INFRARED GAS ANALYZER FOR STACK GAS

DATA SHEET ZSU

This analyzer consists of an infrared gas analyzer, a zirconia O2 sensor and a gas sampling device. It is used for simultaneous and continuous measurement of the NO_X, SO_2, CO, CO_2 and O_2 components in the flue gas of various boilers, garbage incinerators, etc.

For CO and O_2 measurement specifications, the function for coping with the Japanese regulation on dioxin emission is incorporated.

FEATURES

1. Gas concentrations of 5 components measurable simultaneously and continuously
   NOX, SO2, CO and CO_2 gas concentration measurements are integrated by infrared method, to which a zirconia O_2 sensor is added for O_2 measurement. Therefore, the gas concentrations of 5 components are simultaneously and continuously measurable.
2. Minimum installation space and front serviceability because of small structure
   Small size has been achieved by configuring the analyzing block, gas sampling module, etc. as a 19-inch rack mounting type. Installation floor area is about 25% smaller in comparison with Fuji's preceding analyzers.
3. A rich variety of functions incorporated.
   These functions include output after O_2 correction, average value output, auto calibration, CO peak count alarm and warning.

SPECIFICATIONS

1. Standard Specifications

- **Measuring system :**
  Non-dispersive infrared absorption (NDIR) method for NOX, SO_2, CO and CO_2, and zirconia method for O_2
- **Measurable component and min./max. measurement range :**
  NO_X ; 0 to 100ppm/0 to 5000ppm
  SO_2 ; 0 to 100ppm/0 to 5000ppm
  CO ; 0 to 100ppm/0 to 5000ppm
  CO_2 ; 0 to 5%/0 to 20%
  O_2 ; 0 to 10%/0 to 25%
- **Number of measurement ranges :**
  2 ranges (Refer to CODE SYMBOLS.)
- **Warm-up time :** Within 4 hours after power-on
- **Analog output signals :**
  Simultaneous output of signals of 4 to 20 mA DC each (non-isolated or isolated depending on customer's code selection)
  - Five instantaneous value outputs (NO_X, SO_2, CO, CO_2 and O_2)
  - Three instantaneous values (NO_X, SO_2, CO) after O_2 correction when provided with O_2 feature
  - Three average values (NO_X, SO_2, CO) after O_2 correction when provided with O_2 analyzer

  - O_2 average value
  - Allowable load resistance : 550 Ω or less (750 Ω or less for isolated output)
- **Contact output:** ① Each 1a contact (contact capacity 250 V AC, 2 A or 30 V DC, 3 A) for:
  - Range discrimination of each component (Close/1st range) , analyzing block error, calibration error, auto calibration status, maintenance status,and CO peak count alarm

  ② Each 1c contact (contact capacity 250 V AC, 1 A or 30 V DC, 1 A) for:
  - Concentration alarm for each component's instantaneous value (H, L, HL settable), analyzing block power off
- **Contact input :** Non-voltage contact (1.5 sec or longer)
  - Auto calibration start, average value resetting (Status)
  - Range changeover (1st range when contact closes), output hold, remote pump OFF (OFF when contact closes)
- **Indication :** LCD with back light for indicating:
  - Instantaneous values (NO_X, SO_2, CO, CO_2 and O_2)
  - Instantaneous values (NO_X, SO_2, CO) after O_2 correction when provided with O_2 analyzer
  - Average values (NO_X, SO_2, CO) after O_2 correction when provided with O_2 analyzer
  - O_2 average value when provided with O_2 analyzer
  - Peak count value (for CO)
  - Parameter assignment

•Fluorescent lamp in cubicle :
Standard equipped

• Recorder (option) :
100 mm-width, 6-point recorder (Fuji Electric's type PHC) mounted

•Gas extractor : Electrical heating type (filter built in)
- Filter mesh: 40μm mesh of SUS 316 stainless steel
- Flange : JIS 5K 65AFF
- Mass: Approx. 9 kg (excluding gas sampling pipe)
- Power supply voltage: 100 V AC, 50/60 Hz
- Power consumption: Approx 100 W
- Sampling pipe: SUS 316 (length 300, 400, 600, 800, 1000 mm),or titanium (length 600, 800, 1000 mm),or SiC (length 700, 900 mm)

* SUS 316 is used for 800˚C or lower.
* Titanium is used for 1000˚C or lower.
* SiC is used for 1300˚C or lower.

• Sample inlet tube :
ϕ10 / ϕ8 Teflon tube or heating tube (ϕ10 / ϕ8 Teflon) (max. 30 m)
*The heating tube needs to be specified in the following cases.
① Ambient temperature -6˚C or lower
② SO_2 of less than 100 ppm order
③ Tube length 10 m or longer in SO_2 measurement
(Power supply voltage: 100 V AC, 50/60 Hz, power consumption: 25 VA/m)

• Rated operating conditions :
- Ambient temperature: 0 to 40˚C or -5 to 40˚C (depending on customer's code selection)
- Ambient humidity: 90% RH or less
- Power supply voltage: 100, 110, 115, 200 or 230 V AC ±10% (depending on customer's code selection)
- Frequency: 50 or 60 Hz (0.5 Hz
- Power consumption: Max. 600 VA (excluding gas extractor and heating tube)

• Dry air : For Permapure dryer purging (required for SO_2 of 1000 ppm or more)
Dew point; -20˚C DP or lower
Pressure; 100 kPa to 400 kPa
Dust and mist; None

• External dimensions (H x W x D) :
Indoor type; 1580 x 600 x 825 mm
Outdoor type; 1640 x 600 x 825 mm
(excluding gas conditioner)

• Mass : Approx. 170 kg (excluding standard gas)

• Cubicle finish color :
Munsell 5Y7/1 semi-gloss

• Cubicle structure :
Indoor or outdoor installation, self-standing type, single-swing front door, plate thickness 2.3 mm standard (both cubicle and door)

