

Dissolved Oxygen Transmitter (For Low-Concentration Measurement)

OBM-165H

The OBM-165H is a 2-wire type (24VDC power supply) dissolved oxygen transmitter (for Low-Concentration Measurement) housed in a robust, die-cast aluminum enclosure suitable for installation out in the field. This model is equipped with a wide range of useful features, such as HART communication.



Features

HART communication (version 7) supports the transmission of digital data such as DO measured value, temperature measured value, and equipment status commands.

CE mark compliant.

Freely adjustable transmission output range.

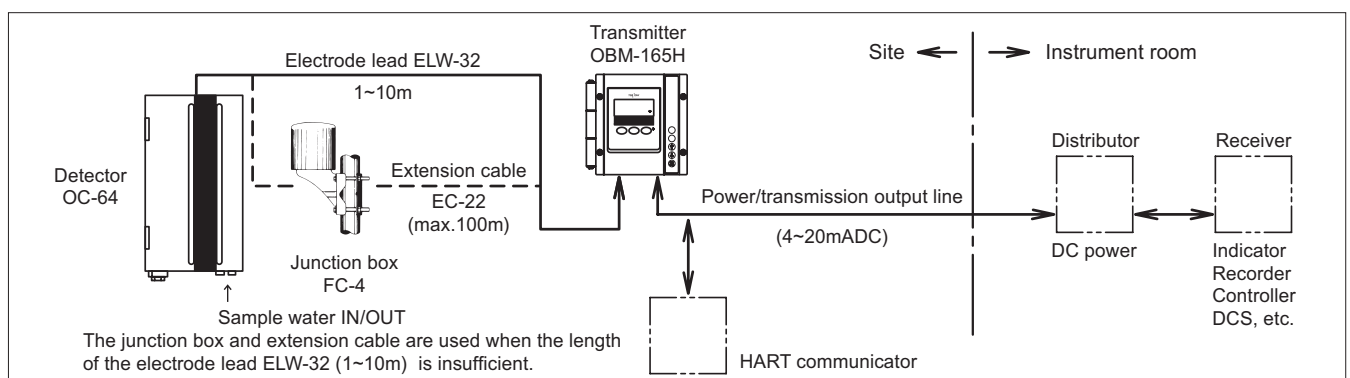
When maintenance mode is enabled, the “ST-BY” indication is on. In maintenance mode, the output signal is held at the value which was set before the mode was enabled.

The instrument can also be configured to automatically return to measurement mode. This feature is especially useful when the instrument is inadvertently left in maintenance mode.

The instrument is equipped with a burn-out function. When the self-diagnostics function detects an error in the measurement system, such as a computer error or the failure of the temperature compensation resistor, the burn-out function provides notification of the problem by causing the transmission output to go off-scale (upper or lower limit).

The instrument automatically judges the quality of electrode characteristics during calibration, and provides diagnostic information in the form of error messages.

System configuration



Standard Specifications

Product Name : Dissolved oxygen transmitter
Model : OBM-165H
Measurement range : Dissolved oxygen; 0.0~2000µg/L (Minimum indication; 0.1µg/L)
 O₂; 0.0~30.0% (Minimum indication; 0.1%)
 SAT; 0.0~200.0% (Minimum indication; 0.1%)
 Temperature; -10.0~100.0°C (Minimum indication; 0.1°C)
 (Transmission output signal is provided for DO only.)
Performance (excluding detector) : DO linearity; Within ±1%FS (0~50µg/L range or less; within ±1µg/L) (by equivalent input)
 (0~20µg/L range or less; within ±0.5µg/L) (by equivalent input)
 DO repeatability; Within ±0.8%FS (0~50µg/L range or less; within ±0.8µg/L) (by equivalent input)
 (0~20µg/L range or less; within ±0.4µg/L) (by equivalent input)
Temperature compensation : Compensation range; 0~45°C
 Compensation accuracy; Within ±3%FS (equal input)
Indication : LCD (4 digit display*1)
Operating power and power consumption : 2-wire system, 24VDC, (18~30VDC with load resistance *2), 0.6VA or less

