



PRODUCT SPECIFICATIONS

System-in type OZONE MONITOR MODEL EG/EL-550

EBARA JITSUGYO CO., LTD.

1. General description

The ozone densitometer (hereafter referred as ozone monitor), EG/EL-550 series was actualized as a small instrument by designing the detector unit and the control unit to one package.

Moreover, by only connecting a pipe on inlet for sample, the monitor can measure ozone concentration continuously.

Still more, to indicate a light intensity for sensor and also value for span is available, so that can easily check the monitor and perform the maintenance.

2. Measuring principle

This monitor is a UV absorption type ozone monitor that can detect and measure quantity of absorption of UV rays by ozone in the sample water (gas) introduced into the detector.

A low-pressure mercury lamp (emission wavelength 253.7 nm) is used for the light source. As the quantum of light absorbed by ozone existing within the optical path 'T' obeys the Lambert-Beer's Law, concentration of ozone can be measured as follows.

$$C = \frac{A}{\alpha T} \times \log \left(\frac{I_0}{I_x} \right)$$

where: C = Concentration of ozone
 α = Absorption coefficient of ozone
 T = Optical path length (Cell gap)
 I_0 = Incident UV light intensity
 I_x = Transmitted UV light intensity
 A = Constant

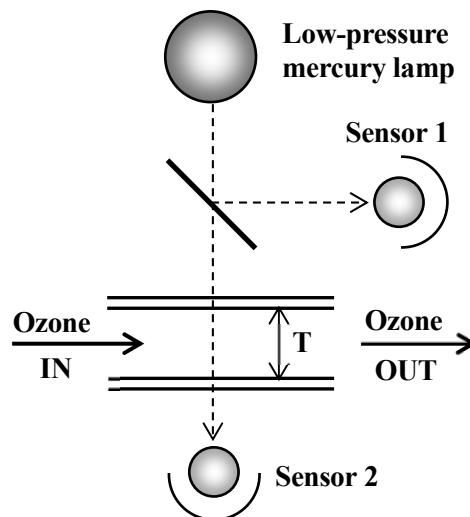


Figure- 1 Logic diagram

3. Specifications

3.1 Dissolved Ozone monitor

Model & Product name	Model EL-550 Dissolved Ozone monitor	
Measuring principle	UV absorption method	
Detection target	Dissolved ozone (not mixture of impurities)	
Measuring ranges	Select one range among the following when your order. (unit: mg/L) 0–10.00, 0–20.0, 0–30.0, 0–40.0, 0–50.0, 0–60.0, 0–100, 0–120, 0–150 * Please consult us for the measuring range other than the above.	
Measuring interval	Continuous measurement	*Note 1
Sampling method	Water pressure intake or suction by the sampling pump (pump is not contained in accessory)	*Note 2
Measuring flow rate	0.05–3.0 L/min	*Note 3
Normal operating pressure	0.3 MPa (G) or less	
Span drift	Within $\pm 1\%$ FS/month	
Zero drift	Within $\pm 3\%$ FS/month	
Linearity	Within $\pm 1\%$ FS	
Repeatability	1% FS or less	
Zero calibration	Adjustment by trimmer	
Display function	available (selection among ozone concentration, light intensity of the sensor or span by a rotary switch) When measuring ozone concentration, minimum figure of the indicator is as follows. - in case of 10 mg/L 0.01 mg/L - in case of 20–60 mg/L 0.1 mg/L - in case of 100–150 mg/L 1 mg/L	
Analog output	Voltage output: 0–1 V or 0–10V DC Current output: 4–20 mA DC (insulated)	*Note 4 *Note 5
Power supply	100–220 V $\pm 10\%$ AC, 50/60 Hz	*Note 6
Power supply connection	Connection through the terminal block	
Power consumption	50 VA	*Note 7
Outside dimension	220 (W) \times 150 (H) \times 105 (D) mm	*Note 8

Pipe port	Flowell, 20 series, 1/4 inch fitting Note: Refer to the following item for the option.	
Operating environment	5–40°C, 90% RH (not condensed)	
Body material	Stainless steel SUS 304	
Wetted material	Synthetic quartz, PTFE, PFA	
Weight	Approx. 2.2 kg	
Accessory	Time-lag type Fuse, 250 V AC, 1 A, approved by UL standard: 1 pc	
Option	(1) Preventive function for condensation (2) Power supply for 24 V DC (3) Fittings for piping connection - 30 series fitting made by Flowell - Final lock fitting made by Kurabo - Super 300 P fitting made by Nippon Pillar Packing	*Note 9
Consumables	Low-pressure mercury lamp	

