number is decided by the measurement gas and the measurement range.

■ Contents of this manual

This manual describes all aspects of the <IR100 Universal Infrared Gas Analyzer> including the installation, operation, inspection and maintenance procedures. Therefore, note that this manual may involve devices and systems that are beyond your specifications. Keep this in mind when you read this manual.

Table 1.1 Manual Contents Summary and Guide to Sections by Task

Chapter	Content	When to read, by task		
		To Install	To Operate	To Maintain
1. Specifications	Gives standard specifications, model codes (or part number), and outline drawings for each device.	◎	○	○
2. Component names and functions	Gives names and brief functional descriptions of IR100 main unit components.	△	○	○
3. Installation	Describes requirements and procedures for installation of IR100 analyzer main units and external sampling systems.	◎		△
4. General operation	Explains the basic procedure to be followed to bring an IR100 system to operational status. This section gives sufficient general knowledge to put a system into operation.		◎	△
5. Detailed key and display operations	Provides details concerning operating panel key operations and displays.		◎	△
6. Maintenance	Gives procedures for inspection and replacement of parts subject to deterioration, to maintain IR100 performance.		○	◎
7. Troubleshooting	Gives procedures for dealing with error messages and for corrective action in the event of a failure.			
CMPL (Parts list)	Lists user-replaceable parts.		△	○

◎ : Read and understand completely before beginning work.

○ : Read once before beginning operation. Then refer to when necessary.

△ : Recommend reading.

Safety Precautions

■ Safety, Protection, and Modification of the Product

- 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 symbols are used in the product and user's manual to indicate that there are precautions for safety:



Indicates that caution is required for operation. This symbol is placed on the product to refer the user to the user's manual in order to protect the operator and the equipment. In the user's manuals you will find precautions to avoid physical injury or death of the operator, including electrical shocks.



Identifies a protective grounding terminal. Before using the product, ground the terminal.



Identifies a functional grounding terminal. Before using the product, ground the terminal.



Indicates an AC supply.



Indicates a DC supply.



Indicates that the main switch is ON.



Indicates that the main switch is OFF.

■ 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.

■ 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 can not predict in advance.

■ Notes on Hardware

● Appearance and Accessories

Check the following when you receive the product:

- Appearance
- Standard accessories

Contact our sales representative or your local distributor if the product's coating has come off, it has been damaged, or there is shortage of required accessories.

● Model and Suffix Codes

The name plate on the product contains the model and suffix codes. Compare them with those in the general specification to make sure the product is the correct one. If you have any questions, contact our sales representative or your local distributor.

■ Symbol Marks

Throughout this user's manual, you will find several different types of symbols are used to identify different sections of text. This section describes these icons.



CAUTION

Identifies instructions that must be observed in order to avoid physical injury and electric shock or death of the operator.



WARNING

Identifies instructions that must be observed in order to prevent the software or hardware from being damaged or the system from becoming faulty.



IMPORTANT

Identifies important information required to understand operations or functions.

TIP

Identifies additional information.

SEE ALSO

Identifies a source to be referred to.

Clicking a reference displayed in green can call up its source, while clicking a reference displayed in black cannot.

◆ After - Sales Warranty

- Do not modify the product.
- 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.
- 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 charged to the customer.
- 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, lighting, 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 re-sells 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.

MODEL IR100

Universal Infrared Gas Analyzer

IM 11G2L1-01E 5th Edition

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1. GENERAL

Model IR100 Universal Infrared Gas Analyzer is a multi-functional and easy-handling non-dispersive type infrared gas analyzer, employing thermal flow sensor which is popular in various fields, highly sensitive, and liable and microprocessor to measure concentrations of gaseous components like CH₄, CO₂, CO etc.

1.1 Standard Specifications

- Model : Horizontal type IR100A (single-gas analyzer) and IR100B (dual-gas analyzer)
Vertical type IR100TA (single-gas analyzer) and IR100TB (dual-gas analyzer)
- Operating principle : Non-dispersive infrared absorption, deflection method, single infrared-source, single-flux (single-beam)
- Measured gas and measuring range
 - [Single-gas dual-range analyzer] CO₂, CO, CH₄;
 - CO₂ : 0 to 500 ppm, 0 to 100 %
 - CO : 0 to 500 ppm, 0 to 100 %
 - CH₄ : 0 to 1000 ppm, 0 to 100 %
 - [Dual-gas dual-range analyzer] CO₂, CO;
 - CO₂ : 0 to 5000 ppm, 0 to 100 %
 - CO : 0 to 500 ppm, 0 to 100 %
 - For the secondary range of the IR100B, you can specify the range as none, two or 2.5 times that of the primary range.
- Output signals : Output 1 : 0 to 1 V DC, non-insulated, linearized output signals
Output 2 : 4 to 20 mA (maximum allowable load resistance : 550 Ω), simultaneous, non-insulated, or linearized output signals
- Material exposed to gas
 - Connection port : SUS 304
 - Cell window : CaF₂
 - Cell material : SUS 304
 - O-ring : Neoprene
- Power supply : 100 V AC ± 10%, 50 / 60 Hz
115 V AC ± 10%, 50 / 60 Hz
220 V AC ± 10%, 50 / 60 Hz
- Power consumption : Max. 37 VA
- Ambient temperature : -5 °C to 45 °C
- Ambient humidity : 90 % RH or less
- Casing : Steel, for indoor use.

- Structure : IR100A, IR100B ; Select out of desktop model, 19-inch rack-mounted model and panel-mounted model
: IR100TA, IR100TB ; Select out of panel-mounted, wall-mounted model
- Weight : Approx. 12 kg
- Storage conditions : Temperature : -20 °C to 60 °C
Humidity : 90 % RH or less (Avoid condensation.)

1.2 Characteristics

- Repeatability : ± 0.5 % FS for the primary range (lower range)
± 1.0 % FS for the secondary range (higher range)
- Zero drift : ± 2 % FS/week
- Span drift : ± 2 % FS/week
- Response time (90% response) : 15 sec or less including the time required for substitution of the sample cell

1.3 Interfering Gas

Influence of interfering gas

Interfering gas and its concentration	CO meter	CO ₂ meter	CH ₄ meter
CO 1000 ppm	—	≤5 ppm	≤ 10 ppm
CO ₂ 20 %	≤ 5 ppm	—	≤ 10 ppm
H ₂ O saturation at 20 °C	≤ 15 ppm	≤ 5 ppm	≤ 10 ppm
CH ₄ 5000 ppm	≤ 10 ppm	≤ 5 ppm	—
SO ₂ 1000 ppm	≤ 2 ppm	≤ 2 ppm	≤ 2 ppm

Note: For gases other than the above, contact this company directly.

1.4 Installation Conditions

- Ambient temperature : -5 °C to 45 °C
- Ambient humidity : 90 % RH or less
- Vibration : should be avoided
- Direct sunlight : should be avoided
- Atmospheric gas concentration : CO₂ 2000 ppm or less
CO 100 ppm or less
SO₂ 5 ppm or less
CH₄ 100 pm or less

1.5 Sample Gas Conditions (without sampling system)

- Flow rate : Approx. 1 l/min.
- Pressure : 500 Pa or more
- Temperature : 0 °C to 50 °C
- Dust : 100 µg / Nm³ with the particle size of 1 µm or less
- Mist : None
- Humidity : Avoid concentration
- Corrosive gases sampled :

NO _x	1000 ppm or less
SO ₂	1000 ppm or less
HCl	1 ppm or less
Others	None

Applications

- Blast furnace : CO; 0 to 40 %, 0 to 50 %
CO₂; 0 to 30 %, 0 to 40 %
- Converter : CO; 0 to 100 % CO₂; 0 to 100 %
- Electric furnace : CO; 0 to 100 % CO₂; 0 to 100 %
- Coke oven : CO; 0 to 100 % CO₂; 0 to 100 %
- Reverberatory furnace : CO; 0 to 20 % CO₂; 0 to 20 %
- Cement kiln : CO; 0 to 1 %, 0 to 5 %
- Coal kiln : CO; 0 to 1 %, 0 to 5 %
- Carbonizing furnace : CO₂; 0 to 1 %, 0 to 2 %
- Transforming furnace : CO₂; 0 to 0.5%, 0 to 1 %
- Inert gas generator : CO₂; 0 to 10%, 0 to 20 % (O₂; 0 to 2 %)
- Waste incinerator : CO₂; 0 to 20 %
- Boiler : CO; 0 to 500 ppm, 0 to 1000 ppm (O₂; 0 to 10 %, 0 to 25 %)
- Leak gas detection : CO, CH₄
- Plant carbon dioxide assimilation: CO₂; 0 to 500 ppm, 0 to 1000 ppm
- Apple storage facility : CO₂; 0 to 5 %, 0 to 10 %
(O₂; 0 to 10 %, 0 to 25 %)
- Rice storage facility : CO₂; 0 to 50 %, 0 to 100 %
- Fermentation plant : CO₂; 0 to 10 %, 0 to 20 %
- Brewery : CO₂; 0 to 5 %

1.6 Model and Suffix Codes

1.6.1 IR100A, IR100B (horizontal type)

1. Single-gas analyzer (IR100A)

Model	Suffix code	Option code	Description
IR100A	.....	.....	Single-gas analyzer
Measured gas	-1.....	.....	CO
	-2.....	.....	CO ₂
	-3.....	.....	CH ₄
Primary range	A.....	.....	0 to 500 ppm (not available for CH ₄)
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	P.....	.....	0 to 3 %
Q.....	.....	0 to 30 %	
R.....	.....	0 to 40 %	
S.....	.....	0 to 70 %	
Secondary range	A.....	.....	0 to 500 ppm (not available for CH ₄)
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	N.....	.....	Not available
Power supply	-5.....	.....	100V AC 50Hz
	-6.....	.....	100V AC 60Hz
	-7.....	.....	115V AC 50Hz
	-8.....	.....	115V AC 60Hz
	-3.....	.....	220V AC 50Hz
	-4.....	.....	220V AC 60Hz
Construction	A...	.....	Desk top
	B...	.....	19-inch rack-mounted
	C...	.....	Panel-mounted
Piping	J..	.....	Rc1/4
	A..	.....	1/4NPT
Panel	-J	.....	Japanese
	-E	.....	English
Additional functions		/P.....	Automatic calibration
		/J.....	Remote range switching function and range identification functions

Fuse (provided as a standard accessory)

Part number	Specification
K9358CY	125 V, 1 A
K9358CZ	250 V, 1 A

2. Dual-gas analyzer (IR100B)

Model	Suffix code	Option code	Description
IR100B	.....	.....	Dual-gas analyzer CO ₂ + CO
Measured gas	-G.....	.....	CO ₂ / CO (Primary gas / secondary gas)
Primary range of CO ₂	E.....	.....	0 to 500 ppm (0 to 500 ppm cannot be specified for CO)
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
Secondary range of CO ₂	1.....	.....	×2
	2.....	.....	×2.5
	N.....	.....	Not available
Primary range of CO	A.....	.....	0 to 500 ppm
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	Secondary range of CO	1.....
2.....		× 2.5
N.....		.....	Not available
Power supply	-5.....	.....	100 V AC 50 Hz
	-6.....	.....	100 V AC 60 Hz
	-7.....	.....	115 V AC 50 Hz
	-8.....	.....	115 V AC 60 Hz
	-3.....	.....	220 V AC 50 Hz
	-4.....	.....	220 V AC 60 Hz
Construction	A...	.....	Desk top
	B...	.....	19-inch rack-mounted
	C...	.....	Panel-mounted
Piping	J..	.....	Rc1/4
	A..	.....	1/4NPT
Panel	-J	.....	Japanese
	-E	.....	English
Additional functions	/P.....	.....	Automatic calibration (for both gases)
	/J.....	.....	Remote range switching function and range identification functions

Fuse (provided as a standard accessory)

Part number	Specification
K9358CY	125 V, 1 A
K9358CZ	250 V, 1 A

1.6.2 IR100TA, IR100TB (vertical type)

1. Single-gas analyzer (IR100TA)

Model	Suffix code	Option code	Description
IR100TA	.....	.....	Single-gas analyzer
Measured gas	-1.....	.....	CO
	-2.....	.....	CO ₂
	-3.....	.....	CH ₄
Primary range	A.....	.....	0 to 500 ppm (not available for CH ₄)
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	P.....	.....	0 to 3 %
	Q.....	.....	0 to 30 %
R.....	.....	0 to 40 %	
S.....	.....	0 to 70 %	
Secondary range	A.....	.....	0 to 500 ppm (not available for CH ₄)
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	N.....	.....	Not available
	Power supply	-5.....	.....	100 V AC 50 Hz
-6.....		.....	100 V AC 60 Hz
-7.....		.....	115 V AC 50 Hz
-8.....		.....	115 V AC 60 Hz
-3.....		.....	220 V AC 50 Hz
-4.....		.....	220 V AC 60 Hz
Construction	C....	.....	Panel-mounted
	D....	.....	Wall-mounted
Piping	J..	.....	Rc1/4
	A..	.....	1/4NPT
Panel	-J	.....	Japanese
	-E	.....	English
Additional functions		/P.....	Automatic calibration
		/J.....	Remote range switching function and range identification functions

Fuse (provided as a standard accessory)

Part number	Specification
K9358CY	125 V, 1 A
K9358CZ	250 V, 1 A

2. Dual-gas analyzer (IR100TB)

Model	Suffix code	Option code	Description
IR100TB	.....	.....	Dual-gas analyzer CO ₂ + CO
Measured gas	-G.....	.....	CO ₂ / CO (Primary gas / secondary gas)
Primary range of CO ₂	E.....	.....	0 to 5000 ppm (0 to 500 ppm cannot be specified for CO)
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
Secondary range of CO ₂	1.....	.....	× 2
	2.....	.....	× 2.5
	N.....	.....	Not available
Primary range of CO	A.....	.....	0 to 500 ppm
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	Secondary range of CO	1.....	.....	× 2
2.....		.....	× 2.5
N.....		.....	Not available
Power supply	-5.....	.....	100 V AC 50 Hz
	-6.....	.....	100 V AC 60 Hz
	-7.....	.....	115 V AC 50 Hz
	-8.....	.....	115 V AC 60 Hz
	-3.....	.....	220 V AC 50 Hz
	-4.....	.....	220 V AC 60 Hz
Construction	C....	.....	Panel-mounted
	D....	.....	Wall-mounted
Piping	J..	.....	Rc1/4
	A..	.....	1/4NPT
Panel	-J	.....	Japanese
	-E	.....	English
Additional functions	/P.....	.....	Automatic calibration (for both gases)
	/J.....	.....	Remote range switching function and range identification functions

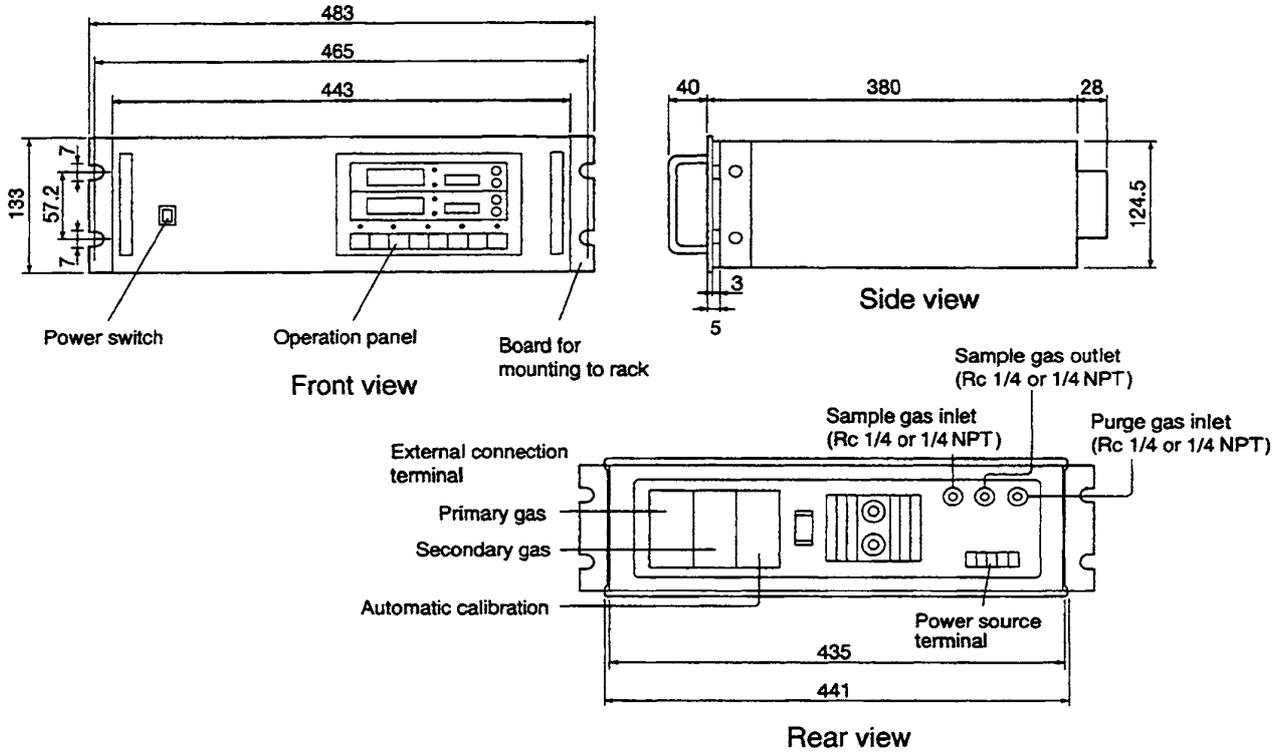
Fuse (provided as a standard accessory)

