Fuji Electric

Innovating Energy Technology

Simultaneous Measurement of 5 Components in Flue Gas

NO_x,SO_2,CO,CO_2 and O_2 ANALYZER

(for N_2O, CH_4 also optionally) **Type ZSU-5**

A single instrument measures concentrations of 5 different gases accurately, simultaneously and continuously!

- Simultaneously and continuously measures concentrations of 5 different gases of NO_x, SO_2, CO, CO_2, O_2 (and, optionally, N_2O and CH_4).
- Adopts a double beam infrared analyzer, a Zirconia type oxygen meter or magnetic oxygen meter with high sensitivity and excellent long-term stability.
- The maintenance type on the front saves space.
- The correction resorting to a twin detector ensures the measurement is free from the majority of interference caused by other gases.
- The back-lit LCD indicates changes in 5 components simultaneously in real time.

21C1-E-0061

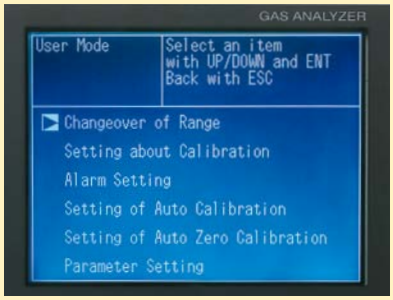
Continuously measures and monitors concentrations of flue gases generated from boilers or garbage incinerators

CO and O_2 measurement complies with the Japanese regulation on dioxin emission, while N_2O and CH_4 can also be optionally measured.

Easy-to-see back-lit LCD indication

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

Menu screen



Setting screen

Analog output of readings for 5 components

Instantaneous values: NOx, SO_2, CO, CO_2, O_2
O_2 corrected instantaneous values: NOx, SO_2, CO
O_2 corrected average values: NOx, SO_2, CO
O_2 average values: O_2

Measurement gas inlet

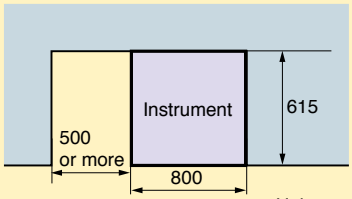
Easily replaceable filter

Sampling of gases while eliminating moisture and foreign matter

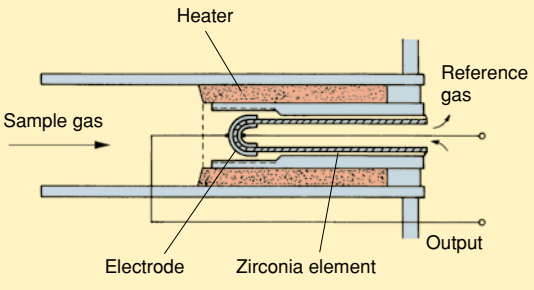
Houses six 3.4 L standard gas cylinders

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

Space-saving design

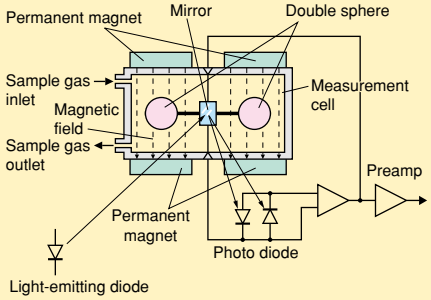


Zirconia oxygen meter that continuously measures the oxygen concentrations (0 to 25%) in sample gases



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

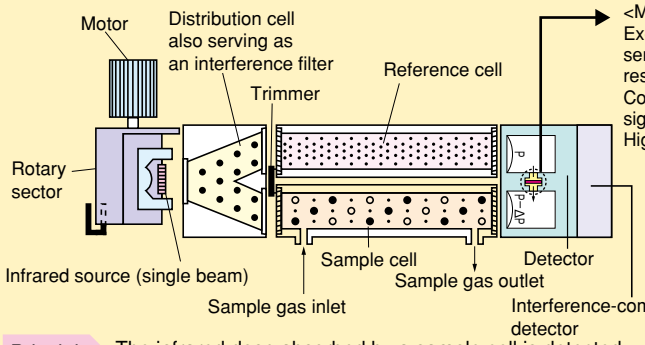


When sample gas enters the measurement cell, the oxygen molecule is attracted to a field where there is considerable magnetic field strength, so that a force corresponding to the oxygen concentration is applied to the double sphere, where it is then converted into an electrical signal.