Supplementary information

- *Note 1: Confirm zero point before supplying ozonized water.
- *Note 2: In the case of suctioning by the pump, the ozone concentration may be decreased due to pressure drop inside the piping.
- *Note 3: Since decomposition of ozone is likely to occur inside the piping when measurement is conducted under a low flow rate, a minimum length of piping should be used in such a case.
- *Note 4: A resistance externally connectable is over 10 k Ω. Specify either 1 V or 10 V when ordering. It is set before dispatch.
- *Note 5: A resistance externally connectable is less than 750 k Ω.
- *Note 6: 24 V DC power supply specifications are optionally available.
(Still more allowable range of this voltage is 24 ±4 V DC.)
- *Note 7: Current consumption when used on AC power supply.
- *Note 8: Protruding parts are excluded.
- *Note 9: Dry air (0.1–1 L/min) to be supplied by the customer.
Connected piping size are O.D. 6 mm or one of 4 mm for one touch coupling, please specify your suitable one when your order.

3.2 Ozone Gas monitor

Model & Product name	Model EG-550 Ozone Gas monitor	
Measuring principle	UV absorption method	
Detection target	Ozone gas (not mixture of impurities)	
Measuring ranges	Select one range among the following when your order. (unit: g/m ³) 0–10.00, 0–20.0, 0–30.0, 0–40.0, 0–50.0, 0–60.0, 0–100, 0–120, 0–150 * Please consult us for the measuring range other than the above.	
Measuring interval	Continuous measurement	*Note 1
Sampling method	Gas pressure intake or suction by the sampling pump (pump is not contained in accessory)	*Note 2
Measuring flow rate	0.05–3.0 L/min	*Note 3
Normal operating pressure	0.1 MPa (G) or less * But, outlet of the monitor should be free to atmosphere, when measuring the ozone. When the outlet is influenced with a pressure, perform to compensate the pressure.	
Span drift	Within ±1% FS/month	
Zero drift	Within ±3% FS/month	
Linearity	Within ±1% FS	
Repeatability	1% FS or less	
Zero calibration	Adjustment by trimmer	
Display function	available (selection among ozone concentration, light intensity of the sensor or span by a rotary switch) When measuring ozone concentration, minimum figure of the indicator is as follows. - in case of 10 g/m ³ 0.01 g/m ³ - in case of 20–60 g/m ³ 0.1 g/m ³ - in case of 100–150 g/m ³ 1 g/m ³	
Analog output	Voltage output: 0–1 V or 0–10V DC Current output: 4–20 mA DC (insulated)	*Note 4 *Note 5
Power supply	100–220 V ±10% AC, 50/60 Hz	*Note 6
Power supply connection	Connection through the terminal block	
Power consumption	50 VA	*Note 7
Outside dimension	220 (W) × 150 (H) × 105 (D) mm	*Note 8

Pipe port	Flowell, 20 series, 1/4 inch fitting Note: Refer to the following item for the option.	
Operating environment	5–40°C, 90% RH (not condensed)	
Body material	Stainless steel SUS 304	
Wetted material	Synthetic quartz, PTFE, PFA	
Weight	Approx. 2.2 kg	
Accessory	Time-lag type Fuse, 250 V AC, 1 A, approved by UL standard: 1 pc	
Option	(1) Preventive function for condensation (2) Power supply for 24 V DC (3) Fittings for piping connection - 30 series fitting made by Flowell - Final lock fitting made by Kurabo	*Note 9
Consumables	Low-pressure mercury lamp	

Supplementary information

*Note 1: Confirm zero point before supplying ozone gas.

*Note 2: In the case of suctioning by the pump, the ozone concentration may be decreased due to pressure drop inside the piping.

*Note 3: Since decomposition of ozone is likely to occur inside the piping when measurement is conducted under a low flow rate, a minimum length of piping should be used in such a case.

*Note 4: A resistance externally connectable is over 10 k Ω . Specify either 1 V or 10 V when ordering. It is set before dispatch.

*Note 5: A resistance externally connectable is less than 750 k Ω .

*Note 6: 24 V DC power supply specifications are optionally available.
(Still more allowable range of this voltage is 24 \pm 4 V DC.)

*Note 7: Current consumption when used on AC power supply.

*Note 8: Protruding parts are excluded.