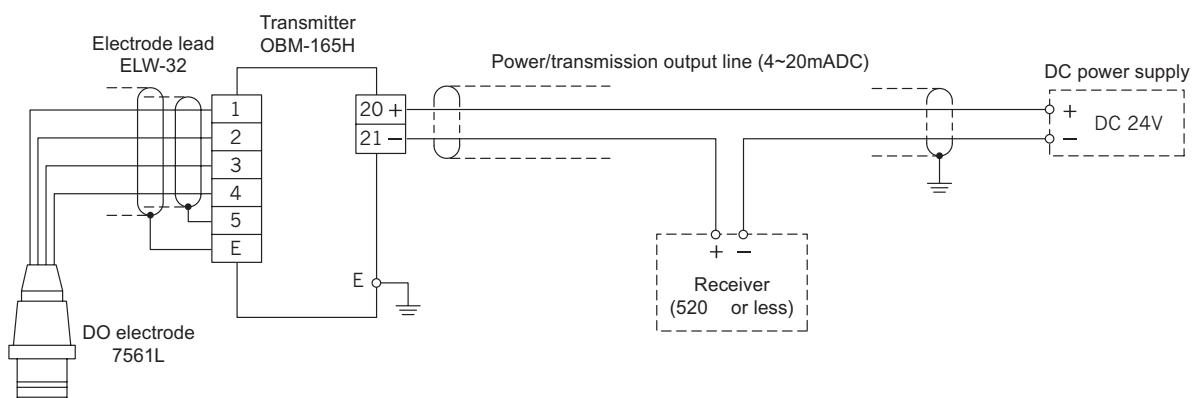
Transmission output range : Dissolved oxygen; The upper limit range can be adjusted in 1µg/L increments within a range of 10~2000µg/L.
Transmission output : 4~20mADC, isolated. Max. load resistance; 520Ω
Control operation : Microcomputer
Ambient conditions : -20~55°C, 95%RH or less (During transport; -30~65°C, 98%RH or less)
Construction : IP65 (NEMA4X compliant)
Dimensions : 181 (W)x95 (D)x180 (H) mm
Mounting : 50A pipe (Option: wall or rack mount)
Weight : Approx. 2kg
Case materials and surface finish : Aluminum die-cast, metallic silver (Display keypad on the operation panel; Polyester resin, Munsel N1.5)
Cable entry : Cable gland for µ6~12 cable, 3 ports
 G1/2 conduit threads can be connected when the cable gland is removed.
Available detectors : OC-64(BOC-64), and other models
 *1: The number of digits displayed for DO measurements varies by measurement range. For ranges of 0.0~10.0µg/L and 0.0~200.0µg/L, only 1 decimal place is displayed. For ranges of 0~201µg/L and 0.0~2000µg/L, no decimal place is displayed.
 *2: Note that HART communication requires a minimum load resistance of 250Ω and a supply voltage of 18VDC or more.

Applicable Standards

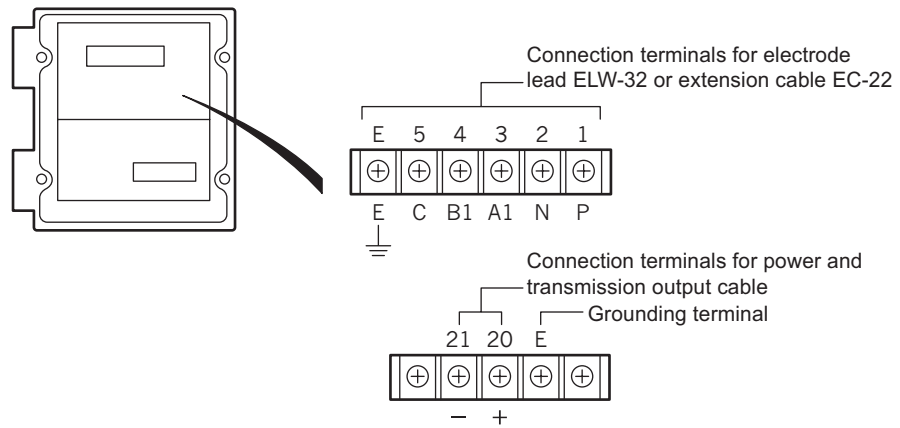
CE mark	Product safety	EN/IEC61010-1
	EMC	EN/IEC61326-1* (Measure variations during testing (when used with the electrode): ±20%FS or less)

* This product is designed to conduct high sensitivity, low concentration measurements. It satisfies the EMC requirements specified in the "Immunity test requirements for equipment intended for use in a controlled electromagnetic environment". Thus, this instrument is best suited for use in a controlled environment, such as a location in which the use of mobile phones and other radio frequency transmitters within the vicinity of the equipment is restricted.

