

pH pH/Ion Meters

Introduction / Indicators

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Call our Application Specialists for assistance in selecting the pH/Ion meter best suited for your application.

847-549-7600

More info

Do you need help selecting the right pH measurement system to fit your specific requirements? We are your product application experts.

Get the right product for the job. Our on-site team of experts offers unbiased purchasing advice.

Or if you are troubleshooting a failing system, our associates are proven problem solvers with practical, hands-on knowledge and technical expertise.

We will be happy to provide maintenance and repair advice in order to keep your system operating and accurate.

With the vast array of pH measurement products available we can ensure component compatibility.

Call for Free Technical Applications Assistance 847-549-7600 or visit www.coleparmer.com/tapps to email your questions and system requirements.

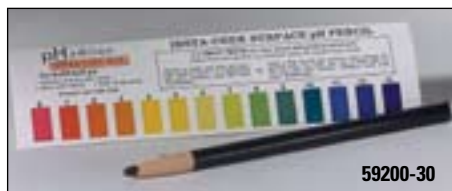


Each Application Specialist receives extensive hands-on product training.

pHydrion Jumbo Insta-Chek pH Pencil

Immediately gives the surface reaction of any solid to the nearest pH value

The handy pencil is perfect for spot checks, requiring as little as 0.001 mL of buffered solution. pHydrion pencil can be used on virtually any surface—even irregular uneven porous or impervious ones.



59200-30

Catalog number	Description	Price
KH-59200-30	pHydrion jumbo insta-chek pH pencil, pH 0 to 13	

pHydrion Ultrafine pH Paper Set

Clear color matches every 0.2 to 0.3 pH unit

pH can be tested in a variety of locations and situations easily—just dip and read! The wide-range utility matches points at all unit values; the medium range matches pH at 0.5 unit intervals, and pH can even be determined in micro quantities of solution (0.001 mL). Each 15-ft roll comes with a color match chart. The set includes 15 different test papers in 8 dispensers housed in a protective tray.



59200-00

Fifteen ultrafine papers cover the full pH range.

Catalog number	Description	Price
KH-59200-00	pHydrion ultrafine pH paper set	

pHydrion AB Double-Roll Dispenser

The most desired and popular dispenser in use today

The dispenser holds two rolls of pHydrion papers and includes color charts. One color chart covers the even (Type A) pH range 2-4-6-8-10. The other chart covers the odd (Type B) pH range 1-3-5-7-9-11. These double rolls contain 30 feet of paper for over 200 tests. Pack of 10 rolls.



59200-20

Catalog number	Description	Price/pk
KH-59200-20	pHydrion AB dispenser (double roll)	

pHydrion 1-12 Paper Strips

Replaces two vials of old-style litmus

These low-cost disposable vials of pHydrion pH paper strips test pH range from 0 to 12. Box of ten vials; 100 strips per vial.



59200-25

Catalog number	Description	Price/bx
KH-59200-25	pHydrion 1-12 paper strips	

pHydrion pH Papers on Plastic Strips

Three times the matching area compared to other plastic strips

These direct-reading pH papers give a simple, single color match for all pH values in distinct, bright color separations. Pack contains 100 dip sticks in a clear plastic case with color chart.



59200-10

Catalog number	pH range	Price/pk
KH-59200-10	1 to 14	
KH-59200-12	0 to 6	
KH-59200-14	5 to 9	
KH-59200-16	6.5 to 13	

OAKTON® Waterproof pHTestrs® 10, 20, and 30**Improved design with large, easy-to-read display**

- A complete meter with key features at an economical price
- Replaceable, double-junction electrode sensors save time and money
- IP67-rated housing sits flat on the table and floats in water

Waterproof pHTestrs are great for outdoor applications such as taking pH measurements in lakes and streams. Designed to float in water, you can even attach a line to the housing for easy retrieval. Valox® sensor housing resists most chemicals.

All waterproof pHTestrs have replaceable sensors for easy maintenance. Double-junction electrode sensors handle wastewater and solutions containing sulfides, heavy metals, and TRIS. Electrode sensors offer a clog-resistant Kynar® junction and a recessed, glass pH bulb to protect against breakage.

The keypad clicks to confirm operation, and allows access to a variety of functions. Calibrate up to three pH points with the auto-buffer recognition at both USA and NIST standard buffers. Additional features include a hold function, automatic temperature compensation, auto-off function, self-diagnostic error messages, and a three-segment battery-life indicator.

pHTestr 10 offers the most economical option.

pHTestr 20 features ±0.01 pH accuracy—suitable for most ASTM and EPA test procedures.

pHTestr 30 includes all of the features of the pHTestr 20 along with dual pH and 0.1-resolution temperature display. Temperature display units in selectable °F or °C.

Specifications & Ordering InformationISO9001:2000
CERTIFIED SUPPLIER

Catalog number	KH-35634-10	KH-35634-20	KH-35634-30
Description	pHTestr 10	pHTestr 20	pHTestr 30 with temperature readout
Range	-1.0 to 15.0 pH		-1.00 to 15.00 pH
Resolution	0.1 pH		0.01 pH
Accuracy	±0.1 pH		±0.01 pH
Temperature compensation	Automatic, 32 to 122°F (0 to 50°C)		
Calibration	Up to three pH points		
Buffer recognition	4.0, 7.0, 10.0 USA 4.0, 6.9, 9.2 NIST		4.01, 7.00, 10.01 USA 4.01, 6.86, 9.18 NIST
Display	Four-digit LCD	Four-digit LCD	pH: 4-digit LCD; Temperature: 4-digit LCD
Power	Four 1.5 V button cell batteries (included)		
Battery life	More than 500 hours		
Dimensions	6½" L x 1½" dia		
Price			

KH-35624-38 Replacement pH sensor

KH-35624-45 Waterproof soft carrying case, built-in belt loop for easy transport. Holds a Testr and buffer pouches

KH-09377-16 Replacement batteries, 1.5 V. Pack of 6

35634-10
pHTestr 1035634-20
pHTestr 2035634-30
pHTestr 30

Replaceable electrode—save money!



All Oakton® waterproof pHTestrs float!

OAKTON® Waterproof pHTestr® Calibration Kits

Store and organize all the components you need for fast, reliable calibration and measurement. The hard carrying case contains all the materials you need to calibrate in the field including premixed, premeasured buffers.

What's included: Waterproof pH tester (described above) except model 35624-70; two single-use pouches of pH 4.01, pH 7.00, pH 10.00 each, and rinse solution; one sample jar; and sturdy carrying case.

Ordering Information

Catalog number	Meter included	Price
KH-35624-70	None	
KH-35634-70	Waterproof pHTestr 10	
KH-35634-80	Waterproof pHTestr 20	
KH-35634-90	Waterproof pHTestr 30	



35634-90

pH pH/Ion Meters

Testers

OAKLON® Waterproof pHTestr® Basic

Low-cost tester is perfect for less demanding applications

- Economical and easy to use
- Replaceable single-junction sensor saves money
- Push-button calibration with auto-buffer recognition
- Waterproof, dustproof housing designed for use in dirty and damp field conditions

pHTestr Basic features a replaceable single-junction sensor with a recessed bulb to protect against breakage. The unit also offers single-point calibration with auto-buffer recognition for quick calibrations, self-diagnostic error messages, hold function to lock measured value, and auto-off to prolong battery life.



35634-00

New

Specs & Ordering Information



Range: -1.0 to 15.0 pH	Display: three-digit LCD
Resolution: 0.1 pH	Power: four 1.5 V button cell batteries (included)
Accuracy: ±0.2 pH	Battery life: 250 hours
Temperature compensation: none	Low-battery warning: none
Calibration: single point	Dimensions: 5 7/8" L x 1 1/2" dia
Buffer recognition: 4.0, 7.0, or 10.0	
Operating temperature: 32 to 122°F (0 to 50°C)	

Catalog number	Description	Price
KH-35634-00	pHTestr Basic	

[KH-35624-09](#) Replacement sensor

[KH-35624-45](#) Soft carrying case

[KH-09377-16](#) Replacement batteries, 1.5 V. Pack of 6

OAKLON® Waterproof pHTestr® 10 BNC

Customizable to your application—use with any pH electrode with a BNC connector

- Versatility of a handheld meter at a pocket price
- IP67 rating protects meter from water, dust, and shock while offering chemical resistance
- Meter floats—accidental drops into water will not result in lost or damaged meters

Simply choose the electrode best suited for your application, connect the pHTestr 10 BNC, calibrate, and measure. Change electrodes to suit your application without having to purchase another meter.

Large display and tactile keypad allow for easy calibration along with USA and NIST auto-buffer recognition. Hold function freezes reading on the display for easy recording. Additional features include Valox® sensor housing, self-diagnostic error messages, a battery-life indicator, and an auto-off function to maximize battery life. Order replacement batteries below right.



35634-14

Specs & Ordering Information



Range: -1.00 to 15.00 pH	Operating temp: 32 to 122°F (0 to 50°C)
Resolution: 0.01 pH	Display: four-digit LCD
Accuracy: ±0.01 pH	Power: four 1.5 V button cell batteries (included)
Temp compensation: fixed at 25°C or manual	Battery life: more than 500 hours
Calibration: up to three pH points	Low-battery warning: three-segment indicator
Buffer recognition: USA: 4.01, 7.00, 10.01 NIST: 4.01, 6.86, 9.18	Dimensions: 6" L x 1 1/2" dia

Catalog number	Description	Price
KH-35634-14	pHTestr 10 BNC	

Electrodes

Cat. no.	Body type	Range	Connection type	Price
Single-junction electrodes for general use				
KH-35804-00	Epoxy, sealed	0 to 12 pH	Direct connect	
KH-35801-00	Epoxy, sealed	0 to 12 pH	3-ft cable	
KH-35804-01	Epoxy, sealed, 9-mm dia	0 to 12 pH	Direct connect	
KH-35804-06	Glass, sealed, spear tip	0 to 12 pH	3-ft cable	
Double-junction electrodes for organics, sulfides, and heavy metals				
KH-35804-08	Epoxy, sealed	0 to 14 pH	Direct connect	
KH-35805-04	Glass, refillable	0 to 12 pH	3-ft cable	
KH-35805-09	Epoxy, refillable flushable PTFE junction	0 to 12 pH	3-ft cable	

OAKLON® Waterproof ORPTestr® 10 and ORPTestr® 10 BNC

Ideal for checking chromate reduction, cyanide oxidation, and other ORP readings

- Large, horizontal readout
- IP67-rated housing floats in water and sits flat on a hard surface

Use these versatile instruments for applications ranging from swimming pool testing to pulp bleaching. ORPTestr 10 and ORPTestr 10 BNC feature ±2 mV accuracy and a ±150 mV offset. Housing allows you to attach a lanyard (included) for easy retrieval. Additional features include a hold function, auto-off function, self-diagnostic error messages, and a three-segment battery-life indicator.

ORPTestr 10 features a replaceable double-junction platinum electrode—ideal for checking dirty water, heavy metals, sulfides, and organics. Valox® electrode body resists most chemicals.

ORPTestr 10 BNC allows you the convenience of using any ORP electrode with a BNC connection. Order electrode separately at right.



35650-14

New



35650-10

Specs & Ordering Information



Range: -999 mV to 1000 mV	Display: four-digit LCD
Resolution: 1 mV	Power: four 1.5 V button cell batteries (included)
Accuracy: ±2 mV	Battery life: 500 hours
Temperature compensation: none	Low-battery warning: three-segment indicator
Calibration: ±150 mV	Dimensions: 6" L x 1 1/2" dia
Operating temperature: 32 to 122°F (0 to 50°C)	

Catalog number	Description	Price
KH-35650-10	ORPTestr 10	
KH-35650-14	ORPTestr 10 BNC	

[KH-35650-09](#) Replacement sensor for 35650-10

[KH-59001-75](#) ORP single-junction electrode for 35650-14

[KH-59001-77](#) ORP double-junction electrode for 35650-14

[KH-05478-60](#) YSI® Zobell solution, 1.25 g

[KH-09377-16](#) Replacement batteries, 1.5 V. Pack of 6

Waterproof ISFET pH Testers

Ion specific field effect transistor (ISFET) uses a silicon chip pH sensor

- Sensor stores dry and needs little maintenance
- Fast response time

These compact, waterproof pH meters can measure samples as small as one drop. The virtually unbreakable sensor eliminates breakage problems associated with fragile glass pH sensors. Advanced model offers three-point calibration and auto buffer recognition.

What's included: calibrating buffers, case, and batteries.



59541-00

Specifications & Ordering Information



Range: 2.0 to 12.0 pH	Buffer recognition: Standard model: none Advanced model: automatic	Power: two CR-2032 lithium 3 V batteries (included)
Resolution: 0.1 pH	Reference: replaceable KCl gel filled	Battery life: 200 hours continuous, 10 hour advance low-battery warning
Accuracy: ±0.1 pH	Operating temperature: 41 to 104°F (5 to 40°C)	Dimensions: 5 1/2" L x 1" W x 5/8" H
Temp compensation: automatic	Display: LCD	
Calibration: Standard model: 1 pt Advanced model: 1, 2, or 3 pts		

Catalog number	Description	Price
KH-59541-00	Standard ISFET pH meter	
KH-59541-10	Advanced ISFET pH meter	

[KH-59541-50](#) Replacement reference

[KH-59541-51](#) Nylon carrying case

"Cardy" pH and Ion Meters

Measure samples as small as 150 µL without immersing in solution!

"Cardy" Twin pH Meter

- Waterproof housing is submersible to 1 meter for up to 30 minutes—plus it floats!
- Temperature alarm alerts you when sample falls outside temperature range
- Auto-shutoff and low-battery indicator provide added convenience



Sample pad

05759-00

Use this pocket-sized, waterproof meter anywhere. Built-in sensor lets you take measurements two ways: by simply immersing meter tip in sample, or by placing a small amount of your sample directly on the sample pad. Results are instantly displayed on the convenient 3 1/2-digit LCD. Two-point autocalibration combines with buffer recognition at pH 4.00 and 7.00 buffer values for simple, quick calibration. Order replacement sensor cartridges and solution kits separately below.

What's included: hard carrying case, batteries, and a solution kit containing calibrating solution and deionized water.

"Cardy" Compact Ion Meters

- Two-point autocalibration
- Automatic range selection
- Calibration and slope adjustment

These portable meters have unique built-in sensor cartridges—no more bulky probes or cables. To use your "Cardy" meter, simply place a small amount of sample directly onto the sensor and read the 3 1/2-digit LCD. Meter is never immersed in your solution, eliminating contamination worries and sample waste. Ideal for use in food processing or research applications. Order replacement sensor cartridges and solution kits from tables below.



05754-00

What's included: calibration solution, deionized water, tweezers, a pipet, sampling sheets, and batteries.

Specifications & Ordering Information

Minimum sample size: 150 µL

Power

pH meter: two CR-2032 3 V lithium batteries (included)
Ion meters: two CR-2025 3 V lithium batteries (included)

Battery life:

average 500 hours with continuous use

Calibration: two-point

Description	Twin pH meter		Compact ion meters			
	Cat. no.	KH-05759-05	KH-05753-00	KH-05754-00	KH-05755-00	KH-05760-00
Type		pH	Salinity (NaCl)	Sodium (Na ⁺)	Potassium (K ⁺)	Nitrate (NO ₃ ⁻)
Range		pH 2.00 to 12.00	0.1 to 10% (in % wt)	23 to 2300 ppm	39 to 3900 ppm	62 to 6200 ppm
Resolution		0.01 pH	0.01% from 0.1 to 0.99%, 0.1% from 1.0 to 10.0%	1 ppm from 23 to 99 ppm, 10 ppm from 100 to 990 ppm, 100 ppm from 1000 to 2300 ppm	1 ppm from 39 to 99 ppm, 10 ppm from 100 to 990 ppm, 100 ppm from 1000 to 3900 ppm	1 ppm from 62 to 99 ppm, 10 ppm from 100 to 990 ppm, 100 ppm from 1000 to 6200 ppm
Repeatability		±0.1 pH	±0.1%	±20% of reading	±20% of reading	±20% of reading
Dimensions		1 1/4"W x 6 1/4"H x 3/4"D	2 3/16"W x 3 3/4"H x 3/8"D	2 3/16"W x 3 3/4"H x 3/8"D	2 3/16"W x 3 3/4"H x 3/8"D	2 3/16"W x 3 3/4"H x 3/8"D
Price						

Replacement Sensor Cartridges

Cat. no.	Measuring type	Price
KH-05759-50	pH	
KH-05753-50	Salinity (NaCl) and Sodium (Na ⁺)	
KH-05755-50	Potassium (K ⁺)	
KH-05760-50	Nitrate (NO ₃ ⁻)	

Replacement Solution Kits

Solution kits contain four bottles of deionized water and four bottles of calibrating solution.

Cat. no.	Measuring type	Price
KH-05758-60	pH	
KH-05753-70	Salinity (NaCl)	
KH-05754-60	Sodium (Na ⁺)	
KH-05755-60	Potassium (K ⁺)	
KH-05760-60	Nitrate (NO ₃ ⁻)	

Accessories

[KH-35624-45](#) Carrying case, soft. Holds meter and two solutions

[KH-05753-80](#) Replacement solution sheets for all meters. Pack of 5 rolls

[KH-09376-17](#) Replacement batteries; CR-2032 lithium, 3 V. Pack of 6

[KH-05944-05](#) Replacement batteries; CR-2025 lithium, 3 V. Pack of 6

pH

pH/Ion Meters

Testers

OAKTON® Waterproof pH Spear

Versatile, convenient, and accurate spear-tip pH tester

- Electrode junction is 200 times larger than standard electrodes, making it virtually impossible to clog
- Rugged spear tip makes it ideal for soft solids and semisolid materials
- Long, thin electrode can be used to determine pH in test tubes and other narrow containers
- IP67-rated housing sits flat on the table; floats in water

Calibrate up to three pH points with the auto-buffer recognition at both USA and NIST standard buffers. Additional features include a hold function, auto-off function, self-diagnostic error messages, and a three-segment battery-life indicator. The electrode uses a single-pore capillary reference junction, about 200 times larger than typical ceramic junctions. The unique junction design provides increased electrolyte flow, resulting in greater contact between sample and reference, ensuring fast, stable readings. The double-junction design offers enhanced performance.



Ideal for food testing



Spear tip fits into microcentrifuge tubes



35634-40

Specs & Ordering Information

ISO9001:2000
CERTIFIED SUPPLIER



Range: -1.00 to 15.00 pH

Resolution: 0.01 pH

Accuracy: ±0.01 pH

Temperature compensation: fixed at 25°C

Calibration: up to three pH points

Buffer recognition
USA: 4.01, 7.00, 10.01
NIST: 4.01, 6.86, 9.18

Operating temperature: 32 to 122°F (0 to 50°C)

Display: four-digit LCD

Power: four 1.5 V button cell batteries (included)

Battery life: more than 500 hours

Low-battery warning: three-segment indicator

Dimensions: 6½" L x 1½" dia

Catalog number	Description	Price
KH-35634-40	pH Spear	

[KH-35634-50](#) Replacement pH electrode

[KH-35624-70](#) Calibration kit. Includes two pouches each of pH buffer, 4.01, 7.00, 10.01, and rinse water; sample jar, instructions; and carrying case

[KH-09377-16](#) Replacement batteries, 1.5 V. Pack of 6

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For our Oakton® food safety infrared thermometer with probe.



OAKTON® Waterproof Conductivity and TDSTests®

CON TDS °C/F

New dual- and multirange models increase application range

- Automatically or manually select measuring range
- Replaceable sensor prolongs the life of the instrument
- Single or one point per range push-button calibration

Oakton Testrs are now available for dual- or multirange conductivity or TDS measurements. Choose either dual-range pin- or multirange cup-style testers depending upon the application and desired resolution. All models have temperature measurement that is displayed in Fahrenheit or Celsius. Features like simple three-button operation, automatic shutoff, low-battery indicator, and waterproof housing that floats make these testers a great value for the money. EC models feature automatic standard recognition.

What's included: protective plastic storage case, lanyard, and batteries.

Specifications & Ordering Information

Catalog number		EK-35662-30	EK-35662-35	EK-35662-10	EK-35662-15
Description		ECTestr 11 Dual-Range	ECTestr 11+ Multirange	TDSTestr 11 Dual-Range	TDSTestr 11+ Multirange
Range	Conductivity	0 to 2000 µS; 0 to 20.00 mS	0 to 200.0, 0 to 2000 µS; 0 to 20.00 mS	0 to 2000 ppm; 0 to 10.0 ppt	0 to 200.0, 0 to 2000 ppm; 0 to 10.0 ppt
	Temperature	32 to 122°F (0 to 50°C)		32 to 122°F (0 to 50°C)	
Resolution	Conductivity	10 µS; 0.10 mS	0.1, 1 µS; 0.01 mS	10 ppm; 0.10 ppt	0.1, 1 ppm; 0.01 ppt
	Temperature	0.1°F (0.1°C)		0.1°F (0.1°C)	
Accuracy	Conductivity	±1% full-scale		±1% full-scale	
	Temperature	±0.9°F (±0.5°C)		±0.9°F (±0.5°C)	
Temperature compensation	Automatic, 0 to 50°C; 2% per °C		Automatic, 0 to 50°C; 2% per °C		
Calibration	One or two points		One or two points		
Power	Four 1.5 V alkaline batteries (included), >150 hours continuous use		Four 1.5 V alkaline batteries (included), >150 hours continuous use		
Display	4-digit LCD, dual line		4-digit LCD, dual line		
Dimensions	6½" L x 1½" dia		6½" L x 1½" dia		
Price					

[EK-35661-17](#) Replacement sensor for pin-style, dual-range Testrs

[EK-35661-08](#) Replacement sensor for cup-style, multirange Testrs

[EK-35624-45](#) Belt-loop carrying case, vinyl

[EK-09377-16](#) Replacement batteries, 1.5 V. Pack of 6

New



Cup-style sensor—draw samples anywhere!



35662-30
Pin-style Testrs now measure and display temperature.

35662-15
Cup-style Testrs have greater range and resolution than pin-style Testrs.

pH/Ion Meters pH

Handheld

OAKLON® Acorn® pH 5 and pH 6 Meters

High ± 0.01 pH accuracy at economical prices!

- Convenient, compact design
- Up to five-point push-button calibration with auto-buffer recognition
- Displays pH and temperature with a button press

These meters are perfect for fast, accurate results. Automatic temperature compensation (ATC) ensures accuracy from 0 to 100°C. The pH 6 also reads mV. Meters include a protective rubber boot that also acts as a meter stand.

Meter includes: protective rubber boot and batteries.

Meter kit adds: pH electrode, ATC probe, pH buffer solutions, three sample bottles, rinse bottle, and hard carrying case.



35613-01

Integral stand for benchtop use

OAKLON® Acorn® Ion 5 and Ion 6 Meters

Direct readout of ion concentration at economical prices!

- Compact and easy-to-use with preprogrammed ion calibration points
- mV mode allows you to check electrode calibration and performance
- ± 1999 mV range is compatible with virtually all ISE electrodes

These rugged, economical meters are very easy to use. Features include all push-button calibration, hold function, auto-off, and splash-resistant keypad. Choose from two models. The Ion 5 reads concentration in ppm and mV. The Ion 6 also reads pH and temperature in °C. The included protective rubber boot also acts as a meter stand for benchtop use.

Meter includes: protective rubber boot and batteries.

Meter kit adds: pH electrode, ATC probe, pH buffer solutions, solution bottles, rinse bottle, and hard carrying case.



Ion 6 meter kit 35613-74 includes a pH electrode and ATC probe.

Specs & Ordering Information

ISO9001:2000 CERTIFIED SUPPLIER CE 3 year warranty

Display: 3½-digit LCD

Power: four AAA batteries (included)

Temperature compensation: automatic with ATC probe, 0 to 100°C

Battery life: 200 hours continuous

Dimensions: 2¾"W x 5¾"H x 1⅜"D

Mode	pH	mV (pH 6 only)	Temperature
Range	0.00 to 14.00 pH	-1999 to +1999 mV or rel mV	0 to 100.0°C
Resolution	0.01 pH	1 mV	0.1°C
Accuracy	± 0.01 pH	± 2 mV	$\pm 0.5^\circ\text{C}$
Calibration	Up to five points: pH 1.68, 4.01, 7.00, 10.00, 12.45 (USA); pH 1.68, 4.01, 6.86, 9.18, 12.45 (NIST) pH 4.10, 6.97 (Pb)	± 20 mV	Offset 0.1°C increments

Catalog number	Model	Description	Mode	Price
KH-35613-01	pH 5	Meter with ATC probe	pH/temp	
KH-35613-11	pH 6		pH/mV/temp	
KH-35613-00	pH 5	Meter with pH electrode and ATC probe	pH/temp	
KH-35613-10	pH 6		pH/mV/temp	
KH-35613-70	pH 5	Meter kit	pH/temp	
KH-35613-72	pH 6		pH/mV/temp	

Accessories

[KH-59001-65](#) Replacement pH electrode; single-junction, gel-filled. Epoxy body, BNC connector

[KH-05992-14](#) "All-in-one" combination pH probe with built-in ATC, three-foot coiled cable, semi-domed tip, epoxy body, sealed

[KH-35613-05](#) Replacement ATC probe, stainless steel

[KH-09376-00](#) Replacement batteries, AAA. Pack of 12

INNOCAL®
INNOVATIVE CALIBRATION SOLUTIONS



Ensure the accuracy of your pH meter

[EK-17106-20](#) NIST-traceable pH certificate, with before and after test data at five pH test points (2, 4, 7, 10, 12 pH) and five mV test points across range

Specs & Ordering Information

ISO9001:2000 CERTIFIED SUPPLIER CE 3 year warranty

Display: 3½-digit LCD

Power: four AAA batteries (included)

Temp comp: (Ion 6 only) automatic with ATC probe, 0 to 100°C

Battery life: 200 hours continuous

Dimensions: 2¾"W x 5¾"H x 1⅜"D

Mode	Ion	mV	pH (Ion 6 only)	Temperature (Ion 6 only)
Range	0.01 to 1999 ppm	± 1999 mV	0.00 to 14.00	0.0 to 100.0°C
Resolution	0.01 ppm (0.01 to 0.99 ppm) 0.1 ppm (1.0 to 199.9 ppm) 1 ppm (200 to 1999 ppm)	1 mV	0.01	0.1°C
Accuracy	1% of reading	± 1 mV	± 0.01	$\pm 0.5^\circ\text{C}$
Calibration	2 to 3 points: 0.1; 1; 10; 1000 ppm (minimum 2 points)	± 50 mV	Up to 5 points 1.68, 4.01; 7.00; 10.00, 12.45 (USA) 1.68, 4.01; 6.86; 9.18, 12.45 (NIST) 4.10; 6.97 (Pb)	Offset 0.1°C increments

Catalog number	Model	Description	Mode	Price
KH-35613-21	Ion 5	Meter only	Ion/mV	
KH-35613-31	Ion 6	Meter only	Ion/mV/pH/temp	
KH-35613-74		Meter kit		

Accessories

[KH-27504-14](#) Fluoride electrode, double junction, refillable. Epoxy body, BNC connector

[KH-27502-00](#) Ammonia electrode, double junction, refillable. Epoxy body, BNC connector

[KH-27504-22](#) Nitrate electrode, double junction, refillable. Epoxy body, BNC connector

[KH-09376-00](#) Replacement batteries, AAA. Pack of 12

pH pH/Ion Meters

Handheld

OAKTON® pH 11 and pH 110 pH/mV/Temperature Meters

High quality and versatility at an economical price

- Electrode bracket positions electrode for one-handed use
- Built-in electrode stand allows for benchtop use
- Data set storage, increased buffer recognition options, and auto-scanning buffer calibration

Large, dual-LCD lets you view pH (or mV) and temperature values simultaneously. Automatic temperature compensation (ATC) ensures accuracy even in fluctuating temperatures. Functions include temperature offset calibration, hold function, ready indicator, and auto-off. Electrode slope display capability allows for quick troubleshooting.

Basic pH 11 Meters feature everything you need for general-purpose pH measurements with not-so-basic benefits. The custom, dual-LCD display provides measurement and troubleshooting data with its decipherable icons. Recall up to 50 data sets and calibrate up to five pH points from USA and NIST buffers.

Advanced pH 110 Meters build on the pH 11 meter qualities and add relative mV offset calibration and reading capabilities. The pH 110 meter offers advanced setup mode, allowing you to customize operating parameters. Calibrate up to six points from USA, NIST, DIN, and PWB buffer options.

Data storage capabilities fit easily into your current GLP-compliance regulations. Store and recall up to 100 sets of data in nonvolatile memory. Free software lets you import downloaded data into popular PC spreadsheet programs. RS-232 output downloads the data to a printer or computer. Current data prints continuously or in selected time intervals between 10 and 24 seconds. Selectable printing of stored data gives you the chance to select the data you want transferred.

Meter includes: electrode bracket and batteries. The pH 110 meter also includes Datalog Assist PC software on CD-ROM.

Meter kit adds: "All-in-One" pH electrode 35811-71 with built-in ATC, twenty pH "Singles" buffer pouches (five each of pH 4.01, 7.00, 10.00, and rinse water), four 50-mL solution bottles, and hard carrying case.



35614-20

35615-20



Meter kit
35615-80

ISO9001:2000
CERTIFIED SUPPLIER

CE 2 year
warranty
meter only

Specifications & Ordering Information

Input impedance: 10¹² Ω **Slope control:** 80 to 126% **Operating temperature:** 32 to 122°F (0 to 50°C) **Low-battery warning:** yes

Model		Basic pH 11 meters			Advanced pH 110 meters		
Catalog number		KH-35614-22	KH-35614-20	KH-35614-80	KH-35615-22	KH-35615-20	KH-35615-80
Description		Meter only	Meter with "All-in-One" electrode	Meter kit	Meter only	Meter with "All-in-One" electrode	Meter kit
Range	pH	-2.00 to 16.00			-2.00 to 16.00		
	mV	±2000 mV			±2000 mV / rel mV		
	Temperature	-10.0 to 110.0°C			-10.0 to 110.0°C; -14.0 to 230.0°F		
Resolution	pH	0.01			0.1/0.01		
	mV	0.1 to ±199.9 mV, 1 mV beyond			0.1 to ±199.9 mV, 1 mV beyond		
	Temperature	0.1°C			0.1°C; 0.1°F between 32.0 to 199.9°F and 1.0 beyond		
Accuracy	pH	±0.01			±0.01		
	mV	±0.2 to ±199.9 mV, ±2 mV beyond			±0.2 to ±199.9 mV, ±2 mV beyond		
	Temperature	±0.5°C			±0.5°C; ±0.9°F		
Temperature compensation		Automatic or manual, 0 to 100°C			Automatic or manual, 0 to 100°C		
Calibration		Up to five points			Up to six points		
Buffer recognition		USA: 1.68, 4.01, 7.00, 10.01, 12.45; NIST: 1.68, 4.01, 6.86, 9.18, 12.45			USA: 1.68, 4.01, 7.00, 10.01, 12.45; NIST: 1.68, 4.01, 6.86, 9.18, 12.45; DIN: 1.09, 3.06, 4.65, 6.79, 9.23, 12.75; PWB: 4.10, 6.97		
Datalogging capabilities		50 data sets			100 data sets with date and time		
Output		None			RS-232		
Display		Dual LCD			Dual LCD		
Power		Four AAA batteries (included) or optional AC adapter			Four AAA batteries (included) or optional AC adapter		
Battery life		700 hours continuous			700 hours continuous (reduced with printing)		
Dimensions		3 1/2"W x 7 3/8"H x 1 3/4"D			3 1/2"W x 7 3/8"H x 1 3/4"D		
Price							

"All-in-One" Electrodes are combination sealed electrodes with built-in ATC element. Epoxy-body electrodes measure 4 1/2"L x 1/2" dia, and include 2-ft cable with BNC connector. Maximum temperature is 176°F (80°C).

KH-35811-71 "All-in-One" electrode, single junction

KH-35811-72 "All-in-One" electrode, double junction

KH-35613-05 ATC probe, stainless steel. Measures 6"L x 1/8" dia; includes 3-ft cable with miniconnector

KH-35615-07 Adapter, 110/220 VAC

KH-35615-09 RS-232 cable for Advanced pH 110 meter. Connects meter to computer

KH-09376-00 Repl. batteries, AAA. Pack of 12

OAKLON® Waterproof pH 300 and pH 310 Meters

Waterproof and dustproof with IP67-rated housing that floats!

- Built-in memory function makes it easy to recall data
- Five-point pH calibration with auto-buffer recognition

Basic pH 300 Meter functions include mV and temperature offset calibration, Hold function, ready indicator, and auto-off. Memory stores 16 readings, recalls electrode slope and offset, and previous calibration data.

Advanced pH 310 Meter has the features of the pH 300, plus a real-time clock that lets you stamp 50 stored readings and calibration data with date/time—ideal for Good Laboratory Practice (GLP) standards. The pH 310 also features selectable automatic endpoint (freezes reading when stable), and selectable temperature (°C or °F).

What's included: "All-in-One" pH electrode with built-in ATC, two electrode brackets, and batteries.

Meter kits include: meter, "All-in-One" pH electrode with built-in ATC, five each of pH "Singles" buffer pouches (pH 4.01, 7.00, 10.01, and rinse water), four solution bottles, two electrode brackets, batteries, and hard carrying case.



35618-03



35618-70



Specs & Ordering Info

Model	Basic pH 300 meter		Advanced pH 310 meter		
	Catalog number	KH-35618-03	KH-35618-70	KH-35618-13	KH-35618-72
Description	Meter	Kit	Meter	Kit	
Range	pH	-2.00 to 16.00	-2.00 to 16.00		
	mV	±2000 mV	±2000 mV		
	Temp	0.0 to 100.0°C	0.0 to 100.0°C (32.0 to 212.0°F)		
Resolution	pH	0.01	0.01		
	mV	0.1 to ±199.9 mV; 1 mV beyond	0.1 to ±199.9 mV; 1 mV beyond		
	Temp	0.1°C	0.1°C (0.1°F)		
Accuracy	pH	±0.01	±0.01		
	mV	±0.2 to ±199.9 mV; ±2 mV beyond	±0.2 to ±199.9 mV; ±2 mV beyond		
	Temp	±0.5°C	±0.5°C (±0.5°F)		
Calibration	pH	Up to 5 points (1.68, 4.01, 7.01, 10.01, 12.45)	Up to five points (select from three sets); NIST (1.68, 4.01, 6.86, 9.18, 12.45); USA (1.68, 4, 7, 10, 12.45); DIN (1.09, 2.06, 4.65, 6.79, 9.23, 12.75)		
	mV	Offset up to ±150 mV	Offset up to ±150 mV		
	Temp	Offset 0.1°C	Offset 0.1°C (°F) increments		
	Temp compensation	Automatic or manual, 0 to 80°C			
Datalogging capabilities	16		50		
Display	Dual LCD shows reading plus temperature				
Power	Four AAA batteries (included)				
Battery life	200 hours continuous				
Dimensions	3 1/2"W x 7 3/8"H x 1 3/4"D				
Price					

KH-59002-75 Replacement "All-in-One" pH electrode with built-in ATC. Single-junction; epoxy body; BNC connector

KH-05992-16 "All-in-One" combination pH probe with built-in ATC, and 10-foot cable. Semi-domed tip, epoxy body, sealed, for use with 35618-series meters only

KH-35618-05 ATC probe. Use for temperature compensation with any pH electrode without built-in ATC

KH-09376-00 Repl. batteries; AAA. Pack of 12

OAKLON® Waterproof pH/Con 10 Meter

No more headaches with multiple probes— one probe does it all!

- Toggle between conductivity and pH with a button press
- Features automatic buffer recognition, auto-off, and HOLD

The waterproof, dustproof model 35630-02 with IP67-rated housing, includes a three-in-one, multi-sensor probe that measures pH, conductivity, and temperature with 10-ft submersible cable. Three-point pH calibration with auto buffer recognition and four-point conductivity calibration provide high accuracy.

What's included: batteries. Model 35630-02 also includes a three-in-one probe 35630-50.

Meter kit includes: meter, three-in-one probe, calibration solution pouches (three each pH 4.01, 7.00, 10.00, two each conductivity 447 µS, 1413 µS, 2764 µS, 15,000 µS), three rinse water pouches, sample bottles, batteries, and hard carrying case.



Meter 35630-02 floats!



Specs & Ordering Info

Conductivity temperature coefficient: fixed at 2.0% per °C

Conductivity cell constant: 1.0 cm⁻¹

Operating temperature: 32 to 122°F (0 to 50°C)

Catalog number		KH-35630-03	KH-35630-02	KH-35630-62
Description		Meter only	Meter with 3-in-1 probe	Kit
Range	pH		0.00 to 14.00	
	Con	0.0 to 19.99 µS, 0 to 199.9 µS, 0 to 1999 µS, 0 to 19.99 mS		
	Temp		0 to 100°C	
Resolution	pH		0.01	
	Con		0.01 µS, 0.1 µS, 1.0 µS, 0.01 mS	
	Temp		0.1°C	
Accuracy	pH		±0.01	
	Con		±1% full-scale or ±1 digit	
	Temp		±0.5°C	
Calibration	pH		Up to three points (4.01, 7.00, 10.00)	
	Con		Up to four points (one per range)	
	Temp		Offset 0.1°C increments to ±5°C	
Temp compensation	Automatic from 0 to 50°C			
Power	Four AAA alkaline batteries (included)			
Display	Dual LCD shows reading plus temperature			
Battery life	100 hours continuous			
Dimensions	3 1/2"W x 7 3/8"H x 1 3/4"D			
Price				

KH-35630-50 Replacement three-in-one probe

Down-Well Probes are available for use with the pH/Con 10 meter. Probe body measures 1 3/8" in diameter. All include a waterproof connector.



35630-52

Catalog number	Description	Cable length	Price
KH-35630-52	Down-well probe	10 ft	
KH-35630-54		25 ft	
KH-35630-56		100 ft	

pH pH/Ion Meters

Handheld

OAKTON® Waterproof pH/DO 300 Meter

Toggle between pH and DO readings with the press of a button

- Waterproof and dustproof with IP67 rating
- Reads pH and dissolved oxygen in mg/L, ppm, or % saturation with simultaneous temperature display

Features include five-point pH calibration with auto buffer recognition for ± 0.01 pH accuracy; compensation for salinity and altitude; independent 100% and zero adjustment calibrations; °C or °F selectable; automatic temperature compensation (ATC); HOLD function; ready indicator; and auto-off. Setup function displays electrode slope, zero offset, and millivolt values. Keypad adjustable backlit display is ideal for taking readings in low light. The galvanic DO probe allows user to take measurements immediately without typical warm-up time.

What's included: batteries.

Meter kit includes: meter, DO probe, pH electrode, pH buffer and electrolyte solutions, replacement membrane cap, four solution bottles, and case.



Meter features backlit display.

Specs & Ordering Info

ISO9001:2000
CERTIFIED SUPPLIER



Operating temp: 32 to 122°F (0 to 50°C) **DO probe:** galvanic probe

Catalog number	KH-35632-02	KH-35632-00	KH-35632-60
Description	Meter only	Meter, DO probe, pH electrode, and	Kit*
Range	pH	-2.00 to 16.00	
	mg/L	0.00 to 20.00 ppm	
	% sat	0.0 to 199.9	
	Temp	32.0 to 122.0°F (0.0 to 50.0°C)	
Resolution	pH	0.01	
	mg/L	0.01 ppm	
	% sat	0.1	
	Temp	0.1°F (0.1°C)	
Accuracy	pH	±0.01	
	mg/L	±1.5% full-scale ppm	
	% sat	±1.5% full-scale	
	Temp	±0.5°F (±0.3°C)	
Temp compensation	Automatic from 0 to 50°C		
Display	Dual backlit LCD; select from eight brightness levels		
Power	Four AAA batteries (included)		
Battery life	100 hours continuous (backlit use decreases battery life)		
Dimensions	3½"W x 7½"H x 1¾"D		
Price			

KH-35640-60 DO meter kit includes 30-mL electrolyte solution, two replacement membrane caps, rinse bottle, and carrying case. Meter is not included

KH-35805-23 Submersible pH electrode with 10-ft cable, single junction, ABS plastic housing

KH-35640-50 Replacement DO probe with 10-ft cable

KH-35640-52 DO probe with 25-ft cable

KH-35640-54 DO probe with 50-ft cable

KH-35640-56 DO probe with 100-ft cable

KH-35640-80 Replacement membrane kit

OAKTON® Waterproof pH/Con 300 Meter

Separate pH and conductivity/TDS probes allow for greater flexibility

- Waterproof and dustproof with IP67 rating
- Dual display of pH, conductivity or TDS plus temperature

Features include automatic pH buffer recognition, auto ranging for conductivity/TDS measurements, auto-off, HOLD, and selectable temperature (°F or °C). Meter recalls previous calibration data and pH electrode slope and offset.

What's included: double-junction pH electrode 59001-70, conductivity/temperature probe 35608-50, and batteries.

Meter kit includes: meter, double-junction pH electrode 59001-70, conductivity/temperature probe 35608-50, calibration solution pouches (three each of pH 4.01, 7.00, 10.00 and two each of conductivity 447 μ S, 1413 μ S, 2764 μ S, 15,000 μ S), three rinse water pouches, sample bottle, batteries, and hard carrying case.



Specs & Ordering Info

ISO9001:2000
CERTIFIED SUPPLIER



Cond temp coefficient: adjustable from 0.0 to 10% per °C

Conductivity-to-TDS factor: adjustable from 0.4 to 1.0

Conductivity cell constant: 1.0 cm⁻¹

Operating temp: 32 to 122°F

Catalog number	KH-35631-00	KH-35631-60
Model	Meter	Kit
Range	pH	-2.00 to 16.00
	Con	0.0 to 19.99, 0 to 199.9, 0 to 1999 μ S; 0 to 19.99, 0 to 199.9 mS
	TDS	0.00 to 9.99, 10.0 to 99.9, 100 to 999 ppm; 1.00 to 9.99, 10.0 to 99.9, 100 to 200 ppt
	Temperature	32.0 to 212.0°F (0.0 to 100.0°C)
Resolution	pH	0.01
	Con	0.01, 0.1, 1 μ S; 0.01, 0.1 mS
	TDS	0.01, 0.1, 1 ppm; 0.01, 0.1, 1 ppt
Accuracy	Temperature	±0.5°C or °F
	pH	±0.01
	Con	±1% full-scale
Calibration	TDS	±1% full-scale
	Temperature	±0.5°C or °F
	pH	Up to 5 points (1.68, 4.01, 7.00, 10.01, and 12.45)
	Con	Up to 5 points (one point per range)
Temp compensation	TDS	Up to 5 points (one point per range)
	Temperature	Offset 0.1°C/°F increments
Display	Automatic or manual	
Power	Dual LCD shows reading plus temperature	
Dimensions	Four AAA batteries (included)	
Price	3½"W x 7½"H x 1¾"D	

KH-59001-70 Replacement combination pH electrode, double junction, gel-filled. Epoxy body, BNC connector, 3-ft cable

KH-35608-50 Replacement conductivity/temperature probe, with built-in ATC element, 3-ft cable

KH-35630-69 Calibration kit. Includes calibration solution pouches (three each of pH 4.01, 7.00, 10.00 and two each of conductivity 447 μ S, 1413 μ S, 2764 μ S, 15,000 μ S), three rinse water pouches, sample bottle, and hard carrying case

KH-35805-24 pH electrode, double junction, gel-filled; epoxy body, BNC connector, 10-ft cable

KH-35608-57 Conductivity/temperature probe; K = 1.0, with built-in ATC element, 16-ft cable

pH/Ion Meters **pH**

Handheld

OAKLON® Waterproof pH 600 Meters

Expanded range, resolution, and accuracy, plus increased memory and advanced communications!

- No more excuses for missing data! Out-of-date or unperformed calibrations are now things of the past!
- Don't waste time looking for those cables!
- Use in dirty and wet environments

These waterproof handheld meters feature a -2.00 to 19.99 pH range expandable to 0.001 pH resolution. Combined with accuracies up to ±0.002 pH, these meters provide a new benchmark in our pH meter line.

Store up to 500 data sets in the meter's memory. Time-and-date stamping meets Good Laboratory Practice (GLP) standards.

The pH 600 meters offer the latest in pH calibration capabilities including up to six calibration points, a user-settable "calibration due" alarm, and up to 15 buffer options with auto-buffer recognition of USA, NIST, DIN, and PWB standards.

The infrared IrDA wireless technology makes PC downloading more convenient and easier. Dual powerup allows you to use batteries while out in the field or the optional AC power adapter while in the lab.

As always, our waterproof meters are IP67 rated for both dust and water intrusion, even with no probes attached.

pH 600 meter measures pH with a 0.01 maximum resolution.

pH 610 meter measures pH with a 0.001 maximum resolution.

pH 620 meter measures pH or ISE with 0.001 maximum resolution.

Meter includes: data management software and batteries.



35418-12

Great in the lab!

Great in the field!

Meter with probe(s) add: "All-in-one" pH electrode with built-in ATC (single-junction, epoxy body, 2.5-ft cable, BNC connector).

Meter kit further adds: pH buffer solutions, protective rubber boot, and hard carrying case.

Specifications



Model	pH 600 meter	pH 610 meter	pH 620 meter
Parameters	pH/mV/°C	pH/mV/°C	pH/mV/ISE/°C
Range	-2.00 to 19.99	-2.000 to 19.999	-2.000 to 19.999
	±2000	±2000	±2000
	—	—	0.001 to 19,900 ppm, molar, or mg/L
Resolution	14 to 230°F (-10 to 110°C)	14 to 230°F (-10 to 110°C)	14 to 230°F (-10 to 110°C)
	0.1/0.01	0.1/0.01/0.001	0.1/0.01/0.001
	0.1	0.1	0.1
	—	—	2 or 3 digits
Accuracy	0.1°F to 199.9°F; 1.0°F from 200 to 230°F (0.1°C)	0.1°F to 199.9°F; 1.0°F from 200 to 230°F (0.1°C)	0.1°F to 199.9°F; 1.0°F from 200 to 230°F (0.1°C)
	±0.01	±0.002	±0.002
	±0.2	±0.2	±0.2
	—	—	0.5% FS (monovalent); 1% FS (divalent)
	±0.9°F (±0.5°C)	±0.9°F (±0.5°C)	±0.9°F (±0.5°C)
Temperature compensation	Automatic or manual, 0 to 100°C		
Calibration	Up to 6 points		
Buffer recognition	USA: 1.68, 4.01, 7.00, 10.01, 12.45; NIST: 1.68, 4.01, 6.86, 9.18, 12.45; DIN: 1.09, 3.06, 4.65, 6.79, 9.23, 12.75; PWB: 4.10, 6.97		
Datalogging capabilities	500 data sets with GLP time-and-date stamping		
Output	IrDA/RS-232C		
Display	Dot-matrix LCD with backlighting		
Power	Four AA batteries (included) or optional universal AC adapter		
Dimensions	3¼"W x 7¼"H x 2¼"D	3¼"W x 7¼"H x 2¼"D	3¼"W x 7¼"H x 2¼"D

Ordering Information

Catalog number	Model	Description	Price
KH-35418-02	pH 600	Meter only	
KH-35418-00		Meter with probe	
KH-35418-70		Meter kit	
KH-35418-12	pH 610	Meter only	
KH-35418-10		Meter with probe	
KH-35418-80		Meter kit	
KH-35418-22	pH 620	Meter only	
KH-35418-20		Meter with probe	
KH-35418-90		Meter kit	

Accessories

KH-35816-71 "All-in-One" pH electrode with built-in ATC; single junction, epoxy body, 2.5-ft cable with BNC connector

KH-35816-72 "All-in-One" pH electrode with built-in ATC; double junction, epoxy body, 2.5-ft cable with BNC connector

KH-35805-23 Submersible pH electrode; single-junction, ABS plastic housing, BNC connector, 10-ft cable

KH-35418-05 ATC probe. Use for temperature compensation with any pH electrode without built-in ATC

KH-35418-83 Optional adapter, 110/220 VAC

KH-09376-01 Batteries; AA. Pack of 4

pH

pH/Ion Meters

Handheld




35431-02

OAKLON® Waterproof pH/CON and pH/DO 650 Meters

Top-of-the-line dual-parameter meters offer features typically found on much more expensive models!

