

**TECHNICAL DATA**  
ELECTRO CHEMISTRY  
DIFFERENTIAL PH AND ORP



# pHD sc Digital Differential PH and ORP Sensors

## Ordering Information

### pHD sc Digital Differential pH/ORP Sensors

All digital sensors include built-in digital electronics and integral 10 m cable terminated with connector for the sc100 digital controller. Body styles:

- Convertible – 1-inch NPT threads at both ends, designed for tee-mounting or other flow through mountings, and pipe mounting for immersion
- Insertion – no threads on the electrode end, designed for use with insertion valve assembly
- Sanitary – 2-inch flange for a tri-clover style fitting
- Immersion – used with chain mounting or pipe mounting

#### pH Sensors

Product Number	Body Material	Body Style	Electrode Material	Max Temp
<b>DPD1P1.99</b>	PEEK <sup>1</sup>	Convertible	Glass, General Purpose	70°C
<b>DPD1P3.99</b>	PEEK <sup>1</sup>	Convertible	Glass, HF-resistant	70°C
<b>DPD2P1.99</b>	PEEK <sup>1</sup>	Insertion	Glass, General Purpose	70°C
<b>DPD3P1.99</b>	PEEK <sup>1</sup>	Sanitary	Glass, General Purpose	70°C
<b>DPD1R1.99</b>	Ryton <sup>2</sup>	Convertible	Glass, General Purpose	70°C
<b>DPD1R3.99</b>	Ryton <sup>2</sup>	Convertible	Glass, HF-resistant	70°C

<sup>1</sup>Polyetheretherketone <sup>2</sup>Polyphenylene Sulfide

#### ORP Sensors

Product Number	Body Material	Body Style	Electrode Material	Max Temp
<b>DRD1P5.99</b>	PEEK <sup>1</sup>	Convertible	Platinum	70°C
<b>DRD1P6.99</b>	PEEK <sup>1</sup>	Convertible	Gold	70°C
<b>DRD2P5.99</b>	PEEK <sup>1</sup>	Insertion	Platinum	70°C
<b>DRD1R5.99</b>	Ryton <sup>2</sup>	Convertible	Platinum	70°C
<b>DRD1R6.99</b>	Ryton <sup>2</sup>	Convertible	Gold	70°C

<sup>1</sup>Polyetheretherketone <sup>2</sup>Polyphenylene Sulfide

### Digital Gateway

**6120500.99** ADpHD Digital Gateway, convert pHD analog sensors to digital output for connecting to sc100 digital controller

### pHD Analog Sensors

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

Definitions of body styles:

- Convertible – 1-inch NPT threads at both ends, designed for tee-mounting or other flow through mountings, and pipe mounting for immersion
- Insertion – has no threads on the electrode end, designed for use with insertion valve assembly
- Sanitary – has a 2-inch flange for a Tri-Clover style fitting

#### pH Sensors

Product Number	Body Material	Body Style	Electrode Material	Max Temp
<b>PD1P1.99</b>	PEEK <sup>1</sup>	Convertible	Glass, General Purpose	95°C
<b>PD1P3.99</b>	PEEK <sup>1</sup>	Convertible	Glass, HF-resistant	95°C
<b>PD2P1.99</b>	PEEK <sup>1</sup>	Insertion	Glass, General Purpose	95°C
<b>PD3P1.99</b>	PEEK <sup>1</sup>	Sanitary	Glass, General Purpose	95°C
<b>PD1R1.99</b>	Ryton <sup>2</sup>	Convertible	Glass, General Purpose	95°C
<b>PD1R3.99</b>	Ryton <sup>2</sup>	Convertible	Glass, HF-resistant	95°C

