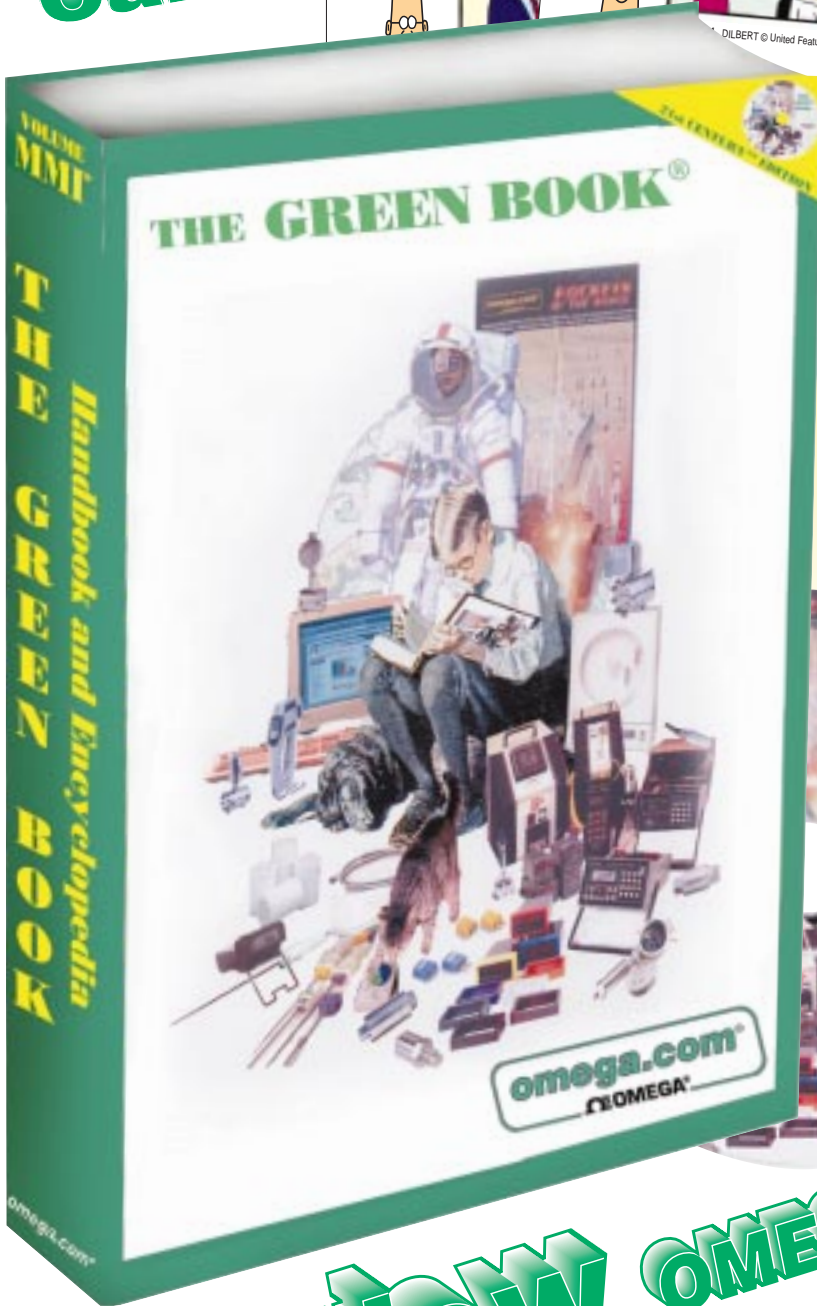
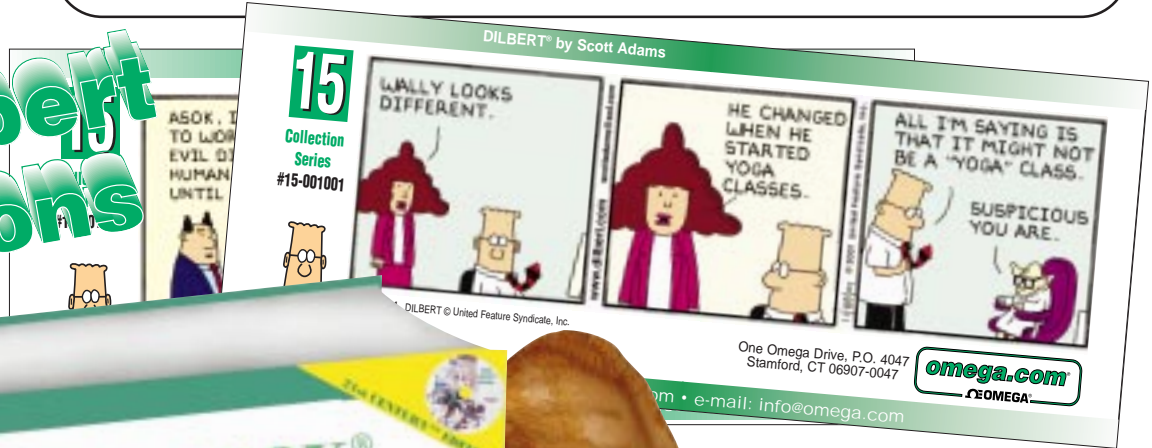


# DILBERT™

# OMEGA SCIENTIFIC™

Timely Introducing Scientific Instruments™

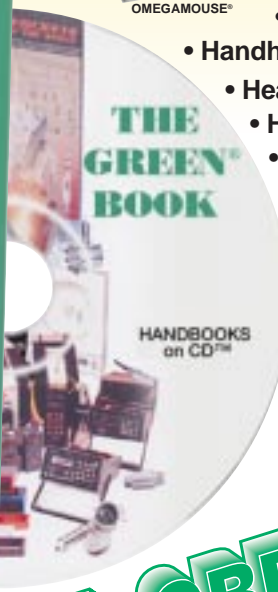
## 48 Dilbert Cartoons



## Preview of the GREEN BOOK®

- pH
- Conductivity
- Dissolved Oxygen
- Environmental Test
- Flow

- Handhelds
- Heaters
- Humidity
- Infrared Temperature
- Pressure
- Process Controllers
- Pumps
- Recorders
- Temperature
- Water Analysis



**Preview OMEGA GREEN BOOK®**

**OS OMEGA SCIENTIFIC, INC.**  
An OMEGA Group Company

Request your **FREE** copy at [usaomega.com](http://usaomega.com)  
Also available on CD ROM

**1-800-82-66342®**  
**1-800-TC-OMEGA**

## Introducing The OMEGA SCIENTIFIC™ Environmental Product Review!

The New Horizons® in Environmental Measurement & Instrumentation previews a selection of exciting products that will be featured in the upcoming GREEN BOOK®.

### Exceeding Your Expectations

Since 1962, OMEGA has grown from manufacturing a single product line of thermocouples to being an established global leader in the technical marketplace, offering more than 100,000 state-of-the-art products for measurement and control of temperature, humidity, pressure, strain, force, flow, level, pH, conductivity, and environmental products. OMEGA also provides customers with a complete line of data acquisition, electric heating and custom engineered products. It is our commitment to quality instrumentation and exceptional customer service that has remained the cornerstone of our success. OMEGA's priority is clear: Our facilities exist to "facilitate" solutions to your needs.

### Easy to Order

Ordering is as easy as picking up the phone and dialing: (USA and Canada)

**1-800-82-66342®**  
**1-800-TC-OMEGA**

One of our courteous, trained sales representative will assist you with product selection and placing your order. If you need more technical assistance, we have degreed application engineers available to help you solve your application problem.

### Internet

Use your web browser to go to








**www.omega.com**

Our online store has over 100,000 products available at the click of a mouse. After you place your order, it is reviewed and delivery confirmation is promptly emailed to you.

### Fast Delivery

OMEGA ships most of its orders within 48 hours. We also have overnight service available for customers who need product the next day.

Prices in U.S. Dollars

OMEGA's Icons	
 This icon indicates that the product is made with quality and pride in the USA.	 This icon indicates that the product has passed the proper EMC and product safety testing required by the European Union.
 This icon indicates the length (in years) of the product's standard warranty.	 This icon indicates that the product has an Underwriters Laboratory mark associated with it.
 This icon indicates the newest state-of-the-art products available.	 This icon is to indicate that the product's calibration is NIST traceable.
 This icon indicates that the product has a Factory Mutual listing.	



## CONDUCTIVITY

CDH-7X Series, Economical Pocket Conductivity Testers . . . . .	29
CDH-721 Series, Water-Resistant Conductivity/TDS Meters with Visual Alarm . . . . .	30
CDTX-300 Series, pH and Conductivity Transmitter with Isolated Output . . . . .	31
CDTX-1201 Series, Conductivity Transmitters Using 4-Ring Technology . . . . .	32
CDS-45 Series, Conductivity Calibration Solutions . . . . .	35
CDCN201 Series, Mini Panel Mount Conductivity and TDS Controllers . . . . .	36



## DISSOLVED OXYGEN INSTRUMENTATION

PHDG-80A Series, Portable Digital Dissolved Oxygen/Temperature Meters . . . . .	38
DOB-210 Series, Compact Dissolved Oxygen Benchtop Meters . . . . .	39
DOTX-45 Series, 2-Wire Isolated Dissolved Oxygen Transmitter Systems . . . . .	40



## WATER ANALYSIS INSTRUMENTS

SC-1919 Series, Colorimeter Reagent Systems . . . . .	42
CLH-1740 Series, Chlorine Analyzers . . . . .	44
SWS-201 Series, Stormwater Samplers . . . . .	45



## SOIL TEST INSTRUMENTATION

PHH-200 Series, Soil pH Test Kits . . . . .	46
---	----



## PUMPS

FPU500 Series, OMEGAFLEX® Peristaltic Pumps . . . . .	48
PHP-600 Series, Chemical Metering Pumps . . . . .	50
PHP-700 Series, pH or ORP Controller & Pumps . . . . .	52
FPUD150 Series, Economical Drum Pumps . . . . .	55



## TUBING & FITTINGS

OMEGAFLEX® Tubing . . . . .	56
FT-PLC Series, Delrin Acetal Tube Fittings . . . . .	58



## FLOW & LEVEL INSTRUMENTATION

FMA-900 Series, General-Purpose Air Velocity Transducers . . . . .	60
HHF23 Series, Environmental Monitoring Meters . . . . .	61
FMA-2600 Series, Mass and Volumetric Gas Flow Controllers . . . . .	62
FLR/FLV-1600 Series, Water Flowmeter and Controllers . . . . .	64
FD610 Series, Portable Doppler Flowmeters . . . . .	66
FPG-100 Series, Digital Open Channel Water Velocity Meters . . . . .	67
OM-CP-Level101 Series, Water and Level and Temperature Datalogger . . . . .	68



## HUMIDITY & WEATHER MONITORING INSTRUMENTATION

OM-CP-RHTEMP1000, Humidity and Temperature Datalogger . . . . .	69
RG-2500 Series, Tipping Bucket Rain Gauges & Electric Rain/Snow Gauges . . . . .	70
WMS-20 Series, Wind Monitor Stations with Analog Outputs . . . . .	71



## LABORATORY INSTRUMENTATION

WT4400 Series, OMEGA's Laboratory-Grade Benchtop Wind Tunnel . . . . .	72
--	----



## PROCESS CONTROLLERS & METERS

iSeries, Process Monitors/Controllers . . . . .	74
---	----



## DATA ACQUISITION, RECORDERS & SIGNAL CONDITIONERS

OM-CP-RFPH101 Series, Wireless pH and Temperature Transmitter . . . . .	76
OM-CP-PH101 Series, pH and Temperature Datalogger . . . . .	77
OM-CP-PROCESS101 Series, 4 to 20 mA Current Datalogger . . . . .	78



## PRESSURE AND INFRARED INSTRUMENTATION

PX831 Series, Fixed Range Industrial Pressure Transmitter . . . . .	79
Infrared Pyrometers . . . . .	80



## pH FIELD & LABORATORY INSTRUMENTS

PHH-720 Series, Water-Resistant pH Indicator with Visual Alarm . . . . .	1
CL600 Series, Omega Scientific™ Calibration Simulators . . . . .	2
PHH-830 Series, Portable pH/mV/ORP and Temperature Meter with RS-232 . . . . .	3
PHH-860 Series, pH/mV/Temp Handheld Meter with RS-232 Capability . . . . .	4
PHB-212 Series, pH/mV/Temperature Benchtop Meter with RS-232 Capability . . . . .	6
PHB-209 Series, pH/mV Benchtop Meter . . . . .	8



## pH FIELD & LAB ELECTRODES

PHE-4200 Series, Clear Epoxy-Bodied, Gel-Filled Combination ALpHA® Electrodes . . . . .	9
ALpHA® Series, Rugged Gel-Filled Electrodes . . . . .	10
PHA Series, pH Calibration Solutions . . . . .	12

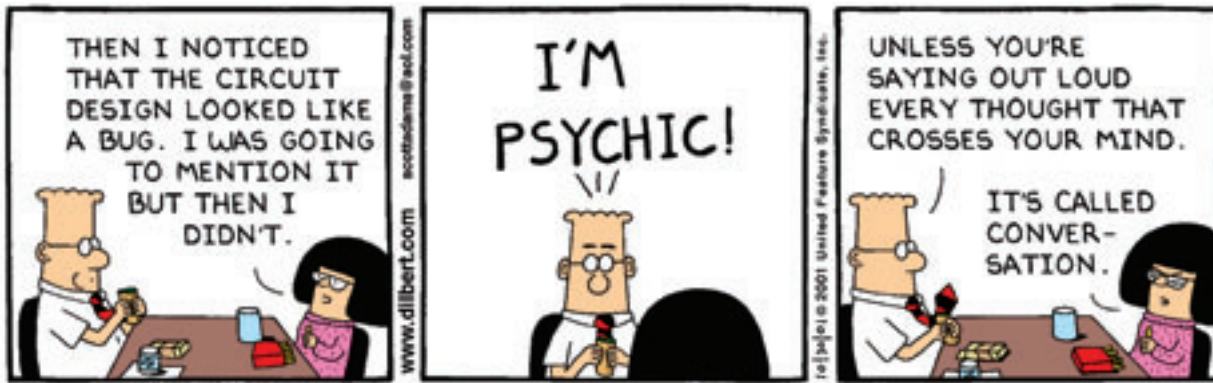


## INDUSTRIAL pH INSTRUMENTATION & ELECTRONICS

CTPH Series, Microprocessor-Based pH & Temperature Recorders . . . . .	13
DP24-PH Series, pH Meter . . . . .	14
PHCN/ORCN-37 Series, Microprocessor-Based pH Controller . . . . .	15
PHCN-70 Series, 1/6 DIN pH Controller . . . . .	16
PHCN-200 Series, Mini Panel-Mount pH Controller . . . . .	17
PHCN-900 Series, Wall-Mounted, Single Setpoint pH Controller . . . . .	18
PHTX-21 Series, pH/ORP Preamplifiers . . . . .	20
PHTX-212 Series, Industrial pH Two Wire 4-20 mA Transmitters . . . . .	21
PHE-4500 Series, Flat Surface pH/ORP Industrial Electrodes . . . . .	22
PHE-6820 Series, Retractable pH and ORP Insertion Electrodes . . . . .	26
PHE-7350 Series, Heavy-Duty pH Sensor for Submersible Applications . . . . .	27
PHE-5580 Series, Industrial Ground Loop Protection and Solution Ground pH Sensors . . . . .	28

For the complete selection of OMEGA products, visit OMEGA online at our website at [www.omega.com](http://www.omega.com)

For Sales & Service **1-800-82-66342®**  
**1-800-TC-OMEGA**  
U.S.A. and Canada

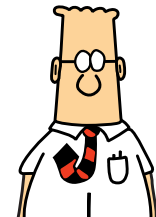


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

10/30/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001001



www.omega.com • e-mail: info@omega.com

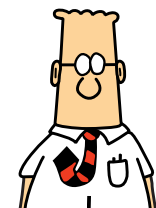


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

10/31/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001002



www.omega.com • e-mail: info@omega.com

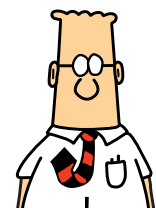


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

11/01/01 DILBERT © United Feature Syndicate, Inc.

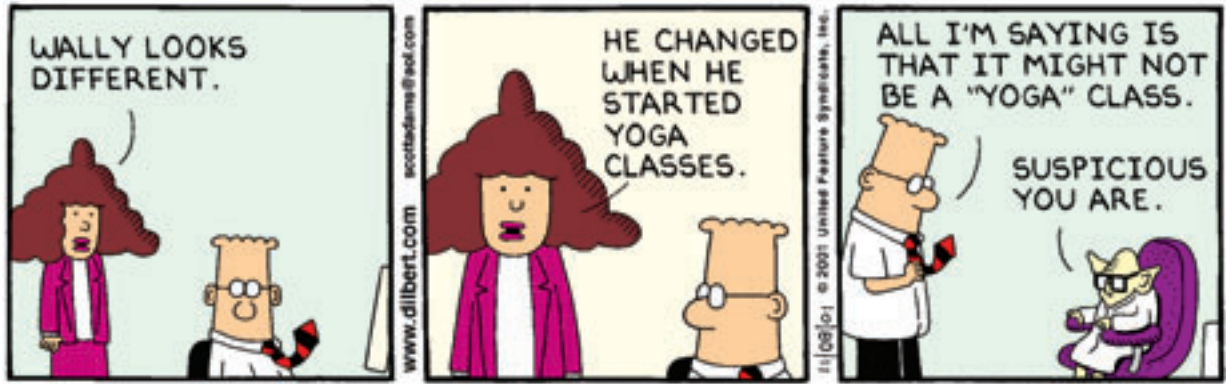
15

Collection Series  
#15-001003



15

Collection Series #15-001004



11/08/01 DILBERT © United Feature Syndicate, Inc.

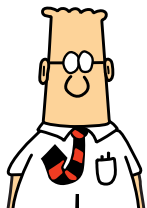
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001005



11/09/01 DILBERT © United Feature Syndicate, Inc.

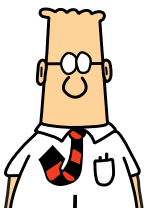
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001006



11/12/01 DILBERT © United Feature Syndicate, Inc.

One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



D2

For Sales and Service, Call Toll-Free: 1-877-82-66342® U.S.A. and Canada

Sales: FAX (Toll-Free) 1-877-FAX-OMEGA(A) 24 HOURS



## pH FIELD & LABORATORY INSTRUMENTS



### Water-Resistant pH Indicator with Visual Alarm

Model PHH-720

**\$80**

Basic Unit



- ✓ Selectable Setpoint in a Wide Range
- ✓ One or Two Point Calibration
- ✓ Water-Resistant Enclosure
- ✓ External 12 VDC Power Supply for Continuous Monitoring

The PHH-720 is a water-resistant pH meter with a built-in 3½-digit LCD. The meter is supplied with the PHE-720 double-junction, plastic-body, gel-filled combination pH electrode with 2 meter (6.6 foot) cable and BNC connector protected by a waterproof sheath. The electrode has a unique clogging-resistant Teflon® diaphragm.

The alarm setpoint can be selected anywhere in the 3 to 11 pH range. A red LED warns the user in the event the reading is outside the setpoint by more than ±0.5 pH. Calibration can be manually performed at 1 or 2 points through two easily accessible trimmers on the front of the unit.

The meter is suited for outdoor installations and highly humid environments. The casing has also been specially designed to give maximum stability and prevent rolling from any surface. In addition, a molded hook allows the meter to be easily installed close to the sample. The 12 VDC power supply is ideal for continuous monitoring over extended periods of time. PHH-720 is supplied complete with pH electrode, pH 4 & 7 buffers, calibration key, power supply and instructions.

#### Specifications:

**Range:** 0.0 to 14.0 pH

**Resolution:** 0.1 pH

**Accuracy:** (@20°C/68°F) ±0.2 pH

**Typical EMC Deviation:** ±0.2 pH

**Calibration:** Manual 2 point at pH 4 and 7

**Setpoint:** Adjustable from 3.0 to 11.0 pH



PHH-720 comes complete with pH electrode pH 4, 7 buffers, calibration key, power supply and operator's manual.

pH 4 and pH 7 buffer samples included

#### MOST POPULAR MODELS HIGHLIGHTED!

To Order (Specify Model No.)		
Model No.	Price	Description
PHH-720	\$80	Water Resistant pH Indicator with Alarm
PHE-720	35	Replacement double junction, plastic body, gel-filled combination pH electrode with 6' cable
PHA-4	5	4.00 pH Buffer Solution 475 ml bottle
PHA-7	5	7.00 pH Buffer Solution 475 ml bottle
PHA-10	5	10.00 pH Buffer Solution 475 ml bottle

Comes complete with pH electrode, PH 4, 7 buffers, calibration key, power supply, and operator's manual.

Ordering Example: PHH-720, pH indicator with Alarm, \$80.

**Alarm:** LED blinks when pH is outside setpoint by more than ±0.5 pH

**Electrode:** PHE-720 double junction, Teflon® diaphragm pH electrode with 2 m (6.6') cable and BNC connector (included)

**Power Supply:** External 12 VDC (included)

**Environment:** 0 to 50°C (32 to 122°F); RH 100%

**Dimensions:** 86 L x 94 W x 33 D mm (3.4 x 3.7 x 1.3")

**Weight:** 150 g (5.3 oz.)

Order Online  
**omega.com**<sup>®</sup>  
 Over 100,000 Products Available!

For the complete selection of pH Field & Laboratory Instruments, shop online at [omegapH.info](http://omegapH.info)



## OMEGA SCIENTIFIC™ Calibration Simulators - Low Cost



### Model CL601 Thermocouple Simulator

- ✓ K (Model CL601K)
- ✓ J (Model CL601J)
- ✓ 0.61 m (2') Cable with Male SMP Connector
- ✓ 4 Common Check Points in °C and °F

### Model PHCL-602 pH Simulator

- ✓ Simulates Values for pH 4.00, 7.00 and 10.00
- ✓ 0.61 m (2') Cable with BNC Connector

### Model CL603 Current Loop Simulator

- ✓ Simulates Output Ranges of 4 mA, 12mA, 20mA
- ✓ Overload Protection When Load > 240W
- ✓ Ideal for Checking Calibration as a Current Source for Indicators and Controller Setup
- ✓ 0.61 m (2') Cable with Spade Lugs

### Specifications:

#### Model CL601

Type J: 0° (32°F), 100°C (212°F), 400°C (752°F)

Type K: 0°C (32°F), 100°C (212°F), 500°C (932°F), 1000°C (1832°F)

Accuracy: ±0.5°C (±1°F)

#### Model PHCL-602

Accuracy: ±0.1% FS

#### Model CL-603

Accuracy: ±0.1mA

#### All Models

Battery: 9V alkaline battery included

Weight: 85g (3 oz.) without battery

Dimensions: 100H x 75W x 30D mm (3.9 x 3.0 x 1.2")

**IN STOCK FOR FAST DELIVERY!**

### To Order (Specify Model Number)

Model No.	Price	Description
CL601K	\$99	Type K thermocouple simulator
CL601J	99	Type J thermocouple simulator
PHCL-602	89	pH simulator
CL603	89	Current loop simulator

All units come with 9V alkaline battery, cable, and complete operator's manual.

Ordering Example: CL601K type K thermocouple simulator, \$99.

PHCL-602  
**\$89**

PHCL-602 model shown smaller than actual size

CL601J  
**\$99**

CL601J model shown smaller than actual size





## Portable pH/mV/ORP and Temperature Meter with RS-232

- ✓ LCD Displays pH/Temperature or mV/Temperature Simultaneously
- ✓ pH Measurement 0 to 14 pH, 0 to 1999 mV
- ✓ Temperature 0 to 100°C (32 to 200°F)
- ✓ Temperature Compensation for pH Range ATC & MTC
- ✓ Data Auto Hold
- ✓ Memory Recall: Single Recording 99 Sets. Continuous Recording 99 Sets, Max 3000 Pts.
- ✓ Auto Power Off for 10 Minutes
- ✓ DMM Talks with PC Via RS232 Interface
- ✓ Calibration for pH 7.00 and pH 4.01
- ✓ Optional pH Electrode, Temperature Probe and Buffer Solution

The PHH-830 pH/mV and temperature meter with RS-232 communication is economically priced for many applications.

The PHH-830 features an auto data hold. Pressing and holding the "test toggle" key during measurement will cause an "A" to flash and then hold the LCD.

The PHH-830 also features recording of 99 records and also has an RS-232 communication for datalogging.

### Specifications:

#### Measuring Range

pH: 0 to 14 pH  
mV: 0 to 1999 mV  
Temp: 0 to 100°C (32 to 212°F)

#### Accuracy

pH: ±0.01 pH  
mV: 0 to 600 mV: ±(0.05%+1d) Rdg  
601 to 1999 mV: ±0.1% Rdg  
Temp: ±0.5°C or ±0.9°F

#### Resolution

pH: 0.001 pH  
mV: 0.1 mV  
Temp: 0.1°C or 0.1°F

#### Temperature Compensation for pH

**Range:** Manual (MTC): 0 to 100°C (32 to 200°F), adjusting by push button or button on front panel. Automatic (ATC): 0 to 100°C (32 to 200°F), adjusting with the optional temperature probe.

Model PHH-830

**\$400**

Basic Unit



**pH Electrode Connection:** BNC  
**Operating Temperature:** 0 to 50°C (32 to 122°F),  
**Operating Humidity:** Max 80% RH  
**Sampling Rate:** About 1.5 time per second  
**Calibration Date:** Record the last data of adjustment  
**Battery Life:** Approx. 120 hours  
**Display:** 76.5 L x 50.5 W x 2.7 D mm (3" x 2" x 0.1") super large LCD dual display  
**Over Input Indication:** Indicate by "----"  
**Power Supply:** 6 AA Batteries (included)  
**Power Current:** Approx. DC 20 mA  
**Data Output:** RS-232 PC Serial Interface  
**Dimensions:** 187 L x 73 W x 53 H mm (7.4" x 2.9" x 2.1")  
**Weight:** Approx. 320 g (11.3 oz) with batteries  
**Optional Accessories:** pH buffer solutions, pH electrode, temperature probe.

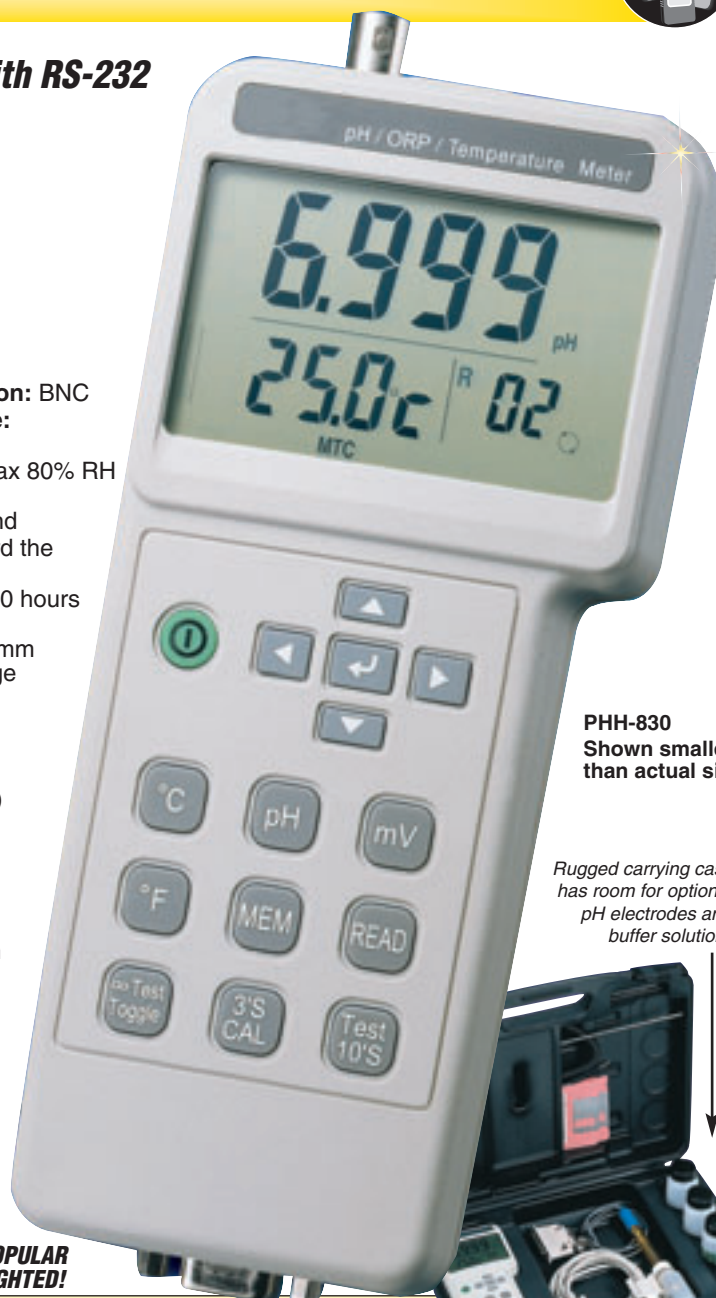
**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

Model No.	Price	Description
PHH-830	\$400	pH meter with RS232
PHAT-830	40	ATC Temperature probe PT100 RTD
PHE-1304	32	General purpose pH laboratory electrode
PHE-1411	58	Double junction pH laboratory electrode
PHA-4	5	Buffer solution, pH 4.00, 475 ml bottle
PHA-7	5	Buffer solution, pH 7.00, 475 ml bottle
PHA-10	5	Buffer solution, pH 10.00, 475 ml bottle
MN1500	1.75	Pkg of 2, AA replacement batteries (3 pks req.)

Unit comes with rugged carrying case, six AA batteries, two 3.5" disk Windows software, RS-232 cable, 9 to 25 pin gender changer and a complete operator's manual. Order pH electrode, ATC probe and buffer solutions separately

**Ordering Example:** PHH-830, pH meter with RS-232, \$400, PHE-1304, general purpose electrode, \$32, PHA-4 & PHA-10 buffer solutions \$5 ea., \$400 + 32 + 5 + 5 = \$442.



PHH-830  
Shown smaller  
than actual size

Rugged carrying case  
has room for optional  
pH electrodes and  
buffer solutions



# *pH FIELD & LABORATORY INSTRUMENTS*

**pH/mV/Temp Handheld Meter with RS232 Capability** CE

PHH-860  
**\$300**

PHH-860 shown smaller than actual size with optional PHH-860-SW (\$75) software and RS232 cable

Carrying case included



PHE-860 electrode included

- ✓ Dual LCD Display Shows pH / °C or °F or mV / °C or °F
- ✓ Max / Min, Rec.
- ✓ RS232 Data Output
- ✓ Auto Power Off in 20 Minutes, Disable Sleep Mode
- ✓ Low Battery Indicator





The PHH-860 pH/mV/temperature meters are excellent for aquaculture, sanitation plants, water and wastewater treatment plants.

The PHH-860 features RS232 communication and an optional software package is available for ease of use.

These microprocessor based digital meters are rugged, portable units which are able to recognize and compensate for electrode offset and slope. The PHH-860 also features hold, relative and average functions.

#### Features:

- ✓ Slope Control: Yes
- ✓ Display: 4 Digit
- ✓ Max./Min., REC
- ✓ Battery low indicator
- ✓ Calibration up to 3 (pH 4.01, 7.01, 10.01)
- ✓ Epoxy-body combination pH electrode
- ✓ Operating humidity max. 80% RH
- ✓ Auto power off in 20 minutes, disable sleep mode
- ✓ Dual LCD display shows pH/°C & °F or mV/°C & °F

#### Specifications:

##### Measuring Range:

pH: 0.00 to 14.00  
mV:  $\pm 499$ , -5 to 80°C

**Accuracy:** pH:  $\pm 0.02$  pH  
mV:  $\pm 0.2$  mV (0.1 to 180.0 mV),  
 $\pm 2$  mV (181 to 499 mV)  
Temp:  $\pm 0.3$ °C

**Resolution:** pH: 0.01  
mV: 0.1 mV  $\pm$ (0.1 to 180.0 mV)  
1 mV  $\pm$ (181 to 499 mV)

**Temperature Compensation:**  
-5 to 80°C (23 to 176°F)

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

**Operating Humidity:** Max 80% RH

**Input Impedance:**  $10^{12}$   $\Omega$

**Display:** 4 Digit LCD

**pH Electrode Connection:** BNC

**Power Input:** 9V Battery (Included)  
or Optional dc Power Adaptor

**Data Output:** RS232 Serial interface

**RS232 Format:** Band Rate: 2400  
Bit/sec, Data Bits:8 Stop Bits:1

##### Dimensions:

72 W x 182 H x 30 D mm (meter)  
(2.8 x 7.2 x 1.2")

**Weight:** 220 g (7.8 oz)  
(with Battery)



Unit comes with hard carrying case, electrode, 4-, 7-, and 10-Buffer Solutions, battery, and complete operator's manual.

#### To Order (Specify Model Number)

**MOST POPULAR MODELS HIGHLIGHTED!**

Model No.	Price	Description
<b>PHH-860</b>	<b>\$300</b>	pH/mV/Temp meter and pH electrode and RS232 port (software and cable optional)
<b>PHH-860-SW</b>	<b>75</b>	3.5" software disks for RS232 communication and cable required for RS232 function
<b>PHE-860</b>	<b>80</b>	Replacement combination 3 in 1 electrode, 12.7 mm diameter, 108 mm long, 1016mm cable (40")
<b>PHH-860-PS</b>	<b>12</b>	dc Power Adapter
<b>PHA-4</b>	<b>5</b>	Buffer solution, pH 4.00, 475 ml bottle
<b>PHA-7</b>	<b>5</b>	Buffer solution, pH 7.00, 475 ml bottle
<b>PHA-10</b>	<b>5</b>	Buffer solution, pH 10.00, 475 ml bottle

Unit comes with hard carrying case, electrode, 4-, 7-, and 10-Buffer Solutions, battery, and complete operator's manual.

**Ordering Example:** PHH-860 handheld meter, PHH-860-SW software and cable, \$300 + 75 = \$375



## **pH/mV/Temperature Benchtop with RS-232 Capability**

PHAT-210,  
temperature  
probe  
included

PHA-77 third arm  
electrode holder  
sold separately, \$35.

PHE-210,  
glass pH  
electrode  
included

Model PHB-212  
**\$420**  
Basic Unit

pH 4 and  
pH 7  
buffer  
samples  
included



- ✓ PHB-212 - PHB-213 Resolution of 0.001 pH and 0.1 °C with RS232 Link-Up
- ✓ Custom Microprocessor - Exclusive Microprocessor Provides Accuracy, Automatic Calibration, Prompts, Stability Indication and Ease-of-Operation Meter
- ✓ Supplied Complete - PHB-212 and PHB-213 are Supplied with Lab-Grade pH Electrode, Temperature Probe, Probe Holder and the Calibration Solutions Ready to Go.
- ✓ Windows Compatible - with the PH-SW Software, Download the Data to Your PC to produce Tables and Graphic Formats.

With a resolution selectable between 0.01 and 0.001 over the -2 to 16 pH range, the top-of-the-range PHB-212 and PHB-213 are designed for those users that need added accuracy. Both meters are supplied with opto-isolated RS232. The pH and temperature are displayed simultaneously and all pH measurements are automatically compensated for the temperature variance. With the probe detached, temperature can also be manually compensated for. PHB-213 also measures mV in the  $\pm 999.9$  mV range when used with ISE's and ORP electrodes. The large horizontal display shows both pH (or mV) and temperature at the same time.

Calibration comes with prompts for the operator, thanks to the meter's sophisticated custom microprocessor. Calibration can be at one or two points aided by automatic buffer recognition at pH 4.01, 6.86, 7.01, 9.18 and 10.01. A hi-tech stability indicator ensures a proper calibration is carried out and that all subsequent measurements are accurate. A particular measurement can be memorized and recalled at a later time at will. The front label carries clear and concise information about how to operate the meters.



# pH FIELD & LABORATORY INSTRUMENTS



## Specifications:

### Range:

PHB-212: -2.00 to 16.00 pH  
and -2.000 to 16.000 pH

PHB-213: -2.00 to 16.00 pH  
and -2.000 to 16.000 pH

PHB-213:  $\pm 999.9$  mV (ISE and ORP)

PHB-212: 0.0 to 100.0°C

PHB-213: 0.0 to 100.0°C

### Resolution:

PHB-212: 0.01/0.001 pH

PHB-213: 0.01/0.001 pH

PHB-213: 0.1 mV (ISE and ORP)

PHB-212: 0.1°C

PHB-213: 0.1°C

### Accuracy (@68°F/20°C):

PHB-212:  $\pm 0.01/\pm 0.002$  pH

PHB-213:  $\pm 0.01/\pm 0.002$  pH

PHB-213:  
 $\pm 0.05\%$  F.S. mV (ISE and ORP)

PHB-212:  $\pm 0.5^\circ\text{C}$

PHB-213:  $\pm 0.5^\circ\text{C}$

**Typical EMC:** PHB-212:  $\pm 0.01$  pH

PHB-213:  $\pm 0.01$  pH

**Deviation:** PHB-213:  $\pm 0.6$  mV

PHB-212:  $\pm 0.5^\circ\text{C}$

PHB-213:  $\pm 0.5^\circ\text{C}$

**pH Calibration:** Automatic 1 or 2 points  
with 5 memorized buffers (pH 4.01, 6.86,  
7.01, 9.18, 10.01)

### Temperature Compensation:

Automatic (with probe PHAT-210) or  
manual from 0 to 100°C (32 to 212°F)



PHA-77 third arm  
electrode holder sold  
separately, \$35.

Comes complete with a laboratory-grade  
glass pH electrode, stainless steel  
temperature probe, electrode holder,  
12 VDC transformer, anti-dust cover  
and the calibration buffers.

**Electrode:** PHE-210 pH electrode, combination, glass,  
interchangeable, BNC connector, 1 m (3.3') cable (included)

**Temperature Probe:**  
PHAT-210 with 1 m (3.3') cable (included)

**Input Impedance:**  $10^{12}$  ohm

**Power Supply:** 12VDC (included)

**Environment:** 32 to 122°F (0 to 50 °C); 95% R.H.

**Dimensions:** 240 L x 182 W x 74 D mm (9.4 x 7.2 x 2.9")

**Weight:** 1.1 Kg (2.4 lb.)

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model No.)		
Model No.	Price	Description
PHB-212	\$420	pH/Temperature C Benchtop Meter
PHB-213	450	pH/mV/Temperature C Benchtop Meter
PHAT-210	44	Replacement Temperature Probe
PHE-210	86	Replacement - glass pH electrode
PHE-1411	58	Double junction, plastic body, gel-filled combination pH electrode with 3.3 FT cable
PHA-77	35	Third Arm Electrode Holder
PHA-4	5	4.00 pH Buffer Solution 475 ml bottle
PHA-7	5	7.00 pH Buffer Solution 475 ml bottle
PHA-10	5	10.00 pH Buffer Solution 475 ml bottle
PHB-200PS	11	220Vac to 12Vdc adapter
PHB-200-SW	55	Windows Compatible Software
PHB-200-C	24	9-Pin Cable for PC

Comes complete with a laboratory-grade glass pH electrode, stainless steel temperature probe, electrode holder, 12 VDC transformer, anti-dust cover and the calibration buffers.

**Ordering Example:** PHB-212, pH/Temperature C benchtop meter, PHA-4, 4.01 buffer solution, PHA-7, 7.01 buffer solution,  
\$420 + 5 + 5 = \$430.



## pH/mV Bench Meter

**PHE-1411 electrode included**



Model PHB-209  
**\$295**  
As Shown

Shown smaller than actual size.

PHB-209 is supplied complete with combination double-junction refillable pH electrode BNC with 1 m (3.3') cable, 12 Vdc adapter, and instruction manual.



- **Oriented for Simplicity - PHB-209 Was Built Around the Idea Of Simplicity with a Large LCD, Easy-to-Operate Knobs, and a pH/Temperature Chart on the Front Panel**
- **New Design - A New User-Friendly Design**
- **Manual Calibration - In Order to Illustrate the Calibration Process, Manual Potentiometers Allow the User to Adjust the Offset and Slope Characteristics.**

A new look, rugged ABS casing with sturdy knobs, and a reference chart for pH and temperature on the front panel make PHB-209 an ideal meter for all users. The keypad has membrane keys for changing the mode and knobs for slope and offset calibration. The pH offset and slope are manually adjustable in order to display the calibration concept and the electrode characteristics to the students. Measurements can be performed for pH with manual temperature compensation as well as for REDOX (Reduction Oxidation Potential). The selected temperature is displayed to ensure better accuracy. The LCD displays the temperature

comprehensively while manually compensating for its effects. Practicality, simplicity and comprehensive operating procedures in addition to an affordable price make this meter one of the most popular, basic pH meters available today. A rugged double-junction refillable pH electrode and 12VDC power supply are also included in the attractive pricing.

### Specifications:

**Range:** 0.00 to 14.00 pH;  $\pm 1999$  mV

**Resolution:** 0.01 pH; 1 mV

**Accuracy (@68°F/20°C):**  $\pm 0.01$  pH;  $\pm 1$  mV

**Typical EMC Deviation:**  $\pm 0.03$  pH;  $\pm 2$  mV

**pH Calibration:** Manual 2 points through offset & slope knobs

**Temperature Compensation:**

Manual from 0 to 100°C (32 to 212°F)

**Electrode:** PHE-1411 combination double-junction refillable pH electrode BNC with 1 m (3.3') cable (included)

**Input Impedance:**  $10^{12}$  ohm

**Power Supply:** 12VDC adapter (included)

**Environment:** 0 to 50°C (32 to 122°F); 95% R.H.

**Dimensions:** 240 L x 182 W x 74 D mm (9.4 x 7.2 x 2.9")

**Weight:** 1.0 kg (2.2 lb.)

*Comes complete with pH electrode, adapter and operator's manual.*

**Ordering Example:** PHB-209, pH/mV benchtop meter, PHA-4, 4.01 buffer solution, PHA-7, 7.01 buffer solution, \$295 + 5 + 5 = \$305.

**IN STOCK FOR FAST DELIVERY!**

To Order (Specify Model No.)		
Model No.	Price	Description
PHB-209	\$295	pH/mV benchtop meter
PHE-1411	58	Replacement double junction, plastic body, gel-filled combination pH electrode with 1 m (3.3') cable
PHA-77	35	Third arm electrode Holder
PHA-4	5	4.00 pH buffer solution 475 ml bottle
PHA-7	5	7.00 pH buffer solution 475 ml bottle
PHA-10	5	10.00 pH buffer solution 475 ml bottle
PHB-200PS	11	220Vac to 12Vdc adapter



One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

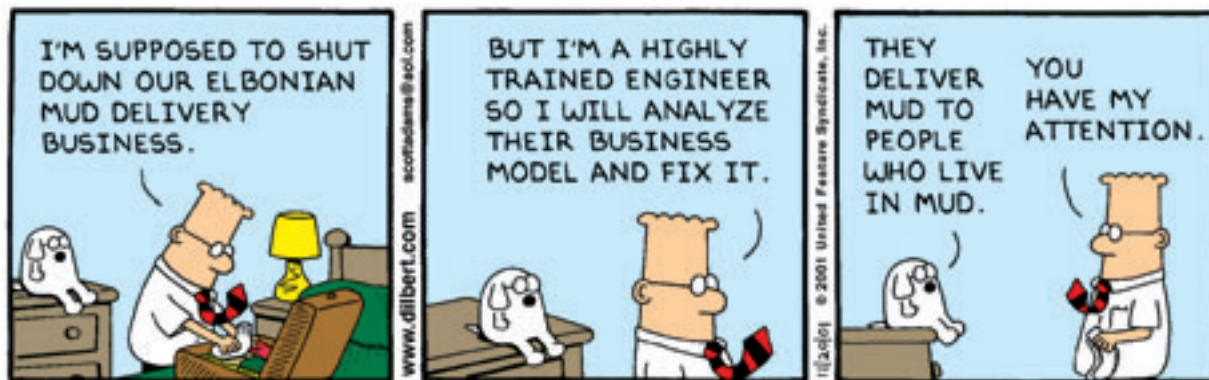
11/16/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series #15-001007



www.omega.com • e-mail: info@omega.com



One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

11/20/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series #15-001008



www.omega.com • e-mail: info@omega.com



One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

12/11/01 DILBERT © United Feature Syndicate, Inc.

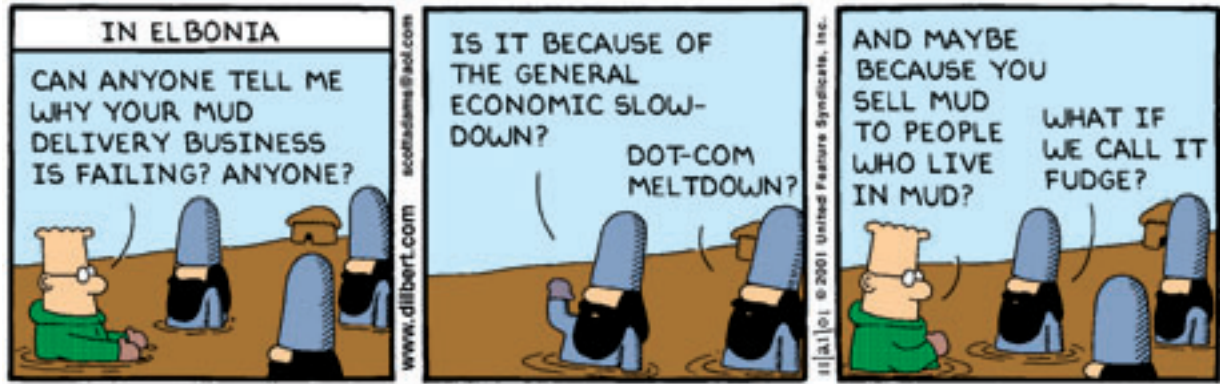
15

Collection Series #15-001009



15

Collection Series #15-001010



11/21/01 DILBERT © United Feature Syndicate, Inc.

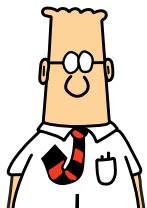
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001011



11/23/01 DILBERT © United Feature Syndicate, Inc.

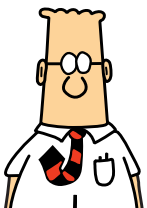
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001012



11/27/01 DILBERT © United Feature Syndicate, Inc.

