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 O_2 sensor (ZFK3) or other O_2 meter enables output of an O_2 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. RS232C port available (option).

(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 O_2 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 ±10%, 50/60Hz

Power consumption:
125VA max. (220VA max. when CO/CO_2 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 (due point of water vapor; less than 2°C)
Dust; less than 0.3µm
Pressure; less than 9.8kPa

Standard adjustment:
Calibration gas; Dry N_2 Balance
Interface compensation Dew point of 2°C water vapor in N_2

Warm up time: Approx. 4 hours

Material of gas-contacting parts:
Sample cell; SUS304, 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:
Rc1/4 (PT1/4 internal thread) or NPT1/4 internal thread

Purge gas flow rate:
1±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 CO_2 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	Refer to table given in page 11
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	
$CC\ell_4$	Carbon tetrachloride	0 to 200	Consult to manufacturer
N_2O	Nitrous oxide	0 to 200	
$CF_3CHBrC\ell$	Halothane	0 to 50	
$C_2HF_3C\ell$-$OCHF_2$	Ethlane	0 to 50	
C_2H_5OH	Ethyl alcohol	0 to 250	

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	Refer to table in page 12
$CO+CO_2$	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	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	0 to 500 0 to 1000
CO	Carbon monoxide	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 (wihtin ± 2% of full scale/day for 0 to 50ppm range)
Span drift: With in ± 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.

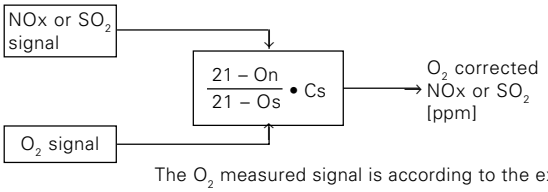
CO/CO_2 converter (emission level calculation):
This converter uses a special catalyst for converting efficiently into CO_2 the CO contained in sample gas which is used in the sample switching type etc. The converter is built in the analyzer.

O_2 correction output (emission levels calculation):
An exclusive O_2 sensor is used for correcting the measured gas concentration into the value at standard O_2 concentration.
For obtaining the NOx and/or SO_2 exhaust standard value, ZRF can measure the NOx and/or SO_2 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 NOx or SO_2 exhaust standard.)

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

Where, C: concentration after O_2 correction
Cs: NOx or SO_2 measured concentration
Os: O_2 measured concentration
On: O_2 standard concentration

Block diagram



The O_2 measured signal is according to the exclusive O_2 sensor (type 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

O_2 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 O_2 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 (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 step) or 1 to 7 days (1-day step)

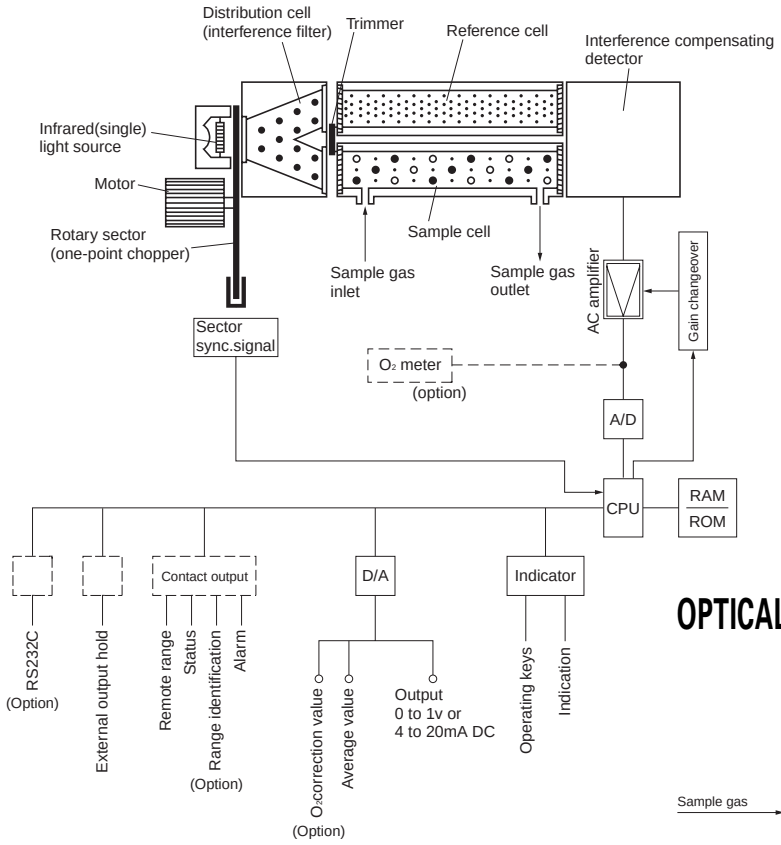
Calibration failure alarm:
Provided when fault occurs during auto calibration.

