



# INDUSTRIAL pH INSTRUMENTATION & ELECTRODES

## Flat Surface pH/ORP Industrial Electrodes

- ✓ Flat Surface Design
- ✓ 100 psig to 76°C (169°F)  
50 psig to 100°C (212°F)
- ✓ Detachable Design for Easy Replacement
- ✓ Self-Cleaning, Abrasion Free

OMEGA's line of self-cleaning/abrasion-free pH and ORP electrodes are designed for applications in which fouling or coating can present a problem. The electrode has a non-protruding, flat surface design which minimizes coating and helps eliminate electrode breakage. It is this same design which utilizes flow sweeping past the electrode to scrub the electrode clean. The flat glass surface also prevents particles moving past the electrode from impinging upon its surface, thus eliminating abrasion and extending electrode life.

Easy to use and install, the electrodes are compatible with most pH equipment. Designed for such difficult applications as oily waste water, emulsions, lime slurries and flocculant coagulation, they may be the solution to your application problems.

### Specifications (General)

**Description:** CPVC or PVDF gel-filled, double junction combination

**pH Range:** 0 to 14

**Maximum Temperature:**

**PHE-6510/PHE-4580/PHE-6820**

**CPVC Body:** 65.5°C (150°F)

**"-ACRYL" Option:** 87.7°C (190°F)

**"-ACRYL" Option with PVDF**

**Body:** 100°C (212°F)

**PHE-5460:** 87.7°C (190°F)

**Pressure Rating:** pH and ORP Electrodes:

100 PSIG @ 75°C/170°F

85 PSIG @ 81°C/180°F

50 PSIG @ 100°C/212°F

**Vacuum:** Up to 5 psia

**Impedance:** Less than 300 megohms @ 25°C/77°F

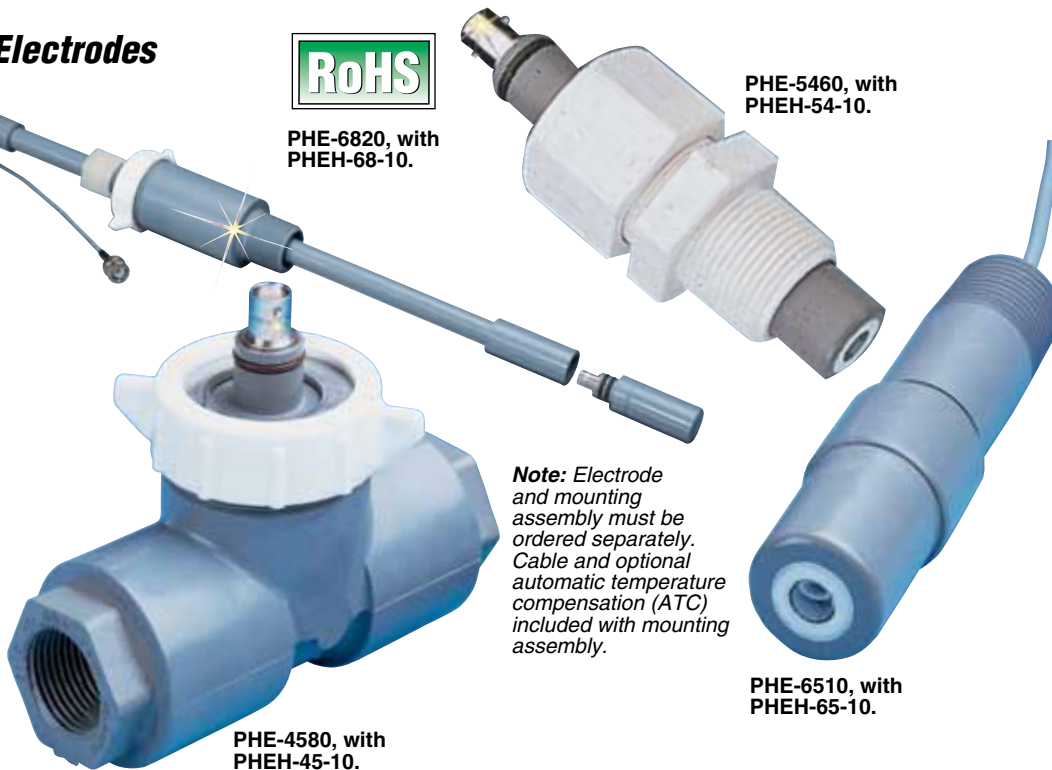
**Response Time:** 95% in 5 seconds

### Flat Surface Electrode Options

**-HF** For up to 5% HF Applications. Includes special glass formulation to give longer life in solutions containing acidic fluorides such as Hydrofluoric Acids pH Range: 0 to 12 pH Temp Range: 0 to 50°C (32 to 122°F) Maximum HF concentration is 10%

**-LC** Low conductivity Gel reference is designed for solutions with low ionic concentrations such as ultrapure or deionized water. LC gels contain 0.1M KCl vs. 3.5 M KCl in standard electrodes.