One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



D4

For Sales and Service, Call Toll-Free: 1-877-82-66342® U.S.A. and Canada

Sales: FAX (Toll-Free) 1-877-FAX-OMEGA(A) 24 HOURS

# PH FIELD & LAB ELECTRODES



**Clear Epoxy-Bodied,  
Gel-Filled Combination  
ALPHA® Electrodes**



**PHE-4241**  
Coil Cable,  
\$59

**PHE-4272**  
Flat Surface  
Double  
Junction, \$98

**PHE-4222**  
Flask Size,  
\$75

**PHE-4202**  
Double  
Junction,  
\$65

**PHE-4201**  
General-  
Purpose, \$53

**PHE-4232**  
Semi-Micro,  
\$88

- ✓ Five Electrode Styles
- ✓ Covers Entire 0 to 14 pH Range
- ✓ Clear Epoxy Body Construction
- ✓ Fast Responding: 95% in Less than 1 Second
- ✓ One-Year Guaranteed Shelf Life
- ✓ Comes with OMEGA Quality Certificate

OMEGA Engineering is pleased to offer a complete line of laboratory pH electrodes. The PHE-4200 Series are gel-filled, combination pH electrodes with a unique clear epoxy body design. With five electrode styles to choose from, you're sure to find one suitable for your application.

OMEGA® PHE-4200 electrodes offer reliable quality at a reasonable cost. The electrodes measure the entire pH range from 0 to 14 pH units at 0 to 100°C (32 to 212°F) and feature an Ag/AgCl reference and polypropylene liquid junction. Each electrode comes in a soaker storage bottle to keep the electrode moist and ready for use. Shelf life is guaranteed for one year, and the OMEGA quality certificate provided assures that these electrodes meet the most stringent quality control requirements.

### Certificate of Quality

This electrode has been manufactured to the most stringent quality control standards. It has been shipped in a special soaker/storage bottle to ensure its quality.

Your electrode has been 100% inspected prior to shipment and meets or exceeds all factory performance specifications.



**PHH-830**, portable  
pH/mV/ORP and  
Temperature  
Meter with RS-232  
\$400, see page 3.

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

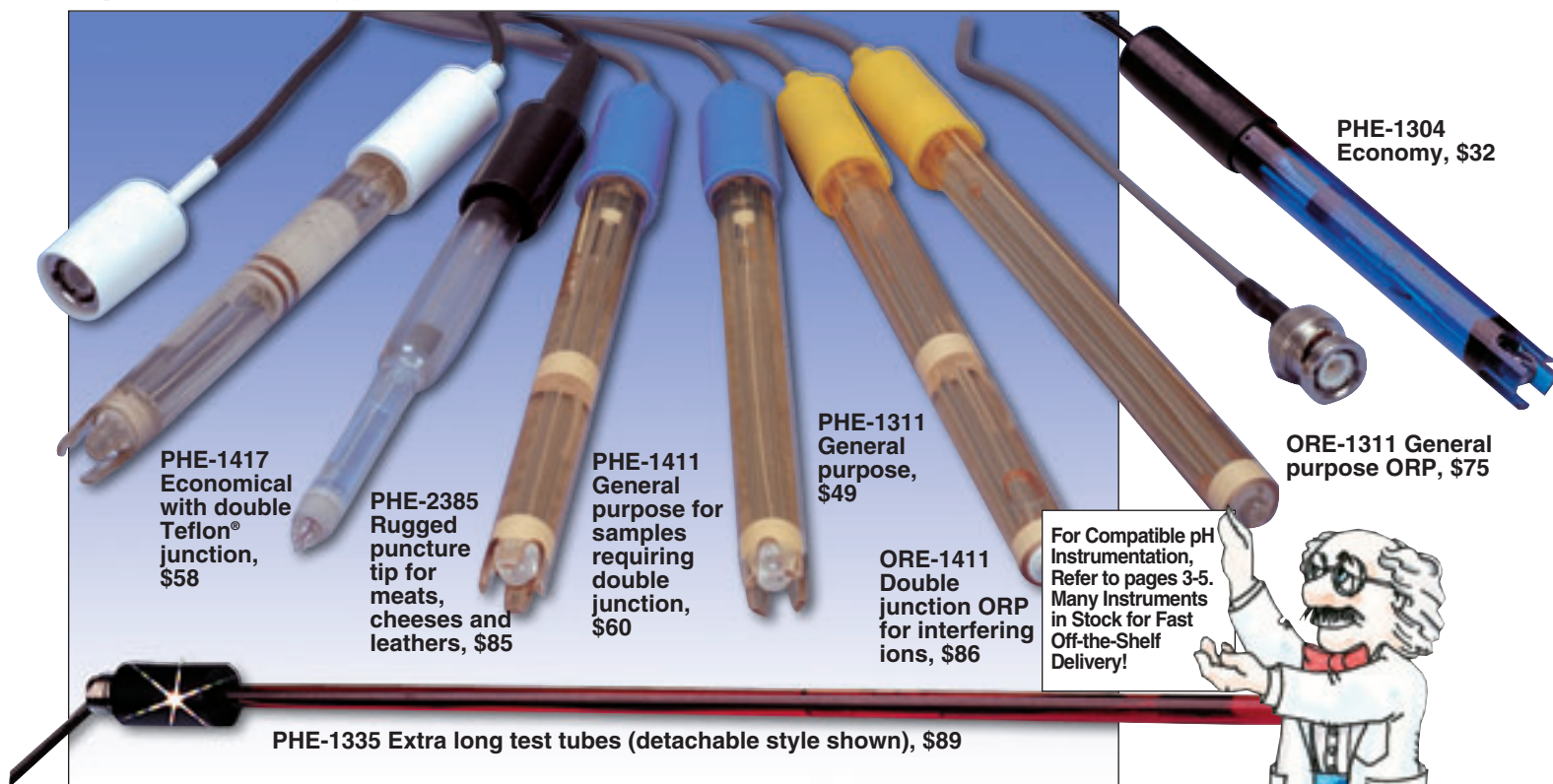
Model No.	Description	Length mm (in)	Dia. mm (in)	R (25°C) MegΩ	Price
<b>PHE-4201</b>	Gen. purpose	150 (6)	12 (.47)	50-80	<b>\$53</b>
<b>PHE-4202</b>	Double junction	150 (6)	12 (.47)	50-80	<b>65</b>
<b>PHE-4222</b>	Flask size	300 (12)	9.5 (.37)	50-80	<b>75</b>
<b>PHE-4272</b>	Flat surface double junction	150 (6)	12 (.47)	50-80	<b>98</b>
<b>PHE-4232</b>	Semi-micro	150 (6)	6 (.24)	50-80	<b>88</b>
<b>PHE-4241</b>	Coil cable	150 (6)	12 (.47)	50-80	<b>59</b>

All electrodes are supplied with 750 mm (2½ft.) of cable and BNC connector.  
**Ordering Example:** PHE-4201, general purpose probe, \$53.



# PH FIELD & LAB ELECTRODES

## ALpHA® Series Rugged Gel-Filled Electrodes



**PHE-1417**  
Economical with double Teflon® junction, \$58

**PHE-2385**  
Rugged puncture tip for meats, cheeses and leathers, \$85

**PHE-1411**  
General purpose for samples requiring double junction, \$60

**PHE-1311**  
General purpose, \$49

**ORE-1411**  
Double junction ORP for interfering ions, \$86

**PHE-1304**  
Economy, \$32

**ORE-1311** General purpose ORP, \$75

**PHE-1335** Extra long test tubes (detachable style shown), \$89

For Compatible pH Instrumentation, Refer to pages 3-5. Many Instruments in Stock for Fast Off-the-Shelf Delivery!

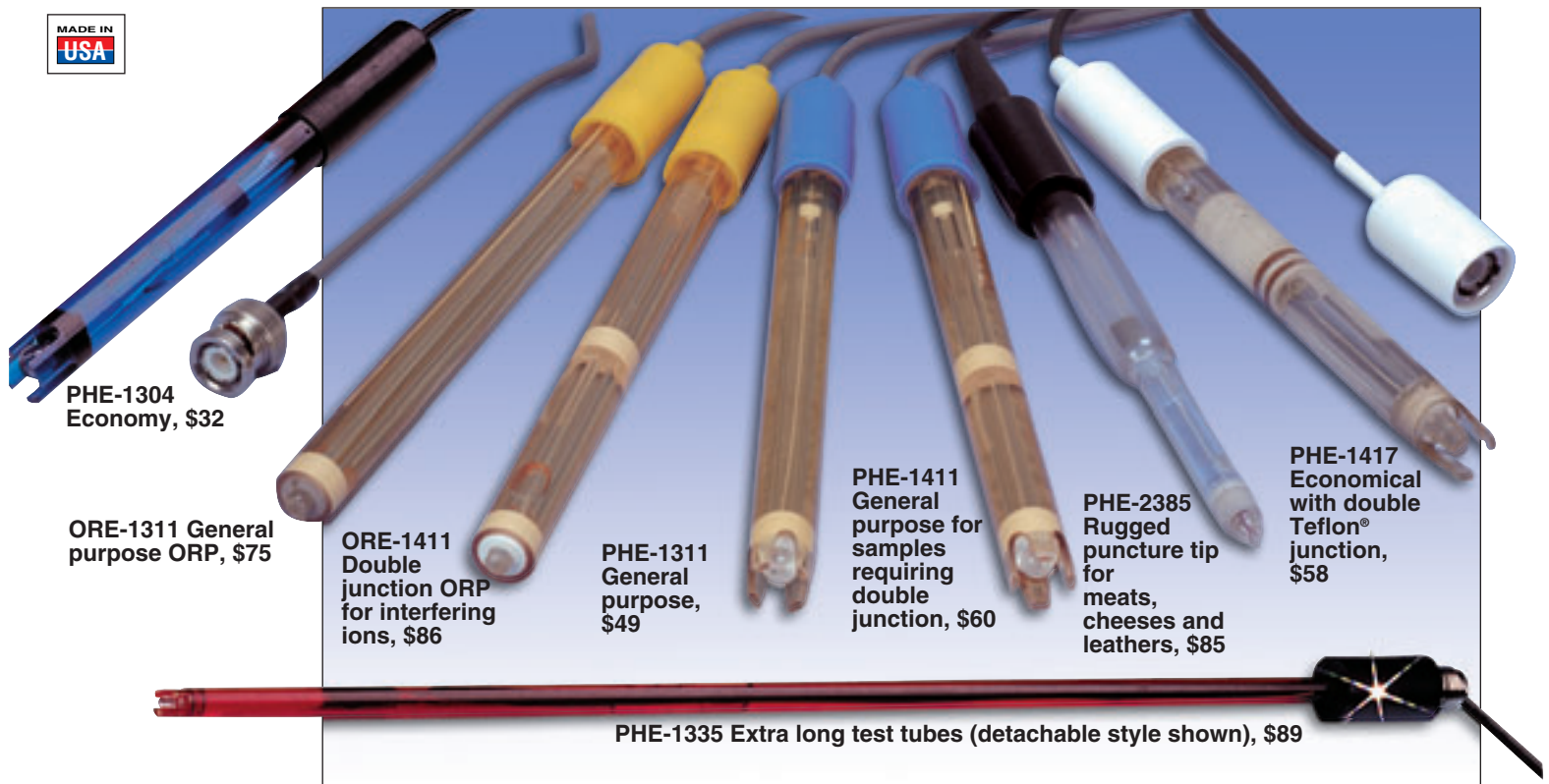
**MOST POPULAR MODELS HIGHLIGHTED!**

Model No. BNC	Model No. U.S. Std.	Application	Insertion Lgth mm (in)	Diameter mm (in)	pH Range	Temp. °C (°F)
PHE-1311	PHE-1311-U	General purpose	150 (6)	12 (.47)	0-14	0-100 (32-212)
PHE-1411	PHE-1411-U	General purpose for samples requiring double junction	150 (6)	12 (.47)	0-14	0-100 (32-212)
PHE-1332	PHE-1332-U	Test tubes	150 (6)	6 (.24)	0-14	0-100 (32-212)
PHE-1432	PHE-1432-U	Test tubes for samples requiring double junction	150 (6)	6 (.24)	0-14	0-100 (32-212)
PHE-1335	PHE-1335-U	Extra long test tubes (detachable style shown)	300 (12)	6 (.24)	0-13	0-100 (32-212)
PHE-1471	PHE-1471-U	Measurement of flat surfaces for samples requiring double junction	150 (6)	12 (.47)	0-14	0-100 (32-212)
PHE-2385	PHE-2385-U	Rugged puncture tip for meats, cheeses, fruits, leather	55 (2.2)	8 (.31)	0-13	0-100 (32-212)
PHE-1317	PHE-1317-U	Economical with removable guard and Teflon® junction	110 (4.3)	12 (.47)	0-13	0-100 (32-212)
PHE-1417	PHE-1417-U	Economical with double Teflon® junction	110 (4.3)	12 (.47)	0-12	0-80 (32-176)
PHE-1304	PHE-1304-U	Economy	90 (3.5)	12.5 (.49)	0-12	0-80 (32-176)
ORE-1311	ORE-1311-U	General purpose ORP	150 (6)	12 (.47)	±2000 mV	0-100 (32-212)
ORE-1411	ORE-1411-U	Double junction ORP for interfering ions such as zinc, copper or sulfide	150 (6)	12 (.47)	±2000 mV	0-100 (32-212)

All electrodes supplied with 3/4 to 1 m (2½ to 3 ft.) cable.

For additional lead length, add desired length **in feet** as suffix to electrode number and add \$1 per additional foot to price.





**PHE-1304**  
Economy, \$32

**ORE-1311** General  
purpose ORP, \$75

**ORE-1411**  
Double  
junction ORP  
for interfering  
ions, \$86

**PHE-1311**  
General  
purpose,  
\$49

**PHE-1411**  
General  
purpose for  
samples  
requiring  
double  
junction, \$60

**PHE-2385**  
Rugged  
puncture tip  
for  
meats,  
cheeses and  
leathers, \$85

**PHE-1417**  
Economical  
with double  
Teflon®  
junction,  
\$58

**PHE-1335** Extra long test tubes (detachable style shown), \$89

Reference Type	Liquid Junction	Body Material	R 25°C (77°F) Megohms	Price
Ag/AgCl	Polypropylene	Epoxy	50-80	\$49
Ag/AgCl Double	Polypropylene	Epoxy	50-80	60
Ag/AgCl	Polypropylene	Epoxy	50-80	82
Ag/AgCl Double	Polypropylene	Epoxy	50-80	93
Ag/AgCl	Annular Ceramic	Epoxy	200	89
Ag/AgCl Double	HDPE	Epoxy	50-80	90
Ag/AgCl	Annular Ceramic	Glass	150	85
Ag/AgCl	Annular Teflon®	Poly Ether Sulfone	60	55
Ag/AgCl Double	Annular Teflon®	Poly Ether Sulfone	60	58
Ag/AgCl	Annular Ceramic	Epoxy	50	32
Ag/AgCl	Polypropylene	Epoxy	-	75
Ag/AgCl Double	Polypropylene	Epoxy	-	86



# PH FIELD & LAB ELECTRODES

## Pre-Mixed pH Calibration Solutions

PHA Series  
**\$5**  
Basic Unit



- ✓ Pre-Mixed pH Solutions
- ✓ Two Bottle Sizes Available
- ✓ Standardized Against NIST Certified Sample

Formulated to provide precise pH determinations, these buffer solutions which are standardized against N.I.S.T.-certified reference samples, are ideal for calibrating electrodes and pH meters. The buffers are color-coded to avoid error and accurate to within  $\pm 0.02$  pH at 25°C (77°F). Each buffer contains a preservative/mold inhibitor and a shrink-sealed cap to prevent contamination and leakage. Temperature compensation charts are included with each buffer solution.

**IN STOCK FOR FAST DELIVERY!**



### To Order (Specify Model Number)

Model No.	Price	Description
PHA-4	\$5	4.00 pH buffer solution 475 ml bottle
PHA-4-GAL	18	4.00 pH buffer solution 3.8 L bottle
PHA-7	5	7.00 pH buffer solution 475 ml bottle
PHA-7-GAL	18	7.00 pH buffer solution 3.8 L bottle
PHA-10	5	10.00 pH buffer solution 475 ml bottle
PHA-10-GAL	18	10.00 pH buffer solution 3.8 L bottle

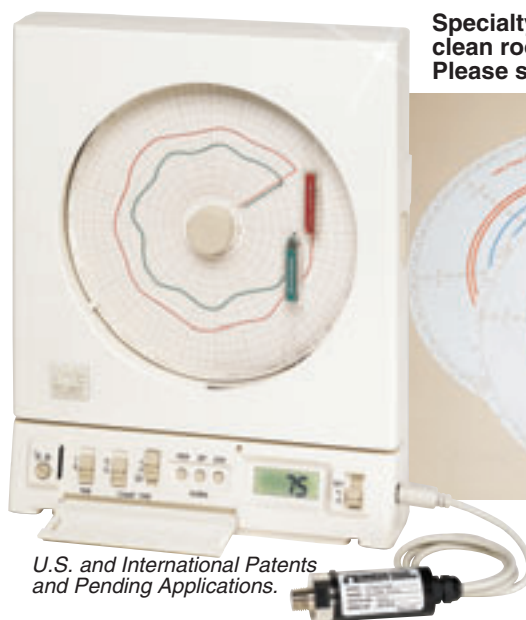
For NIST certificate of conformance, add suffix "-NIST" to part no. and add \$25 to price  
**Ordering Example: PHA-7-GAL-NIST, 7.00 pH buffer solution 3.8 L bottle with NIST conformance, \$18 + 25 = \$43.**

## Chart Recorders



U.S. and International Patents Apply.

**Microprocessor-Based Temperature/Relative Humidity Chart Recorder, CT485B, CE labeled, 220 Vac model shown with included Ferrite core noise suppressor, \$670.** (Basic unit includes 120 double-sided charts). Please see [omega.com](http://omega.com) for more info.



U.S. and International Patents and Pending Applications.

**CT585B, Temperature/Pressure Chart Recorder, \$700.** (Basic unit includes 120 double-sided charts). Please see [omega.com](http://omega.com) for more info.

Specialty charts for museums, hospitals, labs/ clean rooms, and computer rooms. Please see [omega.com](http://omega.com) for more info!



**NEW!**  
Wine Charts Available

**CT485-WMC, 20 double-sided, charts for 32-day wine storage, 10 to 15°C, 60-70% RH, \$20.** Please see [omega.com](http://omega.com) for more info.



## Microprocessor-Based pH & Temperature Recorders With Large 200 mm (8") Diameter Charts

- ✓ pH Range 0.2 to 12.0  
Temperature 2 to 80°C
- ✓ In Line or Submersible pH  
Sensor with PPS (Ryton)  
Body and 3/4" NPT
- ✓ Double-Sided Circular Charts  
1-, 7-, 32-Day Records
- ✓ Alarm Contact Standard
- ✓ Benchtop or Wall Mounted
- ✓ Battery or Wall Socket Powered
- ✓ LCD Backlight & Chart Light  
with AC Power

The CTPH is a cost effective recorder for pH and temperature, ideal for facilities required to maintain a record of pH. pH range is 0.2 to 12.0 with Automatic Temperature Compensation, using a unique, electronically amplified probe that provides pH and temperature input to the recorder unit through a 6-pin Mini DIN connector.

### Specifications

**PH input (green pen)**

**pH Range:** 0.2 to 12.0 pH

**Resolution:** 0.1 pH on LCD  
and 0.2 pH on chart

**Accuracy:** ± 0.2 pH

**ATC Range:** 0 to 80°C

**Sensor:** In line or submersion PPS (Ryton) body with 3/4" MNPT, sealed double junction Teflon®, and a preamplified output to insure accurate signal over long distances

**Cable Length:** 1.8 m (6')

Temperature INPUT (red pen)

**Temperature Range:** 0 to 100°C

**Resolution:**

1°C on LCD and 2°C on chart

**Accuracy:** ±2°C

**Sensor:** Combination pH & temperature

**Display:** User switchable pH  
and temperature (backlit display)

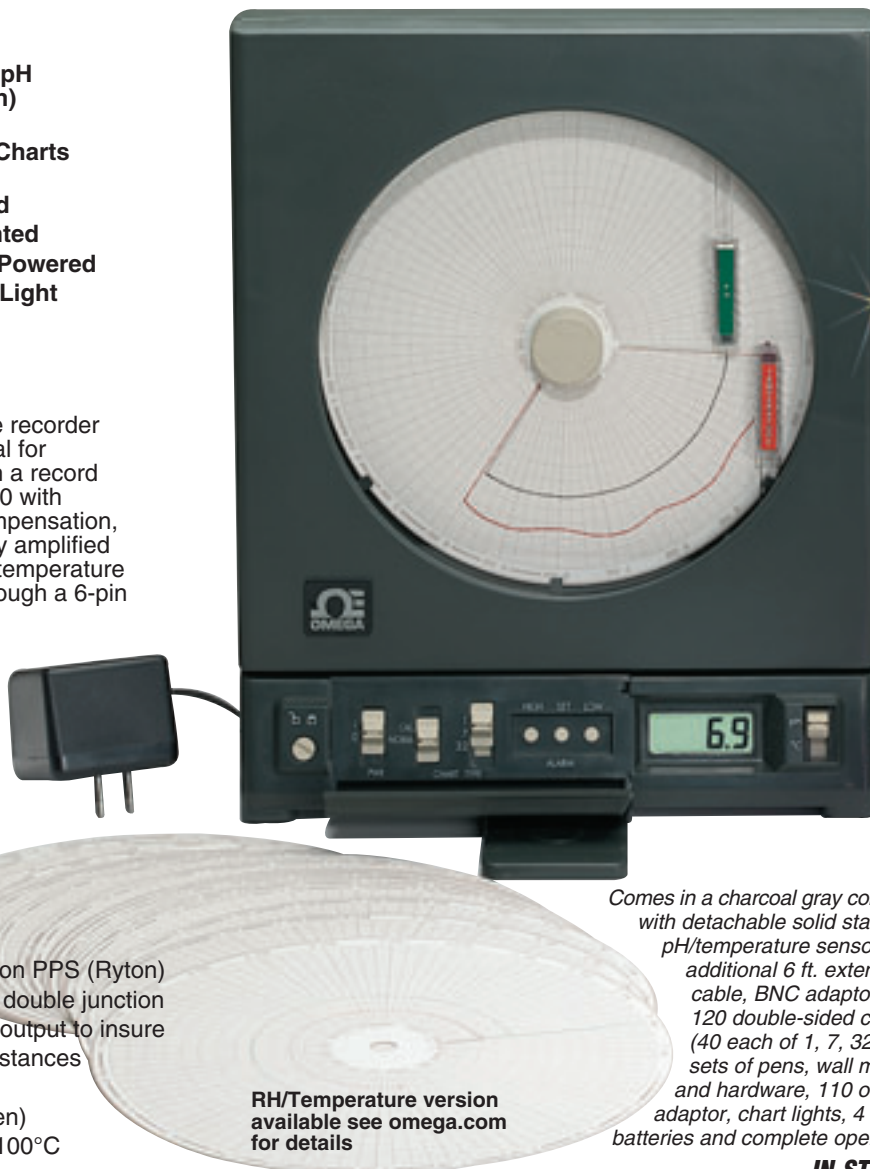
**Audible Alarm:** Integral beeper

**Chart:** 120 double-sided charts included,  
200 mm (8") circular linear radial div.

1-, 7-, 32-day, with pH and °C scale

**Dimensions:** 33.5 H x 27.1 W x 6.7 cm D  
(13 3/8 x 10 1/8 x 2 5/8")

**Weight:** Approx. 3.2 kg (7 lb)  
including batteries



RH/Temperature version  
available see [omega.com](http://omega.com)  
for details

Comes in a charcoal gray color,  
with detachable solid state  
pH/temperature sensor,  
additional 6 ft. extension  
cable, BNC adaptor,  
120 double-sided charts,  
(40 each of 1, 7, 32 day), two  
sets of pens, wall mount template  
and hardware, 110 or 220 Vac  
adaptor, chart lights, 4 "D" alkaline  
batteries and complete operator's manual.

Model CTPH  
**\$970**



Electronics  
Only



220 V Model  
Only

Covered under U.S.  
and international  
patents

Sensor included



**IN STOCK FOR FAST DELIVERY!**

### To Order (Specify Model No.)

Model No.	Price	Description
CTPH-110V-G-AL	\$970	Recorder, 110 Vac
CT585-PS	10	Red (temp) and green (pH) pen set
CT585-PS-6	52	Package of six (6) pen sets
CTPH-C(*)C	19	100 double-sided charts
CTPH-PROBE	225	Replacement pH probe

\*Insert "D" for 1 day, "W" for 7 days, "M" for 32 days of recording.

For 220 Vac version, replace "-110V" with "-220V" in model number, no additional charge.  
For white color case, replace "-G" with "-W", No additional charge.

**Note:** Using the BNC adaptor, the ATC is disabled and any low cost pH sensor can be employed, like PHE-4202. **Ordering Example:** CTPH-110V-G-AL recorder, and CTPH-CDC, pack of 100 double sided 1 day charts, 970 + 19 = \$989

Order Online

**omega.com**

Over 100,000 Products Available!

For the complete selection of Industrial pH  
Instrumentation & Electronics, shop online at  
[omegapHInstrument.info](http://omegapHInstrument.info)



# INDUSTRIAL pH INSTRUMENTATION & ELECTRONICS

## pH Meter

- ✓ Front Panel Min or Max
- ✓ External Display Hold
- ✓ Compact 1/8 DIN Size
- ✓ 4-Digit Display
- ✓ 4-20 mA Output

Model DP24-PH  
\$245



The DP24-PH is an economical, user-friendly panel meter for pH measurement. Its small size allows for easy installation and will accommodate any pH electrode with BNC connector. Temperature compensation is either manual or automatic with use of any 1000Ω platinum RTD.

The DP24-PH features a compact depth of only 104 mm (4.10"), allowing for mounting in areas with limited panel depth.

### Specifications

**Accuracy:** ±0.02 pH

**Input:** Impedance > 10<sup>12</sup> ohms

**Operating Temp:**

0 to 60°C (32 to 122°F)

**Storage Temp:**

-40 to 85°C (-40 to 185°F)

**Relative Humidity:**

95% @ 40 °C, non-condensing

**Temp. Compensation:** Manual fixed resistors; Automatic 1000 Ω

Optional PHE-4201  
general purpose  
electrode, \$53.  
See page 9



### RTD

**Display:** 4 digit, red LED,  
14.2 mm (0.56") high

**Display Range:** 0-14 pH

**Connections:** BNC

### Power Requirements

**Voltage:** 115 Vac ±15% standard  
(230 Vac or 10-32 Vdc optional)

**Frequency:** 50 or 60 Hz

**Power Consumption:** 6 watts max.

### Mechanical Specifications

**Dimensions:** 96 W x 48 H x 104 mm D  
(3.78" x 1.89" x 4.10")

**Panel Cutout:** 92 W X 45 mm H  
(¾ DIN, 3.62" x 1.77")

**Depth Behind Panel:** 100 mm (3.94")

**Weight:** 312 g (11 oz)

### Accessories

Model	Price	Description
SPC4	\$30	NEMA 4 "heavy duty" splash proof lens cover
SPC18	30	NEMA 4 splash proof lens cover

### Display/Power Options

Order Code	Add'l Price	Option
-230	N/C	230 Vac
-DC10/32	\$95	10-32 Vdc
-GN	N/C	Green LED Display

**IN STOCK FOR FAST DELIVERY!**

### To Order (Specify Model No.)

Model	Price	Description
DP24-PH-(*)	\$245	pH monitor

\*Specify display color and power code from chart below.

Comes with complete operator's manual.

**Ordering Example:**

DP24-PH-GN pH monitor with green LED display and 115 Vac power, \$245.



## Microprocessor-Based pH Controller with Automatic Temperature Compensation

Model PHCN/ORCN-37

**\$395**



Don't forget your buffer solutions!

4.00 pH buffer, Model PHA-4, \$5  
7.00 pH buffer, Model PHA-7, \$5  
10.00 pH buffer, Model PHA-10, \$5  
All in 475 mL bottles, see page 12.

Model PHE-6510 pH electrode, \$115 and PHEH-65-10 mounting assembly, \$44. Sold separately, See page 25.

- ✓ **Microprocessor-Based Versatility**
- ✓ **High and Low Alarm Setpoints**
- ✓ **Scalable 4 to 20 mA, 0 to 20 mA or 0 to 10 V Output**
- ✓ **Compact Panel Design**

This new microprocessor-based family of pH, ORP and pH/ORP panel mounted controller is designed for a wide variety of environmental monitoring applications. The units features automatic or manual temperature compensation of pH, two 5 amp mechanical relays and a choice of a scalable 4 to 20 mA, or 0 to 20 mA control or recording output or a 0 to 10 V output. For ease of operation all calibration and parameter setpoints are selectable through the front keypad. The PHCN/ORCN/OPCN-37 can be interfaced with a variety of pH and ORP electrodes.

### Specifications

#### ORP

Range: ORCN-37  $\pm 2$  Vdc;  
OPCN-37  $\pm 620$  mV

**Resolution:** 0.1, 1 mV  
**Accuracy:** 0.1 mV @ 25°C  
**Decimal Point:** 2 position auto ranging pH  
**Range:** 0 to 14.00 pH; 0 to 100°C.  
**Resolution:** 0.01 pH, 0.1°C  
**Calibration pH:** 2 or 3 point  
**Accuracy:**  $\pm 0.01$  pH;  $\pm 0.5$  C  
**Display:** 4-digit, LED, 13.7 mm (0.54")  
**Relays:** dual SPDT (form C) 5 A at 240 Vac, mechanical relay. Programmable deadband hysteresis around

setpoints. Output: 4 to 20 mA, 0 to 20 mA or 0 to 10 V (Scalable) Software selectable.

**Input Impedance:**  $>10^{12}$  ohms

#### Temperature Compensation:

Manual or Automatic, 0 to 100°C using Pt 100 ohm RTD or PT1K OHM RTD

**Connectors:** pH/ORP-BNC;  
Temp. -miniature phone plug (MPP) or terminal strip

**Power:** 115 Vac, STD 230 Vac, 50/60 Hz; 10-32 Vdc, 26-56 Vdc Optional

**Panel Cutout:**  $\frac{1}{2}$  DIN, 45 H x 92 mm W (1.772" x 3.622")

**Dimensions:** 48 H x 96 W x 177 mm D (1.89" x 3.78" x 7.00")

**Weight:** 580 g (1.27 lb)

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model No.)

Model No.	Price	Description
PHCN-37	\$395	Microprocessor-based pH controller
ORCN-37	395	Microprocessor-based ORP controller
OPCN-37	495	Microprocessor-based combination pH/ORP controller

Comes complete with operator's manual.

Ordering Example: PHCN-37 Microprocessor-Based pH Controller, \$395.



# INDUSTRIAL pH INSTRUMENTATION & ELECTRONICS

## 1/6 DIN pH Controller

PHCN-70  
**\$239**



- ✓ Dual Display of pH/ORP and Temperature
- ✓ High/Low Setpoints
- ✓ Optional NEMA-4X Lens Cover
- ✓ Compact Size

The new microprocessor-based family of pH/ORP 1/6 DIN Panel mounted controllers are designed for a wide variety of environmental monitoring applications. The PHCN-70 features two 3 Amp SPDT relays for on/off control or alarms, automatic temperature compensation with 100 ohm RTD, bright dual displays of pH (red) and temperature (green) LED's and EEPROM memory to protect settings in case of power loss.

An optional NEMA-4X gasketed lens cover fits over front bezel of controller made of watertight corrosion-resistant ABS plastic.

### Specifications

**Accuracy:** 0.01 pH, 0.1°C

**pH Range:** 0-14 pH

**Temperature:** 0 to 100°C (32 to 212°F)

**Resolution:** 0.01pH, 0.1°C

**Temperature Compensation:** PT100

**Display:** 3 digits LED, Two Lines, 9.5 mm (3/8") High

**Dimensions:**

45 L x 45 W mm (1.77" x 1.77")  
Depth 119 mm (4.7")

**Outputs:**

Dual 3 Amp SPDT Relays @ 115 VAC

**Deadband:**

0.00 to 2.55 pH adjustable

**Power:**

80 to 250 VAC, 50/60 HZ

**Weight:** 142 g (5 oz)

**Connection:** BNC for pH;

screw terminals for power, relay, ATC



Optional PHCN-70-COVER NEMA-4X lens cover, \$19.



Model PHE-6510 pH electrode, \$115 and PHEH-65-10 mounting assembly, \$44. Sold separately, See page 25.

All products shown larger than actual size

☐ MOST POPULAR MODELS HIGHLIGHTED!

### To Order (Specify Model No.)

Model No.	Price	Description
PHCN-70	\$239	pH Controller
PHCN-70-COVER	19	NEMA-4X Lens Cover
PHE-6510	115	Submersible pH Electrode
PHEH-65-10-PT100	125	Required mounting assembly for PHE-6510

Unit comes complete with mounting brackets and operator's manual.

**Ordering Example:** PHCN-70 pH controller and PHCN-70-COVER, NEMA-4X Lens Cover, \$239 + 19 = \$258.

### Accessories

Model No.	Price	Description
PHA-4	\$5	pH 4.00 Buffer Solution 475 ml
PHA-7	5	pH 7.00 Buffer Solution 475 ml
PHA-10	5	pH 10.00 Buffer Solution 475 ml

**NEW**

# INDUSTRIAL pH INSTRUMENTATION & ELECTRONICS



## Mini Panel-Mount pH Controller

Model PHCN-201  
**\$120**  
 Basic Unit



- ✓ User-Selectable Acid or Alkaline Relay
- ✓ Simple One-Point Calibration
- ✓ Reduced Size to Facilitate Installation
- ✓ Choose from 100-240 V or Low Voltage 12 VDC Models
- ✓ Practical and Convenient

PHCN-201 is a simple-to-operate pH controller specially designed for applications where space or costs are a major concern. Thanks to its compact size of only 8 by 5 cm (3 x 2"), PHCN-201 can be mounted in confined spaces and right next to tanks or vats. The low cost of the meter will also make it possible for processes that up to now were manually maintained to be controlled automatically, saving considerable time and money. Measurements are displayed in large digits on the LCD and LED lights indicate the exact status of the controller, even from a distance. PHCN-201 also incorporates a bi-directional relay. Through a simple jumper on the rear of the meter, the operator can select acid dosage, which means the relay is activated with measurements above the setpoint, or alkaline with relay closed when measuring below the setpoint. In order to adjust the setpoint from 0 to 14 pH or to calibrate meter at any point on the scale, simply turn the relevant trimmer right on the front panel. The controller is easy to use and to install. Any combination pH electrode with a BNC connector can be hooked up to the meter. The meters are available in three models to best suit your application. You can choose from the 100-110 V or the 220-240 V operated model. For those who prefer to operate at low voltage, there is also the 12VDC version with the transformer included in the low cost of the meter.



PHCN-201 shown larger than actual size.

### Specifications:

- Range:** 0.0 to 14.0 pH
- Resolution:** 0.1 pH
- Accuracy (@20°C/68°F):** ±0.2 pH
- Calibration:** 1 point adjustable with trimmer
- Setpoint:** Adjustable from 0.0 to 14.0 pH with trimmer
- Relay Control:** 2 amps @ 220 Vac  
Selectable acid or alkaline dosage.
- Acid:** Activated when reading higher than setpoint.
- Alkaline:** Activated when reading lower than setpoint.
- Power Supply:** 110/115V; 50-60 Hz  
External 12 VDC (optional)  
220/240V; 50-60 Hz (optional)
- Environment:** 0 to 50°C  
(32 to 122°F); max. RH 95%
- Dimensions:** 79 H x 49 W x 95 D mm  
(3.1 x 1.9 x 3.8")
- Weight:** 150 g (5.3 oz.)

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model No.)

Model No.	Price	Description
PHCN-201	\$120	Mini Panel Mount pH Controller
PHE-7351-15	115	Industrial electrode for in-line or submersion
PHE-1411	60	Laboratory double junction, plastic body, gel-filled combination pH electrode with 3.3' cable
PHA-77	35	Third arm electrode holder for laboratory electrodes
PHA-4	5	4.00 pH buffer solution 475 ml bottle
PHA-7	5	7.00 pH buffer solution 475 ml bottle
PHA-10	5	10.00 pH buffer solution 475 ml bottle

Comes complete operator's manual.

Add "-12VDC" or "-240VAC" for optional power requirements, no additional charge.

**Ordering Example:** PHCN-201, pH controller, PHE-7351-15, pH electrode, PHA-4, 4.01 buffer solution, PHA-7, 7.01 buffer solution, \$120 + 115 + 5 + 5 = \$245.

Order Online  
**omega.com**<sup>®</sup>  
 Over 100,000 Products Available!

For the complete selection of Industrial pH Instrumentation & Electronics, shop online at **omegapHInstrument.info**



## PHCN-900 Series Wall-Mounted, Single Setpoint and Proportional pH Control

Model PHCN-901

**\$505**

Basic Unit



- ✓ Wall Mount
- ✓ Isolated Recorder Output
- ✓ Simple Operation

The PHCN-901 is a pH controller with a single setpoint for proportional dosage of acid or alkaline solutions. Any pH electrode ending in a BNC connector can be directly attached to the PHCN-900 series or ORCN-901. The proportional control can be fine tuned through two dials on the front panel. The time cycle is adjustable from 0 to 90 seconds and the proportional band from 0.0 to 2.0 pH. Coarse and fine as well as two offset and slope trimmers make accurate setting and calibration easy and convenient. A pump or electro-valve can be wired directly to the controller and be powered through the terminals.

The PHCN-901 also provides for an alarm relay. The alarm is activated when the measurements stray away from the setpoint by a predetermined value in the 0 to 2 pH range. A max. dosing time from 1 to 10 minutes can also be set, after which the alarm is activated to warn of an abnormality. The alarm can be configured in either normally-closed or normally-open state. The PHCN-900 series also provides an isolated output signal, which is user selectable between 0-20 or 4-20 mA. A dial on the front panel renders manual temperature compensation fast and easy. For automatic compensation, hook up a 3 wire Pt 100 to the controller. To speed up wiring, PHCN-900 and ORCN-901 series comes with extractable terminal modules. Once wired up, the compartment containing the connections is protected behind a fire-retardant ABS panel. Several LED's show whether the setpoint or alarm relays are activated from a distance.

The PHCN-902 is a pH controller with two setpoints for proportional dosage of acidic and alkaline solutions. Through two sets of coarse and fine trimmers, the setpoints can be accurately fine tuned to any value in the 0.00 to 14.00 range. Likewise, two trimmers on the front panel make for easy calibration. The proportional control can be adjusted to match your application through the time cycle from 0 to 90 seconds and the proportional band of 0 to 2 pH. Two pumps or valves can be wired directly to the controller and be powered through the terminals. The PHCN-902 provides for two types of alarms. The alarm relay is activated when the measurements are beyond the setpoints by more than a predetermined value in the 0 to 2 pH range. Or alternatively, when



**PHCN-901, \$505 shown smaller than actual size.**

**PHE-1411 laboratory pH electrode sold separately, \$60, see page 10.**

one of the two independently-adjustable maximum dosing times is exceeded. The alarm can be configured in either normally-closed or normally-open state and turned off during maintenance.

The ORCN-901 is an ORP controller with a single setpoint for user-selectable dosage of reducing or oxidizing solutions. With proportional control, you can fine tune your treatment plant and minimize the use of chemicals. The proportional setting can be adjusted through the time cycle from 0 to 90 seconds and the band from 0 to 200 mV. The setpoint can be accurately adjusted through coarse and fine trimmers. A pump or electro-valve can be wired directly to the controller and be powered through the terminal. In addition to the setpoint relay, the ORCN-901 also provides for an alarm relay. The alarm is activated when the measurements exceed the operator-adjustable threshold of 0 to 200 mV. For extra security, a maximum dosing time from 1 to 10 minutes can also be set, after which the alarm is activated to signal an abnormality. The alarm configuration is alterable in a normally-closed or a normally-open state to accommodate fail-safe installations. Any recorder accepting a 0-20 or 4-20 mA output can also be hooked up to the controller. One can judge the controller's status, even from a distance, by observing the dosage or alarm LEDs.



**NEW**

# INDUSTRIAL pH INSTRUMENTATION & ELECTRONICS

**Specifications:****Range:** 0.00 to 14.00 pH;

ORCN-901: -500 to +1500 mV

**Resolution:** 0.01 pH; ORCN-901: 1 mV**Accuracy @ 20°C/68°F:** ±0.02 pH

ORCN-901: ±5 mV

Typical EMC Deviation: ±0.1 pH;

ORCN-901: ±6 mV

**Calibration:** PHCN-901, ORCN-901: One

point, through trimmers on the front panel;

PHCN-902: Two point

**Temperature Compensation:** Manual

or Automatic with Pt100 probe from

-10 to 80°C

**Setpoint:** PHCN-901: One, Selectable

from 0.00 to 14.00 pH;

PHCN-902: Two, Selectable

**Recorder Output:** Selectable from

0 to 20 mA or 4 to 20 mA, isolated

**Proportional Control:** Adjustable: pH

from 0.0 to 2.0 and time cycle from 0 to 90

seconds; ORCN-901: Adjustable: mV from

0 to 200 and time cycle from 0 to 90

seconds

**Dosing Contact:** PHCN-901: One

powered terminal for pH correction

(115 or 240V) Max. 2 A;

1,000,000 strokes;

activated proportionally when

pH &gt; setpoint for acid dosage or

pH &lt; setpoint for alkaline dosage

PHCN-902: Two powered terminals for

acid and alkaline correction

(115 or 240V) Max. 2 A;

1,000,000 strokes;

Proportional acid dosage: activated when

pH &gt; setpoint, Proportional Alkaline

Dosage: activated when pH &lt; setpoint

ORCN-901: One powered terminal

for mV correction (115 or 240V) Max 2A

1,000,000 strokes;

activated proportionally

mV &gt; setpoint for acid dosage or

mV &lt; setpoint for alkaline dosage

**Alarm Relay:** One, activated when pH

varies (selectable 0 to 2.0) (ORCN-901

selectable 0 to 200 mV) from the setpoint

and/or max. dosage time

(1 to 10 minutes) elapses. Isolated, Max 2

A, Max 240V, resistive load, 1,000,000

strokes

**Power Supply:**

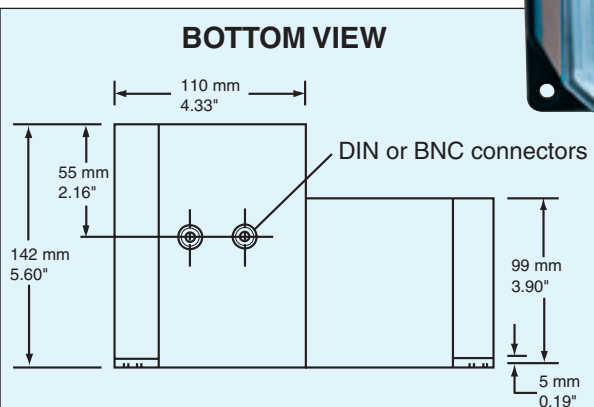
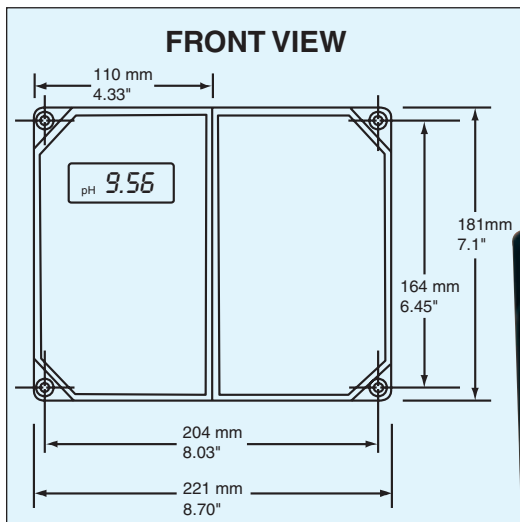
110/115V or 220/240V; 50/60 Hz

**Environment:** -10 to 50°C (14 to 122°F);

95% non-condensing

**Enclosure:** 181 L x 221 W x 142 H mm

(7.1 x 8.7 x 5.6")

**Weight:** 1.6 kg (3.5 lb)ORCN-901 shown  
smaller than actual size.
 **MOST POPULAR MODELS  
HIGHLIGHTED!**
**To Order (Specify Model No.)**

Model No.	Price	Description
PHCN-901	\$505	Wall Mount Single Setpoint pH Controller
PHCN-902	550	Wall Mount Dual Setpoint pH Controller
ORCN-901	505	Wall Mount Single Setpoint ORP Controller
PHE-6510	115	pH Industrial Submersible Electrode (Requires mounting assembly)
PHEH-65-10-PT100	123	Mounting Assembly with Temperature Compensation for PHE-6510
PHA-4	5	4.00 pH Buffer Calibration Solution, 475 ml
PHA-7	5	7.00 pH Buffer Calibration Solution, 475 ml
PHA-10	5	10.00 pH Buffer Calibration Solution, 475 ml
ORE-6510	137	ORP Industrial Submersible Electrode (Requires Mounting Assembly)
PHEH-65-10	44	Mounting Assembly for ORE-6510

Each unit comes with complete operator's manual.

**Ordering Example:** PHCN-901, pH controller, PHE-6510, pH Electrode, PHEH-65-10-PT100, Mounting Assembly with Temperature Compensation, PHA-4, pH 4.01 buffer, PHA-7, pH 7.01 buffer, \$505 + 115 + 123 + 5 + 5 = \$753.

Order Online

**omega.com**<sup>®</sup>

Over 100,000 Products Available!

For the complete selection of Industrial pH  
Instrumentation & Electronics, shop online at  
**omegapHInstrument.info**

19



## pH/ORP Preamplifiers

- ✓ Send pH Electrode Signal 1,000 Feet Over Ordinary, Wire and Connectors or Coaxial Cable.
- ✓ Interface pH Electrodes Directly with Inexpensive mV Meters and Recorders or Sophisticated Process Controllers and Data Acquisition Systems.
- ✓ Extend Useful Life of pH Electrodes.
- ✓ Available With/Without Automatic Temperature Compensation.



PHTX-20 Series  
**\$59**  
Basic Unit



PHTX-22 10-40 Vdc Powered Preamplifier, \$79. Shown larger than actual size.

OMEGA's PHTX-20 series Preamps are unity gain preamplifiers which convert the high impedance mV signal of a pH or ORP electrode to a low impedance signal. This signal can travel up to 1,000 feet using ordinary wire and connectors to high impedance input pH meters and controllers (such as the PHCN-37), and to standard Process Meters and Controllers such as the DP24-E and DP41-E which could not otherwise interface with the high impedance signal. In many applications the PHTX-20 series Preamps will be able to extend the useful life of expensive pH electrodes. By lowering the output impedance of ageing electrodes, the PHTX20 allows them to continue to function and provide a measurable signal.

