General Specifications

IR400
Infrared Gas Analyzer

GS 11G02N01-01E

[Style : S4]

The IR400 infrared gas analyzer is capable of measuring the concentrations of NO, SO_2, CO_2, CO, CH_4 and O_2 components in sample gas.

NO, SO_2, CO_2, CO and CH_4 are measured by non-dispersive infrared method (NDIR), while O_2 is measured by built-in paramagnetic sensor or external zirconia analyzer. A maximum of 5 components including O_2 (up to 4 components except for O_2 measurement) are simultaneously measurable.

The mass flow type twin detector of high sensitivity and reliability adopted in the infrared ray method detection unit makes the measurement hardly affected by interfering components.

In addition, the IR400 includes a microprocessor and has a large-size liquid crystal display, providing easy operation, high accuracy and multiple functions.

Optimum as an analyzer unit of measurement system for combustion exhaust gas from refuse incinerator and boiler, or gas from different industrial furnaces.

■ Features

1. Simultaneous and continuous measurement of up to 5 components including O_2
   O_2 and 4 components selected from among NO, SO_2, CO, CO_2, and CH_4.
2. Minimal interference from other gas components
   The mass flow type twin detector of high sensitivity and reliability minimizes interference from other gas components, ensuring excellent stability.
3. Extensive functions
   Incorporating O_2 correction, average value computing, automatic calibration, one touch calibration, upper/lower limit alarm, remote measurement range changeover, range identification signal output, etc., the analyzer accommodates different application requirements.
4. Easy-to-read, large LCD
   Large LCD provides clear indications of all measured components and computed values and easy interactive operation.
5. 19-inch rack mounting
   Unitized construction of the main body on the 19-inch rack and of the signal input/output terminal module allows easy configuration of a gas analyzer system.
6. Maximum measuring range ratio
   A maximum range ratio of 1:25 is achieved.
7. Zero drift
   ±1% of full scale/week (for range more than 200ppm)

■ Specifications

Standard Specifications

Measurement principle:

NO, SO_2, CO_2, CO, CH_4:	Non-dispersive infrared method Single light source-double beams
O_2:	Paramagnetic type (built-in), or zirconia type (external)

Measurable gas components and measuring ranges:

Component \ Range	Minimum range	Maximum range
NO	0 – 50 ppm	0 – 5000 ppm
SO_2	0 – 50 ppm	0 – 10 vol%
CO_2	0 – 20 ppm	0 – 100 vol%
CO	0 – 50 ppm	0 – 100 vol%
CH_4	0 – 200 ppm	0 – 100 vol%
O_2 (paramagnetic)	0 – 5 vol%	0 – 25 vol%
O_2 (zirconia)	0 – 5 vol%	0 – 25 vol%

- Measurement of up to 5 components including O_2.
- 1 or 2 measuring range per component.
- Measuring range ratio ≤ 1:5 (O_2 analyzer)
  ≤ 1:25 (except O_2 analyzer)

For measurable components and possible combinations of measuring ranges, refer to Measurable Components and Ranges page10 through 11.

Display: Digital indication in 4 digits (LCD with backlight)
- Instantaneous value of each component
- Instantaneous value after O_2 correction (only in NO, SO_2, CO with O_2 measurement)
- Average value after O_2 correction (only in NO, SO_2, CO with O_2 measurement)
- Average O_2 value

Analog output signal:
4 to 20 mA DC or 0 to 1 V DC, non-isolated, 12 points max.
Analog output corresponds one-to-one with measured value indication.

* Input/Output of analog signals is available in combination with the input/output terminal module.

Permissible load resistance:
550 Ω max. for 4 to 20 mA DC
100 kΩ min. for 0 to 1 V DC

*: Refer to the table “Measurable Components and the Corresponding Channel Numbers” of Page 17, for the channel numbers of displayed values and analog output signals.

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GS 11G02N01-01E

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Analog Input Signal :
For signal input from external O_2 analyzer,
Signal requirement;
(1) Signal from Yokogawa's zirconia O_2 analyzer (Model ZX8D*C or ZX8D*D)
(2) 0 to 1V DC from an O2 sensor
Input section is not isolated. This feature is effective when built-in O_2 sensor is not used.
(An input signal triggers measured concentration indication and O_2 correction.)
* : External O_2 analyzer should be purchased separately.

Relay contact output:
1a contact (250 V AC/2 A, resistive load)
Instrument error, calibration error, range identification, auto calibration status, pump ON/OFF, peak alarm.
1c contact (250 V AC/2 A, resistive load)
Selectable 6 outputs.
High/Low limit alarm contact output (for each channel).
Power disconnection alarm.
* All relay contacts are isolated mutually and from the internal circuit.

Contact input:
Non-voltage contact (ON/0 V, OFF/5 VDC , 5 mA flowing at ON).Remote range changeover, auto calibration remote start, remote hold, average value reset, pump ON/OFF. Isolated from the internal circuit with photocoupler. Contact inputs are not isolated from one another.

Transmission output:
Solenoid valve drive signal for automatic calibration.Transistor output (100 mA or less)
* For details, see External Connection Diagram on page 16.

Power supply:
Voltage rating; 100 to 240 V AC
Allowable range; 85 to 264 V AC
Frequency; 50/60 Hz
Power consumption; 250 VA max.
Inlet; Conform to EN60320 Protection Class 1

Operating conditions:
Ambient temperature; -5 to 45°C
Ambient humidity; 90%RH max., non-condensing.

Storage conditions:
Ambient temperature; -20 to 60°C
Ambient humidity; 90%RH max,non-condensing

Dimensions (H × W × D):
Analyzer main unit;
177 × 483 × 599 mm
Input/Output terminal module;
164 × 316 × 55 mm

Weight: Approx. 22 kg (only analyzer)

Finish color:
Front panel;Off-white (Munsell 10Y7.5/0.5 or equivalent)
Casing; Plating, Steel-blue (gray)

Enclosure: Steel casing, for indoor use

Material of gas-contacting parts:
Gas inlet/outlet; SUS304
Sample cell; SUS304/neoprene rubber
Infrared-ray transmitting window; CaF_2
O_2 analyzer sampling cell; SUS316
Internal piping; Toaron tube, PTFE tube

Gas inlet/outlet: Rc1/4 or 1/4 NPT internal thread
Purge gas flow rate: 1 L/min (when required)

Safety, EMC and RoHS conformity standards:
When using IR400 in Europe, select "Indication, Power cable" :C in the suffix code.

Installation altitude; 2000 m or less
Pollution degree; 2 (Note)
Installation category; II (Note)
Note: Installation category, called overvoltage category, specifies impulse with standing voltage. Category II is for electrical equipment.
Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which reduce dielectric strength. Degree 2 is the normal indoor environment.

Safety;
CE EN61010-1, EN IEC 61010-2-030
GB GB30439 Part 1
EAC CU TR 004/2011

EMC;
CE EN61326-1 Class A, Table 2
EN61326-2-3
EN61000-3-2, EN61000-3-3
RCM EN 61326-1 Class A, Table 2
KC Korea Electromagnetic Conformity
한국 전자파적합성 기준
EAC CU TR 020/2011
Note: The product mounted in a steel enclosure conforms to the requirements of EMC directive.

Caution: The instrument is a Class A product, and it is designed for use in the industrial environment. Please use this instrument in the industrial environment only.

RoHS; EN IEC 63000

Information of the WEEE Directive
This product is purposely designed to be used in a large scale fixed installations only and, therefore, is out of scope of the WEEE Directive.The WEEE Directive does not apply.
The WEEE Directive is only valid in the EU.

REACH; Regulation EC 1907/2006

Options

Dedicated relay board (Option code: /R)
This relay board receives signals from connector CN3 of the IR400 I/O terminal module and activates the calibration solenoid valve directly.

Relay Contact 1a contact (250 V AC/2 A, resistive load)
Contact Action
During measurement; CN1: ON
Others: OFF
During calibration: CN1: OFF
Others: Contact corresponding to calibration timing is ON

Recommended connector (CN1 to CN9)
Housing; VHR-2N (JST, Japan Solderless Terminals,)
Contact; SVH-21T-1-1 (JST)

Standard Functions

Output signal hold:
Output signals are kept on hold during the manual or auto calibrations by activation of holding (turning “ON” its setting).
The values to be on hold are the ones obtained just before calibration mode starts.
Indication values will not be on hold.

Remote output hold:
Output signal holds the latest value or setting value by short-circuiting the remote-output-hold input terminals.
Holding is maintained while the terminals are short-circuited. But the indicated instantaneous values will not be on hold.

Switch range :
The range changeover is available in manual, auto, and remote modes. Only preset changeover method is valid.

Manual; Allows range to switch by key operation.

Auto; Allows range to switch from low to high range when 90%FS or more is available in the low range.
Allows range to switch from high to low range when 80%FS or less is available in the low range.

Remote; Non-voltage contact input (for measurable components)
Allows range to switch via an external signal when remote range changeover input is received.

Range identification signal:
The present measuring range is identified by a contact signal.
The contact output terminals for each component are short-circuited when the first range is selected, and when the second range is selected, the terminals are open.

Auto calibration:
Auto calibration is carried out periodically at a preset cycle.
When a standard gas cylinder for calibration and a solenoid valve for opening/closing the gas flow line are prepared externally by the customer, calibration will be carried out with the solenoid valve drive contacts for zero calibration and each span calibration turned on/off sequentially at the set auto calibration timing.

Auto calibration cycle setting;
Auto calibration cycle is set.
Setting is variable within 1 to 99 hours (in increments of 1 hour) or 1 to 40 days (in increments of 1 day).

Gas flow time setting;
The time for flowing each calibration gas in auto calibration is set.
Settable within 60 to 900 seconds (in increments of 1 second)

Auto calibration remote start:
Auto calibration is carried out only once according to an external input signal.
Calibration sequence is settable in the same way as the general auto calibration.
Auto calibration starts by opening the auto-calibration-remote-start input terminals after short-circuiting them for 1.5 seconds or longer.

Auto zero calibration:
Auto zero calibration is carried out periodically at the preset cycle.
This cycle is independent of “Auto calibration” cycle.
When zero calibration gas and solenoid valve for opening/closing the calibration gas flow line are prepared externally by the customer, the zero calibration will be carried out at the preset auto zero calibration timing with the solenoid valve drive contact (for zero calibration) turned on/off.

Auto zero calibration cycle setting;
Auto zero calibration cycle is set.
Setting is variable within 1 to 99 hours (in increments of 1 hour) or 1 to 40 days (in increments of 1 day)

Gas flow time setting;
The time for flowing zero gas in auto zero calibration is set.
Settable 60 to 900 seconds (in increments of 1 second)

Upper/lower limit alarm:
Alarm contact output turns on when measurement value reaches the preset upper or lower limit of alarm value.
Contacts close when the instantaneous value of each component becomes larger than the upper alarm limit value or smaller than the lower alarm limit value.

