

HH6500

Open-Junction pH Electrode

Built for viscous, solids-containing and highly contaminated media

A 12 mm industrial combination pH electrode with a single-hole open junction, double-junction reference and solidified synthetic gel. The diaphragm-free reference interface is designed to reduce the blockage risk commonly encountered with porous ceramic or PTFE junctions.

0-14 pH

measurement range

0-100 deg C

temperature range

PG13.5

process connection

Open junction

diaphragm-free interface



01 / PRODUCT

Product overview

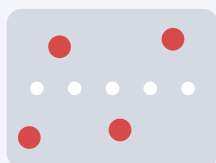
The HH6500 is designed for pH measurement in process liquids where suspended solids, fibres, proteins, oils, pigments, precipitates or high viscosity can restrict a conventional porous junction. Its single-hole open junction places the solidified reference gel in direct ionic contact with the sample through a larger opening.

- No microporous diaphragm at the external reference interface.
- Double-junction reference helps separate the internal reference from the process.
- HA acid/alkali-resistant pH glass supports the full 0-14 pH range.
- Customizable insertion length, temperature sensor and cable connector.



Why the open-junction design matters

CONVENTIONAL POROUS JUNCTION



Micropores can be restricted by deposits or viscous material.

A porous ceramic or PTFE junction relies on narrow liquid paths. In fouling-prone service, these paths can become restricted, causing slow response, drift or unstable calibration.

HH6500 SINGLE-HOLE OPEN JUNCTION



Larger open contact reduces susceptibility to junction blockage.

The HH6500 removes the external porous diaphragm. The solidified gel contacts the sample through one open hole, reducing blockage risk while retaining a double-junction reference.

Important: the open junction reduces one common failure mechanism, but it does not make the electrode maintenance-free. The glass membrane can still foul, and actual service life depends on process chemistry, temperature, pressure, abrasion, installation and cleaning practice.

02 / SPECIFICATION

Technical specifications

Values below describe the available HH6500 platform. The order confirmation and supplied configuration govern the actual temperature sensor, connector, insertion length and pressure rating.

PARAMETER	SPECIFICATION
Product type	Industrial combination pH electrode
Measurement range	0-14 pH
Temperature range	0-100 deg C
Pressure range	0-3 bar standard; up to 6 bar maximum with confirmed configuration
Factory calibrated slope	Better than 95% under factory conditions
Membrane resistance	Less than 250 MOhm
Zero potential (E0)	Within +/-10 mV
Stated response time	Less than 10 s; test conditions not specified
pH-sensitive membrane	HA acid/alkali-resistant glass
External junction	Single-hole open junction; no porous diaphragm
Reference electrolyte	Special solidified synthetic gel
Reference system	Double-junction reference
Process connection	PG13.5
Body material / diameter	Glass / 12 mm
Insertion lengths	120 / 150 / 225 / 325 / 425 mm; customizable
Temperature sensor options	NTC 2.252K / 5K / 10K / 22K / 30K; Pt100; Pt1000
Connector options	S8 / S8M / S7 / VP8 / K8S / K2; customizable

PRESSURE AND PERFORMANCE BOUNDARY

Maximum pressure is temperature- and assembly-dependent. Do not assume 6 bar at 100 deg C. Confirm the pressure-temperature limit of the electrode, holder, seals and process connection for the ordered configuration before commissioning.

03 / INSTALLATION

Installation

Correct mechanical placement and electrical handling are essential for stable online pH measurement. Always isolate, depressurize, drain and cool the process before installation or removal.

Before installation

- Verify the ordered length, connector and temperature sensor.
- Inspect the glass body, bulb, open junction, O-ring and cable.
- Remove the storage cap; condition if dry or long-stored.
- Confirm transmitter compatibility and holder pressure rating.

Process placement

- Keep the glass bulb and open junction fully immersed.
- Avoid sediment beds, bubbles and direct reagent injection.
- Protect from abrasive high-velocity flow and agitators.
- Select a representative, mixed location with stable flow.

RECOMMENDED ORIENTATION

Bulb and open junction fully immersed. Never install bulb-up.



OK



OK



NO

Installation procedure

- 1 Prepare** Isolate the process. Clean the holder and confirm compatible seals.
- 2 Mount** Insert without striking the bulb. Tighten only to the holder specification.
- 3 Connect** Keep the high-impedance signal connector clean and completely dry.
- 4 Route cable** Separate from power and VFD cables; avoid sharp bends and ground loops.
- 5 Start up** Restore process conditions gradually; allow temperature and reading to stabilize.

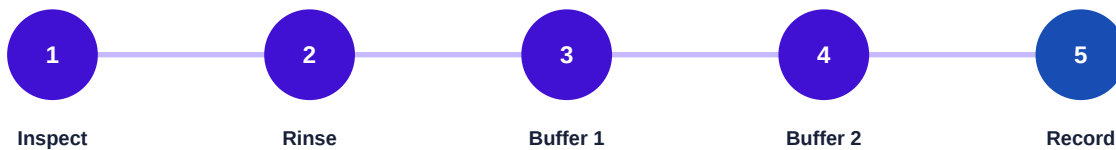
GLASS-BODY CAUTION

Do not use the electrode body as a lever and do not over-tighten PG13.5. A damaged glass body or bulb must be removed from service immediately and handled as broken glass under site procedure.