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)

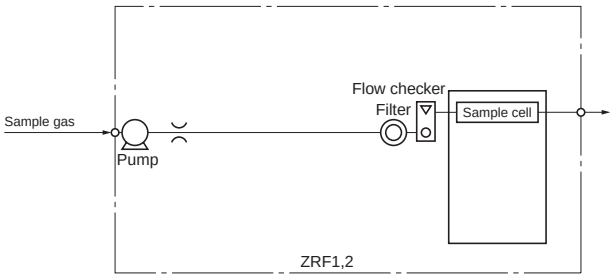
Remote start: Remote start input signal; 5V DC square signal longer than 100msec. in duration

Communication interface:
RS232C

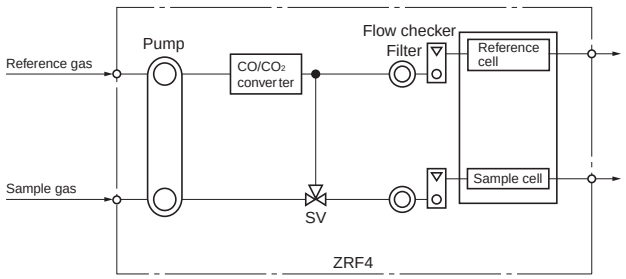
FUNDAMENTAL DIAGRAM



OPTICAL SAMPLING SPECIFICATION



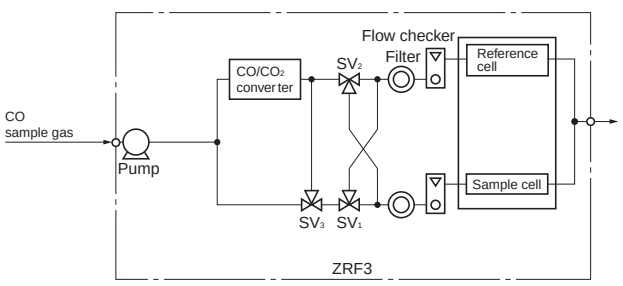
DESCRIPTION OF DIFFERENTIAL FLOW SYSTEM



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 othe 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>

	Description		
Measuring method			
1	Single component analyzer		
Measurable component			
A	SO_2		
B	CO		
D	CO_2		
E	CH_4		
P	NO, (NOx)		
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	**Piping connection**	
0	100VAC 50/60Hz	RC1/4	
2	115VAC 50/60Hz	NPT1/4	
3	220VAC 50/60Hz	RC1/4	
4	220VAC 50/60Hz	NPT1/4	
Structure/output signal			
A	Table-top type	0 to 1V DC	
B	19 inch rack mounting type	0 to 1V DC	
C	Panel mounting type	0 to 1V DC	
D	Table-top type	4 to 20mA DC	
E	19 inch rack mounting type	4 to 20mA DC	
F	Panel mounting type	4 to 20mA DC	
G	Table-top type	0 to 1V DC	RS232C
H	19 inch rack mounting type	0 to 1V DC	RS232C
J	Panel mounting type	0 to 1V DC	RS232C
K	Table-top type	4 to 20mA DC	RS232C
L	19 inch rack mounting type	4 to 20mA DC	RS232C
M	Panel mounting type	4 to 20mA DC	RS232C

