SPECIFICATION SHEET

TOA DKK

COMPACT CITY-WATER ANALYZER MWB4-72

This analyzer is for continuous monitoring water quality (Maximum seven parameters) at faucet feed line or water receiving tank of a building.

In addition to the three items of turbidity, color, and residual chlorine, which are specified by law to be inspected daily, this analyzer can optionally conduct measurements of the electric conductivity, pH, water temperature, and water pressure.

It has a compact design of B4 size so that it can be installed even in a narrow space, and has high reliability, durability, and excellent maintainability.



Features

● Safe design-Easy to read and operate

1) The real-time readouts of the items measured appear on the large color display on the front panel. Along with readouts, the display also provides trend indication.
   This convenient feature makes it possible to analyze the cause of abnormality by referring the anteroposterior trends.
2) The operating part consists of an easy-to-read interactive touch panel.
3) The electrical part and analyzer are kept separate. This ensures the electronics remain insulated while protecting users from potential electric shock.

● High reliability

1) This analyzer features a unique debubbling method that effectively minimizes the formation of bubbles in turbidity and color measurements. In the event bubbles accidentally mingle, they can be completely removed by backwashing. These capabilities enable the analyzer to improve stablity of turbidity and color measurement remarkably.
2) Time-proven non-contact swing rotary type electrode is adopted for chlorine electrode. It enables stable measurement for long period in the combination with unique ceramic beads cleaning even sample flow is fluctuated.
3) This analyzer comes with an electronic dehumidifier designed to keep dew condensation from forming inside the unit. Eliminating dew condensation not only prevents rust from accumulating inside, but also enhances the durability of the equipment.

● Wide variety of output options

In addition to DC 4 to 20mA analog output, this device is also standardly equipped with two digital communication interfaces, RS232C and RS485. These two interfaces support the remote monitoring system.

● Enhanced maintenance and operational performance

1) Operations (such as cleaning and zero calibration) can be remotely controlled from the host system is possible via the use of contact signals or the digital signal interfaces RS232C or RS485. The effective remote control of operations can help cut down on labor and costs.
2) One minute values are stored in the internal memory in 3-month intervals, and one hour values are stored in 1- year intervals. A memory card (optional) can also be inserted in the factory-supplied slot, making it possible to store and carry the data without the need for a computer.
3) The self-diagnostic feature provides advance notice about the current condition of the system, helping to make maintenance more efficient. It issues two different signals, “Caution” and “Warning”, thereby enabling users to identify the severity of the problem.

