

MICROPROCESSOR BASED NDIR GAS ANALYZER

DATA SHEET

ZRF

This NDIR gas analyzer features a 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. Being housed in a 19 inch rack case suitable for mounting on a panel or a table top, this analyzer is applicable not only for measurement of environmental pollution but for use in various processes and/or experimental laboratories.

FEATURES

- (1) Use of a microprocessor provides high accuracy, multiple functions and easy operation.
 - The built-in automatic calibrating function allows calibration of up to three components (option).
 - The signal from a zirconia O₂ sensor (ZFK3) or other O₂ meter enables output of an O₂ correction value (option).
 - Includes an alarm function providing an upper/lower limit contact output (option).
 - Range can be changed over by external signal (option).
 - Zero and span calibration is accurate and easy by means of operating keys.
 - A self-diagnosis function is included.
- (2) This analyzer utilizes a mass flow detector featuring high sensitivity and reliability. It is equipped with two standard ranges for a range ratio of up to 1:20.
- (3) Addition of a zirconia O₂ sensor (ZFK3) to the one/two-component analyzer allows measurement of up to three components simultaneously.
- (4) Besides the standard method of measurement, a sample switching system and differential flow system are also available.

SPECIFICATIONS

General items

Power supply: 100, 115 or 220V AC $\pm 10\%$, 50/60Hz
Power consumption: 125VA max. (220VA max. when CO/CO₂ converter equipped)
Ambient temperature: -5 to +45°C
Ambient humidity: 90%RH or less
Enclosure: Steel casing, for indoor application



Outer dimensions (H x W x D):

Rack mounting type;
220 x 483 x 463mm
 Panel flush mounting type;
220 x 443 x 463mm
 Table top type;
232 x 443 x 463mm

Mass {weight}: Approx. 20kg

Finish color: Munsell 2.5Y8.4/1.2

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

Output hold: Output value before manual or automatic calibration is held. Whether or not to effect hold function can be selected.

Sample gas condition:

Temperature; 0 to 50°C (dew point of water vapor; less than 2°C)
 Dust; less than 0.3 μ m
 Pressure; less than 9.8kPa

Standard adjustment:

Calibration gas; Dry N₂ Balance
 Interface compensation Dew point of 2°C water vapor in N₂

Warm up time: Approx. 4 hours

Material of gas-contacting parts:

Sample cell; SUS304, neoprene rubber
 Infrared-ray transmitting window: CaF₂ or sapphire
 Internal tubing; Teflon tube, silicone tube, Toaron tube

Gas inlet/outlet, purge gas inlet size:

Rc1/4 (PT1/4 internal thread) or NPT1/4 internal thread

Purge gas flow rate:

1 $\pm$ 0.5 ℓ /min
 It is necessary to purge the instrument interior when ambient air contains the corrosive gas etc. or the measuring range of CO₂ is less than 0 to 50ppm.

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

Mounting method:

Mounted on 19 inch rack, or flush on panel, or on table top

Remark: 70% or more of the analyzer weight should be supported at the bottom of the case.

(In case of mounting on panel or 19 inch rack, provide a support at the rear of casing).

Installation conditions:

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 of corrosive and/or combustible gases. If installing outdoor, 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 100
CO ₂	Carbon dioxide	0 to 50
NO	Nitric oxide	0 to 100
SO ₂	Sulfur dioxide	0 to 100
CH ₄	Methane	0 to 500
CCl ₄	Carbon tetrachloride	0 to 200
N ₂ O	Nitrous oxide	0 to 200
CF ₃ CHBrCℓ	Halothane	0 to 50
C ₂ H ₅ FCℓ-OCHF ₂	Ethlone	0 to 50
C ₂ H ₅ OH	Ethyl alcohol	0 to 250

Refer to table given in page 11

Consult to manufacturer

Standard two-component analyzer

Measurable component (1st comp. + 2nd comp.)	Min. measuring range [ppm]	Measuring range
NO+SO ₂	Nitric oxide + sulfur dioxide	0 to 250/0 to 250
CO+CO ₂	Carbon monoxide + carbon dioxide	0 to 200/0 to 200
NO+CO	Nitric oxide + Carbon monoxide	0 to 500/0 to 500
CO ₂ +CH ₄	Carbon dioxide + Methane	0 to 100/0 to 1000

Refer to table in page 12

Consult to manufacturer

Measuring range: Refer to table in page 11 and 12

Output signal: 0 to 1V or 4 to 20mA DC (allowable load resistance 550Ω or less), linear

Repeatability: Within ± 0.5% of full scale (Within ± 1% of full scale)*

Linearity: Within ± 1% of full scale

Zero drift: Within ± 2% of full scale/week (Within ± 3% of full scale/week)*

Span drift: Within ± 2% of full scale/week (Within ± 3% of full scale/week)*

Response time: 25 seconds max. (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. (Standard)

Note*: Shows the value in case of 0 to 50ppm range.

