

ORGANIC POLLUTION MONITOR

Model: OPM-410A

The Model OPM-410A monitors organic pollution in water from industrial effluent, rivers etc.. The design and construction of this latest model is based on decades of development and field experience. The instrument features a direct-insertion detector that eliminates the need for extractive sample conditioning systems. The instrument provides a reliable, low maintenance solution for organic pollution monitoring.

FEATURES

- **Direct insertion detector**

Extractive sample conditioning system is not required. The direct insertion detector eliminates the need for complex sample conditioning and pump systems, increasing reliability and reducing maintenance requirements.

- **Self-diagnostics.**

The instrument continuously performs internal checks to ensure correct operation.

- **Compact and lightweight design.**

Weight of the sensor section has been reduced by 75% (compared to previous model) making handling and installation much simpler. The main instrument frame is made from lightweight FRP (Fibre Reinforced Plastics), which has the additional advantage of being corrosive resistant.

- **Accurate calibration**

Zero/Span calibration can be accurately performed using the stabilization monitoring function. Automatic temperature correction works with span calibration using standard solutions (potassium hydrogen phthalate).

- **Easy span check**

Span check can be simply carried out using a built-in optical calibration filter.

- **Wide measurement range and automatic range switching:**

Absorbance up to 2.5Abs can be measured with manual/automatic range switching (4 ranges available).

- **Accurate turbidity correction**

Built-in turbidity correction function accurately corrects for the turbidity value.

- **COD conversion output**

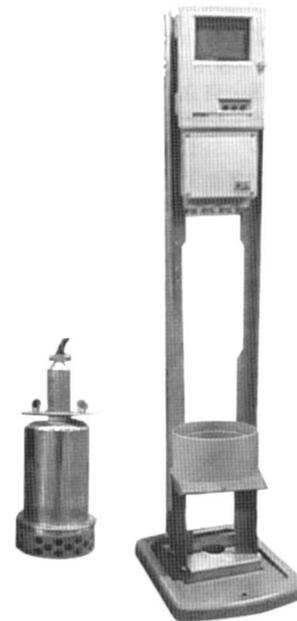
Output signal for "UV absorbance minus VIS (visible light) absorbance" can be provided as a COD conversion value.

- **Sample extraction version also available**

By installing the optional sample-receiving tank, the measurement can be performed by extracting sample from the process stream.

STANDARD SPECIFICATIONS

| | |
|---------------------------|--|
| Product Name | : Organic pollution monitor (UV instrument) |
| Model | : OPM-410A |
| Measurement Object | : Organic pollution in effluent |
| Measurement Method | : Dual-wavelength absorptiometry (UV 254nm/visible light 365~435nm continuous measurement) |
| Measurement Cell | : Immersed parallel cell (6, 10, 25mm) as specified by customer |
| Cell Cleaning | : Automatic cleaning of measurement cell inner wall by a wiper system. |



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|----------------------------|--|
| Measurement Range | : Absorbance 0~0.5/0~1.0/ 0~2.0/0~2.5 (Manual/automatic switching) |
| Ambient Temperature | : -5~40°C |
| Sample Temperature | : 0 ~ 45°C (no freezing) |
| Standard Liquids | |
| Zero | : Zero calibration water such as distilled water |
| Span | : Potassium hydrogen phthalate solution |
| Output signals | : Isolated from ground, UV absorbance, UV-VIS absorbance, VIS absorbance or COD conversion value 4~20mA DC (Max. load 600Ω) 0~1V DC (Max. load 100Ω - optional) |
| Other Signals | |
| Alarm contact outputs | : Insufficient sample signal Light source lamp cut-off signal Power cut-off (leakage) signal Sample cut-off signal Under cleaning signal High concentration alarm Range switching signal Instrument failure signal (including lamp degradation, cell window fouling, water leakage, light receiver degraded) Contact rating 30V DC, 0.3A |
| Input Contact Signals | : Cleaning command signal; The signal to start the cleaning program remotely Pulse contact input (Voltage free) when the command is given. Make time 0.1~1sec. Contact rating 30V DC, 0.3A |
| Power Requirements | : 100V AC±10%, 50/60Hz (other operating voltages available as options). |
| Power Consumption | : Approx. 70VA |