<sup>1</sup>Polyetheretherketone <sup>2</sup>Polyphenylene Sulfide

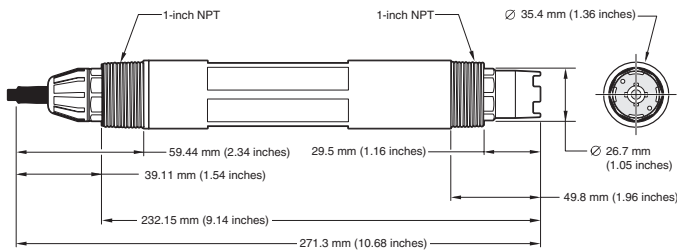
#### ORP Sensors

Product Number	Body Material	Body Style	Electrode Material	Max Temp
<b>RD1P5.99</b>	PEEK <sup>1</sup>	Convertible	Platinum	95°C
<b>RD1P6.99</b>	PEEK <sup>1</sup>	Convertible	Gold	95°C
<b>RD2P5.99</b>	PEEK <sup>1</sup>	Insertion	Platinum	95°C
<b>RD1R5.99</b>	Ryton <sup>2</sup>	Convertible	Platinum	95°C
<b>RD1R6.99</b>	Ryton <sup>2</sup>	Convertible	Gold	95°C

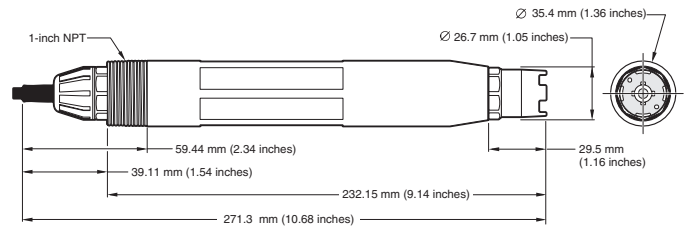
<sup>1</sup>Polyetheretherketone <sup>2</sup>Polyphenylene Sulfide

