

CO/O₂ GAS ANALYZER FOR STACK GAS

DATA SHEET

ZSW

This instrument is equipped with a non-dispersive infrared CO sensor and a galvanic oxygen sensor and used for measuring CO and O₂ in the gas emitted from garbage incinerators.

CO instantaneous value, O₂ instantaneous value and CO average value after O₂ correction (1-hour and time-variable averaging) can be output.

FEATURES

1. The CO sensor adopts high-performance and long-life non-dispersive infrared ray (NDIR) system. The CO sensor is not consumable, and need not be replaced in 1 or 2 years.
2. Automatic calibration function by air equipped as standard allows stable measurement. No need to worry about the consumption of standard gas.
3. Space-saving configuration unitized into 19-inch type allows the maintenance from the front.
4. A microjet recorder (Fuji Electric's type PHC or PHE) can be built in for recording measured gas concentration and temperature values.

SPECIFICATIONS

- **Measuring system:**
Non-dispersive infrared absorption (NDIR) method for CO
Galvanic method for O₂
- **Measurable component and range:**
CO ; 0~500/1000ppm
0~500/2000ppm
O₂ ; 0~25vol%
- **Repeatability:** ±0.5% of full scale/CO
±1% of full scale/O₂
- **Zero drift:** Max. ±2.0% of full scale/month for CO
Max. ±2.0% of full scale/week for O₂
- **Span drift:** Max. ±2.0% of full scale/week for CO
Max. ±2.0% of full scale/month for O₂
- **Linearity:** Max. ±2.0% of full scale
- **Sample gas extracting rate:**
Approx. 0.4 l/min
- **Response time:** Within 150 seconds for 90% indication (after extracting sample gas through the inlet)
- **Warm-up time:** Within 4 hours after power-on



- **Output signals:** Each signal within range from 4 to 20 mA DC
Non-isolated (isolated output available at option)
CO instantaneous value
O₂ instantaneous value
Moving average CO value after O₂ correction (averaging time variable)
Time setting in 1 to 59 minutes (1-minute increment) or 1 to 4 hours (1-hour increment)
Allowable load resistance 550 Ω or less
- **Pump ON/OFF contact input:**
No voltage contact (Closed: Pump ON)
- **Indication:**
LCD with back light for indicating CO instantaneous value, O₂ instantaneous value, CO instantaneous value after O₂ correction and CO average values after O₂ correction, O₂ average value (1-hour and time-variable averaging) and parameter assignment
- **Recorder (option):**
100 mm-width recorder (Fuji Electric's type PHC or PHE) built in, max. 6 points recordable
- **Gas extractor:** General type (without filter)
 - Titanium probe (300, 400, 600 or 800 mm long)
 - Flange JIS 5K25AFF
 - Weight: Approx. 1 kg (800 mm)
 Electrical heating type (filter built in)
 - Filter mesh; 40μm mesh of SUS 316 stainless steel
 - Probe; SUS 316 stainless steel of 300, 400, 600 or 800 mm length
 - Flange; JIS 5K65AFF
 - Weight; Approx. 8.5 kg

