FUJI ELECTRIC

NDIR TYPE INFRARED GAS ANALYZER

DATA SHEET

ZRH

This NDIR gas analyzer is used for measuring CO_2, CO, SO_2 and CH_4 and features a high accuracy, multiple functions and easy operation through use of a microprocessor. It is housed in a 19 inch rack case suitable for mounting on a panel or a table-top.

The analyzer provides a performance superior to the conventional double-beam system, is easy to maintain, and offers an excellent long-term stability. It is thus optimum for continuous measurement in the combustion control of various industrial furnaces, in research on garden-plants, and so on.

FEATURES

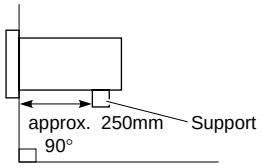
1. The use of a microprocessor provides high accuracy, multiple functions and easy operation.
   - Zero and span calibration is accurate and easy just by pressing the calibrating keys.
   - A self-diagnosis function is included.
   - An automatic calibrating function can be provided as an option.
   - Range can be changed over by a external signal as an option.
2. An improved optical system provides long term stability, and there is a minimum of drift caused by contamination of the measuring cell, so the long-term stability is excellent.
3. Adopting a serial dual-layer type of transmission detector minimizes remarkable the interface from other gas components.
4. Easy maintenance.
   The single-beam photometric system uses a sample cell only and eliminates the necessity of delicate adjustment for optical balance. The instrument is designed as a unit of simple construction featuring easy maintenance and checks.

SPECIFICATIONS

Measurable gas components:
Single-component
CO_2 CO, SO_2, CH_4:
Dual-component
CO_2/CO:
Landfill garbage application
CO_2: 0 to 50%
CH_4: 0 to 80%

Measuring range: Refer to measurable range combination table (page 5).
Measuring system:
Non-dispersion infrared-ray absorption method, deviation method, single light source – single beam
Output signal: Output 1; 0 to 1V DC
Output 2; 4 to 20mA DC (optional allowable load resistance 550Ω or less).
Repeatability: 1st range (low range)
Within ±0.5% of full scale
2nd range (high range)
Within ± 1% of full scale
Linearity: ±2% of full scale
Zero drift: Within ±2% of full scale/week
Span drift: Within ±2% of full scale/week
Response time: Within 15 seconds max. (for 90% response) depending on cell length
Power supply: 100V, 115V, 220V or 240V ±10% AC, 50/60Hz
Power consumption:
37VA max.

Ambient temperature:
–5 to +45°C
Ambient humidity:
90% RH or less
Enclosure: Steel casing, for indoor use
Storage condition:
Temperature; –20 to +60°C
Humidity; 100% RH max. (free from condensation)
Outer dimensions (H x W x D):
Rack mounting type;
133 x 483 x 435 mm
Panel flush mounting type;
133 x 443 x 435 mm
Table-top type;
Mass weight: Approx. 12Kg
Finish color: Munsell 2.5Y8.4/1.2
Display: 4 digit LED for concentration display
4 digit LED for sub-display
Output hold: Output value before manual or automatic calibration is hold. Whether or not to effect hold function can be selected.
Sample gas condition:
Temperature; 0 to 50°C
Dust; less than 0.3 μm
Pressure; less than 9.8 kPa
Standard adjustment gas:
Dry N_2 Balance
Warm up time: Approx. 2 hours
Material of gas-contacting parts:
Sample cell, SUS304, neoprene rubber
Infrared-ray transmitting window; CaF_2 or sapphire
Internal tubing; Toaron tube
Gas inlet/outlet, purge gas inlet size:
Rc1/4 (PT1/4 internal thread) or NPT1/4 internal thread
Measured gas flow rate:
1 ±0.5 liter/minutes
Purge gas flow rate:
Approx. 1 liter/minute
Scope of delivery: Analyzer, power fuse, manual, mounting bracket in the case of panel mounting type
Mounting method:
Mounted on 19 inch rack, or 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 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. A void vibration, and select a clean place free of corrosive and/or combustible gases. If installing outdoors, provide a suitable casing or cover to protect the analyzer from wind, rain, etc.