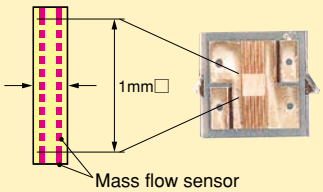
Gas analyzer realized by the concentration of long-term accumulated know-how

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

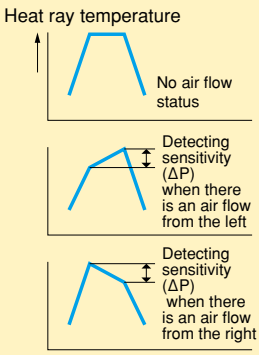
Measures NOx, SO_2, CO and CO_2 concentrations via an infrared method



<Mass flow sensor>
Excellent noise resistance thanks to the low impedance sensor. The absence of moving parts makes the device resistant to vibration and semi-permanently usable.
Converts the infrared absorbance into an electrical signal.
High sensitivity allows a ratio within the range 1: 25.



Mass flow sensor
(heat ray air flow velocity detecting element)



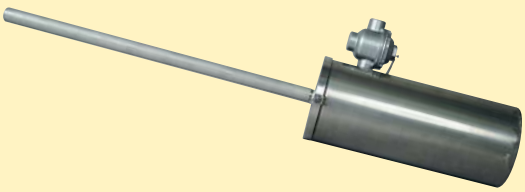
Principle The infrared dose absorbed by a sample cell is detected by the mass flow sensor.

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



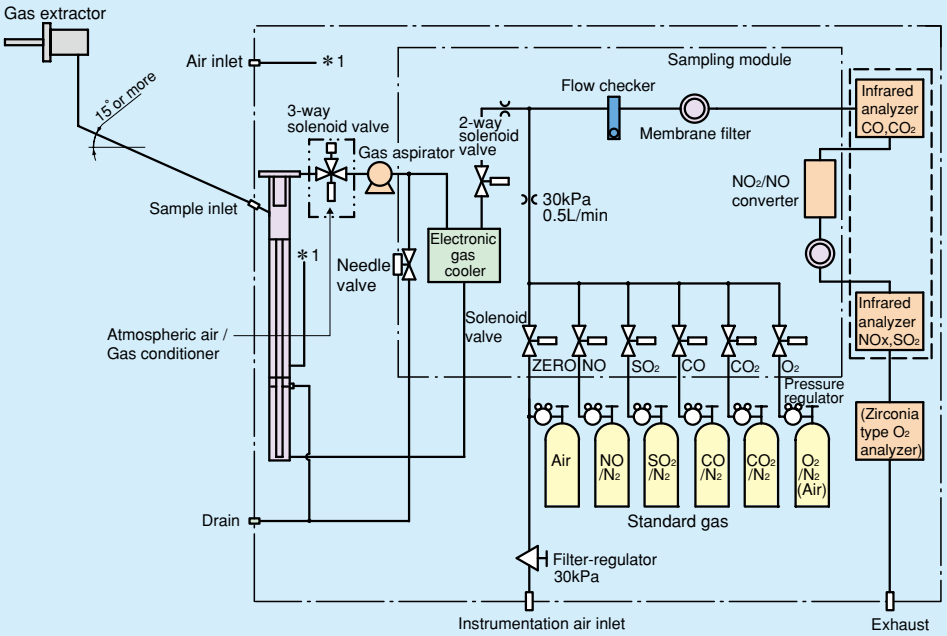
Sampling point temperature	Sampling tube material
Max. 800°C	SUS316
Max.1000°C	Titanium
Max.1300°C	SiC

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

Japanese pattern approval

- No. SAS992-1 (SO_2 meter)
- No. SAC992-1 (CO meter)
- No. SAN991-1 (NOx meter)
- No. SE981 (Zirconia O_2 meter)
- . No. SF011 (Magnetic O_2 meter)