Instrument error contact output:
Contacts close at an occurrence of analyzer error No. 1, 3 or 10.

Calibration error contact output:
Contacts close at occurrence of manual or auto calibration error (any of errors No. 4 to 9).

Auto calibration status contact output:
Contacts close during auto calibration.

Pump ON/OFF contact output:
During measurement, contacts close.
While calibration gas is flowing, contacts open. Contacts are connected in power supply of pump, and stop the sample gas while calibration gas is flowing.

Optional Functions (available with specifying optional code)

O_2 correction:(-/K)
Conversion of measured NO, SO_2 and CO gas concentrations into values at reference O_2 concentration.

Correction formula: $C = \frac{21 - On}{21 - Os} \times Cs$

Where:
C: Sample gas concentration after O_2 correction
Cs: Measured concentration of sample gas
Os: Measured O_2 concentration (limit setting: 1 to 20%O_2, default 17%)

On: Reference O_2 concentration (value changeable by setting: 0 to 19%O_2, default 4%)

The result of calculation is indicated and output in an analog output signal.

Average value after O_2 correction and O_2 average value calculation (-/K):

The result of O_2 correction or instantaneous O_2 value can be outputted as an average value in the determined period of time.
Used for averaging is the moving average method in which sampling is carried out at intervals of 30 seconds.
(Output is updated every 30 seconds. It is the average value in the determined period of time just before the latest updating.)
Averaging time is settable within 1 to 59 minutes (in increments of 1 minute) or 1 to 4 hours (in increments of 1 hour).

Average value reset (-/K):

The above-mentioned output of average value starts from the initial state by opening the average-value-resetting input terminals after short-circuiting them for 1.5 seconds or longer.
Output is reset by short-circuiting and restarted by opening.

CO concentration peak count alarm (-/A):

(available only for CO + O_2 measurement)
Alarm output turns on according to the preset concentration and count.
Whenever the instantaneous value of CO exceeds the preset concentration value, count increments. If the count exceeds the preset value in one hour, the alarm contacts close.

Communication function (-/C):

RS-232C (9 pins D-sub)
Half-duplex bit serial
Start-stop synchronization
Modbus^{TM} protocol

Contents; Read/write parameters
Read measurement concentration and instrument status

Remark; When connecting via RS-485 interface, a RS-232C ←→ RS-485 converter should be used.

Performance

Repeatability: ±0.5% of full scale (±1% of full scale for range less than 0-50 ppm)

Linearity: ±1% of full scale

Zero drift: ±1% of full scale/week
(±2% of full scale/week for range equal to or more than 50 ppm and less than 200ppm)
(±2% of full scale/day for range less than 0-50 ppm)

Span drift: ±2% of full scale/week
(±2% of full scale/day for range less than 0-50 ppm)

Response time (for 90%FS response) :
Within 60 seconds including replacement time of sample gas (when gas flow rate is 0.5 L/min). Gas replacement time depends on the number of measuring components, and measuring range effects of interfering gases.

Effects of interfering gases:
When sample gas contains gas components listed below, the measurement accuracy may suffer. Consult Yokogawa for the countermeasures or the effect on accuracy.

Analyzer	Interference gas	Effect
SO_2 analyzer	NO_2	50 ppm of NO_2 is equivalent to -6 ppm of SO_2
CO analyzer	CO_2	10 % of CO_2 is equivalent to 3 ppm of CO
	N_2O	1000 ppm of N_2O is equivalent to 80 ppm of CO
CH_4 analyzer	CO_2	15% of CO_2 is equivalent to 3 ppm of CH_4

Standard Requirements for Sample Gas

Flow rate: 0.5±0.2 L/min
Temperature: 0 to 50°C
Pressure: 10 kPa or less (Gas outlet side should be open to the atmospheric air.)
Dust: 100 µg/Nm^3 or less in particle size of 1 µm or less
Mist: Unallowable
Moisture: Below a level where saturation occurs at 2°C (condensation unallowable).
Corrosive component: HCl 1 ppm or less

Standard gas for calibration:

	Analyzer without O_2 measurement	Analyzer with built-in O_2 sensor	Analyzer with external zirconia O_2 sensor
Zero gas	N_2 gas	N_2 gas	Dry air or atmospheric air *2
Span gas other than for O_2 measurement	Gas with a concentration of 90% or more of full scale *1	Gas with a concentration of 90% or more of full scale *1	Gas with a concentration of 90% or more of full scale *1
Span gas for O_2 measurement	—	Gas with a concentration of 90% or more of full scale or atmospheric air (21%) *1	1 to 2% O_2

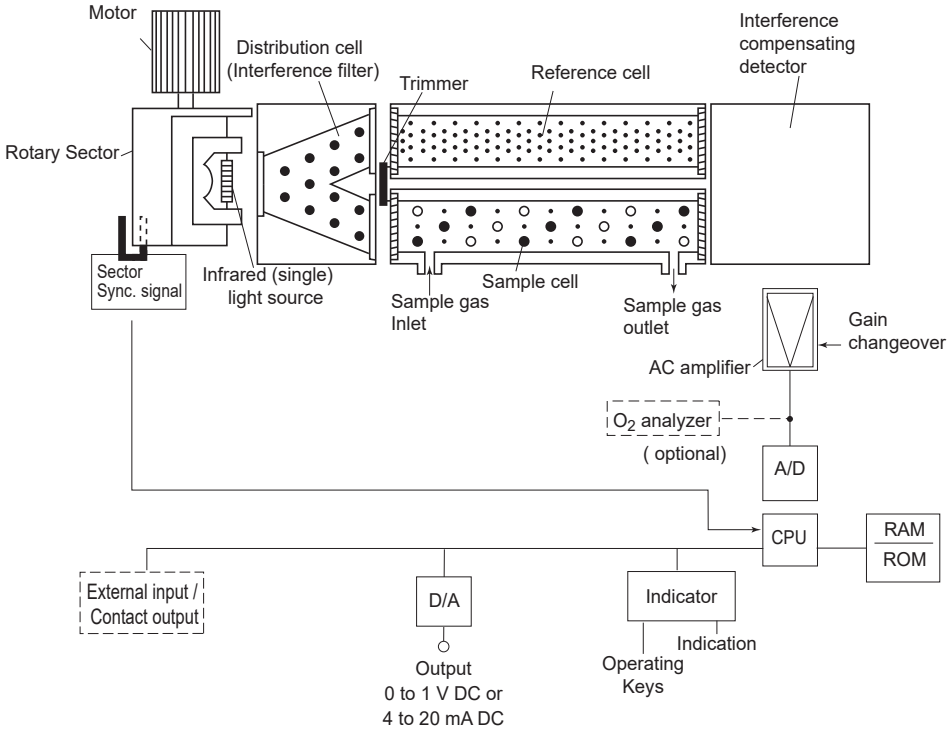
*1 Gas with a concentration of 100% or more of fulll scale cannot be used.
*2 Not selectable when the CO_2 meter is equipped.

Installation Requirements

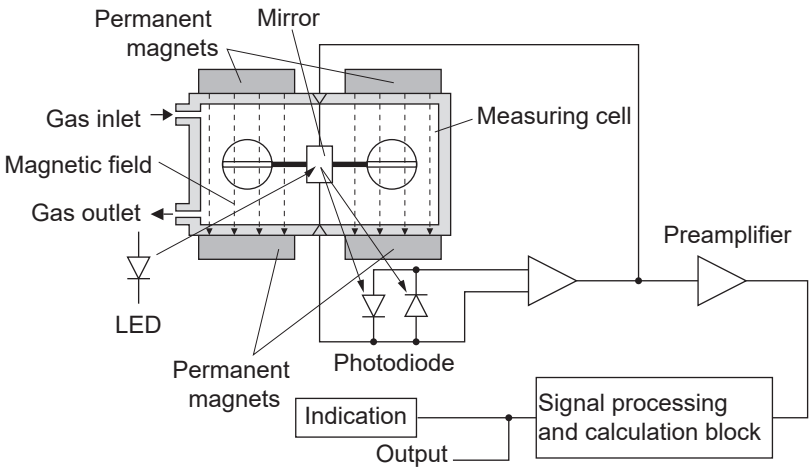
- Indoor use: Avoid exposure to direct sunlight, weather, and radiant heat from hot substances. Where the exposure to such conditions are unavoidable, a protective hood or cover should be prepared.
- Minimal vibration
- A clean atmosphere

■ Measurement Principle

Infrared gas analyzer (NO, SO_2, CO_2, CO, CH_4)

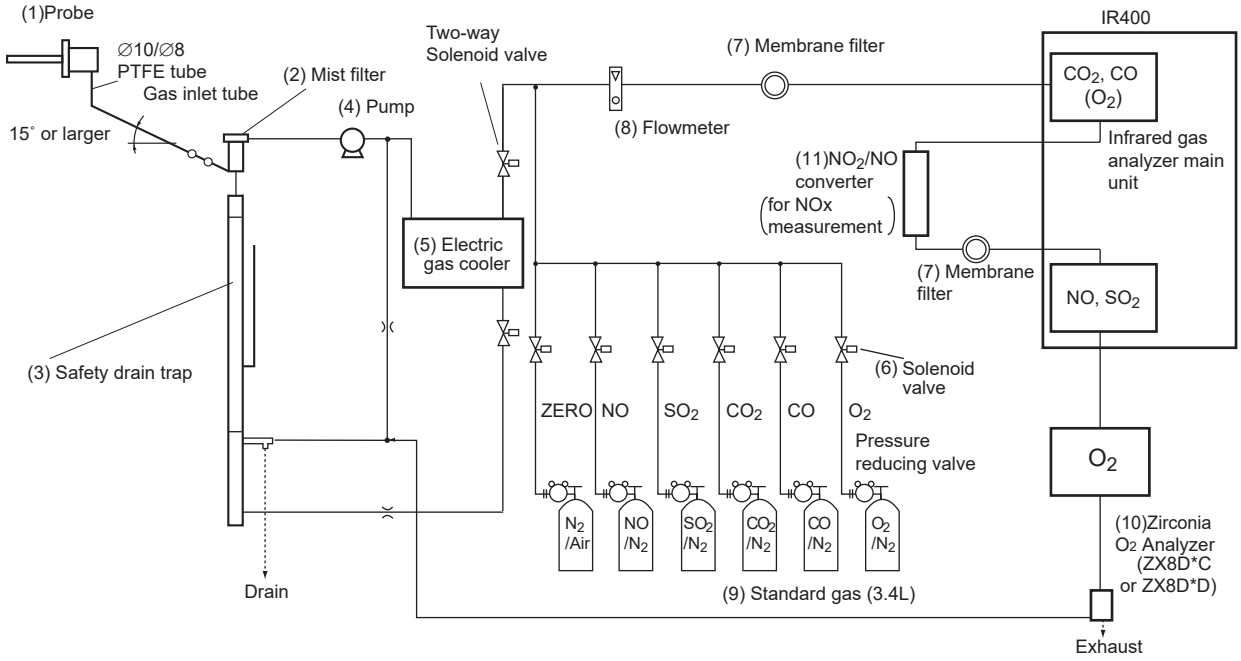


Paramagnetic oxygen analyzer



■ Example of gas sampling system configuration

The following illustrates a typical system configuration for five component gas measurement which monitors combustion exhaust gas from boiler, refuse incinerator, etc. Contact Yokogawa for system configuration for particular use or further information.