Measurement items and performance

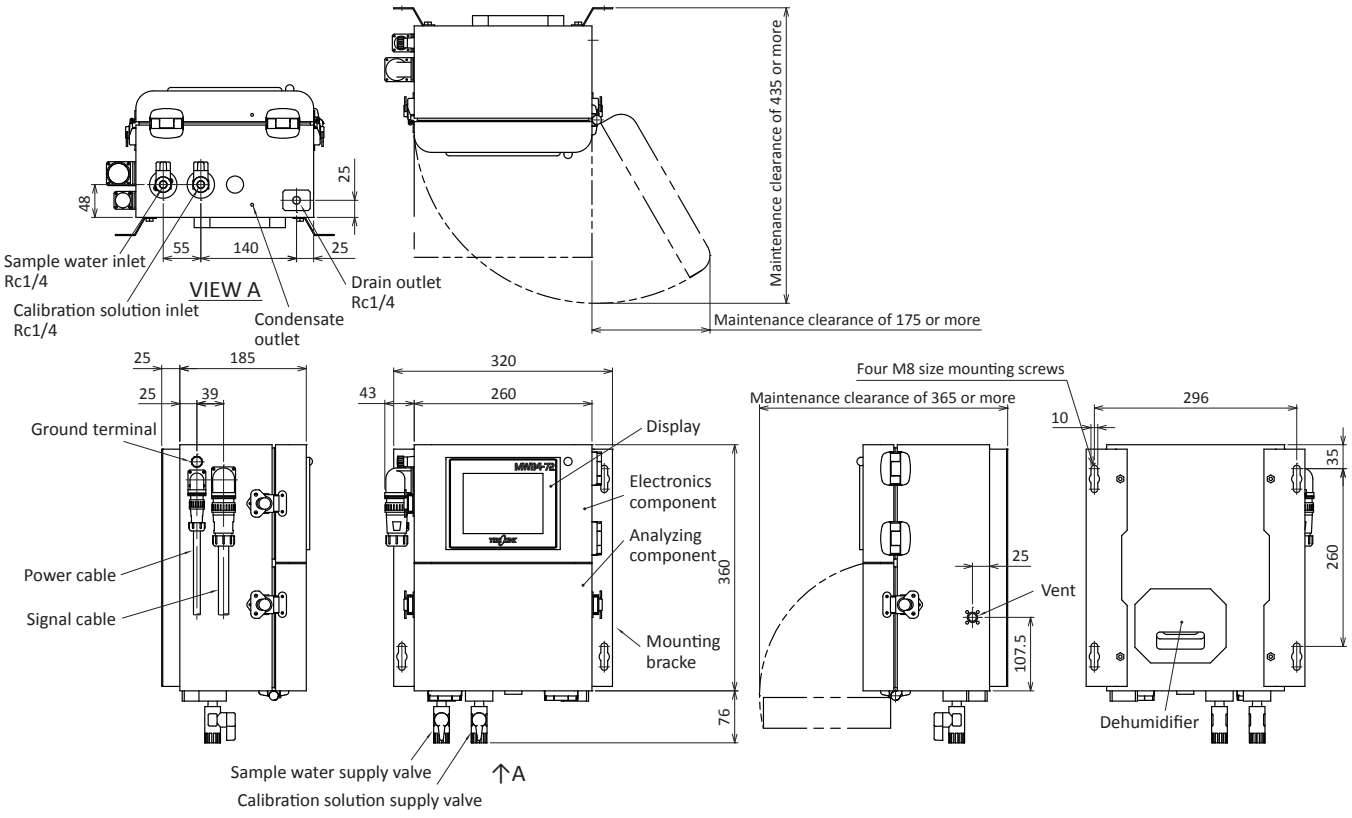
Measurement	Measurement method	Measurement range	Minimum	Linearity	Repeatability
Turbidity	Transmitted light method	0 to 2 /4 degrees	0.01 degrees	Within ±2.5%FS	Within ±2%FS
Color	Transmitted light method	0 to 10 /20 degrees	0.01 degrees	Within ±5%FS	Within ±3%FS
Residual chlorine	Polarography	0 to 2 mg/L	0.01mg/L	Within ±2.5%FS	Within ±2.5%FS
Electric conductivity	AC 2-pole method	0 to 50 mS/m or 0 to 500µS/cm	0.1mS/m or 1µS/cm	Within ±2%FS	Within ±2%FS
pH	Glass electrode method	pH 2 to 12	0.01pH	Within ±0.1pH	Within ±0.1pH
Temperature	Platinum resistance thermometer (Pt 1000Ω) method	0 to 50˚C	0.1˚C	Within ±0.5˚C	Within ±0.5˚C
Water pressure	Diffusion semiconductor method	0 to 1 MPa	0.001 MPa	Within ±0.5%FS	Within ±0.5%FS