■ Gas sampling system



Code symbols

ZSU 4 5 6 7 8 [5] – 9 10 11 12 13 – 14 15 16 17 18 19 20 – 21 22 23 24 25 26 – 27 28 29 30

Digit	Description		Code
4	**<Measuring 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 meter, O2 correction value>**		
	Withou	Withou	0
	Zirconia type	4%(Oil fuel)	4
	Zirconia type	5%(Gas fuel)	5
	Zirconia type	6%(Coal fuel)	6
	Zirconia type	12%(Refuse incinerator)	C
	Magnetic type	4%(Oil fuel)	D
	Magnetic type	5%(Gas fuel)	E
	Magnetic type	6%(Coal fuel)	F
	Magnetic type	12%(Refuse incinerator)	G
6	**<NO_x measurement range>**		
7	See Table 1		
8	**<Improved NO>**		5
9	**<SO_2 measurement range>**		
10	See Table 1		
11	**<CO measurement range>**		
12	See Table 1		
13	**<O_2 measurement range>**		
	Without		0
	25%		2
	10/25%		1
14	**<CO measurement range>**		
15	Without		YY
	10/20%		MN
	10/ Without		MY
	20/ Without		NY
16	**<Analog instantaneous value isolated output>(Note 1)**		
	Without		Y
	NO_x(Isolated)		A
	SO_2(Isolated)		B
	CO(Isolated)		C
	NO_x,SO_2(Isolated)		D
	NO_x,CO(Isolated)		E
	NO_x,SO_2,CO(Isolated)		F
	NO_x,SO_2,CO,CO_2(Isolated)		G
	NO_x,O_2(Isolated)		H
	SO_2,O_2(Isolated)		J
	CO,O_2(Isolated)		K
	NO_x,SO_2,O_2(Isolated)		L
	NO_x,CO,O_2(Isolated)		M
	NO_x,SO_2,CO,O_2(Isolated)		N
	NO_x,SO_2,CO,CO_2,O_2(Isolated)		P
17	**<O_2 correction value isolated output>(Note 1)**		
	Without		0
	NO_x(Isolated)		1
	SO_2(Isolated)		2
	CO(Isolated)		3
	NO_x,SO_2(Isolated)		4
	NO_x,CO(Isolated)		5
	SO_2,CO(Isolated)		6
	NO_x,SO_2,CO(Isolated)		7
18	**<O_2 correction value average isolated output>(Note 1)**		
	Without		0
	NO_x(Isolated)		1
	SO_2(Isolated)		2
	CO(Isolated)		3
	NO_x,SO_2(Isolated)		4
	NO_x,CO(Isolated)		5
	SO_2,CO(Isolated)		6
	NO_x,SO_2,CO(Isolated)		7
19	**Sample gas pressure / External moisture separator**		
	-1~+5kPa	Without	1
	-3~+3kPa	Without	2
	-5~+1kPa	Without	3
	-1~+5kPa	With (Note 3)	4
	-3~+3kPa	With (Note 3)	5
	-5~+1kPa	With (Note 3)	6

Digit	Description		Code
20	**<Locker structure>**		
	Indoor		1
	Outdoor		2
21	**(Piping port) (Wiring port) (Piping port if provided with gas cylinder outside)**		
	Upper left / Upper left / Without		A
	Upper left / Upper left / Lower left 3		C
	Upper left / Upper left / Lower left 6		D
22	**<Ambient temperature>**		
	-5~40°C		2
	-10~40°C		3
23	**<Tag plate>**	**<Language>**	
	Without	Japanese	A
	With	Japanese	B
	Without	English	E
	With	English	F
24	**<Recorder>（Note 4）**		
	Without		0
	With(6-point recorder: Recording contents 1)		1
	With(6-point recorder: Recording contents 2)		2
	With(6-point recorder: Recording contents 3)		3
	With(6-point recorder: Recording contents 4)		4
	With(6-point recorder: Recording contents 5)		5
	With(6-point recorder: Recording contents 6)		6
	With(Others)		Z
25	**<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
26	**<Use>**		
	Garbage/industrial refuse		A
	Gas boiler		B
	Sludge burning		C
	Oil/coal boiler		D
27	**<Measure Act Examination>**		
	Without		Y
	NO_x		A
	SO_2		B
	CO		C
	NO_x, SO_2		D
	NO_x, CO		E
	NO_x, SO_2, CO		F
	NO_x, O_2		G
	SO_2, O_2		H
	CO, O_2		J
	NO_x, SO_2, O_2		K
	NO_x, CO, O_2		L
	NO_x, SO_2, CO, O_2		M
28	**<Zero gas>（Note 2）**		
	Without Instrumentation air		1
	Atmospheric air		2
	Standard gas provided (Separately specify type ZSY)		3
29	<Sampler>	<Sampling tube material> / <Insertion length> / <Sampling point temperature>	
	Without	Without / Without / –	Y
	With	Without / Without / –	1
	With	SUS316 / 300mm / 800°C below	A
	With	SUS316 / 400mm / 800°C below	B
	With	SUS316 / 600mm / 800°C below	C
	With	SUS316 / 800mm / 800°C below	E
	With	SUS316 / 1000mm / 800°C below	G
	With	SUS316 / 1200mm / 800°C below	H
	With	SUS316 / 1500mm / 800°C below	J
	With	SUS316 / 2000mm / 800°C below	K
	With	Titanium / 600mm / 1000°C below	P
	With	Titanium / 800mm / 1000°C below	Q
	With	Titanium / 1000mm / 1000°C below	R
	With	SIC / 700mm / 1300°C below	D
	With	SIC / 900mm / 1300°C below	F