*Note 9: Dry air (0.1–1 L/min) to be supplied by the customer.
Connected piping size are O.D. 6 mm or one of 4 mm for one touch coupling, please specify your suitable one when your order.

4. Description of each position and functions

4.1 Display unit, power supply, and analog output

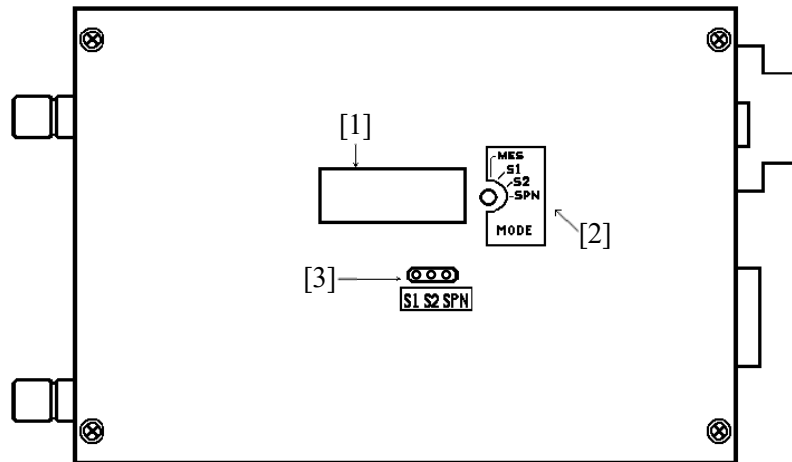


Figure-2 Front body

[1] Display unit (digital display)

The display unit indicates ozone concentration when measuring it. Also, values of each sensors, span value, etc., are displayed in accordance with the selection on the operation mode switch.

Caution: When measuring ozone concentration through analog output, don't set the operation mode switch to SPN. If set so, analog output is not available.

[2] Operation mode switch (MODE)

This switch is used for selecting display of measurement, adjustment, etc.

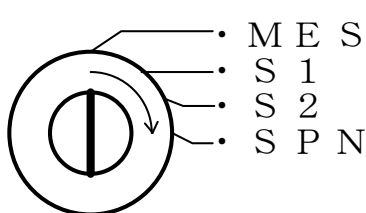


Figure-3 Mode switch

MES: Display of ozone concentration

Note: Ozonized water display in mg/L (unit)
Ozone gas display in g/m³ (unit)

S1: display of light intensity on the sensor 1

S2: display of light intensity on the sensor 2

SPN: display of span value

[3] Trimmer (Variable resistor, S1/S2/SPN)

The trimmer is used for the adjustment of light intensity and span.

S1: Used for adjusting the display of light intensity on the sensor 1.

The light intensity is adjusted within the range of 900–500 (initial value).

(Do not read the decimal point of the confirmation numerical value.

An example: 50.0 → 500)

S2: Used for adjusting the display of light intensity on the sensor 2. Adjust it so that light intensity on the sensor is almost the same value as that on the sensor 1.

SPN: Used for adjusting span values.

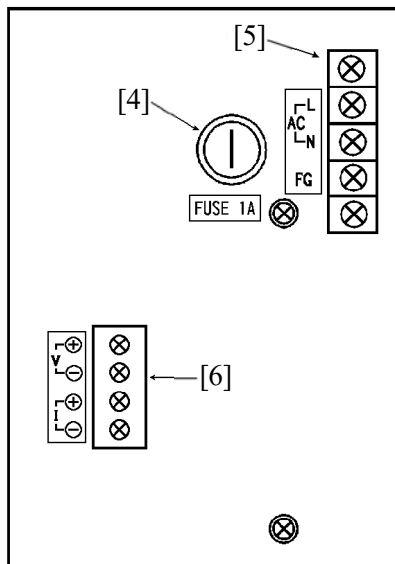


Figure- 4 Right side view of the body

[4] Fuse holder

Fuse standard: 5.2 mm dia. × 20 mm

Use Time-lag type Fuse approved by UL, with rating of 250 V AC, 1 A.

[5] Terminal block 1

Various unit scramble here for connection to the power.

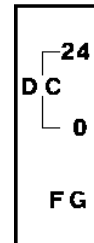
The type of solderless terminal is adaptable to the screw of M4.

