

Simultaneous Measurement of 5 Components in Flue Gas **NO_x, SO₂, CO, CO₂ and O₂ ANALYZER**

Single-beam with sample switching method **Model ZSJ**



**Japanese Meas.
Low approval**

Accurate, simultaneous, and continuous measurement of up to 5 components by a single instrument

- **Fuji's unique and innovative single-beam NDIR ensures excellent zero stability**
- **Easy to operate with large LCD menu driven**
- **Easy to maintain and all maintenance from the front side of the cubicle is available**
- **Zirconia oxygen sensor realizes long-term stability and reduction of maintenance requirements (Paramagnetic oxygen sensor available as option)**

Continuous monitoring of flue gases generated from boilers or garbage incinerators

CO and O₂ measurement complies with the Japanese regulation on dioxin emission.

Insulated analog output of readings for 5 components

Instantaneous values: NO_x, SO₂, CO, CO₂, O₂
 O₂ corrected instantaneous values: NO_x, SO₂, CO
 O₂ corrected average values: NO_x, SO₂, CO
 O₂ average values: O₂

Easy-to-see back-lit LCD indication

Represents change of concentrations of 5 components simultaneously in real time.



Measurement gas inlet

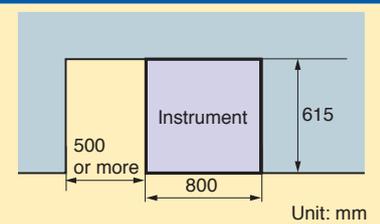
Easily replaceable filter

Sampling of gases while eliminating moisture and foreign matter

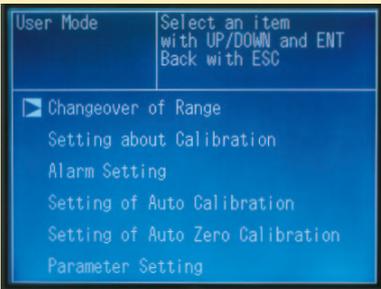
Houses six 3.4 L standard gas cylinders

Can accommodate up to 6 zero and span standard gas cylinders.

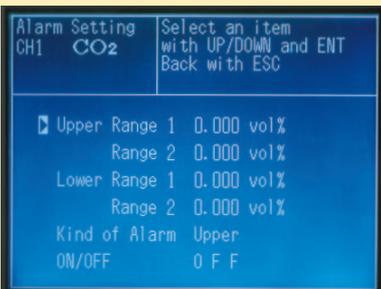
Space-saving design



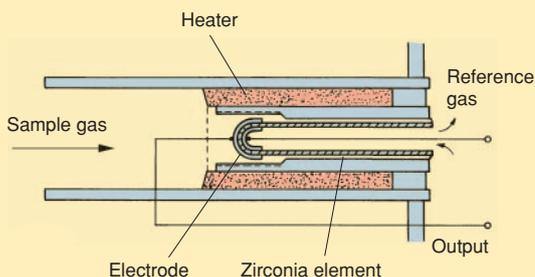
Menu screen



Setting screen

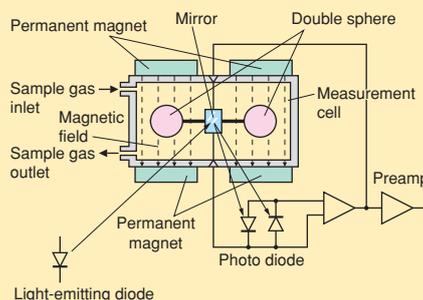


Zirconia oxygen meter that continuously measures the oxygen concentrations (0 to 25%) in sample gases



Detects the EMF (electromotive force) of an oxygen concentration cell generated on electrodes on the front and rear of the Zirconia element

High-response magnetic oxygen meter dispensing with auxiliary gas and unaffected by combustible gases



