100 GP-D
Digital pH/ORP sensor

Measurement made easy

The ¾ in digital pH/ORP sensor for use in general purpose 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
- Enhanced double junction with ion trap delays poisoning effects ensuring the sensor operates longer in your process
- Large PTFE junction promotes fouling resistance and is easy to clean
- Durable Kynar® body provides high chemical and abrasion resistance

Modular design
- Common ¾ in 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 has entry-level sensors designed for light duty use, while the 500 range offers a robust design for industrial applications. The 700 range is 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 100 GP-D digital pH/ORP sensor

Part of the next generation of ABB's pH/ORP sensors, the digital 100 GP-D combines exceptional performance and durability in one efficient, maintenance-free design.

Highly accurate with fast response times, the versatile 100 GP-D provides complete confidence in a wide range of general process applications that include:
- drinking water
- municipal wastewater
- cooling water
- food & beverage

Performance you can trust

The 100 GP-D features ABB's enhanced diffusion path double junction design with a polymerized gel electrolyte and chemical inhibitor, both slowing down the ion-diffusion rate and extending the length of the diffusion path. This design ensures that poisoning substances take longer to reach the encapsulated reference while the large, porous, chemically resistant PTFE junction incorporating Viton™ seals protects against sensor fouling.
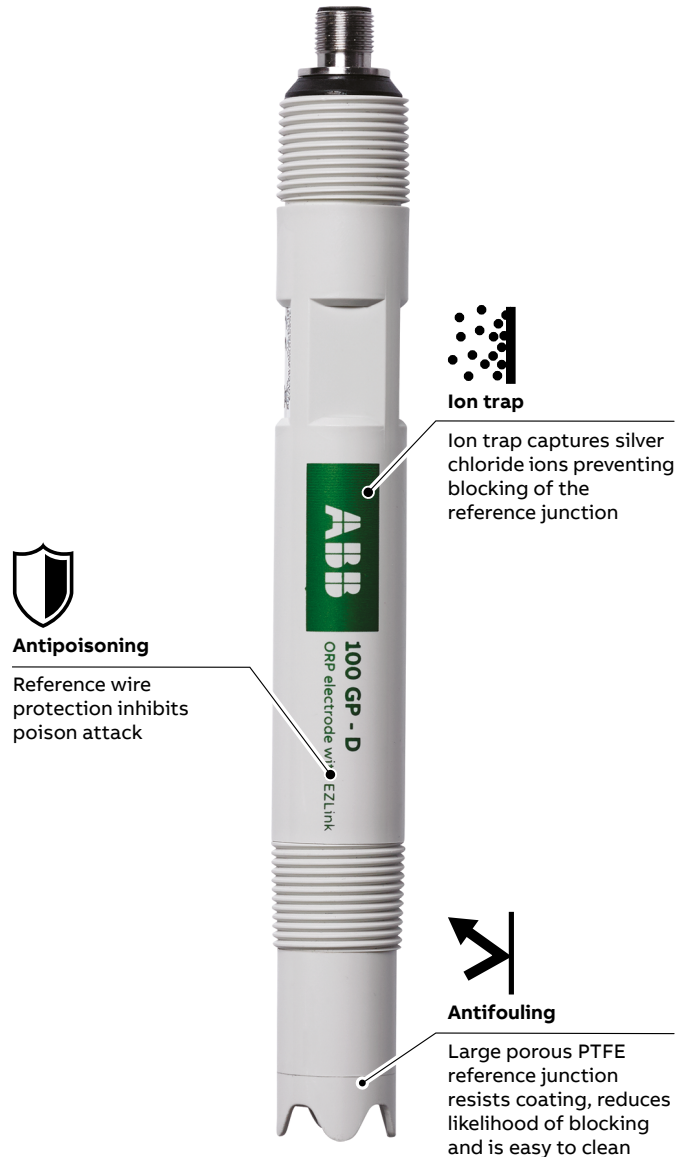

Ion trap

Ion trap captures silver chloride ions preventing blocking of the reference junction

Antipoisoning

Reference wire protection inhibits poison attack

Antifouling

Large porous PTFE reference junction resists coating, reduces likelihood of blocking and is easy to clean