Digit	Description		Code
30	**<Sample inlet tube kind>**	**<Length>**	
	to be arranged by user	–	Y
	φ10/8 Teflon tube	5m	A
	φ10/8 Teflon tube	10m	B
	φ10/8 Teflon tube	15m	C
	φ10/8 Teflon tube	20m	D
	φ10/8 Teflon tube	25m	E
	φ10/8 Teflon tube	30m	F
	φ10/8 Teflon tube	50m	G
	Heating tube	10m	H
	Heating tube	15m	J
	Heating tube	20m	K
	Heating tube	25m	L
	Heating tubes	30m	M

<Table 1>Measurement range and code

Measurement range	Code
Without	YY
50/100ppm	AB
50/200ppm	AC
50/250ppm	AD
50/500ppm	AE
50/1000ppm	AF
50/Without	AY
100/200ppm	BC
100/250ppm	BD
100/500ppm	BE
100/1000ppm	BF
100/2000ppm	BG
100/Without	BY
200/500ppm	CE
200/1000ppm	CF
200/2000ppm	CG
200/5000ppm	CH
200/Without	CY
250/500ppm	DE
250/1000ppm	DF
250/2000ppm	DG
250/5000ppm	DH
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

Note 1. The output is non-isolated only when "Without" is selected in all of the 16th to 18th digits. Isolated and non-isolated outputs cannot be combined.

Note 2. Specify code 3 for the Measure Act and/or CO_2 meter. Separately specify for standard gas (Type ZSY).

Note 3. Specify the external moisture separator and drain pot 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 the moisture content of the sample gas exceeds 30%.

Note 4. The delivered recorder (Type PHR) is wired so that its recording contents will be as follows. For figures other than those specified in the table below, specify expressly.