- **Separate extraction point filter:**
 - Glass wool filter (for general type)
 - Container material: PVC
- **Sample inlet tube:**
 - ϕ10/ϕ8 Teflon tube or heating tube (max. 30 m)
- **Functions:**
 - 1) **O₂ conversion and averaging calculation**
 - Conversion of measured CO gas concentration into a value at standard O₂ concentration
 - Calculating equation:
$$C = \frac{C_s(21-O_N)}{21-O_s}$$
 - C; CO concentration after O₂ correction
 - C_s; Measured CO concentration
 - O_s; Measured O₂ concentration (%)
 - O_N; Standard O₂ concentration (12% for garbage incinerator)
 - Moving average calculation time
 - Calculation is made for 1 to 59 minutes or 1 to 4 hours.
 - 2) **Auto calibration (of CO zero and O₂ span)**
 - Auto calibration cycle settable range:
 - 1 to 99 hours (1-hour step) or 1 to 40 days (1-day step)
 - need 7 days set to keep drift spec.
 - 3) **Output hold function**
 - Holds output signal during auto calibration.
 - 4) **Other functions**
 - Temperature input signal: K thermocouple input x 2 (input for recorder)
- **Standard requirements for sample gas:**
 - Temperature; 60 to 800°C
 - Dust; 0 to 300mg/Nm³ or less
 - 0 to 50mg/Nm³:
 - Use general type extractor.
 - 0 to 150mg/Nm³:
 - Use general type extractor with separate extraction point filter.
 - 0 to 300mg/Nm³:
 - Use heating extractor.
 - Pressure; -2 to +2kPa
 - Components; SO₂ 500 ppm or less
 NO_x 1000 ppm or less
 CO₂ 0 to 15%
 CO 0 to 2000 ppm
 O₂ 0 to 21%
 HCℓ 1000 ppm or less
 N₂, H₂O Remaining percent
- **Rated operating conditions:**
 - Ambient temperature;
 - 0 to +40°C or -5 to 40°C,
 - 10 to 40°C
 - Ambient humidity; 90% RH or less
 - Power supply voltage;
 - 100 V AC ±10 V, 50 or 60 Hz, 115 V AC ±10% 60 Hz, 230 V AC ±10% 50 Hz
 - Power supply frequency;
 - Rating ±0.5 Hz
 - Power consumption; Max. 400 VA (without gas extractor)

- **Installation requirements:**
 - 1) Selection of a place which does not receive direct sunlight or radiation from hot substances
 - 2) Avoidance of a place under heavy vibration
 - 3) Clean atmospheric air
- **External dimensions (H x W x D):**
 - Indoor type 1550 x 600 x 650 mm
 - Outdoor type 1640 x 615 x 765 mm
- **Weight:** Approx. 180 kg (excluding standard gas)
- **Cubicle finish color:** Munsell 5Y7/1 semi-gloss
- **Other:** One standard gas (3.4 ℓ) cylinders accommodable
(2 cylinders accommodable)

SCOPE OF DELIVERY

- Gas analyzer system
- Specified external drain separator
- Specified gas extractor/probe set
- Specified gas inlet tube set
- Specified standard gas (with pressure adjustor) set
- Specified recorder to be accommodated in cubicle
- Standard accessory set

ORDERING INFORMATION

1. Code symbols
2. Necessity of spares for 1-year measurement
3. Type of recorder (option)
 - Type
 - For 6-point continuous recording
 - Type: PHC62043-NA0YY-B
 - Scale specifications: 0 to 500ppmCO, TK7K0750C2
 - For 2-point continuous recording
 - Type: PHE2BB12-660NY-B
 - Scale specifications: 0 to 500ppmCO, TK7K0750C4