Optional specifications

Remote output hold:
Analog output (DC0-1V, 4-20mA) is held via external signal.
Input signal: 5V DC
Remote range changeover:
Range is changeable via external signal.
Range changeover input signal: 5V DC
Range identification signal output:
Contact output; 1 a contact
Contact capacity; 250V AC, 2A (resistive load)
Automatic calibration:
Zero and span are automatically calibrated at the preset cycle. Calibration gas is supplied sequentially by driving an electromagnetic value installed outside.
Calibration channel:
Up to 2 components can be calibrated simultaneously.
Zero calibration point:
Fixed at 0%
Span calibration point:
50 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 2
(4) Zero gas – span gas 1 – span gas 2
Calibration gas flow time:
Settable from 100 to 599 sec.
Calibration cycle:
1 to 199 hours (in 1-hour step)
Calibration failure alarm:
Provided when fault occurs during auto calibration.
Contact output:
During calibration; 1 a (N.O) contact, contact capacity 250V AC, 2A (resistive load)
Calibration failure; 1 a (N.O) contact, contact capacity 250V AC, 2A (resistive load)
Electromagnetic valve drive; 1 a (N.O) contact, contact capacity 250V AC, 2A (resistive load)
Remote start: Remote start signal; voltage input 5V DC

CODE SYMBOLS

(1) Single-component analyzer

1	2	3	4	5	6	7	8		9	10	11	12	13		14	15	16	17		18	Description
Z	R	H	1			Y	2	-			A			-		Y			-		
			1																		**No. of measurable components** Single component
				A																	**Measurable component** SO_2
				B																	CO
				D																	CO_2
				E																	CH_4
					E																**Measuring range (1st range) (Note 1)** 0 to 500 ppm
					F																0 to 1000 ppm
					G																0 to 2000 ppm
					U																0 to 2500 ppm
					H																0 to 5000 ppm
					J																0 to 1%
					K																0 to 2%
					Q																0 to 3%
					L																0 to 5%
					M																0 to 10%
					N																0 to 20%
					W																0 to 40%
					P																0 to 50%
					X																0 to 70%
					R																0 to 100%
					Z																Others
									0												**Power supply, Piping connection** 100V AC 50Hz Rc 1/4
									1												100V AC 60Hz Rc 1/4
									2												115V AC 60Hz Rc 1/4
									3												220V AC 50Hz Rc 1/4
									4												100V AC 50Hz NPT 1/4
									5												100V AC 60Hz NPT 1/4
									6												115V AC 60Hz NPT 1/4
									7												220V AC 50Hz NPT 1/4
									8												240V AC 50Hz NPT 1/4
									9												240V AC 50Hz Rc 1/4
										A											**Structure** Table top type
										B											19 inch rack mounting type
										C											Panel mounting type
											A										**Output signal (Output 1/2) (Notes 2, 3)** 0 to 1V DC /4 to 20mA DC
												Y									**Optional function (1)** None
												A									With auto-calibration
													Y								**Optional function (2)** None
													A								With remote range, range identification and remote output hold
															Y						**Measuring range (2nd range) (Note 1)** None
															F						0 to 1000 ppm
															G						0 to 2000 ppm
															U						0 to 2500 ppm
															H						0 to 5000 ppm
															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						Others
																A					**Adjustment gas** Standard
																B					for carburizing furnace
																Z					Others (Note 4)
																	Y				**Paint** Fuji standard
																		Z			**Non standard specifications** Non standard

Notes :
(1) Refer to measurable range combined table
(2) Output signal are provided simultaneously
(3) 0 to 100mV, 0 to 10mV DC is available on request
(4) To be adviced components of sample gas

(2) Dual-component analyzer

1 2 3 4 5 6 7 8	9 10 11 12 13	14 15 16 17	18	Description
Z R H 2 G 2	A			
				No. of measurable components
2				Dual component
				Measurable component
G				CO_2/CO
				Measuring range (1st comp. 1st range) Note (5, 6)
H				0 to 5000 ppm
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				Others
				Measuring range (2nd comp. 1st range) Note (5, 6)
E				0 to 500 ppm
F				0 to 1000 ppm
G				0 to 2000 ppm
H				0 to 5000 ppm
J				0 to 1%
K				0 to 2%
L				0 to 5%
M				0 to 10%
N				0 to 20%
V				0 to 25%
P				0 to 50%
R				0 to 100%
Z				Others
				Power supply, Piping connection
0				100V AC 50Hz Rc 1/4
1				100V AC 60Hz Rc 1/4
2				115V AC 60Hz Rc 1/4
3				220V AC 50Hz Rc 1/4
4				100V AC 50Hz NPT 1/4
5				100V AC 60Hz NPT 1/4
6				115V AC 60Hz NPT 1/4
7				220V AC 50Hz NPT 1/4
8				240V AC 50Hz NPT 1/4
9				240V AC 50Hz Rc 1/4
				Structure
A				Table top type
B				19 inch rack mounting type
C				Panel mounting type
				Output signal (Output 1/2) (Notes 2, 3)
A				0 to 1V/DC 4 to 20mA DC
				Optional function (1)
Y				None
A				With auto-calibration
				Optional function (2)
Y				None
A				With remote range, range identification and remote output hold