Note(1): Refer to table in page 11 for measuring range

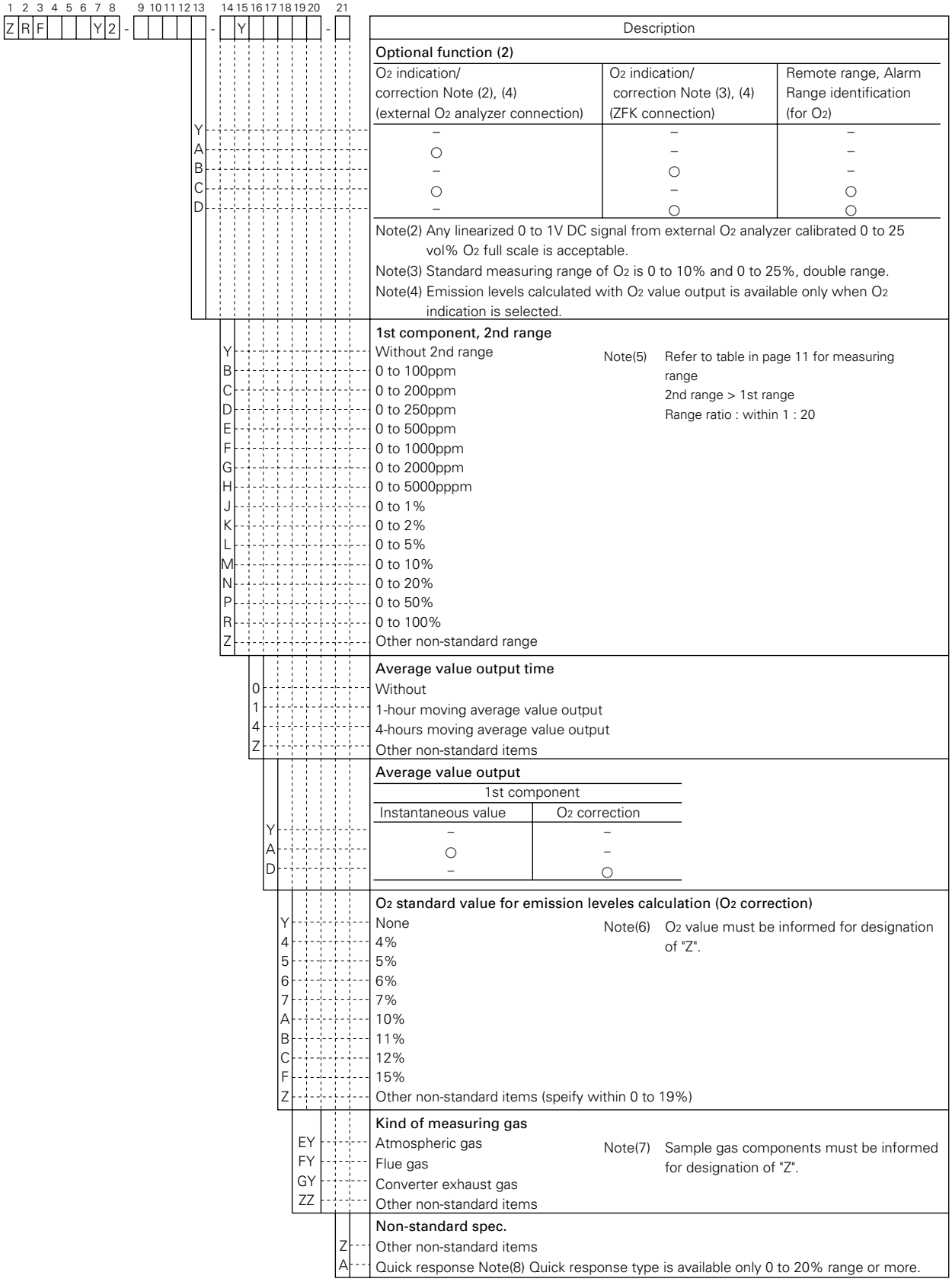
Optional components

	Filter, Flowchecker	Pump
0	–	–
1	○	–
2	○	○

Optional function (1)

	Auto calibration	Average value output	Remote range, Alarm Range identification, External hold
Y	–	–	–
A	○	–	–
B	–	○	–
D	–	–	○
F	○	○	–
H	○	–	○
K	–	○	○
M	○	○	○

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



<Standard dual-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 F				**Measuring method**
2				Two component analyzer
				Measurable component
F				NO (NOx) + SO_2
G				CO + CO_2
H				NO (NOx) + CO
Z				Other non-standard components
				1st component, 1st range
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
				2nd component, 1st range
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 / Piping connection
0				100VAC 50/60Hz / RC1/4
2				115VAC 50/60Hz / NPT1/4
3				220VAC 50/60Hz / RC1/4
4				220VAC 50/60Hz / NPT1/4
				Structure/output signal
A				Table-top type / 0 to 1V DC
B				19 inch rack mounting type / 0 to 1V DC
C				Panel mounting type / 0 to 1V DC
D				Table-top type / 4 to 20mA DC
E				19 inch rack mounting type / 4 to 20mA DC
F				Panel mounting type / 4 to 20mA DC
G				Table-top type / 0 to 1V DC / RS232C
H				19 inch rack mounting type / 0 to 1V DC / RS232C
J				Panel mounting type / 0 to 1V DC / RS232C
K				Table-top type / 4 to 20mA DC / RS232C
L				19 inch rack mounting type / 4 to 20mA DC / RS232C
M				Panel mounting type / 4 to 20mA DC / RS232C
				Optional components
0				– / –
1				○ / –
2				○ / ○
				Optional function (1)
Y				– / – / –
A				○ / – / –
C				– / ○ / –
E				– / – / ○
G				○ / ○ / –
J				○ / – / ○
L				– / ○ / ○
N				○ / ○ / ○

