



Differential pH or Orp Probes With 4 to 20 mA Outputs

PHETX-600/ ORETX-600 Series



All models shown
smaller than actual size.

PHETX-600
1½ NPT differential
pH electrode.

PHETX-620, hot tap
pH electrode with
PHE-620-BVA, PVC
hot tap ball valve.

PHETX-610 compression
fitting pH electrode.

- ✓ Integral 2-Wire 4 to 20 mA Transmitter
- ✓ Accurate Differential Measurement
- ✓ Eliminates Ground Loop Interference
- ✓ Built-In Pre-Amp Supports Up to 914 m (3000') Sensor-to-Analyzer Distance
- ✓ 4.6 m (15') Standard Cable Length
- ✓ Automatic Temperature Compensation on pH Versions

Applications

- ✓ Process Control, Industrial and Municipal Water Treatment
- ✓ Industrial and Municipal Waste Treatment, and Neutralization
- ✓ Fume Scrubbers, Plating, and Circuit Board Manufacturing
- ✓ Food and Beverage
- ✓ Chemical Processing
- ✓ Pulp and Paper
- ✓ Mining and Power Generation
- ✓ Pharmaceuticals

OMEGA® pH and ORP differential probes stay in service and provide accurate measurements under conditions that often render conventional pH probes inoperable. These probes, come with an integral encapsulated 4 to 20 mA, 2-wire transmitter to feed directly to a PLC or a DCS.

The PHETX-600 and ORETX-600 probes employ a differential measurement technique. Unlike conventional combination probes, the differential probe has two high impedance measurement circuits containing a common metallic return electrode. One circuit includes the process measurement electrode which generates a potential E1 proportional to the process pH. The second circuit

includes an internal measurement electrode immersed in a stable buffer solution which generates a standard reference potential, E2. Both circuit share a common potential E3 developed at the return electrode. The two circuits are fed into amplifiers which provide an output representing the differential between them: (E1 - E3) - (E2 - E3). The common potential E3 is cancelled out electronically, greatly reducing inaccuracies caused by ground loops which may exist between process and instrument grounds. Ground loop current will flow through the low impedance path of the return electrode, affecting the potential E3, but not the differential measurement.

The differential probe maintains its accuracy and stability in aggressive process applications long after a combination-style probes performance begins to deteriorate. Maintenance costs are reduced and the life of the probe is increased. The internal reference electrode is electrically connected to the process solution by means of a field-replaceable double junction salt bridge which greatly reduces the possibility of contamination of the buffer solution in the reference circuit. Although seldom required, the reference solution may be easily replaced by removing the screw-out salt bridge. A salt bridge and buffers are available for this purpose.

Another advantage of the PHETX/ORETX-600 series are the semi-flush face which is easily cleaned and avoids solution materials gathering on protrusions found in other probes. The domed glass electrode, the protective metal electrode and the temperature sensor protrude only about ⅛" while the salt bridge is flush. A flat-face version of the pH probe is also available.

The PHETX/ORETX-600 series is available in: 1½ NPT threaded body style (-600), "easy-in, easy-out" variable insertion depth version with 1¼ NPT compression fitting (-610), or the hot tap version (-620).



INDUSTRIAL pH INSTRUMENTATION & ELECTRONICS

Specifications

Measuring Range:

pH: 0 to 14 pH (consult factory for applications below 2 or above 12)

ORP: -500 to 500 mV or 0 mV to 1000 mV, field selectable

Flow Rate: 10 ft/sec max (3 meters/sec) flow should be as low as possible in low conductivity water and in solutions with high suspended solids

Wetted Materials: CPVC, kynar, glass, titanium palladium alloy and EPDM (platinum for ORP probe); opt FKM and ceramic