Typical sampling system components

Item	Description
(1)Probe	With a heating type stainless steel filter. Standard pore size: 40 µm
(2)Mist filter	Separates drain and removes dust and mist.
(3)Safety drain trap	Prevents drain from being sucked. Composite operation of constant-pressure bubbler.
(4)Pump	Sucks in sample gas. Sample gas flow rate: approx. 2 L/min
(5)Electric gas cooler	Dehumidifies sample gas.
(6)Solenoid valve	Used for introducing calibration gas.
(7)Membrane filter	Glass fiber or PTFE filter removes fine dust. Dust buildup conditions can be monitored through front panel of analyzer.
(8)Flowmeter	Adjusts and monitors sample gas flow rate.
(9)Standard gas	Used for zero/span calibration. Zero, NO, SO_2, CO, CO_2, and O_2 gas cylinders.
(10)Zirconia O_2 analyzer	Not required when built-in type is used. Installed externally. Measures O_2 concentration (0 to 25%) of sample gas.
(11)NO_2/NO converter	Required for NOx measurement. Converts NO_2 to NO gas efficiently using special catalyst.

For each sampling component, consult with Yokogawa.

■ Model and Suffix Code

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Model	Suffix code	Option code	Description
IR400	- - - - - - - - - - - - - - - -	- - - - - - - -	Infrared gas analyzer 19-inch rack mounting type with slide rail
Measurable component (Note 8)	**-A**	- - - - - - - -	1st: NO
	-B	- - - - - - - -	1st: SO_2
	-C	- - - - - - - -	1st: CO_2
	-D	- - - - - - - -	1st: CO
	-F	- - - - - - - -	1st: CH_4
	-G	- - - - - - - -	1st: NO, 2nd: SO_2
	-H	- - - - - - - -	1st: NO, 2nd: CO
	-J	- - - - - - - -	1st: CO2, 2nd: CO
	-K	- - - - - - - -	1st: NO, 2nd: SO_2, 3rd: CO
	-L	- - - - - - - -	1st: NO, 2nd: SO_2, 3rd: CO_2, 4th: CO
O_2 Analyzer	**N**	- - - - - - - -	Without O_2 Analyzer
	1	- - - - - - - -	External zirconia oxygen analyzer (purchase separately: ZX8D) (Note 7)
	2	- - - - - - - -	External O_2 Analyzer (Note 1)
	3	- - - - - - - -	Built-in paramagnetic type O_2 sensor
1st Component 1st Range (Note 2)	V	- - - - - - - -	0-20 ppm (Note 3)
	A	- - - - - - - -	0-50 ppm
	B	- - - - - - - -	0-100 ppm
	C	- - - - - - - -	0-200 ppm
	D	- - - - - - - -	0-250 ppm
	W	- - - - - - - -	0-300 ppm
	E	- - - - - - - -	0-500 ppm
	F	- - - - - - - -	0-1000 ppm
	G	- - - - - - - -	0-2000 ppm
	H	- - - - - - - -	0-5000 ppm
	J	- - - - - - - -	0-1%
	K	- - - - - - - -	0-2%
	L	- - - - - - - -	0-3%
	M	- - - - - - - -	0-5%
	P	- - - - - - - -	0-10%
	Q	- - - - - - - -	0-20%
	R	- - - - - - - -	0-40%
	S	- - - - - - - -	0-50%
	T	- - - - - - - -	0-70%
	U	- - - - - - - -	0-100%
1st Component 2nd Range (Note 2)	A	- - - - - - - -	0-50 ppm
	B	- - - - - - - -	0-100 ppm
	C	- - - - - - - -	0-200 ppm
	D	- - - - - - - -	0-250 ppm
	W	- - - - - - - -	0-300 ppm
	E	- - - - - - - -	0-500 ppm
	F	- - - - - - - -	0-1000 ppm
	G	- - - - - - - -	0-2000 ppm
	H	- - - - - - - -	0-5000 ppm
	J	- - - - - - - -	0-1%
	K	- - - - - - - -	0-2%
	L	- - - - - - - -	0-3%
	M	- - - - - - - -	0-5%
	P	- - - - - - - -	0-10%
	Q	- - - - - - - -	0-20%
	R	- - - - - - - -	0-40%
	S	- - - - - - - -	0-50%
	T	- - - - - - - -	0-70%
	U	- - - - - - - -	0-100%
	N	- - - - - - - -	Not available
2nd Component 1st Range (Note 2)	A	- - - - - - - -	0-50 ppm
	B	- - - - - - - -	0-100 ppm
	C	- - - - - - - -	0-200 ppm
	D	- - - - - - - -	0-250 ppm
	W	- - - - - - - -	0-300 ppm
	E	- - - - - - - -	0-500 ppm
	F	- - - - - - - -	0-1000 ppm
	G	- - - - - - - -	0-2000 ppm
	H	- - - - - - - -	0-5000 ppm
	J	- - - - - - - -	0-1%
	K	- - - - - - - -	0-2%
	L	- - - - - - - -	0-3%
	M	- - - - - - - -	0-5%
	P	- - - - - - - -	0-10%
	Q	- - - - - - - -	0-20%
	R	- - - - - - - -	0-40%
	S	- - - - - - - -	0-50%
	T	- - - - - - - -	0-70%
	U	- - - - - - - -	0-100%
	N	- - - - - - - -	Not available

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Model	Suffix code	Option code	Description
2nd Component 2nd Range (Note 2)	**B**	- - - - - - - -	0-100 ppm
	C	- - - - - - - -	0-200 ppm
	D	- - - - - - - -	0-250 ppm
	W	- - - - - - - -	0-300 ppm
	E	- - - - - - - -	0-500 ppm
	F	- - - - - - - -	0-1000 ppm
	G	- - - - - - - -	0-2000 ppm
	H	- - - - - - - -	0-5000 ppm
	J	- - - - - - - -	0-1%
	K	- - - - - - - -	0-2%
	L	- - - - - - - -	0-3%
	M	- - - - - - - -	0-5%
	P	- - - - - - - -	0-10%
	Q	- - - - - - - -	0-20%
	R	- - - - - - - -	0-40%
	S	- - - - - - - -	0-50%
	T	- - - - - - - -	0-70%
	U	- - - - - - - -	0-100%
	N	- - - - - - - -	Not Available
3rd Component 1st Range (Note 2)	**A**	- - - - - - - -	0-50 ppm
	B	- - - - - - - -	0-100 ppm
	C	- - - - - - - -	0-200 ppm
	D	- - - - - - - -	0-250 ppm
	W	- - - - - - - -	0-300 ppm
	E	- - - - - - - -	0-500 ppm
	F	- - - - - - - -	0-1000 ppm
	G	- - - - - - - -	0-2000 ppm
	H	- - - - - - - -	0-5000 ppm
	J	- - - - - - - -	0-1%
	K	- - - - - - - -	0-2%
	L	- - - - - - - -	0-3%
	M	- - - - - - - -	0-5%
	P	- - - - - - - -	0-10%
	Q	- - - - - - - -	0-20%
	R	- - - - - - - -	0-40%
	S	- - - - - - - -	0-50%
	T	- - - - - - - -	0-70%
	U	- - - - - - - -	0-100%
	N	- - - - - - - -	Not Available
3rd Component 2nd Range (Note 2)	**B**	- - - - - - - -	0-100 ppm
	C	- - - - - - - -	0-200 ppm
	D	- - - - - - - -	0-250 ppm
	W	- - - - - - - -	0-300 ppm
	E	- - - - - - - -	0-500 ppm
	F	- - - - - - - -	0-1000 ppm
	G	- - - - - - - -	0-2000 ppm
	H	- - - - - - - -	0-5000 ppm
	J	- - - - - - - -	0-1%
	K	- - - - - - - -	0-2%
	L	- - - - - - - -	0-3%
	M	- - - - - - - -	0-5%
	P	- - - - - - - -	0-10%
	Q	- - - - - - - -	0-20%
	R	- - - - - - - -	0-40%
	S	- - - - - - - -	0-50%
	T	- - - - - - - -	0-70%
	U	- - - - - - - -	0-100%
	N	- - - - - - - -	Not Available
4th Component 1st Range (Note 2)	**A**	- - - - - - - -	0-50 ppm
	B	- - - - - - - -	0-100 ppm
	C	- - - - - - - -	0-200 ppm
	D	- - - - - - - -	0-250 ppm
	W	- - - - - - - -	0-300 ppm
	E	- - - - - - - -	0-500 ppm
	F	- - - - - - - -	0-1000 ppm
	G	- - - - - - - -	0-2000 ppm
	H	- - - - - - - -	0-5000 ppm
	J	- - - - - - - -	0-1%
	K	- - - - - - - -	0-2%
	L	- - - - - - - -	0-3%
	M	- - - - - - - -	0-5%
	P	- - - - - - - -	0-10%
	Q	- - - - - - - -	0-20%
	R	- - - - - - - -	0-40%
	S	- - - - - - - -	0-50%
	T	- - - - - - - -	0-70%
	U	- - - - - - - -	0-100%
	N	- - - - - - - -	Not Available

[Style: S4]

Model	Suffix code				Option code	Description
4th Component 2nd Range (Note 2)	B				- - - - - - - -	0-100 ppm
	C				- - - - - - - -	0-200 ppm
	D				- - - - - - - -	0-250 ppm
	W				- - - - - - - -	0-300 ppm
	E				- - - - - - - -	0-500 ppm
	F				- - - - - - - -	0-1000 ppm
	G				- - - - - - - -	0-2000 ppm
	H				- - - - - - - -	0-5000 ppm
	J				- - - - - - - -	0-1%
	K				- - - - - - - -	0-2%
	L				- - - - - - - -	0-3%
	M				- - - - - - - -	0-5%
	P				- - - - - - - -	0-10%
	Q				- - - - - - - -	0-20%
	R				- - - - - - - -	0-40%
	S				- - - - - - - -	0-50%
	T				- - - - - - - -	0-70%
	U				- - - - - - - -	0-100%
	N				- - - - - - - -	Not available
O_2 Analyzer 1st Range (Note 2)		1			- - - - - - - -	0-5%
		2			- - - - - - - -	0-10%
		3			- - - - - - - -	0-25%
		N			- - - - - - - -	Not available
O_2 Analyzer 2nd Range (Note 2)			2		- - - - - - - -	0-10%
			3		- - - - - - - -	0-25%
			N		- - - - - - - -	Not available
Output				-4	- - - - - - - -	4-20 mA DC, non-isolation
				-1	- - - - - - - -	0-1 V DC, non-isolation
Piping					R	- - - - - - - -	Rc1/4
					T	- - - - - - - -	1/4 NPT
Indication, Power Cable (Note 6)					W	- - - - - - - -	Japanese, Power Cable: rated voltage 125 V AC
					L	- - - - - - - -	English, Power Cable: rated voltage 125 V AC (UL)
					C	- - - - - - - -	English, Power Cable: rated voltage 250 V AC (CEE)
					K	- - - - - - - -	English, Power Cable: rated voltage 250 V AC (KC)
					T	- - - - - - - -	English, Power Cable: rated voltage 125 V AC (BSMI)
Option	O_2 correction and O_2 average (Note 4)					/K	With O_2 correction and O_2 average value
						/A	With peak count alarm (Note 4)
	Communication					/C	RS-232C (Note 9)
	Internal purge					/P	Analyzer internal purging
	Relay board (Note 5)					/R	With dedicated cable
						/EQ	EAC with PA (Note 10)
						/ER	EAC (Note 10)