Figure 1   Sensor features

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 100 GP-D is equipped with a close-coupled temperature element capable of rapid response to quickly changing process conditions, ensuring a high level of accuracy and confidence in your measurement.
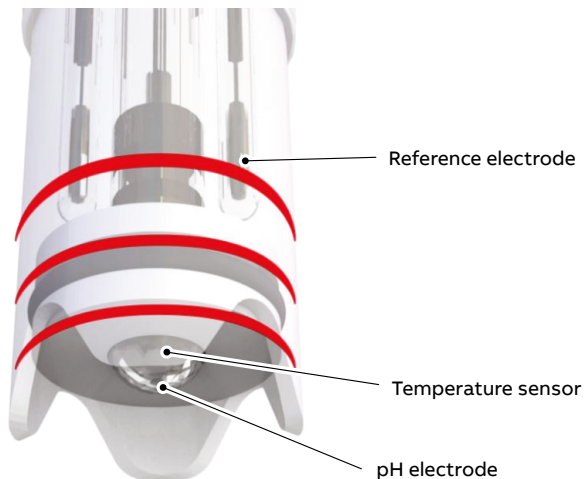

Reference electrode

Temperature sensor

pH electrode

Figure 2   Temperature element location

EZLink connectivity

Convenient EZLink technology enables seamless plug-and-play integration when using the 100 GP-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 100 GP-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.

EZLink plug-and-play connection simplifies user set-up with automatic sensor recognition and guidance
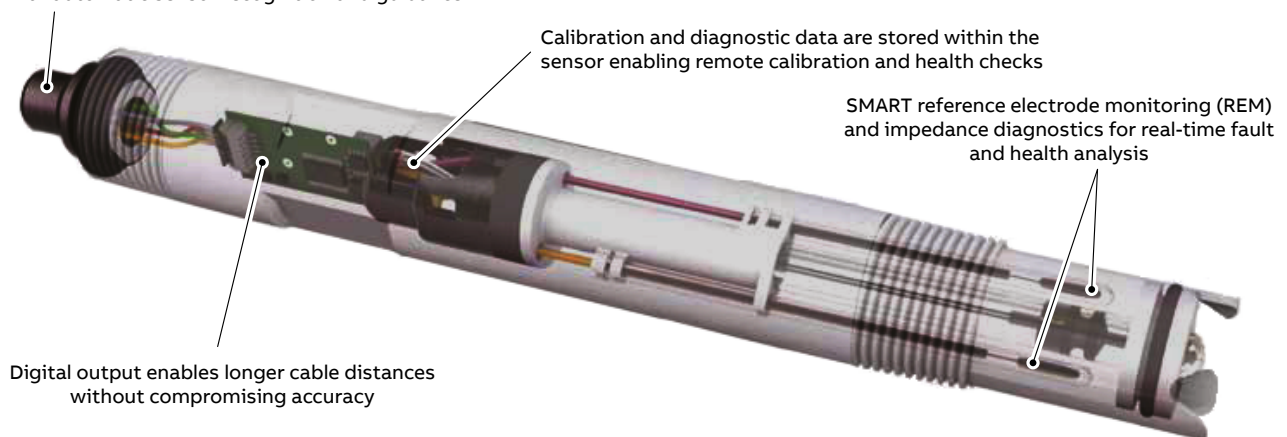
Calibration and diagnostic data are stored within the sensor enabling remote calibration and health checks

SMART reference electrode monitoring (REM) and impedance diagnostics for real-time fault and health analysis

Digital output enables longer cable distances without compromising accuracy

Figure 3   Key features

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Robust glassware

Utilizing ABB's experience in glass manufacturing dating back to the 1950s, the proprietary glass formulations used with the 100 GP-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 designed for conventional ORP/Redox measurement with an RTD element providing process temperature information.

Figure 4   High performance (S) glass – flat with flush body

Figure 6   Low temperature (LT) glass with notched body

Figure 5   ORP electrode with notched body

Product adaptability

The 100 GP-D is available in flush or notched-body design, helping extend sensor operation and maintainability in challenging applications.

Flush-body design
The flush-body design, when paired with a flat-shaped glass electrode, helps promote self-cleaning when installed perpendicular to sample flow. In addition, the minimal protrusion prevents unwanted buildup, especially in fouling applications.

