The pH transmitter is a user-friendly device that features a compact and robust aluminum case, making it ideal for on-site installation.

This device comes in two different models: the 2-wire system (24VDC power supply) and the 4-wire system (adjustable-voltage AC power supply).

### Features

- **Automatic determination of electrode quality**
  The transmitter judges the electrode quality from its characteristics during calibration with standard solutions. Degradation of electromotive force at pH7, degradation of electromotive force per pH and other information is displayed in the form of error messages. Characteristic data of each electrode can be called out to determine the extent of degradation as required.

- **Output hold while performing maintenance work**
  When the transmitter enters maintenance (ST-BY) mode, the previous output value is held. This helps to prevent disruptions to the control system.

- **Measured value shift**
  Measured pH values can be shifted for operational control. (Shift width: ±1.0pH)

- **Manual temperature compensation**
  Manual temperature compensation function (0 - 100ºC) can be provided for use with electrodes which do not have compensation functions.

- **pH temperature compensation**
  The transmitter compensates the pH temperature characteristics of samples (such as pure water and boiler water).

- **Setting range of temperature compensation coefficient : ±0.1pH/ºC**
  Standard conversion temperature: 25ºC

- **Automatic reversion to measurement mode**
  The analyzer/transmitter automatically switches back to measurement mode if it is left in maintenance mode for more than two hours.

- **External input for “hold” feature (option)**
  The transmitter can receive a “hold” command signal from the cleaning devices to hold output during the cleaning.

### System configuration

#### 2-wire system

- **Detector**
- **Electrode lead** (5m or 10m)
- **HC type**
- **Transmitter** HDM-135A
- **Power/Transmission output** (24VDC 4 - 20mA)
- **Site**
- **Instrument room**
- **Distributor**
- **DC power**
- **Receiver**
- **Indicator Recorder Controller DCS, etc.**

#### 4-wire system

- **Detector**
- **Electrode lead** (5m or 10m)
- **HC type**
- **Transmitter** HDM-136A
- **Transmission output** (4 - 20mA/DC)
- **Site**
- **Instrument room**
- **Instrumentation power**
  - 100 - 120VAC
  - 200 - 240VAC
- **Image**
- **Indicator Recorder Controller DCS, etc.**
## Standard Specifications

<table>
<thead>
<tr>
<th>Product name</th>
<th>pH TRANSMITTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>HDM-135A (2-wire system)</td>
</tr>
<tr>
<td>Measurement range</td>
<td>pH: -1.00<del>14.00 mV: -600</del>600 mV Temperature: 0~100ºC (Display only. No output)</td>
</tr>
<tr>
<td>Display</td>
<td>Digital LCD</td>
</tr>
<tr>
<td>Min. Indication</td>
<td>pH: 0.01, mV: 0.1, Temperature: 0.1ºC</td>
</tr>
<tr>
<td>Performance (excluding detector) Linearity</td>
<td>Within ±0.03pH (at equivalent input)</td>
</tr>
<tr>
<td>Repeatability</td>
<td>Within ±0.02pH or less (at equivalent input)</td>
</tr>
<tr>
<td>Transmission Output</td>
<td>4~20mA DC, isolated type Load resistance MAX 650Ω or less.</td>
</tr>
<tr>
<td>Transmission Output Range</td>
<td>Adjustable range between -1 to 14 pH steps with minimum width of 2 pH.</td>
</tr>
<tr>
<td>Power supply</td>
<td>24VDC ±10% 90<del>132VAC 50/60Hz or 180</del>264VAC 50/60Hz (option)</td>
</tr>
<tr>
<td>Power consumption</td>
<td>0.6VA or less Approx. 3VA</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>-20~55ºC, 99% (RH) or less (no condensation)</td>
</tr>
<tr>
<td>Construction</td>
<td>Outdoor installation, IP55 (dust/jet-proof type)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>118 (W) x 129 (H) x 178 (D) mm</td>
</tr>
<tr>
<td>Mounting</td>
<td>Mounted on 50A pipe</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 3.5kg</td>
</tr>
<tr>
<td>Cable entry</td>
<td>G 3/4 (PF 3/4 F), 3 ports</td>
</tr>
<tr>
<td>Materials</td>
<td>Main body Cast aluminum alloy</td>
</tr>
<tr>
<td>Window</td>
<td>Resin</td>
</tr>
<tr>
<td>Mounting bracket</td>
<td>SUS 304</td>
</tr>
<tr>
<td>Color</td>
<td>Metallic silver and blue</td>
</tr>
</tbody>
</table>

### Control switch/Display

- Digital display
- Mode selector switch
- Calibration switch (CALT)
- Stand-by switch (MEAS/ST-BY)
- Measurement (MEAS): Measurement mode
- Stand-by (ST-BY): Maintenance mode
- Display: After the power is on, the indication testing is automatically done for several seconds.