• Other : Six standard gas cylinders (3.4 ℓ) accommodatable

2. Standard Functions (main block)

Function	Description
O_2 Correction	• Conversion of measured NO_X, SO_2 and CO gas concentrations into values at standard O_2 concentration Calculating equation : $C = \frac{Cs\ (21-O_N)}{21-O_S}$ C : Sample gas concentration after O_2 correction C_S : Measured concentration of sample gas O_S : Measured O_2 concentration O_N : Standard O_2 concentration (4% for petroleum fuel, 5% for gas fuel, 6% for coal fuel, 12% for garbage incinerator) • The result of conversion is indicated and output in a signal of 4 to 20 mA DC.
Auto Calibration	• Auto calibration cycle settable range: 1 to 99 hours (1-hour step) or 1 to 40 days (1-day step) • Auto calibration gas flow time settable range: 60 to 599 seconds (in 1-sec step) • Auto/manual calibration error contact output: Provided when calibration quantity exceeds 50% of full scale. • Contact output during auto calibration and maintenance: Provided during calibration gas flow and replacement. Also provided during maintenance. • Auto calibration remote start contact input: Calibration starts at opening after short-circuit for 1 sec or longer. • Standard gas consumption: Approx. 1 year with 3.4 ℓ cylinder in a calibration cycle of 7 days
Average Value after O_2 Correction, O_2 average value	• NO_X, SO_2 and CO values are averaged after O_2 correction, and the result is indicated and output in 4 to 20 mA DC. • Averaging time is settable by key operation at the front of analyzing block. Settable range: 1 to 59 minutes or 1 to 4 hours (factory-set at 1 hour)
Remote Output Holding	• The output signal values are collectively held according to external contact input. • Output is held during short-circuit.
Average Value Resetting Input	• Output and indication of average value are reset according to external contact input. • Output and indication are reset at short-circuit for 1.5 sec or longer.
Remote range Changeover Input	• Low or high range is selectable for each sample component via external contact input. • High range is selected for open-circuit, and low range for short-circuit.
Range Discrimination Contact Output	• Discrimination between low and high ranges is output through a contact. • When the contact is closed, low range is selected.
Concentration Alarm Contact Output	• Instantaneous value alarm is settable for each sample component. High, Low, High or Low is settable (by keys at the front of analyzing block). • Contact output hysteresis is also settable. • Contact is 1c type.
CO Instantaneous Value Peak Count Alarm Contact Output	• Alarm is issued and indicated when CO instantaneous value has exceeded the set limit by the set number of times. Settable number of times: 1 to 99, alarm settable range: 10 to 1000 ppm (5 ppm step) • The number of overshootings per hour is indicated.
Analyzing Block Error Contact Output	• Contact output is provided when the analyzing block is abnormal.
Temperature Input Signal	• K thermocouple input x 2 (for recorder available at option)

3. Performance

- Repeatability : ±0.5% of full scale
- Zero drift : Max. ±2.0% of full scale/week
  Max.±2.0% of full scale/month on O_2 meter
- Span drift : Max. ±2.0% of full scale/week
  Max. ±2.0% of full scale/month on O_2 meter
- Linearity : Max. ±1.0% of full scale
- Response time : For 90% indication (after extracting sample gas through the inlet)
  NO_X : 120 sec or shorter
  SO_2 : 240 sec or shorter
  CO : 120 sec or shorter
  CO_2 : 120 sec or shorter
- Sample gas flow rate :
  Approx. 2 ℓ /min

4. Standard Requirements for Sample Gas

- Temperature : 60 to 800˚C (SUS 316 probe)
  1000˚C (titanuim probe), 1300˚C (SIC probe)
- Dust : 100 mg/Nm^3 or less
- Pressure : ① -3k to 3kpa
  ② -1k to 5kpa
  ③ -5k to 1kpa
- Componen :

SO_2	500 ppm or less
NO_X	1000 ppm or less
CO_2	0 to 15%
CO	2000 ppm or less
O_2	1 to 21%
HCL	1000 ppm or less
The remaining	N_2, H_2O

5. Installation Requirements

① Selection of a place which does not receive direct sunlight or radiation from hot substances
If such a place cannot be found, a roof or cover should be prepared for protection.
② Avoidance of a place under heavy vibration
③ Selection of a place where atmospheric air is clean

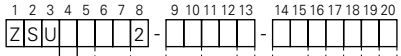
SCOPE OF DELIVERY

- Gas analyzer system
- Specified external drain separator/drain pot
- Specified gas extractor/probe set
- Specified gas inlet tube set
- Standard accessories

ITEMS TO BE PREPARED SEPARATELY

1. Standard gas and pressure regulator type ZSY
2. Recorder (when necessary) type PHC
3. 1-year spare
4. Waterproof gland for outdoor wiring port (A25A), Order No.: 8641625
5. Anchor bolt.

CODE SYMBOLS



Description		
Sample component <4th code>		
P	NO_X	
A	SO_2	
B	CO	
F	NO_X,SO_2	
H	NO_X,CO	
L	NO_X,SO_2,CO	
M	NO_X,SO_2,CO,CO_2	
O_2 meter and Value after O_2 correction <5th code>		
0	Without	Without
4	With	4% (petroleum fuel) (Note 1)
5	With	5% (gas fuel)
6	With	6% (coal fuel)
C	With	12% (garbage incinerator)
NO_X measuring range <6th and 7th codes>		
Select your code in the table at left.		
SO_2 measuring range <9th and 10th codes>		
Select your code in the table at left.		
CO measuring range <11th and 12th codes>		
Select your code in the table at left.		
O_2 measuring range <13th codes>		
0	Without	
1	10/ 25%	
2	25%	
CO_2 measuring range <14th and 15th codes>		
Y Y	Without	
M N	10%/ 20%	
M Y	10%/ Without	
N Y	20%/ Without	
Isolated output of analog instantaneous value <16th codes>		(Note 2)
Y	Each component	Non-isolated
A	NO_X	Isolated
B	SO_2	Isolated
C	CO	Isolated
D	NO_X,SO_2	Isolated
E	NO_X,CO	Isolated
F	NO_X,SO_2,CO	Isolated
G	NO_X,SO_2,CO,CO_2	Isolated
H	NO_X,O_2	Isolated
J	SO_2,O_2	Isolated
K	CO,O_2	Isolated
L	NO_X,SO_2,O_2	Isolated
M	NO_X,CO,O_2	Isolated
N	NO_X,SO_2,CO,O_2	Isolated
P	NO_X,SO_2,CO,CO_2,O_2	Isolated
Isolated output of value after O_2 correction <17th codes>		(Note 2)
0	Each component	Non-isolated
1	NO_X	Isolated
2	SO_2	Isolated
3	CO	Isolated
4	NO_X,SO_2	Isolated
5	NO_X,CO	Isolated
6	SO_2,CO	Isolated
7	NO_X,SO_2,CO	Isolated
Isolated output of average value after O_2 correction <18th codes>		(Note 2)
0	Each component	Non-isolated
1	NO_X	Isolated
2	SO_2	Isolated
3	CO	Isolated
4	NO_X,SO_2	Isolated
5	NO_X,CO	Isolated
6	SO_2,CO	Isolated
7	NO_X,SO_2,CO	Isolated
Isolated output of average value on O_2 meter <19th codes>		
0	Non-isolated	
1	Isolated	
Cubicle structure <20th codes>		
1	Indoor structure (standard locker)	
2	Outdoor structure (standard locker)	
5	Indoor structure (middle locker size)	(Note 3)
6	Outdoor structure (middle locker size)	(Note 3)

Measuring Range List

Unit: ppm

Measuring range	Code
Without	YY
100/200	BC
100/250	BD
100/500	BE
100/1000	BF
100/2000	BG
100/Without	BY
200/500	CE
200/1000	CF
200/2000	CG
200/Without	CY
250/500	DE
250/1000	DF
250/2000	DG
250/5000	DH
250/Without	DY
500/1000	EF
500/2000	EG
500/5000	EH
500/Without	EY
1000/2000	FG
1000/5000	FH
1000/Without	FY
5000/Without	HY

Note 1) In the case of petroleum fuel, specify "Z" in the 31 digit of the code symbols, and designate as "with Permapure dryer."

