

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

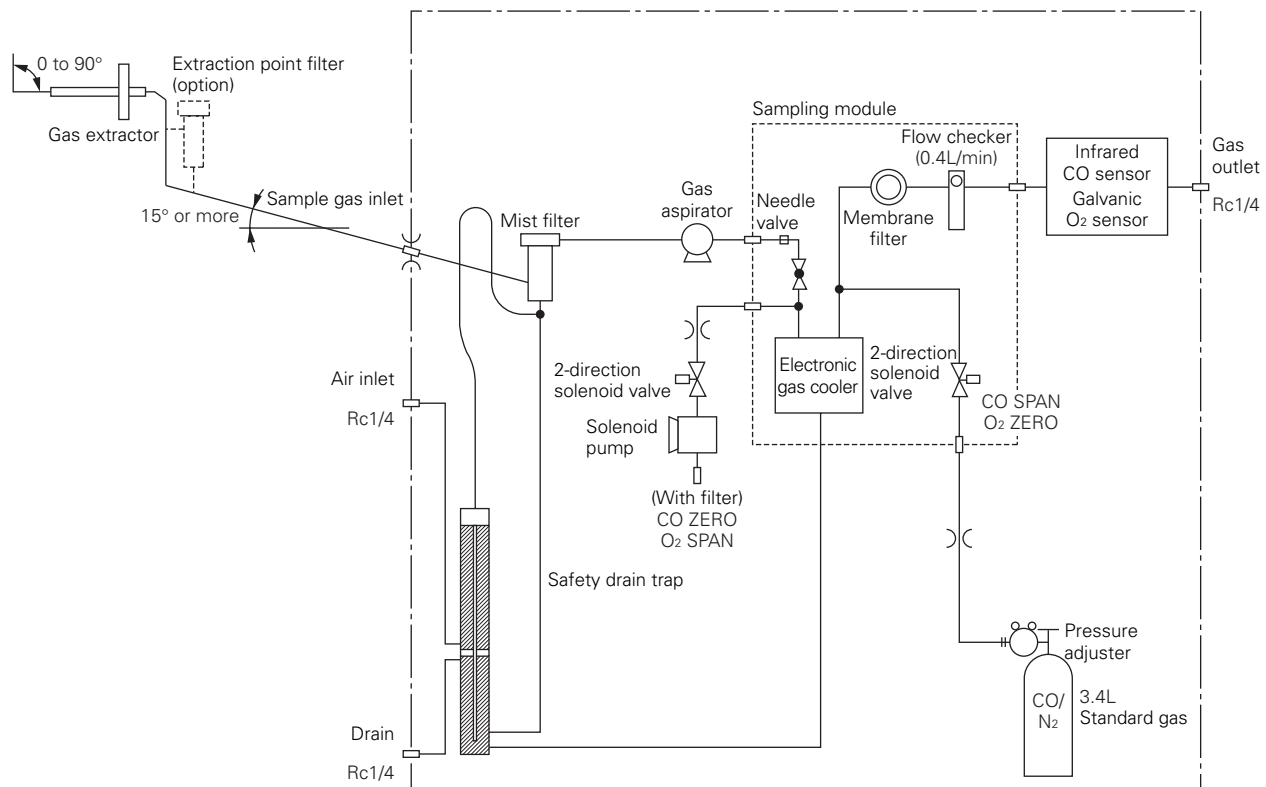
- Gas analyzer system
- Specified external drain separator
- Specified gas extractor/probe set
- Specified gas inlet tube set
- Specified standard gas (with pressure adjustor) set
- Specified recorder to be accommodated in cubicle
- Standard accessory set

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

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Z	S	W					1	-					-			

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)

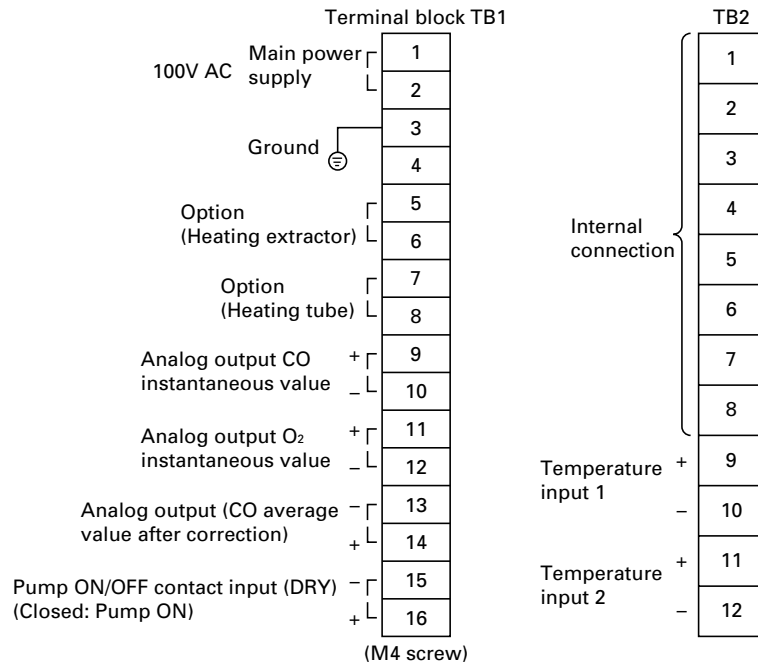
• Standard accessory:

Ink cartridge × 1
Recording paper × 1 roll

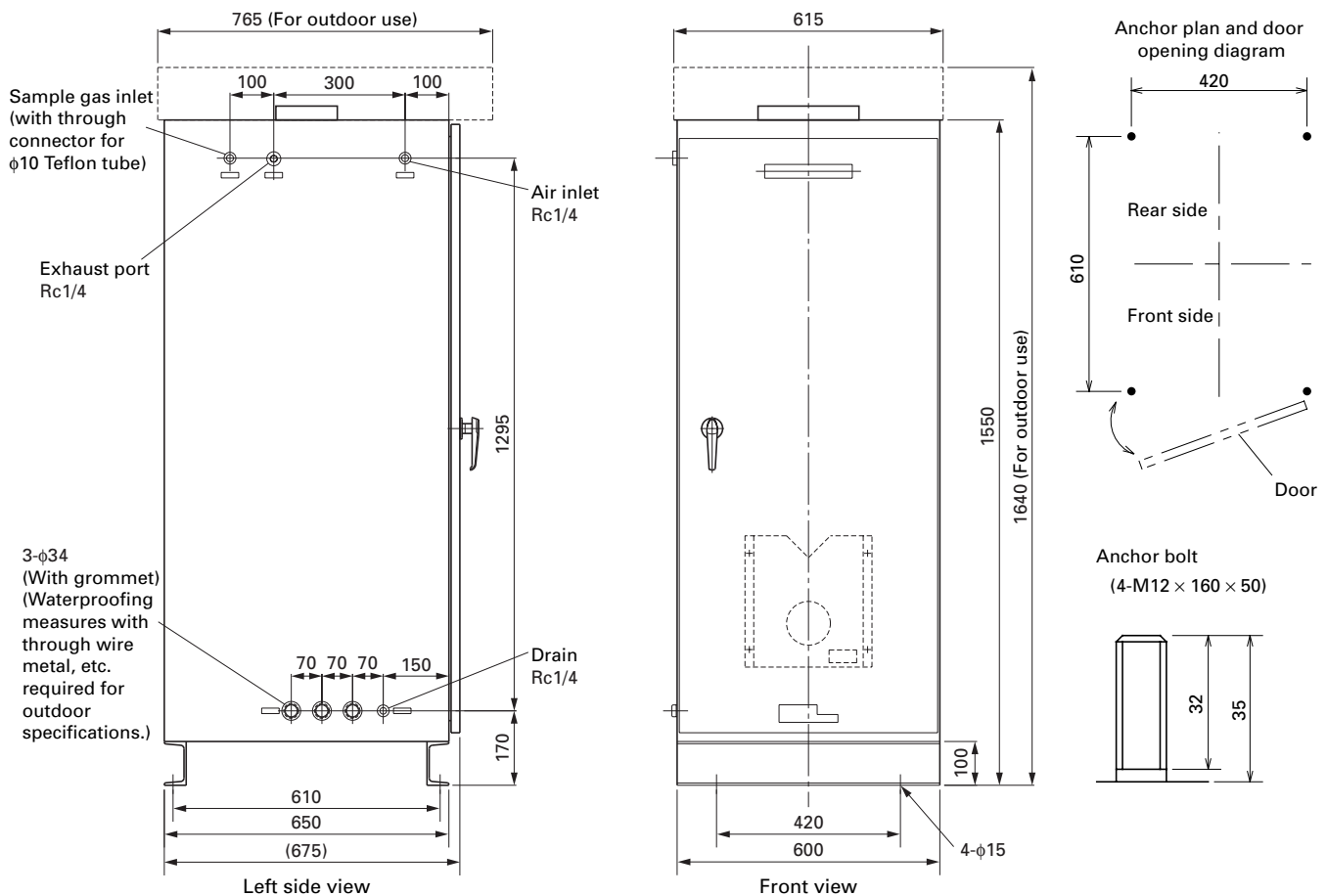
• Spares for 1 year:

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

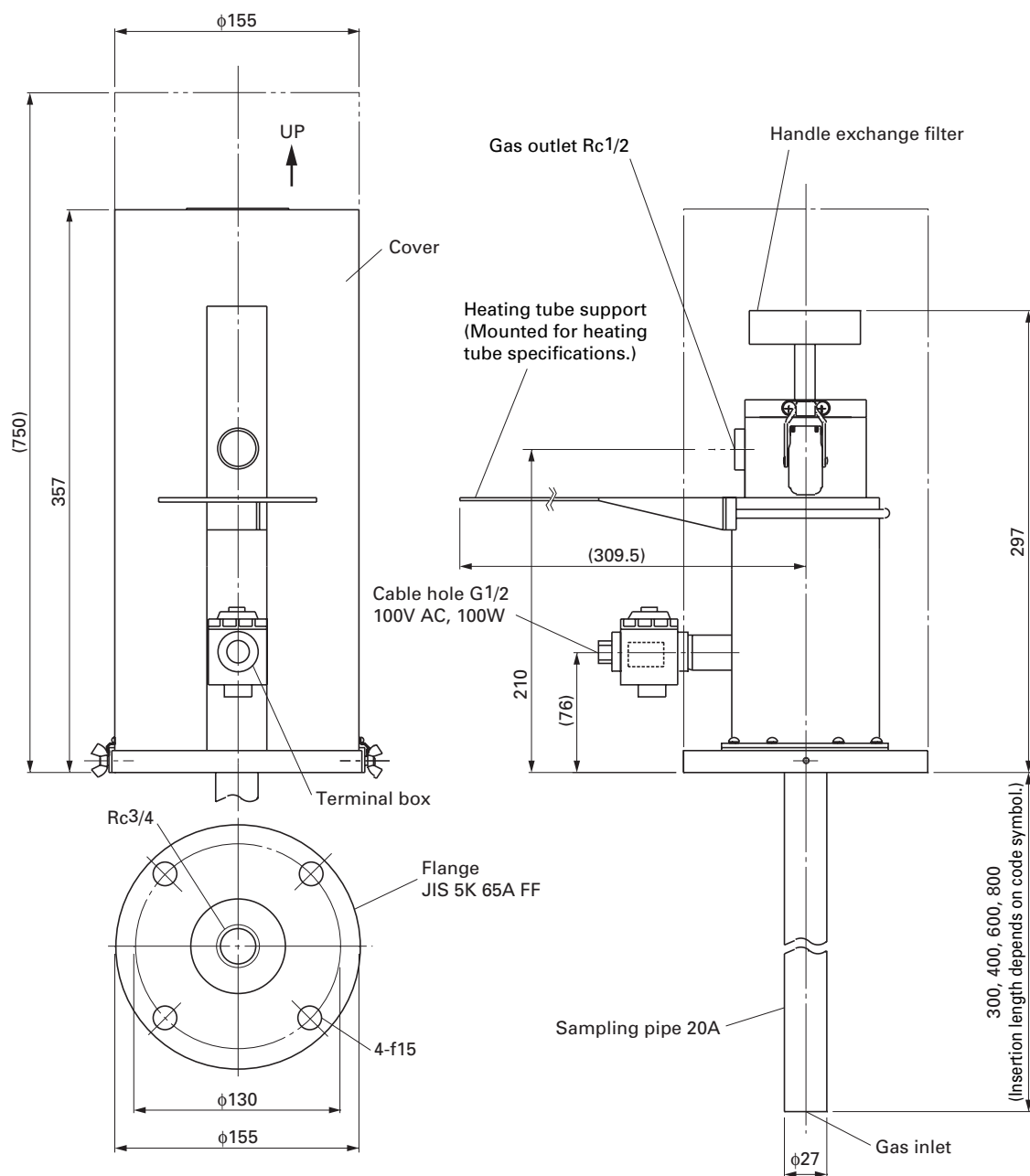


OUTLINE DIAGRAM (Unit: mm)