The PHTX-21 is powered by lithium batteries with an estimated life of 5 years when used with high input impedance instruments. The electronics are entirely encapsulated in an epoxy filled stainless steel enclosure. The input and output connections are industry standard BNC. The output can be split from coaxial to separated leads with the 3073 adapter.

The PHTX-22 is a 10-40 volt dc powered preamp. Power can be provided by the excitation of a process meter (such as the DP24-E) or the optional PSU-12V power supply. The electrodes are entirely encapsulated in a compact epoxy filled enclosure designed for easy mounting in a manufacturing process. The PHTX-22 offers redundant outputs from either a BNC connection, terminal strip or both at the same time.

The PHTX-23-ATC is the same as the PHTX-22 (above) with the added feature of Automatic Temperature Compensation. With the output of a PHTX-23-ATC automatically compensated for temperature variations, it is possible to use an inexpensive but sophisticated process meter or controller such as the DP24, DP25, DP41 series to monitor and control pH in place of more expensive dedicated pH units. The Automatic Temperature Compensating element required is a 1,000 Ohm RTD. (ATC is not used on ORP measurements.)



PHTX-21 Battery Powered Preamplifier, \$59. Shown larger than actual size.

## Specifications:

### Common Specifications

**Output Offset:** 1 mV typical; 2 mV max. which corresponds to .033 pH

**Input Impedance:** 10<sup>13</sup> Ohms

**Output Impedance:** 20K Ohms

**Output Voltage:** -2000 mV to +2000 mV

**Operating Temperature:** 0 to 60°C

### PHTX-21 Internal Battery Powered Model

**Dimensions:** 95.25 L x 17.8 cm D (3.75" x 0.7")

**Weight:** 5.7 g (2 oz.)

**Battery Life:** Approximately 5 Years

### PHTX-22, PHTX-23-ATC External Powered Dual Output Model

**Power:** 10 to 40 Vdc

**Dimensions:** 38.1 H x 76.2 W x 38.1 mm D (1.5 x 3 x 1.5")

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)		
Model No.	Price	Description
PHTX-21	\$59	pH Preamplifier, single output, battery powered
PHTX-22	79	pH Preamp, 10 to 40 Vdc powered
PHTX-23-ATC	129	pH Preamp, 10 to 40 Vdc, Auto Temp Comp

## Accessories

Model No.	Price	Description
3073	\$15	BNC to Banana Plug adapter
BNC-C-36	15	BNC-(M) to BNC-(M) 1 m (3') exten. cable
PSU-93	40	24 Volt dc power supply

Each unit supplied with operator's manual.

**Ordering Example:** PHTX-21 pH preamplifier \$59  
**Accessory:** 3073 BNC to Banana Plug adapter \$15



omega.com®  
ΩMEGA®

One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

11/28/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001013



www.omega.com • e-mail: info@omega.com



omega.com®  
ΩMEGA®

One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

11/29/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001014



www.omega.com • e-mail: info@omega.com



omega.com®  
ΩMEGA®

One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

11/30/01 DILBERT © United Feature Syndicate, Inc.

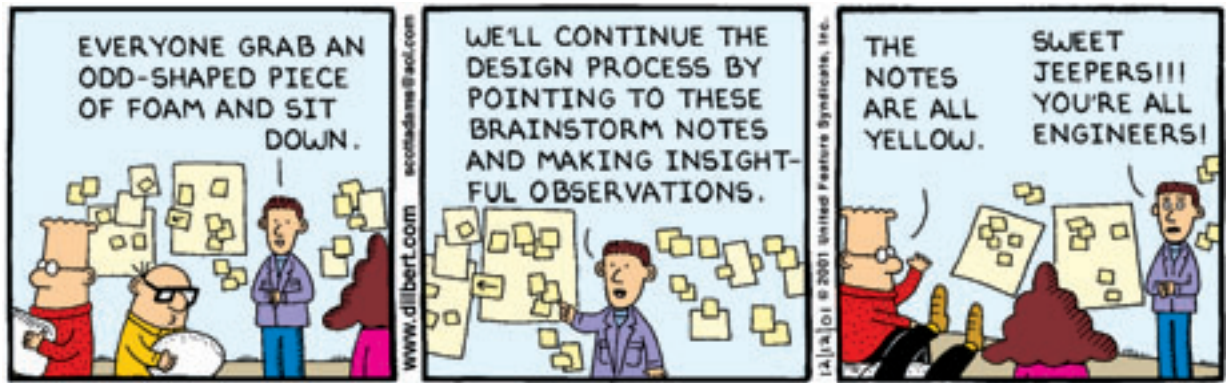
15

Collection Series  
#15-001015



15

Collection Series #15-001016



12/12/01 DILBERT © United Feature Syndicate, Inc.

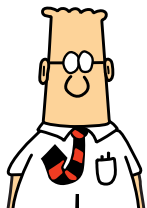
One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001017





## Industrial pH Two Wire 4-20 mA Transmitters

- ✓ Isolated or Non-Isolated Models Available
- ✓ 4 to 20 mA Output
- ✓ Manual or Automatic Temperature Compensation

The model PHTX-014 pH two wire transmitter is designed to provide a standard 4 to 20 mA current output which is proportional to the pH being measured. Its small size and encapsulated construction allow for easy installation and will accommodate any pH electrode with a BNC connector. Temperature compensation is either manual or automatic with use of any 1000Ω Platinum RTD. The PHTX-212 is the same as the PHTX-014 but with a range of 2 to 12 pH.

The PHTX-11 features include a NEMA 4X housing, an integral LCD display for continuous pH reading or for a direct corresponding readout in milliamps, using a convenient push-button switch. The 4-20 mA output signal may be scaled in the field to meet specific pH ranges in any 1 to 14 pH unit increment. Temperature compensation is manual using a fixed resistor or automatic using any of OMEGA's 700 Series thermistors.



PHTX-014 Non-isolated 2-wire Transmitter. Shown actual size.

**\$189**  
PHTX-014 Series



PHTX-11 Isolated 4-20 mA Transmitter. Shown actual size.

### Specifications:

**Range:** 0 to 14 pH

**Span:** PHTX-014, 0 to 14 pH; PHTX-11 Any 1 to 14 pH unit, selectable with internal jumper pads

**Accuracy:** ±0.02 pH

**Operating Temperature:** PHTX-014, -25 to 70°C; PHTX-11 -10 to 60°C

**Display Resolution:** PHTX-11 0.01 pH

**Input Impedance:** > 10<sup>13</sup> Ohms

**Temperature Compensation:** Manual: fixed resistors; Automatic: PHTX-014, 1000 Ω RTD; PHTX-11 OMEGA's 700 series thermistor

**Connector:** BNC

**Power:** 12 to 80 Vdc (24 Vdc recommended)

**Output:** PHTX-014, Non-isolated 4 to 20 mA; PHTX-11 isolated 4 to 20 mA

**Input to Output Isolation:** PHTX-11, 600 V maximum

**Dimensions:** PHTX-014: 50.8 H x 38.1 W x 24.1 mm D (2 x 1.5 x 0.95"); PHTX-11: 125 H x 74.2 W x 99.6 mm D (4.92 x 2.92 x 3.92")

**Display:** PHTX-11: 3½ digit LCD

**IN STOCK FOR FAST DELIVERY!**

### To Order (Specify Model Number)

Model No.	Price	Description
PHTX-212	\$189	Non-isolated 2 wire pH transmitter 2-12 pH
PHTX-014	189	Non-isolated 2-wire pH transmitter 0-14 pH
PHTX-11	430	Isolated 4-20 mA pH transmitter with integral display NEMA 4X enclosure
U24Y101	128	Power Supply 24 Vdc

**Ordering Example:**

PHTX-11 Isolated 4-20 mA transmitter, U24Y101 power supply, \$430 + 128 = \$558.



## Flat Surface pH/ORP Industrial Electrodes

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

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

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

### Specifications (General):

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

**pH Range:** 0 to 14

**Maximum Temperature:**

PHE-6510/PHE-4580/PHE-6820

CPVC Body: 65.5°C (150°F)

“-ACRYL” Option: 87.7°C (190°F)

“-ACRYL” Option with PVDF (Kynar) Body: 100°C (212°F)

PHE-5460: 87.7°C (190°F)

**Pressure Rating:** pH and ORP

Electrodes: 100 PSIG @ 75°C/170°F

85 PSIG @ 81°C/180°F

50 PSIG @ 100°C/212°F

**Vacuum:** Up to 5 psia

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

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

### Flat Surface Electrode Options

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

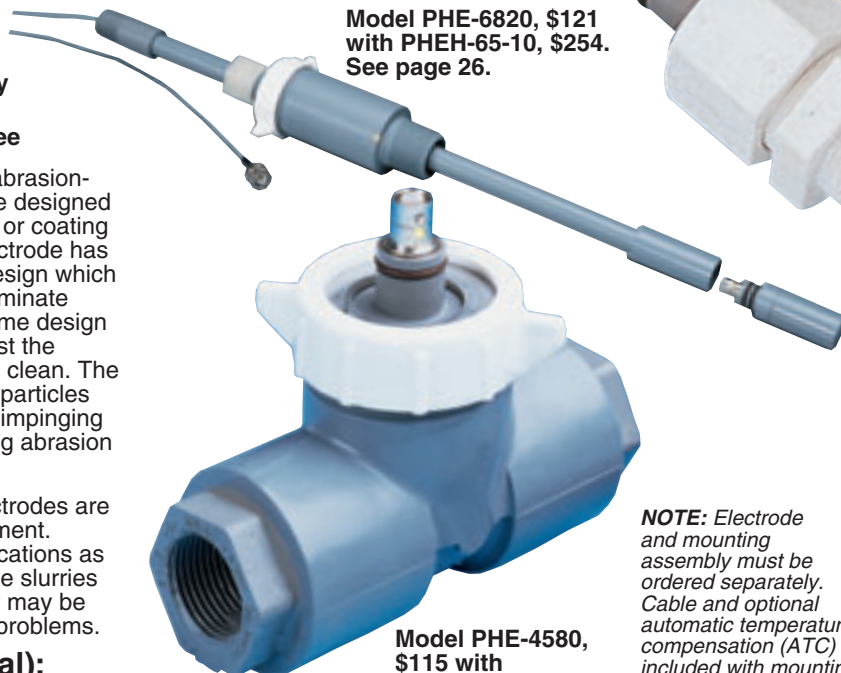
**-LC** Low conductivity Gel reference is designed for solutions with low ionic concentrations such as ultrapure or deionized water. LC gels contain 0.1M KCl vs. 3.5 M KCl in standard electrodes.

**-ACRYL** Acrylamide Gel (Acryl gel) is a thicker gel reference recommended for longer life in operating temperatures above



Model PHE-6820, \$121  
with PHEH-65-10, \$254.  
See page 26.

Model PHE-5460, \$115  
with PHEH-54-10, \$54.  
See page 24.



Model PHE-4580,  
\$115 with  
PHEH-45-10, \$134.  
See page 23.

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

Model PHE-6510, \$115  
With PHEH-65-10, \$44.  
See page 25.

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

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

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

### Flat Surface Electrode Type

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

150°F. This gel does not liquefy at high temperature, maximum temperature 100°C (212°F). It can also increase life in applications with aggressive chemicals by inhibiting diffusion of the chemicals.

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

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

Dirty motors from pumps or mixers, other electrical equipment and even conductivity

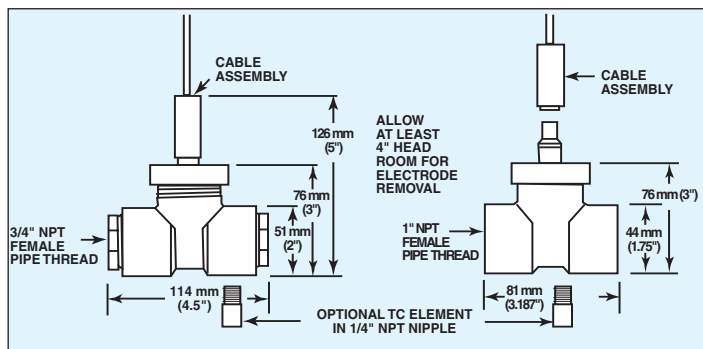
probes leak voltage into the solution which feeds through the pH electrode and electronic circuit. This leads to invalid readings and shortened electrode life.

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

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



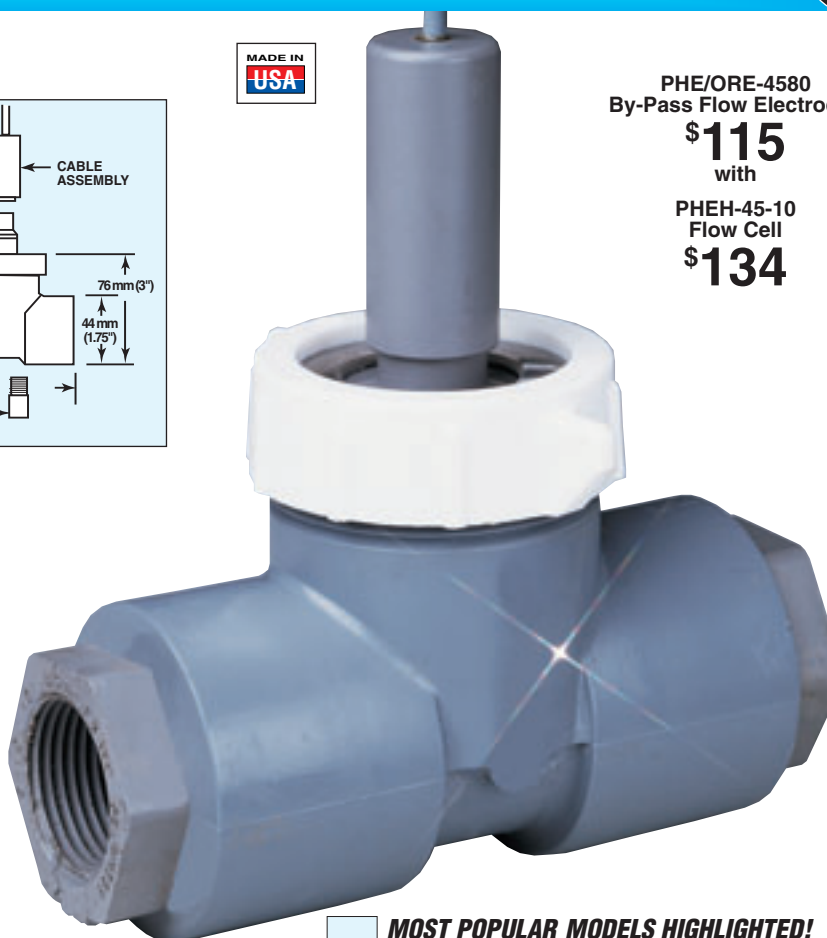
## By Pass Electrodes Flat Surface



PHE/ORE-4580  
By-Pass Flow Electrodes

**\$115**  
with

PHEH-45-10  
Flow Cell  
**\$134**



**MOST POPULAR MODELS HIGHLIGHTED!**

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

### Bypass Electrodes

To Order (Specify Model No.)		
Model No.	Price	Description
PHE-4580	\$115	CPVC Bypass pH Electrode - Max. Temperature 65.5°C (150°F)
PHE-4581	220	PVDF Bypass pH Electrode - Max. Temp. with "-ACRYL" 100°C (212°F)
ORE-4580	137	CPVC Bypass ORP Electrode - Max. Temperature 65.5°C (150°F)
ORE-4581	243	PVDF Bypass ORP Electrode - Max. Temp. with "-ACRYL" 100°C (212°F)
Mounting Assemblies (Bypass) Are Required for Installation		
PHEH-45-10	\$134	CPVC Bypass Mounting Assembly without ATC 3/4" NPT threads
PHEH-45K-10	206	PVDF Bypass Mounting Assembly without ATC 1" female NPT
PHEH-45-10-*	208	CPVC Bypass Mounting Assembly with ATC 3/4" female NPT
PHEH-45K-10-*	293	PVDF Bypass Mounting Assembly with ATC 1" female NPT (not for ORP)

**Note:** Order Electrodes and Mounting Assemblies Separately.

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

\* Specify ATC Sensor "-PT100" for 100 ohm platinum RTD, "-PT1K" for 1000 ohm platinum RTD, "-TH700"

for 700 Series Thermistor, "R3K" for 3000 ohm Balco.

**Note:** Mounting Assemblies come with 3 m (10') cable with BNC connector. Cable lengths available up to 15 m (50'), add \$1.80 per foot.

### Options (Bypass Electrodes)

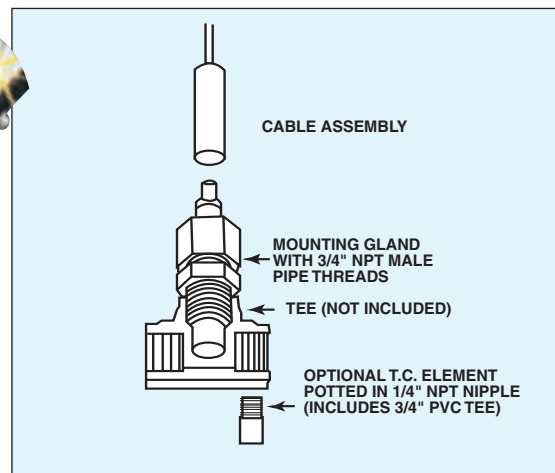
Ordering Suffix	Price Adder	Description	Available Models
-HF	\$40	Fluoride Resistant up to 5% HF	All pH
-LC	30	Low Conductivity	All pH
-ACRYL	30	ACRYL Gel, Max Temp. 100°C (212°F)	All but PHE-5460

Ordering Example: PHE-4581 PVDF Bypass pH electrode, PHEH-45-10 Mounting assembly, \$220 + 134 = \$354.



## In Line pH Electrodes Flat Surface

PHE-5460 with  
PHEH-54-10 From  
**\$169**



In Line Electrodes for 3/4", 1", 2" Pipe

**NOTE:** At the time of initial purchase, please order both electrode and mounting assembly. Mounting assembly includes insertion assembly and cable. If ordered with automatic temperature compensation (ATC), the temperature compensator is built into the insertion assembly. When electrode has expired, simply re-order electrode.

**MOST POPULAR  
MODELS HIGHLIGHTED!**

- ✓ Designed For 3/4", 1", or 2" Pipe Tees
- ✓ Acryl Gel Standard For High Temperature Applications
- ✓ CPVC Construction
- ✓ Maximum Temperature 88°C (190°F)

### In-Line Electrodes

The PHE/ORE-5460 in-line pH and ORP electrodes feature a flat self-cleaning abrasion-free surface. When exposed to turbulent flow, the resulting scrubbing action keeps the electrodes clean. The electrodes can be used in applications with 0 to 88°C (32 to 190°F) temperatures, pressures up to 6.89 bar (100 psig) and a 0 to 14 pH measurement range (0 to 12 without sodium ion error). Having fresh material sweeping past the electrode's surface improves response time as well as accuracy, especially for the measurement of oily waste fluids, lime slurries, flocculant and emulsions. The electrodes accept a cable assembly with a gland mounted in a 3/4", 1" or 2" NPT tee.

In-Line electrodes are ideal for relacing existing threaded electrodes. They are used in applications where flow can be shut off for electrode maintenance.

The high temperature Acrylamide gel is supplied as standard with the PHE-5460 electrodes. These are only available with CPVC construction.

### Flat Surface In-Line Electrodes (CPVC)

To Order (Specify Model No.)		
Model No.	Price	Description
PHE-5460	115	pH Electrode for 3/4" pipe
PHE-5460-1	131	pH Electrode for 1" pipe
PHE-5460-2	155	pH Electrode for 2" pipe
ORE-5460	137	ORP Electrode for 3/4" pipe
ORE-5460-1	152	ORP Electrode for 1" pipe
ORE-5460-2	173	ORP Electrode for 2" pipe
Mounting Assemblies (CPVC) Are Required for Installation		
PHEH-54-10	54	3/4" NPT Mounting Assembly and cable without ATC
PHEH-54-10-1	66	1" NPT Mounting Assembly and cable without ATC
PHEH-54-10-2	86	2" NPT Mounting Assembly and cable without ATC
PHEH-54-10-*	160	3/4" NPT Mounting Assembly and cable with ATC
PHEH-54-10-1-*	175	1" NPT Mounting Assembly and cable with ATC
PHEH-54-10-2-*	201	2" NPT Mounting Assembly and cable with ATC

**Note:** Order Electrodes and Mounting Assemblies Separately

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

**Note:** Mounting Assemblies come with 3 m (10') cable with BNC connector. Cable lengths available up to 15 m (50') Add \$1.80 per extra foot.

### Electrode Options

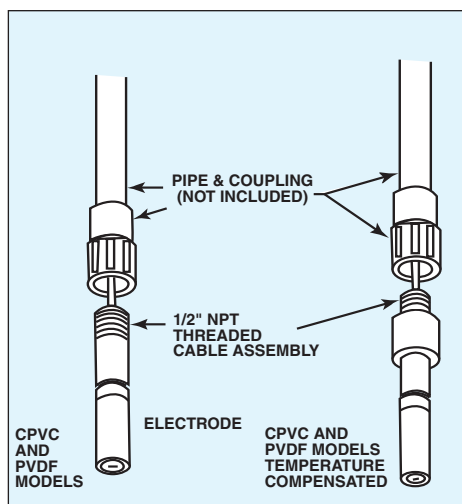
Ordering Suffix	Price Adder	Description	Available In Line Models
-HF	\$40	Fluoride Resistant	All pH including PHE-5460-GL
-GL	135	Ground Loop	PHE-5460 only (3/4")
-LC	30	Low Conductivity	All pH

**Ordering Example:** 3/4" in-line electrode with ground loop interrupt circuit and HF resistant glass PHE-5460-GL-HF, \$115 + 135 + 40 = \$290. Used with 3/4" NPT Mounting Assembly with 100 Ω PT RTD ATC and 20 ft cable PHEH-54-20-PT100, \$160 + 18 = \$178.





## Submersible Electrodes Flat Surface



- CPVC or PVDF Construction
- Designed For Mounting in Tanks, Flumes, etc
- Easy Mounting in Tanks

### Submersion Electrodes

The OMEGA® PHE/ORE-6510 submersible electrodes are designed for use in drums, open tanks and streams, etc. The flat sensing surface is surrounded by a porous polyethylene reference junction which minimizes fouling. Electrode installation and removal done by a simple 1/4 turn quick disconnect. The cable assembly's cap has 1/2" MNPT thread, which can be connected to a coupling and support pipe. The pipe allows easy mechanical mounting and protects the cable from the liquid measured. The resulting assembly is lightweight for convenient handling when maintenance is needed. ATC is available as part of the mounting assembly.

The flat surface design is well suited for applications with relatively high suspended solids or where flocculation operations require low velocities.

Where only low velocities are present and coating is a problem, the electrode can be mounted at a 45° angle facing the flow so as to obtain increased scrubbing action across the measuring surface.



PHE-6510 with  
PHEH-65-10 From  
**\$159**

### Submersion/Electrodes

  **MOST POPULAR MODELS HIGHLIGHTED!**

#### To Order (Specify Model No.)

Model No.	Price	Description
PHE-6510	\$115	Submersion pH Electrode CPVC, Max. temp. 65.5°C (150°F)
PHE-6511	210	Submersion pH Electrode PVDF (Kynar), Max temp with "-ACRYL" option 100°C (212°F)
ORE-6510	137	Submersion ORP Electrode CPVC, Max. temp. 65.5°C (150°F)
ORE-6511	232	Submersion ORP Electrode PVDF (Kynar) Max temp with "-ACRYL" option 100°C (212°F)
Mounting Assemblies Are Required for Installation		
PHEH-65-10	\$44	CPVC without Automatic Temperature Compensation
PHEH-65-10(*)	123	CPVC with ATC
PHEH-65K-10	66	PVDF (Kynar) without ATC
PHEH-65K-10(*)	192	PVDF (Kynar) with ATC

\* Specify ATC Sensor: "-PT100" for 100 ohm platinum RTD, "-PT1K" for 1000 ohm RTD, "300" for 300 ohm Thermistor, "TH700" for 700 Series Thermistor or "-R3K" for 3000 ohm Balco. Other temperature compensation options are available. Contact engineering for details.

**Note:** Temperature compensation is not required with ORP electrodes. Order electrode and mounting assemblies separately. Materials of construction must be the same. Mounting assemblies come with 3 m (10') cable with BNC connector cables available up to 15 m (50'). Add \$1.80 per extra foot.

**Note:** At the time of initial purchase, please order both electrode and mounting assembly. Mounting assembly includes assembly in which the electrode is mounted and 10' cable. If ordered with automatic temperature compensation (ATC), the temperature compensator is built into the mounting assembly. When the electrode has expired, simply re-order the electrode (the mounting assembly is re-usable).

### Submersible Electrode Options

Ordering Suffix	Price Adder	Description	Available In Line Models
-HF	\$40	Fluoride Resistant	PHE-6510, PHE-6511, PHE-6510-GL
-GL	135	Ground Loop	PHE-6510, ORE-6510, PHE-6511, ORE-6511
-LC	30	Low Conductivity	All pH electrodes
-ACRYL	30	ACRYL Gel	All models but PHE-5460

**Ordering Example:** PVDF electrode with HF resistant glass and mounting assembly with 10 ft cable and 700 Series thermistor ATC PHE-6511-HF and PHEH-65K-10-TH700, \$210 + 40 + 192 = \$442.



# INDUSTRIAL pH INSTRUMENTATION & ELECTRONICS

## Retractable pH and ORP Electrodes for Insertion into Tanks and Main Lines



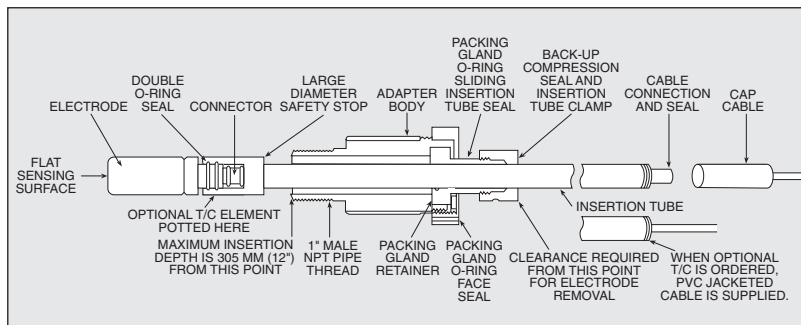
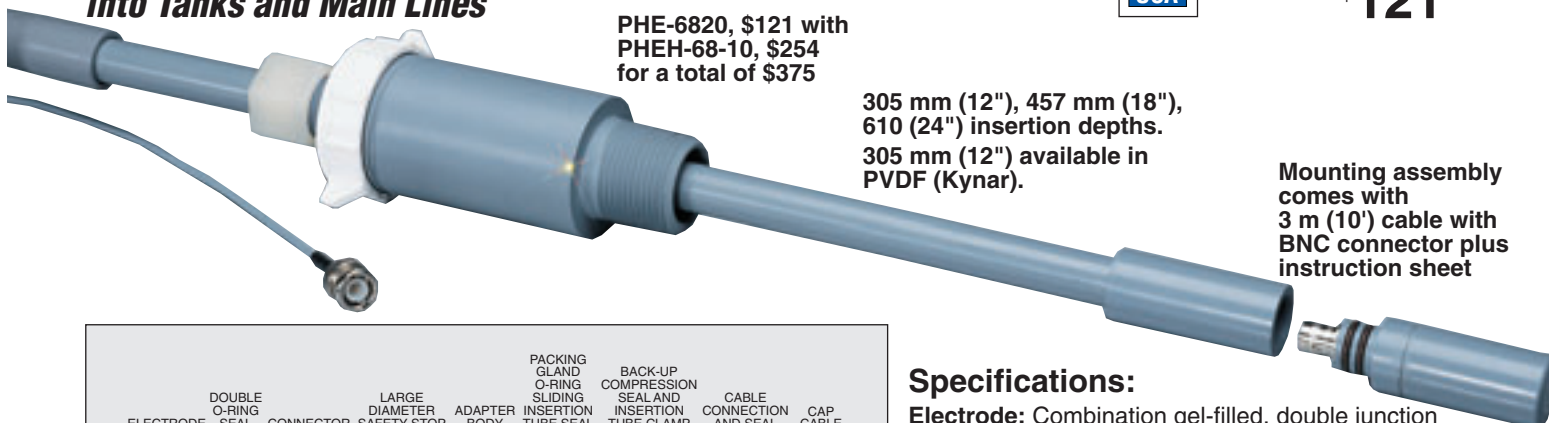
PHE-6820 Series

**\$121**

PHE-6820, \$121 with PHEH-68-10, \$254 for a total of \$375

305 mm (12"), 457 mm (18"), 610 (24") insertion depths. 305 mm (12") available in PVDF (Kynar).

Mounting assembly comes with 3 m (10') cable with BNC connector plus instruction sheet



### Specifications:

**Electrode:** Combination gel-filled, double junction

**Range:** pH: 0 to 14 (0 to 12 without sodium ion error);

**Max. Temperature:** 100°C with "-ACRYL" option and PVDF body

**Pressure:** 100 psig @ 76°C, 50 psig @ 100C

**Impedance:** Less than 300 mΩ @ 25°C

**Housing:** CPVC or PVDF (Kynar)

**Mounting Assembly:** CPVC with Viton® O-rings or PVDF with Viton® O-Rings 1" MNPT Pipe thread connector. x 1" MNPT Pipe thread connection.

- ✓ Can Be Installed in Any Direction
- ✓ Retractable Design Allows Removal Without System Shutdown
- ✓ Flat Surface Design
- ✓ Detachable Electrode for Easy Maintenance and Removal

The PHE-6820 electrode and assembly features a retractable design for insertion into tanks and main lines. The assembly, when used with a 1" full port or larger ball valve (user supplied), allows the electrode to be removed without shutting the system down. This electrode can be mounted in any location, even up through the bottom of a tank with the electrode surface facing upward. Its unique design affords mounting in any direction and is suitable for most systems' inherent design. (This style is also available for ORP measurements.)

The flat surface design minimizes fouling and coating and eliminates electrode breakage. Turbulent flow across the electrode surface results in a scrubbing action that keeps the electrode clean.

The flat surface electrode is specifically designed for difficult applications such as oily waste water, emulsions, lime slurries, and flocculants.

Mounting assemblies come with 3 m (10') cable with BNC connector. Cable lengths are available up to 15 m (50').

*NOTE: At the time of initial purchase, please order both electrode and mounting assembly. Mounting assembly includes insertion assembly and cable. If ordered with automatic temperature compensation (ATC), the temperature compensator is built into the insertion assembly. When electrode has expired, simply re-order electrode.*

### Electrodes

**MOST POPULAR MODELS HIGHLIGHTED!**

#### To Order (Specify Model Number)

Model Number	Price	Description
<b>PHE-6820</b>	<b>\$121</b>	pH Electrode CPVC, Max. temp. 65.5°C (150°F)
<b>PHE-6821</b>	<b>235</b>	pH Electrode PVDF (Kynar), Max. temp with "-ACRYL" option 100°C (212°F)
<b>ORE-6820</b>	<b>142</b>	ORP Electrode CPVC, Max. temp. 65.5°C (150°F)
<b>ORE-6821</b>	<b>245</b>	ORP Electrode PVDF (Kynar) Max. temp with "-ACRYL" option 100°C (212°F)
Mounting Assemblies Are Required for Installation		
<b>PHEH-68-10</b>	<b>254</b>	305 mm (12") CPVC without ATC
<b>PHEH-68K-10</b>	<b>506</b>	305 mm (12") PVDF (Kynar) without ATC
<b>PHEH-68-10-(* )</b>	<b>313</b>	305 mm (12") CPVC with ATC
<b>PHEH-68K-10-(* )</b>	<b>573</b>	305 mm (12") PVDF (Kynar) with ATC
<b>PHEH-6820</b>	<b>296</b>	457 mm (18") CPVC without ATC
<b>PHEH-6830</b>	<b>316</b>	610 mm (24") CPVC without ATC

*\*Specify ATC sensor: "PT100" for 100 ohm platinum RTD; "PT1K" for 1000 ohm RTD, "300" for 300 ohm Thermistor or "R3K" for 300 ohm Balco. Other temperature compensation options are available; please contact engineering for details.*

*Ordering Example: PHEH-68-10 mounting assembly with manual temperature compensation plus PHE-6820 pH electrode, plus replacement PHE-6820 electrode, \$254 + 121 + 121 = \$496.*

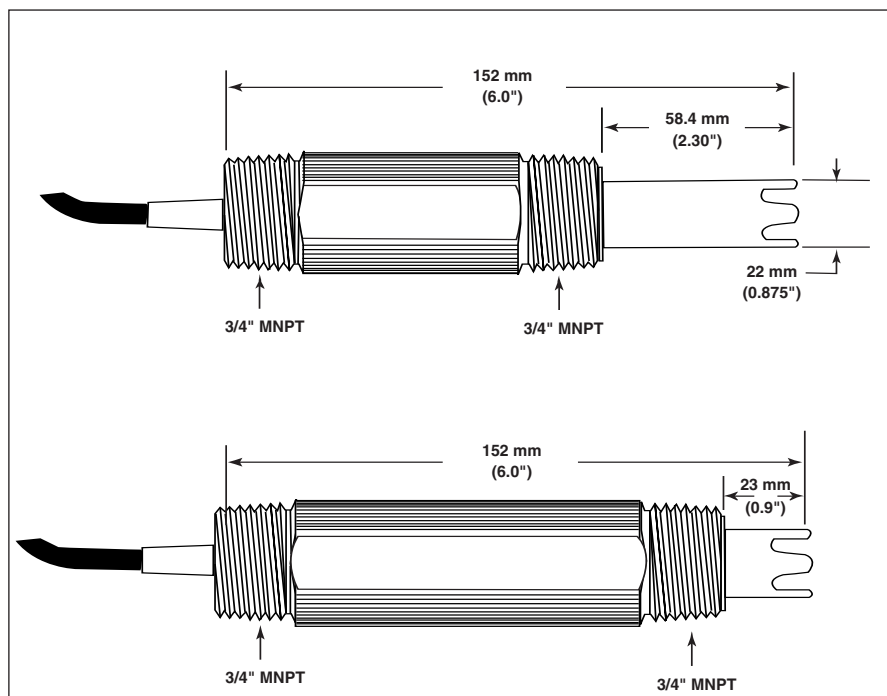
*Note: Temperature compensation is not required with ORP electrodes. Materials of construction must be the same for electrode and mounting assembly.*

### Retractable Electrode Options

Ordering Suffix	Price Adder	Description	Available In Line Models
-HF	\$40	Fluoride Resistant	All pH
-LC	30	Low Conductivity	All pH
-ACRYL	30	ACRYL Gel	All



## Heavy-Duty pH Sensor for Submersible Applications



The PHE-7352-15 is a combination pH sensor designed for insertable use in process and waste water applications where greater pipeline penetration is required. The outer body material is PPS (Ryton) and has 3/4" MNPT (or optional 1" MNPT) front and rear facing threads with 57.1mm (2 1/4") insertion depth. The sensor features sealed double junction construction which is highly resistant to electrode poisoning solutions, (typically those with cyanide, ammonia, sulfide and heavy metals in appreciable concentrations). The use of the non-fouling patented Porous Teflon® liquid junction ensures a steady presence of reference electrolyte. Coupled with the novel Plunger pH glass electrode design, this sensor assures a low long maintenance service life in most applications. Use of the high temperature version is recommended where service temperatures continuously exceed 80°C (176°F).

### Specifications:

**pH Range:** 0 to 14 pH  
**Temperature Range:** 0 to 80°C (32 to 176°F) or 0 to +110°C (32 to 230°F) (high temperature version)  
**Pressure Range:** 0 to 100 psig or 0 to 150 psig (high temperature version)  
**Accuracy:** ±0.1% over full range  
**Sodium Error:** Less than 0.05 pH in 0.1 Molar Na+ ion @ 12.8 pH

**Impedance:** 150 Mohm @ 25°C (76°F)  
**Reference Cell:** Double junction KNO<sub>3</sub> and KCl/AgCl  
**Zero Potential:** 7.0 pH ± 0.2 pH  
**Wetted Materials:** PPS (Ryton®), Teflon®, Viton, Glass  
**Response Time:** 95% of reading in 10 seconds  
**Drift:** Less than 2 mV per week

### Application

- Suitable for Severe Conditions
- Large Diameter Pipe Insertion
- Waste Water Pipeline Insertion
- ✓ Can Be Installed in any Direction
- ✓ Strong Ryton Body
- ✓ Low Maintenance
- ✓ Short or Long Insertion Lengths
- ✓ Any Angle Orientation

MOST POPULAR MODELS HIGHLIGHTED!

### To Order (Specify Model Number)

Model No.	Price	Price w/ATC	Description
PHE-7352-15-(* )	\$115	\$145	Heavy-duty submersible pH sensor
PHE-7353-15-(* )	125	155	Heavy-duty long length submersible pH sensor

Specify ATC sensor: "-PT100" for 100 ohm Platinum RTD or "-PT1K" for 1000 ohm Platinum RTD.

Ordering Example: PHE-7352-15-PT100-HT is a heavy-duty submersible pH sensor with "-HT" (for high temperature), and 100 ohms ATC, \$145 + 30 = \$175.



## Industrial Ground Loop Protection and Solution Ground pH Sensors

PHE-5580-20 and PHE-5590-20 pH sensor shown with Model PHCN-37 pH Controller, \$395, see page 15.



PHE-5580-20  
**\$275**

PHE-5590-20  
**\$200**



The PHE-5580-20 and PHE-5590-20 are wet or dry steam sterilizable pH electrodes constructed of a durable high temperature thermoplastic with a 316 stainless steel jacket. The outer body is fitted with a 3/4" MNPT mounting thread. The use of a double Porous Teflon® liquid junction reference cell and specifically formulated low impedance glass membrane allows use in the broadest spectrum of pH applications. This combination permits extended periods of pH measurement in the presence of poisoning ions, or where membrane leaching would shorten the life of conventional electrodes.

- ✓ Stainless Steel Body
- ✓ Self Powered Amplifier (PHE-5580)
- ✓ Steam Sterilizable
- ✓ Solution Ground Contact (PHE-5590)
- ✓ Any Angle Orientation

### Application

- General Industrial Service
- Chemical Production
- Electro-Plating Baths
- Waste Treatment Processing

### Specifications:

**pH Range:** 0 to 14 pH

**Temperature Range:** -5°C to +130°C

**Pressure Range:** 0 to 150 psig

**Accuracy:** ±0.1% over full range

**Impedance:** PHE-5590 300 Mohm @ 25°C  
PHE-5580 1 Mohm @ 25°C

**Reference Cell:** Double Junction, KCl/AgCl, KNO<sub>3</sub>

**Reference Junction:** Porous Teflon®

**Wetted Materials:**

316 stainless steel, Teflon®, Glass membrane

**Response Time:** 95% of reading in 10 seconds

**Drift:** Less than 2 mV per week

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

Model Number	Price	Price w/ATC	Description
PHE-5580-20	\$275	\$305	General purpose ground loop pH sensor
PHE-5590-20-(*)	200	230	General purpose solution ground pH sensor

Add **-PT100** or **-PT1K** for automatic temperature compensation and add **\$30** to price.

Add **-HF** for HF/fluoride applications and add **\$40** to price.

Add **-ORP** for ORP version and add **\$30** to price.

**Ordering Example:** PHE-5590-20-PT100, General purpose solution ground pH sensor with 20 feet of cable; 100 ohm ATC, \$200 + 30 = **\$230**.





## Economical Pocket Conductivity Testers

Model CDH-7X

**\$119**

- ✓ Measures MicroSiemens, MilliSiemens, PPT and PPM
- ✓ Economical, Compact and Portable
- ✓ Automatic Temperature Compensation

Pocket-sized, digital conductivity meter offers a variety of measuring ranges in one model. Ideal for quick field checks of water-based solutions, the CDH-7X combines the measuring sensor and meter in one compact, pocket-size package. It measures ranges of 1 to 199  $\mu\text{S/cm}$ , 0.01 to 1.99  $\text{mS/cm}$ , 0.1 to 19.9  $\text{mS/cm}$ , 1 to 199 ppm, 0.01 to 1.99 ppt and 0.1 to 19.9 ppt, with ATC 0 to 70°C (32 to 158°F).

### Specification:

#### Range:

**Conductivity:** 0 to 199  $\mu\text{S/cm}$ ,  
0.01 to 1.99  $\text{mS/cm}$ , 0.1 to 19.9  $\text{mS/cm}$

**TDS:** 0 to 199 ppm, 0.01 to 1.99 ppt,  
0.01 to 19.9 ppt

**Resolution:** 1  $\mu\text{S/cm}$  or ppm,  
0.01  $\text{mS/cm}$  or ppt, 0.1  $\text{mS/cm}$  or ppt

**Accuracy:**  $\pm 2\%$  of full scale ( $\pm 4 \mu\text{S/cm}$  or ppm,  
 $\pm 0.04 \text{mS/cm}$  or ppt,  $\pm 0.4 \text{mS/cm}$  or ppt)

**Electrodes:** 550 Stainless Steel

#### Operating Temperature:

0 to 70°C (32 to 158°F), Automatic Temperature Compensation uses a precision temperature sensor with 2% per °C temperature coefficient; readings are referenced to 25°C (77°F)

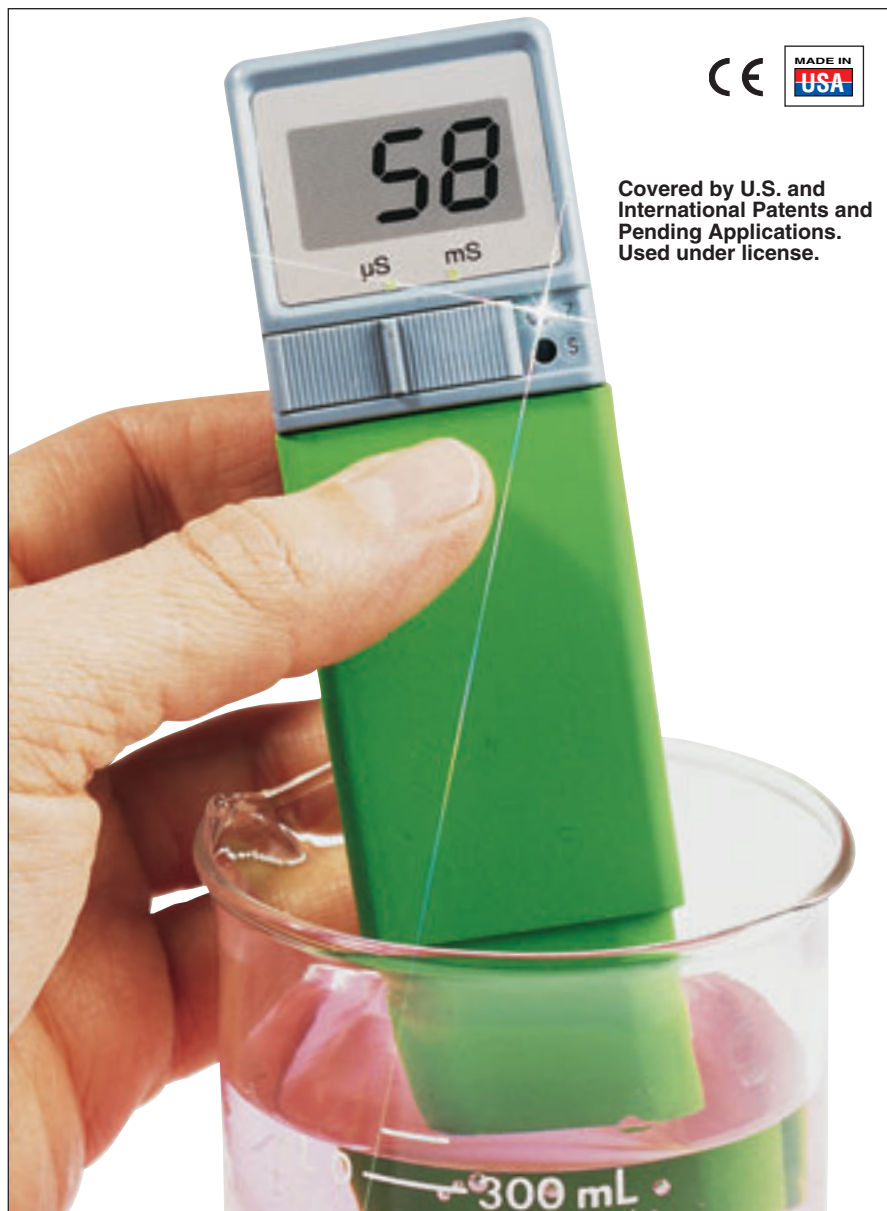
**Display:** 2½-digit LCD, 12.7 mm (0.5") high

**Battery:** three 1.55 V (included)

**Battery Life:** 50 hours continuous

**Dimensions:** 162 H x 43 W x 23 D mm  
(6 x 1.7 x 0.9")

**Weight:** 113 g (4 oz)



Covered by U.S. and International Patents and Pending Applications. Used under license.

**IN STOCK FOR FAST DELIVERY!**

### To Order (Specify Model Number)

Model No.	Price	Description
CDH-7X	\$119	Pocket tester, 1 to 199 $\mu\text{S/cm}$ , 0.01 to 1.99 $\text{mS/cm}$ , 0.1 to 19.9 $\text{mS/cm}$ , 1 to 199 ppm, 0.01 to 1.99 ppt and 0.1 to 19.9 ppt ranges
CDS-45	10/qt	Conductivity standard solution, 45 $\mu\text{S/cm}$
CDS-450	10/qt	Conductivity standard solution, 450 $\mu\text{S/cm}$
CDS-1500	10/qt	Conductivity standard solution, 1500 $\mu\text{S/cm}$
CDS-4500	10/qt	Conductivity standard solution, 4500 $\mu\text{S/cm}$
PH-BATT-3	1 ea	1.55 V silver oxide replacement battery (3 required)

Includes batteries and operator's manual.