Sample switching type

This is an optimum analyzer 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 with integrated zero air generator.

Measurable component:

CO (carbon monoxide)

Measuring range:

1st range [ppm]	2nd range [ppm]
0 to 10	None, 0 to 20, 25, 50, 100
0 to 25	None, 0 to 50, 100
0 to 50	None, 0 to 100
0 to 100	None

Output signal: 0 to 1V or 4 to 20mA DC, linear, step-like output which changes every 50 seconds

Repeatability: Within ± 1% of full scale (Within ± 2% of full scale)*

Linearity: Within ± 1% of full scale

Zero drift: Within ± 0.5% of full scale/week (Within ± 1% of full scale/week)*

Span drift: Within ± 1.5% of full scale/week (Within ± 2.5% of full scale/week)*

Response time: Within 120 seconds (for 90% response)

Measured gas flow rate:

2.0 ± 0.1 ℓ /min.

Note*: Shows the value in case of 0 to 10ppm range.

Differential flow type

This is an optimum gas analyzer for measurement in two modes, absolute concentration and concentration difference.

Measuring system:

Non-dispersion infrared-ray absorption method, single light source – double beam, flow differential system with integrated zero air generator for CO.

Measurable components and measuring range:

Remark: There are restrictions on the reference gas conditions.

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

Output signal:

Remark: Linear output

	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

Repeatability: Within ± 0.5% of full scale

Linearity: Within ± 1% of full scale

Zero drift: Within ± 2% of full scale/week (within ± 2% of full scale/day for 0 to 50ppm range)

Span drift: Within ± 2% of full scale/week (within ± 2% of full scale/day for 0 to 50ppm range)

Response time: 25 seconds max. (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

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

Filter, flow checker:

Membrane filter and flow checker are built in.

Remark: The built-in membrane filter is a glass-fiber paper monitoring type. The pre-filter should be prepared separately.

Pump:

A small two-throw electromagnetic pump is built in, so sample gas and reference gas can be sampled separately at the same time.

CO/CO₂ converter (emission level calculation):

This converter uses a special catalyst for converting efficiently into CO₂ the CO contained in sample gas which is used in the sample switching type etc. The converter is built in the analyzer.

O₂ correction output (emission levels calculation):

An exclusive O₂ sensor is used for correcting the measured gas concentration into the value at standard O₂ concentration.

For obtaining the NO_x and/or SO₂ exhaust standard value, ZRF can measure the NO_x and/or SO₂ concentration and simultaneously the residual oxygen concentration in exhaust gas, and then correct according to the following equation. (Application of this equation is mandatory for the NO_x or SO₂ exhaust standard.)

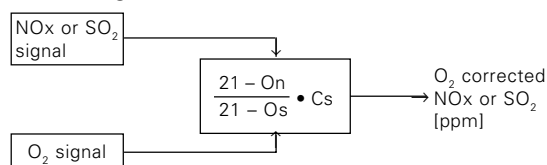
$$C = \frac{21 - O_n}{21 - O_s} \cdot C_s$$

Where, C: concentration after O₂ correction

C_s: NO_x or SO₂ measured concentration

O_s: O₂ measured concentration

O_n: O₂ standard concentration

Block diagram

The O₂ measured signal is according to the exclusive O₂ sensor (type ZFK) or external O₂ meter (0 to 1V DC/0 to 25% O₂).

O₂ output signal:

0 to 1V or 4 to 20mA DC

O₂ converted output signal:

0 to 1V or 4 to 20mA DC, linearity ± 2% of full scale; output can be provided for each of 1st and 2nd components

Alarm output:

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

External output hold:

Output signal is held via external signal.
Output hold input signal: 5V DC

Average value output:

Average or moving average value output is available.

Average value is output every one or four hours.

Moving average value is output every one minutes it is averaged for one or four hours. (When select four hours average output the analyzer has only one average value output.)

Output signal; 0 to 1V or 4 to 20mA DC, linear

Automatic calibration:

Zero and span are automatically calibrated at the preset cycle.

Both of calibration gas and electromagnetic valve are not included.

Calibration channel:

Up to 3 components can be calibrated simultaneously.