Standard specifications

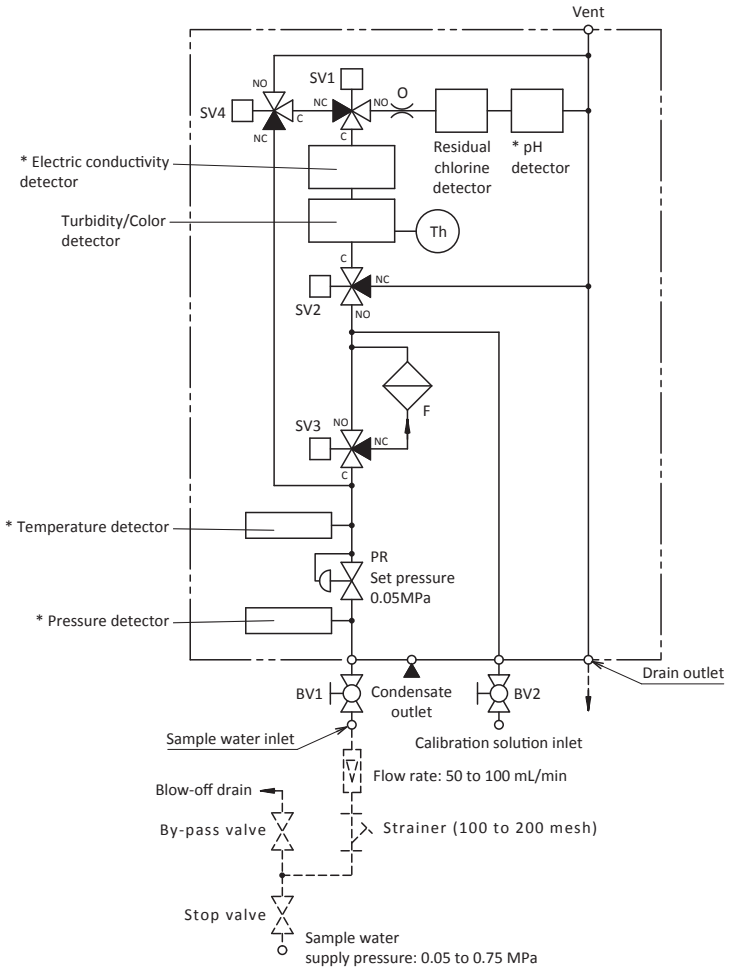
Product name : Compact City Water Analyzer
Model : MWB4-72
Objects measured : Three basic items (turbidity, color, and residual chlorine), electric conductivity, pH, temperature, and pressure
Measurement range switching : Ability to switch between two ranges for both turbidity and color measurements.
Display : Color LCD touch panel
Temperature compensation range : 0 to 40°C for residual chlorine, EC, and pH
Response time : 90% response within three minutes
Operating power : 100 to 240V AC ±10%, 50/60Hz
Power consumption : Approx. 40/55VA (100/240V AC), max. of approx. 83/108 VA (100/240V AC)
Transmission output : DC 4 to 20 mA, isolated
(Negative (–) side is common.)
Load resistance : 600Ω or less
Contact switching output signals : Alarm 1; measured value high/low limit alarm, light source error, residual chlorine motor error, sensor error, and start-up mode error
Alarm 2; concentration upper/lower limit alarm, water temperature compensation error, and auto calibration error
Maintenance; When in ST-BY mode
Event; During auto cleaning, during auto calibration, and during problem diagnosis
(Contact capacity ; DC 24V 0.2A resistance load)
Power cut off; The contact is closed when a power failure occurs.
(Contact capacity; DC 30 V 0.2A resistance load))
Contact switching input signals : Cleaning command; When the closed contact receives, cell window cleaning starts (turbidity / color).
Calibration command; When the closed contact receives, automatic zero calibration starts (turbidity / color / residual / residual chlorine).
(Resistance load; 200Ωor less, Pulse duration; 500mS or greater)
Communication system : RS232C interface or RS485 interface (isolated)
Communication speed; 9600 BPS
Synchronous system; Start-stop synchronization
Control system; Half-duplex communication system
One line for communication (dedicated cable or connector), one line for maintenance (D-SUB connector)
Save functionality : Data such as measurements can be transferred to a memory card.(Compact Flash,CF) They can also be processed by a computer.
One minute measurement values can be stored in 3-month intervals, and one hour values can be stored in 1-year intervals.
Sample water conditions : No suspension or stagnation.
Quality; Ensures that the water quality (excluding the items below) satisfies the water quality standards set by the Water Law or falls within the measurement range of this unit.
Temperature; 0 to 40°C (no freezing)
Pressure; 0.05 to 0.75MPa
pH; 5.5 to 8.6 pH (maximum fluctuations; 1pH)
EC; 8 mS/m (80µS/cm) or greater
Flow rate; 50 to 100 mL/min
Sample consumption : 5m^3/ month or less (9m^3/month, including a by-pass flow of 100mL/min)
Wetted part materials : Polyurethane, PP, acrylic, stainless steel, FKM, etc.
Piping end connection : Sample water inlet; Rc 1/4
Drain outlet; Rc 1/4
Calibration solution inlet; Rc 1/4
Air purge; Rc 1/4
Installation : Mounted on a wall or rack
Wiring end connection : Two water-proof connectors
A power supply cable and I/O signal able (3-meter) are also included.
Ambient conditions : 0 to 40°C (no freezing), 85% RH or less (no condensation)