Materials

- Sensor (wetted parts) : Cast SUS316 equivalent
- Measurement cell : Quartz glass
- Drive : SUS316, urethane rubber
- Transmitter case : AD12 (corrosion resistant cast aluminium)

Construction

- Transmitter : Outdoor installation type (JIS protection class 3); 192(W) x 120(D) x 491(H)mm
- Self-stand frame (opt) : 380(W) x 500(D) x 1500(H)mm
- Sensor : Immersion type; 435(H) x 170(Dia)mm

Weight

- Sensor : Approx. 6.8Kg (exclusive of cable weight)
- Transmitter : Approx. 7Kg (FRP frame 12Kg)

Mounting

- Sensor : Special mounting device (windup device)
- Transmitter : Self-stand frame (standard) or pole. The pole for mounting should be prepared separately.

Surface Finish

: Munsell 5PB^{9/1}

Cable Ports

: Gland socket for Ø15 cable, 4pcs

Connection Cable

: Between sensor and transmitter, 1pc (Ø15, standard length 10m, coated with soft PVC)

Installation

: Free from vibration, impacts and corrosive vapours.

Air Inlet

: The transmitter case interior can be purged by air. Rc^{1/4} plugged when not in use.

Air pressure

: 0.02Mpa (0.2Kgf/cm²)

PERFORMANCE

- Repeatability : Within ±2%FS
- Linearity : Within ±2%FS
- Zero drift : Within ±2%FS/week
- Span drift : Within ±2%FS/week
- Response rate : Within 30sec. for 90% response

OPTIONS

- Modification parts for 10mm cell
- Modification parts for 6mm cell
- Modification parts for custom cell
- Sample conditioning system.