CODE SYMBOLS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17																	
Z	S	W															Description
																	Indication (4th code)
																	Japanese
																	English
																	Measurement range (5th code)
																	0~500 / 1000 ppmCO 0~25% O ₂
																	0~500 / 2000 ppmCO 0~25% O ₂
																	Power supply (6th code)
																	AC 100V 50Hz
																	AC 100V 60Hz
																	AC 115V 60Hz
																	AC 230V 50Hz
																	Cubicle structure (7th code)
																	Indoor type
																	Outdoor type
																	} Temperature of installation site : 0°C or higher
																	Indoor type
																	Outdoor type
																	} Temperature of installation site : - 5°C or higher
																	Indoor type
																	Outdoor type
																	} Temperature of installation site : - 10°C or higher
																	Gas pressure at extraction point (9th code)
																	- 2~+2kPa
																	External drain separator (10th code)
																	Not provided
																	Provided (Note 1)
																	Recorder (11th code)
																	Not provided
																	} (Note 2) (Recorder hardware needs to be ordered simultaneously.)
																	With 2-point recorder PHE
																	Isolated output (12th code)
																	Non-isolated output
																	Isolated output (3 outputs)
																	Fluorescent lamp (13th code)
																	Not provided
																	Provided
																	Standard gas (14th code)
																	Not provided
																	CO/N ₂ (3.4L, cylinders 1)
																	Gas extractor, Flange dimension (15th code)
																	Without gas extractor
																	1 General type, Flange JIS 5K 25A FF
																	2 General type (With separate extraction point filter), Flange JIS 5K 25A FF
																	3 Heating extractor, Flange JIS 5K 65A FF
																	Gas extractor insertion length (16th code)
																	Without gas extractor
																	A 300mm
																	B 400mm
																	C 600mm
																	D 800mm
																	Sample inlet tube type Length (17th code)
																	Y Not provided Not provided
																	A φ10/ φ8 Teflon tube 5m
																	B φ10/ φ8 Teflon tube 10m
																	C φ10/ φ8 Teflon tube 15m
																	D φ10/ φ8 Teflon tube 20m
																	E φ10/ φ8 Teflon tube 25m
																	F φ10/ φ8 Teflon tube 30m
																	G Heating tube 10m
																	H Heating tube 15m
																	J Heating tube 20m
																	K Heating tube 25m
																	L Heating tube 30m
																	(Note) Specify heating extractor.

(Note 1) Specify when the inclination of the gas inlet tube from the gas extraction point to the gas inlet of the main unit is less than 15° downward. If there is a possibility of freezing, separately take measures against freezing.

(Note 2) Recorder assignment is as follows.