Wiring diagrams



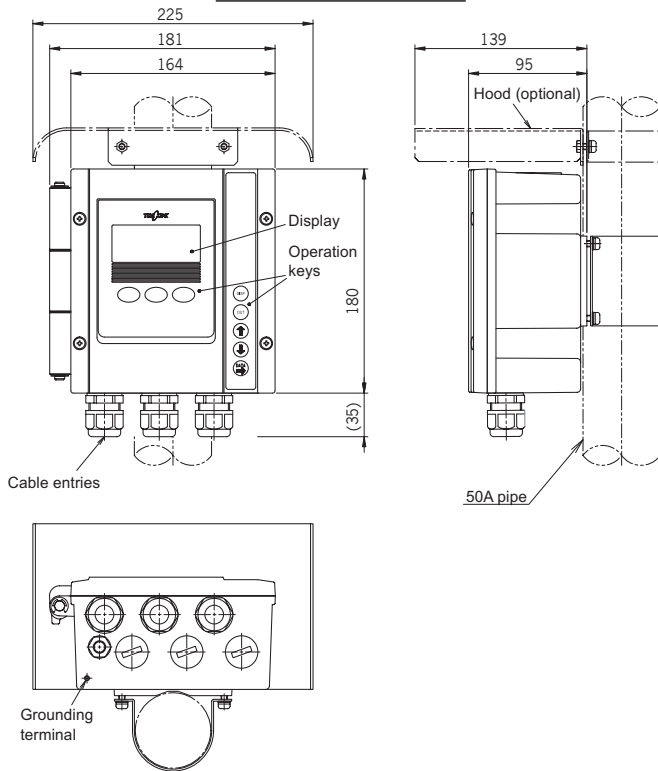
External terminals



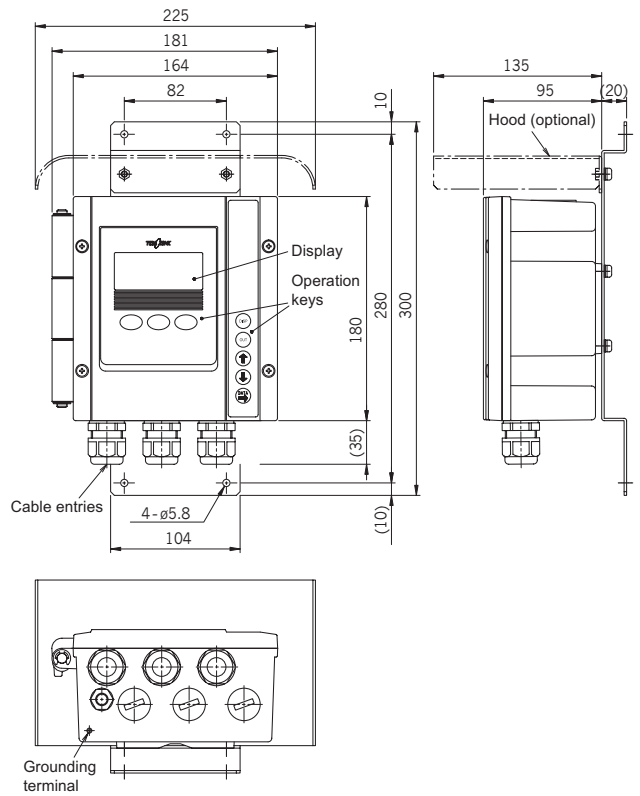
Dimensions

Unit : mm

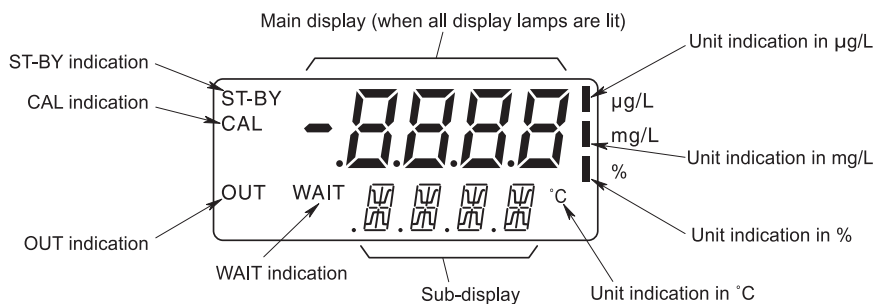
Mounted on a 50A pipe



Mounted on a wall or rack



Display panel



Product code

OBM165H-0-□□□□□□	
A	Measurement range (transmission output range)
B	0.00~20.00µg/L
C	0.00~50.00µg/L
D	0.00~100.00µg/L
Y	0.00~200.00µg/L
	Custom specifications *1
1	Combined electrodes (ordered separately)
	756□L*2
	Surface finish (coating) *3
A	Standard coating
B	High performance coating
	Arrester *4
0	None
1	Included
	Cable entries for power and transmission cable *5
0	Cable gland for ø6~12 cable (standard)
1	Cable gland (Conduit threads G1/2 when cable gland is removed)
2	NPT1/2 supplied with 3 adapters
	Mounting brackets
A	50A pipe mount
B	Wall or rack mount
	Hood (sunshade)
0	None
1	Equipped (50A pipe mount) (Code No. 7049930K)
2	Equipped (wall mount) (Code No. 69304500)
	Markings
0	Japanese (standard)
1	English

Custom spec. code;
Numeric digit: 9
Alphabet: Z

- *1. Specify the measurement output range in 1µg/L steps at a minimum width of 10µg/L, within a range of 0~2000µg/L.
Ex. 0.00~10.00µg/L
- *2. The 4 types of standard electrodes that can be used together with the unit are as follows:
7561L: For use with boiler water at thermal power plants. Wetted part materials; PP/FEP
7562L: For use at nuclear power plants. Wetted part materials; SUS316/FEP
7563L: For use with ultrapure water at semiconductor plants. Wetted part materials; PP/FEP