Note (5) Refer to measurable range combination table
(6) 1st comp. is CO_2, 2nd comp. is CO.

1 2 3 4 5 6 7 8	9 10 11 12 13	14 15 16 17	18	Description
Z R H 2 G 2	A			
				Measuring range (1st comp. 2nd range)
Y				None
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				Others
				Measuring range (2nd comp. 2nd range)
Y				None
F				0 to 1000 ppm
G				0 to 2000 ppm
H				0 to 5000 ppm
J				0 to 1%
K				0 to 2%
L				0 to 5%
M				0 to 10%
N				0 to 20%
V				0 to 25%
P				0 to 50%
R				0 to 100%
Z				Others
				Adjustment gas
A				Standard
B				for carburizing furnace
Z				Others
				Paint
Y				Fuji standard
				Non standard specifications
Z				Non standard

The product conforms to the requirements of the Electromagnetic compatibility Directive 89/336/EEC as detailed within the technical construction file number TZ734576. The applicable standards used to demonstrate compliance are :

EN 50081-1 : 1991 CLASS A Conducted and Radiated emissions

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

Measurable range combination table

(1) Single-component (CO_2• CO• CH_4)

1st range \ 2nd range		F	G	U	H	J	K	L	M	N	P	R
		0 to 1000 ppm	0 to 2000 ppm	0 to 2500 ppm	0 to 5000 ppm	0 to 1%	0 to 2%	0 to 5%	0 to 10%	0 to 20%	0 to 50%	0 to 100%
E	0 to 500 ppm	◎ ○	◎ ○	◎ ○	—	—	—	—	—	—	—	—
F	0 to 1000 ppm	—	◎ ○ △ □	◎ ○ △ □	◎ ○ △ □	—	—	—	—	—	—	—
G	0 to 2000 ppm	—	—	◎ ○ △ □	◎ ○ △ □	◎ ○ △	—	—	—	—	—	—
U	0 to 2500 ppm	—	—	—	◎ ○ △ □	◎ ○ △	—	—	—	—	—	—
H	0 to 5000 ppm	—	—	—	—	◎ ○ △	◎ ○ △	—	—	—	—	—
J	0 to 1%	—	—	—	—	—	◎ ○ △	◎ ○ △	—	—	—	—
K	0 to 2%	—	—	—	—	—	—	◎ ○ △	◎ ○ △	—	—	—
Q	0 to 3%	—	—	—	—	—	—	◎ ○ △	◎ ○ △	—	—	—
L	0 to 5%	—	—	—	—	—	—	—	◎ ○ △	◎ ○ △	—	—
M	0 to 10%	—	—	—	—	—	—	—	—	◎ ○ △	◎ ○ △	—
N	0 to 20%	—	—	—	—	—	—	—	—	—	◎ ○ △	◎ ○
W	0 to 40%	—	—	—	—	—	—	—	—	—	◎ ○ △	◎ ○ △
P	0 to 50%	—	—	—	—	—	—	—	—	—	—	◎ ○ △
X	0 to 70%	—	—	—	—	—	—	—	—	—	—	◎ ○ △
R	0 to 100%	—	—	—	—	—	—	—	—	—	—	◎ ○ △