**-ACRYL** Acrylamide Gel (Acryl gel) is a thicker gel reference recommended for longer life in operating temperatures above 65°C (150°F). This gel does not liquefy at



PHE-6820, with PHEH-68-10.

PHE-5460, with PHEH-54-10.

**Note:** Electrode and mounting assembly must be ordered separately. Cable and optional automatic temperature compensation (ATC) included with mounting assembly.

PHE-6510, with PHEH-65-10.

PHE-4580, with PHEH-45-10.

Process flat surface electrodes and electrode holders are available in either Chlorinated Polyvinyl Chloride (CPVC) or in Polyvinylidene Fluoride (PVDF) materials. The material of construction must be the same for the electrode and the mounting assembly. CPVC designs are useful for a broad range of water-based applications. PVDF offers improved organic solvent resistance and longer life in higher temperature applications.

In CPVC designs, materials wetted by the sample include: CPVC, polyethylene, glass, O-rings made of FKM and, for ORP electrodes, platinum.

Material wetted by the sample in PVDF designs include: PVDF, glass, O-rings made of FKM, and, for ORP electrodes, platinum. CPVC and PVDF electrodes holders are not interchangeable.

### Flat Surface Electrode Type

Series	Type	Applications
PHE-4580	By-Pass	Side stream mount for flows between 3 and 5 GPM
PHE-5460	In Line	¾, 1 or 2" pipes or pipe tees
PHE-6510	Submersion	Tanks, flumes, sewer lines
PHE-6820	Insertion	Retractable for pressurized tanks main lines

high temperature, maximum temperature 100°C (212°F). It can also increase life in applications with aggressive chemicals by inhibiting diffusion of the chemicals.

**-GL** Ground Loop Interrupt Circuit built into the electrode can help eliminate ground loop problems up to potentials of 3 Volts.

Plastic tanks and piping are particularly susceptible because of poor earth grounding.

Dirty motors from pumps or mixers, other electrical equipment and even conductivity probes leak voltage into the solution

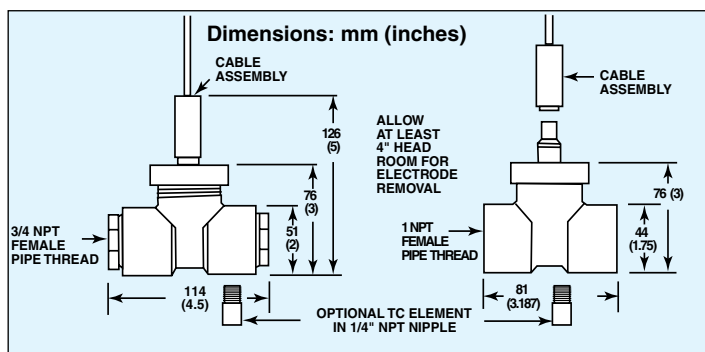
which feeds through the pH electrode and electronic circuit. This leads to invalid readings and shortened electrode life.

This series electrode combats these problems by utilizing a solution ground and internal battery powered ground interrupt circuit. The battery has an estimated 3 year service life.

Another benefit of this electrode is it will allow for long cable runs (up to 1000') because of the low impedance output of the built-in circuit.