Note 2) Analog value is output as standard for each measurement value. Specify the code when output is to be insulated.

Note 3) In the case of locker structure 5 or 6, specify "Z" in the 31st digit of the code symbols, and prescribe detailed specifications. The middle size locker is of the same outside shape as type ZSP with front and rear doors.

1 2 3 4 5 6 7 8	9 10 11 12 13	14 15 16 17 18 19 20	21 22 23 24 25 26	27 28 29 30	31
Z S U				Y	E

Description			
Pipe and cable inlets <21th codes>			
(Piping port)	(Cabling port)	(Piping port for external installation of gas cylinder)	(Purge/instrument-ation air port)
A Top left	Top left	Without	Without
B Top left	Top left	Without	Bottom left
C Top left	Top left	With 3 ports at bottom right	Without
D Top left	Top left	With 6 ports at bottom right	Without
E Top left	Top left	With 3 ports at bottom right	Bottom left
F Top left	Top left	With 6 ports at bottom right	Bottom left
Ambient temperature <22th codes>			
2 Standard 2 (−5 to 40˚C)			
3 For cold climate (−10 to 40˚C)			
Instrument nameplate	Tag plate <23th code>		
A Standard	Without		
B Standard	With		
Recorder <24th code>	Recorder (type PHC) available at option		
0 Without			
1 With (recorder contents 1)	(Note 4)		
2 With (recorder contents 2)	(Note 4)		
3 With (recorder contents 3)	(Note 4)		
4 With (recorder contents 4)	(Note 4)		
5 With (recorder contents 5)	(Note 4)		
6 With (recorder contents 6)	(Note 4)		
Z With (other recorder contents)	(Note 4)		
Power supply <25th code>			
A 100V AC 50Hz			
B 100V AC 60Hz			
C 110V AC 50Hz			
D 110V AC 60Hz			
E 115V AC 50Hz			
F 115V AC 60Hz			
G 200V AC 50Hz			
H 200V AC 60Hz			
J 230V AC 50Hz			
K 230V AC 60Hz			
Gas pressure at extraction point	External drain separator/drain pot <26th code>		
1 −3k to 3kPa	Without		
2 −1k to 5kPa	Without		
3 −5k to 1kPa	Without		
4 −3k to 3kPa	With (Note 5)		
5 −1k to 5kPa	With (Note 5)		
6 −5k to 1kPa	With (Note 5)		
Kind of zero gas <28th code>			
1 Instrumentation gas			
2 Atmospheric air			
3 Standard gas (Note 6) • Standard gas (type ZSY) available at option			
Gas extractor	Sampling pipe material	Pipe length	Extraction point temperature <29th code>
Y Without	Without	Without	Without
1 With	Without	Without	Without
A With	SUS316	300mm	800˚C or lower
B With	SUS316	400mm	800˚C or lower
C With	SUS316	600mm	800˚C or lower
E With	SUS316	800mm	800˚C or lower
G With	SUS316	1000mm	800˚C or lower
P With	Titanium	600mm	1000˚C or lower
Q With	Titanium	800mm	1000˚C or lower
R With	Titanium	1000mm	1000˚C or lower
D With	SiC	700mm	1300˚C or lower
F With	SiC	900mm	1300˚C or lower
Kind of sample inlet tube	Length <30th code)>		
Y Without	Without		
A ϕ10 / ϕ8mm Teflon tube	5m		
B ϕ10 / ϕ8mm Teflon tube	10m		
C ϕ10 / ϕ8mm Teflon tube	15m		
D ϕ10 / ϕ8mm Teflon tube	20m		
E ϕ10 / ϕ8mm Teflon tube	25m		
F ϕ10 / ϕ8mm Teflon tube	30m		
G ϕ10 / ϕ8mm Teflon tube	50m		
H Heating tube	10m		
J Heating tube	15m		
K Heating tube	20m		
L Heating tube	25m		
M Heating tube	30m		