**Ordering Example:** CDH-7X, pocket conductivity tester, 1 to 199  $\mu\text{S/cm}$ , 0.01 to 1.99  $\text{mS/cm}$ , 0.1 to 19.9  $\text{mS/cm}$ , 1 to 199 ppm, 0.01 to 1.99 ppt and 0.1 to 19.9 ppt ranges, and CDS-45 standard solution 45  $\mu\text{S/cm}$ , \$119 + 10 = **\$129**



## Water-Resistant Conductivity/TDS Meters with Visual Alarm

- ✓ Automatic Temperature Compensation
- ✓ Selectable Setpoint and Red LED Alarm
- ✓ External 12 VDC Power Supply
- ✓ Molded Hook for Quick Installation

Model CDH-721  
**\$75**  
 Basic Unit



CDE-722, \$30

The CDH-720 and TDS-720 Series water-resistant conductivity/TDS meters are OMEGA's reply to requests of accurate, low maintenance process monitoring equipment at affordable costs.

Four different models are available to cover all applications. Each meter is supplied with a direct 2 pin probe and 2 meter (6.6') cable with a 1/2" thread for flow-thru mounting. The probe has a temperature sensor that will automatically compensate against temperature changes from 5 to 50°C (41 to 122°F) with a  $\beta$  of 2% per degree.

In the measurement mode, a red LED will warn the user in the event the reading is outside of the alarm interval. A front trimmer allows manual calibration at 1 point. The electrical circuitry is tightly sealed inside the water-resistant enclosure.

In addition, thanks to the molded hook, the CDH-720 and TDS-720 Series be easily and quickly installed anywhere. The specially designed casing is stable and will not roll off a table. The 12 VDC power supply makes it ideal for continuous monitoring over extended periods of time.

**Resolution:** CDH-721: 10  $\mu$ S/cm  
 TDS-721: 10 ppm;  
 CDH-722: 0.01 mS/cm;  
 TDS-722: 0.01 ppt

**Accuracy (@68°F):**  $\pm$ 2% Full Scale

**Calibration:** Manual single point through front trimmer

**Setpoint:**  
 CDH-721: 200 to 1600  $\mu$ S/cm;  
 TDS-721: 200 to 1600 ppm;  
 CDH-722: 0.70 to 3.50 mS/cm  
 TDS-722: 0.70 to 3.50 ppt

**Alarm:**  
 CDH-721: 100  $\mu$ S/cm over setpoint;  
 TDS-721: outside setpoint by more than  $\pm$ 100 ppm;  
 CDH-722: outside setpoint by more than  $\pm$ 0.2 mS/cm;  
 TDS-722: outside setpoint by more than  $\pm$ 0.2 ppt

**Probe:** CDH-721: CDE-721;  
 TDS-721: CDE-721;  
 CDH-722: CDE-722;  
 TDS-722: CDE-722

\*All probes come with 2 m (6.6') cable and 1/2" or 3/4" thread for flow-thru mounting

**Power Supply:**  
 External 12 VDC (included)

**Environment:**  
 0 to 50°C (32 to 122°F); RH 100%

**Dimensions:** 86 L x 94 W x 33 D mm  
 (3.4 x 3.7 x 1.3")

**Weight:** 150 g (5.3 oz.)



Comes complete with probe, 12 VDC adapter, calibration solution and operator's manual.

### Specifications:

**Range:** CDH-721: 0 to 1990  $\mu$ S/cm;  
 TDS-721: 0 to 1990 ppm (mg/L)  
 CDH-722: 0.00 to 9.99 mS/cm;  
 TDS-722: 0.00 to 9.99 ppt (g/L)

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model No.)		
Model No.	Price	Description
CDH-721	\$75	Conductivity meter with Visual Alarm, 0 to 1990 $\mu$ S/cm
CDH-722	75	Conductivity meter with Visual Alarm, 0.00 to 9.99 mS/cm
TDS-721	75	TDS meter with Visual Alarm, 0 to 1990 ppm
TDS-722	75	TDS meter with Visual Alarm, 0.00 to 9.99 ppt
CDE-721	30	Replacement Conductivity/TDS probe, 1/2" NPT, for CDH-721 and TDS-721
CDE-722	30	Replacement Conductivity/TDS probe, 1/2" NPT, for CDH-722 and TDS-722
CDE-723	30	Replacement Conductivity/TDS probe, 3/4" NPT, for CDH-721 and TDS-721
CDE-724	30	Replacement Conductivity/TDS probe, 3/4" NPT, for CDH-722 and TDS-722
CDS-450	10	450 microSiemen Conductivity Standard, 1 QT
CDS-1500	10	1500 microSiemen Conductivity Standard, 1 QT
CDS-4500	10	4500 microSiemen Conductivity Standard, 1 QT

Comes complete with probe, 12 VDC adapter, calibration solution and operator's manual.

Ordering Example: CDH-721, conductivity meter with visual alarm, \$75.

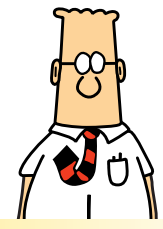


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

12/04/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series #15-001019



www.omega.com • e-mail: info@omega.com

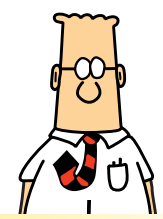


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

12/05/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series #15-001020



www.omega.com • e-mail: info@omega.com

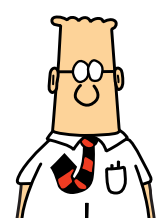


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

12/06/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series #15-001021



15

Collection Series #15-001022



12/07/01 DILBERT © United Feature Syndicate, Inc.

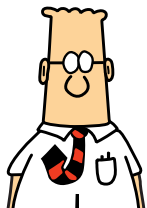
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001023



12/08/01 DILBERT © United Feature Syndicate, Inc.

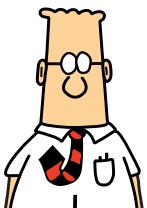
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001024



12/10/01 DILBERT © United Feature Syndicate, Inc.

One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



D8

For Sales and Service, Call Toll-Free: 1-877-82-66342® U.S.A. and Canada

Sales: FAX (Toll-Free) 1-877-FAX-OMEGA(A) 24 HOURS





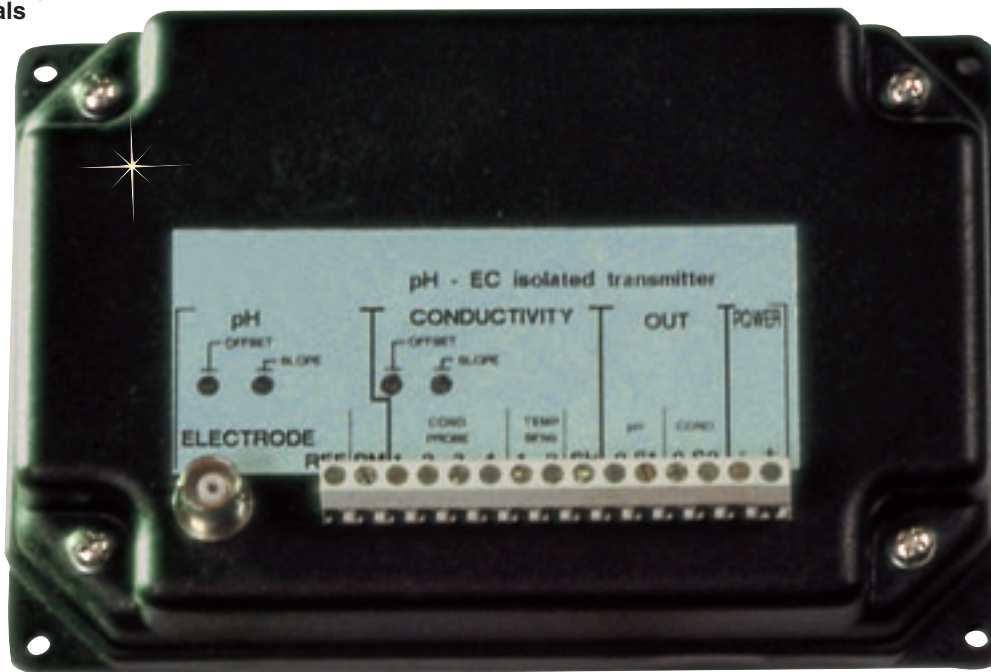
## pH and Conductivity Transmitter with Isolated Output

Model CDTX-300

**\$300**

Basic Unit

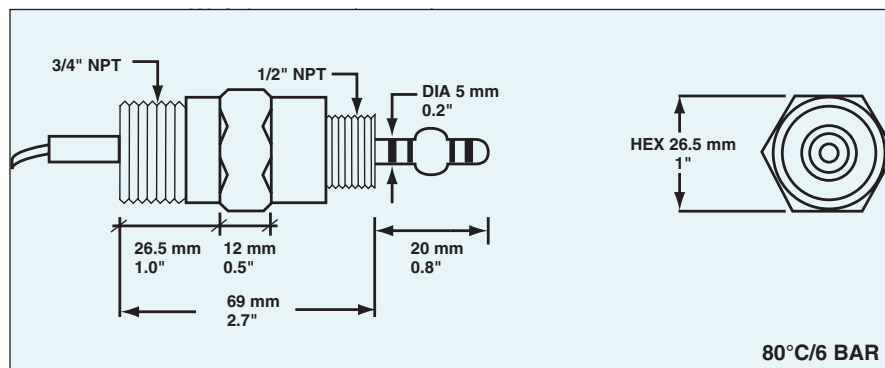
- ✓ CDTX-300 Series is a pH and Conductivity Transmitter Designed to Accept Signals Directly from a pH Electrode and a Conductivity Probe at the Same Time
- ✓ Direct Connection of the Probes to the Transmitter Assures a Positive Electrical Connection with No Signal Loss. This Transmitter is Most Useful in Remote Process Control Applications.



The CDTX-300 two-wire transmitter is widely used for process control in industry today. This instrument is particularly useful in industrial conditions where electrical interference is an important factor. By galvanically isolating the signals, any interference created is prevented from reaching the transmitter. The CDTX-300 uses two wires which reduces costs and eliminates the need for expensive coaxial cable. Two-wire transmitters are ideal when used in remote applications that do not have AC power available.

The CDTX-300 series pH and conductivity transmitter uses top-of-the-line, 4-Ring Potentiometric probes. As opposed to the more widely used 2-Ring Amperometric method, the 4-Ring Potentiometric method provides the highest accuracy and repeatability attainable. When measuring liquids that have a high conductivity, the 2-Ring system is susceptible to polarization. 4-Ring electrodes eliminate the polarization effect by splitting the four rings into 2 current electrodes and 2 voltage electrodes. When placed in a conductive liquid, the 2 current electrodes take the alternating voltage and create a current. This alternating current produces a Buffer Field from which polarization is absent. The voltage is then measured in this field assuring no altered readings.

### CDE-300 Probe Specifications



### Specifications:

**Range:** pH: 0 to 14 pH

Conductivity: 0 to 10 mS/cm (mmho/cm)

**Accuracy (@20°C/68°F):** pH:  $\pm 0.5\%$  of full scale;

Conductivity:  $\pm 2\%$  of full scale

**Calibration:** Manual through offset and slope trimmers for both pH and conductivity at:

pH: 4/10 and 7 pH

Conductivity: 0 and 5 mS/cm

**Temperature Compensation:**

Conductivity: automatic from 0 to 60°C (41 to 132°F) with a  $\beta$  of 2%

**Output:** Two 4 to 20mA isolated

**Power:** 12 to 24 VDC

**Protection:** IP 54

**Environment:** 0 to 50°C (32 to 122°F);

0-95% RH (non-condensing)

**Transmitter Dimensions:**

160 L x 105 W x 31 H mm

(6.3 x 4.1 x 1.2")

**IN STOCK FOR FAST DELIVERY!**

### To Order (Specify Model No.)

Model No.	Price	Description
CDTX-300	\$300	pH and Conductivity transmitter
CDE-300	115	In-Line or submersible Conductivity Probe
PHE-7351-15	115	Industrial Electrode for In-Line or Submersion
PHA-4	5	4.00 pH Buffer Solution 475 ml bottle
PHA-7	5	7.00 pH Buffer Solution 475 ml bottle
PHA-10	5	10.00 pH Buffer Solution 475 ml bottle
CDS-4500	10	4500 microSiemens Conductivity Standard, 1 QT

Comes complete operator's manual.

**Ordering Example:** CDTX-300, pH/conductivity transmitter and potential matching pin, PHE-7351-15, pH electrode, PHA-7, 7.00 buffer solution, CDE-300, conductivity cell, CDS-4500, Conductivity standard, \$295 + 115 + 5 + 115 + 10 = \$540.



## Conductivity Transmitters Using 4-Ring Technology

- ✓ The CDTX1200 Series 4-Ring Potentiometric Conductivity Probe is Virtually Immune to Contamination by Unclean Solutions (This Allows the Transmitter to Operate at Peak Performance at all Times)
- ✓ Temperature Effects are Compensated for by the Built-In Temperature Sensor on the Probe and the Transmitter's ATC Circuitry with a  $\beta$  of 2%
- ✓ Direct Connection of the Probe to the Transmitter Assures a Positive Electrical Connection with no Signal Loss Over Long Distances
- ✓ Two Versions are Available, CDTX1200 without an LCD, and the LCD Version, CDTX1200-D, Allows Easy Verification and Monitoring of Measured Values, and is Easier to Calibrate and Maintain
- ✓ The CDTX1200 Series is for In-Line Applications and Should Be Used in Conjunction with the CDE-1201 In-Line Probe or CDE-1202 Tank Probe with External Threads

Model CDTX1200  
**\$164**  
 Basic Unit



### CONDUCTIVITY, 4-RING TECHNOLOGY

The CDTX1200 series conductivity transmitters use top of-the-line, 4-Ring Potentiometric probes. As opposed to the more widely used 2-Ring Amperometric method, the 4-Ring Potentiometric method provides the highest accuracy and repeatability attainable. When measuring liquids that have a high conductivity, the 2-Ring system is susceptible to polarization. This condition makes it exceptionally difficult to obtain measurements with any accuracy. The polarization is directly related to the electrode's current load, and will cause a considerable, non-linear drop in the voltage. As a result, the solution around the electrode simulates a low conductivity condition.

4-Ring electrodes eliminate the polarization effect by splitting the four rings into 2 current electrodes and 2 voltage electrodes. When placed in a conductive liquid, the 2 current electrodes take the alternating voltage and create a current. This alternating current produces a Buffer Field from which polarization is absent. The voltage is then measured in this field assuring no altered readings.

Voltage electrodes carry very little current. This allows the electrodes to be arranged in a manner where the current electrodes, which are the most susceptible to polarization, are placed where they cannot affect the voltage electrodes.

Consequently, the Buffer Field is large enough for the voltage electrodes to take accurate readings without being effected by polarization.

The wide range of OMEGA conductivity probes includes models for industrial applications. Flow-thru and dip versions are available. In particular, the latest addition to this family are probes with  $\frac{1}{2}$ " and  $\frac{3}{4}$ " external thread for mounting on commercial pipe tees.

Some new conductivity probes combine the proven 4-ring potentiometric method of measuring conductivity with platinum sensors. The universally acclaimed 4-ring

method provides a more stable measurement over a wider range. The probe does not suffer polarization, nor does it need frequent calibration or cell changes. The 4-pin CDE-1201 is a molded conductivity probe with pipe threads at both ends. The housing is fiber-reinforced polypropylene and can work with pressures up to 5 bar (72.5 psi) and temperatures as high as 80°C (176°F).

These probes combine the proven 4-ring potentiometric method with platinum

Model CDTX-1201-D,  
\$248

All products  
shown smaller  
than actual size.

Model CDTX1201, \$164

**NEW****CONDUCTIVITY**

sensors and a stainless steel external thread. The removable protective sleeve is made of Ultem which resists the harmful effects of most chemicals and can be unscrewed for quick and simple maintenance. The new probes withstand temperatures up to 120°C (248°F) and pressures of up to 5 bar (72.5 psi). CDE-1202 incorporates an NTC sensor. Also available with 10 m (33') cable.

### Specifications:

#### Range:

CDTX1201: 0.0 to 199.9 mS/cm;

CDTX1202: 0.00 to 19.99 mS/cm;

CDTX1203: 0 to 1999  $\mu$ S/cm

CDTX1204: 0.0 to 199.9  $\mu$ S/cm

**Resolution:** CDTX1201: 0.1 mS/cm;

CDTX1202: 0.01 mS/cm;

CDTX1203: 1  $\mu$ S/cm;

CDTX1204: 0.1  $\mu$ S/cm

**Accuracy:**  $\pm 2\%$  of full scale

**Calibration:** 4 mA (zero)  $\pm 0.8$  mA Slope:  $\pm 1.6$  mA (90-110%)

**Temperature Compensation:** Automatic from 0 to 50°C (32 to 122°F) with a  $\beta$  of 2%

**Output:** 4 to 20 mA not-isolated Max. 500 ohms

**Power:** without LCD: 12 to 30 VDC/ with LCD 17 to 36 VDC

**Probe:** CDE-1201 or CDE-1202 (not included)

**Protection:** IP 65

#### Environment:

0 to 50°C (32 to 122°F)

0-95% RH (non-condensing)

#### Dimensions:

165 L x 110 W x 90 H mm

(6.5 x 4.3 x 3.5")

**Weight:** 1kg (2.2 lbs)

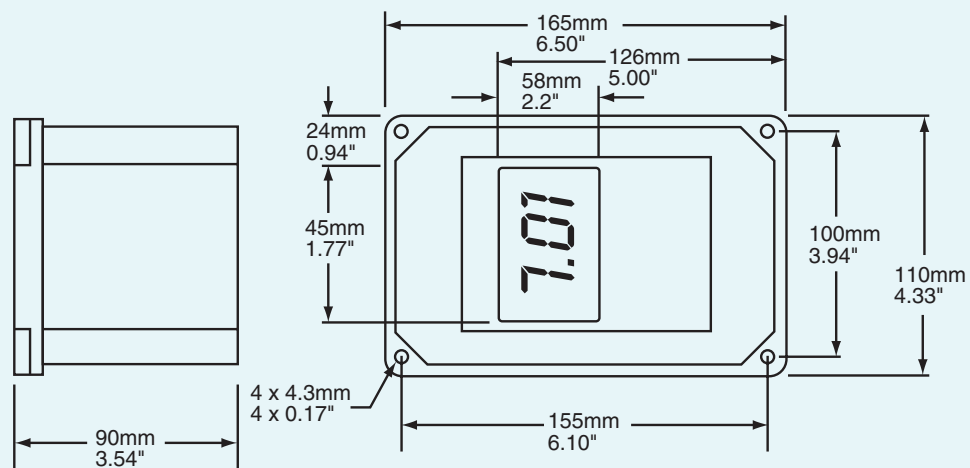


Model CDTX-1201-D, \$248



Model CDTX1201, \$164

### Mechanical Dimensions for CDTX1200 Series



Order Online  
**omega.com**<sup>®</sup>  
 Over 100,000 Products Available!

For the complete selection of Conductivity,  
 shop online at [omegaConductivity.info](http://omegaConductivity.info)



## Probe Specifications:

**Temp Compensation:** CDE1201&2: Automatic 0-50°C (32-122°F)

**Body Material:** CDE-1202: Ultem; CDE-1201: polypropylene

### Working Temperature:

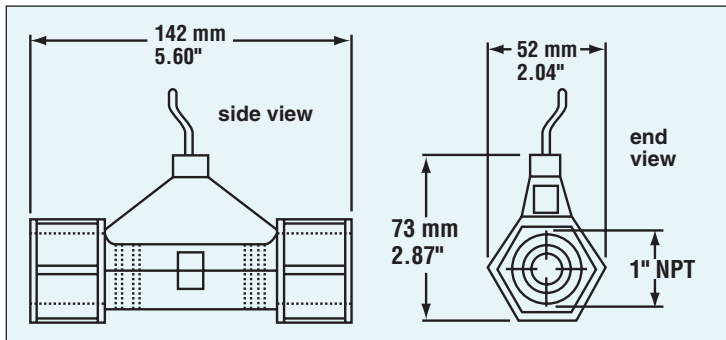
CDE-1201: 0-80°C (32-176°F)

CDE-1202: 0-120°C (32-248°F)

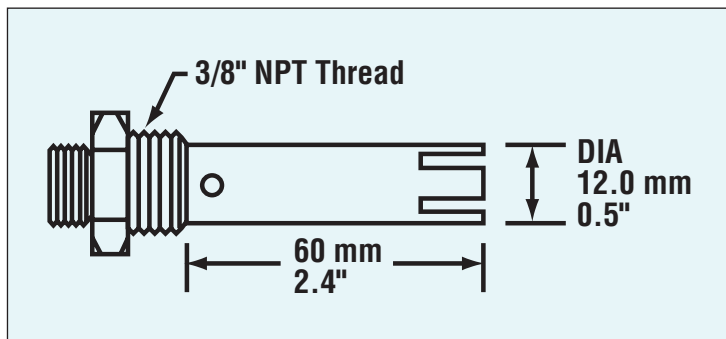
### Max. Pressure (@25°C/77°F):

CDE-1201 & CDE-1202: 5 bar (72.5 psi)

Dimensions for CDE-1201 electrode



Dimensions for CDE-1202 electrode



Model CDTX-1201, \$164

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model No.)			
Model No.	Price	Range	Description
CDTX1201	\$164	0.0 - 199.9 mS/cm	Conductivity Transmitter
CDTX1201-D	248	0.0 - 199.9 mS/cm	Conductivity Transmitter with Display
CDTX1202	164	0.0 - 19.99 mS/cm	Conductivity Transmitter
CDTX1202-D	248	0.0 - 19.99 mS/cm	Conductivity Transmitter with Display
CDTX1203	164	0.0 - 1999 µS/cm	Conductivity Transmitter
CDTX1203-D	248	0.0 - 1999 µS/cm	Conductivity Transmitter with Display
CDTX1204	164	0.0 - 199.9 µS/cm	Conductivity Transmitter
CDTX1204-D	248	0.0 - 199.9 µS/cm	Conductivity Transmitter with Display
CDE-1201	83	—	In-Line 1" NPT Polypropylene Conductivity Probe
CDE-1202	195	—	Submersible Platinum Conductivity Probe
CDS-450	10	—	450 microSiemen Conductivity Standard, 1 QT
CDS-1500	10	—	1500 microSiemen Conductivity Standard, 1 QT
CDS-4500	10	—	4500 microSiemen Conductivity Standard, 1 QT
PHA-50	175	—	Loop Isolator

Comes complete with operator's manual.

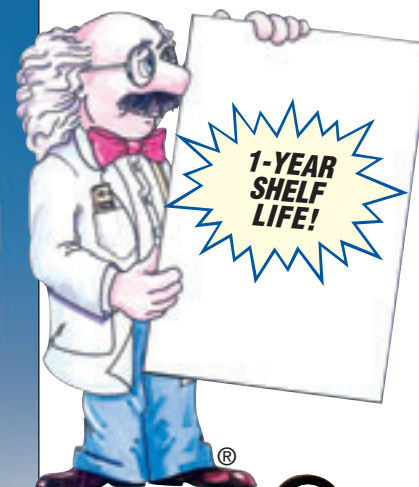
**Ordering Example:** CDTX1203-D, 0.0 - 199.9 µS/cm Conductivity Transmitter, with display

CDE-1202, Submersible platinum probe, CDS-1500, 1500 µS/cm standard, \$248 + 195 + 10 = \$453.



## Conductivity Calibration Solutions

CDS Series  
**\$10**  
 per quart



- ✓ Ideal for Calibrating All Conductivity Instruments
- ✓ 4 Popular Ranges Stocked for Quick Delivery
- ✓ NIST Certificate of Conformance Optional

Conductivity standard solutions are used for calibrating a wide range of the conductivity instrumentation shown in this section. To calibrate your instrument, select a conductivity solution which is close to your measuring range and calibrate the instrument for optimal system accuracy.

Standard solutions are available in either 45, 50, 1500 or 4500  $\mu\text{mho/cm}$  ranges. Custom conductivity solutions are available; Contact Applications Engineering.

Third Arm Electrode Holder  
 Model No. PHA-77 (see page 7)

**\$35**



**STOCKED FOR IMMEDIATE DELIVERY!**

### To Order (Specify Model Number)

Model No.	Price	Description
CDS-45	\$10	45 $\mu\text{mho/cm}$ conductivity solution
CDS-450	10	450 $\mu\text{mho/cm}$ conductivity solution
CDS-1500	10	1500 $\mu\text{mho/cm}$ conductivity solution
CDS-4500	10	4500 $\mu\text{mho/cm}$ conductivity solution

*Note: Calibration of conformance Certification available at time of purchase. Add suffix "-NIST" to model number and add \$25 to price.*

*Ordering Example: CDS-1500, 1500  $\mu\text{mho/cm}$  conductivity solution, \$10.*



## Mini Panel-Mount Conductivity and TDS Controllers

Model CDCN201  
**\$150**  
Basic Unit



Model CDCN202 comes with electrode CDE202

Model CDCN201 comes with electrode CDE201 (shown with the CDCN204).

Model CDCN204 comes with electrode CDE201

All products shown smaller than actual size.

- ✓ Simple One-Point Calibration
- ✓ Compact, Practical and Convenient
- ✓ Activation Relay to Start/Stop Valve or Pump
- ✓ Easy to Mount with Brackets Included

The CDCN200 series mini controllers have been specially designed for the water conditioning applications. They are miniaturized to an 8 by 5 cm (3 x 2") dimension so that they can be mounted right on the water softening equipment. Due to their equally compact prices, these meters are ideal for softeners that do not incorporate a controller and leave the controlling to manual checks. The conductivity and TDS values are displayed in large digits on the LCD. There are even LED's to indicate whether the relay is active or not. CDCN201 and CDCN202 measure conductivity from 0 to 1999 mS/cm and 0.00 to 10.00 mS/cm, respectively. CDCN203 and CDCN204 check and control TDS from 0.00 to 10.00 ppt and 0 to 999 ppm, respectively. CDCN203 and CDCN204 operate with a conversion rate of 0.50 between TDS and conductivity which best fits the water conditioning and softening applications. A built-in relay terminal is activated when the measurements are above the setpoint. This allows for the

conductivity to be lowered to the desired threshold. In order to adjust the setpoint or calibrate the controllers, simply turn the relevant trimmer positioned on the front panel. The controllers are easy to install and come with probes and mounting brackets. The CDE201 and CDE202 probes have 1/2" external threads so that they can be installed directly in the softener's pipe. The probes incorporate a fast responding temperature sensor. The 2 meter (6.6') lead ends in a 5-wire terminal, which incorporates an anti-noise wire, particularly important when working in an environment with running pumps or machinery. Temperature affects EC and TDS to the tune of 2% per degree. These mini controllers compensate for the temperature automatically. In order to provide the best solution for your application, the meters are available in three models. Choose from the 100-110V or the 220-240V operated models, or opt for the 12 VDC version with the transformer included in the low price.

**NEW**

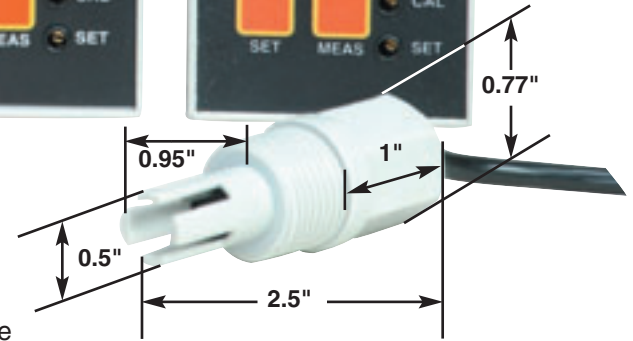
# CONDUCTIVITY



Model CDCN202 comes with electrode CDE202

Model CDCN201 comes with electrode CDE201 (shown with the CDCN204).

Model CDCN204 comes with electrode CDE201



All units come complete with conductivity cell and operator's manual.

**Specifications:**

**Range:**

- CDCN201: 0 to 1999 µS/cm
- CDCN202: 0.00 to 10.00 mS/cm
- CDCN203: 0.00 to 10.00 ppt
- CDCN204: 0 to 999 ppm

**Resolution:** CDCN201: 1 µS/cm

- CDCN202: 0.01 mS/cm
- CDCN203: 0.01 ppt
- CDCN204: 1 ppm

**Accuracy (@20°C/68°F):** ±2% F.S., CDCN204 ±1% F.S.

**Calibration:** 1 point adjustable

**Temperature Compensation:**

Automatic from 5 to 50°C (41 to 122°F)

**Setpoint:** Adjustable with trimmer throughout the range

**Relay Control:** Activated when the reading is higher than the setpoint

**Probe (included):**

- CDCN201: CDE202
- CDCN202: CDE201
- CDCN203: CDE201
- CDCN204: CDE202

**Thread Size:** ½" NPT

**Power Supply:**

110/115V; 50-60 Hz

12VDC adapter (optional)

220/240V; 50-60 Hz (optional)

**Environment:**

0 to 50°C (32 to 122°F); RH 95%

**Dimensions:** 79 x 49 x 95 mm (3.1 x 1.9 x 3.8")

**Weight:** 150 g (5.3 oz.)

   **MOST POPULAR MODELS HIGHLIGHTED!**

**To Order (Specify Model No.)**

Model No.	Price	Range	Description
CDCN201	\$150	0.00 to 1999 µS/cm	Conductivity Controller and Electrode
CDCN202	150	0.00 to 10.00 mS/cm	Conductivity Controller and Electrode
CDCN203	150	0.00 to 10.00 ppt	TDS Controller and Electrode
CDCN204	150	0.00 to 999 ppm	TDS Controller and Electrode
CDE201	30	–	Replacement Electrode for CDCN201 and CDCN204
CDE202	30	–	Replacement Electrode for CDCN202 and CDCN203
CDS-450	10	–	450 microSiemen Conductivity Standard, 1 QT
CDS-1500	10	–	1500 microSiemen Conductivity Standard, 1 QT
CDS-4500	10	–	4500 microSiemen Conductivity Standard, 1 QT

Comes complete with conductivity cell and operator's manual.

Add "-12Vdc" for 12 Volt DC operation (DC adaptor included), add "-240VAC" for 220/240 VAC operation.

**Ordering Example:** CDCN201, Conductivity controller and electrode, \$150



# DISSOLVED OXYGEN INSTRUMENTATION

## Portable Digital Dissolved Oxygen/Temperature Meters



(Electronics Only)

PHDG-80A  
**\$485**  
Basic Model

- ✓ Polarographic Dissolved Oxygen and RTD Sensors
- ✓ Cathode Design Minimizes Oxygen Consumption for Stable Response
- ✓ Integral Benchtop Stand

The PHDG-80A combines a polarographic dissolved oxygen sensor with an integral RTD for dissolved oxygen and temperature measurement in the laboratory, plant or field. The unit contains a small cathode which consumes only a minimal amount of oxygen, thus reducing the need for sample stirring and providing a more stable response. A standby switch stabilizes the probe prior to use while economizing the battery power normally required for the display.

### Specifications:

**Range:** 0.00 to 19.99 ppm O<sub>2</sub>, 0 to 199.9°C (32 to 392°F)

**Resolution:** 0.01 ppm; 0.1°C

**Accuracy:** ±1.5% F.S. O<sub>2</sub>, ±2°C

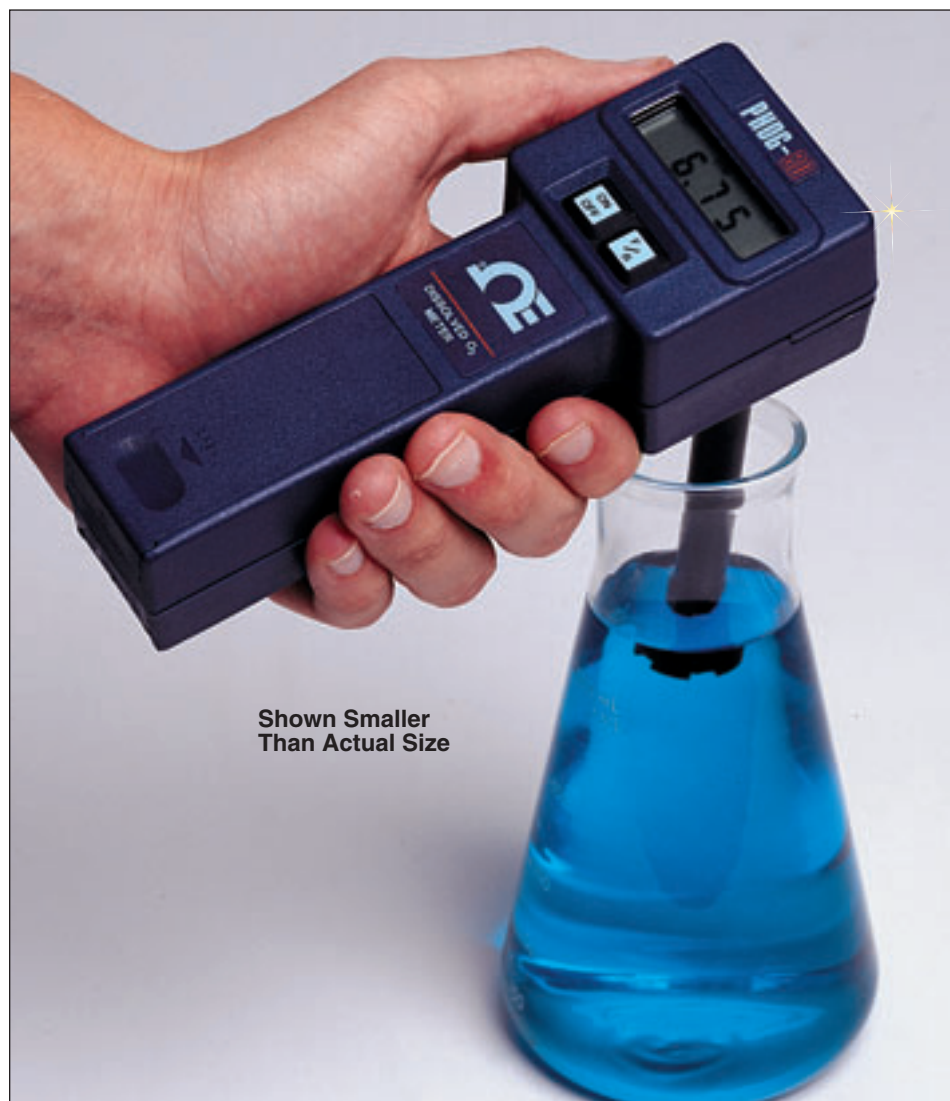
#### Temperature Compensation:

Automatic 0 to 40°C (32 to 104°F)

**Power:** 9 V battery

**Dimensions:** 158.8 x 57.2 x 31.8 mm (6.25 x 2.25 x 1.25")

**Weight:** 241 g (8.5 oz)



Shown Smaller Than Actual Size



New detachable electrode with 1 m (3') cable is ideal for use in the laboratory

**IN STOCK FOR FAST DELIVERY!**

### To Order (Specify Model Number)

Model No.	Price	Description
PHDG-80A	\$485	Dissolved oxygen meter, 0.00-19.99 ppm O <sub>2</sub> , 0-199.9°C
CDE-60	19	1 m (3') extension cable
PHDG-8200	40	PHDG-80 replacement membrane kit
PHDG-8002	260	Replacement probe for PHDG-80A

Each unit is supplied with sensor, screwdriver, vinyl carrying case, battery and operator's manual.  
**Ordering Example:** PHDG-80A, dissolved oxygen meter 0.00-19.99 ppm O<sub>2</sub>, 0-199.9°C, \$485.



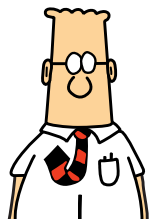


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

12/13/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series #15-001025



www.omega.com • e-mail: info@omega.com

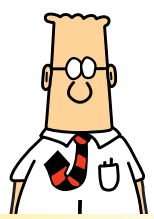


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

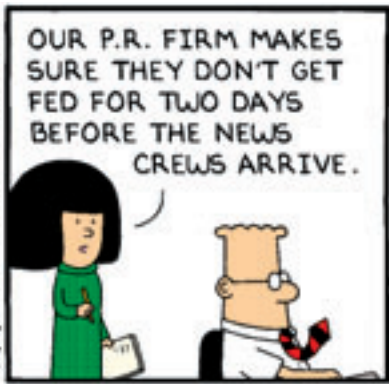
12/15/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series #15-001026



www.omega.com • e-mail: info@omega.com

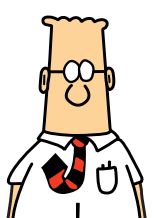


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

12/17/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series #15-001027



15

Collection Series #15-001028



12/18/01 DILBERT © United Feature Syndicate, Inc.

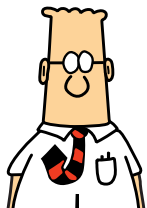
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001029



12/19/01 DILBERT © United Feature Syndicate, Inc.

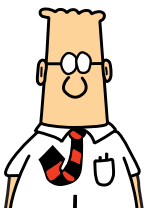
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001030



12/20/01 DILBERT © United Feature Syndicate, Inc.

One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



D10

For Sales and Service, Call Toll-Free: 1-877-82-66342® U.S.A. and Canada

Sales: FAX (Toll-Free) 1-877-FAX-OMEGA(A) 24 HOURS

# DISSOLVED OXYGEN INSTRUMENTATION



## Compact Dissolved Oxygen Benchtop Meters

- ✓ Compact Design
- ✓ Easy to Use
- ✓ Analog or Digital
- ✓ Low Cost

Whether monitoring a food process, a lake's oxygen level, a fish tank, or the biological oxygen demand (BOD) of drinking water, OMEGA has a dissolved oxygen meter which will fit your application. All OMEGA dissolved oxygen meters combine accuracy with simplicity of operation and portability. All models feature a rugged, reliable, fast-response, and easy-to-maintain, replaceable, polarographic oxygen probe which fits standard BOD bottles.

The DOB-210 analog meters display results between 0-120% saturation and 0-15 ppm (simultaneously) with accuracies of  $\pm 2\%$  saturation and  $\pm 0.2$  ppm, respectively. Temperature reading (switch to "Temp." to display the sample temperature) is standard on all OMEGA oxygen meters.

Similar in function and utility to the analog units, the DOB-210 digital dissolved oxygen meter features easy-to-read 3.5 digit LCD displays. Results are displayed over the 0 to 20 ppm range with  $\pm 0.1$  ppm accuracy, and a sample temperature readout (0 to 50°C) mode.

### Specifications:

#### Readout:

DOB-210: 15 cm (6") analog meter;

DOB-215: 8 cm (3") digital LCD

Range: DOB-210: 0-15 ppm;

DOB-215: 0-19.99 ppm

Accuracy: DOB-210: 0.1 ppm;

DOB-215: 0.1 ppm

#### Saturation Range:

DOB-210: 0-120%;

DOB-215: NA

#### Saturation Accuracy:

DOB-210: 1%; DOB-215: NA

Temperature Readout: 0-50°C

Electrode: Polarographic

Size: 13 H x 20 W x 13 cm D  
(5" x 8" x 5")

Weight: 1.2 kg (2.7 lb)

Power: Eight 1.5 V AA batteries or optional wall plug adaptor

Battery Life: approx. 200 hrs,

Shipping Weight: 1 kg (2 lb)

Probe Dimensions: 12 mm (0.47") dia., 140 mm (5.5") long, 3 m (10') cable, Delrin Body

DOB-210  
**\$365**



DOB-210 Shown  
Smaller Than  
Actual Size



DOB-215  
**\$398**



DOB-215 Shown  
Smaller Than  
Actual Size

**MOST POPULAR  
MODEL HIGHLIGHTED!**

### To Order (Specify Model No.)

Model No.	Price	Description
DOB-210	\$365	Analog benchtop
DOB-215	398	Digital benchtop
PHB-110-ADAP	27	AC adaptor, 110 Vac
PHB-220-ADAP	33	AC adaptor, 220 Vac
DOB2-Fill solution	10	Replacement fill solution, 1.25 oz. bottle
DOB2-Kit	95	Replacement membrane caps, 1.25 oz. fill solution
DOE-200-10	130	Replacement oxygen probe with 3 m (10') cable

Each unit is supplied with probe, filling solution, 15 membranes, O-rings, batteries and complete operator's manual.

Ordering Example: DOB-210 analog benchtop with PHB-110-ADAP AC adaptor, \$365 + 27 = \$392.

Order Online

**omega.com**<sup>®</sup>

Over 100,000 Products Available!

For the complete selection of Dissolved Oxygen Instrumentation, shop online at **omegaDO.info**

39



# DISSOLVED OXYGEN INSTRUMENTATION

## 2-Wire Isolated Dissolved Oxygen Transmitter System

- ✓ Reliable 3-Electrode Amperometric Sensor
- ✓ Replaceable Sensor Cartridge
- ✓ Sensor Membrane Puncture/Tear Diagnostic
- ✓ Universal Mounting Configurations
- ✓ Microprocessor Based System
- ✓ Large Dual Display Format
- ✓ Loop Powered, Fully Isolated

DOTX-45 System  
**\$1325**  
 Meter and Sensor  
 (Order Separately)

### Sensor Features

The sensor housings are constructed of PEEK, a high performance thermoplastic that provides outstanding mechanical strength and chemical resistance. Multiple sealing materials are used to preserve sensor integrity over a wide range of applications.

The 3-electrode amperometric sensor produces a current output that is proportional to the partial pressure of oxygen. The semi-permeable sensor membrane consists of a 50-micron thick layer of FEP (fluorinated ethylene propylene). The hydrophobic nature of this material provides a fouling-resistant surface area for the diffusion of oxygen into the reaction cell. The three-electrode reaction cell includes a gold cathode, silver anode, and a silver/silver bromide reference electrode. The reference electrode is used to stabilize the polarization potential, which ensures accurate concentration measurement. The entire reaction cell is housed in a replaceable PEEK cartridge, which makes sensor regeneration fast and simple.

An integral preamplifier is encapsulated in the body of the sensor. This creates a low impedance signal output which ensures stable readings in harsh environments, and maximizes the distance between sensor and transmitter. A large stainless steel diagnostic electrode monitors the integrity of the cartridge membrane. Other sensor diagnostics monitor the condition of the cartridge electrolyte, loss of sensor seal integrity, and integral temperature sensor failure.

### Transmitter Features

The microprocessor-based transmitter is loop-powered and fully isolated for high service reliability. The transmitter includes devices to protect the system from power surge and brownout events. The large, high contrast, super-twist display provides excellent readability over a wide operating temperature range, even in low light conditions. The main display line consists of large, segmented characters with measurement units. The secondary display line utilizes easily readable dot matrix characters for clear display of calibration and diagnostic messages. Two of four



DOTX-45 Transmitter

DOE-45P Sensor

measured parameters may be displayed simultaneously. Four-button programming provides intuitive navigation through the menu-driven user interface. The 4-20 mA transmitter output can be configured to represent any portion of the measurement range. Output HOLD, ALARM and SIMULATION features provide the user

with complete control of the system output under any condition. Diagnostic messages provide a clear description of system condition, which eliminates confusing error codes that must be looked up in the operator's manual. The flexible calibration method includes stability monitors that check temperature and main parameter stability before accepting data.

### To Order (Specify Model Number) MOST POPULAR MODELS HIGHLIGHTED!

Model No.	Price	Description
<b>DOTX-45</b>	<b>\$675</b>	Dissolved Oxygen Transmitter
<b>DOE-45P</b>	<b>650</b>	Dissolved Oxygen Sensor
<b>U24Y101</b>	<b>128</b>	24 Vdc Power Supply
<b>DOTX-45-SC</b>	<b>125</b>	Replacement Sensor Cartridge
<b>PHTX-45-SMH</b>	<b>175</b>	Submersion Mounting Hardware, 1.8 m (6')
<b>PHTX-45-FBMH</b>	<b>375</b>	Float Ball Mounting Hardware

Ordering Example: DOTX-45 Dissolved Oxygen Transmitter, and DOE-45P electrode, \$675 + 650 = \$1325.