Zero calibration point:

Fixed at 0% (Zirconia O₂ meter allows setting zero points)

Span calibration point:

0 to 100% full scale

Calibration start:

Via built-in timer or remote start signal

Output hold at 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 (O₂)
- (5) Zero gas – span gas 1 – span gas 2 – span gas 3 (O₂)

Calibration gas flow time:

Settable from 100 to 599 seconds

Calibration cycle:

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

Calibration failure alarm:

Provided when fault occurs during auto calibration.

Contact output:

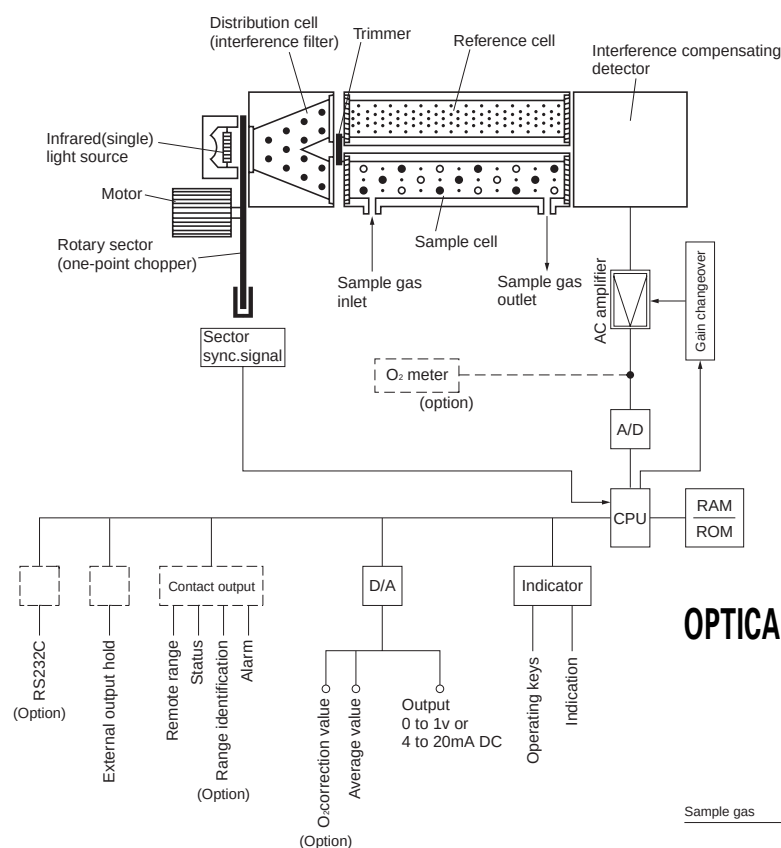
During calibration; 1a contact, contact capacity 250V, 2A AC (resistive load)
Calibration failure; 1a contact, contact capacity 250V, 2A AC (resistive load)
Electromagnetic valve drive; 1a contact, contact capacity 250V, 2A AC (resistive load)

Remote start: Remote start input signal; 5V DC square signal longer than 100msec. in duration

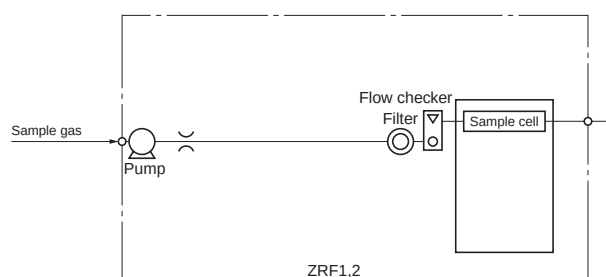
Communication interface:

RS232C

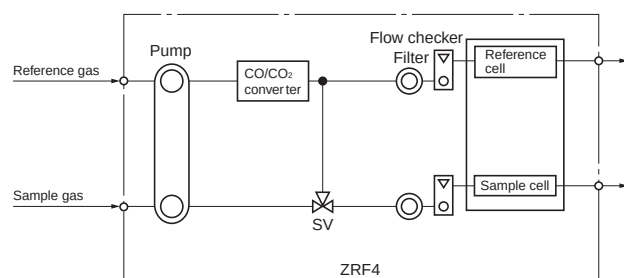
FUNDAMENTAL DIAGRAM



OPTICAL SAMPLING SPECIFICATION



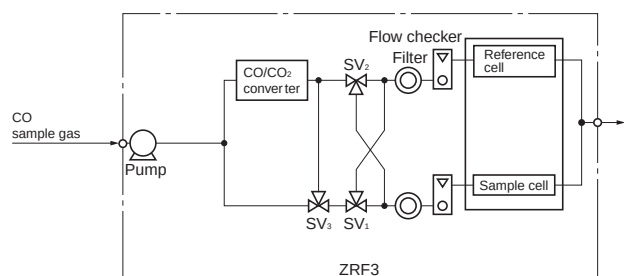
DESCRIPTION OF DIFFERENTIAL FLOW SYSTEM



In case of carbon monoxide measurement, a high performance converter is provided to convert carbon monoxide into carbon dioxide. Here, the carbon monoxide 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. The output of analyzer varies with the difference of the concentration of the carbon monoxide between two cells, eliminating the effects of interfering components.