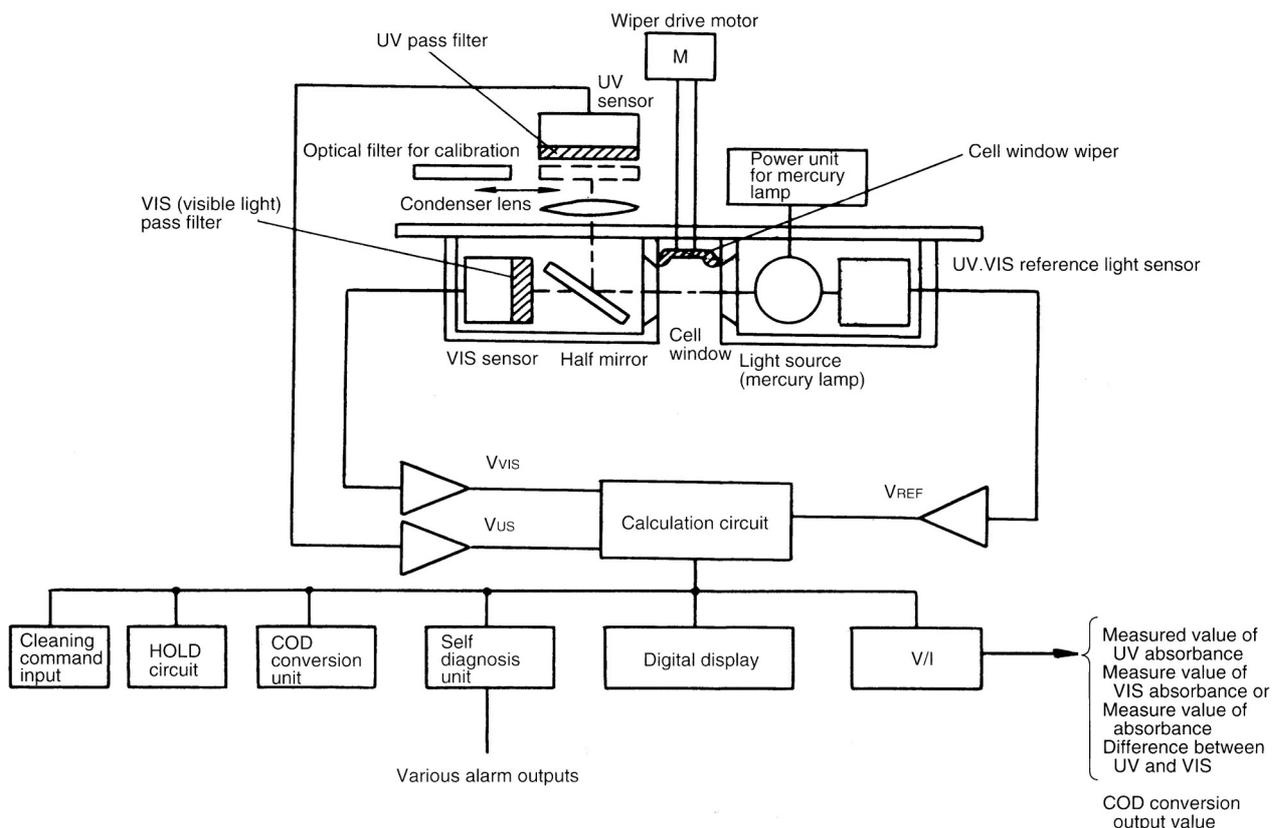
RELATED EQUIPMENT

- Load calculator : Use the load calculator CALD-131 when the cumulative load determination is required.

PRINCIPLE OF OPERATION

The light from a low-voltage mercury lamp, powered by a high stability circuit, passes through the measurement cell, and then through a UV (band pass) filter which allows only the light of wavelength ($\lambda=254\text{nm}$) to pass through and also a VIS (band pass) filter which allows only the light of wavelength ($\lambda=365\sim 435\text{nm}$) to pass through. The wavelengths of light selected by each filter then reach the UV sensor and the VIS sensor and are converted to DC voltages V_{uv} and V_{vis} . These voltages are converted to absorbance A_{uv} and A_{vis} by the microprocessor controller. The difference between A_{uv} and A_{vis} ($A_{uv}-A_{vis}$) is converted to the output signal by a V/I converter to eliminate the effect of suspended solids.

