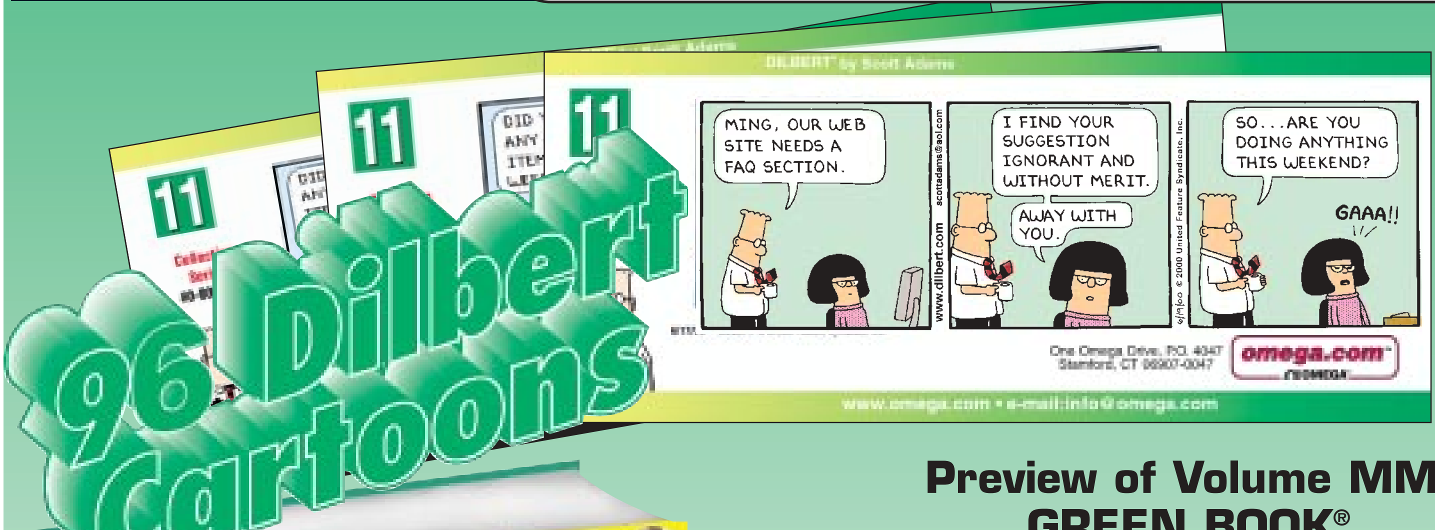
DILBERT™ GREENCAT™

New Horizons® in Environmental Measurement & Instrumentation



96 Dilbert Cartoons
11
DILBERT® by Scott Adams
MING, OUR WEB SITE NEEDS A FAQ SECTION.
I FIND YOUR SUGGESTION IGNORANT AND WITHOUT MERIT.
AWAY WITH YOU.
SO...ARE YOU DOING ANYTHING THIS WEEKEND?
GAAA!!
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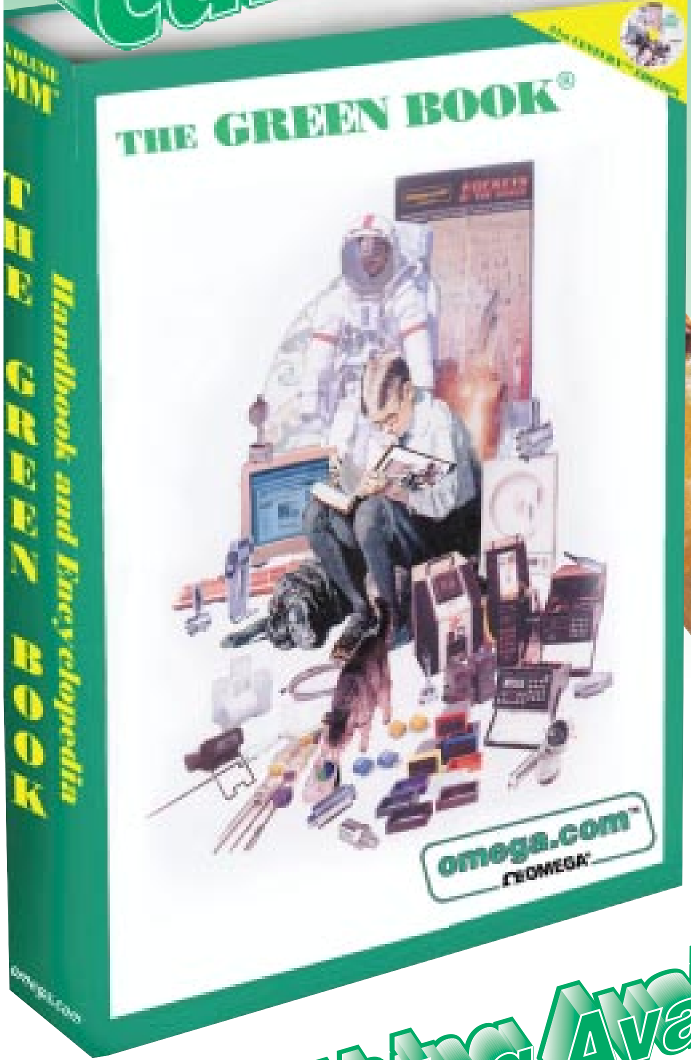
Preview of Volume MMI GREEN BOOK®

- SUPERMETER® • Air Flow
- Conductivity
- Dissolved Oxygen
- Environmental Test
- Flow • Handhelds
- Heaters • Humidity
- Infrared Temperature
- pH • Pressure
- Process Controllers • Pumps
- Recorders • Temperature
- Water Analysis



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COMPLIANCE TESTING

NEW

EMC and FCC Compliance Testing Services

Provided by our Affiliate analab, LLC

Now Open for Testing

- All NIST Traceable
- EMC/EMI Testing to EN 45001 and ISO Guide 25
- Fast, Precise, Quality Calibrations
- FCC Listed
- NVLAP Accredited
- NARTE Certified Personnel on Staff
- FCC DOC TESTING
- Testing and Technical Assistance
- UL Witness Testing Available
- EMC Testing to 89/336/EEC
- Cost Effective
- Low Voltage Directive Testing to 73/23/EEC

Emissions Testing to CISPR 11, 14, 22: FCC Part 15, EN61000-3-2, 3 Immunity Testing to:

- IEC1000-4-2 ESD
- IEC1000-4-3 Radiated RF
- IEC1000-4-4 EFT
- IEC1000-4-5 Surge
- IEC1000-4-6 Conducted RF
- IEC1000-4-8 Power Frequency Magnetic Fields
- IEC1000-4-11 Voltage Dips and Interrupts
- ENV50204:1995 Radiated 900 MHZ Pulsed RF

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For Calibration Services Call:

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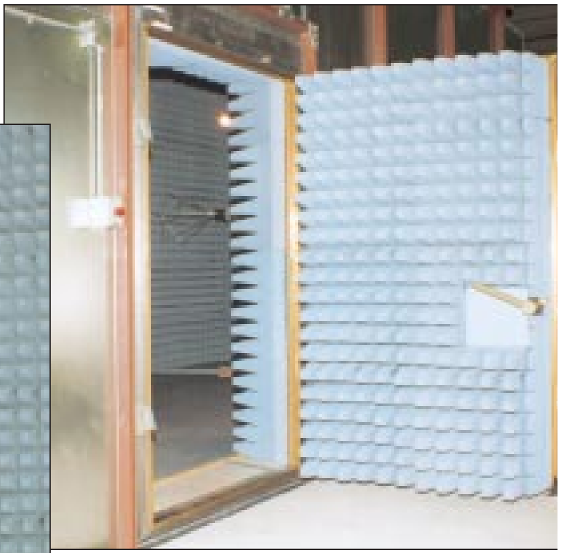
e-mail: info@analab1.com

Pictured above is analab's 3 and 10 meter (OATS) Open Area Test Site used for performing emissions testing

Our expert engineering and technical staff makes global compliance of your product a fast, economical, reliable experience. analab's state-of-the-art facility located at Springhill Airport in Springhill, PA has been designed to provide up to date, accurate service covering a wide range of your CE and FCC compliance testing requirements. Special cost effective pre-compliance programs have been created to provide our customers with a quick low cost solution when products need to be re-checked during the design process before final testing is required. analab is focused on providing the quality, trust and ethics that you, the customer demand. Let our dedicated knowledgeable staff guide you through the process of global compliance.

analab maintains state-of-the-art EMI/EMC testing equipment. Biconical antenna (below) and full anechoic chamber (right)



Prime Location

Located at Springhill, PA Airport and near major transportation lines with local accommodations, we make the best use of your time and money with prompt product review and testing.

NEW

HHM290 SUPERMETER®

Next Generation SUPERMETER®
With Laser Sighting

3 METERS IN 1 Patented

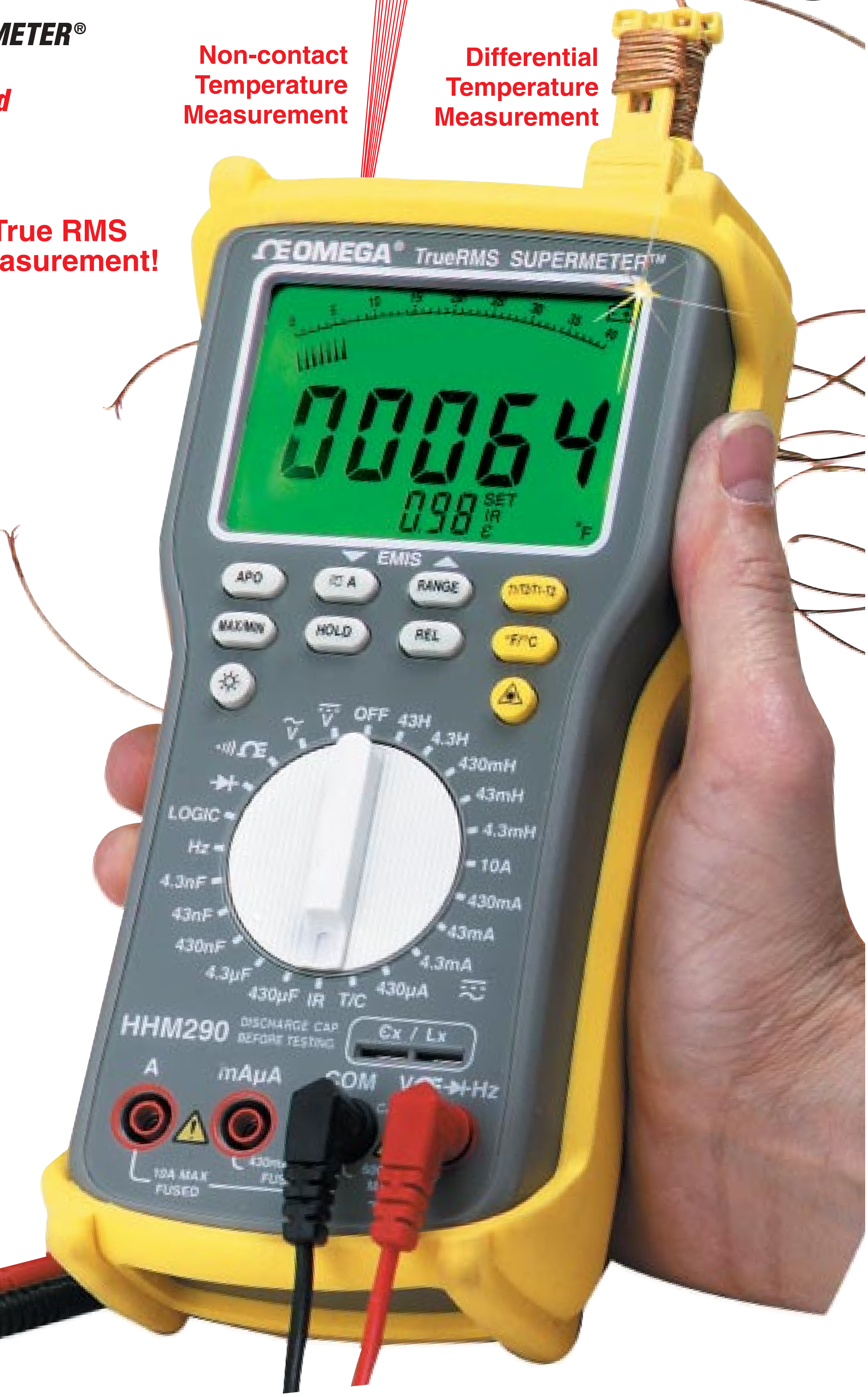
HHM290
$345

- Full Function Auto-Ranging Digital Multimeter
- Infrared Pyrometer with Patented Switchable Laser Circle/ Dot Sighting
- Dual Input Thermometer with Differential Temperature Function

True RMS Measurement!

Non-contact Temperature Measurement

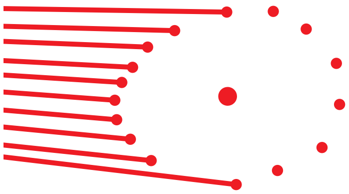
Differential Temperature Measurement


OMEGA® TrueRMS SUPERMETER™
00064
098
SET
IR
°F
EMIS
APO
RANGE
T1/T2/T1-T2
MAX/MIN
HOLD
REL
°F/°C
OFF
43H
4.3H
430mH
43mH
4.3mH
10A
430mA
43mA
4.3mA
430µA
IR
T/C
430µF
4.3µF
430nF
43nF
4.3nF
Hz
LOGIC
HHM290
DISCHARGE CAP BEFORE TESTING
Cx / Lx
A
mAµA
COM
10A MAX FUSED

User Switchable Laser Sighting!

Laser Dot
Range: Up to 23 m (75 ft.)

Laser Circle
Range: Up to 7.6 m (25 ft.)



U.S. and Foreign
Patents and
Patents Pending

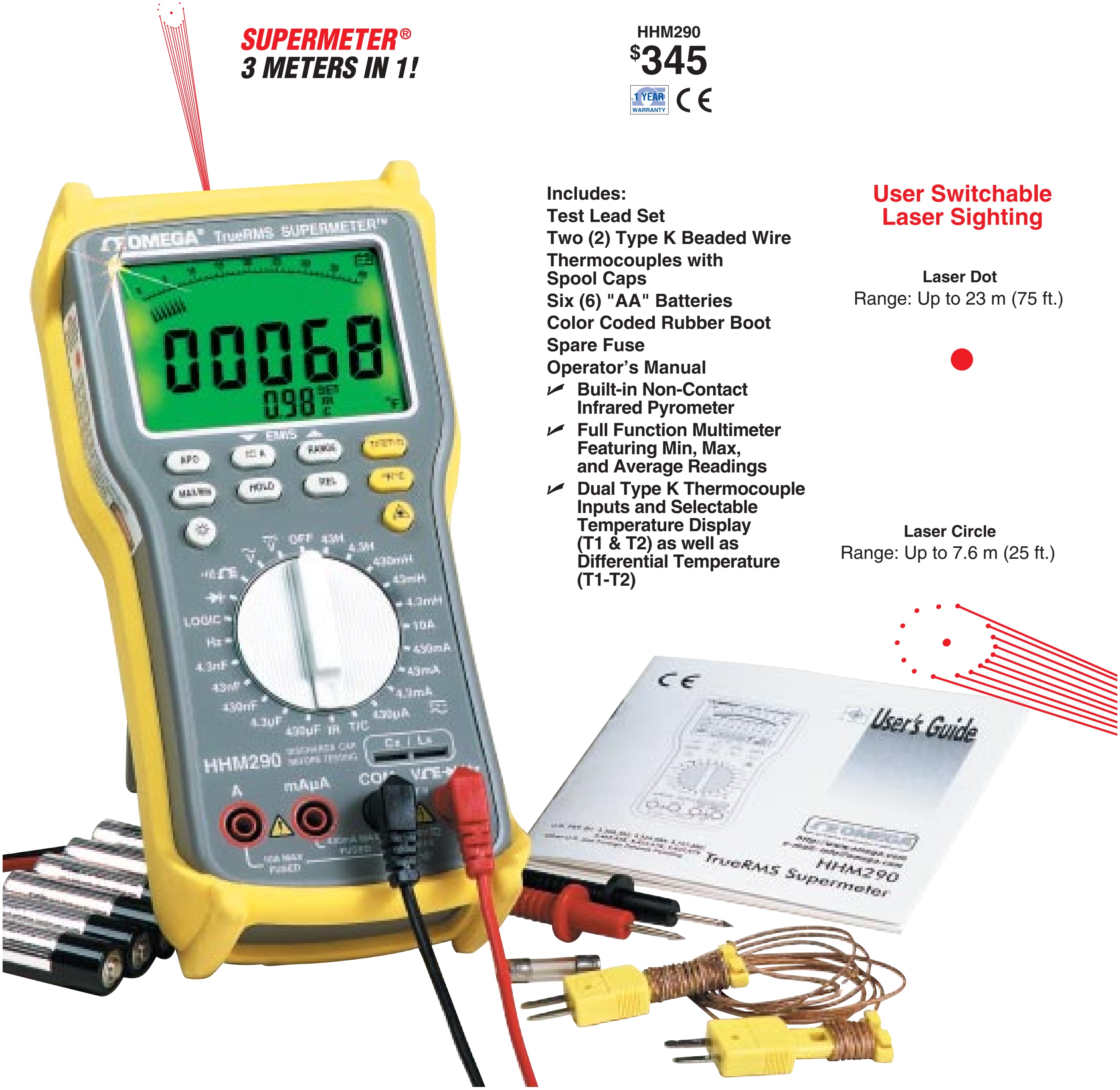
For the complete selection of Handheld products, refer to The Green Book®

HHM290 SUPERMETER®

SUPERMETER®
3 METERS IN 1!

HHM290
$345

1 YEAR WARRANTY CE



Includes:
Test Lead Set
Two (2) Type K Beaded Wire Thermocouples with Spool Caps
Six (6) "AA" Batteries
Color Coded Rubber Boot
Spare Fuse
Operator's Manual

- ✓ **Built-in Non-Contact Infrared Pyrometer**
- ✓ **Full Function Multimeter Featuring Min, Max, and Average Readings**
- ✓ **Dual Type K Thermocouple Inputs and Selectable Temperature Display (T1 & T2) as well as Differential Temperature (T1-T2)**

User Switchable Laser Sighting

Laser Dot
Range: Up to 23 m (75 ft.)

●

Laser Circle
Range: Up to 7.6 m (25 ft.)

Technology Breakthrough!

"It's a technician's dream come true!" OMEGA's new, patented, "all-in-one" SUPERMETER® Model HHM290 combines the power of a True RMS full function Multimeter, Non-contact Infrared Pyrometer with laser sighting and a Dual input Type-K Thermocouple meter with a differential measurement feature into one power-packed handheld instrument. The Multimeter measures…DC/AC Voltage, Current, Resistance, Frequency, Capacitance and features a built-in Logic & Diode tester. The Infrared Pyrometer offers adjustable emissivity, a wide temperature range, a 10:1 field of view and a laser sighting selector switch used to select between "a single laser dot" for hot spot locating and "a laser circle pattern" that outlines the optical field of view for average area measurement. The large backlit LCD display features simultaneous readings in both digital and analog bargraph format with settings for Min/Max and Average readings. Each unit features Auto power-off, fused multimeter inputs, both battery or optional AC wall adapter operation and comes complete with safety test leads, dual type-K temperature probes, rubber protective boot, batteries, spare fuse, user's manual and is CE marked.

NEW

HHM290 SUPERMETER®

Specifications

GENERAL:
Operating Temperature:
0 to 50°C
Power: 6AA size 1.5 Vdc Batteries (included) or optional DC Adaptor, 9 Vdc @ 200 mA
Display: Dual Backlit LCD
Low Battery Indication:
Icon on LCD
Battery Life: 100 hours normal operation No Laser or LCD Backlit
Tripod Mount: ¼"-20 UNC
Dimensions: 203 x 101 x 51 mm (8 x 4 x 2")
Weight: 640 g (1.42 lb)

Temperature Measurement

Thermocouple Type: Dual K type
Display: T1, T2, or T1-T2
Accuracy: 2% Rdg or 2°C
Measurement Range:
-40 to 1315°C (-40 to 2400°F)

Infrared Measurement

Measurement Range:
-20 to 550°C (4 to 1022°F)
Accuracy @22°C: 2% of Rdg or 1.7°C, whichever is greater
IR Resolution: 1°C or °F
Optical Field of View: 10 to 1
Spectral Response: 8 to 14 micron
Emissivity: 0.1 to 1.00 adjustable
Response Time: ≤1.5 seconds

Laser Sighting

Wavelength (Color):
630-700 nm, (Red)
Maximum Optical Power Output:
<5 mW. Class IIIa Laser Product
Operating Distance:
Laser Dot – Up to 23 m (75 ft.)
Laser Circle – Up to 7.6 m (25 ft.)
Laser Indicator:
Laser icon on the display

Multimeter

DC VOLTS
Range: 430 mV to 1000 V
Accuracy: 0.25% Rdg + 1 Digit
AC VOLTS
Range: 430 mVac to 750 Vac
Accuracy: 1% Rdg + 2 Digits
DC CURRENT
Range: 430 uA to 10 A
Accuracy:
0.5% Rdg + 1 Digit (Up to 43 mA)
2% Rdg + 1 Digit (Up to 10 A)

AC Current

Range: 430 µA to 10 A
Accuracy:
1% Rdg + 2 Digits (Up to 43 mA)
2.5% Rdg + 2 Digits (Up to 10 A)

Resistance

Range: Up to 43 MΩ
Accuracy:
0.3% Rdg + 3 Digits
(Up to 4.3 MΩ)

Frequency

Range: Up to 1.8 MHz
Accuracy: 1% Rdg
+ 3 Digits

Capacitance

Range: 4.3 nF to 430 µF
Accuracy: 5% Rdg
+ 10 Digits

OMEGA TrueRMS SUPERMETER
00068
HHM290

Tilt Stand and Rubber Boot Included

Tripod Mountable

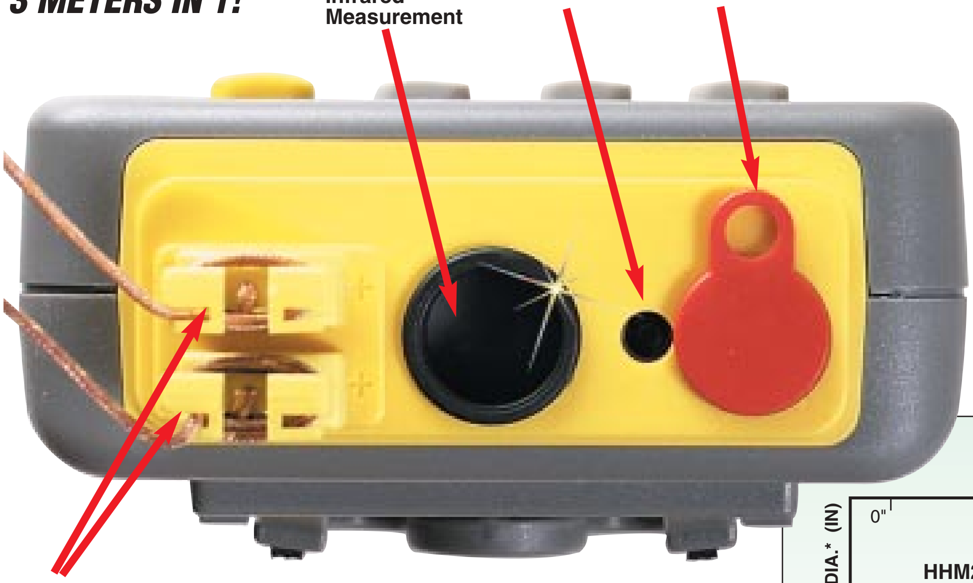
Optional ac Power Adaptor

AVOID EXPOSURE LASER RADIATION IS EMITTED FROM THIS APERTURE
LASER RADIATION: AVOID DIRECT EYE EXPOSURE
MAX. OUTPUT< 5mW, WAVE LENGTH 630-670nm.
CLASS IIIa LASER PRODUCT COMPLIES WITH 21 CFR CHAPTER 1. SUBCHAPTER J.
DANGER

HHM290 SUPERMETER®

NEW

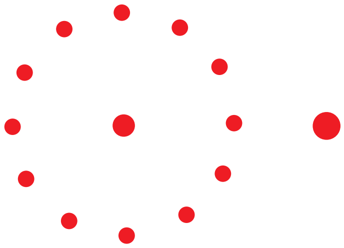
SUPERMETER®
3 METERS IN 1!


Infrared Measurement

Laser Sighting Dot or Circle *Switchable*

Dual Type K Thermocouple Inputs (Thermocouples included) with Differential Function

Patented Laser Sighting Circle or Dot Switchable



Patent Notice: U.S. PAT. B1 5,368,392; 5,524,984; 5,727,880; 5,465,838; 5,823,678, 5,823,679, 6,095,682; 6,123,453, European Patent No. 0644408. Other Patents Pending.

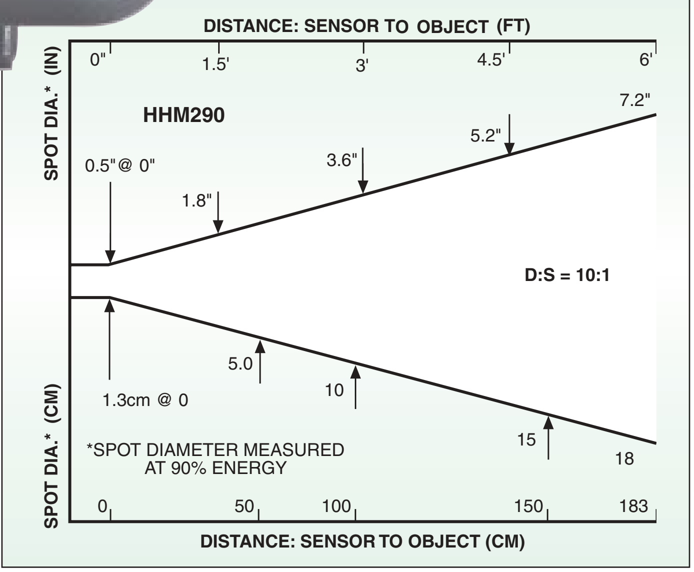
- ✓ **Built-in Non-Contact Infrared Pyrometer**
- ✓ **Full Function Multimeter Featuring Min, Max, and Average Readings**
- ✓ **Dual K Type Thermocouple Input and Temperature Display (T1 & T2) as well as Differential Temperature (T1-T2)**
- ✓ **Built-in Patented Laser Circle Sighting for Infrared Measurement**
- ✓ **Digital Emissivity Adjustment from 0.1 to 1.00 in 0.01 Steps**
- ✓ **Optical Field of View of 10:1 (Distance to Spot Size)**
- ✓ **High Performance, Rugged Design with Large Backlit LCD Display**
- ✓ **Measures Voltage, Current, Resistance, Capacitance, Inductance, and Frequency**
- ✓ **Built-in Diode and Logic Test**
- ✓ **Battery Powered as well as AC Powered Using an Adaptor**
- ✓ **Auto Power Shut Off Feature**
- ✓ **Tripod Mount and a Built-in Rubber Boot**

Immediate Delivery Available

AVOID EXPOSURE LASER RADIATION IS EMITTED FROM THIS APERTURE

LASER RADIATION: AVOID DIRECT EYE EXPOSURE
MAX. OUTPUT< 5mW, WAVE LENGTH 630-670nm.
CLASS IIIa LASER PRODUCT COMPLIES
WITH 21 CFR CHAPTER 1. SUBCHAPTER J.
DANGER

10:1 Field of View



To Order *(Specify Model Number)*

Model Number	Price	Description
HHM290	$345	Digital multimeter/infrared thermometer with laser sighting Dot/Circle Switch
Options and Accessories		
HHM290-SC	15	Soft carrying case
HHM-TL	5	Replacement test leads (1set)
OS520-Adaptor-110V	25	110 Vac adaptor
OS520-Adaptor-220V	25	220 Vac adaptor
KTSS-HH	29	General Purpose, immersion probe, type K
88001K	110	General purpose surface probe, type K
CALIBRATION	*	NIST Traceable Calibration

** Consult Sales for price and Calibrations available*
Each unit comes complete with rubber boot, two (2) type K beaded wire thermocouples, 6 AA alkaline batteries, test leads and operator's manual.
***Ordering Example: HHM290**, Digital multimeter/infrared thermometer with laser sighting $345, **HHM290-SC**, soft carrying case $15, **KTSS-HH**, general purpose immersion probe $29, **$345 + 15 + 29 = $389**.*

We make running changes when technical advances allow. Check at time of ordering for additional features.

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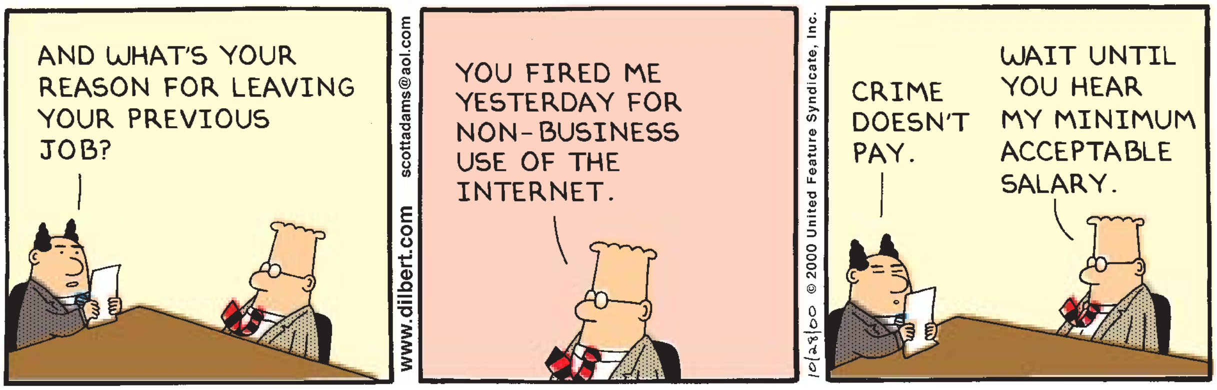
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CRIME DOESN'T PAY.
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11

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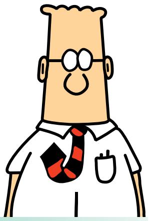

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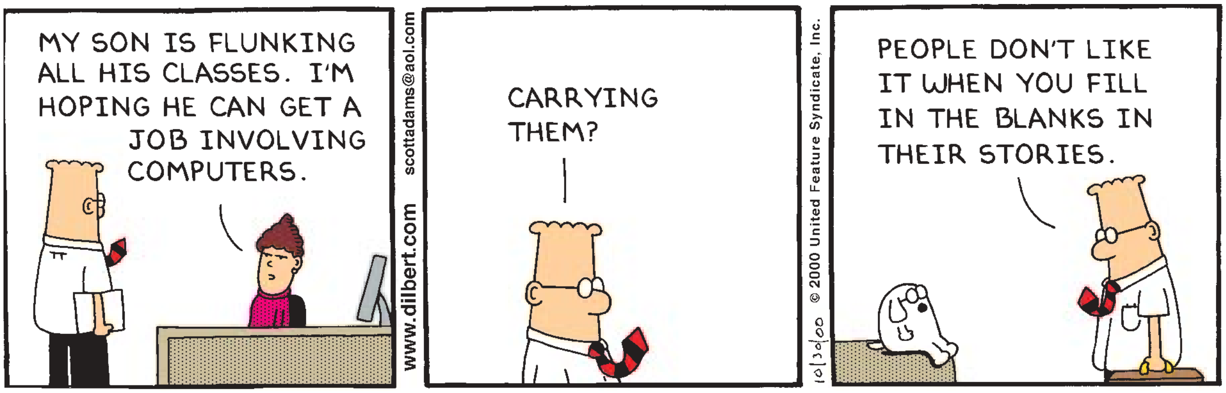
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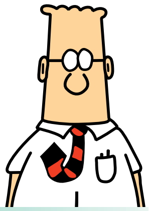

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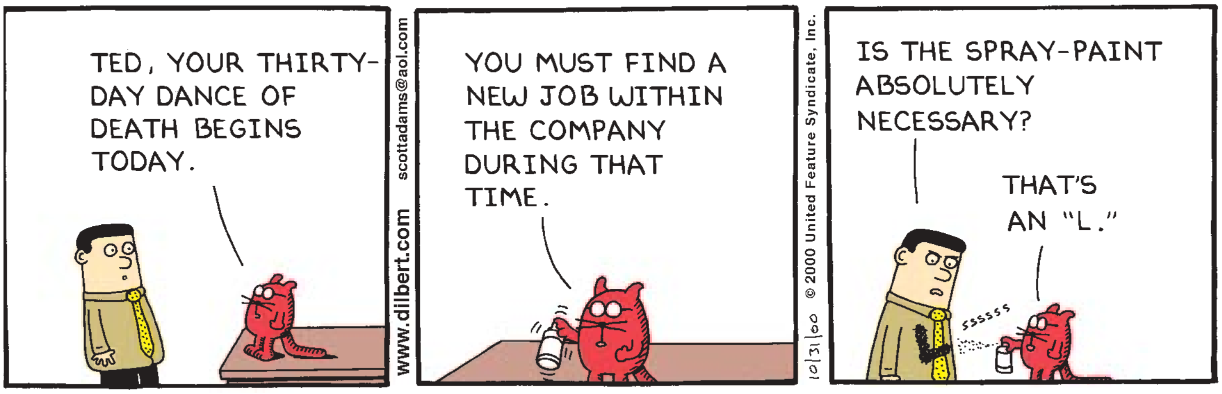
TED, YOUR THIRTY-DAY DANCE OF DEATH BEGINS TODAY.
YOU MUST FIND A NEW JOB WITHIN THE COMPANY DURING THAT TIME.
IS THE SPRAY-PAINT ABSOLUTELY NECESSARY?
THAT'S AN "L."
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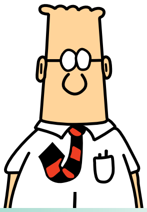

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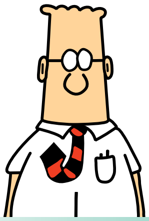

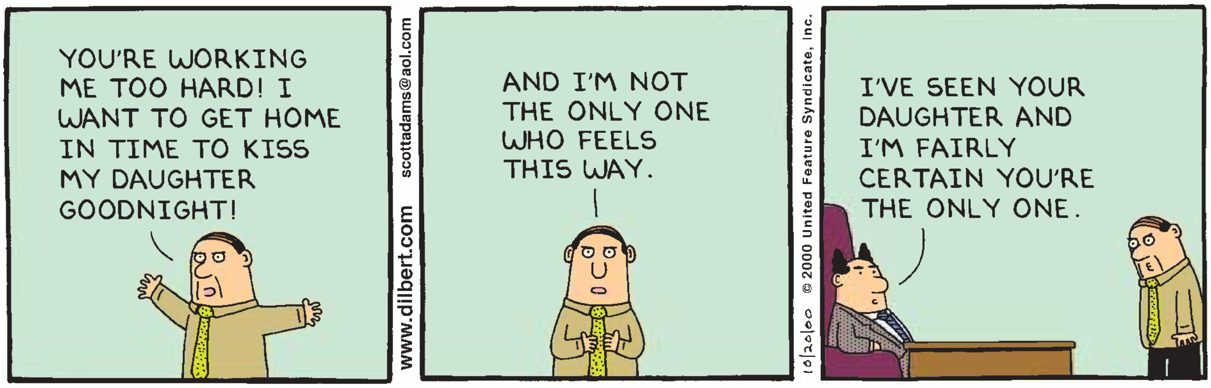
YOU'RE WORKING ME TOO HARD! I WANT TO GET HOME IN TIME TO KISS MY DAUGHTER GOODNIGHT!
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AND I'M NOT THE ONLY ONE WHO FEELS THIS WAY.
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I'VE SEEN YOUR DAUGHTER AND I'M FAIRLY CERTAIN YOU'RE THE ONLY ONE.

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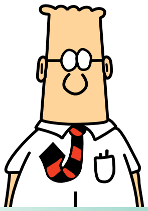

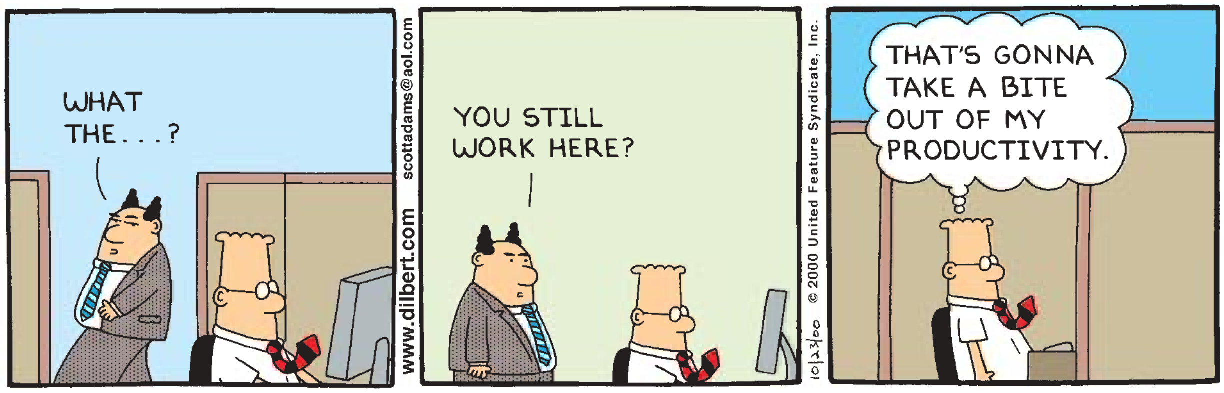
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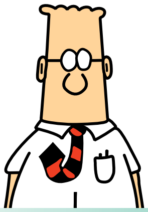

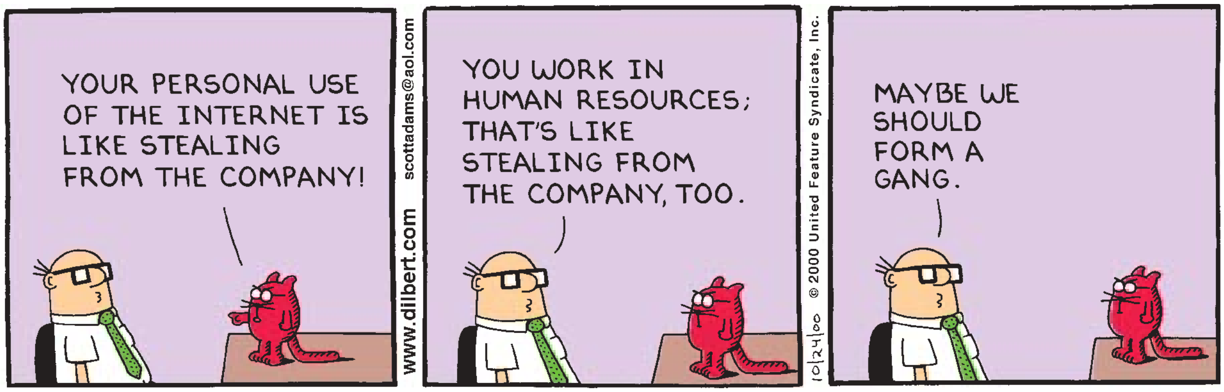
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MAYBE WE SHOULD FORM A GANG.

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Handheld Portable Conductivity Meter

CDH-152
$395
Complete

- **Easy to Use**
- **Complete Kit with Rugged Carrying Case**
- **4 Conductivity Standards Included**
- **Probe with 182 cm (6 ft) Cable Included**
- **Economical Price**

The CDH-152 provides accurate readings over the full 0.2 to 20,000 µS/cm Range. The CDH-152 displays on a large, easy to read 3½ digit LCD display. Units have precision calibration capabilities, automatic temperature compensation and replaceable probes.

0.02
CAL
µS/cm
On
Off
Batt

Shown Smaller Than Actual Size

Specifications

Instrument
Range: 0.2 to 20,000 µS/cm
Accuracy: ±2% full scale
Resolution: 0.1% range
Temp Comp: Automatic 0 to 50°C, (32 to 122°F)
Power: Rechargeable battery (included)
Power Adaptor: 120 Vac to 12 Vdc @ 500 mA (included)
Dimensions: 10 H x 30 W x 20 D cm (4 x 12 x 8 in)
Weight: 1.8 kg (4 lb)
Probe (Included)
Probe: Dip style
Dimensions: 1.9 cm (¾") Diameter, 10 cm (4") Long
Construction: Polycarbonate connected to 1.8m (6 ft) cable with urethane strain relief
Pin Material: Nickel
Conductivity Constant: K=1

To Order *(Specify Model Number)*

▭ ***MOST POPULAR MODEL HIGHLIGHTED!***

Model No.	Price	Description
CDH-152	$395	Handheld Conductivity Kit
CDE-152	110	Replacement Conductivity Probe
CDS-45	10	45 µS Conductivity Standard (1 included)
CDS-450	10	450 µS Conductivity Standard (1 included)
CDS-1500	10	1500 µS Conductivity Standard (1 included)
CDS-4500	10	4500 µS Conductivity Standard (1 included)

Ordering Example: CDH-152**, Handheld conductivity kit, **$395.
Complete Kit Contains: Meter, Probe, 4 standards, rechargeable batteries, power adaptor/charger and carrying case.

NEW

Mass and Volumetric Flow Meters

- ✓ Displays Flow, Temp, Pressure in Mass Flow Unit
- ✓ Full Scale Ranges from 0.5 CCM to 1000 LPM
- ✓ Dynamic Display with 13 Gas Select
- ✓ RS-232 Communication
- ✓ Response Time of 10milliseconds Typical
- ✓ Low Pressure Drop of 10" Water Column or Better for 100 LPM or Less
- ✓ Turndown Ratio of 100:1 Typical Position Insensitive
- ✓ Push Button Tare
- ✓ Repeatability ±0.5%
- ✓ 300 Series Stainless Steel Standard on all Single Channel, Flowmeters 50(S) LPM and Under

FVL-1600
FMA-1600
\$560
Basic Unit

1 YEAR WARRANTY

CE

PSIA.
+13.49
°C
+22.73
Tare
+210.4
Mass
SCCM
Air
+227.4
Volume
+210.4
Mass
Main
MODE
FLOW

FMA-1611 shown larger than actual size

The FMA-1600 and FVL-1600 Series flowmeters use two of the best-studied physical properties of gases to measure flow: Pressure and viscosity. Differential pressure measurement, across a laminar region, to achieve a turndown of 100:1 typical. Gas units are available with very wide range of measurement, starting at 500 micro-liters per minute full scale to 1000 liters per minute full scale. Unique laminar flow elements, no moving parts and modern electronics provide an instrument that is rugged, affordable and accurate.

The FMA-1600 series "NON-THERMAL" Mass FLowmeters use discrete differential pressure, absolute pressure, and temperature sensor measurements within the laminar flow region. The embedded microprocessor provides a software-based STP calculation for the user, compensated for pressure and temperature to standard conditions(1 atmosphere 25° C). The FMA1600 series addresses the limitations of thermal mass flow technologies, as there is no "Hot wire" drift. The unit has an adjustable response time starting from 10 ms.

The FVL-1600 series volumetric gas flowmeters are ideal for applications venting to atmosphere or with little to no back- pressure. These units use discrete differential Pressure sensor measurements within the laminar flow region with an embedded microprocessor to provide flow measurements with an adjustable response time starting from 10 ms.

The FMA-1600 and FVL-1600 series gas flow meters are based on the accurate measurement of volumetric flow. The volumetric flow rate is determined by creating a pressure drop across a unique internal restriction, known as a Laminar Flow Element (LFE), and measuring differential pressure across it. The restriction is designed so that the gas molecules are forced to move in parallel paths along the entire length of the passage; hence Laminar (streamline) flow is established for the entire range of operation of the device. Because of the LFE's in the flow body, straight runs of pipe upstream and downstream are generally not required. Unlike other flow measuring devices, in laminar flow meters the relationship between pressure drop and flow is linear. The underlying principle of operation of the flow meters is known as the Poiseuille Equation:

$Q = (P1-P2)\pi r4/8hL$ (Equation 1)

Where:

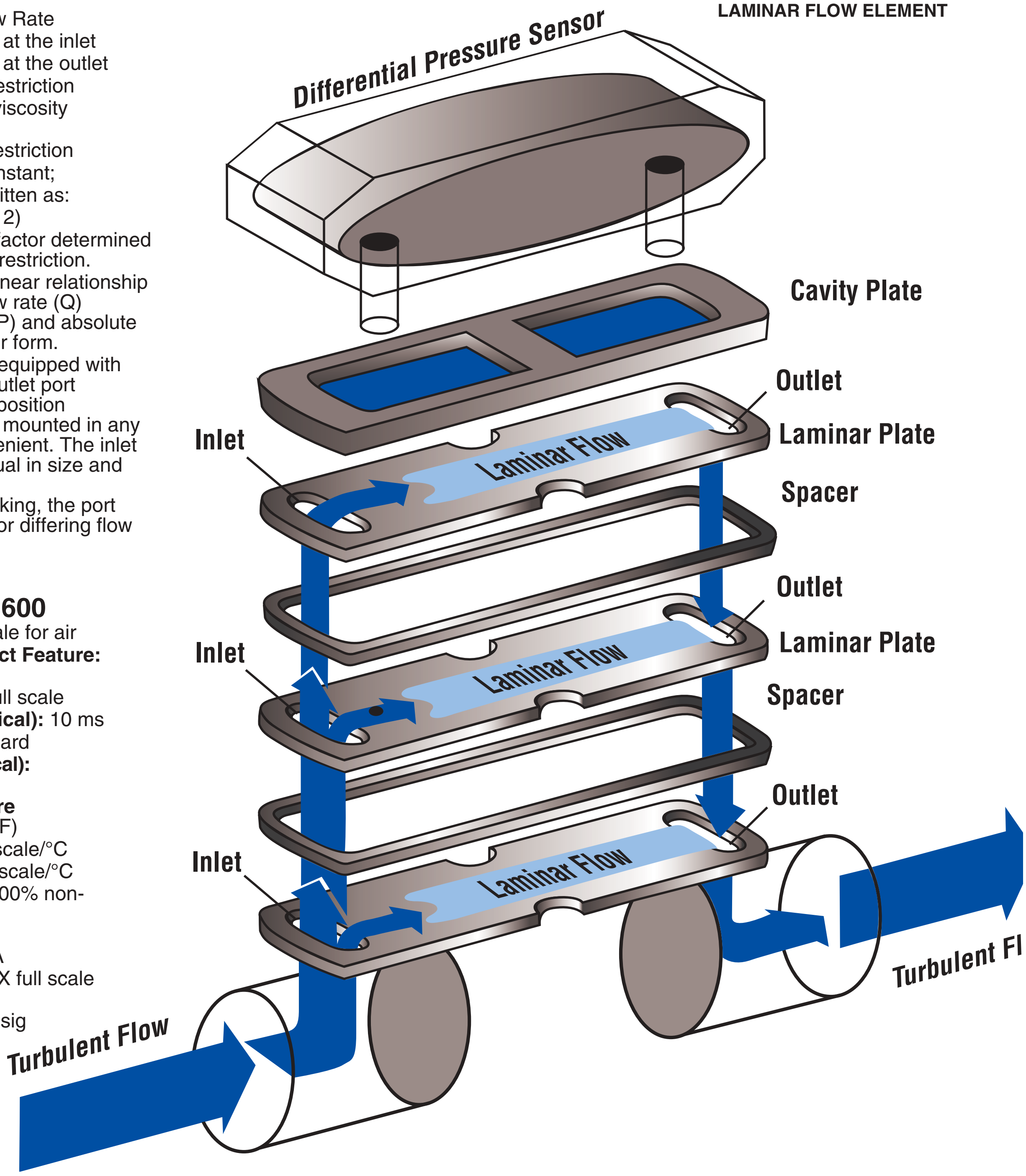
Q = Volumetric Flow Rate
P1 = Static pressure at the inlet
P2 = Static pressure at the outlet
r = Radius of the restriction
h = (eta) absolute viscosity of the fluid
L = Length of the restriction

Since p, r and L are constant;
Equation 1 can be rewritten as:
Q = K (ΔP/h) (Equation 2)
Where K is a constant factor determined by the geometry of the restriction.
Equation 2 shows the linear relationship between volumetric flow rate (Q) differential pressure (DP) and absolute viscosity (h) in a simpler form.
All the flow meters are equipped with female NPT inlet and outlet port connections. They are position insensitive and may be mounted in any orientation that is convenient. The inlet and outlet ports are equal in size and symmetric
(in-line). Normally speaking, the port sizes and dimensions for differing flow ranges are as follows:

Specifications

FMA-1600/FVL-1600

Accuracy: ±1% full scale for air
Accuracy of Gas Select Feature: 2% full scale
Repeatability ±0.5% full scale
Response Time* (Typical): 10 ms
Output: 0-5 Vdc standard
Pressure Drop (Typical):** 0.4 psid full Scale
Operating Temperature -10 to 50°C (14 to 122°F)
Zero Shift: 0.02% full scale/°C
Span Shift: 0.02% full scale/°C
Humidity Range: 0 - 100% non-condensing
Supply Current* (Typical):** 0.25 A to 1 A
Excess Flow Rate: 20X full scale
Common Mode Pressure (max): 125 psig
Supply Voltage: 7 to 30 Vdc
Cable Connection: 8 pin mini DIN
Zero Shift: 0.02% Full scale/°C
Span Shift: 0.02% Full scale/°C
Humidity Range: 0 - 100% non-condensing
Supply Current* (Typical): 0**.25 A to 1 A
Excess Flow Rate: 20X Full scale
Common Mode Pressure (max): 125 psig
Supply Voltage: 7 to 30 Vdc
Cable Connection: 8 pin mini DIN



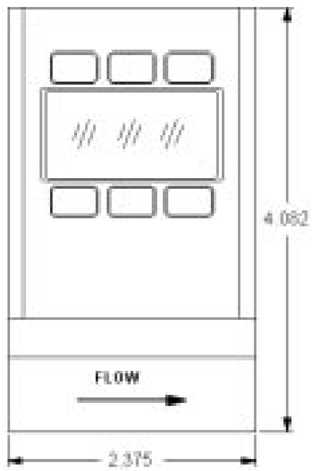
LAMINAR FLOW ELEMENT

Dimensions

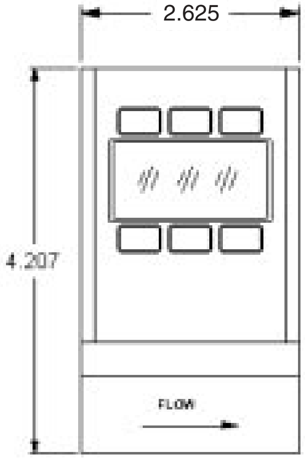
Flow Range	Height	Length	Depth	Port Size
20(S) LPM and under*	4.082"	2.375"	1.05"	1/8"NPT(F)
50 (S) LPM	4.207"	2.625"	1.05"	1/4"NPT(F)
100 (S) LPM	4.367"	3.5"	1.6"	1/4"NPT(F)
250 to 1000 (S) LPM	5.242"	3.5"	1.6"	1/2"NPT(F)

Very low flow devices may have special ports to reduce dead volume.

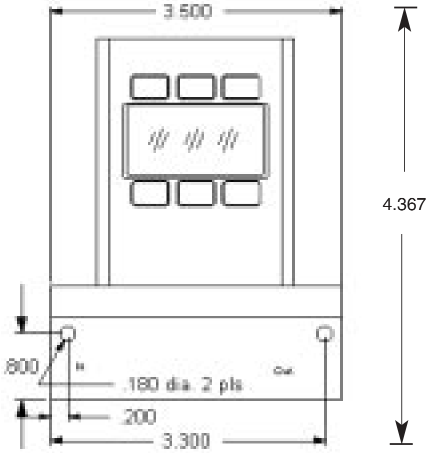
20(S) LPM & Under



50(S) LPM



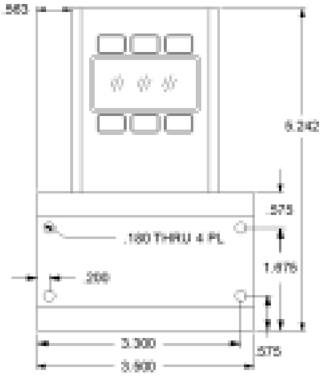
50 -100(S) LPM



Overall Depth is 1.05"

Please allow approximately 1.75" on top of unit for electrical cable connection

250-1000(S) LPM



Overall Depth is 1.60"

Units are calibrated to air @ 5 PSIG 70°F Temp for 0-1 LPM, 15 PSIG for 2-10 LPM, 30 PSIG for 20-100 LPM, 50 PSIG for 200 LPM and Greater

**10 ms represents a typical default response time for 63.2% of a step change. A variable register allows response time to be field adjustable to a certain extent via RS-232 communication. The primary trade-off for response time is signal noise.*

***Pressure drops for meters with flow ranges in excess of 250 (S)LPM can exhibit considerable higher pressure drops.*

****30 mA represents typical current draw, 100 mA available supply recommended.*

To Order *(Specify Model Number)*

▭ ***MOST POPULAR MODEL HIGHLIGHTED!***

Model No. Mass Flow Meter	Price	Model No. Volumetric Flow Meter	Price	Connection NPT(F)	Flow Range
FMA-1601	$1270	FVL-1601	$1070	1/8	0.5 SCCM
FMA-1602	1165	FVL-1602	965	1/8	1 SCCM
FMA-1603	1060	FVL-1603	860	1/8	10 SCCM
FMA-1604	860	FVL-1604	660	1/8	50 SCCM
FMA-1605	760	FVL-1605	560	1/8	2 SLPM
FMA-1606	785	FVL-1606	585	1/8	5 SLPM
FMA-1607	810	FVL-1607	610	1/8	10 SLPM
FMA-1608	860	FVL-1608	660	1/8	20 SLPM
FMA-1609	960	FVL-1609	760	1/4	50 SLPM
FMA-1610	1060	FVL-1610	860	1/4	100 SLPM
FMA-1611	1320	FVL-1611	1070	1/2	250 SLPM
FMA-1612	1730	FVL-1612	1335	1/2	500 SLPM
FMA-1613	2025	FVL-1613	1595	1/2	1000 SLPM

Accessories

Model Number	Price	Description
FMA1600-BP	$80	Battery pack for portable use
FMA1600-C1	25	Replacement single-ended 6' 8-pin mini DIN cable connector
FMA1600-C2	30	Replacement double-ended 6' 8-pin mini DIN cable connector
FMA1600-C3	30	6" adaptor cable with male 8-pin DIN to male DB-9
FMA1600-PS1	40	Replacement 110 Vac to 12 Vdc power supply
FMA1600-E1	60	220 Vac to 12 Vdc power supply

Each unit is shipped with a 110 Vac power supply, 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 a second channel output of 4-20 mA (not available with TTL output); add $50 to price.*
*Add **"-V2"** for a second channel output of 0-5 volts (not available with TTL output); add $50 to price.*
*Add **"-NIST"** to model for NIST traceable output, add $100 to price.*
*Add **"-TTL(*)"** to model for TTL output, add $100 to price.*
**Specify pulses/engineering unit*
Ordering Example: FMA-1601,** 0.5 SCCM mass flowmeter, **FMA-1600-BP,** battery pack, $1270 + 80 = **$1350

General-Purpose Air Velocity Transducers

- ✓ 1.5% Accuracy
- ✓ 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 1" size) with the use of OMEGA® SSLK compression fittings (SSLK-14-14). fluoropolymer ferrules are required. (Model T-FER-14).

