**FEATURES**

- 4-wire ORP transmitter with built-in microcomputer:
  Field installation type pH analyzer / transmitter featuring isolated output, digital indication and rainproof construction.

- Automatic determination of electrode quality:
  The transmitter judges the electrode quality from during calibration with standard solution. It can display “good”, “high”, “low”, and the potential difference from the standard value.

- Output range setting:
  The measurement range for the output signal can be easily adjusted.

- Temperature indication:
  Temperature of sample or calibration standard can be indicated on the display (requires electrode with built-in temperature sensor, such as Models 2600, 2610 etc.).

- Output can be held when in maintenance mode:
  By switching to “standby mode”, the output is kept at the value present just before the mode is switched, preventing disruption to the process control system.

- Compatible with 1KΩ temperature sensors:
  The unit is compatible with 1KΩ temperature sensors as well as the standard 10KΩ temperature sensor (Automatic setting).

- Input for remote “hold” command (Terminals 10-11):
  The transmitter can receive a “hold” command signal from the water jet cleaner or chemical cleaner to hold the output (4–20mA DC) during the cleaning process.

- Measured value shifting:
  The measured value can be shifted up or down to meet specific requirements of the process control system. (Shift width: ±100 mV).

**STANDARD SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>ORP analyzer/transmitter.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>HDM-138A</td>
</tr>
<tr>
<td>Measurement Range</td>
<td>-2000 → ±2000 mV, Temperature: 0~100°C (indication only, no output signal).</td>
</tr>
<tr>
<td>Indication System</td>
<td>Digital (LCD)</td>
</tr>
<tr>
<td>Resolution</td>
<td>1 mV; Temperature: 0.1.</td>
</tr>
</tbody>
</table>

**SYSTEM CONFIGURATION**

- Sensor
- Electrode lead
- HDM-138A Transmitter
- Receiver
- Indicating recorder
- Controller DCS, etc.
- AC power source
- 2-core shielded cable
- Extension cable EC-10 (max. 100m)

* Junction box and extension cable are used when electrode length is insufficient.
**DIMENSIONS**

(Unit: mm)

- **HDM-138A Transmitter**

![Dimensions Diagram]

**TERMINALS**

![Terminals Diagram]

**WIRING DIAGRAMS**

- **Basic configuration**

![Wiring Diagrams]

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Model: HDM-138A - ORP Analyzer/Transmitter - Issue: HDM-138A-0107-R0
WIRING DIAGRAMS

- Example of a system combined with chemical cleaner (Model RHC-7A)

![Wiring Diagram]

When mode switch of transmitter has been set to TEST and during cleaning, output 4 ~ 20mA DC is held at previous value.

Connection terminals description:
13, 14: Cleaning start signal input (Contact pulse of 100ms or longer closure time)
15, 16: Cleaning stop signal input (Stops when open, shipped from factory with jumper across terminals.)
Internal load relay: 100V AC 30mA
92, 93: Servicing power supply

Note: Transmitter includes remote "hold" option (terminals 10 & 11)

OPTIONAL ACCESSORIES

- Sun Shade (hood)
Recommended when the instrument is installed at a location exposed to direct sunlight.
Material: SUS304.
Mounting: 2 inch pipe.

APPLICATION SENSORS

A wide variation of sensors can be combined with the HDM-138A transmitter as shown in the following table. Select the sensor based on your application requirements such as immersion or flow through type, wetted materials and measurement conditions.

<table>
<thead>
<tr>
<th>Electrode selection</th>
<th>Applicable holder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Model No.</td>
</tr>
<tr>
<td>General use (-5 ~ 70 °C)</td>
<td>2800(P), 2905(Alloy)</td>
</tr>
<tr>
<td>High temperature (-5 ~ 95 °C)</td>
<td>2601(P)</td>
</tr>
<tr>
<td>Chemical resistant (-5 ~ 70 °C)</td>
<td>2602(P)</td>
</tr>
<tr>
<td>Pressurized type (-5 ~ 70 °C)</td>
<td>2510(P), 2515(Alloy)</td>
</tr>
<tr>
<td>Insulation Type</td>
<td></td>
</tr>
<tr>
<td>KCL no supply type (-5 to 50°C)</td>
<td>2910(P), 2915(Alloy)</td>
</tr>
<tr>
<td>KC/ no supply type (chip replaceable) (-5 to 80°C)</td>
<td>ELC-61(P), ELC-77 (Alloy)</td>
</tr>
<tr>
<td>High temperature (-5 ~ 95 °C)</td>
<td>2500(P)</td>
</tr>
<tr>
<td>Chemical resistant (-5 ~ 70 °C)</td>
<td>2502(P)</td>
</tr>
<tr>
<td>KC/ no supply type (-5 ~ 50°C)</td>
<td>2910(P), 2915(Alloy)</td>
</tr>
<tr>
<td>KC/ no supply type (chip replaceable) (-5 ~ 80°C)</td>
<td>ELC-61(P), ELC-77 (Alloy)</td>
</tr>
</tbody>
</table>