Note(9) Refer to table in page 12 for measuring range

Note(10) Refer to table in page 12 for measuring range

<Standard dual-component analyzer> (cont'd)

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

Optional function (2)

	O_2 indication/ correction Note (11), (13) (external O_2 analyzer connection)	O_2 indication/ correction Note (12), (13) (ZFK connection)	Remote range, Alarm Range identification (for O_2)
Y	–	–	–
A	○	–	–
B	–	○	–
C	○	–	○
D	–	○	○

Note(11) Any linearized 0 to 1V DC signal from external O_2 analyzer calibrated 0 to 25 vol% O_2 full scale is acceptable.
Note(12) Standard measuring range of O_2 is 0 to 10% and 0 to 25%, double range.
Note(13) Emission levels calculated with O_2 value output is available only when O_2 indication is selected.

1st component, 2nd range

Note(14) 2nd range > 1st range
Range rate : within 1 : 20

Y	Without 2nd range
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

2nd component, 2nd range

Note(15) 2nd range > 1st range
Range rate : within 1 : 20

Y	Without 2nd range
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

Average value output time

0	Without
1	1-hour moving average value output
4	4-hours moving average value output
Z	Other non-standard items

Average value output

	1st component		2nd component	
	Instantaneous value	O_2 correction	Instantaneous value	O_2 correction
Y	Without	Without	Without	Without
A	○	–	–	–
B	○	–	○	–
C	○	–	–	○
D	–	○	–	–
E	–	○	○	–
F	–	○	–	○
G	–	–	○	–
H	–	–	–	○

O_2 standard value for emission leveles calculation

Note(16) O_2 value must be informed for designation of "Z".

Y	None
4	4%
5	5%
6	6%
7	7%
A	10%
B	11%
C	12%
F	15%
Z	Other non-standard items (speify within 0 to 19%)

Kind of measuring gas

Note(17) Sample gas components must be informed for designation of "Z".

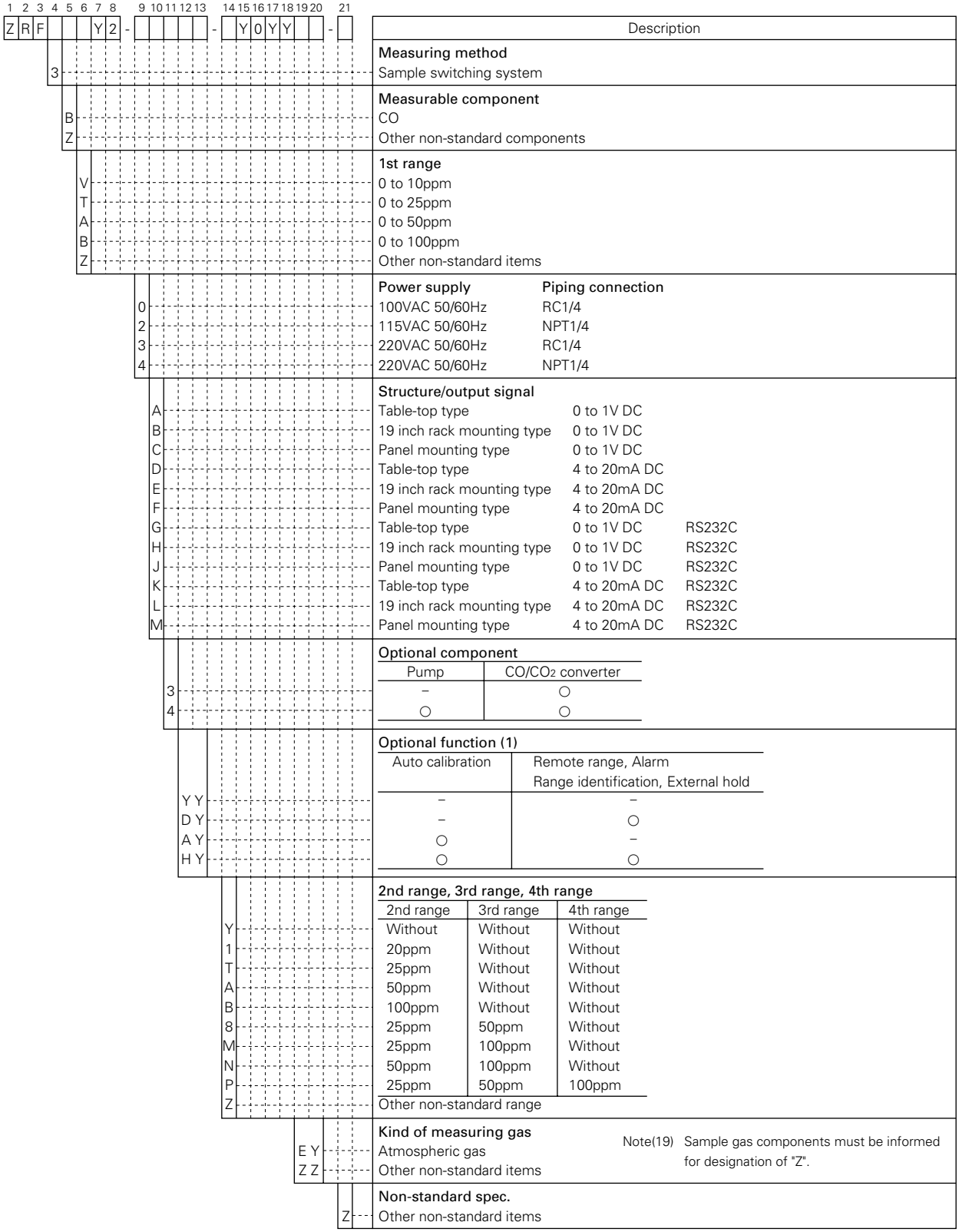
EY	Atmospheric gas
FY	Flue gas
GY	Converter exhaust gas
ZZ	Other non-standard items