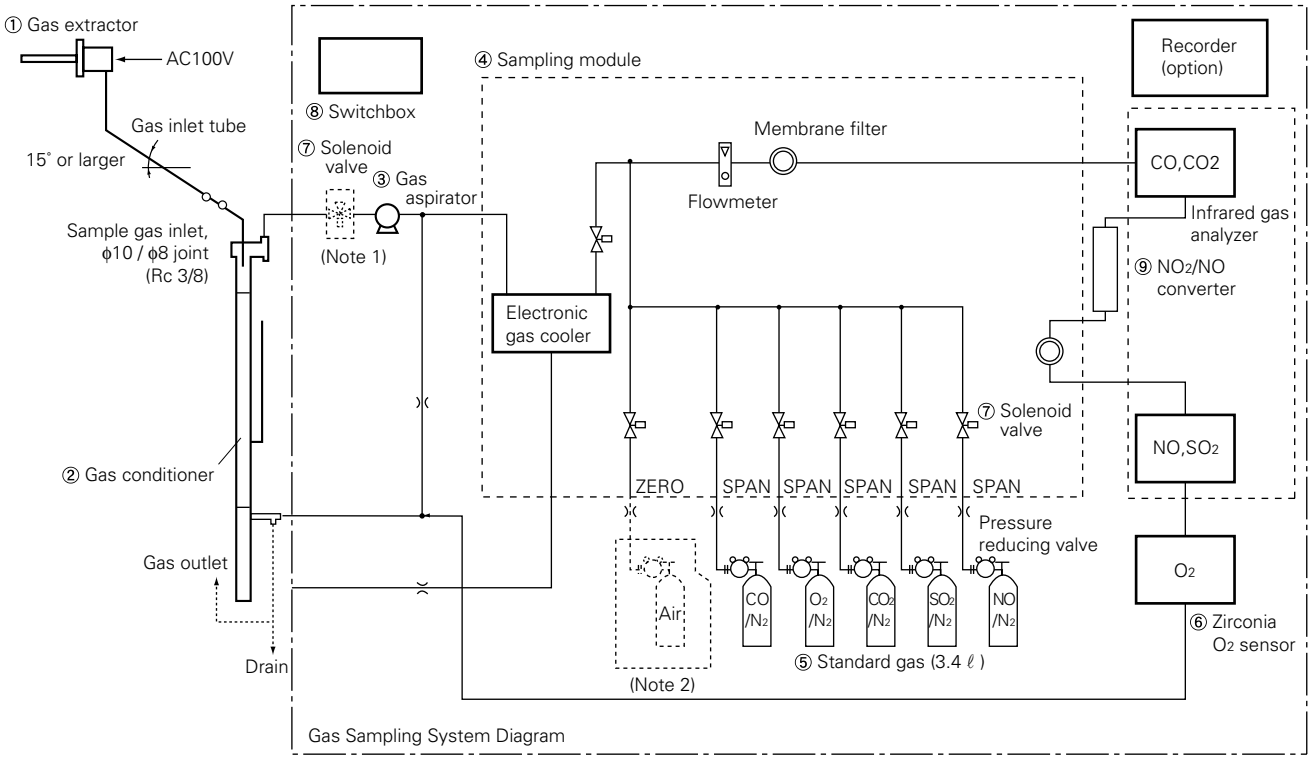
Recorded contents	Code 1	Code 2	Code 3	Code 4	Code 5	Code 6
NO_X instantaneous value			○			○
Average value	○	○	○			○
O_2 correction			○			○
SO_2 instantaneous value			○		○	
Average value	○		○		○	
O_2 correction					○	
CO instantaneous value		○		○		
Average value	○	○		○		
O_2 correction				○		
O_2 instaneous value	○	○	○	○	○	○
Combustion temperature	○	○		○		
Dust collection chamber temperature	○	○		○		

Note 4) The contents to be recorded with a 6-point recorder are assigned and connected as specified in the above table for its delivery.
Recorder type PHC
* If other contents are desired, customer must specify them separately.

Note 5) 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 6) Specify code 3 when Measure Act and/or CO2 meter is selected.

5-Component Gas Sampling System Diagram 1 (for SO_2 concentration in less than 500 ppm range)



Note 1: Solenoid valve for using atmospheric air as zero gas
Note 2: Unnecessary when atmospheric air is used as zero gas

Functions of Individual Components

① **Gas extractor :** Gas extractor with a heating type stainless steel filter of standard mesh 40μm

② **Gas conditioner :** For separation of drain, prevention of drain from being sucked through secondary filter and composite operation of constant-pressure bubbler

③ **Gas aspirator :** For aspiration of sample gas (sample gas flow rate approx. 2 ℓ /min)

④ **Sampling module :** Incorporates electronic gas cooler, solenoid valve, membrane filter and flowmeter.

- Electronic gas cooler: Dries the moisture in sample gas to a dew point of approx. 3˚C.
- Solenoid valve: Used for introducing calibration gas.
- Membrane filter: PTFE filter used to eliminate fine dust particles and permit monitoring of dust adhering condition on the front panel of the gas analyzer.
- Flowmeter: Adjusts and monitors the flow rate of sample gas.

⑤ **Standard gas :** Reference gas used for calibrating zero and span of the analyzer. Total 6 cylinders required for air, zero gas air, span gas NO, SO_2, CO, CO_2 and O_2.

⑥ **Zirconia O_2 sensor :** Zirconia oxygen sensor used for measuring the oxygen concentration (0 to 25%) in sample gas.

⑦ **Solenoid valve for atmospheric air:** Can be built in for using the atmospheric air instead of standard air.

⑧ **Switchbox :** Incorporates 7 power ON/OFF switches for the following units.

- Gas aspirator
- Built-in ventilation fan
- Fluorescent lamp and service receptacle (max. 2A)
- Sampling module, built-in recorder, converter (for NOx measurement) and isolation signal converter
- O_2 meter
- Gas conditioner heater
- Built-in space heater (option)

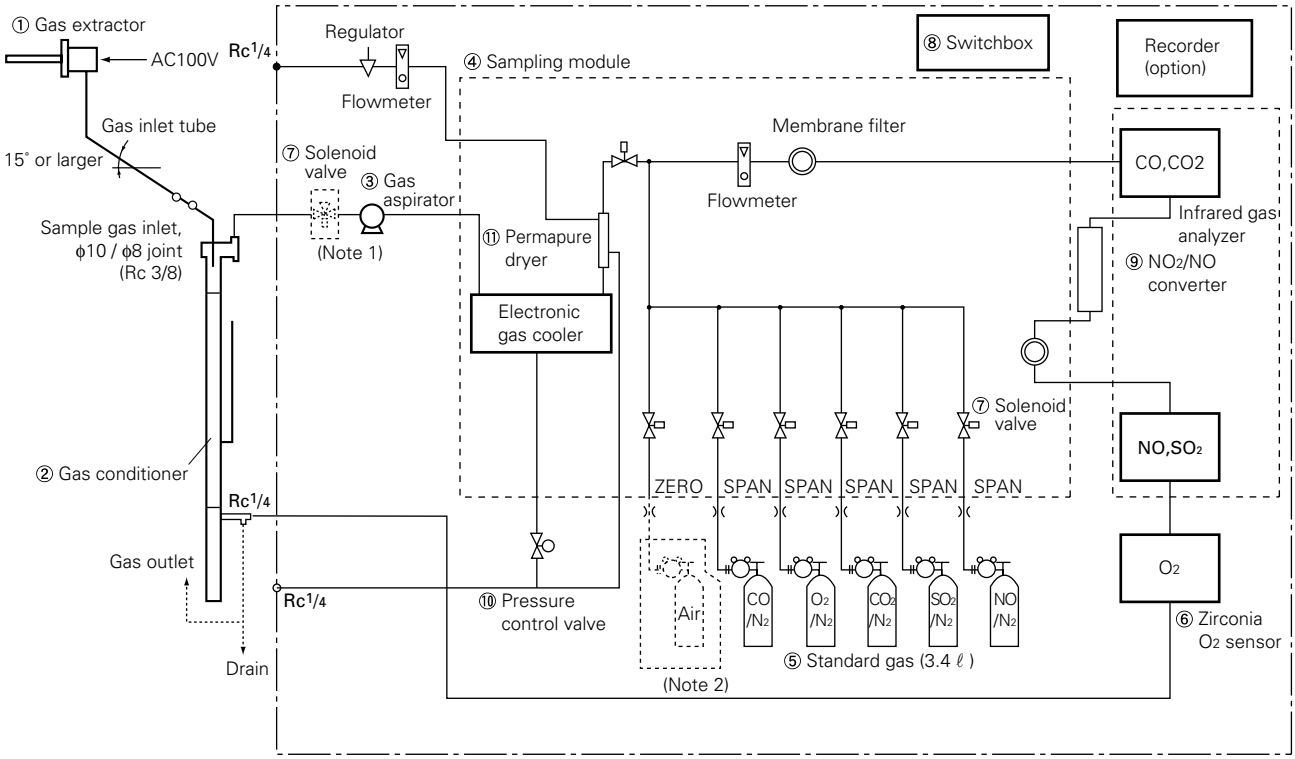
In addition, 3 switches with no fuse breaker for main power supply, gas extractor and heating pipe are built in.