Each unit is individually calibrated in OMEGA's NIST-traceable wind tunnel.

Suggested power supply; FPW-15, ($75).

Specifications

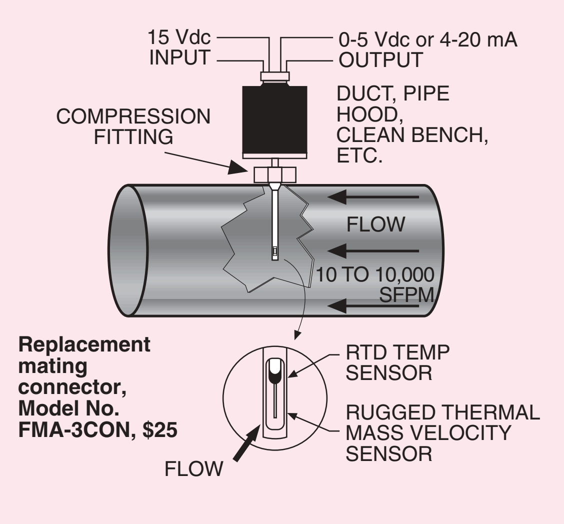
Accuracy: 1.5% FS @ room temp. Add ±0.5% of reading from 0 to 50°C (32° to 122°F); add 1% FS below 1000 SFPM

Repeatability: ±0.2% FS

Response Time: 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)


15 Vdc INPUT
0-5 Vdc or 4-20 mA OUTPUT
COMPRESSION FITTING
DUCT, PIPE HOOD, CLEAN BENCH, ETC.
FLOW
10 TO 10,000 SFPM
RTD TEMP SENSOR
RUGGED THERMAL MASS VELOCITY SENSOR
FLOW

Replacement mating connector, Model No. FMA-3CON, $25

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)

1 YEAR WARRANTY · MADE IN USA · CE

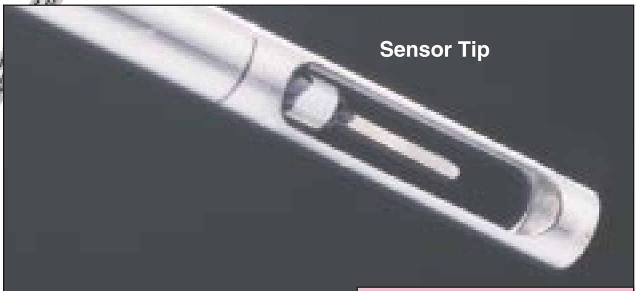
FMA-900 Series
$822
Basic Unit

Shown Smaller Than Actual Size

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 (0.250") O.D., 330 mm (13") length, optional 3.75" available

Weight: 160 g (5.6 oz)



Compatible Meters: DPF50, DPF60, DPF300, DP24-E, DPF403

▭ ***MOST POPULAR MODEL HIGHLIGHTED!***

To Order *(Specify Model Number)*

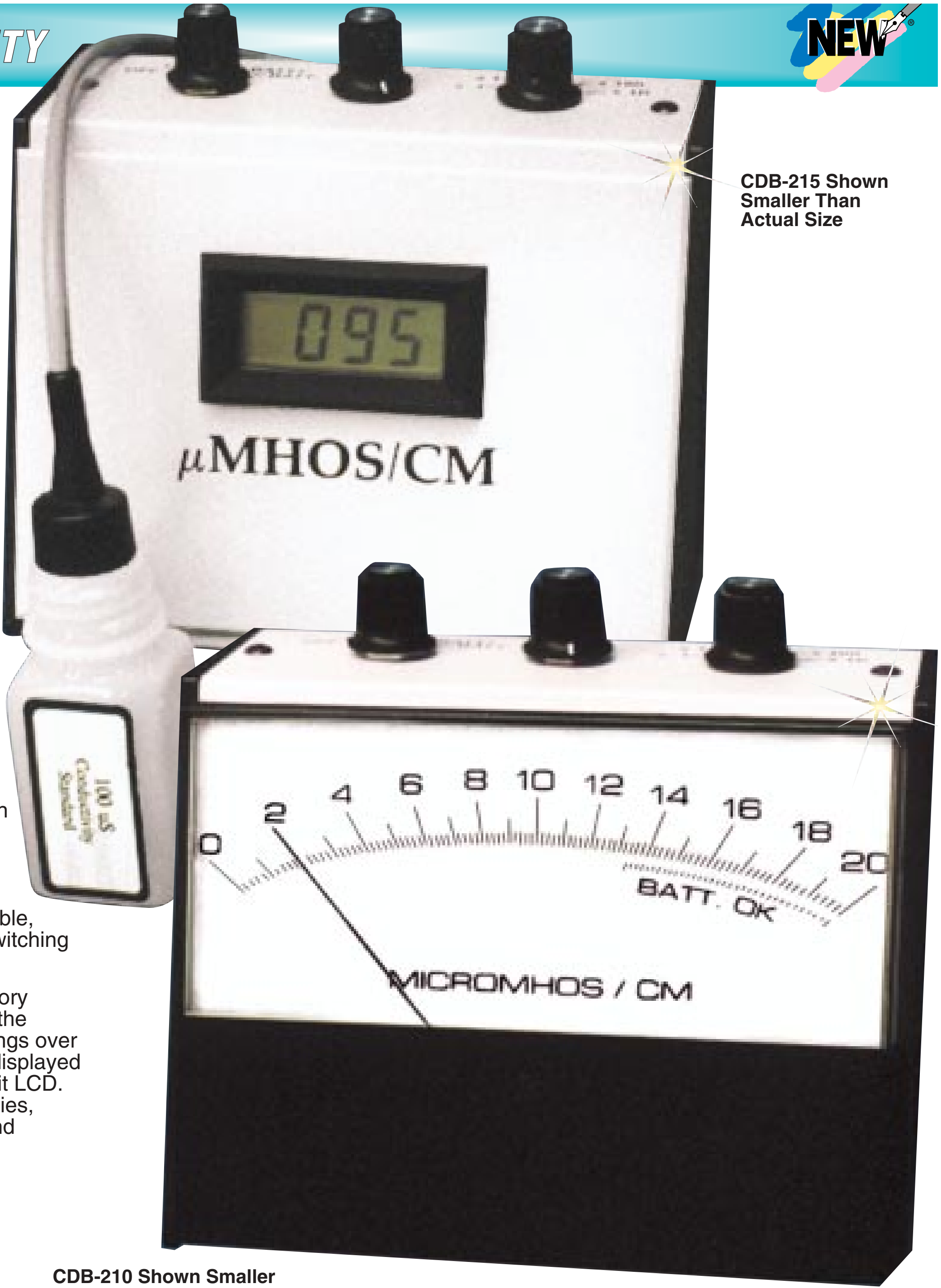
Model No. 0-5 V Output	Price	Model No. 4-20 mA Output	Price	Range
FMA-900-V	$822	FMA-900-I	$882	0-100 SFPM
FMA-901-V	822	FMA-901-I	882	0-200 SFPM
FMA-902-V	822	FMA-902-I	882	0-500 SFPM
FMA-903-V	822	FMA-903-I	882	0-1000 SFPM
FMA-904-V	822	FMA-904-I	882	0-2000 SFPM
FMA-905-V	822	FMA-905-I	882	0-5000 SFPM
FMA-906-V	822	FMA-906-I	882	0-10,000 SFPM

*Comes with mating connector pre-wired to 15' shielded cable and complete operator's manual. To order with 3.75" probe instead of standard 13" probe, add suffix "**-S**" to model number and add **$30** to price.*
Ordering Example: FMA-904-I**, probe with 4-20 mA output, 0-2000 SFPM range, **$882.

Compact Conductivity Benchtops

CDB-210	CDB-215
$375	$405

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



CDB-215 Shown Smaller Than Actual Size

The economical and lightweight CDB-210 analog meter has proven to be highly accurate and dependable for a wide variety of applications. Spanning the entire measurement range of 0.2 to 20,000 mS (0.1 to 10,000 ppm) in five increments with automatic temperature compensation, readings are accurate ±2% of full scale. These models feature a long-life, replaceable probe and will operate for over 200 hours using the internal batteries. Model CDB-210 can also be line operated on 110/220 Vac (optional AC power pack).

The large 15 cm (6") analog displays can be seen in any light and at any distance. Process trends and changes are clearly shown. The dials can be marked with grease markers or tape to show range marks or limits. Analog displays give stable, instantaneous readings, no flipping of switching to obtain the correct reading.

Features normally found in large laboratory conductivity meters are condensed into the CDB-215 digital models. Accurate readings over the full 0.2 to 20,000 mS/cm range are displayed on a large, easy-to-read, 9 cm (3.5") digit LCD. Units have precision calibration capabilities, automatic temperature compensation and replaceable probes.

CDB-210 Shown Smaller Than Actual Size

Specifications

Readout:
CDB-210: 15 cm (6") analog meter;
CDB-215: 9 cm (3½") digit LCD
Resolution:
CDB-210: 1% of full scale;
CDB-215: 0.1% of full scale
Range: 0.2 to 20,000 micromhos
Steps: 0 to 2, 0 to 20, 0 to 200, 0 to 2000, 0 to 20,000
Accuracy: ±2% of full scale
Temperature Compensation: Automatic, 0-50°C
Probe Dimensions: 12 mm D x 140 mm L (0.5" x 5.5")
Probe: Dip style
Dimensions: 13 H x 20 W x 13 cm D (5" x 8" x 5")
Weight: 1.4 kg (3 lbs)
Power: 8 AA batteries or optional wall AC adaptor
Battery Life: 170 hours

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model No.)*

Model No.	Price	Description
CDB-210	$375	Analog conductivity benchtop
CDB-215	405	Digital conductivity benchtop
CDE-152	115	Replacement Conductivity Probe
PHB-110-ADAP	27	AC adaptor, 110 Vac
PHB-220-ADAP	33	AC adaptor, 220 Vac

Each unit is supplied with probe, 2 oz. bottles of 100, 1000, 10,000 mS/cm standard and deionized water and complete operator's manual.

Ordering Example: CDB-210** analog conductivity benchtop with **PHB-110-ADAP** AC adaptor, 110 Vac $375 + 27 = **$402.

CDCN670 and CDCN680 Series Conductivity Analyzers

CDCN670 Series for use with CDE3600 Electrodeless Sensors

CDCN680 Series for use with CDE680 Sensors

1 YEAR WARRANTY MADE IN USA CE

- Two Analog Outputs
- Two or Four Alarm/Control Relays with Overfeed Timer
- Easy Calibration
- Simple Function Menu Operation
- ½ or ¼ DIN Models
- CDCN680 Features Ultrapure Water Capabilities
- Display in English, French, German or Spanish
- Dual Input (CDCN680 Only)

CDCN680 series conductivity analyzers are designed for use with CDE680 conductivity sensors in applications of pure water up to 200 mS. The two sensor inputs can be independently configured to measure conductivity, resistivity, total dissolved solids or to make a two-sensor calculation such as % rejection, % passage, difference or ratio.

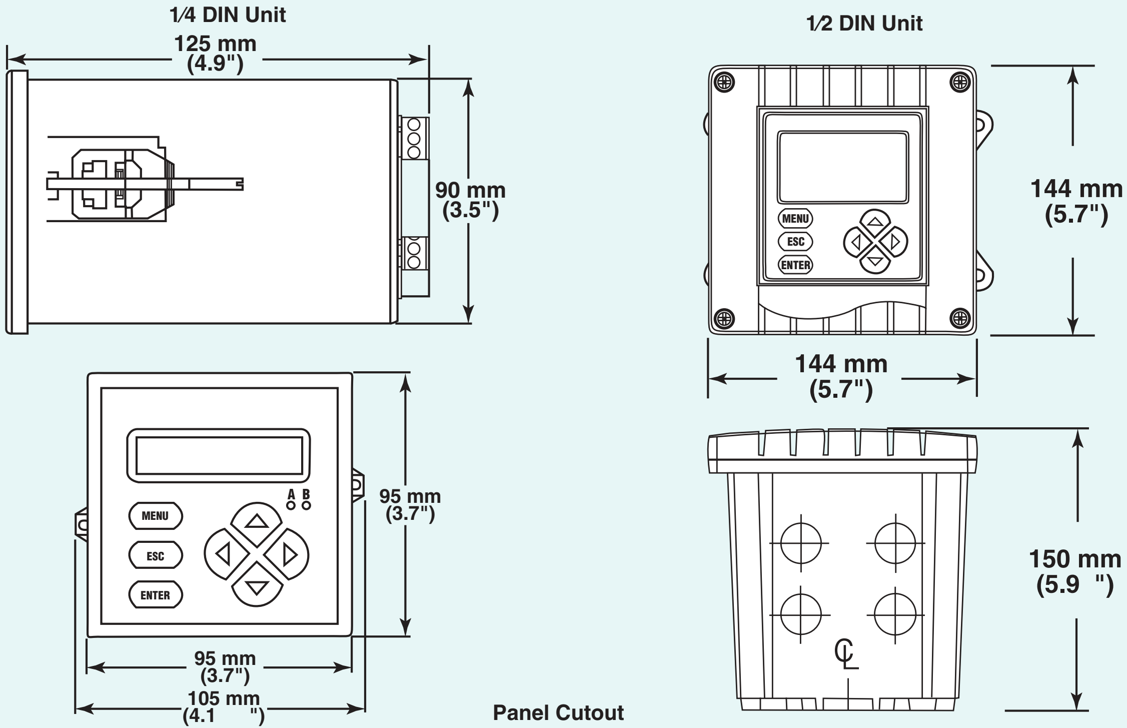
CDCN670 series analyzers are designed for use with CDE3600 series electrodeless conductivity sensors for applications from 200 µS to 2000 mS, particularly where coating and polarization can cause problems with other types of electrodes. The sensor input can be configured to measure conductivity, % concentration or total dissolved solids.

Both the CDCN670 and CDCN680 Series are available in either ¼ or ½ DIN versions. All models have either two or four relay outputs and two analog outputs. The ½ DIN models feature a large LCD display and hardware for wall, pipe or panel mounting.

A:0.059µS, 25.3C
B:0.134µS, 28.7C
A B
MENU
ESC
ENTER
ELAY:
2.00 mS/cm
TEMP:+50.0°C
MENU
ESC
ENTER

CDCN684 with CDE681 electrode (sold separately)
Shown smaller than actual size

CDCN675/676 with CDE3625P electrode (sold separately)
Shown smaller than actual size



Panel Cutout
CDCN674, CDCN684: 90 mm (3.5") square
CDCN675, CDCN676, CDCN685 and CDCN686:
137 H x 131 mm W (5.4 x 5.2")

Dimensions

Specifications for CDCN680 Series

Measurement and Selectable Ranges (One or Two Inputs)

Conductivity:

μS/cm: 0 to 2.000, 0 to 20.00, 0 to 200.0, or 0 to 2000

mS/cm: 0 to 2.000. 0 to 20.00, 0 to 200.0, or 0 to 2000

Resistivity: 0 to 19.99 MΩ • cm or 0 to 999.9 KΩ • cm

TDS: 0 to 9999 ppm or 0 to 9999 ppb

Calculated Sensor A and B Measurement

% Rejection: 0 to 100%

% Passage: 0 to 100%

Ratio A/B or B/A: 0 to 99.99, 0 to 999.9, or 9999

Difference A-B or B-A: Same ranges as those listed above for conductivity, resistivity and TDS

Analyzer Performance (Electrical, Analog Outputs)

Accuracy: 0.1% of span

Stability: 0.05% of span per 24 hours, non-cumulative

Temperature Drift: Zero and span: less than 0.03% of span/°C

Relay Function: Each relay can be assigned to be driven by: sensor A's selected measurement (conductivity, resistivity, or TDS), or temperature; sensor B's selected measurement (conductivity, resistivity, or TDS), or temperature; calculated sensor A and B measurement (% rejection, % passage, ratio A/B or B/A, or difference A-B or B-A)

mA Output: Two 4 to 20 mA dc outputs, each can represent one of the following: measured sensor A or B conductivity, resistivity or TDS; measured sensor A or B temperature; calculated sensor A and B (% rejection, % pass, ratio A/B, ratio B/A, A-B or B-A)

Specifications for CDCN670 Series

Measurement and Selectable Ranges (Single Input Only)

Conductivity:

μS/cm: 0 to 200.0 or 0 to 2000

mS/cm: 0 to 2.000, 0 to 20.00, 0 to 200.0 or 0 to 2000

S/cm: 0 to 2.000

% Concentration: 0 to 99.99% or 0 to 200.0%

TDS: 0 to 9999 ppm

Analyzer Performance (Electrical, Analog Outputs)

Accuracy: 0.5% of span*

Stability: 0.2% of span per 24 hours, non-cumulative*

Repeatability: 0.1% of span or better*

Temperature Drift: Zero and span: less than 0.02% of span/°C

*Above 500 μS and below 100°C (212°F)

Relay function: Each relay can be assigned to one of the following: Conductivity, % concentration or TDS temperature, diagnostic status

mA Output: Two 4-20 mA dc outputs; each one can represent one of the following: conductivity, resistivity, or TDS temperature

Common Specifications

Analog Outputs (#1 and #2): Scalable 0.00 to 20.00 mA or 4.00 to 20.00 mA Isolated into 600 ohm max

Ambient Conditions

Operation: -20 to 60°C (-4 to 140°F); 0 to 95% RH non-condensing

Storage: -30 to 70°C (-22 to 158°F); 0 to 95% RH non-condensing

Relays

Types/Outputs: Two or four electromechanical relays; SPDT (Form C) contacts; U.L. rated 5 A 115/230 Vac, 5A @ 30 Vdc res

Diagnostics Status

Control: Settings for high/low phasing, setpoint, deadband, overfeed timer, off delay and on delay

Alarm: Settings for low alarm point, low alarm point deadband, high alarm point, high alarm point deadband, off delay and on delay

Temperature Compensation: Automatic or manual -20 to 200°C (-4 to 392°F), 1000 Ω Pt RTD

Sensor-to-Analyzer Distance: 61 m (200')

Power Requirements: 90 to 130 Vac, 50/60 Hz (10 VA max.) or 180 to 260 Vac, 50/60 Hz (10 VA max)

CDCN684 with CDE681 Series electrode

CDCN675/676 with CDE3625P electrode (sold separately)

CDE3600 electrodes

¼ DIN Models

Display:
Two-line by 16-character backlit LCD
Enclosure: Polycarbonate with NEMA-4X front panel; general purpose
Mounting Configuration: Panel mounting
Net Weight: 0.8 kg (1.7 lb), approximately

½ DIN Models

Display: Graphic dot matrix LCD, 128 x 64 pixels with LED backlighting; 13 mm (½") main character height; 3 mm (⅛") auxiliary information charter height
Enclosure: Polycarbonate face panel and epoxy-coated cast aluminum door and case with four 13 mm (½") conduit holes; includes nylon mounting bracket and SS hardware
Mounting Configuration: Panel, surface and pipe (horizontal and vertical) mounting
Net Weight: 1.6 kg (3.5 lb) approximately

Cell constant chart for CDE680 Series electrodes for use with CDCN680 Series analyzers

Sensor Cell Constants and Measuring Ranges

Sensor Cell Constant	Inherent Measuring Range	
	Conductivity (µS/cm)	Resistivity (MΩ • cm)
0.05	0 to 100	0.002 to 20
0.5	0 to 1000	0.001 to 20
1	0 to 2000	not applicable
5	0 to 10,000	not applicable
10	0 to 200,000	not applicable

TDS Ranges: *To determine which cell constant to use, convert the full-scale TDS value to its equivalent conductivity value at 25°C (77°F). Do this by multiplying the TDS value by 2. Then choose the cell constant for that calculated value.*

☐ ***MOST POPULAR MODEL HIGHLIGHTED!***

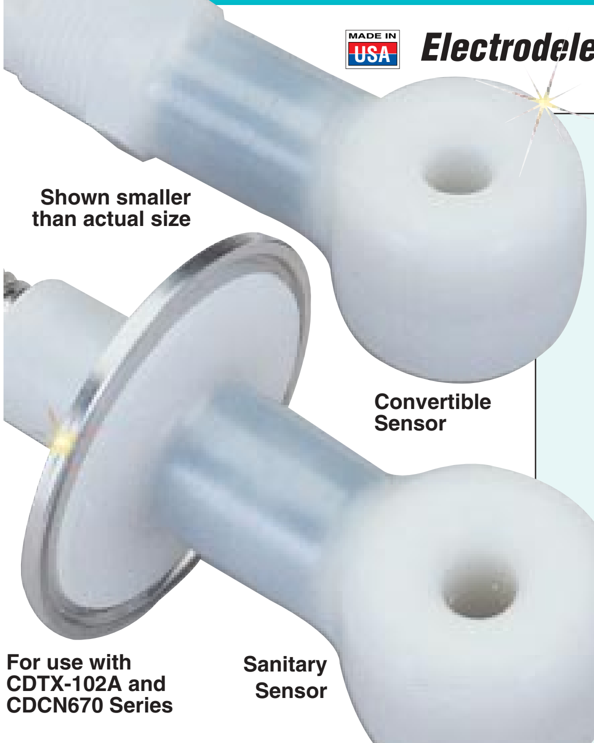
To Order *(Specify Model No)*

Model No	Price	Sensor Type	Number of Inputs	Number Output Relays	Mounting	Range µS
CDCN674	$645	CDE3600 Series Electrodeless	1	2	¼ DIN Panel	0-200 to 0-2,000,000
CDCN675	845		1	2	½ DIN NEMA-4X	
CDCN676	920		1	4		
CDCN684	645	CDE680 Series (Contacting)	1 or 2	2	¼ DIN Panel	0-2 to 0-200,000
CDCN685	845		1 or 2	2	½ DIN NEMA-4X	
CDCN686	920		1 or 2	4		

Note: *Electrodes must be ordered separately* ***Ordering Example: CDCN686,*** *conductivity analyzer,* ***$920.***

Electrodeless Conductivity Sensors Series CDE-3600

CDE-3600 Series
$425 Basic Unit



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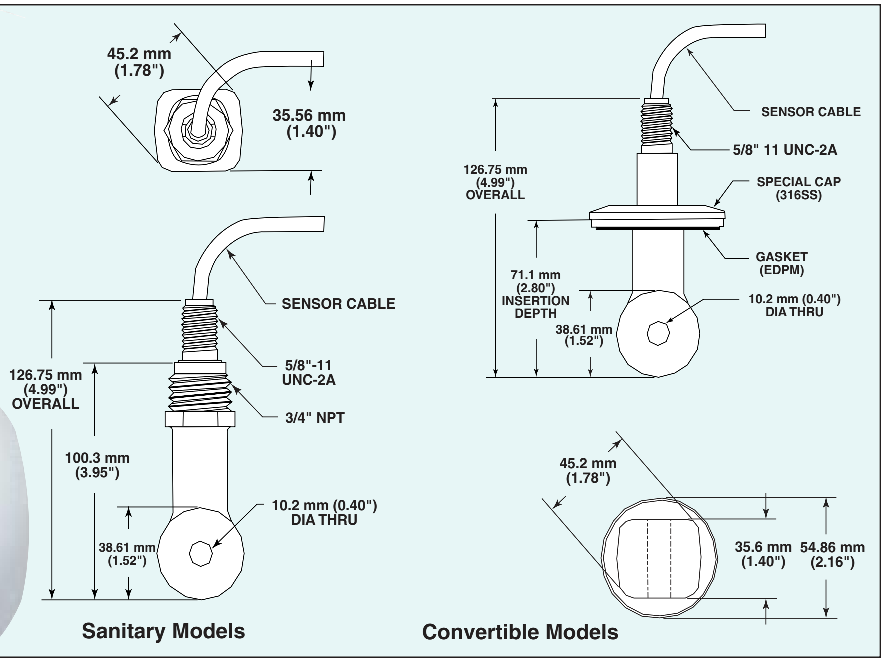
Convertible Sensor

Sanitary Sensor

For use with CDTX-102A and CDCN670 Series



Sanitary Models

Convertible Models

- **Wide Measuring Range**
- **Non-Conductive Chemically Resistive Wetted Materials**
- **Low Maintenance**
- **Convertible Sensor for Submersion or Mounting in 2-Inch Tee**
- **Sanitary Models Available**

Specifications

Wetted Materials: Polypropylene, PVDF, or PFA
Operating Temperature Range: -10 to 125°C (14 to 257°F)
Maximum Flow Rate: 3 m (10 ft) per second
Measuring Range: From 0 to 200 microSiemens/cm up to 0 to 2,000,000 microSiemens/cm
Temperature Compensator: Pt 1000 RTD
Sensor Cable: 5-conductor (plus two isolated shields) cable with XLPE (cross-linked polyethylene) jacket; rated to 150°C (302°F); 6 m (20 ft.) long
Pressure/Temperature Limits (Sensor Only, Hardware Not Included):

Polypropylene	100 psi at 212°F (6.9 bar at 100°C)
PVDF	100 psi at 248°F (6.9 bar at 120°C)
PFA	200 psi at 302°F (13.8 bar at 150°C)

Chemical resistance problems are simplified because only one wetted material contacts the process media. Furthermore, the wetted material is non-conductive, to electrically isolate the sensor from the process fluid, eliminating ground loops that can affect measurement accuracy. The electrodeless sensor design eliminates polarization and electrode coating problems that commonly affect conventional contacting electrode-type conductivity sensors.

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model No.)*

Model No.	Price	Wetted Material	Type
CDE-3625P	**$425**	Polypropylene	Convertible
CDE-3626K	**545**	PVDF (Kynar)	Convertible
CDE-3628T	**635**	PFA	Convertible
CDE-3605P	**475**	Polypropylene	Sanitary
CDE-3606K	**595**	PVDF (Kynar)	Sanitary
CDE-3608T	**685**	PFA	Sanitary

Standard cable length is 6 m (20'). Longer cable available. Specify length @ ***$1.75*** *per additional foot. To order separate cable, order* ***CDE3600-CAB-(*).*** *(*) Length of cable in feet;* ***$1.80*** *ft (25 ft minimum).* ***Ordering Example: CDE-3625P-50ft,*** *polypropylene convertible sensor with 50 ft cable , $425 + 52.50 =* ***$477.50***

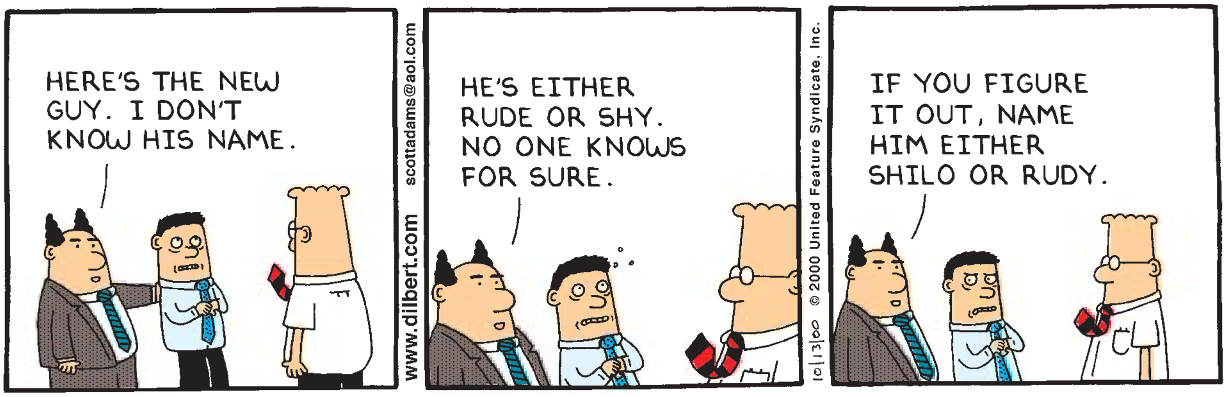
Accessories (Convertible Sensors)

Model No.	Price	Type	Description
CDE-3625PIM	**$90**	Submersion/ immersion mount hardware	CPVC pipe (1/2" dia. by 4'/1.2 m long) and coupling with PVC pipe-mount j-box
CDE-3626KIM	**250**		PVDF pipe (1/2" dia. by 4'/1.2 m long) and coupling with PVC pipe-mount j-box
CDE-36338S	**600**	Union mount hardware (for standard 2" tee)	316SS union adaptor with 2" tee
CDE-36338	**160**		CPVC union adaptor with 2" tee
CDE-36338K	**325**		PVDF union adaptor with 2" tee
CDE-3600-JBOX	**45**		Junction box for union mount

Accessories (Sanitary Sensors)

Model No.	Price	Description
CDE-36048	**$345**	304SS sanitary 2" tee and heavy duty clamp
CDE-36132	**95**	Spare sanitary clamp
CDE-36327	**15**	Spare sanitary gasket (EDPM)
CDE-36037	**30**	Spare special cap

DILBERT® by Scott Adams


HERE'S THE NEW GUY. I DON'T KNOW HIS NAME.
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www.dilbert.com
HE'S EITHER RUDE OR SHY. NO ONE KNOWS FOR SURE.
© 2000 United Feature Syndicate, Inc.
10/13/00
IF YOU FIGURE IT OUT, NAME HIM EITHER SHILO OR RUDY.

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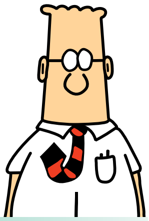
11

Collection Series
#11-00107



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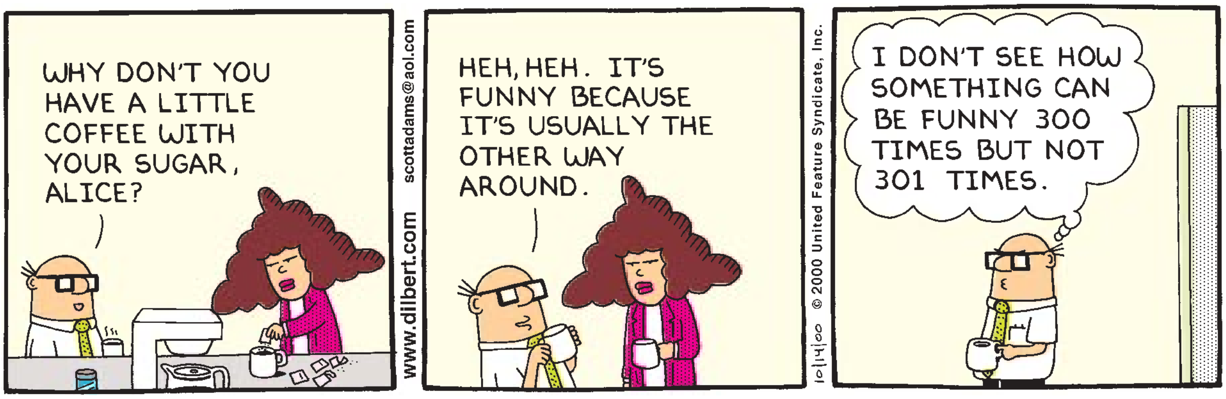
WHY DON'T YOU HAVE A LITTLE COFFEE WITH YOUR SUGAR, ALICE?
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www.dilbert.com
HEH, HEH. IT'S FUNNY BECAUSE IT'S USUALLY THE OTHER WAY AROUND.
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I DON'T SEE HOW SOMETHING CAN BE FUNNY 300 TIMES BUT NOT 301 TIMES.

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11

Collection Series
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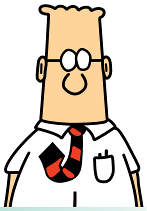

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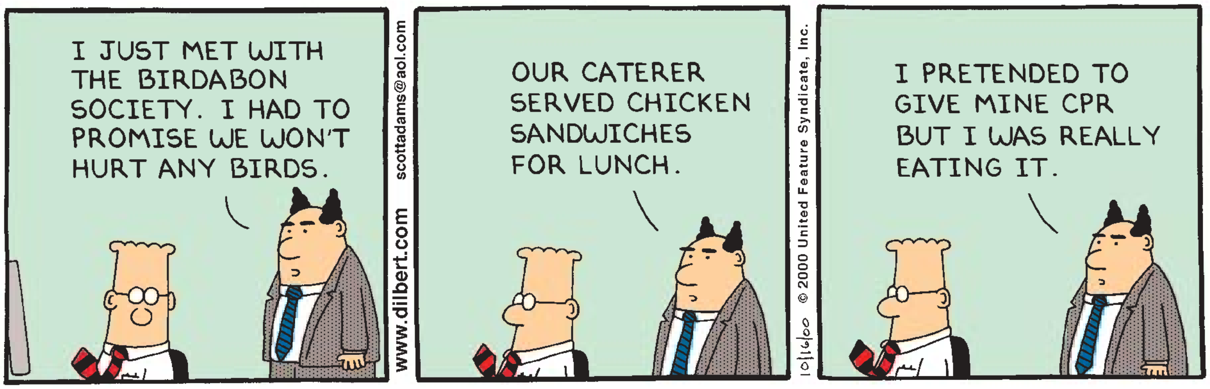
I JUST MET WITH THE BIRDABON SOCIETY. I HAD TO PROMISE WE WON'T HURT ANY BIRDS.
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www.dilbert.com
OUR CATERER SERVED CHICKEN SANDWICHES FOR LUNCH.
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10/16/00
I PRETENDED TO GIVE MINE CPR BUT I WAS REALLY EATING IT.

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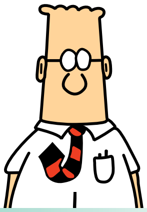
#11-00109



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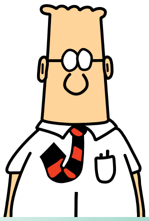

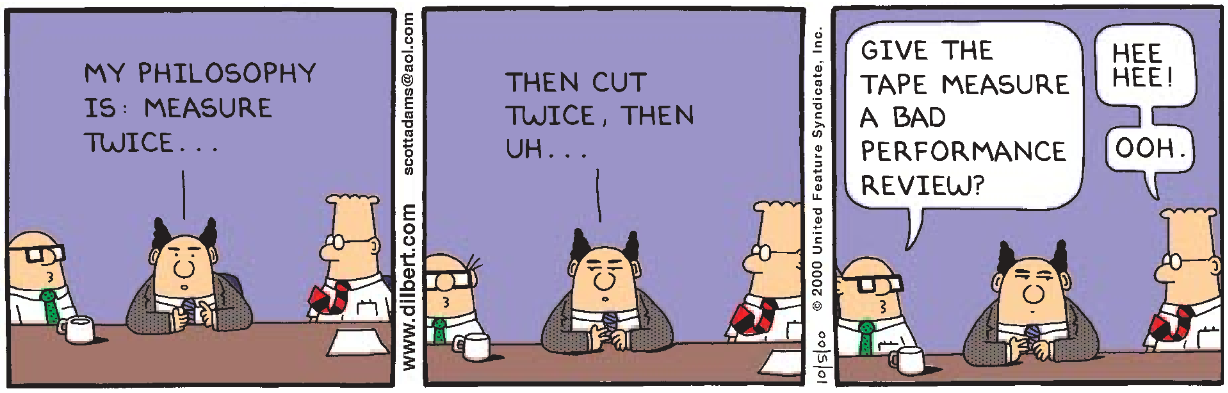
MY PHILOSOPHY IS: MEASURE TWICE...
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THEN CUT TWICE, THEN UH...
10/5/00
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GIVE THE TAPE MEASURE A BAD PERFORMANCE REVIEW?
HEE HEE!
OOH.

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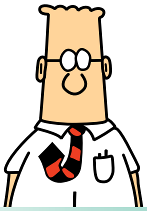

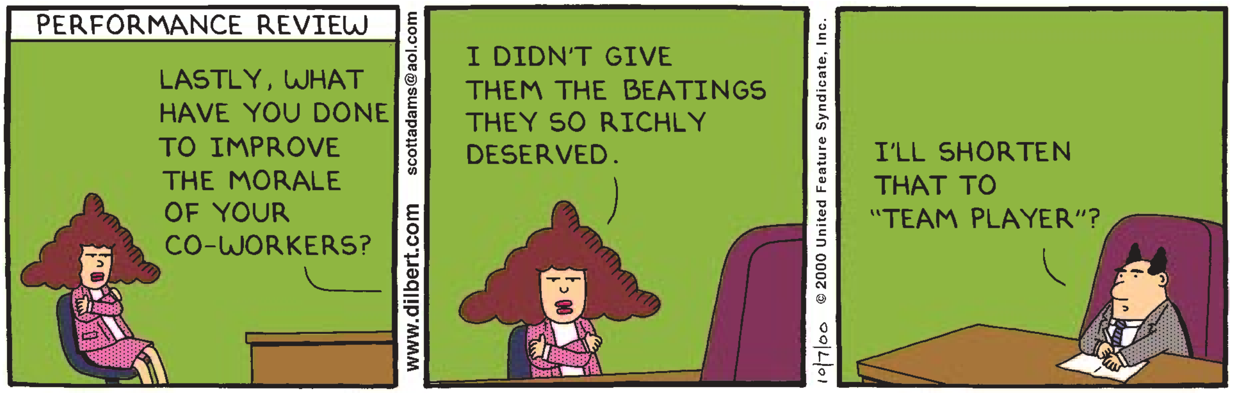
PERFORMANCE REVIEW
LASTLY, WHAT HAVE YOU DONE TO IMPROVE THE MORALE OF YOUR CO-WORKERS?
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www.dilbert.com
I DIDN'T GIVE THEM THE BEATINGS THEY SO RICHLY DESERVED.
10/7/00
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I'LL SHORTEN THAT TO "TEAM PLAYER"?

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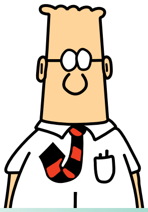

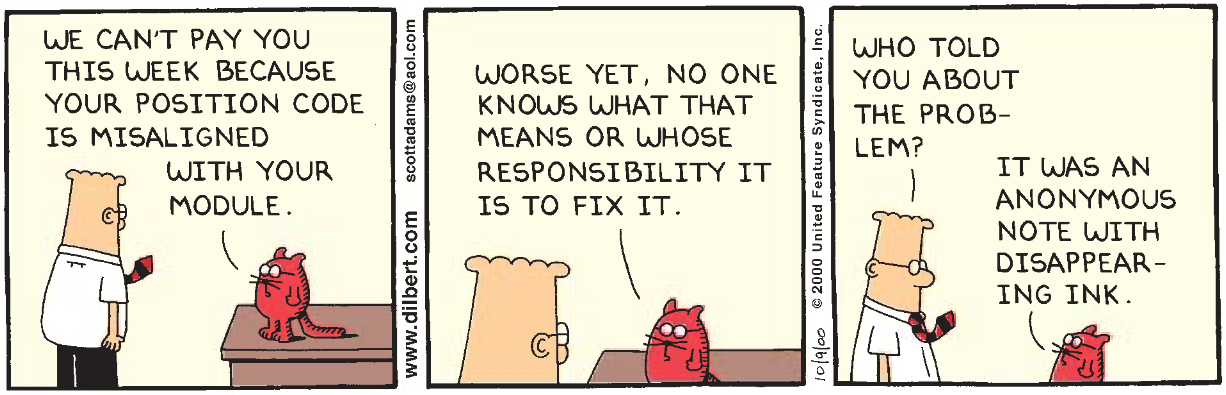
WE CAN'T PAY YOU THIS WEEK BECAUSE YOUR POSITION CODE IS MISALIGNED WITH YOUR MODULE.
scottadams@aol.com
www.dilbert.com
WORSE YET, NO ONE KNOWS WHAT THAT MEANS OR WHOSE RESPONSIBILITY IT IS TO FIX IT.
10/9/00
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WHO TOLD YOU ABOUT THE PROB-LEM?
IT WAS AN ANONYMOUS NOTE WITH DISAPPEAR-ING INK.

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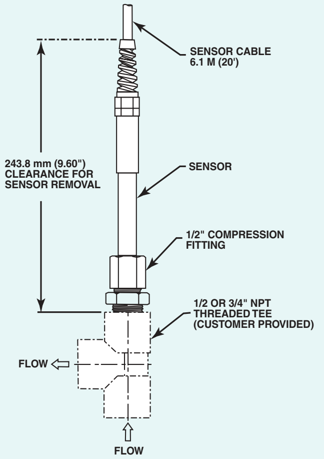
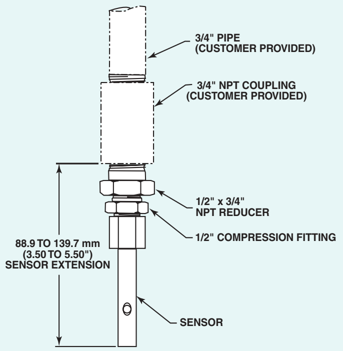
Conductivity Sensors Series CDE680

Contacting Conductivity Probes for Use with CDTX680 Series Transmitters and CDCN684, CDCN685 and CDCN686 Series Controllers

CDE681 Compression Fitting Sensor **Typical Mounting**


SENSOR CABLE
6.1 M (20')
243.8 mm (9.60")
CLEARANCE FOR
SENSOR REMOVAL
SENSOR
1/2" COMPRESSION
FITTING
1/2 OR 3/4" NPT
THREADED TEE
(CUSTOMER PROVIDED)
FLOW
FLOW

Typical Insertion Mounting


3/4" PIPE
(CUSTOMER PROVIDED)
3/4" NPT COUPLING
(CUSTOMER PROVIDED)
1/2" x 3/4"
NPT REDUCER
1/2" COMPRESSION FITTING
88.9 TO 139.7 mm
(3.50 TO 5.50")
SENSOR EXTENSION
SENSOR

Typical Immersion Mounting

A:0.059µS, 25.3C
B:0.134µS, 28.7C
MENU
ESC
ENTER

CDCN684 with
CDE681 Electrode

Common Specifications

Flow Rate: 0 to 10 ft. (0 to 3 m) per second (fully immersed)
Temperature Compensator: Pt 1000 RTD
Sensor Cable Integral (No Junction Box): 6-wire cable (4 conductors and two isolated shield wires); 20 ft. (6 m) long
Longer lengths available. Consult Engineering

CDE681 Compression Fitting Style Sensor

Purposely designed for ultrapure water and pure water applications, these small, enhanced-performance contacting conductivity sensors provide the required absolute cell (K) constant accuracy, and ultrafast-acting temperature compensation. Materials of construction extend sensor operating life with no degradation in measurement reliability.
Wetted Parts–Titanium electrodes, PTFE insulator and treated Viton® O-ring seals

Viton® is a registered trademark of DuPont Dow Elastomers.

▢ ***MOST POPULAR MODELS HIGHLIGHTED!***

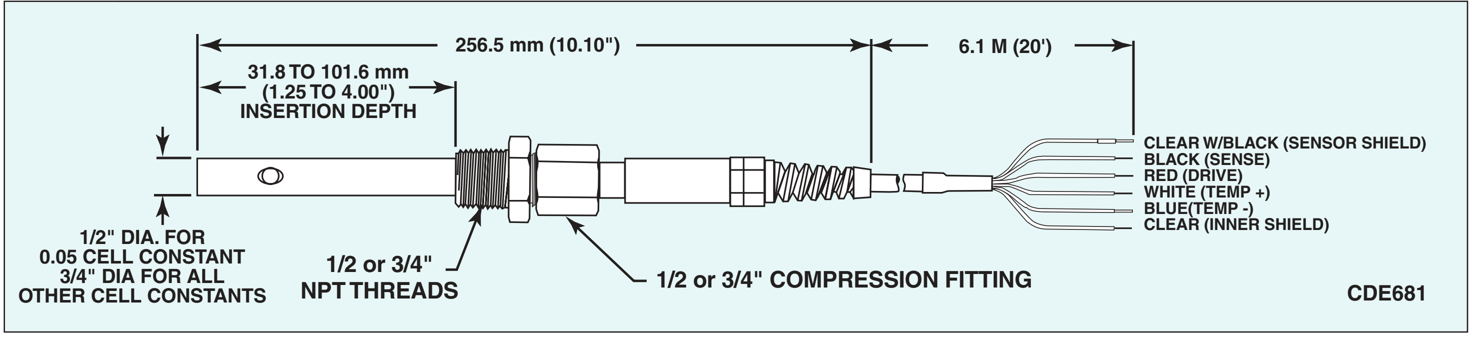
To Order *(Specify Model Number)*

Model Number	Price	Cell Constant	Compression Fitting		Temperature/ Pressure Limits
			Material	Thread	
CDE681-A-K	$275	0.05	Kynar (PVDF)	½ NPT	When ordered with Kynar (PVDF) compression fitting: 302°F at psi (150°C at 1.7 bar) or 97°F at 150 psi (36°C at 10.3 bar) When ordered with 316SS compression fitting: 302°F at 200 psi (150°C at 13.7 bar)
CDE681-A-S	350		316SS		
CDE681-B-K	300	0.5	Kynar	¾ NPT	
CDE681-B-S	375		316SS		
CDE681-C-K	300	1.0	Kynar	¾ NPT	
CDE681-C-S	375		316SS		
CDE681-D-K	300	5.0	Kynar	¾ NPT	
CDE681-D-S	375		316SS		
CDE681-E-K	300	10.0	Kynar	¾ NPT	
CDE681-E-S	375		316SS		

Accessory

Model Number	Price	Description
CDE681-XA-LVFC	$75	Low volume flow chamber

This ½ inch Kynar (PVDF) tee is only used with a 0.05 cell constant sensor. It limits sample volume to approximately 20 ml for high-purity water applications.


256.5 mm (10.10")
6.1 M (20')
31.8 TO 101.6 mm
(1.25 TO 4.00")
INSERTION DEPTH
CLEAR W/BLACK (SENSOR SHIELD)
BLACK (SENSE)
RED (DRIVE)
WHITE (TEMP +)
BLUE(TEMP -)
CLEAR (INNER SHIELD)
1/2" DIA. FOR
0.05 CELL CONSTANT
3/4" DIA FOR ALL
OTHER CELL CONSTANTS
1/2 or 3/4"
NPT THREADS
1/2 or 3/4" COMPRESSION FITTING

CDE681

CDE682 Non-Metallic General Purpose Sensors

CDE682 Series graphite electrode sensors are low-cost and offer advanced features. They are specifically designed for general purpose measuring applications that require a non-metallic sensor. Their Ryton body is compatible with most acidic, basic, and salty solutions. **Wetted Parts–Graphite Electrodes, Ryton Body and Viton® O-Ring Seals.**

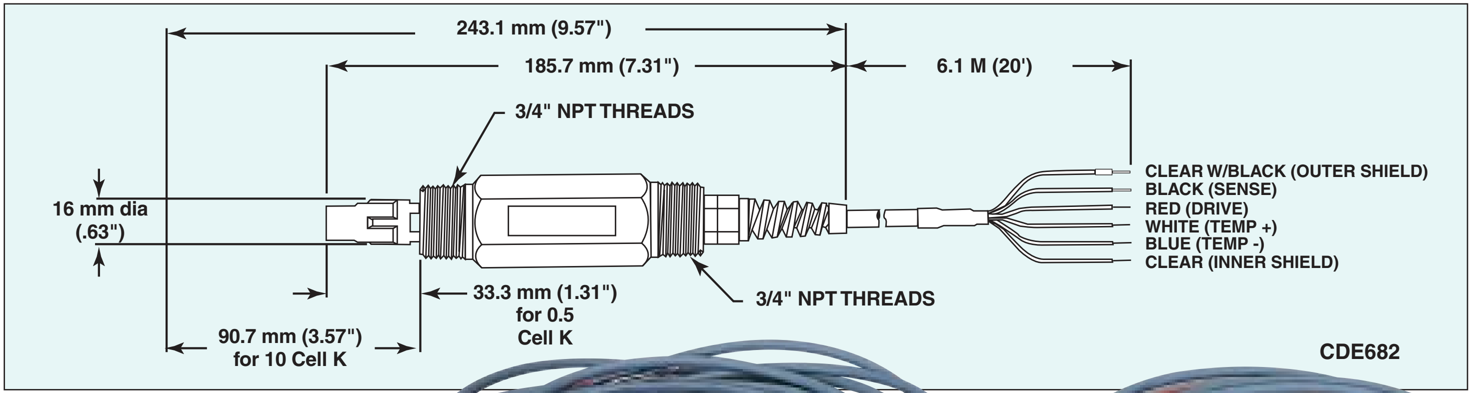
To Order *(Specify Model Number)*

Model Number	Price	Cell Constant	Threaded Connector	Temperature Pressure Rating
CDE682-B	$200	0.5	¾ NPT	302°F at 100 psi (150°C at 6.8 bar)
CDE682-E	200	10.0	¾ NPT	

Accessory

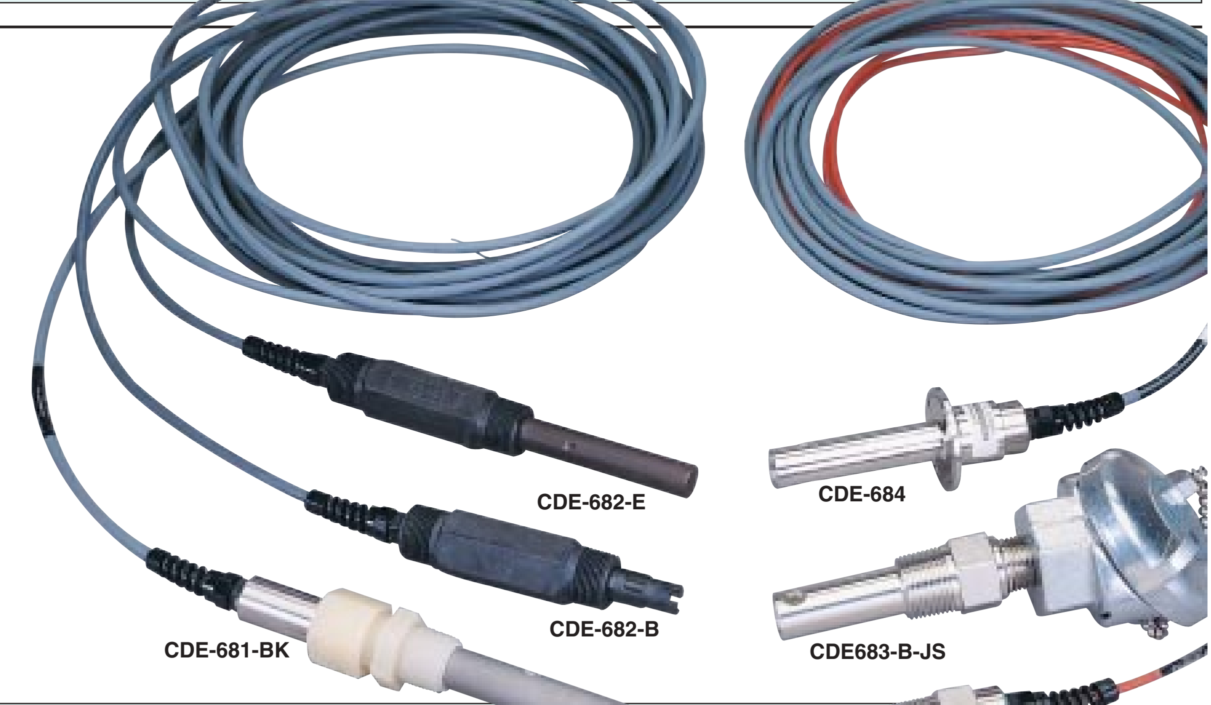
▭ *MOST POPULAR MODEL HIGHLIGHTED!*

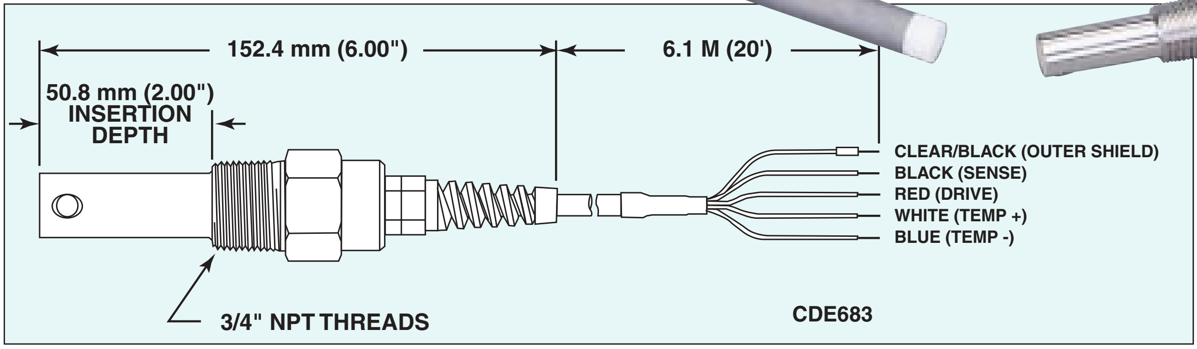
Model Number	Price	Description
CDE682-UM	$100	Union mounting hardware includes 1½" PVC tee, 1½" PVC close nipple and 1½" PVC union


243.1 mm (9.57")
185.7 mm (7.31")
6.1 M (20')
3/4" NPT THREADS
16 mm dia
(.63")
CLEAR W/BLACK (OUTER SHIELD)
BLACK (SENSE)
RED (DRIVE)
WHITE (TEMP +)
BLUE (TEMP -)
CLEAR (INNER SHIELD)
33.3 mm (1.31")
for 0.5
Cell K
3/4" NPT THREADS
90.7 mm (3.57")
for 10 Cell K
CDE682

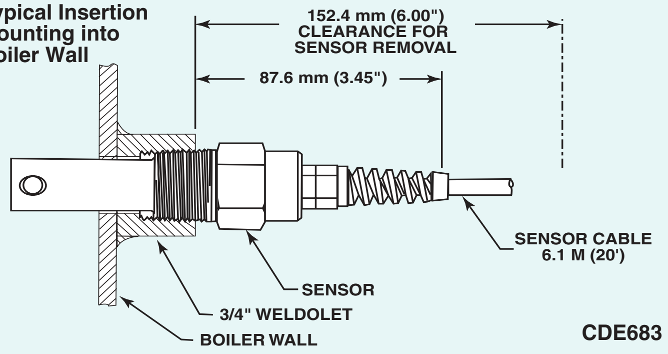
CDE683 Boiler Condensate Sensor

The CDE683 series of enhanced performance contacting conductivity sensors is specifically designed for high temperature and high pressure applications. They are especially convenient for direct boiler wall installations. 316SS electrodes and ¾" male NPT threaded 316SS Body. **Wetted materials– 316 stainless steel and titanium electrodes, PEEK insulator and fluoroelastomer O-ring seals.**


CDE-682-E
CDE-684
CDE-682-B
CDE-681-BK
CDE683-B-JS
CDE-683


152.4 mm (6.00")
6.1 M (20')
50.8 mm (2.00")
INSERTION
DEPTH
CLEAR/BLACK (OUTER SHIELD)
BLACK (SENSE)
RED (DRIVE)
WHITE (TEMP +)
BLUE (TEMP -)
3/4" NPT THREADS
CDE683

Typical Insertion Mounting into Boiler Wall


152.4 mm (6.00")
CLEARANCE FOR
SENSOR REMOVAL
87.6 mm (3.45")
SENSOR CABLE
6.1 M (20')
SENSOR
3/4" WELDOLET
BOILER WALL

CDE683

CDCN685 with CDE681 Electrode

To Order *(Specify Model Number)*

Model No.	Price	Cell Constant	Max Temp/Pressure	Junction Box†
CDE683-B	**$325**	0.5	100°C at 20.7 bar (212°F at 300 psi)	None 20 ft cable
CDE683-D	**325**	5.0	100°C at 20.7 bar (212°F at 300 psi)	None 20 ft cable
CDE683-B-JA	**375**	0.5	200°C at 20.7 bar (392°F at 300 psi)	Aluminum
CDE683-D-JA	**375**	5.0	200°C at 20.7 bar (392°F at 300 psi)	Aluminum
CDE683-B-JS	**425**	0.5	200°C at 20.7 bar (392°F at 300 psi)	316SS
CDE683-D-JS	**425**	5.0	200°C at 20.7 bar (392°F at 300 psi)	316SS

† Interconnect cable required with junction box

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

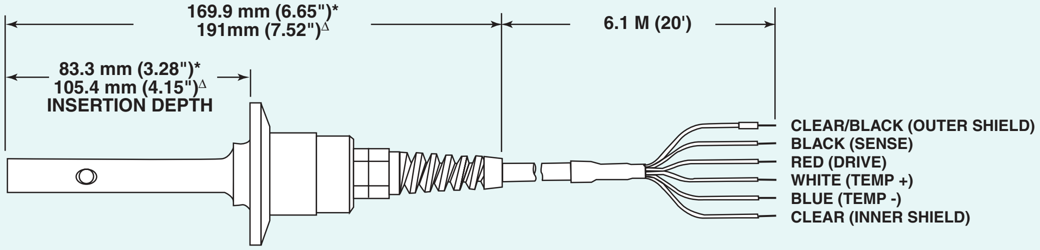
Accessory for CDE683 Series Sensors

Model Number	Price	Description
CDE3600-CAB	**$1.80/ft.**	Interconnect cable (25 ft min)

This 4-conductor cable (2 conductors not used) must be used to connect the sensor j-box head and the analyzer. It has two isolated shield wires, enabling one to be tied to earth ground for optimum EMI shielding. The cable has a PVC jacket rated to 80°C (176°F). Specify required length in whole feet. Cable is supplied unfinished (ends not stripped or tinned).