Part number	Specification
K9358CY	125 V, 1 A
K9358CZ	250 V, 1 A

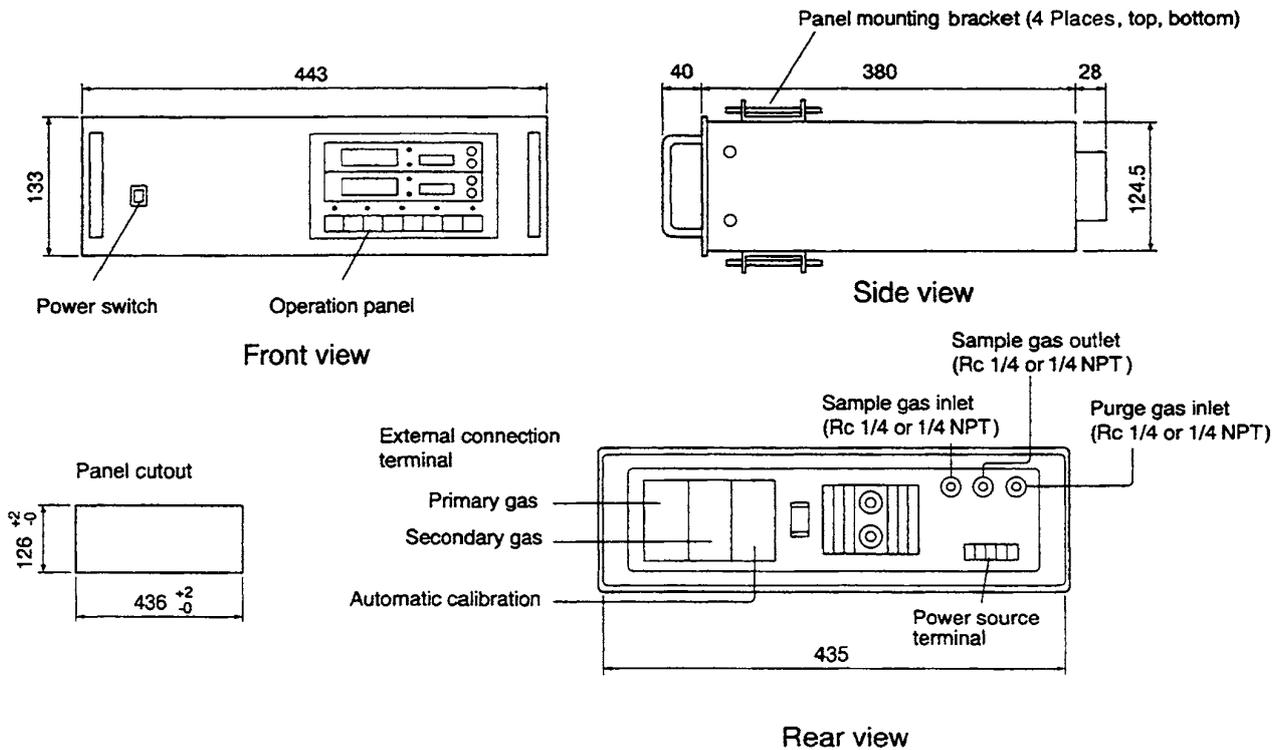
1.7 Dimensions

1.7.1 IR100A, IR100B (horizontal type)

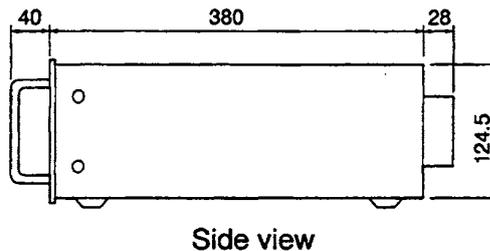
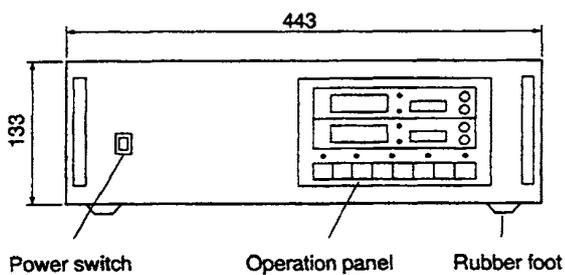
(1) Rack mounting



(2) Panel mounting

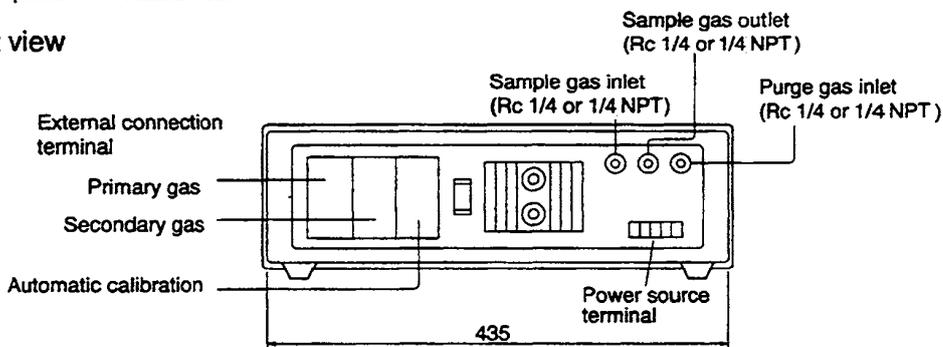


(3) Desktop model



Front view

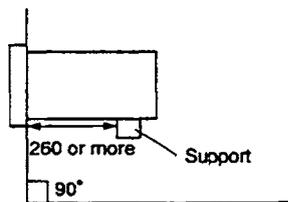
Side view



Rear view

How to mount

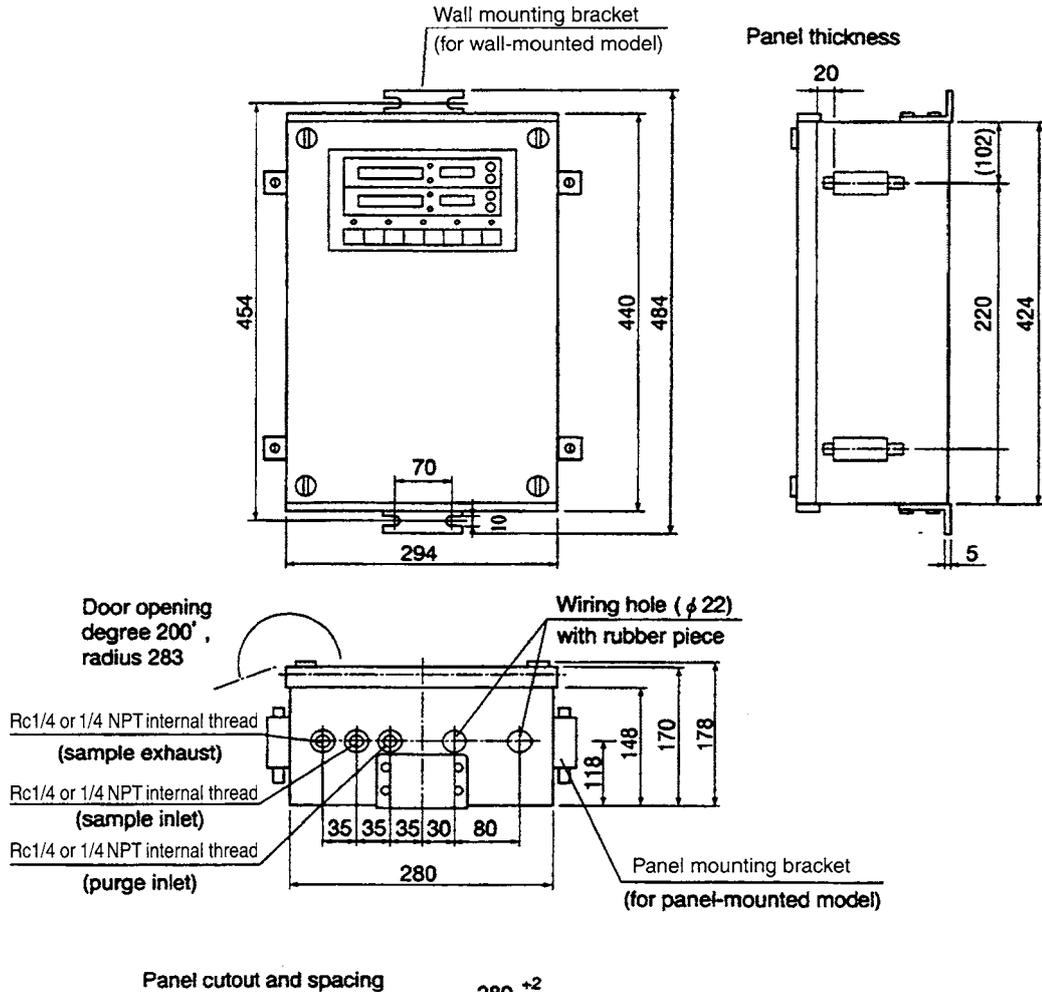
Mount on 19-inch rack, put flush on the panel or place on the desk



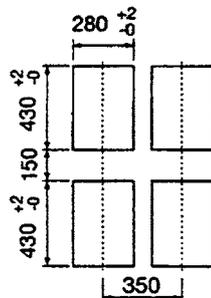
Remarks : Bear at least 70% of the unit weight by the case bottom.

[When putting in the panel or mounting on 19-inch rack, provide a support to bear the case rear.]

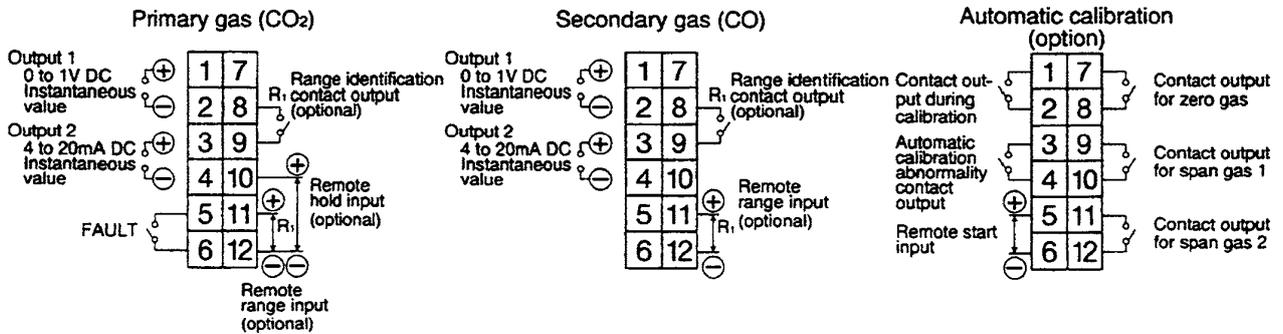
1.7.2 1R100TA, IR100TB (vertical type)