- Simultaneously measure your choice of pH, mV, or ISE and conductivity or dissolved oxygen
- Datalogging of up to 500 data points with GLP compliance
- Wireless IrDA communication for truly waterproof interfacing capabilities

These 650 meters feature user-selectable "calibration due" alarms, automatic or manual standards recognition, and single or multiple calibration points—providing flexibility in meeting your quality objectives. The large backlit LCD shows the measured value, measured units, temperature, time, battery life, and menu options. Infrared (IrDA) wireless technology lets you easily download data without any additional cables.

Both meters measure pH and ISE with a 0.001 maximum resolution. The PC 650 also measures conductivity, TDS, salinity, or resistivity using either a 2- or 4-electrode conductivity cell. The PD 650 also measures oxygen saturation and concentration using a galvanic dissolved oxygen probe.

Meter includes: data management software, probe holder, and batteries.

PC 650 meter with probe(s) adds: a double-junction pH electrode and a 4-electrode (K = 0.3) conductivity cell.

PC 650 meter kit further adds: pH buffer solutions, conductivity standards, protective rubber boot, and hard carrying case.

PD 650 meter with probe(s) adds: a double-junction pH electrode and a dissolved oxygen probe with 25-ft cable.

PD 650 meter kit further adds: pH buffer solutions, electrolyte solution, protective rubber boot, and hard carrying case.

Specifications



Model	PC 650 meter	PD 650 meter
Parameters	pH/mV/ISE/conductivity/TDS/salinity/resistivity/°C	pH/mV/ISE/dissolved oxygen/°C
Range	pH: -2.000 to 19.999 mV: ±2000 ISE: 0.001 to 19,900 ppm, molar, or mg/L Conductivity: 0 to 500 mS TDS: 0 to 200 ppm (TDS factor dependent) Salinity: 80 ppt Resistivity: 0 to 20,000 M μ Dissolved oxygen: — Barometric pressure: — Temperature: 14 to 230°F (-10 to 110°C)	pH: -2.000 to 19.999 mV: ±2000 ISE: 0.001 to 19,900 ppm, molar, or mg/L Conductivity: — TDS: — Salinity: — Resistivity: — Dissolved oxygen: 0 to 600%/ 90 mg/L Barometric pressure: 450 to 825 mm Hg Temperature: 14 to 230°F (-10 to 110°C)
Resolution	pH: 0.1/0.01/0.001 mV: 0.1 ISE: 2 or 3 digits Conductivity: 0.05% full-scale TDS: 0.05% full-scale Salinity: — Resistivity: — Dissolved oxygen: — Barometric pressure: — Temperature: 0.1°F to 199.9°F; 1.0°F from 200 to 230°F (0.1°C)	pH: 0.1/0.01/0.001 mV: 0.1 ISE: 2 or 3 digits Conductivity: 0.05% full-scale TDS: 0.05% full-scale Salinity: 0.05% full-scale Resistivity: 0.05% full-scale Dissolved oxygen: 0.1%, 0.01 mg/L Barometric pressure: 1 mm Hg Temperature: 0.1°F to 199.9°F; 1.0°F from 200 to 230°F (0.1°C)
Accuracy	pH: ±0.002 mV: ±0.2 ISE: 0.5% FS (monovalent); 1% FS (divalent) Conductivity: ±1% full-scale TDS: ±1% full-scale Salinity: — Resistivity: — Dissolved oxygen: — Barometric pressure: — Temperature: ±0.9°F (±0.5°C)	pH: ±0.002 mV: ±0.2 ISE: 0.5% FS (monovalent); 1% FS (divalent) Conductivity: ±1% full-scale TDS: ±1% full-scale Salinity: ±1% full-scale Resistivity: ±1% full-scale Dissolved oxygen: ±2%, ±0.2 mg/L Barometric pressure: ±1% Temperature: ±0.9°F (±0.5°C)
Temperature compensation	Automatic or manual, 0 to 100°C	Automatic or manual, 0 to 100°C
Conductivity temp compensation	Linear and pure	—
pH calibration	Up to 6 points	Up to 6 points
pH buffer recognition	USA: 1.68, 4.01, 7.00, 10.01, 12.45; NIST: 1.68, 4.01, 6.86, 9.18, 12.45; DIN: 1.09, 3.06, 4.65, 6.79, 9.23, 12.75, PVWB: 4.10, 6.97	—
Conductivity standard recognition	Automatic or manual, single or multipoint	—
Temperature coefficient	0 to 10.0%/°C	—
Conductivity-to-TDS factor	0.4 to 1.0	—
Dissolved oxygen salinity correction	—	0 to 45 ppt
Datalogging capabilities	500 data sets with GLP	
Output	IrDA/RS-232C	
Display	Dot-matrix LCD with backlighting	
Power	Four AA batteries (included) or optional universal AC adapter	
Dimensions	3¼"W x 7¼"H x 2¼"D	

Ordering Information

Catalog number	Model	Description	Price
KH-35431-02	PC 650	Meter only	
KH-35431-00		Meter with probes	
KH-35431-70		Meter kit	
KH-35432-02	PD 650	Meter only	
KH-35432-00		Meter with probes	
KH-35432-70		Meter kit	

Accessories

KH-35816-71 "All-in-One" pH electrode with built-in ATC; single junction, epoxy body, 2.5-ft cable with BNC connector

KH-35805-23 Submersible pH electrode; single-junction, ABS plastic housing, BNC connector, 10-ft cable

KH-35418-05 ATC probe. Use for temperature compensation with any pH electrode without built-in ATC

KH-35408-50 Conductivity cell, 2-electrode, K = 0.1

KH-35408-52 Conductivity cell, 2-electrode, K = 1

KH-35408-54 Conductivity cell, 2-electrode, K = 10

KH-35408-56 Conductivity cell, 4-electrode, K = 0.3

KH-35640-50 DO probe with 10-ft cable

KH-35640-52 DO probe with 25-ft cable

KH-35640-54 DO probe with 50-ft cable

KH-35640-56 DO probe with 100-ft cable

KH-35640-80 Replacement membrane kit; two membrane caps and one bottle of electrolyte solution

KH-35418-83 Optional adapter, 110/220 VAC

KH-09376-01 Replacement batteries; AA. Pack of 4

pH/Ion Meters **pH**

Handheld

Thermo Portable pH Meter

ELECTRON CORPORATION

Rugged, low-cost handheld pH meter

Affordable portable pH meter features simple four-button operation, a splashproof keypad, and a protective rubber boot for routine measurements in the field. For laboratory use, the boot doubles as a benchtop stand. The large LCD provides easy viewing of units of measure or error codes. Three-button calibration with auto-buffer recognition allows you to choose US, NIST, or pure low-ionic pH buffers standards.

What's included: protective rubber boot/stand and batteries. Model 58822-22 also includes gel/epoxy pH electrode and ATC probe. Model 58822-24 also includes the 3-in-1 gel/epoxy electrode.



58822-22

New**MYRON L Waterproof Cup-Style pH Meters**

Easy to use—simply fill the cell cup and push a button!

- One-, two-, or three-point calibration
- Manual or automatic temperature compensation

These low-cost meters incorporate features typically found in more expensive models—yet they're surprisingly easy to use. Just add sample to the built-in sample cup and take a reading. You can manually enter temperature compensation value or program meters to compensate automatically. Meters feature built-in, self-maintaining electrodes.

Model 19401-05 is an economical pH/temperature meter with a splashproof IP54-rated case.

Model 19401-22 measures pH, mV, conductivity, total dissolved solids (TDS), resistivity, and temperature. It features TDS-conductivity conversion curves for NaCl, 442, and KCl standards stored in memory; or calibrate meter using your own values. Easily store and recall up to 100 measurements with time-and-date-stamp. Nonvolatile memory retains all data; can be downloaded via UDock™ accessory package sold separately below. Meters are sealed in an IP67 waterproof housing—submersible in water up to 3 feet, plus it floats.



19401-05

New

19401-22

Specifications & Ordering Information

Catalog number		KH-58822-22	KH-58822-24
Description		Meter with pH electrode and ATC probe	Meter with 3-in-1 pH electrode
Range	pH	0.00 to 14.00	
	mV	±1000	
	Temp, °C	0.0 to 100.0	
Resolution	pH	0.01	
	mV	1	
	Temp, °C	0.1	
Accuracy	pH	±0.01	
	mV	±2	
	Temp, °C	±0.5	
Temperature compensation		Auto/manual	
pH calibration		Up to 3 points	
Buffer recognition		USA: 4.01, 7.00, 10.01; NIST: 4.01, 6.86, 9.18; Pure low-ionic: 4.10, 6.97	
Datalogging capabilities		None	
Output		None	
Display		Custom LCD	
Power		Four AAA batteries (included)	
Battery life		>200 hours	
Dimensions		6 ¹ / ₈ "W x 3 ³ / ₈ "H x 1 ⁵ / ₈ "D	
Price			

KH-58822-90 Replacement pH electrode; gel-filled, epoxy body, BNC connector

KH-58822-92 Replacement 3-in-1 pH electrode; gel-filled, epoxy body, BNC connector

KH-58822-94 Replacement ATC probe, stainless steel for use with 58822-90

Technical info**3-in-1 pH electrodes**

A 3-in-1 pH electrode combines a combination electrode (reference half-cell and sensing half-cell) with a temperature sensor in one convenient probe. The advantage is that you don't need a separate temperature probe to have automatic temperature compensation capability. On the downside, a 3-in-1 pH electrode has a slower temperature response than a separate temperature probe.

Specifications & Ordering Information

Operating temperature: 32 to 122°F (0 to 50°C)

Max. sample size: 6.2 mL

Catalog number		KH-19401-05	KH-19401-22
Range	pH	0 to 14.00	0 to 14.00
	mV	—	±999
	Conductivity	—	0 to 200 autoranging
	TDS	—	0 to 200
	Resistivity	—	10 to 100, 100 to 1000 kΩ; 1 to 30 MΩ
	Temperature	32 to 160° (0 to 71°C)	
Resolution	pH	0.01	
	mV	1	
	Conductivity	—	0.01, 0.1, 1.0 μS; 0.01 mS
	TDS	—	0.01, 0.1, 1.0 ppm; 0.01 ppt
	Resistivity	—	0.01, 0.1, 10, 100, 1000 KΩ
	Temperature	0.1°F (0.1°C)	
Accuracy	pH	±0.01 pH	
	mV	—	±1 mV
	Conductivity	—	±1% of reading
	TDS	—	±1% of reading
	Resistivity	—	±1%
	Temperature	±0.1°F (±0.1°C)	
Temp compensation		Automatic 0 to 71°C; adjustable 0 to 9.99% per °C	
Calibration		One, two, or three points	
Display		3-digit LCD	4-digit LCD
Power		One 9 V battery (included)	
Battery life		>100 hours	
Dimensions		2 ¹ / ₂ "W x 7 ¹ / ₂ "H x 2 ³ / ₁₆ "D	
Price			

KH-19401-50 Replacement pH/ORP sensor

KH-19401-30 uDock accessory package, transfers data to computer. Includes docking station, USB cable, and software

K-09376-04 Replacement batteries, 9 V. Pack of 4

pH

pH/Ion Meters

Handheld



58822-02

Thermo Orion® Star Series™ Portable Meters

ELECTRON CORPORATION

Combine simple three-button operation with exceptional performance

- Rugged design is well-suited for both lab and field applications
- Bright backlit LCD is easy to read in various lighting conditions
- Quick-Start guide encourages intuitive and efficient operation

Turn the unit on, calibrate, and measure with only three main buttons—operation couldn't be simpler! The convenient Quick-Start guide will help you get started and provides support while in use. Smart Stability™ and Smart Averaging™ automatically optimize the measurement process to ensure accurate results. Star series meter offer a full complement of GLP-related features including datalogging with time/date stamp, electrode verification, and optional 21 CFR Part 11 software. You can record and store up to 10 setup parameters and calibrations. Download additional methods and software updates via the web.

Meters feature automatic or manual pH calibration, auto-buffer recognition of US/NIST and DIN buffers, advanced self-tests and self-diagnostics, and RS-232 or optional USB connectivity.

Meters include: Quick-Start guide and four AA batteries.

3-Star meter kits include: waterproof Triode™ pH/ATC electrode, 10 single-use pouches of pH 7.00 buffer, Quick-Start guide, hard carrying case, and four AA batteries.

4-Star meter kits include: waterproof Triode™ pH/ATC electrode, 10 single-use pouches of pH 4.01, 7.00 and 10.00 buffer each, five 60-mL bottles of pH storage solution, Quick-Start guide, hard carrying case, and four AA batteries.

Specifications & Ordering Information



Ambient operating conditions: 5 to 45°C; 5 to 85% RH, noncondensing

Catalog number		KH-58822-02	KH-58822-12	KH-58822-04	KH-58822-14
Model		3-Star meter only	3-Star meter kit	4-Star meter only	4-Star meter kit
Parameters		pH/°C		pH/mV/ISE/°C	
Range	pH	-2.000 to 19.999 or 0 to 14 in aqueous solutions		-2.000 to 19.999 or 0 to 14 in aqueous solutions	
	mV	±1999.9		±1999.9	
	Concentration	—		0 to 19,990	
	Temperature	-5.0 to 105.0°C		-5.0 to 105.0°C	
Resolution	pH	0.1/0.01/0.001		0.1/0.01/0.001	
	mV	0.1		0.1	
	Concentration	—		3 significant digits	
	Temperature	0.1°C up to 99.9°C; 1.0°C over 99.9°C		0.1°C up to 99.9°C; 1.0°C over 99.9°C	
Accuracy	pH	±0.002		±0.002	
	mV	±0.2 mV or 0.05%, whichever is greater		±0.2 mV or 0.05%, whichever is greater	
	Concentration	—		±0.2 mV or 0.05%, whichever is greater	
	Temperature	±0.1°C		±0.1°C	
Temperature compensation		Automatic/manual		Automatic/manual	
Calibration		pH: up to five; mV: one		pH/ISE: up to five; mV: one	
Buffer recognition		US/NIST, DIN, and custom		US/NIST, DIN, and custom	
Datalogging capabilities		200 data points with time/date stamp		200 data points with time/date stamp	
Software, 21 CFR Part 11		Not compatible		Optional	
Output		Waterproof bidirectional RS-232, optional USB interface cable		Waterproof bidirectional RS-232, optional USB interface cable	
Display		Backlit LCD; single parameter plus temperature		Backlit LCD; dual parameter plus temperature	
Power		Four AA alkaline batteries (included), 2000 hrs operation		Four AA alkaline batteries (included), 2000 hrs operation	
Dimensions		9"L x 3 3/4"W x 1 3/4"H		9"L x 3 3/4"W x 1 3/4"H	
Price					

Accessories

KH-58822-30 Replacement waterproof Triode™ pH probe, BNC/mini-DIN locking ATC

KH-58822-35 Software for 4-Star meters; 21 CFR, Part 11

KH-58822-40 RS-232 cable for computer and printer

KH-58822-45 Cable adapter from RS-232 to USB

KH-58823-52 Electrode stand for portable meters

KH-53101-72 Soft-sided case

KH-53101-73 Protective jacket. Impact-resistant, with electrode storage sleeves

KH-09376-01 Replacement batteries, AA. Pack of 4

KH-35653-04 Buffer pouch assortment pack; contains five pouches each of pH 4, 7, and 10 buffers and rinse solution

GO to page(s) 284, 1035, 1080–1081, and 2032

For additional Orion Star Series meters, cells, and accessories.



Pinnacle Waterproof pH/mV Meter

Graphic, alphanumeric LCD display

- Store multiple sets of readings in nonvolatile memory
- Ultrasonically sealed

Pinnacle 313 meter works virtually anywhere for fast and easy measurements. Meter comes ultrasonically sealed in an IP67-rated waterproof housing submersible in water up to 1 meter. Use meter with any BNC electrode, or to ensure a complete waterproof system use meter with IP67-rated pH electrode 58904-54. Meter features storage for 10 sets of readings in nonvolatile memory, and is also available in a convenient kit.

Meter includes:
wrist strap and batteries.

Meter kit adds: electrode 58905-54 and buffers.



58904-02

New

Specifications

Slope control: 85 to 105%

Operating conditions: 41 to 104°F (5 to 40°C), 5 to 80% RH

Model		Pinnacle 313
Range	pH	0 to 14.00
	mV	±1999
	Temperature	0 to 100.0°C
Resolution	pH	0.01
	mV	1
	Temperature	0.1°C
Accuracy	pH	±0.01
	mV	±1
	Temperature	±0.2°C
Temperature compensation	Manual or automatic from 0 to 100.0°C	
Calibration	One or two points	
Buffer recognition	Automatic at three buffer sets	
Datalogging capabilities	10 data sets	
Output	None	
Display	LCD	
Power	Four AA batteries (included)	
Battery life	1000 hours (approx)	
Dimensions	3 1/4"W x 7 3/4"H x 1 3/4"D	

ISO9001:2000
CERTIFIED SUPPLIER

CE 2 year warranty

Ordering Information

Catalog number	Model	Description	Price
KH-58904-00	Pinnacle 313	Meter only	
KH-58904-02		Meter kit	

Accessories

[KH-58904-78](#) "Three-in-one" pH/reference/temperature electrode with replaceable junction. BNC connector

[KH-58904-54](#) pH electrode, gel-filled junction; IP67 rated; 6-ft cable

[KH-19450-70](#) Hard rubber carrying case

INNOCAL[®]
INNOVATIVE CALIBRATION SOLUTIONS

Ensure the accuracy of your pH meter

[KH-17106-20](#) NIST-traceable pH certificate, with before and after test data at five pH test points (2, 4, 7, 10, 12 pH) and five mV test points across range

NIST TRACEABLE

Horiba® D-Series Waterproof pH Meters

User-friendly diagnostics check battery voltage, temperature, calibration, and display

- Error code display provides convenient troubleshooting
- Store up to 300 sets of readings with date and time
- Automatic buffer recognition at five buffer values

These pH meters are designed for simple operation. With autocalibration and one-button measurement function, users at any level can operate this meter. Self-diagnostic function ensures reliable measurement. Meter features store function and retains up to 300 readings that can be recalled on multi-line LCD. Model 58702-20 shows pH/temperature simultaneously; model 58702-30 displays pH/temperature or mV/temperature at the same time.

These waterproof meters come in an IP67 case that is submersible to one meter. Order electrode separately below.

What's included: soft case, carrying strap, and two AA batteries.



58702-30

Specs & Ordering Information

Operating temperature: 32 to 113°F (0 to 45°C)

ISO9001:2000
CERTIFIED SUPPLIER

CE

Catalog number		KH-58702-20	KH-58702-30
Model		D-51	D-52
Range	pH	0 to 14.00	
	mV	—	±1999
	Temp, °C	0 to 100.0	
Resolution	pH	0.01	
	mV	—	1
	Temp, °C	0.1	
Accuracy	pH	±0.01 pH ±1 digit	
	mV	—	±1 mV ±1 digit
	Temp, °C	±0.1°C ±1 digit	
Temp compensation	Automatic and manual from 0 to 100°C		
Calibration	One, two, or three points		
Datalogging capabilities	300 data points		
Output	None	RS-232	
Display	LCD		
Power	Two AA batteries (included)		
Battery life	Approx 60 hours		
Dimensions	3 1/8"W x 7 1/8"H x 1 5/8"D		
Price			

[KH-58702-50](#) pH electrode with ATC. Glass body, double junction, BNC connector, Waterproof to 1 m

[KH-99591-54](#) pH electrode with ATC. Polysulfone body, double junction, BNC connector

[KH-58700-70](#) ATC probe. Use with pH electrodes without a built-in temperature compensating element

[KH-99591-70](#) RS-232 cable, for 58702-30

[KH-09376-01](#) Replacement batteries, AA. Pack of 4

OAKLON® pH Solution Pack

Economical and convenient way to order everything you need to calibrate, clean, and store your pH electrodes. Pack includes one 500-mL bottle each of pH 4.01, 7.00, and 10.00 NIST-certified buffers; one 500-mL bottle of cleaning solution; and one 500-mL bottle of electrode storage solution.

[KH-05942-15](#) pH solution pack

New



pH pH/Ion Meters

Handheld



EcoSense® pH 100 pH/mV/Temp Meter

The pH meter from YSI's compact, handheld EcoSense line

- Water-resistant, splash-resistant case accommodates one-handed operation
- A variety of probe and electrode options to customize the meter for your application

The pH 100 combines low cost of ownership with a rugged, reliable design—ideal for spot sampling applications in wastewater, surface water, or aquaculture.

Designed for quick, accurate results, the pH 100 maintains an easy-to-use interface with eight input buttons. Additional features include automatic or manual temperature compensation, low-battery indicator, electrode offset recognition, and electrode efficiency display. Calibrate the instrument quickly using the meter's internal buffer recognition. Autolock mode holds stable readings on the display for easy recording.

Meter includes: one 9 V battery.

Kit includes: pH/temperature probe, one 9 V battery, and hard carrying case.



pH 100 meter 59351-00
with pH/temp probe 59351-25



Specs & Ordering Information

Operating conditions: 0 to 50°C, up to 95% relative humidity

Low-battery warning: yes

Catalog number	KH-59351-00	KH-59351-60	KH-59351-65
Description	Meter only*	Kit with probe and 1-m cable	Kit with probe and 4-m cable
Range	pH	-2 to 16	
	mV	-1999 to 1250	
	Temp, °C	-10 to 120	
Resolution	pH	0.01	
	mV	1	
	Temp, °C	0.1	
Accuracy	pH	±0.1% ±2 digits	
	mV	±0.1% ±1 digit	
	Temp, °C	±0.3°C ±2 digits	
Temp compensation	Automatic/manual from -10.0 to 120.0°C		
Calibration	Up to two points		
Buffer recognition	USA: 4.01, 7.00, 10.01; NIST: 4.00, 6.86, 9.18		
Display	LCD		
Power	One 9 V battery (included)		
Battery life	450 hours at 25°C		
Dimensions	3 1/16" W x 9 1/2" H x 2 1/8" D		
Price			

*Probes sold separately below

Probes for YSI pH 100 meter

Catalog number	Description	Cable length	Price
KH-59351-20	pH electrode	1 meter	
KH-59351-25	pH/temperature electrode; waterproof connectors	1 meter	
KH-59351-27		4 meters	
KH-59351-30	ORP electrode	1 meter	
KH-59351-40	Temperature probe	1 meter	

Accessories

KH-09376-04 Replacement batteries, 9 V. Pack of 4

Hach® Waterproof pH/mV/ISE Meters

Slip-resistant keypad responds even to gloved or wet hands

- Built-in electrode holder

sensION™ 1 pH/mV Meter has an IP67-rated waterproof housing designed for your demanding applications. More precise and intuitive than ever before, these solid-state meters feature fast electrode response, backlit LCD, automatic shut-off after 15 minutes, and display of simultaneous pH or mV readings with temperature. Select manual or automatic temperature compensation. One- or two-point calibration is easily accomplished with automatic buffer recognition at 4.01, 6.86, 7.00, and 10.01.



sensION 2 pH/mV/ISE Meter

59004-02

stores up to 99 readings and features RS-232 output. Combined with the docking station (sold separately below), the sensION 2 allows for recalling, printing, or transferring of readings via RS-232. The docking station also functions as an AC power adapter for the meter.

What's included: pH electrode, ten each of pH 4 and 7 buffer capsules, beaker, and batteries.



Specs & Ordering Information

Catalog number	KH-59004-02	KH-59004-10
Model	sensION 1	sensION 2
Range	pH	-2.00 to 19.99
	mV	-2000 to 2000
	ISE	0.000 to 19900
	Temp	-10.0 to 110°C (14 to 230°F)
Resolution	pH	0.001/0.01/0.1
	mV	0.1
	ISE	01/0.01/0.001
	Temp	0.1
Accuracy	pH	±0.002
	mV	±1 or ±0.05% of reading*
	ISE	±0.2 or ±0.05% of reading*
	Temp	±0.5% of reading
Temp compensation	Manual or automatic	
Buffer recognition	Automatic at pH 4.01, 6.86, or 7.00 and 10.01	
Datalogging capabilities	—	99 data sets
Output	—	One-way RS-232
Power	Four AA batteries	Four AA batteries or optional docking station
Battery life	—	Four months, continuous use
Price		

*Whichever is greater.

KH-59005-50 Docking station for RS-232, 110 VAC

KH-59005-55 Docking station for RS-232, 220 VAC

KH-59005-52 Replacement electrode

KH-59005-54 Gel-filled pH electrode

KH-09376-01 Replacement batteries, AA. Pack of 4

WTW® VARIO Waterproof pH Meter**Custom display inverts 180°**

- Innovative touch-screen display
- Built-in timer with alarm

The VARIO combines handheld versatility with benchtop features. A simple finger tap on the display turns on the meter, setting up the initial display and inverting it if necessary. The multi-functional display can show temperature, the measured value, and any activated special functions simultaneously. The ergonomic, nonslip rubber housing makes it robust, comfortable, and easy to control all parameters with one hand. Battery-saving feature turns off the unit after 10 minutes of nonuse.

Measurements begin automatically once the sensor is immersed in the solution. Lock-in the measurement with the hold function. Additional GLP functions include ident-number and calibration alarm. MultiCal® allows for quick buffer recognition and calibration. The memory accommodates up to 50 time-and-date stamped readings. When the meter is not taking pH readings, it doubles as a precision laboratory clock or timer with alarm.

What's included: S7- and DIN-adaptor, pH 4 and 7 buffers, and hard carrying case.



58908-00

Specifications & Ordering InformationISO9001:2000
SUPPLIER CERTIFIED**3 year warranty**
meter only

Date and time settings: yes

Low-battery warning: yes

Operating temperature: 10 to 55°C

Catalog number	KH-58908-00	KH-58908-05	KH-58908-10
Description	VARIO meter	VARIO meter with SenTix 21 electrode	VARIO meter with SenTix 41 electrode
Range	pH	-2.00 to 16.00	
	Temp	-5.0 to 100.0°C	
Resolution	pH	0.01	
	Temp	0.1°C	
Accuracy	pH	±0.01	
	Temp	±0.3°C	
Temp compensation	Manual/automatic		
Calibration	Up to three pH points		
Buffer recognition	2.00, 4.01, 7.00, 10.01; 1.68, 4.01, 6.87, 9.18		
Datalogging capabilities	Up to 50 readings with date-and-time stamp		
Display	Custom LCD		
Power	One AA battery (sold separately below)		
Battery life	1000 hours		
Dimensions	6"L x 3"W x 2"H		
Price			

Accessories

KH-58908-50 Replacement SenTix 21 electrode.
Plastic electrode body, gel electrolyte, 1-m cable

KH-58908-55 Replacement SenTix 41 electrode.
Plastic electrode body, gel electrolyte, built-in temperature sensor, 1-m cable

KH-09376-01 Batteries; AA. Pack of 4

GO to page(s) 1098

For electrodes compatible with this WTW meter, see page 1098.

WTW® Waterproof, Portable pH Meter Kit**New**

Convenient carrying/support handle doubles as meter stand for benchtop use

- Impact-resistant, rubberized housing
- Stores up to 50 readings, which can download to your computer via RS-232

Rugged shock absorbing housing makes meter virtually indestructible and meets IP67 standards. WTW waterproof meter displays pH/temperature or mV/temperature simultaneously. Readings reflect automatic temperature compensation.

What's included: NiMH rechargeable batteries, dual-voltage 110/220 VAC adapter, and neck strap.



Waterproof portable pH meter 58901-11

2 year warranty
meter only**Specifications & Ordering Information**ISO9001:2000
SUPPLIER CERTIFIED

Catalog number	KH-58901-11	
Range	pH	-2.00 to 16.00
	mV	±1250
	Temperature	-5.0 to 99.9°C
Resolution	pH	0.01
	mV	1
	Temperature	0.1°C
Accuracy	pH	±0.01, ±1 digit
	mV	±2, ±1 digit
	Temperature	±0.1, ±1 digit °C
Temp compensation	Automatic, -5 to 99.9°C	
Buffer recognition	2.00, 4.01, 7.00, 10.01; and pH 1.979, 4.008, 6.865, 9.18	
Datalogging capabilities	50 data sets	
Output	RS-232	
Display	Multi-line LCD	
Power	110/220 VAC adapter	
Battery life	Up to 1500 hrs	
Dimensions	9"L x 7 1/4"W x 3 1/2"H	
Price		

*Buffers with values of 2.00, 4.01, 7.00, 10.01 are standard US buffers. Buffers with values of 1.679, 4.008, 6.865, 9.18 are NIST buffer values.

Accessories

KH-58900-55 Waterproof combination pH electrode

with ATC, gel-filled. Plastic body, waterproof connector

KH-09376-01 Replacement batteries; AA. Pack of 4

INNOCAL®
INNOVATIVE CALIBRATION SOLUTIONS**NIST-Traceable Calibration Certificates****Ensure the accuracy of your pH meter**

Calibration to a NIST-traceable standard helps meet ISO, FDA, USDA, and EPA quality guidelines. Our ISO 17025-accredited metrology laboratory will pretest and calibrate your handheld or benchtop pH meter. The factory-trained InnoCal technicians will verify the electronic output signal of your meter and document the reading accuracy in both pH and mV units of measurement.

Service includes NIST-traceable calibration certificate, with before and after test data at five pH test points (2, 4, 7, 10, 12 pH) and five mV test points (across range).

EK-17106-20 NIST-traceable pH certificate

pH pH/Ion Meters

Handheld



New

Required System Components

- 1 Meter
- 2 Probe(s)
- 3 Cable

GO to page(s) 2030

For the new YSI® Professional Plus multiparameter for simultaneous measurement of pH/ion/conductivity/dissolved oxygen.



Professional Series pH/Ion Meter Systems

Modular meters allow configuration to your specific application

- Combine meters, probes, and cable lengths to meet your needs
- Handheld design offers menu-driven software for added convenience

Whether in the lab or in the field, these versatile meters can accommodate all of your electrochemistry measurement needs. Build your own system by ordering the meter, probe(s), and cables(s) you need without purchasing additional meters or unnecessary accessories.

Easy-to-use meters feature graphic display with detailed messages and instructions. Backlit display and keypad are ideal for low-light situations. Rugged rubberized case protects meters during use. Meters are IP67 waterproof-rated, even without the battery lid.

The single-parameter Pro10 allows you to measure temperature and your choice of pH, ORP, ammonium, chloride, or nitrate. The dual-parameter Pro1000 line allows you to measure temperature and your choice of two electrochemical parameters including DO with automatic barometric compensation and conductivity with automatic salinity compensation. All meters provide automatic temperature compensation if pH is measured.

What's included: two 1.5 V C alkaline batteries.

Pro10 meter
59352-02

ISO9001:2000
CERTIFIED SUPPLIER



3 year
warranty
Meter only

1 Specifications & Ordering Information for YSI Professional Series Meters

Catalog number	KH-59352-02	KH-59352-08	KH-59352-10	KH-59352-12	
Model	Pro10	Pro1010	Pro1020	Pro1030	
Measuring parameters	Single; pH or ISE	Dual; pH and ISE (1)	Dual; DO plus pH or ISE (1)	Dual; conductivity plus pH or ISE (1)	
Range	pH	0 to 14.00	0 to 14.00	0 to 14.00	
	ISE	±1999 mV	±1999 mV	±1999 mV	
	Conductivity	—	—	—	0 to 200 mS/cm
	TDS	—	—	—	0 to 100 g/L
	Dissolved oxygen	—	—	0 to 50 mg/L	—
	Barometer	—	—	375 to 825 mm Hg	—
	Salinity	—	—	—	0 to 70 ppt
	Temperature	-5 to 100°C	-5 to 100°C	-5 to 100°C	-5 to 100°C
Resolution	pH	0.01	0.01	0.01	
	ISE	0.1 mV	0.1 mV	0.1 mV	
	Conductivity	—	—	—	0.001 to 0.1 mS/cm
	TDS	—	—	—	4 digits
	Dissolved oxygen	—	—	0.1 or 0.01 mg/L	—
	Barometer	—	—	0.1 mm Hg	—
	Salinity	—	—	—	0.01 ppt
	Temperature	0.01°C	0.01°C	0.01°C	0.01°C
Accuracy	pH	±0.2	±0.2	±0.2	
	ISE	±20 mV	±20 mV	±20 mV	
	Conductivity	—	—	—	±0.5% of reading or ±0.001 mS/cm
	Dissolved oxygen	—	—	±2% of reading or ±0.2 mg/L	—
	Barometer	—	—	±3 mm Hg within ±15°C temp range from calibration point	—
	Salinity	—	—	—	±1% of reading or ±0.1 ppt
	Temperature	±0.15°C	±0.15°C	±0.15°C	±0.15°C
Temperature compensation	Automatic, -5 to 100°C (pH only)				
Buffer recognition	USA: 4.01, 7.00, 10.01; NIST: 4.00, 6.86, 9.18				
Display	Four-line backlit LCD				
Power	Two C alkaline batteries (included)				
Battery life	300 to 1000 hours depending on model and configuration				
Dimensions	3 1/4"W x 8 1/2"H x 2 1/4"D				
Price					

2 Probes for YSI Professional Series Meters*

Cat. no.	Description	Price
KH-59352-20	pH	
KH-59352-22	ORP	
KH-59352-24	pH/ORP combination	
KH-59352-26	Ammonium ISE	
KH-59352-28	Chloride ISE	
KH-59352-30	Nitrate	
KH-59352-32	Galvanic DO	
KH-59352-34	Polarographic DO	

*Conductivity probe is included with cables for Pro1030 meter.

3 Cables for YSI Professional Series Meters

All cables include a temperature probe.
Cables for Pro1030 meter also include a conductivity probe.

Compatible with meter	Pro10		Pro1010		Pro1020		Pro1030	
	Catalog number	Price	Catalog number	Price	Catalog number	Price	Catalog number	Price
Cable length								
4 m	KH-59352-36		KH-59353-60		KH-59352-64		KH-59352-72	
10 m	KH-59352-38		KH-59353-62		KH-59352-66		KH-59352-74	
20 m	KH-59352-40		KH-59353-64		KH-59352-68		KH-59352-76	
30 m	KH-59352-42		KH-59353-66		KH-59352-70		KH-59352-78	

pH/Ion Meters pH

Handheld / Benchtop

WTW® Waterproof pH Meter Kits

Includes professional transport case which functions as a mobile lab—complete with all calibration and maintenance supplies

- Store and recall up to 800 results via the built-in datalogger
- Rugged housing withstands drops from 1 meter

These waterproof meter kits are designed for rugged environmental conditions and convenience. Waterproof meters meet IP67 standards—wash or submerge meters in water. Meters offer convenience through its simultaneous display of pH or mV with temperature, choice of automatic or manual temperature compensation, up to 3 point calibration with automatic buffer recognition at eight buffer values. Models 58889-21 also features an RS-232 and analog output—send results to a computer or printer for further analysis.

What's included: waterproof electrode with ATC; 50 mL each of pH 4 and 7 buffers; storage solution; electrode stand; beaker; batteries; and hard carrying case.



Waterproof meter kit 58889-21 includes everything you need to take pH measurements.



OAKION® Wall-Mount pH and ORP Meters

Save valuable benchtop space

- Bright red, three-digit LED display is easy to read from a distance
- Easy-to-use, low-cost systems provide months of carefree continuous monitoring



Meters display values continuously when connected to AC power. Units include a long-lasting double-junction pH or ORP electrode with 3 1/2-ft cable.

pH Meter features three-point calibration at pH 4, 7, and 10. Auto buffer recognition automatically identifies correct pH buffer for rapid calibration.

ORP Meter offers mV offset calibration, adjustable to ± 100 mV.

Specifications & Ordering Information

ISO9001:2000
SUPPLIER CERTIFIED



Operating temperature:
32 to 122°F (0 to 50°C)

Input connector: BNC plug

Catalog number	KH-35623-00	KH-35623-05	KH-35649-00	KH-35649-05
Description	Wall-mount pH		Wall-mount ORP	
Range	0.0 to 14.0 pH		0 to 995 mV	
Resolution	0.1 pH		5 mV	
Accuracy	± 0.1 pH		± 5 mV	
Temp compensation	None			
Calibration	Three points (4, 7, and 10 pH) auto buffer recognition		Offset ± 100 mV	
Power*	110 VAC	220 VAC	110 VAC	220 VAC
Dimensions	3 1/2" L x 3 1/2" W x 1 1/4" H			
Price				

*9 VDC via built-in AC adapter.

KH-59001-70 Replacement pH probe: double junction, gel-filled, epoxy body

KH-59001-77 Replacement ORP probe: double junction, gel-filled, epoxy body

Specs & Ordering Info

ISO9001:2000
CERTIFIED SUPPLIER



Catalog number	KH-58889-00	KH-58889-21
Range	pH	-2.000 to 19.999, -2.00 to 19.99
	mV	± 999.9 mV, ± 1999 mV
	Temp, °C	-5.0 to 105.0
Resolution	pH	0.001, 0.01
	mV	0.1, 1
	Temp, °C	0.1
Accuracy	pH	± 0.005
	mV	± 0.3
	Temp, °C	± 0.1
Temp compensation	Manual, automatic from -5.0 to 105.0°C	
Buffer recognition*	Manual, automatic at pH 2.00, 4.01, 7.00, 10.01; and pH 1.679, 4.008, 6.865, 9.18	
Output	None	RS-232 and 50 to 60 mV/pH
Display	5 1/2-digit LCD	
Power	Four AA batteries	Optional 110/220 VAC adapter/charger or four AA batteries
Battery life	3000 hours	
Dimensions	3 3/8" W x 6 3/4" H x 1 1/2" D	
Price		

*Buffers with values of 2.00, 4.01, 7.00, 10.01 are standard US buffers. Buffers with values of 1.679, 4.008, 6.865, 9.18 are NIST buffer values.

KH-58900-55 Replacement waterproof combination pH electrode with ATC, gel-filled. Plastic body, waterproof connector

KH-58889-60 Adapter, 110/220 VAC

KH-09376-01 Replacement batteries, AA. Pack of 4

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For Wide-Vue Panel Mount pH meters.



pH pH/Ion Meters

Benchtop

Pinnacle Scholar pH Bench Meter

Simple setup and operation

- Ideal for all levels of pH meter users

You won't find a pH meter easier to operate than this! With a three-button tactile keypad, this Scholar pH meter performs pH measurements quickly and easily. Large display features simultaneous readings of pH and temperature. If an error occurs, a graphic icon appears on the display. Functions include a manual freeze and self diagnostic test. Housing is splash and chemical resistant.

What's included: general-purpose refillable electrode, storage bottle, and power adapter.



58905-06

ISO9001:2000
CERTIFIED SUPPLIER



Specs & Ordering Info

Catalog number	KH-58905-06		KH-58905-08	
Range	pH	0.00 to 14.00		
	Temp	0 to 100°C		
Resolution	pH	0.01		
	Temp	1°C		
Accuracy	pH	±0.02		
	Temp	±1°C		
Temp compensation	Manual: set at 25°C; automatic: 0 to 100°C			
Calibration	Two point			
Buffer recognition	Automatic			
Display	LCD			
Power	110 VAC		220 VAC	
Dimensions	9"L x 7"W x 3"H			
Price				

KH-58905-75 Replacement electrode; glass body, refillable, no ATC

KH-58905-60 3-in-1 electrode; epoxy body, refillable

KH-58905-80 Electrode fill solution; 3M KCl, 125 mL. Case of six

OAKLON® pH Tutor Benchtop Meter

Easy-to-use meter doesn't sacrifice technology or reliability

- One of the most economical benchtop meters available
- Ideal for quick, simple pH measurements



35619-30

Whether you need quick checks in the classroom or laboratory, the pH Tutor provides microprocessor-based technology for fast, accurate readings. The large, dual LCD shows pH measurement and temperature results simultaneously.

Simple push-button keypad allows access to a variety of features, including HOLD, ATC, and electrode diagnostics. The quick reference card, located beneath the meter, slides out for easy reference and keeps procedures handy at all times.

What's included: refillable, epoxy-body combination pH electrode and 110-VAC power adapter.

Specifications & Ordering Info

ISO9001:2000
CERTIFIED SUPPLIER

CE 3 year
warranty
meter only

Input impedance: 10¹² Ω

Operating temperature: 0 to 50°C

Slope control: 80 to 120%

Catalog number	KH-35619-30	
Range	pH	0 to 14
	Temperature	0 to 100°C
Resolution	pH	0.01
	Temperature	0.1°C
Accuracy	pH	±0.01
	Temperature	±0.3°C
Temp compensation	Manual/automatic	
Calibration	Up to three pH points	
Buffer recognition	USA or NIST	
Display	Dual LCD with mode annunciators	
Power	110 VAC	
Dimensions	9"L x 7"W x 2 ³ / ₈ "H	
Price		

Accessories

KH-35811-71 "All-in-One" combination pH electrode with built-in temperature compensation element, epoxy-body, single-junction, gel-filled. 3-ft cable, BNC connector

KH-35613-05 ATC probe, SS

KH-05992-30 Replacement combination pH electrode

KH-35617-50 Electrode holder. Flexible arm moves electrode side to side or up and down. Weighted 6"-diameter base with 360° pivot capability

INNOCAL®
INNOVATIVE CALIBRATION SOLUTIONS

NIST-Traceable pH Calibration Certificates



Ensure the accuracy of your pH meter!

Calibration to a NIST-traceable standard helps meet ISO, FDA, USDA, and EPA quality guidelines. Our ISO 17025-accredited metrology laboratory will pretest and calibrate your handheld or benchtop pH meter. The factory-trained InnoCal technicians will verify the electronic output signal of your meter and document the reading accuracy in both pH and mV units of measurement.

Service includes NIST-traceable calibration certificate with before and after test data at five pH test points (2, 4, 7, 10, 12 pH) and five mV test points (across range).

EK-17106-20 NIST-traceable pH certificate

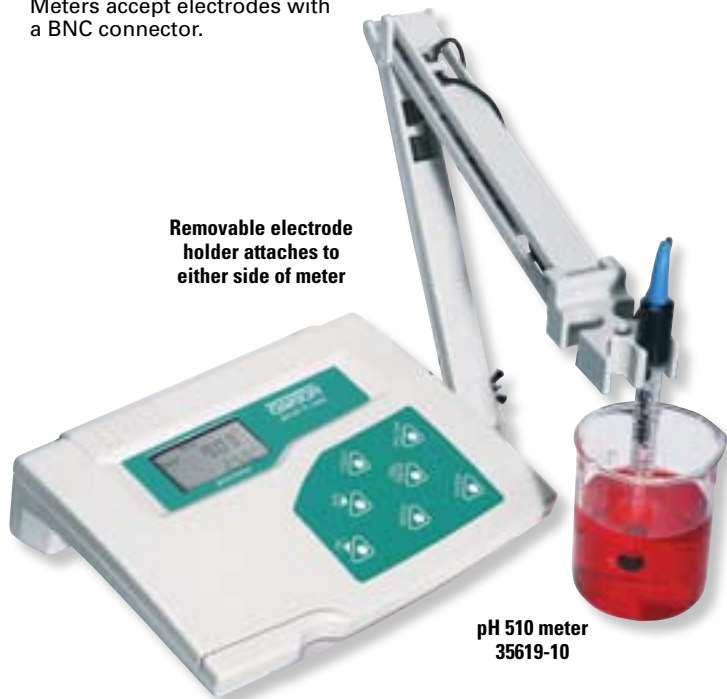


OAKTON® Benchtop pH 510 and Ion 510 Meters**Advanced features at an economical price!**

- Store and recall 50 readings in memory
- Feature a simple push-button keypad—ideal for use in the lab or plant

These easy-to-use, microprocessor-based meters feature HOLD, ATC, recorder output, and electrode diagnostics. The convenient pull-out quick reference card keeps procedures handy at all times. The large, dual-display LCD provides excellent visibility—even from a distance. Meters accept electrodes with a BNC connector.

Removable electrode holder attaches to either side of meter



**pH 510 meter
35619-10**

pH 510 Meter measures pH, temperature, and relative mV. Automatic temperature compensation (ATC) maintains reading accuracy even with fluctuating temperatures. Three-point pH calibration, with automatic buffer recognition for both USA (pH 4.01, 7.00, 10.01) and NIST (pH 4.01, 6.86, 9.18) pH buffers, makes for easy calibration no matter which requirement you need to meet. Create hard copies of your data by using the recorder output.

Specifications & Ordering Information

Slope control: 80 to 120% **Input impedance:** $>10^{12} \Omega$ **Operating temperature:** 0 to 50°C

pH 510 and Ion 510 meters		
Range	pH	0.00 to 14.00 pH
	mV	± 1000 mV
	Temperature	0 to 100.0°C
Resolution	pH	0.01 pH
	mV	0.1 mV within ± 199.9 mV, 1 mV beyond ± 199.9 mV
	Temperature	0.1°C
Accuracy	pH	± 0.01 pH
	mV	0.2 mV within ± 199.9 mV, 2 mV beyond ± 199.9 mV
	Temperature	$\pm 0.5^\circ\text{C}$
Temp compensation		Manual or automatic from 0 to 100.0°C
Buffer recognition		Three points (select NIST or USA buffer sets)
Datalogging capabilities		50 data points
Output		± 1999 mV, 1 mV/mV unit
Display		Dual LCD with mode annunciators
Power		110/220 VAC
Dimensions		9"L x 7"W x 2 ³ / ₈ "H

Ion 510 meter only		
Range	Concentration	0.01 to 1999 ppm
Resolution	Concentration	0.01 ppm from 0.01 to 0.99 ppm,
		0.1 ppm from 0.1 to 199.9 ppm,
		1 ppm from 200 to 1999 ppm
Accuracy	Concentration	$\pm 5\%$ of reading

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To find a variety of ion-selective electrodes for your application.



Ion 510 meter 35619-20

Ion 510 Meter offers all the same features as our pH 510 meter plus additional ion measurement capabilities. Meter measures ion concentration with direct readout in ppm. Verify electrode operation while taking measurements with the dual ppm and mV display. Up to three ion-concentration standards (choose from 0.1, 1.0, 10.0, or 100.0 ppm) may be calibrated. The Ion 510 works with all ion-selective electrodes with BNC connectors.