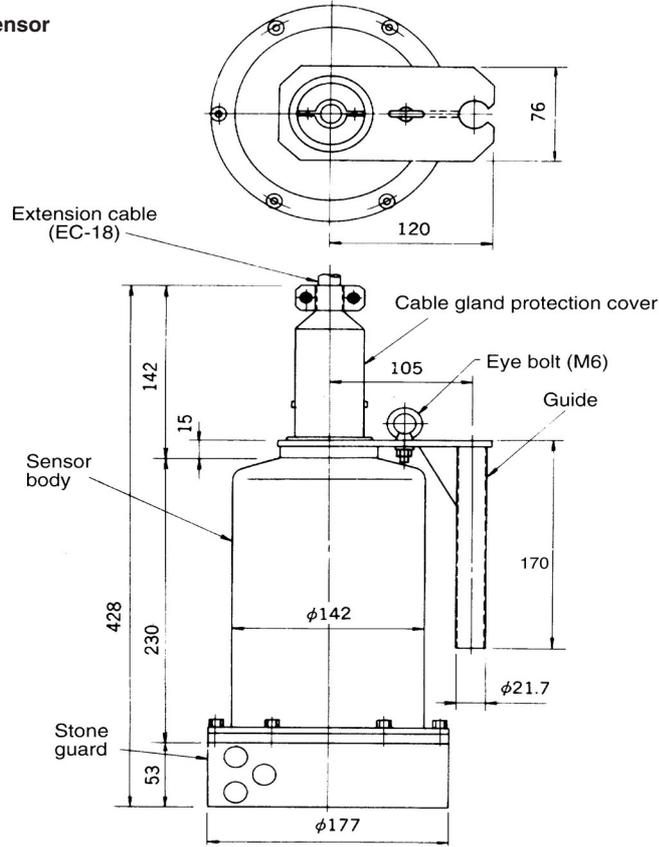
MEASUREMENT SYSTEM DIAGRAM



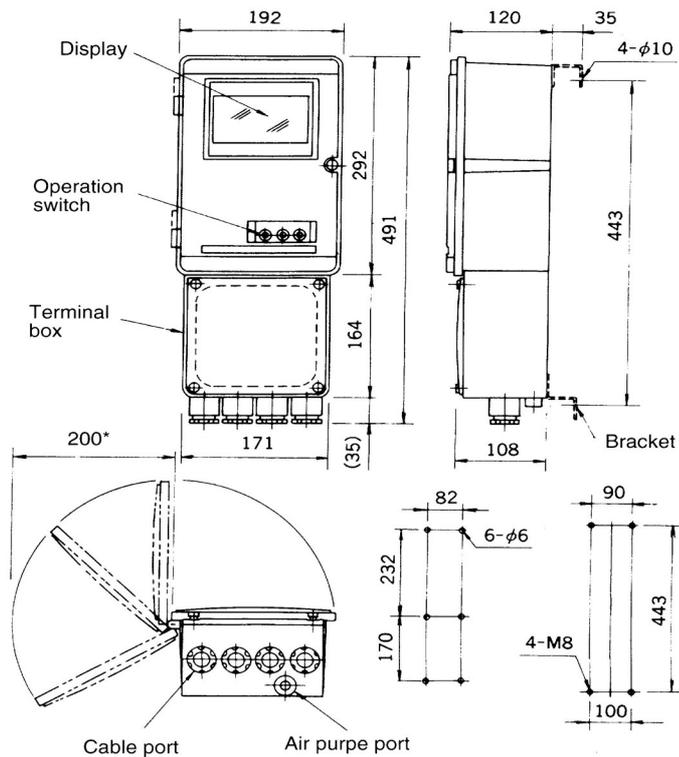
DIMENSIONS

Unit : mm

• Sensor



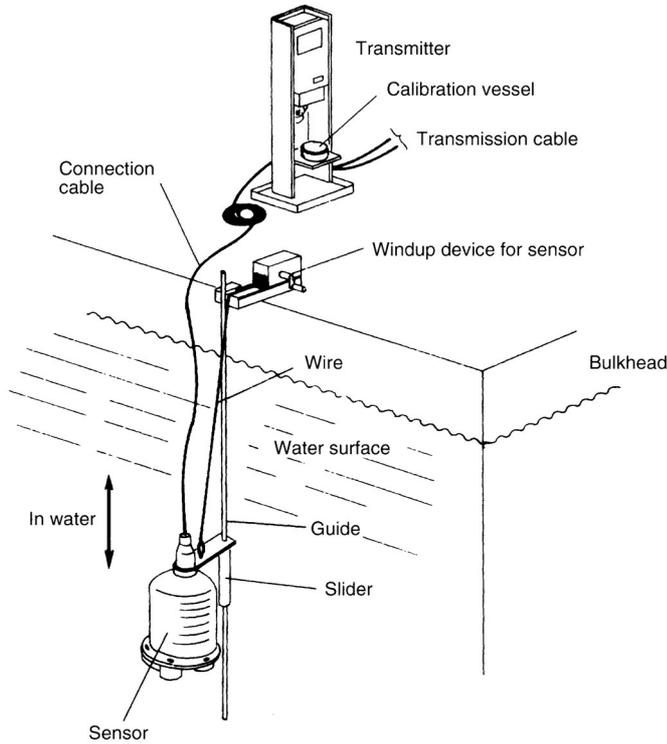
• Indicator – Transmitter



* Maintenance space

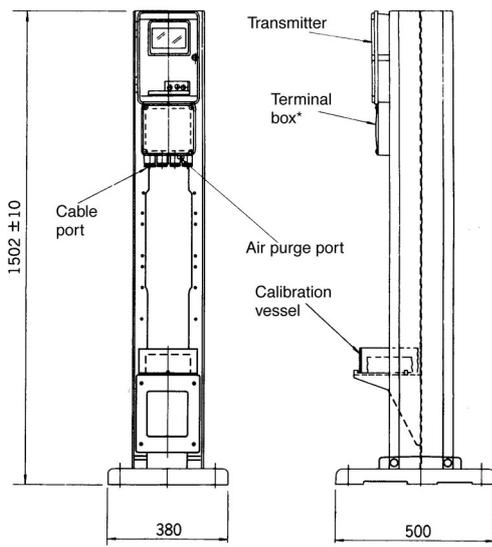
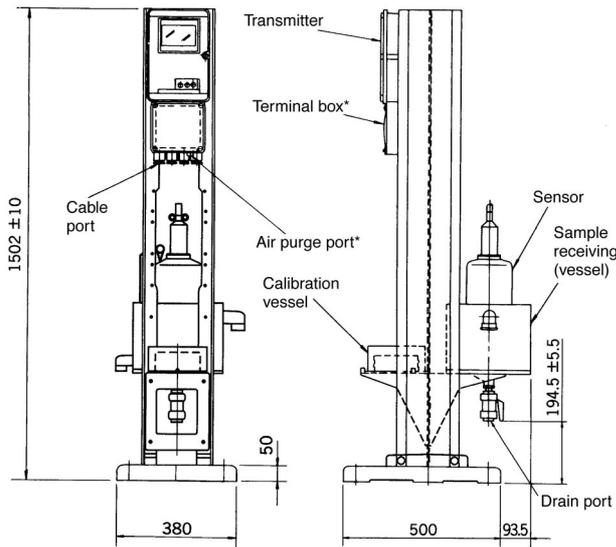