Moreover, zero calibration can be held without zero standard gas, flowing the same reference gas into both reference and sample cell by activating changeover valve.

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 SV1 and SV2 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 effects 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																				
Z	R	F																		
Description																				
Measuring method																				
Single component analyzer																				
Measurable component																				
A																				SO ₂
B																				CO
D																				CO ₂
E																				CH ₄
P																				NO, (NO _x)
Z																				Other non-standard component
1st component, 1st range																				
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 range
Power supply																				
0																				100VAC 50/60Hz
2																				115VAC 50/60Hz
3																				220VAC 50/60Hz
4																				220VAC 50/60Hz
Piping connection																				
0																				RC1/4
2																				NPT1/4
3																				RC1/4
4																				NPT1/4
Structure/output signal																				
A																				Table-top type
B																				19 inch rack mounting type
C																				Panel mounting type
D																				Table-top type
E																				19 inch rack mounting type
F																				Panel mounting type
G																				Table-top type
H																				19 inch rack mounting type
J																				Panel mounting type
K																				Table-top type
L																				19 inch rack mounting type
M																				Panel mounting type
Optional components																				
Filter, Flowchecker																				
0																				—
1																				○
2																				○
Optional function (1)																				
Auto calibration																				
Y																				—
A																				○
B																				—
D																				○
F																				—
H																				○
K																				○
M																				○
Average value output																				
Y																				—
A																				○
B																				—
D																				○
F																				—
H																				○
K																				○
M																				○
Remote range, Alarm																				
Y																				—
A																				—
B																				—
D																				○
F																				—
H																				○
K																				○
M																				○

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Z	R	F				Y	2	-					-	Y						

Optional function (2)		Description
O ₂ indication/ correction Note (2), (4) (external O ₂ analyzer connection)	O ₂ indication/ correction Note (3), (4) (ZFK connection)	Remote range, Alarm Range identification (for O ₂)
—	—	—
○	—	—
—	○	—
○	—	○
—	○	○
Note(2) Any linearized 0 to 1V DC signal from external O₂ analyzer calibrated 0 to 25 vol% O₂ full scale is acceptable. Note(3) Standard measuring range of O₂ is 0 to 10% and 0 to 25%, double range. Note(4) Emission levels calculated with O₂ value output is available only when O₂ indication is selected.		
1st component, 2nd range		
Without 2nd range	Note(5)	Refer to table in page 11 for measuring range
0 to 100ppm		
0 to 200ppm		2nd range > 1st range
0 to 250ppm		Range ratio : within 1 : 20
0 to 500ppm		
0 to 1000ppm		
0 to 2000ppm		
0 to 5000ppm		
0 to 1%		
0 to 2%		
0 to 5%		
0 to 10%		
0 to 20%		
0 to 50%		
0 to 100%		
Other non-standard range		
Average value output time		
Without		
1-hour moving average value output		
4-hours moving average value output		
Other non-standard items		
Average value output		
1st component		
Instantaneous value	O ₂ correction	
—	—	
○	—	
—	○	
O₂ standard value for emission leveles calculation (O₂ correction)		
None	Note(6)	O ₂ value must be informed for designation of "Z".
4%		
5%		
6%		
7%		
10%		
11%		
12%		
15%		
Other non-standard items (speify within 0 to 19%)		
Kind of measuring gas		
Atmospheric gas	Note(7)	Sample gas components must be informed for designation of "Z".
Flue gas		
Converter exhaust gas		
Other non-standard items		
Non-standard spec.		
Other non-standard items		
Quick response Note(8) Quick response type is available only 0 to 20% range or more.		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
Z	R	F					2	-					-							-	

7

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Z	R	F					2	-					-							

[illegible]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
Z	R	F				Y	2	-					-	Y	O	Y	Y			-	

Note(19) Sample gas components must be informed for designation of "Z".