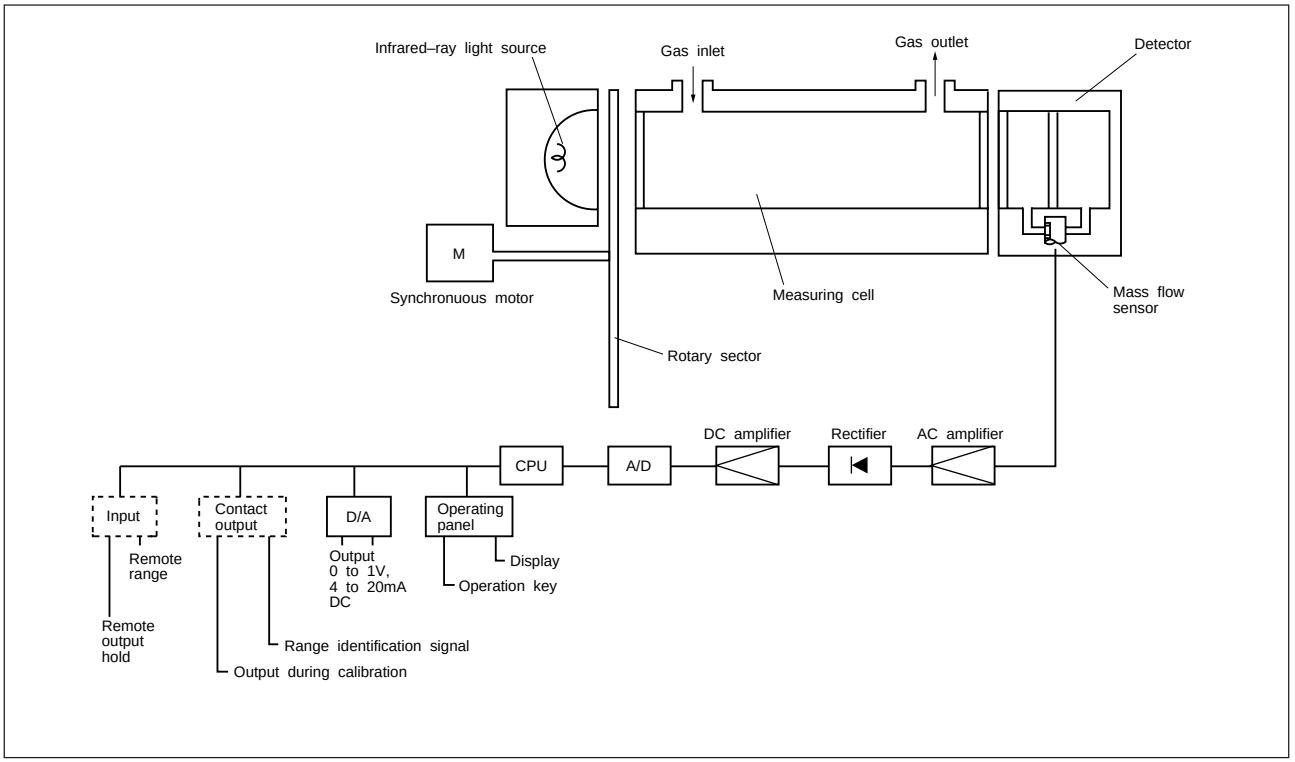
◎:CO_2 ○:CO △ : CH_4 □:SO_2 —: Impossible
* Also single range is possible

(2) Dual-components (CO_2/CO)

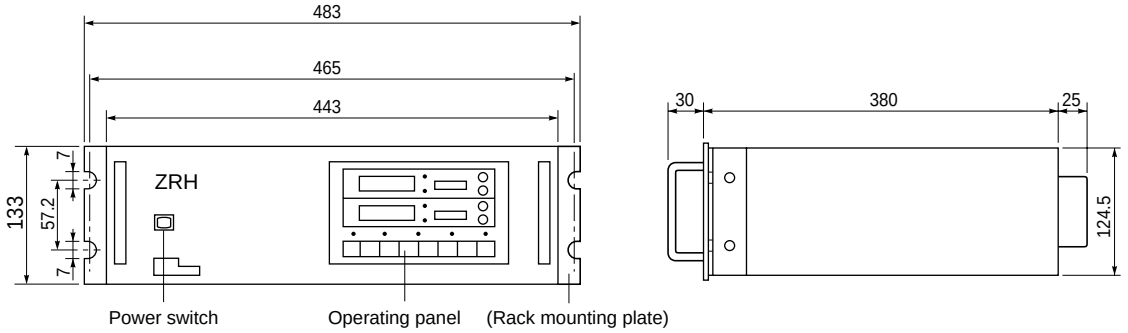
1st component 1st range		2nd component 1st range	CO											
			E	F	G	H	J	K	L	M	N	V	P	R
			0 to 500ppm	0 to 1000ppm	0 to 2000ppm	0 to 5000ppm	0 to 1%	0 to 2%	0 to 5%	0 to 10%	0 to 20%	0 to 25%	0 to 50%	0 to 100%
CO_2	H	0 to 5000 ppm	–	○	○	○	○	○	○	○	○	○	○	○
	J	0 to 1%	○	○	○	○	○	○	○	○	○	○	○	○
	K	0 to 2%	○	○	○	○	○	○	○	○	○	○	*○	○
	L	0 to 5%	○	○	○	○	○	○	○	○	○	○	○	○
	M	0 to 10%	○	○	○	○	○	○	○	○	○	○	○	○
	N	0 to 20%	○	○	○	○	○	○	○	○	○	○	○	○
	P	0 to 50%	○	○	○	○	○	○	○	○	○	○	○	○
	R	0 to 100%	○	○	○	○	○	○	○	○	○	○	○	○