CDE684 Series Sanitary

(CIP) Flange Conductivity Sensors


169.9 mm (6.65")*
191mm (7.52")Δ
6.1 M (20')
83.3 mm (3.28")*
105.4 mm (4.15")Δ
INSERTION DEPTH
CLEAR/BLACK (OUTER SHIELD)
BLACK (SENSE)
RED (DRIVE)
WHITE (TEMP +)
BLUE (TEMP -)
CLEAR (INNER SHIELD)

*DIMENSIONS FOR 1-1/2" SANITARY FLANGE
ΔDIMENSIONS FOR 2" SANITARY FLANGE

CDE684

These CIP-ready, enhanced-performance contacting conductivity sensors are designed for direct mounting into processes using CIP type fittings. Applications may include foods, pharmaceutical, high purity water, reverse osmosis, waste treatment, and other processes. **Wetted parts - 316 stainless steel electrodes, PTFE insulator, and O-ring seals.**

Sanitary mounting hardware available. Consult Engineering.

To Order *(Specify Model Number)*

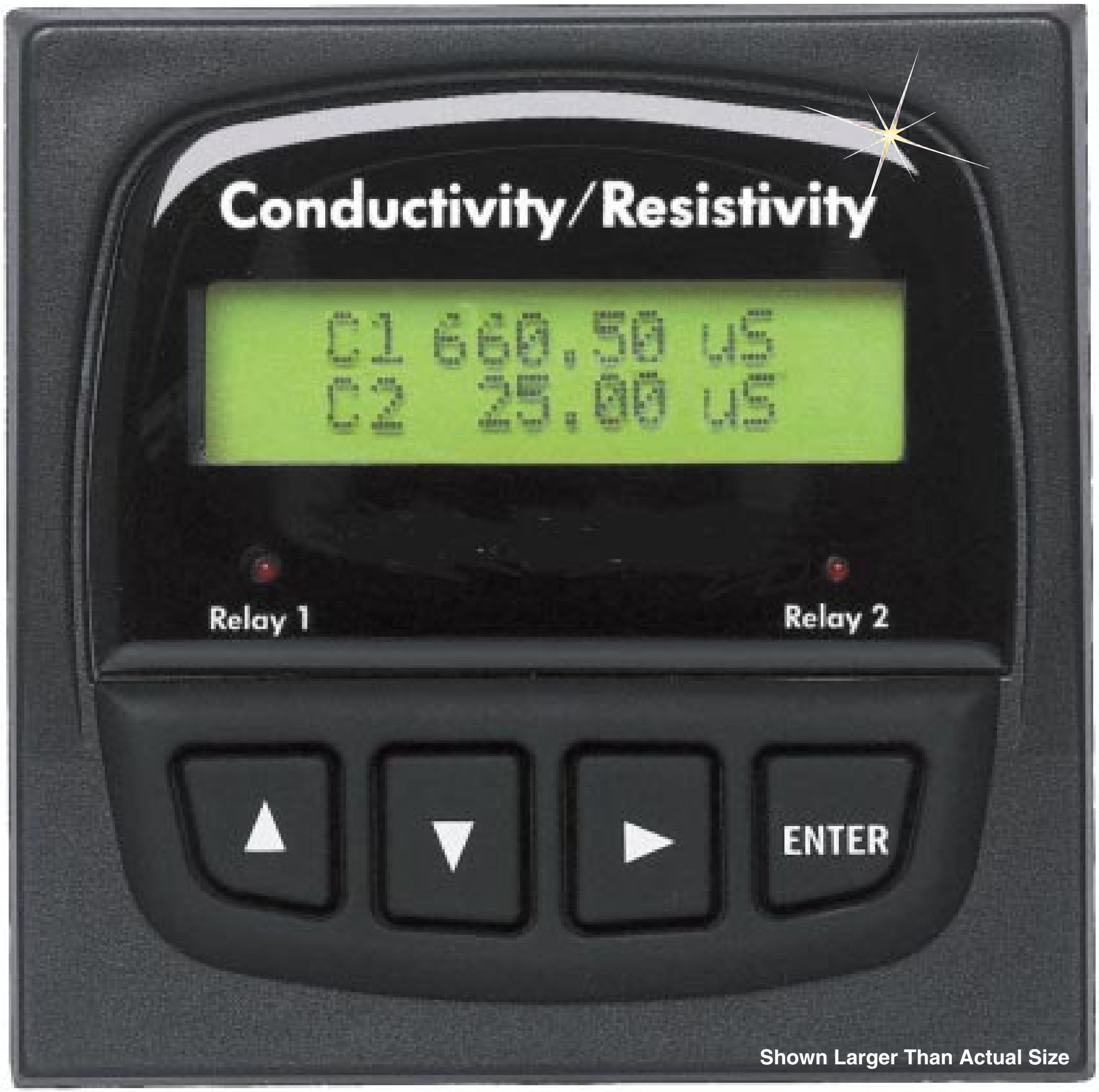
Model Number	Price	Cell Constant	Flange Size (in)	Temp/Pressure Ratings
CDE684-A-1	**$400**	0.05	1½	125°C at 10.3 bar (257°F at 150 psi)
CDE684-A-2	**425**	0.05	2	
CDE684-C-1	**400**	1.0	1½	
CDE684-C-2	**425**	1.0	2	
CDE684-E-1	**400**	10.0	1½	
CDE684-E-2	**425**	10.0	2	

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

Dual Channel Conductivity/ Resistivity Controller

CDCN-91 Series
$910
Basic Unit

Electronics Only



Shown Larger Than Actual Size

Features

- 2-Channel Input
- Simultaneous Display
- AC Line-Voltage or DC Powered
- Display and/or Control: µS, mS, PPM or PPB (TDS), kΩ, MΩ, % Rejection, Difference, Ratio, °C or °F
- 3 Fully Scalable 4 to 20 mA Outputs
- Up to 4 Programmable Relays
- Time Delay Relay Function
- Proportional Pulse Control Capability
- Meets USP Requirements
- Programmable Temperature Compensation
- Output Simulation for Complete System Testing
- Simple Push-Button Operation
- ¼ DIN, NEMA-4X/IP65 Enclosure with Self-Healing Window

Application

- RO/DI System Control
- Demineralizer Regeneration and Rinse
- Scrubber, Cooling Tower and Boiler Protection
- Chemical Concentration
- Rinse Tank Water Quality
- Desalinization
- Leak Detection
- Aquatic Animal Life Support Systems
- Aquaculture
- Environmental Studies

The CDCN-91 series dual channel conductivity/resistivity controller is a two-channel input device equipped with three scalable 4 to 20 mA outputs and four programmable relays. A selector switch activates two open collector outputs in place of two of the relays for extraordinary output versatility. Dual input and advanced control capability, including percent rejection, difference and ratio calculations, together with the CDCE-91 series conductivity sensors listed below, form the perfect measurement and control system for water treatment applications and more. Two versions are available: one accepts AC line-voltage, the other low voltage DC for power. The four-button keypad arrangement with intuitive software design is user-friendly, and the NEMA-4X/IP65 integrity of the front panel can be extended to the entire enclosure by using the optional rear cover kit.

Specifications

General

Compatible Sensors: CDCE-90 series standard conductivity/resistivity sensors

Operating Range:
Conductivity: 0.055 to 400,000 µS/cm
Resistivity: 10 KΩ/cm to 18.26 MΩ/cm (0.055 to 100 µS/cm)
TDS: 0.001 to 999999 ppm or ppb (display limit)
Temperature: PT1000: -25 to 120°C (-13 to 248°F)

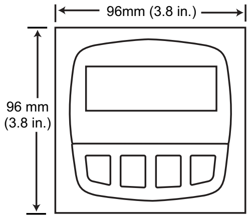
Accuracy:
Conductivity/Resistivity: ±2% of reading
Temperature: ±0.5°C

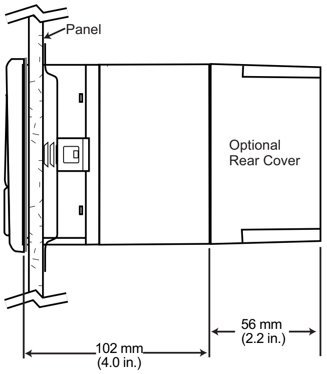
Power Requirements:
3-8860-AC: 100 to 240 Vac ±10%, 50-60 Hz, 20 VA
3-8860: 11 to 24 Vdc ±10% reg., 0.5A max.

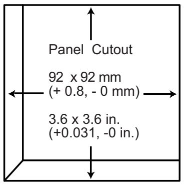
Display: Alphanumeric 2 x 16 LCD

Contrast: User selected, 5 levels
Update rate: 1.5 seconds
Current Outputs: (3 each) 4 to 20 mA, isolated, fully adjustable and reversible.
Max. Loop Impedance:
150Ω @ 12V, 450Ω @ 18 V, 750Ω @ 24 V
Update Rate: Approx. 100 mS
Accuracy: ±0.03 mA @ 25°C, 24 Vdc
Open Collector Outputs:
(2 each) Isolated, 50 mA sink or source, 30 Vdc max. pull-up voltage.
Operational Settings: Hi, Lo, USP, Pulse, Off
Hysteresis: User adjustable
Time Delay: 0 to 6400 seconds
Maximum Pulse Rate:
400 pulses/minute
Alarm Contacts: (up to 4 each) SPDT Relays
Maximum Voltage Ratings:
5A @ 30 Vdc or 5A @ 250 Vac
Operational Settings: Hi, Lo, USP, Pulse, Off
Hysteresis: User adjustable
Time Delay: 0 to 6400 seconds
Maximum Pulse Rate: 400 pulses/minute
Enclosure:
Rating: NEMA-4X/IP65 front and back with optional NEMA-4X Rear Cover Kit
Materials:
Case: PBT
Window: Polyurethane-coated polycarbonate
Keypad: Sealed 4-key silicone rubber
Weight: CDCN-91AC:
Approx. 581 g (20.5 oz)
CDCN-91: Approx. 544 g (19.2 oz)

Dimensions

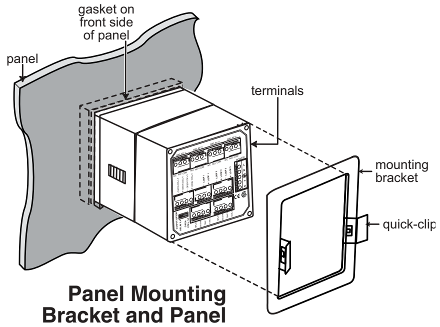

96mm (3.8 in.)
96 mm
(3.8 in.)


Panel
Optional
Rear Cover
56 mm
(2.2 in.)
102 mm
(4.0 in.)

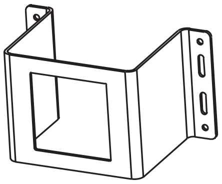

Panel Cutout
92 x 92 mm
(+ 0.8, - 0 mm)
3.6 x 3.6 in.
(+0.031, -0 in.)

INSTALLATION

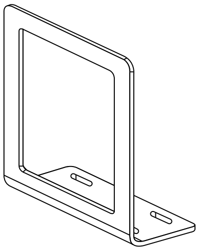
- ✓ **Front Panel provides NEMA-4X/IP65 protection**
- ✓ **Standard ¼ DIN panel cutout**
- ✓ **102 mm (4") mounting depth**
- ✓ **Optional NEMA-4X/IP65 rear cover kit with knockout ports for cable access**
- ✓ **158 mm (6.3") mounting depth with optional rear cover installed**


gasket on
front side
of panel
panel
terminals
mounting
bracket
quick-clip

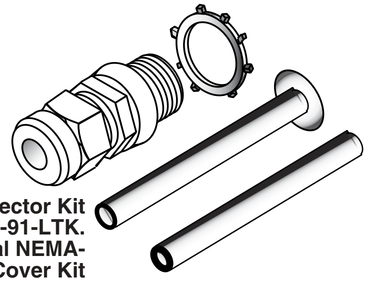
Panel Mounting Bracket and Panel Gasket are Included



Optional Heavy-Duty Wall Mount Bracket CDCN-91-WMB

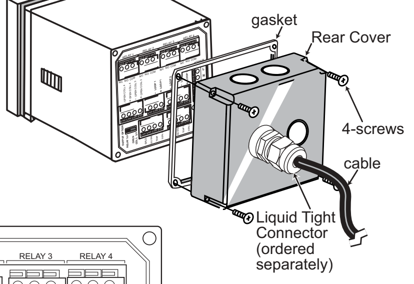


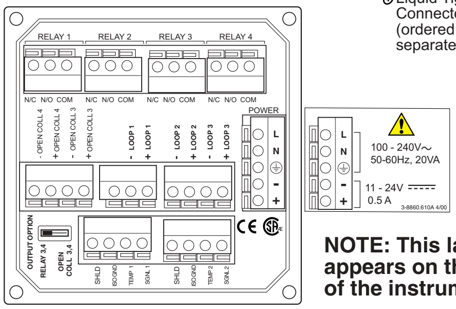
Optional Surface Mounting Bracket CDCN-91-SMB



Liquid Tight Connector Kit 3 sets per kit, CDCN-91-LTK. Use with optional NEMA-4X/IP65 Rear Cover Kit

Optional NEMA-4X/IP65 Rear Cover Kit CDCN-91-RCK


gasket
Rear Cover
4-screws
cable
Liquid Tight
Connector
(ordered
separately)


RELAY 1
RELAY 2
RELAY 3
RELAY 4
N/C N/O COM
N/C N/O COM
N/C N/O COM
N/C N/O COM
- OPEN COLL 4
+ OPEN COLL 4
- OPEN COLL 3
+ OPEN COLL 3
- LOOP 1
+ LOOP 1
- LOOP 2
+ LOOP 2
- LOOP 3
+ LOOP 3
POWER
L
N
-
+
OUTPUT OPTION
RELAY 3,4
OPEN COLL 3,4
SHLD
ISO GND
TEMP 1
SGNL 1
SHLD
ISO GND
TEMP 2
SGNL 2
100 - 240V∼
50-60Hz, 20VA
11 - 24V
0.5 A
3-8860.610A 4/00

NOTE: This label appears on the side of the instrument case

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model No.)*

Model No.	Price	Description
CDCN-91	$910	Conductivity/Resistivity Controller DC Power
CDCN-91AC	964	Conductivity/Resistivity Controller AC/DC Power

Ordering Example:* *CDCN-91* Conductivity/Resistivity Controller DC Power($910), *CDCE-90-1* conductivity cell constant($258), $910 + 258= *$1168

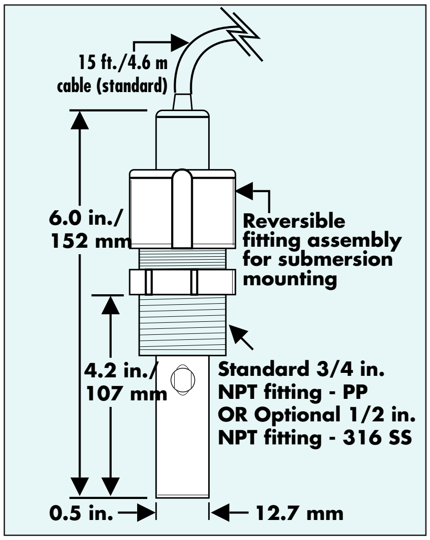
Accessories

To Order *(Specify Model No.)*

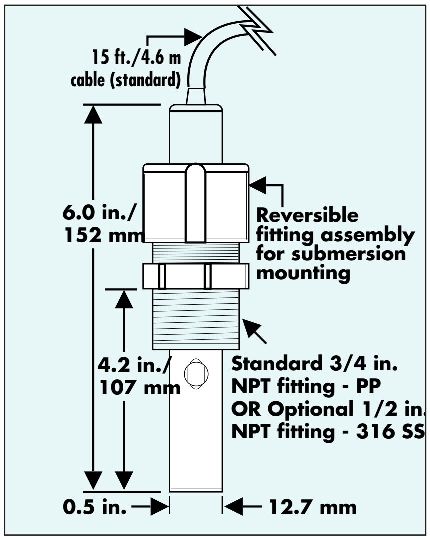
Model No.	Price	Description
CDCN-91-RCK	$38	NEMA-4X Rear Cover Kit
FPM-5000-LTCK	38	Liquid-Tight Kit for Rear Cover
CDCN-91-WMB	45	Wall Mount Bracket
FPM-5000-MB	26	Surface Mount Bracket
FP90RC	15	RC Filter Kit for Relays
CDCE-90-001	258	Conductivity Cell Constant = 0.01
CDCE-90-01	258	Conductivity Cell Constant = 0.1
CDCE-90-1	258	Conductivity Cell Constant = 1.0
CDCE-90-10	443	Conductivity Cell Constant = 10.0
CDCE-90-20	541	Conductivity Cell Constant = 20.0

For the complete selection of Conductivity products, refer to The Green Book®

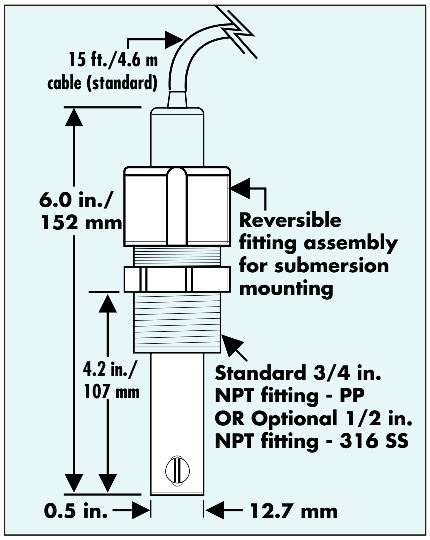
Conductivity Cells for CDCN-91, CDCN-90A, CDTX-90 and CDCN-5800 Series


15 ft./4.6 m
cable (standard)
6.0 in./
152 mm
Reversible
fitting assembly
for submersion
mounting
4.2 in./
107 mm
Standard 3/4 in.
NPT fitting - PP
OR Optional 1/2 in.
NPT fitting - 316 SS
0.5 in.
12.7 mm

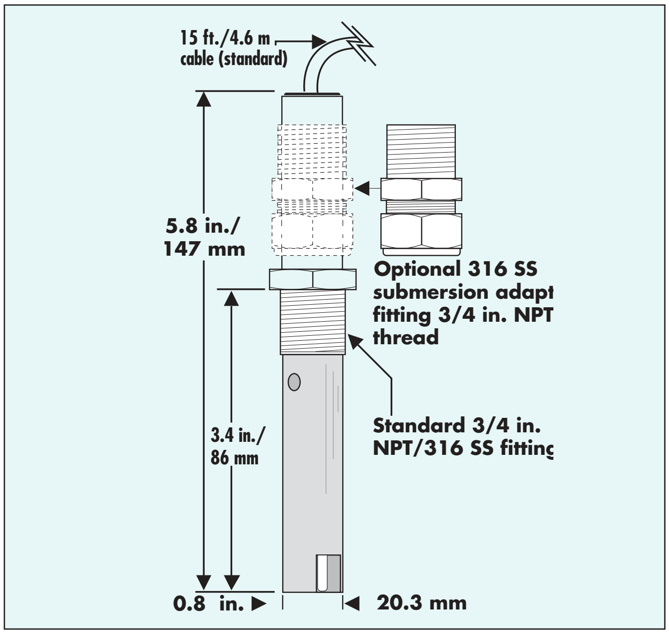
MODEL NO. CDCE-90-001
Cell Constant: 0.01
Conductivity Range: 0.055 to 100 µS
Temperature Compensation:
Pt1000/10K NTC
O-Ring: EPR
Insulator Material: Teflon®
Electrodes: 316 SS
Fitting Material: Polypropylene
Maximum Pressure/Temperature:
100 psig @ 100°C (212°F)


15 ft./4.6 m
cable (standard)
6.0 in./
152 mm
Reversible
fitting assembly
for submersion
mounting
4.2 in./
107 mm
Standard 3/4 in.
NPT fitting - PP
OR Optional 1/2 in.
NPT fitting - 316 SS
0.5 in.
12.7 mm

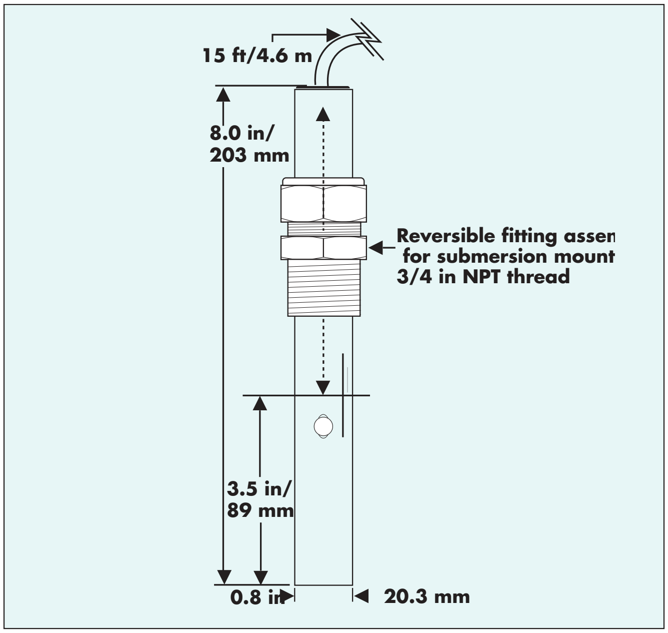
MODEL NO. CDCE-90-01
Cell Constant: 0.1
Conductivity Range: 1 to 1000 µS
Temperature Compensation: Pt1000
O-Ring: EPR
Insulator Material: Teflon®
Electrodes: 316 SS
Fitting Material: Polypropylene
Maximum Pressure/Temperature:
100 psig @ 100°C (212°F)


15 ft./4.6 m
cable (standard)
6.0 in./
152 mm
Reversible
fitting assembly
for submersion
mounting
4.2 in./
107 mm
Standard 3/4 in.
NPT fitting - PP
OR Optional 1/2 in.
NPT fitting - 316 SS
0.5 in.
12.7 mm

MODEL NO. CDCE-90-1
Cell Constant: 1.0
Conductivity Range: 10 to 10,000 µS
Temperature Compensation: Pt1000
O-Ring: EPR
Insulator Material: Teflon®
Electrodes: 316 SS
Fitting Material: Polypropylene
Maximum Pressure/Temperature:
100 psig @ 100°C (212°F)


15 ft./4.6 m
cable (standard)
5.8 in./
147 mm
Optional 316 SS
submersion adapt
fitting 3/4 in. NPT
thread
3.4 in./
86 mm
Standard 3/4 in.
NPT/316 SS fitting
0.8 in.
20.3 mm

MODEL NO. CDCE-90-10
Cell Constant: 10.0
Conductivity Range:
100 to 100,000 µS
Temperature Compensation:
Pt1000
O-Ring: EPR
Insulator Material: CPVC
Electrodes: 316 SS
Fitting Material: Polypropylene
Maximum Pressure/
Temperature:
100 psig @ 95°C (203°F)


15 ft/4.6 m
8.0 in/
203 mm
Reversible fitting assem
for submersion mount
3/4 in NPT thread
3.5 in/
89 mm
0.8 in
20.3 mm

MODEL NO. CDCE-90-20
Cell Constant: 20.0
Conductivity Range:
200 to 200,000 µS
Temperature Compensation:
Pt1000
O-Ring: EPR
Insulator Material: Teflon®
Electrodes: 316 SS
Fitting Material: Polypropylene
Maximum Pressure/
Temperature: 100 psig
@ 100°C (212°F)

Teflon® is a registered trademark of DuPont.

Conductivity Transmitters Series CDTX-90

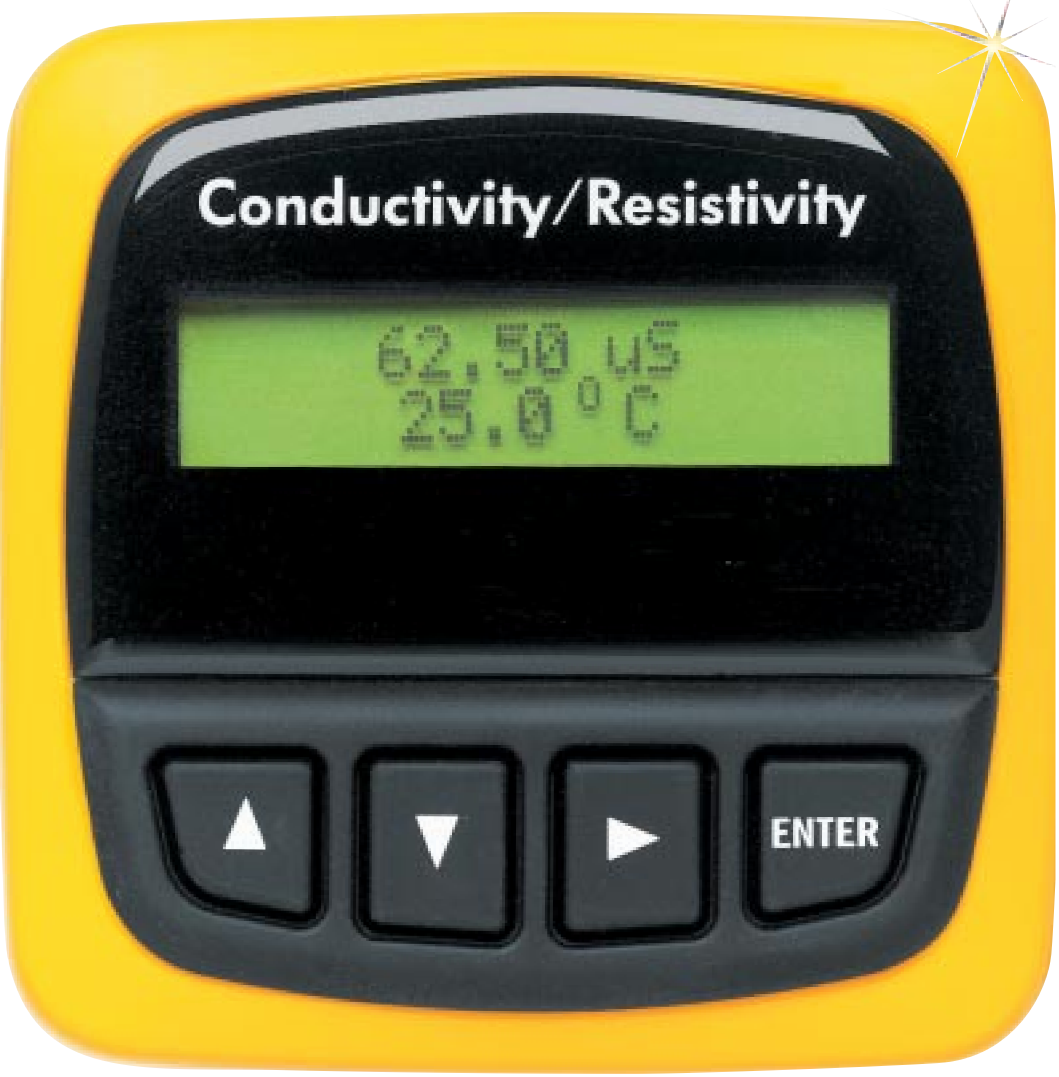
CDTX-90 Series
$350
Basic Unit

2 YEAR WARRANTY MADE IN USA CE
Electronics Only

- **Display in µS, mS, kohm, Mohm, ppm (TDS)**
- **Simulate Function**
- **Programmable Temperature Compensation**
- **Relay Options**
- **Dual Output Option Allows Temperature and Process Signal Transmission**
- **2 x 16 Character Dot Matrix LCD**
- **Chemical Resistant Enclosure and Self-Healing Window**
- **Large Pushbuttons**
- **Clearly Marked Terminal Labels**

Applications

- **RO/DI System Control**
- **Rinse Tank Control**
- **Cooling Tower, Scrubber or Blowdown Control**
- **Environmental Study (TDS)**
- **Desalination Monitor**
- **Water Quality Monitoring**
- **Leak Detection**
- **Chemical Concentration**



Shown Larger Than Actual Size

The CDTX-90 Series Conductivity/Resistivity Transmitter is designed for broad application and ease of setup and use. The unit can be used for conductance, resistance, or TDS signal transmission and display. Mounting can be accomplished in several options best tailored to your application requirements. Full microprocessor based electronics allow wide operating range, and long term signal stability due to the elimination or potentiometers, jumpers and dip switches

Specifications

General
Compatible Electrodes:
OMEGA® CDCE-90-X Series Conductivity/Resistivity Electrodes
Accuracy: ±2% of reading
Enclosure:
Rating: NEMA-4X/IP65 front
Case: PBT
Window: Polyurethane coated polycarbonate
Keypad: Sealed 4-Key Silicone Rubber
Weight: Approx. 325 g (12 oz)

Display:
Alphanumeric: 2 x 16 LCD
Contrast: User selected, 5 levels

Environmental
Operating Temperature:
-10 to 70°C (14 to 158°F)
Storage Temperature:
-15 to 80°C (5 to 176°F)
Relative Humidity:
0 to 95% non-condensing
Standards and Approvals:
CSA, CE, UL listed and manufactured under ISO9001

Electrical
Sensor Input Range:
Conductance: 0.055 to 400,000 µS
Resistivity: 10 KΩ to 18.2MΩ
TDS: 0.023 to 200,000 ppm

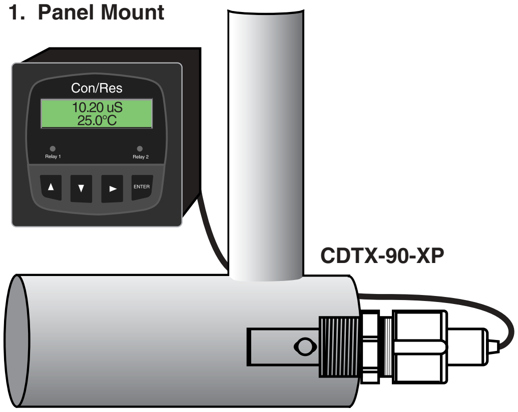
Temperature:
PT1000, -25 to 120°C (-13 to 248°F)
Current Output: 4 to 20 mA, isolated, fully adjustable and reversible
Power: 12 to 24 Vdc ±5% regulated
Max Loop Impedance:
50Ω max @ 12 V,
325Ω max @ 18 V,
600Ω max @ 24 V
Update Rate: 0.5 seconds
Accuracy: ±0.03 mA @ 25°C, 24 V

Relay Output:
Mechanical SPDT Contacts:
Hi, Lo, Pulse, Off
Maximum Voltage Rating:
5 A @ 30 Vdc, or 5 A @ 250 Vac resistive load
Hysteresis: User Adjustable
Max 400 pulses/min
Open Collector Output:
Hi, Lo, Pulse, Off
Open collector, optically isolated, 50 mA max, sink, 30 Vdc max. pull-up voltage. Max 400 pulses/min.

Installation

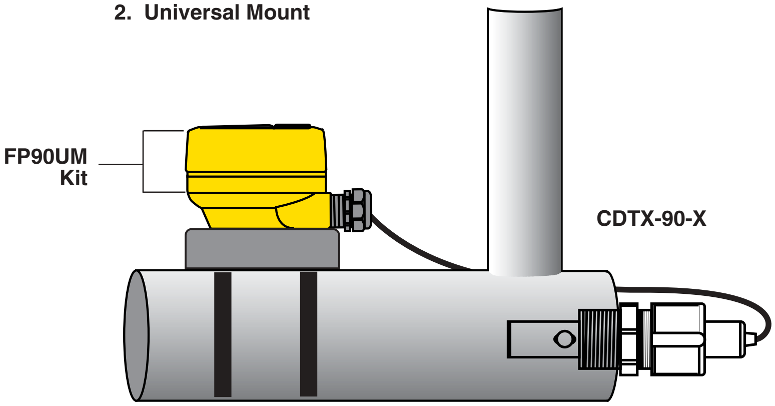
The transmitter is available in a panel mount or a field version. Select the universal mount kit FP90UM to mount the transmitter on a surface near the sensor.

1. Panel Mount

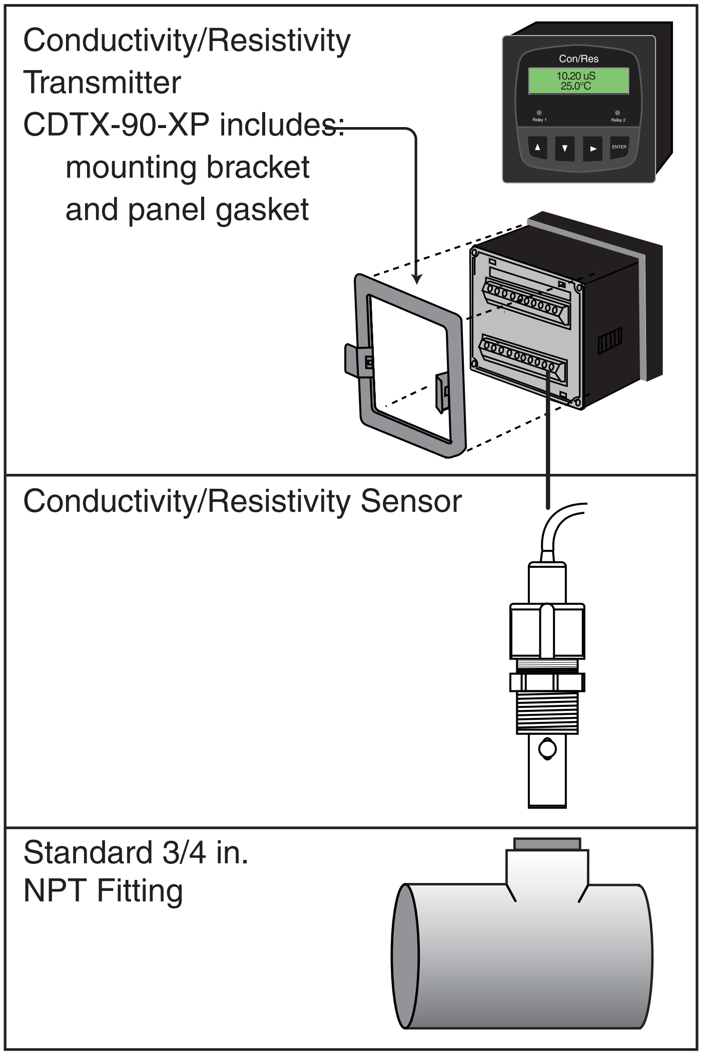

Con/Res
10.20 uS
25.0°C
Relay 1
Relay 2
ENTER
CDTX-90-XP

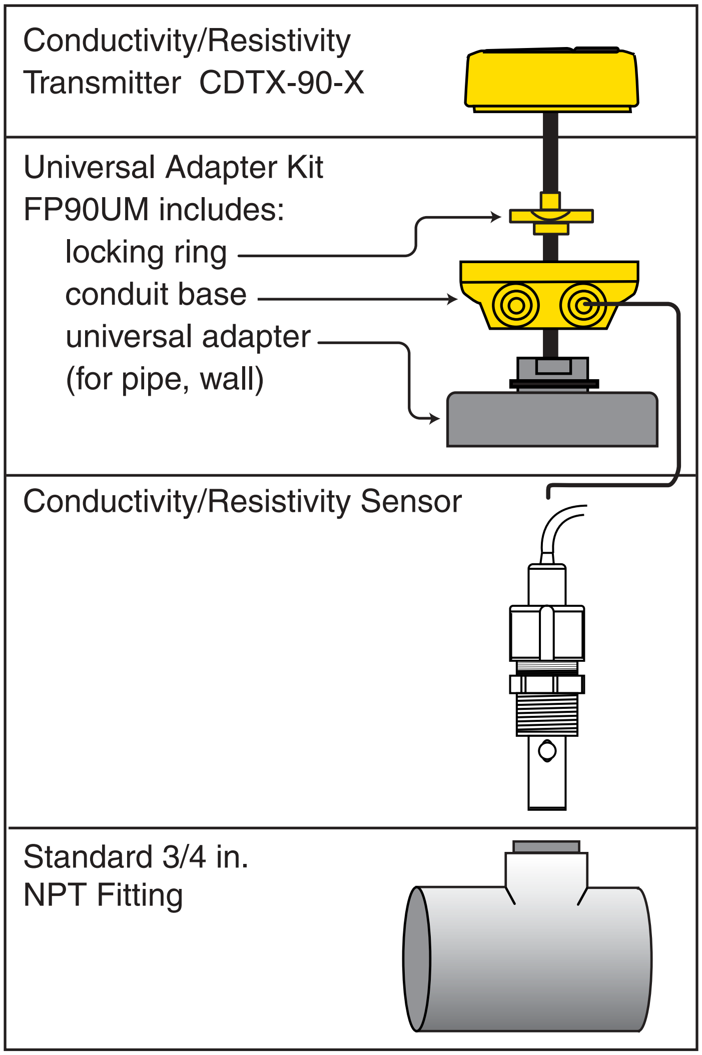
All Panel mount transmitters CDTX-90-XP include a mounting bracket and gasket for a NEMA-4X watertight panel installation. Panel mount transmitters fit into a standard 1/4 DIN panel cutout.

2. Universal Mount

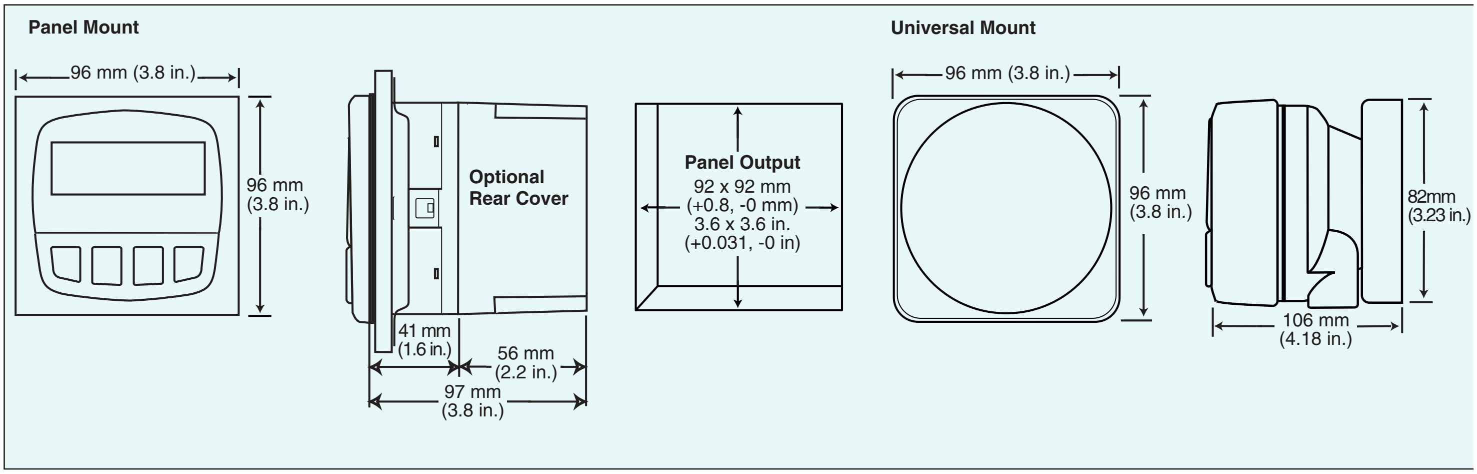

FP90UM
Kit
CDTX-90-X

The Universal Mount Kit FP90UM can be ordered separately and includes a conduit base, locking ring, and universal adapter for mounting the transmitter on a pipe, wall, or other stationary surface.


Conductivity/Resistivity
Transmitter
CDTX-90-XP includes:
mounting bracket
and panel gasket
Con/Res
10.20 uS
25.0°C
ENTER
Conductivity/Resistivity Sensor
Standard 3/4 in.
NPT Fitting


Conductivity/Resistivity
Transmitter CDTX-90-X
Universal Adapter Kit
FP90UM includes:
locking ring
conduit base
universal adapter
(for pipe, wall)
Conductivity/Resistivity Sensor
Standard 3/4 in.
NPT Fitting

Dimensions



All panel mount transmitters CDTX-90P include a mounting bracket and gasket for a NEMA-4X watertight panel installation. Panel mount transmitters fit into a standard 1/4 DIN panel cutout. The Universal Mount Kit CDTX-90UM can be ordered separately and includes a conduit base, locking ring, and universal adapter for mounting the transmitter on a pipe wall or other stationary surface.

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model No.)*

Model No.	Price	Description
CDTX-90-1	**$350**	Conductivity/Resistivity Transmitter Fieldmount with O.C. Output*
CDTX-90-2	**415**	Conductivity/Resistivity Transmitter Fieldmount with 2 Relays*
CDTX-90-3	**595**	Conductivity/Resistivity Transmitter Fieldmount with Single Input/Dual Output*
CDTX-90-1P	**350**	Conductivity/Resistivity Transmitter Panel Mount with O.C. Output
CDTX-90-2P	**415**	Conductivity/Resistivity Transmitter Panel Mount with 2 Relays
CDTX-90-3P	**595**	Conductivity/Resistivity Transmitter Panel Mount with Single Input/Dual Output

** Field Mount Transmitters Require **FP90UM** Universal Mounting Kit.*

Ordering Example:** **CDTX-90-1P** Conductivity Transmitter Panel Mount ($350), **CDCE-90-1** conductivity cell ($258), **U24Y101** power supply ($128), $250 + 258 + 128 = **$736

Accessories

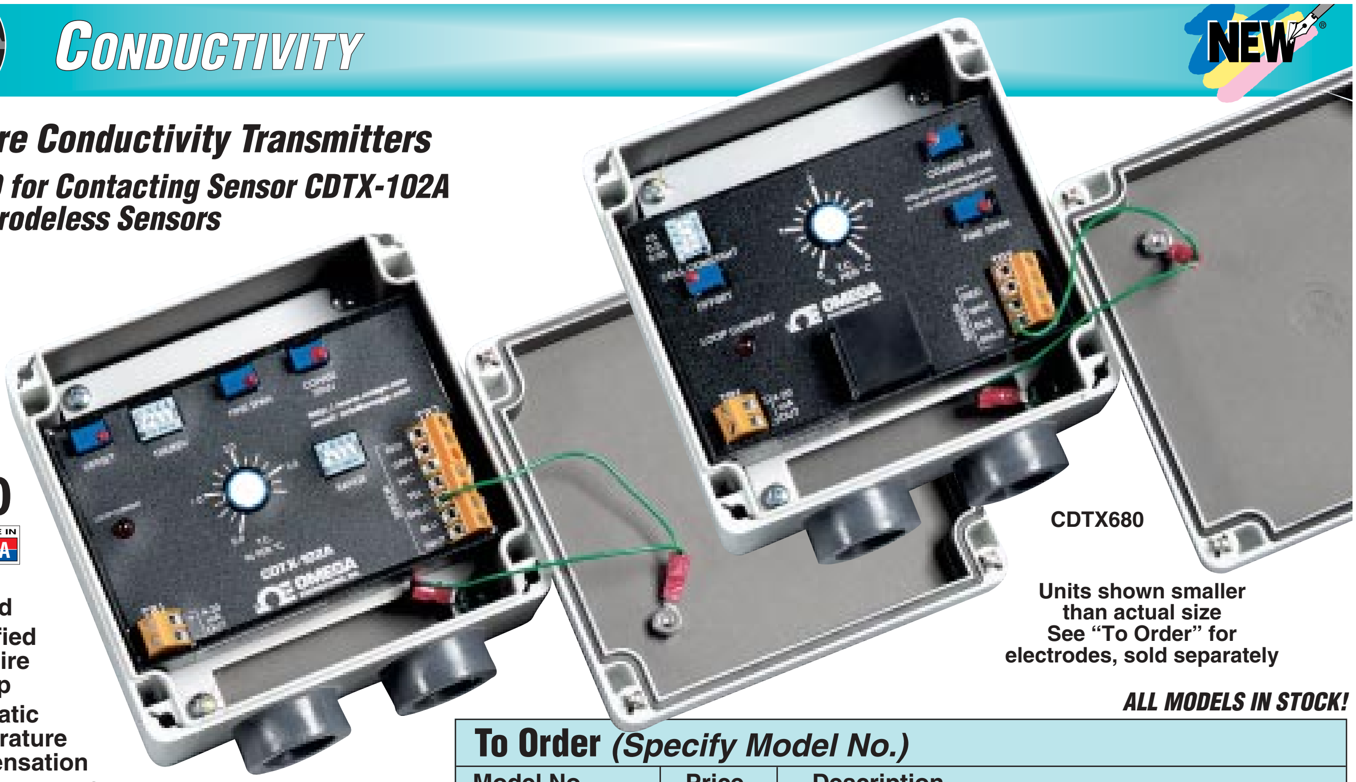
To Order *(Specify Model No.)*

Model No.	Price	Description
FP90UM	**$35**	Universal Mounting Kit
FP90-4X	**38**	NEMA-4X Cover (Panel Mount)
FP90RC	**15**	RC Filter (For Relay Use)
U24Y101	**128**	1000 mA Power Supply
CDCE-90-001	**258**	Conductivity Cell 0.1 to 100 μS Constant 0.01
CDCE-90-01	**258**	Conductivity Cell ¾" NPT 1 to 1000 μS Constant 0.1
CDCE-90-1	**258**	Conductivity Cell ¾" NPT 10 to 10,000 μS Constant 1.0
CDCE-90-10	**443**	Conductivity Cell ¾" NPT 100 to 100,000 μS Constant 10.0
CDCE-90-20	**541**	Conductivity Cell ¾" NPT 200 to 200,000 μS Constant 20.0

NEW

Two-Wire Conductivity Transmitters

CDTX680 for Contacting Sensor CDTX-102A for Electrodeless Sensors


CDTX680

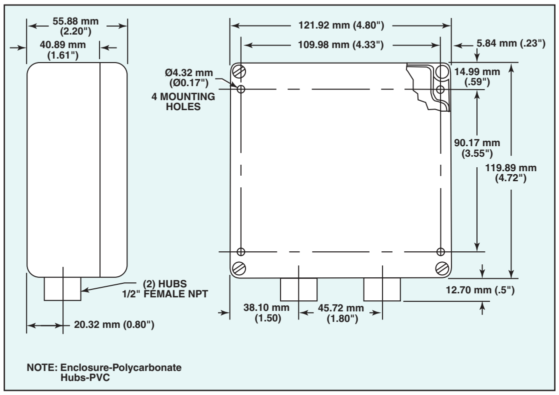
Units shown smaller than actual size
See "To Order" for electrodes, sold separately

CDTX-102A

$520

1 YEAR WARRANTY · MADE IN USA

- ✓ Isolated
- ✓ Simplified Two-Wire Hookup
- ✓ Automatic Temperature Compensation
- ✓ 4 to 20 mA dc Output
- ✓ Field Changeable Ranges
- ✓ NEMA-4X Enclosure



NOTE: Enclosure-Polycarbonate
Hubs-PVC

ALL MODELS IN STOCK!