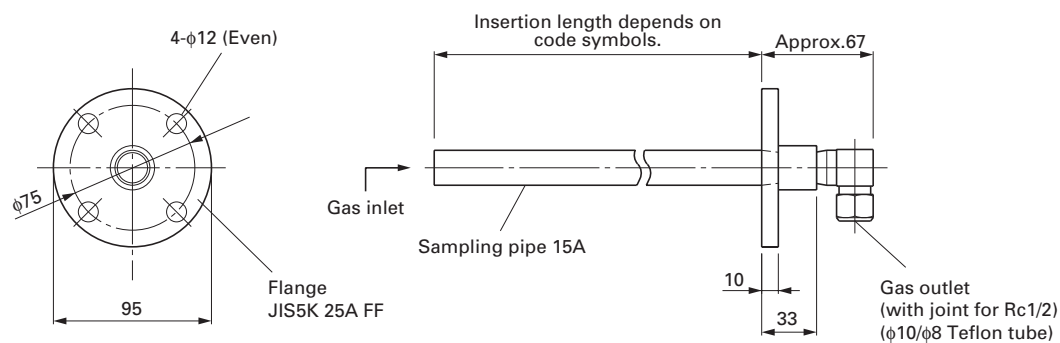


OUTLINE DIAGRAM (Unit: mm)

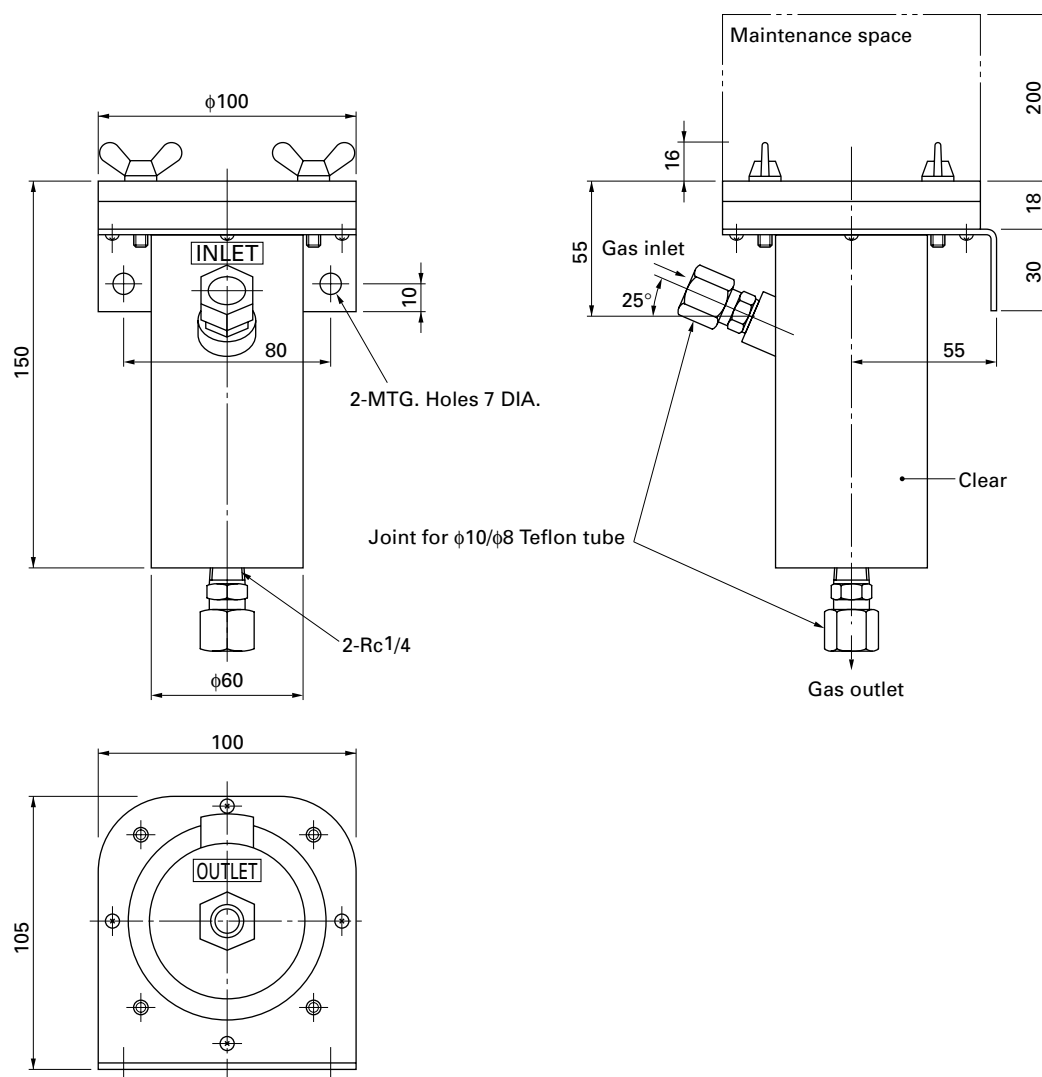
<Heating gas extractor>



<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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