Panel cutout and spacing



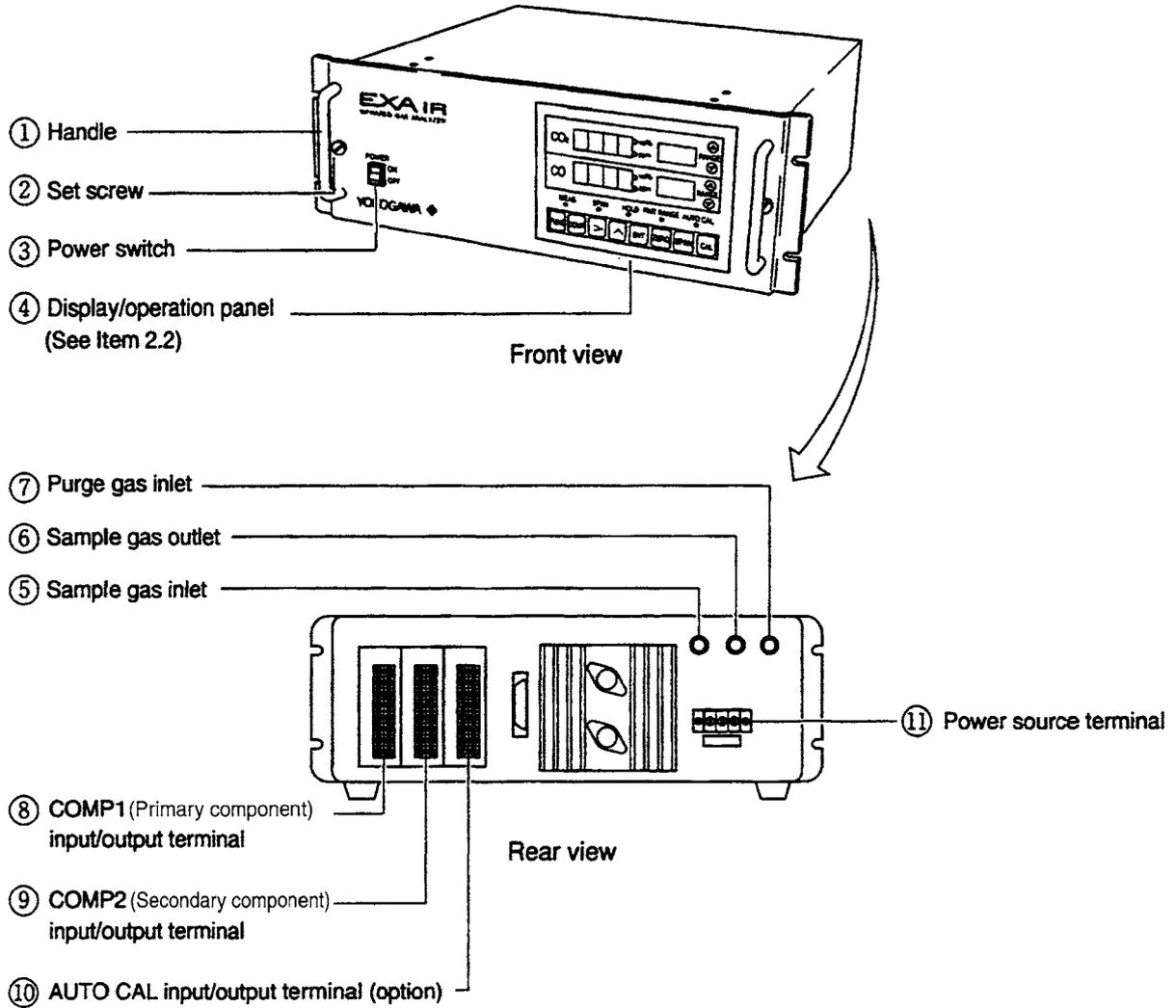
1.8 External Connection Terminal



2. DESCRIPTIONS OF COMPONENTS

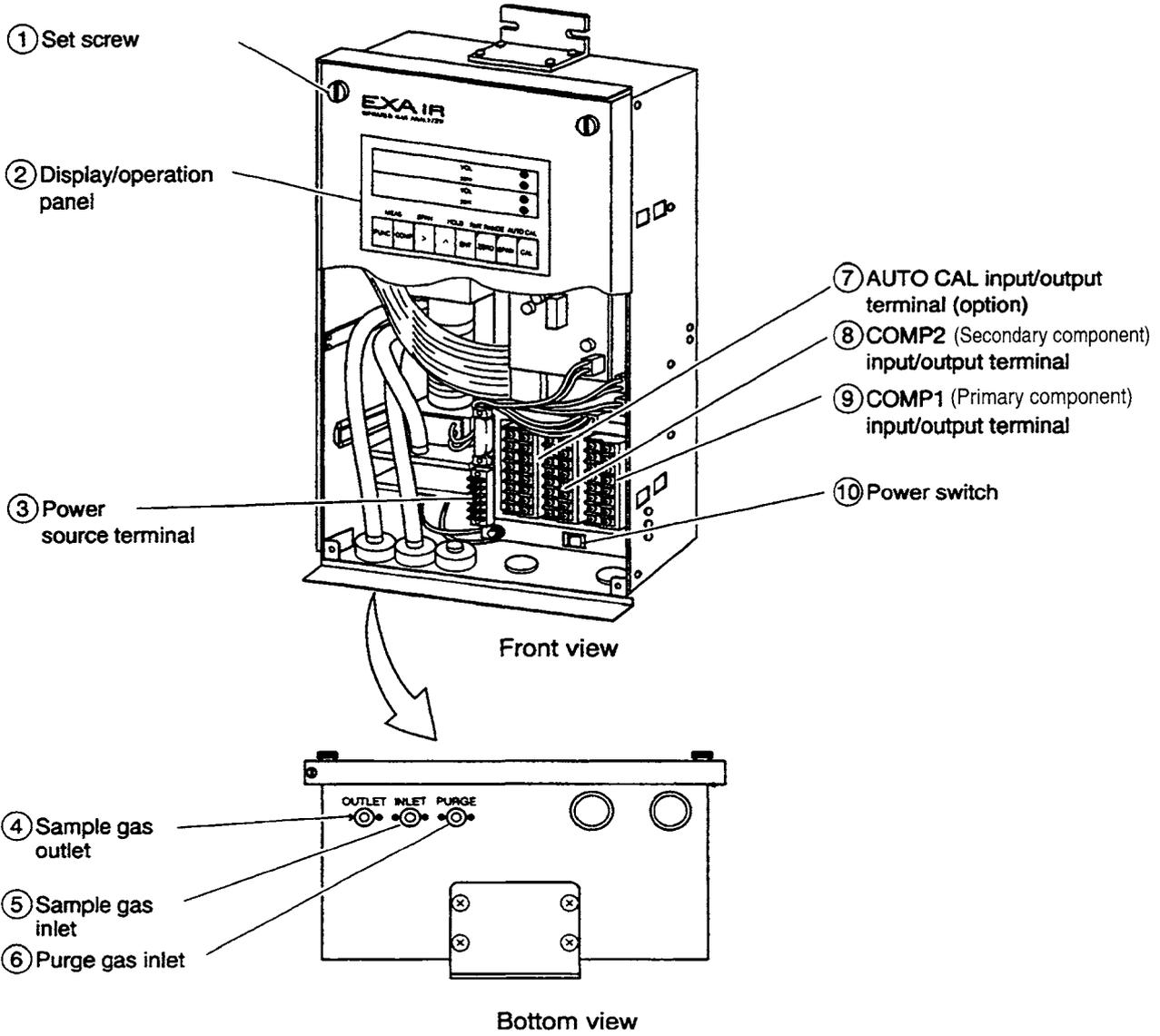
2.1 Descriptions of Components

2.1.1 IR100A, IR100B type



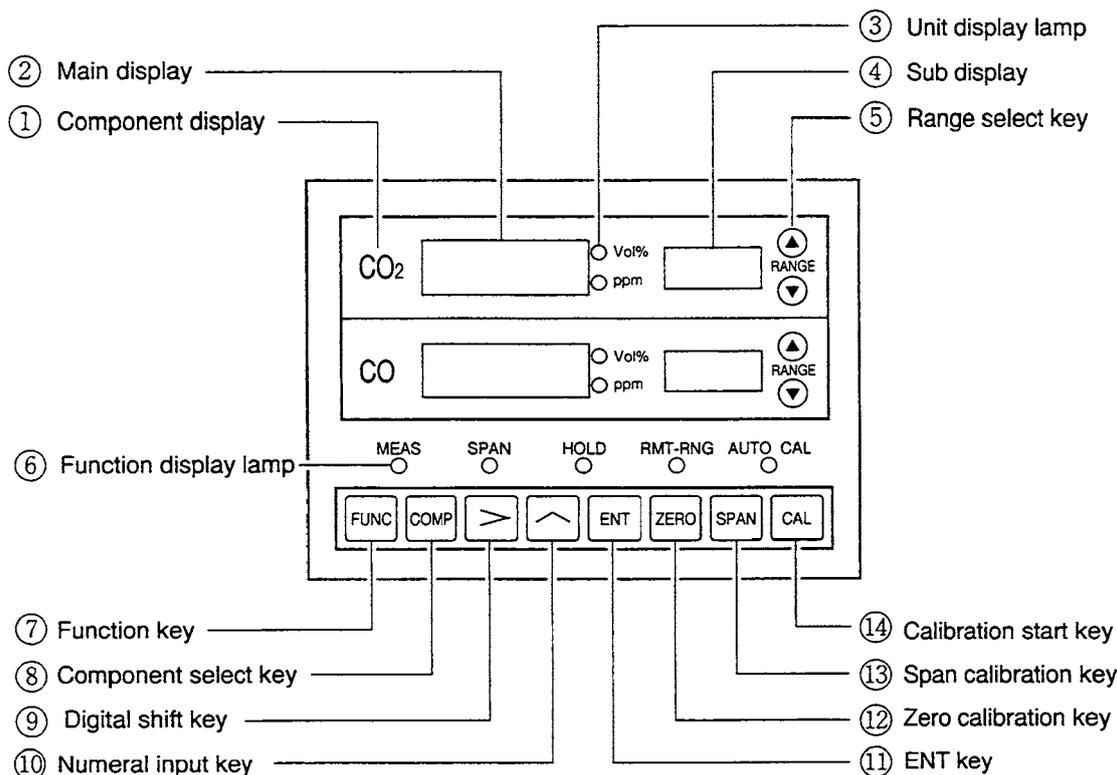
Names of parts	Descriptions	Names of parts	Descriptions
① Handle	Used to draw out the inside (base) of the unit.	⑦ Purge gas inlet	Used to feed purge gas to piping.
② Set screw	Used to hold the unit with its case.	⑧ COMP1 (Primary component) input/output terminal	Used to input and output Primary component.
③ Power switch	The power for the inside of the unit is closed at ON of this switch. The LED display will light 1 - 2 seconds later.	⑨ COMP2 (Secondary component) input/output terminal	Used to input and output Secondary component.
④ Display / operation panel	Displays gas density and measurement ranges. It is provided with function keys necessary for operation and setting (see Item 2.2).	⑩ AUTO CAL input / output terminal (option):	Used for auto calibration functions.
⑤ Sample gas inlet	Used to feed measuring gas to piping.	⑪ Power source terminal	Used to supply power to the unit.
⑥ Sample gas outlet	Used to feed measured gas to piping.		

2.1.2 IR100TA, IR100TB type



Names of parts	Descriptions	Names of parts	Descriptions
① Set screw	Used to hold the unit with its case.	⑦ AUTO CAL input / output terminal (option)	Used for auto calibration functions.
② Display / operation panel	Displays gas density and measurement ranges. It is provided with function keys necessary for operation and setting (see Item 2.2).	⑧ COMP2 (Secondary component) input/output terminal	Used to input and output Secondary component
③ Power source terminal	Used to supply power to the unit.	⑨ COMP1 (Primary component) input/output terminal	Used to input and output Primary component
④ Sample gas outlet	Used to feed measured gas to piping.	⑩ Power switch	The power for the inside of the unit is closed at ON of the power switch. The LED display will light 1 - 2 seconds later.
⑤ Sample gas inlet	Used to feed measuring gas to piping.		
⑥ Purge gas inlet	Used to feed purge gas to piping.		

2.2 Descriptions of Display and Operation Panel



(This diagram shows dual components for measuring CO₂ and CO)

Names of parts	Descriptions	Names of parts	Descriptions
① Component display	Kinds of measuring gas are displayed.	⑦ Function key	Setting mode is selected at a press of each key.
② Main display	Measured density is displayed, in addition to set values for auto calibration functions (option).	⑧ Component select key	Setting component is selected in each setting mode.
③ Unit display lamp	Unit of measured gas density is displayed.	⑨ Digital shift key	Digits are shifted from the first to the last at a press of key.
④ Sub display	Measuring range is displayed, in addition to error codes and set values.	⑩ Numeral input key	Increment of selected digit is made at a press of key.
⑤ Range select key	Used to select measuring ranges; high range at press of ▲ key and low range at press of ▼ key.	⑪ ENT key	By pressing this key, set data is stored in memory and becomes valid.
⑥ Function display lamp	Lamps will light with the following functions. MEAS: This lamp lights when the unit is in measurement mode. SPAN: This lamp flickers when the unit is in calibrated density setting mode. HOLD: This lamp flickers when the unit is in hold setting mode and lights when the unit is in hold function operation mode. RMT RANGE: This lamp flickers when the unit is in remote range setting mode and lights during operation of remote range function. AUTO CAL: This lamp flickers when the unit is in auto calibration setting mode and lights during operation of auto calibration function.	⑫ Zero calibration key	Used for zero calibration (lamp flickers in zero calibration mode).
		⑬ Span calibration key	Used for span calibration (lamp lights in span calibration mode).
		⑭ Calibration start key	This is a manual calibration start key. Zero calibration is started by pressing [ZERO] and [CAL] keys. Span calibration is started by pressing [SPAN] and [CAL] keys (CAL lamp lights during calibration).

3. INSTALLATION



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 attentions 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.
- For lifting the gas analyzer, be sure to wear protective gloves. Bare hands may invite an injury.
- Before transport, fix the casing so that it will not open. Otherwise, the casing may be separated and fall to cause an injury.
- The gas analyzer is heavy. It should be transported carefully. Otherwise, body may be damaged or injured.
- During installation work, care should be taken to keep the unit free from entry of cable chips or other foreign objects. Otherwise, it may cause fire, trouble or malfunction of the unit.

3.1 Mounting

The following mountings are provided according to types.

<IR100A, IR100B>

(Unit: mm)

Type	Ext. dimensions of analyzer	Dimensions for mounting	Mounting method
19" Rack mount			
Panel mount			
Desk top		—	—

<IR100TA, IR100TB>

(Unit: mm)

Type	Ext. dimensions of analyzer	Dimensions for mounting	Mounting method
Panel mount			
Wall mount			

1) Mounting

Mount front side of the analyzer so as to be vertically positioned.

2) Caution on installation

When the IR100A or the IR100B is mounted in a 19-inch rack or on a panel, at least 70 % of its weight should be supported by the bottom of the case. (When the analyzer is mounted in a panel or a 19-inch rack, a support should be provided to support the rear of the case)

3.2 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 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.

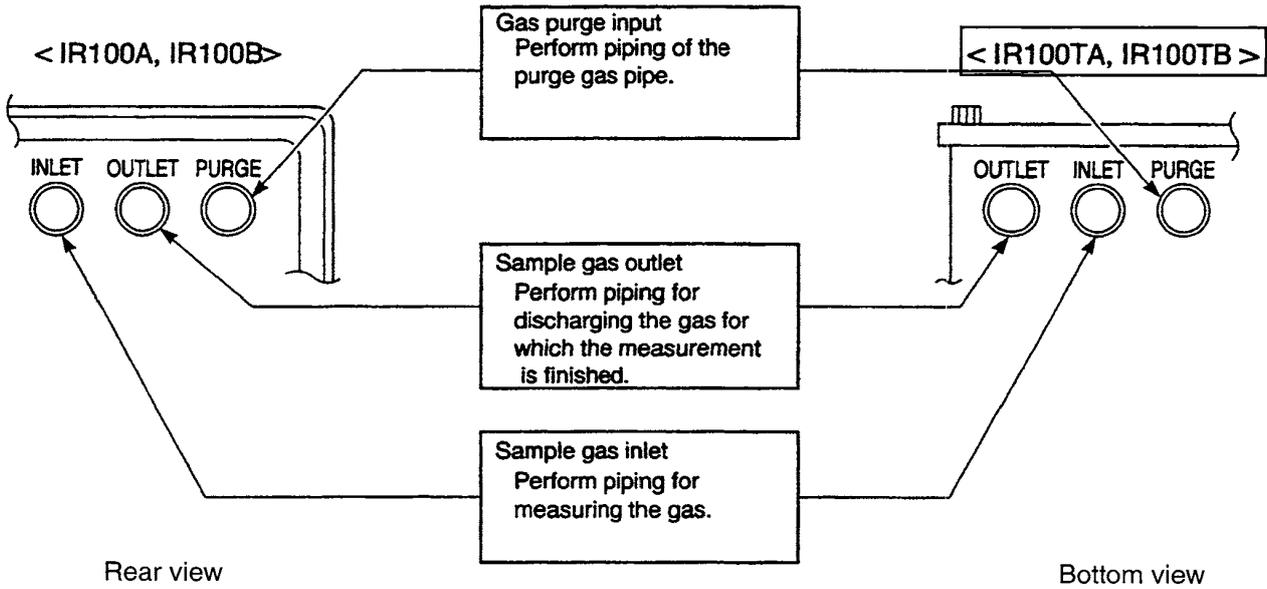
1) Piping

Connect piping with gas inlet-outlet of the analyzer. Connect the analyzer with a sampling system by means of corrosive-resistant tubing like TEFLON stainless steel or polyethylene etc. Do not use rubber or soft vinyl tubing even in any uncorrosive case to avoid incorrect indication due to adsorption of gas onto piping materials. Rc1/4 (or 1/4NPT) female threads connectors are equipped for piping connection.

Be sure to minimize piping length as short as possible in order to ensure quicker response. Adequate tubing bore is 4 mm.

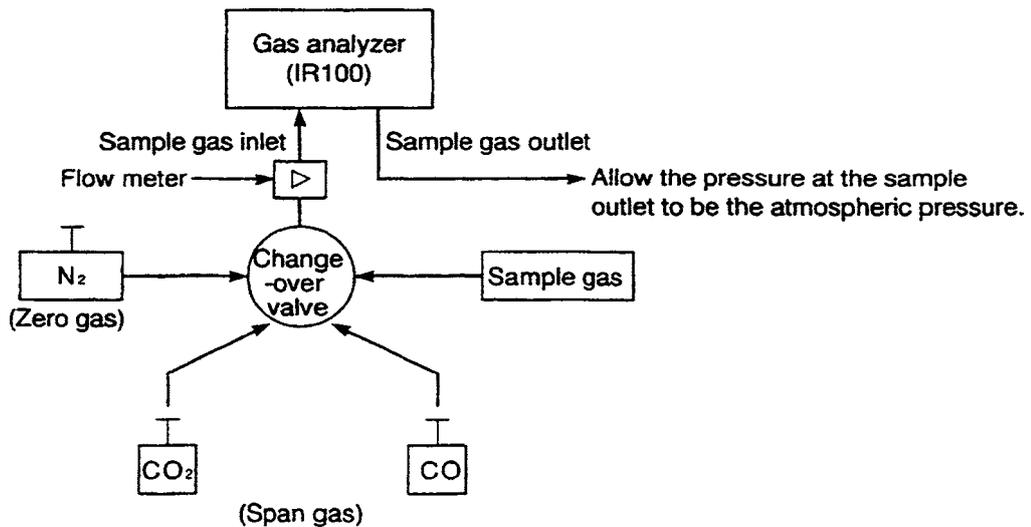
Use clean tubings and connections as dust inhaling may cause improper operation.

Location of pipe connectors of the analyzer is shown below.



2) Piping layout

Next, the piping layout for measuring 2 components is shown below.



3.3 Sampling



WARNING

- When handling the standard gas such as calibration gas, read the instruction manual of the standard gas carefully and use the gas correctly.

3.3.1 Sample gas conditioning

- 1) Remove dust in sample gas completely through filters.
For final stage filtering, use a filter capable of removing particles of dust larger than 0.3 μm.
- 2) Dew point of sample gas must be lower than ambient temperature in order to eliminate moisture to drain inside the analyzer.
In case that moisture is contained in sample gas, bring dew point of the sample gas down to about 0 °C through a dehumidifier.
- 3) When SO₃ mist is contained in sample gas, remove it through a mist-filter and cooler etc.
Remove other moist by similar procedures.
- 4) Note and take care, the life of the analyzer is to be shorted when such heavy corrosive gases as Cl₂, F₂ and HCl etc. are much contained in sample gas.
- 5) Allowable temperature range of sample gas is 0 °C to 50 °C.
Be careful not to bring hot gas into the analyzer directly.

3.3.2 Flow rate of sample gas

Keep flow rate of sample gas at 1 l/min. ± 0.5 l/min.
Prepare flowmeter so as to measure flow rate.

3.3.3 Preparation of calibration gases

Prepare calibration gases for zero and span calibration.

Zero gas	N ₂ gas
Span gas	Each component should have concentration more than 80 % of full scale.

3.3.4 Purging interior of the analyzer case

Purging inside the analyzer is generally unneeded, however, proceed with purging with instrumentation air or N₂ gas for the following cases.

Purging flow rate is to be approx. 1 l/min.

When dust & mist are contained in purge gas, utilize it after their complete removal.

- 1) When combustible gases are contained in the gas to be measured.
- 2) When corrosive gas exists in the environmental air of the installing location.
- 3) When the same or interfering gas component with the gas to be measured, exists in the environmental air of the installing location.

3.3.5 Pressure at the outlet of sampling gas

Keep pressure at the outlet of sample gas so as for it to be atmospheric pressure.

3.4 Wiring



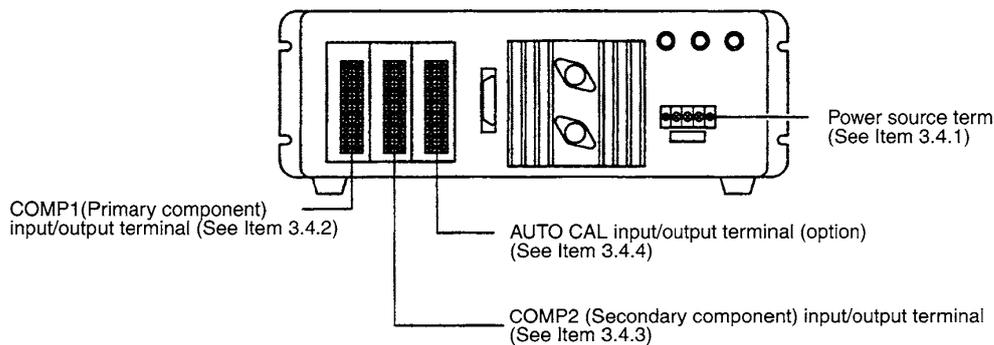
CAUTION

- Before wiring, turn OFF all power. Otherwise electric shock may occur.
- Enforce construction of grounding by all means. If the specified grounding construction is neglected, a shock hazard or fault may be caused.
- Use wiring materials which conform to the device ratings. Otherwise, a fire may occur.
- Use a specified power source. Connecting a source which is not as specified may cause a fire.
- To prevent fire accidents, use 600 V vinyl-insulated wires (JIS C3307) or better wires or cables.
- Before turning ON power, earth the unit with 100 Ω or lower earth resistance.
- For power wiring and earth wiring, use insulated sleeve compression terminal (for 4 mm threads).
- Provide the power line with a switch for disconnecting the unit from main power.

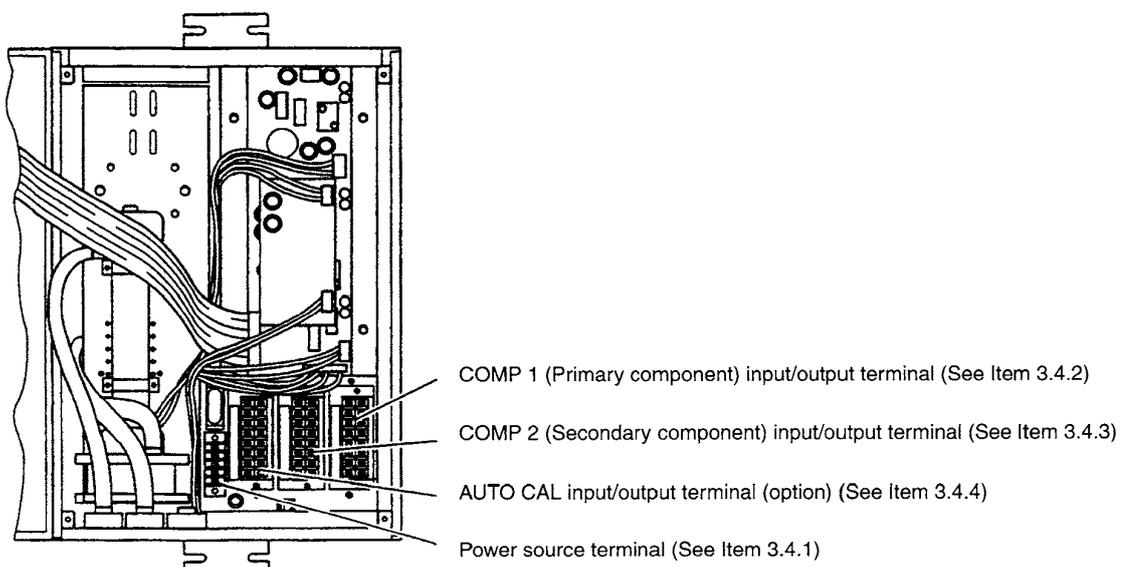
Proceed with wiring of each terminal as shown in the Figures in items 3.4.1 ~ 3.4.4.
Terminal screw is M3.5. (Power source terminal is M4.)

Use shield wire for wiring of output signal in order to reduce the influence of noise.

<IR100A, IR100B type>



<IR100TA, IR100TB type>

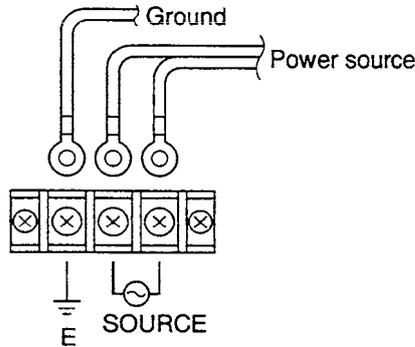


3.4.1 Power source terminals

Layout of power source terminals is shown in the Figure.

