



Differential pH and ORP Sensors

Applications

- Drinking Water
- Wastewater
- Industrial
- Power Generation

The smart choice for accurate and reliable online process pH/ORP measurement

Hach Digital pHD sc sensors are available in convertible (PEEK or PPS), insertion, and sanitary body styles. Three electrodes are used in these sensors to increase measurement accuracy and eliminate sensor ground loops.



Exceptional Process Sensor Performance with the Differential Electrode pHD Measurement Technique

This field-proven technique uses three electrodes instead of the two normally used in conventional pH/ORP sensors. Process and reference electrodes measure the pH/ORP differentially with respect to a third ground electrode. The end result is unsurpassed measurement accuracy, reduced reference junction potential, and elimination of sensor ground loops. These process pH/ORP sensors provide greater reliability, resulting in less downtime and maintenance.

Lower Maintenance Needs with the Double Junction Salt Bridge

The double junction salt bridge creates a barrier to contamination which minimizes the dilution of the internal standard cell solution. The result is lower maintenance needs and a longer time period between calibrations.

Extended Working Life with the Replaceable Salt Bridge/Protector

The unique, replaceable salt bridge holds an extraordinary volume of buffer to extend the working life of the sensor by protecting the reference electrode from harsh process conditions. The salt bridge simply threads onto the end of the sensor if replacement is needed.

Reliability with Built-in Encapsulated Preamp

Encapsulated construction protects the sensor's built-in preamp from moisture and humidity, ensuring reliable sensor operation. The preamp in the pHD analog sensor produces a strong signal, enabling the sensor to be located up to 1000 m (3280 ft.) from the analyzer.

Innovative Technology

The former GLI, now a Hach Company brand, invented the Differential Electrode Technique for pH measurement in 1970. The pHD sensor series takes this field-proven technology to a new level.

Versatile Mounting Styles

Sensors are available in four mounting styles - convertible, insertion, immersion, and sanitary

Differential Sensor Warranty

Hach Company offers the best sensor warranty in the industry on its Differential Sensors. We will replace any Differential Sensor that fails due to defects in materials or workmanship within one year from the date of shipment-and up to 30 months on a prorated basis for any failure.