# Dimensions

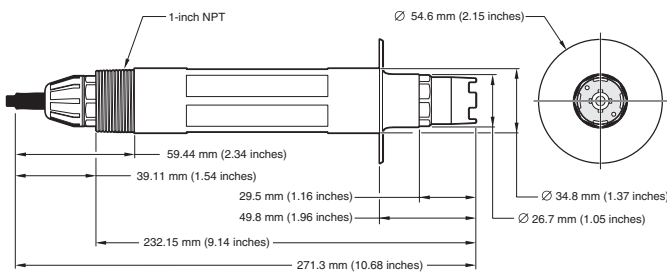
## Convertible Style



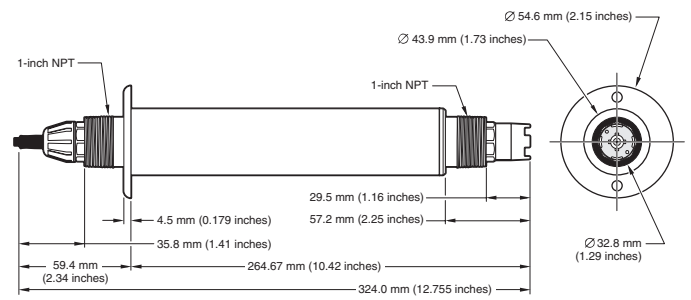
## Insertion Style



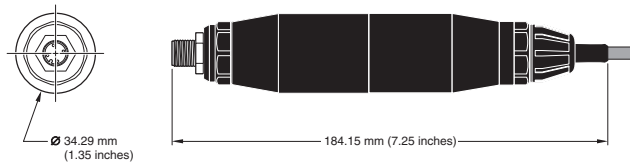
## Sanitary Style



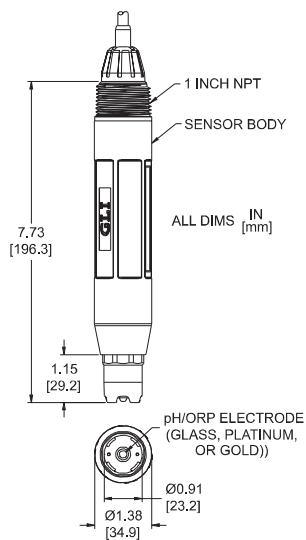
## Immersion Style



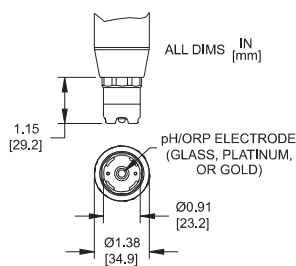
## Digital Gateway



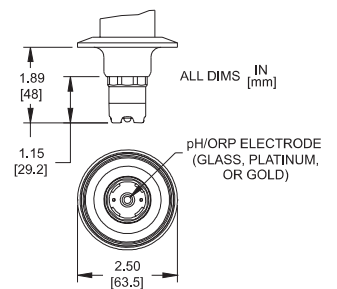
## Analog Convertible Style



## Analog Insertion Style



## Analog Sanitary Style



## Specifications

### pH Sensors

Most pH applications fall in the 2.5 to 12.5 pH range. A Hach Lange pH sc Differential pH sensor with the wide-range glass process electrode performs exceptionally well in this range. 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.

#### Measuring Range

-2 to 14 pH

#### Sensitivity

± 0.01 pH

#### Stability

0.03 pH per 24 hours, non-cumulative

#### Operating Temperature

Digital Sensor: -5 to 70°C

Analog Sensor with Digital Gateway: -5 to 105°C

Immersion Sensor: 0 to 50°C

#### Flow Rate

3 m per second, maximum

#### Sensor Pressure/Temperature Limits

Digital: 6.9 bar at 70°C

Analog: 6.9 bar at 105°C

#### Built-in Temperature Element

NTC 300 ohm thermistor for automatic temperature compensation and analyzer temperature readout

#### Transmission Distance

100 m, maximum

1000 m, maximum when used with a termination box

#### Sensor Cable (integral)

4 conductor cable with one shield and polyurethane jacket; rated to 105°C; 10 m standard length

#### Wetted Materials

PEEK<sup>®</sup> or Ryton<sup>®</sup> (PVDF), salt bridge of matching material with Kynar<sup>®</sup> junction, glass process electrode, titanium ground electrode, and Viton<sup>®</sup> 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)

### ORP (Redox) Sensors

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

#### Measuring Range

-1500 to +1500 mV

#### Sensitivity

± 0.5 mV

#### Stability

2 mV per 24 hours, non-cumulative

#### Operating Temperature

Digital Sensor: -5 to 70°C

Analog Sensor with Digital Gateway: -5 to 105°C

Immersion Sensor: 0 to 50°C

#### Flow Rate

3 m (10 ft.) per second, maximum

#### Sensor Pressure/Temperature Limits

Digital: 6.9 bar at 70°C

Analog: 6.9 bar at 105°C

#### Built-in Temperature Element

NTC 300 ohm thermistor for analyzer temperature readout only—no automatic temperature compensation necessary for ORP measurement