7564L: For use with ultrapure water at semiconductor plants. Wetted part materials; SUS316/FEP
- *3. Standard coating: Melamine primer and topcoat. Average film thickness: Greater than 30µm. Glossiness: G40.
High performance coating: Epoxy primer and middle coat, polyurethane resin topcoat. Average film thickness: Greater than 100µm. Glossiness: G80.
- *4. A ceramic surge arrester (simplified) can be mounted on the power and transmission line.
- *5. There are three cable entries with cable glands for ø6~12 cable (G1/2 conduit threads when the cable gland is removed).
The NPT1/2 is supplied with 3 SUS316 adapters. After removing the cable glands, screw the required number of adapters into the cable entries. The standard cable glands should be left in the cable entries that are not used in order to seal them shut.

Note 1. The OBM-165H is a 2-wire type dissolved oxygen transmitter that supports HART communication (version 7). It has a measurement range of 0~2000µg/L.
The instrument comes with a number of other features, such as temperature (-10.0~100.0°C), self-diagnostics, burn-out, and DO value adjustment.
Note that the external input terminal used to receive output hold commands from the cleaner used with this instrument is not available as an option.

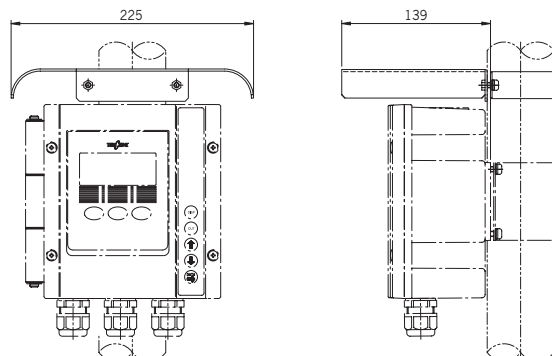
Note 2. The dedicated detector is the micro flow type OC-64 (BOC-64). Separately order the detector together with the ELW-32 electrode lead.

Option

● Hood

Recommended for installation outdoors at a location exposed to direct sunlight.