AC: Terminals for electric power of 100–220 V AC, 50/60 Hz

DC: Terminals for electric power of 24 V DC (optional)

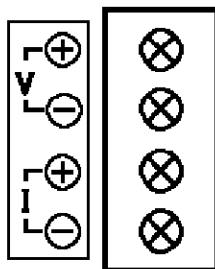
Refer to the right figure.

FG: Terminals for Grounding



[6] Terminal block 2

Various units scramble here for getting analog output. The type of solderless terminal is adaptable to screw of M3.



V: Analog voltage output, 0–1 V or 0–10 V DC

Load resistance externally connectable is more than 10 k Ω.

With respect to analog output range, select either 0–1 V or 0–10 V DC when ordering. It is to be set in the factory before shipment.

L: Analog current output 4–20 mA DC

An isolated electric current, 4–20 mA is output. To connect the outside instrument, a standard resistor needs to be connected to the input it externally, so analog voltage which is not affected by the length of the cable can be generated.

Note that the load resistance to be connected is below 750 Ω.

4.2 Sampling pipe connections

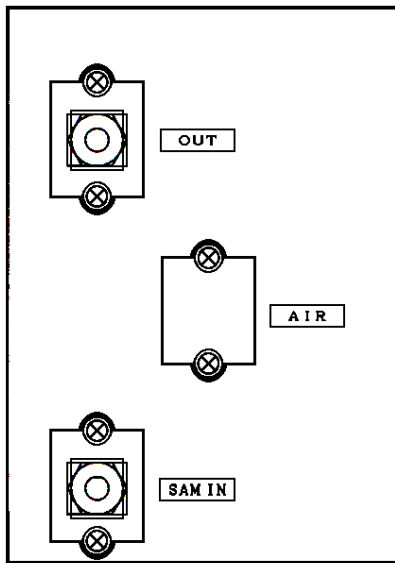


Figure- 5 Left side view of the body

OUT: Sample outlet
 Pipe fitting, 1/4 inch, PTFE
 (Polytetrafluoroethylene)
 Standard: Flowell, 20 series
 Option (only as for the dissolved ozone monitor):
 Final lock fitting made by Kurabo

SAM IN: Sample inlet
 Pipe fitting, 1/4 inch, PTFE
 Standard: Flowell, 20 series
 Option (only as for the dissolved ozone monitor):
 Final lock fitting made by Kurabo

AIR: Air is used for preventing condensation of dew-drop.
 This optional one touch fitting for tube is O.D. 6 mm or 4 mm.

5. Installation

5.1 Requirements of installation

In order to protect the monitor from any damage and to ensure its stable operation, the installation at places as shown below should be avoided.

- (1) Dusty place or any place where such corrosive gas as hydrogen sulfide gas, sulfurous acid gas or halogen gas is floating in the atmosphere.
- (2) Places having characteristic of high temperature, high humidity, or a place of significant temperature changes.
- (3) Places subject to strong or continuous vibration.
- (4) Places subject to direct sunlight.
- (5) Places near strong magnetic field, electric field, and radiofrequency emission source.
- (6) Places where sufficient maintenance/inspection space cannot be ensured.
- (7) Places where an explosive gas may be generated.

5.2 How to install

(1) Supply of electric source

Use the power supply specified for instrumentation. If an inductive load or a large capacity load is connected to the power line, a surge current voltage may be generated, and it will result in erroneous measuring or damaged monitor disturbing the operation. For safety purposes, ground terminal on the monitor without fail. The power cable is not attached.