To Order *(Specify Model No.)*

Model No.	Price	Description
CDTX680-(*)	$520	Two-wire conductivity transmitter for use with CDE680 Series contacting electrodes
CDTX-102A-(*)	520	Two-wire conductivity transmitter for use with electrodeless CDE3600 Series sensors

**Specify range code below; order electrode separately*
Ordering Example: CDTX-680-100**, transmitter for range 0 to 100 μS for use with **CDE680** series sensor with 0.05 cell constant**, $520

	CDTX680	CDTX-102A
Range	0 - 10 to 0 - 20,000 µs/cm	0 - 500 to 0 - 500,000 µs/cm
Sensitivity	0.1% of span	0.1% of span
Stability	0.1% of span per 24 hrs non-cumulative	0.2% of span per 24 hrs non-cumulative
Non-linearity	0.5% of span	0.4% of span
Repeatability	0.1% of span or better	0.2% of span or better
Temperature Drift	Zero and Span: 0.05% of span per °C	Zero and Span: 0.08% of span per °C

Range Codes

Code (*)	Range	Available Ranges for CDTX680		Available Ranges for CDTX-102A
		CDE680 Series	Cell Constant	
10	0 to 10 μS	yes	0.05	no
50	0 to 50 μS	yes	0.05	no
100	0 to 100 μS	yes	0.05	no
200	0 to 200 μS	yes	0.05	no
500	0 to 500 μS	yes	0.5	yes
1000	0 to 1000 μS	yes	0.5	yes
2000	0 to 2000 μS	yes	10.0	yes
5000	0 to 5000 μS	yes	10.0	yes
10M	0 to 10 mS	yes	10.0	yes
20M	0 to 20 mS	yes	10.0	yes
50M	0 to 50 mS	no	—	yes
100M	0 to 100 mS	no	—	yes
500M	0 to 500 mS	no	—	yes

CDTX680 Series transmitters accept the input from a CDE680 Series conductivity sensor with an 0.05, 0.5 or 10.0 cell constant. It can be used for ranges from 10 to 20,000 μs.

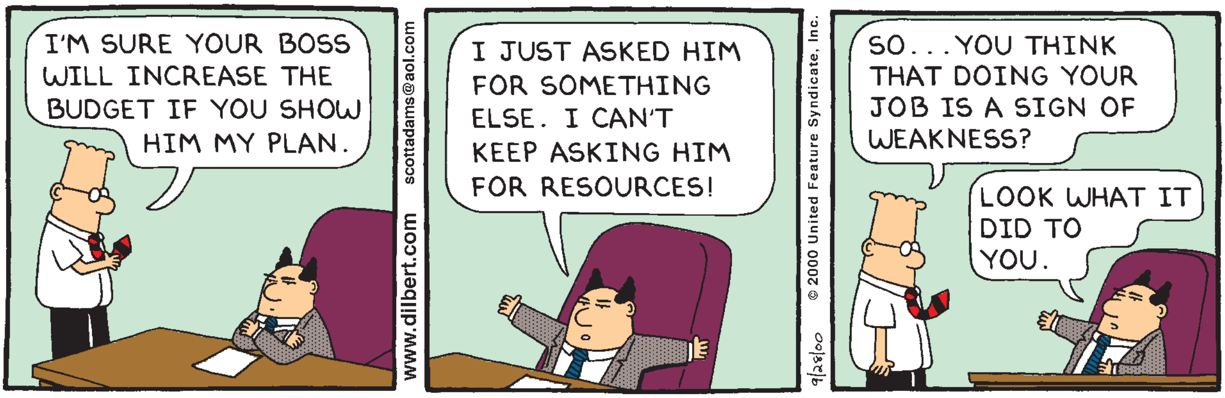
CDTX-102A Series transmitters accept the input from a CDE3600 Series electrodeless sensor. Range is 500 to 500,000 μs.

The output provided is an isolated 4 to 20 mA dc. The units are ordered with specified ranges, but can easily be rescaled in the field.

Specifications

Sensor to Transmitter Distance: 30 m (100 ft)
Power Requirement:
16 to 40 Vdc; 24 Vdc recommended
Connections: Stripped leads
Temperature Compensation:
Automatic 0 to 100°C (32 to 212°F)
Enclosure: NEMA-4X, polycarbonate, surface mount
Response Time:
2 sec to 90% of value upon step change

DILBERT® by Scott Adams


I'M SURE YOUR BOSS WILL INCREASE THE BUDGET IF YOU SHOW HIM MY PLAN.
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I JUST ASKED HIM FOR SOMETHING ELSE. I CAN'T KEEP ASKING HIM FOR RESOURCES!
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SO...YOU THINK THAT DOING YOUR JOB IS A SIGN OF WEAKNESS?
LOOK WHAT IT DID TO YOU.

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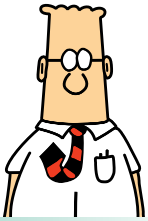
11

Collection Series
#11-001013



omega.com
ΩOMEGA®

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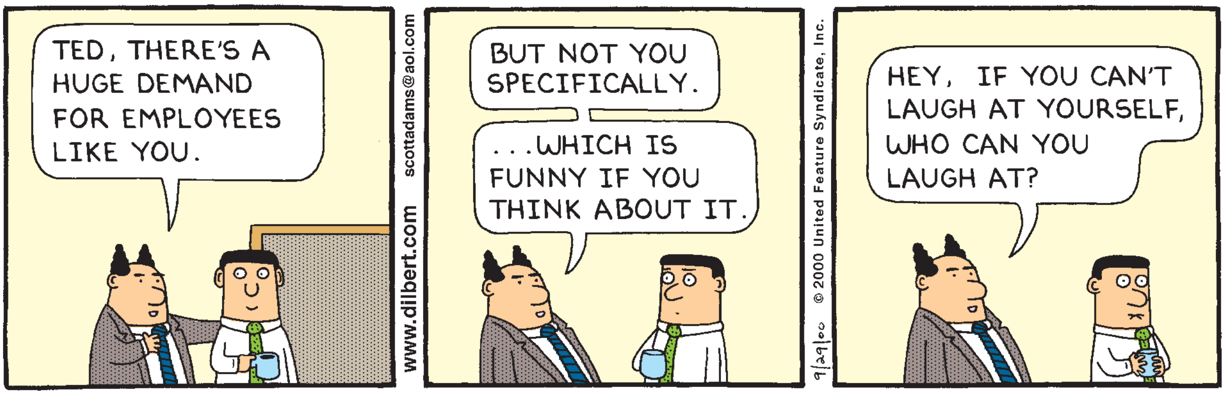
DILBERT® by Scott Adams


TED, THERE'S A HUGE DEMAND FOR EMPLOYEES LIKE YOU.
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BUT NOT YOU SPECIFICALLY.
...WHICH IS FUNNY IF YOU THINK ABOUT IT.
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HEY, IF YOU CAN'T LAUGH AT YOURSELF, WHO CAN YOU LAUGH AT?

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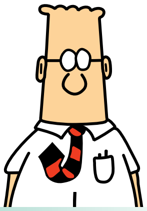
11

Collection Series
#11-001014



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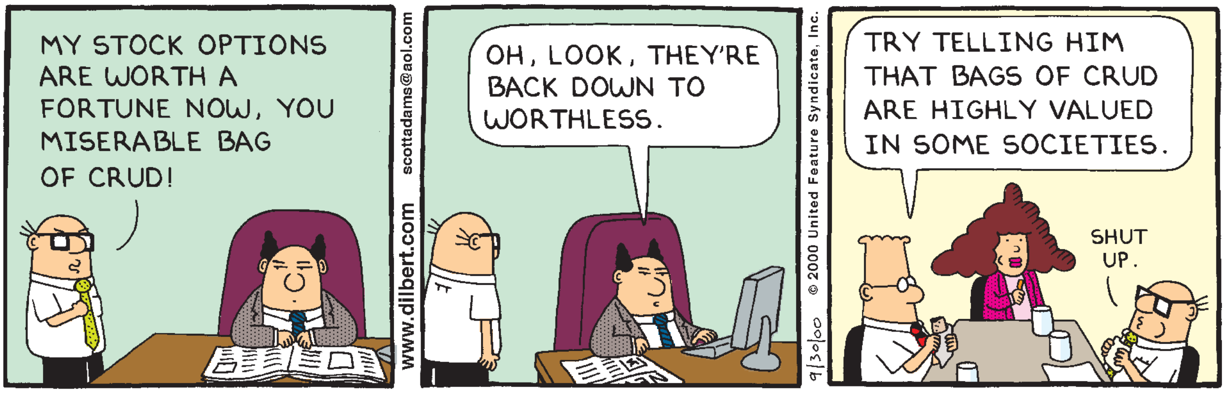
MY STOCK OPTIONS ARE WORTH A FORTUNE NOW, YOU MISERABLE BAG OF CRUD!
www.dilbert.com scottadams@aol.com
OH, LOOK, THEY'RE BACK DOWN TO WORTHLESS.
9/30/00 © 2000 United Feature Syndicate, Inc.
TRY TELLING HIM THAT BAGS OF CRUD ARE HIGHLY VALUED IN SOME SOCIETIES.
SHUT UP.

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Collection Series
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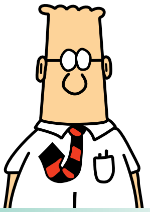

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24 HOURS

For Sales and Service, Call Toll-Free: **1-877-82-66342℠**
1-877-TC-OMEGA
U.S.A. and Canada

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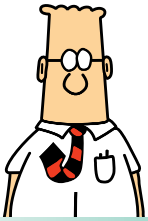
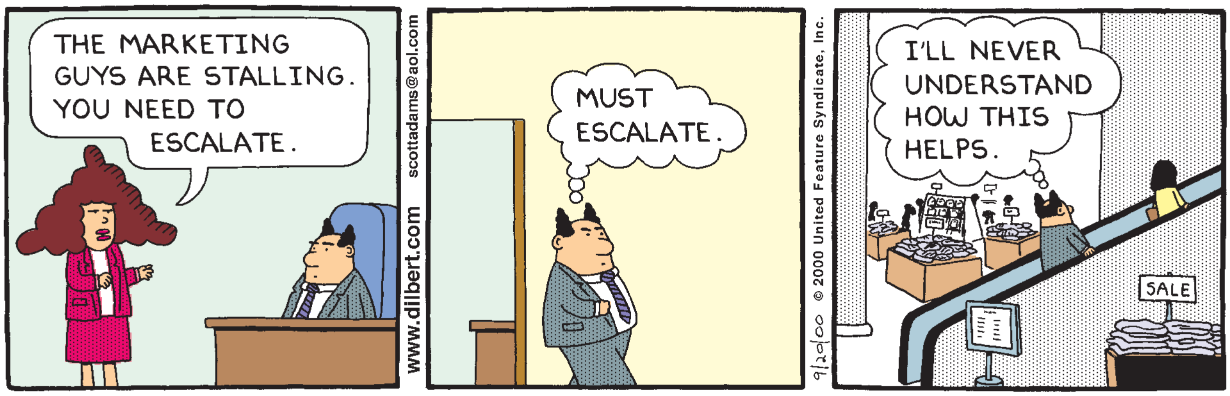
11

Collection Series
#11-001016

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SALE

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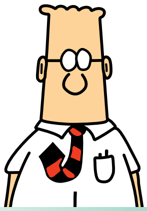
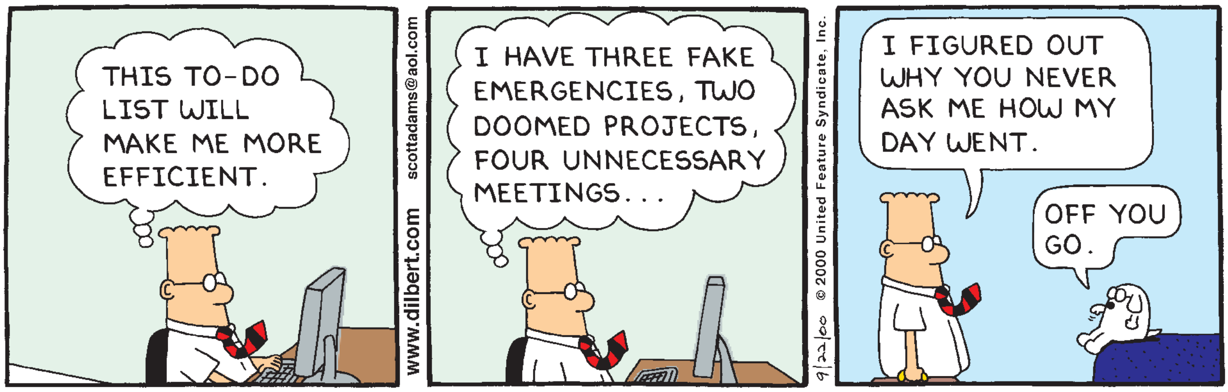
11

Collection Series
#11-001017

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I HAVE THREE FAKE EMERGENCIES, TWO DOOMED PROJECTS, FOUR UNNECESSARY MEETINGS...
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9/22/00
I FIGURED OUT WHY YOU NEVER ASK ME HOW MY DAY WENT.
OFF YOU GO.

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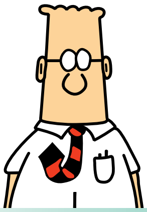
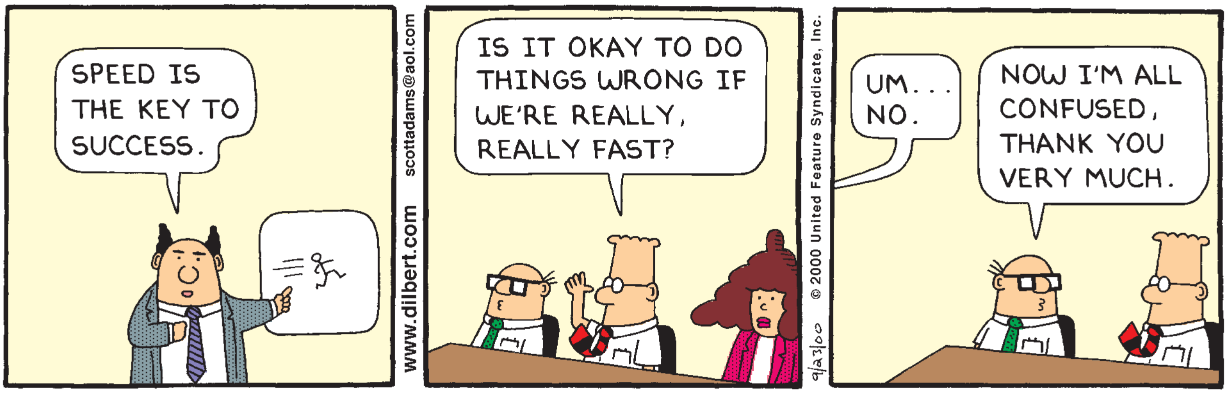
11

Collection Series
#11-001018

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scottadams@aol.com
www.dilbert.com
IS IT OKAY TO DO THINGS WRONG IF WE'RE REALLY, REALLY FAST?
© 2000 United Feature Syndicate, Inc.
9/23/00
UM... NO.
NOW I'M ALL CONFUSED, THANK YOU VERY MUCH.

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Stamford, CT 06907-0047

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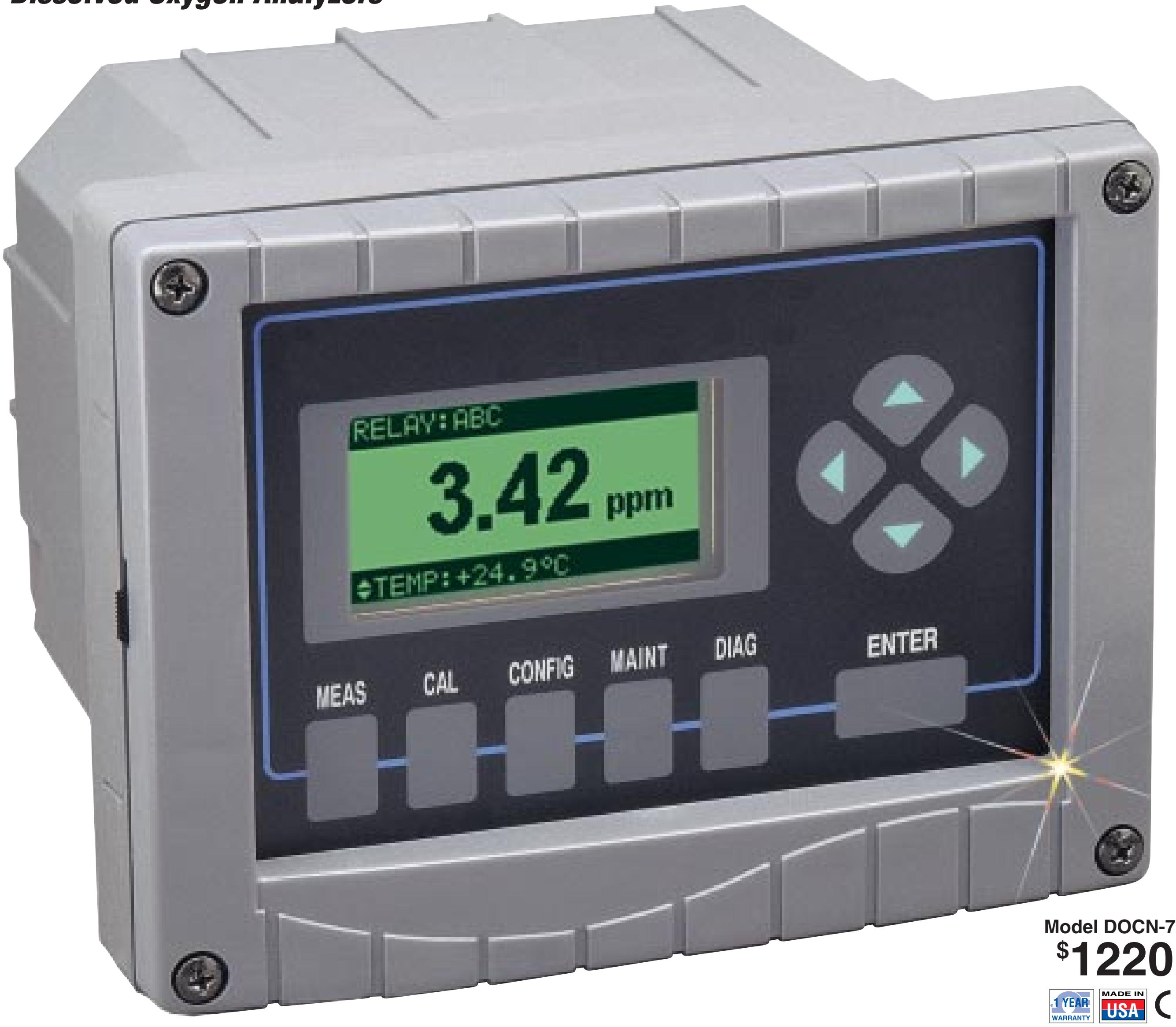
ΩEOMEGA®

Dissolved Oxygen Analyzers



Model DOCN-72
$1220

1 YEAR WARRANTY · MADE IN USA · CE

Optional

- ✓ **Large Display**
- ✓ **Replaceable Membrane Cartridge**
- ✓ **Rugged Foul-Resistant Membrane**
- ✓ **Seven Calibration Methods**
- ✓ **Dual Analog Output**
- ✓ **Three Relays for Alarm or Control**
- ✓ **Advanced Diagnostics**

The DOCN-72 is an easy-to-use dissolved oxygen analyzer/controller designed for use with the DOE-72 submersible mounted membrane dissolved oxygen sensor.

The sensor features a replaceable cartridge, simplifying the task of installing a new membrane.

Besides viewing measured dissolved oxygen in ppm or % saturation, you can display other important system information (analog output values, process temperature, next scheduled date of calibration, etc.) by using the ě or Ė key to scroll the lower line on the measurement screen. The analyzer provides two sets of analog outputs, each consisting of one 4 to 20 mA and one 0 to 5 Vdc/0 to 1 mA output. Each output set can be assigned to represent the measured D.O. (in ppm or % saturation) or temperature. Also, whenever the analyzer detects that one of the 4 to 20 mA loops is open, it displays a "Current Load High" diagnostic message.

The analyzer logbook records up to 100 system events, including calibrations, warning and failure messages, power-up/power-down, and configuration activity. Each event is logged with the date and time of occurrence.

Specifications

Range: 0.00 to 40.00 ppm or 0.0 to 200% saturation 0 to 50°C (32 to 122°F)
Display: Graphic dot matrix LCD, 128 x 64 pixels with LED backlighting; 13 mm (½") main display character height; 3 mm (⅛") auxiliary information character height
Ambient Conditions: -30 to 60°C (-22 to 140°F); 0 to 95% relative humidity, non-condensing
Relays:
Types/Outputs:
Standard: Three electromechanical relays (two SPDT and one SPST); UL rated 5 A 115/230 Vac, 5 A @ 30 Vdc resistive
Functional Modes: Each relay (A, B and C) can be assigned to be driven by the measured D.O. (in ppm or % saturation) or temperature

For the complete selection of Dissolved Oxygen products, refer to The Green Book®

Operating Modes:
Control: Settings for failsafe on/off, high/low phasing, setpoint, deadband, on delay, and off delay
Alarm: Settings for failsafe on/off, high alarm point, high alarm point deadband, low alarm point, low alarm point deadband, on delay, and off delay
Outputs:
Analog: Two separate outputs each. Isolated 0 to 5 Vdc (1 megohm min. load) and isolated 4 to 20 mA (900 ohms max. load). Selectable and scalable for D.O. and/or temperature
Temperature Compensation: Automatic, 0 to 50°C (32 to 122°F)
Sensor-to-Analyzer Distance: 305 m (1000') maximum
Power Requirements: 105 to 250 Vac, 50/60 Hz. (20 Va max.)
D.O. Calibration Methods: Seven methods using sample or water and using either known or saturated values or air
Logbook: Up to 100 system events can be stored
Analyzer Performance (Electrical, Analog Outputs)
Accuracy: 0.10% of span
Sensitivity: 0.05% of span
Stability: 0.05% of span per 24 hours, non-cumulative
Non-linearity: 0.10% of span
Repeatability: 0.05% of span or better
Temperature Drift: Zero: 0.02% of span per °C;Span: 0.02% of span per °C
Enclosure: NEMA-4X; polycarbonate face panel, epoxy-coated high-quality cast aluminum door and case with four 13 mm (½") conduit holes, nylon mounting bracket, and stainless steel hardware
Mounting Configurations: Panel, surface, and pipe (horizontal and vertical) mounting

RELAY:ABC
3.42 ppm
TEMP:+24.9°C
MEAS
CAL
CONFIG
MAINT
DIAG
ENTER

DOCN-72 Dissolved Oxygen Analyzer $1220

DOE-72 Sensor $715

Net Weight: 2.5 kg (5.5 lb), approximately
Dimensions (Analyzer): 192 W x 144 H x 175 mm D (7.56 x 5.67 x 6.9")
Panel Cutout: 180 x 137 mm (7.1 x 5.4")
D.O. Sensor
Wetted Materials: Noryl 316 stainless steel, nylon, PVC, Viton®, Teflon®, and Ryton
Electrode Material: Gold cathode, silver anode, and silver reference
Temperature Range: 0 to 50°C (32 to 122°F)
Maximum Flow Rate: 0.016' (5 millimeters) per second
Maximum Pressure: 145 psi (10 bar)
Measuring Range: 0.00 to 40 ppm

Response Time (@20°C/168°F): 180 seconds to 90% of value upon step change
Membrane Thickness: 50 microns
Sensor Cable: Integral 15' (4.6 m) long cable, terminated with MS-type quick-disconnect plug
Measuring Principle: Potentiostatic, polarographic three-electrode system
Probe Diameter: 37.85 mm (1.49")
Dimensions (Sensor with adaptor hardware):
DOE-72: 48.3 D x 222.3 mm L (1.90 x 8.75")
DOE-72F: 56.4 D x 196 mm L (2.22 x 7.7")

To Order *(Specify Model No.)* *Order Analyzer and Sensor Separately*

Model No.	Price	Description
DOCN-72†	**$1220**	Dissolved oxygen analyzer for use with DOE-72 sensor
DOE-72	**715**	Dissolved oxygen sensor with 4.5 m (15') cable, replaceable cartridge and 12 disposable calibration bags
DOE-72F	**715**	Same as DOE-72, with adaptor for DOE-72-UMH union mounting hardware
DOE-72-RC	**95**	Replace cartridge with semi-permeable membrane, electrolyte, electrodes and O-Ring
DOE-72-OR	**230**	Replacement O-Ring for DOE-72-RC cartridge
DOE-72-SM	**115**	Submersion mounting hardware (1½" dia., 5' long PVC pipe with junction box)
DOE-72-HM	**230**	Handrail mounting hardware 1½" dia., 7.5' long PVC pipe swivel/pivot pipe clamp assembly and junction box
DOE-72-FA	**340**	Flotation assembly (includes handrail mounting hardware plus ball float assembly)
DOE-72-UMH	**60**	Flow-through union hardware for DOE-72F, PVC 2" "Y" tee with socket weld connections and union
CDE-3600-CAB-(*)	**1.80/ft**	Six-conductor cable plus shield. Specify length in feet (25 ft. minimum).

†*For "-**CE**" approved version, order **DOCN-72-CE, $1320.*** **Specify length in feet*

Ordering Example: DOCN-72-CE, *CE approved version of dissolved oxygen analyzer, and **DOE-72,** sensor, and **DOE-72-SM,** submersion mounting hardware $1320 + 715 + 115 = **$2150***

Compact Dissolved Oxygen Benchtops

- ✓ 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 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 ±2% saturation and ±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 ±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 lbs)
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
1 YEAR WARRANTY MADE IN USA CE

PPM O2
% SATURATION
TEMP °C
OXYGEN

DOB-210 Shown Smaller Than Actual Size

DOB-215
$398
1 YEAR WARRANTY MADE IN USA CE

DOB-215 Shown Smaller Than Actual Size

▭ ***MOST POPULAR MODEL HIGHLIGHTED!***

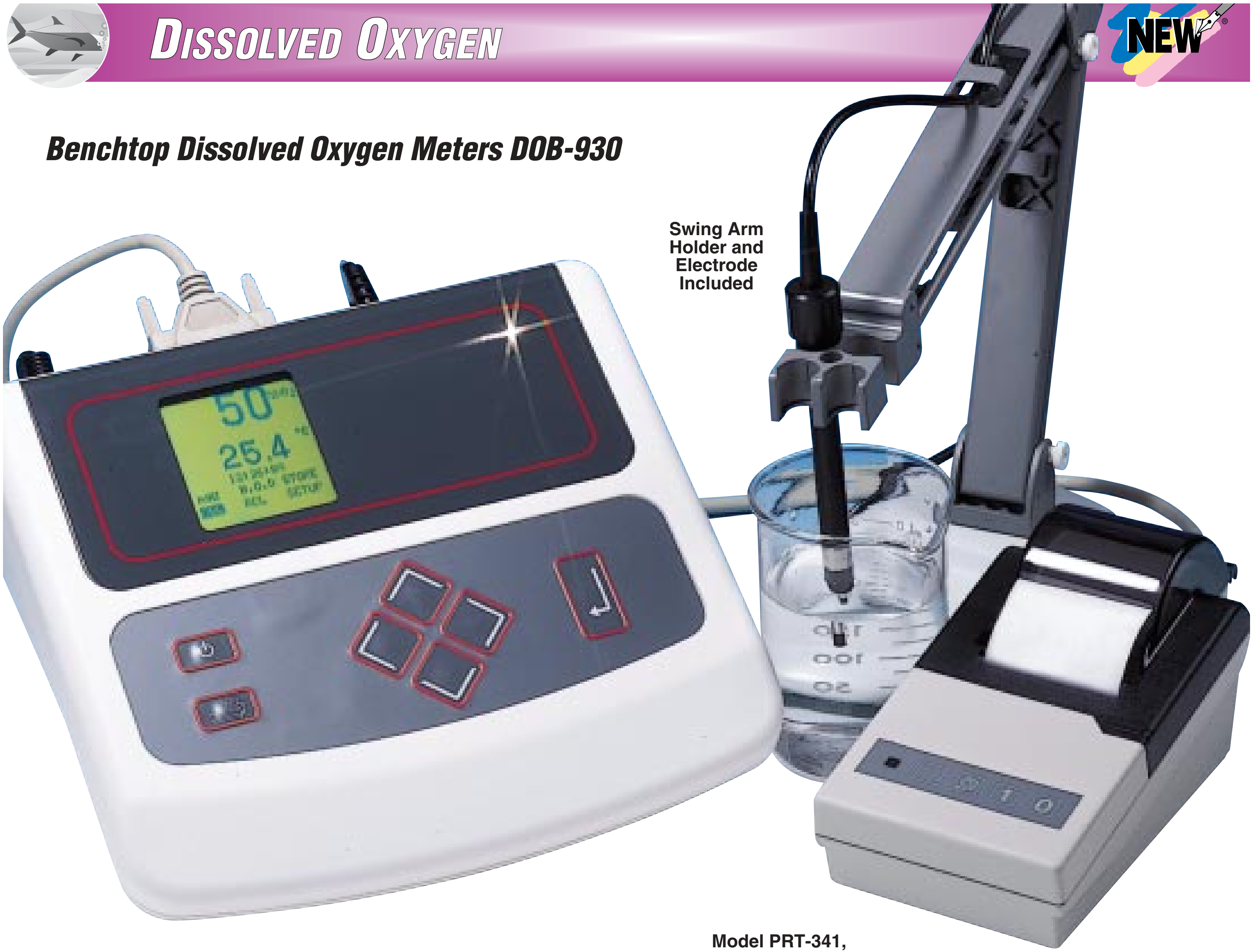
To Order *(Specify Model No.)*

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 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.

Benchtop Dissolved Oxygen Meters DOB-930



Swing Arm Holder and Electrode Included

Model PRT-341, Printer (optional)
$725

DOB-930
$1420

1 YEAR WARRANTY
Electronics Only

- **% Concentration and PPM Readings**
- **Includes Swing Arm Holder**
- **Analog and RS-232 Outputs**
- **B.O.D. Mode Feature**
- **Alarms**

Specifications

DO2:

Ranges: 0 to 199%, 0 to 25.0% or 0 to 19.99 mg/l

Resolution: 1%, 0.1%, 0.01 mg/l

Accuracy: ±2% within 10°C (18°F) of calibration temperature

Temperature:

Ranges: -10 to 60°C (14 to 140°F)

Resolution: 0.1°C/1°F

Accuracy: ± 0.5°C/±1°F

ATC range: 0 to 60°C (32 to 140°F)

Outputs: Analog 1 mV per digit, bi-directional RS-232, Hi/Lo Alarm outputs, open collector 0.5 A 50 V max

Clock: 24 hour, hours/min/sec or day/month/year (leap year corrected)

Stirrer speed: 0 to 100%

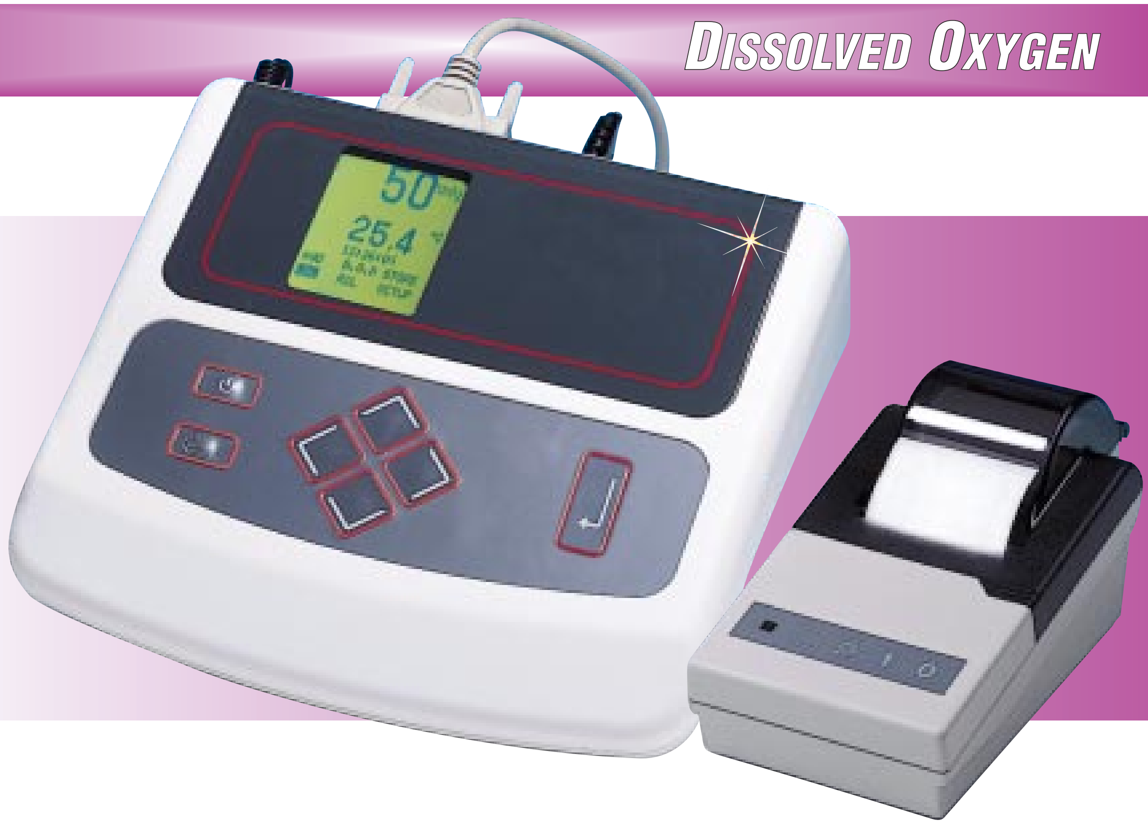
Alarm points: 0 to 199.9% and 0 to 19.99 mg/L; calibration reminder

Display: LCD graphics

Power: 115 ac adaptor supplied, (power supply 9 V ac)

Size: 275 L x 240 W x 150 mm D (10.8 x 9.5 x 5.9")

Weight: 1.2 kg (2.6 lb)



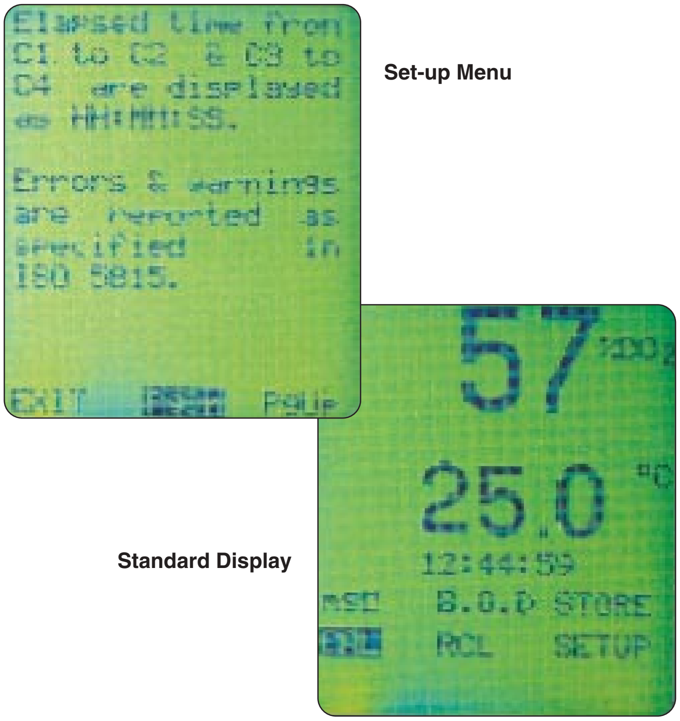
The DOB-930 benchtop dissolved oxygen meter uses a Clark-type polarographic electrode, optimized for both stability and speed of response. Dissolved oxygen levels can be measured either as % saturation or as concentration in mg/l (ppm). The meter also has a mode dedicated to the determination of B.O.D. (Biochemical Oxygen Demand).

The graphics mode liquid crystal display facilitates plain-language, menu-based operating procedures and clear presentation results. The results phase permits the simultaneous display of dissolved oxygen level and temperature.

The sensor measures the partial pressure of oxygen, with the reported results influenced by atmospheric pressure. The DOB-930 allows atmospheric pressure and salinity values to be entered through the menu options for automatic correction.

A real-time clock is built into the meter and displays either day, month and year or seconds, minutes and hours. The clock feature also enables calibration checks to be prompted at intervals determined by the operator.

The unit includes a 100-location memory for logging the results for subsequent recall to the display or downloading via the bi-directional RS-232 link to a printer or PC.



Elapsed time from C1 to C2 & C3 to C4 are displayed as HH:MM:SS.

Errors & warnings are reported as specified in ISO 5815.

Set-up Menu

Standard Display

To Order *(Specify Model Number)*

Model No	Price	Description
DOB-930	**$1420**	Benchtop dissolved oxygen meter with probe, ATC probe, swing arm holder, spare membranes, KCl filling solution, zero powder, and power supply

Ordering Example: DOB-930**, benchtop dissolved oxygen meter with probe, ATC probe, swing arm holder, spare membrane, KCl filling solution, zero powder and power supply, **$1420

2-Wire Isolated Conductivity Transmitter System

- PEEK Sensor Body Construction
- 4-Electrode Sensor Type
- Electrode Coating Rejection Diagnostic
- Universal Mounting Configurations
- Microprocessor-Based System
- Large Dual Display Format
- Loop Powered, Fully Isolated

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 four electrodes used in the cell are made of titanium for greater chemical resistance. Two of these electrodes are used to establish the sensor drive potential. The other two electrodes sense the flow of current between the drive electrodes and maintain the proper drive potential. The current that flows between the two drive electrodes is directly proportional to solution conductivity.

With conventional two-electrode sensors, as the process solution begins to coat the electrode surfaces, the sensor output signal begins to decrease. This produces an artificially low conductivity measurement.

The CDTX-45 four-electrode system uses electrode diagnostics to compensate for the effects of fouling. As the two drive electrodes become coated by the process solution, a feedback mechanism involving the two sensing electrodes detects the decrease in drive potential and automatically re-establishes the proper drive potential. When the degree of coating reaches a limit where compensation is no longer possible, the diagnostic actuates an alarm to signal that the sensor requires cleaning.

The unique drive/control scheme of this system allows a single sensor configuration to be used reliably over a wide conductivity range. This system eliminates the requirement for multiple sensors with varying cell constants that are restricted to narrow operating ranges.

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.

CDTX-45 System
$1090
Meter and Sensor (Order Separately)

1 YEAR WARRANTY

142.0 uS
+25.0 °C
MENU
ESC
ENTER

CDTX-45 Shown Smaller than Actual Size Meter and Electrode Sold Separately

CDE-45P Electrode Shown Smaller than Actual Size Meter and Electrode Sold Separately

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.

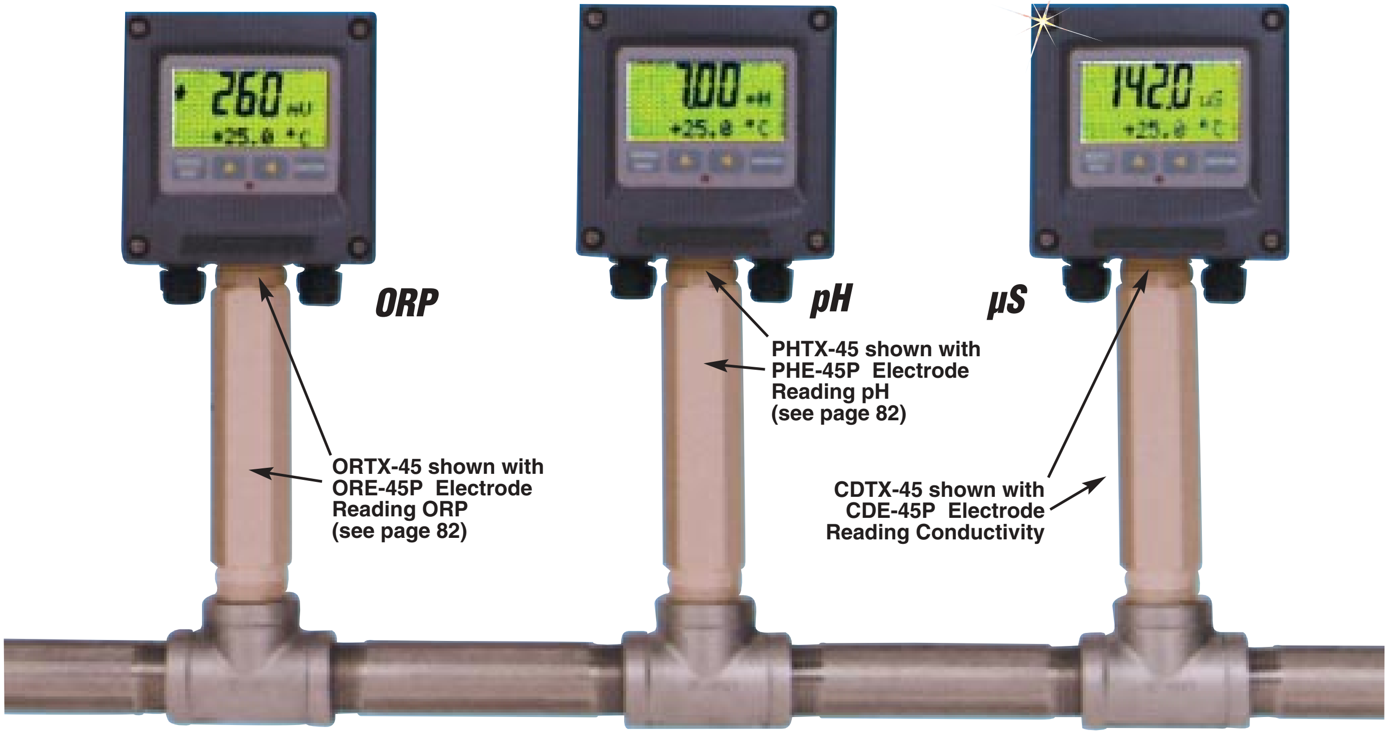
To Order *(Specify Model Number)*

☐ ***MOST POPULAR MODELS HIGHLIGHTED!***

Model No.	Price	Description
CDTX-45	$695	Conductivity Transmitter
CDE-45P	395	Conductivity Electrode
U24Y101	128	24 Vdc Power Supply
PHTX-45-SMH	175	Submersion Mounting Hardware, 1.8 m (6’)
PHTX-45-FBMH	375	Float Ball Mounting Hardware

Ordering Example: CDTX-45** Conductivity Transmitter, and **CDE-45P** electrode, $695 + 395 = **$1090.

CDTX-45 An In Line Application Solution



ORTX-45 shown with
ORE-45P Electrode
Reading ORP
(see page 82)

PHTX-45 shown with
PHE-45P Electrode
Reading pH
(see page 82)

CDTX-45 shown with
CDE-45P Electrode
Reading Conductivity

Two of four 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 operators manual.

The flexible calibration method includes stability monitors that check temperature and main parameter stability before accepting data.

CDE-45P Sensor Specifications

Measuring Range: 0 to 1.000 Siemen
Sensor Cable: 10 feet
Wetted Materials:
PEEK, titanium, Viton®,
EPDM (316 stainless steel with 316SS body option)
Temperature Compensation: Pt1000
Sensor cable 6 Conductor plus 2 shields
Sensor to transmitter distance
9.1 meters (30 feet) maximum
Maximum Flow Rate:
3 meters (10 feet) per second
Mounting Options: 1" NPT convertible, 1¼" insertion, 1½" or 2" sanitary style
Weight/Shipping Weight: 0.45 kg (1lb)

CDTX-45 Transmitter Performance Specifications

Displayed Parameters:
Main input, 0 to 1.000 Siemen
% Concentration
Loop current, 4.00 to 20.00 mA
Sensor temperature, -40° to 210°C (-40 to 410°F)
Main Parameter Range:
0 to 1.000 Siemen
Repeatability: 0.3% of span or better
Sensitivity: 0.05% of span
Non-Linearity: 0.3% 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, 0.03% of span/°C
Sensor to Transmitter Distance:
9.1 meters (30 feet)
Enclosure: NEMA 4X, IP65, polycarbonate, stainless steel hardware, weatherproof and corrosion resistant
Dimensions: 112 mm (4.4") H x 112 mm (4.4") W x 89 mm (3.5")D
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 (1lb)
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

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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

4.10 PPM
+25.0 °C
MENU
ESC
ENTER
1 YEAR
WARRANTY

DOTX-45 Transmitter

DOE-45P Sensor

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 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!***

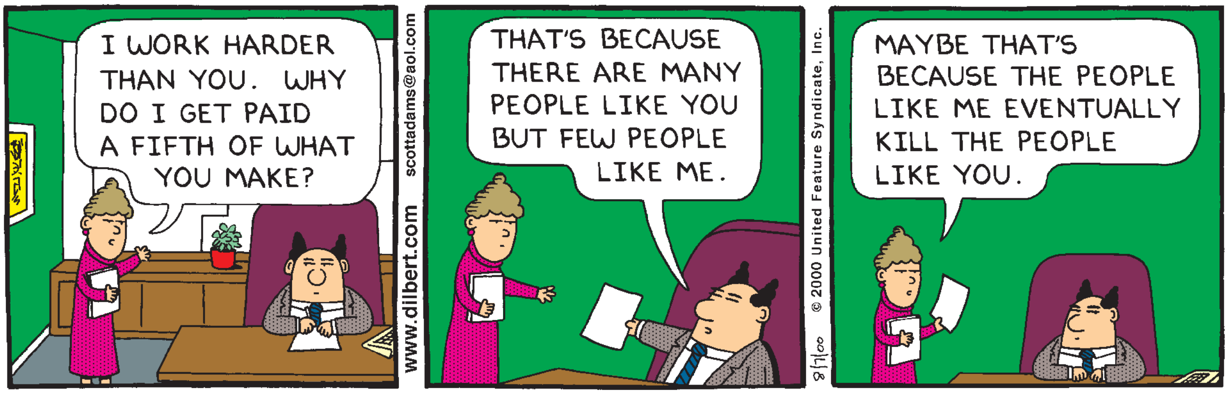
Model No.	Price	Description
DOTX-45	$675	Dissolved Oxygen Transmitter
DOE-45P	650	Dissolved Oxygen Sensor
U24Y101	128	24 Vdc Power Supply
DOTX-45-SC	125	Replacement Sensor Cartridge
PHTX-45-SMH	175	Submersion Mounting Hardware, 1.8 m (6')
PHTX-45-FBMH	375	Float Ball Mounting Hardware

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

DILBERT® by Scott Adams

11

Collection Series
#11-001022


I WORK HARDER THAN YOU. WHY DO I GET PAID A FIFTH OF WHAT YOU MAKE?
scottadams@aol.com
www.dilbert.com
THAT'S BECAUSE THERE ARE MANY PEOPLE LIKE YOU BUT FEW PEOPLE LIKE ME.
© 2000 United Feature Syndicate, Inc.
8/7/00
MAYBE THAT'S BECAUSE THE PEOPLE LIKE ME EVENTUALLY KILL THE PEOPLE LIKE YOU.

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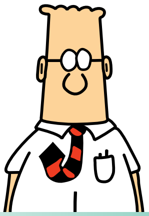

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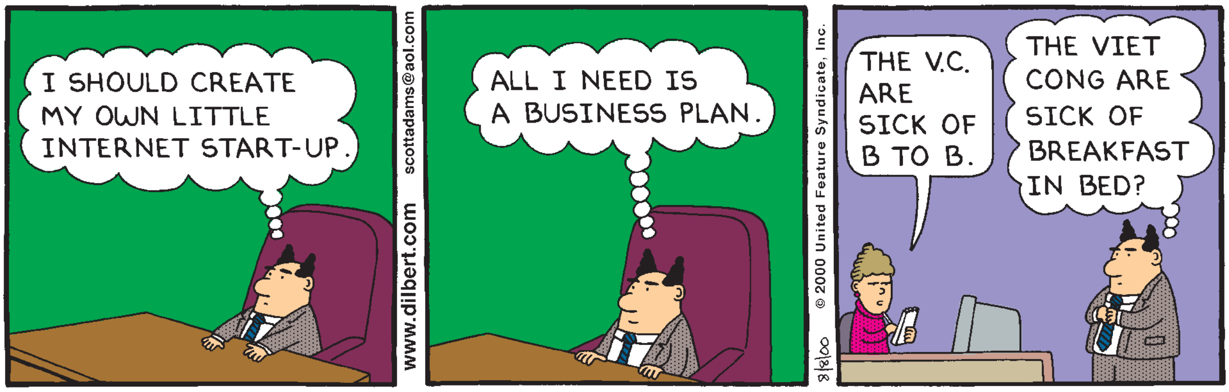
#11-001023


I SHOULD CREATE MY OWN LITTLE INTERNET START-UP.
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ALL I NEED IS A BUSINESS PLAN.
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8/8/00
THE V.C. ARE SICK OF B TO B.
THE VIET CONG ARE SICK OF BREAKFAST IN BED?

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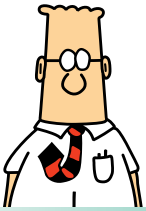

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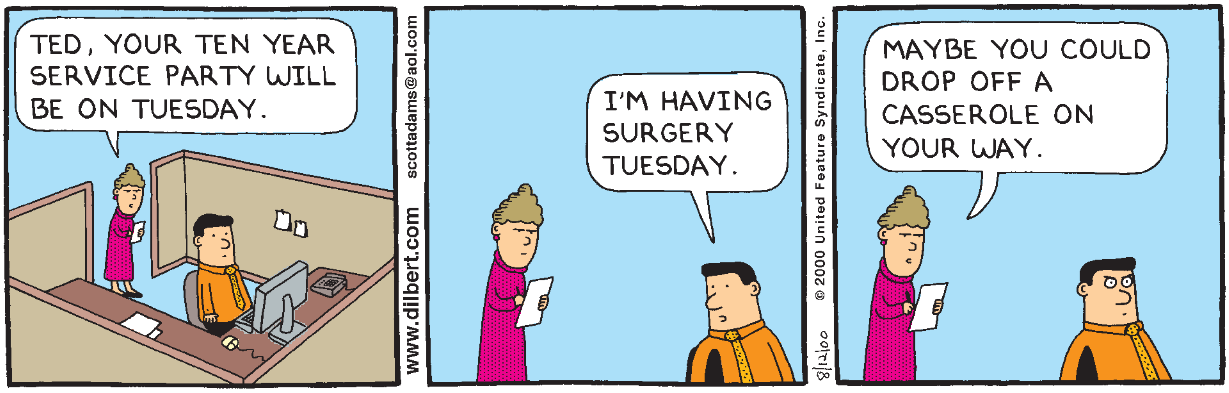
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MAYBE YOU COULD DROP OFF A CASSEROLE ON YOUR WAY.

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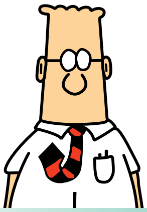

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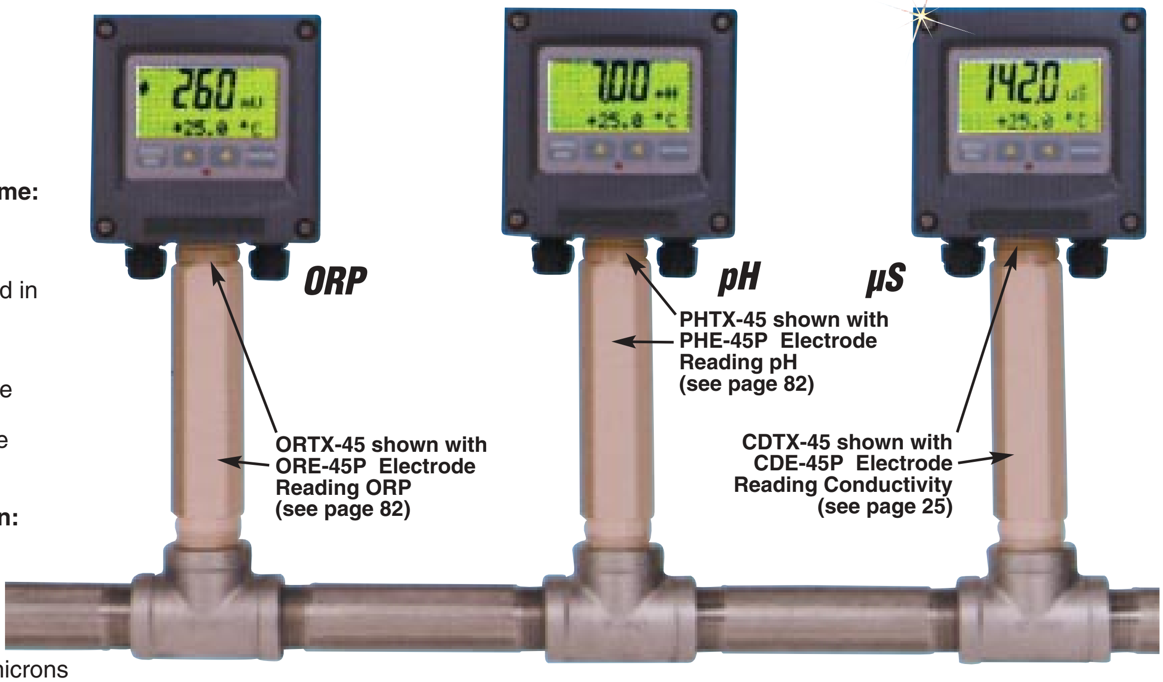
DOTX-45 in Line Application Solution


ORP
pH
µS
ORTX-45 shown with ORE-45P Electrode Reading ORP (see page 82)
PHTX-45 shown with PHE-45P Electrode Reading pH (see page 82)
CDTX-45 shown with CDE-45P Electrode Reading Conductivity (see page 25)
260 mV
+25.0 °C
7.00 pH
142.0 µS

DOE-45P Sensor Specifications

Measuring Range: 0 to 40.00 ppm
Sensor Cable: 10 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, 1¼" 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

4.10 PPM
+25.0 °C
MENU ESC
ENTER

DOTX-45 with DOE-45P (sold separately)

LIGHTSPEED™ Fiber Optic Paddlewheel Flow Sensors – Inherently Safe Design

FP9000 Series
$225

- Unique Fiber-Optic Design for Hazardous Areas
- Fiber-Optic Signal – Insensitive to Electrical Interference
- Non-Magnetic Design Resists Fouling from Rust
- Optical Interface

FP9000 Series LIGHTSPEED™ paddlewheel flow sensors are ideal for applications with low viscosity solutions (like water) which are low in suspended solids.