Material : SUS304
Mounting : Mounted on 50A pipe
Code Number : 7049930K

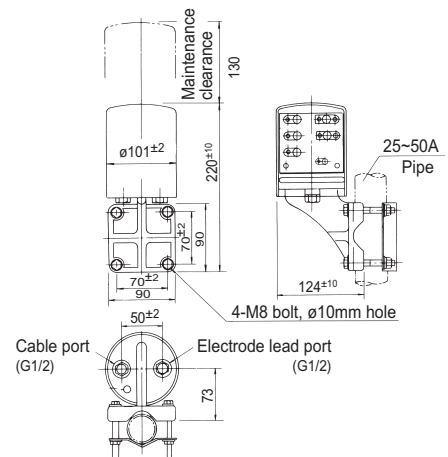


Related equipment

● Junction box

When the transmitter and electrode are installed away from each other and the standard electrode lead length (5m) is too short.

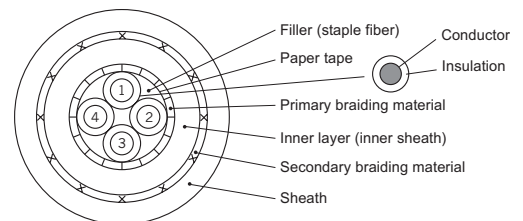
Model	: FC-4
Construction	: Outdoor installation
Weight	: Approx. 0.9kg
Case	: ABS resin
Material	: ABS resin
Finish	: Pearskin finish chromium plating
Mounting	: 25 ~ 50A pipe, wall or panel mount



● Extension cable

The extension cable is a special cable specifically manufactured for a DO analyzer. It connects the transmitter and junction box.

Model	: EC-22
Outside diameter	: $\phi 8$
Insulation	: Polyethylene and vinyl
Sheath	: Vinyl
Insulation resistance between core conductors	: $10^5 \text{M}\Omega$ or greater/100m
Maximum cable length	: 100m, no cable splicing
Standard length	: 5m ~ 100m (5m unit step)
Weight	: Approx. 0.5kg/5m

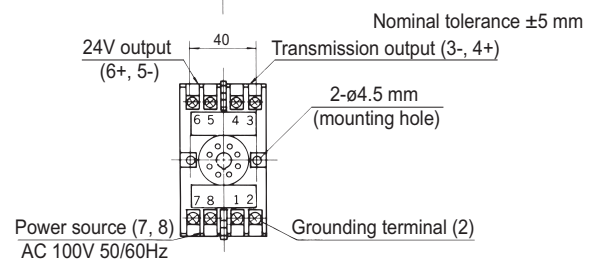
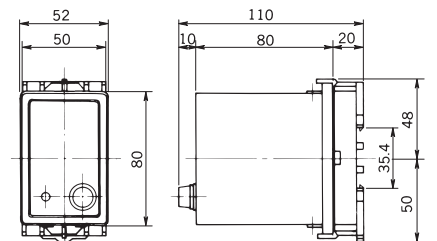


Cross section of EC-22

A power supply unit (24VDC) for the 2-wire type transmitter.

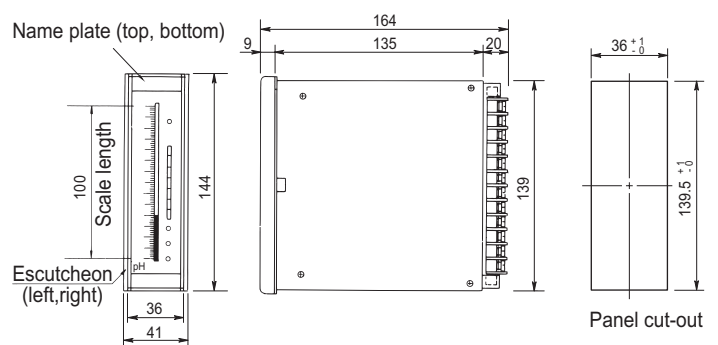
● Power supply unit

Model	: PA-24
Output voltage rating	: 24VDC $\pm 3\%$ -1V
Output current rating	: 2~22mA (Parallel connection between two instruments cannot be made.)
Power requirements	: 100VAC $\pm 10\%$, 50/60Hz
Ambient conditions	: -5~55°C
Construction	: Indoor installation, plug-in type
Weight	: Approx. 300g
*Output transmission signal of 4~20mADC can be drawn from the terminal block. Nominal tolerance $\pm 5\text{mm}$	