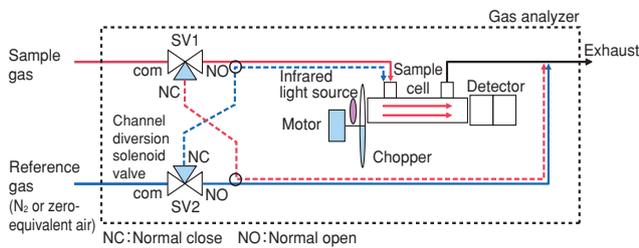
When sample gas enters the measurement cell, the oxygen molecule is attracted to a field where there is considerable magnetic field strength, so that a force corresponding to the oxygen concentration is applied to the double sphere, where it is then converted into an electrical signal.

Gas analyzer realized by the long-term accumulated know-how

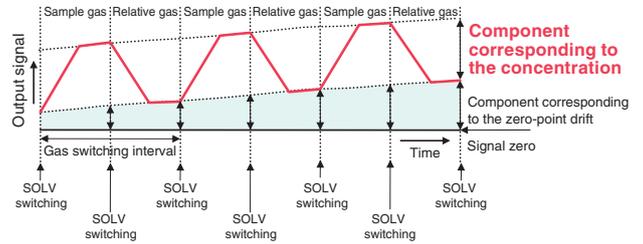
Applicable to garbage and industrial refuse incinerators, gas boilers, sludge burning and oil/coal boilers, iron and steel heating furnaces, etc.

Zero-drift is eliminated by single-beam and sample switching method

Principle of the sample switching system



This product has enhanced stability of the single-beam method, which has usually not been used for low-concentration gas measurement, by measuring sample gas and reference gas alternately, and thus is capable of measuring low-concentration gas.



The sample switching system uses a built-in solenoid valve ("SOLV") to introduce a sample gas and a reference gas equivalent to the zero gas alternately at certain intervals (10 seconds). Measuring these gases alternately makes it possible to compensate the zero point during measurement. The above figure shows the drift-less mechanism. The "component corresponding to the concentration" is used as a measured value. The shaded area represents the zero drift component of output. This area is nearly eliminated by sample switching the zero reference gas.

A paper-less recorder can be housed (option)



Type: PHR

Number of recording points: 9 or 18
Indicator: Color LCD
Recording medium: Compact flash memory (2 GB max.)
Input signal: 4 to 20 mA DC, 1 to 5 V DC, thermocouple, resistance bulb, etc.

Gas extractor with easily replaceable filter



Sampling point temperature	Sampling tube material
Max. 800°C	SUS316
Max. 1000°C	Titanium
Max. 1300°C	SiC

SUS316 wire mesh filter provided.
Power supply 100 V AC, 100 VA.

Equipments for special use can be housed (option)

<Application>

- 1) Switching control and multi-point signal output for multi-point measurement using 1 set of gas analyzer
- 2) Blow-back control for gas extractor and output signal hold function for gas measurement in high-dust environment.