04 / OPERATION

Commissioning and calibration

Use fresh, traceable buffers that bracket the expected process pH. A two-point calibration establishes zero and slope; field acceptance criteria should follow the site quality plan and transmitter instructions.



Two-point calibration procedure

- Confirm the transmitter buffer set and the configured NTC, Pt100 or Pt1000 temperature element.
- Rinse the bulb and open junction with deionized water. Blot gently; do not rub the glass membrane.
- Immerse in the first buffer, remove trapped bubbles and wait for temperature and signal stability.
- Accept the first point, rinse, then repeat with the second buffer on the other side of the process range.
- Review zero and slope against site criteria. Record buffers, lot/expiry, temperature, zero, slope and operator.
- Rinse and return the electrode to the process. Allow the online reading to stabilize before control action.

FACTORY SLOPE

Better than 95% is an initial factory-condition value. It is not a universal field acceptance limit or a guarantee of performance in every process.

TEMPERATURE COMPENSATION

Automatic compensation corrects the temperature dependence of electrode slope. It does not convert the sample chemistry to an equivalent pH at 25 deg C.

Online verification

A successful buffer calibration confirms the electrode-transmitter pair under buffer conditions. It does not by itself prove online accuracy in a viscous, high-salinity or chemically complex process. If buffer response is good but the process value is questionable, verify sample representativeness, flow, temperature, pressure, bubbles, electrical grounding and possible liquid-junction effects.

05 / CARE

Maintenance and storage

Set inspection frequency from actual fouling rate and measurement criticality. There is no universal cleaning interval for all viscous or contaminated media.

INSPECT

- Check the bulb, open hole, body, seals, cable and connector.
- Look for coating, trapped solids, cracks, moisture and abrasion.
- Trend calibration zero, slope and stabilization time.

CLEAN

- Rinse loose solids with low-pressure water.
- Use a soft, non-abrasive swab only when necessary.
- Never scrape, drill or probe the open junction.

RECONDITION

- Rinse after cleaning and condition in approved storage solution.
- Allow hydration and signal stabilization before calibration.
- Recalibrate before returning to service.

CLEANING CHEMISTRY

For oil, protein, mineral or process-specific deposits, use only a manufacturer-approved cleaner compatible with the glass, reference gel, seals and holder. Follow the cleaner SDS, required PPE, site isolation procedure and waste-disposal rules. Do not apply a generic chemical recipe.

Storage

- Keep bulb and junction wet in approved pH electrode storage solution.
- Do not store long-term in deionized water.
- Seal the cap; protect from freezing, heat and impact.

Shutdown and return to service

- Isolate the process before removal.
- Clean, inspect and store wet during extended shutdown.
- Condition, calibrate and stabilize before restart.

OPEN JUNCTION DOES NOT MEAN ZERO MAINTENANCE

The design reduces susceptibility to porous-junction blockage. Coating of the glass membrane, reference ageing, abrasion and process deposits can still affect measurement.

06 / FIELD SUPPORT

Troubleshooting and application guide

SYMPTOM	LIKELY CHECKS	CORRECTIVE DIRECTION
Slow or no response	Coated bulb; junction covered; cold/viscous sample; dry electrode	Inspect, rinse or approved-clean, condition, stabilize
Drift or unstable signal	Bubbles; changing flow/temperature; wet connector; ground loop; ageing	Stabilize process; dry connector; check cable/grounding; buffer test
Calibration fails	Expired buffer; wrong buffer set; temperature mismatch; damaged glass	Replace buffers; verify settings; inspect, condition and repeat
Large offset	Reference contamination; junction potential; process chemistry	Verify in fresh buffer; compare representative sample; replace if unresolved
Sudden signal jumps	Broken glass; loose connector; damaged cable; electrical interference	Isolate, inspect and repair electrical path; replace damaged electrode
Good in buffer, wrong online	Sampling, flow, temperature, pressure, bubbles or matrix effects	Verify the full measurement system before adjusting the transmitter
Temperature incorrect	Wrong NTC/Pt selection or wiring	Match sensor option, transmitter setting and wiring diagram

TYPICAL APPLICATIONS

- Industrial wastewater, sludge and high-solids streams
- Textile, pulp and paper, pigment, coating and ink processes
- Protein-rich fermentation and food-process slurries
- Oily wastewater, polymer solutions and mineral slurries
- Chemical reaction vessels and OEM treatment equipment

VERIFY BEFORE USE

- Enough mobile aqueous phase for conventional pH measurement
- Chemical compatibility, including seals and holder
- No HF service unless independently verified
- Hygienic compliance only with supporting certification

ORDERING / TECHNICAL SUPPORT INFORMATION

Provide expected pH, temperature, pressure, process composition, solids/viscosity, cleaning method, insertion length, temperature sensor, connector, cable and holder details. The confirmed order specification takes precedence over this general manual.