Non-standard spec.

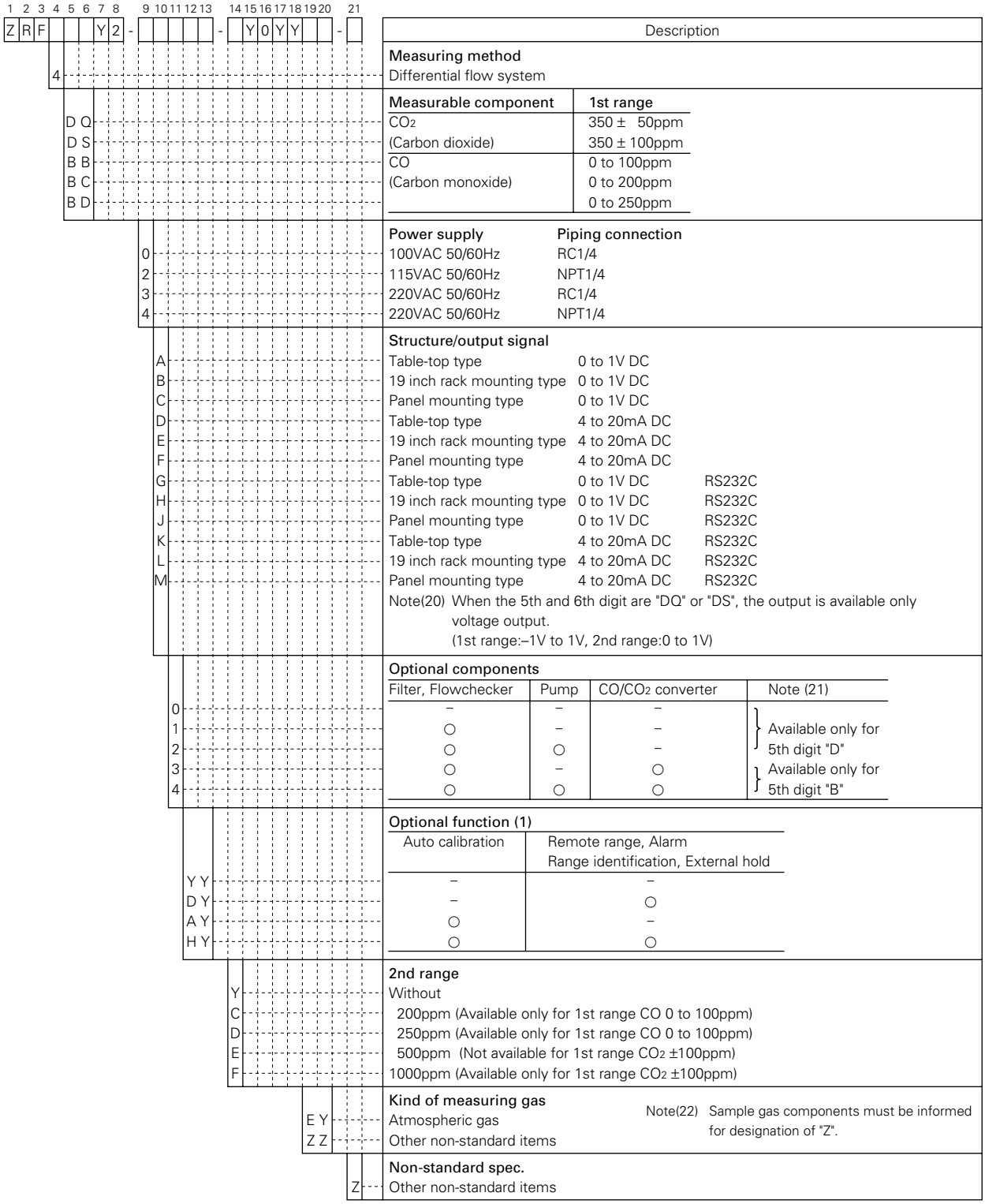
Note(18) Quick response type is available only 0 to 20% range or more.