Proceed with earthing of earth terminal and connect power source terminals to a power source.

Use crimp terminal (for M4 screw) for connecting.

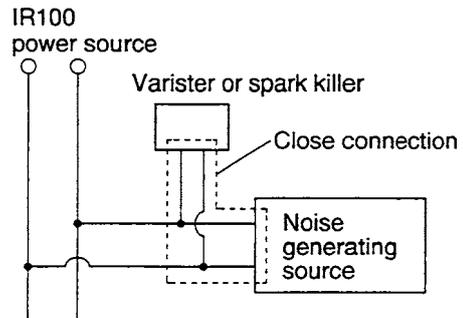


Caution on installation near noise source

Do not install the instrument near an electric device (high-frequency furnace, electric welder, etc.) which generates power noise. When the instrument is installed near such a device, the power line should be separated from other lines to avoid noise.

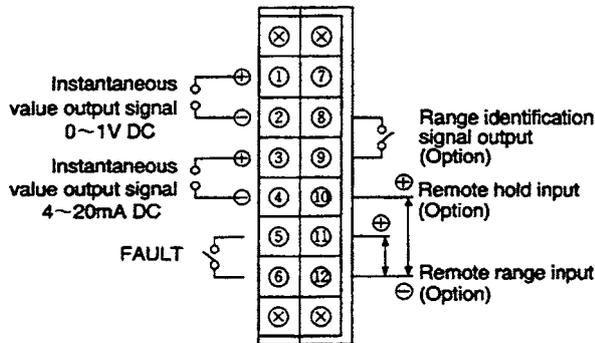
If power noise enters a relay or a solenoid valve, connect a varister or a spark killer to a noise generating source as illustrated.

When it is connected away from a noise generating source, noise cannot be eliminated.



3.4.2 COMP1 input / output terminals

COMP1 Terminals are input & output terminals for primary measuring component. Connection is to be referred to in the connection diagram below.



<Remote hold input> (Option)

To hold output signal, input 5 V DC between ⑩ and ⑫ of COMP1 input/output terminals.

<Range identification signal output> (Option)

When the low range is selected, the line between ⑧ and ⑨ is closed. When the high range is selected, the line between ⑧ and ⑨ opens.

1a contact 250 V AC, 2 A(resistive load)

<FAULT>

Contact output at occurrence of fault in the analyzer:

1a contact 250 V AC, 2 A (resistive load)

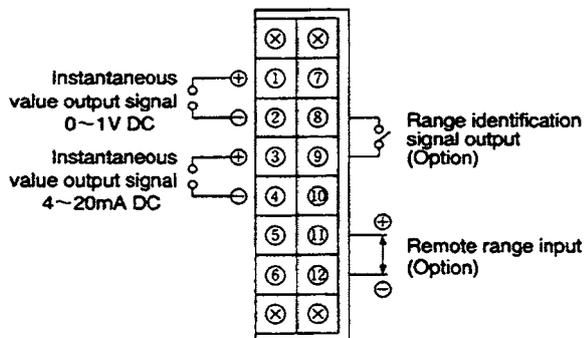
<Remote range input> (Option)

The low range is selected when 5 V DC is inputted between ⑪ and ⑫.

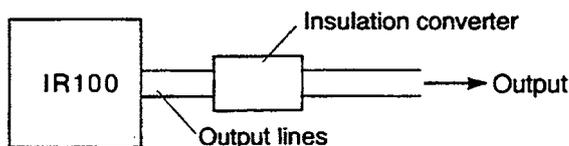
The high range is selected when there is no input between ⑪ and ⑫.

3.4.3 COMP2 input / output terminals

COMP2 Terminals are input & output terminals for secondary measuring component. Connection is to be referred to in the connection diagram below.



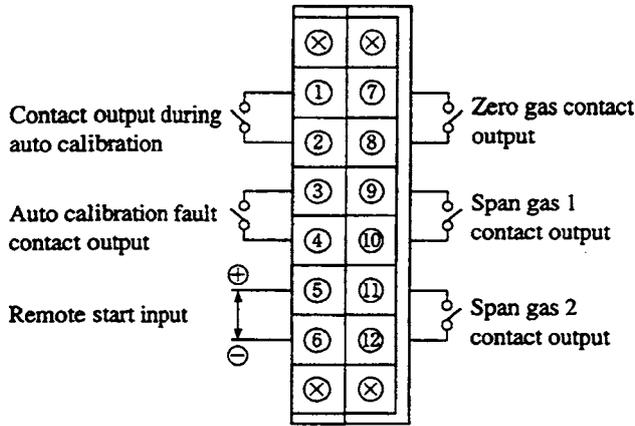
*) If the output signal cable is extended in excess of 3 m, it picks up external noise. In such a case, use an insulating transformer.



*) When the instrument is installed in a panel, the power line should be separated from signal lines.

3.4.4 AUTO CAL input / output terminals

AUTO CAL Terminals are input & output terminals for automatic calibration and the connection is shown in the connection diagram below.



<Contact output during auto calibration>

The contact is ON during auto calibration.
1 a contact 250 V AC, 2 A (resistive load)

<Zero gas contact output>

Contact output for driving zero gas solenoid valve:

1a contact 250 V AC, 2 A (resistive load)

Contact output for driving primary component span gas solenoid valve: 1 a contact 250 V AC, 2 A (resistive load)

Contact output for driving secondary component span gas solenoid valve:

1a contact 250 V AC, 2 A (resistive load)

Each contact output turns ON and OFF according to the time chart of auto calibration (see Item 5.2, (4)).

When **[ZERO]** key is pressed during manual calibration, the zero gas contact output turns ON.

When **[SPAN]** key is pressed and the primary component lamp flickers, the span gas 1 contact output turns ON and when the secondary component lamp flickers, the span gas 2 contact output turns ON.

<Auto calibration fault contact output>

Contact output at occurrence of fault during auto calibration

<Remote start input>

Input an external signal at start of auto calibration.

Auto calibration is started when one-shot pulse of 5 V DC, more than 100 msec is inputted between ⑤ and ⑥.

4. OPERATION

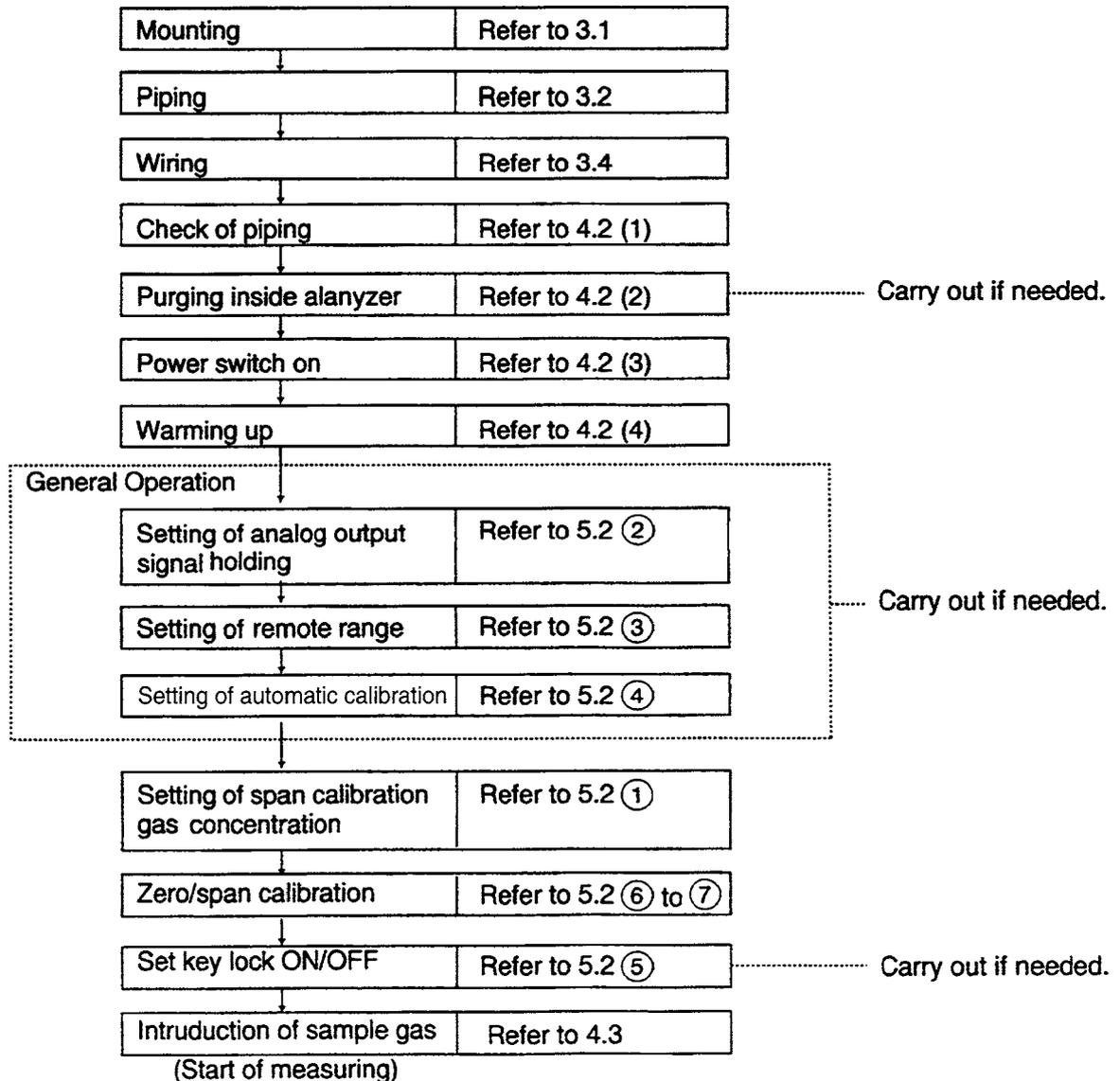


CAUTION

- Avoid continuous operation with the casing drawn out.
- During operation, avoid opening the casing and touching the internal parts. Otherwise, you may suffer a burn or shock hazard.

4.1 Operation Procedures

Set the instrument in operation using the following procedure.
 To start operating, press the function keys on the front panel of the instrument. When using it as an analyzer, be sure to read the instruction manual for the device before operating.



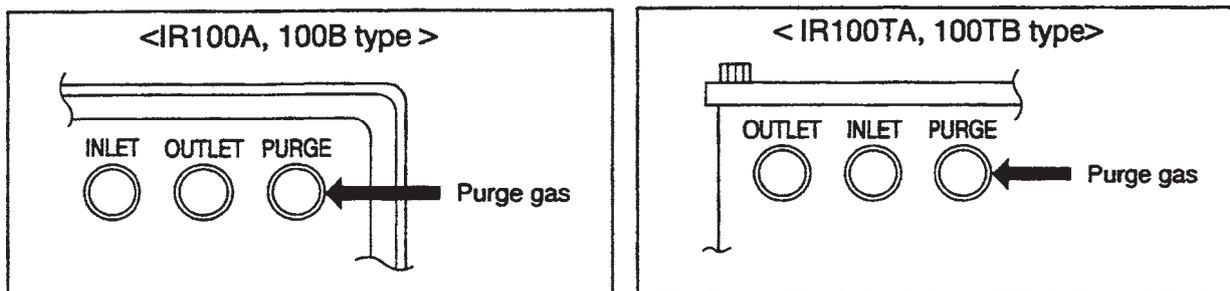
4.2 Preparation for Operation

(1) Check of piping

Check whether piping is rightly made.

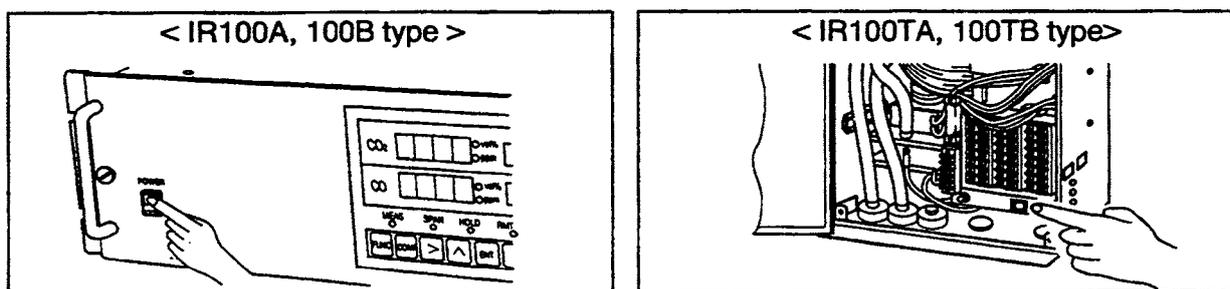
(2) Purging inside analyzer

The inside of the unit should be purged as necessary to prevent explosion and indication errors. If combustible gas is included ambient air, feed a purge gas about 3 hours before closing the power.



(3) Power switch on

When power source is switched on, analyzer is operating in Measuring mode.



(4) Warming up

After power source is switched on, warm up the analyzer.

Warming up is finished when indication comes to be stabilized (approx. 2 hours).

(5) Setting of calibration gas concentration

Set calibration gas concentration. For setting operation, refer to Item 5.2 (1).

(6) Zero calibration

Feed zero calibration gas and perform zero calibration.

For operation of the zero calibration key, refer to Item 5.2 (6).

(7) Span calibration

Feed span calibration gas and perform span calibration.

For operation of the span calibration key, refer to Item 5.2 (7).

4.3 Measurement

Feed sample gas before starting measurement.

4.4 Stop

Stop the sample gas and feed a dry nitrogen gas for about 10 minutes to purge the inside of the measuring cell. Turn OFF the power switch on the unit.

*) The set value is still stored in memory even when the power is turned OFF.

On the time to start auto calibration, the value at power OFF is backed up. So, when the power is ON, auto calibration is started after the termination of the remaining time. Note that the backup function is lost after 4 hours. In such a case, turn ON the power again and input the correct value once again.

5. DESCRIPTION OF DISPLAY AND CONTROL PANEL

5.1 Description of Display and Control Panel

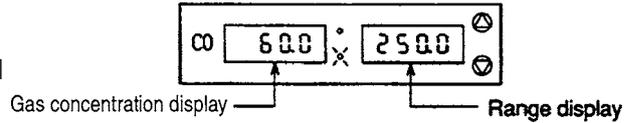
Display/control panel are composed in the following order.

Key	Function	Main display	Sub display	Function display lamp	Page
→ FUNC	Measurement mode	Measured value	Range	MEAS lights	5- 2
↓	Setting mode				
FUNC	Calibration concentration setting	Calibration concentration	Range	SPAN flickers	5- 3
↓					
FUNC	HOLD setting	HOLD	ON or OFF	HOLD flickers	5- 5
↓					
FUNC	REMOTE RANGE setting (option)	R.R.AG	ON or OFF	RMT RANGE flickers	5- 7
↓					
FUNC	Auto calibration start time setting	S - r -	Hour/min.	RMT CAL flickers	5-10
↓					
FUNC	Auto calibration cycle setting	CYCL	Hour	AUTO CAL flickers	5-11
↓					
FUNC	Calibration gas feed time setting	F.SEC	Hour	AUTO CAL flickers	5-12
↓					
FUNC	Calibration gas feed mode setting	FLNo.	Mode No.	AUTO CAL flickers	5-13
↓					
FUNC	Auto calibration change over	ACAL	ON or OFF	AUTO CAL flickers	5-14
↓					
FUNC	Key lock change over	LOC.	ON or OFF		5-15
ZERO	Zero calibration	Measured value	Range	Zero key display flickers	5-16
SPAN	Span calibration	Measured value	Range	Span key display flickers	5-17

- In the setting mode, analog output signal is held to the value just before it enters the setting mode.
- When the unit is not provided with option functions, the data of the functions are not displayed.

5.2 General Operation

The unit is set in measuring mode at power ON. At this time, gas concentration appears on the main display, and the range to be used appears on the sub display.

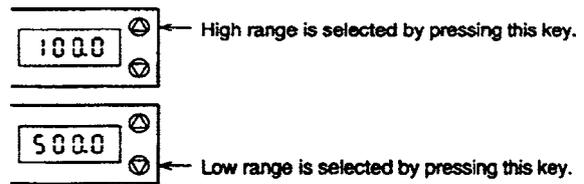


Advice to operation

• Selection of range

Press the key in the setting mode as shown at right.

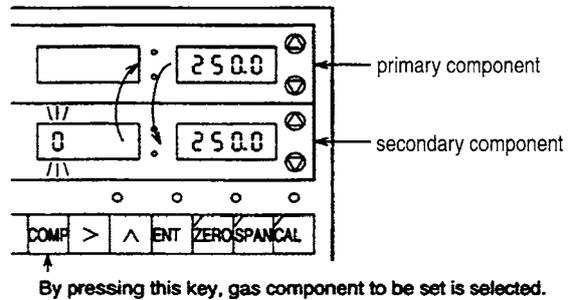
In this way, the high range can be selected. To select the low range, press the key.



• Selection of gas component

Press **COMP** key in the setting mode and gas component will be ready for setting.

Example) When the primary component lamp flickers, press **COMP** key and the flicker will shift to the secondary component as shown at right. In this way, the secondary component is ready for setting.

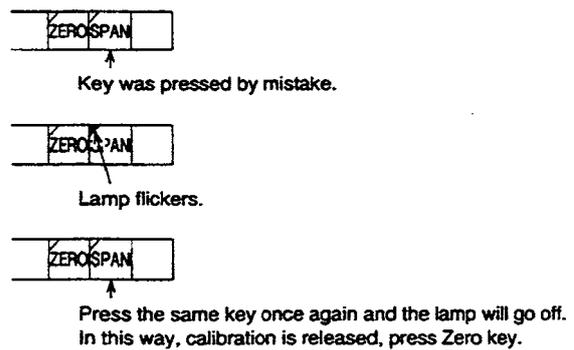


Note) Single-component analyzer does not have **COMP** key.

• Release of zero / span

When the unit is operated incorrectly for zero/span calibration, it should be released using the following procedure as shown at right.

When **SPAN** key is pressed instead of **ZERO** key by mistake, press **SPAN** key once again and the calibration will be released.



When **ZERO** key is pressed instead of **SPAN** key by mistake, press **ZERO** key once again and the calibration will be released.

