NDIR TYPE INFRARED GAS ANALYZER

DATA SHEET ZRG

This NDIR gas analyzer features high accuracy, multiple functions and easy operation through use of a microprocessor. It also utilizes a mass flow detector noted for its high sensitivity and reliability.

This analyzer is used not only for measuring environmental pollution but is also used for various processes and/or experiments.

This product, combined with sampling system (ZSP), has passed the type-approval test based on Weight and Measure Act.

FEATURES

(1) Use of a microprocessor provides high accuracy, multiple functions and easy operation.
- A maximum of 3 gas components can be calibrated with the built-in automatic calibrator (option).
- Using a signal from a zirconiz O_2 sensor (ZFK3) or from any other O_2 sensor, the gas analyzer is able to output a value converted into O_2 (option).
- Alarm function to emit high/low limit contact output is also available (option).
- Measuring range can be selected by using external single (option).
- Zero and span can be calibrated with high accuracy, simply by pressing calibration keys.
- A self-diagnosis function is included.

(2) This analyzer utilizes mass flow detector featuring high sensitivity and reliability. It has 2 standard measuring ranges with a range ratio of up to 1:20.

(3) Three different gas components can be measured simultaneously by connecting a zirconia O_2 sensor (ZFK3), in addition to one-and two-component type sensors.

(4) Besides the standard measurement type, a sample switching type and a differential flow type are also available.

SPECIFICATIONS

General items

Power supply: 100V ±10% AC, 50/60Hz
115, 220V AC also available on request
Note: Refer to "Code symbols"

Power consumption:
125VA max.

Ambient temperature:
–5 to +45°C

Ambient humidity:
90% RH or less

Enclosure: Steel casing, indoor-use

Dimensions (H x W x D):
835 x 220 x 232 mm

Mass{weight}: Approx. 24kg

Finish color: Munsell 2.5Y 8.4/1.2

Indication: 4-digit LED for concentration
4-digit LED for sub-indication

Output hold: Output hold prior to manual/auto calibration is possible. Hold ON/OFF is selectable.

Standard requirements for sample gas:

Temperature	0 to 50°C (dehumidification 2°C saturation or less)
Dust	0.3μm or less
Pressure	9.8kPa{0.1kgf/cm^2} or less (flow rate 0.5 ℓ /min)

Standard control for sample gas:
Calibration gas Dry gas
Interfere control gas 2°C saturation

Warm-up time: About 8 hours (after power ON)
About 4 hours for sample switching type

Material of gas-contacting parts:
Sample cell; 304 stainless steel, neoprene rubber
Infrared-ray transmitting window; CaF_2 or sapphire
Internal tubing; Teflon tube, silicone tube, toaron tube

Gas inlet/outlet, purge gas inlet size:
Rc 1/4 (PT 1/4 internal thread) or NPT1/4 internal thread

Purge gas flow rate:
1 ±0.5 ℓ /min
Purging is required when measuring gas is contained in the atmosphere or the range of CO_2 is 0 to less than 50ppm. In other cases, purging should be made as necessary.

Scope of delivery: Analyzer, test report, power fuse, cloth for cleaning infrared-ray transmitting window

Mounting method:
Flush mounting (vertical mounting)

Installation condition:
Install the analyzer at a place not exposed to direct sunlight or the radiation from a high temperature object. Avoid vibration, and select a clean place free from corrosive and/or combustible gases. If installing outdoors, provide a suitable casing or cover to protect the analyzer from wind, rain, etc.

Standard type

Measuring system:
Non-dispersion infrared-ray absorption method, single light source, double beam

Measurable components and measuring range:
Standard single-component analyzer

Measurable component		Min. measuring range [ppm]	Measuring range
CO	Carbon monoxide	0 to 50	See Page 12
CO_2	Carbon dioxide	0 to 5	
NO^2	Nitrogen monoxide	0 to 50	
SO_2	Sulfur dioxide	0 to 50	
CH_4	Methane	0 to 200	

Standard two-component analyzer

Measurable component 1st and 2nd component		Min. measuring range [ppm]	Measuring range
NO + SO_2	Nitrogen monoxide + sulfur dioxide	0 to 100/0 to 100	Refer to "Code symbols"
CO + CO_2	Carbon monoxide + carbon dioxide	0 to 100/0 to 100	
NO + CO	Nitrogen monoxide + carbon monoxide	0 to 250/0 to 250	

Measuring range: Refer to table.
Output signal: 0 to 1V DC or 4 to 20mA DC (allowable load resistance, 550Ω or less), linear
Repeatability: within ±0.5% of full scale (*1) (within ±1% of full scale)
Linearity: Within ±2% of full scale
Zero drift: Within ±2% of full scale/week (*1) (within ±2% of full scale/day) (*2) (within ±3% of full scale/week)
Span drift: Within ±2% of full scale/week (*1) (within ±2% of full scale/day) (*2) (within ±3% of full scale/week)
Response time: Max. 50 seconds (for 90% response) including gas substitution time; time differs with the length of sample cell.
Measured gas flow rate:
0.5 ± 0.25 ℓ /min

Note: *(1) ( ): For the range less than 50ppm
*(2) ( ): For 50ppm range

Sample switching type

(Sample switching type gas analyzer suited for measurement of low concentrations or for eliminating the effects of interfering components.)

Measuring system:
Non-dispersion infrared-ray absorption method, single light source, double beam, sample switching system

Measurable component:
CO (carbon monoxide)

Measuring range:

1st range [ppm]	2nd range, 3rd range, 4th range (*4) [ppm]
0 to 2 0 to 5 0 to 10 0 to 25 0 to 50 0 to 100	Select from 5, 10, 20, 25, 50, 100 Max. range rate within 1:10 1st range<2nd range<3rd range<4th range

Output signal: 0 to 1V DC or 4 to 20mA DC, linear, step output which changes every 50 seconds
Repeatability: Within ± 1% of full scale (*3) (within ± 2% of full scale)
Linearity: Within ± 2% of full scale
Zero drift: Within ± 0.5% of full scale/week (*3) (within ± 1% of full scale/week)
Span drift: Within ± 1.5% of full scale/week (*3) (within ± 2.5% of full scale/week)
Response time: Within 120 seconds (for 90% response) (*3) (within 150 seconds)
Measured gas flow rate:
1 ± 0.1 ℓ /min (reference gas)
1 ± 0.1 ℓ /min (sample gas)
Sample switching relay drive output:
3V DC, ON/OFF signal at 50 second interval (for solid state relay drive)

Note: *(3) ( ): For 0 to 2ppm range
*(4) ( ): Sample switching type with 4-ranges is available (Max. range ratio within 1:10). In 4-range analyzer, optional functions of remote range, range identification, alarm and external hold are not available.