Weight	: Approx. 11kg
Construction	: Indoor installation (IP43 equivalent)
Case material	: Aluminum
Color	: Light gray (Munsell 5PB 8/1 equivalent)
Automatic calibration	: Zero calibration for turbidity, color, and residual chlorine. The internal timer and an external contact signal are used to start calibration. (Zero water is prepared by filtering sample water through a zero water filter.) Calibration cycle setting; 0 to 24 hours (freely specified) Calibration time; Approx. 12 min 30 sec (fixed) Transmission output hold time during calibration; Calibration time approx. +8 min 30 sec. (fixed)
Automatic cleaning	: The internal timer and an external contact signal are used to start backwashing (by draining the water) to clean the cell window for turbidity and color measurements. Cleaning cycle setting; 10, 15, 20, 30, or 60min. Transmission output hold time during cleaning; Cleaning time approx. 2 min. + 1min. (fixed) Beads cleaning of residual chlorine electrode by self-rotation
Options	: Indoor self-standing frame (preassembled, piping pre-installed) Outdoor cubicle (temperature-controller included) Function addition; Water sampling unit for abnormal time Internal leakage detection unit

Dimensions Unit : mm



Flow sheet

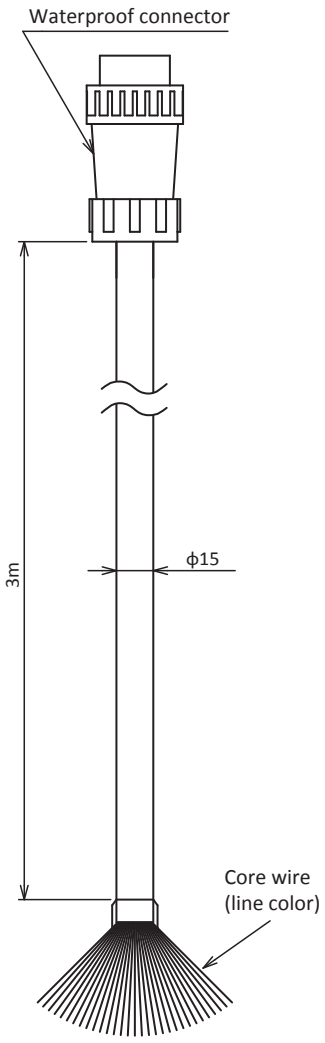


No.	Description
BV1	Sample water supply valve
BV2	Calibration solution supply valve
SV1	Wash water solenoid valve
SV2	Drain solenoid valve
SV3	Zero water switching solenoid valve
SV4	Vent solenoid valve
Th	Temperature compensation sensor
F	Zero water filter
PR	Water pressure reducing valve
O	Orifice

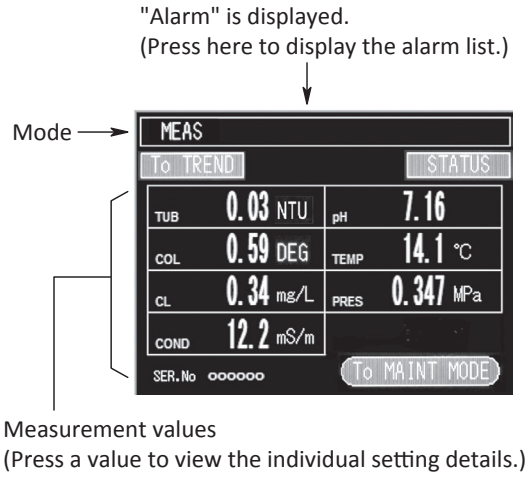
*Detectors for specified measurement items can be added (Maximum seven items).