In 6-point recording: CH1; CO instantaneous value

CH2; O₂ instantaneous value

CH3; vacant

CH4; 1-hour average CO value after O₂ correction

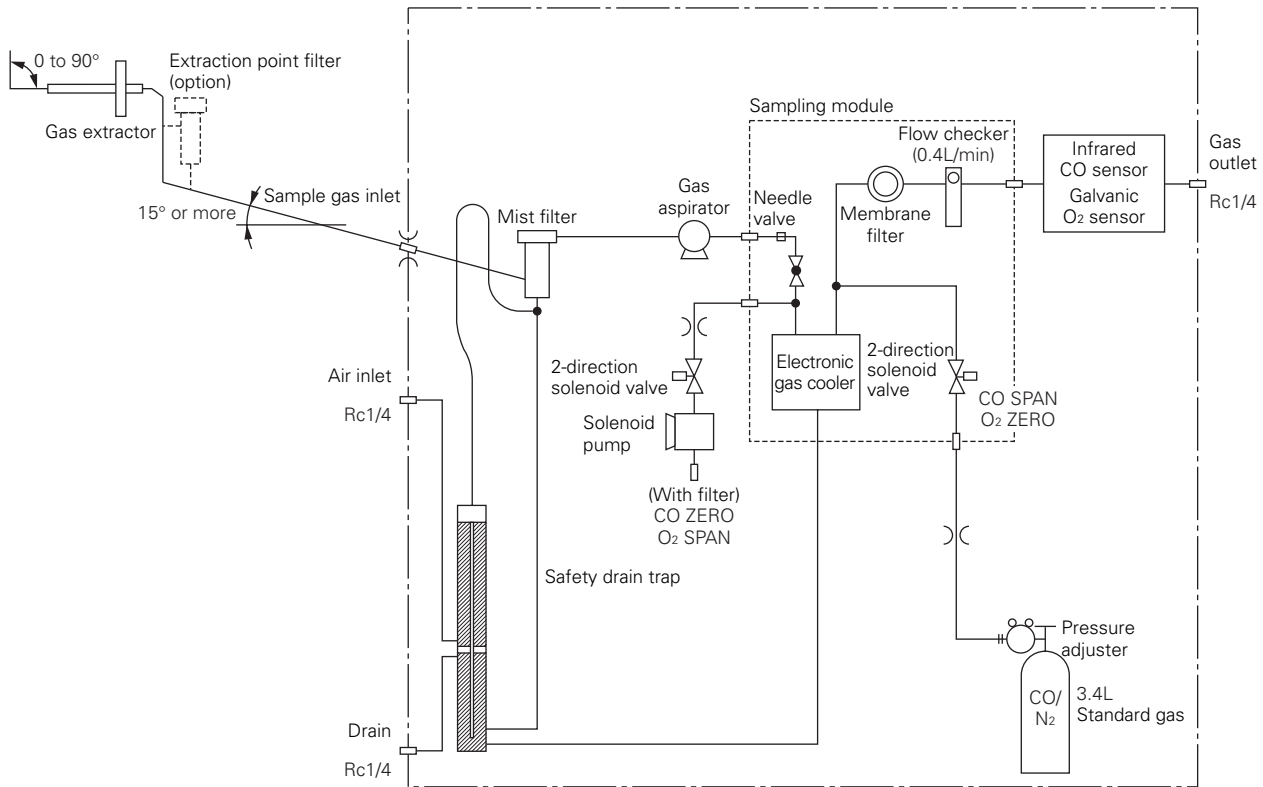
CH5; K thermocouple 1

CH6; K thermocouple 2

In 2-point recording: CH1; Average CO value after O₂ correction

CH2; O₂ instantaneous value

PHE of 2-point continuous recording type only can be specified.



Functions of Individual Components

- **Gas extractor:** Extracts sample gas.
 General type (without filter): Used when dust concentration is $50\text{mg}/\text{Nm}^3$ or lower.
 General type (with separate extraction point filter): Used when dust concentration is $150\text{mg}/\text{Nm}^3$ or lower.
 Heating type (with filter, Filter diameter: 40μ): Used when dust concentration is $300\text{mg}/\text{Nm}^3$ or lower.
- **Extraction point filter:**
 Removes dust. Used when dust concentration is in the range from 50 to $150\text{mg}/\text{Nm}^3$.
- **Mist filter:** Removes dust and mist.
- **Safety drain trap:**
 Functions to prevent suction of drain pot and drain.
 (Suction prevention operating pressure: 6kPa , Water seal pressure: Approx. 2kPa)
- **Solenoid pump:**
 Operated at the time of calibration (atmospheric aspiration)
- **Gas aspirator:** Aspirates sample gas (Approx. $0.4\text{L}/\text{min}$.)
- **Needle valve:** Adjusts sample gas flow rate.
- **Electronic gas cooler:**
 Dehumidifies sample gas.
- **Membrane filter:**
 Removes minute dust.
- **Flow checker:** Monitors flow rate.
- **Standard gas (CO/CO₂):**
 For CO span and O₂ zero calibration
- **Pressure adjuster:**
 Depressurizes standard gas.

Standard Accessories

Name	Type of extractor	General extractor or without extractor	General extractor with extraction point filter	Heating extractor
Filter paper for membrane filter (Spare)		2 sheets	2 sheets	2 sheets
Fuse with nail (3A)		2	2	2
Standard gas joint		1	1	1
Hose band for fixing standard gas cylinder		6	6	6
Toalon tube for standard gas connection, 0.3m and $\phi 9/\phi 6$ mm		1	1	1
Polyethylene tube for standard gas connection, 1m and $\phi 6/\phi 4$ mm		1	1	1
Fixed restrictor for standard gas connection		1	1	1
Water bottle for injection		1	1	1
Gas extractor flange packing		1 pc. or none	1 pc.	1 pc.
Gas extractor fastening bolt and nut		1 set or none	1 set	1 set
Extraction point filter fastening bolt and nut		–	1 set	–
O-ring (G50) for gas extractor (spare)		–	–	1
Heating tube support (only when heating tube is provided)		–	–	1 set
Instruction manual		1 copy	1 copy	1 copy