A patented fiber-optic sensing mechanism makes these sensors especially well suited for applications in hazardous environments, where the paddlewheel electronics can be mounted in a non-hazardous location and the near-infrared light signal can be sent down an optic cable to the paddlewheel inside the hazardous location. This non-magnetic design tolerates some rust, often found in iron pipes. FP9000 Series flow sensors must be used with the companion FP9000 Series pipe installation fittings.

The high amplitude pulse output from the FP9P opto-electronic interface is ideally suited for hook up to the model INF7 ratemeter/totalizer. For 4-20 mA output, connect to OMEGA's FLSC90 Series signal conditioner. (Please specify fitting and calibration range for the 4-20 mA output.) The FLSC90 includes the required optical interface for the FP9000 sensor.

Flow Sensor Specifications

	Range (gpm)		Accuracy	Repeatability	Nominal	Nominal
Pipe Size	Min.	Max.	(% Full Scale)	(% of Full Scale)	K Factor	Hz @ 1 gpm
0.5"	1.0	20	±2%	±2%	938	15.6
0.75"	2.0	30	±2%	±2%	528	8.80
1.0"	4.0	55	±2%	±2%	322	5.37
1.25"	4.5	90	±2%	±2%	161	2.68
1.5"	8.0	125	±2%	±2%	112	1.87
2.0"	15.0	200	±2%	±2%	63.6	1.06
2.5"	20	300	±2%	±2%	48.4	0.807
3.0"	25	500	±3%	±3%	15.5	0.258

FP9001 Sensor shown with FP9P-T interface

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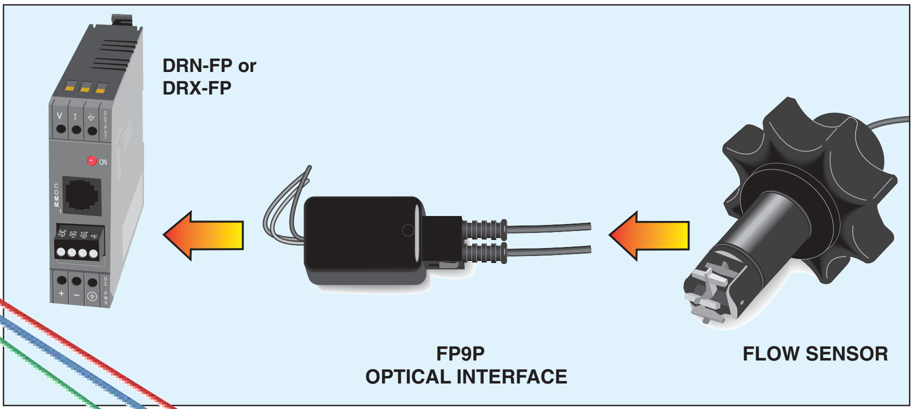
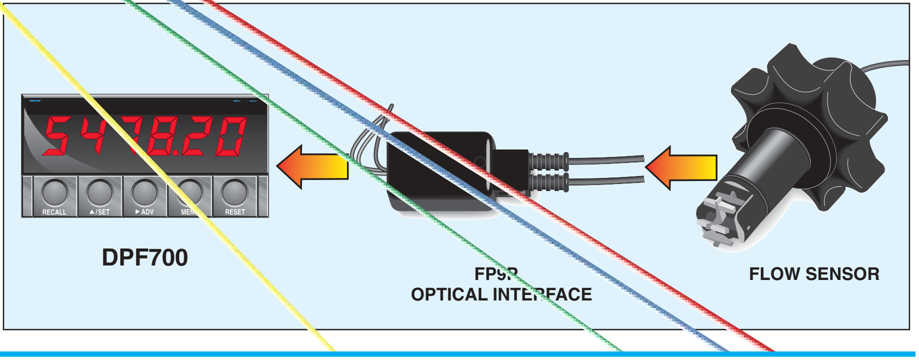


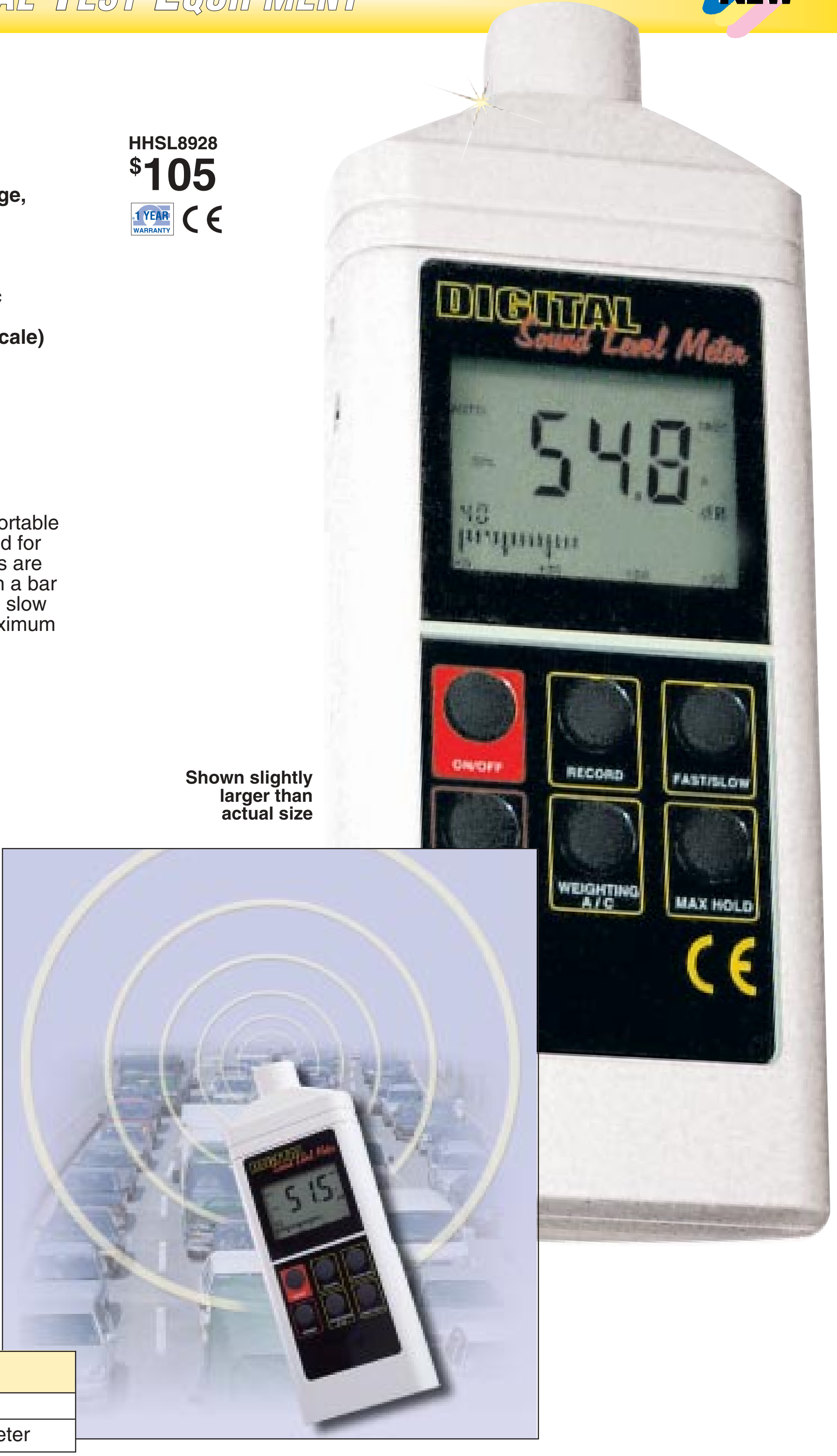


Low Cost Sound Level Meter

- Measurement Frequency Ranging 300 to 8000 Hz
- Quasi-Analog Bar Indicator: 1 dB Display Step, 30 dB Display Range, Updated Every 50ms
- A & C Weighting
- Fast & Slow Response Option for Peak Sound Level
- Microphone:10 mm (0.4") Dia. Electric Condenser Microphone
- Analog Out, AC: 0.707 Vrms (at Full Scale)
- Tripod Mountable
- Battery Low Indicator
- Max/Min Hold and Record
- Manual and Auto Ranging
- Auto Power Off
- 3½ Digit Display

HHSL8928
$105
1 YEAR WARRANTY CE

The HHSL8928 is perfect for the hobbyist. Portable and simple to use, the HHSL8928 is designed for audio and general purpose use. Sound levels are simultaneously displayed both digitally and in a bar graph. The user can select between fast and slow response time and A and C weighting. A maximum Hold Function is provided.



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Specifications

Measurement Frequency Range:
300Hz ~ 8K Hz
Quasi-Analog Bar Indicator:
1 dB display steps, 30 dB display range updated every 50 ms
Measurement Level Ranges:
4 ranges: 40 ~ 70 dB, 60 ~ 90 dB, 80 ~ 110 dB, 100 ~ 130 dB
Measurement Level A Weighting:
40dB ~ 130dB
Measurement Level C Weighting:
45 dB ~ 130 dB
Accuracy @94dB,1KHz: ±2dB
Microphone: 10 mm (0.4") Diameter Electric Condenser Microphone
Digital Display: 3½ digit LCD, 0.1 dB resolution updated every 0.5 sec
Battery Life: 30 hours (alkaline)
Operation Temperature:
0~50°C, 10~90% Relative Humidity
Storage Temperature: -20~60°C
Dimensions:
72 x 182 x 30 mm (3" x 7" x 1.2")
Weight: 150 g (5 oz)

To Order *(Specify Model Number)*

Model No.	Price	Description
HHSL8928	$105	Sound Level Meter

Each unit is shipped with operator's manual.
Ordering Example: HHSL8928**, Sound Level Meter, **$105.

FP9001 Sensor with FP9P-T interface

Model FP9001 Sensor

Wetted Parts: Polypropylene body and impeller, Hastelloy C shaft, Viton® O-rings, acrylic fiber-optic cable
Maximum Fluid Viscosity: 1 centipoise
Temperature/Pressure: ½" **PVC fitting:** 100 psi @ 23°C, 50 psi @ 60°C; ¾" **through 1½":** 200 psi @ 23°C, 100 psi @ 60°C; **2" through 3":** 200 psi @ 23°C (73°F), 50 psi @ 60°C (140°F)
Fiber-Optic Cable Length: 2.7 m (9')
Sensor Weight: 0.45 kg (1 lb)

Flow Sensor Ordering Guide

To Order ***(Specify Model No.)*** Prices Shown in U.S. Dollars

Model No.	Price	Description
FP9001*	$225	Paddlewheel sensor for pipes ½" to 3"

**Must be used with FP9P, FP9250, or FLSC90 optical interface. Please order separately below.*

Works With:

FLSC-90A Signal Conditioner (See Page F-43 of the OMEGA Flow and Level Handbook and Encyclopedia®)

DP41-U Universal Panel Meter (See Page F-43 of the OMEGA Flow and Level Handbook and Encyclopedia®)

DRN-FP/DRX-FP Signal Conditioners (See Section M of the OMEGA Temperature Measurement Handbook®)

DPF400 Digital Flow Meter (See Section M of the OMEGA Temperature Measurement Handbook®)

DPF700 Digital Flow Meter (See Page F-58 of the OMEGA Flow and Level Handbook and Encyclopedia®)

Covered by U.S. and Foreign Patents and Pending Applications

PVC Tee Fitting, for Pipes ½" Through 1½"

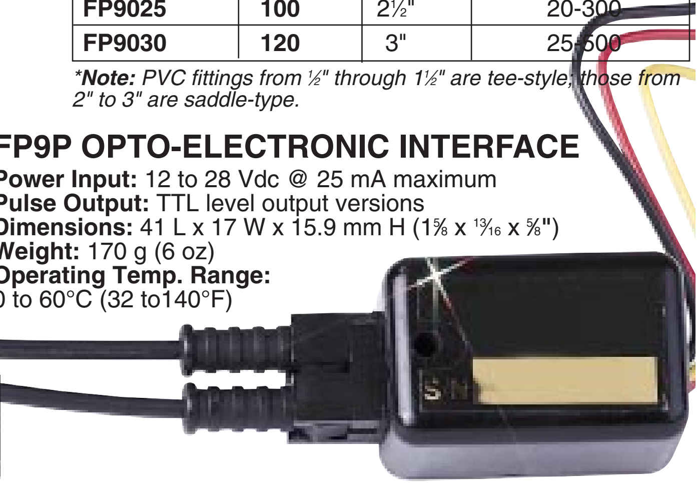
Installation Fittings* PVC Schedule 80

Model No.	Price	Pipe Size	Flow Range (GPM)
FP9005	$80	½"	1.0-20
FP9007	90	¾"	2.0-30
FP9010	90	1"	4.0-55
FP9012	100	1¼"	4.5-90
FP9015	100	1½"	8.0-125
FP9020	100	2"	15.0-200
FP9025	100	2½"	20-300
FP9030	120	3"	25-500

**Note: PVC fittings from ½" through 1½" are tee-style; those from 2" to 3" are saddle-type.*

FP9P OPTO-ELECTRONIC INTERFACE

Power Input: 12 to 28 Vdc @ 25 mA maximum
Pulse Output: TTL level output versions
Dimensions: 41 L x 17 W x 15.9 mm H (1⅝ x 13⁄16 x ⅝")
Weight: 170 g (6 oz)
Operating Temp. Range:
0 to 60°C (32 to140°F)



Accessories

Model No.	Price	Description
FP9P-T	$155.00	Optical-to-TTL pulse interface
PSU-24B	40.00	Wall socket plug-in transformer, 115 Vac in, 24 Vdc out on screw terminals
TX4-100	28.50	4-wire shielded cable, 30 m (100')

Ordering Example:

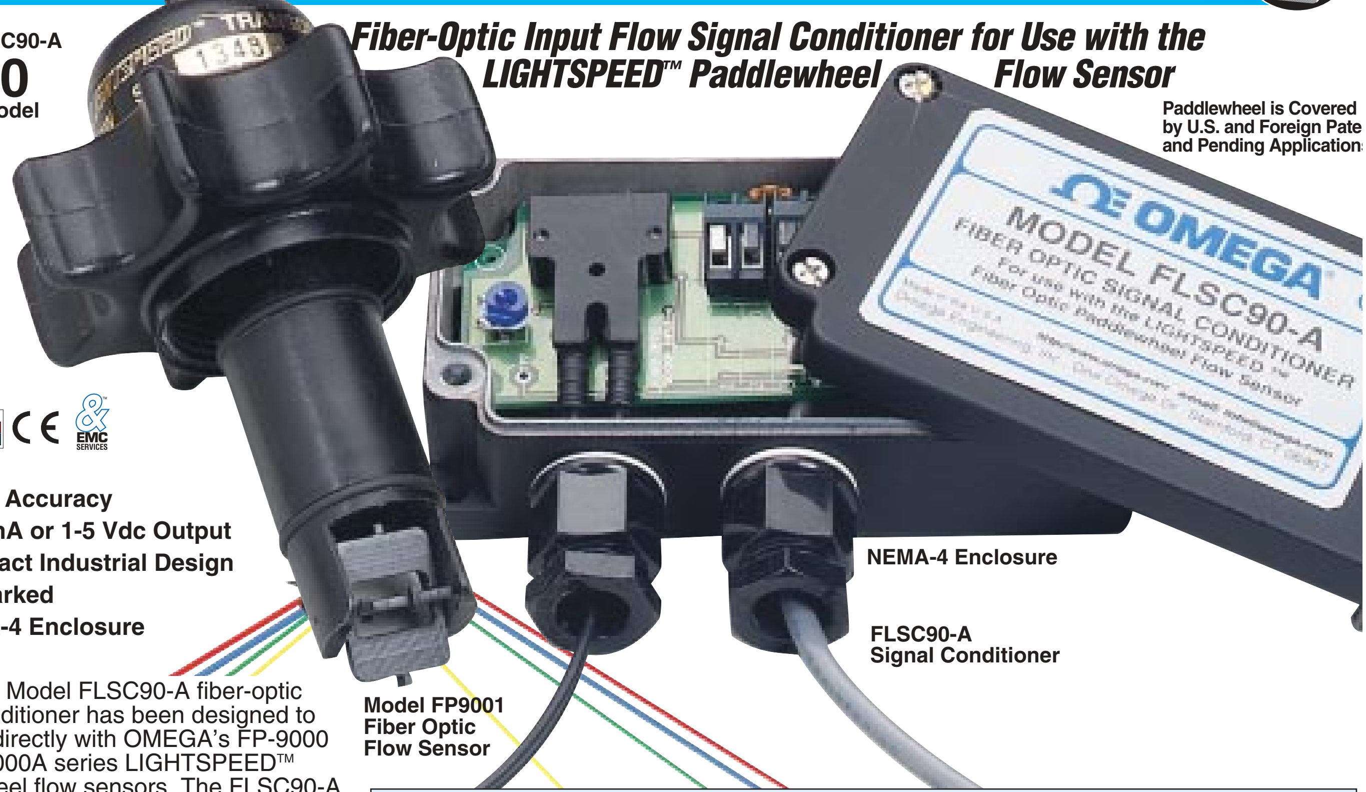
Qty	Description	Price
1	**FP9001,** sensor	**$225.00**
1	**FP9010,** fitting for 1" pipe	**90.00**
1	**FP9P-T,** DPF701, DPF700-A optical pulse interface	**155.00**
1	**TX4-100** 4-wire shielded cable, 100 ft	**28.50**
Total		**$498.50**

Viton® is a registered trademark of DuPont Dow Elastomers.

Model FLSC90-A
$390
Basic Model

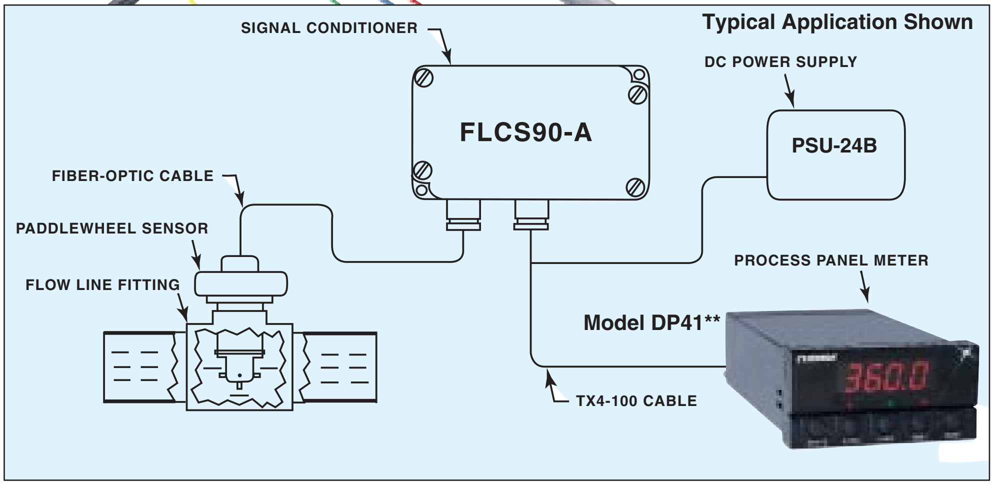
Fiber-Optic Input Flow Signal Conditioner for Use with the LIGHTSPEED™ Paddlewheel Flow Sensor

Paddlewheel is Covered by U.S. and Foreign Pate and Pending Application


NEMA-4 Enclosure
FLSC90-A
Signal Conditioner
Model FP9001
Fiber Optic
Flow Sensor
OMEGA
MODEL FLSC90-A
FIBER OPTIC SIGNAL CONDITIONER
For use with the LIGHTSPEED™
Fiber Optic Paddlewheel Flow Sensor

- **0.15% Accuracy**
- **4-20 mA or 1-5 Vdc Output**
- **Compact Industrial Design**
- **CE Marked**
- **NEMA-4 Enclosure**

OMEGA's Model FLSC90-A fiber-optic signal conditioner has been designed to interface directly with OMEGA's FP-9000 and FP-9000A series LIGHTSPEED™ paddlewheel flow sensors. The FLSC90-A provides a high intensity light source to the patented paddlewheel sensor through a semi-flexible duplex fiber-optic cable. Returning light pulses are measured and converted by the signal conditioner's electronics to a scalable analog output that is proportional to the flowrate. The ability of the paddlewheel flow sensor to operate in harsh and heavy electrical noise environments via the fiber optic cable link makes this system ideal for such applications. The industry standard 4-20 mA or 1-5 Vdc analog output can connect directly to many of OMEGA's process meters, controllers, dataloggers or data acquisition systems.


Typical Application Shown
SIGNAL CONDITIONER
FLCS90-A
DC POWER SUPPLY
PSU-24B
FIBER-OPTIC CABLE
PADDLEWHEEL SENSOR
FLOW LINE FITTING
PROCESS PANEL METER
Model DP41**
360.0
TX4-100 CABLE

**See Section M of the OMEGA Temperature Measurement Handbook® for additional meters

Specifications

Accuracy: ±0.15% of full scale
Repeatability: ±0.025
Input: Light pulses from fiber optic flow sensor (FP-9000 Series) See Note*
Min. Input Frequency: 65 Hz
Max. Input Frequency: 960 Hz
Ambient Operating Range:
0 to 49°C (32 to 120°F)
Power: 8-32 Vdc @ 40 mA
Outputs (3-Wire Configuration):
4-20 mA/1-5 Vdc (Field Selectable)
Maximum Loop Resistance:
(Vsupply-8V)/.020 A = Ohms
Dimensions: 114.5 L x 63.5 W x 35 mm H (4.51 x 2.50 x 1.38")
Storage Temperature:
-20 to 65°C (-4 to 149°F)
Enclosure/Class:
Die cast aluminum, NEMA-4
CE Approved: Yes
Weight: 238 g (8.3 oz)

To Order *(Specify Model Number)*

Model No.	Price	Description
FLSC90-A	**$390**	Fiber optic signal conditioner

Ordering Example: FLSC90-A, *fiber-optic signal conditioner, plus* ***TX4-100,*** *4-conductor power/output cable, plus* ***PSU-24B,*** *24 Vdc power supply, $390 + 28.50 + 40 =* ***$458.50***

Accessories

Model No.	Price	Description
TX4-100	**$28.50**	4-conductor power/output cable 30m (100')
PSU-24B	**40.00**	24 Vdc power supply
FLSC90-CA9*	**35.00**	Fiber-optic extension cable 2.7 m (9')

**Note: Only one extension cable can be used to extend the paddlewheel a maximum of 5.4m (18') from the FLSC90-A signal conditioner.*

NEW

Paddlewheel Flow Sensor/ Transmitter System

- Wide Chemical Compatibility
- 4-20 mA or 1-5 Vdc Field Selectable Output
- NEMA-4 Housing
- Compact Industrial Design Includes Both Paddlewheel Sensor and Process Transmitter in One Assembly

OMEGA's new FP7000 Series Paddlewheel sensor/transmitter flow system provides a low cost, factory calibrated, simple, and easy to install solution for applications requiring a remote long distance flow sensor located away from the main indicating meter or control instrumentation. When ordered with an OMEGA® installation fitting, the sensor/ transmitter is factory calibrated to match the flow rate of the fitting selected. Example: if you ordered a FP7002 sensor/transmitter with a FP7010 PVC fitting, the analog output of the transmitter will be factory calibrated to give 20ma output at the max flow rate of LPM (50 GPM) and 4ma out at the min flow rate of LPM (3 GPM). The analog output can be converted to 1-5 Vdc output in the field without recalibrating the system.

Preliminary Specifications

Accuracy: ±2% of full scale
Repeatability: ±1% of full scale
Power: 12 to 28 Vdc @ 50 mA maximum
FP7002 Wetted Materials:
  Sensor Body: Polypropylene
  O-Ring: Viton®
  Paddle: PVDF
  Locking Nut: PVC
FP7002A Wetted Materials:
  Sensor Body: Polypropylene
  O-Ring: Viton®
  Paddle: PVDF
  Locking Nut: Brass
Fluid Temperature/Pressure Range:
Do not exceed maximum ratings of your piping. Depending on the material of the fitting, the operating temperature/ pressure may be limited by your piping and not by the sensor. For all PVC tee fittings, do not exceed 150 psig @ 27°C (80°F), 100 psig @ 38°C (100°F), 60 psig @ 49°C (120°F) or 30 psig @ 60°C (140°F), due to the insert in the tee. FP7000 sensor: 0-26°C (32 to 80°F) up to 150 psig; max. pressure decreases 1.1 psig per each 0.56°C (1°F) above 27°C (80°F) for a max. temperature of 93°C (200°F) at 18 psig max.
Weight:
  FP7002: 0.75 lb (0.3 kg)
  FP7002A: 1 lb (0.4 kg)
Max Viscosity: 5 cps

Accessories

Model No.	Price	Description
PSU-93	$40.00	24 Vdc power supply
TX4-100	28.50	4-conductor shielded cable, 30m (100')

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Model FP7002
$365
Basic Model

Coming Soon!

Model FP7002 Paddlewheel Flow Sensor/Transmitter Mounted in the FP7007 PVC Fitting

Shown larger than actual size

To Order *(Specify Model Number)*

Model No.	Price	Description
FP7002	$365	Paddlewheel flow sensor/transmitter
FP7002A	385	Paddlewheel flow sensor/transmitter for use with galvanized iron fittings (includes brass locking nut)

*Comes with complete operator's manual. **Ordering Example: FP7002,** plus **FP7007**, sensor/ transmitter and fitting factory calibrated as a system, $365 + 77 = **$442**.*

Required Installation Fittings

▭ *MOST POPULAR MODELS HIGHLIGHTED!*

PVC, Sched. 40*			Galvanized Iron Tee			
Model No.	Price	Lay Length mm (in)	Model No.	Price	Pipe Size NPT	Range (GPM)
FP7007	$77	0.53 (21)	FP7007-GI	$125	¾"	2-30
FP7010	77	0.66 (26)	FP7010-GI	110	1"	3-50
FP7012	80	0.79 (31.3)	FP7012-GI	110	1¼"	5-90
FP7015	90	0.95 (37.5)	FP7015-GI	100	1½"	7-125
FP7020	100	1.27 (50)	FP7020-GI	105	2"	11-205
FP7025	105	1.59 (62.5)	FP7025-GI	150	2½"	15-285
FP7030	125	1.91 (75)	FP7030-GI	170	3"	25-460

**All PVC fittings include 12" of PVC pipe on the flow inlet and 3½" of PVC pipe on the flow outle*

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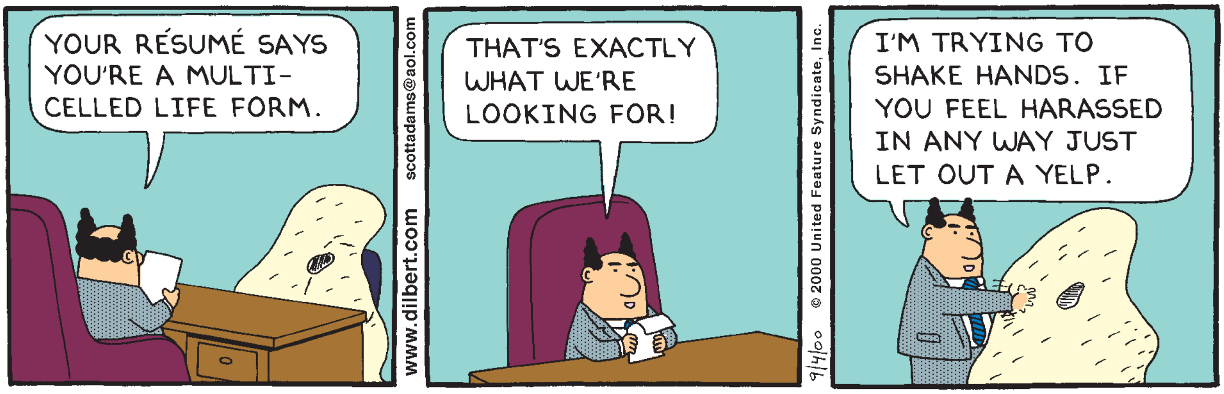
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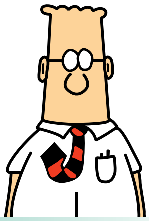

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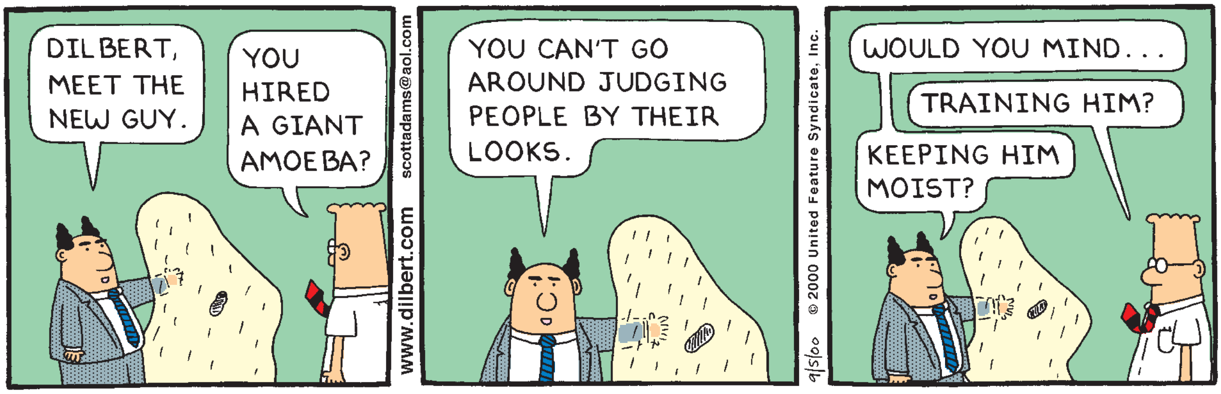
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WOULD YOU MIND...
TRAINING HIM?
KEEPING HIM MOIST?

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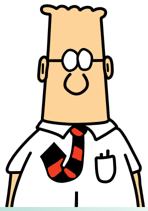

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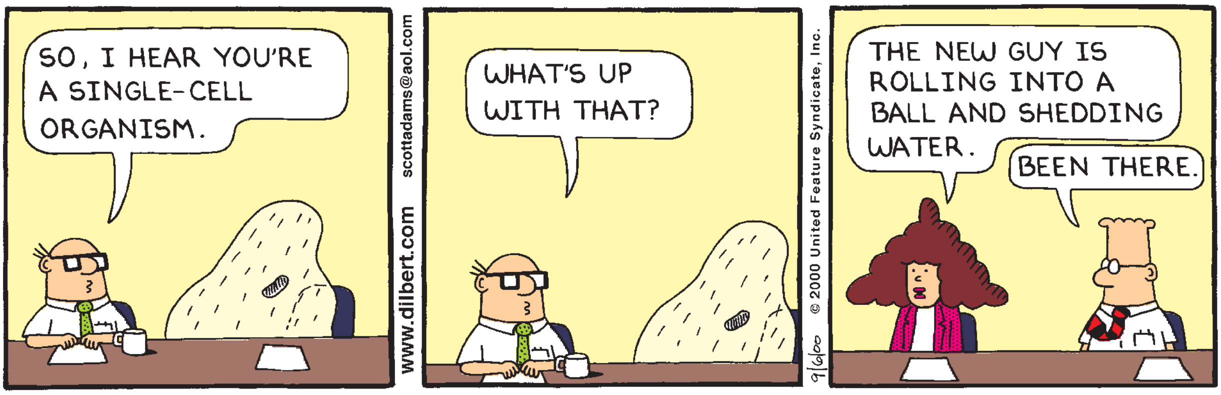
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BEEN THERE.

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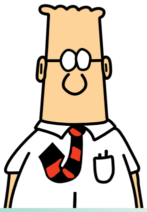

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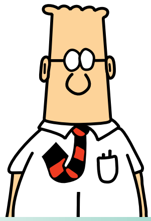

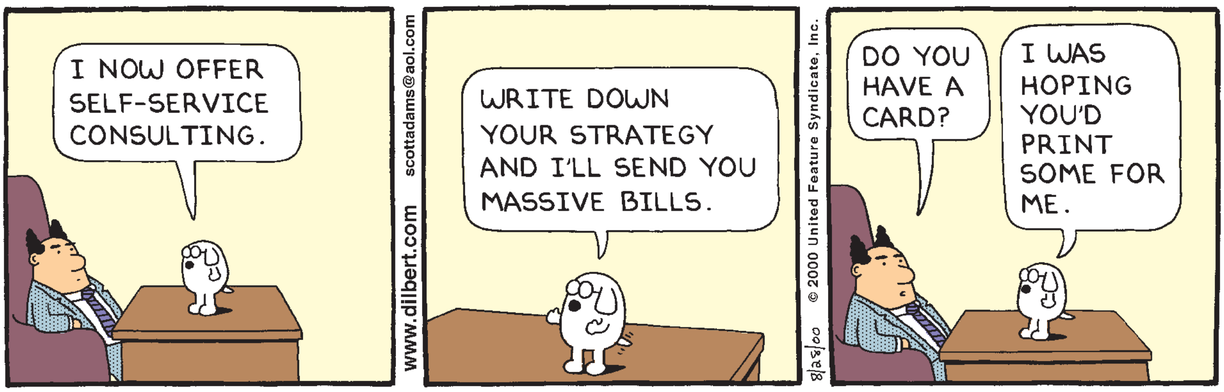
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WRITE DOWN YOUR STRATEGY AND I'LL SEND YOU MASSIVE BILLS.
© 2000 United Feature Syndicate, Inc.
8/28/00
DO YOU HAVE A CARD?
I WAS HOPING YOU'D PRINT SOME FOR ME.

8/28/00 DILBERT © United Feature Syndicate, Inc.

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

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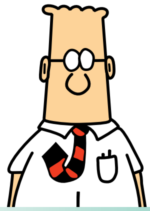
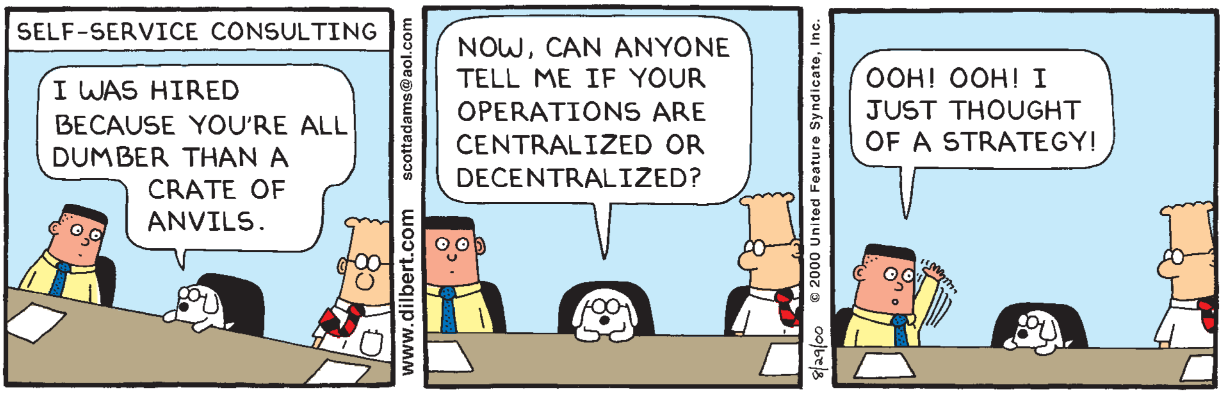
11

Collection Series
#11-001029




SELF-SERVICE CONSULTING
I WAS HIRED BECAUSE YOU'RE ALL DUMBER THAN A CRATE OF ANVILS.
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scottadams@aol.com
NOW, CAN ANYONE TELL ME IF YOUR OPERATIONS ARE CENTRALIZED OR DECENTRALIZED?
© 2000 United Feature Syndicate, Inc.
8/29/00
OOH! OOH! I JUST THOUGHT OF A STRATEGY!

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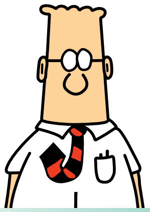
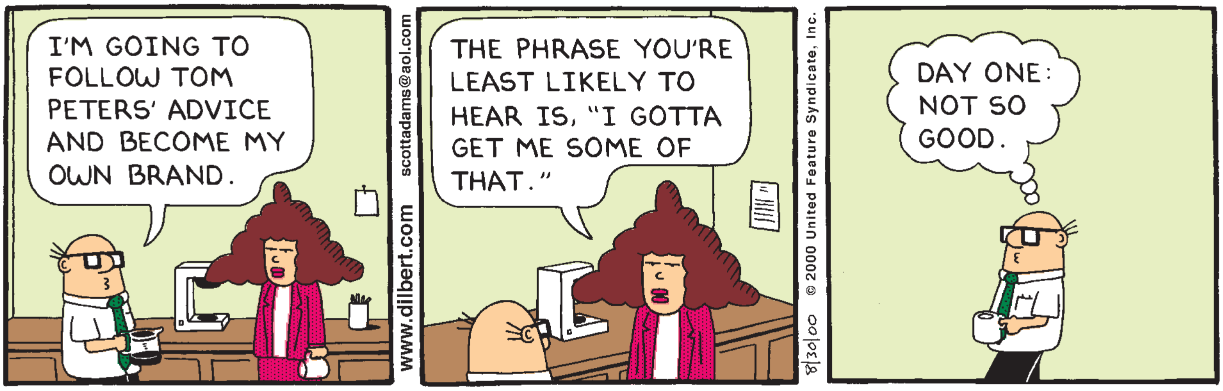
11

Collection Series
#11-001030




I'M GOING TO FOLLOW TOM PETERS' ADVICE AND BECOME MY OWN BRAND.
www.dilbert.com
scottadams@aol.com
THE PHRASE YOU'RE LEAST LIKELY TO HEAR IS, "I GOTTA GET ME SOME OF THAT."
© 2000 United Feature Syndicate, Inc.
8/30/00
DAY ONE: NOT SO GOOD.

8/30/00 DILBERT © United Feature Syndicate, Inc.

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

omega.com® ΩOMEGA®

HHM110 Series Test Meters–Versatility in the Palm of Your Hand!

OMEGAETTE™ — Moderately Priced Instruments. Ideal for Education, Training and Demonstration Programs.

HHM110
$66
Pen Type Multimeter

For accurate measurement in a compact design, the HHM110 Series is a low-cost solution to your test and measurement needs. Model HHM110, the stand-alone DMM, is a full function, digital multimeter that fits neatly into your pocket. You may add HHM110-TC, a thermocouple module, that will convert any DMM into a thermometer. The HHM110-RH module converts any DMM into a relative humidity meter, and the HHM110-CP converts any DMM into an AC clamp meter. Versatility in the palm of your hand! (Note: All modules will work with any standard DMM).

RANGE
HOLD
13.3

- **3200 Count Digital Resolution**
- **65 Segment Analog Bar Graph**
- **Autoranging and Manual Selection**
- **0.7% Basic DC Volts Accuracy**
- **1.7% Basic AC Volts Accuracy**
- **1.0% Basic Ohms Accuracy**
- **600V Protection in Every Range**
- **Fast Continuity Beeper**
- **Data Hold Function**
- **Auto Power Off**
- **Conforms to IEC1010 & UL3111 Specifications**
- **Standard AAA batteries, Long Battery Life**
- **Featured with Standard ¾" Pitch Input Jacks**
- **Rugged Construction with Fire-Retardant, High-Impact Plastic Case**
- **Test Leads and Soft Carrying Case Included**

ON
RELATIVE HUMIDITY TRANSDUCER
ON
OFF
COM
+V

HHM110-RH
$60
RH Relative Humidity Module

- **Converts any DMM into a Relative Humidity Meter 10%RH to 95%RH**
- **Flashing Light Operating Indication**
- **Battery Voltage Check**
- **Polymer Type Sensor Built-In**
- **Standard 9V Battery**

THERMOCOUPLE MODULE
ON

HHM110-TC
$33
Thermocouple Module

- **Converts Any DMM into a Thermometer**
- **-50°C to 1000°C (-58°F to 1830°F) Range**
- **°C/°F Switchable**
- **Flashing Light Operating Indication**
- **Battery Voltage Check**
- **K Type Bead Thermocouple Sensor Included (-40°C to 204°C)**
- **Standard 9V Battery**

HHM110-CP
$33
Ac Clamp-On Module

- **AC 300A Capability**
- **1.9% Basic Accuracy**
- **Non-intrusive Transducing**
- **Up to 29 mm Dia. Conductor**
- **Ergonomically Designed Jaw and Trigger**
- **Hand Guard Designed**

All models shown slightly smaller than actual size

Specifications All at 23°C

HHM110 Pen-Type Multimeter

DC Voltage:

Range: 320mV to 600V

Accuracy: ±(0.7%+2 digit)

Input Resistance: 10MΩ

Overload Protection: 600V

AC Voltage:

Range: 3.2 to 600V

Accuracy: ±(1.7%+5 digit) at 40Hz~500Hz

Overload Protection: 600V rms

Resistance:

Range: 320Ω to 30MΩ

Accuracy: 1.2%+4 digit at 320Ω; 1.0%+2d at 3.2kΩ~320kΩ; 1.5%+3d at 3.2MΩ; 3.0%+5d at 30MΩ

Overload Protection: 600V rms

Continuity Beeper: <20Ω, 2kHz tone buzzer

Diode Test: Open circuit voltage 3.3V max.

Measuring Rate: 2 (sample/sec) digital, 12 (sample/sec) analog

Temperature Coefficient: 0.15x (Spec. Accuracy)/°C<18°C or >28°C

Operating Temperature: 0°C ~ 50°C,≤80% RH.

Storage Temperature: -20°C ~ 60°C

Relative Humidity: 0 ~ 80% (0°C ~ 35°C); 0 ~ 60% (35°C ~ 50°C)

Safety: Conforms to IEC 1010 and UL 3111 specifications

Power Requirements: AAA size 1.5V x 2

Battery Life: 800 hours (alkaline)

Size: 145 L x 42 mm W x 24 mm D (5.7" x 1.7" x .95"), without probes

Weight: 120 grams (4.2 oz), without probes

Included with Instrument: Test leads, battery (installed), belt pouch and manual

HHM110-RH Relative Humidity Transmitter

Output to Meter: 1mVdc per 1%RH

Measurement Range: 10%RH ~ 95%RH

Accuracy:

±7%, 10%RH to 20%RH
±5%, 20%RH to 35%RH
±3%, 35%RH to 75%RH
±5%, 75%RH to 90%RH
±7%, 90%RH to 95%RH

Operating Temperature: 5°C ~ 45°C, (10%RH ~ 95%RH)

Storage Temperature: -20°C ~ 60°C, (0%RH ~ 50%RH)

Temperature Coefficient: 0.2x (Spec. Accuracy) per °C, <18°C or >28°C

Relative Humidity: 10% ~ 95%

Power Requirements: 9V battery

Battery Life: Alkaline, 300 hours

Size: 131 L x 52 W x 30 mm D (5.2" x 2" x 1.2"), without probes

HHM110-CP Current Transducer

Current Range: 0.1A to 300A a.c. RMS

Output Voltage: 1mV a.c. per 0.1 Amp a.c.

Working Voltage: 600V Cat. II per IEC 1010

Accuracy: ±(1.9%+0.5A), 50Hz to 60Hz; ±(3.9%+1A), 40Hz to 400Hz

Operating Temperature: 0°C ~ 50°C,≤80% RH

Storage Temperature: -20°C ~ 60°C

Safety: Designed to IEC 1010 and UL3111 specifications

Jaw Opening: Ø30mm (1.18") max.

Conductor Size: Up to 29 mm diameter

Size: 102 L x 72 mm W x 36 mm D (4" x 2.8" x 1.4")

Weight: 150 g (5.3 oz)

HHM110-TC Thermocouple Module

Temperature Scale: °C or °F user-selectable

Input: Single K-type thermometer

Output to Meter: 1mVdc per °C or °F

Measurement Range:

-50°C ~ 1000°F
-58°F ~ 1830°F

Accuracy:

±(0.5%+2°C), -19°C to 350°C
±(0.5%+4°F), -3°F to 662°F,
±(2.0%+2°C), 351°C to 500°C
±(2.0%+4°F), 663°F to 932°F,
±(2.9%+2°C), 501°C to 1000°C
±(2.9%+4°F), 933°F to 1832°F,
±(2.0%+2°C), -50°C to -20°C
±(2.0%+4°F), -58°F to -4°F

HHM-110-SC, Soft Carrying Case.

Operating Temperature: 0°C ~ 50°C,≤80%RH

Storage Temperature: -20°C ~ 60°C

Temperature Coefficient: 0.15x (Spec. Accuracy) per °C, <18°C or >28°C

Relative Humidity: 0% ~ 80%

Power Requirements: Standard 9V battery

Battery Life: Alkaline, 500 hours

Size: 122 L x 46 mm W x 30 mm D (4.8" x 1.8" x 1.2")

Accessories

Model No.	Price	Description
HHM110-SC	$15	Soft carrying case (can hold HHM110 and two modules)

🟩 ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model No.)*

Model No.	Price	Description
HHM110	$66	Pen-type DMM
HHM110-TC	33	Type K T/C module
HHM110-RH	60	RH module
HHM110-CP	33	AC clamp-on module

Base unit HHM110 includes batteries, set of test leads, belt pouch and manual. ***Ordering Example: HHM110*** *pen-type DMM, and* ***HHM110-TC,*** *Type K T/C Module, $66 + 33 =* ***$99.***

NEW

Handheld Calibrators

- Multifunction Calibrator Model CL123
  K, J, E, T in °C, °F, mA, mV, V, Hz,
- Thermocouple Calibrator Model CL125
  K, J, E, T, R, S, N, L, U, B, C in °C, °F or K
- 4-20 mA Calibrator Model CL100MA
  (4-20 mA, 0-20 mA, 0-24 mA)
- Easy Push Button Programming
- Ramp, % Input, Easy Step, ΔT Function

Model CL100MA
$500
Complete

100 %
mA
CL100MA
ON/OFF
SHIFT
mA LOOP
BRATOR
78.26 INT REF °F
K
CL125
- TC +
ON/OFF
SHIFT
MOCOUPLE
RATOR
4-20 mA
OPR
20.000 mA
OMEGA
CL123
- TC +
ON/OFF
SHIFT
1 4-20mA
2 0-20mA
3 0-24mA
4 mV 1V 12V
5 °C°F
6 KJET
7
8 %
9
%
0
ENTER
V
mV
mA
Hz
°C °F
MULTIFUNCTION
CALIBRATOR

Model CL125
$500
Complete

Carrying case included
with all models

Model CL123
$600
Complete

20.000
OMEGA
CL123
MULTIFUNCTION CALIBRATOR

CL123

Features

4-20 mA (1KΩ load, 24 V loop supply)
0-100.00 mV, 0-1.0000 V, 0-12.000 V
K,J,E,T Thermocouples (°C & °F)
Frequency 1-62500 Hz
0-20 mA, 0-24 mA Selectable
0-100% Input (mA, mV, V)
Beeper Warning when Output is Open (mA)

Basic Accuracy: 0.025%

0-24 mA	±0.025%	±0.003mA
0-100mV	±0.05%	±0.03mV
0-1V	±0.05%	±0.0003V
0-10V	±0.05%	±0.003V

Thermocouples:
K: -200 to 1370, ±0.9°C
J: -100 to 760, ±0.8°C
E: -100 to 700, ±0.7°C
T: -200 to 400, ±0.8°C

Frequency: 1 to 125Hz, ±0.04Hz
126 to 62,500Hz, ±0.01% ±0.04Hz
(604 Available Frequencies)

78.26
2000.0
OMEGA
CL125
THERMOCOUPLE CALIBRATOR

CL125

Features

11 Types of Thermocouples
°C, °F, K Temperature Scales
Internal/External Temperature Reference
Auto-Ramp and ΔT Function
Easy Keypad Programming

Basic Accuracy: 0.3°C/0.6°F

Resolution: 0.1°C/0.2°F (K,J,E,T,N,U,L)
0.2°C/0.4°F (R,S,B,C)

Range:
K: -200 to 1370°C
J: -200 to 1200°C
E: -200 to 1000°C
T: -200 to 400°C
C: 0 to 2300°C
L: -200 to 900°C
R: 0 to 1767°C
S: 0 to 1767°C
B: 600 to 1800°C
N: -200 to 1300°C
U: -200 to 600°C

100
20.000
OMEGA
CL100MA
4-20mA LOOP CALIBRATOR

CL100MA

Features

4-20 mA with 1 μA resolution
Auto-Ramp and Easy Step Functions
1-100% Input
0-20 mA, 0-24 mA Selectable
Easy Keypad Programming

Range	Resolution	Accuracy
0-4 mA	0.001mA	0.025% + 10μA
4-20 mA	0.001mA	0.025% + 5μA
20-24 mA	0.001mA	0.025% + 5μA

General Specifications:
Battery: 9V Alkaline (included)
Displays: 4 and 5 digits
Operating Temperature: 0 to 50°C (32 to 122°F)
Storage Temperature: -20 to 60°C (-4 to 140°F)
Operating/Storage Humidity: < 85% relative
Dimensions: 88 x 168 x 26 mm (3.5 x 6.6 x 1")
Weight: 330 g (11.6 oz.)

CL125 Thermocouple Specifications

Type	Range		Accuracy	
	°C	°F	Internal Temperature Reference	External Temperature Reference
K	-200 ~ -100	-328 ~ -148	±0.5 °C / ±0.9 °F	±0.3 °C / ±0.5 °F
	-100 -25	-148 -13	0.4 0.7	0.2 0.3
	-25 120	-13 248	0.4 0.7	0.2 0.3
	120 1000	248 1832	0.4 0.8	0.2 0.4
	1000 1370	1832 2498	0.5 1.0	0.3 0.6
J	-200 ~ -100	-328 ~ -148	±0.4 °C / ±0.8 °F	±0.2 °C / ±0.4 °F
	-100 -30	-148 -22	0.4 0.7	0.2 0.3
	-30 150	-22 302	0.4 0.7	0.2 0.3
	150 760	302 1400	0.4 0.7	0.2 0.3
	760 1050	1400 1922	0.4 0.8	0.2 0.4
E	-150 ~ -100	-238 ~ -148	±0.6 °C / ±1.1 °F	±0.4 °C / ±0.7 °F
	-100 -25	-148 -13	0.4 0.7	0.2 0.3
	-25 350	-13 662	0.4 0.7	0.2 0.3
	350 650	662 1202	0.4 0.7	0.2 0.3
	650 800	1202 1472	0.4 0.7	0.2 0.3
T	-200 ~ -150	-328 ~ -238	±0.7 °C / ±1.3 °F	±0.5 °C / ±0.9 °F
	-150 0	-238 32	0.4 0.8	0.2 0.4
	0 120	32 248	0.4 0.7	0.2 0.3
	120 400	248 752	0.4 0.7	0.2 0.3
R	0 ~ 250	32 ~ 482	±0.7 °C / ±1.3 °F	±0.5 °C / ±0.9 °F
	250 400	482 752	0.5 1.0	0.3 0.6
	400 1000	752 1832	0.5 0.9	0.3 0.5
	1000 1760	1832 3200	0.5 1.0	0.3 0.6
S	0 ~ 250	32 ~ 482	±0.7 °C / ±1.3 °F	±0.5 °C / ±0.9 °F
	250 1000	482 1832	0.5 1.0	0.3 0.6
	1000 1400	1832 2552	0.5 1.0	0.3 0.6
	1400 1760	2552 3200	0.6 1.1	0.4 0.7
N	-200 ~ -100	-328 ~ -148	±0.5 °C / ±1.0 °F	±0.3 °C / ±0.6 °F
	-100 -25	-148 -13	0.4 0.8	0.2 0.4
	-25 120	-13 248	0.4 0.7	0.2 0.3
	120 410	248 770	0.4 0.7	0.2 0.3
	410 1300	770 2372	0.5 0.8	0.3 0.4
L	-200 ~ -100	-328 ~ -148	±0.5 °C / ±0.9 °F	±0.3 °C / ±0.5 °F
	-100 900	-148 1652	0.4 0.7	0.2 0.3
U	-200 ~ 0	-328 ~ 32	±0.4 °C / ±0.7 °F	±0.2 °C / ±0.3 °F
	0 600	32 1112	0.4 0.7	0.2 0.3
B	600 ~ 800	1112 ~ 1472	±0.7 °C / ±1.2 °F	±0.5 °C / ±0.8 °F
	800 1000	1472 1832	0.6 1.1	0.4 0.7
	1000 1550	1832 2822	0.5 1.0	0.3 0.6
	1550 1820	2822 3308	0.5 0.9	0.3 0.5
C	0 ~ 150	32 ~ 302	±0.5 °C / ±0.9 °F	±0.3 °C / ±0.5 °F
	150 650	302 1202	0.4 0.8	0.2 0.4
	650 1000	1202 1832	0.5 0.9	0.3 0.5
	1000 1800	1832 3272	0.6 1.1	0.4 0.7
	1800 2310	3272 4190	0.9 1.6	0.7 1.2

🟩 ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model No.)*

Model No.	Price	Description
CL123	**$600**	Multifunction calibrator
CL125	**500**	Thermocouple calibrator
CL100MA	**500**	mA loop calibrator

Each unit supplied with rugged carrying case, complete operator's manual, 9 V battery, external battery pak (without batteries) holds four AA batteries, type K thermocouple (models CL123, CL125), test leads and alligator clip (models CL123 & CL100MA)
Ordering Example: CL125,** thermocouple calibrator, **$500.