Differential flow type

(Gas analyzer suited for measurement in two modes, absolute concentration and concentration difference)
Measuring system:
Non-dispersion infrared-ray absorption method, single light source, double beam, differential flow system

Measurable components and measuring range:

		1st range [ppm]	2nd range [ppm]
CO_2	Carbon dioxide	– 50 to +50 –100 to +100	0 to 500 0 to 1000
CO	Carbon monoxide	0 to 50 0 to 100 0 to 200 0 to 250	None, 0 to 100, 0 to 200, 0 to 250, 0 to 500 None, 0 to 200, 0 to 250, 0 to 500 None, 0 to 500 None, 0 to 500

Note: There are restrictions on the reference gas conditions.

Output signal:

	1st range	2nd range
CO_2	– 1 to +1V DC	0 to 1V DC
CO	0 to 1V or 4 to 20mA DC	0 to 1V or 4 to 20mA DC

Note: Linear output
Repeatability: Within ± 0.5% of full scale
Linearity: within ± 2% of full scale
Zero drift: Within ± 2% of full scale/week
Span drift: Within ± 2% of full scale/week
Response time: Max. 50 seconds (for 90% response) including gas substitution time
Measured gas flow rate:
0.5 ± 0.25 ℓ /min (reference gas)
0.5 ± 0.25 ℓ /min (sample gas)

Optional specifications

(There are added on request. Refer to the "Code symbols".)

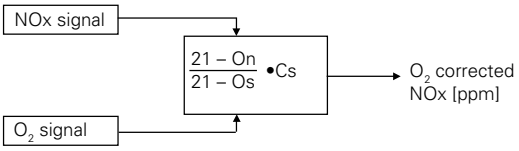
O_2 correction output:

An private O_2 sensor is used for correcting the measured gas concentration into the value at standard O_2 concentration. For obtaining the NOx exhaust standard value, NOx concentration and residual oxygen concentration in exhaust gas are measured simultaneously, then it is corrected according to the following equation. (Application of this equation is mandatory for the NOx exhaust standard.)

$$C = \frac{21 - On}{21 - Os} \bullet Cs$$

where C: Concentration after O_2 correction
Cs: NOx measured concentration
Os: O_2 measured concentration
On: O_2 standard concentration

Block diagram (Example of NOx measurement)



The O_2 measured signal is according to the private O_2 sensor (ZFK) or external O_2 meter (0 to 1V DC/0 to 25% O_2).

O_2 output signal: 0 to 1V or 4 to 20mA DC, linear

O_2 correction output signal:

0 to 1V or 4 to 20mA DC, linear
Output can be provided for each of 1st and 2nd components

Alarm output: Upper limit alarm
Contact output, SPDT (1c) contact
Contact capacity, 250V AC, 2A (resistive load)
Lower limit alarm
Contact output, SPDT (1c) contact
Contact capacity, 250V AC, 2A (resistive load)

Remote range changeover:

Range is changeable via external signal.
Range changeover input signal: 5V DC (minimum range selection at 5V input)

Range identification signal output:

Contact output, SPST (1a) contact
Contact capacity, 250V AC, 2A (resistive load)

External hold: Output hold is possible with external input signal.
External hold signal input:
5V DC (hold at 5V input)

Average value output:

Moving average value or average value is outputted at intervals of 1-hour or 4-hour (only the 1-output type for 4-hour average value is available).
Output signal: 0 to 1V or 4 to 20mA DC, linear.

Automatic calibration:

Zero and span are automatically calibrated at the present cycle.
Calibrating gas is supplied by operating the external electromagnetic valve.

Calibration channels:

Up to 3 components can be calibrated simultaneously.

Zero calibration point:

Fixed at 0% (air point and span point can be set by zirconia O_2 meter)

Span calibration point:

0 to 100% of full scale

Calibration start:

Built-in timer or remote start signal

Output hold during calibration:

Possible

Calibration gas flow mode:

(1) Zero gas
(2) Zero gas – span gas 1
(3) Zero gas – span gas 1 – span gas 2
(4) Zero gas – span gas 1 – span gas 3 (O_2)
(5) Zero gas – span gas 1 – span gas 2 – span gas 3 (O_2)

Calibration gas flow time:

Settable from 100 to 599 seconds

Calibration cycle:

1 to 99 hours (1-hour units) or 1 to 7 days (1-day units)

Calibration failure alarm:

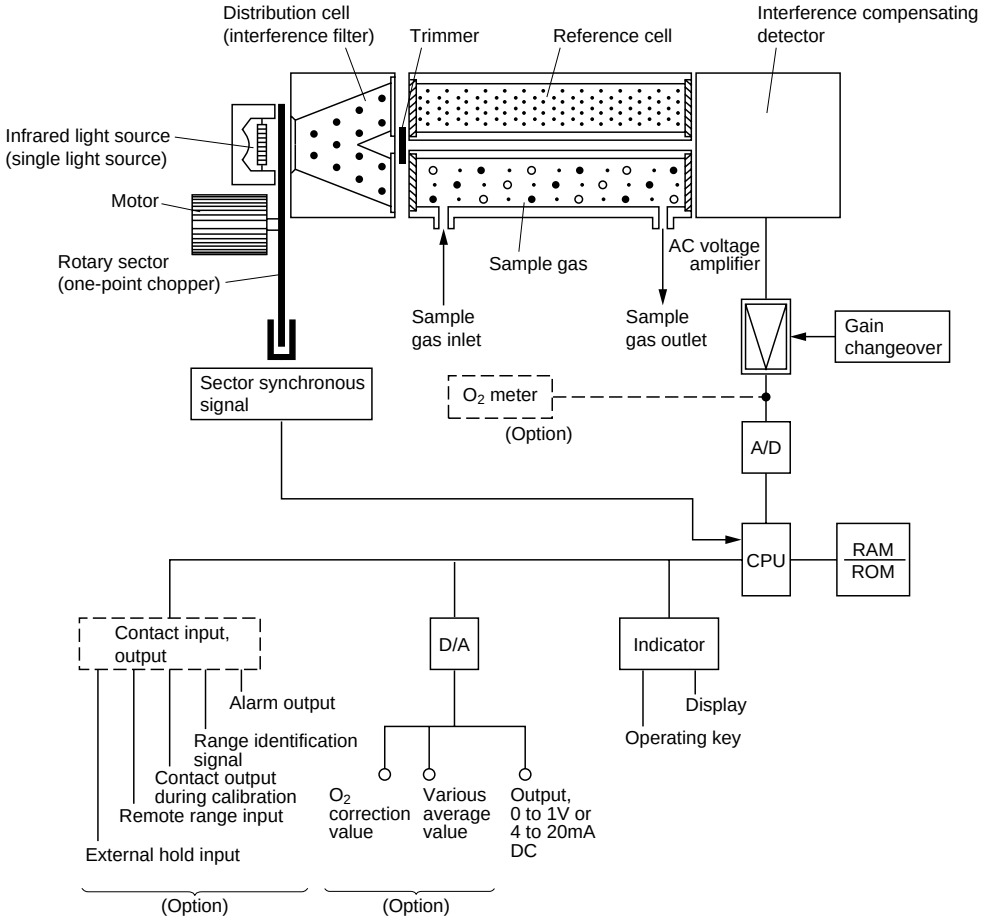
Provided when fault occurs during auto calibration.