Spare Parts for 1-Year Measurement

Name	Type of extractor	General extractor or without extractor	General extractor with extraction point filter	Heating extractor
Type		ZBN1SW12	ZBN1SW22	ZBN1SW32
Filter paper for membrane filter (25 sheets)		1 bag	1 bag	1 bag
Rubber ring for membrane filter		2	2	2
O-ring (G65) for membrane filter		2	2	2
Fuse (3A)		4	4	4
Element for mist filter		2	2	2
O-ring (G65) for mist filter		2	2	2
Diaphragm for gas aspirator		1	1	1
Gas aspirator valve		1	1	1
Filter for extraction point filter		–	12	–
O-ring (G65) for extraction point filter		–	2	–
Mesh filter for heating extractor		–	–	1
Packing for heating extractor		–	–	1 pc.
Seal metal packing for heating extractor		–	–	1 pc.
O-ring (G50) for heating extractor		–	–	1

Recorder (Option)

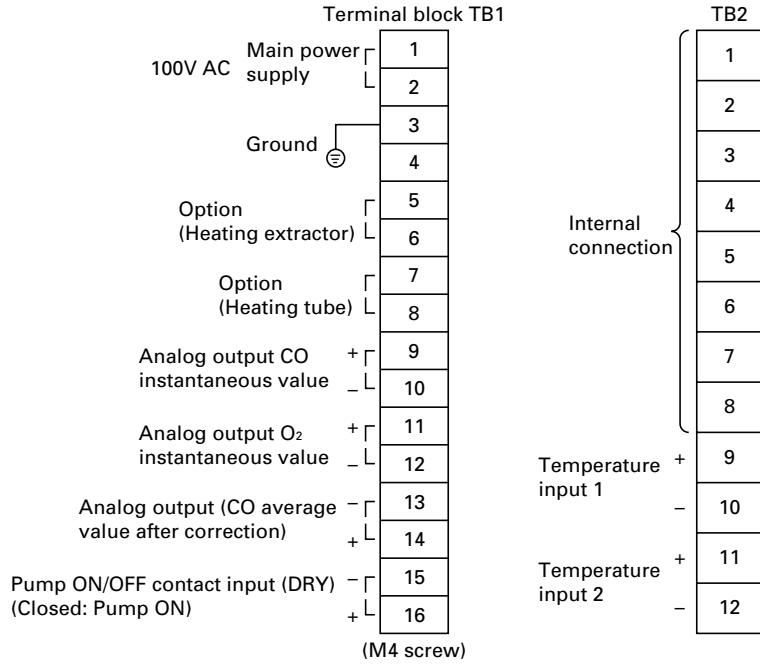
- Standard accessory:

Ink cartridge × 1
Recording paper × 1 roll

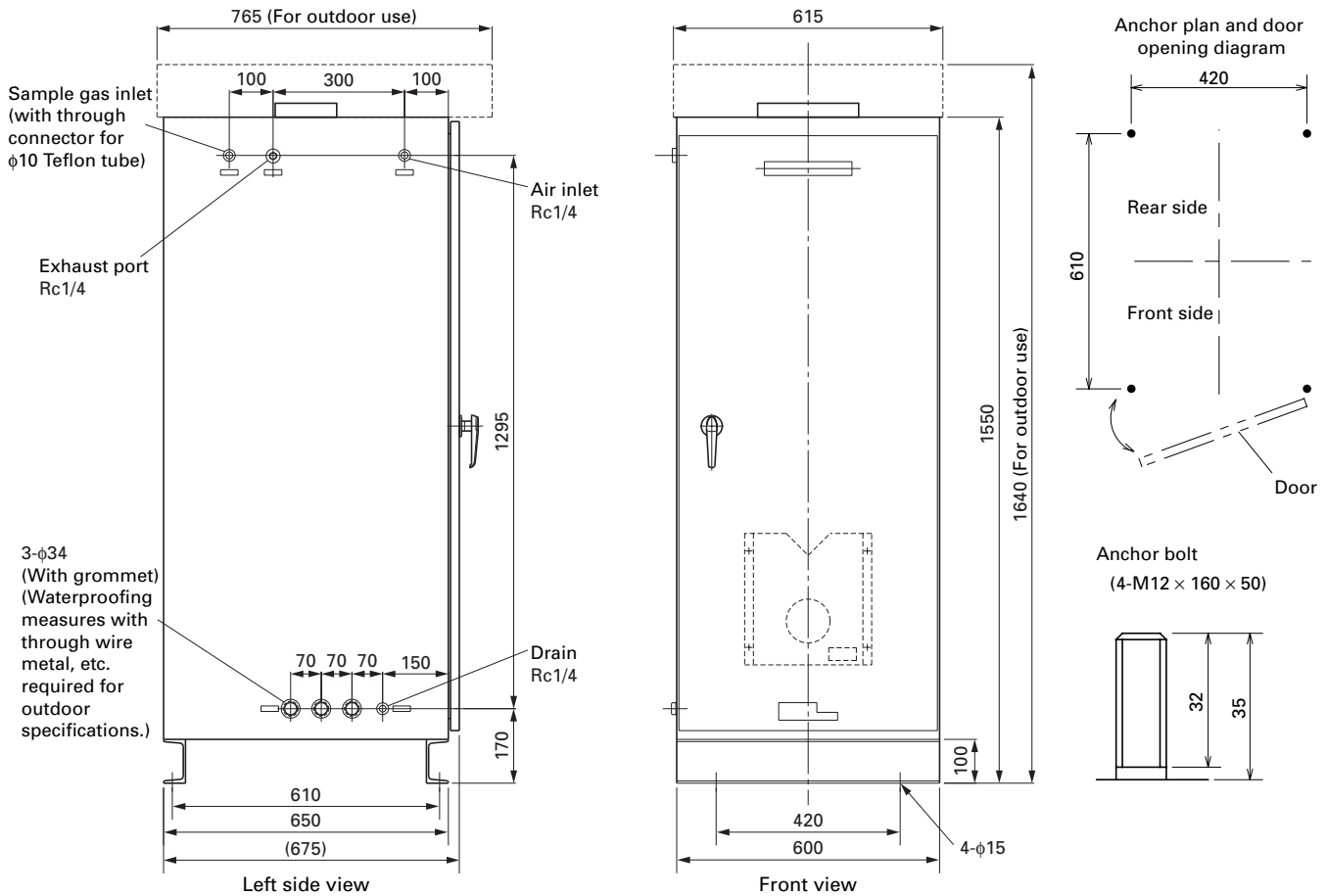
- Spares for 1 year:

PHE type recorder
Ink cartridge (Type: PHZH2002) × 2
Recording paper (Type: PEX00DL1-5000B) × 12 rolls
PHC type recorder
Ink cartridge (Type: PHZH1002) × 2
Recording paper (Type: PEX00DL1-5000B) × 12 rolls

