

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. 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 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 ±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 (due point of water vapor; less than 2°C)
 Dust; less than 0.3µm
 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±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 100 0 to 200 0 to 250
		0 to 500 0 to 1000 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.)

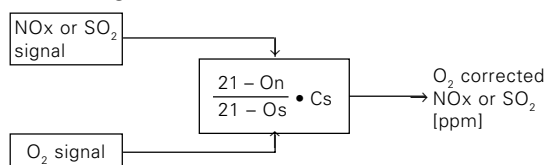
$$C = \frac{21 - O_n}{21 - O_s} \cdot C_s$$

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:

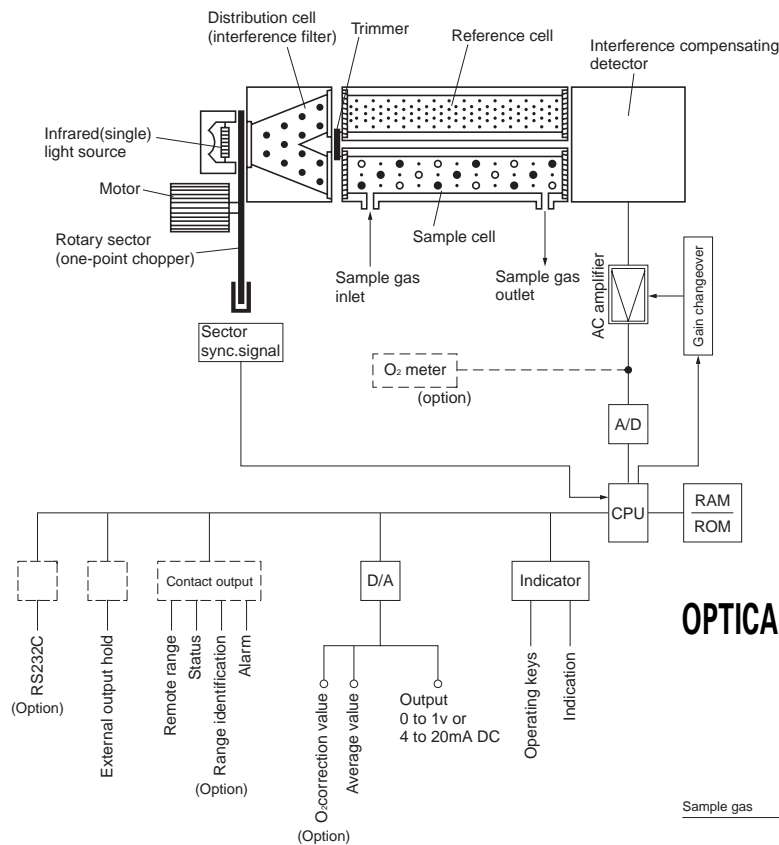
During calibration; 1a contact, contact capacity 250V, 2A AC (resistive load)
 Calibration failure; 1a contact, contact capacity 250V, 2A AC (resistive load)
 Electromagnetic valve drive; 1a contact, contact capacity 250V, 2A AC (resistive load)

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

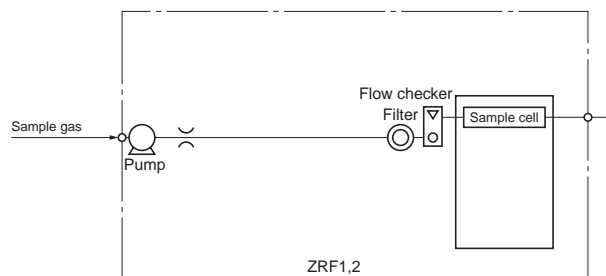
Communication interface:

RS232C

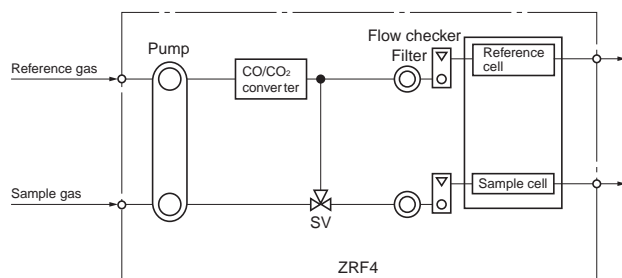
FUNDAMENTAL DIAGRAM



OPTICAL SAMPLING SPECIFICATION



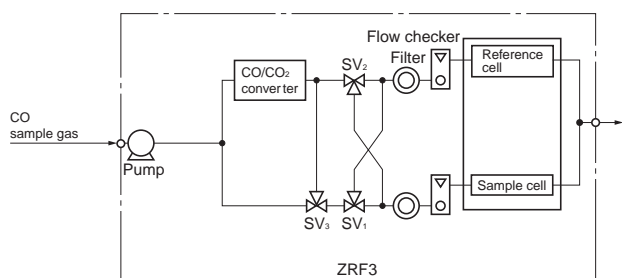
DESCRIPTION OF DIFFERENTIAL FLOW SYSTEM



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																					Description	
Z	R	F																			Measuring method	
																					Single component analyzer	
																					Measurable component	
																					SO ₂	
																					CO	
																					CO ₂	
																					CH ₄	
																					NO, (NO _x)	
																					Other non-standard component	
																					1st component, 1st range	
																					0 to 50ppm	
																					0 to 100ppm	
																					0 to 200ppm	
																					0 to 250ppm	
																					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	
																					Power supply	
																					100VAC 50/60Hz	
																					115VAC 50/60Hz	
																					220VAC 50/60Hz	
																					220VAC 50/60Hz	
																					Piping connection	
																					RC1/4	
																					NPT1/4	
																					RC1/4	
																					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	
																					Optional components	
																					Filter, Flowchecker	
																					Pump	
																					-	
																					○	
																					○	
																					Optional function (1)	
																					Auto calibration	
																					Average value output	
																					Remote range, Alarm	
																					Range identification, External hold	
																					-	
																					○	
																					-	
																					○	
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<Standard single-component analyzer> (cont'd)

Description																				
Optional function (2)																				
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 O ₂ analyzer calibrated 0 to 25 vol% O ₂ full scale is acceptable. Note(3) Standard measuring range of O ₂ is 0 to 10% and 0 to 25%, double range. Note(4) Emission levels calculated with O ₂ value output is available only when O ₂ indication is selected.																				
1st component, 2nd range																				
Without 2nd range										Note(5) Refer to table in page 11 for measuring range										
0 to 100ppm										2nd range > 1st range										
0 to 200ppm										Range ratio : within 1 : 20										
0 to 250ppm																				
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.																				

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

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)					
-										-					-					
○										-					-					
-										○					-					
○										-					○					
-										○					○					
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																				
Without 2nd range										Note(14) 2nd range > 1st range Range rate : within 1 : 20										
Y																				
E																				
F																				
G																				
H																				
J																				
K																				
L																				
M																				
N																				
P																				
R																				
Z																				
2nd component, 2nd range																				
Without 2nd range										Note(15) 2nd range > 1st range Range rate : within 1 : 20										
Y																				
E																				
F																				
G																				
H																				
J																				
K																				
L																				
M																				
N																				
P																				
R																				
Z																				
Average value output time																				
0																				
1																				
4																				
Z																				
Average value output																				
1st component										2nd component										
Instantaneous value					O ₂ correction					Instantaneous value					O ₂ correction					
Without										Without										
○					-					-					-					
○					-					○					-					
○					-					-					○					
-					○					-					-					
-					○					○					-					
-					○					-					○					
-					-					○					-					
-					-					-					○					
O₂ standard value for emission leveles calculation																				
None										Note(16) O ₂ value must be informed for designation of "Z".										
4																				
5																				
6																				
7																				
A																				
B																				
C																				
F																				
Z																				
Kind of measuring gas																				
Atmospheric gas										Note(17) Sample gas components must be informed for designation of "Z".										
EY																				
FY																				
GY																				
ZZ																				
Non-standard spec.																				
Other non-standard items										Note(18) Quick response type is available only 0 to 20% range or more.										
Z																				
A																				