## DOTX-45 In Line Application Solution

### DOE-45P Sensor Specifications:

**Measuring Range:**

0 to 40.00 ppm

**Sensor Cable:** 9.1 m (30 feet)

**Measurement Response Time:**

90% in less than 3 minutes

**Measurement Principle:**

3-Electrode amperometric, electrochemical cell contained in a replaceable cartridge

**Electrode Material:**

Gold cathode, silver anode, silver/silver bromide reference

**Electrolyte:** Potassium bromide/potassium carbonate

**Pressure range:** 0 to 150 psig (@ 25° C)

**Temperature Compensation:** Pt1000

**Temperature range:**

0 to 50° C (32 to 122° F)

**Minimum Flow Rate:**

6 mm (0.02 feet)

per second

**Membrane Thickness:**

50 microns

**Membrane Material:** FEP

(fluorinated ethylene propylene)

**Wetted Materials:** PEEK, FEP

(fluorinated ethylene propylene),

316 stainless steel, Viton®, EDPM

**Sensor Cable:** 6 Conductor plus 2 shields

**Sensor to Transmitter Distance:**

305 meters (1000 feet)

**Mounting Options:** 1" NPT convertible,

1½" insertion, 1½" or 2" sanitary style

**Weight/Shipping Weight:** 0.45 kg (1 lb)

### DOTX-45 Transmitter Specifications

#### Performance Specifications

**Displayed Parameters:** Main input,

0 to 40.0 ppm

**% Saturation:** 0 to 200%

**Loop current:** 4.00 to 20.00 mA

**Sensor Temperature:**

0 to 50° C (32 to 122° F)

**Main Parameter Range:** 0 to 40.0 ppm

**Repeatability:** 0.1% of span or better

**Sensitivity:** 0.05% of span

**Non-Linearity:** 0.1% of span

**Stability:** 0.1% of span per 24 hours,

non-cumulative

**Warm-up Time:**

4 seconds to rated performance

**Supply Voltage Effects:** ±0.05% span

**Transmitter Response Time:**

4 seconds to 90% of step input

at lowest setting

**Temperature Drift:** span or zero,

0.02% of span/°C

**Temperature Compensation:** Solution

comp 0-50° C, Pt1000 element, Sensor

is internally compensated for membrane

permeability changes with temperature

**Sensor to Transmitter Distance:**

305 meters (1000 feet)

**Enclosure:** NEMA-4X, IP65,

polycarbonate, stainless steel hardware,

weatherproof and corrosion resistant,

112 H x 112 W x 89 mm D

(4.4 x 4.4 x 3.5")

**Mounting Options:** Wall, panel, pipe, DIN

rail, integral-sensor

**Conduit Openings:** 2-PG9 openings,

1-1" NPT center opening, cordgrips and

plug included

**Weight/Shipping Weight:**

0.45 kg (1 lb)

**Display:** Large, high-contrast, Super-Twist

(STN) LCD 4-digit main display with sign,

19.1 mm (0.75") seven-segment character

12-digit secondary display,

7.6 mm (0.3") 5 x 7 dot matrix character

**Keypad:** 4-key membrane type

with tactile feedback, polycarbonate

with UV coating, integral EMI/static

shield and conductively coated window

**Ambient Temperature:**

Service -20 to 60° C (-4 to 140° F)

**Storage:**

-30 to 70° C (-22 to 158° F)

**Ambient Humidity:**

0 to 95%, non-condensing

**Location:** Designed for hazardous

and non-hazardous areas

**EMI/RFI influence:**

Designed to EN 61326-1

**Voltage Range:**

16 to 35 VDC

(two-wire device)

**Output Isolation:**

600 V galvanic isolation

**Transmitter Cable Type:**

Belden twisted-pair, shielded

**Filter:** Adjustable 1-99 seconds additional

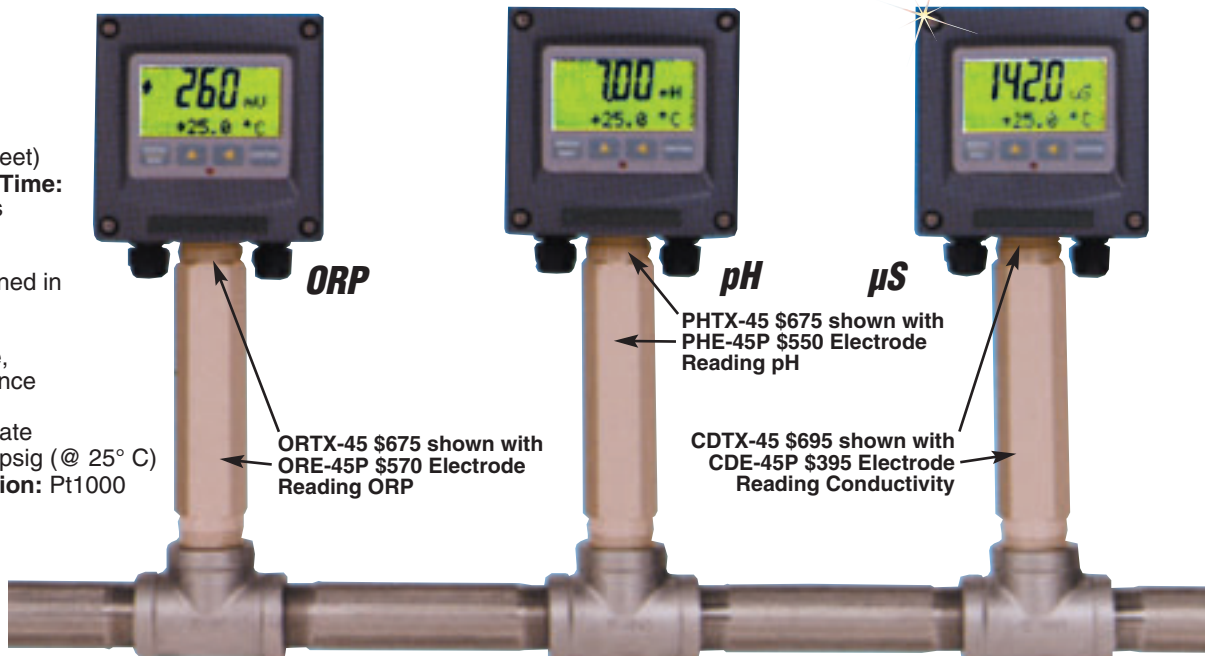
damping to 90%

step input

**Temperature Input:**

Selectable Pt1000 or Pt100, automatic

compensation



ORP

pH

µS

PHTX-45 \$675 shown with PHE-45P \$550 Electrode Reading pH

ORTX-45 \$675 shown with ORE-45P \$570 Electrode Reading ORP

CDTX-45 \$695 shown with CDE-45P \$395 Electrode Reading Conductivity



DOTX-45 \$675 with DOE-45P \$650 (sold separately) see pages 40 and 41

Order Online

**omega.com**

Over 100,000 Products Available!

For the complete selection of Dissolved Oxygen Instrumentation, shop online at [omegaDO.info](http://omegaDO.info)



## SC-1919 Colorimeter Reagent Systems

Model SC-1919

**\$699**  
Basic Unit



- Over 50 Pre-programmed Water Analysis Factors
- Automatic Wavelength Selection
- Friendly Menu-Driven Operation with Simple Six-Button Keypad

The user-friendly SC-1919 Colorimeter is the direct reading colorimeter for complete on-site water analyses. All pre-programmed tests can be run on this compact instrument and each test features automatic wavelength selection. The entire multi-LED optical system is embedded in the light chamber and optimized for OMEGA test reagent systems. This enables the analyst to simply select the test and put in the sample with reagent. The microprocessor, which selects the wavelength, also allows the user to load up to 10 tests for analyzing custom reagent systems.

The SC-1919 Colorimeter is a portable, microprocessor controlled, direct reading colorimeter. It has a graphical 4 line, 16 character liquid crystal display for graphical, alphabetical and numerical messages. The operation is controlled with the keypad through menu driven software in response to selections shown on the display.

The test library consists of 100 tests (not all 100 may be available at present) and 10 "User Tests". The tests are precalibrated for the reagent systems. The colorimeter displays the results of these tests directly in units of concentration. The 10 "User Tests" may be used to enter additional calibrations. All of these tests may be arranged in any of 3 sequences. These sequences can be modified a limitless number of times to meet changing testing needs.

The optics feature 4 different colored LEDs. Each LED has a corresponding silicon photodiode with an integrated interference filter. The interference filters select a narrow band of light from the corresponding LED for the colorimetric measurements. The microprocessor automatically selects the correct LED/photodiode combination for a test. A RS-232 serial port on the back of the colorimeter, and optional software, allows the SC-1919 to be interfaced with a personal computer for real time data acquisition and data storage. This port also allows an interface with a RS-232 serial printer.

Due to its portability, alternate power sources, and rugged construction, the SC-1919 Colorimeter is ideal for lab and field use.



Model SC-1919 shown smaller than actual size.

### MOST POPULAR MODELS HIGHLIGHTED!

To Order (Specify Model Number)		
Model No.	Price	Description
SC-1919	\$699	Colorimeter with 4 sample tubes, AC adapter, and instruction manual, 120V/60Hz
SC-1919-LCS	135	Large carrying case
SC-1919-SCS	85	Small field carrying case
SC-1912-301	149	Interface cable/communication program on 3 1/2 disk
SC-1912-CD-01	149	Interface cable/communication program on CD

Each unit is supplied with 4 sample tubes, AC adaptor, battery, and instruction manual.

Ordering Example: SC-1919, digital colorimeter, SC-1912-CD-01 communication program and cable, SC-1919-SCS small carrying case, \$699 + 149 + 85 = \$933.

### Specifications:

**Light Source:** LED/filter setup at 430nm, 520nm, 570nm, 630nm

**Detector:** Photodiode

**Display:** 122 x 32 LCD, 16x4 line graphics display

**Range:** 0 - 125%T

**Resolution:** 1% FS

**Accuracy:** 2% FS

**CE Mark:** Yes

**Sample Cell:** 25 mm round cell, 10 mm square cuvette, 16mm COD tubes

**Power:** 9V battery or AC adapter, included



# WATER ANALYSIS INSTRUMENTS



**Battery Life:** 500 tests  
**Datalogging:** RS-232, time and date stamped  
**Calibration:** Factory set  
**Keypad:** 6-button membrane switch  
**Size:** 15 x 8 x 5.5 cm (6 x 3.25 x 2.5")  
**Weight:** 900 g (2 lb)

The SC-1919 Colorimeter is complemented by easy-to-use reagent systems. Choose the desired test factors from the list below. Several packaging options are available for field use, making your SC-1919 Colorimeter a "field laboratory."

OMEGA uses ACS raw materials to manufacture reagent systems that have high reproducibility. We design our reagent systems to overcome test interference so results are fast and dependable.

Model No.	Price	Test Factor	Range (ppm)	Test Method (# of Reagents)	# of Tests	Case Size*
SC-3641	\$49	Aluminum	0 to 0.3	Eriochrome Cyanine R (4)	50	L
SC-3659	32	Ammonia Nitrogen	0 to 1.0	Salicylate (3)	25	S
SC-3642	27	Ammonia Nitrogen	0 to 4.0	Nesslerization (2)	50	S
SC-3643-B	36	Bromine	0 to 9.0	DPD Tablets (2)	100	S
SC-3643-C	36	Chlorine	0 to 4.0	DPD Tablets (2)	100	S
SC-3643-I	36	Iodine	0 to 14	DPD Tablets (2)	100	S
SC-3644	21	Chlorine Dioxide	0 to 8.0	DPD Tablet/Glycine (2)	50	S
SC-3645	22	Chromium	0 to 1.0	Diphenylcarbazide (1)	100	L
SC-3646	11	Copper	0 to 6.0	Diethyldithiocarbamate (1)	100	S
SC-3640	18	Copper	0 to 3.5	Bicinchoninic Acid (1)	50	S
SC-3660	64	Cyanide	0 to 0.35	Pyridine-Barbituric Acid (5)	50	L
SC-3661	27	Cyanuric Acid	0 to 200	Melamine (1)	50	L
SC-3647	34	Fluoride	0 to 2.0	SPADNS (2)	50	L
SC-3656	38	Hydrazine	0 to 1.0	P-dimethylaminobenzaldehyde (2)	50	S
SC-3662	26	Hydrogen Peroxide	0 to 1.5	DPD Tablets (2)	100	S
SC-3648	26	Iron	0 to 6.0	Bipyridyl (2)	50	S
SC-3668	30	Iron	0 to 5.0	1,10 Phenanthroline (2)	50	S
SC-4031	50	Lead	0 to 5.0	PAR (5)	50	S
SC-3658	40	Manganese	0 to 0.5	PAN (3)	50	L
SC-3669	54	Manganese (HR)	0 to 15.0	Periodate (2)	50	S
SC-3699-01	39	Molybdenum	0 to 50	Thioglycolate (3)	50	L
SC-3663	67	Nickel	0 to 8.0	Dimethylglyoxime (6)	50	L
SC-3649	31	Nitrate	0 to 3.0	Cadmium Reduction (2)	20	S
SC-3650	31	Nitrite	0 to 0.8	Diazotization/Coupling (2)	20	S
SC-3688	26	Oxygen, Dissolved	0 to 11.0	Winkler Colorimetric (3)	200	S
SC-3651	146	Ozone	0 to 0.4	Indigo Trisulfonate (3)	100	L
SC-3700	42	pH	5.0 to 9.6	Colorimetric (3)	100	L
SC-3652	35	Phenols	0 to 6.0	4-Aminoantipyrine (3)	50	L
SC-3655	14	Phosphate (HR)	0 to 70.0	Molybdovanadate (1)	50	S
SC-3653	22	Phosphate (LR)	0 to 3.0	Ascorbic Acid Reduction (2)	50	S
SC-3639	37	Potassium	0.5 to 10.0	Tetraphenylboron (2)	100	S
SC-3664	35	Silica	0 to 4.0	Heteropoly Blue (4)	100	S
SC-3687	26	Silica (HR)	0 to 75	Silicomolybdate	50	S
SC-3665	17	Sulfate	0 to 100	Barium Chloride (1)	100	S
SC-3654	42	Sulfide	0 to 3.0	Methylene Blue (3)	50	L
SC-3666	33	Tannin	0 to 10	Tungsto-Molybdophosphoric Acid (2)	50	L
SC-3667	71	Zinc	0 to 3	Zincon (6)	50	L

\* S = Small case: 69.85 W x 69.85 D x 101.6 mm H (2.75 x 2.75 x 4") (pictured above),

\* L = Large case: 165 W x 108 H x 140 mm D (6.5 x 4.25 x 5.5")

Ordering Example: SC-3641, aluminum reagent test kit, \$49.

Order Online  
**omega.com**<sup>®</sup>  
 Over 100,000 Products Available! G-43

For the complete selection of Water  
 Analysis Instruments, shop online at  
**omegaWaterAnalysis.info**



## Model CLH-1740 Chlorine Analyzer

CLH-1740  
**\$149**



- ✓ Read Total Chlorine from 0.00-9.99 ppm to 0.01 ppm Resolution
- ✓ Readings are not Affected by Sample Color or Turbidity
- ✓ Extra Bold Display Includes an Analog Bar Graph Feature
- ✓ Memory Saves Calibration Values and can Store up to 15 Readings
- ✓ Chlorine and pH Modes also Displays Sample Temperature
- ✓ Waterproof Design with Matte Finish Makes Opening Battery Compartment and Changing Probe Tips Easier
- ✓ Automatic Shut-off and Low Battery Indicator Provide User Convenience; Uses Four LR-44 Batteries
- ✓ Includes 50 Reagent Tablets at Almost Half the Price of Similar Chlorine ISE Reagents
- ✓ Follows EPA Protocol for ISE Methods

### For your next chlorine analysis!

The world's first pocket-sized ISE meter for measuring chlorine directly in parts per million. It can also be used to display sample temperature or test for pH and ORP. The unit includes 50 reagent tablets at almost half the price of similar Chlorine ISE reagents. Interchangeable flat surface sensor modules make this the most versatile pocket tester ever offered.

### Specifications:

**Display:** Multifunction display with bar graph

**Operating Conditions:** 0 to 50°C (32 to 122°F) and <80% RH

**Chlorine Range:** 0.01 to 10.00 ppm (Total Chlorine)

**Chlorine Accuracy:** ± (10% of reading + 0.01 ppm) from 0.05 to 5.00 ppm

**Temperature Range:** -5 to 90°C (23 to 194°F)

**Temperature Resolution:** 0.1° to 99.9°, then 1°

**Temperature Accuracy:** ± 1°C (1.8°F) from -5° to 50°C (23 to 122°F), 3°C (±5.4°F) from 50 to 90°C (122 to 194°F)

**Measurement Storage:** 15 readings can be stored and recalled

**Low Battery Indication:** 'BAT' appears on the display

**Power:** Four SR-44 button batteries included

**Auto Power Off:** After 10 minutes of inactivity

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model No.)		
Model No.	Price	Description
CLH-1740	\$149	Chlorine analyzer
CLE-1732	99	Chlorine module 0-9.99 / ±10% of reading
PHE-1733	29	pH module
ORE-1742	49	ORP module
CLH-1746	15	Optional weighted stand & 5 sample cups
CLH-7044J	30	Chlorine reagent refill pack (100 tablets)
CLH-7045	18	24 pack of sample cups
PH-BATT-3	1	Replacement battery (4 required)

Unit comes complete with 50 reagent tablets, chlorine module, batteries and complete operator's manual.

Ordering Example: CLH-1740, chlorine analyzer, \$149.



CLH-1740 comes complete with 50 reagent tablets, chlorine module (CLE-1732 module shown), batteries, and complete operator's manual.



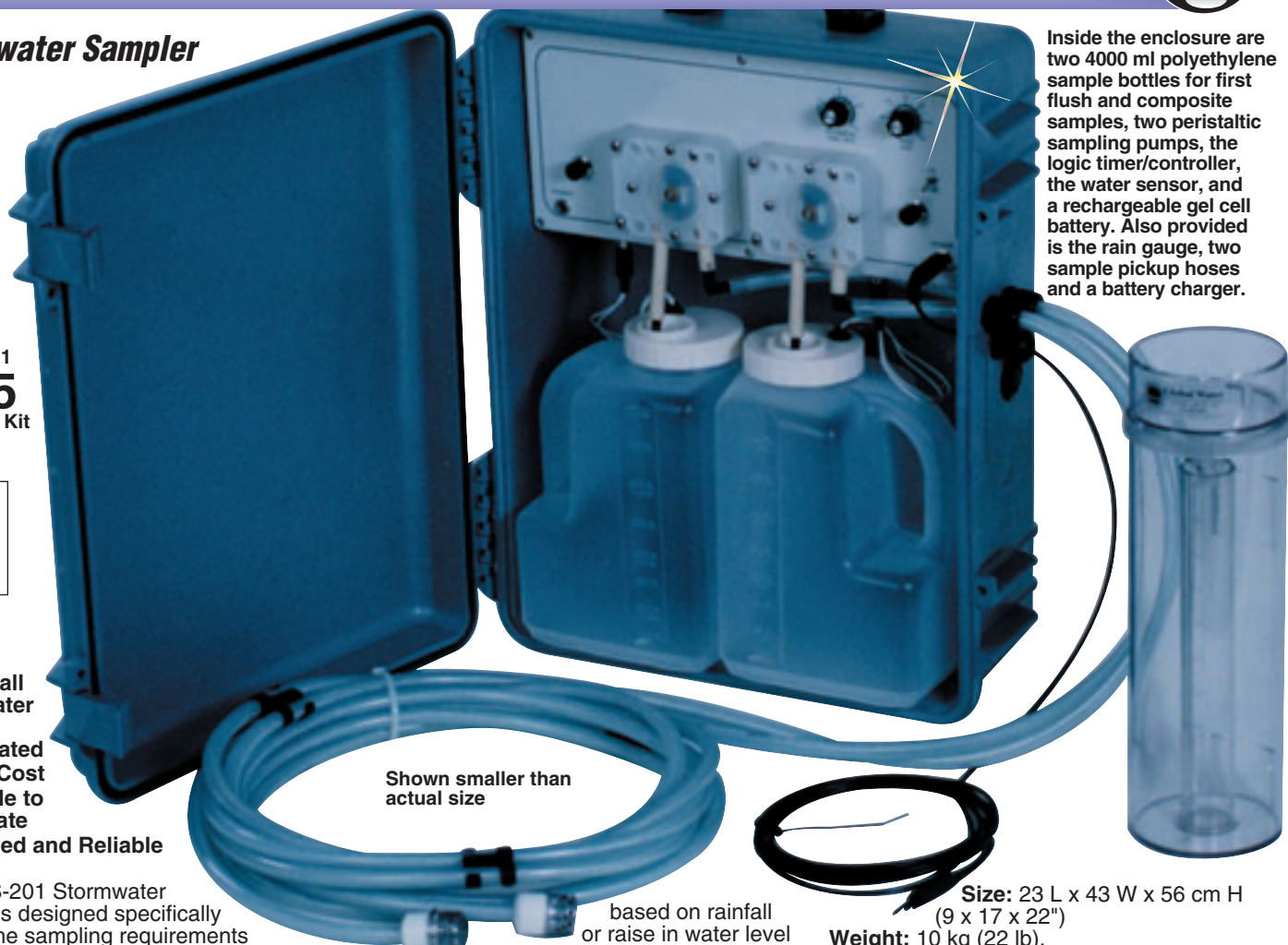


## Stormwater Sampler

SWS-201  
**\$995**  
 Complete Kit



- ✓ Rainfall or Water Level Activated
- ✓ Low-Cost
- ✓ Simple to Operate
- ✓ Rugged and Reliable



Shown smaller than actual size

Inside the enclosure are two 4000 ml polyethylene sample bottles for first flush and composite samples, two peristaltic sampling pumps, the logic timer/controller, the water sensor, and a rechargeable gel cell battery. Also provided is the rain gauge, two sample pickup hoses and a battery charger.

The SWS-201 Stormwater Sampler is designed specifically to meet the sampling requirements of the Stormwater program. The SWS-201 Sampler takes a "first flush" sample in one bottle and a "time weighted" composite sample in the second bottle, to meet the guidelines. It is actually two samplers in one: it consists of two intake tubes, two sampling pumps and two bottles, which eliminates any possibility of cross contamination between the first flush and the composite sample. The SWS-201 Stormwater Sampler is easily set up and installed in any stormwater channel to take and store physical water samples throughout the storm event.

The SWS-201 Stormwater Sampler consists of a rugged, rainproof lockable carrying enclosure. Inside the enclosure are two 4000 ml polyethylene sample bottles for first flush and composite samples, two peristaltic sampling pumps, the logic timer/controller, the water sensor, and a rechargeable gel cell battery. Also provided is the rain gauge, two sample pickup hoses and a battery charger. Everything you need is provided for a successful sampling program.

The SWS-201 Stormwater Sampler is controlled by the water sensor. The water sensor can be used to trigger the sampler

based on rainfall or raise in water level in the storm drain. The internal rechargeable battery will power the sampler for several months and/or for several storm events. Each sample bottle is equipped with a float switch which automatically turns off the sampler pump if the bottle becomes full. The Sampler is provided with a 10 cm (4") cylindrical rain gauge. The water sensor may be positioned in the rain gauge to trigger the sampler after a preset amount of rainfall. Total rainfall for the event is also measured by the rain gauge. The Sampler is not damaged by water or moisture or severe environmental conditions. All parts may be washed with soap and water

### Specifications

**Sample Size:** First Flush: 4000 ml  
**Composite:** 200 ml at 10 minute intervals, or set by user. 4000 ml composite sample maximum.

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model No.)		
Model No.	Price	Description
SWS-201	\$995	Stormwater Sampler

Unit comes complete with operator's manual.

**Ordering Example:** SWS-201, Stormwater Sampler, \$995.

**Size:** 23 L x 43 W x 56 cm H (9 x 17 x 22")  
**Weight:** 10 kg (22 lb), shipping weight 11 kg (24 lb)  
**Operating Temperature:** 0-70°C  
**Materials:** Enclosure: Expanded UV protected PVC; Bottles: 4000 ml polyethylene; Sample Tubing: Polyethylene  
**Sample Pumps:** Flow Rate: 1000 ml per minute at 4ft. head; Type: Peristaltic;  
**Maximum Lift:** 6.7 m (22')  
**Logic Timer/Controller:** CMOS Solid State (fully potted in epoxy)  
**Water Level Sensor:** Solid State with a 4.6 m (15') cable.  
**Sample Hoses:** Two 4.6 m (15') nylon reinforced 6 mm (¼") ID polyethylene flexible tubing sections with intake strainers. Hoses may be extended, as required, using standard 6 mm (¼") tubing and fittings  
**Battery:** Rechargeable 3 AH Gel Cell, included  
**Battery Life:** The battery will power the sampler for a minimum of four months including five 24-hr. storm events before recharging is required



## Measure pH of Soil Directly with a Special pH Electrode

Model PHH-200  
**\$320**  
Basic Unit



- ✓ **Amplified, ATC Electrode:** The Advanced PHE-200 Incorporates a Temp Sensor and has a Tiny Amplifier for Excellent Stability and Quick Response.
- ✓ **Automatic Calibration:** Choose Between Six Memorized Buffers to Automatically Calibrate the Instrument.
- ✓ **Messages on the Display:** The Operator is Helped by Graphic Symbols Visualized on the LCD.
- ✓ **Supplied Complete:** The Ground Auger Allows Direct Measurements or for Greatest Accuracy Use the Beaker & Soil Preparation Solutions.



PHH-200 shown smaller than actual size.

The PHH-200 kit has been designed to address the question of correct and rapid measurement of pH directly in soil. Every item in this kit has been made to facilitate measurements in the field without compromising accuracy. The PHH-200 can test the pH of soil directly or after preparation of a diluted sample. In order to measure the pH directly; the kit includes a plastic auger to perforate the ground. The pH and temperature can be directly tested with the 4-in-1 conic shaped electrode with even a slightly moist soil. For higher degrees of accuracy, or for stony ground where the electrode may be damaged, use the PHTS-200 test solution. This solution is included in the package to help you measure the pH more precisely by diluting a sample of the soil in it. The PHH-200 is waterproof and sophisticated yet engineered for simplicity. The 3-in-1 pH electrode, PHE-200, has been designed for direct soil measurement. It has a conic, rugged tip and can be directly inserted in moist or soft soil. The electrode incorporates a temperature sensor right near the tip to enable it to measure and compensate for the temperature quickly. It also houses a miniaturized amplifier to boost the signal and provide greater stability in spot measurements. The dual-level LCD shows the pH value from -2 to 16 in hundredths of units. It also displays the temperature on the

secondary level at the same time. With a menu-driven custom microprocessor, the user is helped with clear prompts during operation and calibration. The batteries provide up to 1500 hours of continuous operation and indicate the battery level at any time. Calibration is completely automatic and the meter recognizes the buffers too. Any value set by the user as well as the calibration data is retained even during battery replacement. The PHH-200 is ergonomic and has been made for single-handed use. Together with the meter you will also receive a handy booklet which explains how pH should be measured as well as general information about the correct limits in greenhouses, nurseries, fertilizer solutions as well as fruit and vegetable.

PHH-200 is supplied complete with portable waterproof pH meter, pH electrode, ground auger, beaker, soil preparation solution, pH 4 & 7 cal. solutions, batteries, and rugged carrying case.



PHH-200 shown smaller than actual size. Comes complete with portable waterproof pH meter, pH electrode, ground auger, beaker, soil preparation solution, pH 4 & 7 cal. solutions, batteries, and rugged carrying case.

### Specifications:

**Range:** -2 to 16.00 pH; -5 to 105.0°C (23.0° to 221.0°F)

**Resolution:** 0.01 pH; 0.1°C or °F

**Accuracy (@20°C/68°F):**

±0.02 pH; ±0.5°C up to 60°C, ±1.0°C up to 105°C/±1.0°F up to 140°F, ±2.0°F up to 221°F

**Typical EMC Deviation:** ±0.02 pH; ±0.2°C or ±0.4°F

**pH Calibration:** Automatic 1 or 2 points with 2 sets of 3 memorized buffers (4.01/7.01/10.01 or 4.01/6.86/9.18)

**Temp Compensation:**

Automatic from 0 to 60°C

**Electrode:** PHE-200 with temp sensor, amplifier, DIN connector and 1 m (3.3') cable (included)

**Battery Type/Life:** 3 x 1.5V AA included; 1500 hours approx. of continuous use

**Environment:**

0 to 50°C (32 to 122°F); 100% RH

**Dimensions:** 150 x 80 x 36 mm (5.9 x 3.1 x 1.4")

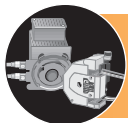
**Weight:** 245 g (8.6 oz.)

### MOST POPULAR MODELS HIGHLIGHTED!

#### To Order (Specify Model No.)

Model No.	Price	Description
PHH-200	\$320	Soil pH Test Kit
PHE-200	112	Replacement Electrode
PHTS-200	7	Replacement Test Solution (Calcium Chloride) for stony ground soil
PHA-4	5	4.00 pH Buffer Solution 475 ml bottle
PHA-7	5	7.00 pH Buffer Solution 475 ml bottle

Comes complete with portable waterproof pH meter, pH electrode, ground auger, beaker, soil preparation solution, pH 4 & 7 cal. solutions, batteries, and rugged carrying case. **Ordering Example: PHH-200, soil pH test kit, \$320.**

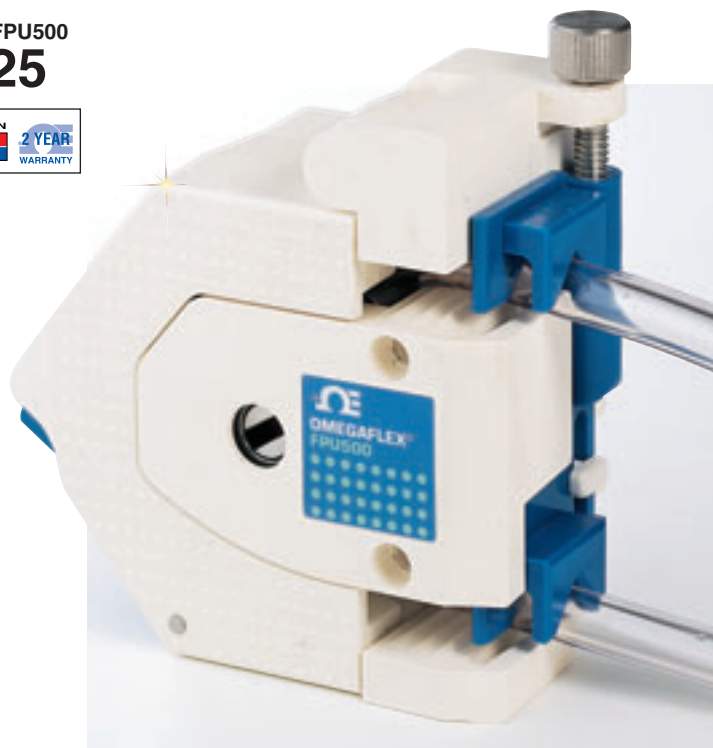


## OMEGAFLEX® Peristaltic Pump

- ✓ Stainless Steel Rotor Assembly
- ✓ Ideal for Use in Sterile, Corrosive, or General Operating Environments
- ✓ Flowrates from 1.0 to 2280 mL/Min (36 GPH)
- ✓ Mounts Directly onto OMEGAFLEX® Motor or Compatible Pump Motor
- ✓ Easily Stackable Mounting for Multichannel Pumping
- ✓ Three-Roller Geometry Reduces Pulsation and Improves Priming
- ✓ Polysulfone Housing for Durability and Chemical Resistance

Model FPU500

**\$125**



The FPU500 Series peristaltic pumps from OMEGA offer exceptional simplicity, ease of use, and variable flow capability.

A motor turns the pump's rollers, which squeeze fluid through precision-bore tubing in a wave-like motion. The fluid does not come into contact with the pump; only the outside wall of the tubing does. This makes these pumps ideal for use in sterile, corrosive, or general fluid flow operating environments.

The pump is self-priming and non-siphoning. When one section of the tube fatigues, simply move the tube along to an unused section and continue pumping. No tools are required to load the tube. A precision-molded tubing cavity provides the proper occlusion for the recommended tubing. A tube clamp holds the tubing securely in place. Tubing is easily changed without removing the pump.

One pump can be used for many different applications, or you can mount two pumps onto the motor. The pumps work with a wide variety of OMEGAFLEX® plastic tubing. Vinyl, Viton®, Tygon, silicone, Santoprene, and Norprene tubing can be purchased in a broad range of sizes. The standard rotor assembly is made of stainless steel.

The FPU500 pump can be purchased with an optional adaptor plate that can be used to mount the pump to a motor other than the FPU5-MT pump motor. The pump comes standard with 2 short mounting screws, used to mount one pump at a time. If you need to stack two pumps, order long mounting screws.

### Specifications:

**Maximum Back Pressure:** 20 psi  
**Maximum RPM to Prime:** 100 RPM  
**Tube Wall:** 1.6 mm (1/16")  
**Fluid Temperature Range:** -50 to 300°F (-46 to 149°C)  
**Dimensions, Pump:** 102 H x 102 W x 57 mm D (4 x 4 x 2 1/4")  
**Optional Mounting Plate:** 76 H x 64 W x 3.2 mm D (3 x 2 1/2 x 1/8")  
**Weight, Pump:** 408 g (14.4 oz)  
**Optional Mounting Plate:** 91 g (32 oz)  
**Maximum Tubing Size:** 8 mm (5/16")  
**Maximum Tube Durometer:** 65 Shore A

Tube Wall (in.)	Tubing Size (in.)	mL/Rev.	Maximum Flowrate @ 600 RPM, mL/min
1/16	1/32	0.05	30
1/16	1/16	0.22	132
1/16	1/8	0.9	540
1/16	3/16	1.9	1140
1/16	1/4	3.0	1800
1/16	5/16	3.8	2280

FPU5-MT-110 pump motor shown with two FPU500 pumps.



## Changing Tubing Is a Snap! Just Follow These Four Easy Steps:

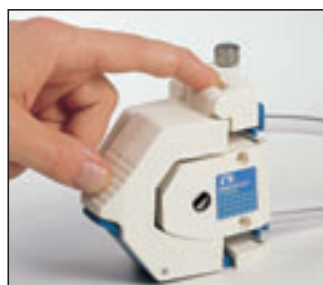
**Step 1: Snap Open with Easy Push-Button Release**



**Step 2: Loop Tubing Over Rollers. No Need to Thread!**

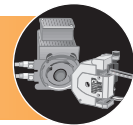


**Step 3: Push to Close**



**Step 4: Tighten Screw to Secure Tubing**





## OMEGAFLEX® Pump Motor



FPU5-MT-110 pump motor shown with two FPU500 pumps, \$975 +125 + 125 = \$1225.

Shown smaller than actual size.

- ✓ Digital Display of Flowrate, RPM, Total Volume, Fluid Temperature (°C or °F), Flow Duration, or Tube ID
- ✓ Flow Rate 1.0 to 2280 mL/Min (10 to 600 RPM) Reversible
- ✓ Easy-to-Read Display
- ✓ Rear Panel Type K SMP Female Thermocouple Input
- ✓ Tachometer Feedback, ±0.5% Speed Control
- ✓ Accepts Two Pumps, One on Each Side or Two Stacked Together
- ✓ Membrane Keypad for Easy Calibration
- ✓ Remote Control Options
  - Aux. In: Remote Start/Stop
  - Aux. Out: Remote Monitor
- ✓ Built-In Electronic Braking and Reversing for Fast Stops and Directional Changes
- ✓ Accepts Metric or English Tube Sizes
- ✓ Displays Information in English, French, Spanish, German, or Italian

The OMEGAFLEX® FPU5-MT pump motor offers microprocessor control and a digital display, and is designed to be fully compatible with OMEGA's FPU500 pump. No mounting plate is needed, just two mounting screws. A 1/8 HP (75 W) motor provides flowrates of up to 2280 mL/minute.

The user enters values and controls all operations through a convenient membrane keypad. A dot matrix LCD provides for easy viewing. Calibrating the unit is easy with the user-friendly control software. Simply select a tubing size and the desired flowrate, and the pump motor locks in the required RPM. Select nominal calibration values stored in ROM (read only memory) or calibrate via gravimetric or flowmeter measurements. Fluid temperature may be displayed (using an optional thermocouple probe). The last flow settings are stored in memory when the drives are shut off.

Model FPU5-MT-110 (110 Vac) Model FPU5-MT-220 (220 Vac)

**\$975**



### Specifications

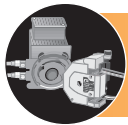
**Motor:** Reversible, 1/8 HP (75 W), 90 Vdc  
**Display:** 16-Character dot matrix LCD, 9 mm (3/8") high characters  
**Power:** 90 to 130 Vac, 1.5 A; 190 to 260 Vac, 0.8 A  
**Line Cord:** 1.8 m (6') with U.S. standard plug on 115 Vac units; European plug on 230 Vac units  
**Housing:** Painted sheet metal with rubber feet; units are stackable  
**Dimensions:** 152 H x 254 W x 254 mm D (6 x 10 x 10")  
**Weight:** 8.2 kg (18 lb)

**IN STOCK FOR FAST DELIVERY!**

### To Order (Specify Model Number)

Model No.	Price	Description
FPU500	\$125	Peristaltic pump
FPU5-MT-110	975	Pump motor (110 VAC)
FPU5-MT-220	975	Pump motor (220 VAC)
<b>Accessories</b>		
FPU500-AP	30	Adapter plate
FPU500-LMS	5	Long mounting screws (2)
FPU500-SMS	5	Short mounting screws (2)
FPU500-RA	75	Replacement rotor assembly

**Ordering Example:** FPU5-MT-110, pump motor \$975, FPU500, peristaltic pump, \$125, \$975+ \$125 = \$1100.



## CHEMICAL METERING PUMPS

PHP-600 Series

**\$225**  
Basic Unit



- ✓ Flow Rates from 1.5 to 18.3 Liters per Hour
- ✓ Simple Operation
- ✓ Easily Mounted

### VERSATILITY OF DESIGN

The PHP-600 series pumps have been designed to meet the ever-changing needs of industry. To accommodate diverse applications, the pumps can be easily mounted anywhere in your plant with a broad, flat base and mounting holes for tank, shelf or floor mounting (horizontal). The rear of the pump housing also provides mounting holes to facilitate vertical mounting; wall, tank or machine. With the pump valve assembly and unit controls both located on the front of the pump, there is never a problem with installation or flow adjustments.

### SIMPLE OPERATION

The PHP-600 series pumps are equipped with a single control for pump output. The external Flow Rate Control (potentiometer) on the face of the pump allows you to adjust the percentage of flow from 0 to 100% of the pump's rated capacity. This feature eliminates the need to worry about stroke lengths and power settings. An LED indicator lights up each time a stroke begins. This allows the user to assess the stroke rate from a distance.

### HIGH QUALITY MATERIALS

The PHP-600 series pumps have been manufactured with the highest level of mechanical precision from materials chosen for their inherent ability to resist the effects of most aggressive chemicals. When you select a PHP-600 series pump you are eliminating the time consuming effort involved in picking the right material for your application. The PHP-600 series pumps are supplied with the highest quality material as standard equipment, not optional. The diaphragm utilizes one-piece construction of Teflon<sup>®</sup>, which unlike conventional laminated diaphragms will stand up to the test of time and wear. Ball valves are constructed in glass. The pump head, and O-rings are all made of Viton<sup>®</sup>, Teflon<sup>®</sup> or Kynar<sup>®</sup>, which offer unsurpassed resistance to the chemicals in your industry.



PHP-601 shown smaller than actual size.

### RUGGED DESIGN

The PHP-600 series pumps are completely sealed during assembly and offer IP65 protection against splashes and spills providing excellent protection even in hostile environments. The fiber-reinforced polypropylene housing stands up to most aggressive chemicals while offering superior strength under tough industrial conditions.

### RELIABILITY THROUGH SIMPLICITY

The PHP-600 series positive displacement solenoid driven pumps use a minimum number of moving parts, therefore reducing the chance of mechanical failure. Part wear and oiling associated with motor driven pumps (ball-bearings, gear drives and cams) are not present in these pumps. The PHP-600 series pumps are more accurate than standard pumps with the positive displacement design ensuring each stroke is identical to the strokes before and after it, thus keeping the flow rate constant.

### THE PHP-600 SERIES PUMPS

A wide range of The PHP-600 series pumps with different dosing capacities is available for your specific dosing needs. Each pump is supplied with discharge and suction valves. Polyethylene tubing, injection fittings, ceramic weights and replacement parts are also available.

### Specifications:

**Power Supply:** 110/115V 50/60 Hz  
220/240V 50/60 Hz (optional)

**Dimensions:** 165 H x 194 W x 121 D mm  
(6.5 x 7.6 x 4.8")

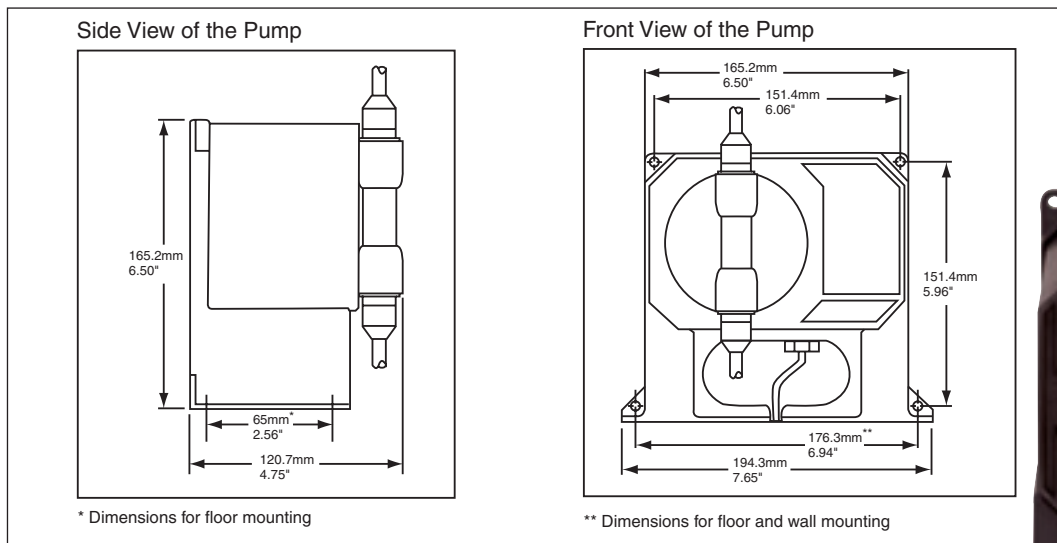
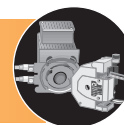
**Weight:** Approx. 3 kg (6.6 lb)

**Pump Casing:**  
Fiber-reinforced polypropylene

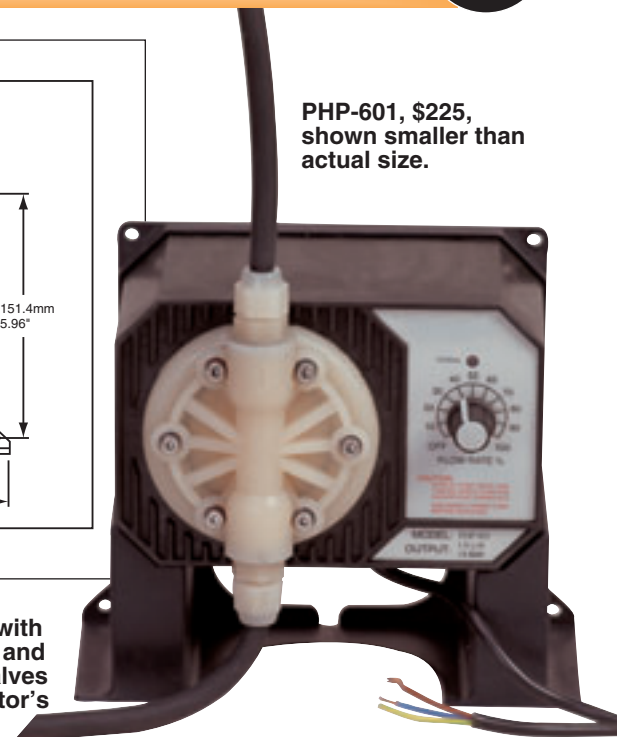
**Max. Absorbed:** Approx. 200W

**Power Protection:** IP65

**Environment:** from 0 to 50°C  
(32 to 122°F); max RH  
95% non-condensing



PHP-601, \$225, shown smaller than actual size.



Comes complete with discharge and suction valves and operator's manual.

MOST POPULAR MODELS HIGHLIGHTED!

**Fittings:** Polyethylene 5 x 8 mm tubing, 3/8" gas pipeline injection fitting  
**Pump Head:** Pump head in Kynar, diaphragm and valve seats in Teflon®  
 Glass Ball Valves and O-rings in Viton®  
**Self-Priming:** Max. self-priming height 1.5 m (5')

To Order (Specify Model No.)						
Model No.	Price	Max Capacity		Rated Pressure		Strokes per minute
		LPH	GPH	PSI	BAR	
<b>Small Diaphragm</b>						
PHP-601	\$225	1.5	0.4	188.5	13.0	120
PHP-602	225	2.9	0.8	116.0	8.0	120
PHP-603	235	5.0	1.3	101.5	7.0	120
<b>Large Diaphragm</b>						
PHP-604	255	7.6	2.0	43.5	3.0	120
PHP-605	260	10.8	2.9	43.5	3.0	120
PHP-606	265	15.2	4.0	14.5	1.0	120
PHP-607	299	18.3	4.8	7.3	0.5	120

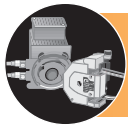
### Accessories

Model No.	Price	Description (See accessory page for more details, page 54)
PHP-600-PHK	\$70	Kynar pumphead, Teflon coated O-ring and 6 screws and washers
PHP-600-DVA	25	Spare discharge valve assembly, complete with a Viton O-ring, glass valve ball, the valve spacer and seat, head nipple and the tube nut to secure the assembled parts
PHP-600-SVA	25	Spare suction valve assembly, complete with a Viton O-ring, glass valve ball, the valve spacer and seat, head nipple and the tube nut to secure the assembled parts.
PHP-600-IVA	23	Injection valve assembly, complete with and injection nipple, Teflon® coated spring, glass valve ball and a valve assembly.
PHP-600-FVA	20	Foot valve assembly contains a filter with a filter holder, and a valve assembly
PHP-600-CW	25	4 x ceramic weight

Comes complete with discharge and suction valves and operator's manual.

Add "-220VAC" to model number for 220/240V operation.

Ordering Example: PHP-601, chemical metering pump, \$225.



## pH or ORP CONTROLLER & PUMP

- ✓ pH or ORP Controller and Dosing Pump in One Compact Unit
- ✓  $\pm 0.01$  pH /  $\pm 5$  mV Accuracy with Unbeatable Performance
- ✓ Isolated 4 to 20 mA Recorder Output
- ✓ Proportional Dosing Slows the Pump Down When the Measured pH or ORP Level Approaches the Set Value Which Ensures Precise Dosage and Avoids Costly Waste of Chemicals Due to Overdosage
- ✓ Alarm Contact is Activated Whenever the pH or ORP Value Varies by More than 2 pH or 200 mV units from the Setpoint.
- ✓ Auxiliary Contacts Allow the User to Attach a Mixer or Priming Pump that is Activated only When the Pump is Dosing
- ✓ Kynar®, Viton® and Teflon® Materials Are Used for All Parts that Come into Contact with Liquid

### TWO ADVANCED INSTRUMENTS IN ONE

The PHP-700 series pumps combine the powerful PHP-600 series dosing pumps with the state-of-the-art controllers. These unique products were developed for measuring and controlling pH or ORP and the regulated dosing of various chemicals. The latest innovation eliminates the need for multiple instruments by combining two instruments into one. No more complicated installations, wiring, and compatibility problems. This compact system features accurate regulation, proportional dosing, alarm and recorder signals and much more all in one unit.

### EASY INSTALLATION

Designed with mounting holes in the rugged base, the PHP-700 series pump/controllers are simple to install. There is no need for any additional hardware. All of the controls and pump assemblies are conveniently located on the front of the unit. If the operator must access the pump head or control panel for any reason, there is no need to dismount the unit.

### RUGGED CONSTRUCTION

The PHP-700 series pump/controllers are housed in rugged, fiber-reinforced polypropylene casings. They are IP65 rated, preventing ingress of liquids. The material used for the housing resists corrosion caused by most chemicals, protecting the unit from hazardous spills and splashes.

### SUPERIOR MATERIALS

The PHP-700 series pumps use Kynar®, Viton® and Teflon® materials for all components in contact with the chemicals



1 YEAR WARRANTY CE

PHP-700 Series  
\$660  
Basic Unit

PHP-701, \$660 Shown with PHE-1411 \$60, see page 10  
Electrode Sold Separately.  
All Products Shown Smaller than Actual Size.

Optional PHE-1411, laboratory electrode, \$60, see page 10.

being dosed. These materials have properties that enable them to resist even the most corrosive chemicals in the industry. The choice of material makes the pump more versatile, allowing it to be used to handle a wider variety of reagents.

### SIMPLE PUMP ACTION

A positive displacement solenoid with few moving parts makes PHP-700 series pumps more reliable than motor driven pumps. With no rotating parts, gears or cams, part wear and oiling associated with motor driven pumps is eliminated, drastically reducing any chance of mechanical failure.