ISO9001:2000 CERTIFIED SUPPLIER **CE** 3 year warranty

Catalog number	Model	Description	Price
KH-35619-02	pH 510	Meter only	
KH-35619-03	pH 510	Meter with "all-in-one" electrode	
KH-35619-23	Ion 510		
KH-35619-10	pH 510	Meter with double-junction pH electrode, ATC probe, and removable swing-arm electrode holder	
KH-35619-20	Ion 510		
KH-35619-12	pH 510	Meter with removable swing-arm electrode holder	
KH-35619-22	Ion 510		

Accessories

KH-59001-65 Combination pH electrode; single junction, gel-filled. Epoxy body, BNC connector

KH-59001-70 Combination pH electrode; double junction, gel-filled, epoxy body, BNC connector

KH-35805-04 Replacement combination pH electrode; double junction, glass body, refillable, BNC connector

KH-35613-05 Replacement ATC probe, SS

KH-17106-20 NIST-traceable calibration certificate for pH meter

pH pH/Ion Meters

Benchtop

OAKION® Benchtop pH 1100 and pH/Ion 2100 Meters

Affordable meters that meet GLP requirements!

- High 0.001 pH resolution with ± 0.002 pH accuracy
- Two-line backlit display provides clear instructions for setup and calibration
- Store and recall up to 100 sets of data—send data to a computer via the RS-232 port or to a recorder via the mV output

Meters meet GLP requirements—meters stamp all calibration and stored data with time/date. Nonvolatile memory stores up to 100 data sets to simplify documenting large volumes of critical ISE (2100 models only), pH, or mV measurements. Meters automatically calculate and display electrode slope and offset—ideal for checking electrode quality.

Manually send stable readings to your printer or PC at the touch of a button or program the meter to send automatically at user-defined intervals. Organize data files for analysis with the included Windows®-based DAS software. Quick-reference card attached to underside of meter keeps commonly used procedures readily at hand. Meters accept electrodes with BNC connections.

pH 1100 meter features selectable manual or automatic temperature compensation. Calibrate up to five points using select NIST/US standard or custom pH buffer sets. User-defined calibration alarm signals when meter requires calibration.

pH/Ion 2100 meter offers all the features of the pH 1100 plus ion concentration capabilities. Ion concentration mode directly displays readings in ppm, ppt, percent, or any other units of your choice. Customize up to five ion calibration points. See page 1296 for our most popular ion-selective electrodes.

What's included: electrode holder, software, quick-reference card, and 110/220 VAC adapter.

Electrode holder arm attaches to either side of the meter.



Backlit 20 character display shows measurements, time/date, error messages, and set-up prompts.

pH/Ion 2100 meter
35621-00

Includes a handy pull-out quick-reference card

ISO9001:2000
CERTIFIED SUPPLIER

CE 3 year warranty

Specifications & Ordering Information

Slope control: 75 to 105%

Input impedance: $>10^{12} \Omega$

Operating temperature: 0 to 50°C

Model	pH 1100		pH/Ion 2100	
Catalog number	KH-35620-22	KH-35620-20	KH-35621-02	KH-35621-00
Description	Meter only	Meter with pH electrode and ATC probe	Meter only	Meter with pH electrode and ATC probe
Range	pH	-1.000 to 14.000	-1.000 to 14.000	
	mV (Rel mV)	± 1850.0	± 1850.0	
	Concentration	—	0.001 to 19999	
	Temperature	23.0 to 221.0°F (-5.0 to 105.0°C)	23.0 to 221.0°F (-5.0 to 105.0°C)	
Resolution	pH	0.001/0.01	0.001/0.01	
	mV (Rel mV)	0.1	0.1	
	Concentration	—	0.001, 0.01, 0.1, or 1	
	Temperature	0.1°F (0.1°C)	0.1°F (0.1°C)	
Accuracy	pH	$\pm 0.002/0.01$	$\pm 0.002/0.01$	
	mV (Rel mV)	± 0.2	± 0.2	
	Concentration	—	$\pm 0.5\%$ of full scale	
	Temperature	$\pm 0.5^\circ\text{F} (\pm 0.5^\circ\text{C})$	$\pm 0.5^\circ\text{F} (\pm 0.5^\circ\text{C})$	
Calibration	pH	Up to five points (NIST, U.S. or custom)	Up to five points (NIST, U.S. or custom)	
	mV (Rel mV)	Offset up to ± 150 mV	Offset up to ± 150 mV	
	Concentration	—	Up to five custom points	
	Temperature	Offset up to $\pm 9^\circ\text{F} (\pm 5^\circ\text{C})$	Offset up to $\pm 9^\circ\text{F} (\pm 5^\circ\text{C})$	
Temperature compensation	Automatic or manual from -5 to 105°C		Automatic or manual from -5 to 105°C	
Datalogging capabilities	100 data sets		100 data sets	
Display	Backlit dot matrix, 2 x 20 characters		Backlit dot matrix, 2 x 20 characters	
Output	RS-232, ± 1850 mV		RS-232, ± 1850 mV	
Power	110/220 VAC		110/220 VAC	
Dimensions	9"L x 7"W x 2 ³ / ₈ "H		9"L x 7"W x 2 ³ / ₈ "H	
Price				

KH-35805-04 Replacement pH electrode; double junction, glass body, refillable

KH-35613-05 Replacement temperature probe, 304 SS

KH-35622-59 RS-232 printer cable; 25 pin to 9 pin, connects your printer to meter

KH-35615-09 RS-232 PC cable; 9 pin, connects meter to PC

OAKION® Benchtop pH/Conductivity/TDS 510 Meter

Easily toggle between pH, conductivity, and TDS measurements at the touch of a button!

- Separate probes to suit a variety of applications
- Conductivity and TDS autoringing chooses the best resolution for each measurement



Probe holder arm attaches to either side of the meter.

35610-10

The pH/Conductivity/TDS 510 meter features pH auto-buffer recognition, selectable °F/°C, HOLD, and water-resistant membrane keypad. Previous calibration points, electrode slope and offset, and conductivity/TDS cell constants are stored in memory for quick and easy retrieval.

What's included: a double-junction pH electrode with BNC connector, conductivity/TDS/temperature probe, electrode holder arm, and 110/220 VAC power adapter.

Specifications & Ordering Information

ISO9001:2000
CERTIFIED SUPPLIER

CE 3 year warranty
meter only

Conductivity temp coefficient:
adjustable from 0.0 to 10% per °C

Conductivity-to-TDS factor:
adjustable from 0.4 to 1.0

Conductivity cell constant:
fixed at K = 1.0 cm⁻¹

Operating temperature:
32 to 122°F (0 to 50°C)

Catalog number		KH-35610-10
Range	pH	-2.00 to 16.00 pH
	Conductivity	0.0 to 19.99, 0 to 199.9, 0 to 1999 µS; 0 to 19.99, 0 to 199.9 mS
	TDS	0.00 to 9.99, 10.0 to 99.9, 100 to 999 ppm; 1.00 to 9.99, 10.0 to 99.9, 100 to 200 ppt
	Temperature	32 to 212°F (0 to 100°C)
Resolution	pH	0.01 pH
	Conductivity	0.01, 0.1, 1 µS; 0.01, 0.1 mS
	TDS	0.01, 0.1, 1 ppm; 0.01, 0.1, 1 ppt
	Temperature	0.1°F or °C
Accuracy	pH	±0.01 pH
	Conductivity	±1% full-scale
	TDS	±1% full-scale
	Temperature	±0.5°F or °C
Calibration	pH	Up to 5 points (pH 1.68, 4.01, 7.00, 10.01 and 12.45)
	Conductivity/TDS	Up to 5 points (one point per range)
	Temperature	Offset in 0.1° increments
Temperature compensation		Automatic or manual
Display		Dual LCD shows reading plus temperature
Power		110/220 VAC
Dimensions		9"W x 2 7/8"H x 7"D
Price		

Accessories

KH-59001-70 Replacement combination pH electrode; double-junction, gel-filled. Epoxy body, BNC connector

KH-35608-50 Replacement conductivity cell, epoxy/stainless steel with built-in temperature sensor

KH-35618-05 Temperature probe, 304 SS

accumet® pH/mV Benchtop Meters

Accept accuFet® or standard glass electrode inputs directly

- Automatic recognition of three buffer sets
- Selectable resolution—choose faster or more precise readings

Basic pH Meter

Access all meter functions, including push-button calibration and automatic electrode check, with five front-panel buttons. The large (3"W x 4 1/4"H) LCD steps you through setup and operation with plain language prompts.

Basic Plus pH Meter

All the features of Basic meter plus 0.001 pH resolution and ±0.002 pH accuracy. Additional high-end features include graphic electrode status indicator which lets you verify electrode condition at a glance, °C or °F temperature display, RS-232 output for downloading to printer or computer, and 100-point memory.



59330-01

Customize display

What's included: electrode support arm, pH electrode 59500-81 with ATC, and power supply.

Specifications & Ordering Information

ISO9001:2000
CERTIFIED SUPPLIER

CE 3 year warranty

Catalog number	KH-59330-00	KH-59330-01
Description	Basic pH meter	Basic Plus pH meter
Range	pH	-1.99 to 19.99
	mV	±1800.0
	Temperature	-5.0°C to 105.0°C
Resolution	pH	0.1/0.01
	mV	0.1
	Temperature	0.1°C
Accuracy	pH	±0.01
	mV	±0.1
	Temperature	±0.5°C
Temperature compensation	Automatic or manual	
Calibration	Up to five pH buffers	
Buffer recognition	Automatic at 16 buffer values	
Datalogging capabilities	—	100 data sets
Output	None	RS-232
Display	Custom 3"L x 4 1/2"W LCD, 3 1/4" and 5 1/16"H digits	
Power	110/220 VAC	
Dimensions	5 1/2"L x 7 1/2"W x 3 1/4"H	
Price		

Accessories

KH-59500-81 Replacement pH/ATC electrode, plastic body, refillable liquid Ag/AgCl reference

KH-59330-70 Optional non-glass accuFet® ISFET electrode for use with Basic or Basic Plus meters

KH-94000-62 Optional ATC probe. For temperature compensation when using electrodes other than 59500-81

KH-17106-20 NIST-traceable calibration certificate for pH meter

pH pH/Ion Meters

Benchtop

accumet[®] Excel (XL) Benchtop Meters

Windows[®] CE-driven, full-color touchscreen provides unmatched ease of use in operation and setup

- USB, RS-232, and Ethernet/Internet connectivity—connect to printers, peripherals, LAN, or the Internet
- Measure and display up to four inputs simultaneously without cross-channel interference

The XL-series offers you the advantages and versatility of having a research-grade pH, mV, ion, conductivity, and dissolved oxygen meter, all in a single instrument. It offers 1000 datapoint memory storage along with RS-232 communication. Password security protects your data from accidental deletion. pH mode accepts standard BNC glass electrodes as well as accuFet[®] electrodes directly, and allows for up to five-point pH calibration. ISE mode offers direct and indirect measurements, known and analyte, addition and subtraction methods. Conductivity mode accepts two-cell and four-cell probes. The XL-60's DO mode calculates 5-day BOD testing, OUR, and SOUR with automatic salinity and barometric pressure compensation.

What's included: accuCap[®] electrode 55500-50, ATC probe 94000-62, electrode support arm and bracket, and 110/220 VAC power supply. Model 59331-65 also includes self-stirring BOD probe 53109-50.



59331-20

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For accumet pH electrodes.

Specifications & Ordering Information

Catalog number	KH-59331-15	KH-59331-20	KH-59331-25	KH-59331-50	KH-59331-60	KH-59331-65
Description	XL 15 pH/mV/°C	XL 20 pH/mV/ Con/Res/°C	XL 25 pH/mV/ISE/°C	XL 50 pH/mV/ ISE/Con/Res/°C	XL 60 pH/mV/ISE/ Con/Res/DO/°C	
Range	pH	-2.000 to 20.000				
	mV*	±2000.0				
	Concentration	1 x 10 ⁻⁶ to 9.99 x 10 ¹⁰				
	Conductivity	—	0 to 5 x 10 ⁵ µS/cm	—	0 to 5 x 10 ⁵ µS/cm	—
	Resistivity	—	3Ω to 100 MΩ cm	—	3 Ω to 100 M Ω cm	—
	Salinity	—	0 to 45 ppt	—	0 to 45 ppt	—
	DO	—	—	—	—	0 to 60 mg/L, 0 to 600%
Resolution	Temperature	14 to 230°F (-10.0 to 110.0°C)				
	pH	0.1/0.01/0.001				
	mV*	0.1				
	Concentration	—	—	—	0.1/ 0.01/ 0.001	—
	Conductivity	—	—	—	1, 2, or 3 significant digits	—
	Resistivity	—	—	—	—	—
	Salinity	—	—	—	—	—
Accuracy	DO	—				
	Temperature	0.1°C; 0.1°F				
	pH	±0.1/±0.01/±0.002 + 1 LSD				
	mV*	±0.2 + 1 LSD				
	Concentration	—	—	—	±0.17n%	—
	Conductivity	—	—	—	—	—
	Resistivity	—	—	—	—	—
Temperature compensation	Salinity	—	—	—	—	—
	DO	—				
	Temperature	±0.6°F (±0.3°C)				
Calibration	Automatic/manual					
	pH: up to five; mV: one	pH: up to five; mV: one; conductivity: up to four	pH, ion: up to five; mV: one	pH, ion: up to five; mV: one; conductivity: up to four	pH, ion: up to five; mV, dissolved oxygen: one; conductivity: up to four	
Buffer recognition	US, Euro, NIST, custom					
Datalogging capabilities	1000 data points					
Output	USB, RS-232, Ethernet, SDCard					
Display	4½" x 6"; single channel	4½" x 6"; up to two channels	4½" x 6"; up to three channels	4½" x 6"; up to four channels	4½" x 6"; up to four channels	
Power	110/220 VAC, 50/60 Hz					
Dimensions	6¾" L x 9¼" W x 3½" H					
Price						

*Absolute or relative

ISO9001:2000
CERTIFIED SUPPLIER

CE 3 year warranty

Input impedance: 10¹² Ω

Slope control: 80 to 120%

Conductivity
(for XL 20, XL 50, and XL 60)
Cell constant: 0.1 cm⁻¹, 1.0 cm⁻¹,
10 cm⁻¹

Temp coefficient: 0 to 10%
Conductivity-to-TDS factor:
0.1 to 1.0

**DO probe (included with
XL 60 59331-65):** self-stirring,
polarographic

**Barometric pressure
correction (for XL 60):**
automatic, 450 to 825 mm Hg

Date and time settings: yes

Operating temperature: 0 to 45°C

Accessories

KH-19550-63 Conductivity cell.

Epoxy body, K=0.1,
built-in ATC element

KH-19550-64 Conductivity cell.

Epoxy body, K=1.0,
built-in ATC element

KH-19550-65 Conductivity cell.

Epoxy body, K=10.0,
built-in ATC element

**KH-55500-50 Replacement
accuCap[®] electrode.**
Glass body, refillable,
single-pore junction

Pinnacle Benchtop pH Meters

Ideal for general laboratory work or educational institutions

- Automatic buffer recognition
- Automatic temperature compensation
- Percent slope readout to monitor electrode performance

New



58907-00

Take accurate pH, mV, and temperature measurements with these easy-to-use benchtop meters. Meters come equipped with sealed membrane keypads and are encased in heat- and chemical-resistant housings. Meters can store and recall readings with time- and date-stamp to meet GLP guidelines.

Pinnacle M530 can store and recall up to ten readings.

Pinnacle M540 can store and recall up to 20 readings, and provides RS-232 communications capability.

What's included: "three-in-one" pH/reference/temperature electrode and electrode arm.



Specifications & Ordering Information

ISO 9001:2000
CERTIFIED SUPPLIER



Slope control: more than 66%

Catalog number		KH-58907-00	KH-58907-10
Model		Pinnacle M530	Pinnacle M540
Range	pH	0.00 to 14.00	-1.99 to 16.00
	mV		±1000
	Temperature		-5.0 to 105.0°C
Resolution	pH	0.01	
	mV	1	
	Temperature	0.1°C	
Accuracy	pH	±0.01	
	mV	±2	
	Temperature	±0.2°C	
Temperature compensation		Auto/manual	
pH calibration		Up to 2 points	
Buffer recognition		4.01, 7.00, 10.01	
Datalogging capabilities		10 data points	20 data points
Output		None	RS-232
Display		Custom LCD	
Power		115 VAC	
Dimensions		10 1/2"W x 2 1/2"H x 7 1/2"D	
Price			

Accessories

KH-58904-78 "Three-in-one" combination pH/reference/temperature electrode; epoxy body, refillable, BNC connector

KH-58905-62 High-performance combination pH electrode; glass body, refillable, BNC connector

KH-58905-64 Combination pH electrode; epoxy body, refillable, BNC connector

KH-58903-66 ATC probe

Cole-Parmer pH/mV Meters

Designed for lab or field use

- Analog display ideal for quick checks at a glance
- Digital display provides direct results

These meters are designed for demanding applications. Lab benchtop meters are ready for use with your combination pH electrode. Portable field meters come as complete kits ready for use in the field. All meters feature high accuracy at an exceptional price.

Lab Meters are ideal for benchtop use—feature solid construction and economical design. They're accurate to ±0.01 pH unit (±1 mV). Lab meters accept electrodes with BNC connectors (order separately from "Accessories" below). Meters operate on eight AA alkaline batteries (included), or optional 110 or 220 VAC adapters (sold separately).

Field Meters are perfect indoors or outdoors—durable plastic case protects meters and accessories from the elements. Field meters include an epoxy-body electrode, batteries, buffer solutions, deionized water, and carrying case.



05996-60



05996-70

Specifications & Ordering Information



Input impedance: >10¹² Ω

Catalog number		KH-05996-50	KH-05996-60	KH-05996-70	KH-05996-80
Description		Lab meters		Field meters	
Range	pH	0 to 14.00 1.4 units FS	0 to 14.00	0 to 14.00 1.4 units FS	0 to 14.00
	mV	±700 mV ±70 mV	±1999 mV	±700 mV ±70 mV	±1999 mV
Resolution	pH	0.1, 0.01	0.01	0.1, 0.01	0.01
	mV	10, 1	1	10, 1	1
Accuracy	pH	±0.1, ±0.01	±0.01	±0.1, ±0.01	±0.01 ±0.01
	mV	±10, ±1	±1	±10, ±1	±1
Temperature compensation		Manual from 0 to 100°C (32 to 212°F)		Manual from 0 to 100°C (32 to 212°F)	
Display		6" analog	3 1/2" LCD	6" analog	3 1/2" LCD
Power		Eight AA batteries (included) or optional AC adapter		Eight AA batteries (included)	
Battery life		Typically 500 hours		Typically 500 hours	
Dimensions		8"W x 7"H x 5 1/2"D		12"W x 4"H x 8"D	
Price					

Accessories

KH-01500-50 Adapter, 110 VAC. For 05996-50 and -60

KH-01500-55 Adapter, 220 VAC. For 05996-50 and -60

KH-05997-10 pH electrode, glass body

KH-59001-65 pH combination electrode, epoxy body

KH-05991-12 Double-junction pH electrode, epoxy body

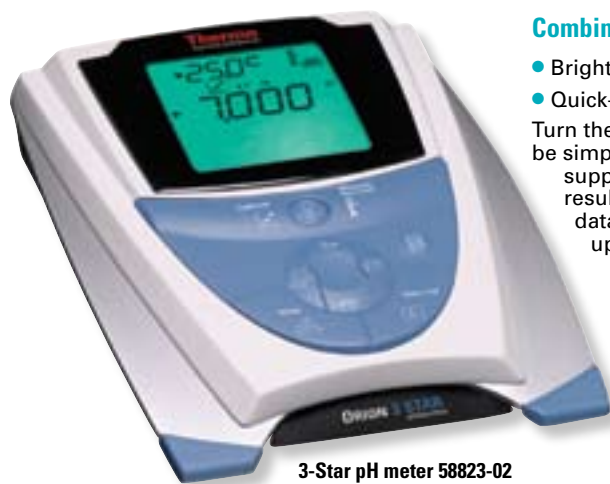
KH-35617-50 Electrode holder, 6"-dia base

KH-09376-01 Replacement batteries, AA. Pack of 4

pH pH/Ion Meters

Benchtop

New



3-Star pH meter 58823-02

Thermo Orion® Star Series™ ELECTRON CORPORATION Benchtop pH and pH/Ion Meters

Combine simple three-button operation with exceptional performance

- Bright backlit LCD is easy to read in various lighting conditions
- Quick-Start guides encourage intuitive and efficient operation

Turn the unit on, calibrate, and measure with only three main buttons—operation couldn't be simpler! The convenient Quick-Start guide will help you get started and provides support while in use. Smart Stability™ and Smart Averaging™ ensure accurate results. The Orion Star Series offers a full complement of GLP-related features including datalogging with time/date stamp and electrode verification. You can record and store up to ten setup parameters and calibrations (3- and 4-Star only). Download additional methods and software updates via the Web. Meters feature automatic or manual pH calibration, auto-buffer recognition of US/NIST and DIN buffers, advanced self-tests and self-diagnostics, and RS-232 or optional USB connectivity.

Meters include: Quick-Start guide and universal power supply.

2-Star meter Convenience kit includes: epoxy Sure-Flow pH electrode, benchtop electrode stand, Quick-Start guide, and universal AC power supply.

2-Star meter Value kit includes: refillable epoxy Triode pH electrode, benchtop electrode stand, Quick-Start guide, and universal AC power supply.

3-Star meter kit includes: Orion Triode™ pH/ATC electrode; one 475-mL bottle each of pH 4.01, 7.00, and 10.00 buffer; one 475-mL bottle of pH electrode storage solution; benchtop electrode stand; Quick-Start guide; and universal AC power adapter.

4-Star meter kit includes: ROSS® Ultra™ pH electrode; epoxy ATC probe; one 475-mL bottle each of pH 4.01, 7.00, and 10.00 buffer; one 475-mL bottle of pH electrode storage solution; benchtop electrode stand; Quick-Start guide; and universal AC power adapter.

Specifications & Ordering Information



Ambient operating conditions: 5 to 45°C; 5 to 85% RH, noncondensing

Catalog number	KH-58823-22	KH-58823-24	KH-58823-26	KH-58823-02	KH-58823-12	KH-58823-04	KH-58823-14
Model	2-Star meter only	2-Star meter convenience kit	2-Star meter value kit	3-Star meter only	3-Star meter kit	4-Star meter only	4-Star meter kit
Parameters	pH/mV/°C			pH/°C		pH/mV/ISE/°C	
Range	pH	-2.000 to 19.999 or 0 to 14 in aqueous solution		-2.000 to 19.999 or 0 to 14 in aqueous solution		-2.000 to 19.999 or 0 to 14 in aqueous solution	
	mV	±1999.9		±1999.9		±1999.9	
	Concentration	—		—		0 to 19,990	
	Temperature	-5.0 to 105.0°C		-5.0 to 105.0°C		-5.0 to 105.0°C	
Resolution	pH	0.1/0.01/0.001		0.1/0.01/0.001		0.1/0.01/0.001	
	mV	0.1		0.1		0.1	
	Concentration	—		—		3 significant digits	
	Temperature	0.1°C up to 99.9°C; 1.0°C over 99.9°C		0.1°C up to 99.9°C; 1.0°C over 99.9°C		0.1°C up to 99.9°C; 1.0°C over 99.9°C	
Accuracy	pH	±0.002		±0.002		±0.002	
	mV	±0.2 mV or ±0.05%, whichever is greater		±0.2 mV or ±0.05%, whichever is greater		±0.2 mV or ±0.05%, whichever is greater	
	Concentration	—		—		±0.2 mV or ±0.05%, whichever is greater	
	Temperature	±0.1°C		±0.1°C		±0.1°C	
Temp compensation	Automatic/manual			Automatic/manual		Automatic/manual	
Calibration points	pH: up to three; mV: one			pH: up to five; mV: one		pH/ISE: up to five; mV: one	
Buffer recognition	US/NIST, DIN, and custom			US/NIST, DIN, and custom		US/NIST, DIN, and custom	
Datalogging capabilities	50 data points with time/date stamp			200 data points with time/date stamp		200 data points with time/date stamp	
Software, 21 CFR Part 11	Not compatible			Not compatible		Optional	
Output	Waterproof bidirectional RS-232, optional USB interface cable			Waterproof bidirectional RS-232, optional USB interface cable		Waterproof bidirectional RS-232, optional USB interface cable	
Display	Backlit LCD; single parameter plus temp			Backlit LCD; single parameter plus temp		Backlit LCD; dual parameter plus temp	
Power	Universal power adapter (included) or 4 AA batteries (not included), 2000 hrs operation			Universal power adapter (included) or 4 AA batteries (not included), 2000 hrs operation		Universal power adapter (included) or 4 AA batteries (not included), 2000 hrs operation	
Dimensions	9 1/4" L x 6 5/8" W x 3 3/4" H			9 1/4" L x 6 5/8" W x 3 3/4" H		9 1/4" L x 6 5/8" W x 3 3/4" H	
Price							

KH-58823-30 Orion Triode pH probe, BNC

KH-05718-57 Sure-Flow pH probe, BNC

KH-05718-70 ROSS Ultra pH probe, BNC

KH-58819-92 Epoxy ATC probe for use with 05718-70, mini-DIN

KH-58823-45 Stirring probe

KH-58823-50 Electrode stand

KH-58822-35 Software for 4-Star meters; 21 CFR, Part 11

KH-58822-40 RS-232 cable for computer and printer

KH-58822-45 Cable adapter from RS-232 to USB

KH-09376-01 Batteries; AA, alkaline. Pack of 4

Thermo Orion Star Series™ Meter Application Packages

ELECTRON CORPORATION

Everything you need to start taking measurements—right out of the box!

- Available for a variety of applications including environmental, wastewater, drinking water, and food and beverage
- Application methods provide a step-by-step analysis procedure based on FDA- or EPA- approved methods
- Offer unique features for improved quality of your pH readings
- Meters feature convenient built-in Quick Reference Guide, GLP electrode verification, and recall of data for 10 previous stored calibrations

Star pH Application Packages include 3-Star pH benchtop meter, appropriate pH electrode, ATC probe, pH buffers, reference filling solution, pH storage solution, benchtop stirrer (except 58824-20), electrode stand, and application methods specific to the material to be measured.

Star Ion Application Packages include 4-Star pH/ISE benchtop meter, appropriate ISE electrode, standards, ionic strength adjuster, reference filling solution, benchtop stirrer, electrode stand, and application methods specific to the material to be measured. Order optional pH electrode and ATC probe separately.

Specifications

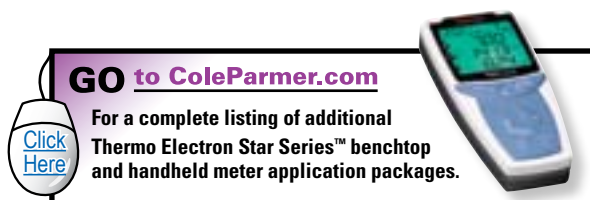


Model	3-Star pH benchtop meter	4-Star pH/ISE benchtop meter
Range	pH	-2.000 to 19.999 or 0 to 14 in aqueous solutions
	mV	±1999.9
	Concentration	— 0 to 19,990
	Temperature	-5.0 to 105.0°C
Resolution	pH	0.1/0.01/0.001
	mV	0.1
	Concentration	— Up to 3 significant digits
	Temperature	0.1°C up to 99.9°C; 1.0°C over 99.9°C
Accuracy	pH	±0.002
	mV	±0.2 mV or ±0.05%, whichever is greater
	Concentration	— ±0.2 mV or ±0.05%, whichever is greater
	Temperature	±0.1°C
Temperature compensation	Automatic/manual	
Calibration	pH: up to 5 pts; mV: yes	pH, ion: up to 5 pts; mV: yes
Buffer recognition	US, NIST, DIN, and custom	
Datalogging capabilities	200 data points with time/date stamp	
21 CFR Part 11 software	Not compatible	Optional
Output	Waterproof bi-directional RS-232 or USB interface	
Display	Backlit LCD; parameter(s) plus temp	
Power	Universal power adapter (included)	



58824-36

Chloride in infant formula package shown with optional pH and temperature probes



GO to ColeParmer.com

For a complete listing of additional Thermo Electron Star Series™ benchtop and handheld meter application packages.

Ordering Information

Catalog number	Application package	Meter included	Electrode included	Price
KH-58823-60	pH in soil	3-Star pH	Sure-Flow® epoxy pH	
KH-58823-65	Nitrate in drinking water	4-Star pH/ISE	ionplus® nitrate	
KH-58823-70	Cyanide in drinking water	4-Star pH/ISE	ionplus® cyanide	
KH-58823-75	Ammonia in wastewater	4-Star pH/ISE	Gas sensing ammonia	
KH-58823-80	Residual chlorine in wastewater	4-Star pH/ISE	Residual chlorine	
KH-58823-85	Fluoride in drinking water	4-Star pH/ISE	ionplus® fluoride	
KH-58824-00	pH in milk	3-Star pH	ROSS Sure-Flow combination pH	
KH-58824-04	pH in wine and beer		ROSS Sure-Flow combination pH	
KH-58824-08	pH in carbonated beverages		ROSS Ultra combination pH	
KH-58824-12	pH in cheeses		ROSS flat-surface combination pH	
KH-58824-16	pH in fruit juices	4-Star pH/ISE	ROSS Sure-Flow combination pH	
KH-58824-20	pH in meats		ROSS Sure-Flow combination pH	
KH-58824-24	Calcium in milk		ionplus Sure-Flow calcium	
KH-58824-28	Potassium in milk		ionplus potassium	
KH-58824-32	Chloride in milk	4-Star pH/ISE	ionplus chloride	
KH-58824-36	Chloride in infant formula		ionplus chloride	

[KH-58824-40](#) ROSS™ Sure-Flow® combination pH electrode

[KH-05718-70](#) ROSS Ultra™ pH combination electrode

[KH-58824-44](#) ROSS Ultra flat-surface combination pH electrode

[KH-58824-48](#) Temperature probe, ATC stainless steel

[KH-58824-52](#) Ionplus® Sure-Flow calcium electrode

[KH-58824-56](#) Ionplus Sure-Flow potassium electrode

[KH-58824-60](#) Ionplus Sure-Flow chloride electrode

[KH-58822-35](#) Software for 4-Star meter; 21 CFR, Part 11

pH pH/Ion Meters

Benchtop

Hach® Benchtop pH/mV/Ion/°C Meters

Antiglare coating on the screen for easy viewing

- Unique "All-in-One" five-pin connector for simple setup
- Stable readings in seconds!



59004-30

Use these meters for your most demanding applications. Meters feature a chemical-resistant, dust-proof, and water resistant, IP67 case—perfect for rugged environments. Automatic temperature compensation and automatic buffer recognition provide for accurate readings.

sensION 3 Meters measure pH, mV, and temperature. Other features include built-in communications protocol for downloading and printing data and a user-activated calibration review that shows the date and time of last calibration, slope, and buffers used.

sensION 4 Meters combine the features of the sensION 3 with other advanced features, including ISE measurement capability and dual electrode inputs. Perform single known additions/subtractions and select own stability criteria for low-level readings or highly accurate measurements.

What's included: platinum-series pH electrode, pH buffers, and beaker.

Specifications & Ordering Information



Slope range: pH 58 ±3 mV/decade 45 to 65 mV/decade

Catalog number (120 VAC)	KH-59004-20	KH-59004-30
Catalog number (220 VAC)	KH-59004-25	KH-59004-35
Model	sensION 3	sensION 4
Range	pH	-2.00 to 19.99 pH
	mV	-2000 to 2000 mV
	ISE	0.000 to 19,900
	Temp	-5.0 to 105°C
Resolution	pH	0.001/0.01/0.1 pH
	mV	0.1 mV
	ISE	01/0.01/0.001 (selectable)
	Temp	0.1°C
Accuracy	pH	±0.01 pH
	mV	±0.2 or ±0.05% of reading whichever is greater
	ISE	1 ±0.5% of rdg
	Temp	±1.0°C
Temp compensation	Auto or manual (5 to 100°C)	
Calibration	Up to 3 pH	Up to 5 pH, 2 to 7 for ISE
Buffer recognition	Auto (1.68, 4.01, 6.86, 7.00, and 10.01) or manual	Auto (4.01, 6.86, 7.00, 10.01, 12.45) or manual
Datalogging capabilities	99 points	
Inputs	One BNC; five-pin Hach; one pin-tip	Two BNC; two five-pin Hach; two pin-tip
Display	LCD	
Output	One-way RS-232	Two-way RS-232
Dimensions	6"W x 10 1/4"H x 3 1/2"D	8 5/16"W x 3 1/2"H x 1 3/8"D
Price		

KH-59005-52 Replacement pH electrode

KH-59005-54 pH electrode, gel-filled, built-in thermistor

WTW® Benchtop pH Meters

MultiCal® system selects the appropriate calibration method for your application

- Easy to operate—procedures are fully automated

These ready-to-go, multiparameter pH meters offer the highest degree of operating comfort, reliability, and accuracy. Menu-driven operation and step-by-step prompts make programming easy. AutoRead function displays readings when stability criteria have been achieved, ensuring precise and reproducible results. All meters can be used on the benchtop or wall mounted

Basic pH/mV Meter is perfect for routine measurements of pH and mV. The large LCD display and simple keypad make measurements easy.

What's included: SenTix pH combination electrode with ATC element, 50-mL bottles of buffers 4 and 7 pH and 110/220 VAC adapter.



58901-13

Specs & Ordering Info



Catalog number	KH-58901-13	
Description	pH/mV	
Range	pH	-2.000 to 16.000
	mV	±1999
	Oxygen, mg/L	—
	Temp	0 to 99.9°C
Resolution	pH	0.001
	mV	0.1/1
	Oxygen, mg/L	—
	Temp	0.1°C
Accuracy	pH	±0.003/±1
	mV	±0.2/±1
	Oxygen, mg/L	—
	Temp	±0.1°C
Temp compensation	Automatic, 0 to 99.9°C with ATC probe; -20 to 130°C manually	
Buffer recognition	4.01, 7.00, and 10.00	
Display	Multiline LCD	
Power	110 VAC/220 VAC	
Dimensions	8 5/16"W x 2 3/4"H x 9"D	
Price		

KH-58901-50 Replacement pH combination electrode with ATC element

OAKION® pH Solution Pack

New

Economical and convenient way to order everything you need to calibrate, clean, and store your pH electrodes. Pack includes one 500-mL bottle each of pH 4.01, 7.00, and 10.00 NIST-certified buffers; one 500-mL bottle of cleaning solution; and one 500-mL bottle of electrode storage solution.



Specifications & Ordering Information

Catalog number	Description	Price
KH-05942-15	pH solution pack	


Benchtop pH Meters
Dual BNC inputs for simultaneous readings

- Five-point pH calibration with automatic buffer recognition
- Enter up to seven ISE standards, using fixed or floating point notation



59501-01

pH/mV/Ion Meter measures pH, mV, temperature, and ISE. Measures ion readings in ppt, ppm, ppb, %, mg/mL, mg/L, moles/L, and generic ion units. Meter features prompt you through measurements—enter one of 18 preprogrammed ions.

pH/mV/Ion/Conductivity Meter measures pH, mV, temperature, ISE, conductivity, salinity, resistivity, and TDS. Meter covers 0 to 300 mS conductivity range in five subranges for each of the three cell constants. Dual BNC input and conductivity cell input allow you to view three readings at once.

What's included: combination pH/ATC electrode (59501-70), electrode arm, and 3-ft power supply with two-prong plug.

Specifications & Ordering Information



Slope control: automatic from 90 to 105%, manual from 80 to 110%

Catalog number (115 VAC)	KH-59501-10	KH-59501-01
Catalog number (230 VAC)	KH-59501-15	KH-59501-05
Description	pH/mV/ion	pH/mV/ion/conductivity
Range	pH	-2.000 to 20.000
	mV	±1800.0
	Concentration	1.00 x 10 ⁻⁹ to 9.99 x 10 ⁹
	Conductivity	— 0 to 300 mS
	Temp	-5.0 to 105.0°C
Resolution	pH	0.001/0.01/0.1
	mV	0.1/1
	Concentration	1, 2, or 3 significant digits
	Conductivity	— 1, 2, or 3 significant digits
Accuracy	Temp	±0.1°C
	pH	±0.002
	mV	±0.05
	Concentration	±0.09n% (n = ion charge)
	Conductivity	— ±0.5% full-scale
Temp compensation	±0.3°C	
Temp compensation	Automatic and manual, -5 to 105°C	
Datalogging capability	620 readings	
Output	RS-232 or analog output (60 mV/pH unit, 1 mV/mV unit)	
Dimensions	10½"L x 7½"W x 4¾"H	
Price		

KH-59501-70 Replacement combination pH/ATC electrode; single junction, liquid-filled glass body, BNC connector

KH-59501-54 Conductivity/ATC cell, K = 0.5 cm⁻¹

KH-59501-56 Conductivity/ATC cell, K = 1.0 cm⁻¹

KH-59501-58 Conductivity/ATC cell, K = 10.0 cm⁻¹


UltraBasic Benchtop pH Meters
Four keys control all operations

- One-button standardization
- Two models to choose from, depending on mV capability

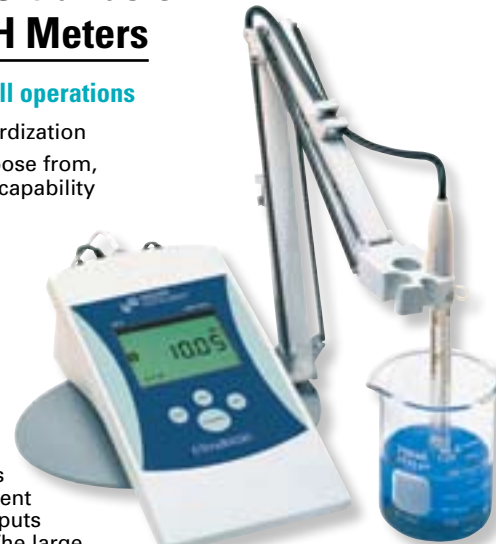
UB-5 Meter features simple operation. Pressing the STANDARDIZE key begins the auto-recognition of buffers for calibration. The SETUP key clears buffers, reviews electrode conditions, or allows you to select a different buffer set. ENTER inputs the current option. The large LCD shows both pH/mV and the temperature measurement simultaneously. A measuring icon denotes when the instrument is taking a reading. When the reading is stable, the stability icon shows.

What's included: combination pH electrode 59505-50 and power supply.

UB-10 Meter Kit offers all the same easy-to-use features as the UB-5 and includes absolute and relative mV capabilities—ideal for use in ORP measurements or to diagnose electrode status. Use the MODE key to toggle between pH and mV readings.

What's included: UB-10 meter, combination pH electrode with built-in ATC, base, electrode arm, and power supply.

UB-10 Bio Kit includes: UB-10 meter, TRIS-compatible, combination pH electrode with built-in ATC, base, electrode arm, and power supply.



59503-10

Specifications & Ordering Info


2 year warranty

Slope control: automatic 90 to 105%

Catalog number (115 VAC)	KH-59503-00	KH-59503-15	KH-59503-20
Catalog number (230 VAC)	KH-59503-05	KH-59503-15	KH-59503-25
Description	UB-5 meter	UB-10 meter kit	UB-10 Bio kit
Range	pH	0.00 to 14.00	
	mV	—	±1800.0
	Temp	0 to 100°C	
Resolution	pH	0.01	
	mV	—	0.1
	Temp	0.1°C	
Accuracy	pH	±0.01	
	mV	—	±0.3
	Temp	±0.4°C	
Temp compensation	Automatic with ATC		
Calibration	Up to three pH points		
Buffer recognition	16 points including 4, 7, and 10		
Display	2"W x 2½"H LCD		
Dimensions	9"L x 4¾"W x 3"H		
Price			

KH-59505-50 Replacement electrode for 59503-00 and -05. Epoxy body, gel-filled combination electrode with Ag/AgCl reference

KH-59503-50 Replacement electrode for 59503-10 and -15. Epoxy body, liquid-filled combination electrode, built-in ATC element

KH-59501-70 Replacement electrode for 59503-20 and -25. Glass body, liquid-filled, combination electrode with built-in ATC element, TRIS-compatible

pH pH/Ion Meters

Benchtop

Thermo Orion PerpHecT pH Meters

ELECTRON CORPORATION

Meters compensate for temperature effects through the pH electrode, eliminating the need for an ATC probe

- Two-step calibration is fast, easy, and accurate
- Automatic calculation and display of electrode slope



Orion 320 (58820-02) economical PerpHecT pH meter with optional electrode holder and stand

Your pH electrode works as a temperature sensor and a temperature compensator to provide temperature-corrected pH readings. You get temperature compensated readings regardless of your electrode—meters have “self compensation” to adjust to any standard electrode. For optimum performance, use PerpHecT electrodes sold below.



Orion 370 (58820-20) pH meter with ISE capabilities

Orion 320 Meter is an economical pH meter for routine pH/temperature measurements. Meter features a selectable display—switch readout to view either pH or temperature. Automatic buffer recognition and built-in buffer temperature tables allow for quick two-point pH calibration.

What's included: Orion PerpHecT electrode 58820-55, an AC adapter, and 6-ft power cord with two-prong plug.

Orion 370 Meter offers all the features of the Orion 320 plus added advantages such as ORP measurement, three-point pH calibration, direct readout ion concentration, two-point ion calibration, RS-232 output, and advanced “Good Laboratory Practices” (GLP) features. GLPcheck™ actively verifies electrode reliability. GLPdoc™ ensures printouts compatible with GLP.

What's included: Orion PerpHecT electrode 58820-59, AC adapter, and 6-ft power cord with two-prong plug.

Orion PerpHecT Electrodes

- Designed for LogR measurements
- Provide better accuracy than ordinary electrodes

These high-quality PerpHecT electrodes are the most accurate Orion electrodes available! They are manufactured to tight tolerances and, when combined with PerpHecT meters, give exceptionally accurate measurements. Select a PerpHecT ROSS electrode when you need higher accuracy or greater chemical resistance. All electrodes have 3-ft cables with BNC connectors.

Specifications & Ordering Information

ISO 9001:2000
CERTIFIED SUPPLIER



Input impedance: $>10^{12} \Omega$

Slope control: automatic 80 to 120%

Cat. no. (110 VAC)	KH-58820-02	KH-58820-20
Cat. no. (220 VAC)	KH-58820-07	KH-58820-25
Model	Orion 320	Orion 370
Range	pH	0.00 to 14.00
	mV	—
	mV (rel)	±1999.9
	Concentration	—
	Temp	—
Resolution	pH	0.1/0.01
	mV	—
	mV (rel)	0.1
	Concentration	—
	Temp	—
Accuracy	pH	±0.01
	PerpHecT pH	±0.005
	mV	—
	mV (rel)	±0.2 mV or ±0.1% of reading
	Concentration	—
Temp	—	
Temp compensation	Manual or automatic from -5 to 105°C	
Buffer recognition	Automatic; 4.01, 7.00, and 10.01	
Output	—	RS-232
Display	Custom LED	
Power	110 or 220 VAC adapter, 50/60 Hz	
Dimensions	9"W x 2"H x 8"D	
Price		

Printer

Printer attaches directly to meter, creating a compact benchtop unit or portable handheld unit. Use for a permanent record of your results. Battery-powered printer is rechargeable using the same adapters included with the meters for 110 or 220 VAC line power. Order additional AC adapters, models 58819-50 and -55, from “Accessories” below. Printer includes a roll of paper.

[KH-58819-70 Printer](#)

[KH-58819-72 Repl. printer paper.](#) Box of ten rolls

[KH-58819-74 Repl. rechargeable printer battery](#)

Accessories

[KH-58819-50 Repl. adapter;](#) 110 VAC, 50/60 Hz

[KH-58819-55 Repl. adapter;](#) 220 VAC, 50/60 Hz

[KH-05730-52 Fill solution](#) for ROSS electrodes 58820-50, -51, and -54; 60-mL bottle. Case of five bottles

[KH-05730-42 Fill solution](#) for conventional electrodes 58820-55, -57, and -59; 30-mL bottle. Case of five bottles

[KH-58819-99 Electrode holder and stand](#)

[KH-58819-80 RS-232 interface cable](#)

Specifications & Ordering Information

Description	Dimensions (L x dia)	PerpHecT ROSS™ electrodes		PerpHecT electrodes	
		Cat. no.	Price	Cat. no.	Price
Glass, combination refillable	120 mm x 12 mm	KH-58820-50	—	KH-58820-55	—
Glass, semi-micro, refillable	165 mm x 6 mm	KH-58820-51	—	—	—
Glass, Sure-Flow®, refillable	120 mm x 12 mm	KH-58820-54	—	KH-58820-59	—
Epoxy, rugged, refillable	120 mm x 12 mm	—	—	KH-58820-57	—
Epoxy, rugged, sealed		—	—	KH-58820-58	—

IQ Scientific ISFET pH/mV/Temperature Meters

Durable pH sensing chip stores dry and cleans easily

- Non-glass, stainless steel design for use directly in food processing without contamination as defined by the US FDA
- Handheld meter accommodates either an ISFET or traditional glass electrode
- Benchtop meter offers RS-232 and memory capabilities

These ISFET pH meters and electrodes are ideal for testing the pH of semisolids. The tip design is perfect for use with liquids, semisolids, or any application that can clog conventional glass electrodes. ISFET technology avoids traditional electrode clogging from semisolids, TRIS buffers, or solutions with organic constituents.

The electrode features a built-in automatic temperature compensation (ATC) element and a durable pH sensing chip. The silicon chip does not need hydration like traditional pH electrodes. You can even store it dry—simply wipe off and put it away. Simple maintenance only requires rinsing the probe in deionized water and then wiping dry with a soft towel. For more aggressive cleaning, use a toothbrush and mild detergent. Order glass sensor electrodes with BNC connectors at right, or see pages 1283–1294 for a complete selection.

IQ150 Handheld Meter combines a rugged design with the accuracy of lab quality results. This shock-resistant meter includes a water-resistant, rubber holster to withstand a 10-ft drop onto concrete. Its versatile design allows for two input types—connect either an ISFET electrode or electrode with BNC connector.

What's included: ISFET electrode 59540-46, water-resistant rubber holster, and 9 V battery.

IQ240 Benchtop Meter is ideal for the lab and crowded desktops. Meter displays pH/temperature, mV/temperature, or relative mV/temperature. Use HOLD button to freeze readings. The meter stores up to 20 sets of readings, which can be downloaded to a printer or computer through the use of the RS-232 port. Upload time, date, pH, temperature, and mV readings to your PC with the help of the downloadable Windows SmartLogger software.

What's included: ISFET electrode 59540-51, 9 V battery, and 110 VAC adapter.



59540-22



59540-32

Rounded electrode tip is suitable for most applications.