5.2.1 Setting of calibration concentration

Set calibration gas concentration (span value) using the following procedure.

Press **[FUNC]** key in measuring mode and the span value which was set previously will appear on the main display. At this time, LED of function display lamp (SPAN) flickers.

Press **[>]** key and the first digit on the 1st COMP main display flickers, indicating that the span value is ready for setting. Then, press **[▽]** and **[△]** keys to select the range.

After the range is selected, set the span value under this condition.

By pressing **[▲]** key, the numerical value increases.

By pressing **[>]** key, the digit to be set is selected.

When selecting components following the 2nd COMP and its range, press **[>]** key and then press **[COMP]** key while the 1st COMP main display is flickering, and the main display for the setting component will flicker.

Select the range by pressing **[▽]** and **[△]** keys.

After the span value is set, press **[ENT]** key.

This completes the setting operation.

(Switch of span calibration method)

Perform the following operation and setting.

When the first digit on the 1st COMP main display flickers, press **[CAL]** key and "S.CAL" appears on the main display and "o n" appears on the sub display.

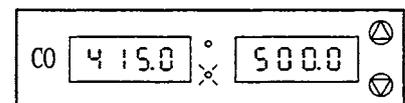
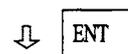
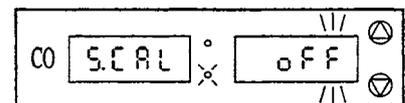
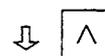
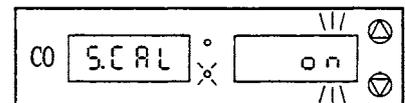
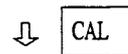
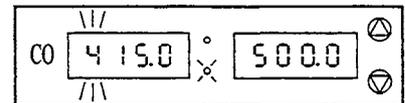
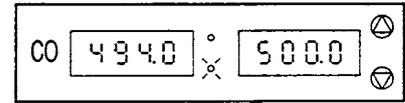
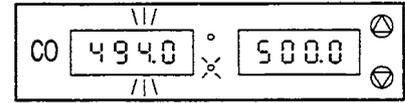
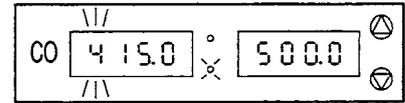
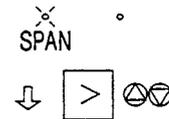
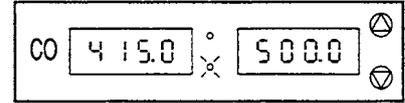
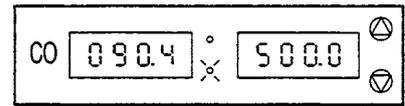
It is changed to "o F F" by pressing **[▲]** key.

- Meaning of set value -

o F F : Effective only at that range and is ready for span calibration without regard to each range.

o n : When 1 range is used for span calibration, other ranges are interlocked with it for span calibration.

When selected, press **[ENT]** key and the setting operation is completed.



5.2.2 Setting of hold

This setting is required to hold the output signal during calibration (it is not held on display).

Hold can be set for each component.

When this setting is not used, set it to OFF. Press **[FUNC]** key in measurement mode to display "Hold".

At this time, LED of function display lamp "Hold" flickers. Press **[>]** key and hold is ready for setting.

The sub display flickers.

Press **[COMP]** key to select gas component.

Select hold "on" or "off" by pressing **[^]** key.

After setting the hold, press **[ENT]** key.

Setting operation is completed.

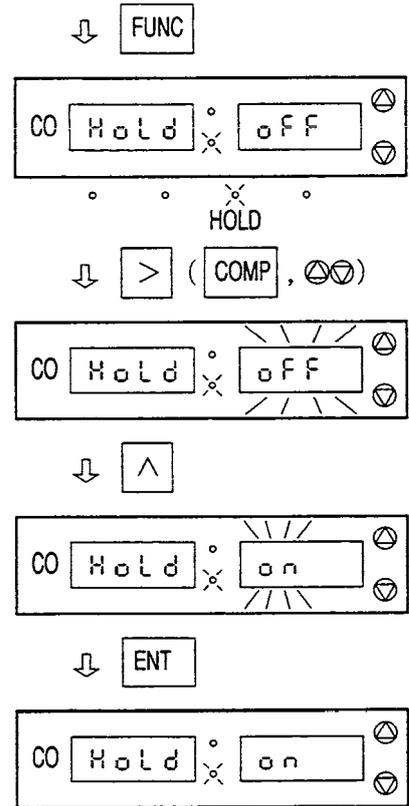
At ON of hold, the function display lamp "HOLD" will light during hold operation.

*) Refer to Caution on Hold Function (next page).



IMPORTANT

When the setting is "on", output is held but its display is not held.



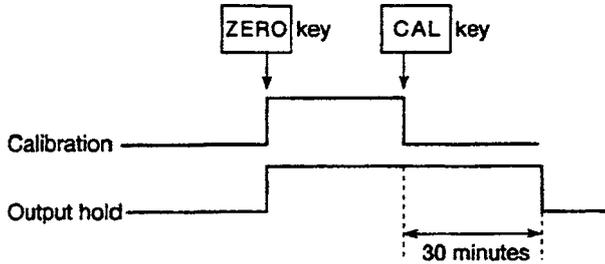
Cautions on Hold Functions

<Output hold function after manual calibration>

This is an output hold function after manual calibration (zero or span).

It can be released automatically after 30 minutes or released by key operation (manual release).

1. Action



2. Release procedure

1) Auto release

After setting hold (ON / OFF), press **ZERO** key or **SPAN** key to start output hold. Calibration is completed by pressing **CAL** key and is automatically released after 30 minutes of hold.

2) Manual release

Calibration is released by pressing **ENT** key and **CAL** key at the same time.

Note 1) Calibration contact output between the auto calibration output terminals (1-2) is invalid during manual calibration.

Note 2) Output hold is valid only for the component which has been set to hold function

Note 3) When manual release is made during auto calibration, the auto calibration action is also interrupted.

<Auto calibration output hold function>

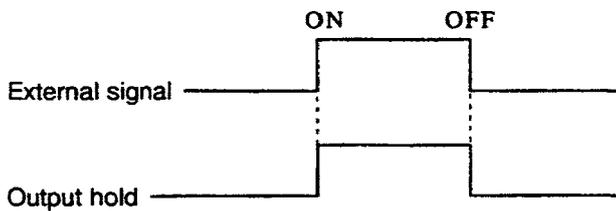
This is an output hold function during auto calibration or at the time of permutation.

For the action, refer to Item 4 of this section.

<Remote hold function> (Option)

This function is used to hold output with external signal.

1. Action



2. Operation

The component which has been set to hold function “□□” starts operating when 5 V DC is inputted to the 1st COMP input/output terminals (10,12) (+, -).

Note 1) The display during operation is the same as that of hold during calibration.

Note 2) This function is valid only when the unit is provided with remote range and range identification functions (option).

Note 3) This function is valid only for the standard type 1 and 2 range instruments.

5.2.3 Setting of remote range (Option)

This is used for range selection with external signal.

Press **FUNC** key in measurement mode to display "r.r RG" and LED of function display lamp "RMT RANGE" will flicker.

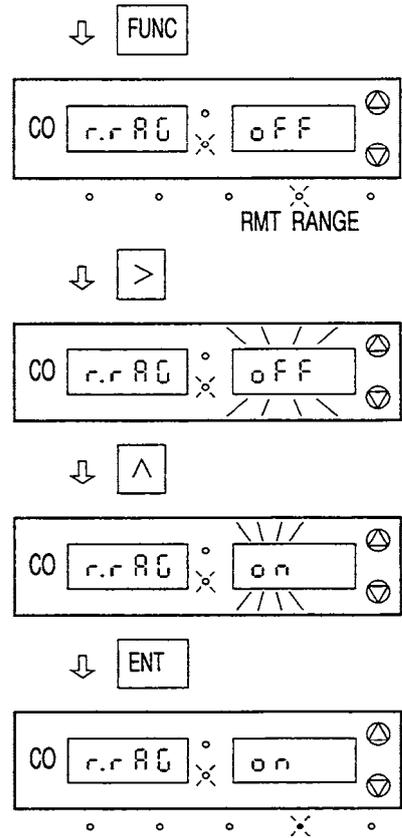
Press **>** key and remote range can be set. The sub display flickers.

Select remote range "on" or "off" by pressing **^** key.

This setting is valid for all components.

After remote range is set, press **ENT** key. This completes the setting operation.

When remote range is set to ON, LED of function display lamp "RMT RANGE" will light at all times, so the range selection cannot be made with **▲** and **▼** keys.



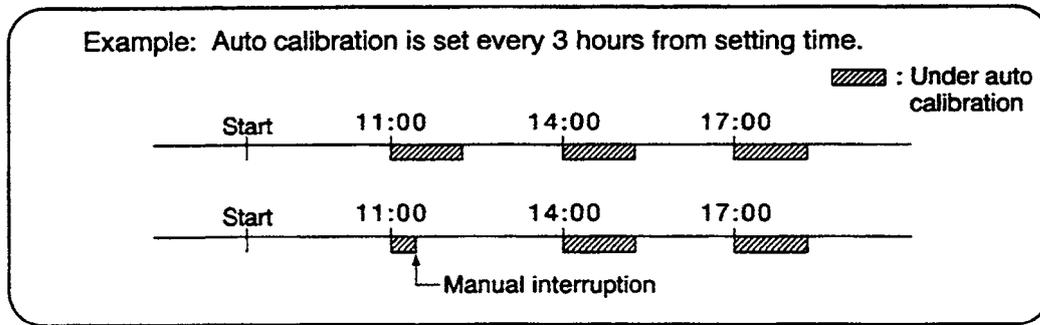
5.2.4 Auto calibration (Option)

By using auto calibration function (option), an external solenoid valve can be driven with signals from the input/output terminals on the rear panel of the unit for calibrating zero point and span point automatically using standard gas.

Auto calibration is effected by setting (1) auto calibration start time, (2) auto calibration cycle, (3) calibration gas feed time, (4) calibration gas feed mode and (5) auto calibration ON/OFF.

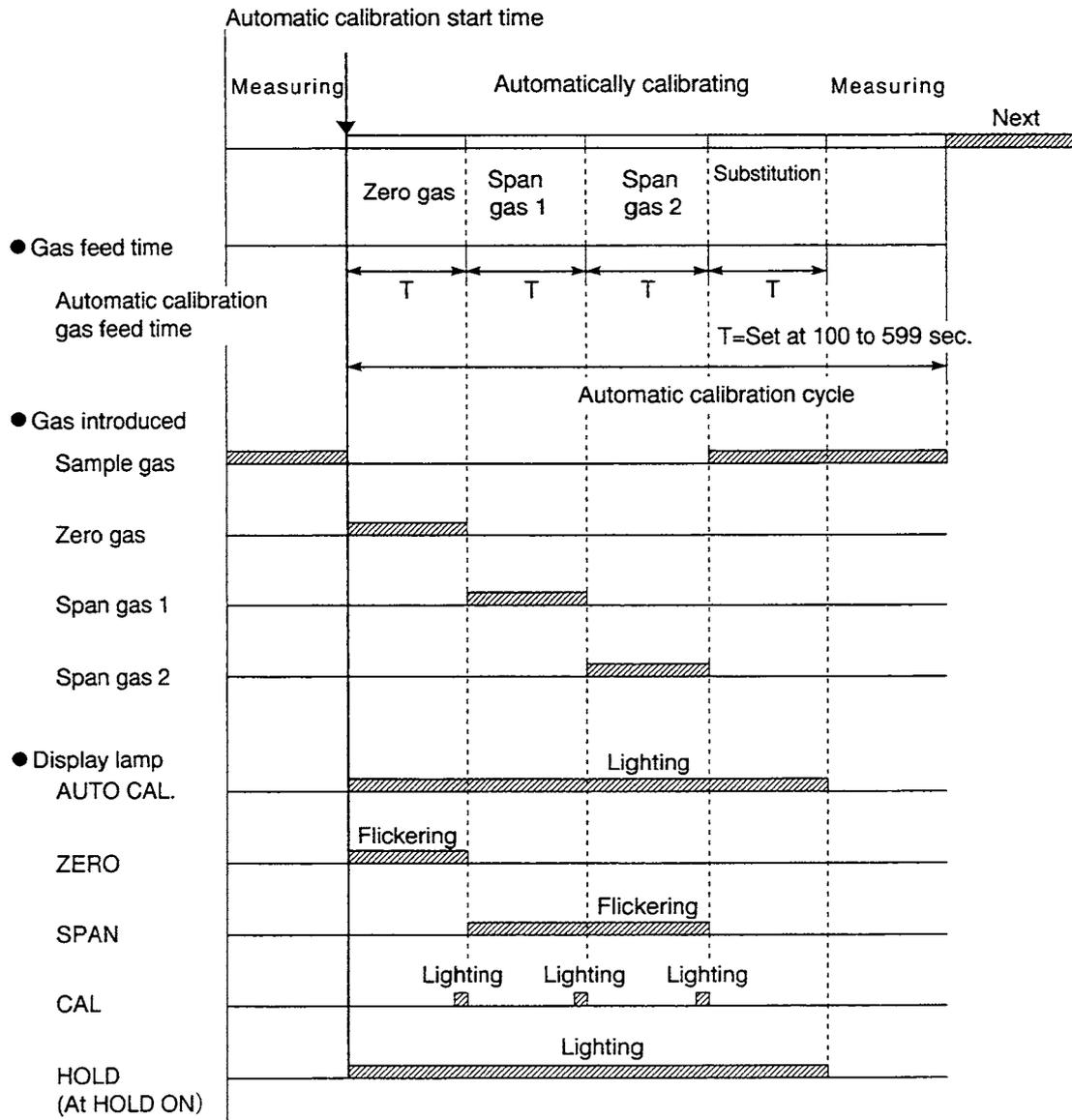
Cautions on Operation

1. When auto calibration start time comes on during key operation, it starts immediately. At this time, none of the keys can be used until auto calibration is finished.
2. When auto calibration is started and needs to be interrupted manually, press **[ENT]** key and **[CAL]** key at the same time. After it is interrupted, the unit is reset to measurement mode and all the keys are ready for operation. Only the interrupted auto calibration is canceled and the following auto calibrations will be performed at initially specified intervals.



3. When auto calibration is not being made, key operation is possible for all settings (span value, hold, remote range) including manual calibration.
4. Auto calibration can also be started by applying input signals (pulse voltage of 5 V DC, 100 msec or more). In this case, calibration is started without regard to auto calibration ON / OFF setting.

When setting "3" on automatic calibration gas feed mode as an example



Auto calibration fault : When calibration fault arises during auto calibration, an auto calibration fault contact output signal is outputted, and an error is displayed at the end of auto calibration. At this time, the next component is calibrated but the component with calibration fault is not calibrated.

(1) Setting of auto calibration start time

Auto calibration start time can be set by the following procedure.

This setting determines the period to 1st auto calibration started after installation.

Press **[FUNC]** key in measurement mode and LED of function display lamp "AUTO CAL" will flicker.

Press **[>]** key and the start time can be set. The calibration start time appears on the sub display.

Press **[>]** key and the digits can be selected.

By pressing **[^]** key, the numerical value becomes large.

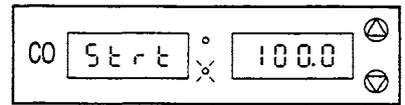
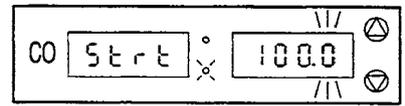
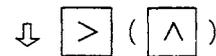
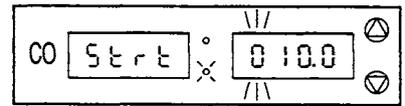
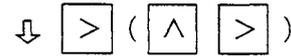
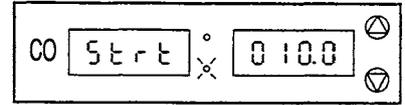
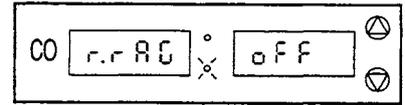
Setting range: 0.1 (10 min) to 199.0 hrs

After setting the auto calibration start time, press **[ENT]** key to store the data in memory.

When **[ENT]** key is pressed, the set time is counted down while it is being displayed.
After the start of auto calibration, the next calibration cycle set data is counted down while it is being displayed.

The calibration cycle set data is counted and displayed without regard to auto calibration ON / OFF.

After setting the auto calibration start time, be sure to set the auto calibration cycle in succession.



(2) Setting of auto calibration cycle

When calibration start time is displayed, press **FUNC** key to display “CYCL”, and LED of function display lamp “AUTO CAL” will flicker.

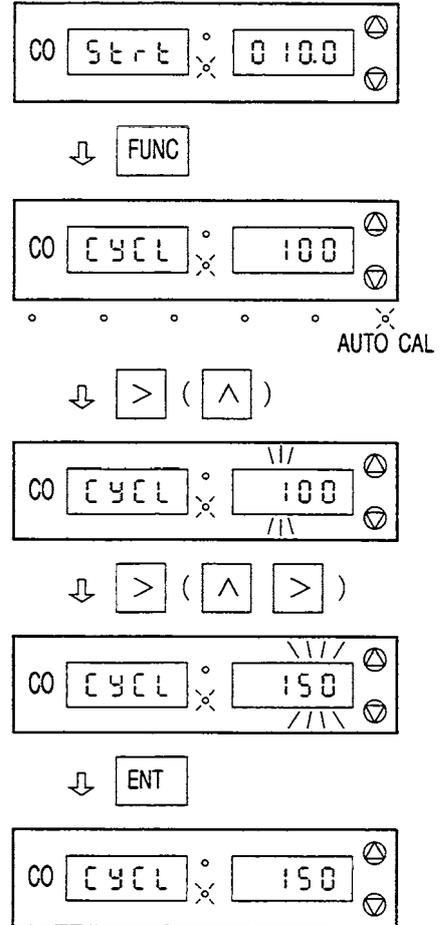
Press **>** key and auto calibration cycle will be ready for setting. At this time, the digits will flicker on the sub panel.

Press **>** key and the digits can be selected. By pressing **^** key, the numerical value becomes large.

“Time” can be set within the range of 1-199 hours.

After setting the calibration cycle, press **ENT** key to store the data in memory.

After setting auto calibration cycle, be sure to set auto calibration gas feed time in succession.