FP90 Series Signal Conditioners

FP90 Series
$350
Basic Unit

- **Permanent and Resettable Totalizers**
- **Scalable Outputs**
- **Relay Options**
- **Mounting Versatility**
- **Simulate Function**
- **2 x 16 Character Dot Matrix LCD**
- **Chemical Resistant Enclosure and Self-Healing Window**
- **Large Pushbuttons**
- **Clearly Marked Terminal Labels**

Application

- **Flow Control and Monitoring**
- **Filtration or Softener Regeneration**
- **Effluent Totalization**
- **Pump Protection**
- **Feed Pump Pulsing**
- **Ratio Control**
- **Water Distribution**
- **Leak Detection**

Flow
6.25 GPM
Total: 12345678>
ENTER

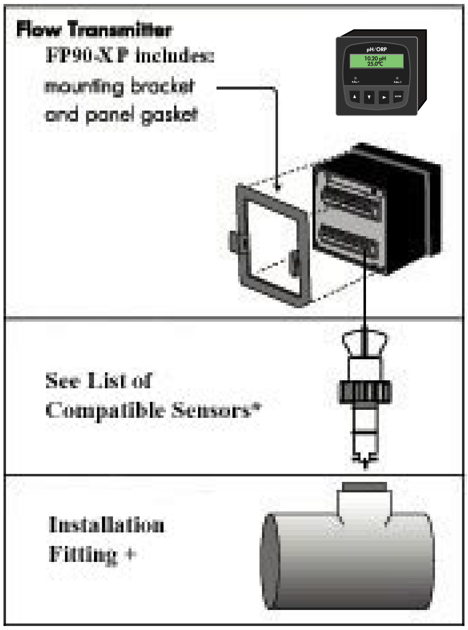
FP90 Flow Transmitter, actual size

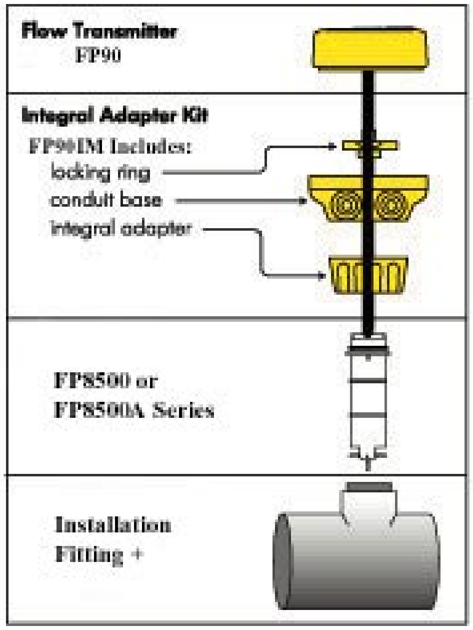
The FP90 Series Flow Transmitter is an advanced solution that converts the signal from many flow sensors into a 4 to 20 mA signal for long distance transmission. Configuration flexibility is maximized with two optional relays for process control, two packaging options for integral/pipe mount or panel installation, and scalability for virtually any flow range or engineering unit. State-of-the-art electronic design ensures long-term reliability, signal stability, and simple user setup and operation. The FP90 can be integrally mounted to FP8500 series paddlewheel sensors utilizing an mounting kit. The FP90 can be remotely used with the OMEGA® FP-5100, FP-5200, FP-5300, FP-5060, FP-2541, FP-5600, FP-3-1500 or FP-6000 flow sensors and a FP90UM mounting kit. The FP90-XP units are designed to be panel mounted. The three front keys control all programming and scaling of the FP90-there are not pots to tweak or internal adjustments to make. Simply enter the K-factor and the FP90 displays rate with field-adjustable decimal point, mA output value, total (field selectable for resettable or non-resettable operation) and the date of the last reprogramming.

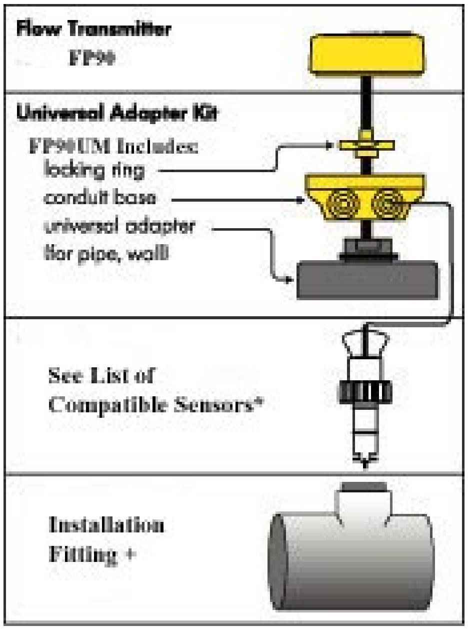
The 8-digit alphanumeric LCD shows every program step in clear language, allowing display in any engineering units and timebase in seconds, minutes, hours or days. A special pushbutton sequence permits entry into the programming, thus providing security against unauthorized reprogramming.

Specifications

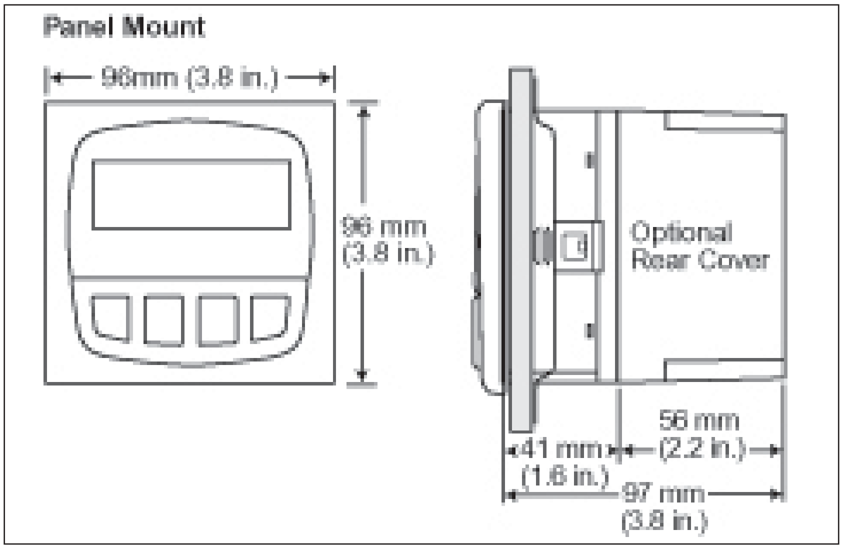
General
Compatibility:
Flow Sensors with frequency outputs
Accuracy: ±0.5 Hz
Enclosure
Rating: NEMA 4X/IP65 front
Case: PBT
Window: Polyurethane coated polycarbonate
Keypad: Sealed 4-key silicone rubber
Weight: Approx. 325g (12 oz.)
Display: Alphanumeric 2 x 16 LCD
Update rate: 1 second
Contrast: User selected, 5 levels
Environmental
Operating temperature:
-10 to 70°C (14 to 158°F)
Storage temperature:
-15 to 80°C (5 to 176°F)
Relative humidity:
0 to 95%, non-condensing
Standards and Approvals
CSA, CE, UL listed
Manufactured under ISO 9001
Electrical
Sensor Input:
Range: 0.5 to 1500 Hz
Sensor power:
2-wire: 1.5 mA @ 5 VDC ± 1%
3 or 4 wire:
20 mA @ 5 VDC ± 1% Optically isolated from current loop Short circuit protected
Current output: 4 to 20 mA, isolated, fully adjustable and reversible
Power: 12 to 24 VDC ±10%, regulated
Max loop impedance:
50Ω max. @ 12 V,
325Ω max. @ 18 V,
600Ω max. @ 24 V

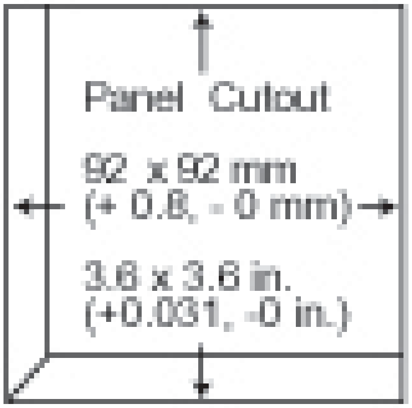

Flow Transmitter
FP90-XP includes:
mounting bracket
and panel gasket
See List of
Compatible Sensors*
Installation
Fitting +


Flow Transmitter
FP90
Integral Adapter Kit
FP90IM Includes:
locking ring
conduit base
integral adapter
FP8500 or
FP8500A Series
Installation
Fitting +

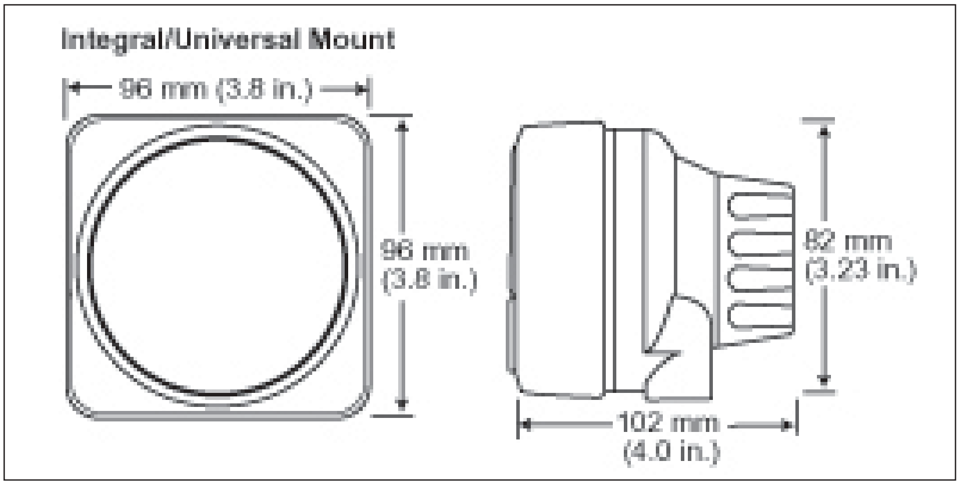

Flow Transmitter
FP90
Universal Adapter Kit
FP90UM Includes:
locking ring
conduit base
universal adapter
(for pipe, wall)
See List of
Compatible Sensors*
Installation
Fitting +

**The panel mount and universal mount units are compatible with the following sensors: FP-5060, FP-5100, FP-5200, FP-5300, FP-2540, FP-5600, FP-3-1500 and FP -6000.*
+Fittings purchased separately. See FP Series fittings.


Panel Mount
98mm (3.8 in.)
96 mm
(3.8 in.)
Optional
Rear Cover
41 mm
(1.6 in.)
56 mm
(2.2 in.)
97 mm
(3.8 in.)


Panel Cutout
92 x 92 mm
(+ 0.8, - 0 mm)
3.6 x 3.6 in.
(+0.031, -0 in.)

Update rate:
100 ms
Accuracy:
±0.03 mA
Relay output:
Mechanical SPDT contacts:
Hi, Lo, Pulse, Off
Maximum voltage rating:
5 A @ 30 VDC,
5 A @ 250 VAC resistive load
Hysteresis:
User adjustable.
Max 300 pulses/min.
Open-collector output:
Hi, Lo, Pulse, Off Open-collector, optically isolated, 50 mA max, sink, 30 VDC max. pull-up voltage. Max 300 pulses/min.


Integral/Universal Mount
96 mm (3.8 in.)
96 mm
(3.8 in.)
82 mm
(3.23 in.)
102 mm
(4.0 in.)

Flow
6.25 GPM
Total: 12345678>
Relay 1
Relay 2
ENTER

FP90-2P Series
Flow Transmitter

FP8500 Series
Flow Sensor

▭ *MOST POPULAR MODELS HIGHLIGHTED!*

Accessories

Model No.	Price	Description
FP90UM	**$35**	Universal mounting kit for remote wall or pipe mount
FP90-4X	**38**	NEMA 4X cover (panel mount)
FP90IM	**35**	Integral mounting kit for mounting on top of FP85XX sensors
FP90RC	**15**	RC filter (for relay use)

Standard Sensor (1 fps minimum) for integral mounting (requires FP90IM integral mounting hardware and OMEGA fitting)

Model No.	Price	Description
FP8501	**$216**	½" to 4" pipe, polypropylene body/titanium shaft
FP8502	**232**	5" to 8" pipe, polypropylene body/titanium shaft
FP8503	**427**	½" to 4" pipe, PVDF body/Hastelloy C shaft
FP8504	**448**	½" to 4" pipe, all PVDF material

Low flow sensors (.3 fps minimum) for integral mounting (requires FP90IM integral mounting hardware and OMEGA fitting) Accuracy=±0.1 fps

Model No.	Price	Housing Material	Shaft Material	Rotor	Pipe Size
FP8501A	**$216**	Polypropylene	Titanium	Black PVDF	0.5” to 4”
FP8502A	**232**	Polypropylene	Titanium	Black PVDF	5” to 8”
FP8503A	**427**	Natural PVDF	Hastelloy C	Natural PVDF	0.5” to 4”
FP8504A	**448**	Natural PVDF	Natural PVDF	Natural PVDF	0.5” to 4”

To Order *(Specify Model Number)*

Model No.	Price	Description
FP90-1	**$350**	Field mount transmitter with 4-20mA and open collector outputs
FP90-2	**415**	Field mount transmitter with 4-20mA output and 2 relays
FP90-3	**595**	Field mount for 1 or 2 inputs with 4-20mA output for input 1, 2 or differential
FP90-1P	**350**	Panel mount transmitter with 4-20mA and open collector outputs
FP90-2P	**415**	Panel mount transmitter with 4-20mA output and 2 relays
FP90-3P	**595**	Panel mount transmitter for 1 or 2 inputs with 4-20mA output for input 1, 2 or differential

** Field mount transmitters require FP90IM internal mounting kit for FP8500 or FP8500A sensor or FP90UM for all other compatible sensors.*

Ordering Example: FP90-1** flow transmitter fieldmount ($350), **FP90IM** integral mounting kit ($35), **FP8501A** paddlewheel sensor ($216), **FP-5310** installation fitting for 1" PVC pipe ($155). $350 + 35 + 216 + 155 = **$756

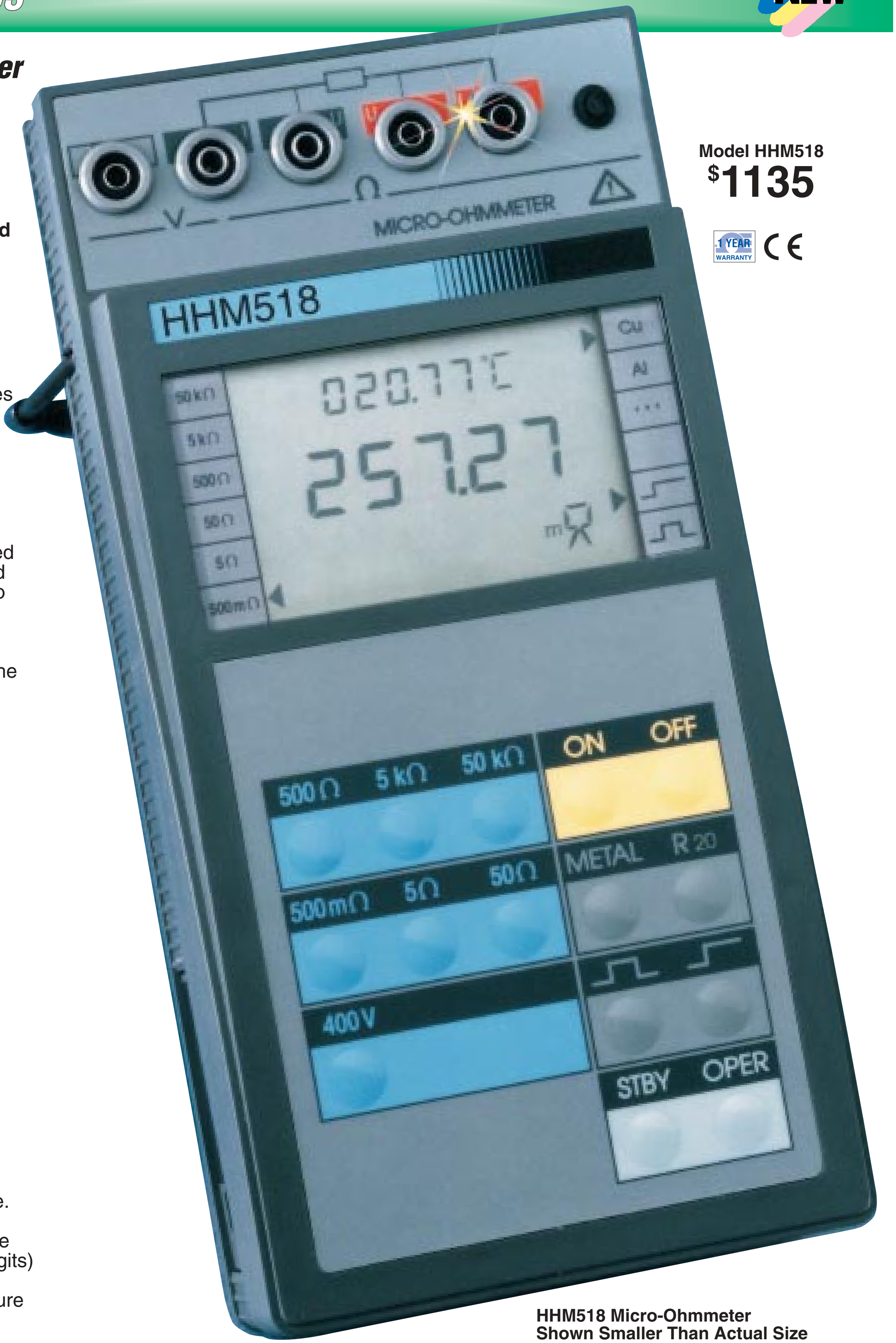
NEW®

Precision Micro-Ohmmeter

- **Measurement On Site**
- **Easy to Use**
- **High Resolution: 10 μΩ**
- **Resistance and Voltage Measurements**
- **Temperature Compensation and Measurement**

Model HHM518
$1135

1 YEAR WARRANTY CE



HHM518 Micro-Ohmmeter
Shown Smaller Than Actual Size

The HHM518 micro-ohmmeter is used for four-wire resistance measurement from low values (resolution 10 μΩ) up to 50 kΩ, with an excellent accuracy. It includes thermal emf compensation and temperature compensation. It can also measure dc and ac voltages and ambient temperature.
The HHM518 has a compact, rugged, heavy duty housing with input protected up to 250 V. It is battery powered for use on site. Fitted with a removable stand and powered by an external ac charger, it can also be used on the bench.

Applications

On-site, in workshop or laboratory, the main applications are listed below:

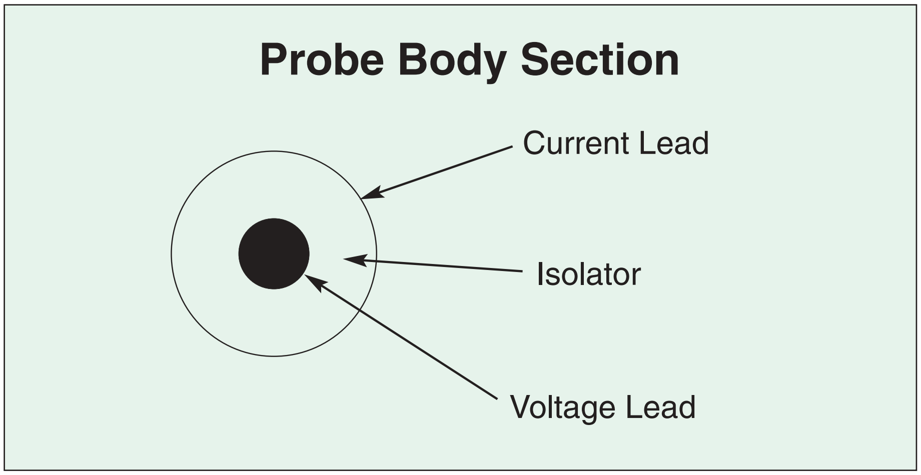
- **Cable Resistance and Resistivity Measurements**
- **Inductive Resistance Measurements (Motors, Transformers)**
- **Contact Resistance Measurements (Connectors, Switches, Relays, Quality of Joints)**
- **Metallization and Earth Bonding Measurements**
- **Testing and Measurement of Electrical Components: Resistors, Fuses, Thermistors, Heating Elements, PCB Trade**
- **Surface State, Resistance of Mechanical Bonds and Materials Testing**

Specifications

Display of measurement values (with units) and ambient temperature. Indication of measurement range, type of current, possible temperature compensation. 50,000 counts (4½ digits) LCD. 13 mm high (0.5")
Range, current waveform, temperature compensation and trigger selected by keyboard
Four-Wire Measurements with automatic compensation for thermal electromotive forces (emfs) and automatic ambient temperature compensation

Measurement Current: User can choose two waveforms for current: continuous (dc) for inductive resistance measurements (permanent current); or pulsed in other cases: current shutoff between measurements (advantage: low self-heating of resistance in test and low power consumption)
Measurement Time: 0.5 s (dc), 1 s (pulsed)
Input Voltage Protection:
250 V (430 V for voltage measurement). Electrical protection against breakoff currents when measuring inductive resistance
Calibration: No need to open the instrument for recalibration; just connect a standard resistance and enter its value through the keypad
Operating Conditions:
Nominal Operating Temperature and Humidity: 0 to 50°C, 20 to 75% RH
Maximum Operating Temperature and Humidity: -10 to 55°C, 10 to 80% RH
Maximum Storage and Transport Temperature: -30 to 60°C
Protection according to IP41
Power Supply:
Internal Battery pack Ni-Cd: 1.7 AH
Battery life (typical use) >10 h
External ac charger provided allows either battery charging or permanent use on ac power, 100-240 Vac, 50/60 Hz
Connections: Sockets for 4 mm test plugs
Housing: Rugged ABS case for site or bench use
Dimensions: 120 x 65 x 245 mm (4.7 x 2.6 x 9.6")
Weight: 1.1kg (2.4 lb)

Resistance Measurement
From very low values (resolution 10 μΩ) up to 50 kΩ with: Measurement and automatic compensation for thermal electromotive forces (emfs);
Measurement and compensation (user choice) of ambient temperature. With temperature compensation, the HHM518 displays the theoretical value at 20°C of a copper or aluminum resistance (other metals on request). Ambient temperature is measured with a sensor built in to the instrument and displayed.
Kelvin Test Lead Set HHM518-TL1
A pair of security measurement leads, each with a Kelvin clip, 1.20m of wire and two 4 mm plugs. The Kelvin clip can be used for four-wire measurement because there is a perfect galvanic isolation between the current input and the voltage connector.
Gold-plated contacts.
Maximum opening: 1.2 cm
Maximum current: 10 A
Kelvin Test Probe HHM518-TL2:
One measurement lead with a dual probe (concentric).
Length of rod: 8 mm.
Diameter of rod: 8 mm
Length of wire: 3 m
Equipped of two 4 mm security banana plugs
Maximum current: 10 A



Range	Resolution	Measurement Current	Voltage Drop	Accuracy*
500 mΩ	10 μΩ	100 mA	50 mV	0.05% + 50 μΩ
5 Ω	0.1 mΩ	10 mA	50 mV	0.05% + 0.5 mΩ
50 Ω	1 mΩ	10 mA	500 mV	0.05% + 5 mΩ
500 Ω	10 mΩ	1 mA	500 mV	0.05% + 50 mΩ
5 kΩ	0.1 Ω	0.1 mA	500 mV	0.05% + 0.5 Ω
50 kΩ	1 Ω	0.1mA	500 mV	0.05% + 5 Ω
400 Vac/dc rms	1 V	—	—	0.05% + 1 V
-10 to 60°C	0.1°C	—	—	1.5°C

**Accuracy is ± (% of reading + n) over 1 year at 23°C ±5°*

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model Number)*

Model Number	Price	Description
HHM518	**$1135**	Micro-Ohmmeter
HHM518-TL1	**250**	Test leads with gold-plated Kelvin alligator clips, 4' (1.2 m) length
HHM518-TL2	**485**	Test leads with dual concentric probe, 10' (3 m) length
HHM518-BATT	**45**	Replacement battery pack
HHM518-SC	**55**	Soft case

Unit supplied with hard carrying case, ac charger, and operator's manual.
Ordering Example: HHM518**, micro-ohmmeter, **HHM518-TL1** test leads, $1135 + 250 = **$1385

Digital Storage Oscilloscope/ Multimeter Powerful 100 MHz Bandwidth

HHSM-310M

$1560

1 YEAR WARRANTY

CE

Probes included

HHSM-310 Printer Sold Separately

Cable sold separately as part of HHSM-310-SW software

HHSM-310M shown with HHSM310-TP probes and optional HHSM310-Printer

- **100 MHz Bandwidth**
- **Fast Rise Time and Low Overshoot**
- **Repetitive Random Interleaved 5GS/s**
- **Two Channels and Dual Digitizers**
- **Low Drift and Internal Noise**
- **Excellent Internal Noise Reduction**
- **External Trigger**
- **Built-In 3¾ (4000 counts) Digital Multimeter with Auto or Manual Range**
- **Roll Mode**
- **Pre-trigger Up to 10 Div**
- **Extra Bright Backlit LCD Display**
- **Independently Floating Isolated Scope and DMM for Safety**
- **Automatic Optimized Panel Setting and Tracking According to Input Signal**
- **Automatic Measurements**
- **Arithmetic Function**
- **RS232C Programmability/ Communications**
- **Rechargeable Ni-Cd Battery and External AC Adaptor**
- **Direct Hardcopy Through RS232C**
- **Hands-free Design and Optional Deluxe Soft Carrying Case**
- **Hands-Free Automatic Test**

The HHSM-310M has measurement capabilities beyond conventional portable instrumentation. Powerful 100 MHz, 2-channel bandwidth, 4000 count digital multimeter and its unique folding design are ideal for design and service applications. RS232C programmability (optional HHSM310-SW) combines high performance and excellent value.

HHSM-310M comes complete with built-in rechargeable battery, AC adaptor, test leads and 2 oscilloscope probe kits.

Specifications

Vertical Axis:
  Resolution: 8 bits
  Sensitivity: 1mV/div ~ 5V/div (1-2-5 sequence, 12 steps)
  Accuracy: 3% (5% for 1mV, 2mV)
  Bandwidth: DC-100MHz (-3dB)
  Low Frequency Limit in AC Couple: 10 Hz
  Input Channel: CH1, CH2
  Input Impedance: 1MΩ/approx. 25pF
  Mode: CH1, CH2 turned on or off independently
  Max. Safe Input Volts: 42Vpk (DC + AC peak at 1 KHz)

Horizontal Axis:
  Max. Sample Rate: Real time 25 MS/s (simultaneous on 2 channels); Repetitive 5GS/s (simultaneous on 2 channels)
  Acquisition Memory: 2 K words/CH
  Sweep Time:
    Equivalent Sample: 5ns/div~2μs/div
    Real Time Sample: 5ns/div~0.5s/div
    Roll Mode: 1s/div~5s/div

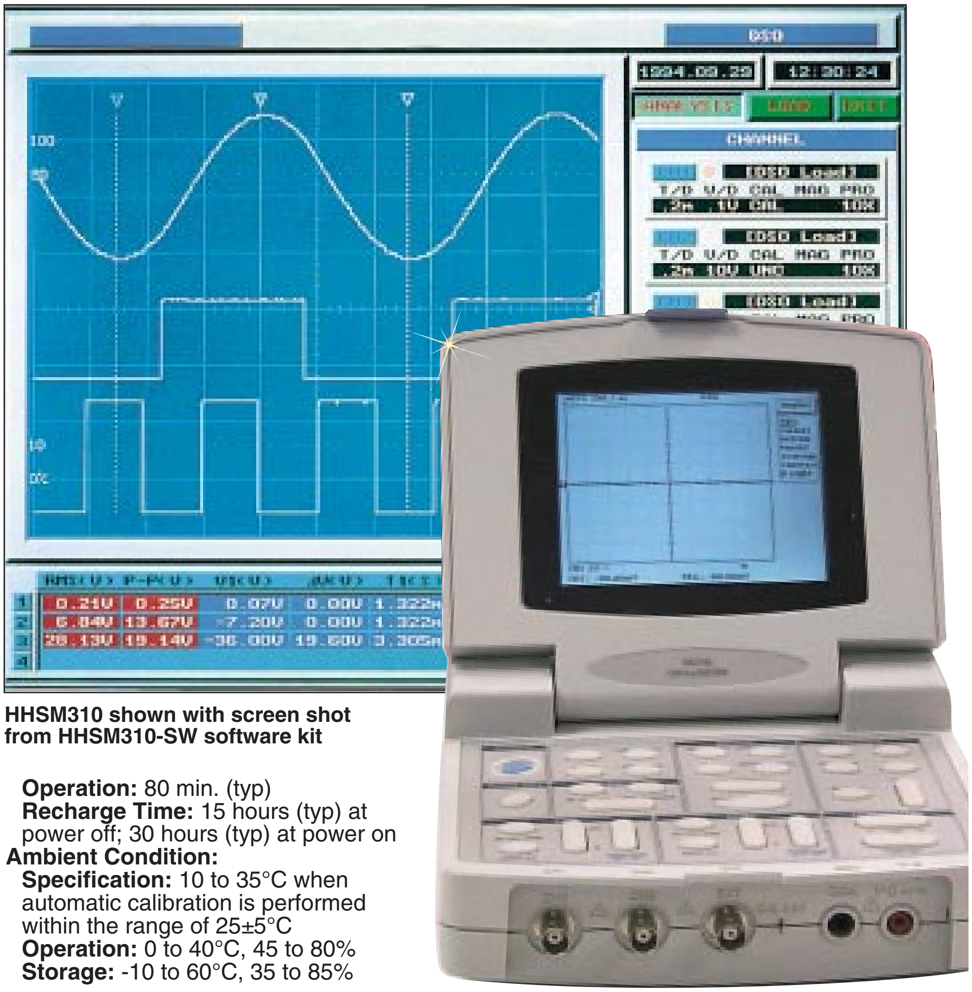
Timebase Error: 1%
Pre-Trigger: Max. 10 div

Specifications

Trigger:
Source: CH1, CH2, EXT
Mode: Auto, Norm, TV-V, TV-H
Couple: DC, AC, HFrej, LFrej
Slope: + or -
Level: Manual setting or automatic 50% setting
Sensitivity:

Trigger	Frequency	Sensitivity	
		5mV-5V/div	1m,2mV/div
CH1	DC-10 MHz	0.5 div	2.5 mVp-p
CH2	10-100 MHz	1.5 div	7.5 mVp-p
EXT	DC-100 MHz	0.1 Vp-p	

TV Trigger: Sync section: 1.0div or more, negative
AC Cut-off Freq.: Approx. 10Hz (-3dB)
HF/LF Cut-off Freq.: Approx. 50kHz (-3dB)
Auto Lower Freq.: Approx. 30Hz
Menu:
Display: 13 cm (5") STN LCD (CCFI backlight), 320 x 240 pixel 10div (H) x 8div (V); 25 x 25 dots/div (V), grid (full, quad, board) interpolation (sine, linear) dot join on/off, persistence, X-Y horizontal mag/alt mag
Save/Recall: Average (exponential 2-256); save/recall max. 10 waveforms and set-up clear waveform set-up
Math:
Parameter: Amplitude (p-p, rms, average), frequency, period, pulse width (positive, negative) duty cycle
Arithmetic: Addition, subtraction, inversion
Utility: Probe (X1, X10) LCD contrast dec/inc, RS-232C
Cursor: ∆V, ∆T, 1/∆T reference, track
Auto Set-Up & Tracking: The front panel settings are automatically performed so that the optimum waveform is displayed for an input signal. Freq: 20Hz-20MHz, duty: 20~80%; amplitude: 10mV~50V (20mV or more for 20 to 100Hz)
Hold/Run: Hold mode is used to stop the updating of the waveform, run mode to update repeatedly
Hardcopy: Hardcopy through RS-232C interface
Resume: The setup data before power off and all the displayed information is retained. At power on these data are displayed and used as setup data
DMM:
Digit: 3¾ (4000 counts)
Others: Diode test, continuity test, min, max, relative, hold
Calibration Out:
Frequency: 1 kHz ± 20%
Output Voltage: 0.5V ± 30%
Power Supply:
Power Supply: Exclusive AC adaptor; built-in battery; rated external input voltage: 12V; power consumption for external power input: 1A (typ)
Power Consumption: 12W (typ)
Built-in Battery: Ni-Cd battery; automatically rechargeable (voltage drop is automatically detected)


1994.08.29
12:30:24
CHANNEL
100
RMS(V) P-P(V) V(V) ∆(V) T(s)
0.21V 0.25V 0.07V 0.00V 1.322m
6.84V 13.67V -7.20V 0.00V 1.322m
28.13V 19.14V -36.00V 19.60V 3.305m

HHSM310 shown with screen shot from HHSM310-SW software kit

Operation: 80 min. (typ)
Recharge Time: 15 hours (typ) at power off; 30 hours (typ) at power on
Ambient Condition:
Specification: 10 to 35°C when automatic calibration is performed within the range of 25±5°C
Operation: 0 to 40°C, 45 to 80%
Storage: -10 to 60°C, 35 to 85%

Dimensions:
180 W x 67 H x 255 mm D (7 x 3 x 10")
Weight: 2.0 kg (4 lb)

AC/DC Voltage:

Range	400mV	4V	40V	400V
Resolution	0.1mV	1mV	10mV	100mV

Resistance:

Range	400	4k	40V	400K	4M
Resolution	0.1	1	10	100	1K

To Order *(Specify Model No.)*

Model No.	Price	Description
HHSM-310M	$1560	Digital storage oscilloscope/multimeter

Accessories

Model No.	Price	Description
HHSM310-SW	$79	Software kit (cable, s/w, manual)
HHSM310-CC	55	Soft carrying case
HHSM310-TP	55	Spare set of oscilloscope probes (2)
HHSM310-Printer	800	RS-232 printer

HHSM-310M comes complete with built-in rechargeable battery, AC adaptor, test lead set, 2 oscilloscope probe kits and manual. ***Ordering Example: HHSM-310M*** *oscilloscope/ multimeter, plus* ***HHSM310-SW,*** *software kit, plus* ***HHSM310-Printer,*** *RS-232 printer,* ***$1560 + 79 + 800 = $2439.***

Silicone Rubber Tubing Heaters

Silicone Rubber
Tubing Heaters
$115
Basic Unit

MADE IN USA

Features

- Patented Grounded Heating Element
- Uniform Heat Distribution
- Operating Temperatures Up to 200°C (392°F)
- Built-In Insulation
- Modular Design to Fit Custom Lines
- Power/Jumper Leads Allow Jackets to be Interconnected in the Field
- No Waiting for Custom Measurements or Engineering
- CE-Pending
- UR-Pending

Benefits

- Grounding Improves Safety
- Clean Room Compatible
- No Need to Apply Insulation
- Reduced Particle Buildup
- Reduced Down Time
- Greater Yields
- Ease of Installation
- Easily Removed and Reinstalled

OMEGA® Silicone Rubber Tubing Heaters provide the heat and insulation necessary to reduce the deposits made from gas delivery lines such as BCL3, WF6, and other gases. Reduced deposits means reduced downtime, increased throughput, improved efficiency and greater process yields. OMEGA's Silicone Rubber Tubing Heaters simplify installation and eliminate the need to wait for custom engineered heaters or jackets.

Specifications

Operating Voltage: 120 Vac
Closed Cell Sponge Insulation: 0.95 cm (⅜")
Silicone Facing: Fiberglass Cloth Reinforced
Operating Temperature:
Maximum Continuous: 232°C (450°F)
Minimum Exposure: -51°C (-60°F)
Maximum Short Term Exposure: 260°C (500°F)
Patented Grounded Heating Element Power/ Jumper Leads: 15.2 cm (6")
Dielectric Strength: 1000 Vdc

To Order *(Specify Model Number)*

🟩 MOST POPULAR MODELS HIGHLIGHTED!

0.635 cm (¼") O.D. Tubing (2.54 cm (1") Jacket O.D.)

Model Number	Price	Length cm (inches)	Watts	Amps
GST25003120	$115	7.6 (3)	6	0.1
GST25006120	120	15.24 (6)	12	0.2
GST25009120	135	22.86 (9)	18	0.3
GST25012120	155	30.48 (12)	24	0.4
GST25018120	190	45.72 (18)	36	0.6
GST25024120	235	60.96 (24)	47	0.8
GST25036120	300	91.44 (36)	72	1.2
GST25048120	370	121.92 (48)	94	1.6

*Ordering Example: **GST25012120,** 0.635 cm O.D. tubing with 30.48 cm length, **$155.***

To Order *(Specify Model Number)*

0.95 cm (⅜") O.D. Tubing (2.86 cm (1⅛") Jacket O.D.)

Model Number	Price	Length cm (inches)	Watts	Amps
GST37503120	$115	7.6 (3)	9	0.1
GST37506120	120	15.24 (6)	18	0.3
GST37509120	135	22.86 (9)	27	0.4
GST37512120	155	30.48 (12)	36	0.6
GST37518120	190	45.72 (18)	53	0.9
GST37524120	235	60.96 (24)	71	1.2
GST37536120	300	91.44 (36)	106	1.8
GST37548120	370	121.92 (48)	142	2.4

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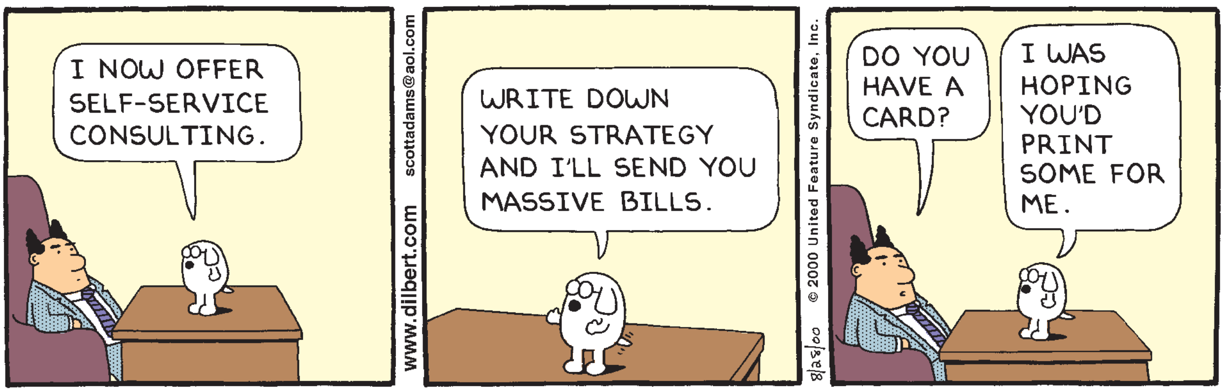
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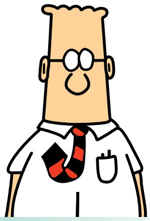

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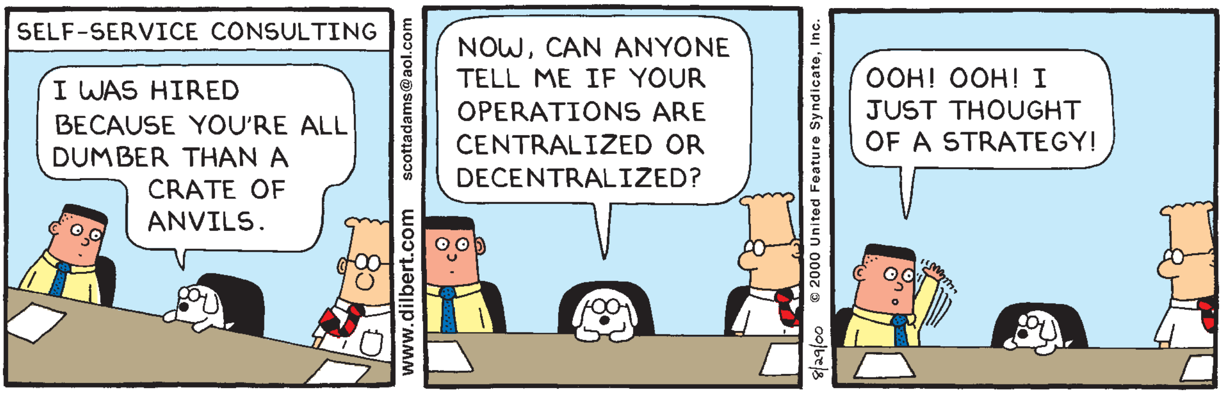
SELF-SERVICE CONSULTING
I WAS HIRED BECAUSE YOU'RE ALL DUMBER THAN A CRATE OF ANVILS.
NOW, CAN ANYONE TELL ME IF YOUR OPERATIONS ARE CENTRALIZED OR DECENTRALIZED?
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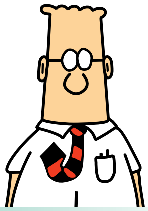

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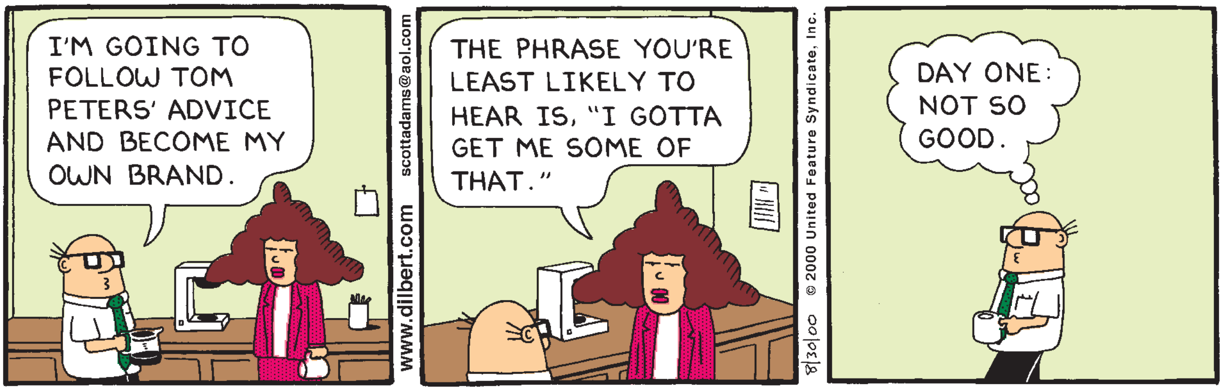
I'M GOING TO FOLLOW TOM PETERS' ADVICE AND BECOME MY OWN BRAND.
THE PHRASE YOU'RE LEAST LIKELY TO HEAR IS, "I GOTTA GET ME SOME OF THAT."
DAY ONE: NOT SO GOOD.
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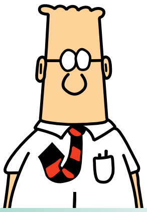

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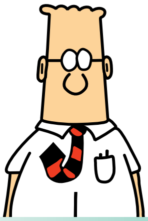

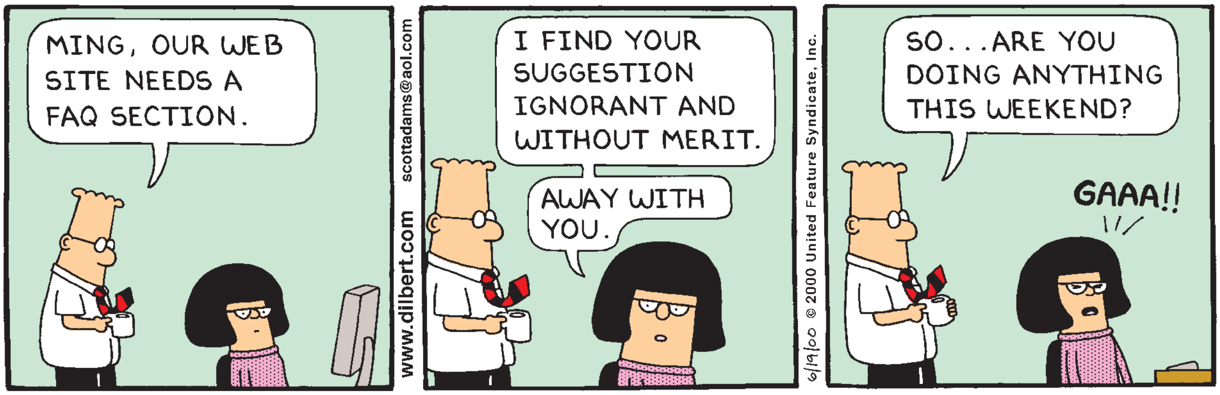
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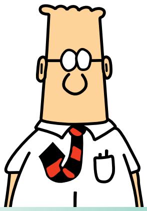

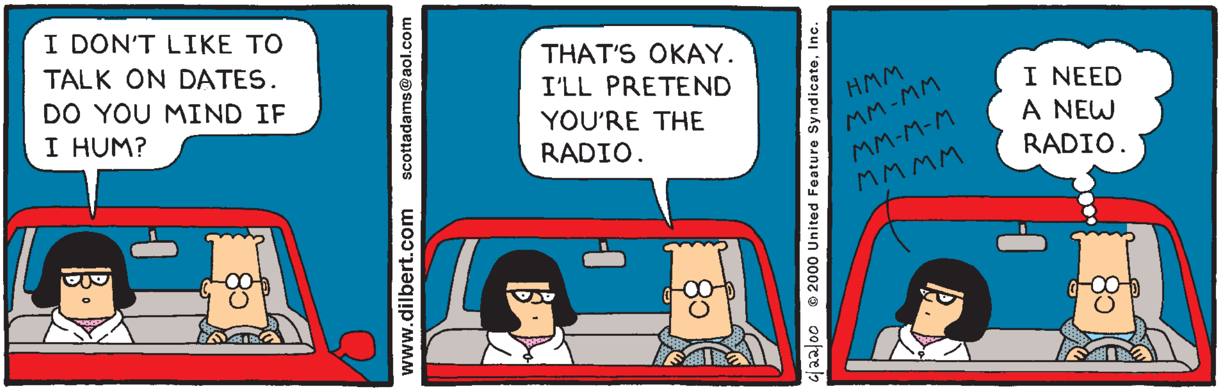
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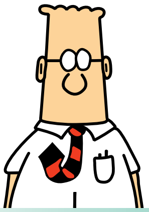

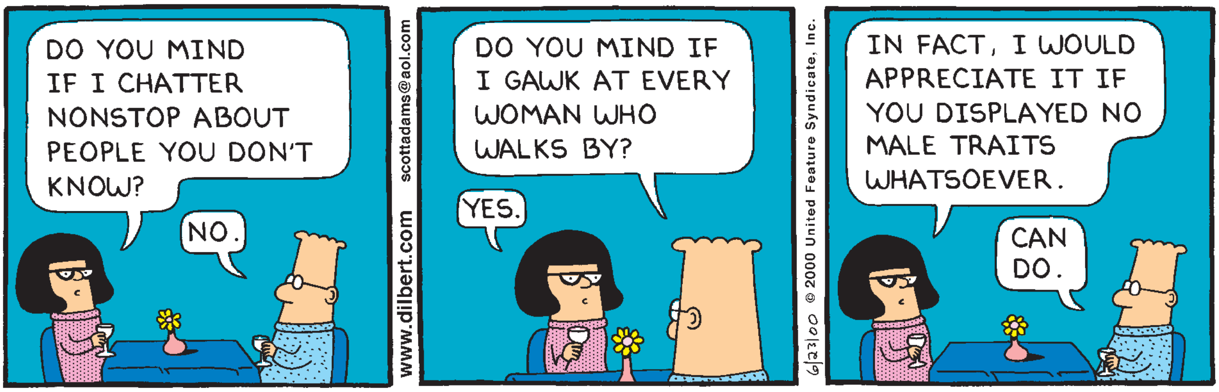
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CAN DO.

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To Order *(Specify Model Number)*

1.27 cm (½") O.D. Tubing (3.18 cm (1¼") Jacket O.D.)				
Model Number	Price	Length cm (inches)	Watts	Amps
GST50003120	$130	7.6 (3)	12	0.2
GST50006120	140	15.24 (6)	24	0.4
GST50009120	135	22.86 (9)	36	0.6
GST50012120	175	30.48 (12)	47	0.8
GST50018120	205	45.72 (18)	71	1.2
GST50024120	250	60.96 (24)	94	1.6
GST50036120	340	91.44 (36)	142	2.4
GST50048120	410	121.92 (48)	189	3.1

Cut to Length Insulators

Built of the same silicone rubber closed cell sponge insulation and fiberglass reinforced silicone facing. These insulators are designed to be cut to length in the field to provide insulation on areas too small for heaters to fit.

Cut to Length Insulators		
Model No.	Price	Diameter cm (in)
GTI25018	$100	6.35 (0.250)
GTI37518	100	0.953 (0.375)
GTI50018	105	1.270 (0.500)

To Order *(Specify Model Number)*

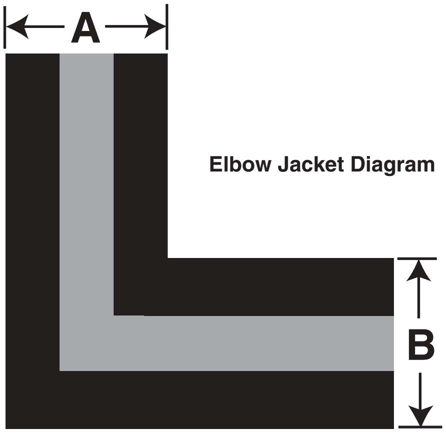
90° Elbow Jackets				
Model Number	Price	Watts	Amps	Diameter cm (inches)
GEL250120	$245	7	0.1	0.635 (0.250)
GEL375120	245	10	0.2	0.953 (0.375)
GEL500120	265		13	0.2 1.270 (0.5)

Ordering Example: *GEL375120 is a 10 watt 0.2 Amp 90° elbow jacket heater,* ***$245***

90° Elbow Jacket Dimensions			
Model Number	Tubing O.D. cm (in)	Diameter "A" cm (in)	Length "B" cm (in)
GEL250120	0.635 (0.250)	2.54 (1)	3.81 (1.5)
GEL375120	0.95 (⅜)	2.86 (1.125)	4.13 (1.625)
GEL500120	1.27 (½)	3.18 (1.25)	4.13 (1.625)

90° Elbow Jackets

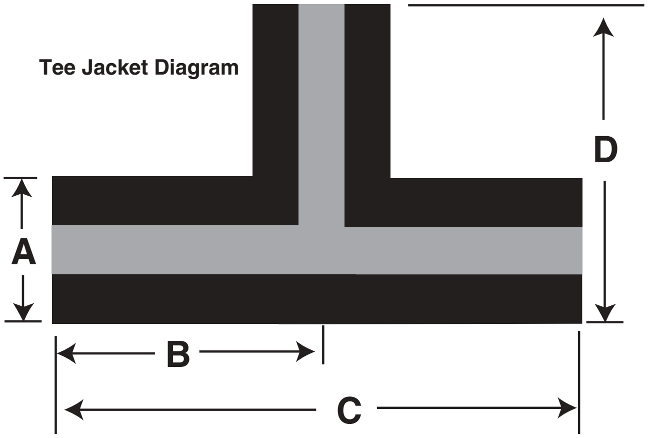
Built to the same specifications as the Straight Silicone Rubber Tubing Heaters. These heaters are designed to fit the welded 90° turns found in semiconductor gas piping.



Elbow Jacket Diagram

Tee Jackets

Built to the same specifications as the Straight Silicone Rubber Tubing Heaters. These heaters are designed to fit the welded tee's turns found in semiconductor gas piping.