Notes:

1: A signal from the external O_2 analyzer should be 0-1 V DC linear to full scale.
2: Possible combinations of ranges are specified in separate tables.
3: Only available for CO_2 measurement. Option code "/P," Analyzer internal purging, must be specified.
4: O_2 correction is available only for NO, CO, and SO_2 Both average value output after O_2 correction and average O_2 value output are provided at the same time. A peak count alarm can be provided only for CO measurement.
5: Should be specified when using a solenoid valve for automatic calibration.
6: Each type of cable is different in its voltage rating and plug type. Select an appropriate code according to the operating power supply voltage to be used in each field. W is for Japan, L for North America, C for Europe, K for Korea, and T for Taiwan. When using IR400 in Europe, select C.
7: Specify Style Code D for ZX8D complying with the directives of CE Marking
8: For NOx measurement, a NO_2/NO converter (P/N K9350LE or K9350LF) should be purchased separately.
9: Should be specified when using Modbus™ communication.
10: "/EQ" is EAC with Pattern Approval for Russia. "/ER" is EAC for Kazakhstan and Belarus.

■ Standard Accessories

Name	Qty	Description
Power cable	1	Standard inlet type (2 m) Part number and (suffix code): K9218SA (W): for Japan 2 m, K9358UC (L): for North America 2 m, K9358UB (C): for Europe 2 m, A1004WD (K): for Korea 2.5 m, A1100WD (T): for Taiwan 2 m
Fuse	2	Replacement fuse (250 V AC, 3.15 A, delay type) Part number: K9218SB
Input/output terminal module	1	External terminal module
Cable	1	Connection cable between main unit and input/output terminal module (1 m)
Slide rail	2	Slide rail Part number: K9218SE

■ Measurable Components and Ranges

(1) Single-component analyzer (NO, SO_2, CO_2, CO, CH_4)

1st range \ 2nd range	A	B	C	D	W	E	F	G	H	J	K	L	M	P	Q	R	S	T	U	N
	0-50ppm	0-100ppm	0-200ppm	0-250ppm	0-300ppm	0-500ppm	0-1000ppm	0-2000ppm	0-5000ppm	0-1%	0-2%	0-3%	0-5%	0-10%	0-20%	0-40%	0-50%	0-70%	0-100%	None
V 0-20ppm	◊	◊	◊	◊	◊	◊	—	—	—	—	—	—	—	—	—	—	—	—	—	◊
A 0-50ppm	—	■□ ◊○	■□ ◊○	■□ ◊○	■□ ◊○	■□ ◊○	■□ ◊○	—	—	—	—	—	—	—	—	—	—	—	—	■□ ◊○
B 0-100ppm	—	—	■□◊○	■□ ◊○	■□ ◊○	■□ ◊○	■□ ◊○	■□ ◊○	—	—	—	—	—	—	—	—	—	—	—	■□ ◊○
C 0-200ppm	—	—	—	■□◊ ○▲	■□◊ ○▲	■□◊ ○▲	■□◊ ○▲	■□◊ ○▲	■□◊ ○▲	—	—	—	—	—	—	—	—	—	—	■□◊ ○▲
D 0-250ppm	—	—	—	—	—	—	■□◊ ○▲	■□◊ ○▲	■□◊ ○▲	—	—	—	—	—	—	—	—	—	—	■□◊ ○▲
W 0-300ppm	—	—	—	—	—	—	■□◊ ○▲	■□◊ ○▲	■□◊ ○▲	—	—	—	—	—	—	—	—	—	—	■□◊ ○▲
E 0-500ppm	—	—	—	—	—	—	■□◊ ○▲	■□◊ ○▲	■□◊ ○▲	□◊ ○▲	—	—	—	—	—	—	—	—	—	■□◊ ○▲
F 0-1000ppm	—	—	—	—	—	—	—	■□◊ ○▲	■□◊ ○▲	□◊ ○▲	□◊ ○▲	—	—	—	—	—	—	—	—	■□◊ ○▲
G 0-2000ppm	—	—	—	—	—	—	—	—	■□◊ ○▲	□◊ ○▲	◊○▲	◊▲	◊▲	—	—	—	—	—	—	■□◊ ○▲
H 0-5000ppm	—	—	—	—	—	—	—	—	—	□◊ ○▲	◊○▲	◊○▲	◊○▲	◊○▲	—	—	—	—	—	■□◊ ○▲
J 0-1%	—	—	—	—	—	—	—	—	—	—	◊○▲	◊○▲	◊○▲	◊○▲	◊○▲	—	—	—	—	□◊○ ▲
K 0-2%	—	—	—	—	—	—	—	—	—	—	—	□◊ ○▲	□◊ ○▲	□◊ ○▲	◊○▲	◊○▲	◊○▲	—	—	□◊ ○▲
L 0-3%	—	—	—	—	—	—	—	—	—	—	—	—	□◊ ○▲	□◊ ○▲	◊○▲	◊○▲	◊○▲	—	—	□◊ ○▲
M 0-5%	—	—	—	—	—	—	—	—	—	—	—	—	—	□◊ ○▲	◊○▲	◊○▲	◊○▲	—	—	□◊ ○▲
P 0-10%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	◊○▲	◊○▲	◊○▲	◊○▲	◊○▲	□◊ ○▲
Q 0-20%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	◊○▲	◊○▲	◊○▲	◊○▲	◊○▲
R 0-40%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	◊○▲	◊○▲	◊○▲	◊○▲
S 0-50%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	◊○▲	◊○▲	◊○▲
T 0-70%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	◊○▲	◊○▲
U 0-100%	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	◊○▲

◊ : CO_2 analyzer measurable range　○ :CO analyzer measurable range　▲ :CH_4 analyzer measurable range
□ : SO_2 analyzer measurable range　■ :NO analyzer measurable range

(2) Two-component analyzer (NO and SO_2)

1st component (NO),1st range \ 2nd component (SO_2) 1st range			SO_2								
			A	B	C	D	W	E	F	G	H
			0-50ppm	0-100ppm	0-200ppm	0-250ppm	0-300ppm	0-500ppm	0-1000ppm	0-2000ppm	0-5000ppm
NO	A	0-50ppm	○ *1	○ *2	○ *2	○ *2	○ *2	○ *2	○ *2	○ *2	—
	B	0-100ppm	○ *3	○ *4	○ *4	○ *4	○ *4	○ *4	○ *4	○ *4	—
	C	0-200ppm	○ *3	○ *4	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5
	D	0-250ppm	○ *3	○ *4	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5
	W	0-300ppm	○ *3	○ *4	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5
	E	0-500ppm	○ *3	○ *4	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5
	F	0-1000ppm	○ *3	○ *4	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5
	G	0-2000ppm	○ *3	○ *4	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5
	H	0-5000ppm	—	—	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5	○ *5

○ : Double components measurable range. 1st component : NO, 2nd component : SO_2.
1st range (low range) must meet the combination in above table.
*1. 2nd range of both NO and SO_2 measurements are available up to 1000 ppm.
*2. 2nd range of NO and SO_2 measurements are available up to 1000 ppm and 2000 ppm, respectively.
*3. 2nd range of NO and SO_2 measurements are available up to 2000 ppm and 1000 ppm, respectively.
*4. 2nd range of both NO and SO_2 are available up to 2000 ppm.
*5. 2nd range of both NO and SO_2 are available up to 5000 ppm.

(3) Two-component analyzer (NO and CO)

Both NO and CO analyzer must meet the range in (1) Single-component analyzer.

(4) Two-component analyzer (CO_2 and CO)

2nd component (CO) / 1st range			CO*									
			A	B	C	D	W	E	F	G	H	J
1st component (CO_2),1st range			0-50ppm	0-100ppm	0-200ppm	0-250ppm	0-300ppm	0-500ppm	0-1000ppm	0-2000ppm	0-5000ppm	0-1%
CO_2	A	0-50ppm	a-a	a-b	a-c	a-c	a-c	a-c	a-c	a-c	a-z	—
	B	0-100ppm	b-a	b-b	b-c	b-c	b-c	b-d	b-d	b-d	b-d	b-z
	C	0-200ppm	c-a	c-b	c-c	c-c	c-c	c-d	c-d	c-d	c-d	c-z
	D	0-250ppm	c-a	c-b	c-c	c-c	c-c	c-d	c-d	c-d	c-d	c-z
	W	0-300ppm	c-a	c-b	c-c	c-c	c-c	c-d	c-d	c-d	c-d	c-z
	E	0-500ppm	c-a	c-b	c-c	c-c	c-c	d-d	d-e	d-e	d-e	d-e
	F	0-1000ppm	c-a	c-b	c-c	c-c	c-c	d-d	e-e	e-e	e-e	e-e
	G	0-2000ppm	c-a	c-b	c-c	c-c	c-c	d-d	e-e	e-e	f-g	f-g
	H	0-5000ppm	z-a	z-b	z-c	z-c	z-c	d-d	e-e	e-e	g-g	g-h
	J	0-1%	—	—	—	—	—	z-d	e-e	e-e	g-g	h-h
	K	0-2%	—	—	—	—	—	—	z-e	z-e	g-g	h-h
	L	0-3%	—	—	—	—	—	—	—	—	g-g	h-h
	M	0-5%	—	—	—	—	—	—	—	—	g-g	h-h
	P	0-10%	h-a	h-b	h-c	h-c	h-c	h-d	h-d	h-d	z-g h-d	h-h
	Q	0-20%	z-a	z-b	z-c	z-c	z-c	z-d	z-d	z-d	z-d	z-h
	R	0-40%	—	—	—	—	—	—	—	—	—	—
	S	0-50%	—	—	—	—	—	—	—	—	—	—
	T	0-70%	—	—	—	—	—	—	—	—	—	—
	U	0-100%	—	—	—	—	—	—	—	—	—	—

Symbol definition: (Example) x-y x: Selectable scale of the second range to measure CO_2.
Y: Selectable scale of the second range to measure CO.

a: Selectable up to 1000 ppm.
b: Selectable up to 2000 ppm.
c: Selectable up to 5000 ppm.
d: Selectable up to 1 %.
e: Selectable up to 2 %.
f: Selectable up to 5 %.
g: Selectable up to 10 %.
h: Selectable up to 20 %.
z: Second range is not available.(Only first range is available.)