(3) Setting of calibration gas feed time

When calibration cycle is displayed, press **FUNC** key to display "F.S E C", and LED of function display lamp "AUTO CAL" will flicker. Press **>** key, and auto calibration gas feed time is ready for setting.

Set calibration gas feed time on the sub display.

Press **>** key to select digits.

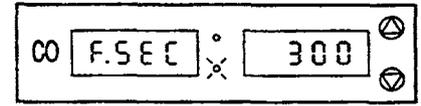
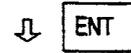
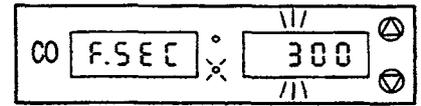
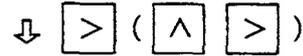
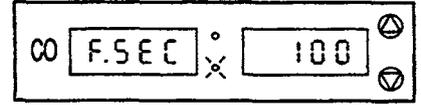
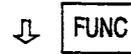
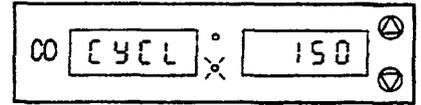
By pressing **>** key, digits can be selected.

By pressing **^** key, the numerical value becomes large.

Setting range = 100 to 599 seconds

After setting calibration gas feed time, press **ENT** key. The data is stored in memory.

After setting auto calibration gas feed time, be sure to set auto calibration gas feed mode.



(4) Setting of calibration gas feed mode

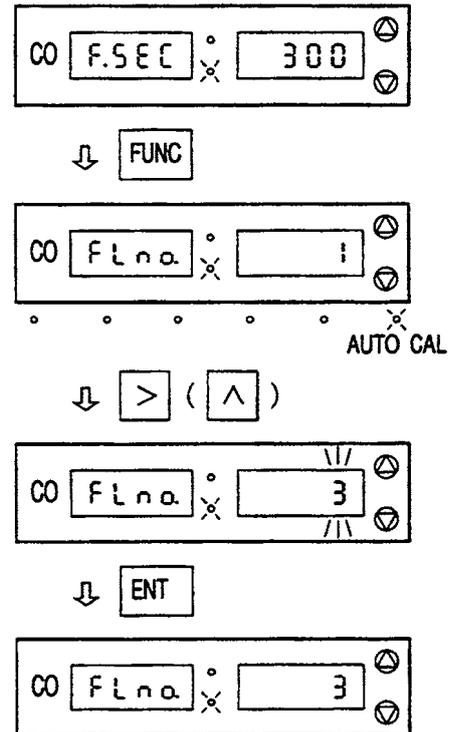
Select calibration gas feed mode according to the number of components to be calibrated.

When calibration gas feed time is displayed, press **[FUNC]** key to display "FLno.", and LED of function display lamp "AUTO CAL" will flicker.

Press **[>]** key, and auto calibration gas feed mode is ready for setting.

Press **[^]** key and set feed mode No. (the meaning of feed mode No. is shown below).

After setting calibration gas feed mode, press **[ENT]** key and the data is stored in memory.



Meaning of feed mode

Mode No. 0 : Zero gas

Mode No. 1 : Zero gas - primary component span gas

Mode No. 2 : Zero gas - secondary component span gas

Mode No. 3 : Zero gas - primary component span gas - secondary component span gas

* Calibration gases are fed sequentially by order of Mode No. setted.

After setting auto calibration gas feed mode, be sure to set auto calibration ON / OFF.

(5) Setting of auto calibration ON/OFF

Select auto calibration function. When auto calibration is not required, it should be set to "OFF".

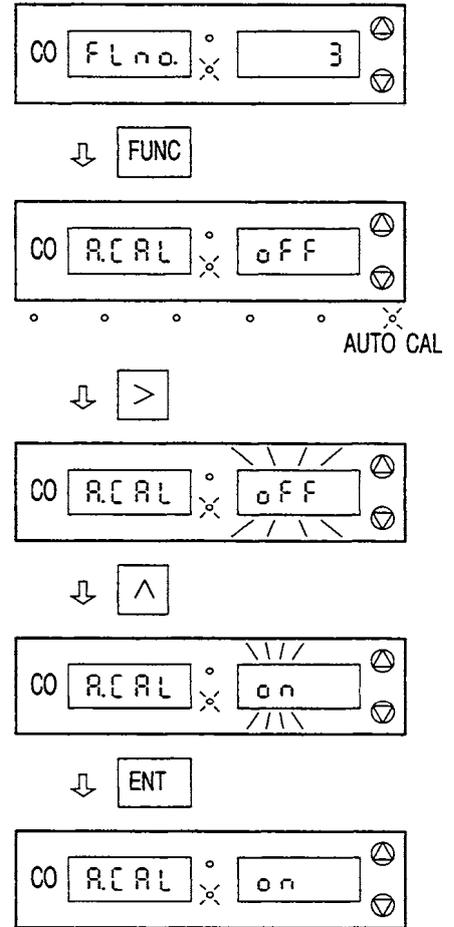
When calibration gas feed mode is displayed, press **[FUNC]** key to display "R.CAL" and LED of function display lamp "AUTO CAL" will flicker.

Press **[>]** key and auto calibration ON / OFF is ready for setting.

By pressing **[^]** key, set "ON" or "OFF" on the sub display.

After setting auto calibration ON / OFF, press **[ENT]** key.

Setting operation is now completed.



5.2.5 Setting of key lock ON/OFF

This is a function to prevent misoperation of keys.

When the key lock is set to “ON”, all the keys other than **FUNC** cannot be operated.

To release this function, set the key lock to “OFF”.

Press **FUNC** key in measurement mode to display “LOC”.

By pressing **>** key, the key lock is ready for setting and the sub display flickers.

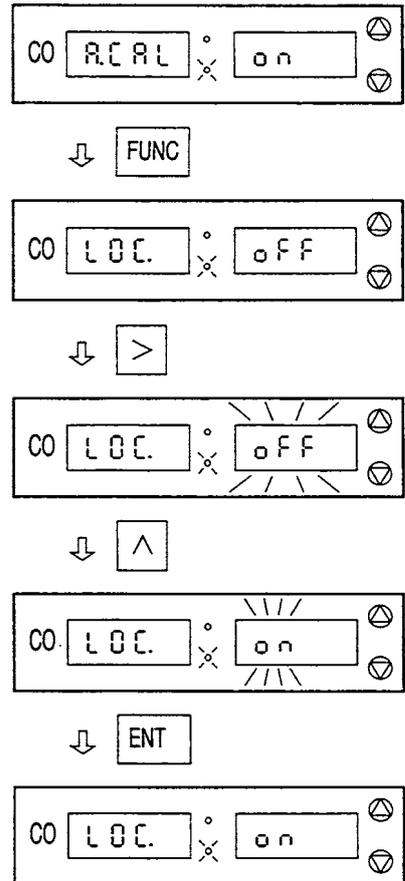
Press **^** key to set key lock ON / OFF.

After setting key lock, press **ENT** key. The setting operation is now completed.



IMPORTANT

When the key lock is set to “ON”, all the keys other than **FUNC** cannot be used



5.2.6 Zero calibration

This function is used for zero point adjustment.

After feeding zero gas, wait until its reading is stabilized.

When it is stabilized, press  and  keys to select the measuring range for calibration.

Zero calibration performs calibrations of all components and all ranges at the same time.

Press  key.

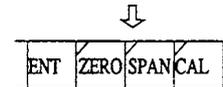
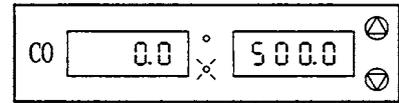
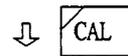
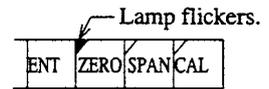
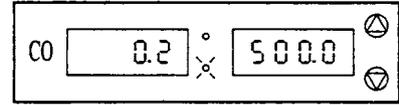
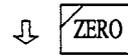
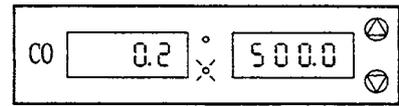
The  key lamp flickers.

Then press  key for zero calibration.

The  key lamp lights during calibration.

After calibration, the unit is reset to measurement mode.

After press  key, press  key once again will release the calibration.



(Lamp goes off after calibration.)

5.2.7 Span calibration

Perform span calibration after feeding calibration gas with concentration set as span value.

Feed calibration gas (1.0 l/min). Under this condition, wait until its reading is stabilized. Then perform span calibration.

Press **SPAN** key.

The **SPAN** key lamp flickers.

When a number of components are measured, the main display showing components which can be calibrated will flicker. By pressing **COMP** key, gas component to be calibrated is changed.

When the required gas component is determined, press \uparrow and \downarrow keys to select the range.

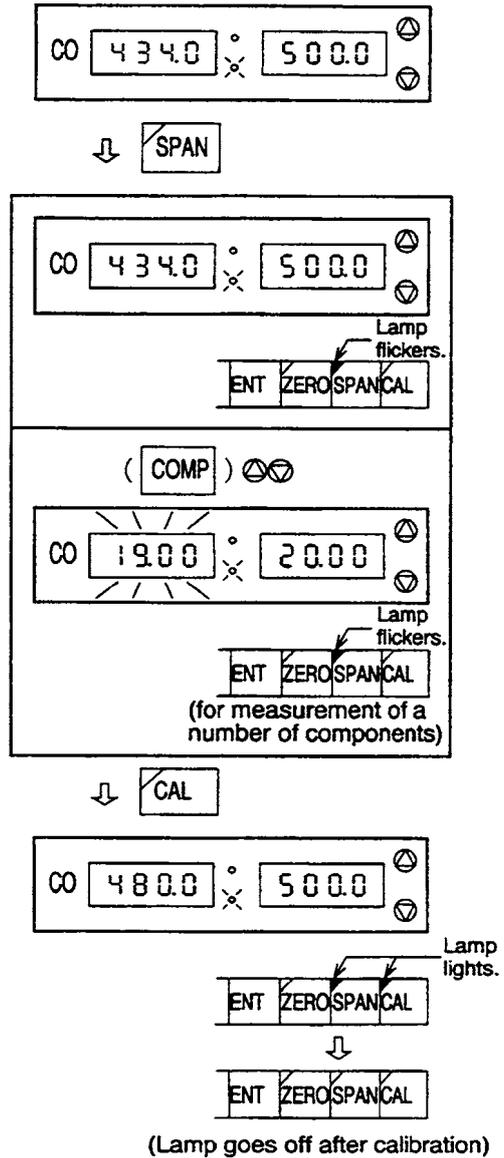
Next, press **CAL** key for span calibration.

The **CAL** key lamp lights during calibration.

After calibration, the unit is reset to measurement mode.

Perform calibration for each component and range in succession.

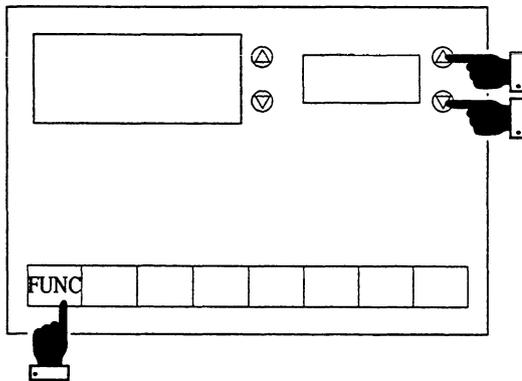
After press **SPAN** key, press **SPAN** key once again will release the calibration.



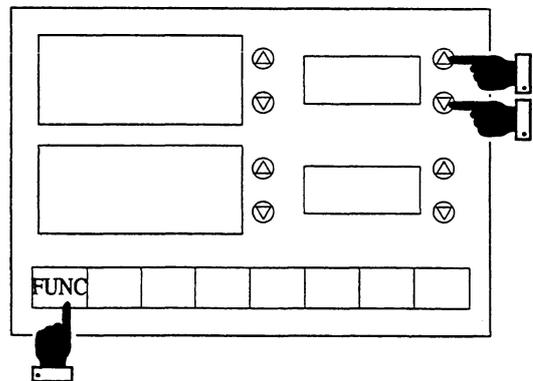
■ When error has appeared by wrong operation

- (1) Press Δ and ∇ simultaneously and then **FUNC** key to select the maintenance mode.

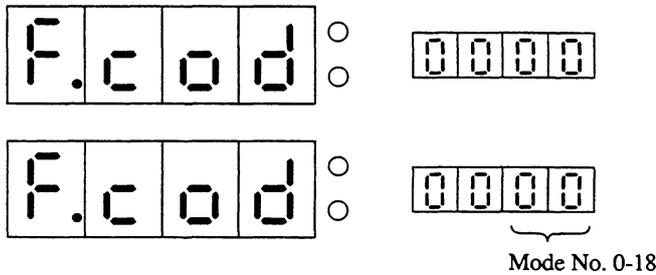
[For single-gas analyzer]



[For dual-gas analyzer]



When the maintenance mode is posted, the display is as follows.



- (2) At a status displayed like this, press the **SPAN** key to display **0001** and press **ENT** key.

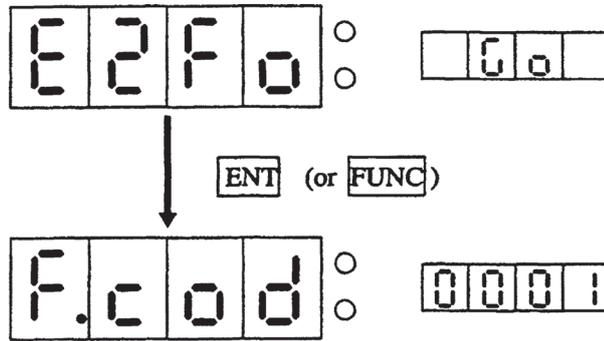
(Each press of **SPAN** key increases the value.)
 (Each press of **CAL** key decreases the value.)

To exit from the relevalt mode, press **FUNC** key. Then, the above display is resumed.

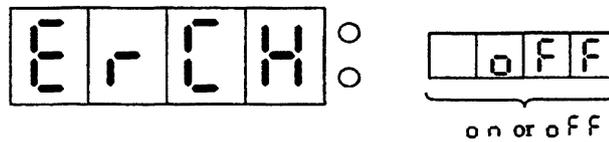
- (3) When this mode is posted, the display appears as follows.

Pressing **ENT** key clears (to 1) the zero and span calibrating coefficient and gives a display as on the lower.

(If it is not desired to clear the calibrating coefficient, press **FUNC** key.



- (4) Press **SPAN** or **CAL** key until **0016** appears and press **ENT** key.
- (5) When this mode is posted, the display is as shown on the right.



Pressing **>** key blinks **0n/0FF**.

By **^** key, change over **0n/0FF** until **on** appears.



CAUTION

If this operation is not reset, no self-diagnostic function errors will appear.

If this mode is kept ON, the self-diagnostic function reveals no error. Turning OFF power and starting up automatically turns OFF this mode.

If errors occur on account of too many quantities to calibrate for zero or span particularly, turning ON this mode reveals no error and allows a calibration.

- (6) Press **ENT** registers the setting and stops blinking.
- (7) Press **FUNC** key and **SPAN** (or **CAL**) key to display **0000** and press **ENT** key twice to resume the measuring mode.
- (8) At this status, no error will be revealed. After the end of calibration, be sure to reset power.

6. MAINTENANCE



WARNING

- When doors are open during maintenance or inspection for adjusting the optical system, etc., be sure to purge sufficiently the inside of the gas analyzer as well as the measuring gas line with nitrogen or air, in order to prevent poisoning, fire or explosion due to gas leaks.



CAUTION

- Before working, take off a wrist watch, finger ring or the like metallic accessories. And never touch the instrument with a wet hand. Otherwise, you will have a shock hazard.
- Do not use a replacement part other than specified by the instrument maker. Otherwise, adequate performance will not be provided. Besides, an accident or fault may be caused.
- Replacement parts such as a maintenance part should be disposed of as incombustibles.

6.1 Points of Daily Check

Table 6-1 Maintenance and check list

	Parts to be checked	Phenomena	Cause	Remedy
Every day	Recorder indication	Lower indication	1) Dust is mixed in the sample cell.	1) Clean sampling cell and check for sampling device, especially gas filter.
			2) Air is sucked in anywhere in the sampling tube.	2) Check for leak of the sampling line and repair, if required.
	Check for purge gas flow if purging the sampling gas flow instrument.	Standard flow rate is 1L/min. It is not within the range of the specified flow rate of 0.5 to 1.5 L/min.	—	Adjust the flow rate with flow rater needle valve.
	Replacement of Monitor filter (mambrane filter)	Much clogged	Primary filter is damaged.	1) Replace primary filter. 2) Replace filter (filter paper).
Every week	Zero point of gas analyzer	Out of zero point	—	Zero calibration (Refer to subsection 5.2.6)
	Span point of gas analyzer	Out of the standard point	—	Span calibration(Refer to subsection 5.2.7)
	Replacement of monitor filter (membrane filter)	Irrespective of phenomena	—	Replace filter (paper).
Every year	Gas analyzer	Irrespective of phenomena	—	Overhaul.
	Optical signal	After overhaul.	—	Difference of instrument.

6.2 Measuring Cell Cleaning

When measuring cell inside is contaminated by dust or mist, a drift of measured value may be caused.

Clean the interior of the measuring cell if contaminated. At the same time, check sampling system devices, especially filter, in order to eliminate any cause of contamination of cell interior by dust & mist.

6.2.1 How to disassemble and reassemble measuring cell

There are 2 types of measuring cell, one is a block cell (cell lengths: 4 mm, 8 mm, 16 mm & 32 mm) and the other is a pipe cell (cell lengths: 64 mm, 125 mm & 250 mm). In case of a dual components analyzer, there is a combination cell type, which is composed of both types of cells in the optical system. For this type, disassemble pipe cell first then the block cell. (Refer to Fig. 6.3)

(1) How to disassemble and reassemble pipe cell (refer to Fig.6.1)

- 1) Shut sample gas glow down. When toxic gas is contained purge measuring cell interior with zero gas sufficiently.
- 2) Turn power switch off.
- 3) <IR100A, IR100B type> : Loosen 2 fixing screws of the front panel and draw out the inner part until stopped by stoppers inside the case. When complete drawing-out of the inner part from the case is needed, hold the front panel up and draw it out beyond stop carefully.