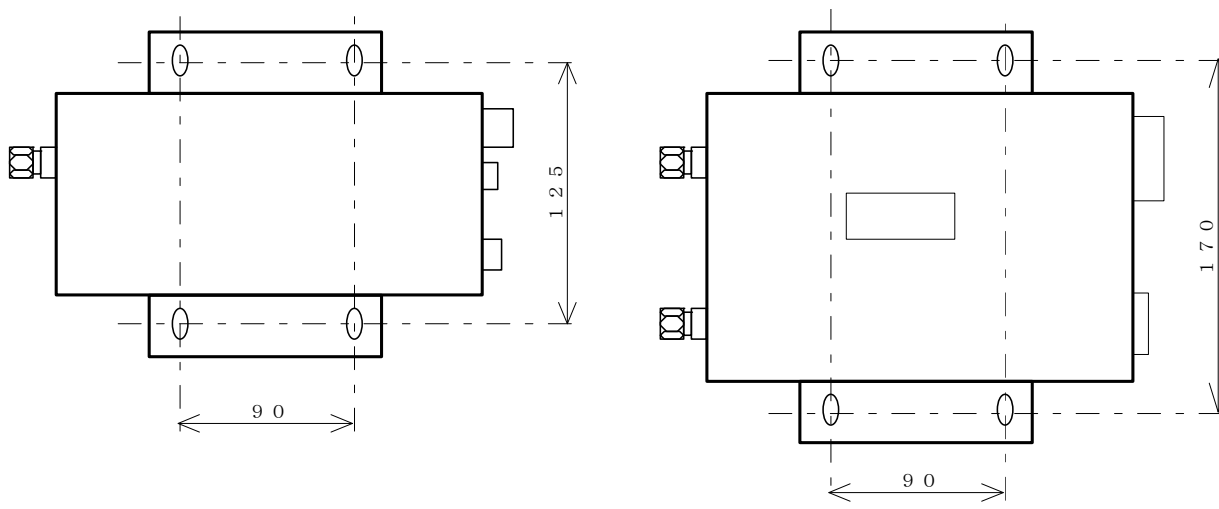
(2) Installation of the monitor

Install the sensor unit at a place where a sufficient space is available for piping and wiring. By shifting the fixing panel of the monitor, it can be set as either a floor-type or a wall-type. In either case, ensure a sufficient space for maintenance (see Figure- 6).

Installation pitch : Floor-mount type 125 × 90 mm
 Wall-mount type 170 × 90 mm

The size of installation bolt hole is applicable to screw of M4.

Concerning the monitor’s front cover, keep it detachable so as to facilitate easy maintenance.