1st component is CO_2, 2nd component is CO.
○ : Dual-components are possible
Both components are able to have 2nd range.
2nd range is x 2 or x 2.5 of 1st range, choose the Code symbols
*○ : Dual-components are possible
But only one component, CO_2 or CO, is able to have 2nd range. 2nd range is x 2 or x 2.5 of 1st range, choose the Code Symbols.
— : Impossible.

FUNDAMENTAL PRINCIPLE DIAGRAM

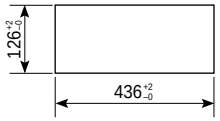


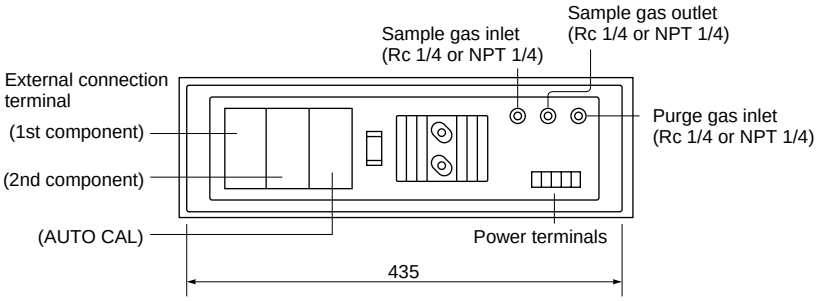
OUTLINE DIAGRAM (Unit:mm)



<Front View> <Side View>

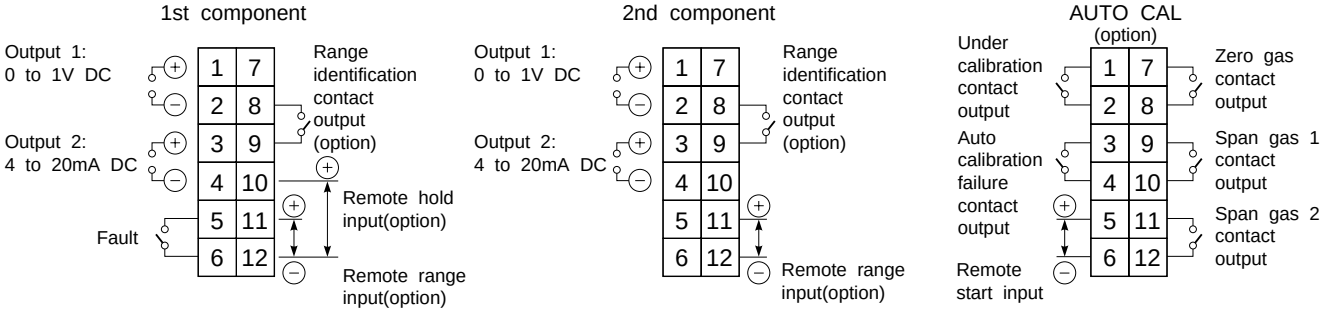
Panel cutout dimensions
(in case of panel mounting)





<Rear View>

CONNECTION DIAGRAM



SCOPE OF DELIVERY

1 x gas analyzer main unit
1 x test report
1 x instruction manual
2 x Power fuse
4 x panel mounting bracket

RELATED DEVICES

- Gas sampling device
- Accommodating locker
- Standard gas (for calibration)
- Receiving instrument

ORDERING INFORMATION

1. Analyzer type.
2. Maximum, normal and minimum concentrations of sample gas as well as type and content (percent by volume) of concomitant gas.
3. Temperatures (maximum, normal and minimum), pressure and humidity of sample gas.
4. Dust conditions (mg/Nm^3 or particle size, characteristics, etc.) and environmental conditions.
5. Other items

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