Specifications & Ordering Information

Low-battery indicator: 10-hr advance warning

Catalog number		KH-59540-22	KH-59540-32
Model		IQ150 handheld meter	IQ240 benchtop meter
Range	pH	0 to 14	
	mV	±1999	±420.0
	Temp	0.0 to 100.0°C	
Resolution	pH	0.01/0.1	0.001/0.01/0.1
	mV	0 to ±199.9: 0.1; 0 to ±1999: 1	0.1
	Temp	0.1°C	
Accuracy	pH	±0.01	
	mV	±0.1	
	Temp	±0.5°C	
Temp compensation	Manual/automatic, -5 to 105°C		Automatic, -5 to 105°C
Calibration	Up to two pH points		Up to three pH points
Buffer recognition	1.68, 4.01, 6.86, 7.00, 9.18, 10.01, and 12.45		1.68, 4.00, 6.86, 7.00, 7.41, 9.18, 10.01, 11.88, 12.45, or enter values manually for custom calibration
Datalogging capabilities	—		20 data sets
Output	—		RS-232
Display	3½ digit LCD		Custom dual line LCD
Power	9 V battery (included) or optional 110 or 220 VAC adapter		9 V battery and 110 VAC adapter (included) or optional 220 VAC adapter
Battery life	200 hours continuous		
Dimensions	3½"W x 7"H x 1½"D		6½"W x 2"H x 4½"D
Price			

IQ Scientific ISFET Electrodes

Customize the meter for your application without sacrificing the low-maintenance and versatility of an ISFET electrode.



Specifications & Ordering Information

Description	Dimensions (mm dia x mm L)	For IQ150 handheld		For IQ240 benchtop	
		Cat. no.	Price	Cat. no.	Price
Replacement SS probe	8.3 x 140	KH-59540-46		KH-59540-51	
NMR tube probe	Tip: 3.8 x 220; Body: 8.3 x 80	KH-59540-61		KH-59540-66	
SS probe with heavy-duty handle	4.8 x 100	KH-59540-70		KH-59540-75	
SS piercing tip, micro probe	Tip: 4.8 x 90; Body: 8.3 x 80	KH-59542-75		KH-59542-80	

pH pH/Ion Meters

ISFET

Waterproof ISFET pH/mV/ORP/Temperature Meter

Handheld meter accommodates either an ISFET or traditional glass electrode

New

- IP67-rated meter is waterproof and even floats if dropped in water

Great for direct use in food processing or applications such as wastewater or Tris buffer use where electrode clogging is common. Versatile meter accepts ISFET stainless steel, non-glass probes or traditional glass electrodes with BNC connector. Meter features buffer recognition of seven buffers and manual or automatic temperature calibration. IP67-rated enclosure is waterproof, chemical resistant, and will float if dropped in water.

Stainless steel ISFET probes feature waterproof connectors, are stored dry, and require no maintenance. Available in several configurations to meet your application needs.

Meter includes: four AA batteries.

Kit includes: general-purpose ISFET pH probe (99360-20), carrying case with calibration kit (500 mL each of pH buffer 4.0, 7.0, 10.0, and rinse), rubber holster, and four AA batteries.



99361-05

Specifications & Ordering Information

3 year
warranty
Meter only

Catalog number	KH-99361-02	KH-99361-05	KH-99361-10
Description	Meter only	Meter with ISFET probe (99360-20)	Kit
Range	pH	0.00 to 14.00	
	mV	±1999 mV	
	Temperature	32 to 212°F (0 to 100°C)	
Resolution	pH	0.01 pH	
	mV	0.1/mV (autoranging)	
	Temperature	0.1°F/°C	
Accuracy	pH	±0.01 pH	
	mV	±0.1 mV	
	Temperature	±0.5°F/°C	
Temperature compensation	Manual or automatic, 0 to 100°C		
Calibration	Up to three pH points (4.01, 7.00, 10.00)		
Buffer recognition	1.68, 4.01, 6.86, 7.00, 9.18, 10.01, 12.45		
Display	Dual LCD shows reading plus temperature		
Power	Four AA batteries (included)		
Battery life	200 hours continuous,		
	10 hour advance low-battery warning		
Dimensions	3½" W x 8" H x 2"D		
Price			

KH-99360-20 Waterproof ISFET pH probe, general purpose

KH-99360-22 Waterproof ISFET pH probe, 4.8 mm micro-tipped

KH-99360-24 Waterproof ISFET pH probe, heavy-duty piercing tip

KH-99361-25 Waterproof ISFET pH probe, for NMR tubes

KH-99361-20 Field carrying case with calibration kit

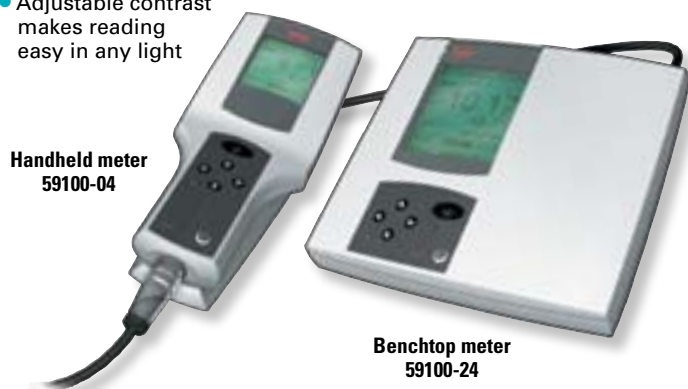
KH-99360-32 Rubber holster

KH-99360-36 Replacement pH calibration kit includes 500 mL each of pH buffer 4.0, 7.0, 10.0, and rinse water

Sentron ISFET Waterproof Meters

Menu driven operation makes meters easy to use

- pH, temperature, probe status, and battery life are displayed on a clear, multifunctional LCD
- Adjustable contrast makes reading easy in any light



Handheld meter
59100-04

Benchtop meter
59100-24

Waterproof meters are ideal for use in the field, on the production line, or in the lab. Sentron's ISFET meters feature low-battery, probe-life, and stability indicators. Automatic buffer recognition for NIST, DIN, JIS, and selectable buffer tables makes calibration easy. Power is provided by an AC adapter or rechargeable battery that gives you up to five hours of use in the field. Argus X and Titan X models feature password protection and date and time settings for GLP compliance. Order probes separately below.

What's included: AC adapter.

Specifications & Ordering Information

CE

High/low audible alarms: yes (model 59100-34 only)

Catalog number	KH-59100-04	KH-59100-24	KH-59100-34
Description	Handheld meters	Benchtop meters	
Model	Argus	Titan	Titan X
Range	pH	0.00 to 14.00	
	Temp	0 to 105°C	
Resolution	pH	0.1/0.01	
	Temp	0.1°C	
Accuracy	pH	±0.01	
	Temp	±0.5°C	
Calibration	Up to two	Up to three	Up to five
Memory	—	300 points*	300 points†
Output	—	—	RS-232
Waterproof rating	IP67	IP65	
Display	Large LCD	Large LCD	Backlit LCD
Dimensions	2"W x 4"H x 12"D	6"W x 13"H x 12"D	
Price			

*Up to 300 pH and temperature measurements

†Up to 300 pH, temperature, date, and time measurements

Accessories

KH-59100-68 Standard ISFET probe features a cut-out tip design that allows testing of small sample volumes by simply placing a single drop on the sensor surface

GO to page(s) 1102

For ISFET electrodes that are compatible with non-ISFET pH meters.

Tips for pH Buffers

Solutions of known pH value, buffers allow you to adjust your testing system to measure your samples' unknown pH more precisely. For best accuracy:

- Perform standardizations with fresh buffer solutions. Never pour used buffer back into the bottle; always discard after using.
- Use buffers that frame the pH range of the samples you are testing—i.e., directly above and below the expected value of your sample.
- Match the temperature of the buffer to the temperature of the samples. For example, if your samples are at 50°C, warm your buffers to 50°C using a beaker in a water bath.
- Calibrate your system before each use or set of uses.

OAKION® pH Solution Pack

New

Includes commonly used solutions for pH measurement and electrode maintenance

Economical and convenient way to order everything you need to calibrate, clean, and store your pH electrodes. Pack includes one 500-mL bottle each of pH 4.01, 7.00, and 10.00 NIST-certified buffers; one 500-mL bottle of cleaning solution for grease, oil, and protein removal; and one 500-mL bottle of storage solution to properly store your electrode while not in use.



Specifications & Ordering Information

Catalog number	Description	Price
KH-05942-15	pH solution pack	

OAKION® pH Buffer Solutions

Oakton buffers for meters with 0.01 resolution are standardized against NIST-certified pH references within 0.01 pH at 77°F (25°C). Store buffers away from direct sunlight. Sold in individual bottles: 500-mL bottles are available in cases of 12; the 4-L bottles in cases of four.

Specifications & Ordering Information

pH	500-mL bottles			1-L bottles		4-L bottles				
	Catalog number	Price/ea	Catalog number	Price/cs of 12	Catalog number	Price/ea	Catalog number	Price/ea	Catalog number	Price/cs of 4
1.68	KH-00654-01		—	—	—	—	—	—	—	—
4.01	KH-00654-00		KH-05942-21		KH-05942-22		KH-05942-24		KH-05942-25	
7.00	KH-00654-04		KH-05942-41		KH-05942-42		KH-05942-44		KH-05942-45	
10.00	KH-00654-08		KH-05942-61		KH-05942-62		KH-05942-64		KH-05942-65	
12.45	KH-00654-12		—	—	—	—	—	—	—	—

[KH-05942-10](#) Buffer solution assortment pack; one 500-mL bottle each of buffer 4, 7, and 10



05942-42 00654-00

05942-64

OAKION® pH Buffer Pouches

Economical pouches are accurate and convenient

Buffers are NIST-traceable and offer ±0.01 accuracy at 77°F (25°C). Pack of 20 pouches.

Specifications & Ordering Information

Catalog number	pH	Price/pk
KH-35653-01	4.01	
KH-35653-02	7.00	
KH-35653-03	10.00	
KH-35653-00	Rinse solution	

[KH-35653-04](#) Buffer pouch assortment pack; contains five pouches each of pH 4, 7, and 10 buffers and rinse solution



Assortment pack 35653-04

OAKION® High-Accuracy pH Buffer Solutions

Buffer solutions for meters with 0.001 resolution are accurate to either ±0.002 pH unit (pH 4 and 7 buffers) or ±0.005 pH unit (pH 10 buffer) when referenced to NIST-certified reference materials at 77°F (25°C). Available as an individual 500-mL bottle, or in a case of 12.

Specifications & Ordering Information

pH	Catalog number	Price/ea	Catalog number	Price/cs of 12
4.01	KH-05942-26		KH-05942-27	
7.00	KH-05942-46		KH-05942-47	
10.00	KH-05942-66		KH-05942-67	

05942-46



pH Buffer Capsules

Prepare fresh buffer solutions with these handy pH buffer capsules. Empty the contents of one capsule into 100 mL of distilled water and stir. Solutions are accurate to ±0.02 pH. Each vial contains ten capsules.

Specifications & Ordering Info

Catalog number	pH	Color	Price/vial
KH-05977-12	4.0	Orange	
KH-05977-14	7.0	Green	
KH-05977-16	9.0	Yellow	
KH-05977-18	10.0	Blue	



05977-12

05977-16

05977-18

05977-14

OAKION® Reference Fill Solutions

Choose from two types of reference fill solutions: 3.8 KCl saturated with AgCl for Ag/AgCl electrodes, or 4 KCl for calomel (Hg/Hg₂Cl₂) electrodes and other specialty electrodes. Both solutions come in a pack of two 125-mL bottles with syringe for easy dispensing.

Specifications & Ordering Information

Catalog number	Description	Price/pk
KH-05992-47	3.8 KCl with AgCl	
KH-05992-48	4 KCl	

05992-47



pH Accessories

Buffers / Standards / Solutions / Electrode Accessories

PerpHect® pH Buffer Packs

Buffers are lightweight and portable; carry only what you need. These convenient pH buffer packs are sealed against light, air, and other contaminants for fast, accurate results. Each pack contains enough buffer solution for one calibration. Simply insert electrode into buffer pack, calibrate, rinse, and discard packages when done—no wasted buffer, no other containers required.



Specifications & Ordering Information

pH	Cat. no.	Qty/pk	Price/pk	Cat. no.	Qty/pk	Price/pk
4.01	KH-55350-00	10		KH-55350-02	25	
7.00	KH-55350-10	10		KH-55350-12	25	
10.01	KH-55350-20	10		KH-55350-22	25	
Rinse solution	KH-55350-30	10		KH-55350-32	25	

BNC Adapters

BNC is a common electrode connector, but your meter may accept a different type of connector. Order an adapter from the table below to use your meter with BNC-electrodes.



05983-25

Specs & Ordering Information

Catalog number	Conversion description	Price
KH-05983-25	U.S. standard meter to BNC	
KH-05983-70	Metrohm meter to BNC	
KH-05983-90	Radiometer® meter to BNC	
KH-05983-21	DIN meter to BNC	

OAKTON® Flexible Electrode Holder

Holds up to four standard size electrodes (14-mm dia max) and one ATC probe. Weighted 6" diameter base lets you pivot holder 360° for added convenience. Flexible arm lets you move electrode side to side or up and down while keeping electrode at a constant vertical angle.



35617-50

Specs & Ordering Information

Cat. no.	Description	Price
KH-35617-50	Electrode holder	

Extension Cables

Cables have BNC connectors. Select from two different lengths.



05992-25

Specs & Ordering Information

Cat. no.	Length	Price
KH-05992-01	10 ft	
KH-05992-25	25 ft	

OAKTON® Electrode Cleaning and Storage Solutions

Remove grease and oil deposits from your electrodes with our cleaning solution. Cleaning solution contains pepsin. After cleaning, keep your electrodes in proper working condition with our storage solution. Available as an individual 500-mL bottle, or in a case of 24.



00653-04

00653-06

Specifications & Ordering Information

Solution type	Catalog number	Price/ea	Catalog number	Price/cs of 24
Cleaning	KH-00653-06		KH-35655-06	
Storage	KH-00653-04		KH-35655-04	

Electrode Saver Bottle

Protect electrodes (13 mm in dia max) against bumps, spills, and drying out. Bottle includes one solid cap and one O-ring cap. Seal bottle with the solid cap when the electrode is in use to reduce evaporation of the storage solution. Fill empty bottle with 50 mL of storage solution 00653-04 (listed above) and seal with O-ring cap. Bottle measures 4"H x 1½" dia.



05990-90

Specifications & Ordering Information

Catalog number	Description	Price
KH-05990-90	Electrode saver bottle	

ORP Standards

These stable, ready-to-use ORP standards require no mixing and contain no organics or hazardous chemicals—use straight out of the bottle. Use these standards as your relative mV standard and calibrate the offset of your sample. Redox potential values are 215 mV for Ag/AgCl reference electrodes and 420 mV for standard hydrogen reference electrodes. Choose from two convenient package sizes for use in the lab or field.



05730-55

05730-57

Specifications & Ordering Information

Catalog number	Description/packaging	Price
KH-05730-55	One-pint (475 mL) bottle	
KH-05730-57	Five 2-oz (60 mL) bottles	

YSI Zobell ORP Calibration Solution

Mix powdered reagent with distilled water for a fresh solution

Use Zobell solution to verify the performance of your ORP electrodes—ideal for use with Ag/AgCl or saturated calomel electrode systems. Reagent is available in dry form only and must be reconstituted prior to use. Reconstitution is simple—add 125 mL of deionized or distilled water to bottle, shake, and use. Bottle label has a place to write the expiration date to guarantee freshness. Redox potential value for Ag/AgCl electrodes is 231 ± 10 mV. Redox potential value for saturated calomel electrodes is 185 ± 10 mV.



05478-60

Specifications & Ordering Information

Catalog number	Description	Price
KH-05478-60	YSI Zobell solution, 1.25 g	

A Guide to Laboratory pH Electrodes

pH Electrode Basics

The Electrode Pair

Sensing half-cell electrodes are the measuring portion of the electrode system and contain the pH-sensitive membrane. Reference half-cells electrodes provide the reference potential needed for pH measurement. Most of the electrodes in our catalog are combination electrodes that house both half-cells in a single probe.

Bulb Material And Design

The bulb or membrane is constructed of different types of glass, each with different useful properties.

General-purpose glass: various pH ranges, temperatures to 100°C (212°F).

Blue glass: pH 0 to 13, temperatures to 110°C (230°F).

Amber glass: pH 0 to 14, temperatures to 110°C (230°F), prevents Na⁺ error in high Na⁺ concentration solutions.

The bulb shape can be modified to provide a semi-dome for increased ruggedness, a spear tip for penetration applications, or even a flat surface.

Glass vs Epoxy Body

Epoxy-body electrodes are impact resistant and are ideal for rough handling but should not be used at higher temperatures or for solvents.

Note: Even though the body of an epoxy electrode is plastic, the bulb will still be glass. Glass-body electrodes withstand high temperatures and highly corrosive materials or solvents.

Sealed vs Refillable

Sealed (also known as gel-filled) electrodes are easier to maintain than refillable liquid filled electrodes. However, they must be replaced when the fill material level is low. Refillable electrodes are long-lasting and provide a faster response.

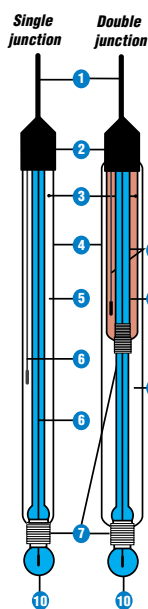
Single- vs Double-junction

In combination electrodes, the reference junction allows H⁺ ions to pass freely between reference and sensing half-cells to complete the electrical circuit. A single-junction design has one place where the H⁺ ions pass between half-cells. The junction is located so that contaminants in your sample can also pass into the reference chamber, leaving the potential for electrode failure due to reference contamination. A double-junction design restricts the reference behind a second junction; thus, it is twice as hard for reference contamination to occur.

Silver/Silver chloride (Ag/AgCl) vs Calomel (Hg/Hg₂Cl₂)

Ag/AgCl is the most common internal element used in electrodes and is suitable for almost all applications. Silver is, however, prone to reacting with proteins, organics, or heavy metal samples to clog the reference junction. Calomel reference should be used in these applications.

pH Electrode Anatomy



- 1) Cable
- 2) Cap
- 3) Fill hole
- 4) Body—glass or epoxy
- 5) Outer reference chamber filled with internal fill solution
- 6) Ag/AgCl wire
- 7) Annular reference junction allows reference solution to leak
- 8) Inner reference chamber
- 9) Outer reference chamber
- 10) pH sensing bulb

Selecting The Right Electrode

Cole-Parmer offers a variety of laboratory electrodes for your general-purpose and specialty laboratory applications. The "Application Guide" below provides information to help you find the electrode that best fits your application. The guide only offers suggestions—call our Application Specialists for more specific recommendations or clarification.

Application Guide

Biological samples, proteins, and tris buffer:

Calomel (Hg/Hg₂Cl₂) or double-junction

Pharmaceuticals: Calomel (Hg/Hg₂Cl₂) or double-junction

Hydrofluoric acid: Antimony or HF electrode

Low ionic strength samples and acid rain:

AccuFlow™ or SURE-FLOW® styles

Boiler feed water and distilled water:

AccuFlow or SURE-FLOW styles

Drinking water: Standard Ag/AgCl with single-junction

Wastewater: Double-junction

Solutions with heavy metals: Double-junction

Soil samples: Soil electrode or double-junction

pH > 9 and high Na⁺: Amber glass bulb, Ag/AgCl

High or rapidly changing temperatures:

ROSS® styles or temperature-stable

Moist, flat surfaces: Flat-surface or calomel (Hg/Hg₂Cl₂)

Cheese, agar, paper, and skin:

Flat-surface or calomel (Hg/Hg₂Cl₂)

Semisolid samples: Spear-tip, Ag/AgCl, ISFET, or FlexipHet

Fruits, cheese, and meat:

Spear-tip, Ag/AgCl, ISFET or FlexipHet

Nonaqueous samples, solvents, and alcohols:

AccuFlow styles, SURE-FLOW styles, or double-junction

Viscous samples, slurries, suspended solids, and sludges:

AccuFlow styles, SURE-FLOW styles, double-junction, or ISFET or FlexipHet

Emulsions and oils: AccuFlow styles, SURE-FLOW styles, double-junction, or ISFET or FlexipHet

Paints and inks: AccuFlow styles, SURE-FLOW styles, double-junction, or ISFET or FlexipHet

pH Laboratory Electrodes Table of Contents

- All-in-One pH and Temperature Electrodes 1101
- Buffers and Accessories..... 1087–1088
- Fermentation Electrodes..... 1099
- General-Purpose Laboratory Electrodes 1090–1098
- Half-Cell and Reference Electrodes..... 1093
- Specialty Electrodes 1100–1101
- Ion-Selective Electrodes..... 1102–1106
- Ion-Specific Field Effect Transistor (ISFET) 1102

Use and Care of Electrodes

Handling—

Electrodes should be rinsed between samples with distilled or deionized water and gently blotted (NEVER WIPED) dry with a labwipe.



Refillable

Electrodes—When adding filling solution, fill up to, but not past, the refill hole. When measuring leave the refill hole open for proper flow through the reference junction.



Storage—

Always keep your pH electrode moist by storing it in 4 M KCl solution. If 4 M KCl is not available, use a pH 4 or 7 buffer solution.



DO NOT store electrode in distilled or deionized water. After storage, if you notice white KCl crystals forming outside your electrode, simply rinse the electrode and blot dry with a lab wipe before use.


Protective Bottle—

Electrodes are shipped with a protective bottle over the glass bulb. Remove the bottle before using your electrode. For long-term storage just fill the bottle with enough 4 M KCl solution to cover the glass bulb and replenish as needed to keep the bulb moist.



pH pH Laboratory Electrodes

General-Purpose



Cole-Parmer
General-Purpose pH/ORP Electrodes

KEEP A SPARE

Our most popular combination electrodes

- Ideal for your general-purpose applications in the lab or field

These electrodes have the impact-resistant qualities of an epoxy body. Electrodes provide a fast, stable response and are ideal for prolonged pH or ORP readings. Sealed, gel-filled design requires virtually no maintenance. Electrodes measure 127 mm L x 12 mm dia and withstand temperatures to 176°F (80°C). Feature BNC connectors.

Catalog number	Description	Price
pH electrodes		
KH-59001-65	Single junction	
KH-59001-70	Double junction	
ORP electrodes		
KH-59001-75	Single junction	
KH-59001-77	Double junction	



Compatible with most brands of pH meters!

Cole-Parmer Epoxy-Body Combination pH and Combination ORP Electrodes

Combines quality with durability

- Epoxy-body housing resists impact

These quality laboratory electrodes have a sealed gel reference unless otherwise noted. Electrodes with PTFE reference-junction resist coating and clogging. All electrodes include BNC connector.



GO to ColeParmer.com

ColeParmer.com/pHElectrodes

Our Parametric Search helps you find the ideal selection FAST!

Specifications & Ordering Information

Key	Application	Description	Maximum temperature	Length x dia (mm)	Reference cell type	Catalog number	Price	Key
General-purpose electrodes (model "B" includes removable bulb guard)								
A	General-purpose lab	Refillable reference	176°F (80°C)	148 x 12	Ag/AgCl	KH-05992-30		A
A	Sulfides, heavy metals	Double-junction reference, refillable	176°F (80°C)	148 x 12	Ag/AgCl	KH-05991-12		A
B	General-purpose lab and field	Rugged, with epoxy bulb guard	176°F (80°C)	148 x 12	Ag/AgCl	KH-05992-40		B
C	Test tube sampling	Extra-long neck, slender	176°F (80°C)	220 x 6	Ag/AgCl	KH-05990-45		C
D	Organics, proteins, metals	Calomel reference	158°F (70°C)	158 x 12	Hg/Hg ₂ Cl ₂	KH-05990-35		D
D	Organics, proteins, metals	Refillable calomel reference	158°F (70°C)	158 x 12	Hg/Hg ₂ Cl ₂	KH-05990-95		D
E	Surface or low-volume sampling (electrophoresis gels, etc.)	Flat measurement surface	176°F (80°C)	127 x 12	Ag/AgCl	KH-05990-65		E
E	Same as "E" above but for organics also	Flat surface with calomel reference	158°F (70°C)	127 x 12	Hg/Hg ₂ Cl ₂	KH-05990-70		E
PTFE reference-junction electrodes (clog-resistant)								
F	Handheld meters, lab or field	Right-angle, mounts on pH meters	194°F (90°C)	140 x 12	Ag/AgCl	KH-05992-55		F
G	Wastewater/monitor reaction progress	ORP, with platinum pin	176°F (80°C)	155 x 12	Ag/AgCl	KH-05990-55		G
H	Surface/low-volume	Flat tip	212°F (100°C)	140 x 12	Ag/AgCl	KH-05993-11		H
H	Aggressive chemicals	Easy to clean	212°F (100°C)	140 x 12	Ag/AgCl	KH-05993-12		H
I	General-purpose lab	Sealed, gel-filled	221°F (105°C)	140 x 12	Ag/AgCl	KH-05993-25		I
I		Sealed, gel-filled; coiled cable				KH-05993-28		I
J		Refillable (order refill solution below)				KH-05993-45		J

[KH-05993-26](#) Refill solution for "J" in table above, 1 qt

[KH-05983-25](#) Adapter, U.S. standard meter to BNC electrode

pH Laboratory Electrodes

pH

General-Purpose



Glass-Body Combination pH and Combination ORP Electrodes

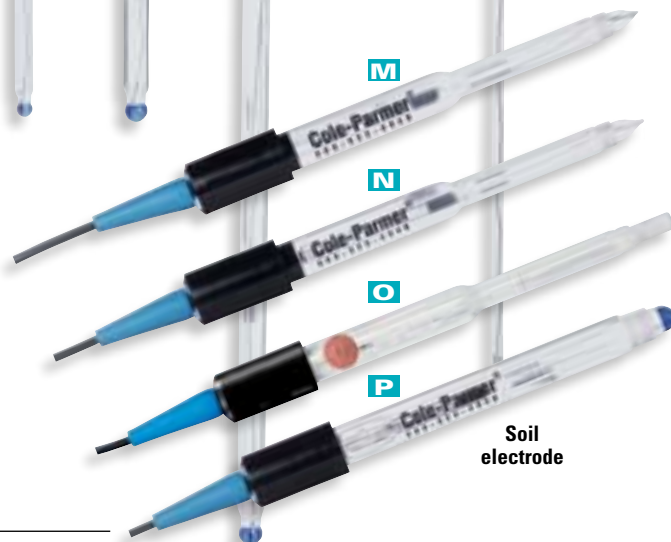
Compatible with
most brands of
pH meters!

Withstand high temperatures and chemical attack

- Compatible with most brands of pH meters

Glass-body combination electrodes feature refillable references, except for 05998-30 which features a high-temperature KNO₃ gel. All have BNC connectors.

Soil Electrode lets you perform soil measurements without “suspension effect.” Our soil electrode has an extra-wide ceramic junction so you can immerse the bulb in the sample without immersing the junction. Order from table below—key letter “P.”



Specifications & Ordering Information

Key	Application	Description	Maximum temperature	Length x dia (mm)	Reference cell type	Catalog number	Price	Key
General-purpose electrodes								
A	Rugged lab and field	—	212°F (100°C)	123 x 8	Ag/AgCl	KH-05991-81		A
B	Rugged lab and field	Detachable plastic Delrin® shield; our most popular glass electrode	212°F (100°C)	154 x 8	Ag/AgCl	KH-05997-10		B
C	General-purpose lab	—	212°F (100°C)	154 x 12	Ag/AgCl	KH-05991-22		C
D	General-purpose lab	Thin neck	212°F (100°C)	154 x 8	Ag/AgCl	KH-05991-42		D
E	High temp, pH with high Na ⁺	Amber glass for low sodium error	230°F (110°C)	154 x 12	Ag/AgCl	KH-05991-32		E
F	Research, water, organics, etc.	Calomel reference	158°F (70°C)	157 x 8	Hg/Hg ₂ Cl ₂	KH-05992-10		F
G	Small test tubes	Long, slender neck	212°F (100°C)	210 x 6	Ag/AgCl	KH-05991-61		G
H	Large test tubes	Long, thin neck	212°F (100°C)	210 x 8	Ag/AgCl	KH-05991-51		H
I	Flasks, bottles	Extra long, thin neck	212°F (100°C)	326 x 8	Ag/AgCl	KH-05990-40		I
J	High temp, pH with high Na ⁺	Amber glass for low sodium error, thin neck	230°F (110°C)	154 x 8	Ag/AgCl	KH-05991-91		J
K	Test and NMR tubes: research, organics, metals, proteins	Calomel reference, extra-slender neck	158°F (70°C)	277 x 3.5	Hg/Hg ₂ Cl ₂	KH-05990-30		K
Special-purpose electrodes								
L	Wide compatibility, high-temp	Double-junction, KNO ₃ gel	248°F (120°C)	130 x 12	Ag/AgCl	KH-05998-30		L
M	Semisolids: foods, etc.	Spear tip for piercing	212°F (100°C)	159 x 8	Ag/AgCl	KH-05998-20		M
N	As above, but organics/proteins	Spear tip with calomel reference	158°F (70°C)	159 x 8	Hg/Hg ₂ Cl ₂	KH-05998-21		N
O	Electrophoresis, small-surface	Micro flat tip calomel	176°F (80°C)	145 x 6	Hg/Hg ₂ Cl ₂	KH-05998-25		O
Soil electrode								
P	Eliminates “suspension effect”	Refillable; 7.5-mm ceramic junction	176°F (80°C)	145 x 12	Ag/AgCl	KH-05992-62		P

KH-05992-47 Reference fill solution; 3.8 M KCl with AgCl for Ag/AgCl electrodes.

Pack of two 125-mL bottles

KH-05992-48 Reference fill solution; 4 M KCl for Hg/Hg₂Cl₂ electrodes.

Pack of two 125-mL bottles

KH-05983-25 Adapter, U.S. standard meter to BNC electrode

pH Laboratory Electrodes

General-Purpose



Cole-Parmer pH Electrodes with Interchangeable Cables

Save space, money by using one cable with multiple electrodes or vice versa

- Cable cap rotates independently and will not bunch up

Match these combination electrodes with the three electrode cables below. The probe-cable interface is moisture proof and noise free, with a sealing O-ring, gold-plated contacts, and PTFE insulation.

Compatible with most brands of pH meters!

Key	Application	Description	Maximum temperature	Length x dia (mm)	Reference cell type	Catalog number	Price	Key
A	Rugged lab and field	Glass, detachable bulb guard	212°F (100°C)	154 x 8	Ag/AgCl	KH-05658-05		A
B	Research, water, organics, metals	Glass, calomel reference	158°F (70°C)	157 x 8	Hg/Hg ₂ Cl ₂	KH-05658-10		B
C	General-purpose lab	Glass	212°F (100°C)	154 x 12	Ag/AgCl	KH-05658-15		C
D	Small test tubes	Glass, with long thin neck	212°F (100°C)	210 x 6	Ag/AgCl	KH-05658-25		D
E	Flasks, bottles	Glass, with extra long thin neck	212°F (100°C)	329 x 8	Ag/AgCl	KH-05658-35		E
F	General-purpose lab and field	Epoxy, extra-rugged	176°F (80°C)	127 x 12	Ag/AgCl	KH-05658-45		F
G	General-purpose lab and field	Epoxy, removable bulb guard	176°F (80°C)	148 x 12	Ag/AgCl	KH-05658-50		G
H	Foods, plastics, other semisolids	Glass, spear tip for piercing	212°F (100°C)	159 x 8	Ag/AgCl	KH-05658-60		H
I	Test tube sampling	Epoxy, long neck	176°F (80°C)	220 x 6	Ag/AgCl	KH-05658-65		I
J	Monitor reaction progress, reclaim metals	Epoxy, ORP electrode with platinum band	176°F (80°C)	155 x 12	Ag/AgCl	KH-05658-70		J

Extension Cable

Attach between the electrode (above) and the electrode cable (at right).

Catalog number	Length	Price
KH-05658-11	3 ft	



Electrode Cables

Match these 3-ft long cables directly to the same connector type of the pH meter.

Catalog number	Connector type	Price
KH-05659-12	BNC	
KH-05659-07	U.S. Standard	
KH-05659-32	Radiometer	

Cole-Parmer Temperature-Stable Electrodes

Technology virtually eliminates drift and accuracy problems

- Fast response even at extreme temperatures
- Double-junction reference provides reliable performance in TRIS buffers and other difficult samples

When sample temperatures change dramatically, many pH electrodes exhibit "temperature hysteresis". This causes delays of up to three minutes before a stable reading results. The reference technology provides stable results in under 30 seconds, even when sample temperature changes from 25 to 80°C. This technology allows for predictable and reliable results without compensating a quick response time.

Select from four versions—refillable or flushable, with either an epoxy or glass body. Flushable-junction models are ideal for applications that can clog other junctions and feature a durable, thicker bulb design for more impact resistance. Electrodes include BNC connectors.

Specifications & Ordering Information

Catalog number	Description	Maximum temperature	Length x dia (mm)	Price
KH-27509-00	Refillable, epoxy body	176°F (80°C)	110 x 12	
KH-27509-02	Refillable, glass body	212°F (100°C)	110 x 12	
KH-27509-04	Flushable junction, epoxy body	176°F (80°C)	120 x 12	
KH-27509-06	Flushable junction, glass body	212°F (100°C)	120 x 12	

1 year warranty



27509-04

Compare to electrodes on page 1097 and **SAVE!**

accumet® MicroProbe™ Combination pH Electrodes

Probe tip measures only 3 mm in diameter!

- Two different stem lengths accommodate various sample container sizes

These glass-body electrodes maximize even the smallest samples for pH readings. In addition to low sample volume requirements, the electrodes feature TRIS compatibility and a PTFE-jacketed tip to withstand harsh chemicals. Electrodes include a single-junction Ag/AgCl reference, BNC connector, and 1-m cable.

Specifications & Ordering Information

Catalog number	Description	pH range	Temperature range	Length x dia (mm)	Price
KH-55500-40	1½" length rigid stem	0 to 14	32 to 176°F (0 to 80°C)	127 x 3	
KH-55500-45	6" length flexible stem	0 to 14	32 to 176°F (0 to 80°C)	254 x 3	

[KH-05992-47](#) Reference fill solution. Pack of two 125-mL bottles



Combination Microelectrode

Take pH measurements in samples as low as 10 µL— even from filter paper and agarose gels

Unbreakable microelectrodes combine measuring and reference cells in a single probe. Tip diameter is less than 1000 µm—fits microwell plates, small capillary tubes, and more. Electrodes are accurate to ±0.01 pH units from 3 to 9 pH, and ±0.1 pH units outside that range. Low impedance provides stable readings.

Obtain best results in mV or relative mV mode. Temperature range is 32 to 167°F (0 to 75°C). Immersion depth is 500 µm. Includes filling solution and plastic dispenser.

Specifications & Ordering Information

Catalog number	Description	Length (mm)	Price
KH-05993-00	Microelectrode with BNC connector	140	

[KH-05983-25](#) Adapter, U.S. standard meter to BNC connector

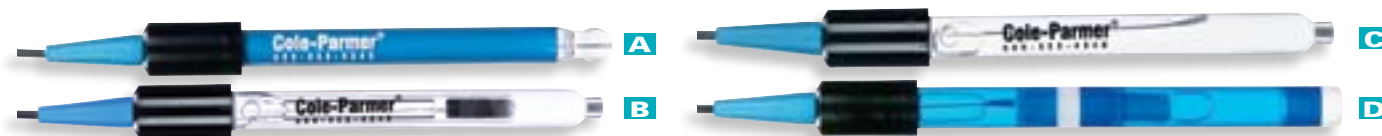


05993-00

Cole-Parmer® Half-Cell and Reference Electrodes

Combine the half-cell and reference electrodes to create a system tailored to meet your specific application requirements

- Refillable reference electrodes allow for repeated uses



Specifications & Ordering Information

Key	Application	Description	Maximum temperature	Length x dia (mm)	Reference cell type	Catalog number	Price	Key
Cole-Parmer half-cell electrodes, BNC connector (must be used with reference electrodes)								
A	General-purpose measurements High-pH, high-temp, highest Na ⁺	Regular sensing glass Amber sensing glass	212°F (100°C) 230°F (110°C)	154 x 12 154 x 12	— —	KH-05990-15 KH-05990-25		A
Cole-Parmer glass-body reference electrodes, reference pin								
B	Research, organics, metals, proteins	Calomel fill with ceramic junction	158°F (70°C)	153 x 12	Hg/Hg ₂ Cl ₂	KH-05990-50		B
C	Research measurements	Ag/AgCl fill	212°F (100°C)	153 x 12	Ag/AgCl	KH-05990-60		C
Epoxy-body reference electrode, reference pin								
D	Organics, metals, proteins, ISE, and aggressive chemicals*	Refillable double junction, porous Teflon®—easy to clean	176°F (80°C)	153 x 12	Ag/AgCl	KH-05899-25		D

*For ion-selective measurement, fill outer sleeve with compatible solution.

Replacement Solutions and Parts for Epoxy-Body Reference Electrode 05899-25

[KH-05899-15](#) Upper chamber filling solution, 4 oz

[KH-05899-20](#) Lower chamber filling solution, 4 oz

[KH-05899-26](#) Teflon upper junction

[KH-05899-27](#) Teflon lower junction

pH Laboratory Electrodes

General-Purpose



accumet® Combination pH Electrodes from Cole-Parmer

Complete line of electrodes for the most challenging applications

Combination pH Electrodes

- Deliver superior reproducibility in aqueous and titration samples

Glass-Body Models resist chemical attack. **Epoxy-Body Models** are impact-resistant and ideal for rough handling. All models include a 30-mL bottle of fill solution and 76-cm lead. Model 55500-20 has a 1-meter lead. Refer to letters "A" through "K" in the table below. All electrodes include a BNC connector.

accu-pHast® Combination Double-Junction pH Electrodes

- Provide a fast, accurate response from 5 to 100°C

Use when samples vary or where samples preclude the use of a single-junction electrode. Electrodes are accurate to within ± 0.05 pH in 20 seconds or less. All models include a 30-mL bottle of fill solution and a one-meter cable with BNC connector. Refer to letters "L", "M", and "N" in the table below.

accuTupH® Combination pH Electrodes

- Glass bulb is up to forty times more durable than normal pH electrodes

The accuTupH model has equidistant internal and external reference cells that give fast and precise measurements within ± 0.01 pH units in 15 seconds. Refer to letter "O" in the table below. All include a BNC connector.

**KEEP
A SPARE**

*Compatible with
most brands of
pH meters!*

Specifications & Ordering Information

Key	Application	Description	Maximum temperature	Length x dia (mm)	Reference cell type	Catalog number	Price	Key
Glass-body accumet combination electrodes								
A	General-purpose lab	Refillable, bulb guard*	230°F (110°C)	140 x 10	Ag/AgCl	KH-55500-00		A
B	Organics, proteins, metals	Refillable, calomel reference, bulb guard*	176°F (80°C)	140 x 10	Hg/Hg ₂ Cl ₂	KH-55500-02		B
C	Small vessels	Refillable, microprobe	230°F (110°C)	127 x 6.4	Ag/AgCl	KH-55500-04		C
D	Tall, narrow vessels	Refillable, microprobe, long neck	230°F (110°C)	180 x 6.4	Ag/AgCl	KH-55500-06		D
E	Tall, narrow vessels; extra-long	Refillable, microprobe, calomel reference	176°F (80°C)	190 x 6.4	Hg/Hg ₂ Cl ₂	KH-55500-08		E
Rugged epoxy-body accumet combination electrodes								
F	General-purpose lab and field	Refillable, built-in bulb guard	176°F (80°C)	140 x 10	Ag/AgCl	KH-55500-10		F
G	Organics, proteins, metals	Refillable, calomel reference, bulb guard*	140°F (60°C)	140 x 10	Hg/Hg ₂ Cl ₂	KH-55500-12		G
H	Surfaces or low volumes	Refillable, flat surface, bulb guard*	176°F (80°C)	152 x 12.7	Ag/AgCl	KH-55500-14		H
I	General-purpose	Gel-filled, built-in bulb guard	176°F (80°C)	140 x 10	Ag/AgCl	KH-55500-16		I
J	General-purpose; tall, thin vessels	Gel-filled, long neck, built-in bulb guard	176°F (80°C)	200 x 6.4	Ag/AgCl	KH-55500-18		J
K	Paper pulp testing	Gel-filled, double-junction	176°F (80°C)	140 x 10	Ag/AgCl	KH-55500-20		K
accumet accu-pHast high-performance, double-junction combination electrodes								
L	General-purpose lab	Glass body, refillable, bulb guard*	212°F (100°C)	140 x 10	Ag/AgCl	KH-55500-22		L
M	Small vessels	Glass body, refillable, microprobe	212°F (100°C)	165 x 10	Ag/AgCl	KH-55500-24		M
N	Rugged body	Epoxy body, refillable, bulb guard*	212°F (100°C)	140 x 12	Ag/AgCl	KH-55500-26		N
accumet accuTupH rugged, combination glass-body pH electrodes								
O	Rugged, general-purpose	Refillable, single-junction	212°F (100°C)	140 x 10	Ag/AgCl	KH-55502-00		O
O	Rugged, general-purpose	Refillable, double-junction	212°F (100°C)	140 x 10	Sat. KCl	KH-55502-02		O
O	Rugged, unstable environments	Refillable, accuTupH, fast response	212°F (100°C)	140 x 10	Sat. KCl	KH-55502-04		O

*These models feature a removable bulb guard

KH-05983-25 Adapter for U.S. Standard meter to BNC electrode

accumet® accuFlow™ Combination pH Electrodes

Clean your electrode with just a quick press

- Flushable junction eliminates junction clogging
- For general purpose and harsh applications such as biological/pharmaceutical products, emulsions, and viscous samples

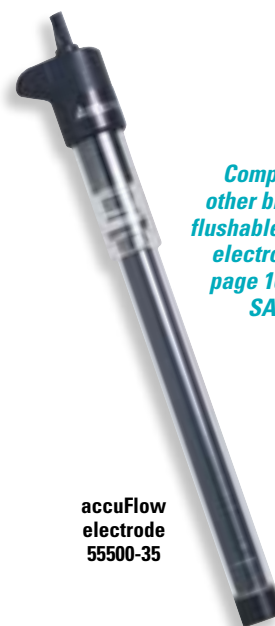
pH Electrodes with Ag/AgCl Double-Junction Reference offer more reproducible results and improved service life when compared with conventional electrodes. Rugged epoxy body houses an easy-to-clean junction—just press down on the cap, and the filling solution flushes away any viscous solutions or small particles from the reference junction. Electrodes come with a 1-meter cable and BNC connector.

pH Electrodes with accu-pHast® Reference provide the same conveniences as the Ag/AgCl double junction electrodes with the added advantage of fast, accurate results for widely varying sample temperatures. Patented design features dual ceramic junctions, sealed Ag/AgCl reference elements, and a special internal electrolyte to eliminate slow response. Accurate to ± 0.01 pH at 77°F (25°C) and ± 0.05 pH at other temperatures up to 212°F (100°C).

Specifications & Ordering Information

Catalog number	Description	pH range	Temperature range	Length x dia (mm)	Price
KH-55500-30	Double-junction reference	0 to 14	32 to 212°F (0 to 100°C)	175 x 12	
KH-55500-35	accu-pHast reference	0 to 14	32 to 212°F (0 to 100°C)	175 x 12	

[KH-88019-90](#) Reference fill solution, saturated KCl. One 500-mL bottle



Compare to other brands of flushable junction electrodes on page 1097 and **SAVE!**

accuFlow electrode
55500-35

accumet® accuCap™ pH Electrodes

Most accurate pH electrode, as tested by the PTB (the German Federal Physical Technical Institute in Braunschweig)*

- Precise, reliable, and fast readings
- About 200 times larger junction than standard electrodes—makes it impossible to clog

The accuCap electrodes use a single pore capillary reference junction, about 200 times larger than typical ceramic junctions. The unique junction design provides increased electrolyte flow, resulting in greater contact between sample and reference, ensuring fast, stable readings. The double junction design offers enhanced performance. A diffusion barrier separates the AgCl reservoir from the reference electrolyte, allowing the use of silver-free electrolytes and preventing AgCl loss due to temperature variations. The end result is an extremely stable reference potential, providing long electrode life.

accuCap Refillable Electrode

Unique fluid-gel electrolyte and accuCap junction design leads to a faster flow rate and improved contact between the reference electrode and sample. It performs well in aggressive samples, liquids with low ion concentration, or partly aqueous samples.

accuCap Gel-Filled Electrodes

The accuCap solid polymer-gel electrolyte offers the advantages of the accuCap system in a maintenance-free version. Polymer gel provides reliable results in very dirty, ion-weak, or protein samples, and even at low pH or in presence of organic solvents.

accuCap Spear Tip Electrode

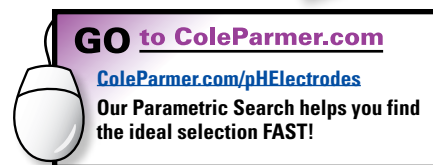
Rugged spear tip is ideal for soft food sample testing in the lab. Using the accuCap polymer gel electrolyte provides the same reliable performance needed in difficult samples.

*See "Traceability of pH measurement" by Petra Spitzer; ISBN 3-89429-877-4 or SSN 0947-7063.

Specifications & Ordering Information

Catalog number	Description	Temperature range	Length x dia (mm)	Price
KH-55500-50	Glass body, refillable	32 to 176°F (0 to 80°C)	160 x 12	
KH-55500-51	Glass body, gel-filled	32 to 176°F (0 to 80°C)	130 x 12	
KH-55500-52	Epoxy body, gel-filled	32 to 140°F (0 to 60°C)	120 x 12	
KH-55500-53	Glass body, spear tip	32 to 122°F (0 to 50°C)	70 x 6 (insertion length 25 mm)	

[KH-55500-55](#) Refill solution for 55500-50



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Our Parametric Search helps you find the ideal selection **FAST!**



55500-53

55500-50

1 year
warranty

pH pH Laboratory Electrodes

General-Purpose



Glass and Epoxy-Body pH Electrodes



Measure the pH of virtually any sample with these precision ORION pH electrodes

Combination electrodes have either refillable or sealed (gel-filled) references. All combination electrodes have a 1-meter cable and BNC connector.

Half-cell electrodes require reference electrode listed with them in the "Application" column of the table. Reference electrodes have pin-jack connector. Reference electrodes "L" and "M" are refillable—filling solutions are sold separately below.