⑨ **Converter :** Added to NOx analyzer. A special catalyst material for efficient conversion of NO_2 gas to NO is used.

⑩ **Pressure regulating valve :** Maintains sample gas pressure at the constant level.

⑪ **Permapure dryer :** A semi-permeable membrane type vapor phase dehumidifier for drying moisture in sample gas to about dew point -15˚C

5-Component Gas Sampling System Diagram 2 (for SO_2 concentration in 1000 ppm range or higher)



Note 1: Solenoid valve for using atmospheric air as zero gas

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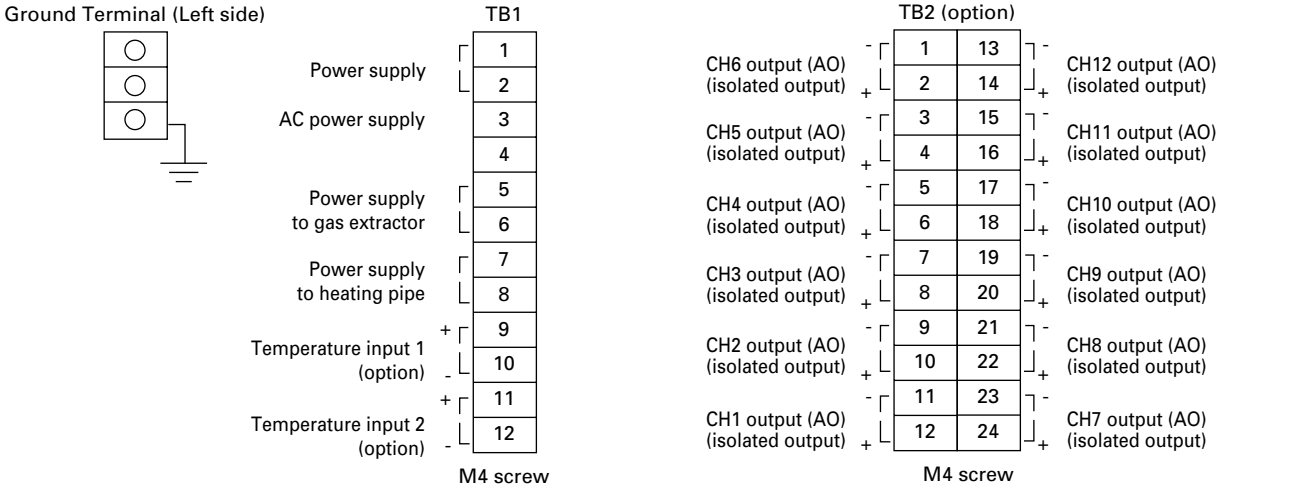
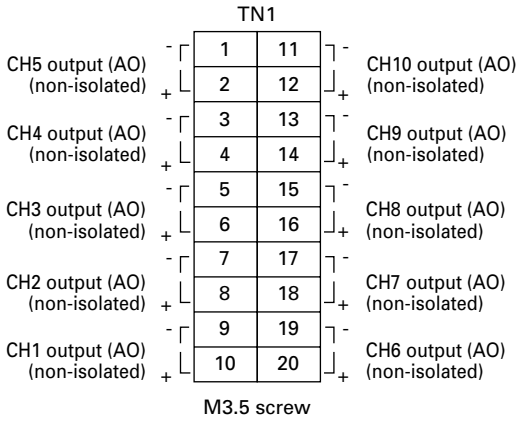
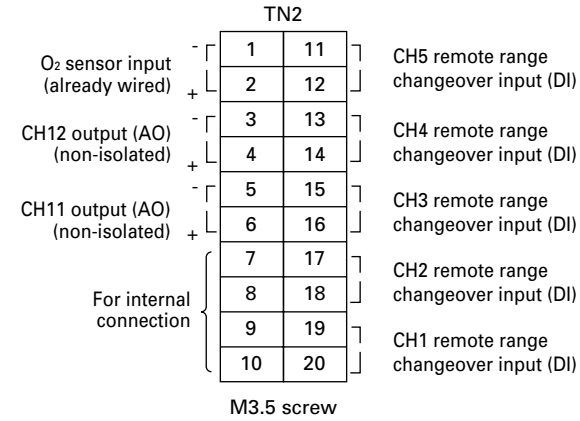
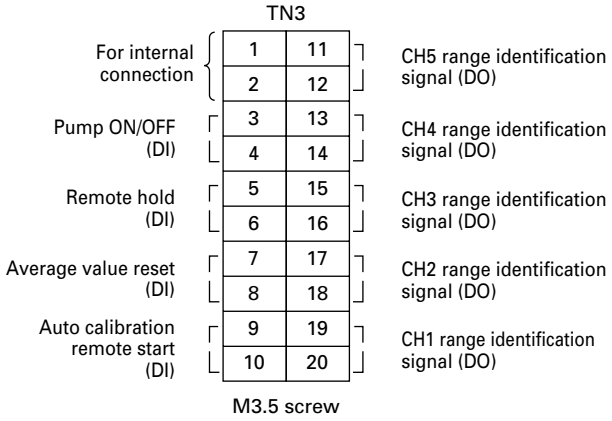
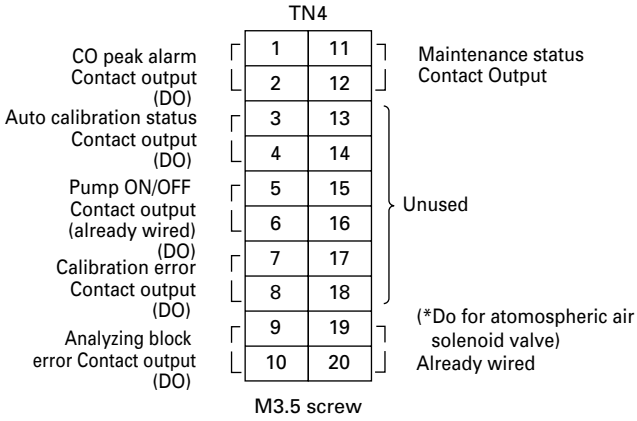
External Terminal Connection Diagram