Transmission Distance: Dependant upon transmission distance and supply voltage

Sensitivity:

pH: 0.001 pH

ORP: 0.1 mV

Stability

pH: 0.03 pH per day, non-cumulative

ORP: 2 mV per day, non-cumulative

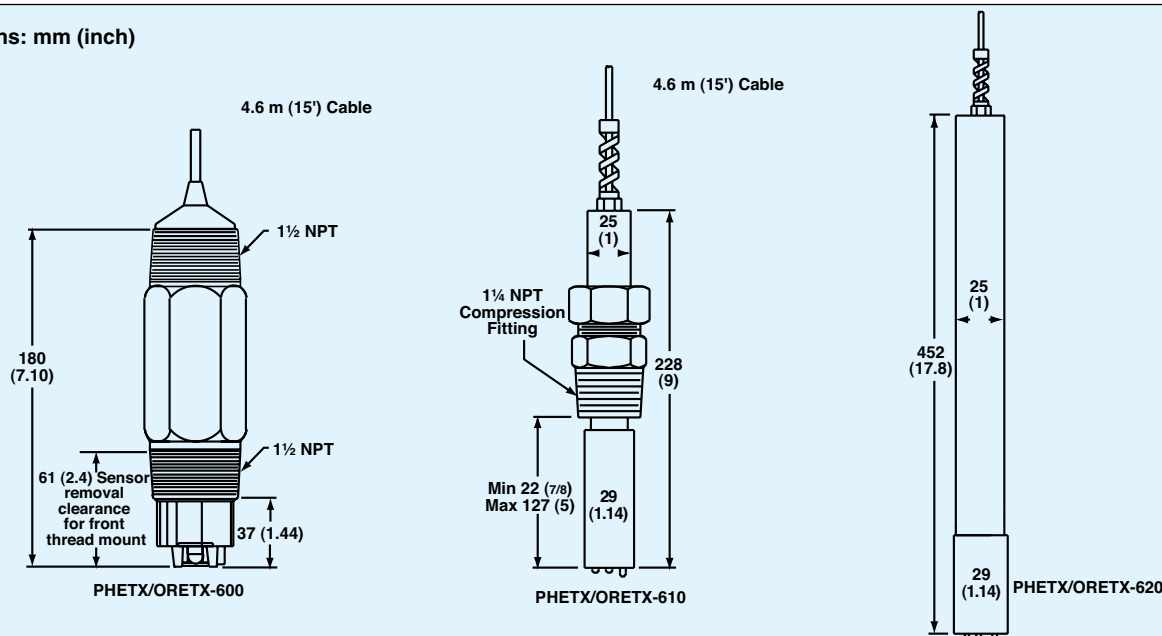
Temperature Compensation (Automatic): -5 to 95°C (23 to 203°F)

Pressure Limit: 100 psig at 65°C (149°F) maximum

Temperature Limits (CPVC): -5 to 95°C (23 to 203°F) the temperature limit of probes in flow through applications is limited by pressure and by the pipe fitting material.

Probe Cable: 5 conductor plus shield, 4.6 m (15') long

Dimensions: mm (inch)



To Order

Model No.	Description
PHETX-600	1½ NPT differential pH electrode with 4 to 20 mA output
ORETX-600	1½ NPT differential ORP electrode with 4 to 20 mA output
PHETX-610	Compression fitting pH electrode with 4 to 20 mA output for ⅞ to 5" variable insertion
ORETX-610	Compression fitting ORP electrode with 4 to 20 mA output for ⅞ to 5" variable insertion
PHETX-620	Hot tap pH electrode with 4 to 20 mA output for ⅞ to 5" variable insertion
ORETX-620	Hot tap ORP electrode with 4 to 20 mA output for ⅞ to 5" variable insertion

Comes complete with electrode, salt bridge and operator's manual.

Accessories

Model No.	Description
PHE-600-SB	Replacement salt bridge kit with PVDF outer junction (3 pack) for PHETX/ORETX-600 series
PHE-612-SB	Replacement salt bridge kit with PVDF outer junction (3 pack) for PHETX/ORETX-610/620 series
PHE-600-EP	Electrode protector for PHETX/ORETX-600
PHE-610-EP	Electrode protector for PHETX/ORETX-610/620
PHE-620-BVA	PVC hot tap ball valve assembly for PHETX/ORETX-620
PHA-4	4.00 pH buffer solution 500 mL (1 pint) bottle
PHA-7	7.00 pH buffer solution 500 mL (1 pint) bottle
PHA-10	10.00 pH buffer solution 500 mL (1 pint) bottle

Ordering Examples: PHETX-600, 1½ NPT differential pH electrode with 4 to 20 mA output, PHA-4, pH 4 buffer, and PHA-7, pH 7 buffer. PHETX-620, hot-tap differential pH electrode with 4 to 20 mA output, and PHE-620-BVA, PVC hot tap ball valve assembly.