Specifications & Ordering Information

Key	Application	Description	Length x dia (mm)	Catalog number	Price
Glass-body electrodes, max temp 194°F (90°C)					
A	Maximum accuracy, use w/ 05710-01	Half-cell, research-grade	110 x 12	KH-05711-01	
B	Accurate research results	Combination, research-grade	120 x 12	KH-05712-06	
C	Accurate test tube use; 0.2 to 0.4 mL minimum volume	Combination, semimicro, research-grade	140 x 6.25	KH-05712-11	
D	Rugged lab or research use	Combination, lab-grade	120 x 12	KH-05712-16	
E	Routine measuring, use w/ 05710-01	Half-cell, rugged bulb	110 x 12	KH-05711-21	
F	Viscous solutions	Combination, rugged bulb	120 x 12	KH-05712-26	
Sealed epoxy-body electrodes, gel-filled, max temp 176°F (80°C)					
G	General-purpose; rugged use	Combination, general-purpose	110 x 12	KH-05712-41	
H	For test tubes, small samples	Combination, semimicro	150 x 7.5	KH-05711-46	
I	For flasks and other tall vessels	Combination, flask	305 x 8	KH-05711-51	
J	Direct pH measurement of semisolids	Combination, flat surface	110 x 12	KH-05711-56	
Refillable epoxy-body electrode, max temp 194°F (90°C)					
K	Rugged applications	Combination, with bulb guard	120 x 12	KH-05712-71	
Epoxy-body reference electrodes, max temp 212°F (100°C)					
L	General lab applications	Single-junction, sleeve-type	110 x 12	KH-05710-01	
M	Easy cleaning, use with solutions that clog standard junctions	Double-junction, sleeve-type	110 x 12	KH-05710-10	

KH-05730-38 Filling solution for reference electrode "L"; equitransferent. Carton of five 50-mL bottles

KH-05730-39 Inner chamber filling solution for electrode "M"; equitransferent. Carton of five 50-mL bottles

KH-05730-40 Outer chamber filling solution for electrode "M"; 10% KNO₃. Carton of five 50-mL bottles

KH-05730-42 Filling solution for electrodes "B", "C", "D", "F", and "K"; 4 M KCl with AgCl. Carton of five 50-mL bottles

GO to page(s) 1056-1086

See our "pH/Ion Meters" section for new Thermo Electron Orion Star Series pH meters.

New



ISO 9001:2000
CERTIFIED SUPPLIER

ROSS™ pH Electrodes

Drift less than 0.002 pH per day

These electrodes provide fast, accurate, and stable pH readings. Ideal for food, pharmaceuticals, or biological samples. Platinum wire prevents contamination with silver and mercury ions—excellent for use in tris buffer.

Double ceramic junction design protects the inner reference solution and prolongs the life of the electrode. Readings stabilize to 0.01 pH in less than 30 seconds—even with a 50°C temperature change. Electrodes read pH from 0 to 14. Maximum temperature is 90°C for glass electrodes and 80°C for epoxy. All models have BNC connectors.

What's included: 50-mL of 3 M KCl filling solution and 1-m cable. Order additional fill solution separately.

GO to page(s) 1098

For the latest ROSS edition—the ROSS Ultra with a 2-year warranty.

Specifications & Ordering Information

ISO9001:2000
CERTIFIED SUPPLIER **1** year warranty

Applications	Description	Length x dia (mm)	Reference cell type	Catalog number	Price
General-purpose, tris buffers, nonaqueous solutions, and deionized water	Glass, combination	120 x 12	ROSS	KH-05718-02	
For rugged general-purpose use, tris buffers, nonaqueous solutions, and DI water	Epoxy, combination	120 x 12	ROSS	KH-05718-07	
Samples as small as 0.2 mL in small diameter vessels	Glass, combination	165 x 6	ROSS	KH-05718-16	
Rugged general-purpose and field use, tris buffers, nonaqueous solutions, and deionized water	Glass, rugged bulb, combination	120 x 12	ROSS	KH-05718-27	
Soft, moist surfaces of solids and semisolids such as agar plates and other similar samples	Epoxy, flat surface, combination	120 x 12	ROSS	KH-05718-32	



05718-02

05718-07

Sure-Flow® pH Electrodes

Eliminate junction clogging problems with a free-flow sleeve

These long-lasting electrodes have no ceramic or fiber junction to clog—ideal for viscous and dirty samples. Just press the cap to flush the junction; release the cap to take more measurements.

Combination electrodes have an Ag/AgCl reference cell. The epoxy-body electrode is sturdy for more rugged handling than glass. Electrodes read pH from 0 to 14. Maximum temperature is 90°C for glass electrodes and 80°C for epoxy. All models have BNC connectors.

What's included: 50-mL of 4 M KCl filling solution and a 1-m cable. Order additional filling solution separately.

Specifications & Ordering Information

ISO9001:2000
CERTIFIED SUPPLIER **1** year warranty

Applications	Description	Length x dia (mm)	Reference cell type	Catalog number	Price
General-purpose; viscous and dirty solutions	Glass, combination	120 x 12	Ag/AgCl	KH-05718-55	
For rugged use, general-purpose; viscous and dirty solutions	Epoxy, combination	120 x 12	Ag/AgCl	KH-05718-57	

KH-05730-42 Fill solution for Sure-Flow electrodes, 4 M KCl with AgCl. Carton of five 50-mL bottles



05718-55

05718-57

ROSS™ Sure-Flow® pH Electrodes

Easy-to-clean and accurate

These electrodes combine the Sure-Flow easy-clean junction with the speed, accuracy, and stability of ROSS electrodes. All models have BNC connectors.

What's included: a 50-mL bottle of 3 M KCl and a 1-m cable. Order extra filling solutions below.

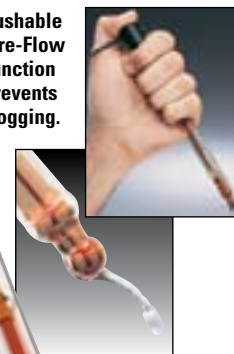
Specifications & Ordering Information

ISO9001:2000
CERTIFIED SUPPLIER **1** year warranty

Applications	Description	Length x dia (mm)	Reference cell type	Catalog number	Price
General-purpose; viscous and dirty solutions	Glass, combination	120 x 12	ROSS	KH-05718-51	
For rugged use, general-purpose; viscous and dirty solutions	Epoxy, combination	120 x 12	ROSS	KH-05718-53	

KH-05730-52 Outer chamber fill solution for all ROSS and ROSS Sure-Flow electrodes, 3 M KCl. Case of five 60-mL bottles

Flushable Sure-Flow junction prevents clogging.



05718-51

pH Laboratory Electrodes

General-Purpose

ROSS™ Ultra® Electrodes

2-year replacement warranty

- Builds on the ROSS™ technology for greater stability, reliability, and renowned accuracy and temperature response
- Less long term drift saves time from recalibrating

The ROSS Ultra stability gives you ± 0.01 pH accuracy even over a long period of time. Using a nonmetallic reference system, the liquid-liquid equilibration occurs almost instantaneously, saving time plus ensuring accurate results. Complex, delicate samples, such as biological media, foods, and pharmaceuticals, measure easily without metallic contamination of the sample or excessive cleaning. ROSS Ultra electrodes are refillable—easily accommodating a change in filling solution for samples sensitive to potassium or chloride ions.

Specifications & Ordering Information

ISO9001:2000
CERTIFIED SUPPLIER

2 year
warranty

Catalog number	Description	Maximum temperature	Length x dia (mm)	Price
KH-05718-70 KH-05718-73	Glass body Glass body, rugged bulb	212°F (100°C)	120 x 12	
KH-05718-75	Glass body, semi-micro bulb	212°F (100°C)	165 x 6 (6 mm section: 95 mm length)	
KH-05718-77 KH-05718-79	Epoxy body, Epoxy body, flat surface	212°F (100°C)	120 x 12	
KH-05718-82	Epoxy body, semi-micro	212°F (100°C)	165 x 6 (6 mm section: 95 mm length)	



[KH-05730-52](#) Replacement filling solution, 3 M KCl, 60-mL bottles. Pack of five

BlueLine Electrodes

Patented Silamid® reference system eliminates corrosion and interference from silver/silver chloride ions

- Platinum diaphragm and free flow of electrolyte ensure excellent stability

Laboratory work has never been easier with these high-quality electrodes from Schott. Innovative design features a sliding gate that allows easy filling of electrolyte solution and seals it from the solution being measured. BlueLine electrodes feature fast adjustment of measured values and high mechanical stability. Operating range is 0 to 14 pH.

Electrode models 55503-00 and -46 offer superior durability with a cone-shaped electrode tip that is rugged and easy to clean. BNC and DIN fixed cable electrodes include a 3-ft (1-m) cable. Order cable 55503-50 with DIN connector or 55503-55 with BNC connector below for use with electrodes with removable cable.



Models "A" and "B" feature a platinum junction for unique performance and extended lifetime.

Specifications & Ordering Information

Key	Application	Shaft material	Maximum temperature	Length x dia (mm)	Electrodes with BNC fixed cable		Electrodes with DIN fixed cable		Electrodes with removable cable	
					Catalog number	Price	Catalog number	Price	Catalog number	Price
A	General purpose	Glass	212°F (100°C)	120 x 12	KH-55503-46	—	—	—	KH-55503-00	—
B	General purpose with ATC*	Glass	212°F (100°C)	120 x 12	KH-55503-34	—	—	—	—	—
C	Field, rugged	Glass	176°F (80°C)	120 x 12	KH-55503-40	—	KH-55503-36	—	KH-55503-08	—
D	Field, rugged with ATC*	Glass	176°F (80°C)	120 x 12	KH-55503-44	—	KH-55503-38	—	—	—

*ATC element is NTC 30 k Ω which is compatible with WTW meters.

[KH-55503-55](#) Removable cable with BNC connector, 3-ft (1-m) cable

[KH-55503-50](#) Removable cable with DIN connector, 3-ft (1-m) cable

OAKLON® pH Solution Pack

- Convenient way to order everything you need to calibrate, clean, and store your pH electrodes

Pack includes one 500-mL bottle each of pH 4.01, 7.00, and 10.00 NIST-certified buffers; one 500-mL bottle of cleaning solution for grease, oil, and protein removal; and one 500-mL bottle of storage solution to properly store your electrode while not in use.

Ordering Information

Catalog number	Description	Price/pk
EK-05942-15	pH solution pack	

Cole-Parmer® Autoclavable Fermentation pH Electrodes

Compact, combination electrodes deliver high quality at a low price

Annular ceramic junction eliminates clogging problems and provides excellent stability. Operating temperature range for all electrodes is 23 to 266°F (-5 to 130°C). Order detachable cables separately below to autoclave your glass-bodied electrode and vessel as a single unit—simply detach cable and place a protective cap over the cable connector before sterilizing.

A Double-Junction Electrodes

These electrodes are designed for insertion in Radiometer® mountings or Ingold® nonpressurized assemblies 761-351, 761-31, 761-361, and 761CH-31 (12 mm dia). Sealed, gel-filled, reference electrodes require no refilling, and offer long-term stability and extended service life.

Catalog number	Probe immersion length	Price
Refillable electrodes		
KH-05661-02	150 mm	
KH-29041-00	180 mm	
KH-05661-04	210 mm	
KH-29041-02	250 mm	
KH-29041-04	320 mm	
KH-29041-06	420 mm	

Catalog number	Probe immersion length	Price
Sealed electrodes		
KH-05993-95	150 mm	
KH-29041-50	180 mm	
KH-05993-96	210 mm	
KH-29041-52	250 mm	
KH-29041-54	320 mm	
KH-29041-56	420 mm	

Note: Probe immersion length = length + 70 mm (except Ingold 761-31 where probe immersion length = length + 50 mm).

Accessories

[KH-05661-68](#) Reference filling solution for inner cell. High-temperature 3 M KCl gel saturated with AgCl; 125 mL

[KH-05661-70](#) Reference filling solution for outer cell. High-temperature 3 M KCl gel; 125 mL

[KH-05661-03](#) Spare protective cap for cable connector

[KH-05983-21](#) DIN connector to female BNC plug

B Mini Electrodes

Ideal for narrow or crowded culture flasks and fermentors (6 mm dia). Double-junction reference offers stability and extended service life. Sealed, autoclavable.

Catalog number	Probe immersion length	Price
KH-05662-15	150 mm	
KH-29044-50	180 mm	
KH-05662-16	210 mm	

Note: Probe immersion length equals housing length + 70 mm.

Detachable Cables

Catalog number	Plug type	Length	Price
KH-05661-08	BNC	5 ft	
KH-05661-09	BNC	10 ft	
KH-29073-00	Stripped ends [†]	5 ft	
KH-29073-02	Stripped ends [†]	10 ft	

[†]Stripped end cables are not for temperature compensated use.

Detachable Cable Adapter

allows you to use a Cole-Parmer detachable-cable type electrode with your Ingold series-K9 cable.

[KH-29040-00](#) Detachable-cable adapter



GO to page(s) 437-444

See our "Fermentation" section on pages 437-444.

KEEP
A SPARE

A
Refillable
electrode
05661-02

A
Sealed
electrode
05993-95

B
Mini
electrode
05662-15

Flow-Through pH Cells

Ideal for fermentation applications

- Feature detachable cables and three cell material options

Choose glass cells, durable Ultem® plastic cells, or 316 stainless steel cells for long-lasting durability. Electrodes are accurate to ±0.1 pH units. Order electrodes and cables separately at right.



Specifications & Ordering Information for Flow-Through Cells

Key	Catalog number	Material	Volume	Tubing connection ID	Price
A	KH-05662-40	Glass	6000 µL	7 mm	
B	KH-05662-41	Ultem®	6000 µL	6 mm	
C	KH-05662-42	316 SS	6000 µL	6 mm	
D	KH-05662-48	Glass	800 µL	3 mm	

Electrodes for Flow-Through Cells

For flow cell	Catalog number	Combination electrode type	Junction	Auto-clavable	Price
A	KH-05662-44	Sealed, Ag/AgCl	Double	Yes	
	KH-05662-45	Refillable, Ag/AgCl	Double	Yes	
B,C	KH-05662-80	Sealed, Ag/AgCl	Double	Yes	
	KH-05662-82	Refillable, calomel	Single	No	
	KH-05662-84	Sealed, Ag/AgCl	Single	No	
D	KH-05662-51	Sealed, Ag/AgCl	Double	Yes	
	KH-05662-52	Refillable, Ag/AgCl	Double	Yes	
	KH-05662-54	Refillable, calomel	Single	No	

Detachable Cables

Catalog number	Plug type	Length	Price
KH-05662-55	BNC	3 ft	
KH-05662-56		10 ft	

pH Laboratory Electrodes

Specialty

Cole-Parmer Vertical-Flow Electrode

Quickly measures pH of vertically flowing samples

- Connect 1/16" OD tubing directly to the electrode—no need for additional equipment

This combination electrode/flow-through cell has an internal volume of 50- μ L. Inlet and outlet ports accept 1/16" OD tubing. Wetted parts are glass, ceramic, polypropylene, and fluororubber. Comes with 3-ft cable.



05992-64

Specifications & Ordering Information

Catalog number	Description	Price
KH-05992-64	Vertical-flow electrode, BNC connector	

AquaPro pH® Electrodes

Patented reference system and double-junction design keep silver ions from contacting the sample

Glass-body electrode features a "hard nose" bulb for use in the lab. Durable, rugged epoxy-bodied electrodes withstand demanding field applications—ideal for water or wastewater applications. Measure pH levels of moist surfaces and semi-solids with the 05711-42 flat surface electrode. All electrodes feature a temperature range of 32 to 140°F (0 to 60°C), measure 0 to 14 pH, and include a 1-meter cable with BNC connector.



05711-33

05711-39

05711-42

ISO9001:2000
CERTIFIED SUPPLIER

Specifications & Ordering Information

Catalog number	Junction	Price
KH-05711-33	Glass body	
KH-05711-39	Epoxy body	
KH-05711-42	Epoxy body, flat surface	

KNIpHE® pH Electrode

Ideal for applications where glass electrodes might break

- Realistic solution to glass electrode breakage when testing the pH of meats.

The innovative design features an electrode centered in a sharp knife-shaped blade. This stainless steel blade easily penetrates semi-solids.

Use this electrode to measure 0 to 14 pH in temperatures from 32 to 140°F (0 to 60°C). Electrode includes handle, blade, and one 60-mL bottle of filling solution.



05711-80

Specifications & Ordering Information

ISO9001:2000
CERTIFIED SUPPLIER

Catalog number	Description	Length x dia (mm)	Price
KH-05711-80	KNIpHE pH electrode	215 x 25	

Cole-Parmer pH Electrodes for Field Use

Ideal for your most rugged applications

These combination electrodes withstand the most demanding field conditions—the semi-domed tip protects the pH bulb and ensures a quick response when taking measurements in harsh and dirty environments. Easy-to-clean electrodes feature an impact-resistant epoxy body for further protection from the elements. The large, annular ceramic reference junction and sealed cross-linked polymer reference resist clogging.

Operating range is from 0 to 13 pH. Electrodes measure 110 mm L x 12 mm dia and withstand temperatures up to 212°F (100°C). All models have BNC connectors.



05992-00

The durable tip ensures reliable use in water and wastewater applications.



Specifications & Ordering Information

Catalog number	Junction	Cable length	Price
KH-05992-00	Single	3 ft	
KH-05992-02	Double		
KH-05992-04	Single	10 ft	
KH-05992-06	Double		

Cole-Parmer pH Electrodes with Coiled Cables

Add to your handheld meter for extra convenience

- Coiled cables stretch to provide extra length when needed
- Self-retracting design keeps cable neat and tangle-free when not in use

These are some of our most popular electrodes with the added benefit of coiled cables. Stretch up to 5 feet to accommodate most arm spans. Retract back to 1-foot length when not in use for easier storage than conventional cables. All electrodes include BNC connectors for use with most pH meters. You can even use these electrodes with benchtop meters for a neater and more organized workspace.



05993-28

Specifications & Ordering Information

Catalog number	Description	Maximum temperature	Length x dia (mm)	Price
Glass-body electrodes				
KH-05999-10	Protective plastic shield	212°F (100°C)	154 x 8	
KH-05999-81	Low-cost	212°F (120°C)	123 x 8	
KH-05999-35	Gel-filled, non-refillable	248°F (100°C)	130 x 12	
Epoxy-body electrodes				
KH-05999-45	Long, thin neck	176°F (80°C)	220 x 6	
KH-05999-65	Flat measurement surface	176°F (80°C)	127 x 12	
KH-05993-28	Clog-resistant PTFE junction, gel-filled, nonrefillable	221°F (105°C)	140 x 12	

Cole-Parmer® "All-in-One" Electrodes

Save money without giving up temperature compensation!

- Designed to work with meters you already have
- Find the design that works best for your application without losing automatic temperature compensation

New

"All-in-One" electrodes offer versatility and customization. These electrodes combine the pH reference, pH half-cell, and temperature sensor in one 12-mm diameter electrode body. Select from low-maintenance, sealed electrodes, or clog-resistant refillable electrodes.

Tuff-Tip® electrodes feature a semi-domed tip which protects the pH bulb and ensures a quick response in harsh and dirty samples. Temperature-stable electrodes provide predictable, reliable, and quick responses—no matter what the sample temperature. This design virtually eliminates drift, accuracy problems, and premature performance losses due to temperature. All electrodes include 3-ft cable and BNC connector for pH, except where noted.

Beckman Instruments Compatible Electrodes feature a 30 kΩ temperature compensator with a 3.5 mm audio plug for connecting to your meter.

Corning Compatible Electrodes use the same temperature compensation element as Beckman, but offer an RCA plug for the temperature connection.

Hanna Compatible Electrodes connect to the meter with a 3.5-mm audio plug while using Hanna's transistor for temperature compensation.

Jenco Compatible Electrodes come complete with the special 4-pin temperature connector for the Pt-100 temperature compensation element.

Metrohm Instruments Compatible Electrodes consist of a Pt-1000 and banana plugs for temperature compensation. The Metrohm type F connector is the pH connection offered with these electrodes.

Mettler-Toledo Compatible Electrodes arrive with the proper 30 kΩ temperature compensator and cinch connector for connecting to your meter.

Orion A-series Compatible Electrodes work with both the A- and A plus-Orion series meters through the 30 kΩ temperature compensator and 8-pin DIN connector for temperature.

Schott Compatible Electrodes have a Pt 1000 temperature compensation element which connects to the meter via banana plugs.

WTW Compatible Electrodes feature a 30 kΩ temperature compensation element to the meter via banana plugs.



Sealed
electrode
27507-04

Refillable
electrode
27507-12

Specifications & Ordering Information

Dimensions: 12 mm diameter x 115 mm length

pH meter brand	Single-junction		Double-junction		Tuff-Tip, double-junction		Temperature-stable, double-junction	
	Catalog number	Price	Catalog number	Price	Catalog number	Price	Catalog number	Price
Sealed electrodes								
Beckman Instruments	KH-27507-00		KH-27507-02		KH-27507-04		KH-27507-06	
Corning	KH-27507-20		KH-27507-22		KH-27507-24		KH-27507-26	
Hanna	KH-27507-40		KH-27507-42		KH-27507-44		KH-27507-46	
Jenco	KH-27507-60		KH-27507-62		KH-27507-64		KH-27507-66	
Metrohm	KH-27507-80		KH-27507-82		KH-27507-84		KH-27507-86	
Mettler-Toledo	KH-27508-00		KH-27508-02		KH-27508-04		KH-27508-06	
Orion A-series	KH-27508-20		KH-27508-22		KH-27508-24		KH-27508-26	
Schott	KH-27508-40		KH-27508-42		KH-27508-44		KH-27508-46	
WTW	KH-27508-60		KH-27508-62		KH-27508-64		KH-27508-66	
Refillable electrodes								
Beckman Instruments	KH-27507-08		KH-27507-10		—	—	KH-27507-12	
Corning	KH-27507-28		KH-27507-30		—	—	KH-27507-32	
Hanna	KH-27507-48		KH-27507-50		—	—	KH-27507-52	
Jenco	KH-27507-68		KH-27507-70		—	—	KH-27507-72	
Metrohm	KH-27507-88		KH-27507-90		—	—	KH-27507-92	
Mettler-Toledo	KH-27508-08		KH-27508-10		—	—	KH-27508-12	
Orion A-series	KH-27508-28		KH-27508-30		—	—	KH-27508-32	
Schott	KH-27508-48		KH-27508-50		—	—	KH-27508-52	
WTW	KH-27508-68		KH-27508-70		—	—	KH-27508-72	



Call our Application Specialists.
If you have a meter brand not listed above,
contact our Application Specialists
for a "All-in-One" electrode that
meets your needs.

847-549-7600

pH Laboratory Electrodes

ISFET/Ion-Selective

FlexipHet ISFET Electrodes

**No specialized meter required—
connects to any pH meter with a BNC connector**

- Ideal for areas prohibiting the use of glass
- IP67 rated, fully submersible housing

Rugged, nonglass ISFET (Ion Specific Field Effect Transistor) pH probes provide faster and more reliable measurements. Silicon chip sensors are virtually unbreakable—use where broken glass electrodes can be hazardous to the sample or the environment. The clog-resistant sensing area requires minimal routine maintenance. Electrodes can be stored dry. To clean, simply run under water or use a toothbrush.

General-Purpose Gel-Filled Electrode features a flattened tip with a ridge and is well suited for most pH measurements. Requires only a small sample to be used as a cup-style microsensor.

Cone-Tip Gel-Filled Electrode is useful for thick, dirty, or sticky samples.

Stainless Steel (SS) Penetration Tip Electrode allows easy penetration in dense or very viscous samples and semi-solids.



59101-00 59101-02

ISO9001:2000
CERTIFIED SUPPLIER



Model 59101-06 with stainless steel penetration tip is perfect for meats and cheeses.

Specifications & Ordering Information

Catalog number	Description	Temperature range	Price
KH-59101-00	General purpose	23 to 221°F (-5 to 105°C)	
KH-59101-02	Cone tip gel filled	23 to 221°F (-5 to 105°C)	
KH-59101-06	SS penetration tip	32 to 140°F (0 to 60°C)	

GO to page(s) 1056–1086

See our "pH/Ion Meters" section for ISFET meters and additional electrodes.

Cole-Parmer Replaceable Membrane Ion-Selective Electrodes

Replace worn membranes quickly and extend the useful life of your electrodes

Membrane replacement saves time and the expense of electrode replacement. The durable outer epoxy body is ideal for field applications. Simply replace the worn membrane without removing any other component of the electrode. The liquid junction won't leak during membrane replacement. To sense a new ion, interchange membranes of the same type. These double-junction combination electrodes require no external reference. Electrodes are refillable with an outer silver-free reference fill, and include BNC connector with 3-ft cable. Contact our Application Specialists if you need an electrode not shown below.

Electrodes with PVC Membranes include one sensing module (in place), reference fill solution, and internal fill solution.

Electrodes with Solid-State Membranes include one sensing module (in place), polishing strips, and reference fill solution.

Replacement PVC Membrane Kits include three membranes, a set of O-rings, polishing strips, internal fill solution, and reference solution.

Replacement Solid-State Membrane Kits include three billets, a set of O-rings, polishing strips, and reference fill solution.

Solution Kits contain one pipette, one 60-mL bottle of filling solution, one 475-mL bottle of 1000 ppm standard solution (except model 27502-67) and one 475-mL bottle of ionic strength adjuster (1-gal. bottle for 27502-69).

27505-00

Specifications & Ordering Information

Ion-selective electrode	Catalog number	Price	Concentration range	Temp/pH range*	Interferences [†]	Replacement membrane kits		Solution kits			
						Catalog number	Price	Catalog number	Formulations for fill/standard solutions	Ionic strength adjuster formulation	Price
Electrodes with PVC membranes											
Ammonium (NH ₄ ⁺)	KH-27505-00		5 x 10 ⁻⁶ to 1.0 M (0.1 to 18,000 ppm)	0 to 50°C/4 to 10	K ⁺	KH-27505-50		KH-27502-53	0.1 M NaCl/1000 ppm as N	5 M NaCl	
Calcium (Ca ²⁺)	KH-27505-06		5 x 10 ⁻⁶ to 1.0 M (0.2 to 40,000 ppm)	0 to 50°C/3 to 10	Pb ²⁺ , Hg ²⁺ , Cu ⁺	KH-27505-56		KH-27502-59	4 M KCl/1000 ppm as Ca ²⁺	4 M KCl	
Nitrate (NO ₃ ⁻)	KH-27505-12		7 x 10 ⁻⁶ to 1.0 M (0.5 to 62,000 ppm)	0 to 50°C/2.5 to 11	ClO ₄ ⁻ , I ⁻ , CN ⁻ , BF ₄ ⁻	KH-27505-62		KH-27502-79	0.1 M (NH ₄) ₂ SO ₄ /1000 ppm as NO ₃ ⁻	2 M (NH ₄) ₂ SO ₄	
Potassium (K ⁺)	KH-27505-24		10 ⁻⁶ to 1.0 M (0.04 to 39,000 ppm)	0 to 50°C/2 to 12	Cs ⁺ , NH ₄ ⁺ , TI ⁺	KH-27505-74		KH-27502-89	0.1 M NaCl/1000 ppm as K ⁺	5 M NaCl	
Electrodes with solid-state membranes											
Bromide (Br ⁻)	KH-27506-00		5 x 10 ⁻⁶ to 1.0 M (0.4 to 79,900 ppm)	0 to 80°C/2 to 14	S ²⁻ , I ⁻ , CN ⁻	KH-27506-50		KH-27502-55	1 M KNO ₃ /1000 ppm as Br ⁻	5 M NaNO ₃	
Chloride (Cl ⁻)	KH-27506-12		5 x 10 ⁻⁶ to 1.0 M (1.8 to 35,500 ppm)	0 to 80°C/2 to 12	S ²⁻ , I ⁻ , CN ⁻ , Br ⁻	KH-27506-62		KH-27502-63	1 M KNO ₃ /1000 ppm as Cl ⁻	5 M NaNO ₃	
Copper (Cu ²⁺)	KH-27506-18		10 ⁻⁸ to 10 ⁻¹ M (0.0006 to 6350 ppm)	0 to 80°C/2 to 12	Ag ⁺ , Hg ²⁺ , high Cl ⁻	KH-27506-68		KH-27502-65	1 M KNO ₃ /1000 ppm as Cu ²⁺	5 M NaNO ₃	
Cyanide (CN ⁻)	KH-27506-24		5 x 10 ⁻⁶ to 10 ⁻² M (0.1 to 260 ppm)	0 to 80°C/11 to 13	S ²⁻ , I ⁻ , Br ⁻ , Cl ⁻	KH-27506-74		KH-27502-67	1 M KNO ₃ [‡]	10 M NaOH	
Fluoride (F ⁻)	KH-27506-30		10 ⁻⁶ to saturated (0.02 to saturated)	0 to 80°C/5 to 8	OH ⁻	KH-27506-80		KH-27502-69	4 M KCl/1000 ppm as F ⁻	TISAB I	

*Optimal pH range for direct measurement. [†]These ions are listed in order of decreasing concentrations of interference. [‡]Customer-formulated standard solution required.

Cole-Parmer® Combination Ion-Selective Electrodes and Solutions

Cost-effective choices that are also easy to use

- Easily fit into small spaces—no additional reference electrode is needed

Whether your application involves end point determinations in potentiometric titrations or continuous monitoring of specific ions, we can help you find the right electrode for the job.

These fast and accurate electrodes do not require an external reference—they're easier to use than separate sensing and reference half-cell electrodes.

All Cole-Parmer electrodes are double-junction combination ion-selective electrodes and are convenient to use in places where two electrodes won't fit.

All electrodes include a 15-mL bottle of reference solution, a reference filling pipette, 1-m cable, BNC connector, and an instruction manual. Solid-state electrodes also have twelve polishing strips. For other types of connections, order a BNC adapter from page 1091.

Economy Epoxy Electrodes have a durable epoxy body and are well-suited for portable field applications. Outer reference chamber is silver-free and resists contamination. These electrodes are refillable.

Laboratory Glass Electrodes are double-junction in design, with a glass body that provides high-quality measurements for your laboratory applications. Improved glass seal enhances performance and reliability. Sealed inner junctions and refillable outer junctions accommodate special reference fill solutions—ideal for low-concentration measurements.

Use electrodes with a meter that has a resolution of 0.1 mV for the most accurate results. Many meters in our "pH/Ion Meters" section have 0.1 mV resolution; several also give direct readings in ppm. For monitoring ions not listed below or for more electrode application information, call our Application Specialists.



**Solid-state
chloride electrode
27504-08**

Specifications & Ordering Information

Ion-selective electrode	Economy epoxy electrodes		Laboratory glass electrodes		Type	Concentration range	Temperature/pH range*	Interferences [†]
	Cat. no.	Price	Cat. no.	Price				
Ammonium (NH ₄ ⁺)	KH-27504-00		KH-27502-03		PVC membrane	5 × 10 ⁻⁶ to 1.0 M (0.1 to 18,000 ppm)	0 to 50°C/ 4 to 10	K ⁺
Bromide (Br ⁻)	KH-27504-02		KH-27502-05		Solid-state	5 × 10 ⁻⁶ to 1.0 M (0.4 to 79,900 ppm)	0 to 80°C/ 2 to 14	S ²⁻ , I ⁻ , CN ⁻ ; high Cl ⁻ and NH ₃ levels
Cadmium (Cd ²⁺)	KH-27504-04		KH-27502-07		Solid-state	10 ⁻⁷ to 10 ⁻¹ M (0.01 to 11,200 ppm)	0 to 80°C/ 2 to 12	Ag ⁺ , Hg ²⁺ , Cu ²⁺ ; high Pb ²⁺ and Fe ²⁺ levels
Calcium (Ca ²⁺)	KH-27504-06		KH-27502-09		PVC membrane	5 × 10 ⁻⁶ to 1.0 M (0.2 to 40,000 ppm)	0 to 50°C/ 3 to 10	Pb ²⁺ , Hg ²⁺ , Cu ²⁺ , Ni ²⁺ , Fe ²⁺ , Mg ²⁺ , Zn ²⁺ , Ba ²⁺ , K ⁺ , Na ⁺
Chloride (Cl ⁻)	KH-27504-08		KH-27502-13		Solid-state	5 × 10 ⁻⁵ to 1.0 M (1.8 to 35,500 ppm)	0 to 80°C/ 2 to 12	S ²⁻ , I ⁻ , CN ⁻ , Br ⁻ , OH ⁻ , NH ₃ , S ₂ O ₃ ²⁻
Copper (Cu ²⁺)	KH-27504-10		KH-27502-15		Solid-state	10 ⁻⁸ to 10 ⁻¹ M (0.0006 to 6350 ppm)	0 to 80°C/ 2 to 12	Ag ⁺ , Hg ²⁺ ; high Cl ⁻ , Br ⁻ , Fe ²⁺ , and Cd ²⁺ levels
Cyanide (CN ⁻)	KH-27504-12		KH-27502-17		Solid-state	5 × 10 ⁻⁶ to 10 ⁻² M (0.1 to 260 ppm)	0 to 80°C/ 11 to 13	S ²⁻ , I ⁻ , Br ⁻ , Cl ⁻
Fluoride (F ⁻)	KH-27504-14		KH-27502-19		Solid-state	10 ⁻⁹ to saturated (0.02 to saturated)	0 to 80°C/ 5 to 8	OH ⁻
Iodide (I ⁻)	KH-27504-18		KH-27502-23		Solid-state	5 × 10 ⁻⁸ to 1.0 M (0.006 to 127,000 ppm)	0 to 80°C/ 0 to 14	S ²⁻ , CN ⁻ , Br ⁻ , Cl ⁻ , NH ₃ , S ₂ O ₃ ²⁻
Lead (Pb ²⁺)	KH-27504-20		KH-27502-25		Solid-state	10 ⁻⁶ to 10 ⁻¹ M (0.2 to 20,700 ppm)	0 to 80°C/ 3 to 8	Ag ⁺ , Hg ²⁺ , Cu ²⁺ ; high Cd ²⁺ and Fe ²⁺ levels
Nitrate (NO ₃ ⁻)	KH-27504-22		KH-27502-31		PVC membrane	7 × 10 ⁻⁶ to 1.0 M (0.5 to 62,000 ppm)	0 to 50°C/ 2.5 to 11	ClO ₄ ⁻ , I ⁻ , CN ⁻ , BF ₄ ⁻
Perchlorate (ClO ₄ ⁻)	KH-27504-24		KH-27502-35		PVC membrane	7 × 10 ⁻⁶ to 1.0 M (0.7 to 98,000 ppm)	0 to 50°C/ 2.5 to 11	NO ₃ ⁻ , NO ₂ ⁻ , CN ⁻ , ClO ₃ ⁻ , I ⁻
Potassium (K ⁺)	KH-27504-26		KH-27502-39		PVC membrane	10 ⁻⁶ to 1.0 M (0.04 to 39,000 ppm)	0 to 50°C/ 2 to 12	Cs ⁺ , NH ₄ ⁺ , Tl ⁺ , H ⁺ , Ag ⁺ , Li ⁺ , Na ⁺ , Trist ¹⁺
Silver/Sulfide (Ag ⁺ /S ²⁻)	KH-27504-28		KH-27502-41		Solid-state	10 ⁻⁷ to 1.0 M (Ag ⁺ , S ²⁻) (0.01 to 107,900 ppm Ag ⁺ ; 0.003 to 32,100 ppm S ²⁻)	0 to 80°C/ 2 to 12	Hg ²⁺
Sodium (Na ⁺)	KH-27504-30		KH-27502-43		Glass membrane	10 ⁻⁶ M to saturated (0.02 ppm to saturated)	0 to 80°C/ 5 to 12	H ⁺ , K ⁺ , Li ⁺ , Ag ⁺ , NH ₄ ⁺ , Rb ⁺ , Cs ⁺ , Tl ⁺
Surfactant (X ⁻ /X ⁻)	KH-27504-32		KH-27502-45		PVC membrane	10 ⁻⁶ to 5 × 10 ⁻² M (1.0 to 12,000 ppm)	2 to 12	Similar types of surfactants
Water hardness (Ca ²⁺ /Mg ²⁺)	KH-27504-34		KH-27502-49		PVC membrane	10 ⁻⁵ to 1.0 M (0.4 to 40,000 ppm as Ca ²⁺)	0 to 50°C/ 5 to 10	Cu ²⁺ , Zn ²⁺ , Ni ²⁺ , Fe ²⁺

*Optimal pH range for direct measurement.

[†]These ions are listed in order of decreasing concentrations of interference.

pH Laboratory Electrodes

Ion-Selective

Solution Kits sold separately below include all of the solutions needed for accurate measurements. Each kit includes one reference filling pipette, one 60-mL bottle of reference fill solution, one 475-mL bottle of 1000 ppm standard solution, and one 475-mL bottle of ionic strength adjuster (except model 27502-69, which comes in a one-gallon bottle).

Replacement ionic strength adjusters come in 475-mL bottles (except model 27503-58, which comes in a one-gallon bottle).

GO to 1056-1086

See our pH/Ion section for meters with direct ion concentration readouts.



Solution kit 27502-63 and ISA bottle 27503-51

Cole-Parmer® Ammonia Ion-Selective Electrode

Ideal for high-purity water, fish tanks, sea water, waste water, plating baths, air/stack gases, and biological samples

- Reference electrode and half-cell combined in one housing
- Measure concentrations up to 17,000 ppm

Easy-to-use, single-junction electrode features a durable, epoxy body. The electrode design minimizes errors and provides accurate results within 30 seconds, depending on solution concentration. Low-maintenance electrode is refillable, and worn membranes change out easily. BNC connector and one-meter cable allow you to use with almost any existing meter.

What's included: 15-mL of electrolyte, replacement membrane, filling pipette, and instructions. Order standards, ionic strength adjusters, and fill solution separately below.



27502-00

Specifications & Ordering Information

Catalog number	Type	Concentration range	Temperature/pH range*	Interferences	Price
KH-27502-00	Gas sensing	5 x 10 ⁻⁷ to 1.0 M (0.01 to 17,000 ppm)	0 to 50°C/above 11	Volatile amines	

*Optimal pH range for direct measurement

[KH-27503-00](#) Ammonia standard, 0.1 M NH₄Cl, 475-mL bottle

[KH-27503-93](#) Ammonia standard, 1000 ppm ammonia as nitrogen, 475-mL bottle

[KH-27503-94](#) Ammonia standard, 100 ppm ammonia as nitrogen, 475-mL bottle

[KH-27503-50](#) Ionic strength adjuster, 10 M NaOH, 475-mL bottle

[KH-27503-71](#) Ammonia fill solution, 0.1 M NH₄Cl, 125-mL bottle

[KH-27503-95](#) Replacement membranes.

Ten membrane tapes, one O-ring, and tweezers

Ion	Standards and fill solution kits			Replacement ionic strength adjusters*		
	Catalog number	Formulations for fill/standard solutions	Price	Catalog number	Solution formulation	Price
NH ₄ ⁺	KH-27502-53	0.1 M NaCl/ 1000 ppm as N		KH-27503-53	5 M NaCl	
Br ⁻	KH-27502-55	1 M KNO ₃ / 1000 ppm as Br ⁻		KH-27503-51	5 M NaNO ₃	
Cd ⁺	KH-27502-57	1 M KNO ₃ [†]		KH-27503-51	5 M NaNO ₃	
Ca ⁺²	KH-27502-59	4 M KCl/ 1000 ppm as Ca ⁺²		KH-27503-52	4 M KCl	
Cl ⁻	KH-27502-63	1 M KNO ₃ / 1000 ppm as Cl ⁻		KH-27503-51	5 M NaNO ₃	
Cu ⁺²	KH-27502-65	1 M KNO ₃ / 1000 ppm as Cu ⁺²		KH-27503-51	5 M NaNO ₃	
CN ⁻	KH-27502-67	1 M KNO ₃ [†]		KH-27503-50	10 M NaOH	
F ⁻	KH-27502-69	4 M KCl/ 1000 ppm as F ⁻		KH-27503-58	TISAB I	
I ⁻	KH-27502-73	1 M KNO ₃ / 1000 ppm as I ⁻		KH-27503-51	5 M NaNO ₃	
Pb ⁺²	KH-27502-75	1 M KNO ₃ / 1000 ppm as Pb ⁺²		KH-27503-56	5 M NaClO ₄	
NO ₃ ⁻	KH-27502-79	0.1 M (NH ₄) ₂ SO ₄ / 1000 ppm as NO ₃ ⁻		KH-27503-60	2 M (NH ₄) ₂ SO ₄	
ClO ₄ ⁻	KH-27502-85	0.1 M (NH ₄) ₂ SO ₄ / 1000 ppm as ClO ₄ ⁻		KH-27503-60	2 M (NH ₄) ₂ SO ₄	
K ⁺	KH-27502-89	0.1 M NaCl/ 1000 ppm as K ⁺		KH-27503-53	5 M NaCl	
Ag ⁺ / S ⁻²	KH-27502-91	1 M KNO ₃ / 1000 ppm as Ag ⁺		KH-27503-51	5 M NaNO ₃	
Na ⁺	KH-27502-93	0.1 M NH ₄ Cl/ 1000 ppm as Na ⁺		KH-27503-54	4 M NH ₄ Cl with 4 M NH ₄ OH	
X ⁺ /X ⁻	KH-27502-95	4 M KCl/ 0.05 M Hyamine® and 0.01 M SLS [‡]		KH-27503-59	0.1% Triton X-100	
Ca ⁺² / Mg ⁺²	KH-27502-99	4 M KCl/ 1000 ppm as Ca ⁺²		KH-27503-52	4 M KCl	

*A 475-mL bottle of ionic strength adjuster is supplied with kit.

[†]Customer-formulated standard solution required. [‡]None required.

OAKLON® Ion 6 Meter

- Direct readout of ion concentration at economical prices!
 - Preprogrammed ion calibration points
- Rugged, economical meter features push-button calibration, hold function, auto-off, and splash resistant key pad. Reads concentration in ppm up to 1999 ppm, mV, pH, and temperature in °C. Meter includes a protective rubber boot that also acts as a meter stand for benchtop use. Operates on four AAA batteries (included).



35613-31

[EK-35613-31](#) Ion 6 meter

Ion-Selective Electrodes and Solutions

Orion-designed for optimum performance and the most comprehensive ISE selection

ionplus® Sure-Flow® Combination Ion-Selective Electrodes are easier to use than reference and half-cells—eliminating fumbling and tangles from multiple cables. Sure-flow technology provides stable, reproducible results. The easy-to-clean design reduces the risk of inaccurate readings due to clogging of the reference junction.

Combination Ion-Selective Electrodes feature both half-cell and reference cell in one electrode—more convenient than half-cell electrodes. Ideal for measuring smaller sample than half-cells with reference.

Half-Cell Ion-Selective Electrodes are the classic means of taking ion measurements and are still the only option for some ion measurements. Half-cell give you more flexibility and choice in reference electrodes. Half-cell electrodes require that you also purchase a reference electrode.

All electrodes include a BNC connector, a 3-ft cable, and manual. Complete systems require the purchase of a standardizing solution, filling solution for the reference electrode, ionic strength adjustor, and pH adjusters.

Note: Ions such as aluminum, boron, manganese, and molybdate can be measured using the correct electrode and pH adjustors even though electrodes are not listed for them. Some specific measurements may require variants of electrode and solution combinations.



ISO 9001:2000
CERTIFIED SUPPLIER

Specifications & Ordering Information

Ion-selective electrode	Catalog number	Price	Electrode type	Concentration range	Temperature/pH range*	Interferences†
ionplus Sure-Flow combination ion-selective electrodes						
Bromide (Br ⁻)	KH-05713-01		Solid-state	5 x 10 ⁻⁶ to 1 M (0.4 to 79,900 ppm)	0 to 80°C/ 2 to 14	I ⁻ , S ⁻² , CN ⁻ ; high levels of Cl ⁻ , NH ₃
Calcium (Ca ⁺²)	KH-58824-52		Plastic membrane	5 x 10 ⁻⁷ to 1 M (0.02 to 40,100 ppm)	0 to 40°C/ 2.5 to 11	Pb ⁺² , Hg ⁺² , H ⁺ , Sr ⁺² , Fe ⁺² , Cu ⁺² , Ni ⁺² , H ⁴⁺ , Na ⁺ , Tris ⁺ , Li ⁺ , K ⁺ , Ba ⁺² , Zn ⁺² , Mg ⁺²
Chloride (Cl ⁻)	KH-58824-60		Solid-state	5 x 10 ⁻⁵ to 1 M (1.8 to 35,500 ppm)	0 to 80°C/ 2 to 12	CN ⁻ , Br ⁻ , I ⁻ , OH ⁻ , S ⁻² must be absent
Cupric (Cu ⁺²)	KH-05713-07		Solid-state	10 ⁻⁸ to 0.1 M (6.4 x 10 ⁻⁴ to 6350 ppm)	0 to 80°C/ 2 to 12	Hg ⁺² and Ag ⁺ must be absent; high levels of Fe ⁺² , Br ⁻ , and Cl ⁻ may interfere
Cyanide (CN ⁻)	KH-05713-09		Solid-state	8 x 10 ⁻⁶ to 10 ⁻² M (0.2 to 260 ppm)	0 to 80°C/ 0 to 14	I ⁻ , Br ⁻ , Cl ⁻ ; S ⁻² must be absent
Fluoride (F ⁻)	KH-05723-02		Solid-state	10 ⁻⁶ M to saturated (0.02 ppm to saturated)	0 to 80°C/ 5 to 11	OH ⁻
Iodide (I ⁻)	KH-05713-11		Solid-state	5 x 10 ⁻⁸ to 1 M (5 x 10 ⁻³ to 127,000 ppm)	0 to 80°C/ 0 to 14	CN ⁻ , S ₂ O ₃ ⁻² , S ⁻² , NH ₃ , Cl ⁻
Lead (Pb ⁺²)	KH-05713-13		Solid-state	10 ⁻⁶ to 0.1 M (0.2 to 20,700 ppm)	0 to 80°C/ 4 to 7	Hg ⁺² , Ag ⁺ , and Cu ⁺² must be absent; high levels of Fe ⁺² and Cd ⁺² may interfere
Nitrate (NO ₃ ⁻)	KH-05713-15		Plastic membrane	7 x 10 ⁻⁶ to 1 M (0.10 to 14,000 ppm as N)	0 to 40°C/ 2.5 to 11	ClO ₄ ⁻ , I ⁻ , ClO ₃ ⁻ , CN ⁻ , Br ⁻ , HS ⁻ , HCO ₃ ⁻ , CO ₃ ⁻² , Cl ⁻ , PO ₄ ⁻³ , OAc ⁻ , F ⁻ , SO ₄ ⁻² , NO ₂ ⁻ , HPO ₄ ⁻
Silver/Sulfide (Ag ⁺ /S ⁻²)	KH-05713-21		Solid-state	Ag ⁺ : 10 ⁻⁷ to 1 M (0.01 to 107,900 ppm) S ⁻² : 10 ⁻⁷ to 1 M (0.003 to 32,100 ppm)	0 to 80°C/ 2 to 12	Hg ⁺²
Combination ion-selective electrodes						
Ammonia (NH ₃) Ammonium (NH ₄ ⁺)	KH-05722-16		Gas sensing	5 x 10 ⁻⁷ to 1 M (0.01 to 17,000 ppm)	0 to 50°C/ 11 to 13	Volatile amines
Carbon dioxide (CO ₂) Carbonate (CO ₃ ⁻²)	KH-05722-01		Gas sensing	10 ⁻⁴ to 10 ⁻² M (4.4 to 440 ppm)	0 to 50°C/ 4.8 to 5.2	Volatile weak acids
Chlorine (Cl ₂)	KH-05724-02		Solid-state	10 ⁻⁷ to 3 x 10 ⁻⁴ M (0.01 to 20 ppm)	0 to 50°C/ 2 to 14	Strong oxidizing agents (IO ₃ ⁻ , BrO ₃ ⁻ , MnO ₂)
Nitrogen oxide (NO _x)	KH-05713-17		Gas sensing	4 x 10 ⁻⁶ to 5 x 10 ⁻³ M (0.18 to 230 ppm)	0 to 50°C/ 1.1 to 1.7	CO ₂ and volatile weak acids
Sodium (Na ⁺)	KH-05723-31		ROSS™ Sure-Flow	10 ⁻⁶ M to saturated (0.02 ppm to saturated)	0 to 100°C/ 3 to 12	Ag ⁺ , Li ⁺ , K ⁺ , Tl ⁺ , H ⁺ , Cs ⁺
Half-cell ion-selective electrodes: require reference electrode. Match the key letters in the "filling solutions" column with the ones in the "Reference Electrodes" table on the facing page.						
Chloride (Cl ⁻)	KH-05721-41		Solid-state	5 x 10 ⁻⁵ to 1 M (1.8 to 35,500 ppm)	0 to 80°C/ 2 to 12	CN ⁻ , Br ⁻ , I ⁻ , OH ⁻ , S ⁻² must be absent
Fluoride (F ⁻)	KH-05721-11		Solid-state	10 ⁻⁶ M to saturated (0.02 ppm to saturated)	0 to 80°C/ 5 to 11	OH ⁻
Thiocyanate (SCN ⁻)	KH-05721-91		Solid-state	5 x 10 ⁻⁶ to 1 M (0.29 to 58,100 ppm)	0 to 50°C/ 2 to 10	I ⁻ , Br ⁻ , CN ⁻ , S ₂ O ₃ ⁻² , Cl ⁻ , OH ⁻ , NH ₃ , S ⁻²
Water hardness (Ca ⁺² /Mg ⁺²)	KH-05720-42		Liquid membrane	6 x 10 ⁻⁶ to 1 M (0.24 to 40 ppm as Ca ⁺² ; 0.15 to 24 ppm as Mg ⁺²)	0 to 50°C/ 7 to 10	Cu ⁺² , Zn ⁺² , Ni ⁺² , Sr ⁺² , Fe ⁺² , Ba ⁺² , Na ⁺ , K ⁺

*Optimal pH range for direct measurement †Ions are listed in order of decreasing concentrations of interference ‡See page 1263 for a description of ROSS and ROSS Sure-Flow electrodes

pH Laboratory Electrodes

Ion-Selective

Solutions for Ion-Selective Electrodes

Standardizing solutions calibrate your instrument and help perform addition and subtraction operations. Solutions work best when combined with ionic strength and pH adjusters, which eliminate interferences from other ion species and adjust standards and samples to an optimal pH range.