Input/Output Signal Table

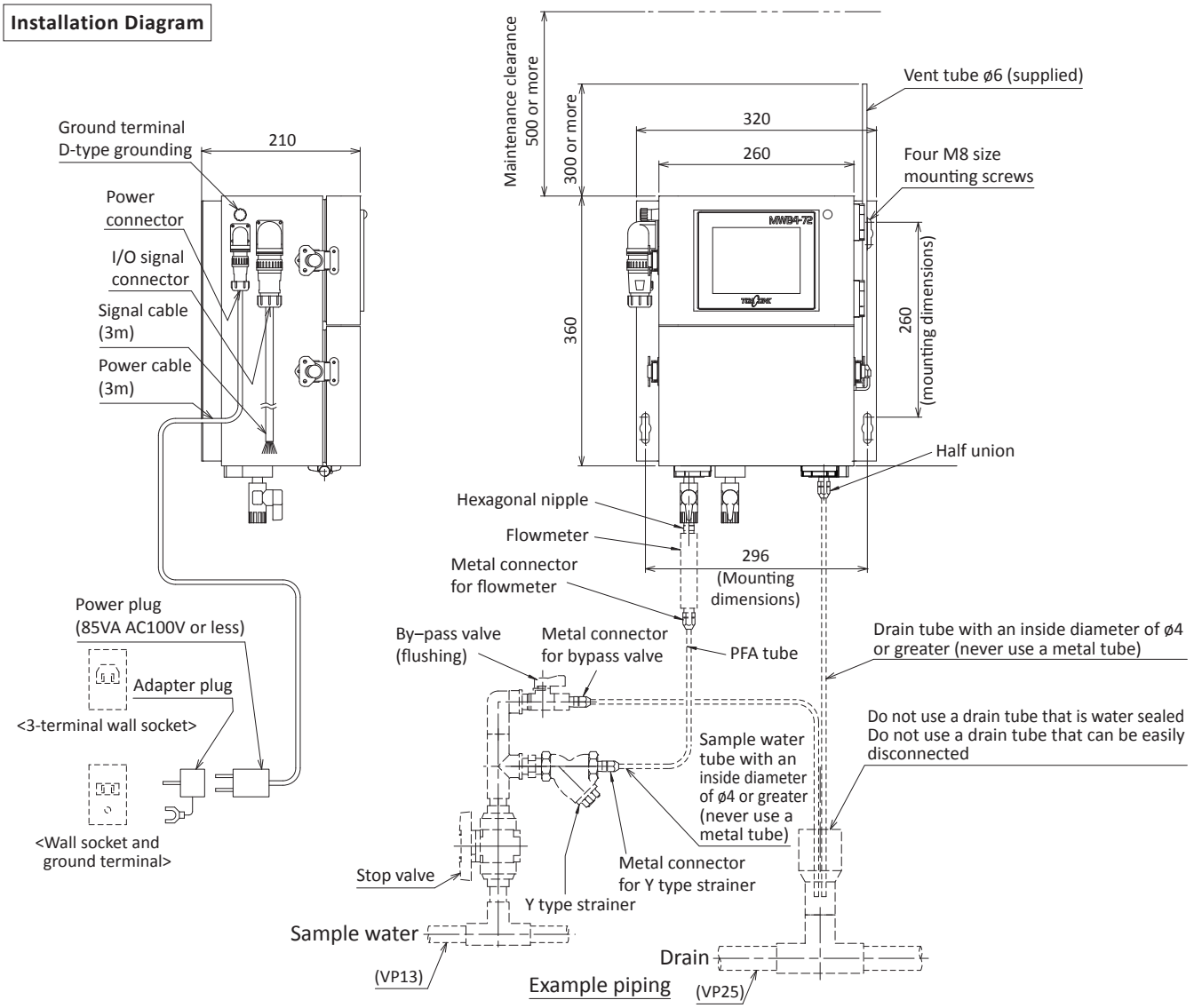
Connector No.	Line color	Signal type		Signal description
1	Black	Analog output DC 4 to 20mA	+	Turbidity measurement value
2	White/Black		−	
3	Red		+	Color measurement value
4	White/Red		−	
5	Green		+	Residual chlorine measurement value
6	White/Green		−	
7	Yellow		+	Electric conductivity measurement value
8	White/Yellow		−	
9	Brown		+	pH measurement value
10	White/Brown		−	
11	Blue		+	Water temperature measurement value
12	White/Blue		−	
13	Gray		+	Water pressure measurement value
14	White/Gray		−	
15	Orange	Contact input (Pulse)		Cleaning command
16	White/Orange			Calibration command
17	Purple	Contact output (status)		Spare1
18	White/Purple			Spare2
19	Bright green	Switching input COM		COM
20	White/Bright green	Contact output (Status)		COM
21	Peach			Alarm 1
22	White/Peach			Alarm 2
23	Azure			Maintenance
24	White/Azure			Event
25	White			Spare (for option)
26	Black/White			Power cut off
27	Black/Green	Analog input DC 4 to 20mA	+	Converted to digital output
28	Red/Green		−	Flow meter, water gauge, etc.
29	Black/Yellow	Digital output RS-232C		RxD
30	Red/Yellow			TxD
31	Black/Brown			COM
32	Red/Brown	None		
33	Black/Blue	Switching output COM		COM
34	Red/Blue	Digital output RS-485	+	
35	Black/Gray		−	
36	Red/Gray			COM
37	Shielding wire	Grounding		D-type