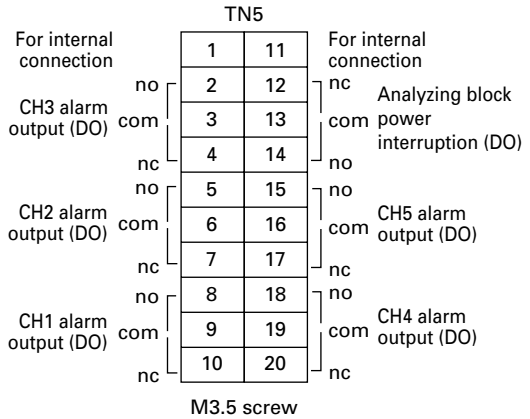












External terminal block diagram (Upper side of front side of main unit)

TB1	TB2		TN1		TN2		TN3		TN4		TN5	
1	1	13	1	11	1	11	1	11	1	11	1	11
2	2	14	2	12	2	12	2	12	2	12	2	12
3	3	15	3	13	3	13	3	13	3	13	3	13
4	4	16	4	14	4	14	4	14	4	14	4	14
5	5	17	5	15	5	15	5	15	5	15	5	15
6	6	18	6	16	6	16	6	16	6	16	6	16
7	7	19	7	17	7	17	7	17	7	17	7	17
8	8	20	8	18	8	18	8	18	8	18	8	18
9	9	21	9	19	9	19	9	19	9	19	9	19
10	10	22	10	20	10	20	10	20	10	20	10	20
11	11	23										
12	12	24										

Note) no; normal open contact, nc; normal close contact

Contents of Measured Channel (CH)

The following table gives the contents of each output signal according to code symbols.

Code symbol		Contents
4th digit	5th digit	
P	0	CH1: NOx
A	0	CH1: SO_2
B	0	CH1: CO
F	0	CH1: NOx, CH2: SO_2
H	0	CH1: NOx, CH2: CO
L	0	CH1: NOx, CH2: SO_2, CH3: CO
M	0	CH1: NOx, CH2: SO_2, CH3: CO_2, CH4: CO
P	4, 5, 6, C	CH1: NOx, CH2: O_2, CH3: Corrected NOx, CH4: Corrected NOx average, CH5: O_2 average
A	4, 5, 6, C	CH1: SO_2, CH2: O_2, CH3: Corrected SO_2, CH4: Corrected SO_2 average, CH5: O_2 average
B	4, 5, 6, C	CH1: CO, CH2: O_2, CH3: Corrected CO, CH4: Corrected CO average, CH5: O_2 average; with peak alarm
F	4, 5, 6, C	CH1: NOx, CH2: SO_2, CH3: O_2, CH4: Corrected NOx, CH5: Corrected SO_2, CH6: Corrected NOx average, CH7: Corrected SO_2 average, CH8: O_2 average
H	4, 5, 6, C	CH1: NOx, CH2: CO, CH3: O_2, CH4: Corrected NOx, CH5: Corrected CO, CH6: Corrected NOx average, CH7: Corrected CO average, CH8: O_2 average; with peak alarm
L	4, 5, 6, C	CH1: NOx, CH2: SO_2, CH3: CO, CH4: O_2, CH5: Corrected NOx, CH6: Corrected SO_2, CH7: Corrected CO, CH8: Corrected NOx average, CH9: Corrected SO_2 average, CH10: Corrected CO average, CH11: O_2 average; with peak alarm
M	4, 5, 6, C	CH1: NOx, CH2: SO_2, CH3: CO_2, CH4: CO, CH5: O_2, CH6: Corrected NOx, CH7: Corrected SO_2, CH8: Corrected CO, CH9: Corrected NOx average, CH10: Corrected SO_2 average, CH11: Corrected CO average, CH12 : O_2 average; with peak alarm

Note) When CO and O_2 are included in measurement components, CO peak alarm output is provided.

Standard Accessories

No.	Name	Quantity	Remarks
1	Filter paper for membrane filter/as spare	1 pair	fluoro-carbon: for SO_2, glass fiber: other
2	Fuse (2A)/as spare	2 fuses	
3	Fuse (3.2A)/as spare	2 fuses	
4	Standard gas joint R1/4 - ϕ6	1 set	
5	Hose band for fixing standard gas cylinder	1 set	
6	Toaron tube for standard gas connection, 1 m and ϕ9 / ϕ5	1 tube	
7	Polyethylene tube for standard gas connection, 6 m and ϕ6 / ϕ4	1 tube	
8	Anchor bolt for cubicle installation, M12 × 160 × 50 (Option)	4	
9	Water bottle for injection into gas conditioner	1	
10	Gas sampling pipe flange packing	1	When gas extractor is equipped
11	Gas extractor fastening bolt and nut (M12×60)	1 set	
12	O-ring (G50) for gas extractor/as spare	1	
13	Heating tube support	1 set	When heating tube is equipped
14	Standard gas joint R1/4 - ϕ6	1 set	When standard gas cylinder is externally provided
15	Instruction manual (INZ-TN1ZSU-E)	1 copy	
16	capillalry tube 30kPa/0.6 ℓ	1 set	
17	Cell assembling tool	1	Only for block cell

Spare Parts for 1-Year Measurement

- 2 pairs of or 1 pack of filter paper for membrane filter (Note 1)
- Membrane filter O-ring (P49) ×2
- Membrane filter O-ring (P3) ×2
- Filter for gas conditioner ×2
- O-ring (G65) for gas conditioner ×2
- Diaphragm for gas aspirator ×1
- Valve for gas aspirator ×1
- Capillary tube (ϕ1) ×1
- Capillary tube (ϕ1.4) ×1 } (Note 2)
- O-ring (G50) for gas extractor ×1
- Packing for gas extractor mesh filter ×1
- Packing for gas extractor seal ×1
- Mesh filter for gas extractor ×1 } Added when gas extractor is equipped
- NOx/NO converter catalyst × 1
- Filter for above catalyst × 2 } Added when NOx analyzer is equipped

(Note 1) 2 pairs for SO_2 measurement, on 1 pack (25sheets) for other

(Note 2) Capillary tube 50kPa/0.6 ℓ × 1 when SO_2 concentration is 1000 ppm or higher