Contact output:

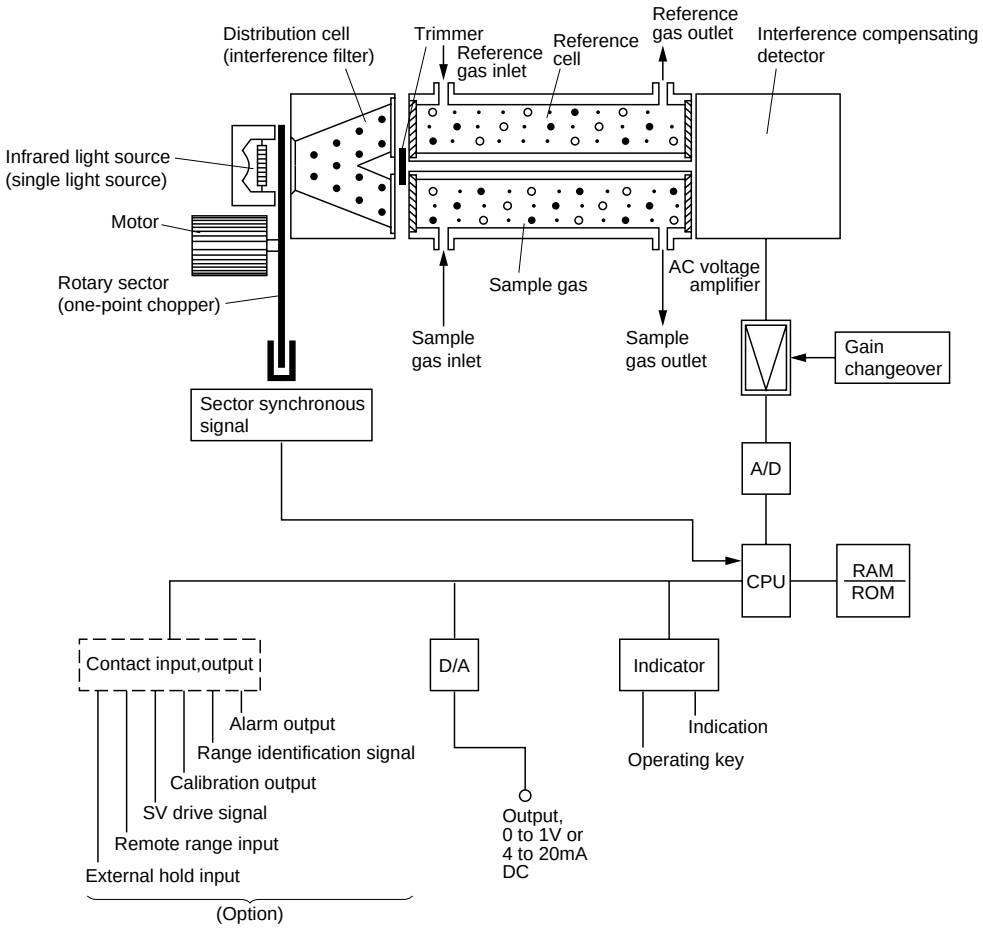
Under calibration; SPST (1a) contact, contact capacity 250V AC, 2A (resistive load)
Calibration failure; SPST (1a) contact, contact capacity 250V AC, 2A (resistive load)
Electromagnetic valve drive; SPST (1a) contact, contact capacity 250V AC, 2A (resistive load)

Remote start: Remote start signal
Voltage input 5V DC
(start at 100msec pulse input)

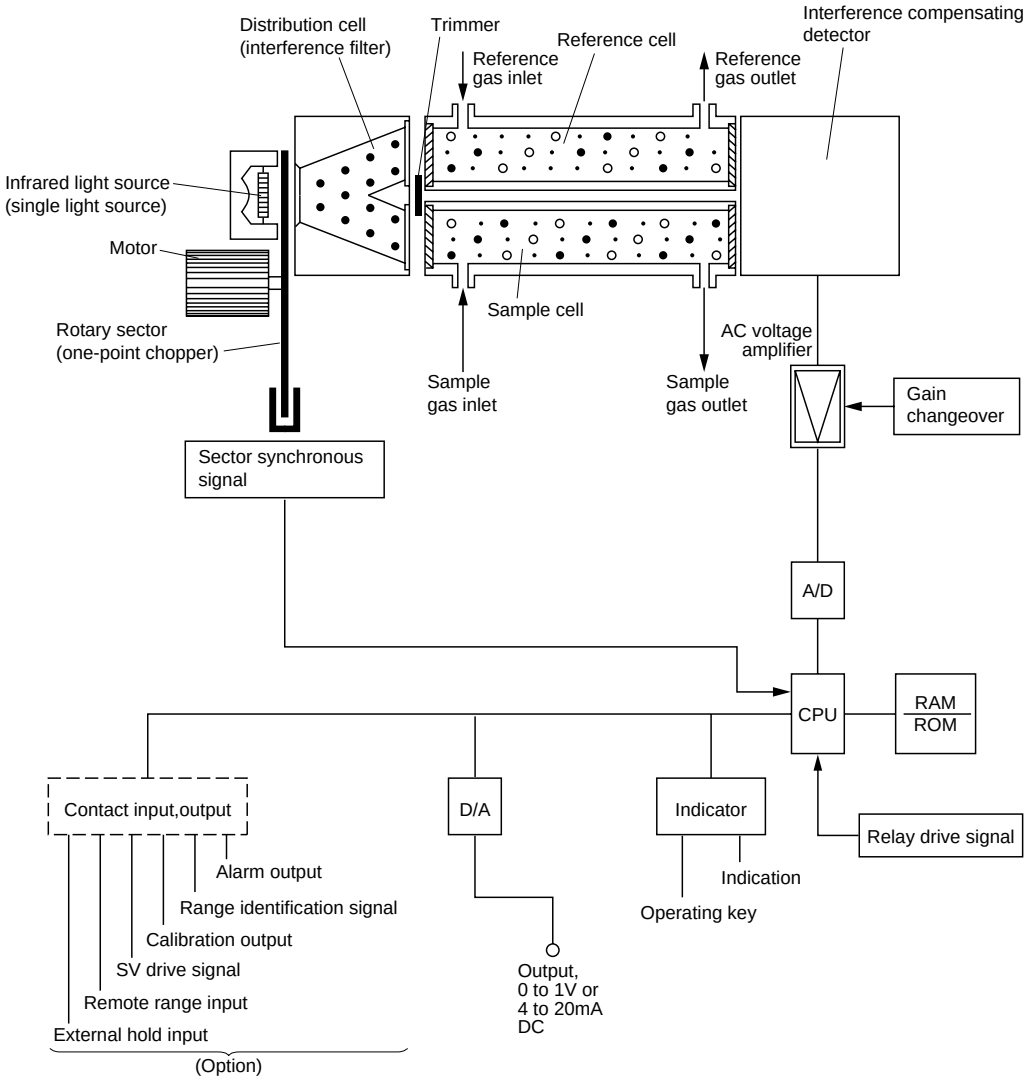
FUNDAMENTAL DIAGRAM (Standard type)