Tee Jacket Diagram

To Order *(Specify Model Number)*

Tee Jackets				
Model Number	Price	Diameter cm (inches)	Watts	Amps
GTE250120	$265	0.635 (0.250)	9	0.1
GTE375120	265	0.953 (0.375)	13	0.2
GTE500120	275	1.270 (0.5)	17	0.3

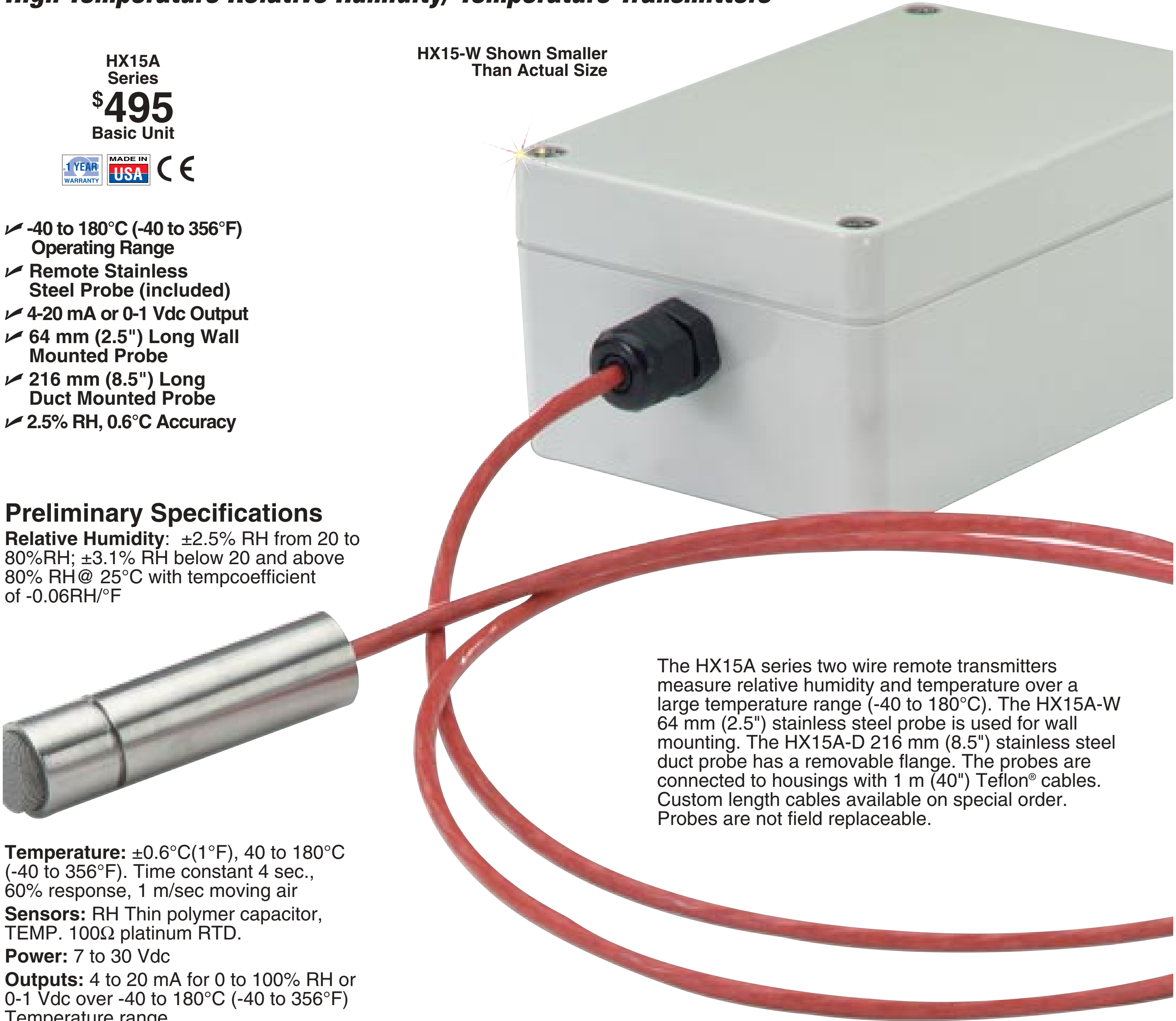
Tee Jacket Dimensions					
Model Number	Tubing O.D. cm (inches)	Diameter "A" cm (inches)	Length "B" cm (inches)	Length "C" cm (inches)	Length "D" cm (inches)
GTE250120	0.635 (¼)	2.54 (1)	4.13 (1⅝)	8.26 (3¼)	3.81 (1½)
GTE375120	0.95 (⅜)	2.86 (1⅛)	4.13 (1⅝)	8.26 (3¼)	4.13 (1⅝)
GTE500120	1.27 (½)	3.18 (1¼)	4.13 (1⅝)	8.26 (3¼)	4.13 (1⅝)

High Temperature Relative Humidity/ Temperature Transmitters

HX15A
Series
$495
Basic Unit

1 YEAR WARRANTY MADE IN USA CE

- ✓ **-40 to 180°C (-40 to 356°F) Operating Range**
- ✓ **Remote Stainless Steel Probe (included)**
- ✓ **4-20 mA or 0-1 Vdc Output**
- ✓ **64 mm (2.5") Long Wall Mounted Probe**
- ✓ **216 mm (8.5") Long Duct Mounted Probe**
- ✓ **2.5% RH, 0.6°C Accuracy**



HX15-W Shown Smaller Than Actual Size

The HX15A series two wire remote transmitters measure relative humidity and temperature over a large temperature range (-40 to 180°C). The HX15A-W 64 mm (2.5") stainless steel probe is used for wall mounting. The HX15A-D 216 mm (8.5") stainless steel duct probe has a removable flange. The probes are connected to housings with 1 m (40") Teflon® cables. Custom length cables available on special order. Probes are not field replaceable.

Preliminary Specifications

Relative Humidity: ±2.5% RH from 20 to 80%RH; ±3.1% RH below 20 and above 80% RH@ 25°C with tempcoefficient of -0.06RH/°F

Temperature: ±0.6°C(1°F), 40 to 180°C (-40 to 356°F). Time constant 4 sec., 60% response, 1 m/sec moving air

Sensors: RH Thin polymer capacitor, TEMP. 100Ω platinum RTD.

Power: 7 to 30 Vdc

Outputs: 4 to 20 mA for 0 to 100% RH or 0-1 Vdc over -40 to 180°C (-40 to 356°F) Temperature range

Operating Range: Electronics ABS enclosure NEMA 4X, -20 to 70°C (-4 to 158°F).

Probes: -40 to 180°C (-40 to 356°F).

Dimensions:

Electronics: 79.8 x 81.8 x 54.9 mm (3.14" x 3.22" x 2.16"). Teflon® cable, Metal wall mounting clip.

Duct probe: 216 x 16 mm (8.5 x 0.625"D), 1 m (40") Teflon® cable.

Removable and adjustable duct flange.

Teflon® is a registered trademark of DuPont.

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order ***(Specify Model Number)***

Model No.	Price	Description
HX15AC-W	**$495**	Wall Mount RH/Temp Current Transmitter (2.5" probe)
HX15AV-W	**495**	Wall Mount RH/Temp Voltage Transmitter (2.5" probe)
HX15AC-D	**545**	Duct Mount RH/Temp Current Transmitter (8.5" probe)
HX15AV-D	**545**	Duct Mount RH/Temp Voltage Transmitter (8.5" probe)
PSU-93	**40**	Power Supply, unregulated 16-23Vdc, 300mA max

Units supplied with operator's manual

Ordering Example: *HX15AC-W, wall mount RH/Temp transmitter 4-20 mA outputs,* ***$495.***

Relative Humidity/ Temperature Transmitter

Wall, Duct Mount and Remote Probe Models

Model HX93A

$225

- ✓ 4-20mA or 0-1V Output
- ✓ RH and Temperature Output
- ✓ Compact Size for Mounting Versatility
- ✓ Watertight Enclosure
- ✓ Accurate to 2.5% RH and 0.6°C

Wall Mount Model Shown Smaller Than Actual Size

Duct Mount Model Shown Smaller Than Actual Size

The HX93A transmitter provides remote or on-site monitoring of relative humidity and temperature. The HX93A outputs a linearized current or voltage signal proportional to the measured humidity or temperature. RH outputs are temperature compensated. Current output models enable placing of the transmitter at a remote location virtually any distance away from the readout or datalogging device. HX93A utilizes a thin-film polymer capacitor to sense relative humidity, and a Platinum 100Ω RTD to accurately sense temperature. A stainless steel mesh type filter protects the sensors, which is easily removable for cleaning. Mounting screws are easily accessible inside the rugged, ABS enclosure, which houses and protects the electronics to NEMA 13 specifications. An unregulated power supply providing a voltage of 6-30V powers the HX93A.

Specifications

Input Voltage Range:
24 Vdc nominal (6 to 30Vdc)

MEASURING RANGE

RH: 3 to 95%

Temperature:
-20 to 75°C (-4 to 167°F)

ACCURACY

RH: ±2.5% RH from 20 to 80%RH; ±3.1% RH below 20 and above 80% RH@ 25°C with temp coefficient of -0.06RH/°F

Temperature: 0.6°C (±1°F)

OUTPUT

HX93AC: 4 to 20mA for 0 to 100% RH and -20 to 75°C (-4 to 167°F)

HX93AV: 0 to 1Vdc for 0 to 100% RH and -20 to 75°C (-4 to 167°F)

RH Temperature Compensation:
-20 to 75°C (-4 to 167°F)

RH Time Constant (90% response at 25°C, in moving air at 1m/s):
>10 seconds, 10 to 90% RH;
>15 seconds, 90 to 10% RH

Repeatability: ±1% RH, 0.5°F

Housing: ABS plastic watertight enclosure; meets NEMA 1, 2, 3, 3R, 4, 4X, 5, 12 and 13 specifications

Connections: Liquid-tight nylon with neoprene gland, for 0.09 to 0.265" diameter cable; internal 4-pin terminal block accepts 14-22 gauge wire

Dimensions: HX93A(*) & HX93A(*)-D: Enclosure: 79.8 x 81.8 x 54.9 mm (3.14" x 3.22" x 2.16")
HX93A(*)-D: Probe: 15.7 D x 124.5 mm L (.620" x 4.9")

Weight: HX93A(*): 170 g (6 oz)
HX93A(*)-D: 187 g (6.6 oz)

☐ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model Number)*

Model No.	Price	Description
HX93A(*)	**$225**	Wall Mount RH and Temperature Transmitter
HX93A(*)-D	**235**	Duct Mount RH and Temperature Transmitter
HX93A(*)-RPI	**265**	Remote Probe Relative Humidity/Temp Transmitter
HX92-CAL	**65**	Calibration Kit, 11 and 75% RH Standards
PSU-93	**40**	Unregulated Power Supply, 16 to 23Vdc, 300mA max
TX4-100	**28.50**	4 conductor shielded transmitter cable (100 ft)
CAL-3-Hu	**125**	NIST Traceable Calibration
HX90DM-KIT	**12**	Duct Mounting Kit (for HX92A(*)-D or HX92A(*)-RPI only)

** To order, Specify "C" for 4 to 20mA output(s), or "V" for 0-1 Vdc output(s)*

Ordering Example: HX93AC**, humidity transmitter with 4-20mA output, with HX92-CAL Calibration kit $225 + 65 = **$290.

Relative Humidity Transmitter – Wall, Duct Mount and Remote Probe Models

Model HX92AC

$190

- **4-20mA or 0-1V Output**
- **Compact Size for Mounting Versatility**
- **Watertight Enclosure**
- **Accurate to 2.5% RH**

The model HX92A is an economical humidity transmitter, providing on-site continuous monitoring of relative humidity. It is a 2-wire transmitter with either voltage or current output. The transmitter output is linearized, and RH readings are temperature compensated. A thin-film polymer capacitor senses relative humidity. The sensor is protected by a stainless mesh-type filter that is easily removable for cleaning. The case and weathertight protection, and screws are provided for mounting the unit via internal hole. An unusually low minimum voltage of 6 V allows the use of large impedances for longer wire runs. The HX93A is a similar unit that provides transmitter outputs for both humidity and temperature.

Specifications

Input Voltage Range:
24 Vdc nominal
(6 to 30 Vdc)

Measuring Range
RH: 3 to 95%
Temperature:
-20 to 75°C (-4 to 167°F)

Accuracy
RH: ±2.5% RH from 20 to 80% RH; ±3.1% RH below 20 and above 80% RH@ 25°C with temp coefficient of -0.06RH/°F

Output
HX92AC: 4 to 20 mA for 0 to 100% RH
HX92AV: 0 to 1Vdc for 0 to 100% RH

RH Temperature Compensation:
-20 to 75°C (-4 to 167°F)

RH Time Constant (90% response at 25°C, in moving air at 1m/s):
>10 seconds, 10 to 90% RH;
>15 seconds, 90 to 10% RH

Repeatability: ±1% RH, 0.5°F

Wall Mount HX92A Shown Smaller Than Actual Size

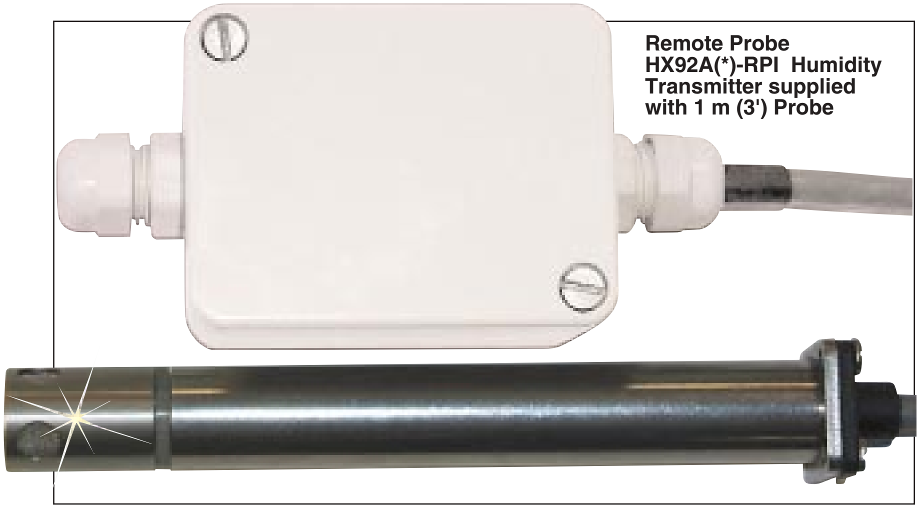
Housing: ABS plastic watertight enclosure; meets NEMA 1, 2, 3, 3R, 4, 4X, 5, 12 and 13 specifications
Connections: Liquid-tight nylon with neoprene gland, for 0.09 to 0.265" diameter cable; internal 4-pin terminal block accepts 14 to 22 gage wire
Dimensions: HX92A(*) & HX92A(*)-D:
Enclosure: 49.8 x 64.8 x 34.8 mm (1.96" x 2.55 x 1.37")
HX92A(*)-D: Probe: 15.7 D x 124.5 mm L (.620" x 4.9")
Weight: HX92A(*): 82 g (2.9 oz);
HX92A(*)-D: 100 g (3.5 oz)

To Order *(Specify Model Number)*

Model No.	Price	Description
HX92A(*)	$190	Wall Mount Relative Humidity Transmitter
HX92A(*)-D	205	Duct Mount Relative Humidity Transmitter
HX92A(*)-RPI	235	Remote Probe RH Transmitter
HX92-CAL	65	Calibration Kit, 11 and 75% RH Standards
PSU-93	40	Unregulated Power Supply, 16 to 23Vdc, 300mA max
TX4-100	28.50	4 conductor shielded transmitter cable (100 ft)
CAL-3-HU	125	NIST Traceable Calibration
HX90DM-KIT	12	Duct Mounting Kit (for HX92A(*)-D or HX92A(*)-RPI only)

**To order, Specify "C" for 4 to 20mA output(s), or "V" for 0-1 Vdc output.*
Ordering Example: HX92AC,** humidity transmitter with current output, with HX92-CAL Calibration kit and PSU-93 power supply, $190 + 65 + 40 = **$295.

☐ ***MOST POPULAR MODELS HIGHLIGHTED!***



Remote Probe HX92A(*)-RPI Humidity Transmitter supplied with 1 m (3') Probe

Duct Mount Model Shown Smaller Than Actual Size

Relative Humidity Controller

RHCN-3A
$290

1 YEAR WARRANTY MADE IN USA CE

- **Stainless Steel Miniature RH Probe May Be Remotely Mounted Thousands Of Feet from Controller**
- **Setpoint/Bandwidth Control**
- **10 mV/%RH or 50 mV/%RH Recorder Output**
- **OEM Markets**

OMEGA's RHCN-3A is an economical relative humidity controller. The probe uses a thin film polymer capacitive sensor which may be mounted thousands of feet from the controller box. The RHCN-3A has a standard 10 mV/%RH or 50 mV/%RH (internally selectable) recorder output, and a 5 amp SPDT relay for control. The controller is suitable in such applications as baking and food processing, HVAC, computer rooms, art galleries, drug manufacturing, and many others.

Specifications

Accuracy: ±3% RH from 3% to 95% RH at 25°C
Operating Temperature Range: -20 to 85°C (4 to 185°F)
Control Output: SPDT relay form "C"; rated 5 amps, 250 Vac, 30 Vdc
Recorder Output: 10 mV/%RH or 50 mV/%RH, internally set
Bandwidth Control: Non-interacting, 0 to ±20% RH
Power: 8.0 Vdc to 30 Vdc, 125 milliamps maximum
Mechanical
Probe: Stainless steel, 19 mm dia. (.75"), 119 mm long (4.7"), 1.5 m (5'), 2-wire cable, bracket for wall mounting
Controller: Housed in standard "T" box 114 x 70 x 51 mm deep (4½" x 2¾" x 2") screw terminal connections

10
20
30
40
50
60
70
80
90
100
0
%RH

Shown Smaller Than Actual Size

☐ ***MOST POPULAR MODEL HIGHLIGHTED!***

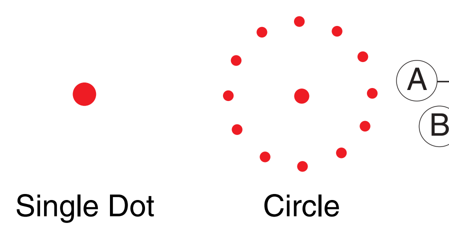
To Order *(Specify Model Number)*

Model Number	Price	Description
RHCN-3A	$290	Relative humidity controller
PSU-93	40	16-23 Vdc, 300 mA max
HX90DM-KIT	12	Duct mounting kit for probe

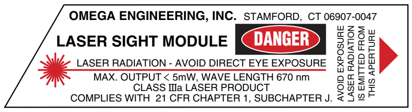
Comes with wall mounting bracket for probe, operator's manual.
Ordering Example: RHCN-3A** relative humidity controller, **$290.

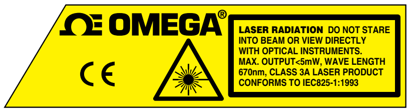
NEW

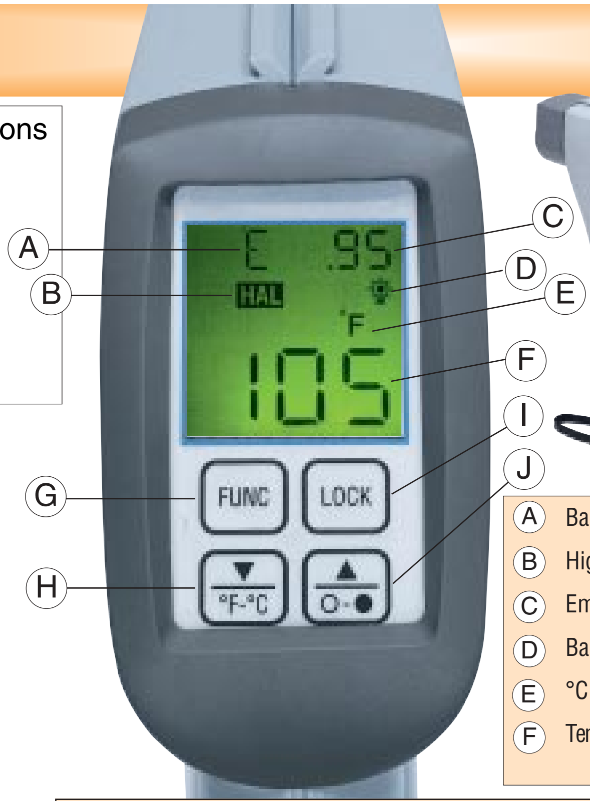
Laser Sight Model Configurations



Laser Circle to Dot Switchable


OMEGA ENGINEERING, INC. STAMFORD, CT 06907-0047
LASER SIGHT MODULE DANGER
LASER RADIATION - AVOID DIRECT EYE EXPOSURE
MAX. OUTPUT < 5mW, WAVE LENGTH 670 nm
CLASS IIIa LASER PRODUCT
COMPLIES WITH 21 CFR CHAPTER 1, SUBCHAPTER J.
AVOID EXPOSURE
LASER RADIATION
IS EMITTED FROM
THIS APERTURE


OMEGA®
LASER RADIATION DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS.
MAX. OUTPUT<5mW, WAVE LENGTH 670nm, CLASS 3A LASER PRODUCT
CONFORMS TO IEC825-1:1993



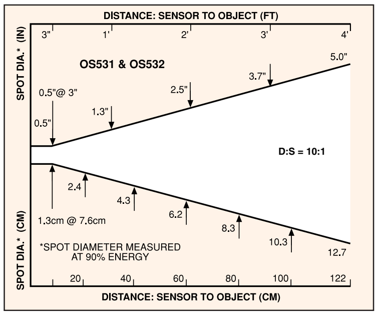
Soft carrying case included

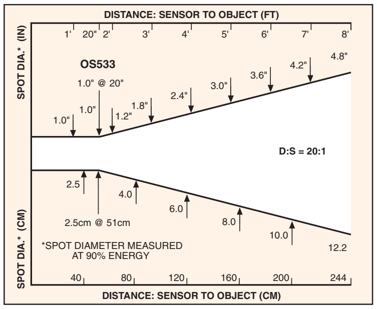
MONOGRAM® SERIES

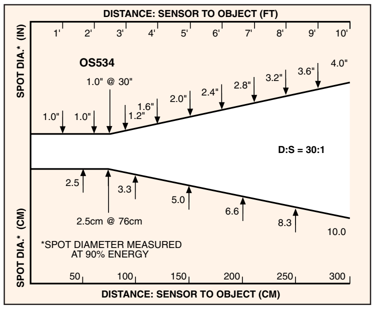
Ⓐ	Backlit LCD Display	Ⓖ	Function Key/Scrolling
Ⓑ	High Alarm Icon	Ⓗ	▼ for decrementing data; **°F-°C** for changing units of measure
Ⓒ	Emissivity Setting	Ⓘ	Locks the trigger/ Enables/Disables Alarm
Ⓓ	Backlight Icon	Ⓙ	▲ for incrementing data; ❍-● for turning on/off the backlight
Ⓔ	°C or °F Units		
Ⓕ	Temperature Reading		

Laser Sight Specifications

Wavelength (color): 670 nm (red)
Operating Distance:
Laser Dot: 2-75 ft.
Laser Circle: 2-25 ft.
FDA Classification: Class IIIa
Safety Classification: Class 3A
Beam Diameter: 5mm
Operating Temperature: 0 to 50°C







To Order *(Specify Model Number)*

ALL MODELS IN STOCK!

Model Number	**OS530L**	**OS530HR**	**OS531**	**OS532**	**OS533**	**OS534**
Price	**$295**	**$345**	**$395**	**$550**	**$895**	**$1095**
Accuracy**	±1% rdg	±1% rdg	±2% rdg	±1% rdg	±1% rdg	±1% rdg
Range	-18 to 540°C 0 to 1000°F	-30 to 121°C -22 to 250°F	-18 to 400°C 0 to 750°F	-18 to 540°C 0 to 1000°F	-18 to 540°C 0 to 1000°F	-18 to 871°C 0 to 1600°F
Emissivity	adjustable	adjustable	adjustable	adjustable	adjustable	adjustable
Backlit Dual Display	std	std	std	std	std	std
Distance to Spot Size Ratio	10:1	20:1	10:1	10:1	20:1	30:1
Differential Temperature	std	std	std	std	std	std
Min/Max Temperature	std	std	std	std	std	std
Average Temperature	std	std	std	std	std	std
High Alarm	std	std	std	std	std	std
Low Alarm	—	—	—	—	std	std
Audible Buzzer & Indicator	std	std	std	std	std	std
Ambient Target Temp Comp.	—	—	—	—	std	std
Analog Output	1 mV/deg	1 mV/deg	1 mV/deg	1 mV/deg	1 mV/deg	1 mV/deg
RS-232 Output	—	—	—	—	std	std
Thermocouple Input	—	—	—	std	std	std
Data Storage	—	—	—	—	—	std
Laser Sight (Built-In)	dot	dot	dot/circle	dot/circle	dot/circle	dot/circle
Trigger Lock	std	std	std	std	std	std
Last Temperature Recall	std	std	std	std	std	std

Ordering Example: ***OS531****, Handheld Infrared Thermometer with Built-In Laser Sighting Circle,* ***$395****.* ** *or 3°F, whichever is greater.*

☐ ***MOST POPULAR MODEL HIGHLIGHTED!***

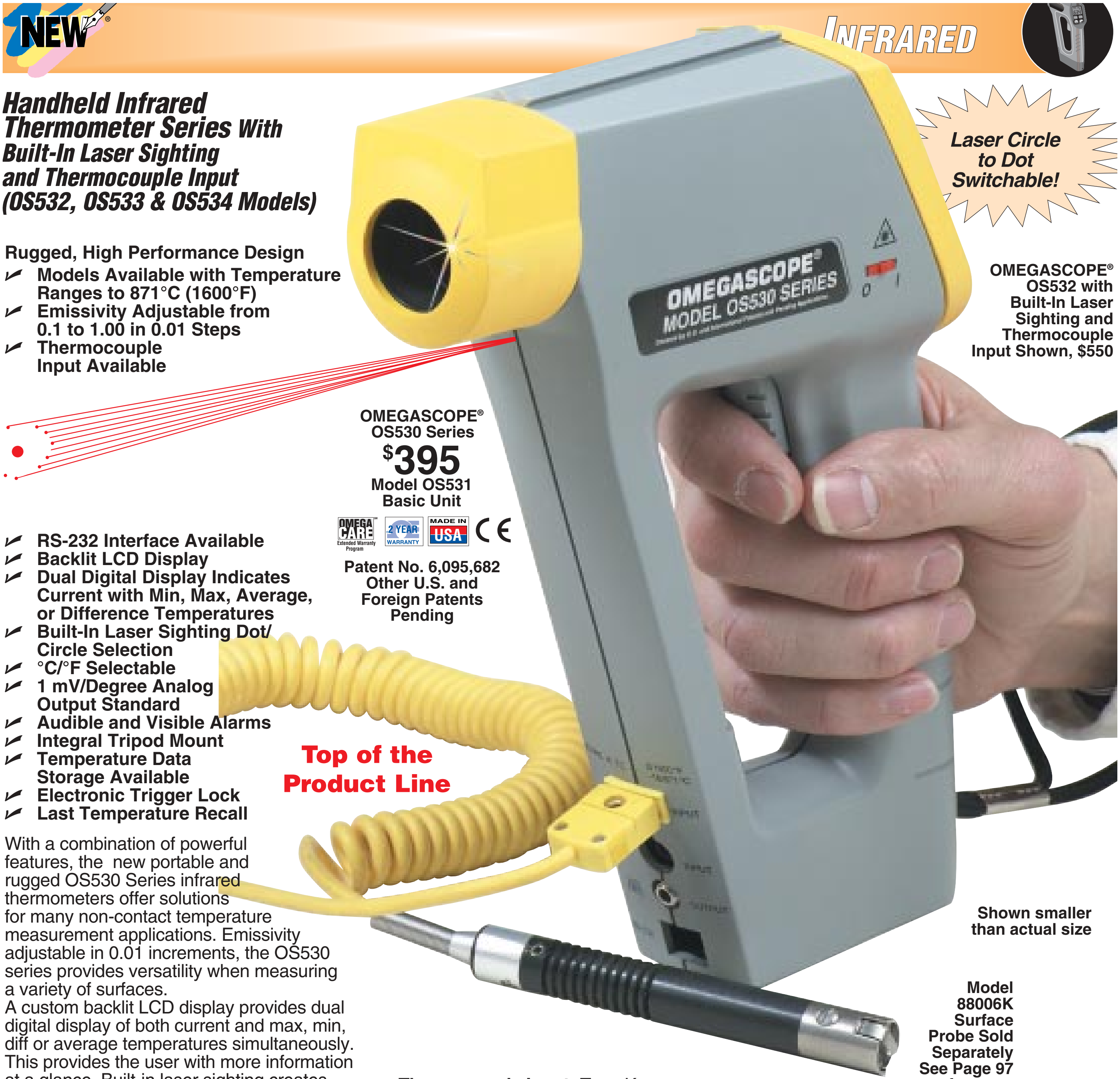
Accessories

Model No.	**Description**	**Price**
OS520-ADAPTER-110V	110 Vac wall adaptor	**$ 25**
OS520-ADAPTER-220V	220 Vac wall adaptor	**25**
OS520-RCC	Hard Carrying Case	**30**
88013K	Surface Probe, up to 815°C (1500°F)	**110**
88001K	Surface Probe, up to 482°C (900°F)	**110**
CAL-3-IR	NIST Traceable Calibration	**125**

Handheld Infrared Thermometer Series With Built-In Laser Sighting and Thermocouple Input (OS532, OS533 & OS534 Models)

Rugged, High Performance Design

- **Models Available with Temperature Ranges to 871°C (1600°F)**
- **Emissivity Adjustable from 0.1 to 1.00 in 0.01 Steps**
- **Thermocouple Input Available**



Laser Circle to Dot Switchable!

OMEGASCOPE® OS532 with Built-In Laser Sighting and Thermocouple Input Shown, $550

OMEGASCOPE® OS530 Series

$395

Model OS531 Basic Unit

OMEGA CARE Extended Warranty Program · 2 YEAR WARRANTY · MADE IN USA · CE

Patent No. 6,095,682 Other U.S. and Foreign Patents Pending

- **RS-232 Interface Available**
- **Backlit LCD Display**
- **Dual Digital Display Indicates Current with Min, Max, Average, or Difference Temperatures**
- **Built-In Laser Sighting Dot/ Circle Selection**
- **°C/°F Selectable**
- **1 mV/Degree Analog Output Standard**
- **Audible and Visible Alarms**
- **Integral Tripod Mount**
- **Temperature Data Storage Available**
- **Electronic Trigger Lock**
- **Last Temperature Recall**

Top of the Product Line

Shown smaller than actual size

Model 88006K Surface Probe Sold Separately See Page 97 for more probes

With a combination of powerful features, the new portable and rugged OS530 Series infrared thermometers offer solutions for many non-contact temperature measurement applications. Emissivity adjustable in 0.01 increments, the OS530 series provides versatility when measuring a variety of surfaces.

A custom backlit LCD display provides dual digital display of both current and max, min, diff or average temperatures simultaneously. This provides the user with more information at a glance. Built-in laser sighting creates a 12-point circle which clearly indicates the target area being measured.

The OS530 also features a high alarm setpoint, providing both audible and visual indication of the alarm status. The standard 1 mV per degree analog output allows interfacing with data acquisition equipment, including chart recorders, dataloggers and computers.

Specifications

Repeatability: ±(1% rdg + 1 digit)
Resolution:
1°C or 1°F (0.1°C or °F on OS530HR)
Response Time: 250 msec
Spectral Response: 8 to 14 µ
Emissivity: 0.10 to 1.00 in 0.01 increments
Thermocouple Input: Type K, -18 to 871°C (0 to 1600°F)
Operating Ambient:
0 to 50°C (32 to 122°F)
Power:
4 'AA' batteries included or ac adaptor
Battery Life:
60 hr, alkaline; 10 days, lithium
Analog Output:
1 mV/°C or 1 mV/°F
Tripod Mount: ¼"-20 UNC
Display: Backlit LCD; displays current and min or max, differential, average temperatures simultaneously
Alarm: High alarm standard, with audible and visual indication
RS-232: One way communication

We make running changes when technical advances allow. Check at time of ordering for additional features.

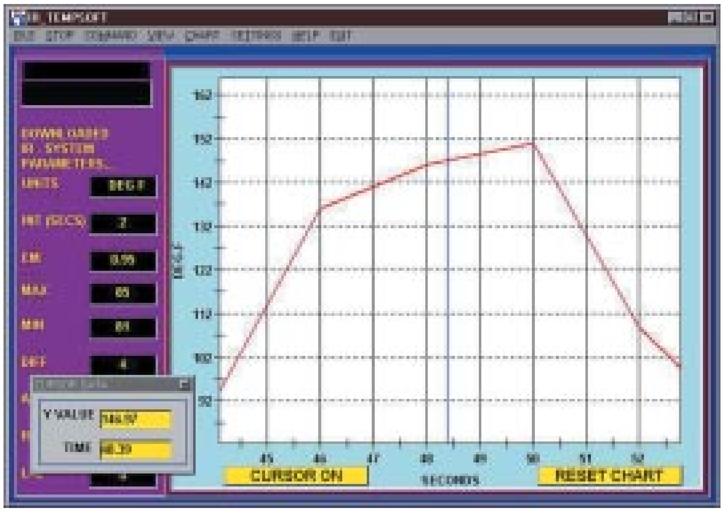
PATENT NOTICE
This product may be protected by one or more of the following patents:
U.S. PAT. D357,194, B5,368,392, 5,524,984, 5,727,880, 5,465,838, 5,823,678, 5,823,679/Canada 75811 Ⓓ OMEGA ENGINEERING, INC./ Czech Republic 25372/France 0378411 to 0378446/Germany M 94 06 478.4/Italy RM940000913/Japan 988,378/Netherlands 25009-00/Spain mod. ut. 133292/Slovak Republic 24565/U.K. Registered 2041153
Other U.S. and Foreign Patents Pending.

OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order

Datalogging Software for Infrared Measurement

IR-TEMPSOFT For Windows PC Interface

- Can be Used - and is Distributed FREE, with the Following Infrared Products: OS521, OS522, OS523, OS524, OS533, OS534, OS552, OS553,OS554
- Charts Temperature in Real-Time
- Data Can be Stored to Text File or Exported to Microsoft Excel
- Chart Can be Saved to a File and Pasted to Other Microsoft Windows Applications
- Includes Temperature Bar Graph with Configurable Alarm Limits
- Chart Includes Zoom/Reset and Measurement Cursor Operations
- Help Documentation is in HTML Format for Dynamic Viewing
- Downloads Stored Temperature Data Points for Viewing or Saving to a Text File


IR_TEMPSOFT
UNITS
DEG F
Y VALUE
TIME
CURSOR ON
RESET CHART
SECONDS
DEG F
162
152
142
132
122
112
102
92
45
46
47
48
49
50
51
52

Using the Chart cursor feature to measure charted temperature

MINIMUM SYSTEM REQUIREMENTS:

PC with Pentium Class Processor (Any speed)

Mouse or similar pointing device

Microsoft Windows 95, 98, NT 4.0 or greater

32 MB of RAM

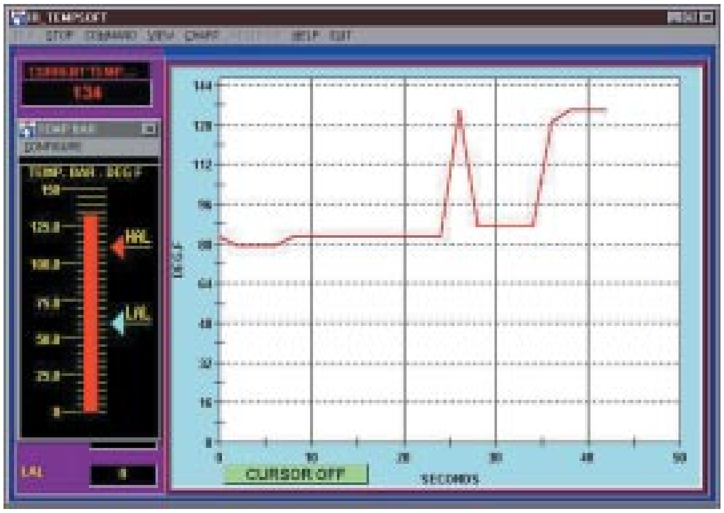
14 MB of hard drive space

VGA display adapter (Super VGA recommended)

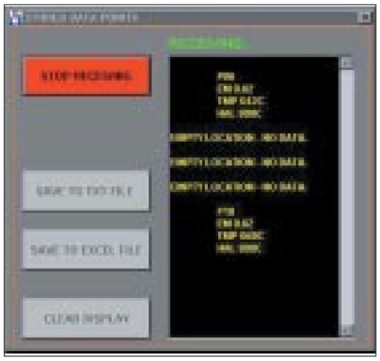
CD-ROM Drive

RS-232 Communications Port

HTML viewer or Microsoft Word to view help documentation

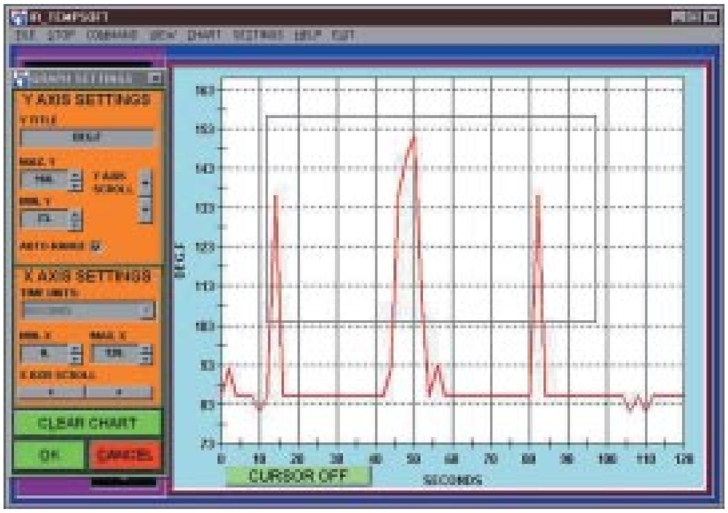

IR_TEMPSOFT
CURRENT TEMP
134
TEMP. BAR - DEG F
HAL
LAL
CURSOR OFF
SECONDS
DEG F

Charting real-time temperature data with the moveable Temperature Bar Graph enabled


STOP RECEIVING
SAVE TO TXT FILE
SAVE TO EXCEL FILE
CLEAR DISPLAY

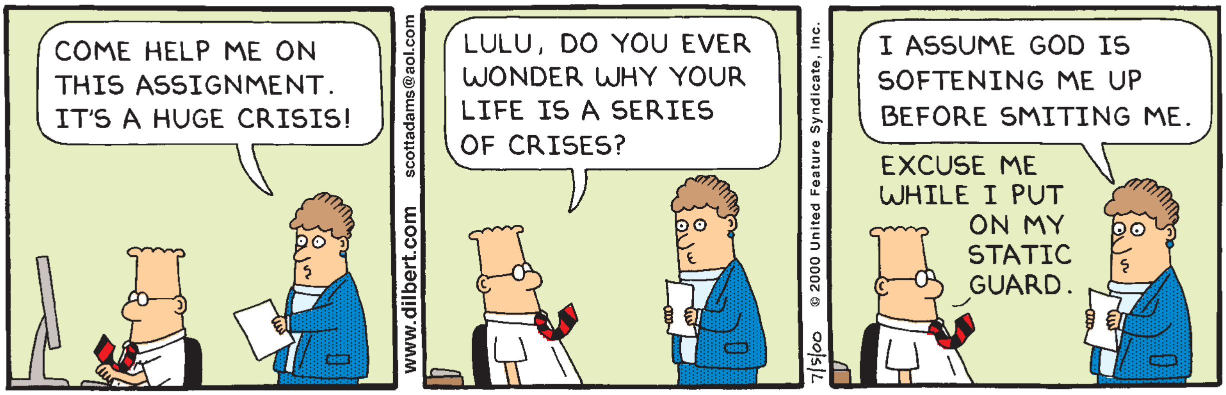
Viewing the downloaded stored temperature data points.

IR-Tempsoft makes your Temperature Data Logging applications easy with its user-friendly Microsoft Windows interface. With its advanced chart operations, easy data file storage/ retrieval, easy connection to above stated IR devices, and online help manual, you can use IR Tempsoft to quickly start your temperature measurement applications.


IR_TEMPSOFT
Y AXIS SETTINGS
X AXIS SETTINGS
CLEAR CHART
OK
CANCEL
CURSOR OFF
SECONDS
DEG F
0
10
20
30
40
50
60
70
80
90
100
110
120

Using the Chart Zoom feature to zero in on area of interest

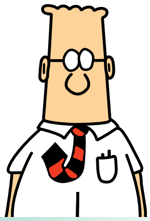
DILBERT® by Scott Adams


COME HELP ME ON THIS ASSIGNMENT. IT'S A HUGE CRISIS!
scottadams@aol.com
www.dilbert.com
LULU, DO YOU EVER WONDER WHY YOUR LIFE IS A SERIES OF CRISES?
© 2000 United Feature Syndicate, Inc.
7/5/00
I ASSUME GOD IS SOFTENING ME UP BEFORE SMITING ME.
EXCUSE ME WHILE I PUT ON MY STATIC GUARD.

7/05/00 DILBERT © United Feature Syndicate, Inc.

11

Collection Series
#11-001037



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Stamford, CT 06907-0047

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

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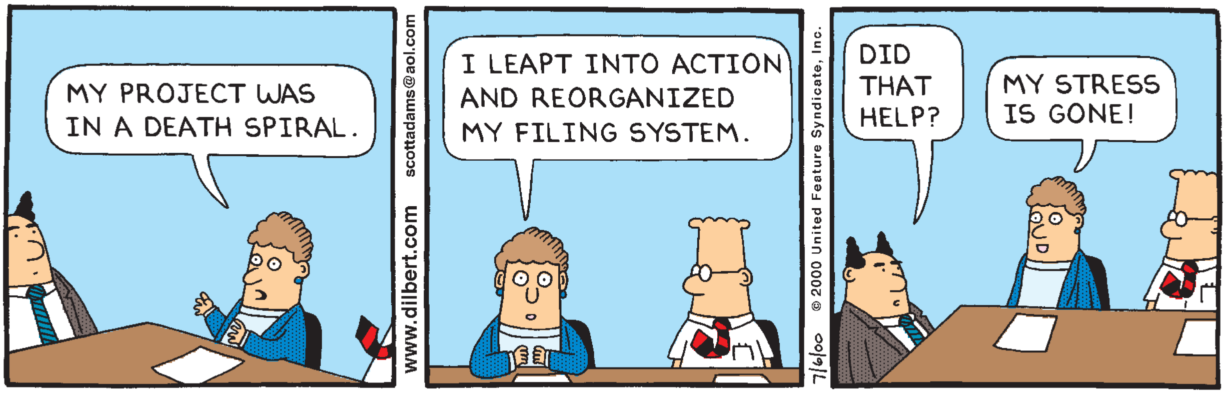
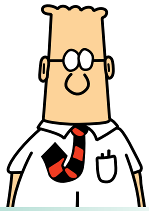

MY PROJECT WAS IN A DEATH SPIRAL.
scottadams@aol.com
www.dilbert.com
I LEAPT INTO ACTION AND REORGANIZED MY FILING SYSTEM.
© 2000 United Feature Syndicate, Inc.
7/6/00
DID THAT HELP?
MY STRESS IS GONE!

7/06/00 DILBERT © United Feature Syndicate, Inc.

11

Collection Series
#11-001038



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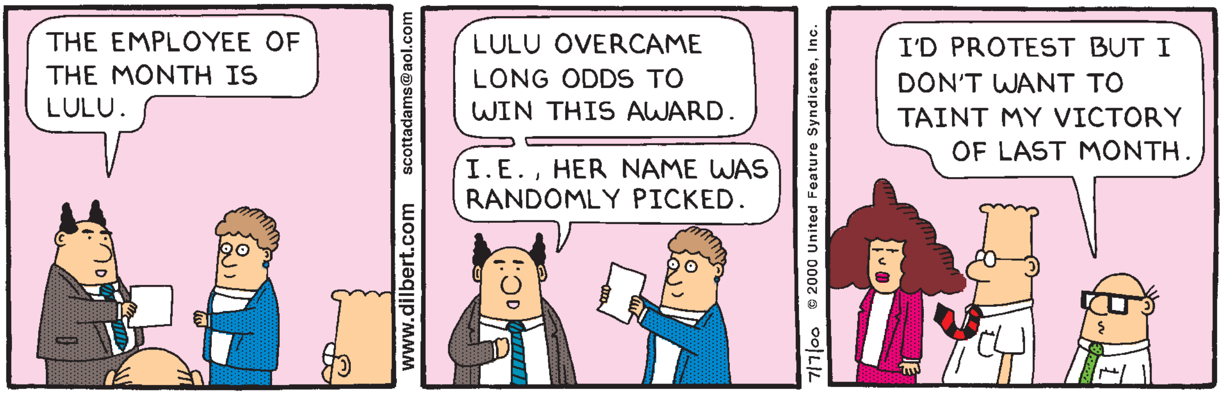
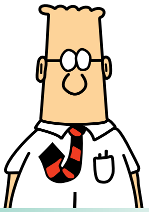

THE EMPLOYEE OF THE MONTH IS LULU.
scottadams@aol.com
www.dilbert.com
LULU OVERCAME LONG ODDS TO WIN THIS AWARD.
I.E., HER NAME WAS RANDOMLY PICKED.
© 2000 United Feature Syndicate, Inc.
7/7/00
I'D PROTEST BUT I DON'T WANT TO TAINT MY VICTORY OF LAST MONTH.

7/07/00 DILBERT © United Feature Syndicate, Inc.

11

Collection Series
#11-001039



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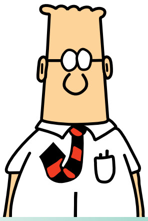
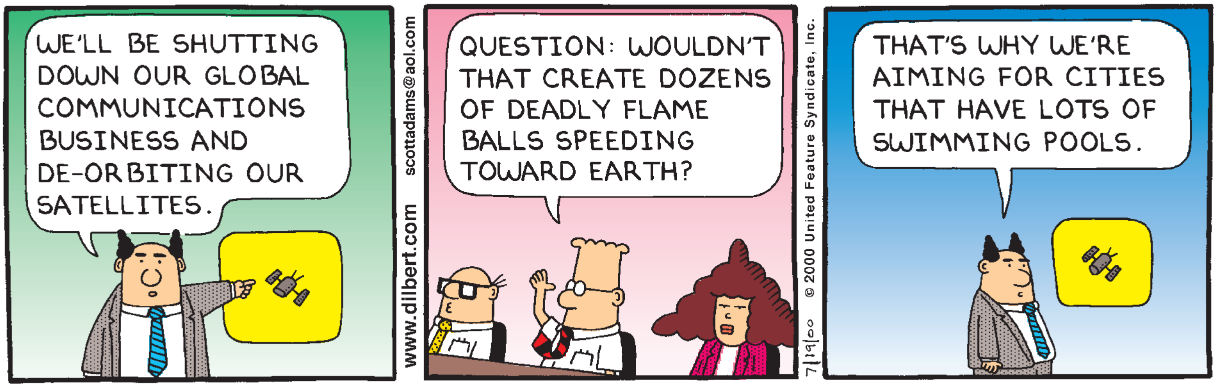
DILBERT® by Scott Adams

11

Collection Series
#11-001040




WE'LL BE SHUTTING DOWN OUR GLOBAL COMMUNICATIONS BUSINESS AND DE-ORBITING OUR SATELLITES.
www.dilbert.com
scottadams@aol.com
QUESTION: WOULDN'T THAT CREATE DOZENS OF DEADLY FLAME BALLS SPEEDING TOWARD EARTH?
© 2000 United Feature Syndicate, Inc.
7/19/00
THAT'S WHY WE'RE AIMING FOR CITIES THAT HAVE LOTS OF SWIMMING POOLS.

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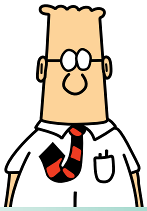
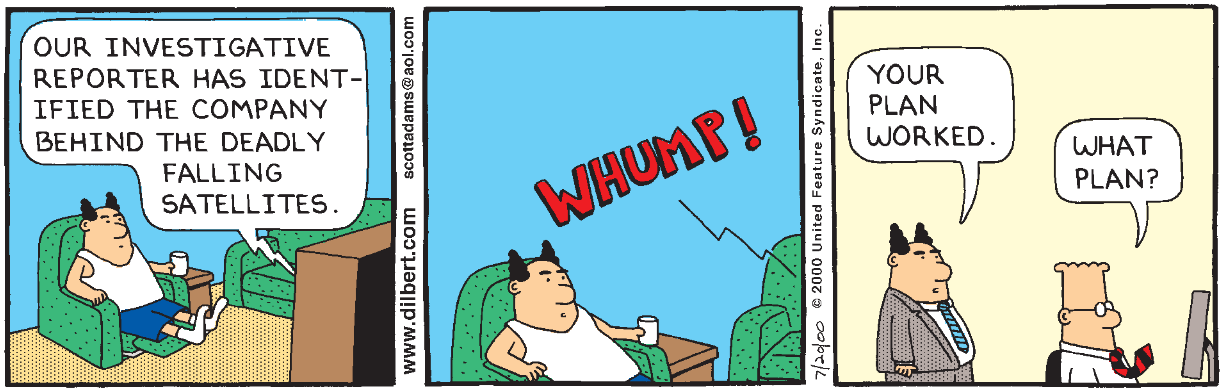
11

Collection Series
#11-001041




OUR INVESTIGATIVE REPORTER HAS IDENTIFIED THE COMPANY BEHIND THE DEADLY FALLING SATELLITES.
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scottadams@aol.com
WHUMP!
© 2000 United Feature Syndicate, Inc.
7/20/00
YOUR PLAN WORKED.
WHAT PLAN?

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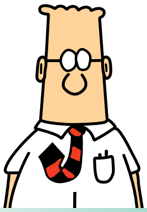
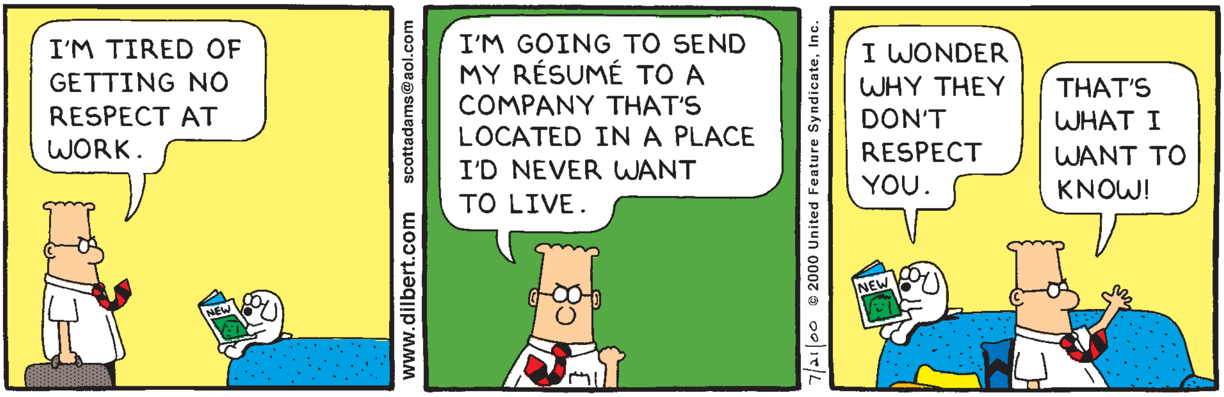
11

Collection Series
#11-001042




I'M TIRED OF GETTING NO RESPECT AT WORK.
NEW
www.dilbert.com
scottadams@aol.com
I'M GOING TO SEND MY RÉSUMÉ TO A COMPANY THAT'S LOCATED IN A PLACE I'D NEVER WANT TO LIVE.
© 2000 United Feature Syndicate, Inc.
7/21/00
I WONDER WHY THEY DON'T RESPECT YOU.
THAT'S WHAT I WANT TO KNOW!
NEW

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Stamford, CT 06907-0047

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ΩOMEGA®

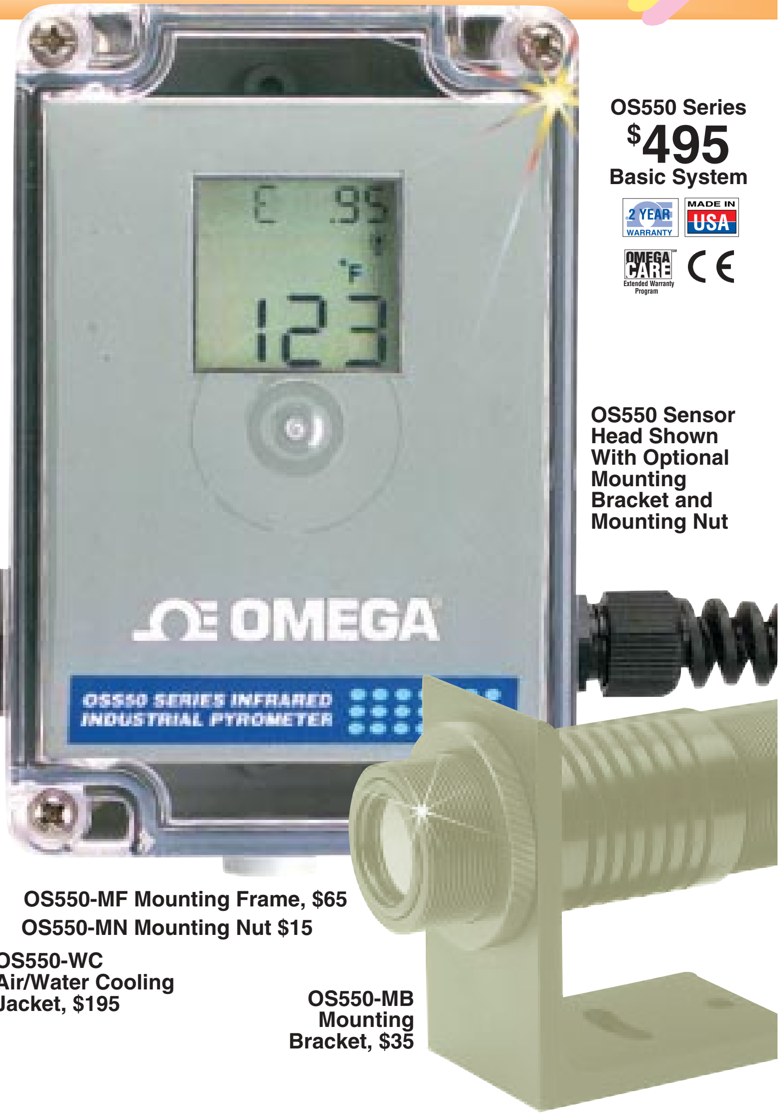
NEW

Industrial Non-Contact Infrared Thermometer/Transmitter
with Local Display and Analog Output

- Accuracy ±1% of Reading
- Models with Temperature Ranges Measuring up to 2500°F (1370°C)
- Current,Voltage or Millivolt Output
- Laser Sight Optional
- °C/°F Keypad Selectable
- Local Backlit LCD Display Standard
- Dual Display Indicates Current Plus Min, Max, Average or Differential Temperatures on Most Models
- Visual and Audible High/Low Alarm
- Emissivity Adjustable from 0.1 to 1.00 in 0.01 Steps via the Programmable Keypad
- Fast 250 msec Response Time
- NEMA-4 Enclosure
- RS-232 Communication
- Safe and Easy to Install

OS550 Series
$495
Basic System

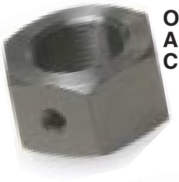
2 YEAR WARRANTY
MADE IN USA
OMEGA CARE Extended Warranty Program
CE



Shown smaller than actual size

OS550 Sensor Head Shown With Optional Mounting Bracket and Mounting Nut

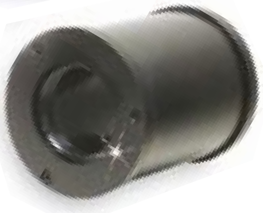
Available Accessories



OS550-AP Air Purge Collar, $65

OS550-MF Mounting Frame, $65

OS550-MN Mounting Nut $15



OS550-WC Air/Water Cooling Jacket, $195

OS550-MB Mounting Bracket, $35

OMEGACARE^{SM} extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order.