INSTALLATION EXAMPLES

• Installation example of self-stand frame

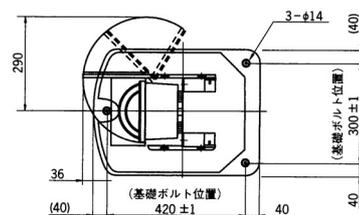
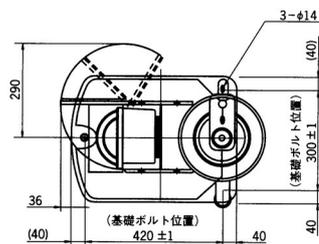


• Installation of sampling type installation (optional)

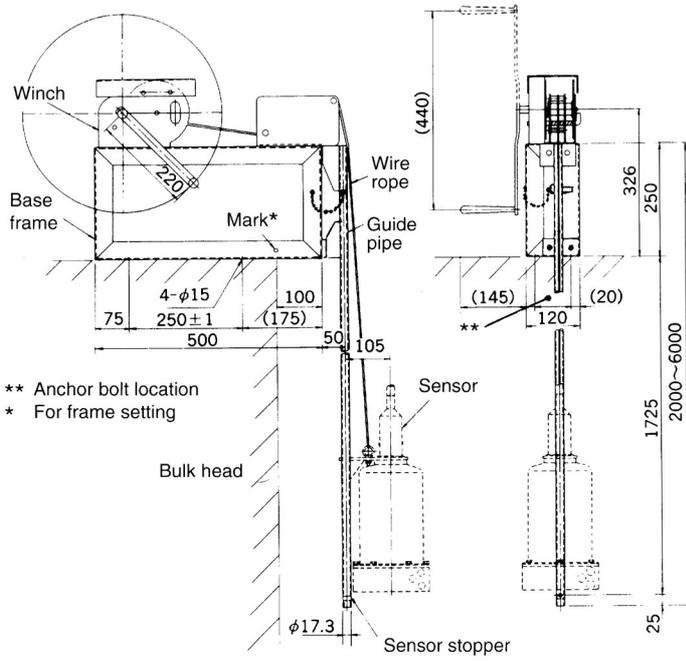
• Example of immersion type installation



