700 ULTRA-D
Digital pH/ORP sensor
Measurement made easy
The 12 mm digital pH/ORP sensor for use in ultrapure applications

Increased efficiency
• ABB’s glass formulation provides fast process response without compromising durability and robustness
• Close-coupled temperature measurement ensures high accuracy even with rapid temperature changes

EZLink™ connectivity
• Plug-and-play technology makes sensor integration fast and easy
• Advanced diagnostics providing end-of-life indication and fault analysis
• Improved measurement accuracy with digital communication

Dependable performance
• Refillable KCl reservoir providing maximum usability and extended operation in high purity applications with minimal drift
• Triple ceramic junction reduces plugging while providing improved measurement stability and speed of response

Modular design
• Modular 12 mm sensor design, paired with intelligent accessories, provides mounting flexibility with safety and convenience in mind
Introduction

Making the right sensor selection for your application should be simple and easy. To help you make the right choice, we’ve divided our new family of pH/ORP sensors into three distinct ranges based on the applications they have been designed for: the 100, 500 and 700 ranges.

The 100 range are entry-level sensors designed for light duty use, while the 500 range offer a robust design for industrial applications. The 700 range are a specialty range for target applications.

Each electrode is clearly named and is also color-coded for ease of identification. This enables you to easily select the best sensor to meet your needs, ensuring optimal plant efficiency, performance and lifetime; every time.

The 700 ULTRA-D digital pH/ORP sensor

Part of the next generation of ABB’s pH/ORP sensors, the digital 700 ULTRA-D is a high-performance electrode designed for ultra-pure water applications. Its reservoir-fed rechargeable design provides extended operation and minimal drift for applications down to 0.055 μS/cm.

The 700 ULTRA-D is designed for use in:

- boiler water
- demineralized water
- power plants
- steam water analysis
- reverse osmosis
- condensate/feedwater

Performance you can trust

Featuring a rechargeable reservoir-fed design, the 700 ULTRA is capable of extended operation in ultrapure applications down to 0.055 μS/cm, minimizing the frequency of sensor replacement due to loss of electrolyte. With an enhanced triple ceramic junction design, the 700 ULTRA has improved speed of response while maintaining measurement stability in the most demanding high purity applications.

Refillable KCl design provides extended operation down to 0.055 μS/cm and ensures minimal drift due to KCl loss

Universal 12 mm body with PG13.5 connection

Ion trap technology prevents blockage of internal junctions keeping the sensor operational

Triple ceramic junction minimizes blocking potential and ensures measurement stability
Improved process efficiency
Varying sample temperature is one of the most common causes of pH measurement error due to its impact on sensor output. The 700 ULTRA-D is equipped with a close-coupled temperature element capable of rapid response to quickly changing process conditions thus ensuring a high level of accuracy and confidence in your measurement.

EZLink connectivity
Convenient EZLink technology enables seamless plug-and-play integration when using the 700 ULTRA-D. Automatically recognized, the sensor uploads calibration, diagnostic and manufacturing information to any of ABB’s EZLink-capable transmitters within seconds; significantly reducing commissioning and product maintenance.

Sensor health check
The 700 ULTRA-D provides advanced sensor diagnostics such as the unique perpetual impedance monitoring (patent-pending) that detects electrode faults such as Broken Glass or Out-of-Sample in real-time without the need for a solution earth.

In addition, ABB’s SMART reference electrode monitoring (REM) system provides early warning notification of electrolyte loss enabling the sensor to be replenished when required, saving money without risking process control.

Enhanced accuracy
Instantaneous signal conditioning from analog to digital ensures minimal electrical interference and strengthens signal strength, greatly improving measurement accuracy even with longer cable distances.
Robust glassware

Utilizing ABB’s experience in glass manufacturing dating back to the 1950s, the proprietary glass formulations used with the 700 ULTRA-D offer fast response without sacrificing durability. Selectable in several configurations, the robust glassware is made suitable for wide range of general-purpose applications.

Low temperature (LT) glass
For measurement below 15 °C (59 °F), our low temperature blue glass provides ultrafast response in applications such as municipal and industrial wastewater treatment. Available in bullet style.

High-performance (S) glass
Our high-performance yellow glass provides fast response and accurate measurement over the entire pH range. With an extremely low sodium error, the glass can maintain its accuracy even at very high pH levels. Available in flat or bullet style.

ORP platinum electrode
Chemically inert, our platinum electrode is design for conventional ORP/Redox measurement with an RTD element providing process temperature information.

Extended storage

We understand most customers maintain stock of pH/ORP sensors in case of unexpected demand. Ensuring peak performance, even after extended storage, is critical in maintaining product availability and keeping your process running.

The 700 ULTRA-D is stored in a specially formulated solution with added antimicrobial agent keeping the sensor active for up to 2 years when stored as recommended.
700 ULTRA panel

While some of our customers prefer to integrate their ABB products themselves, ABB has developed a range of easy and ready-to-install systems using industry-standard components and best practice in fitting design. Our panel-mounted analyzers include:

- standard sized backboard for wall-or rail mounting
- 700 ULTRA, flow-chambers and pipework
- predrilled panel and transmitter mounting holes
- isolation and flow control valves with indicators
- pH sensor calibration pot and bracket for easy calibration

Optional sampling panel

The 700 ULTRA panel offers a ready-to-install kit making commissioning quick and easy. Additional mounting accessories designed to improve adaptability are available for the 700ULTRA sensor and offer safe and convenient operation. The additional accessories include:

- flowcell
- quick-connect bayonet
## Dimensions

Dimensions in mm (in)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value (in mm)</th>
<th>Value (in in)</th>
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</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>233.6</td>
<td>9.2</td>
</tr>
<tr>
<td>Ø</td>
<td>12.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Height</td>
<td>118.2</td>
<td>4.7</td>
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<tr>
<td>Sampling panel</td>
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<td>15.75</td>
</tr>
<tr>
<td></td>
<td>600.0</td>
<td>23.6</td>
</tr>
<tr>
<td>115.0</td>
<td>(4.53)</td>
<td></td>
</tr>
</tbody>
</table>

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...Dimensions

Reservoir/flowcell assembly
Electrical connections

All digital sensors are supplied with EZLink connectivity.
Specifications

Measurements
- pH/ORP (platinum)
- Temperature

Measurement range
High performance (S) glass
0 to 14 pH
Low temperature (LT) glass
0 to 10 pH
ORP
-2,000 to 2,000 mV

Temperature range
High performance (S) glass
0 to 100 °C (32 to 212 °F)
(typical glass impedance at 25 °C [77 °F] = 250 MΩ)
Low temperature (LT) glass
-5 to 50 °C (23 to 122 °F)
(typical glass impedance at 25 °C [77 °F] = 25 MΩ)
ORP platinum electrode
0 to 60 °C (32 to 140 °F)

Temperature sensor
Pt1000 (Class B, IEC 60751)

Maximum pressure
Atmospheric

Recommended minimum sample conductivity
0.055 μS/cm

Recommended sample flowrate
100 to 500 mL/min

Recommended sensor storage
Between 15 and 35 °C (59 and 95 °F)

Isothermal point at 25 °C (77 °F)
pH 7

Reference system
Flowing KCl electrolyte with Ag/AgCl double junction

Process connections
PG 13.5

Wetted materials
Electrode body
Glass
Reference junction system
Ceramic
Measure system
pH: Glass
ORP: Platinum

Approvals, certification and safety
CE Mark
Covers EMC+LV directives
(including latest version of EN61010)
Regulation 31
Drinking water approval: Complies to DWI Regulation 31(4)(b)
Additional tests: BS6920 parts 2.2 and 2.4 on all wetted parts
EMC
Meets requirements of IEC61326 for an industrial environment
## Ordering information

<table>
<thead>
<tr>
<th>700 ULTRA-D 12 mm flowing junction pH/ORP electrode (EZLink digital)</th>
<th>APS732/XX</th>
<th>X</th>
<th>XX</th>
<th>Option</th>
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<tbody>
<tr>
<td>Sensor type</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH – bullet glass for standard applications: high performance (S) glass</td>
<td></td>
<td></td>
<td>P2</td>
<td></td>
</tr>
<tr>
<td>pH – low temperature (LT) glass</td>
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<td>P4</td>
<td></td>
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<tr>
<td>ORP (Redox) – platinum</td>
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<td></td>
<td>R2</td>
<td></td>
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<td>Connection type</td>
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<td>Integral cable length</td>
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<tr>
<td></td>
<td>1 m (3.3 ft)</td>
<td></td>
<td>01</td>
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</tr>
<tr>
<td></td>
<td>3 m (10 ft)</td>
<td></td>
<td>03</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 m (16 ft)</td>
<td></td>
<td>05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 m (33 ft)</td>
<td></td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

### Optional order code

Add one or more of the following codes after the standard ordering information to select any additional options if required

### Flowcell systems

- Panel-mounted system for ultrapure water applications
  Includes: flowcell, reservoir, flowmeter, flow alarm and calibration cup holder mounted on a stainless steel panel
  (% in NPT process connections)
  - Includes: flowcell, reservoir, calibration cup holder and mounting kit
  - Polypropylene flowcell kit for general process applications
    Includes: flowcell, reservoir, calibration cup holder and mounting kit

### Operating instructions

- English
  - EZLink digital extension cable
    - 1 m (3.3 ft) | E01
    - 5 m (16.4 ft) | E05
    - 10 m (32.8 ft) | E10
    - 15 m (49.2 ft) | E15
    - 25 m (82 ft) | E25
    - 50 m (164 ft) | E50
## Accessories

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>3KXA163000L0013</td>
<td>1/2 in NPT stainless steel flowcell + PG13.5 adapter</td>
</tr>
<tr>
<td>3KXA163000L0014</td>
<td>1/2 in NPT polycarbonate flowcell + PG13.5 adapter</td>
</tr>
<tr>
<td>3KXA163700L0001</td>
<td>Reservoir complete with mounting bracket assembly</td>
</tr>
<tr>
<td>3KXA163000L0120</td>
<td>Calibration kit (includes calibration beaker and holder)</td>
</tr>
<tr>
<td>3KXA163700L0005</td>
<td>1/2 in NPT stainless steel flowcell + reservoir + calibration kit</td>
</tr>
<tr>
<td>3KXA163700L0006</td>
<td>1/2 in NPT polycarbonate flowcell + reservoir + calibration kit</td>
</tr>
<tr>
<td>3KXA163700L0007</td>
<td>3.5 M KCl solution, 500 mL</td>
</tr>
<tr>
<td>AWT4009010</td>
<td>EZLink cable 1 m (3.3 ft)</td>
</tr>
<tr>
<td>AWT4009050</td>
<td>5 m (16.4 ft)</td>
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<tr>
<td>AWT4009100</td>
<td>10 m (32.8 ft)</td>
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<td>AWT4009150</td>
<td>15 m (49.2 ft)</td>
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<td>AWT4009250</td>
<td>25 m (82 ft)</td>
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<tr>
<td>AWT4009500</td>
<td>50 m (164 ft)</td>
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<tr>
<td>3KXA163700L0002</td>
<td>700ULTRA panel assembly</td>
</tr>
</tbody>
</table>

For a complete list of spares and accessories refer to Operating Instruction OI/700.
Notes