Calculators

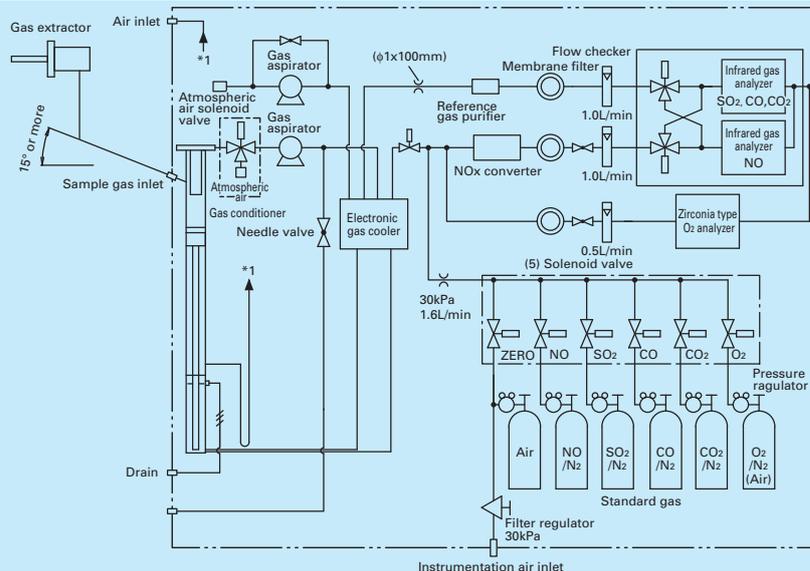


Sequencer

Japanese Meas. Low approval

- No. SAS131 (SO₂ meter)
- No. SAC131 (CO meter)
- No. SAN131 (NO_x meter)
- No. SE981
(Zirconia O₂ meter)
- No. SF011
(Magnetic O₂ meter)

Gas sampling system



Code symbols

ZSJ

Digit	Description	Code
4	<Measuring gas component>	
	NO _x	P
	SO ₂	A
	CO	B
	NO _x , SO ₂	F
	NO _x , CO	H
	NO _x , SO ₂ , CO	L
NO _x , SO ₂ , CO, CO ₂	M	
5	<O₂ Sensor> <O₂ correction value>	
	Without Without	0
	Zirconia 4% (Oil fuel)	4
	Zirconia 5% (Gas fuel)	5
	Zirconia 6% (Coal fuel)	6
	Zirconia 12% (Refuse incinerator)	C
	Magnetic 4% (Oil fuel)	D
	Magnetic 5% (Gas fuel)	E
Magnetic 6% (Coal fuel)	F	
Magnetic 12% (Refuse incinerator)	G	
6	<NO_x measuring range>	
7	Select your code in the Table1	
8	<Revision code>	1
9	<SO₂ measuring range>	
10	Select your code in the Table1	
11	<CO measuring range>	
12	Select your code in the Table1	
13	<O₂ measuring range>	
	Without	0
	25%	2
	10%/25%	1
14	<CO₂ measuring range>	
	Without	0
	10%/20%	1
	10%/Without	2
20%/Without	3	
15	<Cubicle structure> <Ambient temperature>	
	Indoor structure -5 to 40°C	1
	Outdoor Structure -5 to 40°C	2
	Indoor structure -10 to 40°C	3
	Outdoor Structure -10 to 40°C	4
16	<Display screen> <Inspection> <Recorder>	
	Japanese With With (Note1)	A
	English With With (Note1)	B
	Japanese Without With (Note1)	C
	English Without With (Note1)	D
	Japanese With Without	E
	English With Without	F
	Japanese Without Without	G
English Without Without	H	
17	<Power supply>	
	100V AC 50Hz	A
	100V AC 60Hz	B
	110V AC 50Hz	C
	110V AC 60Hz	D
	115V AC 50Hz	E
	115V AC 60Hz	F
	200V AC 50Hz	G
	200V AC 60Hz	H
	230V AC 50Hz	J
	230V AC 60Hz	K
18	<Zero gas> <External drain separator>	
	Instrumentation air Without	1
	Air Without	2
	Standard gas Without (Note3)	3
	Instrumentation air With (Note2)	4
	Air With (Note2)	5
	Standard gas With (Note2,3)	6
*Order standard gas (type ZSY) separately		