<Differential flow system>

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

Z R F - - - - - Y 2 - - - - - Y 0 Y Y - - -

4

D Q
D S
B B
B C
B D

0
2
3
4

A
B
C
D
E
F
G
H
J
K
L
M

Y Y
D Y
A Y
H Y

Y
C
D
E
F

E Y
Z Z

Z

Description			
Measuring method			
Differential flow system			
Measurable component		1st range	
CO ₂		350 ± 50ppm	
(Carbon dioxide)		350 ± 100ppm	
CO		0 to 100ppm	
(Carbon monoxide)		0 to 200ppm	
		0 to 250ppm	
Power supply		Piping connection	
100VAC 50/60Hz		RC1/4	
115VAC 50/60Hz		NPT1/4	
220VAC 50/60Hz		RC1/4	
220VAC 50/60Hz		NPT1/4	
Structure/output signal			
Table-top type		0 to 1V DC	
19 inch rack mounting type		0 to 1V DC	
Panel mounting type		0 to 1V DC	
Table-top type		4 to 20mA DC	
19 inch rack mounting type		4 to 20mA DC	
Panel mounting type		4 to 20mA DC	
Table-top type		0 to 1V DC	RS232C
19 inch rack mounting type		0 to 1V DC	RS232C
Panel mounting type		0 to 1V DC	RS232C
Table-top type		4 to 20mA DC	RS232C
19 inch rack mounting type		4 to 20mA DC	RS232C
Panel mounting type		4 to 20mA DC	RS232C
Note(20) When the 5th and 6th digit are "DQ" or "DS", the output is available only voltage output. (1st range:-1V to 1V, 2nd range:0 to 1V)			
Optional components			
Filter, Flowchecker	Pump	CO/CO ₂ converter	Note (21)
—	—	—	} Available only for 5th digit "D"
○	—	—	
○	○	—	} Available only for 5th digit "B"
○	—	○	
○	○	○	
Optional function (1)			
Auto calibration	Remote range, Alarm Range identification, External hold		
—	—		
—	○		
○	—		
○	○		
2nd range			
Without			
200ppm (Available only for 1st range CO 0 to 100ppm)			
250ppm (Available only for 1st range CO 0 to 100ppm)			
500ppm (Not available for 1st range CO ₂ ±100ppm)			
1000ppm (Available only for 1st range CO ₂ ±100ppm)			
Kind of measuring gas			
Atmospheric gas		Note(22) Sample gas components must be informed for designation of "Z".	
Other non-standard items			
Non-standard spec.			
Other non-standard items			

NDIR TYPE INFRARED GAS ANALYZER

(Standard single-component analyzer measuring ranges)

Measurable component	2nd range	1st measuring range														
		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	—	○	○	○	○	○	○	○	○	○	○	—	—	—	—
CO ₂	x 20	—	○	○	○	○	○	○	○	○	○	○	—	—	—	—
	x 0	—	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	x 2	—	○	○	○	○	○	○	○	○	○	○	○	○	○	—
	x 2.5	—	○	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 4	—	○	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 5	—	○	○	○	○	○	○	○	○	○	○	○	○	—	—
	x 8	—	○	○	○	○	○	○	○	○	○	○	○	—	—	—
NO	x 10	○	○	○	○	○	○	○	○	○	○	○	○	—	—	—
	x 20	○	○	○	○	○	○	○	○	○	○	○	—	—	—	—
	x 0	△	○	○	○	○	○	○	△	—	—	—	—	—	—	—
	x 2	△	○	○	○	○	○	○	△	—	—	—	—	—	—	—
	x 2.5	△	○	○	○	○	○	△	—	—	—	—	—	—	—	—
	x 4	△	○	○	○	○	△	—	—	—	—	—	—	—	—	—
	x 5	△	○	○	○	○	△	—	—	—	—	—	—	—	—	—
SO ₂	x 8	△	○	○	○	△	—	—	—	—	—	—	—	—	—	—
	x 10	△	○	○	○	△	—	—	—	—	—	—	—	—	—	—
	x 20	△	○	○	○	△	—	—	—	—	—	—	—	—	—	—
	x 0	△	○	○	○	○	○	○	○	○	○	○	○	—	—	—
	x 2	△	○	○	○	○	○	○	○	○	○	○	—	—	—	—
	x 2.5	△	○	○	○	○	○	○	○	○	○	○	—	—	—	—
	x 4	△	○	○	○	○	○	○	○	○	○	○	—	—	—	—
CH ₄	x 5	△	○	○	○	○	○	○	○	○	○	—	—	—	—	—
	x 8	△	○	○	○	○	○	○	○	○	—	—	—	—	—	—
	x 10	△	○	○	○	○	○	○	○	○	—	—	—	—	—	—
	x 20	△	○	○	○	○	○	○	○	—	—	—	—	—	—	—
	x 0	—	—	△	△	○	○	○	○	○	○	○	○	○	○	○
	x 2	—	—	△	△	○	○	○	○	○	○	○	○	○	○	—
	x 2.5	—	—	△	△	○	○	○	○	○	○	○	○	○	○	—
	x 4	—	—	△	△	○	○	○	○	○	○	○	○	○	—	—
	x 5	—	—	△	△	○	○	○	○	○	○	○	○	○	—	—
	x 8	—	—	△	△	○	○	○	○	○	○	○	○	—	—	—
	x 10	—	—	△	△	○	○	○	○	○	○	○	—	—	—	—
	x 20	—	—	△	△	○	○	○	○	○	○	—	—	—	—	—