* : Consult YOKOGAWA for information on any combination of two ranges among K through U when you measure CO as a second component at above 2% level of its first range.

(5) Three-component analyzer (NO + SO_2 + CO)

See the table (2) "Two-component analyzer" of Page 10 for NO + SO_2 measurement of three-component analyzer (NO + SO_2 + CO). See the table (1) "Single-component analyzer" of Page.10 for CO measurement.

(6) Four-component analyzer (NO + SO_2 + CO_2+ CO)

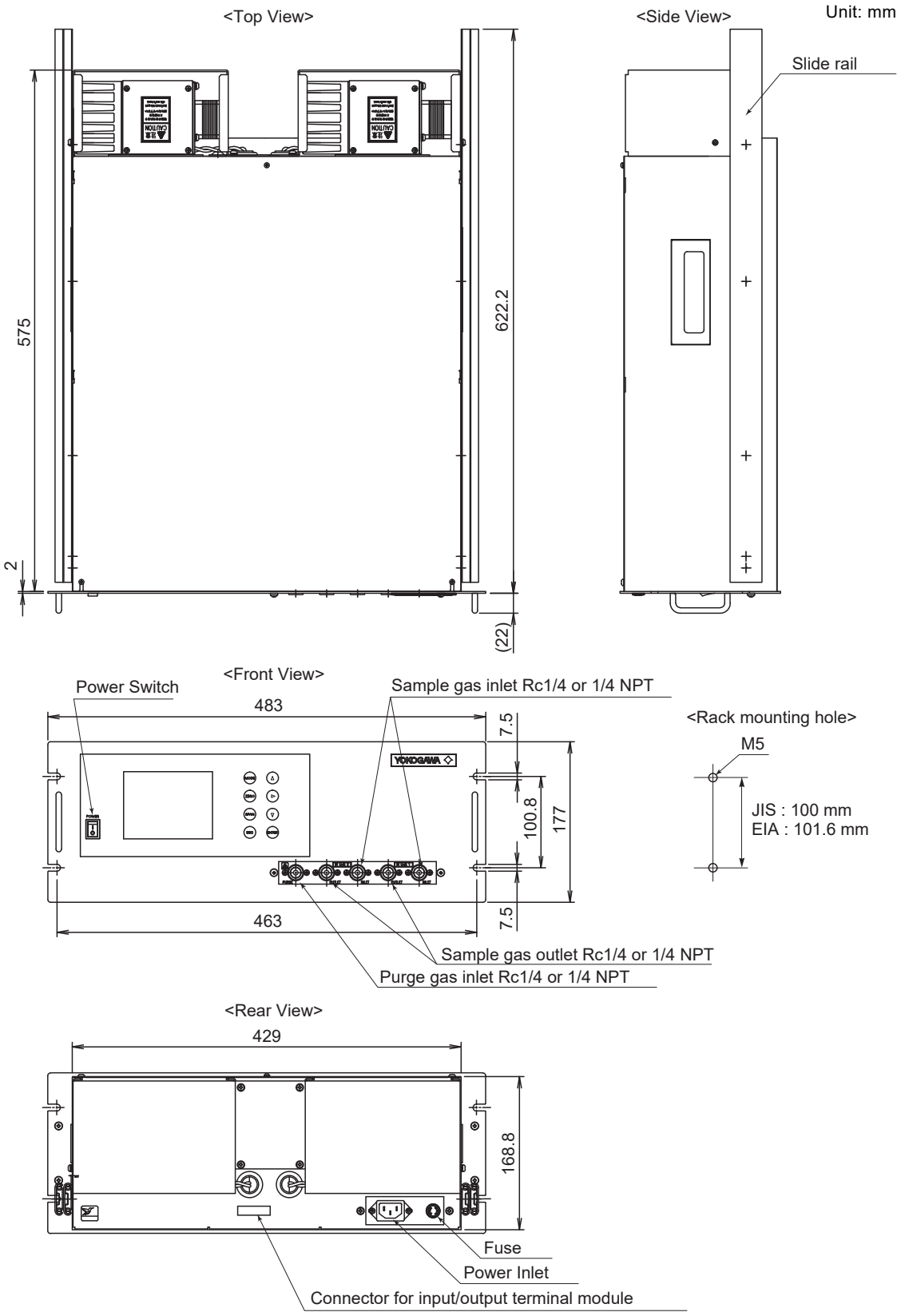
See the table (2) "Two-component analyzer" of Page 10 for NO + SO_2 measurement and (4)" Two component analyzer " for CO_2 + CO measurement.

(7) O_2 analyzer

2nd range / 1st range		2	3	N
		0-10%	0-25%	No 2nd range
1	0-5%	○▲	○▲	○▲
2	0-10%	—	○▲	○▲
3	0-25%	—	—	○▲

○ : Built-in O_2 analyzer measurable range
▲ : External Zirconia Oxygen Analyzer (in this case, Yokogawa's ZX8D) measurable range
*O_2 analyzer is selectable independently of its combination with other components.

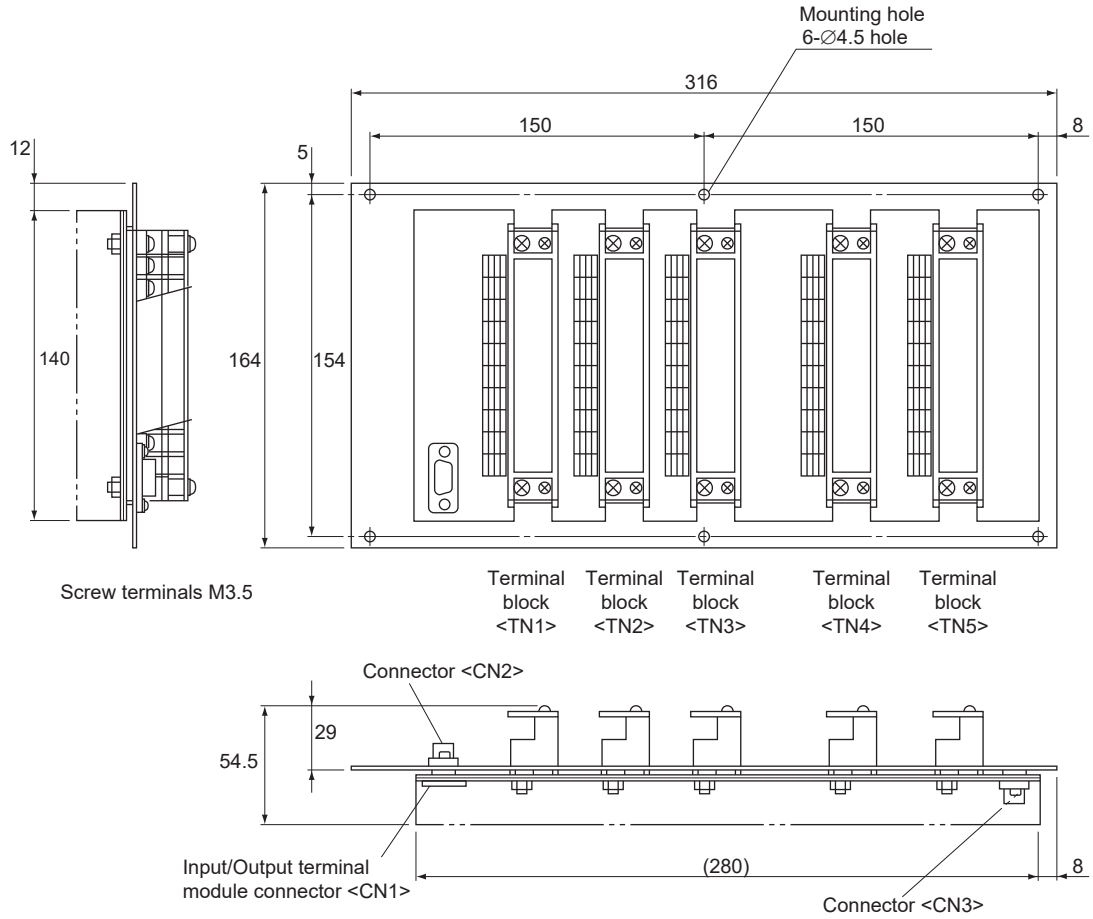
■ External Dimensions



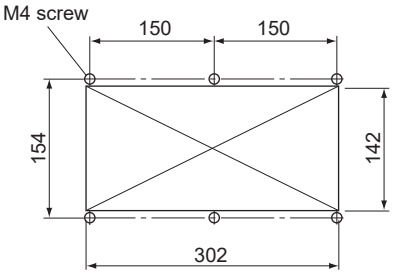
Accessory

- **Input/Output Terminal Module**

Unit: mm

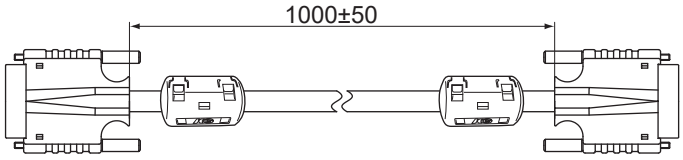


Dimensions for Mounting Input/Output Terminal Module

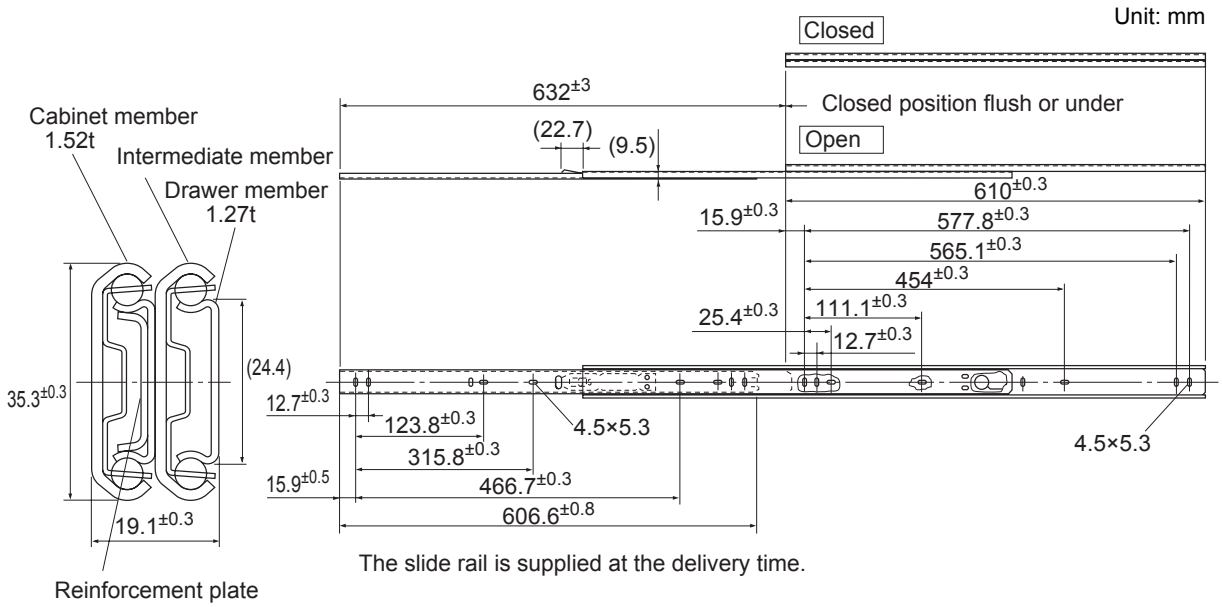


Cut M4 screw holes at 6 positions.
Drill a rectangular hole of 302 x 142 mm or more in the center.