Code Symbols for Spare Parts for 1-Year Measurement

1	2	3	4	5	6	7	8
Z	B	N	1	S	U		2

	Description		
	(Gas extractor)	(NOx meter)	(SO_2 meter)
0	-	-	-
4	Yes	-	-
2	-	Yes	-
5	Yes	Yes	-
A	-	-	Yes
E	Yes	-	Yes
C	-	Yes	Yes
F	Yes	Yes	Yes

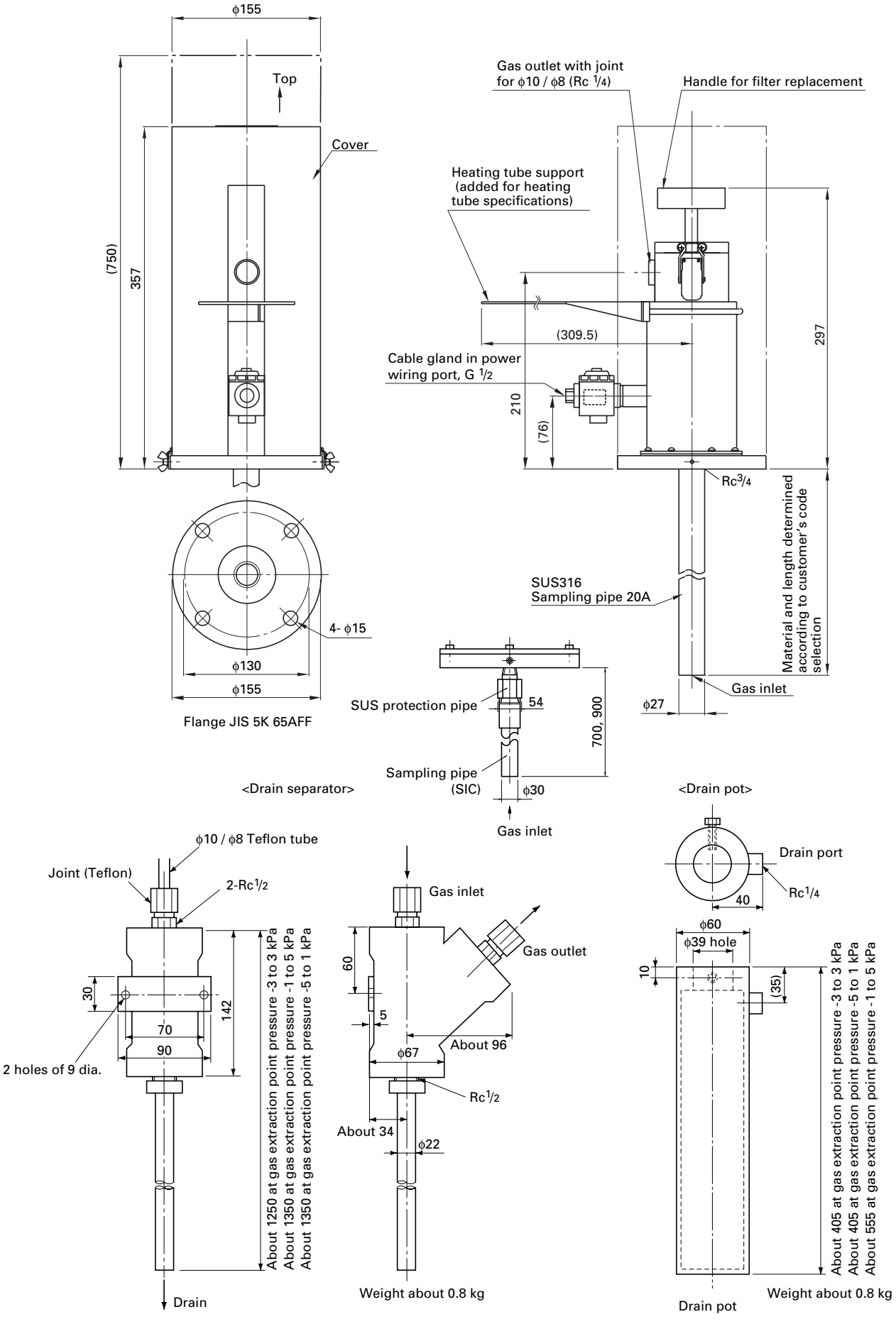
STANDARD GAS CODE SYMBOLS

1 2 3 4 5 6 7 8 9 10 11	Description
Z S Y	
	NO span gas (measurement range ppm) <4th code>
0	Without
1	100
2	200
3	250
4	500
5	1000
6	2000
7	5000
	SO_2 span gas (measurement range ppm) <5th code>
0	Without
1	100
2	200
3	250
4	500
5	1000
6	2000
7	5000
	CO span gas (measurement range ppm) <6th code>
0	Without
1	100
2	200
3	250
4	500
5	1000
6	2000
7	5000
	CO_2 span gas (measurement range, %) <7th code>
Y	Without
A	5
B	10
C	20
	Zirconia O_2 span gas, % <9th code>
0	Without
1	1.8 to 2% O_2 / N_2
	Zero gas <10th code>
Y	Without
A	Air cylinder (without certificate)
B	Air cylinder (with certificate Japanese offical organization)
	Offical certificate <11th code>
Y	Without
A	NO_X
B	SO_2
C	CO
D	NO_X, SO_2
E	NO_X, CO
F	NO_X, SO_2, CO
G	NO_X, O_2
H	SO_2, O_2
J	CO, O_2
K	NO_X, SO_2,O_2
L	NO_X, CO,O_2
M	NO_X, SO_2, CO, O_2