Display/Control unit

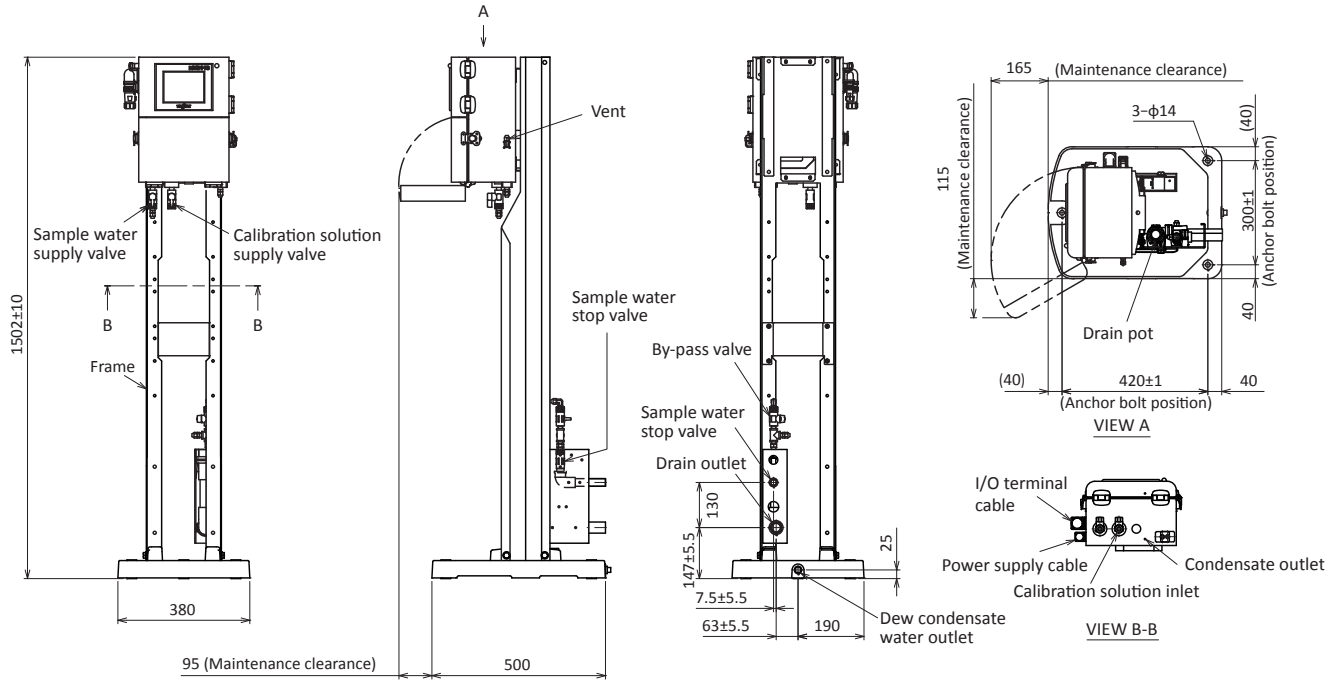


Installation Diagram



1. Installation conditions
   Install the analyzer in a location that satisfies the following criteria:
   a) A location that is not exposed to rain, wind, or direct sunlight.
   b) A location where sample water meeting "4. Sample water condition" such as temperature and pressure etc. mentioned below, can be drawn.
   c) Vibration-free location
   d) A location where an electric device causing electric noise is not placed near by.
   e) A location with sufficient space around the analyzer that allows for safe and easy access during maintenance.
2. Mounting
   The analyzer is designed to be hung on a wall or mounted on hooks. Before mounting the analyzer, make mounting holes in the wall, and then use four M8 screws to fix the unit in place. Make sure the upper surface of the main unit is horizontally level.
   Weight: Approx. 11kg
3. Piping
   a) Use tubes for the sample water and drain piping to minimize the load applied on the valves of the main unit.
   b) Because pressure is applied to the piping on the supply side, use metal connectors (stainless) for the tube joints.
   c) Install both a stop valve and by-pass valve (which is also used for flushing) on the supply side. Although the minimum required flow rate is between 50 to 100 mL per minute, we recommend maintaining a flow rate of 100 to 200 mL per minute for the water* flowing through the by-pass valve. *Water that initially flows from the faucet. (This prevents water from stagnating and leads to shorter response times, resulting in more accurate measurements.) Depending on the quality of the sample water, a strainer (100 to 200 mesh) can also be installed when needed.
   d) Make sure the end of the drain pipe is open to the atmosphere.
   e) Specify a length of pipe between the measurement point to the analyzer that enables the sample water to reach the analyzer in 3 to 5 minutes.
   Example: Approx. 3 to 5 meters at 13A (ø4 x ø6 size tubes, no greater than 3 meters)