- **Cable for connecting Input/Output Terminal**



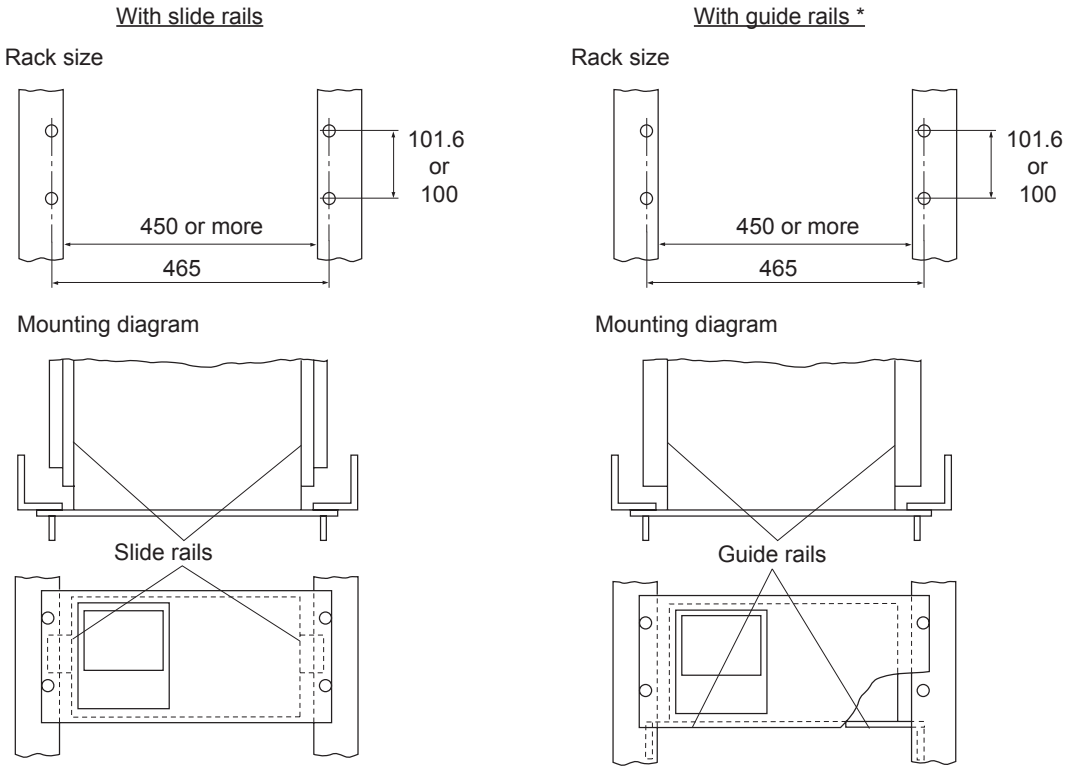
- **Slide Rail**
  Model: equivalent to 305A-24/Accuride International Inc.



The slide rail is supplied at the delivery time.

<19-inch rack mounting method>

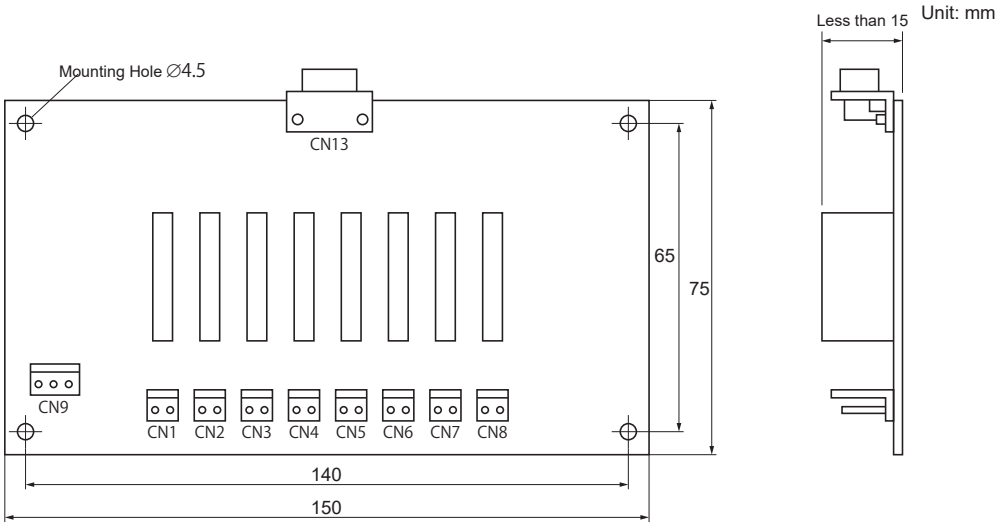
For easy maintenance, we recommended the mounting method which allows the rack to be drawn out along the slide rail.



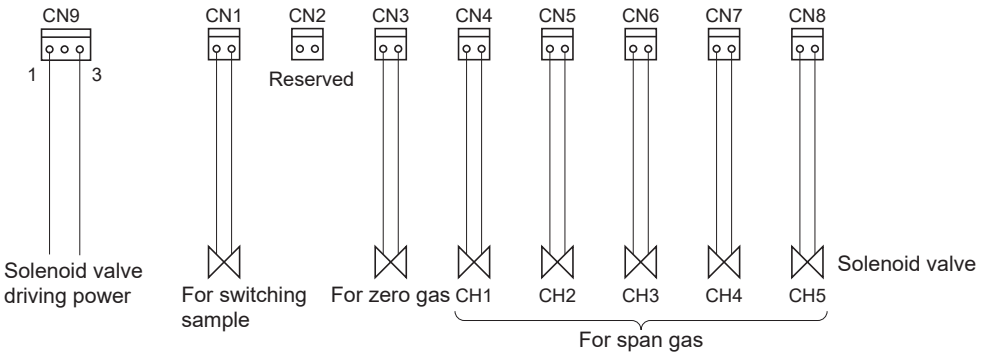
* For mounting with guide rails, a maintenance space (200 mm or more) should be provided on top of the main unit.

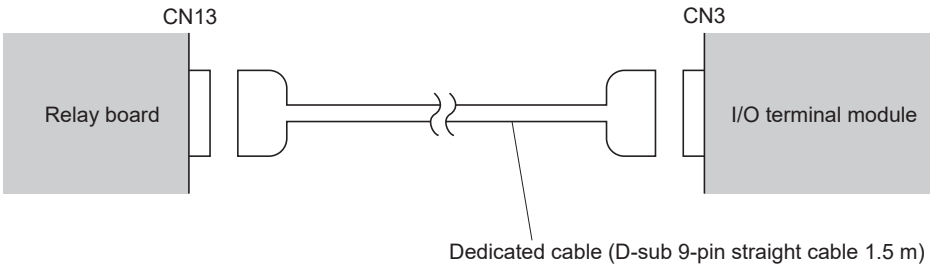
Dedicated Relay Board (option code /R)