<Sample switching system>

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				Y	2									Y	0	Y	Y			Measuring method Sample switching system	
																						Measurable component CO Other non-standard components	
																						1st range 0 to 10ppm 0 to 25ppm 0 to 50ppm 0 to 100ppm Other non-standard items	
																						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 component Pump CO/CO ₂ converter 3 - ○ 4 ○ ○	
																						Optional function (1) Auto calibration Remote range, Alarm Range identification, External hold YY - - DY - ○ AY ○ - HY ○ ○	
																						2nd range, 3rd range, 4th range 2nd range 3rd range 4th range Y Without Without Without 1 20ppm Without Without T 25ppm Without Without A 50ppm Without Without B 100ppm Without Without 8 25ppm 50ppm Without M 25ppm 100ppm Without N 50ppm 100ppm Without P 25ppm 50ppm 100ppm Z Other non-standard range	
																						Kind of measuring gas Note(19) Sample gas components must be informed for designation of "Z". E Y Atmospheric gas Z Z Other non-standard items	
																						Non-standard spec. Z Other non-standard items	

<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 -

		Description			
4		Measuring method Differential flow system			
D Q		Measurable component	1st range		
D S		CO ₂ (Carbon dioxide)	350 ± 50ppm 350 ± 100ppm		
B B		CO	0 to 100ppm		
B C		(Carbon monoxide)	0 to 200ppm		
B D			0 to 250ppm		
0		Power supply	Piping connection		
2		100VAC 50/60Hz	RC1/4		
3		115VAC 50/60Hz	NPT1/4		
4		220VAC 50/60Hz	RC1/4		
		220VAC 50/60Hz	NPT1/4		
A		Structure/output signal			
B		Table-top type	0 to 1V DC		
C		19 inch rack mounting type	0 to 1V DC		
D		Panel mounting type	0 to 1V DC		
E		Table-top type	4 to 20mA DC		
F		19 inch rack mounting type	4 to 20mA DC		
G		Panel mounting type	4 to 20mA DC		
H		Table-top type	0 to 1V DC RS232C		
J		19 inch rack mounting type	0 to 1V DC RS232C		
K		Panel mounting type	0 to 1V DC RS232C		
L		Table-top type	4 to 20mA DC RS232C		
M		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)
0		-	-	-	} Available only for 5th digit "D"
1		○	-	-	
2		○	○	-	} Available only for 5th digit "B"
3		○	-	○	
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		Note(22) Sample gas components must be informed for designation of "Z".	
Z Z		Other non-standard items			
		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	-	○	○	○	○	○	○	○	○	○	○	○	-	-	-	-
CO ₂	x 0	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	x 2	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	-
	x 2.5	-	○	○	○	○	○	○	○	○	○	○	○	○	○	-	-
	x 4	-	○	○	○	○	○	○	○	○	○	○	○	○	○	-	-
	x 5	-	○	○	○	○	○	○	○	○	○	○	○	○	○	-	-
	x 8	-	○	○	○	○	○	○	○	○	○	○	○	○	-	-	-
	x 10	○	○	○	○	○	○	○	○	○	○	○	○	○	-	-	-
NO	x 0	△	○	○	○	○	○	○	△	-	-	-	-	-	-	-	-
	x 2	△	○	○	○	○	○	○	△	-	-	-	-	-	-	-	-
	x 2.5	△	○	○	○	○	○	△	-	-	-	-	-	-	-	-	-
	x 4	△	○	○	○	○	△	-	-	-	-	-	-	-	-	-	-
	x 5	△	○	○	○	○	△	-	-	-	-	-	-	-	-	-	-
	x 8	△	○	○	○	△	-	-	-	-	-	-	-	-	-	-	-
	x 10	△	○	○	○	△	-	-	-	-	-	-	-	-	-	-	-
SO ₂	x 0	△	○	○	○	○	○	○	○	○	○	○	○	○	-	-	-
	x 2	△	○	○	○	○	○	○	○	○	○	○	○	-	-	-	-
	x 2.5	△	○	○	○	○	○	○	○	○	○	○	○	-	-	-	-
	x 4	△	○	○	○	○	○	○	○	○	○	○	-	-	-	-	-
	x 5	△	○	○	○	○	○	○	○	○	○	○	-	-	-	-	-
	x 8	△	○	○	○	○	○	○	○	○	-	-	-	-	-	-	-
	x 10	△	○	○	○	○	○	○	○	○	-	-	-	-	-	-	-
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)