● Bar graph meter relay with DC power source

Model	: BMR-24
Output voltage	: 24VDC $\pm 1\text{V}$
Input	: 4~20mADC (input resistance; 10 Ω)
Alarm outputs	: High-high, high, low, low-low, 4 contacts (Contact rating; 125VAC, 0.5A)
Scale	: Custom specifications
Scale length	: 100mm
Display	: Red LED, 101 dots
Power requirements	: 85V~264VAC, 50/60Hz, Approx. 5VA
Power consumption	: Approx. 5VA
Ambient conditions	: 0~45°C, 40~80%RH
Weight	: Approx. 450g



Combined Detector OC-64 / BOC-64

Suitable for measurement of boiler water in power plants and pure water in semiconductor plants.

Trace sample water consumption

Combined electrodes: 7561L/7562L, electrode lead ELW-32



OC-64



BOC-64

Sample conditions : Temperature ... 0~45°C
 Flow rate ... Constant flow rate within 100~300 mL/min
 Pressure ... Inlet pressure; 0.05 MPa or less
 Outlet pressure; Open to atmospheric pressure

Inlet : Rc1/4 (Both sample inlet and outlet) (OC-64)
 Connction port; ø6mm tube union (BOC-64)

Ambient temperature : 0 ~ 40°C, Max.90% RH
 and humidity

Dimension : Approx. 4 kg (OC-64), Approx. 0.4 kg (BOC-64)

External dimensions : 220 (W)x 400 (H)x 80 (D) mm (OC-64)
 180 (W)x 210 (H)x 70 (D) mm (BOC-64)

Mounting : Wall mount, or 50A pipe mount

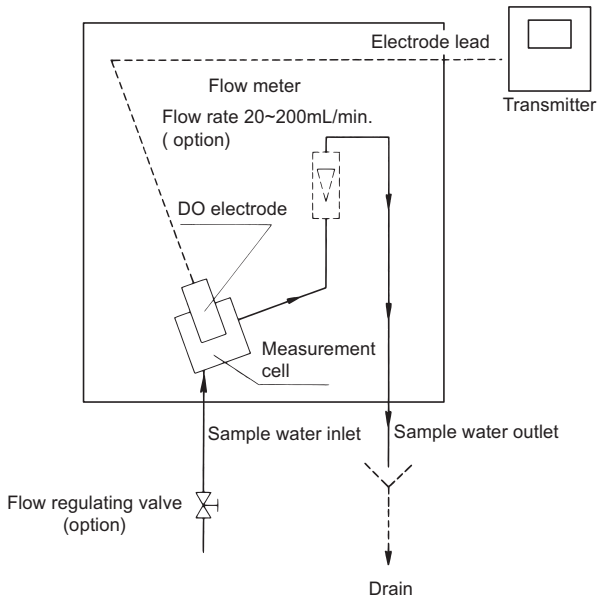
Materials : Case ... PVC coated SPCC
 1Measurement cell ... Heat-resistant PVC
 Tubing ... Nylon

Construction : Rain proof type (JIS C 0920)

Surface color : Metallic silver and blue

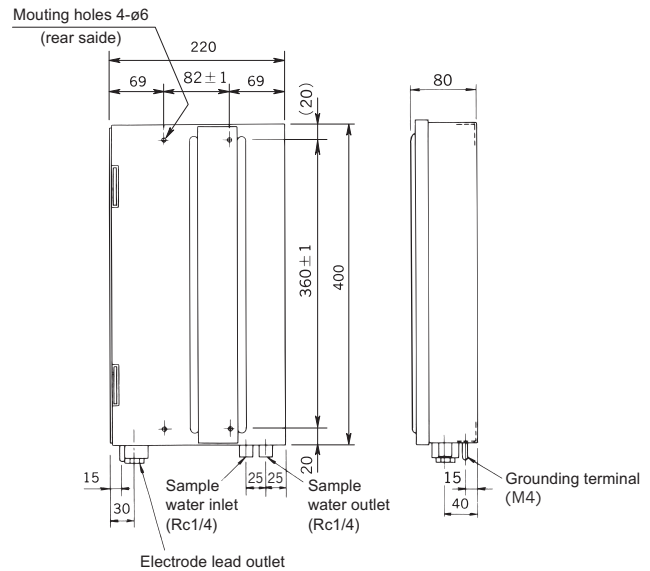
* The BOC-64 is housed in a conveniently-sized case, making it ideal for installation in a boiler water sampling system.