4. Sample conditions
   a) No suspension or stagnation.
   b) Consistent with the quality standards for city water set by the Water Law.
   c) Temperature: 0 to 40˚C (no freezing)
   d) Pressure: 0.05 to 0.75 MPa
   e) Flow rate: 50 to 100 mL/min
   f) If air bubbles excessively mingled into sample water, it is required to arrange de-bubbling process in the preceding step to analyzer such as arrangement of bypass.

Indoor self-standing frame



Product code

MWB472–0–□□□□□□□□□□ Indoor Installation (IP43)

- Measurement items
  - A: Three basic items: Turbidity, color, and residual chlorine
  - B: In addition to these items, other items can also be measured
- Measurement items: EC added
  - 0: None
  - 1: Added (unit: mS/m)
  - 2: Added (unit: S/cm)
- Measurement items: pH added
  - 0: None
  - 1: Added
- Measurement item: Temperature added
  - 0: None
  - 1: Added
- Measurement item: Water pressure added
  - 0: None
  - 1: Added (unit: MPa)
  - 2: Added (unit: m)
- Measurement range and unit*1
  - A: Standard (as shown in the table on the right)
  - Y: Custom specifications
- Configuration
  - A: Main unit only (mounted on a wall or on racks)
  - B: Assembled on an indoor self-standing frame
  - C: Mounted in our standard local cubicle (optional)*2
  - D: Mounted in the custom local cubicle (optional)*3

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

- Communication system
  - 0: None
- Additional function*4
  - 0: None
  - 1: Water sampling unit for abnormal time
  - 2: Internal leakage detection unit
- Display
  - A: Japanese (standard)
  - B: English

*1. Standard measurement range and unit

	Measurement item	Measurement range / unit
1	Turbidity	0 to 2/4 NTU (dual range)
2	Color	0 to 10/20 degrees (dual range)
3	Residual chlorine	0 to 2mg/L
4	Electric conductivity	0 to 50mS/m, or 0 to 500μS/cm
5	pH	pH 2 to 12
6	Water temperature	0 to 50°C
7	Water pressure	0 to 1MPa

In case that other customers' specifications are required, please contact us regarding availability of such specifications.