Digit	Description	Code
19	<Gas extractor> <Tube material> <Tube length> <Extraction point temperature>	
	Without Without Without -	Y
	With Without Without -	1
	With SUS316 300mm 800°C or lower	A
	With SUS316 400mm 800°C or lower	B
	With SUS316 600mm 800°C or lower	C
	With SUS316 800mm 800°C or lower	E
	With SUS316 1000mm 800°C or lower	G
	With SUS316 1200mm 800°C or lower	H
	With SUS316 1500mm 800°C or lower	J
	With SUS316 2000mm 800°C or lower	K
	With Titanium 600mm 1000°C or lower	P
	With Titanium 800mm 1000°C or lower	Q
	With Titanium 1000mm 1000°C or lower	R
With SiC 700mm 1300°C or lower	D	
With SiC 900mm 1300°C or lower	F	
20	<Kind of sample inlet tube> <Length>	
	Without Without	Y
	φ 10/φ 8 Teflon tube 5m	A
	φ 10/φ 8 Teflon tube 10m	B
	φ 10/φ 8 Teflon tube 15m	C
	φ 10/φ 8 Teflon tube 20m	D
	φ 10/φ 8 Teflon tube 25m	E
	φ 10/φ 8 Teflon tube 30m	F
	φ 10/φ 8 Teflon tube 50m	G
	Heating tube 10m	H
	Heating tube 15m	J
Heating tube 20m	K	
Heating tube 25m	L	
Heating tube 30m	M	

<Table1> Measuring Range & code

Measuring Range	Code
Without	YY
50/100ppm	AB
50/200ppm	AC
50/250ppm	AD
50/500ppm	AE
50/Without	AY
100/200ppm	BC
100/250ppm	BD
100/500ppm	BE
100/1000ppm	BF
100/Without	BY
200/500ppm	CE
200/1000ppm	CF
200/2000ppm	CG
200/Without	CY
250/500ppm	DE
250/1000ppm	DF
250/2000ppm	DG
250/Without	DY
500/1000ppm	EF
500/2000ppm	EG
500/5000ppm	EH
500/Without	EY
1000/2000ppm	FG
1000/5000ppm	FH
1000/Without	FY
2000/5000ppm	GH
2000/Without	GY
5000/Without	HY

Note1) Recorder type : PHR

Regarding recording contents, be sure to specify them separately.

Note2) Specify this code when the downward inclination of the sample inlet tube from the gas extraction point to the analyzer gas inlet is less than 15 ° or when moisture content of the sample gas is higher than 30%.

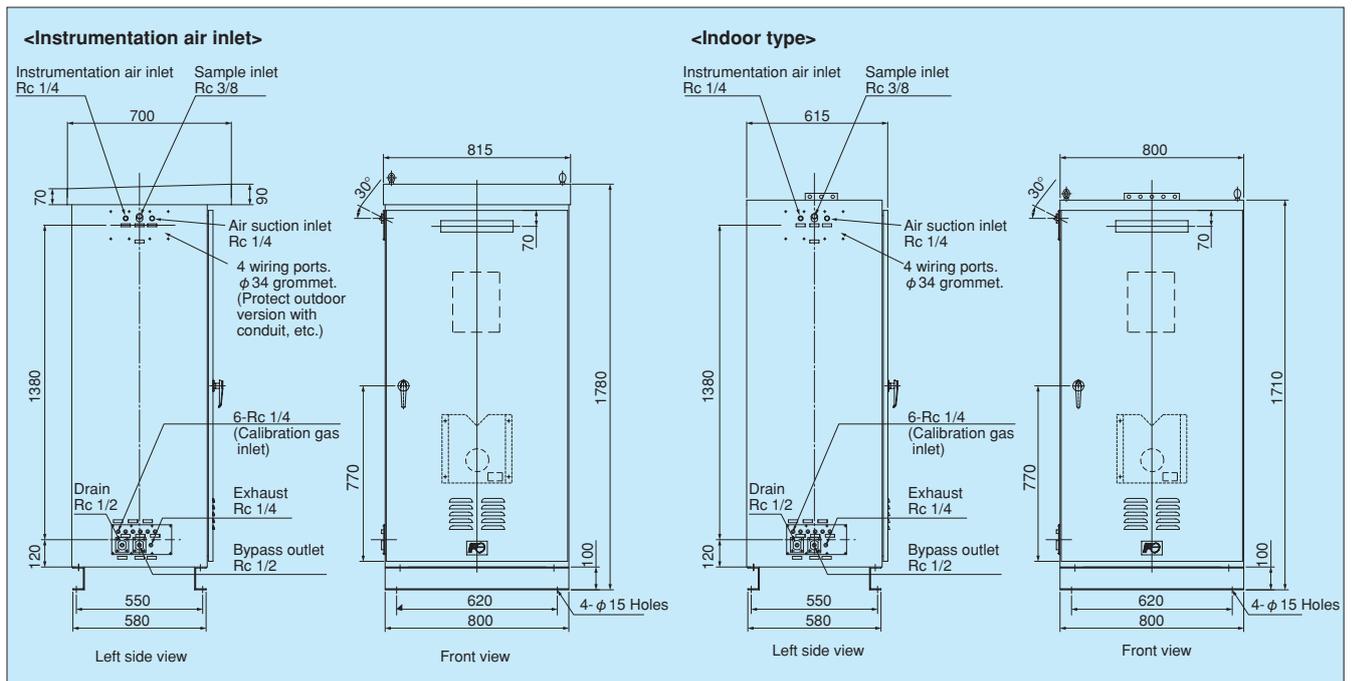
Note 3) Specify code 3 or 6 for Japanese pattern approval type and/or when CO₂ meter is selected.