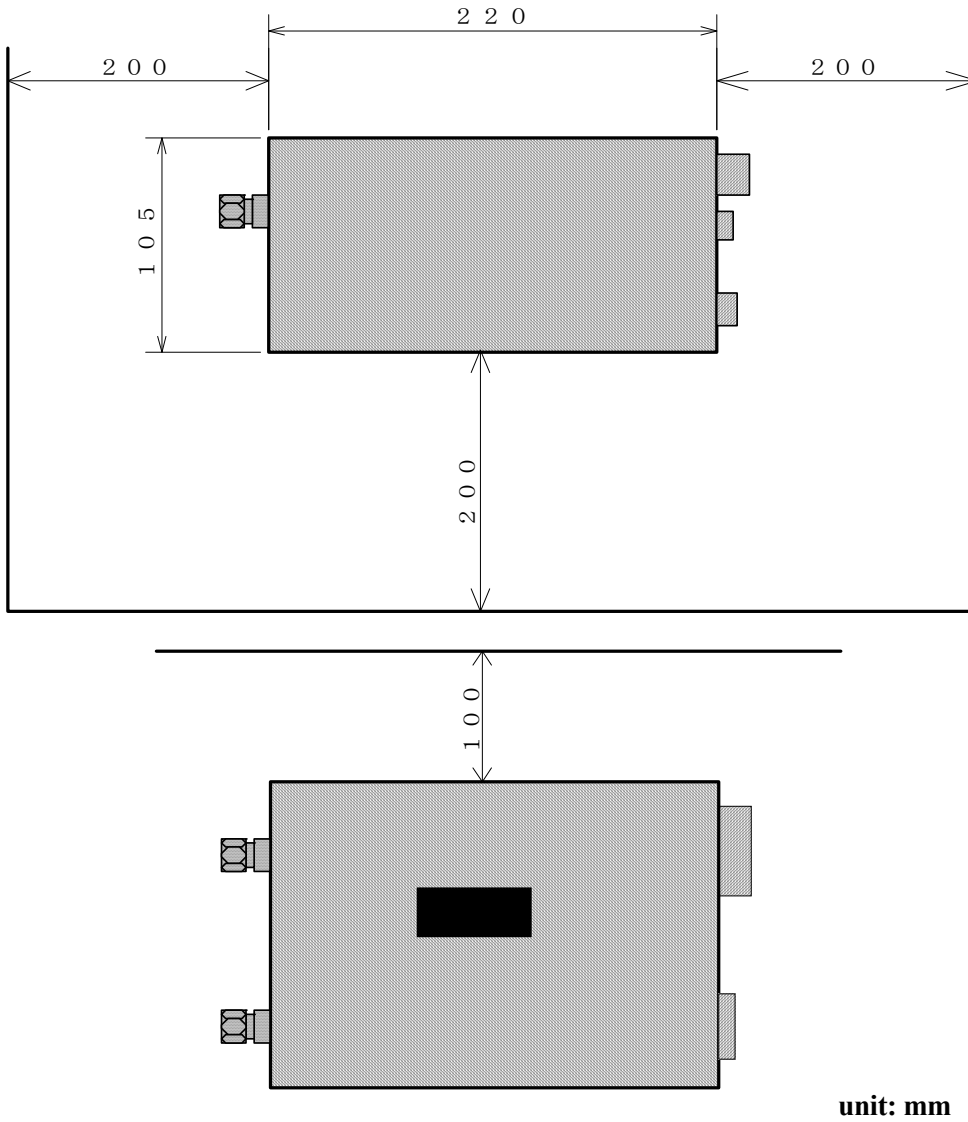


Floor-type (view from upper side)

Wall-type (view from front side)

Figure- 6 Installation dimension

unit: mm



unit: mm

Figure-7 Maintenance space

6. Maintenance

The mercury lamp is needed to be replaced every one year because the light intensity decreases with the use time.

Table-1 Replacement parts

Regular replacement parts (the consumables)				
Parts name	Goods code	Quantity/unit	Recommended replacement cycle	Remarks
Low-pressure mercury lamp	BZ103┘	1 pc	Approx. 1 year	The low-pressure mercury lamp has an operating life so that the light intensity may decrease or it may not emit light.

* Identification number for our company (e.g., A, B, C ...) is described in “┘” at the end of the Goods code. When you order replacement parts, please inform us of the 5-digit Goods code starting with the alphabet (e.g., BZ123).

7. Model code

7.1 Dissolved ozone monitor

Model

EL-550			
power rating		Installation dimension ^{*1}	
AC	100-220 V AC	A	Floor installation
DC	24 V DC	B	Wall installation

Code

Measuring ranges [mg/L]	Analog output [V] ^{*2}	Piping connection	Prevention of condensation	Required document ^{*3}
0	0-10.00	1	A	1
1	0-20.0	2	B	2
2	0-30.0		C	3
3	0-40.0	3	none	4
4	0-50.0			
5	0-60.0	4	OD 4 mm	Calibration certificate & English Instruction manual
6	0-100			
7	0-120	Flowell 30 series for OD 1/4 inch or 6mm fitting	OD 6 mm	
8	0-150			

***1:** Customer is able to change a position of the fixing metal.

***2:** The monitor has two kind of outputs for voltages and current. Regarding voltage, there are two outputs, select it.

***3:** As standard, one book of Japanese Instruction manual and one sheet of Test report are attached on the goods.

7.2 Ozone Gas monitor

Model

EG-550			
power rating		Installation dimension ^{*1}	
AC	100-220 V AC	A	Floor installation
DC	24 V DC	B	Wall installation

Code

Measuring ranges [g/m ³]		Analog output [V] ^{*2}		Piping connection		Prevention of condensation		Required document ^{*3}	
0	0-10.00	C	0-1 V	1	Flowell 20 series for OD 1/4 inch fitting	A	none	1	not needed
1	0-20.0		4-20 mA	2	Kurabo Final lock for OD 1/4 inch fitting	B	OD 4 mm	2	Calibration certificate
2	0-30.0	D	0-10 V	4	Flowell 30 series for OD 1/4 inch or 6mm fitting	C	OD 6 mm	3	English Instruction manual
3	0-40.0		4-20 mA	4				4	Calibration certificate & English Instruction manual
4	0-50.0								
5	0-60.0								
6	0-100								
7	0-120								
8	0-150								

*1: Customer is able to change a position of the fixing metal.

*2: The monitor has two kind of outputs for voltages and current. Regarding voltage, there are two outputs, select it.

*3: As standard, one book of Japanese Instruction manual and one sheet of Test report are attached on the goods.

Example of model code

EG-550ACA0D1A4

Specifications: Ozone Gas monitor

Power rating..... 100-220 V AC

Floor installation

Measuring ranges 0-10 g/m³

Analog output 0-10 V DC and 4-20 mA DC

Piping connection Flowell 20 series for OD 1/4 inch fitting

Privation of condensation..... none

Required document Calibration certificate (one sheet) and
English Instruction manual (one book)

8. Warranty

The monitor will be warranted for a period of 12 months from the date of delivery.