### Terminals

#### HDM-135A (2-wire system)

- Power/transmission cable
- Electrode lead
- Grounding terminal

#### HDM-136A (4-wire type)

- Power/transmission cable
- Electrode lead
- Grounding terminal

---

-2-
Recommended when installing the instrument in a location exposed to direct sunlight.

Material : SUS304
Mounting : Mounted on 50A pipe
Code Number : 544493K
**Wiring diagrams for 2-wire system**

*<When electrode is directly connected to transmitter>*

*<When the electrode is connected via a junction box and extension cable>*

*<Wiring example when using the device together with a RHC-7C chemical cleaner>*

When the transmitter is equipped with the external input for the output hold command (terminals #90 - #11 (option))

- **13, 14:** Cleaning start signal input
  - Contact closed: No-voltage contact pulse of 100ms or longer
  - Contact capacity: 30VDC, 0.1 mA or greater
- **15, 16:** Cleaning stop signal input
  - Stops when open (factory shipped with jumper across terminals)
  - Internal load: 100VAC, 220 mA (solenoid valve)
- **10, 11, 12:** Cleaning signal 1 output
  - Contact across terminals #10 and #11 is closed during cleaning.
  - Contact capacity: 125VAC, 1A
- **17, 18, 19:** Cleaning signal 2 output
  - Contact across terminals #17 and #18 is closed during cleaning.
  - Contact capacity: 125VAC, 1A

**Connection terminals description:** (Connect terminals as required)

- AC power supply (100VAC, 50/60Hz)
- Liquid transfer unit
- Chemical cleaner
- Receiver
- Air supply
- Pressure reducing valve with gauge (setting range 0.06 - 0.1 MPa): Option

**Legends:**

- Air
- Chemical + air
Wiring diagrams for 4-wire system

<When electrode is directly connected to transmitter>

<When the electrode is connected via a junction box and extension cable>

<Wiring example when using the device together with a RHC-7C chemical cleaner>
When the transmitter is equipped with the input for the external output hold command (terminals #10 - #11 (option))

Connection terminals description (Connect terminals as required)
13, 14: Cleaning start signal input
  Contact closed: No-voltage contact pulse of 100ms or longer
  Contact capacity: 30VDC, 0.1 mA or greater
15, 16: Cleaning stop signal input
  Stops when open (factory shipped with jumper across terminals)
  Internal load: 100VAC, 220mA (solenoid valve)
10, 11, 12: Cleaning signal 1 output
  Contact across terminals #10 and #11 are closed during cleaning.
  Contact capacity: 125VAC, 1A
17, 18, 19: Cleaning signal 2 output
  Contact across terminals #17 and #18 are closed during cleaning.
  Contact capacity: 125VAC, 1A
### Transmission output range (4 - 20mA DC)

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**Input for external output hold command**

- None
- Equipped

**Surface finish (coating)**

- Standard coating
- Heavy-duty anticorrosion coating

**Arrester**

- None
- Included

**Assembly with cable port adapter**

- None, G3/4 (PF3/4) standard
- G1/2 (PF1/2) SUS304
- NPT1/2 SUS304
- NPT3/4 SUS304

**Electrode lead port**

- Direct connection
- EC-10 Extension cable (connection with FC-4)

**Hood (sun shade)**

- None
- Equipped (No. 544493K)

**Markings**

- Japanese (standard)
- English

---

*1. Specify the output range (4 - 20mA DC) in 0.1 pH steps, with a minimum width of 2 pH.

*2. Select “Equipped” when using the device together with JHC/BHC/BJHC/RHC cleaners (UHC excluded). Output is held during cleaning.

*3. Standard coating: Melamine primer and topcoat. Average film thickness: 30 µm or greater.

*4. Heavy-duty anticorrosion coating: Epoxy primer and middle coat, polyurethane resin topcoat. Average film thickness: 100 µm or greater.

*5. Ceramic surge arrester (simplified) is mounted on the power/ transmission line.
Related equipment

There are related optional products for HDM-135A/136A. Order separately as necessary.