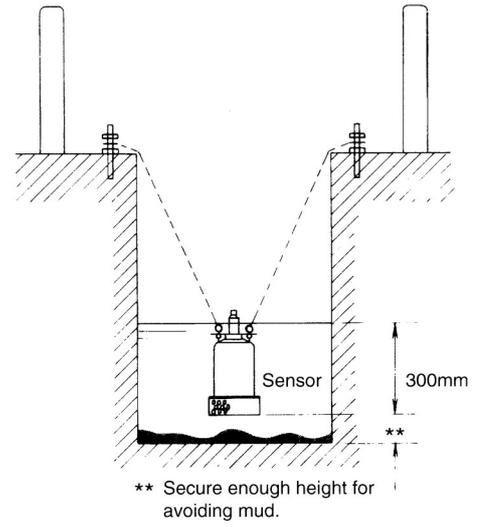
※ オプション仕様



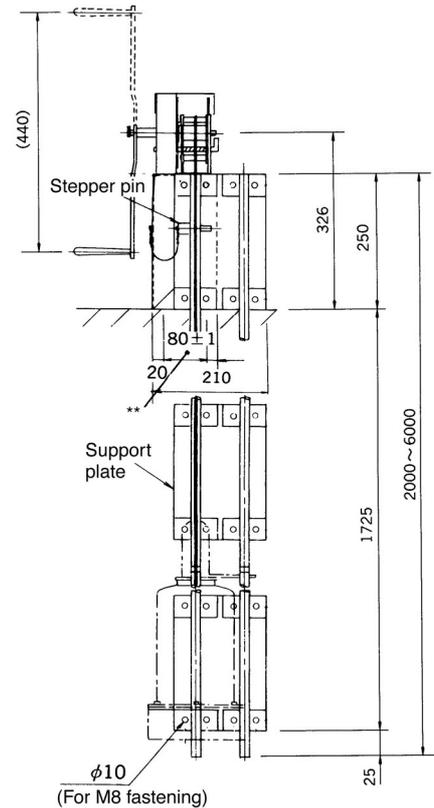
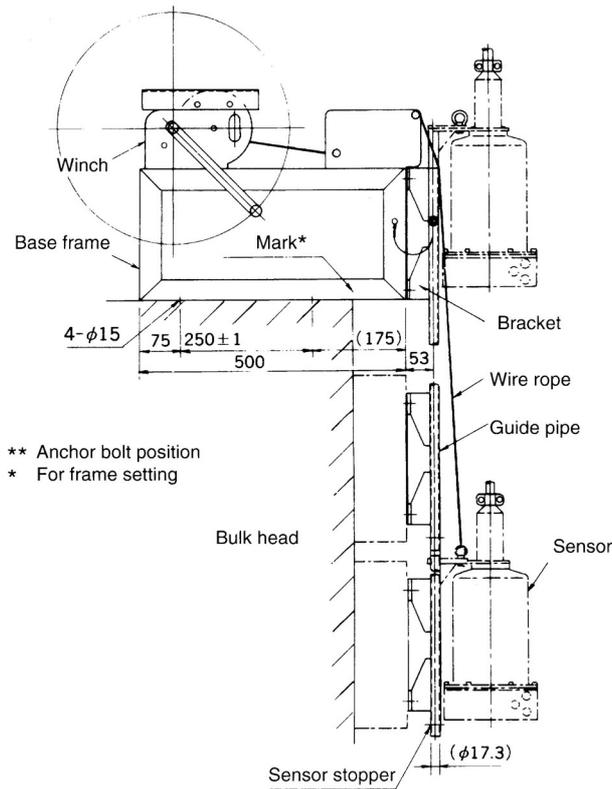
• Windup device for UV instrument (Standard)



• Chain hanging system



• Windup device for UV instrument (2 guide pipes system)