Note, however, that the following items are not covered by the warranty even within the warranty period:

◇ Following events that occur during the warranty period:

- (1) Failure due to improper handling
- (2) Failure caused by improper repair or modification using non-genuine parts
- (3) Failure and damage due to fall after delivery or during transportation
- (4) Failure and damage caused by fire, salt damage, gas damage, earthquake, wind and flood damage, lightning, abnormal voltage, and other force majeure
- (5) Failure due to deterioration of consumables (such as packing, sealing materials, and etc.)

This product only is covered by the warranty during the warranty period. We are not responsible for compensating any damage caused by its use (such as lost earnings, personal injury, and damage to other equipment).

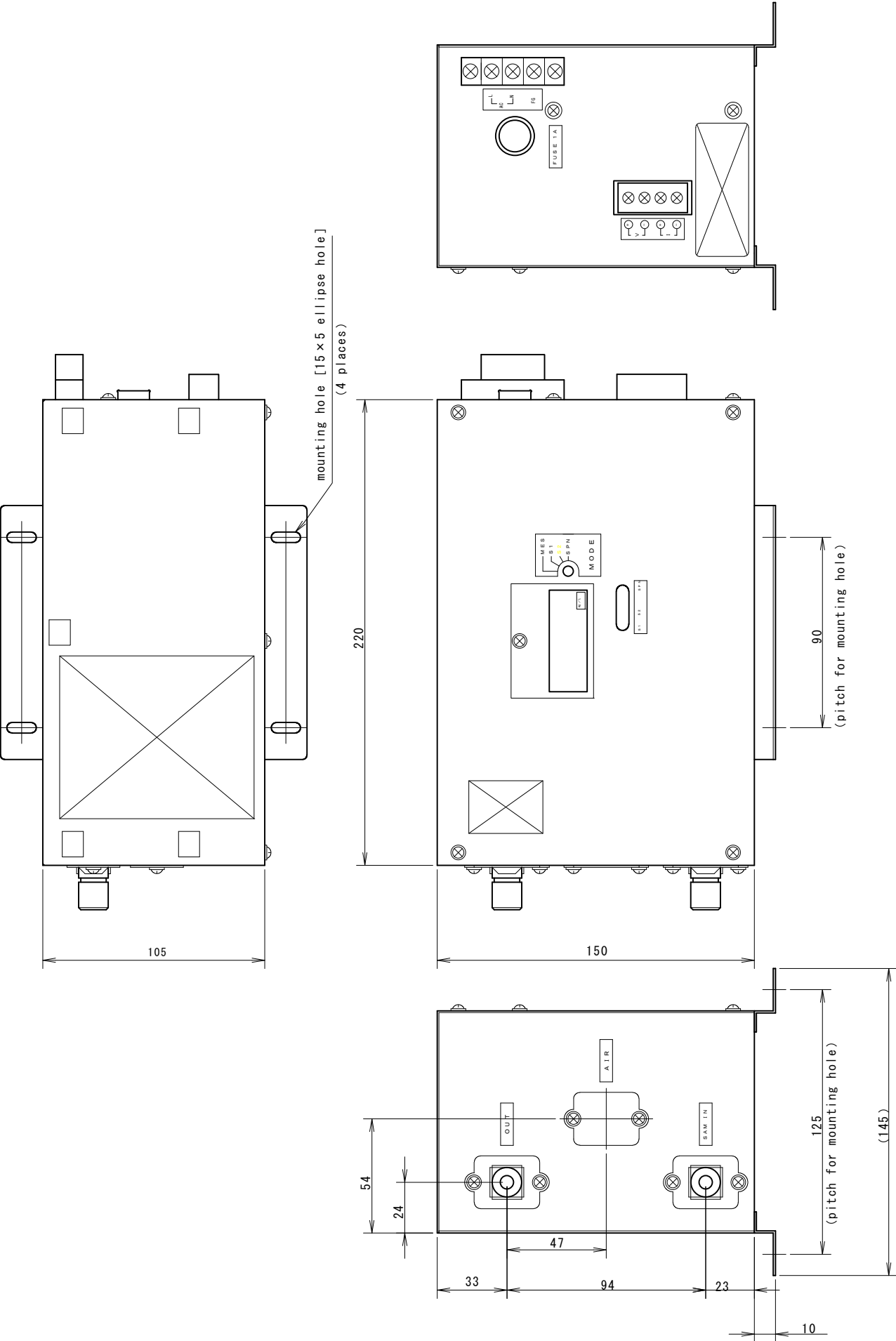
◇ Others

- (1) Contact your dealer when repair is needed.
- (2) Repair should be done by the manufacturer side, so please return the product.
- (3) The minimum retaining period of performance components for repair of this product is 7 years after the discontinuance of production.