Technical Data*

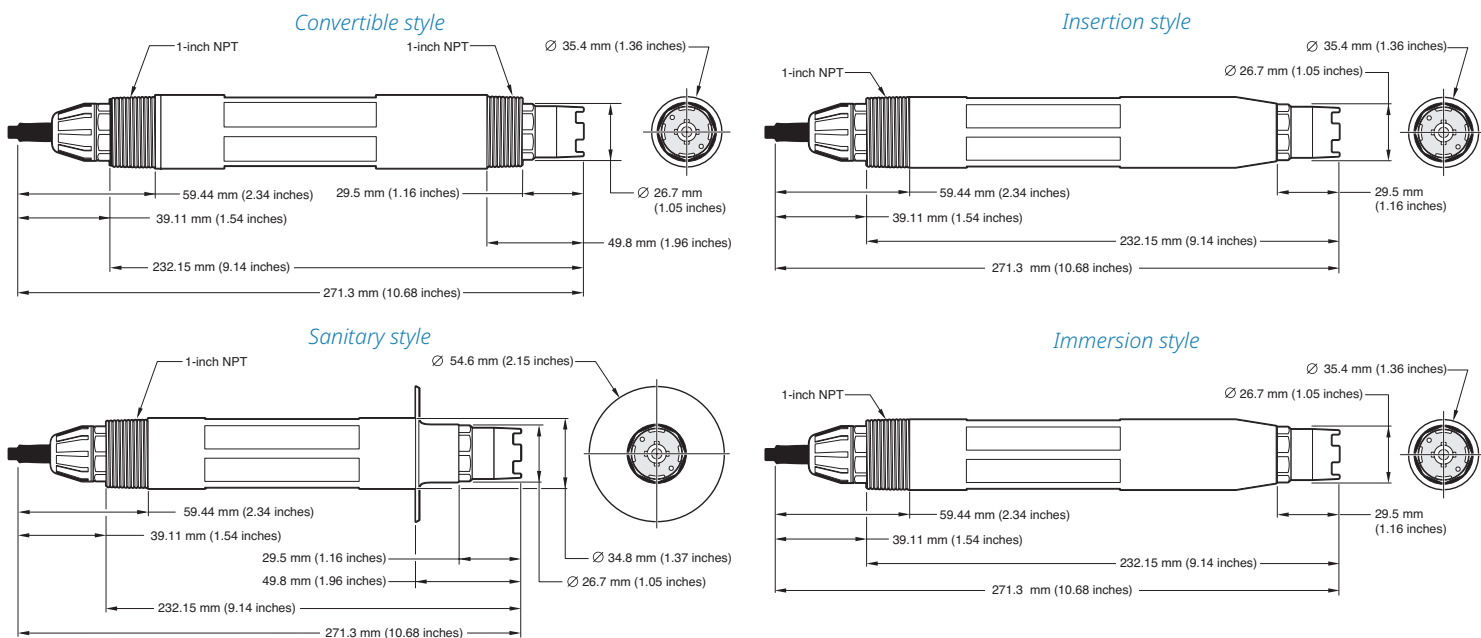
Compliance	For hazardous and maritime applications, CE	For non-hazardous and non-maritime applications only
Operating Temperature Range	-5 - 70 °C (23 - 158 °F) pH/D and ORP 0 - 50 °C (32 - 122 °F) SS pH/D Before initial pH calibration, calibrate the temperature measurement when the sensor is in water or buffer which is at approximately the same temperature as the pH buffers (matches current recommendation)	-5 - 70 °C (23 - 158 °F) pH/D and ORP 0 - 50 °C (32 - 122 °F) SS pH/D Before initial pH calibration, calibrate the temperature measurement when the sensor is in water or buffer which is at approximately the same temperature as the pH buffers (matches current recommendation) Please Note: When the sensor is placed into the application sample, if that sample is more than 10 °C (18 °F) different than the previous temperature/pH calibration, then it is recommended to recalibrate the temperature while the sensor is in the sample to maintain the ±0.5 °C (±0.9 °F) temperature accuracy specification.
Range	-2.0 to 14.0 pH -1500 to +1500 mV ORP	
Sensitivity	± 0.01 pH ± 0.5 mV	
Flow Rate	3 m (10 ft.) per second, maximum	
Pressure Range	Digital: 6.9 bar at 70 °C (100 psi at 158 °F)	
Temperature Sensor	NTC 300 Ω thermistor for automatic temperature compensation and analyzer temperature readout	
Transmission Distance	100 m (328 ft.), maximum	
Temperature Accuracy	± 0.5 °C (± 0.9 °F)	
Sensor Cable	4 conductor cable with one shield and polyurethane jacket; rated to 105 °C (221 °F); 10 m (33 ft.) standard length	
Wetted Materials	PEEK or PPS, salt bridge of matching material with PVDF junction, glass process electrode, titanium ground electrode, and FKM/FPM O-ring seals (pH sensor with optional HF-resistant glass process electrode has 316 stainless steel ground electrode, and perfluoroelastomer wetted O-rings; consult factory for other available wetted O-ring materials)	

*Subject to change without notice.

Some industrial applications require accurate measurement and control below 2 or above 12 pH. In these special cases, please contact Hach Technical Support for further details.

For best ORP measuring results in solutions containing zinc, cyanide, cadmium or nickel, Hach recommends using the pH/D sc ORP sensor equipped with an optional gold electrode.