Main specifications

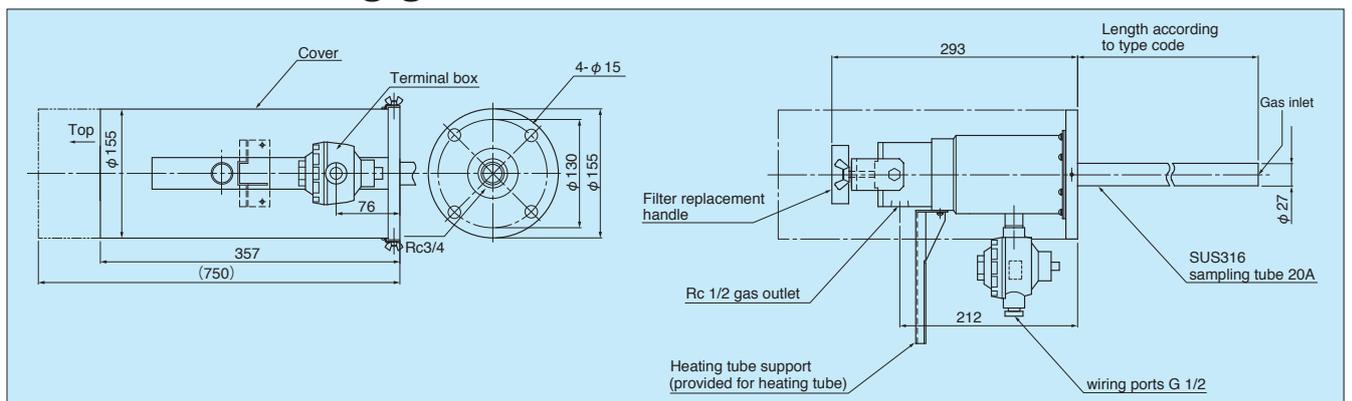
Measuring principle	NO _x , SO ₂ , CO, CO ₂ : Non-dispersion infrared (NDIR) O ₂ : Zirconia or magnetic force
Measuring component measurement range	NO _x : 0~50ppm.....5000ppm SO ₂ : 0~50ppm.....5000ppm CO : 0~50ppm.....5000ppm CO ₂ : 0~10% / 0~20% O ₂ : 0~10% / 0~25% (2 ranges each, maximum range ratio 1: 10 except O ₂)
Repeatability	±0.5% FS
Linearity	±1.0% FS max
Zero drift	±1.0% FS max./week ±2.0% FS max./month for O ₂ meter
Span drift	±2.0% FS max./week ±2.0% FS max./month for O ₂ meter
Measurement gas extractor	About 3L/min
Response speed	120 seconds max. for 90% response from the analyzer inlet (240 seconds max./month for the SO ₂ meter)
Output signal	4 to 20mA DC Instantaneous value output (each measurement gas component concentration) O ₂ correction instantaneous value output O ₂ correction average value output Allowable load resistance: 750 Ω max. for isolated output
External contact input	No-voltage contact Automatic calibration start, average value reset, range changeover, output hold, pump OFF
Contact output	Each component range identification, analyzing section error, calibration error, auto calibration status, maintenance status, CO peak count alarm, each component instantaneous concentration alarm, analyzing section power OFF
Auto calibration function	Zero, span are auto calibrated (calibration cycle settable)