PRODUCT CODE

| | | | | | | | | | | |
|------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|
| OPM410A-0- | <input type="checkbox"/> | |
| | 1 | | | | | | | | | Power |
| | 9 | | | | | | | | | 100VAC 50/60Hz ^{*1} |
| | | | | | | | | | | Custom ^{*2} |
| | | | | | | | | | | Output signal ^{*3} |
| | 1 | | | | | | | | | DC4 ~ 20mA |
| | 1 | | | | | | | | | DC0 ~ 1V |
| | 9 | | | | | | | | | Custom |
| | | | | | | | | | | Measurement range ^{*4} |
| | 1 | | | | | | | | | Absorbance 0.5/1.0/2.0/2.5/AUTO |
| | | | | | | | | | | Sensor cell length |
| | | A | | | | | | | | 25mm |
| | | B | | | | | | | | 10mm |
| | | C | | | | | | | | 6mm |
| | | | | | | | | | | Cable Length (Transmitter-Sensor) |
| | 1 | | | | | | | | | 10mm(Standard immersion type) |
| | 2 | | | | | | | | | 3m(standard sampling type) |
| | 9 | | | | | | | | | Customs |
| | | | | | | | | | | Installation ^{*6} |
| | 0 | | | | | | | | | No frame ^{*6} |
| | 1 | | | | | | | | | Immersion type (with FRP frame) |
| | 2 | | | | | | | | | Sampling type (with FRP frame) ^{*7} |
| | 9 | | | | | | | | | Custom ^{*6} |
| | | | | | | | | | | Sensor bracket ^{*7} |
| | 0 | | | | | | | | | Nil |
| | 1 | | | | | | | | | Windup device (standard) 2m |
| | 2 | | | | | | | | | Windup device (standard) 3m |
| | 3 | | | | | | | | | Windup device (standard) 4m |
| | 4 | | | | | | | | | Windup device (standard) 5m |
| | 5 | | | | | | | | | Windup device (standard) 6m |
| | 6 | | | | | | | | | Chain hang type(3.5m#2) ^{*8} |
| | A | | | | | | | | | Windup device (standard) 2m ^{*9} |
| | B | | | | | | | | | Windup device (standard) 3m ^{*9} |
| | C | | | | | | | | | Windup device (standard) 4m ^{*9} |
| | D | | | | | | | | | Windup device (standard) 5m ^{*9} |
| | E | | | | | | | | | Windup device (standard) 6m ^{*9} |
| | 9 | | | | | | | | | Custom |
| | | | | | | | | | | Marking |
| | A | | | | | | | | | Standard (Japanese) |
| | B | | | | | | | | | English |
| | Z | | | | | | | | | Custom |

- *1 Line frequencies 50Hz and 60Hz available
- *2 When a custom line voltage is applied, install a stepdown transformer (model ZP, for 100V AC separately. To be separately procured.)
- *3 Three different outputs; UV, UV-VIS, VIS or COD conversion value are available. (VIS and COD conversion value are switched of 0.5/1.0/2.0/2.5 absorbances. This function is equipped as a standard. When a load calculator is combined with the monitor, the range of the monitor should be fixed.
- *4 AUTO means the automatic range switching of 0.5/1.0/2.0/2.5 absorbances. This function is equipped as a standard. When a load calculator is combined with the monitor, the range of the monitor should be fixed.
- *5 The extension cable may be routed up to 30m.
- *6 Select "No frame" when the FRP frame is not required.
- *7 When the sampling type is selected, the windup device and the sample tank (of UV instrument) OPM-410W need not be ordered.
- *8 Hanging with two 3.5mm chains utilizing the feature of OPM-410 is recommended as the simplified installation method. (When this method is employed, two eye bolts are supplied with the sensor.)
- *9 When there is no wall near the guide pipe of windup device, the sensor may be unexpectedly rotated. Select the 2-guide pipe type in such a case.

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|------------------------|---------------|
| (Spare parts) | (Code number) |
| Hanging chain assembly | 6140970K |
| Chain stopper | 122E164 |

DKK-TOA CORPORATION



CAUTION

Do not operate products before consulting instruction manual.

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