All standardizing solutions and ionic strength adjusters come in 475-mL bottles except model 05730-15 (1-gal) and model 05730-53 (five 50-mL bottles). All filling solutions for reference electrodes come in cartons of one 60-mL or five 50-mL bottles.

Reference Electrodes

Choose the model that matches the key letter under "Filling solutions" below. Reference electrodes have pin-tip connectors.

Key	Catalog number	Junction type	Solution included	Price
A	KH-05710-01	Single	05730-38	
B	KH-05710-10	Double	05730-40	



Ion	Standardizing solutions			Filling solutions			Ionic strength and pH adjusters			
	Cat. no.	Description	Price	Key	Cat. no.	Description	Price	Cat. no.	Description	Price
ionplus Sure-Flow combination ion-selective electrodes										
Br ⁻	KH-05730-22	0.1 M NaBr		—	KH-05713-36	Optimum Results™ D (2-oz)		KH-05730-27	ISA 5 M NaNO ₃	
Ca ⁺²	KH-05730-09	0.1 M CaCl ₂		—	KH-05713-30	Optimum Results™ A		KH-05730-10	ISA 4 M KCl	
Cl ⁻	KH-05730-18	0.1 M NaCl NaCl as Cl, 100 ppm 1000 ppm as Cl		—	KH-05730-47	Internal	††	KH-05730-27	ISA 5 M NaNO ₃	
	KH-05730-19									
	KH-05730-20									
Cu ⁺²	KH-05730-21	0.1 M Cu(NO ₃) ₂		—	KH-05713-36	Optimum Results D (2-oz)		KH-05730-27	ISA 5 M NaNO ₃	
CN ⁻	**	—	—	—	KH-05713-32	Optimum Results™ B		—	—	—
F ⁻	KH-05730-13	0.1 M NaF NaF as F, 100 ppm		—	KH-05730-38	Equitransferent	††	KH-05730-15	TISAB II	
	KH-05730-14							KH-05730-16	TISAB III (conc)	
I ⁻	KH-05730-23	0.1 M NaI		—	KH-05713-36	Optimum Results D (2-oz)		KH-05730-27	ISA 5 M NaNO ₃	
Pb ⁺²	KH-05730-25	0.1 M Pb(ClO ₄) ₂ 0.1 M Na ₂ SO ₄		—	KH-05713-32	Optimum Results™ B		—	—	—
	KH-05730-26									
NO ₃ ⁻	KH-05730-01	0.1 M NaNO ₃		—	KH-05713-40	Optimum Results F (2-oz)		KH-05730-04 KH-05713-46	ISA 2 M (NH ₄) ₂ SO ₄ Interference suppressor	
Ag ⁺ /S ⁻²	**	—	—	—	KH-05713-32	Optimum Results B (Ag ⁺)		KH-05730-27	ISA 5 M NaNO ₃ for Ag ⁺	
					KH-05713-30	Optimum Results A (S ⁻²)		KH-05713-50	SAOB reagent for S ⁻²	
Combination ion-selective electrodes										
NH ₃ NH ₄ ⁺	KH-05730-31 KH-05730-32	0.1 M NH ₄ Cl NH ₄ Cl as N, 1000 ppm		—	KH-05730-45	Internal		KH-05730-51	ISA (NaOH & EDTA)	
CO ₂ CO ₃ ⁻²	KH-05730-28	0.1 M NaHCO ₃ NaHCO ₃ as CaCO ₃ , 1000 ppm		—	KH-05730-46	Internal		KH-05730-30	CO ₂ buffer	
	KH-05730-29									
Cl ₂	KH-05730-35	KIO ₃ as Cl ₂ , 100 ppm		—	—	—		KH-05730-36 KH-05730-53	Acid reagent Iodine reagent	
(NO _x) _i NO ₂ ⁻	KH-05730-33	0.1 M NaNO ₂		—	KH-05730-48	Internal		KH-05730-34	2 M sulfate mixture	
Na ⁺	KH-05730-17	NaCl as Na, 100 ppm		—	KH-05730-50	0.1 M NH ₄ Cl for measurement below 0.2 ppm	††	—	—	—
Half-cell ion-selective electrodes: requires reference electrode. Match the key letters in the "filling solutions" column with the ones in the "Reference Electrodes" table above.										
Cl ⁻	KH-05730-18	0.1 M NaCl NaCl as Cl, 100 ppm 1000 ppm as Cl		A B	KH-05730-38	Equitransferent	††	KH-05730-27	ISA 5 M NaNO ₃	
	KH-05730-19				10% KNO ₃					
	KH-05730-20									
F ⁻	KH-05730-13	0.1 M NaF NaF as F, 100 ppm		A	KH-05730-38	Equitransferent	††	KH-05730-15	TISAB II	
	KH-05730-14				KH-05730-16	TISAB III (conc)				
SCN ⁻	**	—	—	A B	KH-05730-38 KH-05730-40	Equitransferent 10% KNO ₃	†† ††	KH-05730-27	ISA 5 M NaNO ₃	
Ca ⁺² /Mg ⁺²	KH-05730-09	0.1 M CaCl ₂		A	KH-05730-42	4 M KCl with Ag ⁺	††	—	—	—

**Customer-formulated solution required

††These items are sold in packs of five.

A Guide to Industrial pH/ORP Electrodes

Cole-Parmer offers one of the largest selections of industrial pH and Oxidation Reduction Potential (ORP) electrodes. If you need a specialized electrode that is not shown or need more specific information, call our Application Specialists and they will direct you to the appropriate electrode or determine if it can be special ordered. Additional lead times apply to special order electrodes.

Use and Care of Electrodes

The use and care of industrial electrodes is similar to laboratory electrodes except that industrial electrodes are generally not refillable and are replaced when the fill solution is depleted. Go to page 1089 for general instructions for their use and care. Calibration and storage of pH electrodes are probably the most important aspects of maintaining a properly working pH electrode.

Periodic calibration with NIST-traceable calibration buffers is the best way to ensure accurate and repeatable results as the electrode's response to pH changes over time. Calibration intervals are application specific, dependent upon the data quality objectives, and the historical data generated from the installation. More frequent calibrations provide more accurate data. If possible, new installations should be calibrated or, at a minimum, checked daily with the interval increased as needed.

Electrode Junctions

Industrial pH/ORP electrodes are available as single- or double-junction models. Double-junction electrodes are highly recommended for any application that is not relatively "clean" as they protect the reference element against contamination from heavy metals, organics, and sulfides. Go to page 1089 for a diagram of single- and double-junction electrodes.

Automatic Temperature Compensation (ATC)

pH electrodes are available with or without an ATC element. Temperature compensation is important for correct pH measurement and is more important in processes where temperature changes substantially or where pH varies significantly from pH 7. Refer to the meter manual for the correct ATC element and connector. See page 1115 for reusable ATC probes that allow temperature compensation with pH electrodes without ATC elements. The reusable ATC probes may save money over time, but require an additional process connection. ATC is not available with ORP electrodes as the complex and often changing chemistry makes correction curves nearly impossible to develop.

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Process Connections

pH electrodes can be in-line or insertion mounted into the process and most electrodes have threads that allow either installation. In-line electrodes are typically mounted vertically in a pipe tee in the main process stream or a side-stream if damage to the electrode can occur from current, particulates, or mechanical damage. If the electrode needs to be mounted horizontally, use a gel-filled side-mount electrode. Electrodes with threads on the top portion allow them to be submersed in a process. Simply place the electrode cable through a pipe that has the correct female pipe thread connection; care should be used so that the cable is not submersed in liquid. We also offer submersible electrodes that have a 3-ft body that allows the electrode to be immersed up to the cable, making them ideal for open tanks especially if the liquid level may change.

Preamplified Cables

Cole-Parmer offers new preamplified cables for installations in which the electrode will be mounted more than 30 feet from the controller/transmitter or in any processes where electromagnetic or radio frequency interferences may be present. The signal sent from a standard pH/ORP electrode is a high-impedance signal which means that there is great resistance for the signal to flow to the indicating device. Since the electrode is measuring millivolts, even small electrical interferences can be interpreted as variations in pH, when there is none. With a preamplifier, the signal resistance is lowered and stronger signal strength is produced that eliminates extraneous voltage interferences.

The new preamplified electrodes are powered by a VAC or VDC power source so there is no need to replace batteries. Preamplified cables can be used with any nondifferential pH electrode with a BNC pH connector. Cables come in 25, 50, or 100 feet and are available with or without temperature compensation, and

with temperature compensation and solution ground capabilities. Contact our Application Specialists for longer lengths.

Asymmetrical vs Symmetrical

Some controllers allow asymmetrical or symmetrical operation. Typically lower cost controllers operate only in a single-ended mode, called asymmetrical, which has the reference electrode connected to the ground potential of the controller's amplifier. Asymmetrical operation works well as long as the environment is electronically noise-free. Electrical noise from a nongrounded electrical motor can inject noise that is incorrectly interpreted as pH/ORP. In a controller with symmetrical mode and with a pH/ORP electrode that has a potential matching pin (solution ground), measurements are made relative to the liquid ground. Disturbances are measured equally on the reference and pH electrodes and the solution ground noise is subtracted from the measurement by the controller for a correct pH measurement.

Differential pH Measurement

Some manufacturer's controllers measure pH/ORP by differential measurement. Differential measurement essentially combines the benefits of the preamplified cables and a solution ground into the electrode. The integral electronic amplifiers measure potential difference of the process electrode and the reference electrode with respect to the solution ground and produces a low impedance signal. The signal can be transmitted several hundred feet with reduced electrical interferences and virtual elimination of ground loops. Also the reference solution and salt bridge can be replaced; providing a longer sensor life in a wide range of environments. The increased upfront cost of a differential system is offset by the extended sensor life and provides greater accuracy in environments that would quickly foul a traditional electrode, such as wastewater.

pH Industrial Electrodes

1/2" NPT In-Line

Cole-Parmer Economical In-Line pH and ORP Electrodes

Integral, one-piece electrode and housing for installation convenience

- Economical single-junction or rugged double-junction designs
- 1" insertion depth, 1/2" threads

Select either a single- or double-junction reference and your choice of temperature compensating (ATC) elements. Double-junction electrodes resist contamination from heavy metals, organics, or compounds that might react with the AgCl reference solution.

Specifications & Ordering Information

Thread size: 1/2" NPT(M) **Temperature range:** 23 to 212°F (-5 to 100°C)
Insertion depth: 1" **Maximum pressure:** 150 psi
Housing length: 5" **Cable:** 10 ft, with BNC pH connector

Catalog number	ATC element	ATC connector	Price
In-line, single-junction pH electrodes, 0 to 13 pH			
KH-05993-90	None	None	
KH-05993-70	100 Ω RTD	Mini-audio	
KH-05993-79	100 Ω RTD	Tinned ends	
KH-05993-91	1 kΩ RTD	Spade lugs	
In-line, double-junction pH electrodes, 0 to 13 pH			
KH-27001-90	None	None	
KH-27001-70	100 Ω RTD	Mini-audio	
KH-27001-72	100 Ω RTD	Tinned ends	
KH-27001-91	1 kΩ RTD	Spade lugs	
In-line, single-junction ORP electrode			
KH-05993-62	None	None	
In-line, double-junction ORP electrode			
KH-27001-62	None	None	

Cole-Parmer Tuff-Tip® In-Line pH and ORP Electrodes

Semi-domed, Tuff-Tip limits glass exposure and protects electrode from damage

Order single- or double-junction disposable electrodes for your in-line process control needs.

Specifications & Ordering Information

Thread size: 1/2" NPT(M) **Temperature range:** 23 to 176°F (-5 to 80°C)
Insertion depth: 1" **Maximum pressure:** 150 psi
Housing length: 5" **Cable:** 10 ft, with BNC pH connector

Bulb is protected from contact with flat surfaces.

Catalog number	ATC element	ATC connector	Price
In-line, single-junction pH electrodes, 0 to 13 pH			
KH-05995-01	None	None	
KH-05995-02	100 Ω RTD	Tinned ends	
KH-05995-04	1 kΩ RTD	Spade lugs	
In-line, double-junction pH electrodes, 0 to 13 pH			
KH-05995-10	None	None	
KH-05995-12	100 Ω RTD	Tinned ends	
KH-05995-14	1 kΩ RTD	Spade lugs	
In-line, single-junction ORP electrode			
KH-05995-20	None	None	
In-line, double-junction ORP electrode			
KH-05995-22	None	None	

Cole-Parmer Gel-Filled, Side-Mount pH Electrodes

Mount these versatile electrodes in any position

- Durable—ideal for your demanding applications

Sealed single- and double-junction reference cells require no refilling during use. Use for measurements up to pH 13.



Specifications & Ordering Information

Thread size: 1/2" NPT(M) **Cable:** 10 ft, with BNC pH connector
Insertion depth: 1" **Temperature range:** 23 to 212°F (-5 to 100°C)
Housing length: 5" **Maximum pressure:** 150 psi
Housing material: Kynar®

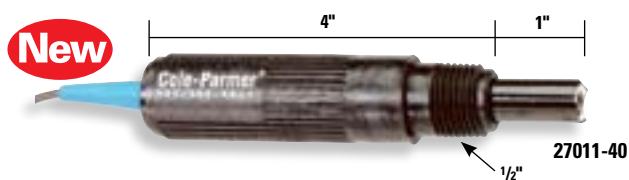
Single-junction models		Double-junction models		ATC element	ATC connector
Catalog number	Price	Catalog number	Price		
KH-27011-00		KH-27011-10		None	None
KH-27011-01		KH-27011-11		100 Ω RTD	Mini audio plug
KH-27011-20		KH-27011-30		100 Ω RTD	Tinned ends
KH-27011-02		KH-27011-12		1 kΩ RTD	Spade lugs
KH-27011-05		KH-27011-15		3 kΩ Balco	Spade lugs



Cole-Parmer Tuff-Tip®, Gel-Filled, Side-Mount pH Electrodes

Durable Tuff-Tip with ability to mount sideways

Use electrodes for measurements up to pH 13. The tip design protects the bulb from breakage and the internal gel fill solution allows electrode to be installed where others cannot.



Specifications & Ordering Information

Thread size: 1/2" NPT(M) **Temperature range:** 23 to 176°F (-5 to 80°C)
Insertion depth: 1" **Maximum pressure:** 150 psi
Housing length: 5" **Cable:** 10 ft, with BNC pH connector
Housing material: Kynar®

Gel fill solution allows sideways mounting.

Single-junction models		Double-junction models		ATC element	ATC connector
Catalog number	Price	Catalog number	Price		
KH-27011-40		KH-27011-50		None	None
KH-27011-42		KH-27011-52		100 Ω RTD	Tinned ends
KH-27011-44		KH-27011-54		1 kΩ RTD	Spade lugs

Cole-Parmer Self-Cleaning Flat pH and ORP Electrodes

Flat electrode surface prevents buildup of solids

- Double junctions for difficult applications
- Annular junction reduces reference cell fouling

Flat surface does not collect suspended solids—fluid flow across the electrode provides a cleaning action that extends electrode life and improves performance.

Choose either a CPVC housing or chemical-resistant Ryton® housing. Both electrode types have a Viton® O-ring to hold glass bulb in place. Built-in ATC elements and pH BNC connectors match a variety of meters and controllers.

Cole-Parmer Semi-Domed Rugged pH Electrodes

Unique design protects bulb

- Reduce electrolyte leakage and sample contamination—stand up to viscous samples better than Teflon® junctions
- Extended life in severe applications
- Graphite-tipped models eliminate electrical noise from your system

These double-junction electrodes have a revolutionary annular ceramic reference junction and a uniform pore size that reduces contamination and clogging. All electrodes are threaded for insertion into a pipe tee or a submersion pipe. Choose between chemical-resistant Ryton® or graphite-tipped electrodes with solution ground.

Cole-Parmer pH and ORP Electrodes with Probe Guard

Guard allows full-sized pH bulb, but protects against damage

- Economical single-junction or rugged double-junction designs

These combination electrodes have 3/4" NPT(M) threads on both ends for use as a submersion or in-line sensor.

Select either a single- or double-junction reference and your choice of temperature compensating (ATC) elements. Double-junction electrodes resist contamination from heavy metals, organics, or compounds that might react with the AgCl reference solution.

3/4" NPT In-Line, Submersible

Specifications & Ordering Information

Thread size: 3/4" NPT(M)

Insertion depth: 1.75"

Housing length: 6.75"

Housing material: CPVC or Ryton

Cable: 10 ft, with BNC pH connector

Temperature range

CPVC: 32 to 176°F (0 to 80°C)

Ryton: 32 to 212°F (0 to 100°C)

Maximum pressure: 100 psi

pH Electrodes

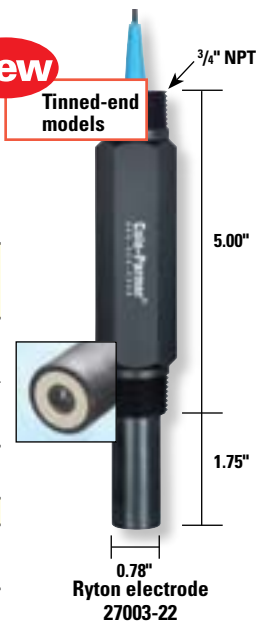
pH electrodes with CPVC housing, 0 to 14 pH		pH electrodes with Ryton housing, 0 to 14 pH		ATC element	ATC connector
Catalog number	Price	Catalog number	Price		
KH-27003-00		KH-27003-20		None	None
KH-27003-02		KH-27003-22		100 Ω RTD	Mini audio plug
KH-27003-12		KH-27003-23		100 Ω RTD	Tinned ends
KH-27003-04		KH-27003-24		1 kΩ RTD	Spade lugs
KH-27003-06		KH-27003-26		100 kΩ thermistor	1/4" phone plug
KH-27003-10		KH-27003-30		3 kΩ Balco	Spade lugs

ORP Electrodes

Catalog number	Housing material	Band type	Price
KH-27003-40	CPVC	Platinum	
KH-27003-50	Ryton	Platinum	
KH-27003-60	Ryton	Gold	

New

Tinned-end models



Ryton electrode
27003-22

Specifications & Ordering Information

Thread size: 3/4" or 1" NPT(M)

Insertion depth: 0.9"

Housing length: 5.9"

Housing material: Ryton

Cable: 10 ft, with BNC pH connector

Temperature range: 32 to 230°F (0 to 110°C)

Maximum pressure: 150 psi

pH electrodes		pH electrodes with graphite tips		ATC element	ATC connector
Catalog number	Price	Catalog number	Price		
3/4" NPT(M) threading, hexagonal body, Ryton, 0 to 14 pH					
KH-27020-00		KH-27020-40		None	None
KH-27020-02		KH-27020-42		100 Ω RTD	Mini audio plug
KH-27020-03		KH-27020-43		100 Ω RTD	Tinned ends
KH-27020-06		KH-27020-46		1 kΩ RTD	Spade lugs
1" NPT(M) threading, round body, Kynar, 0 to 14 pH					
KH-27020-20		KH-27020-60		None	None
KH-27020-22		KH-27020-62		100 Ω RTD	Mini audio plug
KH-27020-23		KH-27020-63		100 Ω RTD	Tinned ends
KH-27020-26		KH-27020-66		1 kΩ RTD	Spade lugs

New

Tinned-end models



Electrode
27020-00

Graphite-tipped
electrode
27020-60

KEEP
A SPARE

New

Tinned-end models

Specifications & Ordering Information

Thread size: 3/4" NPT(M)

Insertion depth: 1.75"

Housing length: 6.75"

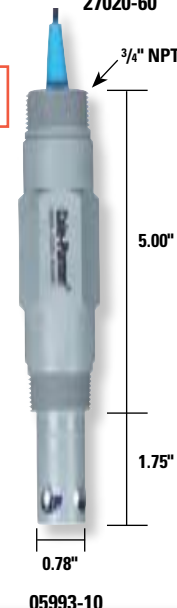
Housing material: CPVC

Cable: 10 ft, with BNC pH connector

Temperature range: 32 to 176°F
(0 to 80°C)

Maximum pressure: 100 psi

Catalog number	ATC element	ATC connector	Price
Insertion/submersion, single-junction pH electrodes, 0 to 14 pH			
KH-05993-10	None	None	
KH-27300-21	100 Ω RTD	Mini audio plug	
KH-27300-23	100 Ω RTD	Tinned ends	
KH-27300-24	1 kΩ RTD	Spade lugs	
Insertion/submersion, double-junction pH electrodes, 0 to 14 pH			
KH-27301-20	None	None	
KH-27301-21	100 Ω RTD	Mini audio plug	
KH-27301-23	100 Ω RTD	Tinned ends	
KH-27301-24	1 kΩ RTD	Spade lugs	
Insertion/submersion, single-junction ORP electrode			
KH-27300-19	None	None	
Insertion/submersion, double-junction ORP electrode			
KH-27301-19	None	None	



05993-10

PH Industrial Electrodes

3/4" NPT In-Line, Submersible

Cole-Parmer Solution Grounded pH/ORP Electrodes

KEEP
A SPARE

Solution ground combats electrical interferences

- Teflon® double junctions for longer life
- Polymerized gel electrolyte for harsh conditions

General-Purpose Electrodes have low-resistance glass with a very fast and stable response. Designed for minimal salt applications.

High-Salt Application Electrodes are designed for continuous long-term use at high temperatures in strong alkaline solutions above pH 11. Negligible salt ion error may be expected above pH 13. Response time will increase as solution temperature rises due to higher glass impedance.

Platinum-Band and Gold-Band ORP Electrodes have a metal-band sensor for oxidation reduction potential measurements.

Specifications & Ordering Information

Thread size: 3/4" NPT(M)

Housing material: Rytan

Insertion depth: 0.9"

Cable: 10 ft, with BNC pH connector

Housing length: 5.9"

Maximum pressure: 100 psi

Catalog number	ATC element	ATC connector	Temperature range	Price
Insertion/submersion, general-purpose pH electrodes, 0 to 14 pH				
KH-27018-00	None	None	32 to 212°F (0 to 100°C)	
KH-27018-02	100 Ω RTD	Mini-audio plug	32 to 212°F (0 to 100°C)	
KH-27018-03	100 Ω RTD	Tinned ends	32 to 212°F (0 to 100°C)	
Insertion/submersion, high-salt application pH electrodes, 0 to 14 pH				
KH-27018-20	None	None	32 to 275°F (0 to 135°C)	
KH-27018-22	100 Ω RTD	Mini-audio plug	32 to 275°F (0 to 135°C)	
KH-27018-23	100 Ω RTD	Tinned ends	32 to 275°F (0 to 135°C)	
KH-27018-24	1 kΩ RTD	Spade lugs	32 to 275°F (0 to 135°C)	
Insertion/submersion, platinum-band ORP electrode				
KH-27018-40	None	None	32 to 266°F (0 to 130°C)	
Insertion/submersion, gold-band ORP electrode				
KH-27018-50	None	None	32 to 266°F (0 to 130°C)	



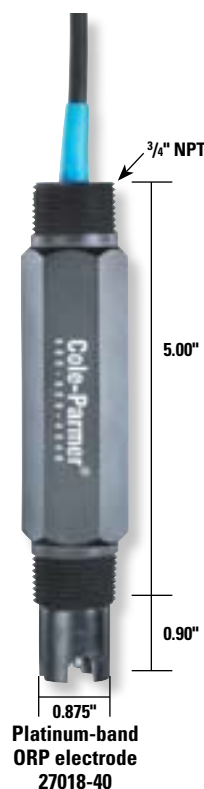
General-purpose electrode 27018-00



High-salt electrode 27018-20



Platinum-band ORP electrode 27018-40



Cole-Parmer Submersible pH/ORP Electrodes

Excellent for measuring large industrial tanks and processes

- Permanently potted in sturdy ABS plastic housing
- Economical single-junction or rugged double-junction designs
- Three-foot probe length for multiple applications

These combination electrodes are permanently potted in a 3 ft L x 1 1/16" dia ABS plastic sheath—submersible up to the cable. These unique electrodes are ideal for measurements in open containers such as tanks or troughs.

Specifications & Ordering Information

Thread size: None

Housing material: ABS plastic

Insertion depth: up to 3 ft

Cable: 10 ft, with BNC pH connector

Housing length: 3 ft

Maximum pressure: NA

Catalog number	ATC element	ATC connector	Price
Submersible, single-junction pH electrodes, 0 to 14 pH			
KH-05993-80	None	None	
KH-05993-81	100 Ω RTD	Mini-audio plug	
KH-05993-85	100 Ω RTD	Tinned ends	
KH-05993-84	1 kΩ RTD	Spade lugs	
Submersible, double-junction pH electrodes, 0 to 14 pH			
KH-27001-80	None	None	
KH-27001-81	100 Ω RTD	Mini-audio plug	
KH-27001-83	100 Ω RTD	Tinned ends	
KH-27001-84	1 kΩ RTD	Spade lugs	
Submersible, double-junction ORP electrode			
KH-27001-69	None	None	

ABS housing protects glass electrode from breakage.



New

Tinned-end models



Cole-Parmer Self-Cleaning Cartridge pH/ORP Electrodes

Keep original housing and simply replace the electrode cartridge—fast and easy!

- Fluid flow across the surface provides a cleaning action that extends the life of your electrode and improves performance!
- Flat measuring surface minimizes electrode coating, scratching, and breakage

These self-cleaning, double-junction electrodes feature an annular junction which prevents clogging and allows fast, stable response. Use in most applications, including viscous solutions, or in solutions with sulfides or heavy metals.

Select CPVC or chemical-resistant Kynar® housings (housings include one electrode cartridge). All five electrode styles are rated to 100 psi at 170°F (76°C); 50 psi at 212°F (100°C). CPVC and Kynar components are not interchangeable.

What's included: cartridge electrode, housing with 10-ft detachable cable with BNC connector, Viton® O-rings, and instructions.

KEEP
A SQUARE



A Submersible pH electrode and housing 27102-00
B In-line pH electrode 27106-60 and flow-cell
C Ground loop interrupt pH electrode 27111-50
D Fluoride-resistant pH electrode 27108-50
E In-line ORP electrode 27106-50 w/mounting gland

A Submersible pH Electrodes

Ideal for use in drums, tanks, or where low velocities are present. Electrodes feature a 1/2" NPT(M) thread for connection to a protective extension pipe. Mount at a 45° angle for best results when high levels of suspended solids are present.

Submersible pH electrodes		ATC element	Replacement electrode cartridges	
Catalog number	Price		Catalog number	Price
Submersible electrodes with CPVC housing				
KH-27102-00		None		
KH-27102-10		100 Ω RTD	KH-27102-60	
KH-27102-20		1 kΩ RTD		
Submersible electrodes with Kynar housing				
KH-27103-00		None	KH-27103-60	
KH-27103-10		100 Ω RTD		

B In-Line pH Electrodes

Perfect for systems with turbulent flow. Electrode mounting glands feature a 3/4" NPT(M) thread.

In-line pH electrodes		ATC element	Replacement electrode cartridge	
Catalog number	Price		Catalog number	Price
In-line electrodes with CPVC housing—3/4" NPT(F) flow-cell				
KH-27106-00		None		
KH-27106-10		100 Ω RTD	KH-27106-60	
KH-27106-20		1 kΩ RTD		

C Ground Loop Interrupt Electrodes

These electrodes combat interference with a solution ground and internal battery powered ground loop interrupt. Built-in amplifier in electrode cartridge permits long cable runs up to 1200 feet.

Grounded pH electrodes		ATC element	Replacement electrode cartridges	
Catalog number	Price		Catalog number	Price
Submersible electrodes with CPVC housing—1/2" NPT(M) thread				
KH-27111-00		None		
KH-27111-04		1 kΩ RTD	KH-27111-50	
In-line electrodes with CPVC housing—3/4" NPT(F) flow-cell				
KH-27112-00		None	KH-27112-50	
KH-27112-04		1 kΩ RTD		

D Fluoride-Resistant pH Electrodes

Ideal for use with solutions containing up to 5% acidic fluorides (hydrofluoric acid).

Fluoride-resistant pH electrodes		ATC element	Replacement electrode cartridges	
Catalog number	Price		Catalog number	Price
Submersible electrodes with CPVC housing—1/2" NPT(M) thread				
KH-27108-00		None		
KH-27108-02		100 Ω RTD	KH-27108-50	
KH-27108-04		1 kΩ RTD		
In-line electrodes with CPVC housing—3/4" NPT(F) flow-cell				
KH-27110-00		None	KH-27110-50	

E ORP Electrodes

In-line ORP electrodes		Application type	Replacement electrode cartridges	
Catalog number	Price		Catalog number	Price
ORP electrodes with CPVC housing				
KH-27106-50		In-line	KH-27106-62	
KH-27102-50		Submersible	KH-27102-62	

OAKION® pH Buffer Solutions

Buffers are standardized against NIST-certified pH references within 0.01 pH at 77°F (25°C). Store buffers away from direct sunlight.

EK-05942-10 Buffer pack, includes 500 mL each of buffers 4, 7, and 10



pH	500 mL volume		1 L volume		4 L volume	
	Cat. no.	Price/ea	Cat. no.	Price/ea	Cat. no.	Price/ea
1.68	EK-00654-01		—	—	—	—
4.01	EK-00654-00		EK-05942-22		EK-05942-24	
7.00	EK-00654-04		EK-05942-42		EK-05942-44	
10.00	EK-00654-08		EK-05942-62		EK-05942-64	
12.45	EK-00654-12		—	—	—	—

PH Industrial Electrodes

12-mm Electrodes and Housings

Cole-Parmer 12-mm Diameter pH/ORP Electrodes and Industrial Housings

Economical and efficient combination—buy a protective housing assembly, then simply replace the electrode as needed

- Use for many applications in a variety of housings

Standard 12-mm diameter electrodes and housings are economical and versatile options. The probes can be used with any of the industrial mounting assemblies on the facing page. Reorder and replace the economical pH electrode and reuse the housing!

A
05994-20

A General-Purpose Single-Junction Electrodes

Economical yet accurate, measures up to pH 13. Maximum pressure is 150 psi at 25°C.

Catalog number	ATC element	ATC connector	Temperature range	Price
Electrodes with 10-ft cable				
KH-05994-20	None	None		
KH-05994-26	100 Ω Pt RTD	Mini audio plug	23 to 212°F	
KH-05994-01	101 Ω Pt RTD	Tinned ends	(-5 to 100°C)	
KH-05654-80	1 kΩ Pt RTD	Spade lugs		
Electrodes with 25-ft cable				
KH-27013-20	None	None	23 to 212°F	
KH-27013-26	100 Ω Pt RTD	Mini audio plug	(-5 to 100°C)	

D
27012-00

D High-Accuracy Single-Junction Electrodes

Ideal for testing where temperature variations make many pH electrodes unreliable. Innovative junction design that stabilizes readings in less than 20 seconds with an accuracy of ±0.02 pH! The pH value stays constant at any given temperature up to pH 13. Maximum pressure is 100 psi at 25°C.

Catalog number	ATC element	ATC connector	Temperature range	Price
Electrodes with 10-ft cable				
KH-27012-00	None	None		
KH-27012-01	100 Ω Pt RTD	Mini audio plug	32 to 230°F	
KH-27012-06	100 Ω Pt RTD	Tinned ends	(0 to 110°C)	
KH-27012-02	1 kΩ Pt RTD	Spade lugs		
Electrodes with 25-ft cable				
KH-27012-10	None	None	32 to 230°F	
KH-27012-11	100 Ω Pt RTD	Mini audio plug	(0 to 110°C)	
KH-27012-16	100 Ω Pt RTD	Tinned ends		

B
05994-22

B General-Purpose Double-Junction Electrodes

Double-junction reference prevents contamination of the AgCl reference cell by solutions that might react with silver (heavy metals, organics, sulfides). Measure up to pH 13. Maximum pressure is 150 psi at 25°C.

Catalog number	ATC element	ATC connector	Temperature range	Price
Electrodes with 10-ft cable				
KH-05994-22	None	None		
KH-05994-27	100 Ω Pt RTD	Mini audio plug	32 to 230°F	
KH-27013-00	100 Ω Pt RTD	Tinned ends	(0 to 110°C)	
KH-05654-82	1 kΩ Pt RTD	Spade lugs		
Electrodes with 25-ft cable				
KH-27013-22	None	None	32 to 230°F	
KH-27013-27	100 Ω Pt RTD	Mini audio plug	(0 to 110°C)	
KH-27013-02	100 Ω Pt RTD	Tinned ends		
KH-27013-82	1 kΩ Pt RTD	Spade lugs		

E
05994-24

E Antimony Single-Junction pH Electrode

Designed for solutions containing hydrofluoric acid (HF)—sensor has no glass wetted parts. Electrode has a response of roughly 49 mV per pH unit with a -320 mV offset at pH 7 (requires special calibration on most meters).

Catalog number	ATC element	ATC connector	Temperature range	Price
Electrode with 10-ft cable, single-junction				
KH-05994-24	None	None	32 to 176°F	
Electrode with 10-ft cable, double-junction				
KH-05994-06	None	None	32 to 176°F	
			(0 to 80°C)	

C
05994-23

C High-pH Double-Junction Electrodes

Well suited for pH levels above 13 or high sodium ion concentrations. Double-junction reference protects against contamination from heavy metals, organics, and sulfides. Maximum pressure is 150 psi at 25°C.

Catalog number	ATC element	ATC connector	Temperature range	Price
Electrodes with 10-ft cable				
KH-05994-23	None	None		
KH-05994-28	100 Ω Pt RTD	Mini audio plug	32 to 230°F	
KH-05994-04	100 Ω Pt RTD	Tinned ends	(0 to 110°C)	
KH-05654-84	1 kΩ Pt RTD	Spade lugs		
Electrodes with 25-ft cable				
KH-27013-23	None	None	32 to 230°F	
KH-27013-28	100 Ω Pt RTD	Mini audio plug	(0 to 110°C)	
KH-27013-04	100 Ω Pt RTD	Tinned ends		
KH-27013-84	1 kΩ Pt RTD	Spade lugs		

F
05994-21

F Single-Junction ORP Electrodes

Measure oxidation/reduction levels in plating baths, wastewater monitoring, and more. Select the platinum-band electrodes for your general-purpose applications; choose the gold-band electrodes for solutions containing cyanide. Maximum pressure is 150 psi at 25°C.

Catalog number	Sensor band	Temperature range	Price
Electrodes with 10-ft cable			
KH-05994-21	Platinum	23 to 212°F (-5 to 100°C)	
KH-05994-25	Gold	23 to 230°F (-5 to 110°C)	

G
27006-21

G Double-Junction ORP Electrodes

Measure oxidation/reduction levels in plating baths, wastewater monitoring, and more. Select the platinum-band electrodes for your general-purpose applications; choose the gold-band electrodes for solutions containing cyanide. Maximum pressure is 150 psi at 25°C.

Catalog number	Sensor band	Temperature range	Price
Electrodes with 10-ft cable			
KH-27006-21	Platinum	23 to 212°F (-5 to 100°C)	
KH-27006-25	Gold	23 to 230°F (-5 to 110°C)	
Electrodes with 25-ft cable			
KH-27013-41	Platinum	23 to 212°F (-5 to 100°C)	
KH-27013-45	Gold	23 to 230°F (-5 to 110°C)	

Industrial Electrodes

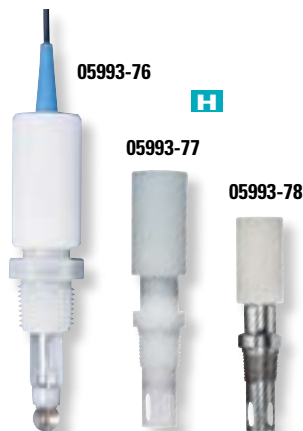
pH

12-mm Electrodes and Housings

H Threaded In-Line Housings

Simply slip an electrode into one of these housings and screw it onto a tee fitting. Pipe tee connection is 1/2" NPT(M). Include a Viton® O-ring. Maximum pressure is 150 psi. Housings measure 3³/₁₆" L x 1" dia.

Guarded models protect electrode from breakage. Kynar guard is suitable for harsh chemicals. Stainless steel guard model is ideal for sanitary and high-temperature applications.



Catalog number	Housing material	Guard material	Price
KH-05993-76	Kynar	None	
KH-05993-77		Kynar	
KH-05993-78		Stainless steel	

I Twist-Lock In-Line Housings

Change electrodes quickly with a single twist. Two 316 stainless steel pins lock the Kynar housing into a collar. The collar can be permanently mounted in a pipe tee. EPR and Viton O-rings seal collar and electrode in housing. Maximum pressure: 150 psi. Measures 3³/₁₆" L x 1" dia. Order housing, collar, and pipe tee from table for a complete system (collar and pipe tee not pictured).

Catalog number	Description	Material	Price
KH-05993-73	Twist-lock in-line housing	Kynar	
KH-05993-74	Collar	PVC	
KH-05993-75		Kynar	
KH-05994-61	Pipe tee, 1" NPT(F), schedule 80	PVC	
KH-05994-62		Kynar	

**J** ATC/Grounded Housings

These unique holders feature an integrated 316 stainless steel pin and ground wire that serves as a temperature compensator and a solution ground[†].

Submersible holders		
Catalog number	ATC element	Price
KH-05725-40	None [†]	
KH-05725-42	100 Ω RTD	

[†]Model 05725-40 without ATC element does not include solution ground.

**K** Submersion Housings

This 41" L x 1¹/₁₆" OD pipe is welded to a PVC connection box, and sealed with Viton O-rings for superior waterproof protection. Bottom tube detaches for electrode installation.

Catalog number	Housing material	Maximum temperature	Price
KH-05993-83	CPVC	176°F (80°C)	
KH-05993-93	Kynar	230°F (110°C)	

**GO to page(s) 1115**

For accessories such as ATC probes, preamplifier kits, cables, and fittings.

Cole-Parmer® 12-mm Diameter pH/ORP Electrodes with Integrated Assemblies

Easily remove electrodes in seconds without removing the holder

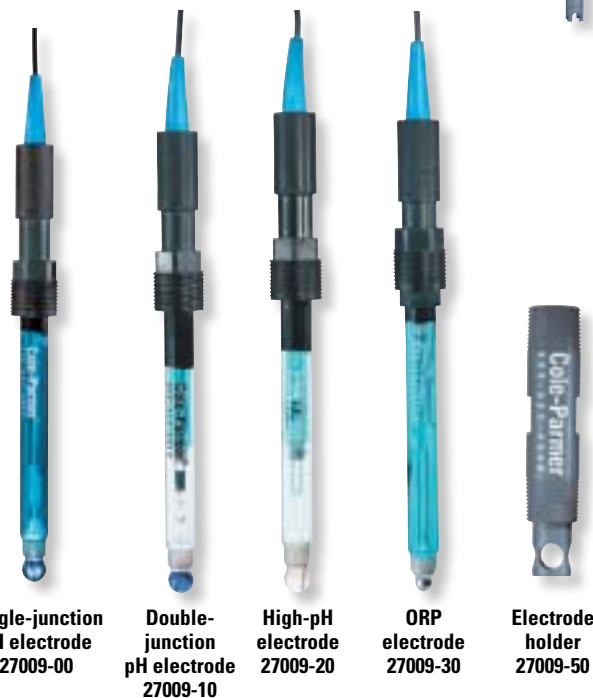
- Ideal for in-line or submersion monitoring

Integral cap assembly permits quick servicing for calibrations or replacement. Electrode holders (order separately below) have threads on each end. Install holders into a pipe tee for in-line use or on the end of a submersion pipe.

Electrodes feature an annular junction—prevents clogging and allows a fast, stable response. The High pH electrodes are ideal for applications involving high-sodium concentrations. All models include a 10-ft, low-noise shielded cable with BNC connector.

Specifications and Ordering Information for Electrodes

Catalog number	ATC element	ATC connector	Temperature range	Price
General-purpose single-junction pH electrodes , for routine pH applications, 0 to 13 pH				
KH-27009-00	None	None		
KH-27009-01	100 Ω RTD	Mini audio plugs	23 to 212°F (–5 to 100°C)	
General-purpose double-junction pH electrodes , 0 to 13 pH				
KH-27009-10	None	None		
KH-27009-11	100 Ω RTD	Mini audio plugs	23 to 212°F (–5 to 100°C)	
High-pH double-junction pH electrodes , 0 to 14 pH				
KH-27009-20	None	None		
KH-27009-21	100 Ω RTD	Mini audio plugs	23 to 230°F (–5 to 110°C)	
Single-junction platinum-band ORP electrode				
KH-27009-30	None	None	23 to 212°F (–5 to 100°C)	
Double-junction platinum-band ORP electrode				
KH-27009-31	None	None	23 to 212°F (–5 to 100°C)	



Specifications and Ordering Information for Electrode Holders

Catalog number	Material	NPT(M)	Temperature range	Max psi	Price
KH-27009-50	CPVC	3/4"	23 to 176°F (–5 to 80°C)	100	
KH-27009-52	Kynar		23 to 230°F (–5 to 110°C)		

pH Industrial Electrodes

Cartridge Electrodes, Ultrapure water electrode system

Cole-Parmer® Retractable Self-Cleaning Cartridge Electrodes

Insert up to 12" into pressurized pipes or tanks

- Double junctions for demanding applications

These retractable electrodes feature a flat measuring surface to minimize electrode coating and breakage. Fluid flow across the flat surface increases electrode life and performance. Use this electrode with the 1" port ball valve (order separately below table) to service your electrode without shutting down the process. For specialty applications, select electrodes for low-ionic strength solutions and high-temperature applications. Mount in any position—connection is 1" NPT(M). Electrodes are rated to 100 psi at 170°F (76°C); 50 psi at 212°F (100°C).

What's included: cartridge electrode, housing with 10-ft detachable cable, BNC connector, and Viton® O-rings.

Specifications and Ordering Information

Catalog number	ATC element	ATC connector	Price
CPVC housing and pH cartridge electrodes			
KH-27104-00	None	None	
KH-27104-10	100 Ω RTD	Tinned ends	
KH-27104-20	1 kΩ RTD		
KH-27104-40	3 kΩ Balco	Tinned ends	

[KH-27015-80](#) Ball valve; full-port, CPVC, 1" NPT(F)



Flat measuring surface eliminates clogging.



Retractable pH electrode with CPVC housing
27104-00



Replacement Cartridge Electrodes

Cat. no.	Type	Application	Price
For electrodes with CPVC housing			
KH-27104-60	pH	General-purpose	
KH-27104-64		Low-ionic strength solutions	
KH-27104-66		High-temperature applications*	

*Maximum temperature is 212°F.

Signet pH/ORP Probes and Preamplifiers

Use with +GF+ Signet Controllers listed in our "pH Control" section

Probes measure 5 1/2" L x 3 1/2" dia; insertion depth is 2 3/4". Order a flat-surface sensor for use in abrasive solutions or in solutions that coat ordinary electrodes. Flat-surface sensors have a polyethylene junction and withstand 100 psi at 25°C, 50 psi at 85°C.

Glass bulb pH sensors feature an annular HDPE liquid junction with a double-junction reference cell and withstand 100 psi at 25°C and 25 psi at 100°C. The platinum-band ORP sensor also features a double-junction reference cell.

Ordering Information for probes

Catalog number	Sensor	Type	Price
KH-56560-50	pH	Flat-surface	
KH-56560-52		Glass bulb	
KH-56560-60	ORP	Flat-surface	
KH-56560-62		Glass bulb	

Preamplifiers let you install a sensor up to 400 ft away from the controller. For submersible installation, connect a 3/4" NPT(M) pipe (not included) to top of preamplifier. For in-line installation, order standard cap 05614-27 below and installation fittings from the "Flowmeters" section on pages 556–635. Cable is 15-ft long.

Ordering Information for preamplifiers

Catalog number	Installation type	Price
KH-56560-80	Submersible	
KH-56560-85	In-line	

[KH-05614-27](#) Standard cap, for in-line installation

Preamplifier
56560-80



pH probe
56560-50

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For Signet pH/ORP Transmitters and Controllers (model 56560-20 shown below), go to our "pH Control" section.



Cole-Parmer® Ultrapure Water Electrode System

For in-line pH measurements of ultrapure water—ideal for use in power plants

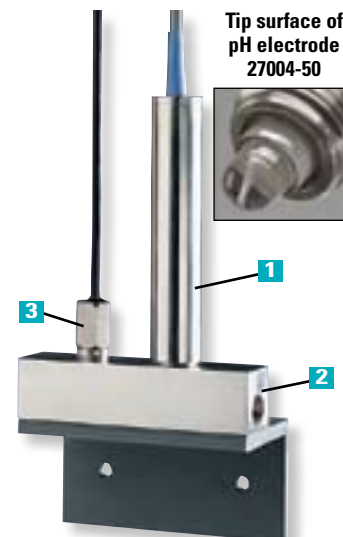
Measure the pH of high-purity water without the problems usually associated with low-ionic strength solutions. Concentric design and low sample flow rate (100 to 150 mL/min) help reduce streaming potential effects. Rugged 316 stainless steel system is grounded to prevent noise pickup and CO₂ contamination. Electrode measures pH from 0 to 12 and withstands temperatures from 32 to 176°F (0 to 80°C). Order electrode, flow cell, and temperature compensation probe for a complete system.