(Differential flow type)



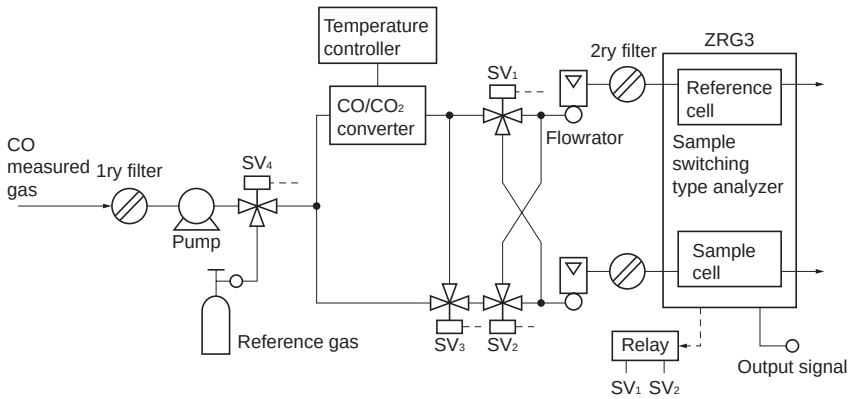
FUNDAMENTAL DIAGRAM (Sample switching type)



Description of sample switching system

The measured gas is divided into two, and in one of the flow paths, a high performance converter is provided to convert carbon monoxide into carbonic acid gas. Here, the carbon monoxide in the measured gas is eliminated and the gas is led into one cell of the high-sensitivity infrared analyzer. In the other flow path, the gas is led directly into the other cell of the analyzer.

These flow paths are changed over via changeover valves SV_1 and SV_2 every 50 seconds by means of the changeover valve drive signal transmitted from the analyzer. By carrying out this changeover cyclically, the output of the analyzer varies with the concentration of the carbon monoxide in the measured gas. Use of the obtained variation width as a measured value enables improving the S/N ratio and eliminating the effect of interfering components plus zero drift.



CODE SYMBOLS

(Standard single-component analyzer)

1 2 3 4 5 6 7 8	9 10 11 12 13	14 15 16 17 18 19 20	21	Description
Z R G		Y 2	-	0	-		
				Measuring method
1				Single-component analyzer
5				Single-component analyzer (approved by Weight and Measure Act)
				Measurable components
A				SO_2
B				CO
D				CO_2
E				CH_4
P				NO
Z				Other non-standard items
				1st component, 1st range
W				0 to 5ppm
V				0 to 10ppm
0				0 to 15ppm
1				0 to 20ppm
T				0 to 25ppm
A				0 to 50ppm
B				0 to 100ppm
C				0 to 200ppm
D				0 to 250ppm
E				0 to 500ppm
F				0 to 1000ppm
G				0 to 2000ppm
H				0 to 5000ppm
J				0 to 1%
K				0 to 2%
L				0 to 5%
M				0 to 10%
N				0 to 20%
P				0 to 50%
R				0 to 100%
Z				Other non-standard items
				Power supply / Piping connection
0				100V AC 50/60Hz / Rc 1/4
2				115V AC 50/60Hz / NPT 1/4
3				220V AC 50/60Hz / Rc 1/4
4				220V AC 50/60Hz / NPT 1/4
				Output signal
A				0 to 1V DC linear
B				4 to 20mA DC linear
				Optional functions [1]
	Y			– / – / –
	A			○ / – / –
	B			– / ○ / –
	D			– / – / ○
	F			○ / ○ / –
	H			○ / – / ○
	K			– / ○ / ○
	M			○ / ○ / ○
				Optional functions [2]
		Y		– / – / –
		A		○ / – / –
		B		– / ○ / –
		C		○ / – / ○
		D		– / ○ / ○

Note: (1) When selecting a range, be sure to refer to the table of "Measuring range".
(2) The specifications for Dioxin CO analyzer of 200ppm max. are different in some points.

Automatic calibration	Average value output	Range identification alarm, remote range, external hold
–	–	–
○	–	–
–	○	–
–	–	○
○	○	–
○	–	○
–	○	○
○	○	○

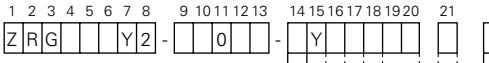
Note: (3) Details of average value output depend on 16th and 17th digits.
(4) Average value output includes moving average value output.

O_2 indication (external O_2 analyzer connection)	O_2 indication (ZFK connection)	Range identification alarm, remote range
–	–	–
○	–	–
–	○	–
○	–	○
–	○	○

Note: (5) In the case of O_2 indication, corrected O_2 is outputted as standard specification.
(6) Standard type of O_2 analyzer has 2 ranges (0 to 10/25%)

Note: (7) Corrected O_2 is designated by 18th digit.
(8) External O_2 analyzer is required 0 to 1V linear output.

(Standard single-component analyzer) (cont'd)



	Description	
	1st component, 2nd range	Note: (9) 2nd range>1st range
Y	2nd range without	Range rate: within 1:20
V	0 to 10ppm	
0	0 to 15ppm	
1	0 to 20ppm	
T	0 to 25ppm	
A	0 to 50ppm	
B	0 to 100ppm	
C	0 to 200ppm	
D	0 to 250ppm	
E	0 to 500ppm	
F	0 to 1000ppm	
G	0 to 2000ppm	
H	0 to 5000ppm	
J	0 to 1%	
K	0 to 2%	
L	0 to 5%	
M	0 to 10%	
N	0 to 20%	
P	0 to 50%	
R	0 to 1 00%	
Z	Other non-standard items	
	Average value output time	Note: (10) Average value output (option) designated only by 12th digit.
0	Without	
1	1-hour moving average value output	
4	4-hour moving average value output	
5	1-hour average value output	
6	4-hour average value output	

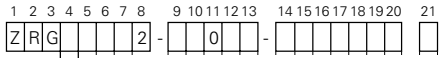
Average value output object component

Note: (11) Average value output (option) designated only by 12th digit.
(12) For selection of 4-hour moving average value output and 4-hour average value output, only the 1-output type is available.