Z	Other non-standard items
A	Quick response

<Sample switching system>



<Differential flow system>



Description

Measuring method

4 Differential flow system

	Measurable component	1st range
D Q	CO_2	350 ± 50ppm
D S	(Carbon dioxide)	350 ± 100ppm
B B	CO	0 to 100ppm
B C	(Carbon monoxide)	0 to 200ppm
B D		0 to 250ppm

	Power supply	Piping connection
0	100VAC 50/60Hz	RC1/4
2	115VAC 50/60Hz	NPT1/4
3	220VAC 50/60Hz	RC1/4
4	220VAC 50/60Hz	NPT1/4

Structure/output signal

A	Table-top type	0 to 1V DC	
B	19 inch rack mounting type	0 to 1V DC	
C	Panel mounting type	0 to 1V DC	
D	Table-top type	4 to 20mA DC	
E	19 inch rack mounting type	4 to 20mA DC	
F	Panel mounting type	4 to 20mA DC	
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J	Panel mounting type	0 to 1V DC	RS232C
K	Table-top type	4 to 20mA DC	RS232C
L	19 inch rack mounting type	4 to 20mA DC	RS232C
M	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)
0	–	–	–	
1	○	–	–	Available only for 5th digit "D"
2	○	○	–	
3	○	–	○	Available only for 5th digit "B"
4	○	○	○	

Optional function (1)

	Auto calibration	Remote range, Alarm Range identification, External hold
Y Y	–	–
D Y	–	○
A Y	○	–
H Y	○	○

2nd range

Y	Without
C	200ppm (Available only for 1st range CO 0 to 100ppm)
D	250ppm (Available only for 1st range CO 0 to 100ppm)
E	500ppm (Not available for 1st range CO_2 ±100ppm)
F	1000ppm (Available only for 1st range CO_2 ±100ppm)

Kind of measuring gas

E Y	Atmospheric gas
Z Z	Other non-standard items

Note(22) Sample gas components must be informed for designation of "Z".

Non-standard spec.

Z 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	–	○	○	○	○	○	○	○	○	○	○	–	–	–	
	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 with us regarding capability of manufacture, price and delivery period.
(3) – : outside of manufacturing range.

(Standard dual-component analyzer measuring ranges)

Compbination 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.

SO_2 \ NO	250 ppm	500 ppm
250ppm	○	○
500ppm	○	○

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

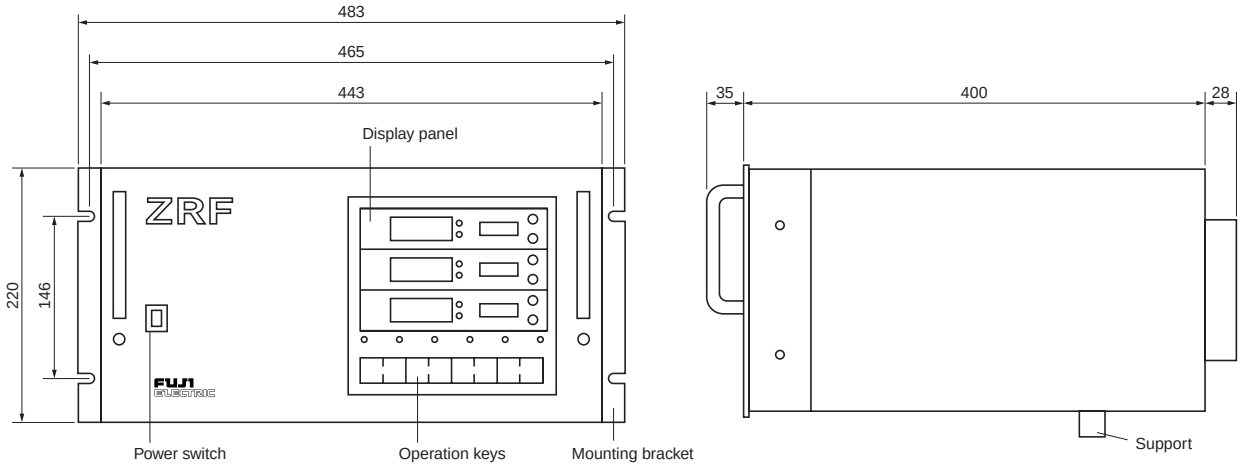
Remarks: (1) ○ : available range for 1st measuring range.
Up to 1:20 possible for 2nd range.
(Max. 2000ppm for NO analyzer)