Unit: mm

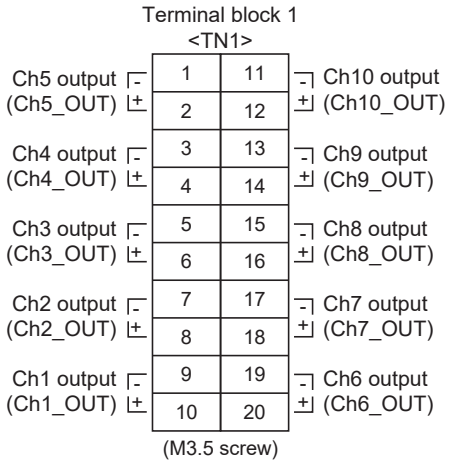


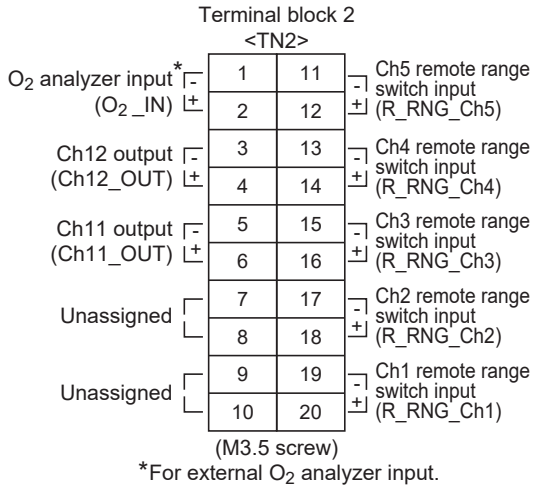
<How to connect>

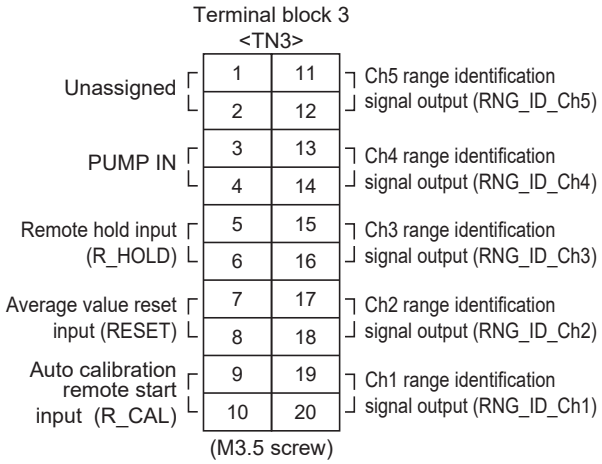


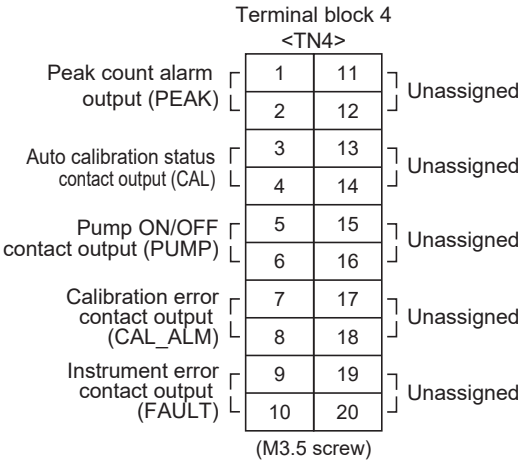


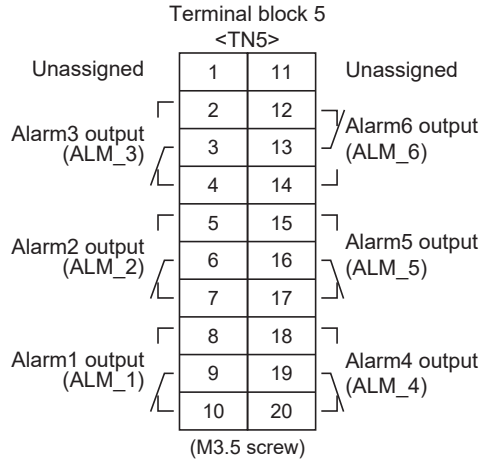
■ External Connection Diagram

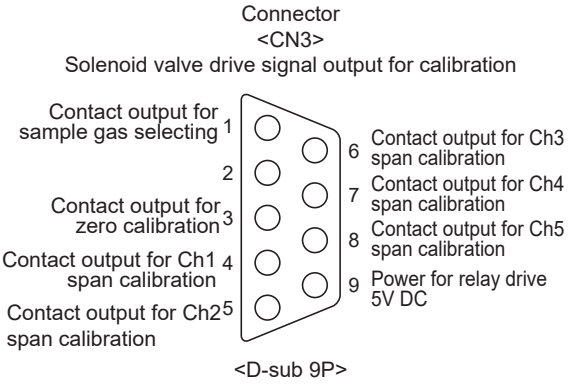












Note 1: Unassigned terminals are used for internal connection. So they should not be used as repeating terminals either.
Note 2: The allocation of each channel (Ch1 to Ch12) depends on measured gas components. Refer to the table on the next page.

<Measurable Components and the Corresponding Channel Numbers>

Suffix/Option Code			Output and Corresponding Channel											
Measurable component	O_2 analyzer	Option code*	Ch1	CH2	Ch3	Ch4	Ch5	Ch6	Ch7	Ch8	Ch9	Ch10	Ch11	Ch12
-A	N	Not specified	NO											
-B	N	Not specified	SO_2											
-C	N	Not specified	CO_2											
-D	N	Not specified	CO											
-F	N	Not specified	CH_4											
-G	N	Not specified	NO	SO_2										
-H	N	Not specified	NO	CO										
-J	N	Not specified	CO_2	CO										
-K	N	Not specified	NO	SO_2	CO									
-L	N	Not specified	NO	SO_2	CO_2	CO								
-A	1, 2, 3	/K	NO_X	O_2	Correct NO_X	Correct NO_X av.	O_2 av.							
-B	1, 2, 3	/K	SO_2	O_2	Correct SO_2	Correct SO_2 av.	O_2 av.							
-D	1, 2, 3	/K	CO	O_2	Correct CO	Correct CO av.	O_2 av.							
-F	1, 2, 3	/K	CH_4	O_2	O_2 av.									
-G	1, 2, 3	/K	NO_X	SO_2	O_2	Correct NO_X av.	Correct SO_2	Correct NO_X av.	Correct SO_2 av.	O_2 av.				
-H	1, 2, 3	/K	NO_X	CO	O_2	Correct NO_X	Correct CO	Correct NO_X av.	Correct CO av.	O_2 av.				
-J	1, 2, 3	/K	CO_2	CO	O_2	Correct CO_2 av.	Correct CO av.	O_2 av.						
-K	1, 2, 3	/K	NO_X	SO_2	CO	O_2	Correct NO_X	Correct SO_2	Correct CO	Correct NO_X av.	Correct SO_2 av.	Correct CO av.	O_2 av.	
-L	1, 2, 3	/K	NO_X	SO_2	CO_2	CO	O_2	Correct NO_X	Correct SO_2	Correct CO	Correct NO_X av.	Correct SO_2 av.	Correct CO av.	O_2 av.
-D	1, 2, 3	/A	CO	O_2										
-H	1, 2, 3	/A	NO	CO	O_2									
-J	1, 2, 3	/A	CO_2	CO	O_2									
-K	1, 2, 3	/A	NO	SO_2	CO	O_2								
-L	1, 2, 3	/A	NO	SO_2	CO_2	CO	O_2							

: NO measurement in this area is displayed as NOx.

*: In the column of Option code, “Not specified” refers the option codes except /K or /A.

Notes: Peak count alarm is a contact output.

“Correct XX” means an instantaneous XX value after O_2 correction, “Correct XX av.” an average XX value after O_2 correction, and O_2 av.” an average O_2 value.

■ Dedicated Zirconia Oxygen Analyzer ZX8D (to be purchased separately)

For O_2 correction, the IR400 can accept linearized 0 to 1 V DC signal coming from an analyzer calibrated to 0 to 25% O_2 of full scale. Dedicated zirconia Oxygen Analyzer, Model ZX8D, is available from Yokogawa.

Measuring system: Zirconia solid electrolyte
Measuring range: Minimum range 0 to 5 vol% O_2 and maximum range of 0 to 25 vol% O_2, if used in combination with infrared gas analyzer
Measurable component: Oxygen in noncombustible gas or combustion exhaust gas
(sensor will be burned and error will appear if combustible gas is mixed in sample gas)
Output signal: 4 to 20mA DC and 0 to 1V DC linear connected to infrared gas analyzer or direct output from sensor of the ZX8D.
Sensor output: Logical output of zirconia sensor (with sensor temperature of 800°C)

$$E = 50.74 \log \frac{20.6}{X} - B$$

E: Logical output (mV)
X: Measured gas concentration (%O_2)
B: Blank voltage (mV)

Temperature alarm output: Contact output normally-closed contact,
Contact capacity: 220V AC, 1A (resistive load)
Flow rate: 0.5±0.25 liter/minute (when connected with infrared gas analyzer)

NOTE : The Zirconia system, due to its principle, may produce a measuring error due to relative concentration versus the combustible O_2 gas concentration. Also, a corrosive gas (SO_2 of 250 ppm or more, etc.) may affect the life of the sensor.

Warm up time: Approx. 30 minutes
Ambient temperature: 0 to +45°C
Ambient humidity: 90% RH or less
Use environment: Indoors
Mounting method: Indoor wall mounting
Gas inlet/outlet: Rc1/4 or 1/4NPT
Enclosure: Steel casing
Indication: Temperature indication (LED)
Outer dimensions (H×W×D): 141×170×190 mm
Mass: Approx. 3 kg
Finish color: Munsell 5Y7/1
Power supply
Rated voltage: 100 to 115 V AC or 200 to 240V AC
Rated frequency: 50 Hz/60 Hz
Maximum rated power: 215 VA (at power on) / 65 VA (during normal operation)
Fluctuation of power supply voltage: 230V AC ±10%
Repeatability: ±0.5% FS (when connected with infrared gas analyzer)
Linearity: Within ± 1% of full scale
Zero drift: Within ± 1% of full scale/week
Span drift: Within ± 2% of full scale/week
Response speed: Approx. 20 seconds for 90% response
(when connected with infrared gas analyzer)

Model	Suffix code		Option code	Description
ZX8D	- - - - - - - - - -		- - - - - - - - - -	Zirconia Oxygen Analyzer
Power supply	-5		- - - - - - - - - -	100-115 V AC, 50/60 Hz
	-3		- - - - - - - - - -	200-240 V AC, 50/60 Hz
Style code		*C	- - - - - - - - - -	For IR202, IR400
		*D	- - - - - - - - - -	For IR202, IR400 (CE conformity)

Safety, EMC and RoHS conforming standards (Only ZX8D-□*D):
Installation altitude: 2000 m or less
Pollution degree: 2
Installation category: II

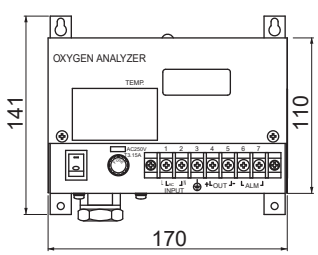
Note · Installation category, called overvoltage category, specifies impulse withstanding voltage. Category II is for electrical equipment.
· Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which reduce dielectric strength. Degree 2 is the normal indoor environment.

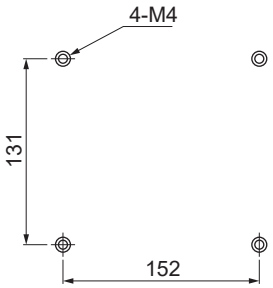
Safety: EN61010-1
EMC: EN61326-1 Class A, Table 2 (For use in industrial locations), EN61326-2-3, EN61000-3-2, EN61000-3-3
EMC Regulatory Arrangement in Australia and New Zealand
Korea Electromagnetic Conformity Standard Class A 한국 전자파적합성 기준

Note: The product mounted in a steel enclosure conforms to the requirements of EMC directive.
Caution: The instrument is a Class A product, and it is designed for use in the industrial environment. Please use this instrument in the industrial environment only.
RoHS: EN IEC 63000

Information of the WEEE Directive

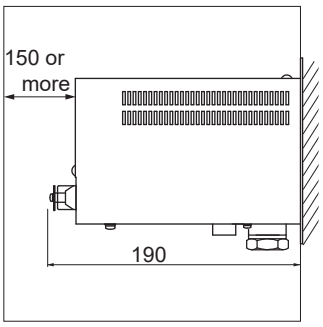
This product is purposely designed to be used in a large scale fixed installations only and, therefore, is out of scope of the WEEE Directive.The WEEE Directive does not apply. The WEEE Directive is only valid in the EU.