	1st component	
	Instantaneous value	O_2 corrected
Y	–	–
A	○	–
D	–	○

	O_2 corrected standard value	Note: (13) For designation of "Z", the data must be put on the data code.
Y	Without	
4	4%	
5	5%	
6	6%	
7	7%	
A	10%	
B	11%	
C	12%	
F	15%	
Z	Other non-standard items (specify within 0 to 19%)	
	Measuring gas kind	Note: (14) For designation of "Z", gas components specifications should be attached.
E Y	Atmospheric gas	
F Y	Combustible exhaust gas (Dioxin included)	
G Y	Converter exhaust gas	
Z Z	Other non-standard items	
	Non-standard spec.	Note: (15) Data should be put on data code.
Z	Other non-standard items	(16) Quick response type is available only when gas density is 20% or more.
A	Quick response	

(Standard two-component analyzer)



Description

Measuring method

2 Two-component analyzer
6 Two-component analyzer (approved by Weight and Measure Act)

Measurable components (1st component) + (2nd component)

F $NO + SO_2$
G $CO + CO_2$
H NO + CO
Z Other non-standard items

1st component, 1st range

Code	Range value	Code	Range value	Code	Range value
B	0 to 100 ppm	G	0 to 2000ppm	M	0 to 10 %
C	0 to 200 ppm	H	0 to 5000ppm	N	0 to 20 %
D	0 to 250 ppm	J	0 to 1%	P	0 to 50 %
E	0 to 500 ppm	K	0 to 2%	R	0 to 100 %
F	0 to 1000 ppm	L	0 to 5%	Z	Other non-standard items

Note: (1) For range selection, be sure to refer to the table of "Measuring range".
(2) NO + CO min. range: 0 to 250ppm

2nd component, 1st range

Code	Range value	Code	Range value	Code	Range value
B	0 to 100 ppm	G	0 to 2000ppm	M	0 to 10 %
C	0 to 200 ppm	H	0 to 5000ppm	N	0 to 20 %
D	0 to 250 ppm	J	0 to 1%	P	0 to 50 %
E	0 to 500 ppm	K	0 to 2%	R	0 to 100 %
F	0 to 1000 ppm	L	0 to 5%	Z	Other non-standard items

Note: (3) For range selection, be sure to refer to the table of "Measuring range".
(4) NO + CO min. range: 0 to 250ppm

	Power supply		Piping connection
0	100V AC	50/60Hz	Rc 1/4
2	115V AC	50/60Hz	NPT 1/4
3	220V AC	50/60Hz	Rc 1/4
4	220V AC	50/60Hz	NPT 1/4

Output signal

A 0 to 1V DC linear
B 4 to 20mA DC linear
Z Other non-standard items

Optional functions [1]

	Automatic calibration	Average value output	Range identification alarm, remote range, external hold
Y	–	–	–
A	○	–	–
C	–	○	–
E	–	–	○
G	○	○	–
J	○	–	○
L	–	○	○
N	○	○	○

Note: (5) Details of average value output depend on 16th and 17th digits.
(6) Average value output includes moving average value output.

Note: (7) This function applies to 1st and 2nd components.

Optional functions [2]

	O_2 indication (external O_2 analyzer connection)	O_2 indication (ZFK connection)	Range identification alarm, remote range
Y	–	–	–
A	○	–	–
B	–	○	–
C	○	–	○
D	–	○	○

Note: (8) In the case of O_2 indication, corrected O_2 is outputted as standard specification.
(9) Standard type of O_2 analyzer has 2 ranges (0 to 10/25%)

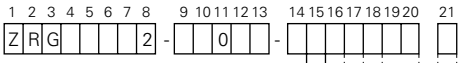
Note: (10) Corrected O_2 is designated by 18th digit.
(11) External O_2 analyzer is required 0 to 1V linear output.

1st component, 2nd range

Code	Range value	Code	Range value	Code	Range value
Y	Without	G	0 to 2000ppm	M	0 to 10 %
C	0 to 200 ppm	H	0 to 5000ppm	N	0 to 20 %
D	0 to 250 ppm	J	0 to 1%	P	0 to 50 %
E	0 to 500 ppm	K	0 to 2%	R	0 to 100 %
F	0 to 1000 ppm	L	0 to 5%	Z	Other non-standard items

Note: (12) 2nd range>1st range range rate: within 1:20

(Standard two-component analyzer) (cont'd)



Description

2nd component, 2nd range

Code	Range value	Code	Range value	Code	Range value
Y	Without	G	0 to 2000ppm	M	0 to 10 %
C	0 to 200 ppm	H	0 to 5000ppm	N	0 to 20 %
D	0 to 250 ppm	J	0 to 1%	P	0 to 50 %
E	0 to 500 ppm	K	0 to 2%	R	0 to 100 %
F	0 to 1000 ppm	L	0 to 5%	Z	Other non-standard items

Note: (13) 2nd range>1st range range rate: within 1:20

Average value output time

Note: (14) Average value output (option) designated only by 12th digit.

- 0 Without
- 1 1-hour moving average value output
- 4 4-hour moving average value output
- 5 1-hour average value output
- 6 4-hour average value output

Average value output object component

	1st component		2nd component		Note:
	Instantaneous value	O_2 corrected	Instantaneous value	O_2 corrected	(15) Average value output (option) designated only by 12th digit. (16) For selection of 4-hour moving average value output and 4-hour average value output, only the 1-output type is available.
Y	–	–	–	–	
A	○	–	–	–	
B	○	–	○	–	
C	○	–	–	○	
D	–	○	–	–	
E	–	○	○	–	
F	–	○	–	○	
G	–	–	○	–	
H	–	–	–	○	

O_2 correct standard value

Note: (17) For designation of "Z", the data must be put on the data code.

- Y Without
- 4 4%
- 5 5%
- 6 6%
- 7 7%
- A 10%
- B 11%
- C 12%
- F 15%
- Z Other non-standard items (specify within 0 to 19%)

Measuring gas kind

Note: (18) For designation of "Z", gas components specifications should be attached.

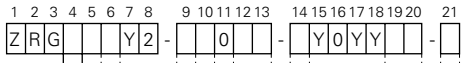
- E Y Atmospheric gas
- F Y Combustible exhaust gas (Dioxin included)
- G Y Converter exhaust gas
- Z Z Other non-standard items

Non-standard spec.

Note: (19) Data should be put on data code.
(20) Quick response type is available only when gas density is 20% or more.