### PROPORTIONAL DOSING

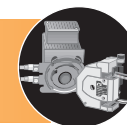
The PHP-700 series controller/pump

strokes at full capacity when the measured value deviates by more than 1.5 pH or 150 mV from the set value. A proportional control slows down the stroke rate as the measured value approaches the user-selectable value, avoiding over-dosage of chemicals. This feature makes the pump's dosing more accurate, saves chemicals and eliminates unnecessary and costly corrections of your processes, especially with slow reacting chemicals.

### ISOLATED RECORDER OUTPUT

To enhance troubleshooting and provide





the user with the ability to record data while monitoring, the PHP-700 series controller/pumps provide for a recorder output. By simply attaching a recorder to the instrument's 4 to 20 mA output contacts, conveniently located on the front panel, you can obtain a hard copy of the results on demand.

### ALARM OUTPUT

When monitoring and controlling pH and ORP levels in a process, it is very important that any potential problem will not go unattended. The units incorporate an alarm system that will alert the user if the reaction is not within certain guidelines. The alarm of the PHP-700 series will be activated if the measured pH value is 2 pH units lower than the setpoint (if dosing acid, this indicates overdosage, a common symptom of siphoning). The alarm will also activate if the value is 2 pH higher than the setpoint (if dosing acid, this is an indication of insufficient dosage, a common symptom of the lack of reagent). The alarm will activate if the mV value is 200mV lower than the setpoint (if dosing reducing chemicals, this indicates overdosage). The alarm will also activate if the value is 200mV higher than the setpoint (if dosing reducing chemicals, this is an indication of lack of reagent).

### AUXILIARY DOSING CONTACTS

The auxiliary dosing contacts of the units are closed whenever the pump is dosing. This solution offers considerable advantages, especially for small plants, where these pumps need to be the only equipment left running. This will spare

other equipment such as mixers, priming pumps etc. With this feature activated, a mixer can be automatically started, when the pump is dosing.

### Specifications:

**Power Supply:** 110/115V 50/60 Hz ±15% (40W)

220/240V 50/60 Hz ±15% (40W)(optional)

**Range:** 0.00 to 14.00 pH;  
0 to ±999 mV

**Resolution:** 0.01 pH; 1 mV

**Accuracy:** ±0.01 pH; ±5 mV

**Input:** High impedance 1012 Ohm

**Dosage:** Proportional; acid or base; oxidizing or reducing. User selectable

**Dosing Contact:** Isolated, 2A, Max. 240V, resistive load, 1,000,000 strokes

**Alarm Contact:** Isolated, 2A, Max. 240V, resistive load, 1,000,000 strokes

**Calibration:** Offset: ±1 pH by offset trimmer; Slope: 85 to 115% by slope trimmer

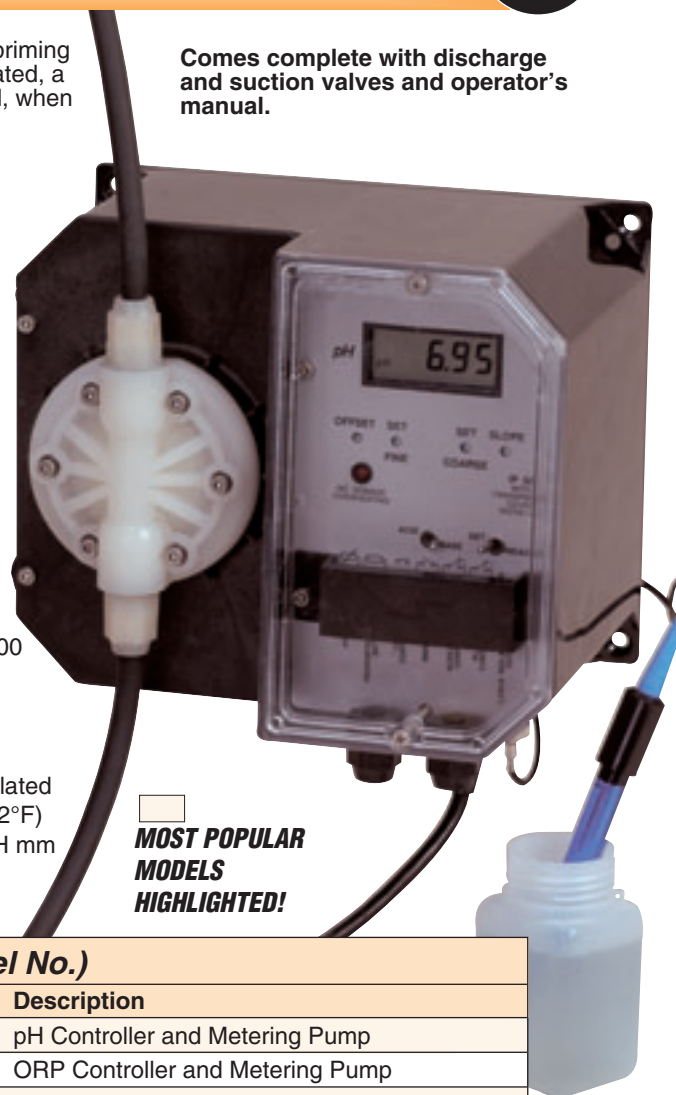
**Recorder Output:** 4 to 20 mA, isolated

**Environment:** 0 to 50°C (32 to 122°F)

**Dimensions:** 181L x 221W x 142H mm (7.1 x 8.7 x 5.6")

**Weight:** 11 lb (Approx. 5 Kg)

**Comes complete with discharge and suction valves and operator's manual.**



**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model No.)

Model No.	Price	Description
PHP-701	\$660	pH Controller and Metering Pump
PHP-702	660	ORP Controller and Metering Pump
PHE-7351-15	115	Industrial Electrode for In-Line or Submersion
PHA-4	5	4.01 pH Buffer Solution 475 ml bottle
PHA-7	5	7.01 pH Buffer Solution 475 ml bottle
PHA-10	5	10.01 pH Buffer Solution 475 ml bottle
ORE-6510	137	ORP Submersible Electrode
PHEH-65-10	44	Required Mounting Assembly for ORE-6510

Maximum Capacity			
Flow		Pressure	
PSI	BAR	GPH	LPH
14.5	1.0	3.1	11.7
29.0	2.0	2.7	10.1
58.0	4.0	2.1	7.8

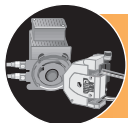
### Accessories

Model No.	Price	Description (See accessory page for more details, page 54)
PHP-600-PHK	\$70	Kynar pumphead, Teflon coated O-ring and 6 screws and washers
PHP-600-DVA	25	Spare discharge valve assembly, complete with a Viton® O-ring, glass valve ball, the valve spacer and seat, head nipple and the tube nut to secure the assembled parts
PHP-600-SVA	25	Spare suction valve assembly, complete with a Viton® O-ring, glass valve ball, the valve spacer and seat, head nipple and the tube nut to secure the assembled parts.
PHP-600-IVA	23	Injection valve assembly, complete with and injection nipple, Teflon coated spring, glass valve ball and a valve assembly.
PHP-600-FVA	20	Foot valve assembly contains a filter with a filter holder, and a valve assembly
PHP-600-CW	25	4 x ceramic weight

Comes complete with discharge and suction valves and operator's manual.

Add "-220VAC" to model number for 220/240V operation.

**Ordering Example:** PHP-701, controller and chemical metering pump, PHE-7351-15, pH electrode, PHA-4, 4.01 pH buffer, PHA-7, 7.01 pH buffer, \$660 + 115+ 5 + 5 = \$785.



## Pump Accessories for PHP-600 and PHP-700 Series



PHP-600-PHK  
\$70



PHP-600-IVA  
\$23



PHP-600-FVA  
\$20



PHP-600-SVA  
\$25



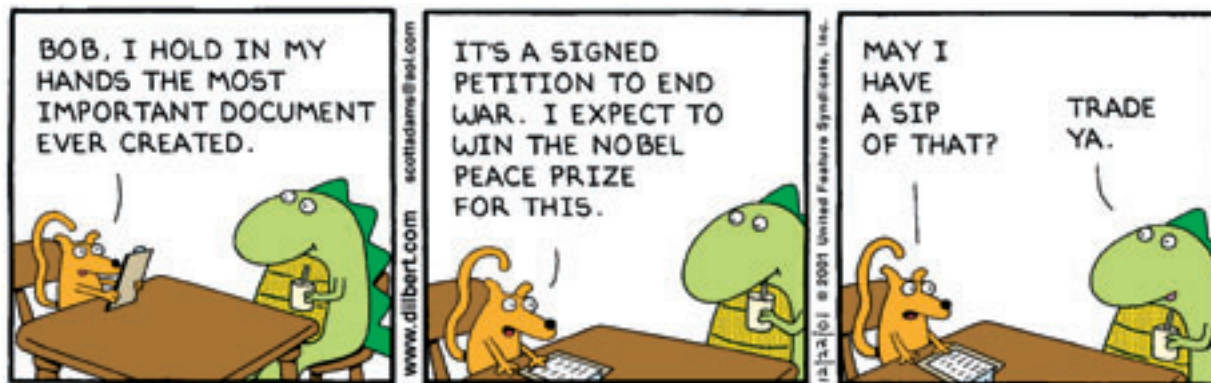
PHP-600-CW  
\$25



PHP-600-DVA  
\$25

### Accessories

Model No.	Price	Description
PHP-600-PHK	\$70	Kynar pumphead, Teflon coated O-ring and 6 screws and washers
PHP-600-DVA	25	Spare discharge valve assembly, complete with a Viton O-ring, glass valve ball, the valve spacer and seat, head nipple and the tube nut to secure the assembled parts
PHP-600-SVA	25	Spare suction valve assembly, complete with a Viton O-ring, glass valve ball, the valve spacer and seat, head nipple and the tube nut to secure the assembled parts.
PHP-600-IVA	23	Injection valve assembly, complete with and injection nipple, Teflon <sup>®</sup> coated spring, glass valve ball and a valve assembly.
PHP-600-FVA	20	Foot valve assembly contains a filter with a filter holder, and a valve assembly
PHP-600-CW	25	4 x ceramic weight



One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

12/22/01 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001031



www.omega.com • e-mail: info@omega.com



One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

01/01/02 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001032



www.omega.com • e-mail: info@omega.com



One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

01/02/02 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001033



15

Collection Series #15-001034



01/03/02 DILBERT © United Feature Syndicate, Inc.

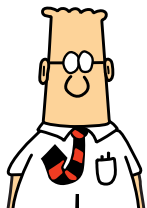
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001035



01/04/02 DILBERT © United Feature Syndicate, Inc.

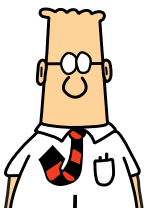
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001036



01/05/02 DILBERT © United Feature Syndicate, Inc.

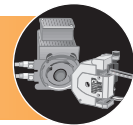
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



D12

For Sales and Service, Call Toll-Free: 1-877-82-66342 U.S.A. and Canada

Sales: FAX (Toll-Free) 1-877-FAX-OMEGA 24 HOURS



## FPUD150 Series Economical Drum Pumps



FPUD150  
**\$250**  
 Basic Model

- ✓ Very Economical
- ✓ Corrosion-Resistant Polypropylene Tube
- ✓ Portable and Lightweight
- ✓ Intermittent Duty
- ✓ Rugged Construction for Industrial Use
- ✓ Push-Button Operation
- ✓ Splashproof Motor

The new FPUD150 Series drum pump is both labor and cost efficient. It is the best value drum pump on the market. Designed to replace hand pumps or awkward air-operated diaphragm pumps, it is extremely lightweight and easy to handle. The combination of corrosion-resistant polypropylene tubing and its electric motor makes it a perfect choice for intermittent duty chemical transfer applications.

### Specifications:

**Maximum fluid specific gravity:** 1.4  
**Maximum Temperature:** 49°C (120°F)  
 23 l/min (6 gpm) maximum flow rate  
**Maximum Viscosity:** 150 centistokes  
**Maximum Head:** 3 m (10 ft)



### Tube Specifications

  **MOST POPULAR MODELS HIGHLIGHTED!**

Model No.	Price	Material	Tube Diameter		Length		Seal	Shaft	Internals	Hose Size		Wt. kg (lb)
			mm	in	cm	in				in	mm	
FPUD1-P27	\$100	Polypropylene	25	1	69	27	Graphite-filled Teflon®	316 SS	Polypropylene, Teflon®, Viton®, PVDF	19	¾	.9 (2)
FPUD1-P40	125				102	40						1.4 (3)

### Motor Specifications

Model No.	Price	Type	Certifications	Electrical Requirements	Output	RPM	Wt. kg (lb)
FPUD151	\$150	IP44, double insulated with 2.7 m (9') cord & 2-prong plug	CE	220 to 240 Vac/50-60 Hz	100 W	10,000	1.4 (3)
FPUD152	160	Encl. 3 double insulated with 2.7 m (9') cord and plug		120 Vac/50-60 Hz	½ HP	10,000	1.4 (3)

Ordering Example: FPUD1-P40, drum pump, and FPUD151 motor, \$125 + 150 = \$275



# TUBING & FITTINGS

## OMEGAFLEX® Santoprene Flexible Rubber Tubing

Santoprene thermoplastic rubber tubing is offered with Shore A hardness rating of 55A (TYSP5), 64A (TYSP6), and 73A (TYSP7). The tubing resists fatigue and exposure to ozone and ultraviolet radiation.

- **Broad Operating Temp. Range:**  
-59 to 135°C (-75 to 275°F)
- **Available in Shore A Hardnesses of**  
55, 64 and 73
- **Suitable for Many Peristaltic Pumps**



TYSP Series

### Specifications

	TYSP5	TYSP6	TYSP7
Hardness, Shore A	55A	64A	73A
Specific Gravity	0.97	0.97	0.97
Tensile Strength, psi	640	950	1,100
Elongation at Break, %	330	400	410
Heat Distortion Temp.	135°C (275°F)	135°C (275°F)	135°C (275°F)
Low Temp. Flexibility	Below 60°C (140°F)		

TYSP Series  
**\$8**  
Basic 50' Spool



**IN STOCK FOR FAST DELIVERY!**

### To Order, (Specify Model Number)

#### 1/16" to 3/4" ID TUBING

Regular Tubing				FDA Approved Tubing				Dimensions		
Model No.	55A	64A	73A	Model No.	55A	64A	73A	ID, in x OD, in	Wall, in	
TYSP(*)-316116-50	\$8	\$9	\$10	TYSP(*)F-316116-50	\$10	\$11	\$12	1/16 3/16	1/16	
TYSP(*)-1418-50	10	12	14	TYSP(*)F-1418-50	12	15	17	1/8 1/4	1/16	
TYSP(*)-3818-50	19	23	27	TYSP(*)F-3818-50	23	28	32	1/8 3/8	1/8	
TYSP(*)-516316-50	9	11	13	TYSP(*)F-516316-50	11	13	16	3/16 5/16	1/16	
TYSP(*)-38316-50	18	22	26	TYSP(*)F-38316-50	22	27	31	3/16 3/8	3/32	
TYSP(*)-916316-50	48	60	72	TYSP(*)F-916316-50	58	72	86	3/16 9/16	3/16	
TYSP(*)-3814-50	14	17	20	TYSP(*)F-3814-50	17	20	24	1/4 3/8	1/16	
TYSP(*)-71614-50	21	27	33	TYSP(*)F-71614-50	26	32	40	1/4 7/16	3/32	
TYSP(*)-1214-50	32	40	48	TYSP(*)F-1214-50	38	48	58	1/4 1/2	1/8	
TYSP(*)-5814-50	64	70	84	TYSP(*)F-5814-50	77	84	101	1/4 5/8	3/16	
TYSP(*)-716516-50	16	20	24	TYSP(*)F-716516-50	17	24	29	5/16 7/16	1/16	
TYSP(*)-12316-50	30	39	39	TYSP(*)F-12516-50	32	34	36	3/16 1/2	3/32	
TYSP(*)-18116-50	7	8	9	TYSP(*)F-1316516-50	9	10	11	1/16 1/8	1/4	
TYSP(*)-1238-50	18	23	28	TYSP(*)F-1238-50	22	28	34	3/8 1/2	1/16	
TYSP(*)-91638-50	29	37	45	TYSP(*)F-91638-50	35	44	54	3/8 9/16	3/32	
TYSP(*)-5838-50	42	53	64	TYSP(*)F-5838-50	50	64	77	3/8 5/8	1/8	
TYSP(*)-138-50	148	184	220	TYSP(*)F-138-50	178	221	264	3/8 1	5/16	
TYSP(*)-916716-50	25	32	39	TYSP(*)F-916716-50	30	38	47	7/16 9/16	1/16	
TYSP(*)-5812-50	24	30	36	TYSP(*)F-5812-50	29	36	43	1/2 5/8	1/16	
TYSP(*)-111612-50	39	48	57	TYSP(*)F-111612-50	47	58	68	1/2 11/16	3/32	
TYSP(*)-3412-50	54	67	80	TYSP(*)F-3412-50	65	80	96	1/2 3/4	1/8	
TYSP(*)-7858-50	64	80	96	TYSP(*)F-7858-50	77	96	115	5/8 7/8	1/8	
TYSP(*)-134-50	74	93	112	TYSP(*)F-134-50	89	112	134	3/4 1	1/8	

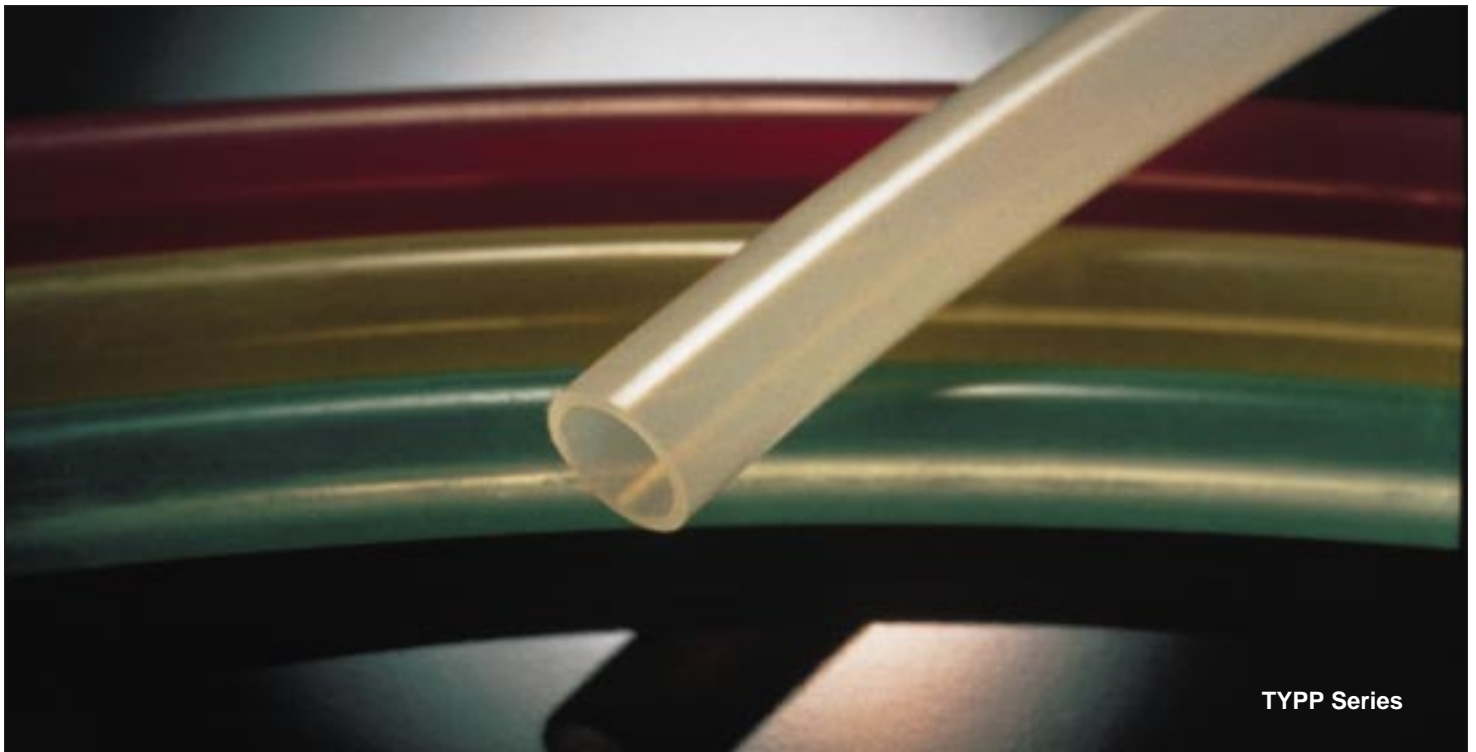
\* Specify durometer: 5 (for 55A), 6 (for 64A), or 7 (for 73A).

Ordering Example: TYSP5-38316-50, specifies a 50' spool, 55A durometer hardness, 3/16" ID x 3/8" OD, 3/32 wall, \$18



## OMEGAFLEX® Polypropylene Tubing

TYPP Series  
**\$19**  
Basic 50' Spool



TYPP Series

This is a tough, heat-resistant tubing, ideal for the transfer of hot liquids or gases. It is recommended for low pressure systems and uses where higher temperatures and pressures are encountered. It has good compatibility with acids and alkalis.

### Specifications:

**Operating Temperature Range:**  
-40 to 121°C (-40 to 250°F)  
**Durometer, nom. (Shore) 15 secs:** 75 (D)  
**Color:** Translucent  
**Specific Gravity:** 0.90  
**Tensile Strength (psig):** 3700  
**Ultimate Elongation:** 200%

### Minimum Bend Radius:

ten times tube O.D.  
*Specifications given are typical and are meant only as a guide. Field testing is required to find the actual operating specifications in a given application.*

**MOST POPULAR MODELS HIGHLIGHTED!**

To Order (Specify Model Number)							
Model No.	Price	Std Length (Ft)	Wall (in)	OD (in)	ID (in)	Working psi @21°C/70°F	Weight/100' kg (lb)
TYPP-1418-100	\$19	100	1/16	1/4	1/8	272	1.4 (3.0)
TYPP-14170-100	19	100	0.04	1/4	0.17	149	0.7 (1.5)
TYPP-516316-100	22	100	1/16	5/16	3/16	196	1.4 (3.0)
TYPP-3814-100	27	100	1/16	3/8	1/4	157	1.4 (3.1)
TYPP-1238-100	32	100	1/16	1/2	3/8	112	2.3 (5.0)
TYPP-5812-100	50	100	1/16	5/8	1/2	87	2.7 (6.0)
TYPP-3458-100	51	100	1/16	3/4	5/8	71	3.2 (7.0)
TYPP-1141-100	147	100	1/8	1 1/4	1	87	6.1 (13.5)
TYPP-178-100	111	100	1/16	1	7/8	52	3.3 (7.3)
TYPP-112114-100	210	100	1/8	1 1/2	1 1/4	71	9.7 (21.3)
TYPP-134112-100	250	100	1/8	1 3/4	1 1/2	60	22.5 (25.2)
TYPP-2134-100	285	100	1/8	2	1 3/4	52	13.2 (29.1)

Ordering Example: TYPP-1418-100, 100 feet of tubing, 1/16" wall, of 1/8" ID x 1/4" OD, \$19

Order Online  
**omega.com**<sup>®</sup>  
Over 100,000 Products Available!

For the complete selection of Tubing & Fittings,  
shop online at [omegaTubing.info](http://omegaTubing.info)



# TUBING & FITTINGS

## Delrin Acetal 1/4" Flow, FT-PLC Series for 1/4" to 3/8" Tubing

Delrin acetal, our most popular coupling material. With 1/4" flow, it offers the widest selection of sizes and configurations for 1/4" to 3/8" plastic tubing.

### FT-PLC Series Features:

- Straight Thru, Single End or Double End Shutoff
- Small Package Size
- Leak Free O-Ring Seal
- Special Configurations Quoted

### Applications:

- Water and air supply lines
- Potable water
- Cooling lines
- Mild chemical handling
- Beverage dispensing



To Order Specify Model Number

## Coupling Bodies 1/4" Flow PIPE THREAD

In stock for fast delivery.



### MALE THREAD

- 1/4" NPT
- 3/8" NPT
- 1/4" BSPT
- 3/8" BSPT

### STRAIGHT THRU MODEL NUMBER

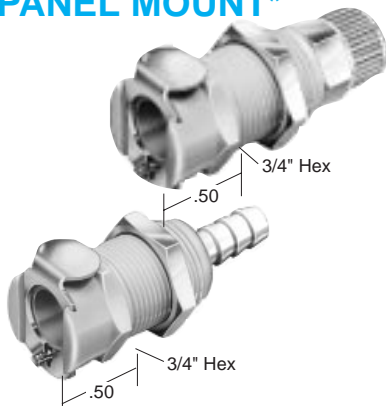
MODEL NUMBER	PRICE
FT-PLC100-04	\$5.31
FT-PLC100-06	5.31
FT-PLC100-04BS	5.31
FT-PLC100-06BS	5.31

### SHUTOFF

### MODEL NUMBER

MODEL NUMBER	PRICE	LENGTH
FT-PLCD100-04	\$5.94	1.15"
FT-PLCD100-06	5.94	1.15"
FT-PLCD100-04BS	5.94	1.15"
FT-PLCD100-06BS	5.94	1.15"

## PANEL MOUNT\*



### Ferruleless Polytube Fitting, PTF†

#### TUBING SIZE OD X ID

TUBING SIZE OD X ID	METRIC EQ MM
1/4" x .170"	6 x 4.3
—	8 x 6
3/8" x .270"	9.5 x 6
—	10 x 8

#### STRAIGHT THRU MODEL NUMBER

MODEL NUMBER	PRICE
FT-PLC120-04	\$10.81
FT-PLC120-M8	11.41
FT-PLC120-06	10.81
FT-PLC120-M10	11.41

#### SHUTOFF MODEL NUMBER

MODEL NUMBER	PRICE	LENGTH
FT-PLCD120-04	\$11.91	1.83"
FT-PLCD120-M8	12.49	1.95"
FT-PLCD120-06	11.91	1.95"
FT-PLCD120-M10	12.49	1.95"

### Hose Barb

TUBING SIZE	METRIC EQ MM	STRAIGHT THRU MODEL NUMBER	PRICE	SHUTOFF MODEL NUMBER	PRICE	LENGTH
1/4" ID	6.4 ID	FT-PLC160-04	\$10.27	FT-PLCD160-04	\$11.53	1.95"
3/16" ID	7.9 ID	FT-PLC160-05	10.76	FT-PLCD160-05	12.08	1.95"
3/8" ID	9.5 ID	FT-PLC160-06	10.27	FT-PLCD160-06	11.53	1.95"

## IN LINE, Streamline Design



### Ferruleless Polytube Fitting, PTF†

#### TUBING SIZE OD X ID

TUBING SIZE OD X ID	METRIC EQ MM
1/4" x .170"	6 x 4.3
—	8 x 6
3/8" x .250"	9.5 x 6
—	10 x 8

#### STRAIGHT THRU MODEL NUMBER

MODEL NUMBER	PRICE
FT-PLC130-04	\$7.98
FT-PLC130-M8	8.72
FT-PLC130-06	8.14
FT-PLC130-M10	8.72

#### SHUTOFF MODEL NUMBER

MODEL NUMBER	PRICE	LENGTH
FT-PLCD130-04	\$8.69	1.82"
FT-PLCD130-M8	9.34	1.95"
FT-PLCD130-06	8.94	1.95"
FT-PLCD130-M10	9.34	1.95"

### Hose Barb

TUBING SIZE	METRIC EQ MM	STRAIGHT THRU MODEL NUMBER	PRICE	SHUTOFF MODEL NUMBER	PRICE	LENGTH
1/4" ID	6.4 ID	FT-PLC170-04	\$4.98	FT-PLCD170-04	\$6.09	1.95"
3/16" ID	7.9 ID	FT-PLC170-05	4.98	FT-PLCD170-05	6.09	1.95"
3/8" ID	9.5 ID	FT-PLC170-06	4.98	FT-PLCD170-06	6.09	1.95"

\*Panel Opening = 1/16" Diameter  
Maximum Panel Thickness = 1/2"  
Minimum Panel Thickness = .020"  
Panel Nuts = 3/16" Hex

† PTF fittings are designed for semi-rigid tubing, i.e. polyethylene, nylon, etc., and polyurethane tubing

Delrin and chrome-plated brass coupling halves interchange.



**NEW**

# TUBING & FITTINGS

Working Pressure: Vacuum to 120 psi, 8.3 Bar  
 Operating Temperature: -40 to 180°F continuous  
 -40 to 82°C continuous  
 Materials: Bodies and Valves: Delrin acetal  
 Internal Spring: 316 Stainless Steel  
 External Springs, Pin, Latch: Stainless Steel  
 Seals: Buna-N; others available  
 Color: Natural White; others available  
 Tubing Sizes: 1/4" thru 3/8" ID  
 1/4" and 3/8" OD  
 6 x 4 mm thru 12 x 8 mm (OD x ID)

**In stock for fast delivery.**

This coordinate measuring system uses OMEGA® couplings to hold complex parts.

## Coupling Inserts 1/4" Flow PIPE THREAD



MALE THREAD		STRAIGHT THRU		SHUTOFF			
		MODEL NUMBER	PRICE	LENGTH	MODEL NUMBER	PRICE	LENGTH
1/4" NPT		FT-PLC240-04	\$1.93	1.25"	FT-PLCD240-04	\$6.06	1.51"
3/8" NPT		FT-PLC240-06	1.93	1.25"	FT-PLCD240-06	6.06	1.40"
1/4" BSPT		FT-PLC240-04BS	1.93	1.25"	FT-PLCD240-04BS	6.06	1.51"
3/8" BSPT		FT-PLC240-06BS	1.93	1.25"	FT-PLCD240-06BS	6.68	1.40"

## PANEL MOUNT\*



### Ferruleless Polytube Fitting, PTF†

TUBING SIZE OD X ID	METRIC EQ MM	STRAIGHT THRU MODEL NUMBER	PRICE	LENGTH	SHUTOFF MODEL NUMBER	PRICE	LENGTH
1/4" x .170"	6 x 4.3	FT-PLC400-04	\$5.97	1.78"	FT-PLCD400-04	\$9.34	1.78"
—	8 x 6	FT-PLC400-M8	6.56	1.91"	FT-PLCD400-M8	9.94	1.91"
3/8" x .250"	9.5 x 6	FT-PLC400-06	5.97	1.91"	FT-PLCD400-06	9.34	1.91"
—	10 x 8	FT-PLC400-M10	6.56	1.91"	FT-PLCD400-M10	9.94	1.91"



### Hose Barb

1/4" ID	6.4 ID	FT-PLC420-04	\$7.99	1.91"	FT-PLCD420-04	\$7.92	1.91"
5/16" ID	7.9 ID	FT-PLC420-05	4.75	1.91"	FT-PLCD420-05	8.30	1.91"
3/8" ID	9.5 ID	FT-PLC420-06	4.55	1.91"	FT-PLCD420-06	8.30	1.91"

## STRAIGHTS



### Ferruleless Polytube Fitting, PTF†

TUBING SIZE OD X ID	METRIC EQ MM	STRAIGHT THRU MODEL NUMBER	PRICE	LENGTH	SHUTOFF MODEL NUMBER	PRICE	LENGTH
1/4" x .170"	6 x 4.3	FT-PLC200-04	\$3.24	1.25"	FT-PLCD200-04	\$6.95	1.75"
—	8 x 6	FT-PLC200-M8	3.82	1.38"	FT-PLCD200-M8	7.53	1.68"
3/8" x .250"	9.5 x 6	FT-PLC200-06	3.24	1.38"	FT-PLCD200-06	6.95	1.68"
—	10 x 8	FT-PLC200-M10	3.82	1.38"	FT-PLCD200-M10	7.53	1.68"



### Hose Barb

1/4" ID	6.4 ID	FT-PLC220-04	\$1.28	1.35"	FT-PLCD220-04	\$5.98	1.86"
5/16" ID	7.9 ID	FT-PLC220-05	1.28	1.35"	FT-PLCD220-05	5.98	1.86"
3/8" ID	9.5 ID	FT-PLC220-06	1.28	1.35"	FT-PLCD220-06	5.98	1.67"

## ELBOWS



TUBING SIZE OD X ID	METRIC EQ MM	STRAIGHT THRU MODEL NUMBER	PRICE	LENGTH	SHUTOFF MODEL NUMBER	PRICE	LENGTH
3/8" x .250"	9.5 x 6	FT-PLC210-06	\$5.60	1.22"	FT-PLCD210-06	\$8.03	1.22"

### Hose Barb

1/4" ID	6.4 ID	FT-PLC230-04	\$4.68	1.10"	FT-PLCD230-04	\$7.53	1.22"
3/8" ID	9.5 ID	FT-PLC230-06	4.68	1.20"	FT-PLCD230-06	7.53	1.22"

Delrin and chrome-plated brass coupling halves interchangeable.

† PTF fittings are designed for semi-rigid tubing, i.e. polyethylene, nylon, etc., and polyurethane tubing

Order Online  
**omega.com**<sup>®</sup>  
 Over 100,000 Products Available!

For the complete selection of Tubing & Fittings,  
 shop online at [omegaTubing.info](http://omegaTubing.info)



# FLOW & LEVEL INSTRUMENTATION

## General-Purpose Air Velocity Transducers



Models with Remote Electronics add "-R" Suffix



FMA-900 Series  
**\$822**  
Basic Unit

FMA-900  
Shown Smaller  
Than Actual Size

Model  
FMA-902-V-R,  
\$852  
Shown smaller  
than actual size

For Compatible Meters  
and Controllers See  
the i Series, Pages 74-75

- 1.5% Accuracy
- Remote Electronics Model Available with 4.6 m (15') Cable
- Each Unit Individually Calibrated
- Durable Fast-Response Platinum Sensors
- Compact Solid-State Electronics
- Directly Monitors True Air Mass Velocity
- Linear 0-5 Vdc or 4-20 mA Output
- 400 msec Response Time
- Economical Insertion Design

The unique FMA-900 air velocity transducer utilizes both a velocity sensor and a temperature sensor to accurately measure air velocity (in SFPM, standard feet per minute). The built-in temperature sensor automatically corrects the flowrate for temperature variations. Both sensors are rugged glass-coated platinum resistance detectors (RTDs). The circuit heats the velocity sensor to a constant temperature differential above ambient temperature and measures the cooling effect of the air flow. This design provides excellent low velocity sensitivity and high accuracy. The FMA-900 also features negligible pressure drop.

To obtain mass flowrate in SCFM (standard cubic feet/minute), the SFPM velocity indicated by the FMA-900 is multiplied by the cross-sectional area of the pipe or duct in square feet. A traverse across the pipe or duct can be performed to determine the mounting location for average velocity indication. The FMA-900 can be mounted in pipes (down to 25 mm [1"] size) with the use of OMEGA® SSLK compression fittings (SSLK-14-14, \$8.50 ea). Teflon® ferrules are required. (model T-FER-1/4, \$40/10 pack).

Each unit is individually calibrated in OMEGA's NIST-traceable wind tunnel.

Suggested power supply; FPW-15, \$75 ea.

### Specifications

**Accuracy:** 1.5% FS @ room temp. Add  $\pm 0.5\%$  of reading from 0 to 50°C (32° to 122°F); add 1% FS below 1000 SFPM

**Repeatability:**  $\pm 0.2\%$  FS

**Initial Stabilization Time in Flow:** 40 sec

### Response Time/After Stabilization:

400 msec to within 63% of final value at room temperature

**Probe:** Aluminum oxide ceramic glass coating, epoxy; probe body 304 SS

**Probe Temperature:** -40 to 121°C (-40 to 250°F)

### Probe Pressure:

150 psig max.

### Electronics Temperature:

0 to 50°C (32 to 122°F), operating;

0 to 70°C (32 to 158°F), storage

**Operating Relative Humidity:** less than 80% RH, without condensation

**Ambient Temp Compensation:** about 5 min for 11°C (20°F) temp change

**Outputs:** 0 to 5 Vdc or 4 to 20 mA

**Voltage Load Resistance:** 250 ohms minimum

**Current Loop Resistance:** 0 ohms min. to 400 ohms max.; 4 wire

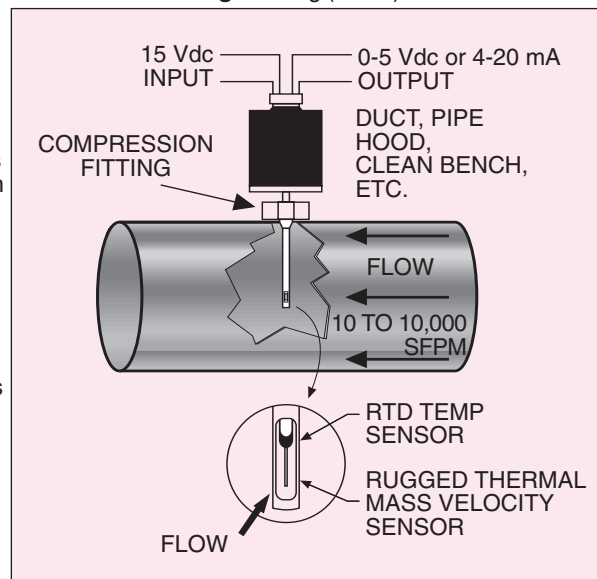
**Power:** 15 to 24 Vdc, 300 mA (0 to 100 and 0 to 200 SFPM only); 15 to 18 Vdc, 300 mA (all other ranges)

**Accessories:** Mating connector pre-wired to 15' shielded cable (with built-in ferrite core) included

### Dimensions:

**Case:** 89 H x 51 W x 31.8 mm D (3.5 H x 2 W x 1.25" D)

**Probe:** 6.35 mm (0.25") O.D., 330 mm (13") length, optional 95.25 mm O.D. (3.75") available  
**Weight:** 160 g (5.6 oz)



Replacement mating connector, Model No. FMA-3CON, \$25.

**IN STOCK FOR FAST DELIVERY!**

### To Order (Specify Model Number)

Model No. 0-5 V Output	Price	Model No. 4-20 mA Output	Price	Range
FMA-900-V	\$822	FMA-900-I	\$882	0-100 SFPM
FMA-901-V	822	FMA-901-I	882	0-200 SFPM
FMA-902-V	822	FMA-902-I	882	0-500 SFPM
FMA-903-V	822	FMA-903-I	882	0-1000 SFPM
FMA-904-V	822	FMA-904-I	882	0-2000 SFPM
FMA-905-V	822	FMA-905-I	882	0-5000 SFPM
FMA-906-V	822	FMA-906-I	882	0-10,000 SFPM

Comes with 4 point certificate of compliance, mating connector pre-wired to 4.7 m (15') shielded cable and complete operator's manual. To order with 95 mm (3.75") probe instead of standard 330 mm (13") probe, add suffix "-S" to model number and add \$30 to price.

To order models with remote electronics add suffix "-R" to model number and \$30 to price.

Ordering Example: FMA-904-I, probe with 4-20 mA output, 0-2000 SFPM range, \$882.

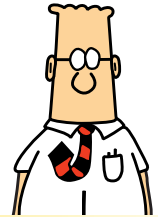


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

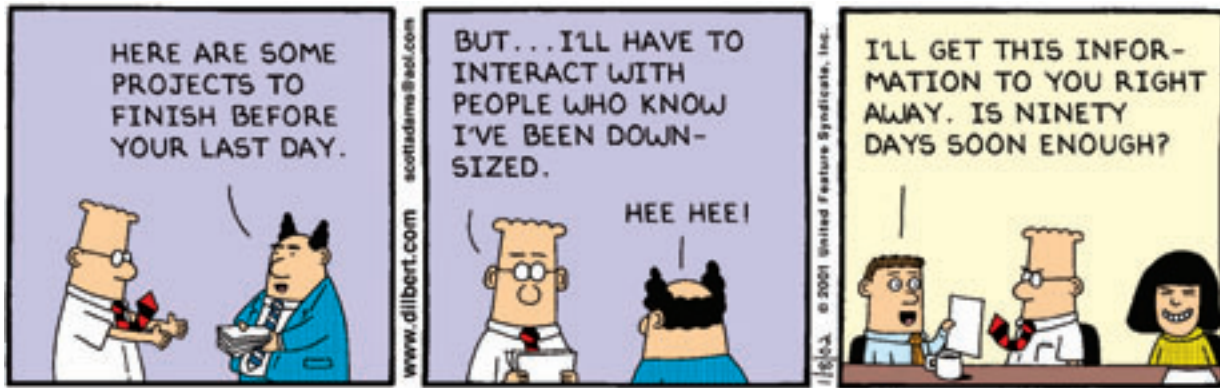
01/07/02 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001037



[www.omega.com](http://www.omega.com) • e-mail: [info@omega.com](mailto:info@omega.com)

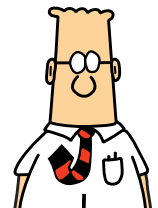


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

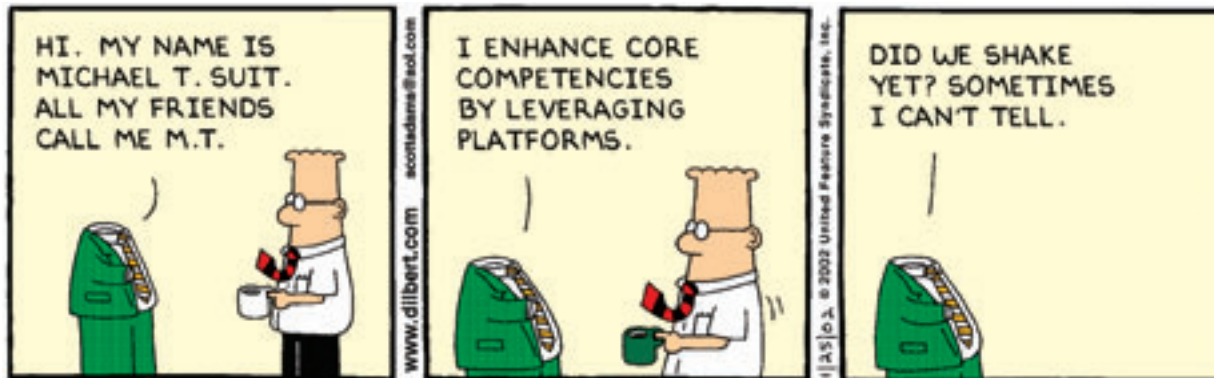
01/08/02 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001038



[www.omega.com](http://www.omega.com) • e-mail: [info@omega.com](mailto:info@omega.com)

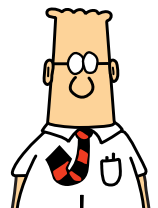


One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

01/25/02 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001039



15

Collection Series #15-001040



02/05/02 DILBERT © United Feature Syndicate, Inc.

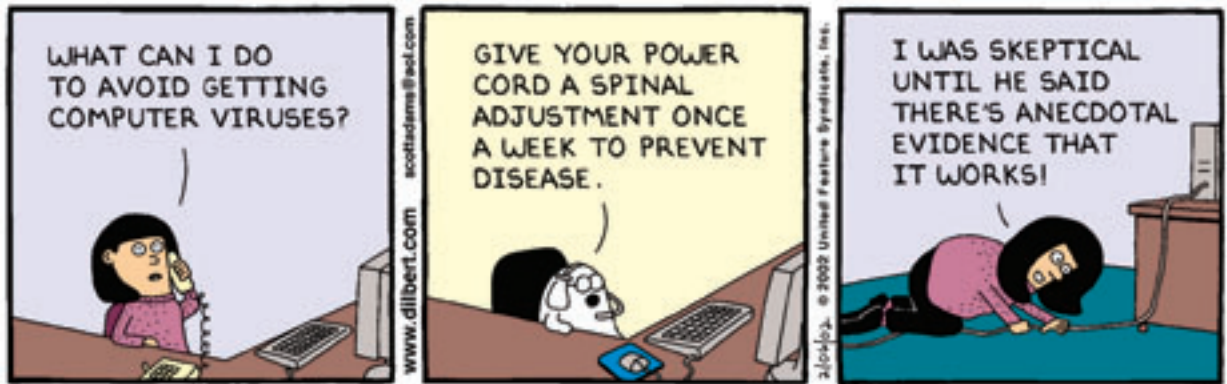
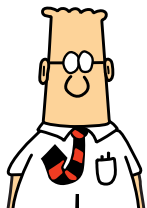
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001041



02/06/02 DILBERT © United Feature Syndicate, Inc.

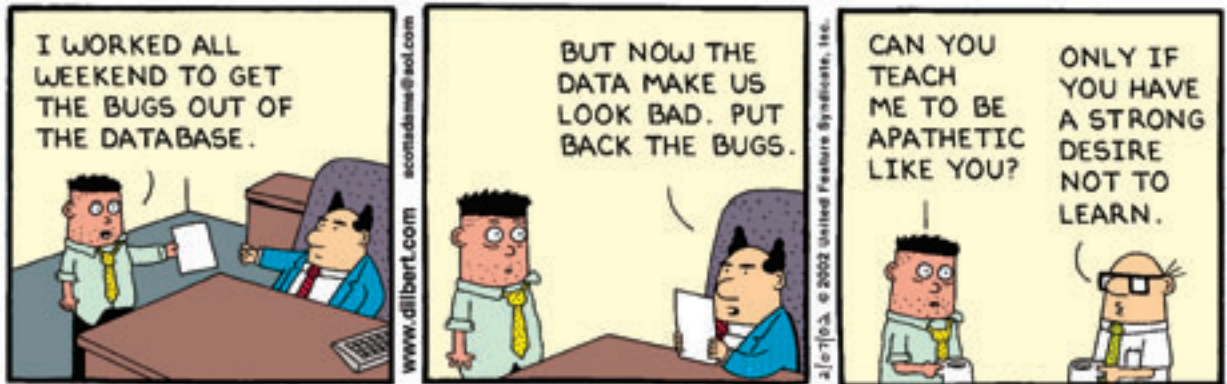
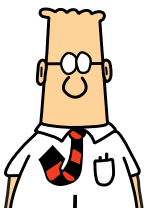
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001042



02/07/02 DILBERT © United Feature Syndicate, Inc.