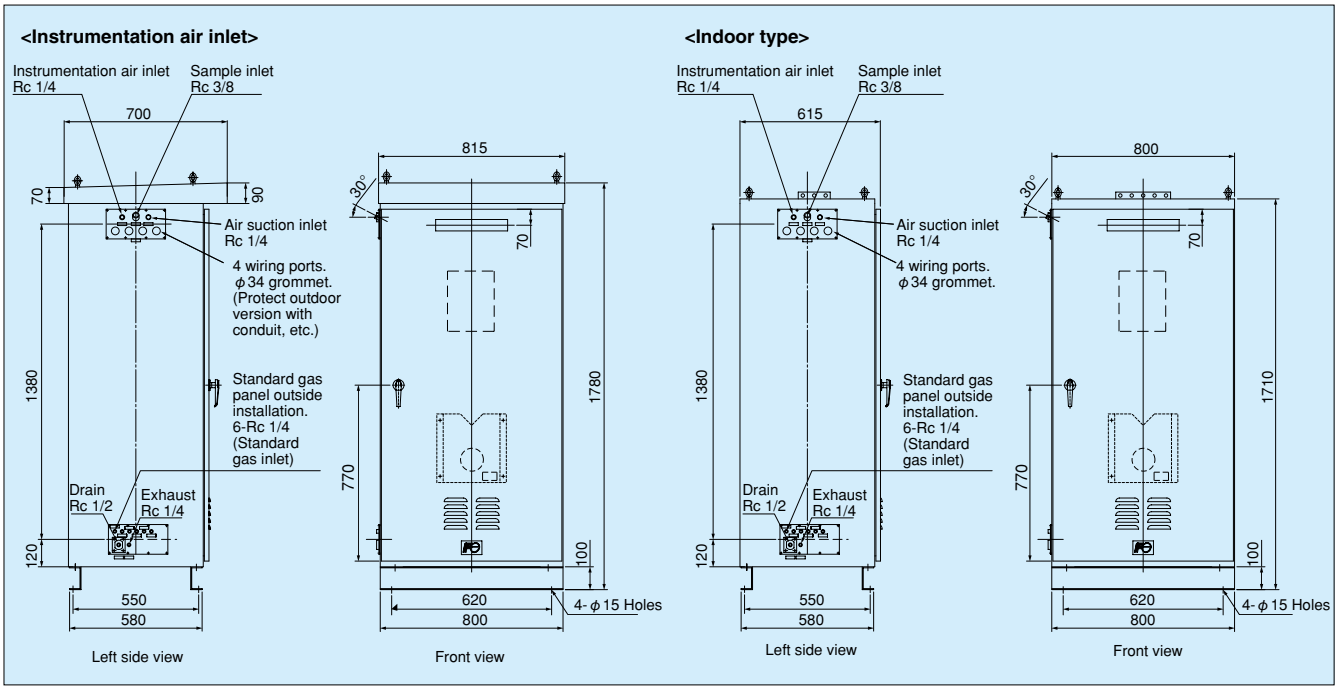
Recording contents	Code 1	Code 2	Code 3	Code 4	Code 5	Code 6
NO_x instantaneous value			○			○
Average value	○	○	○			○
O_2 correction value			○			○
SO_2 instantaneous value			○		○	
Average value	○		○		○	
O_2correction value					○	
CO instantaneous value		○		○		
Average value	○	○		○		
O_2 correction value				○		
O_2 instantaneous value	○	○	○	○	○	○
Burning temperature	○	○		○		
Dust collection chamber temperature	○	○		○		

■ Main specifications

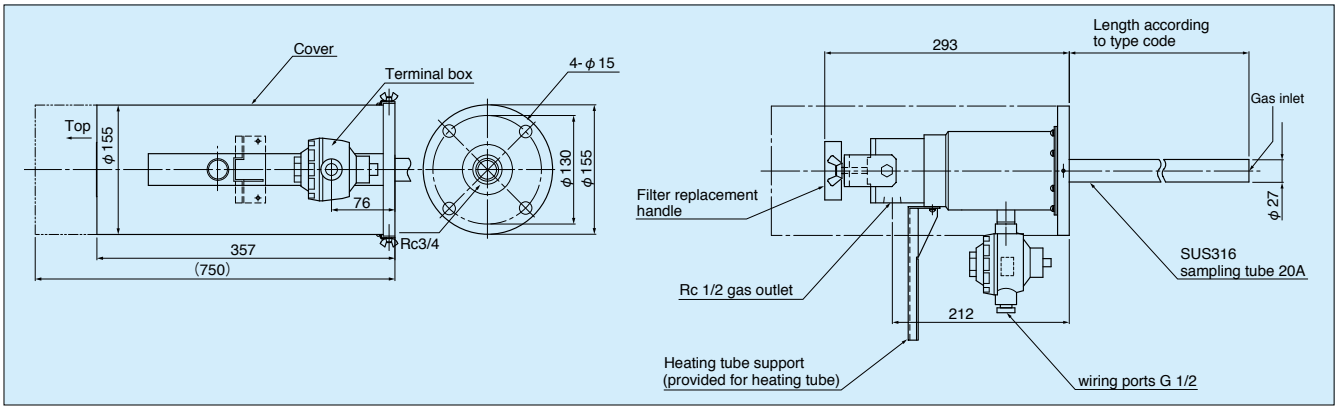
Measuring principle	NOx, SO_2, CO, CO_2: Non-dispersion infrared (NDIR) O_2: Zirconia or magnetic force
Measuring component measurement range	NOx : 0~50ppm……5000ppm SO_2 : 0~50ppm……5000ppm CO : 0~50ppm……5000ppm CO_2 : 0~10% / 0~20% O_2 : 0~10% / 0~25% (2 ranges each, maximum range ratio 1: 25 except O_2) ＊Optionally, N_2O and CH_4 can be measured
Repeatability	±0.5% FS
Linearity	±1.0% FS max
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
Measurement gas extractor	About 2L/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: 550 Ω max. (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	φ10/φ8mm 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	600VA max. (gas extractor, heating tube excluded)
Measurement gas conditions	Temperature: 60 to 800°C (standard) Non-standard: 1000°C (Gas extractor tube material: Titanium) 1300°C (Gas extractor tube material: SiC) Dust: 100mg/Nm^3 max., Pressure: -3~+3kPa Component: SO_2 500ppm max., NOx 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