CONNECTION DIAGRAM

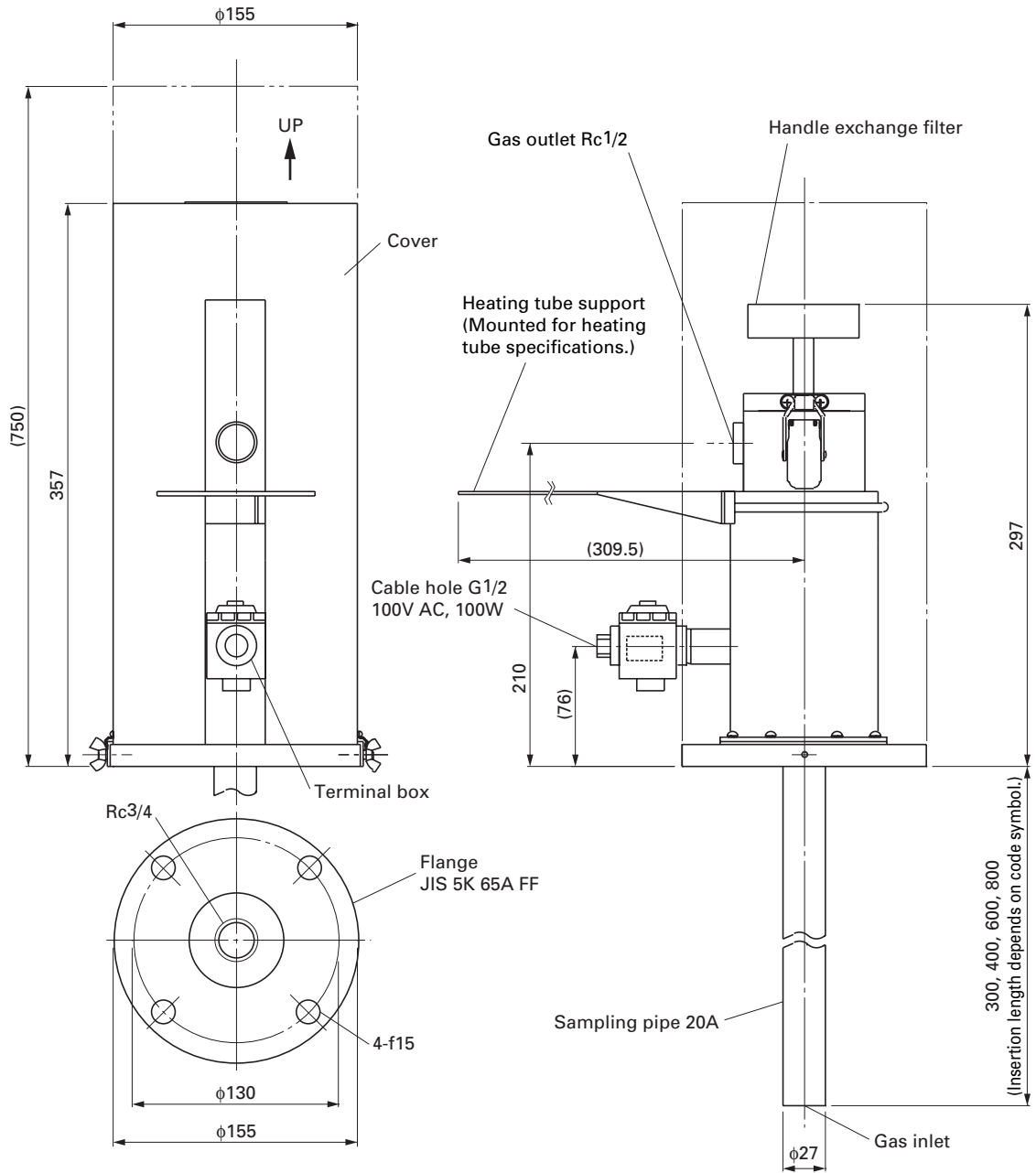


OUTLINE DIAGRAM (Unit: mm)

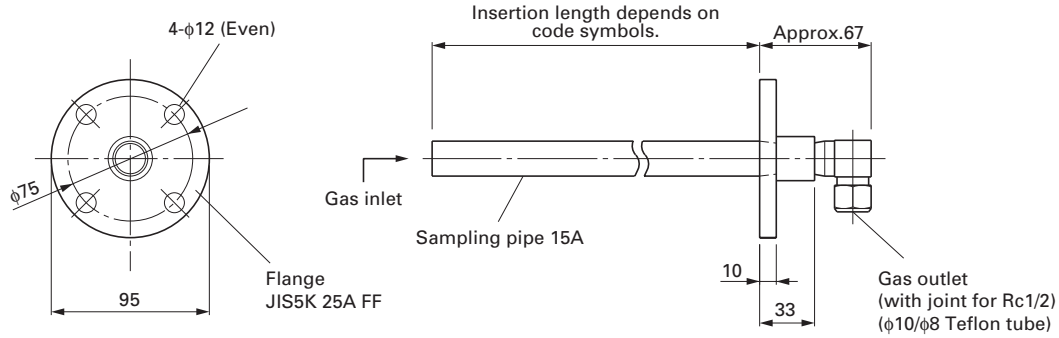


OUTLINE DIAGRAM (Unit: mm)