Notched-body design
The notched-body design provides additional protection for bullet-style glass electrodes, especially from abrasive applications that can damage the glass electrode rendering it unresponsive.

Intelligent accessories
The 100 GP-D is offered with mounting accessories designed to improve adaptability into your process while providing safe and convenient operation. Available with flowcell, quick-connect bayonet and dip pole assemblies, the 100 GP-D utilizes modular accessories that are compatible with all ABB's next generation ¾ in threaded sensor bodies.

Optional autocleaning functionality is available as an added feature, ensuring extended operation with minimal intervention.

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.
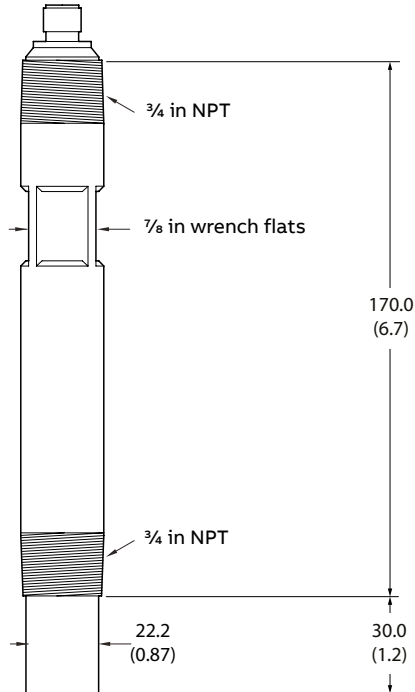
The 100 GP-D is stored in a specially formulated solution with added antimicrobial agent, keeping the sensor active for up to two years when stored as recommended.
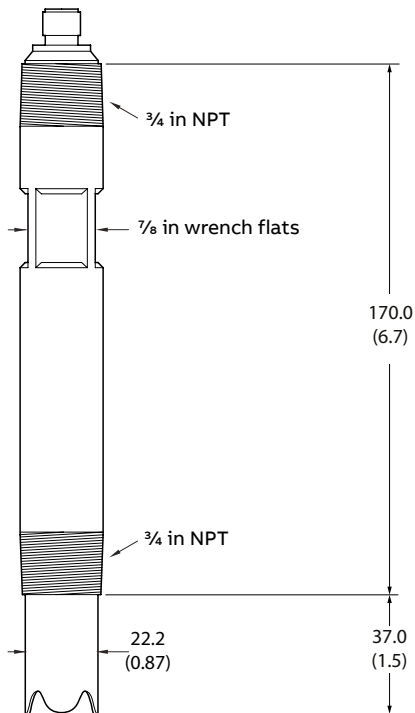
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Dimensions

Dimensions in mm (in)

Flush sensor body

¾ in NPT

⅞ in wrench flats

170.0
(6.7)

¾ in NPT

22.2
(0.87)

30.0
(1.2)

Notched sensor body

¾ in NPT

⅞ in wrench flats

170.0
(6.7)

¾ in NPT

22.2
(0.87)

37.0
(1.5)

ASME B1.20.1 ¾ in NPT thread is compatible with ASME
B16.11 ¾ in NPT threaded fittings including: couplings, half
couplings, bosses, couplets.

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Electrical connections

All digital sensors come with EZLink connectivity.

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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 (bullet)
0 to 60 °C (32 to 140 °F)
(typical glass impedance at 25 °C [77 °F] = 250 MΩ)
High performance (S) glass (flat)
5 to 60 °C (41 to 140 °F)
(typical glass impedance at 25 °C [77 °F] = 600 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
6 bar (90 psi)

Recommended minimum sample conductivity
50 µS/cm

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

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

Cable
EZLink digital sensor connector IP rating
IP67 (when connected)
Extension cable options
1, 3, 5, 10, 15, 25, 50 m (3.3, 9.8, 16.4, 32.8, 49.2, 82, 164 ft)
Maximum length (including optional extension cable)
Up to 210 m (689 ft)