Dimensions



Order Information

pHD sc Digital Differential pH Sensors

DPD1P1	Digital pH Sensor, PEEK, Convertible, General Purpose
DPD1P1.1	Digital pH Sensor, PEEK, Convertible, General Purpose, Non-Hazardous Environment
DPD1P3	Digital pH Sensor, PEEK, Convertible, HF-resistant
DPD1P3.1	Digital pH Sensor, PEEK, Convertible, HF-resistant, Non-Hazardous Environment
DPD2P1	Digital pH Sensor, PEEK, Insertion, General Purpose
DPD2P1.1	Digital pH Sensor, PEEK, Insertion, General Purpose, Non-Hazardous Environment
DPD3P1	Digital pH Sensor, PPS, Convertible, HF-resistant
DPD1R1	Digital pH Sensor, PPS, Convertible, General Purpose
DPD1R1.1	Digital pH Sensor, PPS, Convertible, General Purpose, Non-Hazardous Environment
DPD1R3	Digital pH Sensor, PPS, Convertible, HF-resistant
DPD1R3.1	Digital pH Sensor, PPS, Convertible, HF-resistant, Non-Hazardous Environment
DPS1	Digital pH Sensor, Stainless Steel, Immersion, General Purpose
DPS1.1	Digital pH Sensor, Stainless Steel, Immersion, General Purpose, Non-Hazardous Environment

pHD sc Digital Differential ORP Sensors

DRD1P5	Digital ORP Sensor, PEEK, Convertible, Platinum
DRD1P5.1	Digital ORP Sensor, PEEK, Convertible, Platinum, Non-Hazardous Environment
DRD1P6	Digital ORP Sensor, PEEK, Convertible, Gold
DRD1R5	Digital ORP Sensor, PPS, Convertible, Platinum
DRD1R5.1	Digital ORP Sensor, PPS, Convertible, Platinum, Non-Hazardous Environment
DRD1R6	Digital ORP Sensor, PPS, Convertible, Gold
DRD1R6.1	Digital ORP Sensor, PPS, Convertible, Gold, Non-Hazardous Environment
DRD2P5	Digital ORP Sensor, PEEK, Insertion, Platinum
DRD2P5.1	Digital ORP Sensor, PEEK, Insertion, Platinum, Non-Hazardous Environment
DRS5	Digital ORP Sensor, Stainless Steel, Immersion, Platinum
DRS5.1	Digital ORP Sensor, Stainless Steel, Immersion, Platinum, Non-Hazardous Environment

All digital sensors include built-in digital electronics and integral 10 m (33 ft.) cable terminated with connector for the Hach SC Digital Controllers.

Digital Gateway

6120500	Use the Digital Gateway to connect pHD analog sensors to a Hach digital controller
6120500.1	Use the Digital Gateway to connect pHD analog sensors to a Hach digital controller

pHD Analog pH Sensors

PD1P1	Analog pH Sensor, PEEK, Convertible, General Purpose
PD1P3	Analog pH Sensor, PEEK, Convertible, HF-resistant
PD2P1	Analog pH Sensor, PEEK, Insertion, General Purpose
PD3P1	Analog pH Sensor, PEEK, Sanitary, General Purpose
PD1R1	Analog pH Sensor, PPS, Convertible, General Purpose
PD1R3	Analog pH Sensor, PPS, Convertible, HF-resistant

pHD Analog ORP Sensors

RD1P5	Analog ORP Sensor, PEEK, Convertible, Platinum
RD1P6	Analog ORP Sensor, PEEK, Convertible, Gold
RD2P5	Analog ORP Sensor, PEEK, Insertion, Platinum
RD1R5	Analog ORP Sensor, PPS, Convertible, Platinum
RD1R6	Analog ORP Sensor, PPS, Convertible, Gold

All analog sensors include built-in preamplifier and integral 4.5 m (15 ft.) cable terminated with stripped and tinned wires.

Cables

Extension cables are used only with digital sensors or digital gateways when connecting to an SC Digital Controller.