- Z Other non-standard items
- A Quick response

(Sample switching type)



Description			
Measuring method			
3	Sample switching system		
Measurable components			
B	CO		
1st range			
X	0 to 2ppm		
W	0 to 5ppm		
V	0 to 10ppm		
T	0 to 25ppm		
A	0 to 50ppm		
B	0 to 100ppm		
Z	Other non-standard items		
	Power supply		**Piping connection**
0	100V AC	50/60Hz	Rc 1/4
2	115V AC	50/60Hz	NPT 1/4
3	220V AC	50/60Hz	Rc 1/4
4	220V AC	50/60Hz	NPT 1/4
Output signal			
A	0 to 1V DC	linear	
B	4 to 20mA DC	linear	

Optional functions [1]

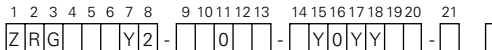
	Automatic calibration	Range identification alarm, remote range, external hold
Y Y	–	–
D Y	–	○
A Y	○	–
H Y	○	○

2nd range/3rd range/4th range [Unit: ppm]

	2nd range	3rd range	4th range	
Y	—	—	—	
W	5	—	—	For 1st range 2ppm
V	10	—	—	
1	20	—	—	
2	5	10	—	
3	5	20	—	
4	10	20	—	
5	5	10	20	
V	10	—	—	For 1st range 5 ppm
T	25	—	—	
A	50	—	—	
6	10	25	—	
7	10	50	—	
8	25	50	—	
9	10	25	50	
T	25	—	—	For 1st range 10ppm
A	50	—	—	
B	100	—	—	
8	25	50	—	
M	25	100	—	
N	50	100	—	
P	25	50	100	
A	50	—	—	For 1st range 25ppm
B	100	—	—	
N	50	100	—	
B	100	—	—	For 1st range 50ppm

Measuring gas kind		Note: (1) For designation of "Z", gas components specifications should be attached.
E Y	Atmospheric gas	
Z Z	Other non-standard items	
Non-standard spec.		Note: (2) Data should be put on data code.
Z	Other non-standard items	

(Differential flow system)



Description		
Measuring method		
4 Differential flow system		
Measurable component	**1st range**	
D Q CO_2 (Carbon dioxide)	350 ± 50ppm	
D S	350 ± 100ppm	
B A CO (Carbon monoxide)	0 to 50ppm	
B B	0 to 100ppm	
B C	0 to 200ppm	
B D	0 to 250ppm	
Power supply		**Piping connection**
0 100V AC	50/60Hz	Rc 1/4
2 115V AC	50/60Hz	NPT 1/4
3 220V AC	50/60Hz	Rc 1/4
4 220V AC	50/60Hz	NPT 1/4
Output signal		Note: (1) Voltage output signal only for 5th and 6th digits, DQ or DS (1st range: –1V to +1V) (2nd range: 0 to 1V)
A 0 to 1V DC linear		
B 4 to 20mA DC linear		
Optional functions (1)		
	Automatic calibration	Range identification, alarm, remote range, external hold
Y Y	–	–
D Y	–	○
A Y	○	–
H Y	○	○
2nd range [Unit : ppm]		
Y Without		
E 500 . For 1st range CO2 350±50		
F 1000 . For 1st range CO2 350±100		
B 100 — For 1st range CO 50ppm		
C 200 — For 1st range CO 50ppm		
D 250 — For 1st range CO 50ppm		
E 500 — For 1st range CO 50ppm		
C 200 — For 1st range CO 100ppm		
D 250 — For 1st range CO 100ppm		
E 500 — For 1st range CO 100ppm		
E 500 . For 1st range CO 200ppm		
E 500 . For 1st range CO 250ppm		
Measuring gas kind		Note: (2) For designation of "Z", gas components specifications should be attached.
E Y Atmospheric gas		
Z Y Other non-standard items		
Non-standard spec.		Note: (3) Data should be put on data code.
Z Other non-standard items		

NDIR TYPE INFRARED GAS ANALYZER

<Standard single-component analyzer measuring range>

Measuable component	2nd range	1st measuring range																			
		5ppm	10ppm	15ppm	20ppm	25ppm	50ppm	100ppm	200ppm	250ppm	500ppm	0.1%	0.2%	0.5%	1%	2%	5%	10%	20%	50%	100%
CO	x 0	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	x 2	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—
	x 2.5	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 4	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 5	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 8	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	○	—	—	—
	x 10	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	○	—	—	—
	x 20	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	○	—	—	—
CO_2	x 0	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	x 2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—
	x 2.5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 4	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 8	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—	—
	x 10	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—	—
	x 20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	—	—	—
NO	x 0	—	△	△	△	△	○	○	○	○	○	○	○	△	—	—	—	—	—	—	—
	x 2	—	△	△	△	△	○	○	○	○	○	○	○	△	—	—	—	—	—	—	—
	x 2.5	—	△	△	△	△	○	○	○	○	○	○	△	—	—	—	—	—	—	—	—
	x 4	—	△	△	△	△	○	○	○	○	○	△	—	—	—	—	—	—	—	—	—
	x 5	—	△	△	△	△	○	○	○	○	○	△	—	—	—	—	—	—	—	—	—
	x 8	—	△	△	△	△	○	○	○	○	△	—	—	—	—	—	—	—	—	—	—
	x 10	—	△	△	△	△	○	○	○	○	△	—	—	—	—	—	—	—	—	—	—
	x 20	—	△	△	△	△	○	○	○	△	—	—	—	—	—	—	—	—	—	—	—
SO_2	x 0	—	△	△	△	△	○	○	○	○	○	○	○	○	○	○	○	○	—	—	—
	x 2	—	△	△	△	△	○	○	○	○	○	○	○	○	○	○	○	—	—	—	—
	x 2.5	—	△	△	△	△	○	○	○	○	○	○	○	○	○	○	○	—	—	—	—
	x 4	—	△	△	△	△	○	○	○	○	○	○	○	○	○	○	—	—	—	—	—
	x 5	—	△	△	△	△	○	○	○	○	○	○	○	○	○	○	—	—	—	—	—
	x 8	—	△	△	△	△	○	○	○	○	○	○	○	○	○	—	—	—	—	—	—
	x 10	—	△	△	△	△	○	○	○	○	○	○	○	○	○	—	—	—	—	—	—
	x 20	—	△	△	△	△	○	○	○	○	○	○	○	○	—	—	—	—	—	—	—
CH_4	x 0	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○
	x 2	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 2.5	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 4	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 5	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 8	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 10	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 20	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	—	—	—

Remarks: (1) ○ : Standard measuring range
(2) △ : Consult us regarding manufacture availability, price and delivery period.
(3) — : Not manufactured

<Standard type two-component analyzer measuring range>

SO_2 \ NO	100 ppm	200 ppm	250 ppm	500 ppm
100ppm	○	○	○	○
200ppm	○	○	○	○
250ppm	○	○	○	○
500ppm	○	○	○	○

Remarks : (1) ○ : Scope of manufacture for 1st range
(2) 2nd range type is available provided the range ratio of 1st or 2nd component is within 1:20.
(Max. 2000ppm for NO analyzer)

CO \ NO	250 ppm	500 ppm	1000 ppm
250ppm	○	○	○
500ppm	○	○	○
1000ppm	○	○	○

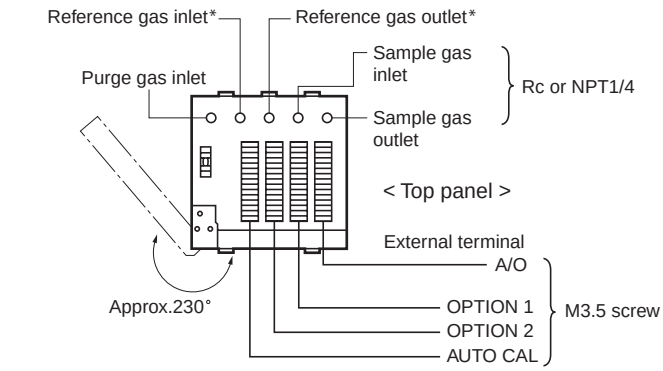
Remarks : (1) 2nd range type is available provided the range ratio of 1st or 2nd component is within 1:20.
(Max. 2000ppm for NO analyzer)