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	○	○

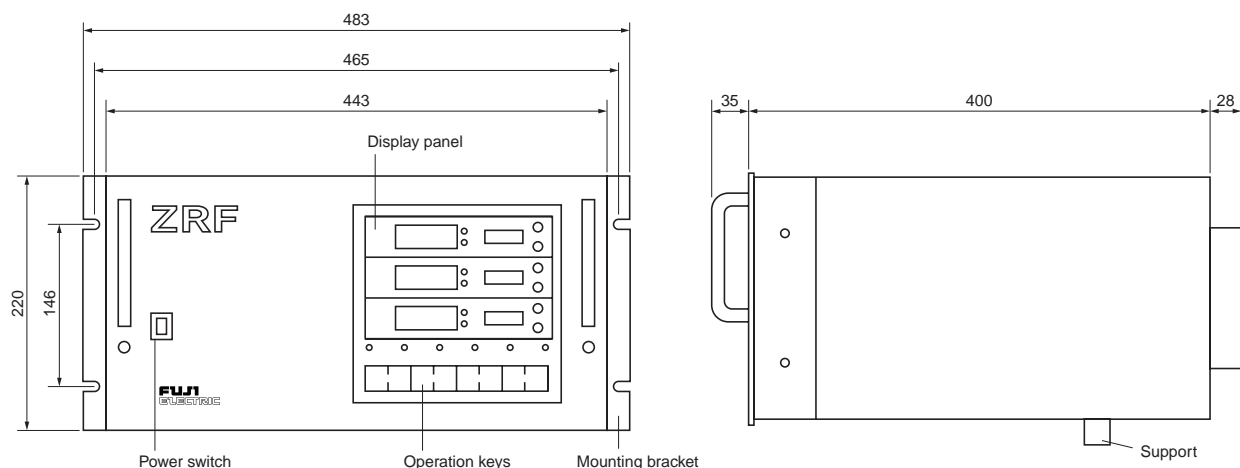
Remarks: (1) ○ : available range for 1st measuring range.
Up to 1:20 possible for 2nd range.
(Max. 2000ppm for NO analyzer)