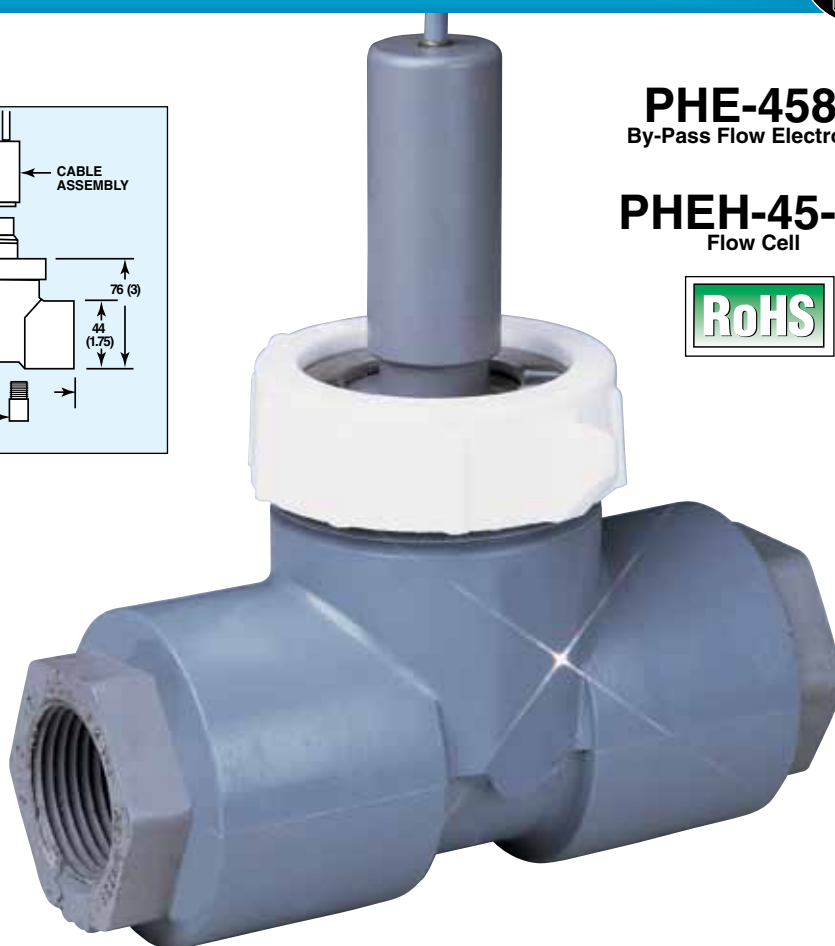


## By Pass Electrodes Flat Surface



**PHE-4580**  
By-Pass Flow Electrodes

**PHEH-45-10**  
Flow Cell



The OMEGA® PHE/ORE-4580 bypass flow pH system has a modified 1" CPVC or PVDF tee and cable assembly matched to the flat surface pH and ORP electrodes. Each GPM flowing through the tee results in a 2 ft/sec velocity which performs the self-cleaning action. No moving parts, liquid jets or power are required. Flow rates of 3 to 5 GPM provide adequate cleaning velocities in water weight applications. Exact control of flow rate is not required. Electrodes can be used in applications in which emulsions, slurries, oily wastewater and other difficult flowing samples are present. Continuous self-cleaning affords uninterrupted readings. Automatic temperature compensation is available as an option.

### Bypass Electrodes

To Order	
Model No.	Description
<b>PHE-4580</b>	CPVC bypass pH electrode; maximum temperature 65.5°C (150°F)
<b>PHE-4581</b>	PVDF bypass pH electrode; maximum temperature with "-ACRYL" 100°C (212°F)
<b>ORE-4580</b>	CPVC bypass ORP electrode; maximum temperature 65.5°C (150°F)
<b>ORE-4581</b>	PVDF bypass ORP electrode; maximum temperature with "-ACRYL" 100°C (212°F)
Mounting Assemblies (Bypass) Are Required for Installation	
<b>PHEH-45-10</b>	CPVC bypass mounting assembly without ATC 3/4 NPT threads
<b>PHEH-45K-10</b>	PVDF bypass mounting assembly without ATC 1 female NPT
<b>PHEH-45-10-(* )</b>	CPVC bypass mounting assembly with ATC 3/4 female NPT
<b>PHEH-45K-10-(* )</b>	PVDF bypass mounting assembly with ATC 1 female NPT (not for ORP)

**Note:** Order electrodes and mounting assemblies separately.

Materials of construction must be the same for the electrode and mounting assembly.

\* Specify ATC sensor "-PT100" for 100 Ω platinum RTD, "-PT1K" for 1000 Ω platinum RTD, "-TH700" for 700 Series Thermistor, "-R3K" for 3000 Ω Balco.

Mounting Assemblies come with 3 m (10') cable with BNC connector. Cable lengths available up to 15 m (50'), consult Omega for pricing.

### Options (Bypass Electrodes)

Ordering Suffix	Description	Available Models
<b>-HF</b>	Fluoride resistant up to 5% HF	All pH
<b>-LC</b>	Low conductivity	All pH
<b>-ACRYL</b>	ACRYL gel, maximum temperature 100°C (212°F)	All (standard with PHE-5460)

Ordering Example: PHE-4581 PVDF Bypass pH electrode, PHEH-45-10 Mounting assembly.