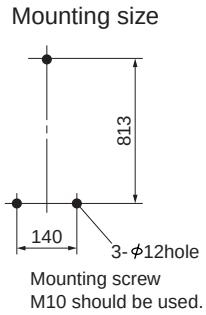
CO_2 \ CO	100 ppm	200 ppm	250 ppm	500 ppm	0.1 %	0.2 %	0.5 %	1 %	2 %	5 %	10 %	20 %	50 %	100 %
100ppm	○	○	○	○	⊗	⊗	⊗	—	—	—	—	—	—	—
200ppm	○	○	○	○	○	⊗	⊗	—	—	—	—	—	—	—
250ppm	○	○	○	○	○	⊗	⊗	⊗	—	—	—	—	—	—
500ppm	○	○	○	○	○	○	○	⊗	⊗	—	—	—	—	—
0.1%	⊗	⊗	⊗	⊗	○	○	○	⊗	⊗	⊗	—	—	—	—
0.2%	⊗	⊗	⊗	⊗	⊗	○	○	○	⊗	⊗	⊗	—	—	—
0.5%	—	—	—	⊗	⊗	⊗	⊗	○	○	⊗	⊗	⊗	—	—
1%	—	—	—	—	⊗	⊗	⊗	○	○	○	⊗	⊗	⊗	⊗
2%	—	—	—	—	—	⊗	⊗	⊗	○	○	○	○	○	○
5%	—	—	—	—	—	—	⊗	⊗	⊗	○	○	○	○	○
10%	—	—	—	—	—	—	—	⊗	⊗	○	○	○	○	○
20%	—	—	—	—	—	—	—	—	⊗	○	○	○	○	○
50%	—	—	—	—	—	—	—	—	—	○	○	○	○	○
100%	—	—	—	—	—	—	—	—	—	○	○	○	○	○

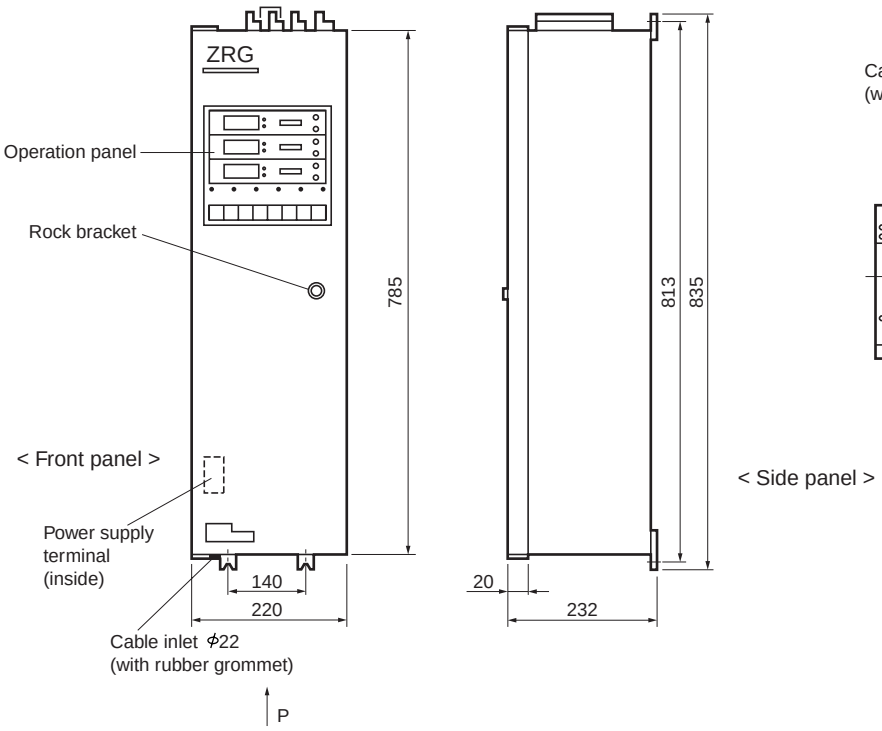
Remarks : (1) ○ : Scope of manufacture for 1st range
⊗ : Scope of manufacture for 2nd range for CO and CO_2 (maximum range)
(2) 2nd range type is available provided the range ratio of 1st or 2nd component is within 1:20.

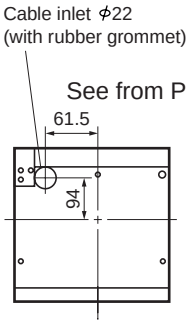
OUTLINE DIAGRAM (Unit:mm)

NOTE* Lid is mounted when
reference gas is not used.