Flow sheet



Dimensions

Unit : mm



Product code

OC64-1-	□	□	□	□	
	A				Main material of wetted part *1 Measurement cell: Heat-resistant PVC Piping: Nylon tube (standard)
	B				All SUS316
		0			Sample flow water*2 Not provided
		1			Provided (200 mL/min FS) when wetted part is made of standard resin
		2			Provided (1L/min FS) when the wetted part is made of SUS
			0		Sample flow control valve*3 Not provided
			1		Provided (SUS316)
				A	Structure of case Simplified spray-proof (standard)
				B	Splash-proof, dust-proof (equivalent to IP54)*4
Custom spec. code; Numeric digit: 9 Alphabet: Z				A	Mounting Wall or rack mount
				B	Pole-mount (with 50A pole saddle)
					Markings
			0		Japanese (Standard)
			1		English

- *1. Standard (heat-resistant PVC and nylon tube) is for boiler water. Select "All SUS316" for ultra pure/ultra low concentration water for semi-conductor plant, etc.
- *2. A small flow meter is installed at the measurement cell outlet in the case. When the wetted part material is resin for boiler water measurement, etc., select 200mL/min FS (set at 100mL/min).
- *3. Stainless needle valve is installed at the sample inlet the lower surface of the case. So, when the sample flow control valve is "Provided", the sample inlet becomes "IN" side (Rc 1/4) of the needle valve.
- *4. A rubber gasket is used to seal the door of the case. A stainless draw latch (for opening and closing) is mounted on the door.

Note 1. The OC-64 is a detector which is ideal for use in conducting low concentration DO measurements, such as measurements of boiler water at power plants and ultrapure water at semiconductor plants.
Sample water: Temperature; 0~45°C
Flow rate (consumption volume); Constant within a range of 100 ~ 300 ml/min
Pressure; 50 kPa or less. Output side open to the atmosphere.

Sample inlet/outlet: Rc1/4 for both inlet and outlet

Electrode lead port: Waterproof connection for ø8 cable

Note 2. The 4 types of standard electrodes that can be used together with the unit are as follows.

7561L: For use with boiler water at thermal power plants. Wetted part materials; PP/FEP

7562L: For use at nuclear power plants. Wetted part materials; SUS316/FEP

7563L: For use with ultrapure water at semiconductor plants. Wetted part materials; PP/FEP

7564L: For use with ultrapure water at semiconductor plants. Wetted part materials; SUS316/FEP

Separately order the detector together with the ELW-32 electrode lead.

Low-Concentration Dissolved Oxygen Electrodes 7561L / 7562L

Polarographic-membrane type dissolved oxygen electrode for low-concentration DO measurements.

Use of dual cathode structure for low-to-high concentration measurements allows for quicker response.

Not susceptible to interference gases, such as dissolved hydrogen and dissolved carbon dioxide for low-concentration measurements.

Use of cartridge-type diaphragm allows for easier maintenance (easier replacement of inner solution).

Environment-conscious design. Polarographic membrane type eliminates the use of lead within the internal electrode, as well as the use of strong acidic and alkaline reagents.

Measurement method : Polarographic-diaphragm type

Operational temperature range : 0~45°C

Operational pressure range : 0.5MPa or less

Measurement range : 0µg/L~20mg/L

Minimum limit of detection : 0.1µg/L

Output : Approx. 9µA(at saturation in atmosphere)

Response time : Within 15 seconds (90% response from atmosphere to zero liquid at 25°C)

Flow : 100~300mL/min. (OC-64 embedded flow cell used)

Repeatability : Within ± 2% F.S.





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CAUTION

Do not operate products before consulting instruction manual.