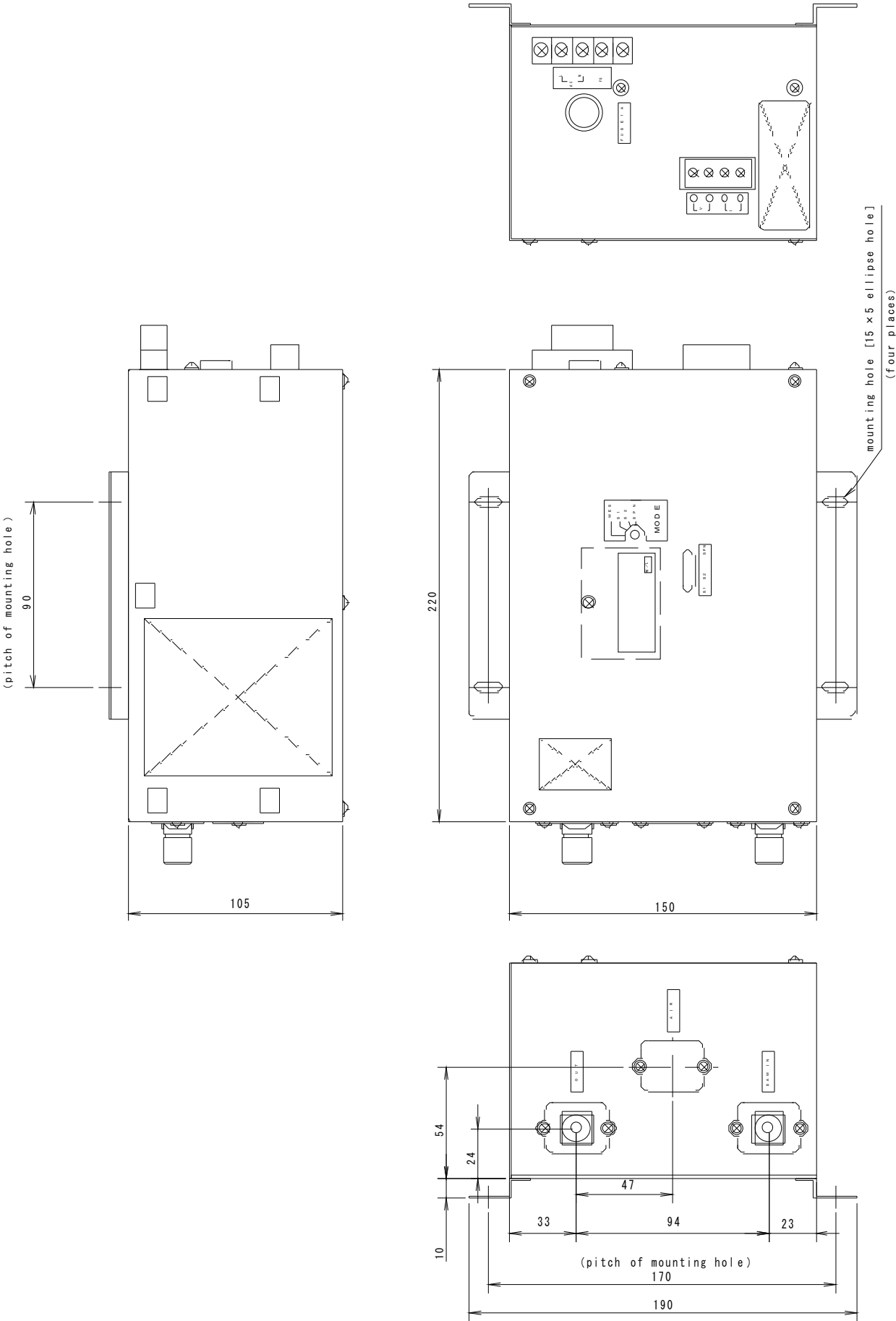
Note: The performance parts for repair are defined as parts necessary to maintain the intended performance of products.

- (4) The scope of warranty for failures due to unprecedented causes will be determined by discussion on a case-by-case basis.

Note that this specification is subject to change without prior notice due to improvement.



Attached drawing 1 Outline drawing of EG/EL-550 (in case of floor mounting)



Attached drawing 2 Outline drawing of EG/EL-550 (in case of wall mounting)

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