One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



D14

For Sales and Service, Call Toll-Free: 1-877-82-66342® U.S.A. and Canada

Sales: FAX (Toll-Free) 1-877-FAX-OMEGA(A) 24 HOURS



## Environmental Monitoring Meters Model HHF23 Windspeed, Temperature, Windchill, Relative Humidity, Heat Index and Dew Point



- ✓ Large LCD Display
- ✓ Patented Field Replaceable Impeller, Can Be Installed Without Loss of Calibration
- ✓ Pocket Sized
- ✓ Sapphire Bearings For Long Life
- ✓ Humidity Sensor Field-Replaceable and Field-Recalibrateable

Model HHF23  
**\$179**  
 Basic Unit

The HHF23 is the only handheld instrument for measuring windspeed, temperature, windchill, relative humidity, heat index and dew point temperature, all in one meter. It can track maximum and average wind speeds along with current readings, and it displays windspeed in your choice of knots, meters per second, kilometers per hour, miles per hour, feet per minute or Beaufort force.

The impeller pops out without tools for easy and inexpensive replacement. The capacitive RH sensor is factory calibrated to  $\pm 3\%$  accuracy and can be recalibrated in the field with a humidity chamber. Windchill, heat index and dew point temperatures are automatically calculated using U.S. National Weather Service formulas.

The HHF23 is waterproof, buoyant and comes with a convenient neck lanyard. The battery is easy to replace and provides 300 hours of use. The protective slip-on case prevents damage to the unit.

### Specifications:

#### Wind Functions

**Operating Modes:** Moving 3-second average, maximum 3-second gust since power on (MAX) or average since power on (AVG).

**Display Update:** 1 second

**On-Axis Accuracy:** greater of  $\pm 3\%$  of reading or  $\pm$  least significant digit

**Off-Axis Response:**  $-1\%$  @  $5^\circ$ ,  $-2\%$  @  $10^\circ$ ,  $-3\%$  @  $15^\circ$

**Calibration Drift:**  $<2\%$  after 100 hours use at 7 M/S (~14 KT, 25 KMH, 16 MPH or 1,400 FPM)

**Minimum Speed:** 0.3 M/S (~0.6 KT, 1 KMH, 0.7 MPH or 60 FPM)

**Maximum Speed:** 40 M/S (~78 KT, 144 KMH, 89 MPH or 7,830 FPM)

#### Temperature and Windchill Functions

**Accuracy:**  $\pm 1.0^\circ\text{C}$

**Display Update:** 1 second

**Resolution:** 0.1

#### Relative Humidity Functions

**Accuracy:** Relative humidity  $\pm 3\%$ ; dew point temperature,  $\pm 2^\circ\text{C}$ ; heat index,  $\pm 3^\circ\text{C}$  (Humidity sensor can be field or factory recalibrated)



HHF23 Meter  
U.S. Patented

**Temperature/Windchill Display Update:** 1 second

**Response Time:** 1 minute

**Resolution:** 0.1

#### Other Functions

**Auto Shutdown:** 30 minutes after last key press

**Battery:** User-replaceable CR2032 coin cell battery included. Typical life, 300 hrs

#### Environmental

**Sealing:** Electronics enclosure IP67; water resistant to 1 m (3 ft) buoyant

**Shock:** Drop tested to 2 m (6 ft)

**Operating Temperature:** LCD operational temperature range  $-15$  to  $50^\circ\text{C}$  (5 to  $122^\circ\text{F}$ )

#### Storage Temperature:

Safe storage temperature range  $-20$  to  $80^\circ\text{C}$  ( $-4$  to  $176^\circ\text{F}$ )

#### Physical

**Impeller:** 25 mm (1 in) diameter, sapphire bearings, lightweight; User-replaceable without tools

**Display:** Reflective 3½-digit LCD, 9 mm (0.36") digit height

**Dimensions:** 122 x 42 x 14 mm (4.8 x 1.7 x 0.6"); case, 117 x 46 x 19 mm (4.6 x 1.8 x 0.7"); lanyard, 0.5 m (20")

**Weight:** Unit, 44 g (1.6 oz); case, 23 g (0.8 oz)

**IN STOCK FOR FAST DELIVERY!**

### To Order (Specify Model Number)

Model No.	Price	Description
HHF23	\$179	3½-digit environmental monitor with rigid slip-on cover
<b>Accessory</b>		
Model No.	Price	Description
HHF2R	15	Replacement impeller
HHF20-BATT	3	Replacement battery

**Ordering Example:** HHF23, 3½-digit environmental monitor with rigid slip-on cover, \$179.



## Mass and Volumetric Gas Flow Controllers

- ✓ 13 Gas Select Features: He, O<sub>2</sub>, Neon, N<sub>2</sub>O, N<sub>2</sub>, H<sub>2</sub>, Air, Argon, CO, CO<sub>2</sub>, Methane, Ethane, Propane
- ✓ Pressure, Temperature, Volumetric & Mass Flow Simultaneously Displayed (FMA-2600 Series)
- ✓ Easy Operator Push Button Interface
- ✓ NIST Traceability Optional
- ✓ Full Scale Ranges from 0.5CCM to 1000LPM+
- ✓ Response Time of 100 milliseconds Typical
- ✓ Turndown Ratio of 100:1 Typical
- ✓ Position Insensitive
- ✓ Accuracy of  $\pm 1\%$  Full Scale
- ✓ RS232 Standard

The FMA-2600 and FVL-2600 line of Laminar Flow Controllers utilize a proportional valve coupled to a flowmeter body. Measurements are taken within the laminar region of the flowmeter and the integral PID controller positions the valve according to the user programmed setpoints. These robust, closed-loop devices can accept a 0-5Vdc control set point from external devices. The controllers can also accept an optional RS-232 control input signal, depending on what is preferred by the customer. Independent of the set point voltages, the controllers can be configured for single or dual output signals of the same or different voltages and/or different parameters such as mass flow and temperature or flow and pressure. This is because our mass flow controllers incorporate solid-state Differential, Absolute Pressure and Temperature sensors to determine flow. The result is an easy to use, fast responding meter that is inherently linear and can display or transmit multiple process parameters. With the RS232 digital link, all the process data is available simultaneously as well as remote set point capability. In a serial connection, up to 26 units can be individually addressed. Gas units are available from 500 micro-liters per minute full scale to 1000 liters per minute full scale. (Volumetric meters do not require absolute pressure sensors or discrete temperature sensors and are therefore less expensive. They are commonly used in applications where back pressure is negligible).

### Specifications:

**Accuracy:**  $\pm 1\%$  FS  
**Repeatability:** FMA-2600:  $\pm 0.5\%$  FS FVL-2600:  $\pm 1\%$  FS  
**Turndown Ratio:** 100: 1  
**Control Response Time:** 100 Milliseconds  
**Input Control Signal:** 0-5 Volts dc, RS232



FMA2600 Series  
**\$1545**  
 Basic Unit

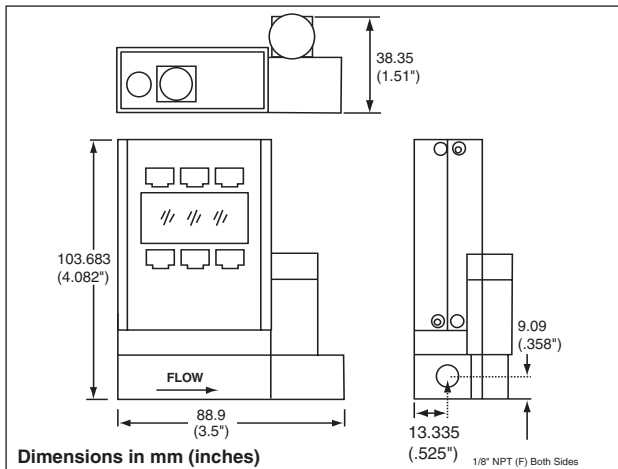


**Model FMA-2600 shown smaller than actual size.**

**Output Signal:** 0-5 Volts dc, RS232  
**Optional Input/Outputs:** 4-20 mA, 0-10 Volts dc  
**Operating Temperature:** 0 to +50 °C  
**Zero Shift:** 0.02% / ATM FS/°C  
**Span Shift:** 0.02% / ATM FS/°C  
**Humidity Range:** Ambient 0-100% Non-Condensing  
**Excess Flow Rate:** + 2.4% Full Scale  
**Maximum Pressure:** 125 Typical PSIG  
**Minimum Differential Pressure Required:** 5 LPM and under : 5 PSID; 10 LPM to 250 LPM: 15 PSID; 500 LPM : 35 PSID 1000 LPM : 50 PSID  
**Supply Current:** 0.250 Amp for 20(S)LPM & Under; (Typical) 1 Amp for 50(S)LPM & Above  
**Supply Voltage:** Less or equal to 20 (S) LPM: 12-25V; Less or equal to 50 (S) LPM: 24-30V  
**Electrical Connections:** 8 pin Circular Mini DIN  
**Wetted Materials:** 303 and 302 Stainless Steel, Viton®, Silicone RTV, Glass Reinforced Nylon, Anodized AL, 410 & 304 Stainless Steel, Nickel, Brass, Delrin, Loctite Adhesives 326, 401, 609



## FMA/FVL-2600 Series Gas Flow Meters 0-20 (S)LPM Typical



**MOST POPULAR MODELS HIGHLIGHTED!**



Model FMA-2600 shown smaller than actual size.

### To Order (Specify Model No.)

Model No. Gas Mass Flow Controller	Price	Model No. Volumetric Gas Flow Controller	Price	Connection FNPT	Flow Range
FMA-2601	\$1625	FVL-2601	\$1390	1/8"	0.5 sccm
FMA-2602	1515	FVL-2602	1280	1/8"	1 sccm
FMA-2614	1405	FVL-2614	1170	1/8"	2 sccm
FMA-2615	1405	FVL-2615	1170	1/8"	5 sccm
FMA-2603	1405	FVL-2603	1170	1/8"	10 sccm
FMA-2616	1195	FVL-2616	960	1/8"	20 sccm
FMA-2604	1195	FVL-2604	960	1/8"	50 sccm
FMA-2617	1090	FVL-2617	855	1/8"	100 sccm
FMA-2618	1035	FVL-2618	855	1/8"	200 sccm
FMA-2619	1090	FVL-2619	855	1/8"	500 sccm
FMA-2620	1090	FVL-2620	855	1/8"	1 SLPM
FMA-2605	1090	FVL-2605	855	1/8"	2 SLPM
FMA-2606	1115	FVL-2606	880	1/8"	5 SLPM
FMA-2607	1140	FVL-2607	905	1/8"	10 SLPM
FMA-2608	1245	FVL-2608	960	1/4"	20 SLPM
FMA-2609	1545	FVL-2609	1310	1/4"	50 SLPM
FMA-2610	1780	FVL-2610	1415	1/4"	100 SLPM
FMA-2611	2060	FVL-2611	1635	1/2"	250 SLPM
FMA-2612	2330	FVL-2612	2060	1/2"	500 SLPM
FMA-2613	2610	FVL-2613	2330	1/2"	1000 SLPM

Add (-\*): Please specify gas, inlet/outlet or back pressure, and temperature for custom specific calibrations.

Each unit is supplied with a 110VAC power supply, 1.83 m (6') cable 8 pin mini din connector and a complete operator's manual.

Add "-I" to model for 4-20 mA output, add \$50 to price.

Add "-I2" to model for second channel output of 4-20mA, add \$50 to price.

Add "-V2" to model for second channel output of 0-5 Volts, add \$50 to price.

Add "-NIST" to model for NIST traceable certificate, add \$100 to price

Add "-TOT" to model for totalizer option, add \$100 to price. Please specify resolution. This is a 6 digit counter.

Example: For totalizing in liters with 1/100th resolution the max count would be 9999.99.

Example: For totalizing in liters with 1 liter resolution the max count would be 999999.

**Ordering Example:**  
FMA-2601-I2-NIST, 1/8" FNPT Mass Gas Flow Controller with optional second channel output of 4-20mA and NIST certificate, \$1625 + 50 + 100 = \$1775.

### Accessories for FMA/FVL-2600 Series

Model No.	Price	Description
FMA1600-C1	25	Replacement Single ended 6' 8-pin mini DIN cable connector
FMA1600-C3	30	6' adapter cable with Male 8-pin DIN to Male DB-9
FMA1600-PS1	40	Replacement 110VAC to 12 VDC Power supply for units 20 LPM or less.
FMA1600-PS2	65	Replacement 110VAC to 24 VDC Power supply for units 50 LPM and greater.
FMA1600-E1	60	220VAC to 12VDC Power Supply
FMA1600-E2	60	220VAC to 24VDC Power Supply



## Water Flowmeter and Controller

- ✓ Response Time of 20 milliseconds Typical (Meter)
- ✓ Turndown Ratio of 50:1
- ✓ Push Button Tare (with Display)
- ✓ Accuracy of  $\pm 2\%$  Full Scale
- ✓ NIST Traceability Optional
- ✓ Rechargeable Battery Pack for Portable Use (FLR-1600 Series Only)

The OMEGA® Series FLR-1600 and FLV-4600 series flowmeters and controllers use two of the best-studied physical properties of liquids to measure flow: Pressure and Viscosity. Differential pressure measurement, across a laminar flow element, results in a flow meter that is inherently linear. OMEGA® flow meters measure differential pressure within that laminar region to achieve a turndown of 50:1 typical and the accuracy is  $\pm 2.0\%$  of full scale. It uses the same technology as the laminar gas mass flow and volumetric flow meters, FMA-1600 and FLV-1600. There are no moving parts to wear out.

The FLR-1600 Series is a Volumetric Water Flowmeter. The unique method of flow detection allows the meter to measure extremely low flow rates at an affordable price. The FLR-1600 Series was designed with deionized water in mind. These flowmeters are available in ranges of 500 micro-liters per minute full scale to 10 liters per minute full scale. By placing the battery pack option on the FLR-1600 Series, it can function as a portable water meter for spot check or calibration.

The FLV-4600 Series Water Flow Controller utilizes a proportional valve coupled to a flowmeter body creating a unique in-situ closed-loop flow controller system. Measurements are taken within the laminar region of the flow meter and the integral PID controller positions the valve according to the flow set points. The controllers can accept an RS-232 or the 0-5 Volt control input signal depending on what is preferred. Independent of the set point voltages, the controllers can be configured for single or dual output of the same or different voltages and/or different parameters such as temperature and flow. This is possible because of our laminar flowmeter design that incorporates solid-state Differential, Absolute Pressure, and Temperature sensors to determine flow in an inherently linear system. The result is a fast responding linear flow meter with multiple outputs. All these parameters are simultaneously visible with our dynamic display that includes a push button operator interface. Water flow controllers are available from 50 milliliters per minute full scale to 500 milliliters per minute full scale.



FLV-4600 Series  
**\$1430**  
Basic Unit



Model FLV-4600 shown smaller than actual size.

### Specifications:

**Accuracy:**  $\pm 2\%$  Full Scale (FS)

**Repeatability:**  $\pm 2\%$  FS

**Turndown Ratio:** 50:1

**Response Time:**

FLR-1600: 20 Milliseconds;

FLV-4600: 100 Milliseconds

**Input Control Signal:**

0-5 Volts dc, RS232

**Output Signal:** 0-5 Volts dc, RS232

**Optional Input/Outputs:**

4-20 mA, 0-10 Volts dc

**Operating Temperature:** 1 to 50°C

**Compensated Temperature:** 10 to 50°C

**Zero Shift:** 0.02% / ATM FS/°C

**Span Shift:** 0.02% / ATM FS/°C

**Humidity Range:**

0-100% Non-Condensing

**Excess Flow Rate:** Approx. 2% overage is shown on display; units can see about 10X rated full scale flow before damage may occur

**Maximum Pressure:** 100 PSIG

**Pressure Drop:** 0.4 PSID

**Supply Current (Typical):**

FLR-1600: 30 mA

FLV-4600: 250 mA

**Supply Voltage:** FLR-1600: 7-30 Vdc

FLV-4600: 12-25 Vdc

**Electrical Connections:**

8 pin Circular Mini DIN

**Wetted Materials:** 303 and 302

Stainless Steel, Viton®, Silicone RTV,

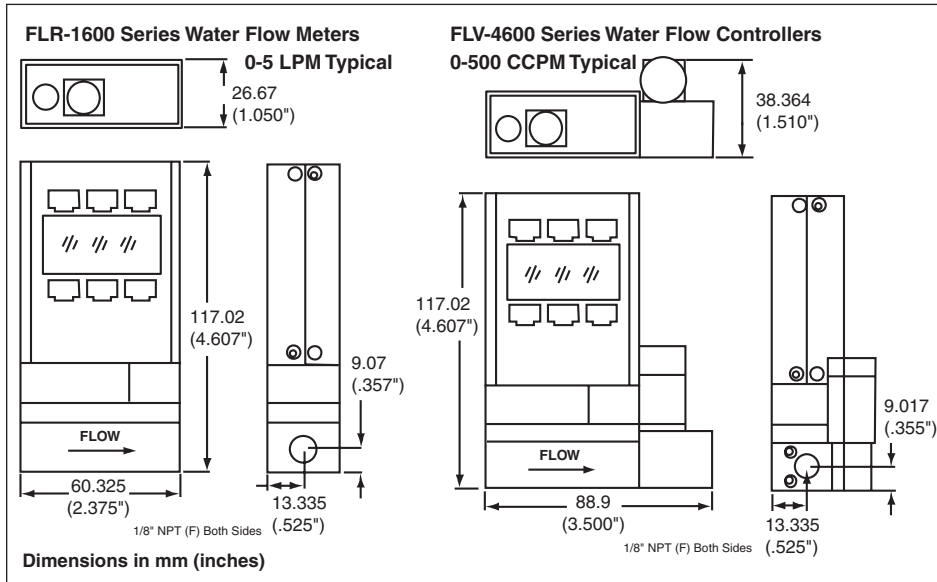
Glass Reinforced Nylon, Valves: 304

Stainless Steel, Brass





# FLOW & LEVEL INSTRUMENTATION



**MOST POPULAR MODELS HIGHLIGHTED!**

## To Order (Specify Model No.)

Model No. Water Flow Meter	Price	Model No. Water Flow Controller Min Δ P = 5 PSIG	Price	Connection FNPT	Flow Range
FLR-1601	\$1535	---	---	1/8"	0.5 sccm
FLR-1602	1355	---	---	1/8"	1 sccm
FLR-1614	1145	---	---	1/8"	2 sccm
FLR-1615	1145	---	---	1/8"	5 sccm
FLR-1603	1145	---	---	1/8"	10 sccm
FLR-1616	1020	---	---	1/8"	20 sccm
FLR-1604	1010	<b>FLV-4604</b>	<b>1440</b>	1/8"	50 sccm
FLR-1617	1010	<b>FLV-4617</b>	<b>1430</b>	1/8"	100 sccm
FLR-1618	1010	<b>FLV-4618</b>	<b>1430</b>	1/8"	200 sccm
FLR-1619	1010	<b>FLV-4619</b>	<b>1430</b>	1/8"	500 sccm
FLR-1620	1010	---	---	1/4"	1 SLPM
FLR-1605	1010	---	---	1/4"	2 SLPM
FLR-1606	1220	---	---	1/4"	5 SLPM
FLR-1607	1640	---	---	1/4"	10 SLPM

## Accessories for FMA/FLV-1600 Series

Model No.	Price	Description
FMA1600-BP	\$80	Battery Pack for portable use for water meter only.
FMA1600-C1	25	Replacement Single ended 6' 8-pin mini DIN cable connector
FMA1600-C3	30	6' adapter cable with Male 8-pin DIN to Male DB-9
FMA1600-PS1	40	Replacement 110VAC to 12 VDC Power supply
FMA1600-E1	60	220VAC to 12VDC Power Supply

Each unit is supplied with a 110VAC power supply, 1.83 m (6') cable 8 pin mini DIN connector and a complete operator's manual.

Add "-I" to model for 4-20 mA output, add \$50 to price.  
 Add "-I2" to model for second channel output of 4-20mA, add \$100 to price.  
 Add "-V2" to model for second channel output of 0-5 Volts, add \$50 to price.  
 Add "-NIST" to model for NIST traceable certificate, add \$100 to price  
 Add "-TOT" to model for totalizer option, add \$100 to price. Please specify resolution. This is a 6 digit counter.

Example: For totalizing in liters with 1/100th resolution the max count would be 9999.99.

Example: For totalizing in liters with 1 liter resolution the max count would be 999999.

**Ordering Example:** FLR-1601-I2-NIST, 1/8" FNPT Water Flow Meter with optional second channel output of 4-20mA and NIST certificate, \$1535 + 100 + 100 = \$1735.



# FLOW & LEVEL INSTRUMENTATION

## FD610 Series Portable Doppler Ultrasonic Flowmeters

FD610 Series  
**\$1045**  
Basic System



- ✓ Battery Operated
- ✓ Non-Invasive Clamp-On Transducer
- ✓ Microprocessor-Based Signal Conditioning Electronics
- ✓ Large Character Display
- ✓ User Selected Velocity Units (FPS or MPS)
- ✓ Measures Fluid Velocities from 0.3 to 30.0 FPS (0.10 to 9.00 MPS)
- ✓ 100:1 Turndown Ratio
- ✓ Pipe Sizes from 6.3 mm (0.25")
- ✓ CE Approval Optional

The FD610 Series flowmeter features advanced Trans-Phase measuring technology, providing accurate and reliable flow velocity assessments in closed piping systems. The FD610 Series utilizes a non-invasive clamp-on transducer which is placed on the outside of a pipe. Within seconds, the large 18 mm (0.7") LCD provides stable flowrate readings in feet per second or meters per second. This product operates on metal or plastic pipes containing liquids with more than 25 ppm of 100 micron or larger suspended solids or entrained gases.

### Principle of Operation

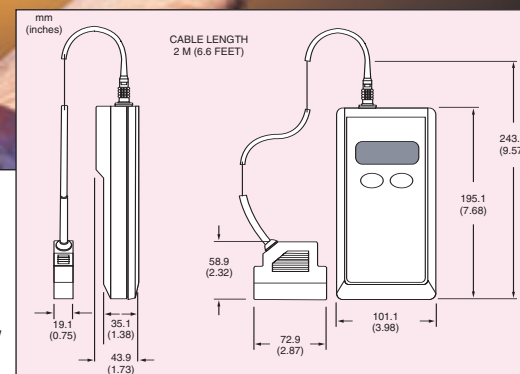
The FD610 Series flowmeter utilizes an advanced Trans-Phase measuring technique, providing accurate, non-invasive fluid velocity assessment without opening the pipe. The FD610 Series utilizes two piezoelectric crystals contained within one transducer to transmit ultrasonic energy into the fluid stream and receive back energy reflected off discontinuities (suspended particles or entrained gases) within the moving liquid. Transformations that result from the energy reflections are processed and converted to a measurement of fluid velocity by the sophisticated software algorithm. The processor also controls all operations of the instrument from its ultra-efficient battery management circuitry to a proprietary FIR (Finite Impulse Response) filtration program.

### Specifications:

**Supply Voltage:** Battery powered, non-rechargeable alkaline, four AA cells included, providing over 30 hours of continuous operation



FD613 shown with FD613-S2



**Flow Range:** 0.30 to 30.00 FPS (0.10 to 9.00 MPS)

**Display:** Single line – four-digit LCD readout of velocity (18 mm (0.7") digits), signal strength, measuring units, and low battery indication

**Temperature:** -20 to 60°C (-28 to 140°F)

**Enclosure Rating/Dimensions:** NEMA-12X ABS plastic; 200 H x 100 W x 38 mm H (7.76 x 4 x 1.5")

**Weight:** 0.7 kg (1.5 lb)

**Accuracy:** ±2% full scale

### Transducer

**Transducer Material:** Plated body; ULTEM 1000 sensor material

**Cable:** 2 m (6.6 ft) cable and connector

**Temperature:** -40 to 82°C (-40 to 180°F)

**Humidity:** 0 to 95% non-condensing

**Mounting Method:** Clamp-on style with DOW 111 coupling compound

### IN STOCK FOR FAST DELIVERY!

#### To Order (Specify Model Number)

Model No.	Price	Range
FD613	\$700	Handheld Readout, Carrying Case, Silicone Couplant, and 4 AA Batteries; Sensor sold separately
FD614-CE	1340	FD613 kit with CE approval with sensor for pipes 1" dia. and larger
<b>Required Accessory Sensor for FD613 only</b>		
FD613-S1	395	Clamp-on sensor for ¼" to 1" diameter pipe
FD613-S2	345	Clamp-on sensor for pipes 1" dia. and larger

**Ordering Example:** FD613 flowmeter and FD613-S1, clamp-on sensor for ¼" to 1" pipe, \$700 + 395 = \$1095



## Digital Open Channel Water Velocity Meters



FPG-100 Series

**\$695**

Basic Model

- ✓ Ideal for Storm Water, Rivers, Ditches, Flumes, Sewers, Effluents, Canals, Creeks
- ✓ Turbo-Propeller Sensor
- ✓ Waterproof Digital Display
- ✓ Telescoping Expandable Handle  
— .9 to 1.8 m or 1.5 to 4.5 m  
(3 to 6 ft or 5 to 15 ft)

The FPG-101 and FPG-201 flow probes are highly accurate water velocity instruments for measuring flows in open channels and partially filled pipes such as sewers. The flow probe consists of a protected turboprop positive displacement sensor connected by an expandable probe handle to a digital readout display. The flow probe incorporates true velocity averaging for the most accurate flow measurement. It is ideal for storm water runoff studies, measuring flows in rivers and streams as well as in ditches and sewers. The probe housing can be placed directly on the bottom of pipes or stream beds for measuring low flows to 1½" depth. The turboprop is easily removed for cleaning or replacement.

### Specifications:

**Range:** 0.1 to 8.0 MPS (0.3 to 25 FPS)

**Accuracy:** 0.1 FPS

**Averaging:** True digital running average;  
Readings taken once per second

**Display:** LCD, waterproof

**Sensor Type:**

Waterproof protected turboprop propeller with electromagnetic pickup

**Weight:** .9 kg (2 lb)

**Shipping Weight:** 4.5 kg (10 lb)

**Size:** FPG-101: .9 to 1.8 m L (3 to 6');  
FPG-201: 1.5 to 4.5 m L (5 to 15')

**Sensor Housing:**

50.8 D x 76.2 L mm (2 x 3")

**Materials:** PVC, anodized aluminum, 416 stainless steel

**Power:** Internal button-type batteries,  
1 year life, included

**Operating Temperature:**

-18 to 49°C (0 to 120°F)

**Carrying Case:** The flow probe is shipped in a padded carrying case



FPG-101 \$695



**MOST POPULAR MODEL HIGHLIGHTED!**

### To Order (Specify Model Number)

Model No.	Price	Description
<b>FPG-101</b>	<b>\$695</b>	.9 to 1.8 m (3 to 6') Open Channel Sensor
FPG-201	735	1.5 to 4.5 m (5 to 15') Open Channel Sensor

Unit comes complete with padded carrying case, batteries, and operator's manual.

**Ordering Example:** FPG-201, digital open channel water velocity meter with 1.5 to 4.5 m (5 to 15') handle, \$735.

### Accessories

Model No.	Price	Description
FPG-TP	\$26	Turboprop/bearing assembly replacement
PH-BATT-3	1	Replacement button batteries

Order Online

**omega.com**

Over 100,000 Products Available!

For the complete selection of Flow & Level Instrumentation products, shop online at

**omegaFlow.info**



## OM-CP-LEVEL101 Water Level and Temperature Datalogger

Part of the NOMAD® Family



OM-CP-LEVEL101-SS

**\$559**

Basic Unit

- ✓ Submersible
- ✓ Programmable Start Time
- ✓ User Calibration Through Software

The OM-CP-LEVEL101 rugged water level and temperature datalogger is a battery powered, stand-alone device used for automatically recording water level from 0 to 70 ft and temperatures from -40 to 80°C. The OM-CP-LEVEL101 does this by recording the absolute water pressure and then converting the water pressure to level through software. Atmospheric pressure compensation is accomplished by the user making a separate measurement of the surface atmospheric air pressure and then entering this value into the software which subtracts it out. This all-in-one compact, portable, easy to use device will measure and record up to 16,383 water level and 16,383 temperature measurements. The OM-CP-LEVEL101 is a major leap forward in both size and performance. Its real time clock ensures that all data is time and date stamped. The

storage medium is non-volatile solid state memory, providing maximum data security even if the battery becomes discharged. Its small size allows it to fit almost anywhere. Data retrieval is simple. Plug it into an empty COM port and the easy to use Windows software does the rest. The software converts your PC into a real time strip chart recorder. Data can be printed in graphical or tabular format and can be exported to a text or Microsoft Excel file.

### Specifications:

#### TEMPERATURE CHANNEL

**Temperature Sensor:** semiconductor  
**Calibrated Accuracy:** ±0.5°C (0°C to +50°C)  
**Temperature Resolution:** 0.1°C  
**Temperature Measurement Range:** -40 to +80°C (-40 to 176°F)

#### LEVEL/PRESSURE CHANNEL

**Calibrated Accuracy:** ±0.3% max at 25°C, ±0.1% typical.  
**Pressure Resolution:** 0.0005 psia, 0.02 inH<sub>2</sub>O  
**Pressure Range:** 0 to 30 psia, 0 to 830 in H<sub>2</sub>O, 0 to 69 ft H<sub>2</sub>O, records water level from 0 to 30 ft in atmospheric pressure  
**Pressure Sensor:** strain gage  
**Pressure Adapter:** fully submersible  
**Temperature effect on span/offset:** ±1.0% max relative to 25°C, 0 to 50°C; ±0.2% typical.

#### GENERAL SPECIFICATIONS

(Submersible to 150 feet)

**Temperature/Pressure/Level Calibration:** digital calibration is available through software  
**Recording Interval:** every 2 seconds to 12 hours selectable in software  
**Calibration Date:** automatically recorded within device to alert user when calibration is required

**Start Time:** start time and date are programmable through software, up to six months in advance

**Real Time Recording:** device may be used with PC to monitor and record data in real time

**Power:** 3.6 V lithium battery included

**Battery Life:** 1 year typical

**Time Accuracy:** ±1 minute per month at 20°C, when RS-232 port is not in use

**Data Format:** date and time stamped, °C, °F, °K, °R, PSI, inH<sub>2</sub>O, ftH<sub>2</sub>O, mmH<sub>2</sub>O, cmH<sub>2</sub>O, mH<sub>2</sub>O, bar, atm, Torr, Pa, kPa, MPa

**Weight:** 140g (5 oz)

**Computer Interface:** PC serial or RS-232C COM

**Software:** Windows 95/98/2000/NT/2000

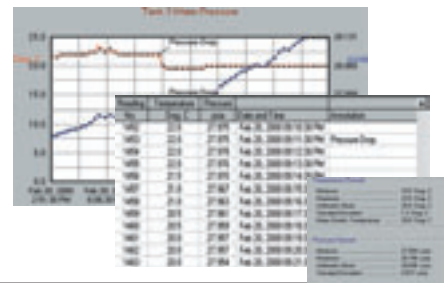
**Operating Environment:** -40 to +80°C (-40 to 176°F), 0 to 99% RH non-condensing (while unit is open)

**Dimensions:** 25 mm dia x 108 mm L (1.0 x 4.25")

**Material:** Stainless Steel



OM-CP-LEVEL101 Datalogger  
Shown larger than actual size



**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

Model No.	Price	Description
OM-CP-LEVEL101-SS	559	Water level and temperature datalogger
OM-CP-IFC101	99	Windows software & 1.22 m (4') RS-232 cable with DB9F termination
OM-CP-BAT102	10	Replacement 3.6 V lithium battery

Operator's manual, battery, and RS-232 cable are included with the OM-CP-IFC101 Windows software (software sold separately). To order datalogger with NIST calibration certificate, add suffix "-cert" to model number and add \$60 to price. (NIST calibration for temperature only).

**Ordering Example:** OM-CP-LEVEL101-SS-CERT water level and temperature datalogger with NIST calibration certificate and OM-CP-IFC101 Windows software and RS-232 cable, \$559 + 60 + 99 = \$718.



## OM-CP-RHTEMP1000

Humidity and Temperature Datalogger  
Part of the NOMAD® Family



OM-CP-RHTEMP100  
**\$399**  
Basic Unit

- ✓ Real Time Operation
- ✓ User Calibration through Software
- ✓ Dew Point/Vapor Concentration Calculated in Software

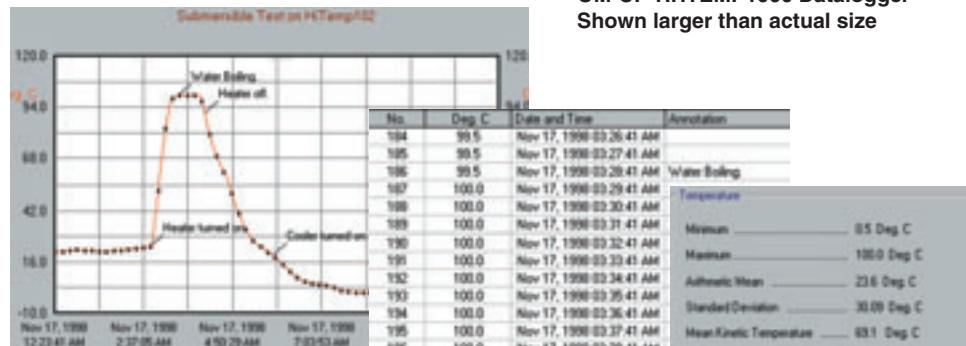
This OM-CP-RHTEMP1000 humidity and temperature datalogger is a water proof (temperature measurement only), battery powered, stand-alone device used for automatically recording temperatures from -40 to 125°C. This all-in-one compact, portable, easy to use device will measure and record up to 10,920 temperature and 10,920 humidity measurements. The OM-CP-RHTEMP1000 is a major leap forward in both size and performance. Its real time clock ensures that all data is time and date stamped. The storage medium is non-volatile solid state memory, providing maximum data security even if the battery becomes discharged. Its small size allows it to fit almost anywhere. Data retrieval is simple. Plug it into an empty COM port and the easy to use Windows software does the rest. The software converts your PC into a real time strip chart recorder. Data can be printed in tabular format and can also be exported to a text or Microsoft Excel file.

### Specifications:

**Temperature Sensor:** thermistor  
**Temperature Accuracy:** 0.5°C  
**Temperature Resolution:** 0.1°C  
**Temperature Range:** -40 to 80°C (-40 to 176°F) for 15 minutes  
**Extended Temperature Range:** 80 to 125°C (176 to 257°F) for 15 minutes  
**Humidity Sensor:** solid state semiconductor  
**Humidity Accuracy:** 3%RH



OM-CP-RHTEMP1000 Datalogger  
Shown larger than actual size



**Humidity Resolution:** 0.5%RH  
**Humidity Range:** 5 to 95% non-condensing  
**Temperature/Humidity Calibration:** digital calibration is available through software  
**Calibration Date:** automatically recorded within device to alert user when calibration is required  
**Recording Interval:** every 2 seconds to every 24 hours, selectable through software  
**Start/Time:** start time and date are programmable through software  
**Real Time Recording:** device may be used with PC to monitor and record data in real time  
**Power:** 3.6 V lithium battery included

**Battery Life:** 1 year typical  
**Time Accuracy:** ±1 minute per month at 20°C  
**Data Format:** date and time stamped, %RH, mg of water vapor concentration, °C, °F, °K, °R  
**Weight:** 25.5g (1 oz.)  
**Computer Interface:** PC serial or RS-232C COM  
**Software:** Windows 95/98/NT/2000/XP  
**Operating Environment:** -40 to 125°C (-40 to 257°F) 5 to 95% RH non-condensing  
**Dimensions:** 25 mm dia x 137 mm L (1.00 x 5.40")  
**Material:** aluminum or stainless steel

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

Model No.	Price	Description
OM-CP-RHTEMP1000	\$399	Humidity and temperature datalogger (aluminum)
OM-CP-RHTEMP1000-SS	449	Humidity and temperature datalogger (stainless steel)
OM-CP-IFC101	99	Windows software and 4ft RS-232 cable with DB9F termination
OM-CP-BAT102	10	Replacement 3.6 V lithium battery

Operator's manual, battery, and RS-232 cable are included with the **OM-CP-IFC101** Windows software (software sold separately). To order datalogger with NIST calibration certificate, add suffix "-cert" to model number and add \$60 to price. (NIST calibration for temperature only).

**Ordering Example:** OM-CP-RHTEMP1000-CERT humidity and temperature datalogger with NIST calibration certificate and OM-CP-IFC101 Windows software and RS-232 cable, \$399 + 60 + 99 = \$558.



## Tipping Bucket Rain Gauges & Electric Rain/Snow Gauge



RG-2500 Series  
**\$545**  
Basic Unit

- ✓ Choose from 20 cm (8") and 30 cm (12") Orifice
- ✓ Heated Models Available for Snowfall Collection

The RG-2500 tipping bucket rain gauge is a dependable instrument used for measuring precipitation. Rainfall that enters the 20 cm (8") or 30 cm (12") funnel collector is directed to the tipping bucket assembly. When an incremental amount of precipitation has been collected 0.01, the bucket assembly tips and activates a magnetic reed switch. The sample is discharged through the base of the gauge. A momentary electrical contact is provided for each increment of rainfall. The contact closure is used to operate a data acquisition system.

The Model RG-2500E is used where 115 Vac is available and precipitation is often in the form of snow. A heating kit has been added to the basic RG-2500 rain gauge to provide capability for measuring snowfall.

### Specifications:

**Capacity:** Unlimited

**Orifice Size:**

RG-2500, RG-2500E 20 cm (8"); RG-2500-12, RG-2500E-12 30 cm (12")

**Accuracy:**

±1% for 1 to 3"/hr,

±3% for 0 to 6"/hr

**Switch:**

Magnetic reed, SPST NO, 10 watts, 200 Vdc, 0.5 amps maximum

**Sensitivity:** 0.01" per tip

**Dimensions:**

RG-2500, RG-200E:

203.2 dia. x 431.8 H mm (8 x 17");

RG-2500-12, RG-2500E-12:

304.8 dia x 508 H mm (12 x 20")

**Weight:**

RG-2500 3.2 kg (7 lb);

RG-2500E 3.2 kg (7 lb);

RG-2500-12 6.4 kg (14 lb);

RG-2500E-12 7.7 kg (17 lb)



RG-2500-12, \$695



RG-2500, \$545

Each unit is supplied with 7.62 m (25') signal cable, heated units also include 7.62 m (25') power cable, complete operator's manual.

Shown Smaller Than Actual Size

MOST POPULAR MODELS HIGHLIGHTED!

### To Order (Specify Model Number)

Model No.	Price	Description
RG-2500	\$545	Rain gauge with 20 cm (8") orifice
RG-2500E	795	Heated rain gauge with 20 cm (8") orifice
RG-2500-12	695	Rain gauge with 30 cm (12") orifice
RG-2500E-12	995	Heated rain gauge with 30 cm (12") orifice

Each unit is supplied with 25' signal cable, heated units also include 25' power cable, complete operator's manual.

**Ordering Example:** RG-2500E heated rain gauge with 20 cm orifice, \$795.



**omega.com**  
ΩOMEGA

One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

02/08/02 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001043



[www.omega.com](http://www.omega.com) • e-mail: [info@omega.com](mailto:info@omega.com)



**omega.com**  
ΩOMEGA

One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

02/09/02 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001044



[www.omega.com](http://www.omega.com) • e-mail: [info@omega.com](mailto:info@omega.com)



**omega.com**  
ΩOMEGA

One Omega Drive, P.O. 4047  
Stamford, CT 06907-0047

02/11/02 DILBERT © United Feature Syndicate, Inc.

15

Collection Series  
#15-001045



15

Collection Series #15-001046



02/12/02 DILBERT © United Feature Syndicate, Inc.

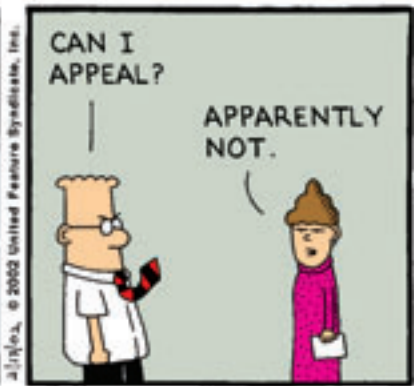
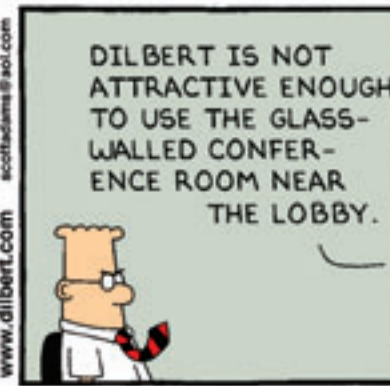
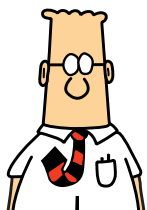
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001047



02/13/02 DILBERT © United Feature Syndicate, Inc.

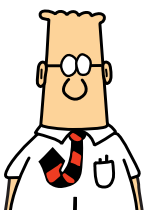
One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



www.omega.com • e-mail: info@omega.com

15

Collection Series #15-001048



02/14/02 DILBERT © United Feature Syndicate, Inc.

One Omega Drive, P.O. 4047 Stamford, CT 06907-0047



D16

For Sales and Service, Call Toll-Free: 1-877-82-66342® U.S.A. and Canada

Sales: FAX (Toll-Free) 1-877-FAX-OMEGA(A) 24 HOURS





## Wind Monitor Stations with Analog Outputs



WMS-20 Series  
**\$550**  
 Basic Unit

The WMS-20 series consist of three individual wind monitor stations. The WMS-21 is a microprocessor based wind alarm station. It sounds an alarm buzzer and controls the operation of two electrical circuits whenever wind speed reaches either of two independent setpoints. An LCD display provides a readout of the measured wind speed and is also used to set the value of the setpoints. Self-contained relays for each alarm point can be used to actuate external devices such as air samplers or sirens.

The WMS-22 series monitors wind speed and direction. Each parameter is converted into a 4 to 20mA signal for use by process controllers or monitoring systems. Two versions are offered, WMS-22A measures wind speed only, while the WMS-22B measures both wind speed and direction.

### Specifications:

**Wind Speed:** WMS-21 0 to 99 mph;  
 WMS-22 0 to 136 mph

**Average Speed Resolution:** 1 mph

**Threshold Speed:**

WMS-21, 2 mph; WMS-22, 1 mph

**Measurement Accuracy:**

WMS-21  $\pm 1$  mph; WMS-22  $\pm 3\%$  FS

**Alarm (WMS-21 only)**

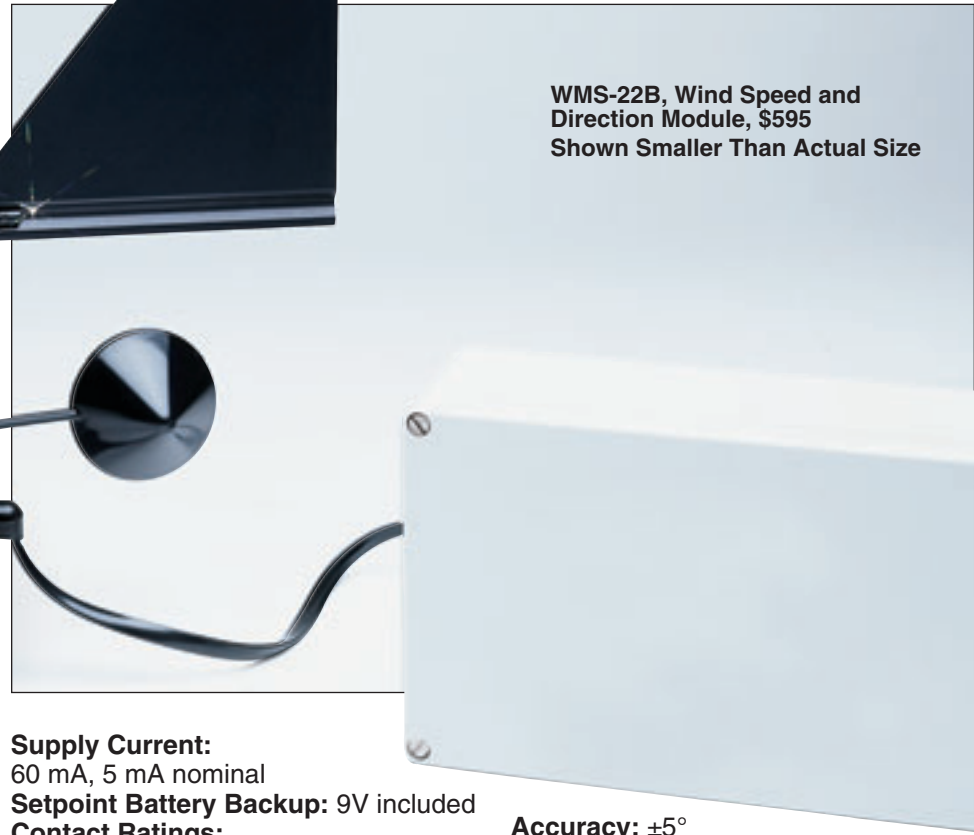
**On/Off Delay Range:** 0 to 99 sec.

**Controls:** Protected push-button for run, or set variables, select menu items, increment and decrement alarm values.

**Indicator:** 16 character LCD,  
 Led for setpoint 1 and 2

**Supply Voltage:**

12 to 24 Vac or Vdc



WMS-22B, Wind Speed and  
 Direction Module, \$595  
 Shown Smaller Than Actual Size

### Supply Current:

60 mA, 5 mA nominal

**Setpoint Battery Backup:** 9V included

**Contact Ratings:**

3A SPDT @ 24Vdc

**Operating Temperature:**

-20 to 50°C

**Anemometer Size:** 76.2 x 127 mm

(3 x 5") turning radius

**Connecting Cable:**

2-wire 15.2 m (50') supplied

**Wind Direction  
 (WMS-22B only)**

**Range:** 0 to 360° mechanical,

0 to 350° electrical

**Resolution:** 2°

**Accuracy:**  $\pm 5^\circ$

**Current Loop WMS-22**

**Output Span:** 4 to 20 mA

**Supply Voltage:** 10 to 48 Vdc

**Wind Sensor Cable:**

6 conductor 12.2 m (40') supplied

**Wind Sensor:** 190.5 H x

177.8 mm radius (7.5 x 7")

**Signal Conditioning Enclosure:**

119.4 H x 198.1 x 88.9 mm

(4.7 x 7.8 x 3.5")

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

Model No.	Price	Description
WMS-21	\$590	Dual setpoint wind station
WMS-22A	550	Wind speed only 4 to 20 mA output
WMS-22B	595	Wind speed/direction 4 to 20 mA outputs
WMS-EC-40	20	12.2 m (40') extension cable

Units Supplied with sensor cable and operator's manual.