Indication	Back-lit LCD Each component instantaneous value, O ₂ correction instantaneous value, O ₂ correction average value, O ₂ average value Parameter setting (In Japanese or English as specified)
Locker inside fluorescent lamp	Standard provided
Recorder (option)	Paper-less recorder (Type PHR) can be housed
Gas extractor	Electric heating type (40 μm SUS316 wire mesh filter provided) Flange: JIS5K 65A Power supply: 100V AC 50/60Hz Sampling tube material: SUS316 or titanium, SiC
Sample inlet tube	φ 10/ φ 8mm Teflon tube or heating tube (30m max.) Specify the heating tube in the following cases • Ambient temperature is lower than -5°C • SO ₂ range is 100ppm or lower • For SO ₂ measurement, the heating tube length is 10 m or more
Dimensions	Indoor type: 1710(H)×800(W)×615(D)mm Outdoor type: 1780(H)×815(W)×700(D)mm
Mass	About 300kg (standard gas excluded)
Ambient conditions	-5 to +40°C or -10 to +40°C, 90% RH max
Source voltage	100, 110, 200, 230V AC 50 or 60Hz as specified
Power consumption	900VA max. (gas extractor, heating tube excluded)
Measurement gas conditions	Temperature: 60 to 800°C (standard) 1300°C (Gas extractor tube material: Titanium) 1300°C (Gas extractor tube material: SiC) Dust: 100mg/Nm ³ max., Pressure: -5~+5kPa Component: SO ₂ 500ppm max., NO _x 1000ppm max. CO ₂ 0~15%, CO 0~2000ppm, O ₂ 1~21%, HCl 100ppm max.

Dimensions (Unit: mm)



Electric heating gas extractor



Related products

Simultaneous Measurement of
5 Components in Flue Gas

NO_x, SO₂, CO, CO₂ and O₂ analyzer <Type ZSU>



Japanese pattern approval

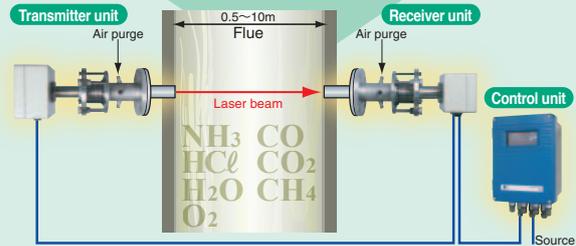
SAS992-1(SO₂ meter)
SAC992-1(CO meter)
SAN992-1(NO_x meter)
SE981(Zirconia O₂ meter)
SF011(Magnetic O₂ meter)

Main specifications (Type ZSU)