Reference system
Ag/AgCl with KCl gel electrolyte, double junction
plus ion trap

Process connections
¾ in NPT

Wetted materials
Electrode body
PVDF (Kynar)
Reference junction system
Porous PTFE and Viton O-rings
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
CRN approval
Maximum allowable working pressure (MAWP): 5.58 bar
(81 psi)
Design temperature: -5 to 105 (23 °F to 221 °F)
CRN number: 0F22557
MCERTS
Certificate no: Sira MC220375/00

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Ordering information

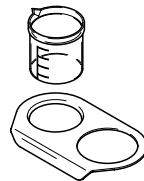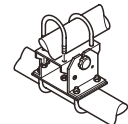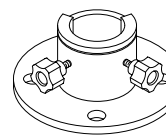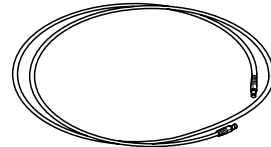| 100 GP-D ¾ in pH/ORP electrode (EZLink digital)	APS122/	XX	XX	X	XX	Option
Sensor type						
pH – bullet glass for standard applications: high-performance (S) glass		P2				
pH – flat glass for in-line, fouling applications: high-performance (S) glass		P3				
pH – low-temperature (LT) glass		P4				
ORP (Redox) – platinum		R2				
Body style						
¾ in threaded insertion/immersion – no sensor guard (flush)			K1			
¾ in threaded insertion/immersion – notched sensor guard			K2			
Connection type						
EZLink digital				D		
Integral cable length						
None					00	
1 m (3.3 ft)					01	
3 m (10 ft)					03	
5 m (16 ft)					05	
10 m (33 ft)					10	
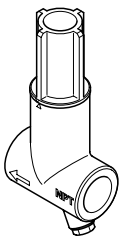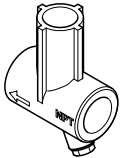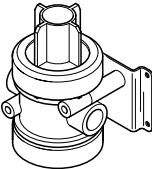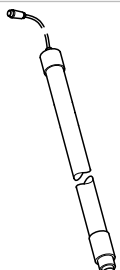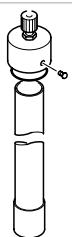
Optional ordering code
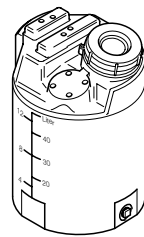
Add one or more of the following codes after the standard ordering information to select any additional options if required

Operating instructions	
English	M5
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

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Accessories

Part number	Description	
3KXA163000L0002	1 in BSP bayonet polycarbonate T-piece	
3KXA163000L0004	1 in NPT bayonet polycarbonate T-piece	
3KXA163000L0006	1 in BSP screw polycarbonate T-piece	
3KXA163000L0008	1 in NPT screw polycarbonate T-piece	
3KXA163000L0012	½ in NPT polycarbonate flowcell and ¾ in adapter	
3KXA163000L0011	½ in NPT stainless steel flowcell and ¾ in adapter	
3KXA163000L0024	Protective shroud for ¾ in body	
3KXA163000L0021	1¼ in NB dip pole assembly 2.5 m (8.2 ft)	
3KXA163000L0022	1 m (3.3 ft)	
3KXA163000L0023	Dip pole kit (customer-supplied 1¼ in NB tube)	

Part number	Description	
3KXA163000L0025	Automatic cleaning system (liquid)	
3KXA163000L0026	T-piece cleaning adapter	
3KXA163000L0120	Calibration kit (includes calibration beaker and holder)	
ATS4000760	Rail mounting kit (tilt only)	
ATS4000785	Open-tank flanged dip mount	
	EZLink cable	
AWT4009010	1 m (3.3 ft)	
AWT4009030	3 m (9.8 ft)	
AWT4009050	5 m (16.4 ft)	
AWT4009100	10 m (32.8 ft)	
AWT4009150	15 m (49.2 ft)	
AWT4009250	25 m (82 ft)	
AWT4009500	50 m (164 ft)	

For a complete list of spares and accessories, refer to Operating Instruction OI/100/500.

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Acknowledgements

- EZLink is a trademark of ABB Limited.
- Kynar is a registered trademark of Arkema Inc.
- Viton is a registered trademark of the Chemours Company.

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ABB Measurement & Analytics

For your local ABB contact, visit:
www.abb.com/contacts

For more product information, visit:
www.abb.com/measurement