Scope of Delivery: standard gas (3.4 ℓ) with pressure regulator

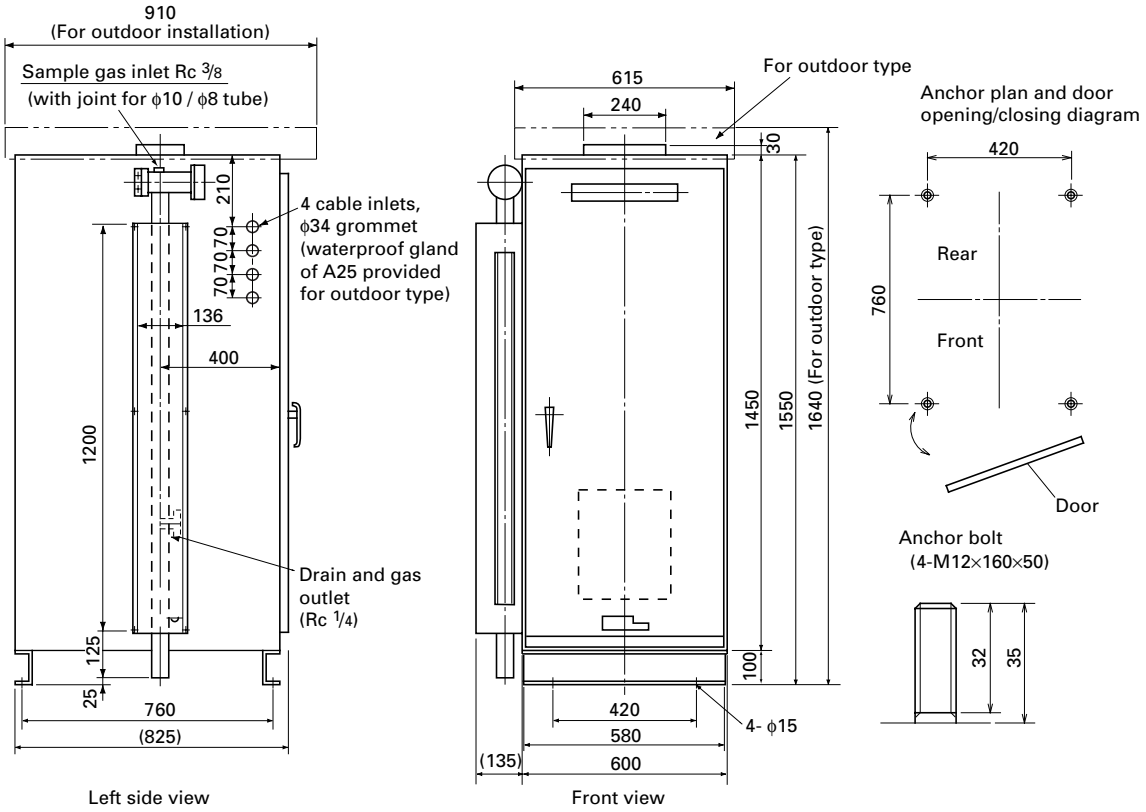
OUTLINE DIAGRAM (Unit: mm)

<Gas extractor>



OUTLINE DIAGRAM (Unit: mm)

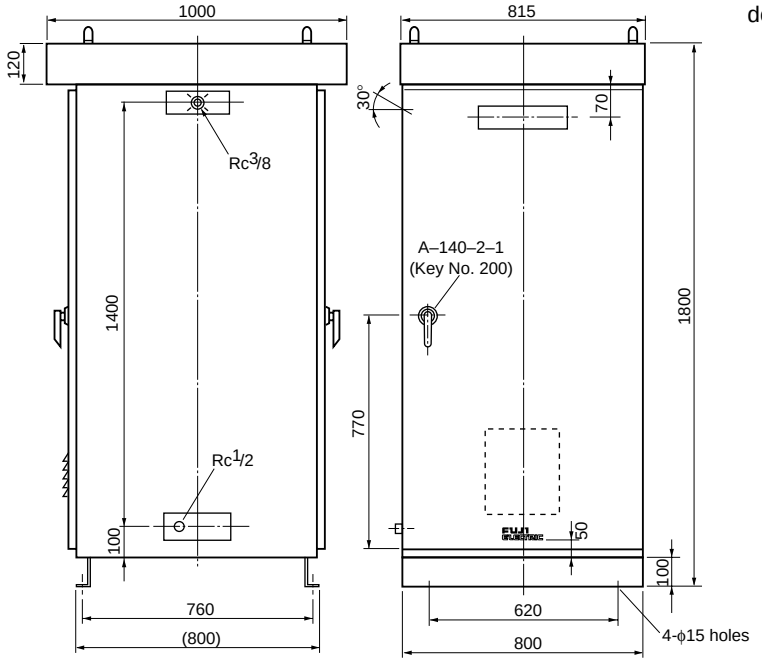
< Standard locker >



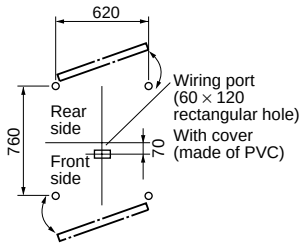
OUTLINE DIAGRAM (Unit: mm)

< Middle locker size >

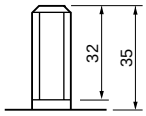
(For outdoor installation)



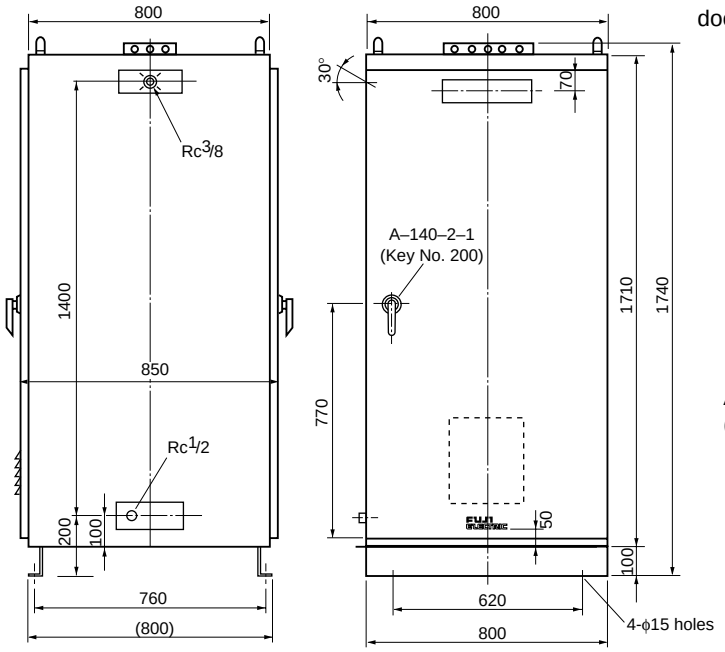
Anchor plan,
door open/close diagram



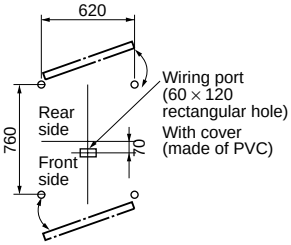
Anchor bolt (option)
(4–M12 × 160 × 50)



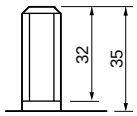
(For indoor installation)



Anchor plan,
door open/close diagram



Anchor bolt (option)
(4–M12 × 160 × 50)



Unit: mm

⚠ Caution on Safety

*Before using this product, be sure to read its instruction manual in advance.

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