Garbage application
(CO₂: 0 to 50%
CH₄: 0 to 80%

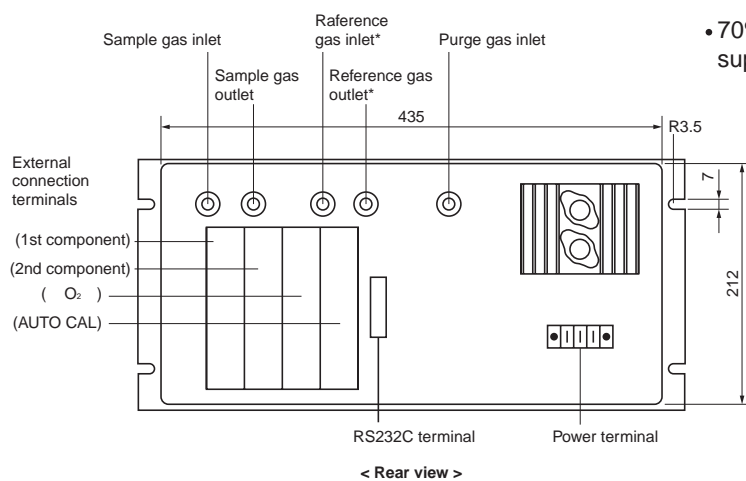
CO CO ₂	200 ppm	250 ppm	500 ppm	0.1 %	0.2 %	0.5 %	1 %	2 %	5 %	10 %	20 %	50 %	100 %
200ppm	○	○	○	○	⊗	⊗	-	-	-	-	-	-	-
250ppm	○	○	○	○	⊗	⊗	⊗	-	-	-	-	-	-
500ppm	○	○	○	○	○	○	⊗	⊗	-	-	-	-	-
0.1%	⊗	⊗	⊗	○	○	○	⊗	⊗	⊗	-	-	-	-
0.2%	⊗	⊗	⊗	⊗	○	○	○	⊗	⊗	⊗	-	-	-
0.5%	-	-	⊗	⊗	⊗	⊗	○	○	⊗	⊗	⊗	-	-
1%	-	-	-	⊗	⊗	⊗	○	○	○	⊗	⊗	⊗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

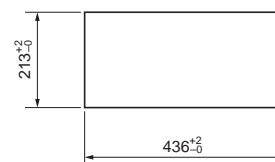
OUTLINE DIAGRAM (Unit:mm)



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

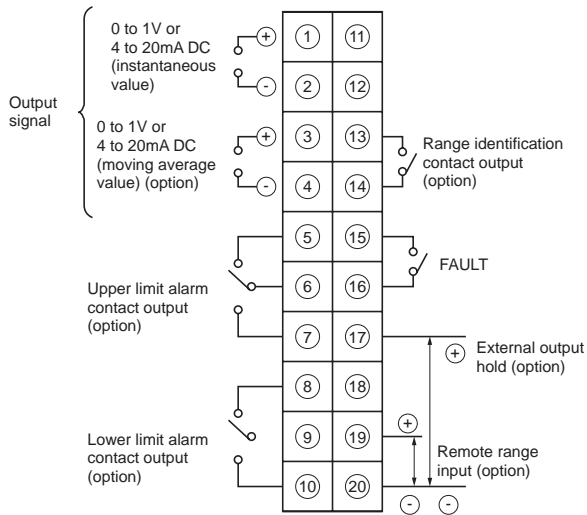


Panel cutout dimensions (in case of panel flush mounting)