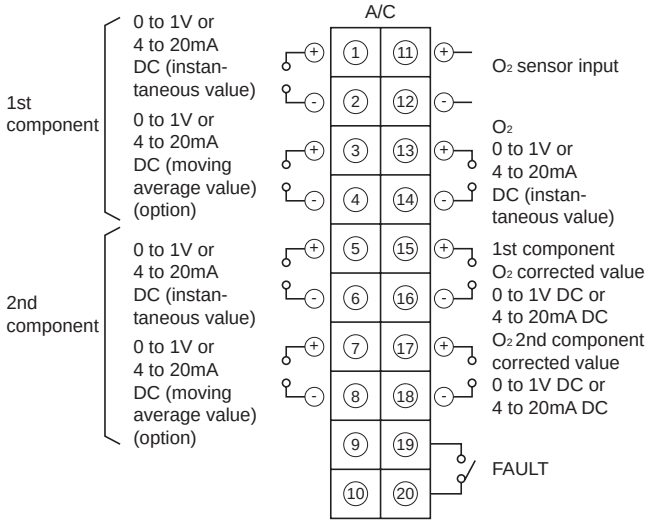


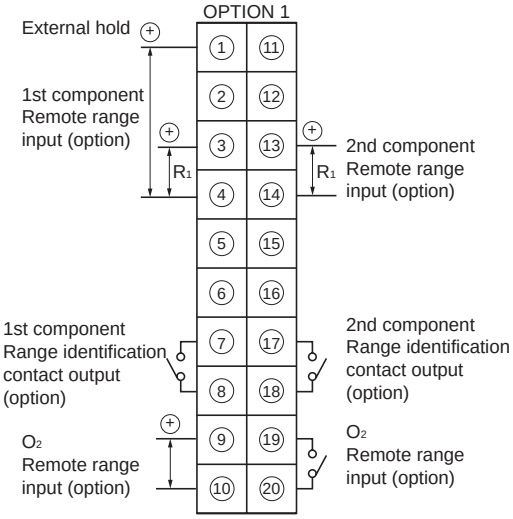


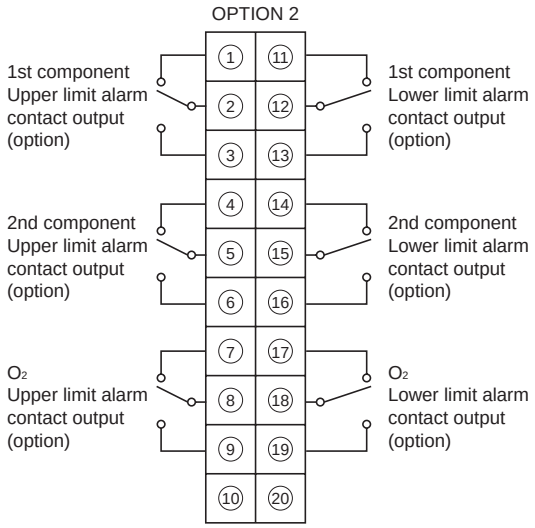


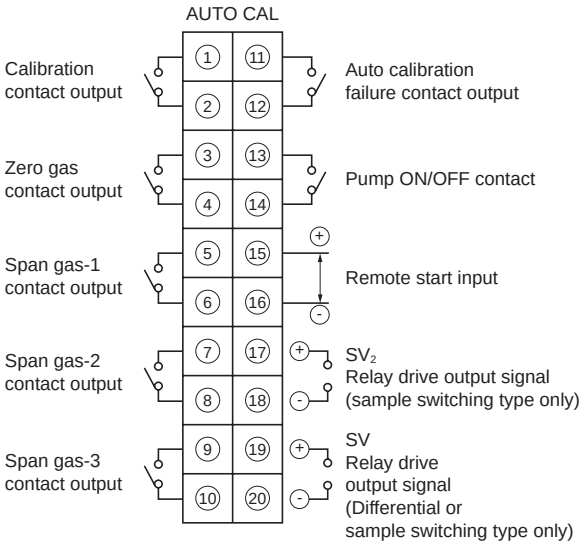


External connection diagram



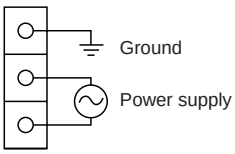






Note: For relay drive output signal terminal, only the sample switching type of differential flow system is used.
Terminal block should be used at the position of AUTO-CAL terminal block.

Power supply (installed in the main unit)



Private zirconia O_2 sensor <option>
This sensor is used together with ZRG.

Measuring method:
Zirconia system

Measurable component and measuring range:

Measurable component		1st range	2nd range
O_2	Oxygen	0 to 10 vol %	0 to 25 vol %

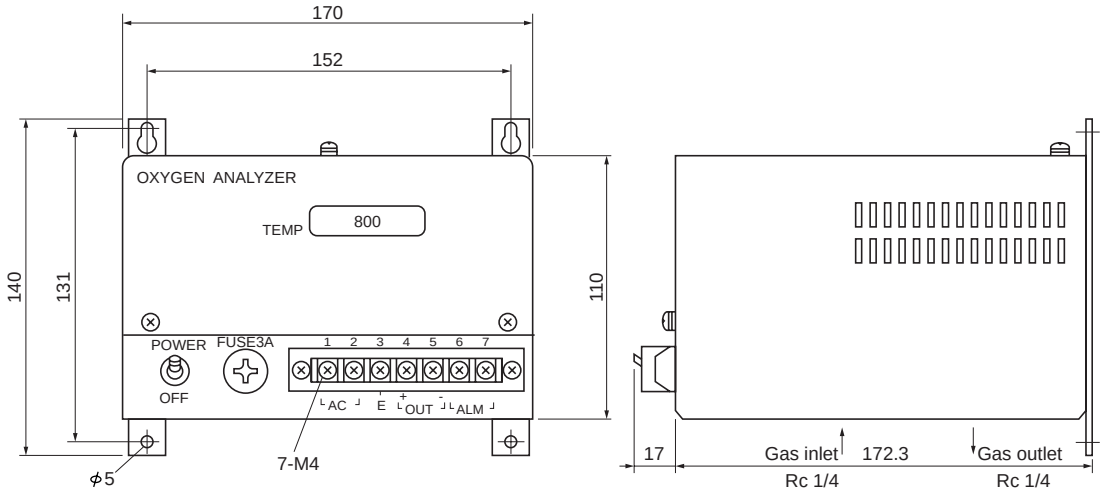
Repeatability: Within ±0.5% of full scale
Linearity: Within ±2% of full scale
Zero drift: Within ±1% of full scale/week
Span drift: Within ±2% of full scale/week
Response time: Approx. 20 sec (for 90% response)
Measured gas flow rate:
0.5 ±0.25 ℓ /min
Note: The Zirconia system, due to its principle, may produce a measuring error due to relative concentration versus combustible O_2 gas concentration. Also, a corrosive gas (SO_2 of 250ppm or more, etc.) may affect the life of the sensor.

Gas inlet/outlet size:
Rc1/4
Power supply: 90 to 126V or 200 to 240V AC, 50/60Hz
Enclosure: Steel casing, for indoor application
Indication: Temperature indication (LED)
Temperature alarm output:
Contact output, SPST (1a) contact
Contact capacity, 220V AC 1A
(resistive load)
Dimensions (H x W x D):
140 x 170 x 190mm
Mass{weight}: Approx. 3kg
Finish color: Munsell 5 Y7/1

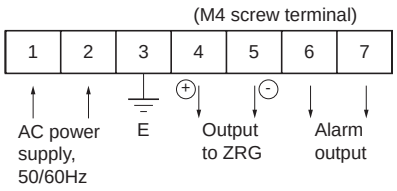
CODE SYMBOLS

1 2 3 4 5 6 7 8 9	Description
Z F K	
3 Y Y	**Measuring method**
3 Y Y	Zirconia system
4 Y Y	Zirconia system, (approval by Weight and Measure Act)
3	**Power supply**
1	90 to 126V AC 50/60Hz
3	200 to 240V AC 50/60Hz

OUTLINE DIAGRAM (Unit:mm)



External connection diagram



⚠ Caution on Safety

*Before using this product, be sure to read its instruction manual in advance.

Fuji Electric Systems Co., Ltd.

Head office
6-17, Sanbancho, Chiyoda-ku, Tokyo 102-0075, Japan
http://www.fesys.co.jp

Fuji Electric Instruments Co., Ltd.

Sales Div.
International Sales Dept.
No.1, Fuji-machi, Hino-city, Tokyo, 191-8502 Japan
Phone: 81-42-585-6201, 6202
Fax: 81-42-585-6187
http: //www.fic-net.co.jp

Printed in Japan