- Junction box and Extension cable

  Junction box and Extension cable are required when the transmitter and electrode are installed away from each other and the standard electrode lead length (5m) is too short. Both of them are special high insulating shielded type.

<table>
<thead>
<tr>
<th>Model</th>
<th>Construction</th>
<th>Mounting</th>
<th>Material</th>
<th>Finish</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC-4</td>
<td>Outdoor installation</td>
<td>25 - 50A pipe, wall or panel mount</td>
<td>ABS resin</td>
<td>Pearskin finish chromium plating</td>
<td>Approx. 0.9kg</td>
</tr>
</tbody>
</table>

- Sensor Cable

  Model : EC-10
  Outer Diameter : φ8 mm
  Insulation : Polyethylene and vinyl
  Casing : Vinyl
  Insulation resistance between core wires : At least 10³ MΩ / 100m
  Extension distance : Maximum length of 100m, intermediate connection cannot be used
  Standard length : 5m to 50m in 5-meter units
  Weight : Approx. 0.5kg / 5m

- Power supply unit

  A power supply unit (24VDC) for the 2-wire type HDM-135A.

  Model : PA-24
  Output voltage rating : 24VDC+3/-1V
  Output current rating : 2 × 22mA (Parallel connection between two instruments cannot be made.)
  Power requirements : 100VAC+10%, 50/60Hz
  Ambient conditions : -5°C - 55°C
  Construction : Indoor installation, plug-in type
  Weight : Approx. 300g
### Supported detectors

Supported detectors can be used together with HDM-135A/136A controller, as shown in the following table. Select the detector that best fits the immersion type, flow-through type, material and measurement conditions.

#### Detectors for replaceable-tip electrodes

<table>
<thead>
<tr>
<th>Classification</th>
<th>Application</th>
<th>Model</th>
<th>Wetted part material</th>
<th>pH electrode</th>
</tr>
</thead>
<tbody>
<tr>
<td>KC Refillable</td>
<td>General use (below 60˚C)</td>
<td>HC-G70</td>
<td>PVC</td>
<td>GSS-314B (general use)</td>
</tr>
<tr>
<td></td>
<td>High temperature (below 80˚C)</td>
<td>HC-G70</td>
<td>PP</td>
<td>GSS-314A (high alkali resistant)</td>
</tr>
<tr>
<td></td>
<td>General use, pressurized type (below 60˚C)</td>
<td>HC-G80P</td>
<td>PVC</td>
<td>GSS-314F (hydrofluoric acid resistant)</td>
</tr>
<tr>
<td></td>
<td>High temperature, pressurized type (below 80˚C)</td>
<td>HC-G82P</td>
<td>PP SUS316</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For boiler and pure water</td>
<td>HC-G65</td>
<td>Acrylic</td>
<td>GSS-314P</td>
</tr>
</tbody>
</table>

#### Detectors for integrated (conventional) KCl refillable type electrodes

<table>
<thead>
<tr>
<th>Classification</th>
<th>Application</th>
<th>Model</th>
<th>Wetted part material</th>
<th>pH electrode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immersion type</td>
<td>General process/effluent treatment (below 60˚C)</td>
<td>HC-703C</td>
<td>PVC</td>
<td>5600 (general use) 5605 (hydrofluoric acid resistant)</td>
</tr>
<tr>
<td></td>
<td>High temperature process (below 80˚C)</td>
<td>HC-763</td>
<td>PP</td>
<td>5601</td>
</tr>
<tr>
<td></td>
<td>High temperature process, chemical resistant</td>
<td>HC-703F</td>
<td>PVDF</td>
<td>5601</td>
</tr>
<tr>
<td></td>
<td>High temperature process, organic solvent resistant</td>
<td>HC-703T</td>
<td>PFA PTFE</td>
<td>5602</td>
</tr>
<tr>
<td>Flow-through type</td>
<td>General process use/effluent treatment, insertion type, pressurized type</td>
<td>HC-880</td>
<td>PP or PVC</td>
<td>5610 (normal temperature) 5611 (high temperature)</td>
</tr>
<tr>
<td></td>
<td>General process use/effluent treatment, pressurized type, supplied with PP or PVC case</td>
<td>HC-882</td>
<td>PP or PVC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General process use/effluent treatment, pressurized type, supplied with SUS case</td>
<td>HC-883</td>
<td>PP or PVC SUS316</td>
<td></td>
</tr>
</tbody>
</table>