**Ordering Example:** WMS-22B wind speed and direction wind station with 4 to 20 mA outputs \$595.

Order Online

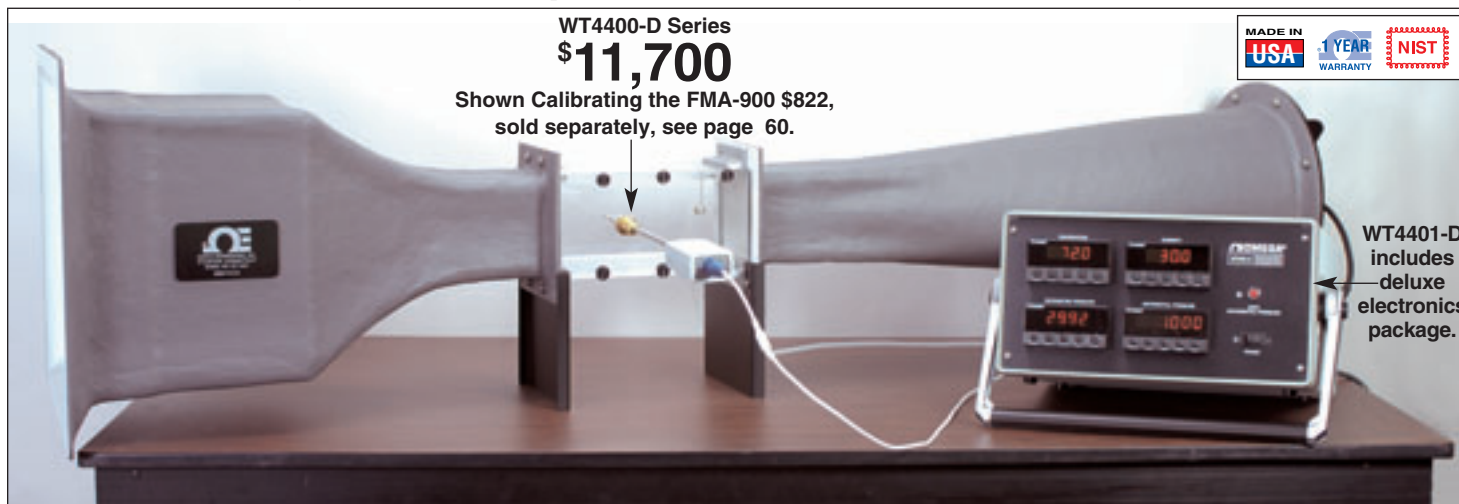
**omega.com**

Over 100,000 Products Available!

For the complete selection of Humidity & Weather  
 Instrumentation, shop online at  
**omegaHumidity.info**



## OMEGA's Laboratory-Grade Benchtop WindTunnel



WT4400-D Series

**\$11,700**

Shown Calibrating the FMA-900 \$822,  
sold separately, see page 60.



WT4401-D  
includes  
deluxe  
electronics  
package.

- ✓ Precise Motor Control for Adjusting Flowrates
- ✓ NIST Calibration Supplied with Each Windtunnel
- ✓ Highly Accurate to 1% of Reading
- ✓ Large 101.6 x 101.6 mm (4" by 4") Test Chamber

- ✓ Highly Stable Delta Pressure Sensor and Readout Included with Each Windtunnel
- ✓ Fully Instrumented
- ✓ Optional Environmental Monitoring Package of Temp, Humidity, Barometric Pressure and Delta P Available

OMEGA's state-of-the-art windtunnel is designed to give a highly uniform flow rate over a 6" test section. A powerful 12 amp motor with variable speed from 0 to 10,000 RPM is adjustable to give a particular flowrate by a precise motor control unit. Each windtunnel is supplied with an NIST traceable certificate.

The uniform flowrate is determined by monitoring a highly repeatable differential pressure sensor which has been calibrated to each individual wind tunnel as a system. Each windtunnel is supplied with two restrictive plates for achieving optimum low flowrates. The established differential pressure measurements versus flowrates are listed from 25 to 9000 FPM. Calibration sheets are included, which makes calibrating different flow sensors simple.

The differential pressure measurement used to establish known flowrates will be affected by barometric pressure and

temperature conditions during testing. Depending on the probe being calibrated, humidity may also be a factor.

OMEGA's deluxe windtunnel package is an environmental monitoring system that measures barometric pressure, room temperature, humidity and differential pressure. By monitoring room conditions, standard differential pressures can be converted to actual differential pressure readings to ensure accurate flowrates.

For testing different probes, a 1/2" NPT connection is available. An assortment of compression fittings is provided to help mount the probe under calibration.

### Specifications:

#### Windtunnel:

**Accuracy:** 1% rdg  
(2% rdg with restrictive plates)

**Flow Rates:** 25 to 9000 fpm  
(0.15 to 45 m/s)

**Noise:** 95 dBA max.

**Size:** 1.5 meter L x 431.8 mm H  
(5 feet x 17")

#### Motor:

**Power:** 120 Vac

**Current:** 12 amps

**Speed:** 10,000 RPM

#### Motor Control Box:

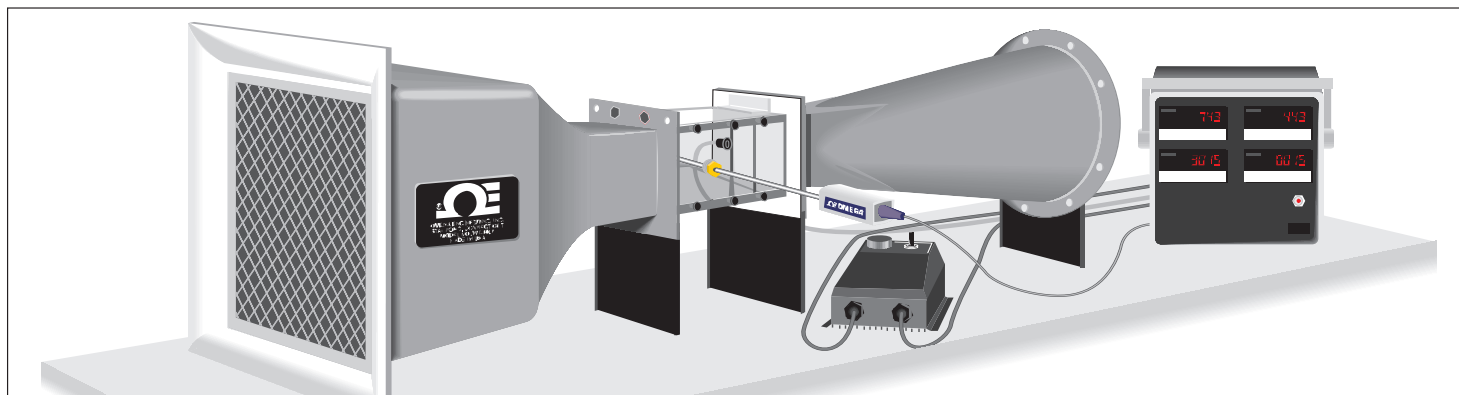
**Power:** 120 Vac

**Speed Adj.:** 10 turn pot.

**Internal Adj.:** Min., Max.,  
Acceleration & Current Limit

**Size:** 140 W x 184 L x 89 mm H  
(5.53 x 7.25 x 3.5")

**Weight:** tunnel: 22.5 kg (49.5 lb);  
Standard elec. 3.2 kg (7 lb);





## Standard and Deluxe Packages Establish Flowrates from 25 to 9000 FPM

deluxe elec. 7 kg (15.3 lb)

### Monitoring Systems

#### Standard Package

PX657 127 mm (5") H<sub>2</sub>O differential pressure sensor and DP41-S-A meter with analog output in benchtop case

#### Deluxe Package

Same differential system as above, plus HX97-A sensor for temperature and humidity, PX02C1-16A5T barometric sensor, PSS-D15B power supply and 3 DP25-E panel meters mounted in a benchtop case.

All 4 meters have 10 Vdc analog outputs.

Windtunnels come complete with 1/8, 3/16, 1/4 and 3/8" brass compression fittings with Teflon<sup>®</sup> ferrules, two 1.52 m (5') lengths of silicone tubing, operator's manual with NIST calibration data and pressure sensor with benchtop meter.

The entrance to this precise windtunnel is a fiberglass-constructed baffle. The honeycomb baffle design insures constant and evenly distributed air intake. The design minimizes turbulent air flow created by movement in front of the intake.



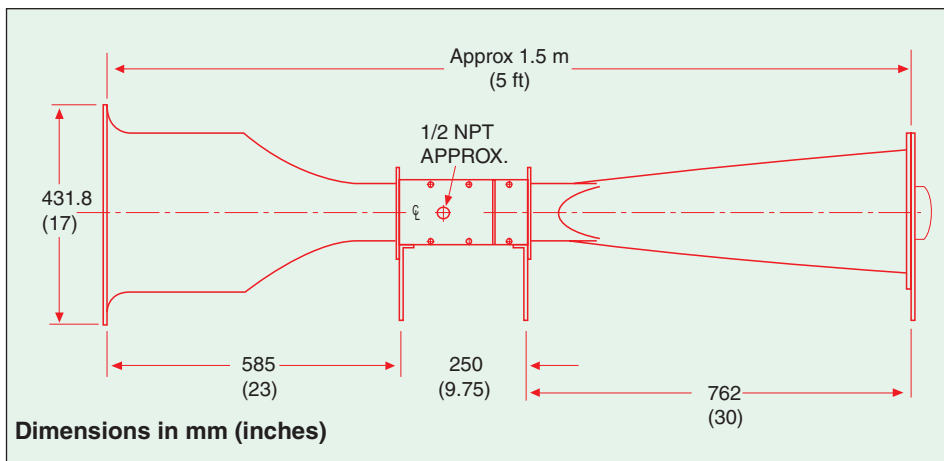
WT4400 front



WT4400 back

The back of the baffle has a profile design that keeps the stream uniform, while decreasing the area to a 101.6 mm x 101.6 mm (4" by 4") cross-section.

The 4" by 4" cross-section is 152 mm (6") in length and constructed of clear plastic for easy viewing. In back of this test section, the motor pulls the air through the windtunnel. The motor and intake profiles utilize fiberglass construction, which minimizes airflow distortion.



WT4401-D deluxe package electronics



WT4401-S standard package electronics

A deluxe monitoring package keeps track of ambient conditions as well as the precise differential pressure measurement. The monitoring sensors and instruments are all packaged inside a single powerful housing. Each sensor has an analog output for use with a strip chart recorder or computer datalogging system. Humidity, temperature

and barometric sensors are enclosed in the benchtop case for monitoring atmospheric conditions which can influence the exact air speed. The differential pressure cell is connected to the wind tunnel via silicone tubing. The entrance and test chambers' pressures are monitored, which determines true air speed.

Flow Ranges Windtunnel Configuration	Flow Ranges	
	FPM	M/S
No restrictive plates	1000 to 9000 FPM	5.0 to 45 M/S
Restrictive plate A	250 to 1250 FPM	1.25 to 6.3 M/S
Restrictive plate B	25 to 350 FPM	0.15 to 1.77 M/S

### To Order (Specify Model Number)

Model	Price	Description
WT4401-S	\$8,995	Windtunnel with differential pressure monitor
WT4401-D	11,700	Windtunnel deluxe package (barometric pressure, temperature, humidity and differential pressure monitoring system)

The tunnel comes complete with everything you need to calibrate probes quickly. All accessories, NIST documents, manuals, fitting, etc. are supplied for most any application.

Ordering Example: WT4401-D, deluxe windtunnel package, \$11,700.

Order Online

**omega.com**<sup>®</sup>





Over 100,000 Products Available!

For the complete selection of Laboratory Instrumentation shop online at **omegainstrument.info**



# PROCESS CONTROLLERS & METERS

## Meter Selection Guide

   			
	i8	i8DH	
<b>Description</b>	1/8 DIN Single Display Monitor/ Controller	1/8 DIN Dual Display Horizontal PID Controller	1/8 DIN Dual Display Vertical PID Controller
<b>Input</b> <b>Process and Temperature (model "i")</b> T/C: (J,K,T,E,R,S,B,C,N,J DIN) RTD: Pt 100,500,1000 Ohms (385,392) 4-20mA, 0-100mV, 0-1V, 0-10V	✓	✓	✓
	<b>Strain and Process (model "iS")</b> 4 to 20mA, 0 to 100 mVdc, -100 mVdc to -1Vdc, 0 to 10 Vdc Ratiometric/Non-Ratiometric 10 pt linearization	✓	✓
<b>Display</b> Nine Segment LED Digits Color Programmable: <b>RED, AMBER, GREEN</b>  Height of Digits	Single Display  21mm (0.83")	Dual Display  Process Value: 21 mm (0.83") top display Setpoint Value: 10.2 mm (.40") bottom display	Dual Display  Process Value: 10.2 mm (.40") top display Setpoint Value: 10.2mm (.40") bottom display
	<b>Available Output Options</b> (Any combination of Two) <b>SSR's:</b> Solid State Relays 0.5A @120/240Vac <b>Relays:</b> Form "C" SPDT 3A @120/240Vac <b>Pulse:</b> 10Vdc @20mA (for use w/ external SSR) <b>A/O:</b> Programmable Analog Voltage & Current Output (non-isolated)	✓	Two Outputs Standard ✓
<b>Optional</b> Isolated Programmable Analog Voltage & Current Output (i8A only)	✓		
<b>Power</b> (standard) 90-240 Vac, 50-400Hz 110-375 Vdc, Equivalent voltage	✓	✓	✓
<b>Low Voltage Power</b> Option 12-36Vdc, 3W	✓	✓	✓
<b>Mechanical</b> (size: H x W x D )	48 x 96 x 127 mm (1.89 x 3.78 x 5")	48 x 96 x 127 mm (1.89 x 3.78 x 5")	96 x 48 x 127 mm (3.78 x 1.89 x 5")
<b>Weight</b>	295 g (0.65 lb)	295 g (0.65 lb)	295 g (0.65 lb)
<b>Network Options</b> 1. RS232,RS424,RS485, modbus (-C24) 2. Ethernet + RS485,Modbus (-C4EI) 3. Ethernet (-EI)	✓	✓	✓
	✓	✓	✓
	✓	✓	✓
<b>Base Unit Pricing</b>	DPI8 \$240	CNI8DH33 \$340	CNI8DV33 \$340
<b>Most Popular Model</b>	CNI833-C24 1/8 DIN single display controller with two mechanical relay output + Serial output	CNI8DH33-C4EI 1/8DIN dual display Horizontal Controller with two mechanical relay output + Serial and Ethernet output	CNI8DV43 1/8 DIN dual display Vertical Controller with pulse and relay output







# PROCESS CONTROLLERS & METERS



## Temperature, Process & Strain Meters & PID Controllers



Made in the U.S.A.

			
i8C	i16	i16D	i32
1/8 DIN Ultra Compact Monitor/ Controller	1/16 DIN Single Monitor/ Controller	1/16 DIN Dual Display Monitor/ Controller	1/32 DIN Single Monitor/ Controller
✓	✓	✓	✓
✓	✓	✓	✓
Single Display	Single Display	Dual Display	Single Display
21 mm (0.83")	10.2 mm (.40")	Process Value: 10.2 mm (.40") top display Setpoint Value: 10.2 mm (.40") bottom display	10.2 mm (.40")
		Two Outputs Standard	
✓	✓	✓	✓
✓	✓	✓	✓
✓	✓	✓	✓
✓	✓	✓	✓
✓	✓	✓	✓
✓	✓	✓	✓
48 x 96 x 54.84 mm (1.89 x 3.78 x 2.159")	48 x 48 x 127 mm (1.89 x 1.89 x 5")	48 x 48 x 127 mm (1.89 x 1.89 x 5")	25.4 x 48 x 127 mm (1.0 x 1.89 x 5")
255 g (0.55 lb)	159 g (0.35 lb)	159 g (0.35 lb)	127 g (0.28 lb)
✓	✓	✓	✓
		✓	
EIS module	EIS module	✓	EIS module
DPI8C \$285 CNI8C53 1/8 DIN compact controller with analog and relay output	DPI16 \$180 CNI1633 1/16 DIN single display controller with two relay outputs	CNI16D33 \$245 CNI16D43-C24 1/16 DIN Dual Display with pulse and relay output + serial output	DPI32 \$150 CNI3243-C24 1/32 DIN controller with pulse and relay output + serial output



## OM-CP-RFPH101 Wireless pH and Temperature Transmitter

Part of the NOMAD® Family

OM-CP-RFPH101

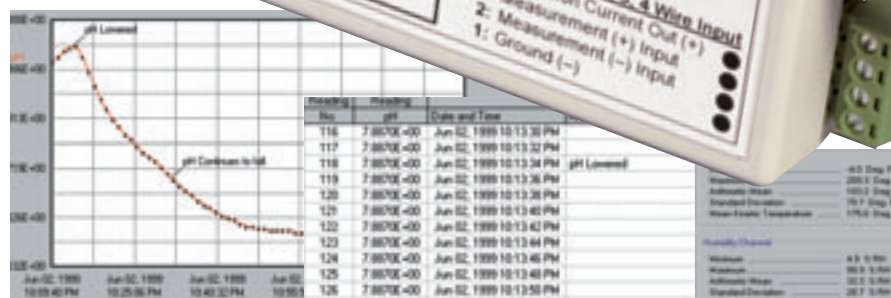
\$449

Basic Unit



- ✓ No Wires, No Installation Cost
- ✓ Works with OMEGA® PHE-4200 Series of pH Probes
- ✓ Real Time Operation
- ✓ Miniature Size
- ✓ Automatic Temperature Compensation
- ✓ Automatically Converts Your PC Into a Strip Chart Recorder

OM-CP-RFPH101 Transmitter Shown larger than actual size



The OM-CP-RFPH101 is a miniature, wireless, battery powered, stand-alone, pH and temperature transmitter. This all-in-one compact, portable, easy to use device will measure and transmit pH and temperature measurements. The OM-CP-RFPH101 uses a 16 bit ADC to achieve a resolution of 0.01pH. In addition, the OM-CP-RFPH101 will directly connect to most off-the-shelf pH electrodes. The user can easily calibrate to a specific electrode through the software. It can be started and stopped instantly through an externally accessible push button. Data is received at the PC using our receiving antenna that attaches directly to the serial port. All received data is time and date stamped and stored directly in your PC. Its small size allows it to fit almost anywhere. The OM-CP-RFPH101 is a major leap forward in both size and performance. Numerous devices may transmit data to the same receiving station. The Windows software converts your PC into a real time strip chart recorder. Data can be printed in graphical or tabular format and can also be exported to a text or Microsoft Excel file.

**Range:** 36.6 m (120') line of sight  
**Frequency:** 418 MHz  
**Transmit Interval:** 2/minute to 1/12 hours, factory settable (1/minute default setting)  
**Start Time:** externally accessible push button enables users to instantly start and stop device  
**Green Visual Indicator:** LED flashes at 15 second interval to indicate device is running  
**Power:** 9 V alkaline battery included  
**Battery Life:** 2 months typical, continuously transmitting at 1 minute intervals  
**Time Accuracy:** ±1 minute/month at 20°C when RS232 port is not in use

**Data Format:** date and time stamped, pH, °C, °F, °K, °R  
**Weight:** 113 g (4 oz)  
**Computer Interface:** PC serial or RS-232C COM  
**Software:** Windows 95/98/NT/2000/XP  
**Operating Environment:** -5 to +50°C (23 to 122°F)  
 5 to 95 % RH non-condensing  
**Dimensions:** 61 mm H x 95 mm W x 26 mm D (2.4" x 3.8" x 1")  
**Communication:** 418 MHz

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

Model No.	Price	Description
OM-CP-RFPH101	\$449	Wireless pH and temperature transmitter
OM-CP-RFC101	199	Windows software and 4ft RS-232 cable with DB9F termination and receiving antenna
OM-CP-BAT103	20	Replacement 9 V alkaline battery

Operator's manual, battery, RS-232 cable, and receiving antenna are included with the OM-CP-RFC101 Windows software (software sold separately). To order datalogger with NIST calibration certificate, add suffix "-cert" to model number and add \$60 to price. (NIST calibration for temperature only).

**Ordering Example:** OM-CP-RFPH101-CERT wireless pH and temperature transmitter with NIST calibration certificate and OM-CP-RFC101 Windows software and RS-232 cable with receiving antenna, \$449 + 60 + 199 = \$708.



## OM-CP-PH101 pH and Temperature Datalogger Part of the NOMAD® Family

OM-CP-PH101  
**\$399**  
Basic Unit



- ✓ Works with OMEGA® PHE-4200 Series of pH Probes
- ✓ 16-Bit Resolution
- ✓ Programmable Calibration/Start Time
- ✓ Miniature Size
- ✓ Memory Wrap Around
- ✓ User Calibration Through Software
- ✓ Real Time Operation
- ✓ Automatic Temperature Compensation

The OM-CP-PH101 is a low cost, high resolution, miniature battery powered, stand-alone data logger used for automatically recording pH between 0.00 and 14.00 pH.

The OM-CP-PH101 uses a 16-bit ADC to achieve a resolution of 0.01pH. In addition, the OM-CP-PH101 will directly connect to many off-the-shelf pH electrodes. The user can easily calibrate to a specific electrode through our software. This all-in-one compact, portable, easy to use device will measure and record up to 8,192 pH and 8,192 temperature measurements. The OM-CP-PH101 is a major leap forward in both size and performance. Its real time clock ensures that all data is time and date stamped. The storage medium is non-volatile solid state memory, providing maximum data security even if the battery becomes discharged. Its small size allows it to fit almost anywhere. Data retrieval is simple. Plug it into an empty COM port and our easy to use software does the rest. The software converts your PC into a real time strip chart recorder. Data can be printed in graphical or tabular format and can be exported to a text or Microsoft Excel file.

### Specifications

#### TEMPERATURE CHANNEL

Temperature Sensor: 100Ω Pt RTD  
Calibrated Accuracy:  $\pm 0.5^{\circ}\text{C}$   
(0 to 100°C)

Temperature Resolution: 0.1°C

#### Measuring Range:

-40 to 140°C (-40 to 284°F)

Input Connection: screw-terminal

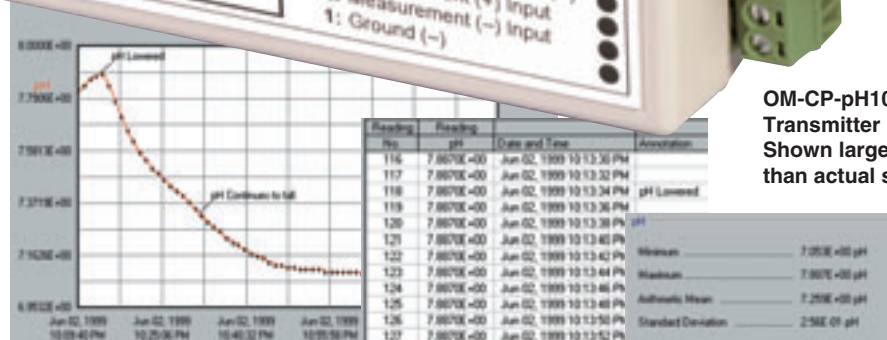
#### pH CHANNEL

pH Range: 0.00 to 14.00 pH

pH Resolution: 0.01 pH



OM-CP-PH101 Transmitter  
Shown larger than actual size



**Calibrated Accuracy:**  $\pm 0.1\text{pH}$

**Input Connection:** BNC connector

#### GENERAL SPECIFICATIONS

**ADC Resolution:** 16-bits

**pH Calibration:** digital calibration is available in software

**Recording Interval:** 2 seconds to 12 hours selectable in software

**Real Time Recording:** device may be used with PC to monitor and record data in real time

**Green Visual Indicator:**

LED flashes at selected reading rate

**Memory:** 8,192 pH and 8,192 temperature readings

**Power:** 9 V alkaline battery included

**Battery Life:** 1 year typical

**Time Accuracy:**  $\pm 1$  minute per month at 20°C

**Data Format:** date and time stamped, pH, °C, °F, °K, °R

**Weight:** 113 g (4 oz)

**Computer Interface:** PC serial or RS-232C COM

**Software:** Windows 95/98/NT/2000/XP

**Operating Environment:**

-5 to 50°C (23 to 122°F)

5 to 95% RH non-condensing

**Dimensions:**

61 mm H x 95 mm W x 26 mm D

(2.4 x 3.8 x 1")

**MOST POPULAR MODELS HIGHLIGHTED!**

### To Order (Specify Model Number)

Model No.	Price	Description
OM-CP-PH101	\$399	pH and temperature datalogger
OM-CP-IFC101	99	Windows software and 1.2 m (4') RS-232 cable with DB9F termination
OM-CP-BAT103	20	Replacement 9 V alkaline battery

Operator's manual, battery, and RS-232 cable are included with the OM-CP-IFC101 Windows software (software ordered separately). To order datalogger with NIST calibration certificate, add suffix "-cert" to model number and add \$60 to price. (NIST calibration for temperature only).

**Ordering Example:** OM-CP-PH101-CERT pH and temperature datalogger with NIST calibration certificate and OM-CP-IFC101 Windows software and RS-232 cable, \$399 + 60 + 99 = \$558.

Order Online

**omega.com**

Over 100,000 Products Available!

For the complete selection of Data Acquisition, Recorders, & Signal Conditioners shop online at

**omegaDataAcquisition.info**



# DATA ACQUISITION, RECORDERS & SIGNAL CONDITIONERS

## OM-CP-PROCESS101 4 to 20 mA Current Datalogger

Part of the NOMAD® Family

OM-CP-PROCESS101

**\$199**

Basic Unit



- ✓ 16-Bit Resolution
- ✓ Programmable Scale Factor, Engineering Units and Offset Value
- ✓ Memory Wrap Around
- ✓ Miniature Size
- ✓ User Calibration Through Software
- ✓ Real Time Operation

The OM-CP-PROCESS101 is a low cost, high resolution, miniature battery powered, stand-alone data logger used for automatically recording current between 0.000 and 100.0 mA. The OM-CP-PROCESS101 uses a 16-bit ADC to achieve a resolution of 0.5 micro-Amps. In addition, the OM-CP-PROCESS101 allows the user to store user defined units such as pressure into the device as well as scale factors and offset values. This enables the user to easily linearize and scale any process meter that provides an analog output to engineering units automatically. This all-in-one compact, portable, easy to use device will measure and record up to 32,768 current measurements. The OM-CP-PROCESS101 is a major leap forward in both size and performance. Its real time clock ensures that all data is time and date stamped. The storage medium is non-volatile solid state memory, providing maximum data security even if the battery becomes discharged. Its small size allows it to fit almost anywhere. Data retrieval is simple. Plug it into an empty COM port and our easy to use software does the rest. The software converts your PC into a real time strip chart recorder. Data can be printed in graphical or tabular format and can be exported to a text or Microsoft Excel file.

### Specifications

**Current Accuracy:** 0.1% of FSR

**Current Resolution:** 10 µA

**Specified Accuracy Range:**

0 to 100 mA

**Measurement Range:**

-20.0 to 100.0 mA

**Input connection:**

screw terminal

**Input Impedance:** 10Ω

**Current Calibration:** digital calibration is available in software

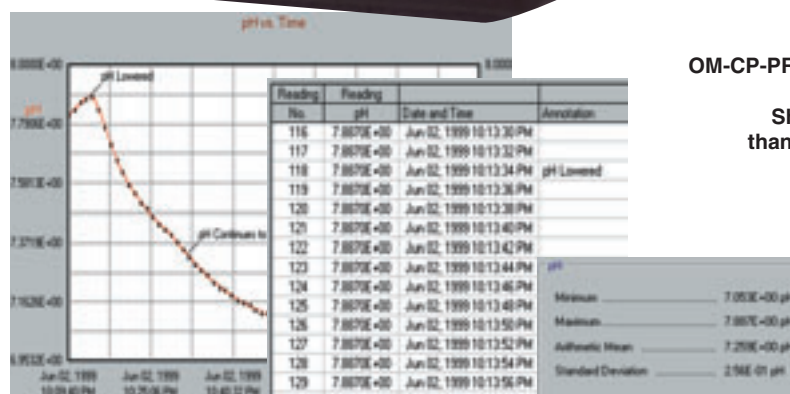
**Recording Interval:**

2 seconds to 12 hours

selectable in software



OM-CP-PROCESS101 Datalogger Shown larger than actual size



**Real Time Recording:** device may be used with PC to monitor and record data in real time

**Green Visual Indicator:** LED flashes at selected reading rate

**Power:** 3.6 V lithium battery included

**Battery Life:** 1 year typical

**Time Accuracy:** ±1 minute per month at 20°C

**Data Format:** Date and time stamped, volts, other engineering units programmable through software

**Weight:** 25.5 g (1 oz)

**Computer Interface:** PC serial or RS-232C COM

**Software:** Windows 95/98/NT/2000/XP

**Operating Environment:**

-0 to 50°C (40 to 176°F)  
5 to 95% RH non-condensing

**Dimensions:**

35 mm H x 54 mm W x 15 mm D  
(1.4 x 2.15 x 0.6")

**MOST POPULAR MODELS HIGHLIGHTED!**

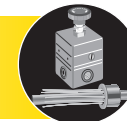
### To Order (Specify Model Number)

Model No.	Price	Description
OM-CP-PROCESS101	\$199	4 to 20 mA datalogger
OM-CP-IFC101	99	Windows software and 1.2 m (4') RS-232 cable with DB9F termination
OM-CP-BAT105	12	Replacement 3.6 V lithium battery

Operator's manual, battery, and RS-232 cable are included with the OM-CP-IFC101 Windows software (software sold separately). To order datalogger with NIST calibration certificate, add suffix "-cert" to model number and add \$60 to price.

**Ordering Example:** OM-CP-PROCESS101-CERT 4 to 20 mA current datalogger with NIST calibration certificate and OM-CP-IFC101 Windows software and RS-232 cable, \$199 + 60 + 99 = \$358.





## Fixed Range Industrial Pressure Transmitter

PX831  
\$420



- ✓ 0.3% Full Scale Accuracy
- ✓ Compact Size
- ✓ ½" NPT Process Connection
- ✓ ¾" Conduit Connection with 0.6 m (24") Cable
- ✓ All Welded 316 Stainless Steel Construction
- ✓ FM Approved

The PX831 is a durable, accurate, fixed range transmitter designed to give years of stable performance in even the toughest environmental and media conditions. The small size and lightweight of the PX831 eliminates the need for complicated mounting hardware and mechanical supports, thereby reducing installation time substantially.

The in-line connection permits simple field wiring without the need for additional hardware, adding to the speed and ease of installation.

With its all welded design, the PX831 is weatherproof and capable of withstanding a direct spray with forces up to 200 psi without internal leakage. All 316 stainless steel housing and wetted parts make it compatible with corrosive media and

hazardous environments. The PX831 is designed to meet FM explosion-proof ratings and NACE standards for offshore requirements.

0.6 m (24") cable is standard.

## PX831 Series



PX831, \$420  
Shown actual size

### **MOST POPULAR MODELS HIGHLIGHTED!**

#### To Order (Specify Model Number)

Range	Model No.	Price	Compatible Meters
0 to 15 psig	PX831-015GI	\$420	i Series, DP41-E, DP25B-E, DP24-E
0 to 30 psig	PX831-030GI	420	i Series, DP41-E, DP25B-E, DP24-E
0 to 100 psig	PX831-100GI	420	i Series, DP41-E, DP25B-E, DP24-E
0 to 300 psig	PX831-300GI	420	i Series, DP41-E, DP25B-E, DP24-E
0 to 1000 psig	PX831-1KGI	420	i Series, DP41-E, DP25B-E, DP24-E
0 to 3000 psig	PX831-3KGI	420	i Series, DP41-E, DP25B-E, DP24-E
0 to 5000 psig	PX831-5KGI	420	i Series, DP41-E, DP25B-E, DP24-E
<b>Absolute Pressure</b>			
0 to 15 psia	PX831-015AI	462	i Series, DP41-E, DP25B-E, DP24-E
0 to 30 psia	PX831-030AI	462	i Series, DP41-E, DP25B-E, DP24-E
0 to 100 psia	PX831-100AI	462	i Series, DP41-E, DP25B-E, DP24-E
<b>Vacuum and Compound Ranges</b>			
0 to 30 inHg Vacuum	PX831-30VACI	462	i Series, DP41-E, DP25B-E, DP24-E
30 inHg Vac to 15 psig	PX831-30V15GI	462	i Series, DP41-E, DP25B-E, DP24-E
30 inHg Vac to 30 psig	PX831-30V30GI	462	i Series, DP41-E, DP25B-E, DP24-E
30 inHg Vac to 60 psig	PX831-30V60GI	462	i Series, DP41-E, DP25B-E, DP24-E

Ordering Example: PX831-100GI, industrial pressure transmitter with 0-100 psig range and 4-20 mA output, \$420.

### Specifications

**Excitation:** 12-30 Vdc

**Output:** 4 to 20 mA (2 wire)

**Max Loop Resistance:** 900 Ohms @ 30 Vdc

**Accuracy:** ±0.3% of span @ 25°C (includes linearity, hysteresis, and repeatability)

**Zero Offset:** 4 mA ±2% of span

**Span:** 16 mA ±1% of span

**Storage Temperature:** -40 to 100°C (-40 to 212°F)

**Process Temperature:** -40 to 100°C (-40 to 212°F)

**Ambient Temperature:** -40 to 60°C (-40 to 140°F)

**Thermal Effects:** (Zero and span combined) ±2% per 50°F (28°C) between -40 to 60°C (-40 to 140°F)

**Proof Pressure:** 300% of rated pressure

**Humidity Limits:** 0 to 100% RH

**Vibration Effect:** ±0.1% FS for 3 g to 200Hz

**Housing:** 316 stainless steel, NEMA-4 rated

**Wetted Parts:** 316 L stainless steel

**Fill Fluid:** DC 200 silicone

**Process Connection:** ½" NPT female

**Electrical Connection:** 0.6 m (24"), 22 AWG cable with ¾" NPT female conduit port

**Weight:** 374 g (0.87 lb)

Order Online

**omega.com**

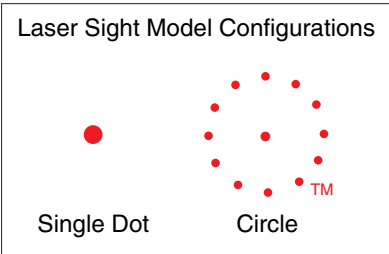
Over 100,000 Products Available!

For the complete selection of Pressure Instrumentation, shop online at [omegaPressure.info](http://omegaPressure.info)



## OS540 Infrared Thermometer

Ideal Applications: Diesel and Fleet Maintenance, Electrical, Asphalt, Measure Ink and Dryer Temp. (Screen Printing), HVAC/R Automotive, In-Process Temperature Measurement, Fire and Safety, Plastics Molding, Marine and RV, Food Safety



OS540  
**\$85**

Patent No: 6,095,682  
Other U.S. and International  
Patents Pending

Shown slightly  
smaller than  
actual size



### Specifications:

**Laser Sighting:** Circle or Dot  
**Range:** -20 to 420°C (0 to 788°F)  
**Resolution:** 1°C/1°F  
**Repeatability:** ±1°C  
**Emissivity:** 0.95 Fixed  
**Spectral Response:** 6-14 mm  
**Response Time:** 500 ms  
**Accuracy:** -20 °C to 100°C: 2°C;  
101°C to 420°C: ±3%  
**Storage Ambient:** -20 to 50°C Less than 90%  
of Humidity

**Laser Circle  
to Dot  
Switchable!**



**INFRARED THERMOMETER**  
LASER RADIATION  
AVOID DIRECT EYE EXPOSURE  
Range: -20 to 420°C (-4 to 788°F)  
DIODE LASER  
<1mW OUTPUT AT 675nm  
CLASS II LASER PRODUCT  
U.S. PATENTS AND PATENTS PENDING

**8 to 1 Field of View (Distance to Spot Ratio):** Minimum  
Spot 14 mm (0.55")  
**Operating Ambient:** 0 to 50°C Less Than 80% of Humidity  
**Ambient Temperature:** ±5°C Calibrated by Black Body  
Emissivity at 0.95  
**Dimensions:** 44 W x 40 D x 170 mm H (1.7" x 1.6" x 6.7")  
**Power:** 9 Volt Battery Included  
**Power Consumption:** Max. 40 mA  
**Weight:** Approx. 140 g (4.9 oz)

### To Order (Specify Model Number)

Model No.	Price	Description
OS540	\$85	Infrared Thermometer

**Ordering Example:** OS540 Infrared Thermometer, Batteries, Wrist Strap and Laser Circle to Dot Switchable Sighting Included, \$85.

## OS-PP OMEGAETTE™ POCKET PAL® Infrared Thermometer

OMEGAETTE™ POCKET PAL®, OS-PP measures window temperatures to find drafts. Excellent for oven/stove/grill temperatures. Perfect for food temperatures (surface only). Non-contact avoids contamination of foods. OS-PP is not recommended for industrial or scientific use.

OS-PP  
**\$49**



- ✓ FOV 6:1
- ✓ Single Button Operation
- ✓ °C/°F Switchable; Min/Max; Auto Off
- ✓ Continuous Update of Temperature While Button is Held
- ✓ Carrying Case and Removable Neck Strap
- ✓ LCD Backlight

**Cheaper by the  
dozen, purchase  
12 units and  
save 15%**

### Specifications:

**Temperature Range:**  
-20°C (-4°F) to 300°C (572°F)  
with 0.1° resolution  
**Field of View:** 6:1  
**Accuracy:** ±2%  
**Emissivity:** 0.95 Fixed  
**Operating Range:**  
0°C (+32°F) to 40°C (104°F)

**Power:** 4 button batteries  
(LR44) included  
**Battery Life:** 2000 readings  
@ 10 seconds per measurement  
**Dimensions:** 56 W x 23 D x  
102mm H (2.2" x 0.9" x 4")  
**Weight:** 113 g (4 oz)

### To Order (Specify Model Number)

Model No.	Price	Description
OS-PP	\$49	POCKET PAL® Infrared Thermometer

**Ordering Example:** OS-PP POCKET PAL® Infrared Thermometer, four LR44 batteries, neck strap, manual, and carrying case, \$49.



Shown slightly  
smaller than  
actual  
size. Comes complete  
with neck strap, soft  
case, batteries, and  
operator's manual.

# OMEGA USA Warranty/Disclaimer

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to any order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for any damages or losses, whether direct, indirect, incidental, special or consequential. This warranty cannot be transferred or assigned to third parties. It is limited to the purchaser only.

**CONDITIONS:** Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language above, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

*The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains and reserves the right to alter specifications without notice.*

## How to Order

### U.S.A. AND CANADA

#### TELEPHONE

**1-800-82-66342®**  
**1-800-TC-OMEGA**

**Mexico: 001 (203) 359-7803**

**International: (203) 359-1660**

**24 hr. FAX: (203) 359-7700**

**EasyLink 62968934**

**Toll-Free Fax: 1-877-FAX-OMEGA**

Our qualified sales personnel are trained to offer technical assistance as well as aid you in placing an order.

#### CONFIRMING ORDERS:

When placing an order by telephone, please inform the salesperson that confirming paperwork will follow. To avoid duplication, mark your confirming paperwork "Confirmation Only, Do Not Duplicate" and include the salesperson's name.

Send order confirmations to:

**OMEGA ENGINEERING, INC.**

**P.O. BOX 2669**

**STAMFORD, CT 06906 USA**

#### WRITTEN ORDERS:

Written orders are welcomed. If you are familiar with our products and do not need to consult with a salesperson, send or FAX your written orders to:

**OMEGA ENGINEERING, INC.**

**P.O. Box 4047**

**Stamford, CT 06907-0047 USA**

**FAX: (203) 359-7700**

or e-mail your order to:

sales@omega.com (domestic orders)

intl@omega.com (international orders)

**For fast, efficient processing of your order, please include:**

Purchase Order Number

Billing and Shipping Addresses

Part No. and Description of Items Ordered

Telephone Number of Requisitioner

#### TERMS:

We are pleased to extend the terms of Net 30 days to all customers who have established an open account with OMEGA. All shipments will be F.O.B. Stamford, CT. OMEGA welcomes new accounts and will process orders on a C.O.D. or a prepaid basis when an open account is being established. Prepayment checks should be mailed to:

**OMEGA ENGINEERING, INC.**

**P.O. Box 2349**

**Stamford, CT 06906 USA**

#### PRICES:

The prices of goods sold are those in effect at the time of sale. The prices listed are those in effect at the time of publication and are subject to change without notice. Please contact OMEGA's Sales Department for current prices. OMEGA will be pleased to furnish quotations either by mail, e-mail, telephone, FAX, EasyLink, or Telex upon request.

#### QUANTITY DISCOUNTS:

Many items have quantity discount schedules. For large quantities and for products which do not have discount schedules listed, please consult the Sales Department.

#### CREDIT CARDS:

OMEGA is pleased to honor major credit cards for your ordering convenience: VISA, MasterCard and American Express.

#### MINIMUM BILLING:

The minimum billing is \$10.

#### SHIPMENTS:

Domestic and international orders are shipped via UPS. Other qualified carriers are available upon request.

#### PAYMENTS BY CHECK:

OMEGA Engineering, Inc.

P.O. Box 740496

Atlanta, GA 30374-0496 USA

#### PAYMENTS BY TRANSFER:

OMEGA Engineering, Inc.

Fleet Bank

ABA# 011500010 (immediate wires)

ACH#011900571

For Credit To OMEGA Engineering, Inc.

Acct # 1584271

#### ADDITIONAL PAYMENT INFORMATION:

U.S. Federal Tax I.D. #: 06-6041011

Duns Reference No.: 001455856

#### ORDER STATUS AND RETURN/REPAIR INQUIRIES:

For delivery status, order changes, cancellations, in-warranty and out-of-warranty repairs, please contact OMEGA's Customer Service Department. Before returning any Product(s), please contact the Customer Service Department to obtain an Authorized Return (AR) number and shipping address. The designated AR number should then be marked on the outside of the return package. To avoid processing delays, please be sure to include: purchase order number, invoice number, name, address and phone number, product model and serial number, and repair instructions. Call Toll-Free for Service:

**1-800-622-2378®**  
**1-800-622-BEST**

#### OEM ACCOUNTS:

Original equipment manufacturers' discounts are available to all qualified manufacturers. Contact the OEM Sales Department for an application form.

## International Customers

OMEGA has a complete staff of trained sales personnel and engineers fluent in several languages to assist you with your order. Orders may be placed by telephone, internet, FAX, Telex or written purchase order through our various sales offices.

## WORLDWIDE SALES OFFICES:

OMEGA Engineering, Inc.

One Omega Drive

P.O. Box 4047

Stamford, CT 06907-0047 USA

**Toll-Free: 1-800-826-6342**

**TEL: (203) 359-1660**

**FAX: (203) 359-7700**

**e-mail: info@omega.com**

#### BENELUX:

Postbus 8034

1180 LA Amstelveen

The Netherlands

**Toll-Free: 0800 0993344**

**TEL: +31 20 3472121**

**FAX: +31 20 643 46 43**

**e-mail: sales@omegaeng.nl**

#### CANADA:

976 Bergar

Laval (Quebec)

Canada H7L 5A1

**Toll-Free: 1-800-826-6342**

**TEL: (514) 856-6928**

**FAX: (514) 856-6886**

**e-mail: info@omega.ca**

#### CZECH REPUBLIC:

Rudé armády 1868

733 01 Karviná 8

Czech Republic

**Toll-Free: 0800-1-66342**

**TEL: +420-69-6311899**

**FAX: +420-69-6311114**

**e-mail: info@omegashop.cz**

#### France:

11, rue Jacques Cartier

78280 Guyancourt

France

**Toll-Free: 0800 466 342**

**TEL: +33 (0) 161 37 2900**

**FAX: +33 (0) 130 57 5427**

**e-mail: sales@omega.fr**

#### GERMANY/AUSTRIA:

Daimlerstrasse 26

D-75392 Deckenpfronn

Germany

**Toll-Free: 0 800 6397678**

**TEL: +49 (0) 7056 9398-0**

**FAX: +49 (0) 7056 9398-29**

**e-mail: info@omega.de**

#### UNITED KINGDOM:

OMEGA Engineering Ltd.

One Omega Drive

River Bend Technology Centre

Northbank, Irlam

Manchester M44 5BD United Kingdom

**Toll-Free: 0800-488-488**

**TEL: +44 (0)161 777-6611**

**FAX: +44 (0)161 777-6622**

**e-mail: sales@omega.co.uk**

# DILBERT™

Includes 48 Dilbert Cartoons!

Laugh your way to the top at The DILBERT Zone at [www.dilbert.com](http://www.dilbert.com)

# OMEGA SCIENTIFIC™

Timely Introducing Scientific Instruments™

## Supermeter®

- ✓ Infrared Pyrometer with Patented Laser Circle/Dot Sighting
- ✓ Autoranging Multimeter
- ✓ Differential Thermometer

**TECHNOLOGY BREAKTHROUGH!**  
*Advanced manufacturing techniques have reduced our costs and we are passing the savings on to you!*

**\$100 Instant Rebate!**

**NOW!**  
**Model HHM290**  
**\$245\***

\*After \$100 Instant Rebate



**Immediate Delivery Available**

Includes: Test Leads, Two (2) Type K Beaded Wire Thermocouples, six (6) "AA" batteries, color coded protection boot and operator's manual

See [omega.com](http://omega.com) for complete specifications and ordering details

For Sales and Service, Call TOLL FREE:

**1-800-82-66342®**  
**1-800-TC-OMEGA**

# OMEGA SCIENTIFIC, INC.

An OMEGA Group Company

Covered by U.S. and International Patents and Pending Applications

**Shop online at [omega.com](http://omega.com)™**

**e-mail: [info@omega.com](mailto:info@omega.com)**



An OMEGA Group Company

OMEGA SCIENTIFIC, INC.  
One Omega Drive  
Stamford CT 06907-0047

PRSR STD  
U.S. POSTAGE  
PAID  
OMEGA  
Engineering, Inc.

[www.omega.com](http://www.omega.com)

### NOTICE OF INTELLECTUAL PROPERTY RIGHTS

This OMEGA SCIENTIFIC™ publication is based upon original intellectual property rights that were created and developed by OMEGA. These rights are protected under applicable copyright, trade dress and trademark laws. The distinctive, composite appearance of this OMEGA SCIENTIFIC™ publication is uniquely identified with OMEGA, including graphics, product identifying pings, pagination and layout style.

Prices in U.S. Dollars

© COPYRIGHT 2002 OMEGA ENGINEERING, INC. ALL RIGHTS RESERVED.

**AN OMEGA PRESS PUBLICATION**

Handbook Covers: © SEPS Licensed by Curtis Publishing, Indianapolis, IN [www.curtispublishing.com](http://www.curtispublishing.com)