To prevent dioxin emissions from the incinerator

CO, O_2 analyzer

<Type ZSQ>

Japanese pattern approval

SAC984 (CO meter)
SE981 (O_2 meter)

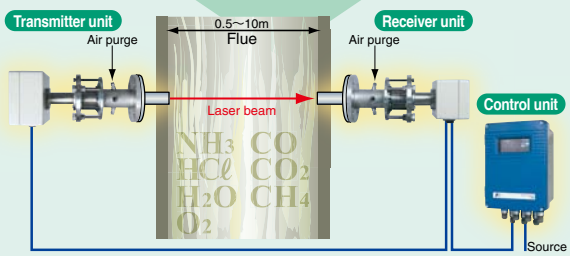
Main specifications (Type ZSQ)

Item	Description
Measurement component	CO, O_2
Measuring method	CO: Non-dispersion infrared O_2: Zirconia
Measurement range	CO: 0~200/500,0~200/1000, 0~500/1000,0~500/2000ppm O_2: 0~25vol%
Repeatability	±0.5%FS
Zero drift	CO: ±2% FS/week. O_2: ±2% FS/month.
Span drift	±2% FS/week.
Linearity	±1%FS
Response speed	Within 90 seconds (90% response, from analyzer inlet)
Output signal	• 4 to 20mA DC, (linear) (CO instantaneous value, O_2 instantaneous value, O_2 correction CO instantaneous value, O_2 correction CO moving average/1 and 4 hours) • Contact output (Peak count/alarm, auto calibration status, hardware error, etc.)
Functions	Auto calibration O_2 correction calculating equation Average value calculating equation (moving average time 1 hour, 4 hours) CO peak count/alarm Recorder (option)
Ambient conditions	-5 to +40°C, 90% RH max.
Source voltage	100V AC, 50 or 60Hz
Dimensions	600(W)×1550(H)×650(D)mm for indoor use
Standard measurement gas conditions	Temperature: 800°C max. Dust: 100mg/Nm^3 max. Pressure: -1~+5, -3~+3, -5~+1kPa Components: SO_2 500 ppm max. NOx 1000 ppm max. CO_2 15% max.

High speed concentration measurement for NH_3 or $HC\ell$, H_2O, CO,CO_2,CH_4,O_2 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
- ○ Simultaneous measurement of 2 components ($CO + O_2$, $CO + CO_2$)
- ○ Measurable at high temperatures and with high dust content
- ○ Contributes to energy saving with a power consumption of about 80 VA

Main specifications (Type ZSS)

Item	Description
Measurement gas Measurement range Note) H_2O range is 50vol% fixed	$HC\ell$: 0 to 10…5000ppm CO_2 : 0 to 2…50vol% NH_3 : 0 to 15…5000ppm CH_4 : 0 to 100ppm…50vol% CO : 0 to 2…50vol% O_2 : 0 to 4…100vol% $HC\ell+H_2O$: 0 to 50…1000ppm(Note) NH_3+H_2O : 0 to 50…5000ppm(Note) $CO+CO_2$: 0 to 2.5…50vol% $CO+O_2$: 0 to 200ppm…50vol%(CO) 0 to 4…100 vol%(O_2)
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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