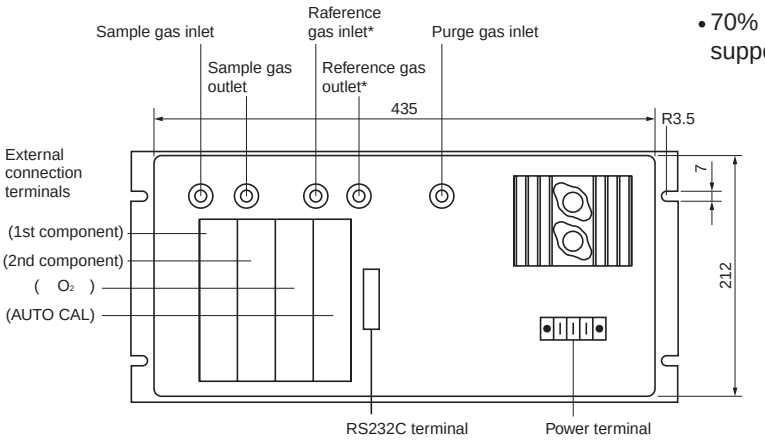
Garbage application
(CO_2: 0 to 50%
CH_4: 0 to 80%

CO_2 \ CO	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 CO_2.

OUTLINE DIAGRAM (Unit:mm)

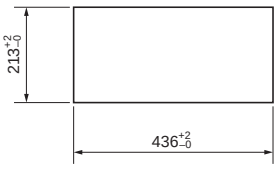




< Rear view >

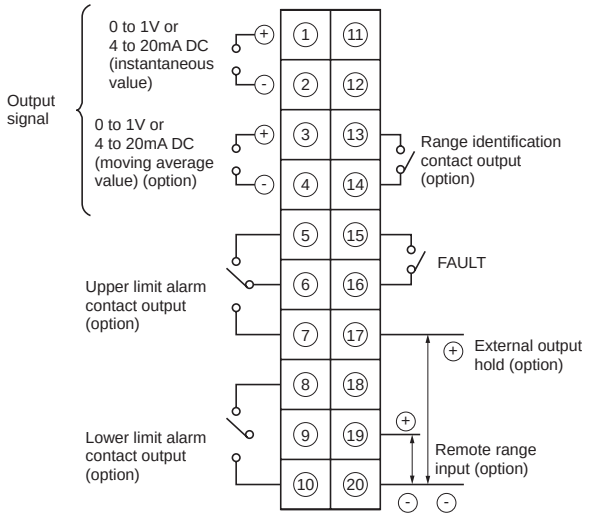
- 70% or more of instrument mass (weight) should be supported at bottom of case.

Panel cutout dimensions (in case of panel flush mounting)