Remarks: (1) ○ : standard measuring range
 (2) △ : Consult with us regarding capability of manufacture, price and delivery period.
 (3) — : outside of manufacturing range.

(Standard dual-component analyzer measuring ranges)

Combination of 1st, 2nd measurable components, measuring ranges:

Manufacture is possible as non-standard specifications even for some items not given in the table, so please consult to us and our distributor.

NO SO ₂	250 ppm	500 ppm
250ppm	○	○
500ppm	○	○

NO CO	500 ppm	1000 ppm
500ppm	○	○
1000ppm	○	○

Remarks: (1) ○ : available range for 1st measuring range.
Up to 1:20 possible for 2nd range.
(Max. 2000ppm for NO analyzer)

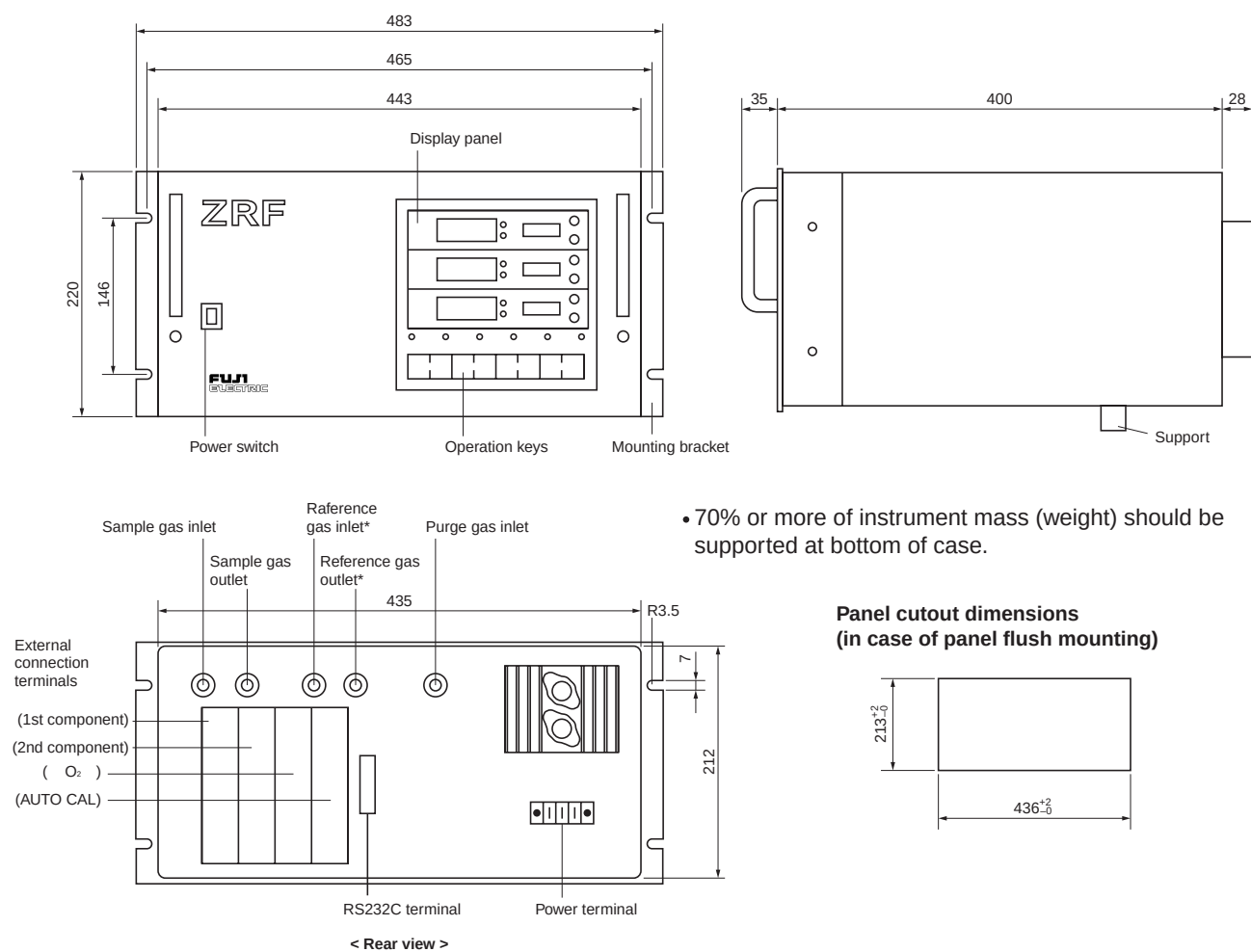
Garbage application

(CO₂: 0 to 50%
CH₄: 0 to 80%

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

Remarks: (1) ○ : available range for 1st measuring range.
(2) ⊗ : available range for 2nd measuring range (max. range) for CO and CO₂.

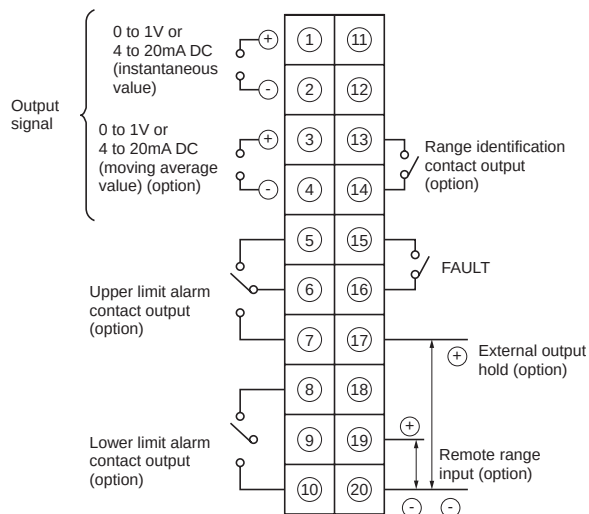
OUTLINE DIAGRAM (Unit:mm)



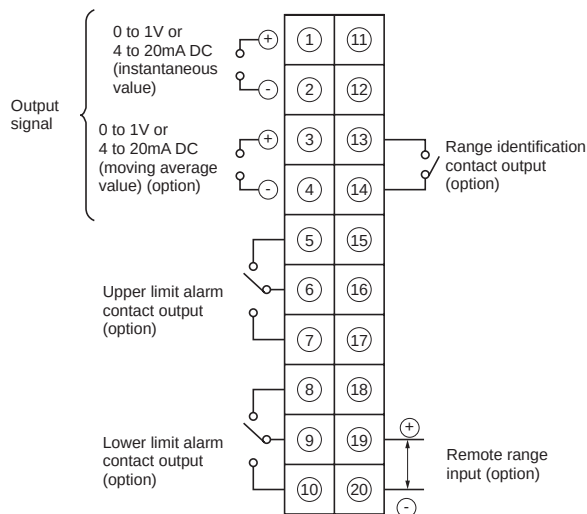
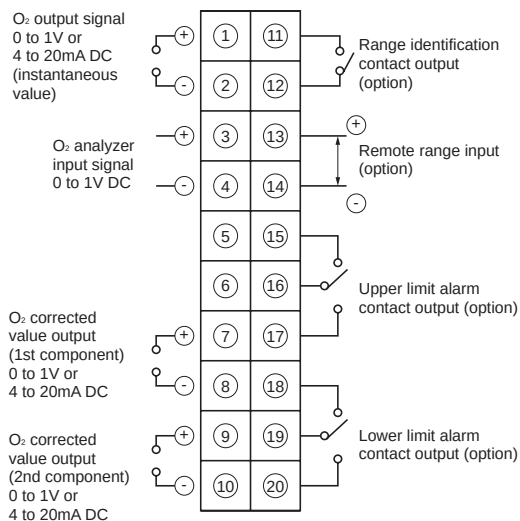
- 70% or more of instrument mass (weight) should be supported at bottom of case.