#### Transmission Distance

100 m, maximum

1000 m, maximum when used with a termination box

#### Sensor Cable (integral)

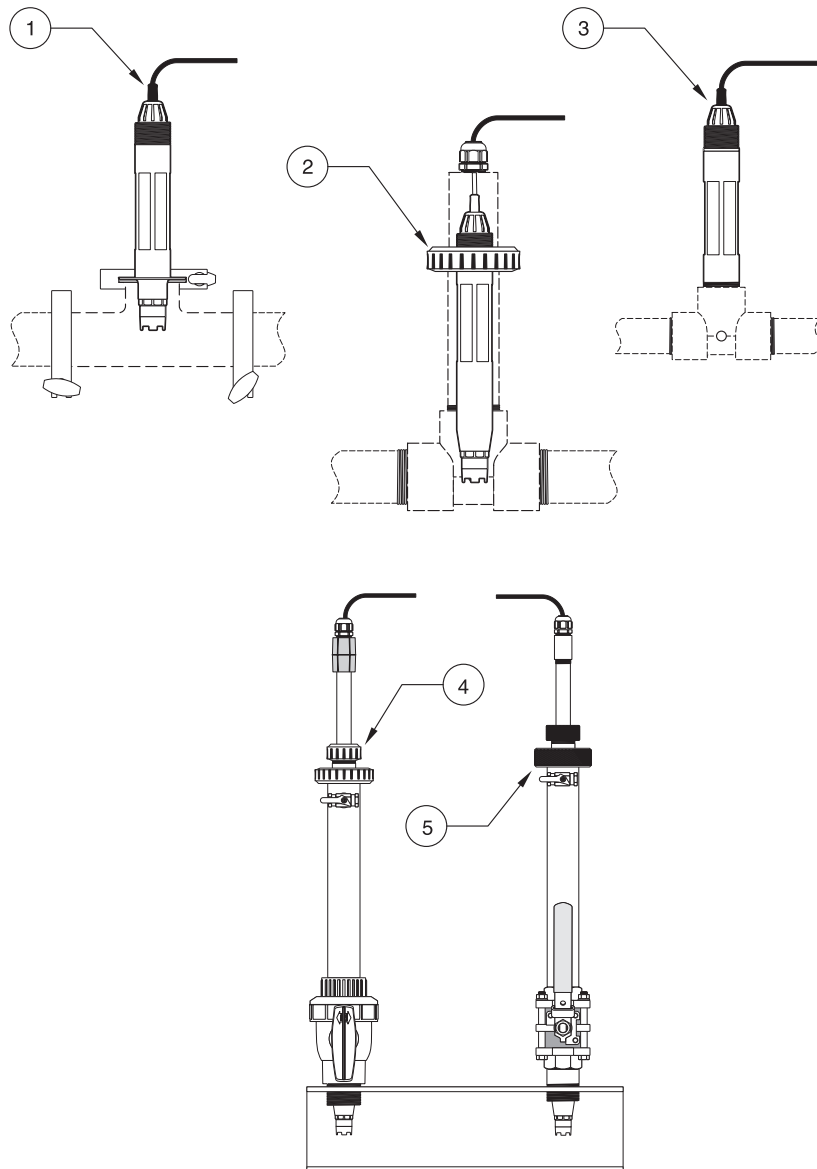
4 conductor cable with one shield and polyurethane jacket; rated to 105°C; 10 m standard length

#### Wetted Materials

PEEK<sup>®</sup> or Ryton<sup>®</sup> (PVDF), salt bridge of matching material with Kynar<sup>®</sup> junction, glass and platinum (or plastic and gold) process electrode, titanium ground electrode, and Viton<sup>®</sup> O-ring seals

\*Specifications subject to change without notice.

## Mounting Hardware



### Sanitary Mount (1)

**MH018S8SZ** 316 SS

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

### Union Mount (2)

**61313-00** CPVC  
**61314-00** 316 SS

Includes standard 1-1/2 inch tee, special union pipe with adapter, sealing hub, and lock ring in respective material, and Viton<sup>®</sup> O-ring.

### Flow-through Mount (3)

**MH334N4NZ** CPVC  
**MH314N4MZ** 316 SS

Includes a standard 1-inch tee in respective material.

### Insertion Mount (4) + (5)

Digital

**61367-00** CPVC  
**61368-00** 316 SS

Analog

**MH736M4MZ** CPVC  
**MH716M4MZ** 316

Includes a 1-1/2 inch ball valve in respective material, 1-1/2 inch NPT close nipple, sensor adapter with two Viton<sup>®</sup> O-rings and wiper, extension pipe, pipe adapter, back tube, and lock ring.

### Immersion Mount

See separate Technical Datasheet for Immersion Mounting Hardware.

ELECTRO CHEMISTRY  
DIFFERENTIAL PH AND ORP

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