Ordering Information

Key	Catalog number	Description	Price
1	KH-27004-50	pH electrode for use in ultrapure water	
2	KH-27004-00	Flow cell; 600 µl volume, 1/4" NPT(F) ports	
3	KH-27004-22	ATC temperature compensating probe; 100 Ω Pt RTD, mini audio plug connections	
3	KH-27004-24	ATC temperature compensating probe; 1 kΩ Pt RTD, spade lug connections	

Required System Components

- 1 pH electrode 27004-50
- 2 Flow cell 27004-00
- 3 ATC compensating probe 27004-22 or 27004-24



Tip surface of pH electrode
27004-50



Cole-Parmer pH/ORP Preamplified Cables and Power Supply Adapters

Amplify pH or ORP signals without having to replace batteries

- Recommended for industrial pH/ORP cable runs of 30 to 500 feet
- VAC- or VDC-powered options

Preamplified cables are an ideal way to send high-impedance pH or ORP signals in industrial applications where electrical noise from motors, mixers, and other electrically powered equipment may cause unstable measurements. Order the cable and power supply adapter and easily hook up to any non-differential industrial pH/ORP electrode with a BNC connector (sold separately on pages 1108-1114). Cables have female BNC connectors on the electrode side and male BNC connectors on the meter side. Order an optional adapter for connection to meters with terminal strips.

Required System Components

- 1 Preamplified cable
- 2 Power supply adapter

Add these options

- 3 BNC to spade lug or tinned end adapter



Preamplified cable with ATC and solution ground 27007-40

New



Preamplified cable with ATC 27007-30



Preamplified cable without ATC 27007-20



110 VAC power supply 27007-50



24 VDC adapter clip 27007-64

Electrode ATC element	25-ft length		50-ft length		100-ft length*		Power supply adapters		
	Catalog number	Price	Catalog number	Price	Catalog number	Price	Catalog number	Description	Price
None	KH-27007-20		KH-27007-22		KH-27007-24		KH-27007-50	110 VAC, 60 Hz power supply	
ATC	KH-27007-30		KH-27007-32		KH-27007-34		KH-27007-55	220 VAC, 50 Hz power supply	
ATC with solution ground	KH-27007-40		KH-27007-42		KH-27007-44		KH-27007-64	24 VDC adapter clip	
							KH-27007-66	12 VDC adapter clip	

*For lengths greater than 100 feet, contact our Application Specialists.

[KH-05994-90](#) BNC/spade lug adapter

[KH-56105-60](#) BNC/tinned end adapter

Cole-Parmer Automatic Temperature Compensation Probes

Use these ATC probes with pH electrodes without a built-in temperature compensating element

- Select from lab, in-line, or submersible models

Catalog number	ATC element	Connector type	Housing material	Cable length	Price
Lab-type probes, 5"L x 1/4" dia					
KH-05994-40	100 Ω Pt RTD	Miniature audio plug	Epoxy	3 ft	
KH-05654-90	1 kΩ Pt RTD	Spade lugs			
KH-05994-41	100 kΩ thermistor	Standard 1/4" phone plug			
In-line probes, 4"L x 1 5/16" dia, 1/2" NPT(m) threads					
KH-05994-42	100 Ω Pt RTD	Miniature audio plug	Kynar	10 ft	
KH-05654-92	1 kΩ Pt RTD	Spade lugs			
KH-05994-43	100 kΩ thermistor	Standard 1/4" phone plug			
Submersible probes, 3 ft L x 1 1/16" dia					
KH-05994-44	100 Ω Pt RTD	Miniature audio plug	ABS	10 ft	
KH-05654-94	1 kΩ Pt RTD	Spade lugs			
KH-05994-45	100 kΩ thermistor	Standard 1/4" phone plug			



Lab-type probe 05994-41

In-line probe 05654-92

Submersible probe 05994-44

Cole-Parmer Extension Cables

Heavy-duty shielded extension cables for pH and ORP electrodes are insulated for strength and noise reduction. Cables measure 5 mm OD. BNC connector is protected with rubber hood.



05994-57

Catalog number	ATC element	Length (ft)	Price
KH-05994-56	None	10	
KH-05994-57		25	
KH-05994-58		50	
KH-05994-80	100 Ω Pt RTD	10	
KH-05994-81		25	
KH-05994-82		50	
KH-05994-86	1 kΩ Pt RTD	10	
KH-05994-87		25	
KH-05994-88		50	

Cole-Parmer T-Fittings

These 1" NPT(F) T-fittings let you quickly and easily mount your electrodes in-line. Choose fitting with a 1/2" or 3/4" NPT(F) adapter depending on the thread size of your in-line electrode. See pages 487-546 for additional fittings.



27003-80

Catalog number	Adapter size	Material of construction	Price
KH-27003-84	1/2" NPT(F)	CPVC	
KH-27003-86		Kynar	
KH-27003-80	3/4" NPT(F)	CPVC	
KH-27003-82		Kynar	

OAKTON® pH Solution Pack

New

- Includes commonly used solutions for pH measurement and electrode maintenance

Pack includes one 500-mL bottle each of pH 4.01, 7.00, and 10.00 NIST-certified buffers; one 500-mL bottle of cleaning solution for grease, oil, and protein removal; and one 500-mL bottle of storage solution to properly store your electrode while not in use.



Catalog number	Description	Price
EK-05942-15	pH solution pack	

pH

pH Control

Introduction

Let Cole-Parmer supply all of your pH/ORP control system needs

Cole-Parmer is committed to providing the most complete and innovative solutions for your pH/ORP control applications. If you are controlling effluent levels for wastewater, run-off, or any other process, we can help. Our catalog features virtually everything needed for your control system.

How to Build a Control System

Proper control of pH/ORP requires more than just a controller—many other components are used to ensure that pH/ORP is measured correctly, that a long term record is kept, and that chemical is stored, added, and mixed. These items can be ordered separately, or often as bundled systems. Cole-Parmer can help you with all your control needs.

pH/ORP Controllers

We offer a wide range of pH/ORP controllers. Controllers are available with different mounting styles, number of inputs and outputs, control method; temperature compensation; and other features to suit your application. In addition, we offer a range of transmitters for use when control is not required or is handled by existing systems.



Some controllers offer an adjustable dead band. Dead band refers to the span of input signal (pH or mV) from the set point that produces no change in output. A nonzero dead band prevents pumps from cycling on and off rapidly. This is useful when the measured value of the system is very close to the set point.

Temperature compensation is another option that needs consideration. The temperature of a process is rarely fixed and pH electrodes respond differently at different temperatures. When precise control is needed and/or the temperature varies more than a few degrees, temperature compensation is a desirable option. Controllers are available with automatic temperature compensation (ATC), manual temperature compensation, or no temperature compensation.

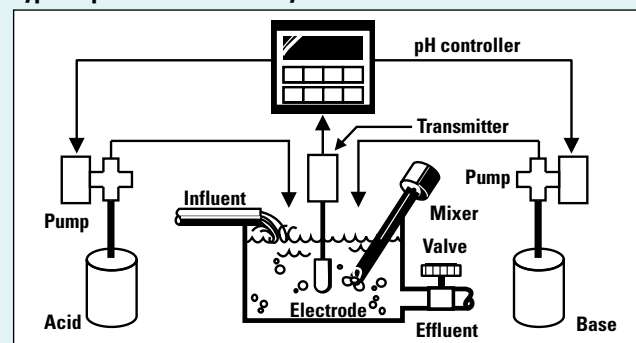
Controllers with flow assemblies, pumps and recorders are also available.

Control methods

On/Off Control is the simplest and most economical for equipment cost, but the least precise control method. Here, a pump set at a fixed flow rate is turned on when deviations from the set point occur and off when the set point is reached.

Proportional Control provides an output proportional to the difference between the set point and measured value. This can take the form of a pulse whose frequency increases, as more chemical additive is required, or as a 4 to 20 mA signal where increased amperage corresponds to more chemical feed demand. Proportional control provides faster and tighter control to minimize deviations in systems whose measured values change significantly from the set point.

Typical pH Neutralization System



GO to ColeParmer.com

For questions about pH measurement and control, see our "Technical Info" section for additional information.



Industrial pH Electrodes

We offer single- and double-junction combination electrodes in a variety of mounting configurations, ATC elements, and materials of construction such as thicker glass bulb, flat sensor, or probe guard; options to make them more durable for industrial monitoring and control.

Differential electrodes are a good option when ground loop problems and probe fouling can effect analysis. See pages 1107-1115 for our full selection of industrial pH electrodes.



If you don't see the pH electrode you need, call our Application Specialists to see if we can special order it for you. Expect a 4- to 6-week lead time for special orders.

pH/ORP Pump Control System

Pumps are a necessary component of many pH/ORP control systems. When selecting a suitable pump, keep in mind the required flow rate, compatibility of the pump's control input with the controller's output, as well as the chemical compatibility of the pump's wetted materials. We offer a wide range of pH/ORP pump control systems to meet your application needs (see page 1133, or see our Metering Pumps Section on pages 1382-1410 for additional models).



Tanks, Valves, Tubing, and Fittings

Cole-Parmer offers a large selection of tanks for storage, dispensing and reaction of the chemicals. Refer to the selection guides for chemical compatibility.

Mixers

Use a mixer to blend chemicals in your system. Proper mixing can help you maintain a stable pH throughout your process. For a complete selection of mixers please see pages 972-1002.



Recorders and dataloggers

Many regulatory agencies require that pH levels be maintained within certain levels and verified with a log. Many of the controllers we offer have a current or voltage recorder output to send data to a datalogger while some controllers have a built-in recorder or datalogger (see pages 1130-1131). For our complete line of stand-alone dataloggers and recorders, see pages 349-360.



pH Control pH

Transmitters

EUTECH
INSTRUMENTS

Blind Industrial pH and ORP Transmitters

Economical and compact—yet ideal for tough applications

- Weatherproof, IP65-rated housing—suitable for harsh environments

Simple and reliable transmitters are ideal for connecting to your PLC for advanced control systems or connecting to a recorder for a low cost documentation system. Transmitter mounts easily on a plate, pole, or wall with mounting holes.

Transmitters can be installed in series and isolated from each other so that there is no disruption of operations should one transmitter fail. Wires can be installed from any direction through knockouts with rubber septums that keep dust and water away from the electronics. Easy access to potentiometers allows for fast, simple calibration. LED indicator shows when transmitter is powered.

Order the BNC to spade lug adapter (05994-90) listed at right for easier connections to the transmitter. Order in-line ORP or pH electrodes listed at right or refer to our industrial electrode section, pages 1107–1115, for additional nontemperature compensated pH or ORP electrodes.

Specifications & Ordering Information



Catalog number	KH-56717-00	KH-56717-10
Description	pH transmitter	ORP transmitter
Range	0.00 to 14.00 pH	0 to 1000 mV
Resolution	0.01 pH	1 mV
Accuracy	±0.05 pH	±3 mV
Output	4 to 20 mA	
ATC	None	
Display	None	
Housing	IP65	
Calibration	Offset ±1 pH	Offset ±50 mV
Slope	Slope 80 to 120%	
Power	12 to 24 VDC	
Dimensions	3"W x 3"H x 1½"D (77 x 77 x 28 mm)	
Price		



56717-00

Accessories

- [KH-27001-90](#) pH electrode; Kynar® body and 10-ft cable, BNC connector
- [KH-27001-62](#) ORP electrode
- [KH-05994-90](#) BNC to spade lug adapter

GO to page(s) 349–360

For our complete line of recorders

EUTECH
INSTRUMENTS

pH 500 pH/ORP Transmitter with Display

Industrial transmitter with many features!

- Displays pH or ORP plus temperature
- Scaleable pH or ORP output with automatic temperature compensation (ATC)
- Accommodates solution ground for use in electrically noisy environments

The pH 500 industrial transmitter with display allows easy setup and calibration without tools. Features input to output isolation plus it accommodates electrodes with a solution ground to operate in symmetrical mode, ensuring proper operation in electrically noisy environments. Display allows local monitoring of measurement and temperature and output signal to a centralized control, datalogging, or recording system. Mounting holes allow easy installation on plates, poles, or walls. Order the BNC to spade lug adapter 05994-90 for proper connections. Order ORP or pH electrodes with solution ground below. Additional ORP or pH electrodes with 100 Ω Pt RTD can be ordered from pages 1107–1115.



Specifications & Ordering Information

Catalog number	KH-56717-20	
Range	pH	0.00 to 14.00 pH
	mV	±1000 mV
	Temperature	–10 to 110°C
Resolution	pH	0.01 pH
	mV	1 mV
	Temperature	0.1°C
Accuracy	pH	±0.01 pH
	mV	±2 mV
	Temperature	±0.5°C
Output	4 to 20 mA	
ATC	100 Ω Pt RTD, terminal strip, 2 or 3 wire system	
Display	Dual-line LCD	
Housing	IP65	
Calibration	pH	Offset ±1 pH
	mV	Offset ±50 mV
	Temperature	None
Slope	Slope 80 to 120%	
Power	12 to 24 VDC	
Dimensions (W x H x D)	3 ¾" x 3 ¾" x 2 ¾" (96 x 96 x 66 mm)	
Price		



56717-20

Accessories

- [KH-27018-02](#) Ryton® body pH electrode with 100 Ω Pt RTD, solution ground, and 10-ft cable
- [KH-27018-40](#) Ryton® body, platinum ring ORP electrode with solution ground, and 10-ft cable
- [KH-05994-90](#) BNC/spade lug adapter; connects pH electrodes with BNC connectors to meters with terminal strips

pH pH Control

Transmitter / 1/8-DIN Controller

EUTECH INSTRUMENTS pH 550 Monitor and pH 560 pH/ORP Controller

ISO9001:2000
CERTIFIED SUPPLIER



1/4-DIN, economical monitor or controller with large dual displays

- Measure and display both pH/ORP and temperature
- Automatic or manual temperature compensation
- Asymmetrical or symmetrical mode operation

The pH 550 and pH 560 models are used to measure pH/ORP and temperature values in applications such as water treatment and monitoring, chemical processing, or food processing. The monitors have user-friendly features like menu-driven programs and calibrations that are easily performed with the push-button keypad. One- or two-point calibrations can be performed with USA or NIST buffer sets. All values, operational, and error messages are indicated on the large, dual-line LCD. All setup and calibration parameters are retained in the nonvolatile memory to prevent data loss during power outages.

Measurements are compensated for temperature variations automatically when used with pH electrodes that have temperature elements. These monitors also offer manual temperature compensation with independent settings for calibration and process temperature. Order 100 Ω Pt RTD pH and ORP electrodes from pages 1107–1115; also requires BNC-to-spade-lug adapter to install pH or ORP electrodes.

The pH 560 controller offers additional features over the pH 550 monitor including on/off control and backlit LCD. The pH 560 relays have separately adjustable high and low set point hysteresis (dead bands) to prevent relay chattering. The relays feature a 0 to 2000 second time delay to prevent false alarms and unnecessary control.

What's included: 110/220 VAC to 9 VDC power adapter.



56717-30

EUTECH INSTRUMENTS pH 190 1/8-DIN pH/ORP Controller

Improved user interface allows direct access to calibration mode and set point adjustment

- Universal power supply input from 85 to 250 VAC/DC allows use at multiple sites
- Automatic temperature compensation ensures accurate measurements
- Galvanically isolated 4 to 20 mA output for remote monitoring or logging data

The 1/8-DIN controller displays the measured parameter value or temperature with a touch of a button. The user interface of the popular pH 200 series was simplified for quick set point review and programming. Access into the calibration mode is accomplished by simply pressing keys on the front panel—no need to remember and enter security codes. All information is displayed on the 14-segment LED display that is easy to read in low light installations.

The controller has two relays that can be set for any combination of low/high level on/off (limit) control. Independently adjustable hysteresis provides accurate control in varying applications and prevents relay chatter near the set point. All data is retained in the nonvolatile memory.

The controller can operate in asymmetrical or symmetrical mode. Asymmetrical mode uses standard industrial pH electrodes and is acceptable for environments that are not electrically noisy. Symmetrical mode eliminates electronic noise problems when using electrodes with solution grounds. Order 100 Ω Pt RTD, tinned-end electrodes with BNC connections separately on pages 1107–1115.



56700-10

Specifications & Ordering Information

Catalog number	KH-56717-30	KH-56717-32
Description	pH 550 monitor	pH 560 controller
Range	pH	0.00 to 14.00
	mV	-1000 to 1000
	Temperature	14.0 to 257.0°F (-10 to 125°C)
Resolution	pH	0.01
	mV	1 mV
	Temperature	0.1°C
Accuracy	pH	±0.01
	mV	±2 mV
	Temperature	±0.5°C
ATC	Automatic or manual	
Control type	None	On/off
Number of set points	None	Two
Dead band	None	Independently programmable
Display	LCD	LCD with backlight
Output	Relay	None
	Current	None
Programmable relay delay	N/A	0 to 2000 seconds
Power	110/220 VAC, 50 Hz to 9 V DC (adapter included)	
Housing	1/4 DIN, IP65	
Dimensions (W x H x D)	3 3/4" x 3 3/4" x 2 5/8" (96 x 96 x 66 mm)	
Price		

KH-05994-90 BNC to spare lug adapter; connects pH electrodes to meters with terminal strips

GO to ColeParmer.com

ColeParmer.com/pHControl

For the full selection of pH/ORP controllers, go to ColeParmer.com/pHControl.

ISO9001:2000
CERTIFIED SUPPLIER



Specifications & Ordering Information

Catalog number	KH-56700-10	
Range	pH	0.00 to 14.00
	mV	-999 to 1000 mV
	Temperature	-10 to 110°C
Resolution	pH	0.01
	mV	1 mV
	Temperature	0.1°C
Accuracy	pH	±0.01
	mV	±2 mV
	Temperature	±0.5°C
ATC	Manual or automatic from 0 to 100°C, 100 Ω Pt RTD, terminal strip, 2 or 3 wire	
Control type	On/off	
Number of set points	Two (high, low)	
Display	4-digit, 14-segment LED	
Output	Relay	Two SPDT (120 VAC, 6 A max; 240 VAC, 3 A max)
	Current	4 to 20 mA, 200 Ω max load
Power	85 to 250 VAC, 50/60 Hz	
Dimensions	3 3/4" W x 1 7/8" H x 6" D (96 x 48 x 152 mm)	
Price		

KH-50001-00 Power cord; U.S. standard plug, 6 ft, 120 VAC

EUTECH INSTRUMENTS pH 200 1/8-DIN pH/ORP Controller

Offers features found in a much more expensive instrument

- Two-level password protection allows calibration access without accidentally changing controller setup
- Symmetrical or asymmetrical mode operation
- Tactile, water-resistant membrane keypad



This compact and economical controller has removable terminal strips and accepts power input between 85 to 250 VAC/DC for simple installation. The scrolling 14-segment LED display guides the user through setup, calibration, and operation functions.

Setup and calibration modes are password-protected to prevent unauthorized changes. Operator can review previous calibration points and the electrode slope and offset for diagnostic purposes. The controller can be set for automatic or manual temperature compensation depending upon the application. The user can select one- or two-point calibration at seven common buffer values.

Two independently programmable relays can be customized for set points and hysteresis. LED enunciators on the front panel indicate operation mode, measured parameter, and relay status. A galvanically isolated, 4 to 20 mA output is available for logging purposes. Order 100 Ω Pt RTD, tinned-end electrodes with BNC pH connectors separately on pages 1107–1115.

Specifications & Ordering Information



Catalog number		KH-56700-00
Range	pH	0.00 to 14.00
	mV	-999 to 1000 mV
	Temperature	-10 to 110°C
Resolution	pH	0.01
	mV	1 mV
	Temperature	0.1°C
Accuracy	pH	±0.01
	mV	±2 mV
	Temperature	±0.5°C
ATC		Manual or automatic from 0 to 100°C, 100 Ω Pt RTD, terminal strip, 2- or 3-wire system
Control type		On/off
Number of set points		Two (high, low)
Display		4-digit, 14-segment LED
Output	Relay	Two SPDT (120 VAC, 6 A max; 240 VAC, 3 A max)
	Current	4 to 20 mA, 200 Ω max load
Power		85 to 250 VAC, 50/60 Hz
Dimensions		3 3/4" W x 1 7/8" H x 6" D (96 x 48 x 152 mm)
Price		

Accessories

KH-50001-00 Power cord; U.S. standard plug, 6 ft, 120 VAC

KH-05656-55 Benchtop stand for 1/8-DIN panel meters

EUTECH INSTRUMENTS pH 800 1/4-DIN pH/ORP Controller

Economical controller with the features and reliability of a much more expensive instrument

- Built-in memory stores calibration data and controller configuration
- Automatic or manual temperature compensation (with independent process and calibration temperatures)

Programmable delay (up to 2000 seconds) minimizes false alarms caused by minor fluctuations.

The pH 800 offers a large dual line display to facilitate programming and displays pH or ORP and temperature. Nonvolatile memory retains programming, even if power fails.

Relay hold feature maintains relay and current output status during configuration or calibration. Programmable hysteresis bands prevent relay chatter when value fluctuates around set points. Controller provides a 4 to 20 mA output signal. Removable terminal strips simplify power, temperature input, and relay installation. Order electrodes with 100 or 1000 Ω temperature sensors on pages 1107–1115.



56705-00

GO to page(s) 1107-1115

For a complete selection of industrial pH and ORP electrodes

Specifications & Ordering Information



Catalog number		KH-56705-00	KH-56705-05
Range	pH	-2.00 to 16.00	
	mV	±1000 mV	
	Temperature	-9.9 to 125.0°C	
Resolution	pH	0.01	
	mV	1 mV	
	Temperature	0.1°C	
Accuracy	pH	±0.01	
	mV	±1 mV	
	Temperature	±0.5°C	
ATC		100 Ω or 1000 Ω Pt RTD, -9.9 to 125°C, terminal strip, 2- or 3-wire system	
Control type		On/off	
Number of set points		Two (high, low)	
Dead band		0.1 to 1.0 pH units; 10 to 100 mV	
Display		Dual-line LCD; 4-digit upper and 3 1/2-digit lower	
Output	Control	Two SPDT relays (110 VAC, 6 A, 500 W)	
	Current	4 to 20 mA, 600 Ω max load	
Programmable relay delay		0 to 2000 sec	
Power		110 VAC, 48 to 62 Hz	220 VAC, 48 to 62 Hz
Housing		1/4-DIN, IP54 front, IP30 housing	
Panel cut-out		3 3/8" W x 3 3/8" H (92 x 92 mm)	
Dimensions		3 1/8" W x 3 1/8" H x 6 1/8" D (96 x 96 x 175 mm)	
Price			

KH-50001-00 Power cord U.S. standard plug, 6 ft, 120 VAC for use with model 56705-00

PH pH Control

1/4-DIN and 1/2-DIN Controllers

EUTECH
INSTRUMENTS

pH 1000 1/4-DIN pH/ORP Proportional/On/Off Controller

ISO9001:2000
CERTIFIED SUPPLIER 

All the features of the economical pH 800 plus proportional control

- Controller features fully adjustable 0 to 20 mA/4 to 20 mA output.
- Easily program relays, either to normally open or normally closed, with the front keypad.
- Two level password protection keeps your program parameters safe.

Control your process with three available control strategies: On/off, proportional pulse length, or proportional pulse frequency. Use proportional control to gradually increase or decrease pump or valve response, depending on the deviation from the set point.



56710-00

Manually control test relays with the touch of one button. Relays include programmable time delay to minimize false alarms. Hold relay feature lets you connect other controllers, flow switches, or level switches for failsafe operation.

Controller is compatible with a variety of electrodes, including glass and antimony. Symmetrical electrode inputs eliminate electrical noise problems when used with a solution ground. Connections are made through the two removable terminal strips for easy installation. Order electrode separately at right or see pages 1107–1115 for the complete line of industrial electrodes.

Specifications & Ordering Information

Catalog number	KH-56710-00		KH-56710-05	
Range	pH	0.00 to 14.00		
	mV	±1000 mV		
	Temp	-9.9 to 125.0°C		
Resolution	pH	0.01		
	mV	1 mV		
	Temp	0.1°C		
Accuracy	pH	±0.01		
	mV	±1 mV		
	Temp	±0.5°C		
ATC	100 Ω or 1000 Ω Pt RTD, -9.9 to 125°C, terminal strip, 2-or 3-wire system			
Control type	Proportional or on/off			
No. of set points	Three (high, low, and alarm)			
Input impedance	106 MΩ			
Dead band	0.1 to 1.0 pH units; 10 to 100 mV			
Display	Dual-line LCD; 4-digit upper and 3 1/2-digit lower			
Output	Control	Two SPDT relays; 110 VAC, 6 A, 500 W		
	Alarm	110 VAC, 6 A, 500 W with adjustable delay (0 to 200 sec)		
	Pulse	Pulse length (0.5 to 20 sec) or pulse frequency (60 to 120 Hz)		
	Current	Isolated 0 to 20/4 to 20 mA, 600 Ω max load, adjustable and invertible		
Programmable relay delay	0 to 2000 sec			
Power	110 VAC, 48 to 62 Hz		220 VAC, 48 to 62 Hz	
Housing	1/4-DIN, IP54 front, IP30 housing			
Dimensions	3 1/16"W x 3 1/16"H x 6 1/16"D (96 x 96 x 175 mm)			
Price				

[KH-27020-43 Industrial pH electrode with solution ground](#)

[KH-50001-00 Power cord; U.S. standard plug, 6 ft, 120 VAC](#)

EUTECH
INSTRUMENTS

pH 2000 Advanced pH/ORP PI Controllers

New
Models



ISO9001:2000
CERTIFIED SUPPLIER (56715-00 only) 

Most advanced features of any controller in its price range

- Programmable for on/off, proportional, and PI (proportional integral) control
- Proportional pulse frequency and pulse length control
- Two-point pH calibration with automatic or manual buffer recognition; controller recognizes a wide range of buffer sets.



56715-00

Controllers are ideal for industries that require accurate and precise pH or ORP control. The 1/2-DIN wall mount model is IP66 (NEMA 4X)-rated and suitable for wall, panel, or pipe mounting. Large backlit display provides easy reading of pH/mV and temperature measurements, even in low light conditions. Universal power supply input from 80 to 250 VAC/DC allows for use at multiple sites.

The pH 2000 controllers feature removable terminal strips for simple installation. The controller allows asymmetrical or symmetrical electrode inputs and operation. Symmetrical mode eliminates electrical noise problems when used with a potential matching pin as a solution ground.

Two programmable relay outputs for set points, delay, hysteresis, or control functions, and separate programmable alarm relay provide multiple options for control. Individually adjustable high and low set point dead bands prevent rapid contact switching if the value fluctuates near the set point. Programmable relay delay minimizes false alarms caused by minor fluctuations. Both models feature two galvanically isolated and scaleable 0 to 20/4 to 20 mA outputs for pH/ORP and temperature.

Order pH/ORP electrodes with 100 or 1000 Ω Pt RTD ATC elements listed on pages 1107–1115.

Specifications & Ordering Info

Catalog number	KH-56715-00		KH-56715-10	
Description	1/2-DIN wall-mount		1/2-DIN panel-mount	
Range	pH	-2.00 to 16.00		
	mV	±0 to 100.0%; -1000 to 1000		
	Temperature	-9.9 to 125.0°C		
Resolution	pH	0.01		
	mV	0.1%; 1		
	Temperature	0.1°C		
Accuracy	pH	±0.01		
	mV	±2		
	Temperature	±0.5°C		
ATC	Automatic or manual, 100 Ω or 1000 Ω Pt RTD, 2-or 3-wire system			
Control type	On/off; proportional; proportional integral (PI)			
Number of set points	Two			
Display	Dual-line backlit LCD; 4-digit upper and 3 1/2-digit lower			
Output	Control	Three SPST relays, 3 A, 250 VAC/600 W max		
	Alarm	One SPDT relay, 3 A, 250 VAC/600 W max		
	Current	Two channels; isolated 0 to 20/4 to 20 mA, 600 Ω max load		
	Voltage	12 VDC, 50 mA		
Wash contact relay	Latching/pulse (switchable); max 250 VAC, 3 A, 600 W, programmable for interval (0 to 199.9 hours) and duration (0 to 1999 sec)			
Electrode use	Glass or antimony			
Password protection	Two-level password protection			
Power	80 to 250 VAC/DC, 48 to 62 Hz			
Housing	1/2-DIN, IP66 (NEMA 4X)		1/2-DIN, IP54 (front panel)	
Dimensions	5 1/16"W x 5 1/16"H x 4 1/4"D (144 x 144 x 108 mm)		3 3/4"W x 3 3/4"H x 6 1/16"D (96 x 96 x 175 mm)	
Price				

[KH-27020-43 Industrial pH electrode with solution ground](#)

[KH-50001-00 Power cord; U.S. standard plug, 6 ft, 120 VAC](#)

EUTECH INSTRUMENTS pH 2000D Advanced ½-DIN Differential pH/ORP Controller

Differential technology is more robust in industrial measurements

- Two control, one wash, and one alarm relay for more accurate control
- On/off (limit), proportional, or proportional-integral (PI) control
- Replaceable reference solutions and salt bridges extend electrode life

The advanced ½-DIN pH 2000D has all of the benefits of the advanced pH 2000, but with the additional ability to accept differential pH or ORP electrodes.

Rugged NEMA 4X (IP66) enclosure can be wall, panel, or post-mounted for installation in almost any industrial application. The unit has a large dual-line, backlit LCD that can be adjusted to display in any lighting condition. The controller can be operated on 85 to 250 VAC/DC power sources for greater installation flexibility.

Easily program the controller through the front-panel keypad and intuitive menus. The controller can be programmed for on/off (limit), proportional, or proportional-integral (PI) control with either pulse length or pulse frequency operators. Differential operation is ideal in situations where electrical noise may cause problems.

Two control relays can be independently programmed for set point, delay, and hysteresis to provide extreme control flexibility in any application. The controller also has a wash relay that can be programmed for interval and duration to keep the electrode operating properly. An alarm relay, with programmable delay, is also included to activate if the set point has been exceeded. Two-level password protection prevents unauthorized tampering with settings.

Use controller with differential electrodes to reduce the chance of reference electrode fouling; order separately at right. Controller also accepts pH electrodes with 100 or 1000 Ω Pt RTD, tinned-end temperature sensors—see pages 1107–1115.

Specifications & Ordering Info



Catalog number		KH-56715-20
Range	pH	-2.00 to 16.00
	mV	-1000 to 1000
	Temperature	14.0 to 257.0°F (-10.0 to 125.0°C)
Resolution	pH	0.01
	mV	1°F / °C
	Temperature	0.1
Accuracy	pH	±0.01
	mV	±1
	Temperature	±1.0°F (±0.5°C)
Temperature compensation	Automatic or manual	
Control type	On/off (limit), proportional, proportional-integral (PI)	
Number of set points	2	
Dead band	Independently selectable (high/low)	
Display	Dual-line backlit LCD	
Output	Alarm	One SPDT relay
	Relay	Two SPST (hi/low)
	Current	Two channels (0/4 to 20 mA)
	Wash	One SPST relay
Power	80 to 250 VAC/DC, 50/60 Hz	
Housing	NEMA 4X, IP66	
Dimensions	5.67" W x 5.67" H x 4.39" D (144 x 144 x 112 mm)	
Price		

New



56715-20

Replaceable salt bridge increases electrode life.



56715-50

Differential Electrodes

The differential pH and ORP electrodes are ideal for industrial applications. Differential measurement technology minimizes ground loop interferences that can affect standard electrodes. In addition, a built-in pre-amplifier allows cable extensions up to 300 feet. Replaceable heavy-duty quad junction salt bridges and refillable reference solution extend the life of the sensor in severe applications, reducing the cost of ownership.

Electrodes have ½" NPT(M) threads on both ends for in-line or submersible mounting. A 300 Ω NTC temperature sensor allows the electrodes to be used as direct replacements for existing GLI electrodes.

Catalog number	KH-56715-50	KH-56715-60
Type	Differential pH	Differential ORP, platinum sensor
Range	0 to 14 pH	-1000 to 1000 mV
Reference	PVDF and ceramic, double junction	
Reference electrolyte	Standard cell solution	
Operating temperature	23 to 203°F (-5 to 95°C)	
Pressure tolerance	100 psig at 212°F (100°C)	
Temperature sensor	300 Ω NTC	
Potential matching pin	316 stainless steel	
Material	CPVC	
Thread	½" NPT(M)	
Cable	Integral 10 ft (3 m)	
Connector	Tinned ends	
Length (excludes cable)	6.01" (153 mm)	
Diameter (external)	1.90" (48 mm)	
Price		

Accessories

KH-56715-52 Replacement salt bridge, protected CPVC

KH-56715-54 Reference solution, 500 mL

KH-50001-00 Power cord; U.S. standard plug, 6 ft, 120 VAC

pH

pH Control

Controllers

1/4- and 1/2-DIN pH/ORP Dual-Input Controllers

Simple interactive diagnostics walk you through troubleshooting

- Display information in English, French, German, or Spanish

Simultaneously display, record, and control your measured pH (or ORP) and process temperature systems. Controllers feature two independent SPDT relays and two isolated 0/4 to 20-mA outputs for on/off control, high/low alarm, or recorder output. LED indicates when relays are active.

Configure your controller completely from the front keypad. Menu screens guide you through setup, calibration, operation, and test/maintenance. Order pH or ORP electrode at right.

Model 19065-00 is housed in a 1/4-DIN plastic case with a polycarbonate, NEMA 4X front panel.

Model 19065-10 is housed in a 1/2-DIN, epoxy-coated, metal NEMA 4X case. Hinged front panel provides easy access to wiring. Can be panel-, surface-, or pipe-mounted.



1/2-DIN universal mount model 19065-10 has a NEMA 4X rating.

Specifications & Ordering Information

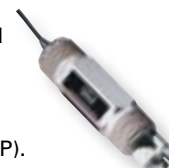


Catalog number	KH-19065-00	KH-19065-10
Description	1/4-DIN panel-mount (P33)	1/2-DIN universal-mount (P53)
Range	pH	-2.00 to 14.00
	mV	-2100 to 2100
	Temperature	-20 to 200°C (-4 to 392°F)
Accuracy	±0.1% of span	
Stability	±0.05% of span per 24 hours, noncumulative	
Control type	On/off; proportional	
ATC	Automatic or manual from -10 to 110°C, terminal strip	
Output	Relay	Two SPDT relays; at 5 A at 115/230 VAC and 30 VDC res.
	Current	Two isolated 0 to 20 mA or 4 to 20 mA; 600 maximum load
Display	Backlit LCD	Backlit graphic dot matrix LCD
Power	90 to 130 VAC, 50/60 Hz 190 to 260 VAC, 50/60 Hz	
Dimensions	3 3/4"W x 3 3/4"H x 6"D	5 1/16"W x 5 1/16"H x 6"D
Price		

Encapsulated Differential Sensors ensure unsurpassed accuracy, reduced clogging, and minimized ground loops. Sensor has three electrodes: process, standard, and ground. Includes 10-ft cable, 1 1/2" NPT(M) threaded housing, and a built-in 300-Ω thermistor ATC. Sensor material is Liquid Crystal Polymer (LCP).

KH-27400-00 pH sensor

KH-27400-10 Platinum band ORP electrode



Sensor 27400-00 has three electrodes and ATC all in one.

pH/ORP Process Controllers

Provides multiple control options with five outputs—use as set points, alarms, or probe wash

- Automatic buffer recognition for U.S., European, or manual calibration standards.
- Choose from on/off or direct pulse output control
- Controllers are prewired for standard plug in pump connections



56610-10

These pH/ORP controllers work well in wastewater treatment plants and other industrial applications. Controllers are housed in a weatherproof IP65 (NEMA 4X) enclosure for protection against the elements. Setup parameters are secured with user-selectable access code. User defined calibration intervals remind you when it is time to recalibrate and display last sensor calibration data. Order pH electrode with built-in preamplifier (extend cable up to 1000 feet) at right.

What's included: a 10-ft power cord with three-pronged plug.

Specifications & Ordering Information



Catalog number	KH-56610-00	KH-56610-10
Range	pH	0.00 to 16.00
	mV	±1500
	Temperature	32 to 212°F (0 to 100°C)
Resolution	pH	0.01
	mV	1
Accuracy	Temperature	0.09°F (0.05°C)
	pH	±0.01
	mV	±1
ATC	±0.9°F (±0.5°C)	
ATC	100 or 1000 Ω Pt RTD from 0 to 100°C	
Control type	Five on/off relays	Three on/off relays
Number of inputs	One	
Number of set points	Five (high or low)	
Dead band	0.01 to 1.9 pH units	
Display	2 x 16-character backlit LCD	
Output	On/off	Internally powered relays (10 A at 115 VAC; 6 A at 230 VAC)
	Proportional	Opto-isolated open collector (50 mA, 20 VDC maximum)
Power	115 VAC, 50/60 Hz	
Housing	IP65 (NEMA 4X)	
Dimensions	7 1/4"W x 7 1/2"H x 5"D (184 x 191 x 127 mm)	
Price		

Cartridge Style Electrodes

Electrodes have built-in preamplifier and ATC. Feature 1" NPT(M) thread for submersion and 1 1/4" NPT(M) thread for in-line installations. Includes 20-ft cable.

Type	Submersible		In-line		Replacement cartridge	
	Cat. no.	Price	Cat. no.	Price	Cat. no.	Price
pH	KH-56610-50		KH-56610-52		KH-56610-60	
ORP	KH-56610-54		KH-56610-56		KH-56610-64	

Multiparameter 1/4-DIN Controller and Transmitter

Measure pH, ORP, Conductivity, DO, or Flow with one SHARK™ controller!

- Programmable for desired parameter, no extra cards or options needed.
- Two displays, one external LED for operation/calibration and one internal LCD for configuration and control functions
- NEMA 4X, polycarbonate, universal mount controller



SHARK controller
57520-20

The SHARK controller is designed to be the most flexible and easy-to-use multiparameter analyzer on the market. Universal mounting and removable terminal strip provide for simple installation.

The external LED displays the measured value of the process. The bar graph shows if it is within programmed limits and if relays and/or alarms are activated. An additional 16-character LCD and keypad on the inside of the controller allows configuration of the controller without accidental changes from the outside.

The single input SHARK provides two isolated and independently scaleable 4 to 20 mA outputs, and one nonisolated 0 to 1 mA or 0 to 5 VDC output. Controller also features three process control relays with cycle timers. Two relays are factory set for bidirectional control with programmable on and off set points with independent programmable cycle times. The third relay is factory set as an alarm relay, but can be changed to a process control relay.

Order electrodes and sensors at right. Conductivity probes have epoxy bodies with graphite electrodes and CPVC compression fittings that allow variable insertion depths. pH and ORP electrodes are three-electrode differential probes with built-in preamplifiers for installation runs up to 3000 feet. Replaceable salt bridge increases operational life and reduces overall cost of ownership. Models with 1/4" NPT compression fitting allow variable insertion depth, while 1/2" NPT models have threads on both ends for use as an in-line or submersion probe. Hot tap assemblies and electrodes 57520-74 and -84 allow removal of the probe without shutting down the process. DO probe has a 1/2" NPT fitting that allows for submersion installations.



Hot tap for pH
or ORP electrodes
57520-59

Specifications & Ordering Information



Catalog number	KH-57520-20	KH-57520-22
Description	Shark controller	Shark transmitter
Range	pH	0.01 to 14.00
	mV	-1999 to +1999
	Conductivity	0 to 2,000, 20.00, 200.0, 2000 µS; 0 to 2,000, 20.00, 200.0 mS
	DO	0 to 20.00 ppm, 0 to 250%
	Flow	0 to 9999 with selectable flow rate units
	Temperature	0 to 100°C
Resolution	pH	0.01
	mV	1
	Conductivity	0.001, 0.01, 0.1, 1µS; 0.001, 0.01, 0.1 mS
	DO	0.01
	Flow	1
	Temperature	0.1
Accuracy	1% (for all parameters)	
ATC	Automatic or manual 300 or 3000 Ω NTC thermistor	
Control type	On/off	—
Number of set points	Two	—
Dead band	Adjustable	
Display	Front panel: 7 segment LED	—
	Inside panel: 16 segment LCD	—
Output	Alarm	One
	Relay	Two (10 A/NO, 5 A/NC)
	Current	Two isolated 4 to 20 mA
Housing	Universal mount, 1/4-DIN, NEMA 4X	
Dimensions	3 3/8"W x 3 3/8"H x 7 1/4"D (97 x 97 x 184 mm)	
Power	120 VAC 50/60Hz	24 VDC
Price		

Electrodes and Sensors

Catalog number	Body material	Sensor material	Cell constant (K)	Fitting NPT(M)	Maximum temperature	Price
Contacting conductivity sensors						
KH-19063-50	Epoxy	Graphite	0.01	3/4"	140°F (60°C)	
KH-19063-55			0.5			
KH-19063-60			1			
Electrodeless conductivity sensors						
KH-19063-40	Polypropylene	N/A	N/A	3/4"	221°F (105°C)	
pH electrodes (differential, 3-electrode)						
KH-57520-70	CPVC	Glass	N/A	1 1/4"	203°F (95°C)	
KH-57520-72				1 1/2"		
KH-57520-74				1 1/4"™		
ORP electrodes (differential, 3-electrode)						
KH-57520-80	CPVC	Glass	N/A	1 1/4"	203°F (95°C)	
KH-57520-82				1 1/2"		
KH-57520-84				1 1/4"™		
DO sensor, cartridge not included order below						
KH-53028-50	CPVC	PTFE membrane	N/A	1/4"	104°F (40°C)	

† Order hot tap fitting separately below.

Accessories

- [KH-57520-53](#) Junction box with terminal strip
- [KH-57520-57](#) Extension cable; 50-ft
- [KH-57520-59](#) Hot tap fitting for 57520-74 and -84
- [KH-57520-51](#) Replacement salt bridge for 57520-72 and -82. Pack of three
- [KH-57520-55](#) Replacement salt bridge for 57520-70, -74, -80, and -84. Pack of three
- [KH-53028-60](#) Replacement DO cartridge

PH

pH Control

Multiple-Input Controller

Required System Components

- 1 Base controller
- 2 Input cards
- 3 Electrodes

Add these options

Extra relays and mA output, wall- and pipe-mount kit, PIE software



56611-00



1 Base controller

Catalog number	KH-56611-00	
Range	pH	0 to 14
	mV	-1600 to 1600
	Conductivity	0 to 199.99 mS
	Oxygen	0 to 200 ppm
	Temperature	-14 to 284°F (-10 to 140°C)
Resolution	pH	0.01
	mV	1
	Conductivity	0.001
	Oxygen	0.01
	Temperature	0.1
Accuracy	pH	0.5% of reading
	mV	
	Conductivity	
	Oxygen	
	Temperature	
ATC	Programmable	
Control type	On/off, current, pulse frequency, or time proportional. PID with fuzzy logic available as a factory field upgrade; additional charges may apply, refer to manual.	
Number of set points	Two included, upgradeable to four (see Accessories)	
Dead band	Independently programmable	
Display	Graphic LCD with white LED backlight	
Output	Relay	Two SPDT form C, 4A load rating included, upgradeable to four (see Accessories)
	Current	Two 0/4 to 20 mA included, upgradeable to four (see Accessories)
Housing	NEMA 4X (IP65) Valox® thermoplastic	
Dimensions	Full DIN, 6.14"W x 6.14"H x 5.91"D (156 x 156 x 150 mm)	
Power	90 to 264 VAC, 47 to 63 Hz	
Price		

3 Electrodes

Catalog number	Description	Body material	Cable length	Process connection	Price
KH-56611-20	Durafet III nonglass pH electrode for immersion applications	Ryton®	50-ft quick disconnect	¾" NPT(M)	
KH-56611-22	Durafet III nonglass pH electrode for in-line applications	Ryton	50-ft quick disconnect	¾" NPT(M)	
KH-56611-24	Durafet III nonglass pH electrode for sanitary in-line applications	Polysulfone	50-ft quick disconnect	1.5" Tri-Clamp flange	
KH-56611-26				2.0" Tri-Clamp flange	
KH-56611-28				3.0" Tri-Clamp flange	
KH-56611-30	Conductivity electrode, K = 0.1; 0 to 19.99 mS	Polysulfone; titanium electrode	20-ft integral	¾" NPT(M)	
KH-56611-32	Conductivity electrode, K = 1; 0 to 199.99 mS	Polysulfone; graphite electrode			
KH-56611-34	Conductivity electrode, K = 10; 0 to 1999 mS	Polysulfone; graphite electrode			
KH-56611-40	Dissolved oxygen electrode	PVC	20-ft integral	1" NPT(M) for immersion applications	
KH-56611-42		Stainless steel	20-ft integral		
KH-56611-44	Ultrapure water DO connection kit, for use with DO electrode	PVC	N/A	¼"	
KH-56611-46		Stainless steel			
KH-56611-48	Wastewater submersion kit, for use with DO electrode	Ryton	N/A	N/A	

New Multiple-Input Controller

Build a system to measure one or two inputs of pH/ORP, conductivity, or dissolved oxygen

- Mix and match input cards and probes for a customized controller
- Global installation with universal power and multiple languages
- Nonglass Durafet® probes available for sanitary applications

Create the control system that fits your application—simply purchase the base controller and the number and types of input cards, probes, and other options that you need. The controller can be set up as a single- or dual-input analyzer that measures any combination of pH/ORP, contacting conductivity, and dissolved oxygen. The base controller has a large backlit LCD, two 4 to 20 mA outputs, and two programmable relays. The full DIN enclosure is NEMA 4X/IP66 rated for installation in moist, dusty, or hose-down applications.

Order the number and type(s) of input cards and any combination of electrodes to complete your system. Options like additional outputs and relays, pipe- and wall-mounting hardware, and Process Instrument Explorer (PIE) software allow multiple instrument configurations to be stored, modified, and retrieved via wireless infrared communications port. Programming is simple with the menu-driven software in English, Spanish, German, French, or Italian languages.

pH measurement can be programmed for either traditional glass electrodes or nonglass ISFET pH probes. Sanitary Tri-Clamp® nonglass pH electrodes are virtually unbreakable making them suitable for food and dairy applications. Auto-buffer recognition of NIST, US, and European buffers is also available. Order 1000 Ω RTD standard glass pH electrodes from pages 1107–1115.

High-purity contacting conductivity measurements can be programmed for preset temperature compensation or custom-configured values. Computed values of percent rejection/passage, difference, or ratio can be displayed and assigned to outputs or alarms. Relays can also be configured to alarm on conductivity values as determined by USP26 Standards.

Dissolved oxygen can be measured in ppb or ppm, depending upon the input card. The unique equilibrium probe technology is unaffected by fouling, is not flow sensitive, and does not require replacement membranes or electrolyte.