For other custom specifications specify code 9 for numeric digit and code Z for alphabetical digit. (Required with inspection tab)

*1. Limitations for “Custom Spec”, Output range:
- Range must include 0mV
- Span shall be above 400mV (100mV steps)

PRODUCT CODE

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power source 90~132V AC 50/60Hz</td>
</tr>
<tr>
<td>2</td>
<td>180~284V AC 50/60Hz</td>
</tr>
<tr>
<td>A</td>
<td>+/- 200mV</td>
</tr>
<tr>
<td>B</td>
<td>+/- 700mV</td>
</tr>
<tr>
<td>C</td>
<td>+/- 1000mV</td>
</tr>
<tr>
<td>D</td>
<td>+/- 1400mV</td>
</tr>
<tr>
<td>E</td>
<td>+/- 2000mV</td>
</tr>
<tr>
<td>F</td>
<td>0 ~ +700mV</td>
</tr>
<tr>
<td>G</td>
<td>0 ~ +1000mV</td>
</tr>
<tr>
<td>H</td>
<td>0 ~ +1400mV</td>
</tr>
<tr>
<td>Y</td>
<td>Custom spec. *1 Assembling with cable port adapter NiG / (PF) / SUS304</td>
</tr>
<tr>
<td></td>
<td>Electrode lead port Direct connection Equipment (No. 54493K)</td>
</tr>
<tr>
<td></td>
<td>Hood Markings 0 ~ 9 Standard (Japanese) - English</td>
</tr>
</tbody>
</table>

RELATED EQUIPMENT FOR pH, ORP ANALYZERS

JUNCTION BOX

When the transmitter is installed remotely to the sensor (mainly for panel mounted transmitters) and the standard electrode lead length is too short, a junction box is required.

Model: FC-4
Construction: Field installation, spray proof (JIS CP020)
Mounting: 25–50A Pipe, wall or panelmount
Material: ABS resin
Finish: Matted chromium plating, metallic silver
Weight: Approx. 0.9kg
Applicable extension cable: EC-10

EXTENSION CABLE

The extension cable is a special cable specifically manufactured for use with pH analysers. It is used for connection between transmitter and junction box. Maximum cable length is 100m. The cable must not be spliced.

<table>
<thead>
<tr>
<th>Model</th>
<th>EC-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall diameter</td>
<td>8mm</td>
</tr>
<tr>
<td>Insulation</td>
<td>Polyethylene and PVC</td>
</tr>
<tr>
<td>Sheath</td>
<td>PVC</td>
</tr>
<tr>
<td>Insulation resistance between core conductors</td>
<td>At least 10^7Ω/100m</td>
</tr>
<tr>
<td>Standard length</td>
<td>5m, 10 ~ 100m</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 0.5kg/5m</td>
</tr>
</tbody>
</table>

BARGRAPH METER RELAY

Model: 1914
Output Signal: 4–20mA DC
Alarm Outputs: High-high, high, low, low-low.
Scale: Specify with purchase order.
Scale Length: 100mm
Display: Red LED, 101 dots.
Power Requirements: 85–264V AC, 50/60Hz
Power Consumption: Approx. 7VA
Ambient Conditions: 0–45°C, 40–80% RH
Weight: Approx 420g

SUN-SHADE

(For protection from direct sun-light)
Material: 304 Stainless Steel
Mounting: 50A Pipe bracket

International Operations:
DKK-TOA Corporation
29-10, 1-Chome, Takadanobaba, Shinjuku-ku, Tokyo 169-8648 Japan
Tel: +81-3-3202-0225 Fax: +81-3-3202-5685

Representative Office (Europe):
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http://www.toadkk.co.jp

CAUTION
Do not operate products before consulting instruction manual.