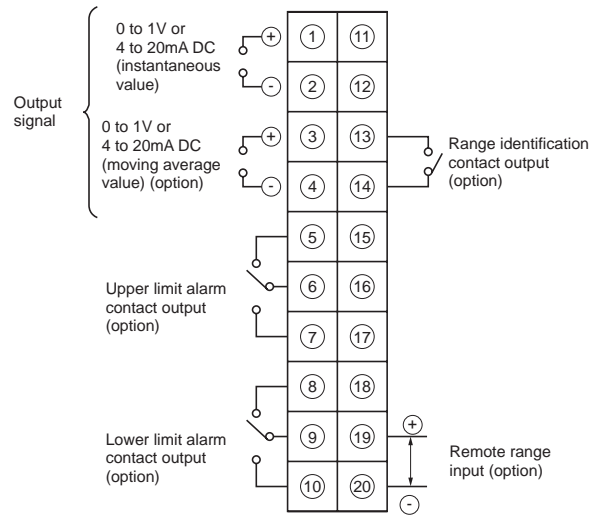


EXTERNAL CONNECTION DIAGRAM

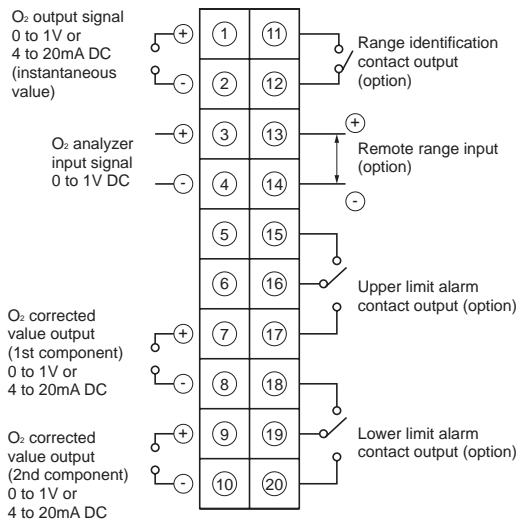
1st component



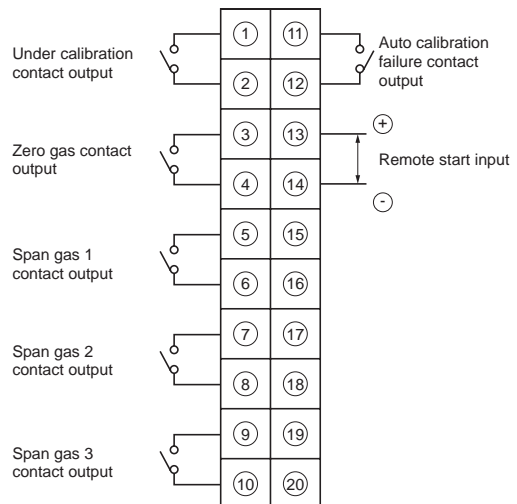
2nd component



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

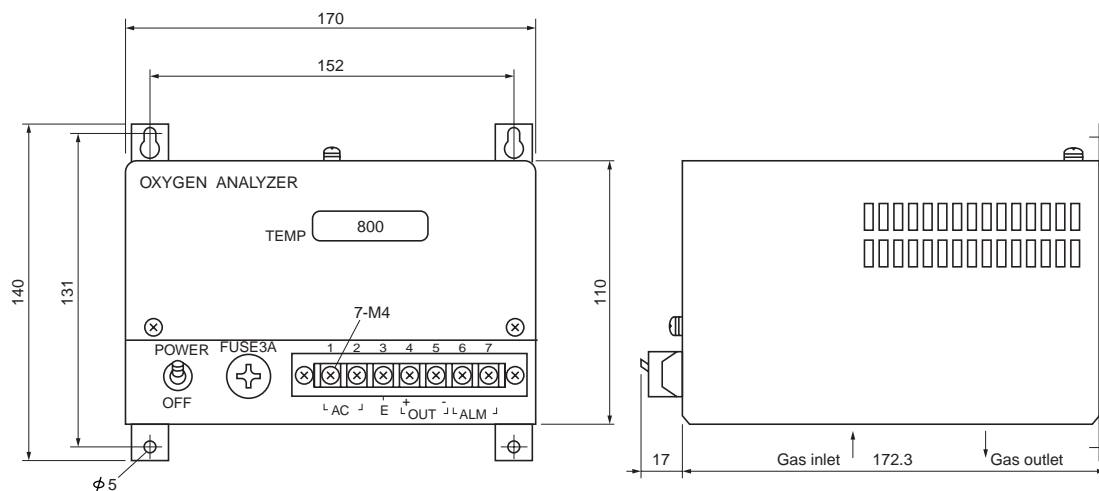
Mass {weight}: Approx. 3kg

Finish color: Munsell 5Y 7/1

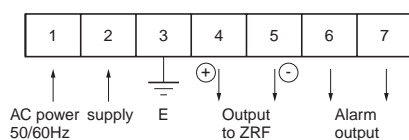
CODE SYMBOLS

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	
							-----						Power supply	
							-----						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.

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