<IR100TA, IR100TB type> : Loosen 4 fixing screws of the front panel and open the door.
- 4) Detach piping connection to the measuring cell.
- 5) Displace the infrared source unit (No.5 in Fig. 6.1) by loosening 2 fixing screws (No.1 in Fig.6.1) to base plate so as to make a gap between pipe cell (No.12 in Fig.6.1) and IR source unit.
- 6) Loose n and detach 4 screws (No.7 in Fig.6.1) of the cell holders (No.11 in Fig. 6.1)
- 7) Remove the cell from optical unit then detach both windows (No. 14 in Fig. 6.1) by rotating the window holders anticlockwise.
- 8) A window plate made of calcium-fluoride is fixed to the window holder and reflector plate inside cell is fixed to cell wall, therefore both are unremovable.
- 9) Proceeded with reassembling in reverse to disassembling procedures.
In reassembly, make a space of approx. 0.5 mm both between infrared source unit & cell and between cell & detector.

No.	Name
1	Screw (for infrared source unit fixing)
2	Screw (for detector fixing)
3	Screw (for base plate fixing)
4	Base plate
5	Infrared source unit
6	Screw (for support fixing)
7	Screw (for holder fixing)
8	Connector for chopper motor
(9)	Filter
10	Support
11	Holder
12	Pipe cell
13	O-ring
14	Window
15	Detector
16	Bridge circuit board
17	Bridge resistor
(18)	Detector for the secondary component
(19)	Screw for the secondary component detector fixing

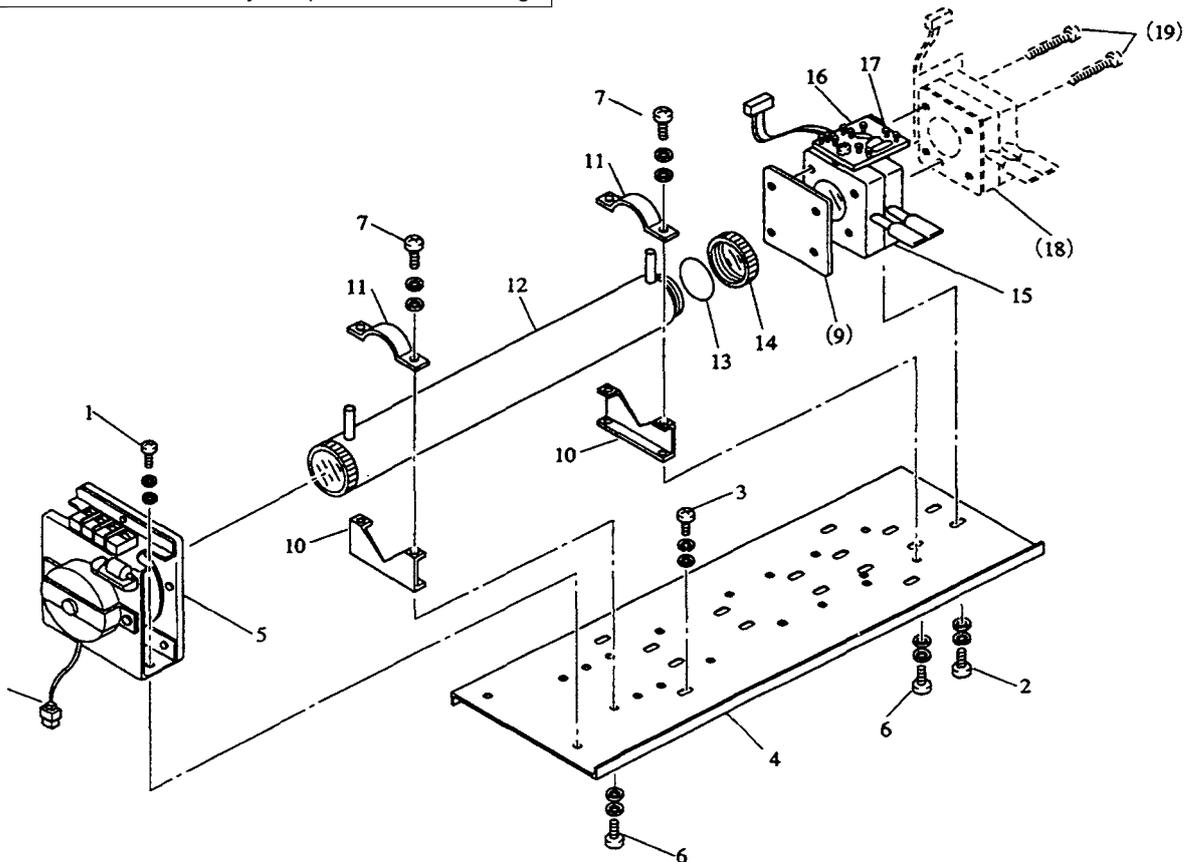


Fig. 6.1 Exploded view of measuring unit (Pipe cell)

(2) How to disassemble and reassemble block cell (refer to Fig.6.2 on next page)

1) to 4) Proceed with the same procedures described in 1) to 4) of (1) how to disassemble pipe cell.

5) Remove a connector of detector output cord from p.c.b..

In case of the dual components analyzer, remove connector of output cord of the secondary component detector (No.13 in Fig.6.2) from the secondary component printed circuit board, then remove the secondary component detector by loosening 2 screws (No.14 in Fig.6.2).

6) Loosen 2 screws (No.10 in Fig.6.2), with which the detector and the infrared source unit are mounted together, then remove the detector from the infrared source.

In this removal, the cell is also removed together with detector.

7) Remove the cell from the detector by loosening 2 fixing screws (No.6 in Fig.6.2).

A window (No.6 in Fig.6.2) on one side of block cell is not fixed but only inserted between detector and block cell, therefore hold the detector upside while disassembling not so as to drop the window down.

8) Proceed with reassembling in reverse to disassembling procedures.

Locate an O-ring between the window holder and the cell.

Be sure not to mislocate the O-ring.

For the dual components analyzer, the secondary component detector should be assembled after finishing assemble of the primary component detector.

Make sure not to make space between primary and secondary detectors.

Also, make sure that 2 connectors of detector output cord are connected properly to the primary and secondary component p.c.b.

(3) How to disassemble measuring unit

1) to 4) Proceed with the same procedures described in 1) to 4) of (1) how to disassemble pipe cell.

5) Remove connectors of output cord of detector from printed circuit boards.

6) Remove both wiring to 2 pin terminals of the infrared source unit and 2 pin connectors (No.8 in Fig.6.1) of the chopper motor.

7) Remove 4 screws (No.4 in Fig.6.1) for fixing the base plate (No.3 in Fig.6.1) and take out the measuring unit.

**WARNING**

- Do not give any rough handling to both pipings of detector and infrared source unit during disassembling & reassembling measuring cell. Pipe deforming may lead to irregular action due to leakage of sealed gas.

No.	Name
1	Screw (for infrared source unit fixing)
(2)	Filter
3	Screw (for base plate fixing)
4	Base plate
5	Infrared source unit
6	Screw (for block cell fixing)
7	Block cell
8	Window
9	O-ring
10	Screw (for detector fixing)
11	Connector of shopper motor
12	Detector
(13)	Detector for the secondary component
(14)	Screw for the secondary component detector fixing

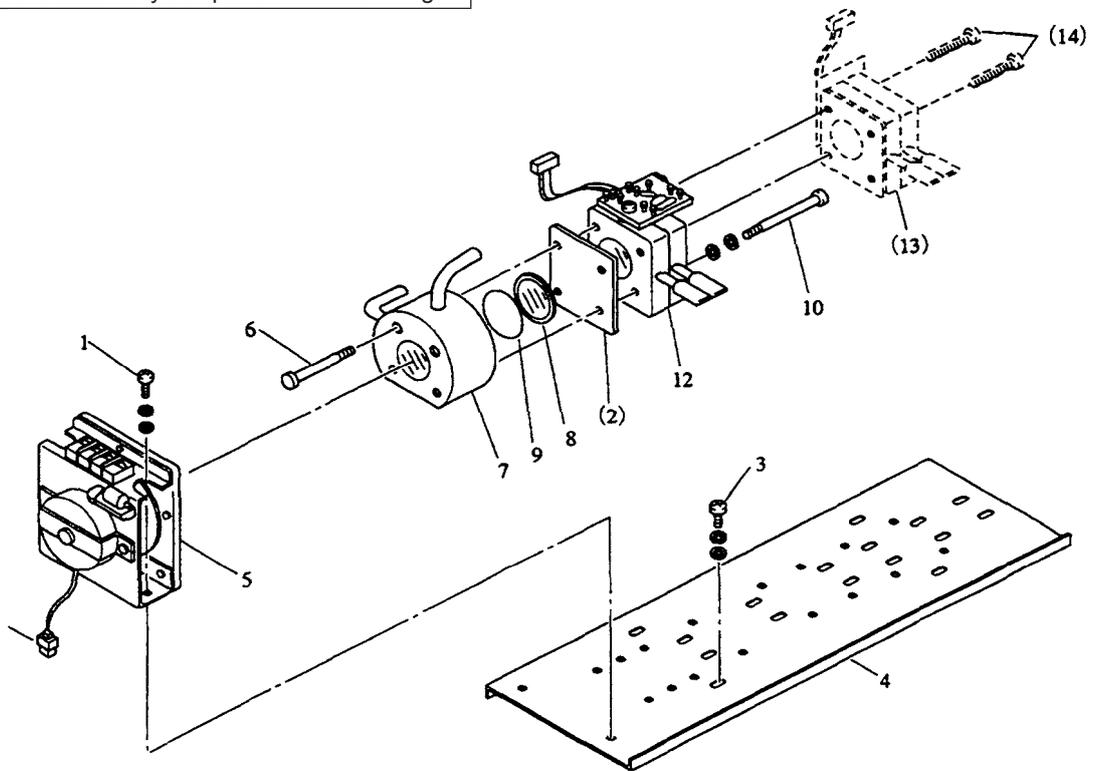


Fig. 6.2 Exploded view of measuring unit (Block cell)

No.	Name
1	Screw (for infrared source unit fixing)
2	Screw (for detector fixing)
3	Base plate
4	Infrared source unit
5	Screw (for block cell fixing)
6	Block cell
7	Window
8	O-ring
9	Detector
10	Screw (for support fixing)
11	Support
12	Screw (for holder fixing)
13	Holder
14	Pipe cell
15	O-ring
16	Window
17	Screw (for detector fixing)
18	Detector

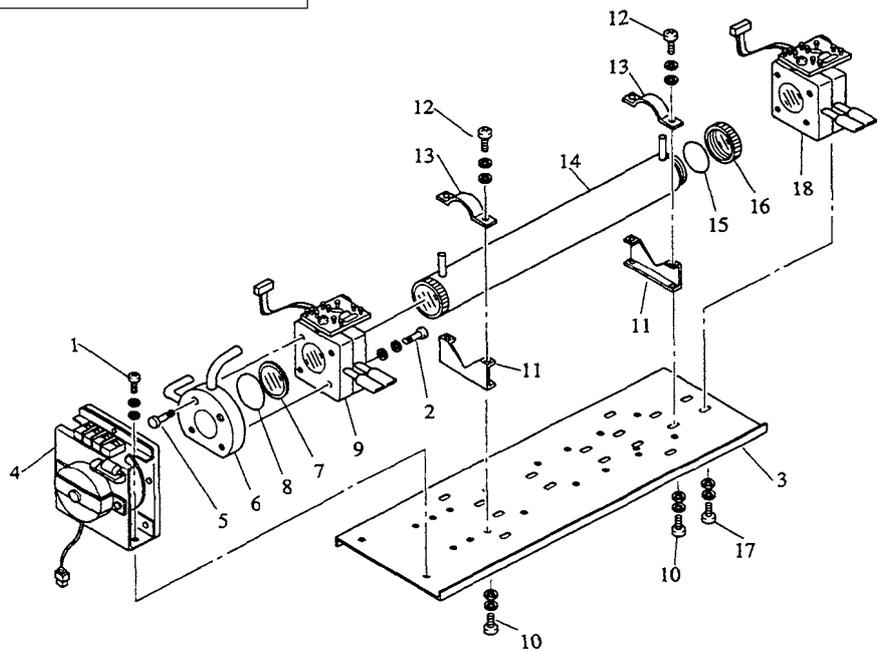


Fig. 6.3 Exploded view of measuring unit (Combination cell)

6.2.2 How to clean cell

- (1) At cleaning of cell inside and infrared ray window, firstly wipe out with soft brush etc. for rather big particles of dust, then with soft cloth lightly.

Do not use hard cloth for cleaning.



WARNING

- Handle window carefully as it is easily broken. Care should be taken not to flaw the window by rubbing it forcibly.

- (2) In case of a heavily dirty window, clean it with alcohol or acetone moistened soft cloth.
- (3) If the window is corroded, rub off the scale from the window lightly with a soft cloth to which chrome oxide powder is applied. If it is excessively corroded, it should be replaced with new one.
- (4) After cleaning of cell and window, reassemble them according to disassembling & reassembling procedures of cell.

Connect piping rightly so as not to leak during operation. Also, be sure to connect piping rightly without forced bent portion.

6.3 Inspection and maintenance of limited service-life components

The analyzer uses limited-life components. The recommended replacement periods are listed in the below table.

1. Limited service-life components are those which wear out or for which failure is presumed within five years under normal operating or storage conditions. Components with more than five years of service life are the exception.
2. The previous table only involves the recommended periods for conducting preventive maintenance for limited service-life components; these periods do not guarantee that accidental failures will not occur.
3. The recommended replacement periods are tentative and depend on operating conditions.
4. The recommended replacement periods may vary depending on the field data.

Checkpoint	Check and maintenance items	Procedure and criteria	Recommended check and maintenance periods							
			Routine	Once a week	Once a month	Every three months	Every six months	Once a year	Every two years	Every five years
Infrared gas analyzer	1. Light source	Recommended replacement period: Every five years (*1)								★
	2. Sector motor	Recommended replacement periods: Every five years (*1)								★
	3. Detector without O ₂ sensor	Recommended replacement period: Every five years (*1)								★
	4. O-ring	Recommended replacement period: Once a year, inspect it when cleaning of measuring cell.						★		
	5. Measuring cell	Set up an appropriate maintenance period (by referring to the check results)				○				

(*) In the check and maintenance columns, place a check mark (○) for check and confirmation work, a dark star (★) for replacement.

(*1) These are serviceperson's work, contact our servicepersons.

● Precautions to be taken while checking

1. When handling reference gas (during calibration), carefully read the reference-gas instruction manual to use the gas correctly. In particular, special attention must be taken in handling carbon monoxide gases; otherwise, you may suffer from gas poisoning.
2. During maintenance checks, be sure to keep the near fan on. If any gas leaks, you may suffer from gas poisoning.
3. When replacing the analyzer gas filter or conducting maintenance service of the washer, completely shut the calibration-gas valve. Otherwise, you may suffer from gas poisoning.

7. TROUBLESHOOTING



CAUTION

- If the cause of any fault cannot be determined despite reference to the instruction manual, be sure to contact Yokogawa's office or your dealer. If the instrument is disassembled carelessly, you may have a shock hazard or injury.
 - Before working, take off a wrist watch, finger ring or the like metallic accessories. And never touch the instrument with a wet hand. Otherwise, you will have a shock hazard.
 - If the fuse is blown, eliminate the cause, and then replace it with the one of the same capacity and type as before. Otherwise, shock hazard or fault may be caused.
-

7.1 Error-Codes and How to Repair

As self diagnostic functions are provided in the analyzer, an error-code is displayed on occasion of error.

In case an error is displayed, carry out checking and/or repairing according to the following table.

Error code	Error details	Check or repair procedure
E - 0 E - 1	Error of digital part	If error is not displayed again after the error display goes off by pressing [ENT] key, check that the display and output when the zero gas and span gas flow indicate the normal values and use as is.
E - 2 E - 3	Error of sensor signal procedure	Turn off the power supply and turn on it again if error is displayed again by even pressing [ENT] key. When error is displayed, replacement of P.C.B. is required. Contact our engineer.
E - 4 E - 5	Correction amount in calibration is out of allowable range	Clean the interior of the cell according to 6.2 Item. If calibration can not be made after the cell is cleaned, it is necessary to check the detector. Contact our engineer.
E - 6	Correction amount of zero exceeding 50% of measurement range	
E - 7	Correction amount of span exceeding 50% of measurement range	Check the span concentration set value meets the span gas concentration.

Supplemental explanations on error codes

- Error-code is displayed on the sub-display screen in the single component analyzer and on the sub-display screen of the 1st component in the dual components analyzer.
- At the occasion of plural errors, the error codes are to be displayed in turn from the lower error-codes No. by depressing **[ENT]** key.
After displaying all error codes, the error codes display is once off by further depression of **[ENT]** key, however, the error codes appear again while the error state continues.
- After error occurs, if the causes of error are removed, the device continues to operate normally. The error code continues to display as it is to inform of the occurrence of error.
Error display goes off by pressing **[ENT]** key.
- When the calibration error is not removed on display, refer to 5-18.
- In case an error-code is displayed, firstly check whether power supply and gas piping are in good order or not.
- In case an error-code is displayed, firstly check whether power supply and gas piping are in good order or not.
- At occasion of error, the contact output of FAULT closes.
If error display does not go off or error is often displayed, contact the nearest Yokogawa's office.

7.2 Other Troubleshooting

The following table shows how to remedy other troubles, such as faulty readings.

Symptom	Checking Item	Remedy, etc.
Drift	<ul style="list-style-type: none"> * Check if the sample gas is supplied to the analyzer at the specified flow rate. * Check the optical system, e.g., the sample cell window, O-ring, detector window and inside of the cell for heavy dirt. 	<ul style="list-style-type: none"> * Locate and check gas leaking points, and take the proper remedy. (See Section 3.2.) * Clean the cell and window. Replace the part. (See Section 6.2.)
Readings are abnormally high	<ul style="list-style-type: none"> * Check if the sample gas contains interfering components (water and CO₂) in large quantities or not. 	<ul style="list-style-type: none"> * Investigate the components of the sample gas and then contact our serviceperson. See address information on the end cover.
Readings do not increase	<ul style="list-style-type: none"> * Check if the sample gas is supplied to the analyzer at the specified flow rate. * Check if the zero and span calibration is enabled. 	<ul style="list-style-type: none"> * Locate and check gas leaking points, and take the proper remedy. (See Section 3.3.) * If enable, sampling (check the points relating only to the sample gas and take the proper remedy.) * If not enabled, check the calibration related error items. (See Error code. 4 to 7 in Section 7.1.)