*2. Compact and designed to be set up outdoors (temperature-controller included). For details about the manufacturing specifications, refer to the next page.

*3. For details about custom specifications, please consult with one of our sales representatives.

*4. The water sampling unit for abnormal time or internal leakage detection unit can be added as an option.

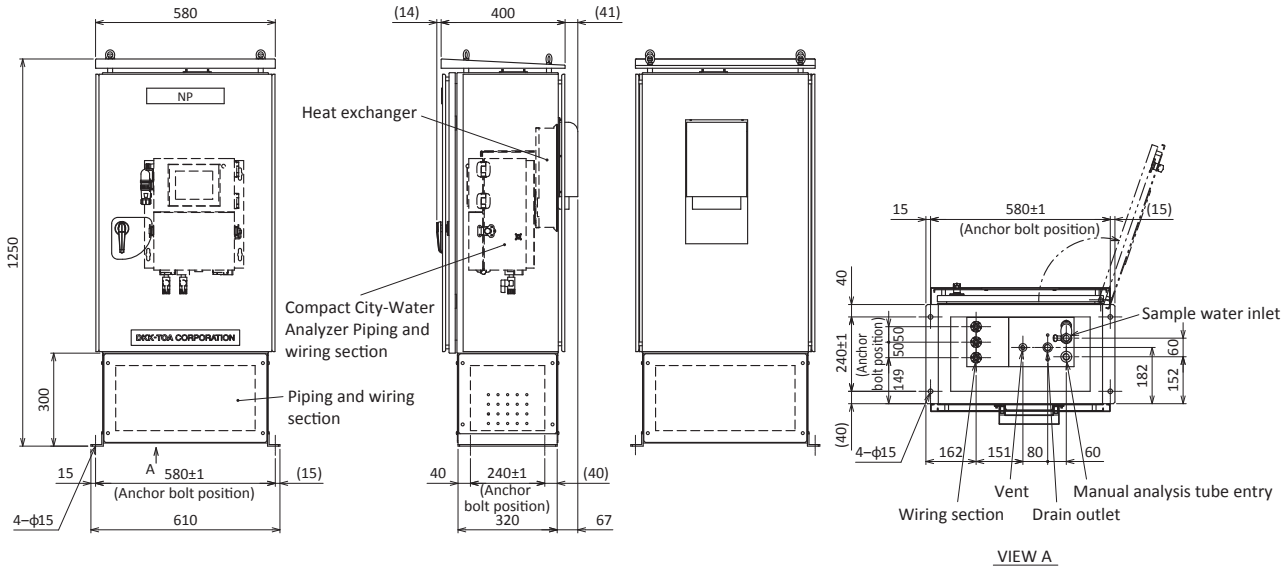
Manufacturing specifications for standard outdoor cubicle

This is our standard compact outdoor cubicle used to house the MWB4-72. It can also be used to house communication equipment.

Construction : IP23D, rainproof for outdoor use (sun shade included)
Front door (doorstop included)
Materials : SS400 (steel), SECC (sheet steel)
Board thickness : L40 x t5 (SS400), t2.3 (SECC)
Surface finish : Metallic silver, semi-gloss
Acrylic paint baked-on finish (cubicle), polyurethane paint baked-on finish (sun shade)
Power requirements : AC Line ± 10% 50/60Hz.
Power consumption : Max. 300 VA including MWB4-72 (consumption varies depending on the ambient temperature.)

Wiring end connection : Three G3/4
Piping end connection : Sample water inlet; Rc1/2
Drain outlet; Rc 1/2
Weight : Approx. 130kg (including MWB4-72)
Wetted part materials : SUS304, rigid PVC, PFA tube
Ambient conditions : −5 to 40°C, 85% RH or less (no freezing)
Equipped devices :

Product name	Rating
Heat exchanger	Max. 30W
Dehumidifier	–
Panel heater	Max. 200W
Breaker	5 AT
Lightning protection transformer	300VA



NP (equipment name plate): Please provide the information to be inscribed on the plate.

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⚠ CAUTION Please read the operation manual carefully before using products.

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