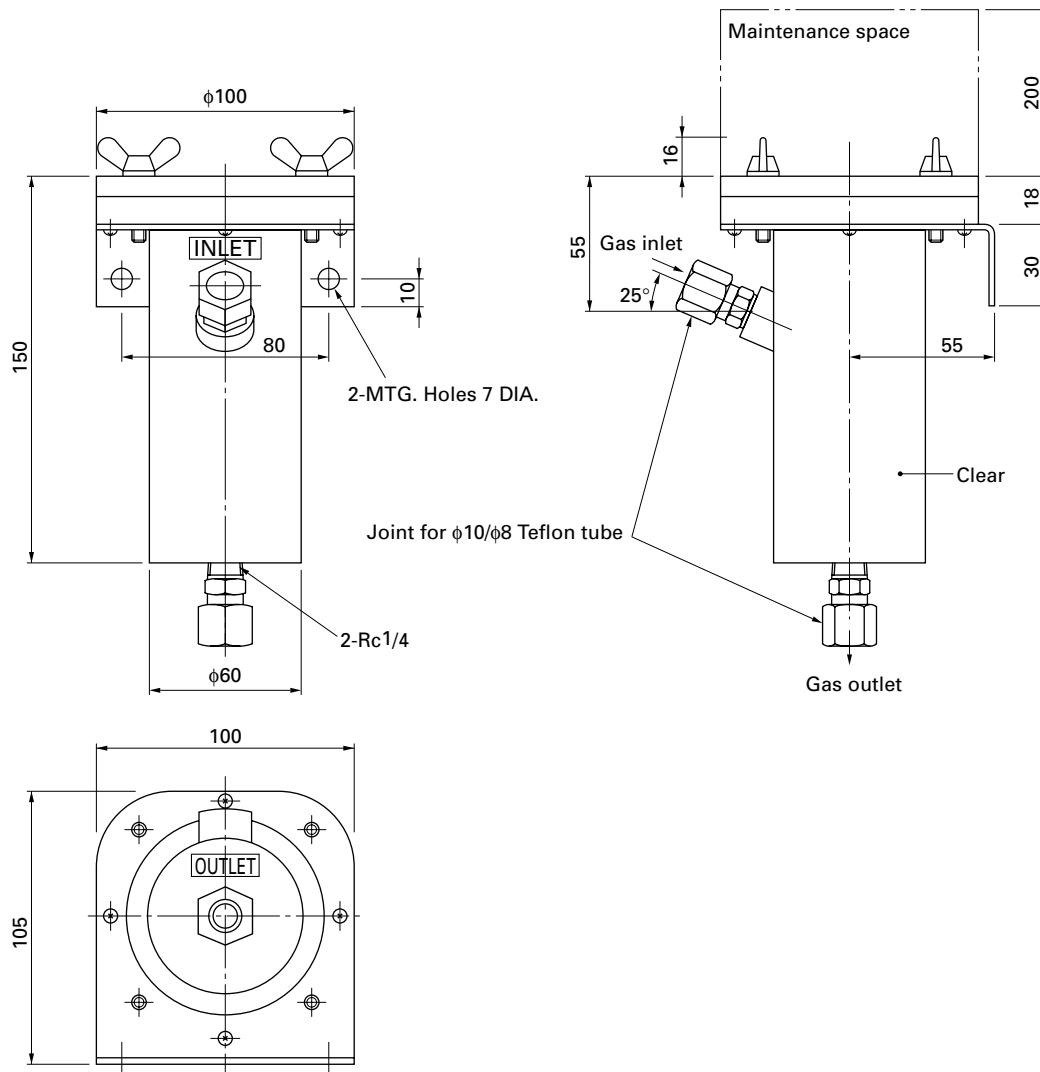
<Heating gas extractor>



<General type gas extractor>



<Extraction point filter>



⚠ Caution on Safety

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

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