6122400	Digital Extension Cable, 1 m (3.3 ft.)
5796000	Digital Extension Cable, 7.7 m (25 ft.)
5796100	Digital Extension Cable, 15 m (50 ft.)
5796200	Digital Extension Cable, 30 m (100 ft.)

Interconnect cables are used only with analog sensors, junction box, and controller.

1W1100	Analog Interconnect Cable, order per foot
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Order Information *Continued.*

Analog Junction Box

Required when the cable between the analog sensor and controller is greater than standard sensor cable. Includes terminal strip and gasket.

60A2053	Junction Box, Surface-mount, aluminum (includes mounting hardware)
60A9944	Junction Box, Pipe-mount, PVC (for 1/2-inch diameter pipe, includes mounting hardware)
60G2052	Junction Box, Pipe-mount, PVC (for 1-inch diameter pipe, includes mounting hardware)
76A4010-001	Junction Box, NEMA 4X (no mounting hardware included)

Salt Bridges

The double junction salt bridge on the standard cell of all Hach pHD sensors is field-replaceable.

SB-P1SV	PEEK sensor and salt bridge body, PVDF outer junction
SB-P2SV	PEEK sensor and salt bridge body, ceramic outer junction
SB-P1SP	PEEK sensor and salt bridge body, PVDF outer junction
SB-R1SV	PPS sensor and salt bridge body, PVDF outer junction

pHD sensor reagents and standards

25M1A1025-115	Standard cell solution, concentrated pH 7.0 buffer (equi-transferrant), 500 mL
25M8A1002-101	Proprietary Gel Powder for pHD sc and pHD Sensors for high temperature applications

pH buffers

2283549	pH Buffer Solution, pH 7.00, 500 mL
2283549	pH Buffer Solution, pH 7.00, 500 mL
2283449	pH Buffer Solution, pH 4.01, 500 mL

ORP reference solutions (in resealable plastic bottles)

25M2A1001-115	200 mV reference sol. 500 mL (1 pt)
25M2A1002-115	600 mV reference sol. 500 mL (1 pt)

Sanitary mount

MH018S8SZ 316 SS

Includes 2 inch sanitary tee and heavy-duty clamp. cap and EPDM compound gasket supplied with sensor; can be ordered separately.

Union mount

6131300 CPVC
6131400 316 SS

Includes standard 1½ inch tee, union pipe with adapter, sealing hub, and lock ring and FKM/FPM O-ring.

Flow-through mount

MH334N4NZ 316 SS
MH314N4MZ CPVC

Includes a standard 1 inch tee in respective material.

Insertion mount

Digital
5646300 CPVC
5646350 316 SS
Analog
5646400 CPVC
5646450 316 SS

Includes a 1½ inch ball valve, 1½ inch NPT close nipple, sensor adapter with two FKM/FPM O-rings and wiper, extension pipe, pipe adapter, back tube, and lock ring.

Immersion mount

Standard hardware

Digital
6136400 CPVC
6136500 316 SS

Analog

MH434A00B CPVC
MH414A00B 316 SS

Includes 1 inch by 4 ft. pipe and 1 inch x 1 inch NPT coupling (pipe-mount junction box with terminal strip included in analog hardware).

Handrail hardware

MH236B00Z Handrail Mounting Kit (for sensor to be used with either adapter above) includes 1.5-inch diameter by 7.5-ft long CPVC pipe and swivel/pivot/ pipe clamp assembly

Includes 1½ inch by 7.5 ft., CPVC pipe, and swivel/pivot pipe clamp assembly.

Chain mount hardware

2881900 316 SS

Includes stainless steel bail, nuts, and washers. Does not include chain. To be used with stainless steel immersion sensor only.

Ball Float Hardware

6131000 CPVC

Includes 1½ inch by 7.5 ft. CPVC pipe, ball float assembly, and swivel/pivot pipe clamp assembly.



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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.

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