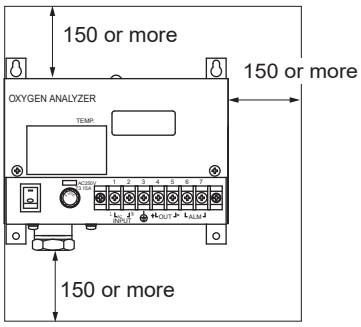




Mounting dimensions

Unit: mm





Maintenance space

■ NO_2/NO Converter

Part number: K9350LE
K9350LF
Mounting: Indoor surface mounting
Target Gases: General boiler exhaust gas, atmosphere
Catalyst; Amount: 2 cm^3
Replacement cycle; Approx. 8 months
(at flow rate of 0.5 L/min with 5%O_2,10 ppm NO_2)
Temperature set-point: 220 ±10°C
(Sensing tip; K thermocouple)
Wetted materials: Ceramic, Viton, glass filter, SUS316
Conversion efficiency: 90% or higher, conforms to JIS
Gas Flow Rate: 0.5 L/min
Ambient Temperature: -5 to 45°C
Power Supply: K9350LE; 100 V AC, 50/60 Hz
K9350LF; 100 to 240 V AC, 50/60 Hz (K9350LF)
Weight: Approx. 1.1 kg Approx. 1.2 kg (K9350LF)
Sample gas requirements: Dust/drain removed, gas temperature at 150°C or lower

Safety, EMC and conformity standards (K9350LF only):
Installation altitude; 2000 m or less
Pollution degree; 2 (Note)
Installation category; II (Note)
Note • Installation category, called overvoltage category, specifies impulse with standing voltage. Category II is for electrical equipment.
• Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which reduce dielectric strength. Degree 2 is the normal indoor environment.
Safety; EN61010-1
EMC; EN61326-1 Class A, Table 2 (For use in industrial locations), EN61326-2-3, EN61000-3-2, EN61000-3-3
EMC Regulatory Arrangement in Australia and New Zealand
Note: The product mounted in a steel enclosure conforms to the requirements of EMC directive.

Caution: The instrument is a Class A product, and it is designed for use in the industrial environment. Please use this instrument in the industrial environment only.

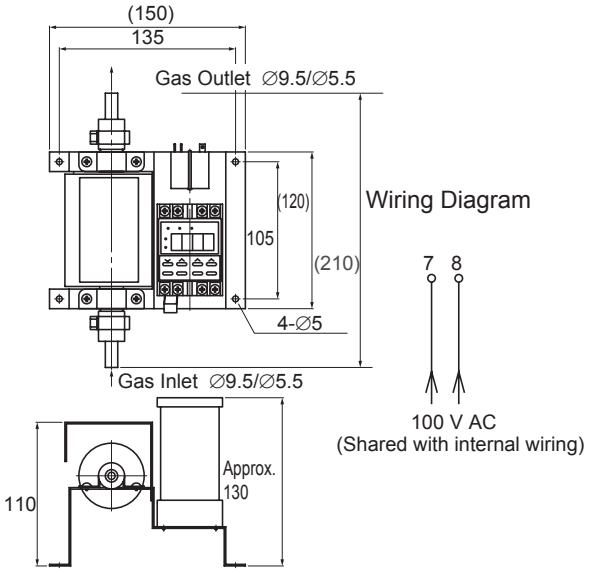
RoHS; EN IEC 63000

One-year-Use Spare Parts

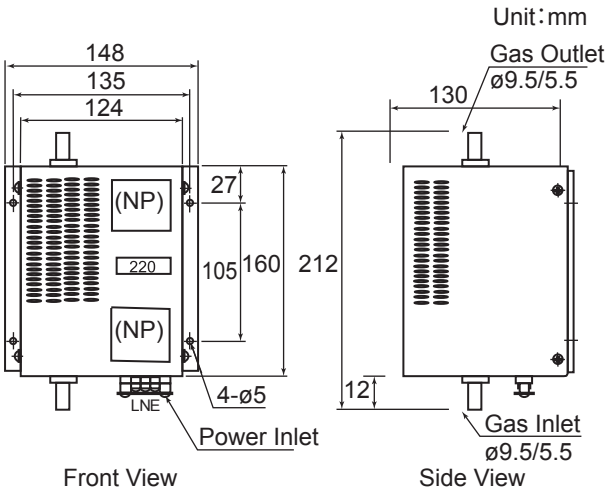
Item	Part No.	Qty
Catalyst for NO_2/NO converter	K9350LP	2
Glass wool for NO_2/NO converter	K9350LQ	2
Fitting for NO_2/NO converter	K9350LV	2

K9350LE

Unit: mm



K9350LF



Inquiry Sheet for IR400 NDIR Type Infrared Gas Analyzer

Place a checkmark ✓ in the appropriate box and fill in the specific information in the blanks for your reference.

1. General Information

Company: _____ Delivery destination: _____

Responsible person: _____ Section: _____ (Phone No.) _____

Plant name: _____ Measurement location: _____

Purpose: ☐ Indication reading, ☐ Recording, ☐ Alarm, ☐ Control

2. Requirements

Measurable component:

	1st	2nd	3rd	4th
□	NO			
□	SO_2			
□	CO_2			
□	CO			
□	CH_4			
□	NO	SO_2		
□	NO	CO		
□	CO_2	CO		
□	NO	SO_2	CO	
□	NO	SO_2	CO_2	CO

O_2 Analyzer:

- ☐ Without O_2 analyzer
- ☐ External zirconia O_2 sensor (use ZX8D)
  - ☐ Style C (Non-CE conformity)
  - ☐ Style D (CE conformity)
- ☐ External O_2 analyzer
- ☐ Built-in paramagnetic type O_2 sensor

NO_2/NO Converter:

- ☐ With NO_2/NO converter
- ☐ K9350LE (non-CE conformity)
- ☐ K9350LF (CE conformity)
- ☐ Without NO_2/NO converter

Range:

1st component, 1st range	1st component, 2nd range	2nd component, 1st range	2nd component, 2nd range
☐ 0 – 20 ppm	☐ 0 – 50 ppm	☐ 0 – 50 ppm	☐ 0 – 100 ppm
☐ 0 – 50 ppm	☐ 0 – 100 ppm	☐ 0 – 100ppm	☐ 0 – 200 ppm
☐ 0 – 100 ppm	☐ 0 – 200 ppm	☐ 0 – 200 ppm	☐ 0 – 250 ppm
☐ 0 – 200 ppm	☐ 0 – 250 ppm	☐ 0 – 250 ppm	☐ 0 – 500 ppm
☐ 0 – 250 ppm	☐ 0 – 500 ppm	☐ 0 – 500 ppm	☐ 0 – 1000 ppm
☐ 0 – 500 ppm	☐ 0 – 1000 ppm	☐ 0 – 1000 ppm	☐ 0 – 2000 ppm
☐ 0 – 1000 ppm	☐ 0 – 2000 ppm	☐ 0 – 2000 ppm	☐ 0 – 5000 ppm
☐ 0 – 2000 ppm	☐ 0 – 5000 ppm	☐ 0 – 5000 ppm	☐ 0 – 1%
☐ 0 – 5000 ppm	☐ 0 – 1%	☐ 0 – 1%	☐ 0 – 2%
☐ 0 – 1%	☐ 0 – 2%	☐ 0 – 2%	☐ 0 – 3%
☐ 0 – 2%	☐ 0 – 3%	☐ 0 – 3%	☐ 0 – 5%
☐ 0 – 3%	☐ 0 – 5%	☐ 0 – 5%	☐ 0 – 10%
☐ 0 – 5%	☐ 0 – 10%	☐ 0 – 10%	☐ 0 – 20%
☐ 0 – 10%	☐ 0 – 20%	☐ 0 – 20%	☐ 0 – 40%
☐ 0 – 20%	☐ 0 – 40%	☐ 0 – 40%	☐ 0 – 50%
☐ 0 – 40%	☐ 0 – 50%	☐ 0 – 50%	☐ 0 – 70%
☐ 0 – 50%	☐ 0 – 70%	☐ 0 – 70%	☐ 0 – 100%
☐ 0 – 70%	☐ 0 – 100%	☐ 0 – 100%	☐ Not available
☐ 0 – 100%	☐ Not available	☐ Not available	

3rd component, 1st range	3rd component, 2nd range	4th component, 1st range	4th component, 2nd range
☐ 0 – 50 ppm	☐ 0 – 100 ppm	☐ 0 – 50 ppm	☐ 0 – 100 ppm
☐ 0 – 100 ppm	☐ 0 – 200 ppm	☐ 0 – 100 ppm	☐ 0 – 200 ppm
☐ 0 – 200 ppm	☐ 0 – 250 ppm	☐ 0 – 200 ppm	☐ 0 – 250 ppm
☐ 0 – 250 ppm	☐ 0 – 500 ppm	☐ 0 – 250 ppm	☐ 0 – 500 ppm
☐ 0 – 500 ppm	☐ 0 – 1000 ppm	☐ 0 – 500 ppm	☐ 0 – 1000 ppm
☐ 0 – 1000 ppm	☐ 0 – 2000 ppm	☐ 0 – 1000 ppm	☐ 0 – 2000 ppm
☐ 0 – 2000 ppm	☐ 0 – 5000 ppm	☐ 0 – 2000 ppm	☐ 0 – 5000 ppm
☐ 0 – 5000 ppm	☐ 0 – 1%	☐ 0 – 5000 ppm	☐ 0 – 1%
☐ 0 – 1%	☐ 0 – 2%	☐ 0 – 1%	☐ 0 – 2%
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☐ 0 – 50%	☐ 0 – 70%	☐ 0 – 50%	☐ 0 – 70%
☐ 0 – 70%	☐ 0 – 100%	☐ 0 – 70%	☐ 0 – 100%
☐ 0 – 100%	☐ Not available	☐ 0 – 100%	☐ Not available
☐ Not available		☐ Not available	

O_2 Analyzer, 1st range	O_2 Analyzer, 2nd range
☐ 0 – 5%	☐ 0 – 10%
☐ 0 – 10%	☐ 0 – 25%
☐ 0 – 25%	☐ Not available
☐ Not available	

Output:	☐ 4 – 20 mA DC	☐ 0 – 1 V DC	☐ RS-232C
O_2 correction and O_2 average:		☐ Yes	☐ No
Peak count alarm:	☐ Yes	☐ No	
Relay board:	☐ Yes	☐ No	

3. Sample gas conditions

Fuel: ☐ Gas, ☐ Oil, ☐ Coal, ☐ Refuse, ☐ Other fuel _____

(1) Temperature: _____ to _____, Normal temperature _____ [°C]

(2) Pressure: _____ to _____, Normal pressure _____ [MPa]

(3) Humidity: _____ [vol%]

(4) Dust: _____ [mg/Nm^3]

(5) Corrosive gas: ☐ Yes _____ ☐ No

Composition (Detailed composition of sample gas should be provided. This is important for the purpose of knowing the effect of interference gases)

Contents		Concentration range		
CO	:	to	☐ %	☐ ppm
CO_2	:	to	☐ %	☐ ppm
CH_4	:	to	☐ %	☐ ppm
H_2	:	to	☐ %	☐ ppm
O_2	:	to	☐ %	☐ ppm
N_2	:	to	☐ %	☐ ppm
SO_2	:	to	☐ %	☐ ppm
NOx	:	to	☐ %	☐ ppm
H_2O	:	to	☐ %	☐ ppm
	:	to	☐ %	☐ ppm