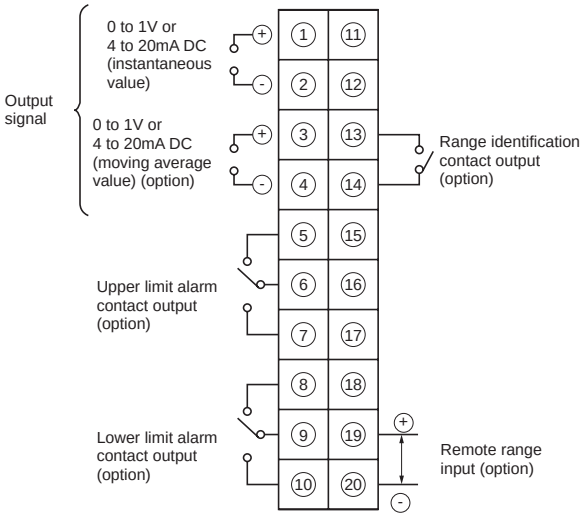


EXTERNAL CONNECTION DIAGRAM

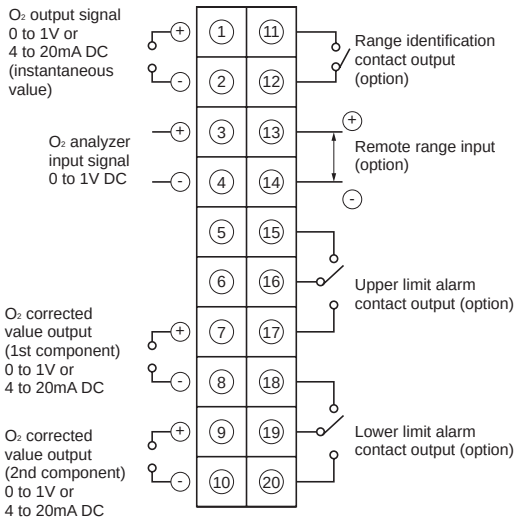
1st component



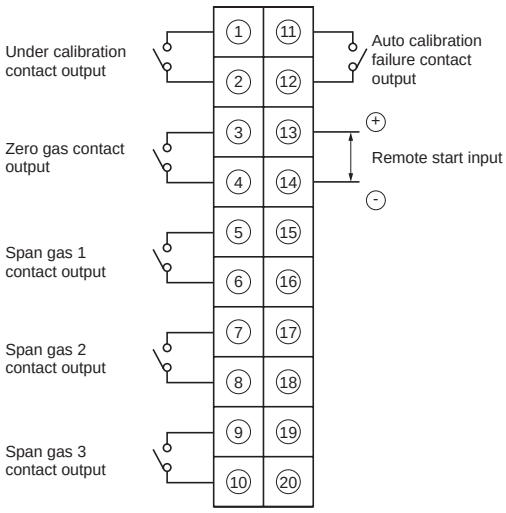
2nd component



O_2 (option)



Auto Cal (option)



Exclusive Zirconia O2 Sensor (to be purchased separately)

For O_2 correction, the gas analyzer ZRF can accept linealized 0 to 1V DC signal coming from analyzer calibrated 0 to 25% O_2 full scale. If the analyzer is not available, Fuji can supply exclusive Zirconia O_2 sensor Model ZFK3.

Measuring method:
Zirconia system

Measurable component and measuring range:

Measurable component		1st range	2nd range
O2	Oxygen	0 to 10vol%	0 to 25vol%

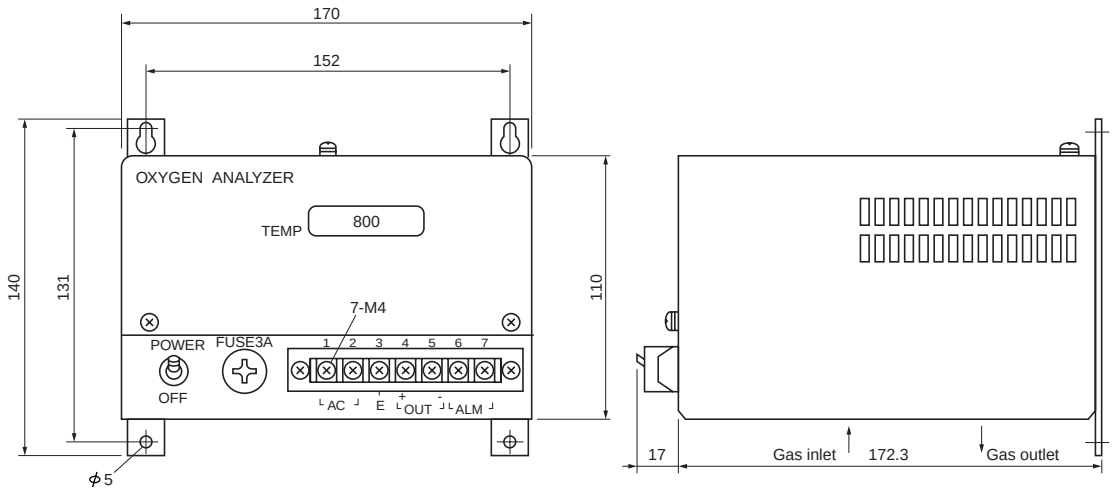
Repeatability: Within ± 0.5% of full scale
Linearity: Within ± 2% of full scale
Zero drift: Within ± 1% of full scale/week
Span drift: Within ± 2% of full scale/week
Response time: Approx. 20 seconds (for 90% response)
Measured gas flow rate:
0.5 ± 0.25 ℓ /min
Remark: The Zirconia system, due to its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

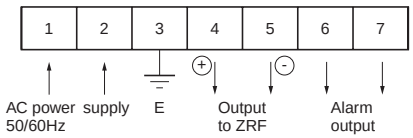
CODE SYMBOLS

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	
			3	Y	Y									**Measuring method** Zirconia method
						1								**Power supply** 90 to 126V AC 50/60Hz
						3								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.

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