Item	Description
Measurement principle	NO _x , SO ₂ , CO, CO ₂ : Non-dispersion infrared (NDIR) O ₂ : Zirconia or magnetic force
Measurement component Measurement range	NO _x : 0 to 50ppm.....5000ppm SO ₂ : 0 to 50ppm.....5000ppm CO : 0 to 50ppm.....5000ppm CO ₂ : 0 to 10% / 0 to 20% O ₂ : 0 to 10% / 0 to 25% (2 ranges each, maximum range ratio 1: 25 except O ₂) +Optionally, N ₂ O and CH ₄ can be measured
Repeatability	±0.5% FS
Zero drift	±1.0% FS max./week (±2.0% FS/week max. if range is less than 200ppm) ±2.0% FS max./month for O ₂ meter
Span drift	±2.0% FS max./week ±2.0% FS max./month for O ₂ meter
Response speed	120 seconds max. for 90% response from the analyzer inlet
Output signal	4 to 20mA DC Instantaneous value output (each measurement gas component concentration) O ₂ correction instantaneous value output O ₂ correction average value output
External contact input	No-voltage contact Automatic calibration start, average value reset, range changeover, output hold, pump OFF
Contact output	Each component range identification, analyzing section error, calibration error, auto calibration status, maintenance status, CO peak count alarm, each component instantaneous concentration alarm, etc.
Ambient conditions	-5 to +40°C or -10 to +40°C, 90% RH max
Source voltage	100, 110, 200, 230V AC 50 or 60Hz as specified
Dimensions	Indoor type: 1710 (H) × 800 (W) × 615 (D) mm Outdoor type: 1780 (H) × 815 (W) × 700 (D) mm
Measurement gas conditions	Temperature: 1300°C max. Dust: 100mg/Nm ³ Pressure: -3 to +3kPa Component: SO ₂ 500ppm max., NO _x 1000ppm max. CO ₂ 0 to 15%, CO 0 to 2000ppm, O ₂ 1 to 21%, HCl 100ppm max.

High speed concentration measurement for
NH₃ or HCl, H₂O, CO, CO₂, CH₄, O₂ in flue!

Laser gas analyzer <Type ZSS>



Features

- Excellent long term stability: ±1.0% FS/6 months (Zero drift)
- Ultrahigh response speed: 1 to 5 seconds
- Direct insertion requires practically no maintenance
- Hardly interfered with or affected by other gases
- 2 component (HCl + H₂O, NH₃ + H₂O) measurement function allows dry gas correction measurement
- Measurable at high temperatures and with high dust content
- Contributes to energy saving with a power consumption of about 75 VA

Main specifications (Type ZSS)

Item	Description
Measurement gas Measurement range	HCl : 0 to 10...5000ppm NH ₃ : 0 to 15...5000ppm CO : 0 to 2...50vol% CO ₂ : 0 to 2...50vol% CH ₄ : 0 to 100ppm...50vol% O ₂ : 0 to 4...100vol% (Note) H ₂ O range is 50vol% fixed
Measuring principle	Wavelength non-dispersion infrared (NDIR)
Installation method	Cross stack
Laser class	1M
Measurement optical path length (flue/stack width)	0.5-10m
Repeatability	±2.0% FS
Zero, span drift	±2.0% FS/6 months (±3.0% FS/6 months for NH ₃ range of 20ppm or less)
Response speed (= 90%)	1 to 5 seconds
Analog output	4-20mA DC, 0 to 1 V DC, 0 to 5V DC, 0 to 10V DC (as specified), 2 or 4 points
Analog input	4 to 20mA DC, 2 or 6 points
Communication function	USB or RS-485 (MODBUS)
Contact input (option)	3 points (Average value reset, remote hold, remote range changeover, instantaneous value/average value selection)
Contact output	5 points (beyond high/low limit range, poor beam detection, power OFF, hardware error, calibration status/hold status)
Source voltage	100 to 240V AC, about 75VA
Ambient temperature, humidity	Receiver unit/Transmitter unit: -20 to 55°C, control unit: -5 to 45°C. 90% RH max.
Measurement gas temperature	1200°C max.
Measurement gas pressure	±10kPa
Dimensions (W×D×H)mm	Receiver unit (180×400×200mm) Transmitter unit (240×400×200mm) Control unit(240×135×320mm)
Mass	Receiver unit, Transmitter unit: About 10kg each. Control unit: About 8kg
Mounting	Control unit: On wall or pipe Receiver unit, Transmitter unit: By flange

⚠ Caution on Safety

* Before using products in this catalog, be sure to read their instruction manuals in advance.

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