Revision Information

- Title : Model IR100 Universal Infrared Gas Analyzer Instruction Manual
- Manual No. : IM 11G2L1-01E

Jun. 2007/5th Edition

Corrected and revised all over. e.g.: After Sales Warranty, Revision Information etc. are added
IM Format and Style renewal (As a result of changing Data Source from paper to electric files
and of applying Indesign)

Sep. 2005/4th Edition

Sep. 1996/1st Edition

Newly published

- If you want have more information about Yokogawa products, you can visit
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Thank you for selecting our Model IR100 Universal Infrared Gas Analyzer.

User's Manual, IM 11G2L1-01E, 5th Edition, supplied with the product, some revisions/additions have been made. Please replace the corresponding pages in your copy with the attached, revised pages.

Revisions:

- Page 1-4, Section 1.6.1, "IR100A, IR100B (horizontal type)," Fuse (provided as a standard accessory): Changed of Parts Number.
- Page 1-6, Section 1.6.2, "IR100TA, IR100TB (vertical type)," Fuse (provided as a standard accessory): Changed of Parts Number.
- CMPL "CMPL 11G2L1-01E," Fuse: Changed of Parts Number.
CMPL No. revised to 4th edition.

1.6 Model and Suffix Codes

1.6.1 IR100A, IR100B (horizontal type)

1. Single-gas analyzer (IR100A)

Model	Suffix code	Option code	Description
IR100A	.....	.....	Single-gas analyzer
Measured gas	-1..... -2..... -3.....	..... ..... .....	CO CO ₂ CH ₄
Primary range	A..... B..... C..... D..... E..... F..... G..... H..... J..... K..... L..... M..... P..... Q..... R..... S.....	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	0 to 500 ppm (not available for CH ₄) 0 to 1000 ppm 0 to 2000 ppm 0 to 2500 ppm 0 to 5000 ppm 0 to 1 % 0 to 2 % 0 to 5 % 0 to 10 % 0 to 20 % 0 to 50 % 0 to 100 % 0 to 3 % 0 to 30 % 0 to 40 % 0 to 70 %
Secondary range	A..... B..... C..... D..... E..... F..... G..... H..... J..... K..... L..... M..... N.....	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	0 to 500 ppm (not available for CH ₄) 0 to 1000 ppm 0 to 2000 ppm 0 to 2500 ppm 0 to 5000 ppm 0 to 1 % 0 to 2 % 0 to 5 % 0 to 10 % 0 to 20 % 0 to 50 % 0 to 100 % Not available
Power supply	-5..... -6..... -7..... -8..... -3..... -4.....	..... ..... ..... ..... ..... .....	100V AC 50Hz 100V AC 60Hz 115V AC 50Hz 115V AC 60Hz 220V AC 50Hz 220V AC 60Hz
Construction	A... B... C...	..... ..... .....	Desk top 19-inch rack-mounted Panel-mounted
Piping	J.. A..	..... .....	Rc1/4 1/4NPT
Panel	-J -E	..... .....	Japanese English
Additional functions		/P..... /J.....	Automatic calibration Remote range switching function and range identification functions

Fuse (provided as a standard accessory)

Part number	Specification
K9358DP	125/250 V, 500 mA

2. Dual-gas analyzer (IR100B)

Model	Suffix code	Option code	Description
IR100B	.....	.....	Dual-gas analyzer CO ₂ + CO
Measured gas	-G.....	.....	CO ₂ / CO (Primary gas / secondary gas)
Primary range of CO ₂	E.....	.....	0 to 500 ppm (0 to 500 ppm cannot be specified for CO)
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
Secondary range of CO ₂	1.....	.....	x2
	2.....	.....	x2.5
	N.....	.....	Not available
Primary range of CO	A.....	.....	0 to 500 ppm
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	Secondary range of CO	1.....
2.....		x 2.5
N.....		.....	Not available
Power supply	-5.....	.....	100 V AC 50 Hz
	-6.....	.....	100 V AC 60 Hz
	-7.....	.....	115 V AC 50 Hz
	-8.....	.....	115 V AC 60 Hz
	-3.....	.....	220 V AC 50 Hz
	-4.....	.....	220 V AC 60 Hz
Construction	A...	.....	Desk top
	B...	.....	19-inch rack-mounted
	C...	.....	Panel-mounted
Piping	J..	.....	Rc1/4
	A..	.....	1/4NPT
Panel	-J	.....	Japanese
	-E	.....	English
Additional functions	/P.....	.....	Automatic calibration (for both gases)
	/J.....	.....	Remote range switching function and range identification functions

Fuse (provided as a standard accessory)

Part number	Specification
K9358DP	125/250 V, 500 mA

1.6.2 IR100TA, IR100TB (vertical type)

1. Single-gas analyzer (IR100TA)

Model	Suffix code	Option code	Description
IR100TA	.....	.....	Single-gas analyzer
Measured gas	-1.....	.....	CO
	-2.....	.....	CO ₂
	-3.....	.....	CH ₄
Primary range	A.....	.....	0 to 500 ppm (not available for CH ₄)
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	P.....	.....	0 to 3 %
	Q.....	.....	0 to 30 %
R.....	.....	0 to 40 %	
S.....	.....	0 to 70 %	
Secondary range	A.....	.....	0 to 500 ppm (not available for CH ₄)
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	N.....	.....	Not available
	Power supply	-5.....	.....	100 V AC 50 Hz
-6.....		.....	100 V AC 60 Hz
-7.....		.....	115 V AC 50 Hz
-8.....		.....	115 V AC 60 Hz
-3.....		.....	220 V AC 50 Hz
-4.....		.....	220 V AC 60 Hz
Construction	C....	.....	Panel-mounted
	D....	.....	Wall-mounted
Piping	J..	.....	Rc1/4
	A..	.....	1/4NPT
Panel	-J	.....	Japanese
	-E	.....	English
Additional functions		/P.....	Automatic calibration
		/J.....	Remote range switching function and range identification functions

Fuse (provided as a standard accessory)

Part number	Specification
K9358DP	125/250 V, 500 mA

2. Dual-gas analyzer (IR100TB)

Model	Suffix code	Option code	Description
IR100TB	.....	.....	Dual-gas analyzer CO ₂ + CO
Measured gas	-G.....	.....	CO ₂ / CO (Primary gas / secondary gas)
Primary range of CO ₂	E.....	.....	0 to 5000 ppm (0 to 500 ppm cannot be specified for CO)
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
Secondary range of CO ₂	1.....	.....	× 2
	2.....	.....	× 2.5
	N.....	.....	Not available
Primary range of CO	A.....	.....	0 to 500 ppm
	B.....	.....	0 to 1000 ppm
	C.....	.....	0 to 2000 ppm
	D.....	.....	0 to 2500 ppm
	E.....	.....	0 to 5000 ppm
	F.....	.....	0 to 1 %
	G.....	.....	0 to 2 %
	H.....	.....	0 to 5 %
	J.....	.....	0 to 10 %
	K.....	.....	0 to 20 %
	L.....	.....	0 to 50 %
	M.....	.....	0 to 100 %
	Secondary range of CO	1.....	.....	× 2
2.....		.....	× 2.5
N.....		.....	Not available
Power supply	-5.....	.....	100 V AC 50 Hz
	-6.....	.....	100 V AC 60 Hz
	-7.....	.....	115 V AC 50 Hz
	-8.....	.....	115 V AC 60 Hz
	-3.....	.....	220 V AC 50 Hz
	-4.....	.....	220 V AC 60 Hz
Construction	C....	.....	Panel-mounted
	D....	.....	Wall-mounted
Piping	J..	.....	Rc1/4
	A..	.....	1/4NPT
Panel	-J	.....	Japanese
	-E	.....	English
Additional functions	/P.....	.....	Automatic calibration (for both gases)
	/J.....	.....	Remote range switching function and range identification functions

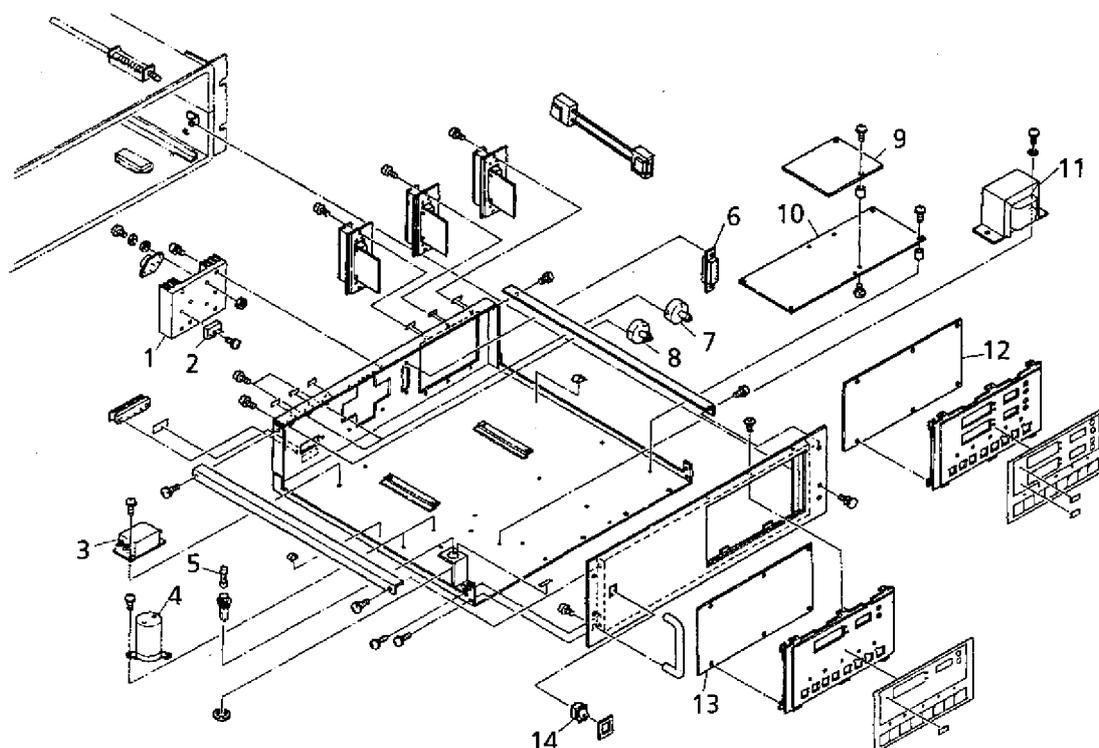
Fuse (provided as a standard accessory)

Part number	Specification
K9358DP	125/250 V, 500 mA

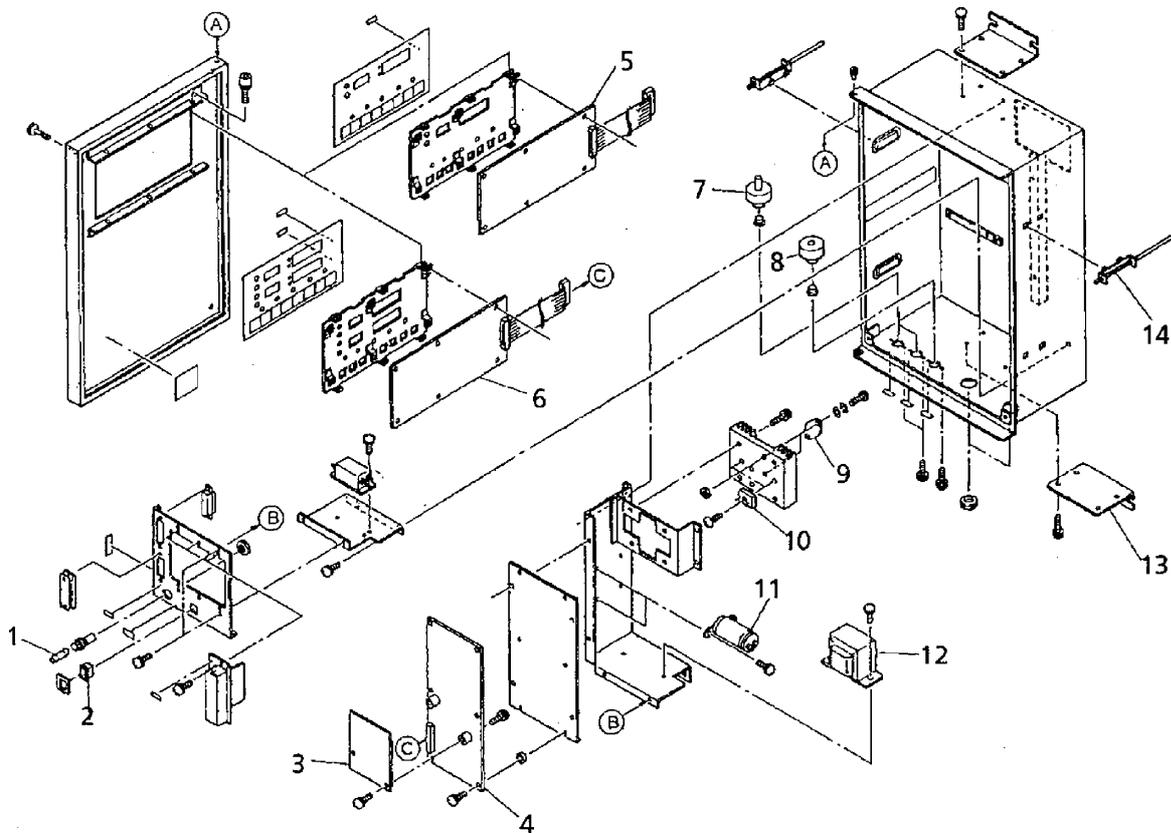
Customer Maintenance Parts List

Model IR100 Universal Infrared Gas Analyzer

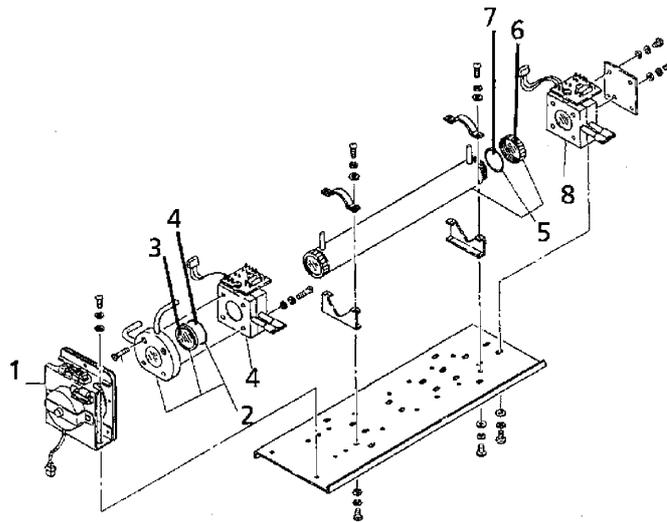
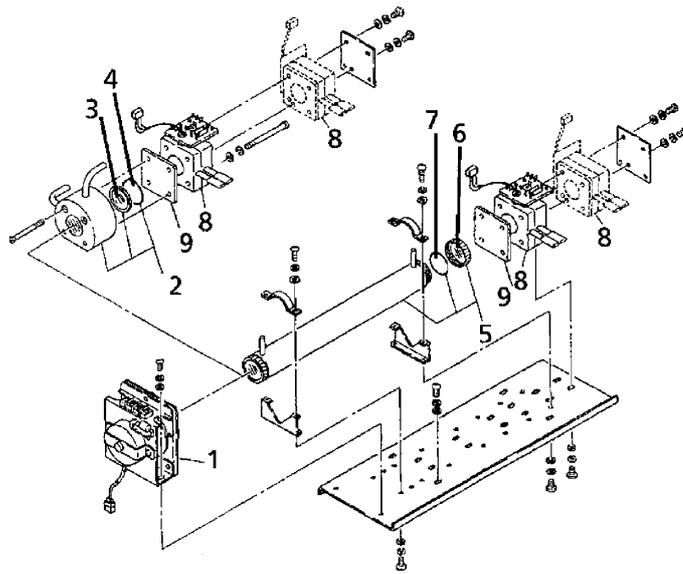
EXA IR



Item	Part No.	Qty	Description
1	K9358CK	1	Heat Sink
2	K9358CL	2	Diode
3	K9358CV	1	Noise Filter
4	K9358CW	1	Capacita
5	K9358DP	1	Fuse (125/250V, 500mA)
6	K9358CS	1	Connector
7	K9358CQ	2	Fittings
	K9358CR		1/4 NPT Rc 1/4
8	K9358CN	1	Socket
	K9358CP		1/4 NPT Rc 1/4
9	K9358DC	1	PCB (Only dual-gas analyzer IR100B)
10	K9358DB	1	PCB
11	K9358DA	1	Trans
12	K9358EK	1	Display Board PCB (For dual-gas analyzer IR100B)
13	K9358EH	1	Display Board PCB (For single-gas analyzer IR100A)
14	K9358DH	1	Switch



Item	Part No.	Qty	Description
1	K9358DP	1	Fuse (125/250V, 500mA)
2	K9358DH	1	Switch
3	K9358DC	1	PCB (Only dual-gas analyzer IR100TB)
4	K9358DB	1	PCB
5	K9358EH	1	Display Board PCB (For single-gas analyzer IR100TA)
6	K9358EK	1	Display Board PCB (For dual-gas analyzer IR100TB)
7		2	Fittings
	K9358CQ		1/4 NPT
	K9358CR		Rc 1/4
8		1	Socket
	K9358CN		1/4 NPT
	K9358CP		Rc 1/4
9	K9358CJ	2	Transistor
10	K9358CL	2	Diode
11	K9358CW	1	Condenser
12	K9358DA	1	Trans
13	K9358HE	2	Mounting Plate
14	K9358CC	4	Mounting metal fittings (Panel Type)



Item	Part No.	Qty	Description
1	K9358FA	1	IR Source Unit
2	— *	1	Cell Unit
3	K9358FK	1	Window Assembly
4	K9358FL	1	O - Ring
5	— *	1	Cell Assembly
6	K9358GM	1	Window Assembly
7	K9358GN	1	O - Ring
8	— *	1	Detector Unit Assembly
9	— *	1	Filter

* : Please consult specifying the model code because the part number is decided by the measurement gas and the measurement range.