EXTERNAL CONNECTION DIAGRAM

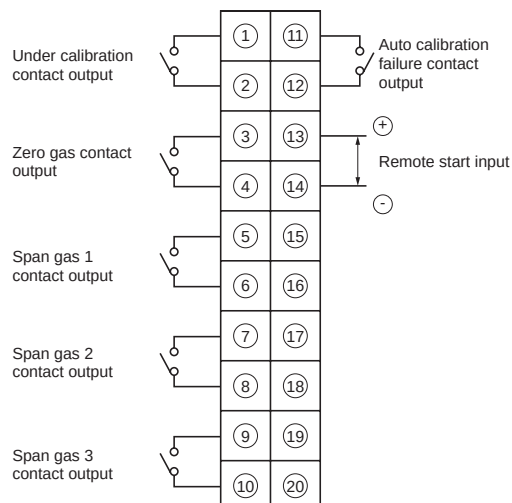
1st component



2nd component

O₂ (option)

Auto Cal (option)



Exclusive Zirconia O₂ Sensor (to be purchased separately)

For O₂ correction, the gas analyzer ZRF can accept linealized 0 to 1V DC signal coming from analyzer calibrated 0 to 25% O₂ full scale. If the analyzer is not available, Fuji can supply exclusive Zirconia O₂ sensor Model ZFK3.

Measuring method:

Zirconia system

Measurable component and measuring range:

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

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 seconds (for 90% response)

Measured gas flow rate:

0.5 ± 0.25 ℓ /min

Remark: The Zirconia system, due to its principle, may produce a measuring error due to relative concentration versus the combustible O₂ gas concentration. Also, a corrosive gas (SO₂ of 250 ppm or more, etc.) may affect the life of the sensor.

Gas inlet/outlet size:

Rc1/4

Power supply: 90 to 126V AC or 200 to 240V AC, 50/60Hz

Enclosure: Steel casing, for indoor application

Indication: Temperature indication (LED)

Temperature alarm output:

Contact output 1a contact,
Contact capacity 220V, 1A AC (resistive load)

Outer dimensions (H x W x D):

140 x 170 x 190mm

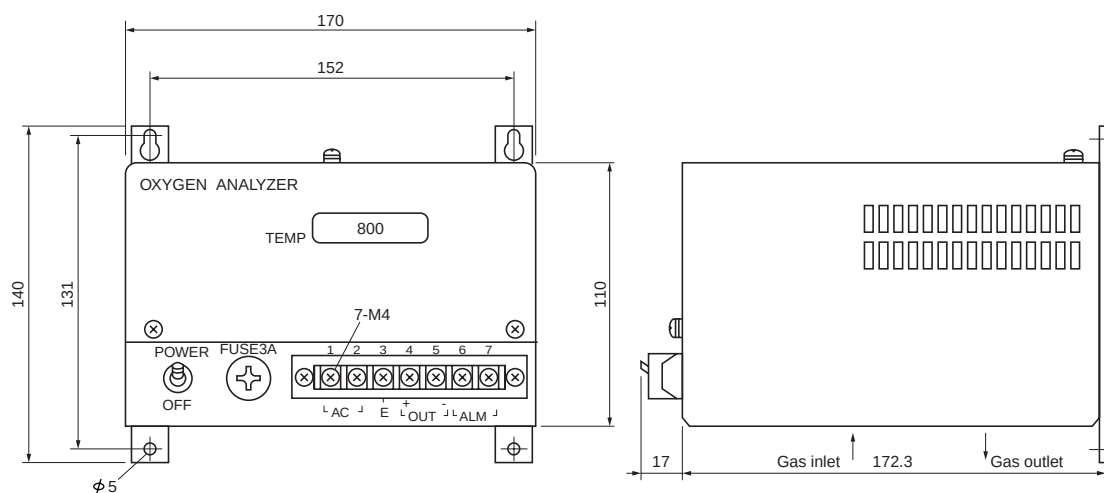
Mass {weight}: Approx. 3kg

Finish color: Munsell 5Y 7/1

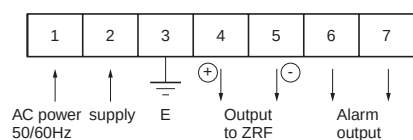
CODE SYMBOLS

1	2	3	4	5	6	7	8	9	10	11	12	13	Description
Z	F	K	3	Y	Y	4	-	1	Y	0	Y	Y	Measuring method
			3	Y	Y								Zirconia method
								1					Power supply
								3					90 to 126V AC 50/60Hz
													200 to 240V AC 50/60Hz

OUTLINE DIAGRAM (Unit:mm)



EXTERNAL CONNECTION DIAGRAM



The product conforms to the requirements of the Electromagnetic compatibility Directive 89/336/EEC as detailed within the technical construction file number TZ734577. The applicable standards used to demonstrate compliance are :

EN 50081-1 : 1992 Conducted and Radiated emissions

EN 50082-1 : 1992 Radiated immunity, ESD and FBT

ZRF

⚠ 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/eng>

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.jp/eng>