2 Input cards

Catalog number	Description	Price
KH-56611-02	pH/ORP	
KH-56611-04	Contacting conductivity	
KH-56611-06	Dissolved oxygen, ppb	
KH-56611-08	Dissolved oxygen, ppm	

Accessories

KH-56611-10 Two extra relays and one 4 to 20 mA output

KH-56611-12 Wall and pipe mounting kit for controller

KH-56611-14 PIE software. Upload or download programming and data via a comm port or infrared connection

KH-56611-16 Replacement electrolyte, for Durafet pH electrodes

pH Control pH

Controllers / Transmitters

1/4-DIN pH/ORP Controllers

Send data to computer or recorder via 4 to 20 mA output

Use two independent SPDT relays for on/off control or use as alarms. Both models have high/low alarm settings, pH standardization, and slope controls. Switchable auxiliary output direction (acid feed/base feed). Recessed set point potentiometers prevent accidental changes.

Controllers accept pH or ORP electrodes with BNC connector. Order electrodes at right. See pages 1107-1115 for additional electrodes.



05802-25

1/16-DIN Compact pH Controller

Displays both pH and temperature simultaneously!

Controller features high and low set point adjustments on the front panel with memory backup to protect settings in case of power loss. Controller includes recessed rear screw terminals for power, two sets of relays, ATC input, BNC connector for pH input, and panel mounting brackets.



05636-00

Industrial pH and ORP Transmitters

NEMA 4X enclosure protects transmitter from harsh conditions

Transmitters accommodate most pH or ORP two-wire loop applications. Models are available for pH or ORP. Input-to-output isolation ensures clean signal transmission even in noisy environments. Transmitters with display feature a scalable, 4 to 20 mA output over the full range or a portion of the range (as small as one pH unit or 100 mV). Blind transmitters have a fixed output spanning the full range of the transmitter. Order electrodes at right.



57100-00

Specifications & Ordering Information

ISO9001:2000
CERTIFIED SUPPLIER

Catalog number		KH-05802-00	KH-05802-25
Range	pH	0.00 to 14.00	
	mV	±1999 mV	
Resolution	pH	0.01	
	mV	1 mV	
Accuracy	pH	±0.02	
	mV	±2 mV	
ATC*		100 Ω Pt RTD, 0 to 100°C, terminal strip	
Control type		On/off	
Number of set points		Two (high, low)	
Input impedance		107 M Ω	
Dead band		0.1 pH unit, 10 mV	
Display		3½-digit LCD, ½"H	3½-digit LED, ½"H
	Relay	Two SPDT (115 VAC, 5 A max; 230 VAC, 2.5 A)	
Output	Current	Isolated 4 to 20 mA; adjustable, invertible span from 2 to 14 pH (200 to 1400 mV); 550 Ω max load	Isolated 4 to 20 mA; fixed span from pH 0.00 to 14.00 (0 to 1400 mV)
	Relay		
Power		80 to 250 VAC, 50/60 Hz	
Dimensions		3¾"W x 3¾"H x 4¾"D (96 x 96 x 119 mm)	
Price			

KH-27301-19 In-line/submersion ORP electrode with probe guard; double junction, platinum band, 10-ft cable

KH-27301-21 In-line/submersion pH electrode with probe guard; double junction, 100 Ω Pt RTD, 10-ft cable

Specifications & Ordering Information

Catalog number		KH-05636-00
Range	pH	0.00 to 14.00
	Temperature	0 to 100°C
Resolution	pH	0.01
	Temperature	0.1°C
Accuracy	pH	±0.01
	Temperature	±0.5°C
ATC		100 Ω Pt RTD, 0 to 100°C, terminal strip
Control type		On/off
Number of set points		Two (high, low)
Input impedance		>1000 M Ω
Display		Two-line 3-digit LED, ¾"H each
Output	Relay	Two SPDT (115 VAC, 3 A max)
Power		115/230 VAC, 50/60 Hz
Dimensions		1¾"W x 1¾"H x 4½"D (45 x 45 x 114 mm)
Price		

KH-05636-50 Optional NEMA 4X lens cover for controller 05636-00

KH-27001-70 In-line pH electrode with ATC, 100 Ω Pt RTD double junction; 10-ft cable with BNC connector, ½" NPT(M)

Specifications & Ordering Information

Cat. no.	KH-57100-10	KH-57100-00	KH-57101-10	KH-57101-00
Range	pH 0.00 to 14.00		-700 to 700 mV	
Accuracy	±0.02 pH, ±1 digit		±1 mV, ±1 digit	
Display	None	3½-digit LCD	None	3½-digit LCD
Output span	Fixed; 0.00 to 14.00 pH	Adjustable; any 1 to 14 pH units	Fixed; -700 to 700 mV	Adjustable; any 100 to 1400 mV
ATC	Automatic or fixed, 0 to 100°C; 3 k Ω Balco		None	
Output current	4 to 20 mA, isolated (to 700 Ω at 24 VDC)			
Housing	NEMA 4X			
Power	11 to 80 VDC			
Dimensions	2½½"W x 4½½"H x 4½"D (75 x 125 x 105 mm)			
Price				

KH-27011-15 pH electrode. Gel-filled, double junction, 3 k Ω Balco. 10-ft cable

KH-27001-90 pH electrode, in-line, no ATC

KH-27006-21 ORP electrode, platinum band, double junction. 10-ft cable

KH-26900-10 Power supply, 24 VDC, 365 mA

PH pH Control

Dual Parameter Controllers / ISFET Controller

1/4-DIN Multiparameter Analyzers

Measure, analyze, and control pH/ORP/Temperature or pH/DO/Temperature with one controller!

- Watertight IP65 housing
- 5 programmable relays: two for pH, two for ORP or DO, and one for temperature
- Isolated and reversible 4 to 20 mA output for a single parameter

These multiparameter analyzers provide multiple control strategies. Use the five relays with programmable hysteresis for on/off control or use the 4 to 20 mA output for proportional control. Both units have RS-485 output for remote access via PC compatible computer and allows multiple units to be connected together.

Setup and calibrations are done through a user-friendly guided menu that is password protected. Calibrations can be performed with automatic buffer recognition of U.S. or European buffer sets and is stored in nonvolatile memory.

The large backlit display provides pH, ORP, and temperature or pH, DO and temperature measurements, plus the current mA output and relay status. Both units perform a self-diagnostic at power up to ensure proper operation. Electrode efficiency can be displayed to indicate when electrode maintenance is necessary. Order electrodes separately on pages 1107-1115 and DO probe at right. Order BNC-to-Y connector to maintain IP65 rating with pH electrodes.

Model 05802-30 has temperature compensation provided by either a resistor or pH probes with 10 kΩ thermistors.

Model 05802-40 has temperature compensation provided by DO probe. Order non-temperature compensated pH electrodes from pages 1107-1115.



05802-40 with
05802-42 DO probe



Specifications & Ordering Information

Catalog number		KH-05802-30	KH-05802-40
Range	pH		-2.00 to 16.00
	mV	-2500 to 2500 mV	—
	DO	—	0.00 to 60.00 ppm/0.0 to 500.0%
	Temperature		-10 to 120°C
Resolution	pH		0.01
	mV	1 mV	—
	DO	—	0.01 ppm/ 0.1%
	Temperature		0.1°C
Accuracy	pH		±0.01, ±1 LSD
	mV	±0.2% of span	—
	DO	—	±0.2% of span
	Temperature	0.1°C ±1 LSD	—
ATC		10 kΩ thermistor	Provided by DO probe
Control type			On/off
Number of set points			Five
Dead band			Programmable
Display			128 x 64 graphical LCD
Output	Relay	5 A at 115 VAC, 2.5 U at 230 VAC	
	Current	Isolated 4 to 20 mA	
Housing		1/4-DIN, IP65	
Dimensions		3 7/8" W x 3 3/8" H x 5 7/8" D (96 x 96 x 148 mm)	
Power		115/230 VAC, 50/60 Hz	
Price			

KH-50001-00 Power cord; U.S. standard plug, 6 ft, 120 VAC

KH-05802-42 DO probe; for controller 05802-40

KH-05802-44 Replacement membranes; screw on membranes and O-rings for DO probe 05802-42. Pack of 6

KH-05802-46 BNC-to-Y connector

IQ Scientific Nonglass pH/mV/ORP Controller

Controller uses nonglass or traditional glass electrodes for continuous monitoring!

- Rugged NEMA 4X (IP67) polycarbonate enclosure
- Extra large 5 1/2" backlit LCD
- Four relays and four optically isolated 0/4 to 20 mA outputs

The pH controller accepts traditional or rugged nonglass electrodes, making it ideal for sanitary applications and where glass breakage may be an issue. The waterproof controller is a powerful instrument that is easily configured with plain language setup and operation.

Select Kynar probe for applications such as water, wastewater, or process with interrupted or intermittent flow; stainless steel probe with sanitary design for food or dairy applications. Engineered to withstand CIP, the SS probe is extremely rugged and easy to clean. Electrodes have waterproof quick disconnects and various length cables; sold separately below. See pages 1107-1115 for traditional pH electrodes.

KH-56810-12 In-line pH electrode; Kynar nonglass silicon chip sensor with quick disconnect (order cable separately)

KH-56810-14 In-line pH electrode; stainless steel, 1.5" sanitary design, nonglass silicon chip sensor with quick disconnect (order cable separately)

KH-56810-20 Cable; 12 ft for 56810-12 and -14

KH-56810-22 Cable; 20 ft for 56810-12 and -14

KH-56810-24 Cable; 30 ft for 56810-12 and -14



56810-00

56810-14

56810-12



Specifications & Ordering Information

Catalog number		KH-56810-00
Range	pH	0.00 to 14.00
	mV	-999.9 to 999.9
	Temperature	-5 to 105°C
Resolution	pH	0.01
	mV	0.1
	Temperature	0.1
Accuracy	pH	±0.02
	mV	±0.5
	Temperature	±0.5
ATC		Manual or automatic, -5 to 105°C; 3 or 4 wire 1000 Ω Pt RTD
Control type		On/off, pulse length, or pulse frequency
Number of set points		Two
Dead band		Programmable
Display		5 1/2", 360 x 240 pixel LCD with LED backlight
Output	Alarm	Four relays for control or alarm
	Relay	Four relays for control or alarm
	Current	Four optically isolated 0/4 to 20 mA
Housing		IP67 (NEMA 4X)
Dimensions		11" W x 9" H x 3 1/2" D (280 x 152 x 89mm)
Power		110/230 VAC, 50/60Hz; 24 VAC/VAC
Price		

Dual-Input Process Controller with Graphical Interface

Measures and controls any two functions (pH, mV, DO, or temperature) simultaneously

- View numerical or graphical data on a high-resolution LCD
- Stores up to 1200 measurements



View numerical data, graphical charts, and wiring diagrams on a high-resolution LCD 56310-00

Connect two electrodes for the same function to measure the difference between the two channels. Controller features a special differential function that triggers the relays when the value of the difference exceeds a preset level.

View measurements for both channels, temperature, time, and date at a quick glance.

Easily scroll through stored values or send data to a printer, computer, or recorder in any interval from 1 to 99,999 seconds. You can even view wiring instructions with step-by-step drawings on how to connect to electrodes, recorder, or computer in English, Dutch, French, or German.

Calibrate in pH mode using any of nine preprogrammed or with two user specified pH buffers. Security code prevents accidental change of setup parameters. See pages 1107–1115 for 100 or 1000 Ω Pt RTD pH/ORP electrodes.

Use relays for on/off control of pumps, mixers, or alarms; use the 4 to 20 mA outputs for proportional control of pumps or valves, or to send data to a recorder. Make all connections via terminal strip.

ISO9001:2000
CERTIFIED SUPPLIER



3 year
warranty

Specifications & Ordering Information

Catalog number		KH-56310-00	KH-56310-05
Range	pH	0.00 to 14.00	
	mV	± 2000 mV	
	Temperature	30 to 130°C	
	DO	0 to 60 mg/l, 0 to 600%	
Resolution	pH	0.01	
	mV	1 mV	
	Temperature	0.1°C	
	DO	0.01/0.1%	
Accuracy	0.1% of reading		
ATC	Automatic from 0 to 100°C; 100/1000 Ω Pt RTD; screw terminal		
Control type	On/off or proportional		
Number of inputs	Two		
Number of set points	Two (high/low)		
Input impedance	10 ⁶ M Ω		
Display	128 x 64 pixel LCD		
Output	Relay	Four SPST electronic relays (240 VAC, 0.5 A max)	
	Current	Two 4 to 20 mA, RS-485	
Power	110 VAC, 50/60 Hz 220 VAC, 50/60 Hz		
Housing	IP65		
Dimensions	7 1/8" W x 4 3/4" H x 3 1/2" D (200 x 120 H x 90 mm)		
Price			

KH-56310-60 Optional DIN rail mounting adapter

KH-59521-73 Dissolved oxygen probe

Consort Multi-Channel Benchtop Controller

Laboratory meter and controller in one unit



56300-10

- Measures pH, mV, conductivity, resistivity, salinity, TDS, or temperature

- Stores up to 500 measurements with real-time clock and date stamp

- RS-485 allows connection to printer or computer

This controller allows customizable set-up features for your specific needs. Two relay controlled electrical outlets are

programmable for high/low or alarm functions. Dual LED display allows you to view the temperature simultaneously with your pH/mV or conductivity measurement. Scanning mode enables sequential display of all channels with four-second intervals.

Order conductivity cells with integral 1000 Ω Pt temperature compensation listed below. Order pH electrodes with 1000 Ω Pt temperature sensors on pages 1107–1115. Temperature compensation can also be accomplished with Pt 1000 Ω ATC probe listed below.

What's included: 6 ft power cord.

Cells with 1000 Ω Pt RTD sensor

Catalog number	Body material	Cell Const cm ⁻¹	Temperature compensation	Cell type [†]	Measurement range	Temp range	Price
KH-59521-62	Glass	0.1	1000 Ω Pt RTD	D, 12mm dia	0.01 to 10 μ S/cm	0 to 110°C	
KH-59521-56	Epoxy	1	1000 Ω Pt RTD	D, 12mm dia	1 μ S/cm to 10 mS/cm	0 to 80°C	
KH-59521-58	Glass	1	None	D, 12mm dia	0.1 μ S/cm to 100 mS/cm	0 to 110°C	

[†]D = Dip style

KH-59521-52 ATC probe; 1000 Ω Pt RTC, stainless steel (required unless other probes used have built-in ATC element)

ISO9001:2000
CERTIFIED SUPPLIER

3 year
warranty

Specifications & Ordering Information

Catalog number		KH-56300-10	KH-56300-15
Range	pH	0 to 14.00	
	mV	± 2000	
	Conductivity	0 to 200 mS/cm	
	Resistivity	0 to 20 M Ω cm	
	Salinity	0 to 70 ppt	
	TDS	0 to 100 g/l	
	Temperature	0 to 100°C	
Resolution	pH	0.01	
	mV	1 mV	
	Conductivity	0.1 μ S/cm	
	Resistivity	10 Ω cm	
	Salinity	0.1 ppt	
	TDS	0.01 mg/l	
	Temperature	0.1°C	
Accuracy	pH	0.1% ± 1 digit	
	Conductivity	0.5% ± 1 digit	
	Temperature	0.3°C	
ATC	Manual or automatic, 0 to 100°C		
Control type	On/off or proportional		
Set points	Two		
Dead band	Programmable		
Display	8-digit LED		
Output	Alarm	Audible/relay	
	Relay	Two powered outputs	
	Current	0 to 2 V, programmable	
Housing	Benchtop, splash resistant		
Dimensions (W x H x D)	11 1/8" x 4 3/4" x 7 1/2" (30 x 12 x 18cm)		
Power	110 VAC, 50/60 Hz 220 VAC, 50/60 Hz		
Price			

pH Control

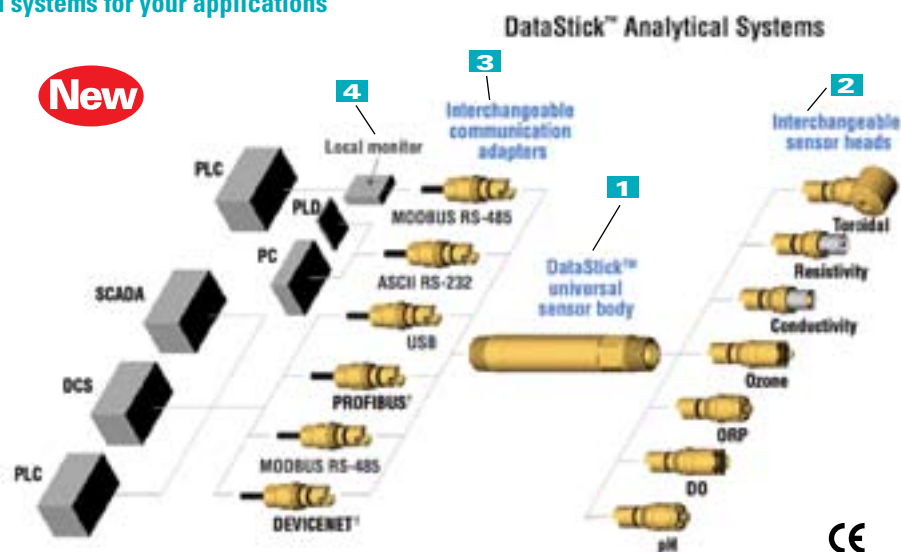
Transmitters

AquaSensors DataStick™ Measurement Systems

Exchangeable components allow customized systems for your applications

- Universal sensor body automatically converts sensor signals
- Precalibrated sensor heads save time
- Multiple communication adapters integrate with most control systems
- Use optional local monitor to display sensor and temperature data

The DataStick system integrates a universal sensor body and sensor head to provide a complete family of analytical sensor measurements that are compensated and precalibrated. The data can be used directly by PLCs and other computer systems with any of the integrated communication adapters without the need for an analyzer or transmitter. Alternatively, the sensor body can be hooked directly to the local monitor to display the measured parameter and temperature. Systems require a 9 to 35 VDC power supply (not included). Overall system measurements are approximately 11½"H x 1½" dia.



1 Universal Sensor Body converts a complete family of analytical sensor measurements into compensated and calibrated data that can be used directly with PLCs or other computer systems. Universal sensor body is CPVC construction with 1" NPT(M) thread on both ends for in-line or submersion applications.

Catalog number	Description	Price
KH-56200-10	DataStick universal sensor body	

2 Precalibrated Sensor Heads connect directly into the universal sensor body. These precalibrated sensors are automatically detected by the sensor body and can be replaced or switched with another parameter at any time. Sensors are available for differential pH or ORP, contacting conductivity, toroidal conductivity, resistivity, dissolved oxygen, and ozone.

Catalog number	Parameter	Body material	Operating temperature	Max pressure	Max flow rate	Price
KH-56200-20	Differential pH	CPVC	23 to 203°F (-5 to 95°C)	100 psi	10 ft/sec	
KH-56200-22	Differential ORP	CPVC	23 to 203°F (-5 to 95°C)	100 psi	10 ft/sec	
KH-56200-24	Conductivity, contacting (K = 1)	CPVC	-4 to 203°F (-20 to 95°C)*	150 psi	10 ft/sec	
KH-56200-30	Conductivity, toroidal	CPVC	-4 to 203°F (-20 to 95°C)*	150 psi	10 ft/sec	
KH-56200-26	Resistivity (K = 0.1)	PEEK	-4 to 203°F (-20 to 95°C)*	150 psi	10 ft/sec	
KH-56200-28	Dissolved oxygen (ppm)	CPVC	23 to 122°F (-5 to 50°C)	150 psi	10 ft/sec	
KH-56200-32	Ozone	CPVC	23 to 122°F (-5 to 50°C)	290 psi	10 ft/sec	

*Higher temperatures and pressures are available with other materials of construction. Contact our Application Specialists for more information.

3 Communication Adapters provide seamless integration into industrial control systems without the need for an analyzer or controller box. Select the appropriate communications module for your computer system. All adapters have 10-ft cables.

Catalog number	Communications type [†]	Material	Cable length	Connector	Price
KH-56200-40	ASCII RS-232	CPVC	10 ft	Wires, stripped and tinned	
KH-56200-42	Modbus RS-485	CPVC	10 ft	Wires, stripped and tinned	
KH-56200-44	USB	CPVC	10 ft	USB	
KH-56200-50	DF-1 RS-232	CPVC	10 ft	Wires, stripped and tinned	

[†]DeviceNet and Profibus communications adapters are also available; contact our Application Specialists for more information.

4 Optional Local Monitor allows local access to calibration, configuration, and diagnostic functions via the easy-to-use menu system. The module automatically detects and displays the sensor type and temperature on a 2-line, 16-character backlit LCD. The ¼-DIN, NEMA 4X rated module has a single 4 to 20 mA output to function as a transmitter without the need for a computer control system. Local monitor uses Modbus RS-485 communications adapter to connect to universal sensor body. Various other relay and digital communications output options are available—contact our Application Specialists for more information.



Catalog number	Description	Price
KH-56200-15	Local monitor with display and 4 to 20 mA output	

Required System Components

- 1 Universal sensor body
 - 2 Precalibrated sensor head(s)
 - 3 Communication adapter(s)
- Add these options**
- 4 Local monitor with display and 4 to 20 mA output

Specifications for Precalibrated Sensor Heads

Parameter	Units		
Range	pH	0 to 14	
	mV	-2100 to 2100	
	Conductivity, contacting	0 to 5000 µS	
	Conductivity, toroidal	0 to 2 S	
	Resistivity	0 to 18.2 MΩ	
	Dissolved oxygen	0 to 40 ppm	
	Ozone	0 to 50 ppm	
	Temperature	-4 to 257°F (-20 to 125°C)	
	Resolution	pH	0.01
		mV	0.1
Conductivity, contacting		4.5 significant digits	
Conductivity, toroidal		4.5 significant digits	
Resistivity		0.01	
Dissolved oxygen		0.01	
Ozone		0.01	
Temperature		0.1°F (0.1°C)	
Accuracy		pH	0.014
		mV	±0.1% of reading
	Conductivity, contacting	±0.1% of reading	
	Conductivity, toroidal	±0.1% of reading	
	Resistivity	±0.1% of reading	
	Dissolved oxygen	±0.1% of reading	
	Ozone	±1% of reading	
	Temperature	±0.1% of reading	

pH Control **pH**

Controllers / Transmitters

Digital pH Controllers and Transmitters

Low voltage, packaged systems for industrial installations

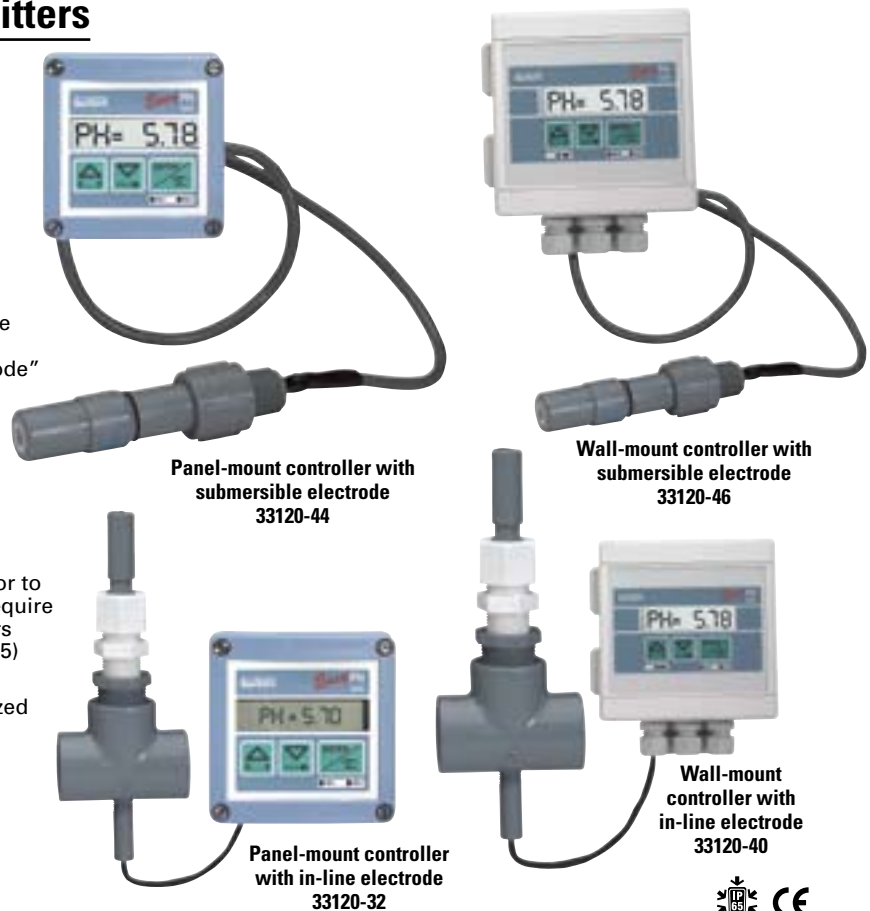
- Panel-mount, wall-mount, or compact sensor mounted electronics for in-line or submersible applications
- Control valves or metering pumps with frequency or on/off pulse output
- 25 feet of cable from sensor to wall mount or panel mount controllers

These 12 to 30 VDC pH controllers and transmitters feature flat-surfaced, cartridge style electrodes for ease of maintenance and replacement. Controllers have "hold mode" which allows two-point calibration and/or output verification while holding desired value. Programmable PID control functions provide easy and precise pH control. Order in-line systems sized for your specific application (electrode included). Submersible systems include electrodes with 1/2" NPT(M) threaded fittings for attachment to submersion pipe (pipe not included). Order replacement pH electrode cartridges below.

Compact Controllers are mounted directly to the pH sensor to save space for in-line installations. Compact controllers require Burkert in-line fittings (order separately below). Controllers are constructed of polycarbonate and have a NEMA 4 (IP65) rating. Sensors are made of PVDF with Viton® O-rings.

Panel-Mount Controllers are available in either specific sized in-line systems or submersible installations.

Wall-Mount Controllers are housed in NEMA 4 (IP65). Available in specific sized in-line systems or submersible installation systems. A 25-foot sensor cable allows the controller to be mounted at a distance from the sensor.



Specifications & Ordering Information

Model	Compact controller	Panel-mount controllers				Wall-mount controllers			
Catalog number	KH-33120-14	KH-33120-32	KH-33120-34	KH-33120-36	KH-33120-44	KH-33120-38	KH-33120-40	KH-33120-42	KH-33120-46
Description	Compact	3/4" in-line	1" in-line	2" in-line	Submersible	3/4" in-line	1" in-line	2" in-line	Submersible
Range					0.00 to 14.00				
Resolution					0.01				
Accuracy					±0.2%				
ATC					Automatic, integrated Pt Ω 1000				
Control type					P, PI, PID programmable				
Number of set points					Two, high/low with programmable dead band				
Display					8-digit LCD				
Output	Alarm				One 3 amp relay				
	Controller				Two transistor pulse outputs; one for acid addition and the other for base addition				
Housing					One 4 to 20 mA for actual pH value				
					NEMA 4 (IP65), Polycarbonate				
Dimensions	4 1/2"W x 6 1/16"H x 3 1/2"D (12.6 x 17.0 x 8.8 cm)	3 1/2"W x 3 1/2"H x 2 1/16"D (8.8 cm x 8.8 cm x 5.2 cm)				5"W x 5 1/2"H x 3 1/2"D (12.6 cm x 14.0 cm x 9.0 cm)			
Power	12 to 30 VDC	12 to 30 VDC				12 to 30 VDC			
Price									

Replacement electrode cartridges

Catalog number	KH-33121-34	KH-33121-36	KH-33121-38	KH-33121-40	KH-33121-42	KH-33121-36	KH-33121-38	KH-33121-40	KH-33121-42
Price									

In-Line Fittings for Compact Controllers

Fitting size	PVC, true union		SS, NPT(F)		SS, Tri-clamp®	
	Cat. no.	Price	Cat. no.	Price	Cat. no.	Price
1/2"	KH-33120-50		KH-33120-62		—	—
3/4"	KH-33120-52		KH-33120-64		KH-33120-82	
1"	KH-33120-54		KH-33120-66		KH-33120-84	
1 1/4"	KH-33120-56		KH-33120-68		KH-33120-86	
1 1/2"	KH-33120-58		KH-33120-70		KH-33120-88	
2"	KH-33120-60		KH-33120-72		KH-33120-90	



Replacement in-line electrode 33121-36



PVC true union fitting for compact controllers 33120-52

PH pH Control

Controllers / Recorders

Cole-Parmer

pH/ORP Controllers/Recorders

Advanced digital control and recording capabilities

- Programmable for on/off, proportional, or PI (proportional integral) control
- 30-day continuous recording of process values
- Automatic temperature compensation (ATC)

New



56850-20

These advanced controllers and recorders include Eutech pH 2000 controllers for precise process control. Program the unit through the user-friendly dual-line backlit LCD. Programming is secured by two-level password protection. Parameters are kept in nonvolatile memory so there is no need to reprogram when unplugged or moved. Full specifications for the controller are listed on page 1314. Select from single-input benchtop models with or without a recorder, or single- or dual-input wall-mount models with recorders. Models with chart recorders provide 30-day documentation of process parameters.

Wall-Mount Models feature a waterproof NEMA 12 enclosure that houses all measurement, control, and recording functions behind a windowed door for easy visual checks. Single-input model controls and records from a single Eutech pH 2000 controller. Dual-input model allows either feed-forward or feed-backward control and records the value from one controller.

Benchtop Models include a single-input Eutech pH 2000 controller and your choice of models with or without a built-in recorder.

What's included: 6 foot U.S. standard 110 VAC power cord, enclosure with plugged knockout holes, and recorder with 30-day supply of paper (select models). Order 100 Ω Pt RTD electrodes on pages 1107–1115.



Wall-mount model 56850-10 features dual electrode input.

Specifications & Ordering Information

Catalog number		KH-56850-00	KH-56850-10	KH-56850-20	KH-56850-30
Description		Single input wall-mount	Dual input wall-mount	Single input benchtop	Single input benchtop
Recorder		Yes	Yes	Yes	No
Range	pH	-2.00 to 16.00			
	mV	0 to 100%, -2000 to 2000 mV			
	Temperature	-9.9 to 125.0 °C			
Resolution	pH	0.01			
	mV	0.1%, 1 mV			
	Temperature	0.1°C			
Accuracy	pH	±0.1			
	mV	±2mV			
	Temperature	±0.5°C			
ATC		Automatic or manual, 100 ΩPt RTD			
Control type		On/off, proportional, PI (proportional integral)			
Number of set points		Two			
Dead band		Programmable			
Display		Dual-line backlit LCD			
Output	Alarm	One SPST relay			
	Relay	Two SPST relays			
	Current	Two channels			
Power		110 VAC, 50/60 Hz			
Housing		NEMA 12		Splash resistant	
Dimensions		14"W x 16"H x 6"D		15½"W x 6"H x 9"D	
Price					

KH-08354-95 Chart paper; 30-day roll. Box of six rolls

OAKTON® pH Buffer Solutions

Oakton buffers for meters with 0.01 resolution are standardized against NIST-certified pH references within 0.01 pH at 77°F (25°C). Store buffers away from direct sunlight. Sold in individual bottles: 500-mL bottles are available in cases of 12; the 4-L bottles in cases of four.

pH	500-mL bottles				1-L bottles		4-L bottles			
	Catalog number	Price/ea	Catalog number	Price/cs of 12	Catalog number	Price/ea	Catalog number	Price/ea	Catalog number	Price/cs of 4
1.68	EK-00654-01	—	—	—	—	—	—	—	—	—
4.01	EK-00654-00	—	EK-05942-21	—	EK-05942-22	—	EK-05942-24	—	EK-05942-25	—
7.00	EK-00654-04	—	EK-05942-41	—	EK-05942-42	—	EK-05942-44	—	EK-05942-45	—
10.00	EK-00654-08	—	EK-05942-61	—	EK-05942-62	—	EK-05942-64	—	EK-05942-65	—
12.45	EK-00654-12	—	—	—	—	—	—	—	—	—



05942-42 00654-00

05942-64

EK-05942-10 Buffer solution assortment pack; one 500-mL bottle each of buffer 4, 7, and 10

EK-05942-15 pH solution pack; one 500-mL bottle each of electrode cleaning solution, storage solution, and buffer 4, 7, and 10

Cole-Parmer Benchtop and Wall-Mount pH/ORP Controllers/Recorders

Keep permanent records of pH levels with the built-in recorder

- Analog meter available with or without automatic temperature compensation (ATC)
 - Single-input benchtop controllers with or without recorders
 - Single- or dual-input wall-mount models available
- Set high and low alarms to within 0.1 pH unit (10 mV) for single-electrode input. When pH or ORP levels exceed preset limits, front-panel signal lights up. Controller then activates pumps, solenoid valves, or other instrumentation connected to the two, powered 110 VAC outlets on the benchtop models or wired to the 110 VAC powered relays on the wall-mount models. Timed alarm circuit shuts off power output if pH or ORP levels do not return to preset limits within the chosen time span (adjustable from 0 to 10 minutes).

Mirror-backed, 6" analog scale has a range of 0 to 14 pH (± 700 mV); expanded scale is 1.4 pH (140 mV) span. Models with built-in recorder provide a permanent record of pH/ORP levels; chart paper (one roll included) lasts for 30 days. For controllers that do not have ATC, order nontemperature compensated electrodes with BNC pH connector separately on pages 1107–1115; for controllers with ATC, order pH electrodes with 30K thermistor separately below. Contact an Application Specialist for information on special-order electrodes or models with 4 to 20 mA outputs.

Ordering Information

Catalog number	Number of inputs	Recorder included	ATC	Power	Price
Benchtop models					
KH-05997-20	1	N	N	110 VAC, 50/60 Hz	
KH-05997-22			Y		
KH-05997-30		Y	N		
KH-05997-32			Y		
Wall-mount models					
KH-05997-35	1	Y	N	110 VAC, 50/60 Hz	
KH-05997-37			Y		
KH-05997-80	2		N		
KH-05997-82			Y		

Accessories

[KH-08354-95](#) Chart paper, 30-day roll. Box of 6 rolls

[KH-05997-02](#) pH electrode, in-line/submersion with probe guard, 30K thermistor, 3/4" NPT threads

[KH-05997-04](#) pH electrode, in-line/submersion with flat surface, 30K thermistor, 3/4" NPT threads

New

ATC models



Wall-mount model 05997-35

Benchtop model 05997-30 features built-in recorder.

Benchtop Models include a single electrode input, 110 VAC power supply cord, and two relay-powered 110 VAC outlets. Benchtop models have optional built-in recorder and ATC capabilities.

Wall-Mount Models feature a waterproof, NEMA 12 cabinet and built-in recorder. Cabinet houses all the measurement, control, and recording functions. Single-input model controls and records from a one electrode; dual-input model lets you connect one electrode to the meter/controller and another electrode to the recorder to monitor and record the effect of the control system.

Specifications

Description	Benchtop	Wall-mount
Range	pH	0.00 to 14.00 (normal); 1.4 span (expanded)
	mV	-700 to 700 mV (normal); 140 mV span (expanded)
Resolution	pH	0.01 (normal); 0.001 (expanded)
	mV	1 mV (normal); 0.1 mV (expanded)
Accuracy	pH	± 0.05 (normal); ± 0.005 (expanded)
	mV	± 5 mV (normal); ± 0.5 mV (expanded)
Temp compensation	Manual temperature compensation, 0 to 100°C	
Control type	On/off	
Dead band	0.1 pH units	
Number of set points	Two; low (0 to 6.2 pH), high (7 to 14 pH)	
Display	6" analog	
Output	Relay	Two powered receptacles, 4 A at 110 VAC
	Voltage	Two solid-state powered relays; 4 A at 110 VAC
Power time limit	High and low output have adjustable time limit (0 to 10 min) to prevent over-addition of chemical	
Dimensions	14 1/4"W x 8 1/4"H x 11 3/4"D	12"W x 14"H x 6"D

Cole-Parmer pH Recorder/Monitors

Inexpensive way to continuously monitor and record pH of solutions

Use these recorder/monitors for environmental, wastewater collection, industrial testing, or lab-based processes. Model with NEMA 4 enclosures allows unattended operation in harsh environments. The monitor can record between 0-14 pH range with manual temperature compensation. Order nontemperature-compensated pH electrodes with BNC connector from pages 1107–1115. Chart paper (one roll included) will last for 30 days of continuous use, order additional rolls at right.



05997-40

Specifications & Ordering Information

Catalog number	KH-05997-40	KH-05997-42
Description	pH recorder/monitor	NEMA 4 enclosed pH recorder/monitor
Range	0 to 14 pH	
Temperature compensation	Manual, 0 to 100°C	
Chart speed	1" per hour, continuous	
Display	None	
Housing	None	NEMA 4 enclosure
Dimensions	3 1/2"W x 7 1/4"H x 4 1/2"D	
Power	115 VAC, 50/60 Hz	
Price		

[KH-08354-95](#) Chart paper; 30-day roll. Box of 6 rolls

PH pH Control

Controllers / Pumps

Industrial Wall-Mount pH Controllers and Pumps

Pre-wired electrical plugs permit easy connections

- Pulse-output models feature three-point proportional control for precise measurements
- Use with flow and level switches to stop pump in case of blockage or chemical exhaustion

These wall-mount controllers feature either on/off or pulse output with optional isolated 4 to 20 mA output. Compatible electronic diaphragm pumps are listed below to simplify component selection.

All controllers accept pH probes with 1 k Ω Pt RTD ATC—order from pages 1107–1115. Controllers also accept contact closures from flow and level switches to stop pump operation in the event of blockage or chemical exhaustion. Remote on/off enables use with another control system.

Use the three-point proportional control capability found with pulse-output controllers (57300-20, -30) to define two slopes of flow rate vs. pH. This feature is ideal for either fine tuning the pump output or for maximizing pump output when conditions require rapid chemical addition.

Backlit LCD presents a number of parameters including pH, relay status, temperature, and run time. Interface prompts you through controller setup—use is simple and convenient. Password protection locks keypad to prevent accidental changes.

What's included: on/off controllers come with 6-ft cord with plug and two 1-ft output power cords with grounded receptacles for pumps. Pulse-output controllers include 6-ft cord with plug and two 10-ft output cables for direct connection to 74503-, 74507-, and 74508-series pumps.



ISO9001:2000
CERTIFIED SUPPLIER
2 year warranty

Specifications for Controllers

Description		On/off controllers	Pulse-output controllers
Range	pH	2.00 to 14.00	
	Temp	0 to 70°C	
Resolution	pH	0.01	
	Temp	1°C	
Accuracy	pH	±0.02	
	Temp	±0.5°C	
ATC		1 k Ω Pt RTD, terminal strip	
Control type		On/off or pulse	
Number of inputs		One	
Non-pH inputs		Optically isolated flow switch, level switch, remote on/off	
Number of set points		Two	
Dead band		Adjustable from 0.00 to 14.00 pH units	
Display		Backlit, multi-line LCD, 1 $\frac{1}{8}$ "W x 1 $\frac{1}{4}$ "H	
Output	Relay	Three unpowered SPDT, (Type C) 115/230 VAC, 10/6 A for alarms or solenoids	
	Current†	Isolated 4 to 20 mA, adjustable boundaries, 500 Ω max load	
	Control	Two powered SPST (Type A), 115/230 VAC, 10/6A	
		0 to 100 pulses/min; 2 mA, 24 VDC, 100 msec pulse	
Relay delay		Unpowered relays can be programmed for pH settling time and maximum actuation time	
Pump run time		Up to 11 hr, 10 mins, or no limit (programmable)	
Housing		NEMA 4X	
Dimensions		7"W x 9 $\frac{1}{8}$ "H x 4 $\frac{3}{8}$ "D (176 x 252 x 109 mm)	

†Models 57300-10 and -30 only

Controllers

Controllers with pulse output are compatible with 74507-, and 74508-series pumps—no need for a separate timer to “translate” pulse signal.

Catalog number	Isolated 4 to 20 mA output	Power	Price
On/off controllers			
KH-57300-00	No	115 VAC, 60 Hz	
KH-57300-10	Yes		
Pulse-output controllers			
KH-57300-20	No	115/230 VAC, 50/60 Hz	
KH-57300-30	Yes		

Electronic Diaphragm Pumps

Order from a sampling of compatible pumps below. Wetted materials are PVDF head and fitting, ceramic balls, Fluorofilm® diaphragm, and PVDF/PTFE seal ring. See our “Pumps—Metering” section on pages 1382–1410 for a full selection of metering pumps.

Catalog number	Max flow rate GPH	mL/min	Stroke adjustability Length	Rate	4 to 20 mA input	Power	Price
Manual control pumps							
KH-74503-30	1.0	63.3	Manual	Manual	No	115 VAC	
KH-74503-35						230 VAC	
Remote control pumps							
KH-74507-30	1.0	63.3	Manual	Manual or remote	Yes	115 VAC	
KH-74507-35						230 VAC	
Digital remote control pumps							
KH-74508-30	1.0	63.3	Manual	Manual or remote	Yes	115 VAC	
KH-74508-35						230 VAC	

DLX/B series pH/ORP Pump Control Systems

Digital controller and pump system in one!

- On/off or proportional control modes
- 4 to 20 mA output
- Programmable hysteresis and delay

Control the pH or ORP levels of your process with an integrated controller and pump—saves you time, money, and space. These solenoid driven, diaphragm metering pumps and controllers are encased in an IP65, acid-resistant plastic housing. Polypropylene pump heads have manual air bleed for outgassing fluids, PTFE diaphragm, and Viton® wetted parts. Pump control systems accept level switches (order separately below). LCD display has resolution of 0.01 pH or 1 mV.

Controllers are programmable for on/off or proportional control applications and have manual temperature compensation. Control can be fine-tuned by programmable hysteresis and delay functions. Frequency of injections is programmable between 0 to 100% of the maximum flow rate of the pump.

Control systems accept electrodes with BNC connectors with no temperature compensation—order electrodes from pages 1107–1115.

What's included: 6-ft length of both clear PVC and PE tubing (3/16" ID x 1/4" OD), weighted filter, and 6-ft U.S. standard power cord.



Foot mounted
pH pump
controller
56022-00



Wall-mounted
pH pump
controller

New
Models

Specifications & Ordering Information



Description	pH	ORP
Range	0.00 to 14.00 pH	0 to 1000 mV
Resolution	0.01 pH	1 mV
Accuracy	±0.1 pH	±1 mV
Temperature compensation	Manually adjustable from 0 to 100°C	
Control type	On/off or proportional	
Set points	One	
Dead band	Programmable	
Display	4-digit LCD	
Current output	4 to 20 mA	
Dimensions	5"W x 8 1/2"H x 7"D	

Max flow rate GPH (L/hr)	Max pressure psi (bar)	Power	Foot-mount		Wall-mount	
			Cat. no.	Price	Cat. no.	Price

pH pump control systems						
0.3 (1)	218 (15)	110 VAC, 50/60 Hz	KH-56022-00		KH-56022-01	
0.5 (2)	145 (10)		KH-56022-02		KH-56022-03	
1.3 (5)	102 (7)		KH-56022-04		KH-56022-05	
1.3 (5)	174 (12)		KH-56022-06		KH-56022-07	
2.1 (8)	145 (10)		KH-56022-08		KH-56022-09	
3.9 (15)	58 (4)		KH-56022-10		KH-56022-11	
5.3 (20)	45 (3)		KH-56022-12		KH-56022-13	

ORP pump control systems						
0.3 (1)	218 (15)	110 VAC, 50/60 Hz	KH-56022-20		KH-56022-21	
0.5 (2)	145 (10)		KH-56022-22		KH-56022-23	
1.3 (5)	102 (7)		KH-56022-24		KH-56022-25	
1.3 (5)	174 (12)		KH-56022-26		KH-56022-27	
2.1 (8)	145 (10)		KH-56022-28		KH-56022-29	
3.9 (15)	58 (4)		KH-56022-30		KH-56022-31	
5.3 (20)	45 (3)		KH-56022-32		KH-56022-33	

[KH-07187-06](#) Level switch; PP stem and float, 0.90 specific gravity

Signet pH/ORP Transmitters

Transmitters auto-configure for either pH or ORP when using the sensors sold separately at right. Both feature automatic buffer recognition and a scratch-resistant, self-healing display window. Hold function automatically holds the last known process value to allow electrode calibration. Use the simulate function to manually set the current loop output to test or calibrate a PLC or chart recorder.

Panel-mount model includes a mounting bracket and gasket for NEMA 4X watertight panel installation. Order preamplifiers, sensors, and mounting accessories at right.



56560-20



56560-30

Ordering Information

Catalog number	Description	Power	Price
KH-56560-20	Field-mount	12 to 24 VDC	
KH-56560-30	1/4-DIN panel-mount		

Specifications



Mode	pH	ORP	Temperature sensor
Range	0.00 to 14.00	-1000 to 2000 mV	-25 to 120°C (-13 to 248°F)
Resolution	0.01	1 mV	0.1°C
Accuracy	±0.03	±2 mV	±0.5°C
ATC	Automatic, 3 kΩ Balco		
Operating temp	-10 to 70°C (14 to 158°F); 0 to 95% RH, noncondensing		
Hysteresis	User-adjustable		
Display	2 x 16 alphanumeric LCD		
Output	Relay	Two SPDT 5 A at 30 VDC or 250 VAC resistive load maximum; Hi/Low/Pulse/Off programmable	
	Current	4 to 20 mA, isolated, fully adjustable and reversible	
Housing	NEMA 4X (IP65)		
Panel cutout	3 3/8"H x 3 3/8"D (92 x 92 mm)		
Dimensions	Field-mount: 3 1/16"W x 3 1/16"H x 4 3/16"D (96 x 96 x 97 mm)		
	Panel-mount: 3 1/16"W x 3 1/16"H x 3 1/16"D (96 x 96 x 106 mm)		

GO to page(s) 1107–1115

For a complete selection of industrial pH and ORP electrodes

Sensors and Preamplifiers

pH and ORP Sensors measure 5 1/2" L x 3 1/2" dia; insertion depth is 2 3/4". Order a flat-surface sensor for use in abrasive solutions or in solutions that coat ordinary electrodes. Flat sensors have a polyethylene junction while glass bulb pH sensors feature an annular HDPE liquid junction with a double-junction reference cell. Both platinum-band ORP sensors feature a double-junction reference cell.

Catalog number	Sensor	Type	Tolerance	Price
KH-56560-50	pH	Flat-surface	100 psi at 25°C, 58 psi at 85°C	
KH-56560-52		Glass bulb		
KH-56560-60	ORP	Flat-surface		
KH-56560-62		Glass bulb		

Preamplifiers let you install a sensor up to 400 feet away from transmitter. For submersible installation, connect a 3/4" NPT (M) pipe (not included) to top of preamplifier. For in-line installation, order standard cap 05614-27 (below) and fittings from Flowmeter section on pages 556–635. Cable length is 15 feet.

Catalog number	Type	Price
KH-56560-80	Submersible installation	
KH-56560-85	In-line installation	

[KH-05614-27](#) Standard cap

Mounting Accessories

[KH-05629-50](#) NEMA 4X rear cover kit

[KH-05629-60](#) Surface-mount kit for flat surface or pipe mounting. Use with rear cover kit 05629-50 (above)

[KH-05629-55](#) Liquid-tight connector kit for wire connection to the rear cover. Includes three watertight connectors

[KH-05631-50](#) Universal mount kit for pipe or wall mount. Includes conduit base, locking ring, and universal adapter

[KH-19007-50](#) Heavy-duty wall mount bracket

[KH-19007-52](#) RC filter kit for relays. Pack of two