OMEGA's new OS550 Series industrial, high performance, economical thermometer/transmitter offers a wide choice of temperature ranges, optical patterns or fields of view and three outputs (1 mV/ degree, 4-20 mA, and 0-5 Vdc) to feed directly into panel meters, recorders, temperature/process controllers, dataloggers, data acquisition systems or other process instrumentation.

Since the OS550 Series infrared thermometers do not use chopper motors or vibrator mechanisms, they can be mounted in any position and in hostile environments without suffering any loss in performance.

This rugged design coupled with their relatively small dimensions make these sensors ideally suited for a wide variety of applications.

Specifications

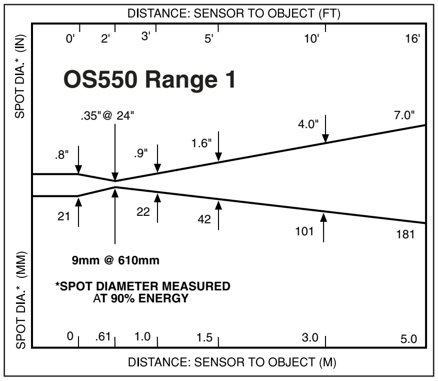
Accuracy: ±1% of reading or 3°F @ 25°C ambient , whichever is greater
Repeatability: ±1% rdg ±1 digit
Spectral Response: 8-14 microns
Emissivity Range: 0.10 to 0.99
Field of View (FOV): See Diagrams
Display: Backlit LCD
Transmitter Outputs:
1 mV/degree, 0 to 5 Vdc, or 4 to 20 mA
Power: 7 to 24 Vdc @ 80 mA
Environmental Ratings:
NEMA-4 water tight and dust tight for electronics enclosure
Ambient Operating Range:
sensing head -18 to 85°C (0 to 185°F) with OS550-WC; 0 to 50°C (32 to 122°F) without OS550-WC
Electronics, 0 to 50°C (32 to 122°F)
Response Time:
250 msec; 0 to 63.2%
Alarms: Visual and audible
RS-232: Standard on OS552, OS553, and OS554 models. One way communication.PC compatible software included.
Connection: 4.5 m (15 ft.)
Head and Power Cable Included
Dimensions:
Sensing Head: 10.9 x 4.1 cm (4.30 x 1.63"),1½-20 thread
Electronics: 13.3 x 9.1 cm (5.25 x 3.62")
Weight:
Sensing Head: 0.45 kg (12 oz)
Electronics Mounted in NEMA-4 Enclosure: 1.2 kg (43.2 oz)

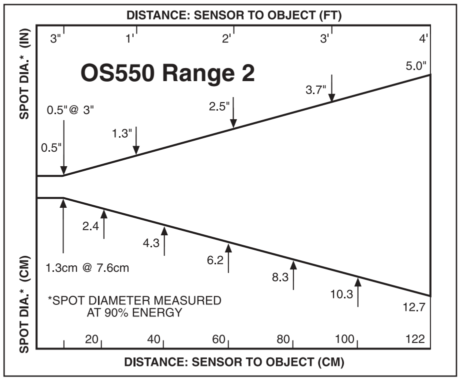
We make running changes when technical advances allow. Check at time of ordering for additional features.

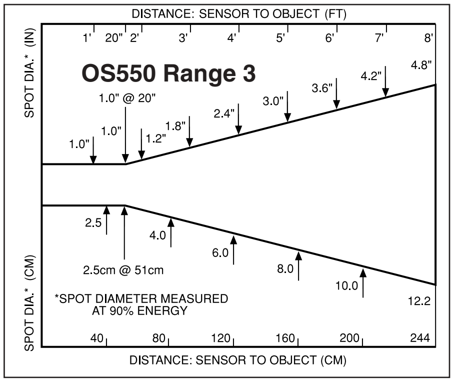
OMEGA ENGINEERING, INC. STAMFORD, CT 06907-0047
LASER SIGHT MODULE DANGER
LASER RADIATION - AVOID DIRECT EYE EXPOSURE
MAX. OUTPUT < 5mW, WAVE LENGTH 670 nm
CLASS IIIa LASER PRODUCT
COMPLIES WITH 21 CFR CHAPTER 1, SUBCHAPTER J.
AVOID EXPOSURE LASER RADIATION IS EMITTED FROM THIS APERTURE

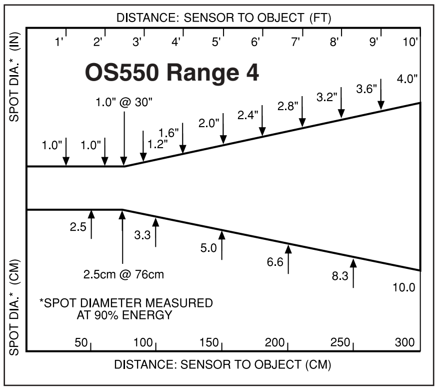
Industrial Infrared Thermometer, OS550 Series

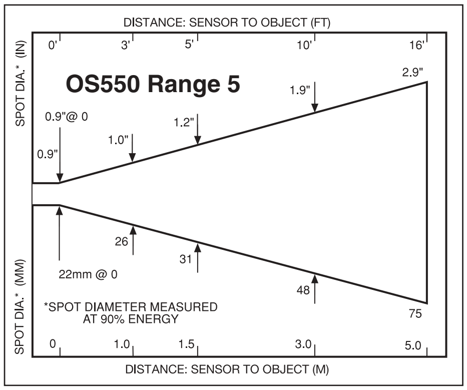
OS550 Series Optical Field of View Diagrams

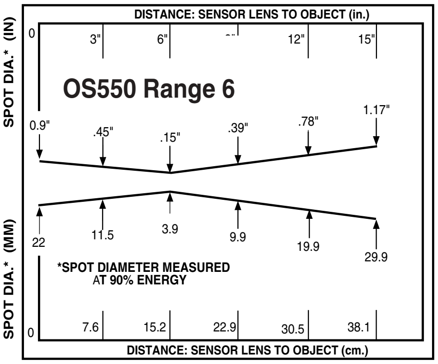

DISTANCE: SENSOR TO OBJECT (FT)
0' 2' 3' 5' 10' 16'
SPOT DIA.* (IN)
OS550 Range 1
.35" @ 24"
.8"
.9"
1.6"
4.0"
7.0"
21
22
42
101
181
9mm @ 610mm
*SPOT DIAMETER MEASURED AT 90% ENERGY
SPOT DIA.* (MM)
0 .61 1.0 1.5 3.0 5.0
DISTANCE: SENSOR TO OBJECT (M)


DISTANCE: SENSOR TO OBJECT (FT)
3" 1' 2' 3' 4'
SPOT DIA.* (IN)
OS550 Range 2
0.5"@ 3"
0.5"
1.3"
2.5"
3.7"
5.0"
2.4
4.3
6.2
8.3
10.3
12.7
1.3cm @ 7.6cm
*SPOT DIAMETER MEASURED AT 90% ENERGY
SPOT DIA.* (CM)
20 40 60 80 100 122
DISTANCE: SENSOR TO OBJECT (CM)


DISTANCE: SENSOR TO OBJECT (FT)
1' 20" 2' 3' 4' 5' 6' 7' 8'
SPOT DIA.* (IN)
OS550 Range 3
1.0" @ 20"
1.0"
1.0"
1.2"
1.8"
2.4"
3.0"
3.6"
4.2"
4.8"
2.5
4.0
6.0
8.0
10.0
12.2
2.5cm @ 51cm
*SPOT DIAMETER MEASURED AT 90% ENERGY
SPOT DIA.* (CM)
40 80 120 160 200 244
DISTANCE: SENSOR TO OBJECT (CM)


DISTANCE: SENSOR TO OBJECT (FT)
1' 2' 3' 4' 5' 6' 7' 8' 9' 10'
SPOT DIA.* (IN)
OS550 Range 4
1.0" @ 30"
1.0"
1.0"
1.2"
1.6"
2.0"
2.4"
2.8"
3.2"
3.6"
4.0"
2.5
3.3
5.0
6.6
8.3
10.0
2.5cm @ 76cm
*SPOT DIAMETER MEASURED AT 90% ENERGY
SPOT DIA.* (CM)
50 100 150 200 250 300
DISTANCE: SENSOR TO OBJECT (CM)


DISTANCE: SENSOR TO OBJECT (FT)
0' 3' 5' 10' 16'
SPOT DIA.* (IN)
OS550 Range 5
0.9"@ 0
0.9"
1.0"
1.2"
1.9"
2.9"
26
31
48
75
22mm @ 0
*SPOT DIAMETER MEASURED AT 90% ENERGY
SPOT DIA.* (MM)
0 1.0 1.5 3.0 5.0
DISTANCE: SENSOR TO OBJECT (M)


DISTANCE: SENSOR LENS TO OBJECT (in.)
0 3" 6" -- 12" 15"
SPOT DIA.* (IN)
OS550 Range 6
0.9"
.45"
.15"
.39"
.78"
1.17"
22
11.5
3.9
9.9
19.9
29.9
SPOT DIA.* (MM)
*SPOT DIAMETER MEASURED AT 90% ENERGY
0 7.6 15.2 22.9 30.5 38.1
DISTANCE: SENSOR LENS TO OBJECT (cm.)

To Order Complete System

Model Number	Price	Output	Temperature Range	RS-232
OS551-MV-(*)	**$495**	1 mV/deg.	-18 to +400°C (0 to +750°F)	—
OS551-MA-(*)	**495**	4-20 mA	-18 to +400°C (0 to +750°F)	—
OS551-V1-(*)	**495**	0-5 Vdc	-18 to +400°C (0 to +750°F)	—
OS552-MV-(*)	**550**	1 mV/deg.	-18 to +400°C (0 to +1000°F)	Standard
OS552-MA-(*)	**550**	4-20 mA	-18 to + 540°C (0 to +1000°F)	Standard
OS552-V1-(*)	**550**	0-5 Vdc	-18 to + 540°C (0 to +1000°F)	Standard
OS553-MV-(*)	**650**	1 mV/deg.	-18 to +870°C (0 to +1600°F)	Standard
OS553-MA-(*)	**650**	4-20 mA	-18 to +870°C (0 to +1600°F)	Standard
OS553-V1-(*)	**650**	0-5 Vdc	-18 to +870°C (0 to +1600°F)	Standard
OS554-MV-(*)	**750**	1 mV/deg.	-18 to +1370°C (0 to +2500°F)	Standard
OS554-MA-(*)	**750**	4-20 mA	-18 to +1370°C (0 to +2500°F)	Standard
OS554-V1-(*)	**750**	0-5 Vdc	-18 to +1370°C (0 to +2500°F)	Standard

MOST POPULAR MODEL HIGHLIGHT

** Insert optics code from table below. **Ordering Example:** OS552-MA-2, Infrared thermometer with 0 to 1000°F range, 4-20 mA output and spot size .5" at 3", **$550. Note:** Sensor head cable can be extended at the factory at time of purchase to a maximum of 50 feet (15m). Add suffix -(*) FT to order number and $1 per FT over 15FT to price. **Ordering Example:** OS551-MA-2-35 FT, OS551 with current output, .5 at 3" FOV, 35 FT sensor head cable, $495 + 20 = **$515. OCW-1** OMEGACARE℠ extends standard 2-year warranty to a total of 3 years ($51), $515 + 51 = **$566.***

Optical Table*

Optical Range Code	Field of View (FOV)
– 1	Spot Size .35" @ 24"
– 2	Spot Size .5" @ 3"
– 3	Spot Size 1" @ 20"
– 4	Spot Size 1" @ 30"
– 5	Spot Size 1" @ 60"
– 6	Spot Size .15" @ 6"

Accessories

Model Number	Price	Description
OS550-AP	**$65**	Air purge collar
OS550-WC	**195**	Air/water cooling jacket
OS550-MF	**65**	Mounting frame
OS550-MB	**35**	Right-angle mounting bracket
OS550-MN	**15**	Mounting nut
OS550-LS	**195**	Sighting viewer (laser) (not shown)*
CAL-3-IR	**125**	NIST Calibration Certification
PSU-93	**40**	24 Vdc power supply
TX4-100	**28.50**	Power/output extension wire (100 feet)

**One unit suitable for aligning many heads.*

NEW

Pocket Laser Infrared Meter

OMEGAETTE™ — Moderately Priced Instruments.
Ideal for Education, Training and Demonstration Programs

- **Low Cost Pocket IR with Laser Sighting**
- **6:1 Field of View Optics**
- **Max/Min/Delta T/Average T**
- **Recall/Audio Alarm**
- **Temperature Range: -20 to 315°C (-4 to 600°F)**

Model OS8885
$125

Shown smaller than actual size

Model OS8886
$149

1 YEAR WARRANTY CE

Models OS8885 and OS8886 at a Glance

- Non-contact temperature measurement with laser circle sighting
- Adjust the emissivity of the meter to get a reliable temperature reading (OS8886)
- Audio alarm for temperature limits (OS8886)
- Easy to use, simple and accurate!
- A popular meter for the temperature measurement of process conditions and rotating objects
- Simple one-hand operation
- 6:1 Field of View
- Wide range of applications include: heating and air conditioning, safety and fire inspectors, plastics molding, asphalt, marine, screen printing, measure ink and dryer temperature
- Class II laser product

Specifications

Laser Power Output: <1mWat 675nm wave length

Battery Life: 100 hr (9 V)

Operating Temp: 10 to 40°C, 10 to 90% RH

Display Hold Features:

LCD Size: 19 x 34 mm (¾" x 1⅜")

Auto Power Off: After 4 seconds of non-operation

Temperature Range: -20 to 315°C (-4 to 600°F)

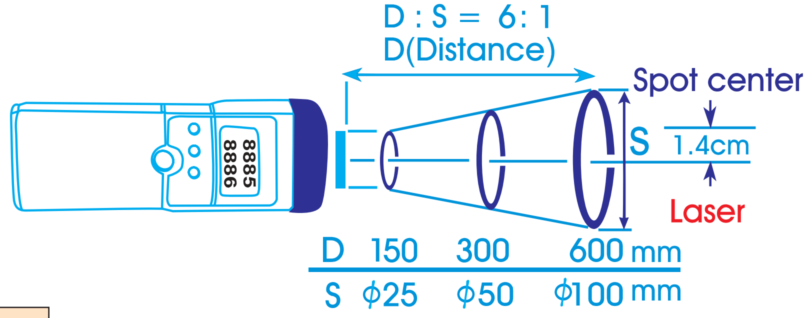
Repeatability: ±1°C or ±2°F

Response Time: 500 ms

Meter Includes: Soft case, battery, manual, wrist strap

Weight: 180 g (6.3 oz)

Dimensions: 156 L x 33 W x 52.6 mm H (6.1" x 1.3" x 2")



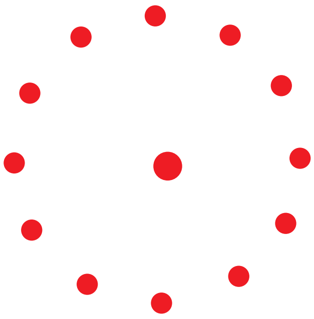
Model No.	Emissivity	Accuracy	Features
OS8885	Pre-set (0.95)	±3°C or ±3%	Pre-set unit °C or °F
OS8886	Adjustable (0.3 to 1.0)	±2°C or ±2%	°C/°F Switchable,9 point Memory, Max/Min/Delta T/ Average/Audio alarm

To Order *(Specify Model Number)*

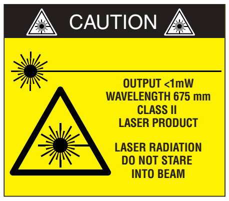
Model No.	Price	Description
OS8885	$129	Pocket IR, fixed emissivity
OS8886	149	Pocket IR, adjustable emissivity, memory, alarm

Each meter is supplied with a soft case, battery, manual, and wrist strap.
Ordering Example: OS8886,** pocket IR with adjustable emissivity, memory and alarm, **$149.

Laser Circle
Patented and Patents Pending



Covered by one or more of the following patents: U.S. PAT. B1 5,368,392; 5,524,984; 5,823,678; Germany G 94 22 197.9, G 94 22 203.7; France 2 767 921; Holland 1007752; other U.S. and Foreign Patent Applications Pending



OS545 Infrared Thermometer

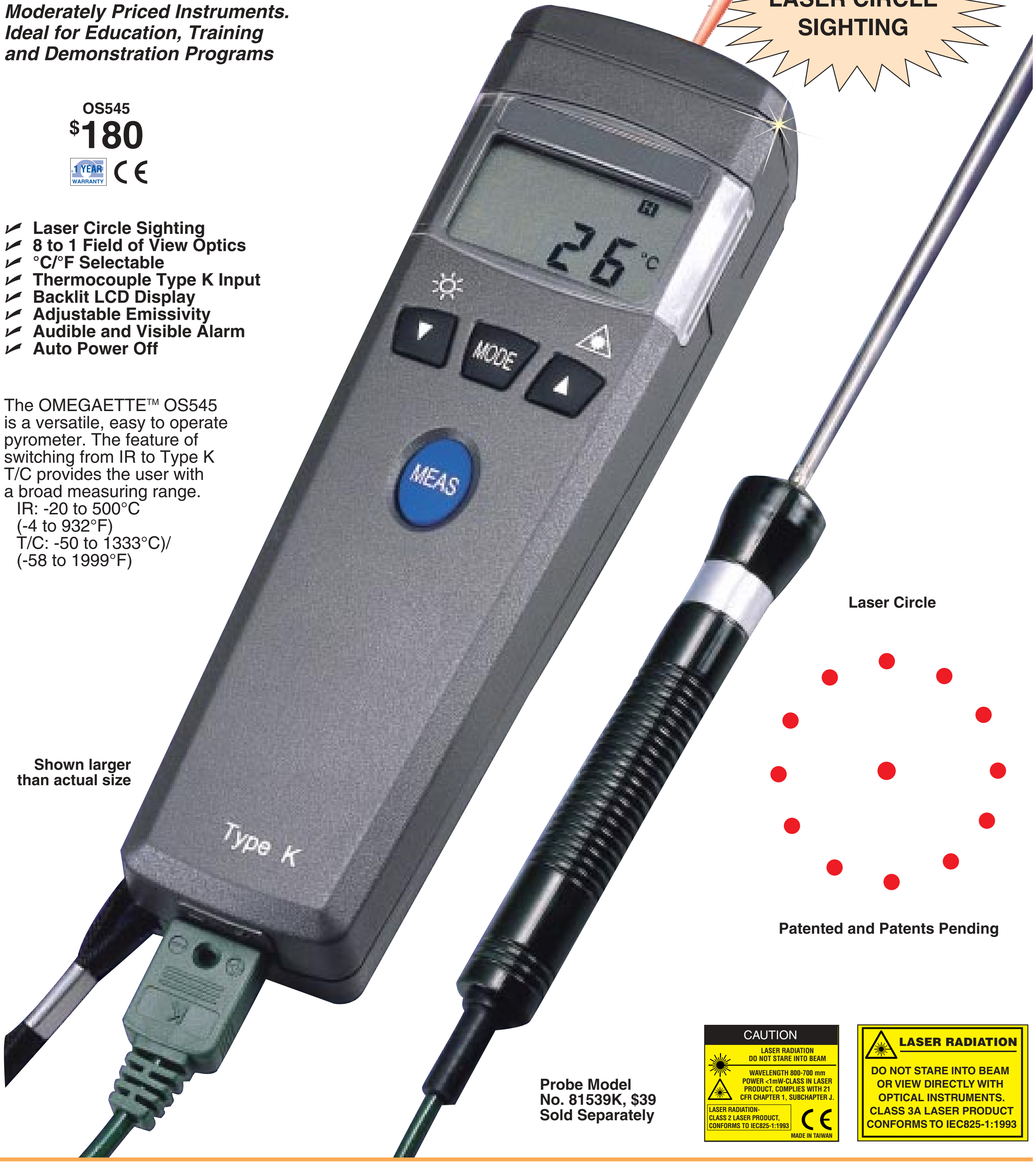
OMEGAETTE™ —
Moderately Priced Instruments.
Ideal for Education, Training
and Demonstration Programs

LASER CIRCLE SIGHTING

OS545
$180
1 YEAR WARRANTY CE

- **Laser Circle Sighting**
- **8 to 1 Field of View Optics**
- **°C/°F Selectable**
- **Thermocouple Type K Input**
- **Backlit LCD Display**
- **Adjustable Emissivity**
- **Audible and Visible Alarm**
- **Auto Power Off**

The OMEGAETTE™ OS545 is a versatile, easy to operate pyrometer. The feature of switching from IR to Type K T/C provides the user with a broad measuring range.
IR: -20 to 500°C
(-4 to 932°F)
T/C: -50 to 1333°C)/
(-58 to 1999°F)



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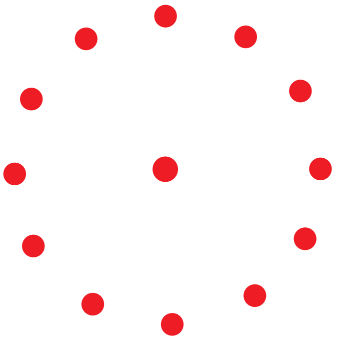
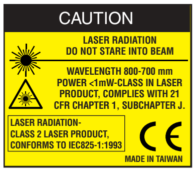
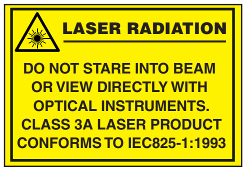
Probe Model No. 81539K, $39 Sold Separately

Laser Circle



Patented and Patents Pending


CAUTION
LASER RADIATION
DO NOT STARE INTO BEAM
WAVELENGTH 800-700 mm
POWER <1mW-CLASS IN LASER
PRODUCT, COMPLIES WITH 21
CFR CHAPTER 1, SUBCHAPTER J.
LASER RADIATION-
CLASS 2 LASER PRODUCT,
CONFORMS TO IEC825-1:1993
CE
MADE IN TAIWAN


LASER RADIATION
DO NOT STARE INTO BEAM
OR VIEW DIRECTLY WITH
OPTICAL INSTRUMENTS.
CLASS 3A LASER PRODUCT
CONFORMS TO IEC825-1:1993

OMEGAETTE™ — Moderately Priced Instruments. Ideal for Education, Training and Demonstration Programs.

Specifications

- ✓ °C/°F Selectable
- ✓ Emissivity Adjustable
- ✓ Back-light LCD Display
- ✓ Audible and Visible Alarm
- ✓ Laser Targeting
- ✓ Thermocouple Input K -50 to 1333°C (-58 to 1999°F)
- ✓ Laser Circle Sighting
- ✓ 8 to 1 Field of View Optics

Infrared Thermometer Specifications

Display: Backlight LCD display
Measurement Range : -20 to 500°C (-4 to 932°F)
Resolution: 1°C / 1°F
Accuracy: ±3% reading or ±3°C
Spectral Response: 6 to 14 μm
Field of View: 8:1 optics ratio with a 1" min target
Emissivity: adjustable 0.1 to 1.0
Auto Power Off: approx. 15 sec
Sighting: Laser circle marker 1mw
Laser Safety Classification: Class 2

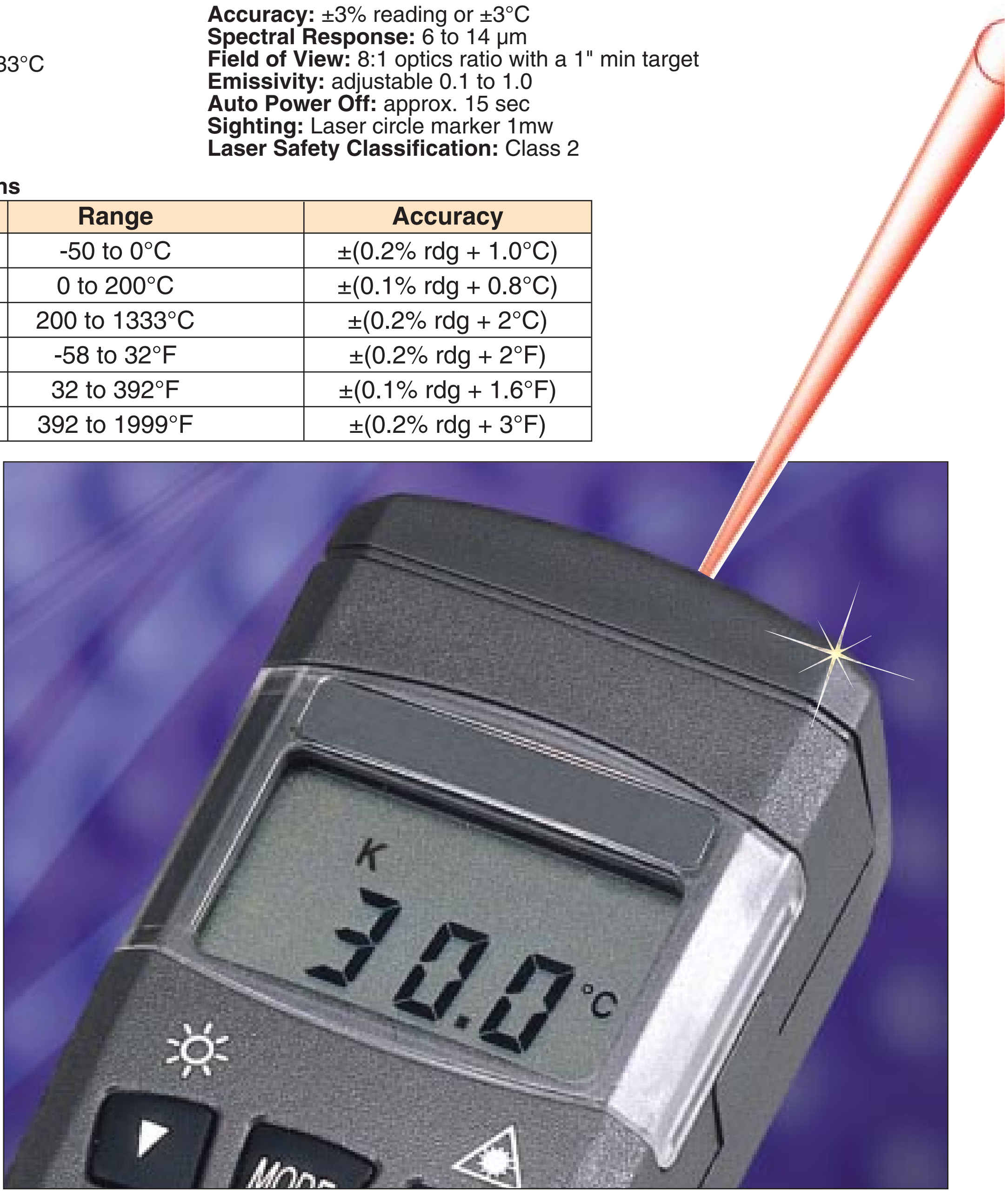
Type-K Thermometer Specifications

Function	Resolution	Range	Accuracy
°C	0.1°C	-50 to 0°C	±(0.2% rdg + 1.0°C)
		0 to 200°C	±(0.1% rdg + 0.8°C)
	1°C	200 to 1333°C	±(0.2% rdg + 2°C)
°F	0.1°C	-58 to 32°F	±(0.2% rdg + 2°F)
		32 to 392°F	±(0.1% rdg + 1.6°F)
	1°C	392 to 1999°F	±(0.2% rdg + 3°F)

Type K Thermometer Specifications

(Thermocouple probes sold separately. See Section A of the Temperature Handbook™).
Display: Backlit LCD Display
Measurement Range:
-50 to 1333°C (-58 to 1999°F)
Resolution:
0.1°C/1°C, 0.1°F/1°F
Battery Life: 50 hr
Power Source:
One 9V Battery (included)
Operating / Storage Condition:
0 to 40°C (32 to 104°F)
below 80% RH;
-10 to 60°C (14 to 140°F)
below 70% RH
Dimensions:
170 H X 44 W X 40 mm D
(6.7 x 1.7 x 1.6")
Weight: 180 g (6.3 oz)

Covered by one or more of the following patents:U.S. PAT. B1 5,368,392; 5,524,984; 5,727,880; 5,823,678; 5,823,679; Germany G 94 22 197.9, G 94 22 203.7, France 2 767 921; Holland 1007752; other U.S. and Foreign Patents Applications Pending



Large Easy to Read Display

To Order *(Specify Model Number)*

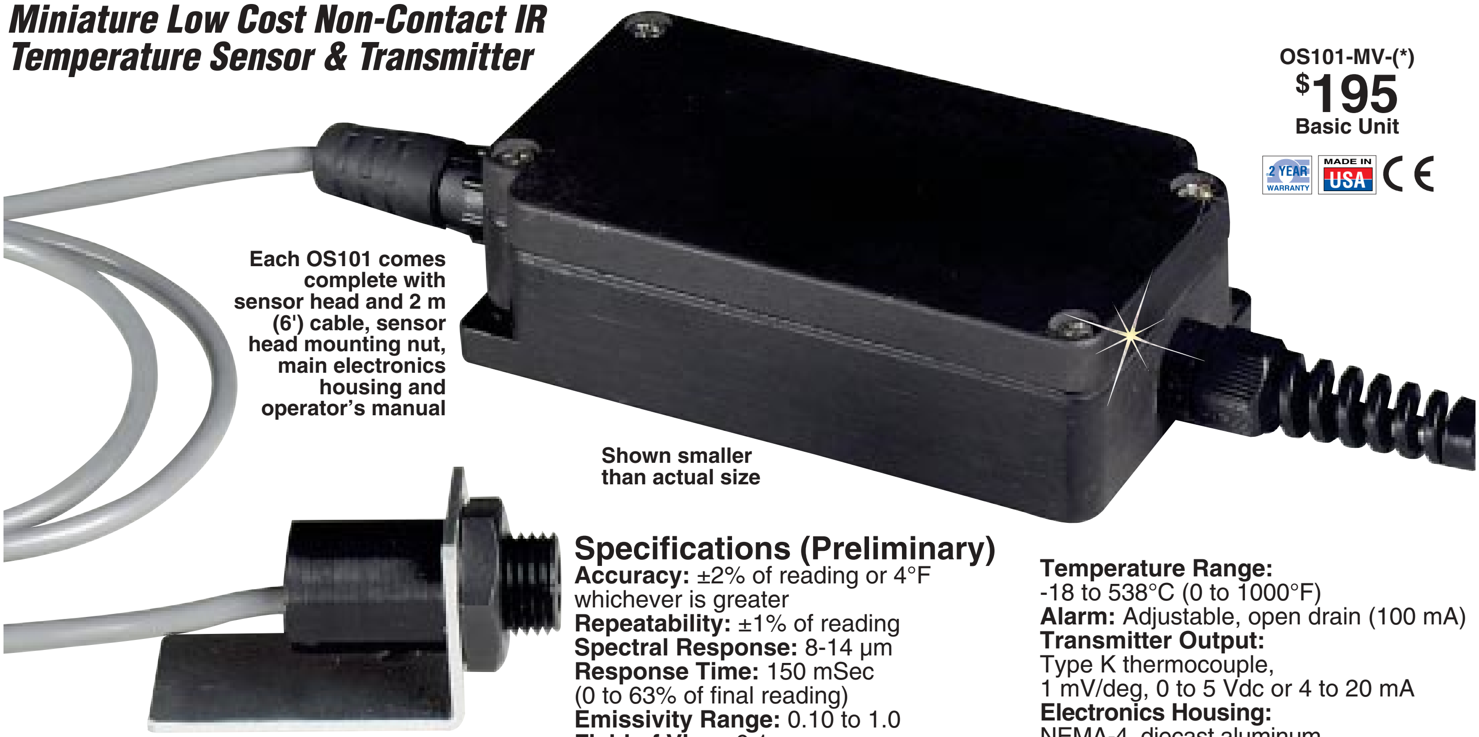
Model No.	Price	Description
OS545	**$180**	Infrared/Type K Thermometer with Laser Circle Sighting
81539K	**39**	Type K Surface Probe, 304SS, 150 mm (5.9") Length Sheath

Each meter is supplied with a battery, soft case, manual and wrist strap. Ordering Example: OS545*, infrared/Type K thermometer, battery, soft carrying case, laser circle sighting, and user manual,* ***$180.***

Miniature Low Cost Non-Contact IR Temperature Sensor & Transmitter

OS101-MV-(*)
$195
Basic Unit

2 YEAR WARRANTY MADE IN USA CE

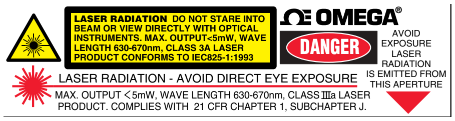


Each OS101 comes complete with sensor head and 2 m (6') cable, sensor head mounting nut, main electronics housing and operator's manual

Shown smaller than actual size

- **-18 to 538°C (0 to 1000°F) Measurement Range**
- **Adjustable Emissivity From 0.10 to 1.0**
- **Fast, Accurate, Repeatable Readings**
- **Type K Thermocouple, 0 to 5 Vdc, 4 to 20 mA or 1 mV/Deg. Analog Output Models**
- **Rugged, Miniature Industrial Design with Remote Sensor Head**
- **User Adjustable High or Low Alarm Standard**
- **NEMA-4 Metal Housing**

OMEGA's new low cost OS100 Series mini infrared transmitter system features a remotely mounted infrared temperature sensor and high performance microprocessor based signal conditioner. The OS100's miniature sensor head design is ideal for measuring temperature in confined, hard-to-reach places and harsh environments. The sensor head is connected to the main electronics housing via a 1.8 m (6') shielded cable standard on all models. The signal conditioners main electronics are mounted in a rugged NEMA-4 rated diecast aluminum housing and feature adjustable emissivity, linear voltage, current or type K thermocouple output calibrated for the temperature range of -18 to 538°C (0 to 1000°F). A user adjustable high/low alarm output is standard on all models.



LASER RADIATION DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS. MAX. OUTPUT<5mW, WAVE LENGTH 630-670nm, CLASS 3A LASER PRODUCT CONFORMS TO IEC825-1:1993

OMEGA®

DANGER

AVOID EXPOSURE LASER RADIATION IS EMITTED FROM THIS APERTURE

LASER RADIATION - AVOID DIRECT EYE EXPOSURE

MAX. OUTPUT <5mW, WAVE LENGTH 630-670nm, CLASS IIIa LASER PRODUCT. COMPLIES WITH 21 CFR CHAPTER 1, SUBCHAPTER J.

Specifications (Preliminary)

Accuracy: ±2% of reading or 4°F whichever is greater
Repeatability: ±1% of reading
Spectral Response: 8-14 µm
Response Time: 150 mSec (0 to 63% of final reading)
Emissivity Range: 0.10 to 1.0
Field of View: 6:1
Open Aperture: 0.4"
Ambient Operating Range:
Main electronics: 0 to 50°C (32 to 122°F)
Sensor head: 0 to 70°C (32 to 158°F)
High temp sensor head (-HT): 0 to 85°C (32 to 158°F)
Power: 12 to 24 Vdc
Temperature Range:
-18 to 538°C (0 to 1000°F)
Alarm: Adjustable, open drain (100 mA)
Transmitter Output:
Type K thermocouple,
1 mV/deg, 0 to 5 Vdc or 4 to 20 mA
Electronics Housing:
NEMA-4, diecast aluminum
Sensor Head Cable Length:
1.8 m (6') standard
Dimensions:
11.4 x 6.3 x 3 cm (4.5" x 2.5" x 1.2")
Weight: 272 g (0.6 lb)
Sensor Head: 2.5 dia. x 6.3 cm long (1" x 2.5") with ¾-16 UNF thread

☐ ***MOST POPULAR MODEL HIGHLIGHTED!***

To Order *(Specify Model Number)*

Model Number	Price	Description
OS101-MV-*	**$195**	Transmitter with 1 mV/°C or °F output
OS101-K	**195**	Transmitter with type K output
OS101-V1	**195**	Transmitter with 0 to 5 Vdc output
OS101-MA	**245**	Transmitter with 4 to 20 mA output

*(*) Insert **F** for mV/°F or **C** for mV/°C output*
*Insert **-HT** to model number for high temperature sensor head and add **$100.***
Ordering Example: OS101-MA + OS100-LS + OS100-CA15FT,** is a transmitter with 4 to 20 mA output, laser sighting accessory and (4.6 m) 15' sensor head extension cable, $245 + 175 + 35 = **$455.

Accessories

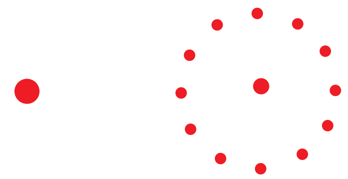
Model Number	Price	Description
OS100-MB	**$20**	Mounting Bracket
OS100-DR	**25**	DIN Rail Mounting Adaptor
OS100-AP	**30**	Air Purge Collar
OS100-WC	**175**	Water Cooling Jacket, up to 200°C
OS100-LS	**175**	Laser Sighting Accessory
OS100-CA15FT	**35**	Sensor Head Extension Cable 4.6 m (15')
OS100-CA25FT	**45**	Sensor Head Extension Cable 7.6 m (25')
TX8-100	**45.50**	Power / Output Cable 30 m (100')
PSU-93	**40**	24 Vdc Power Supply
CAL-3-IR	**125**	NIST Traceable Calibration

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
1 YEAR WARRANTY
CE

Laser Sight Model Configurations



Laser Circle to Dot Switchable!

Patent No:
6,095,682
Other U.S. and Foreign Patents Pending

25°C
InfraRed Thermometer
ON HOLD
°F/°C
LASER
BACKLIT

Infrared Thermometer
25°C
CE
MEASURE
C/F
LASER
BACK LIGHT

⚠ CAUTION
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

Shown slightly smaller than actual size

Specifications

- Circle or Dot Laser Sighting
- 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 µm
- 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
- 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.***

Miniature Blackbody Calibration Source; Portable Design and High Temperature Range

Model BB703
$890
Basic Unit

230 Vac model only

- **Calibrates from Ambient +10 to 400°C (Ambient +20 to 752°F)**
- **Portable Miniature Design**
- **Built-in Digital 1⁄32 DIN Temperature Controller**
- **Calibrates Infrared Instruments Quickly and Accurately**
- **NIST-Traceable Calibration Certificate with 3 Data Points Included**

BLACK POINT Blackbody Calibrator
OMEGA BB703
F 680.0

Shown slightly smaller than actual size

The BB703 is a high performance, rugged, miniature blackbody calibrator. It is used for infrared pyrometer calibrations with a temperature range of ambient +10 to 400°C (ambient +20 to 752°F). With its unique miniature design and built-in 29 mm (1.125") target plate, the BB703 is an ideal and economical infrared calibrator for any laboratory or field service application.

Specifications

Temperature Range: Ambient +10 to 400°C (Ambient +20 to 752°F)
Accuracy: ±1.4°C (±2.5°F)
Resolution: 0.1°
Stability: 0.3°C (±0.5°F)
Ambient Operating Range: 0 to 40°C (32 to 104°F)
Target Emissivity: 0.97
Target Plate Diameter: 29 mm (1.125")
Power: 115 Vac, 50/60 Hz or 230 Vac, 50/60 Hz,175 W
Size: 127 x 56 x 155 mm (5 W x 2.2 H x 6.1" D)
Weight: 1.09 kg (2.4 lb)

OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order.

Caution: To avoid fire hazard or damage to your calibrator, always allow your calibrator to cool down to ambient temperature before returning to storage.

We make running changes when technical advances allow. Check at time of ordering for additional features.

To Order *(Specify Model Number)*

Model No.	Price	Description
BB703	$890	Miniature blackbody calibration source,115 Vac
BB703-230VAC	890	Miniature blackbody calibration source, 230 Vac

****Note:** Only 230 Vac model is available as CE marked.*

Ordering Example: **BB703**, 115 Vac Blackbody Calibration Source, **$890**. *OMEGACARE℠ extends standard 3-year warranty to a total of 4 years ($89), $890 + 89 = **$979.***

Hot/Cold Blackbody Calibration Source

Model BB701
$2995

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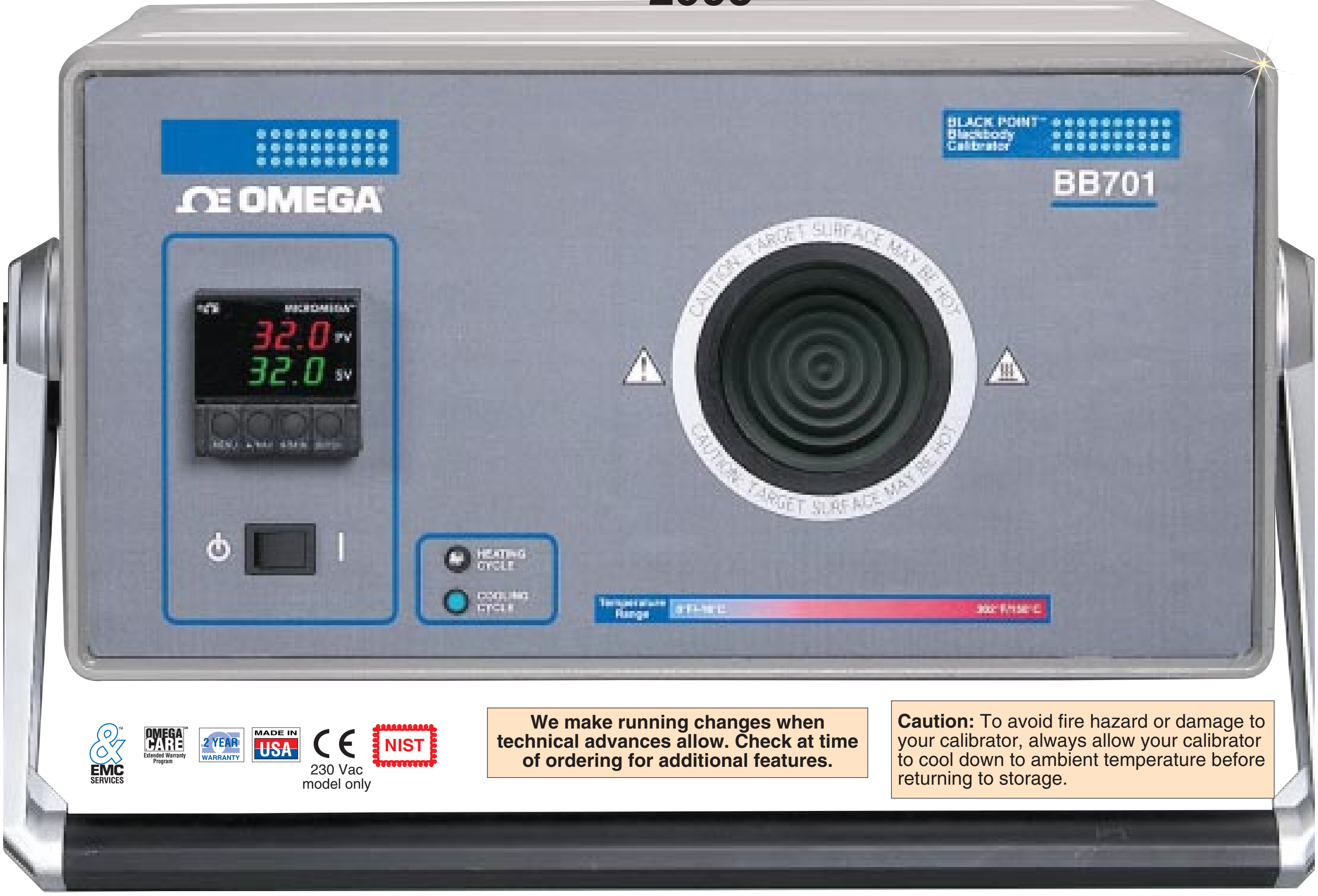

EMC SERVICES · OMEGA CARE Extended Warranty Program · 2 YEAR WARRANTY · MADE IN USA · CE 230 Vac model only · NIST

We make running changes when technical advances allow. Check at time of ordering for additional features.

Caution: To avoid fire hazard or damage to your calibrator, always allow your calibrator to cool down to ambient temperature before returning to storage.

- **Model BB701 Calibrates from -19 to 149°C (0 to 300°F)**
- **Portable Rugged Design**
- **Calibrates Infrared Pyrometers Quickly and Accurately**
- **Built in Digital PID Autotune Temperature Controller with Temperature Readout**
- **NIST Traceable Calibration Certificate Included with Three Data Points**
- **RS-232 Standard**
- **Special Nitrogen Purge Collar Limits Target Plate Condensation and Frosting at Low Temperatures**
- **Built-In RTD Reference Probe Output**

The BB701 Blackbody Calibrator is a high performance, rugged, portable calibrator for infrared pyrometers. The BB701 Hot/Cold model has a range of -19 to 149°C (0 to 300°F). The BB701's ability to provide a stable, repeatable cold calibration point allows the user to calibrate or test most infrared pyrometers quickly and accurately without having to prepare an ice bath. Both models come with an RS-232 computer interface which allows computer control of the setpoints for automatic test applications. A NIST traceable calibration certificate is also provided.

Specifications

Operating Temperature Range: (Blackbody Cavity): -19 to 149°C@29.4°C (0 to 300°F @ 85°F)
Ambient Temperature: 4.4 to 43°C (40 to 110°F)
Power: 115 Vac 50/60 Hz or 230 Vac 50/60 Hz,175 W
Internal Sensing Element: Platinum RTD
Stability: ±0.6°C (±0.1°F)
Accuracy: ±0.8°C (±1.4°F)
Display Resolution: 0.1°
Dimensions: 192 H x 364 W x 363 mm D (7.6 x 14.3 x 14.3")
Cavity Emissivity: .98
Cool Down Time: 5 min from ambient to -19°C (0°F).
Target Plate Diameter: 64 mm (2.5")
Weight: 12.7 kg (28 lb)

OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order.

To Order *(Specify Model Number)*

Model No.	Price	Description
BB701	$2995	Hot/Cold B.B. cal. source, 115 V, range: 19 to 149°C (0 to 300°F)
BB701-230VAC	2995	Hot/Cold B.B. cal. source, 230 V, range: 19 to 149°C (0 to 300°F)

***Note:** Only 230 Vac model is available as CE marked.*
***Ordering Example: BB701** Hot/Cold Blackbody Calibration Source comes complete with operator's manual and calibration certificate, **$2995**. OMEGACARE℠ extends standard 2-year warranty to a total of 3 years ($150), $2995 + 150 = **$3145**.*

OMEGAETTE™ — Moderately Priced Instruments. Ideal for Education, Training and Demonstration Programs.

Economical pH, ORP, Conductivity and TDS Testers

Model CDH-5021
$45

1 YEAR WARRANTY

- ✓ **Economical**
- ✓ **Easy to use**
- ✓ **Electrode Extends to 80 mm**

The CDH-5020 Series, PHH-5000 Series, and TDH-5031 are easy to use. The units feature a telescoping electrode which extends to 80 mm. The kits are supplied with a carrying case, battery, calibration solution, and complete instructions.

CDH-5021
TDH-5031
PHH-5011
ORP-5041

All products shown smaller than actual size
Carrying case, battery, screw driver, calibration solution and operation instructions included

Pull-Out Telescoping Electrodes!

▭ ***MOST POPULAR MODEL HIGHLIGHTED!***

To Order *(Specify Model No.)*

Model No.	CDH-5021	CDH-5022	TDH-5031	PHH-5011	PHH-5012	ORP-5041
Price	**$45**	**$47**	**$45**	**$45**	**$47**	**$85**
Range	10-9990 µs/m	0-999 µs/m	10-9990 ppm	0-14.0 pH	0-14.0 pH	±999 mV
Resolution	10 µs/m	1 µs/m	10ppm	.01 pH	.01 pH	1mV
Accuracy	±1%FS	±1%FS	±1%FS	±.2ph @ 25°C	±.01ph @ 25°C	±5%FS
ATC	Yes (0-50°C)	Yes (0-50°C)	Yes (0-50°C)	No	Yes (0-50°C)	No
Power (Battery)	9V	9V	9V	9V	3AA	9V
Size	Meter:158 x 40 x 34 mm (6 x 1.6 x 1.3"); carrying case: 165 x 100 x 40 mm (6.5 x 3.9 x 1.6")					
Weight	120 g (4.2 oz) with battery (avg)					

Unit comes complete with carrying case, battery, screw driver, calibration solution and operation instructions.
Ordering Example: PHH-5011,** pH tester, **$45.

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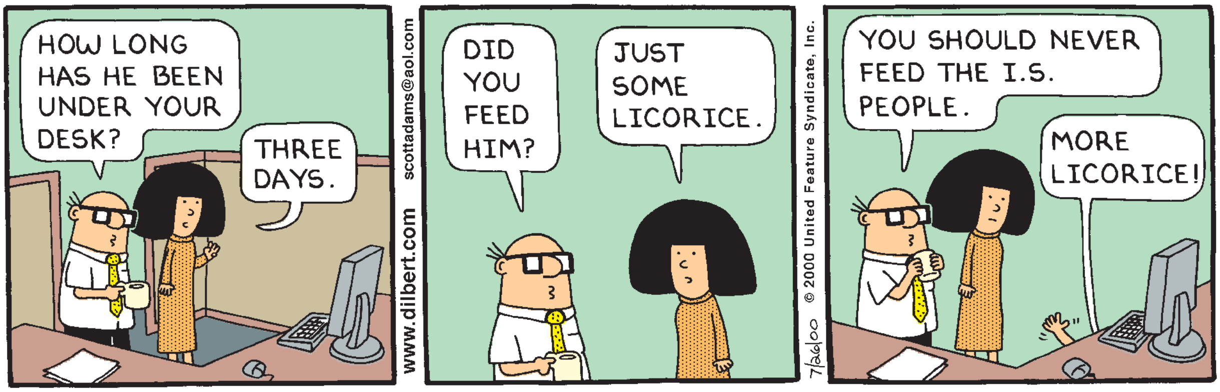
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11

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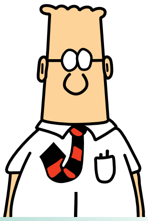

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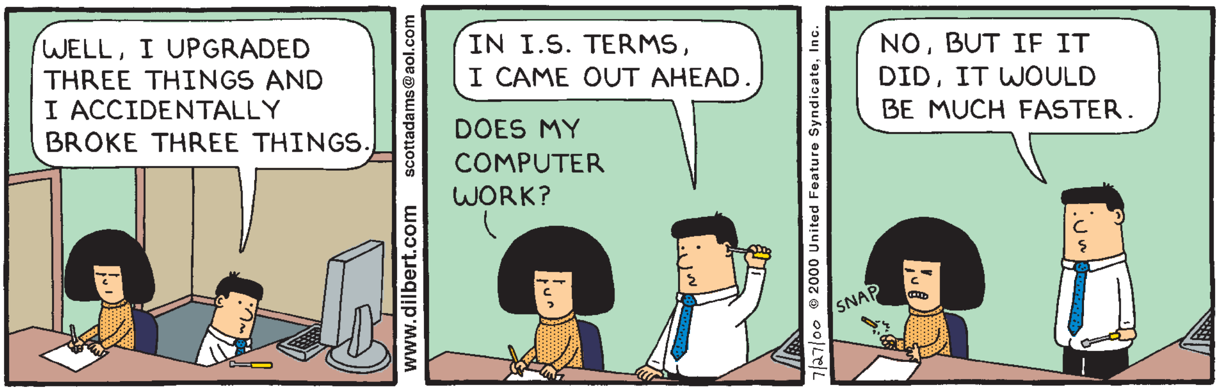
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DOES MY COMPUTER WORK?
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NO, BUT IF IT DID, IT WOULD BE MUCH FASTER.
SNAP

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11

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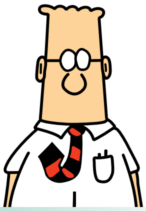

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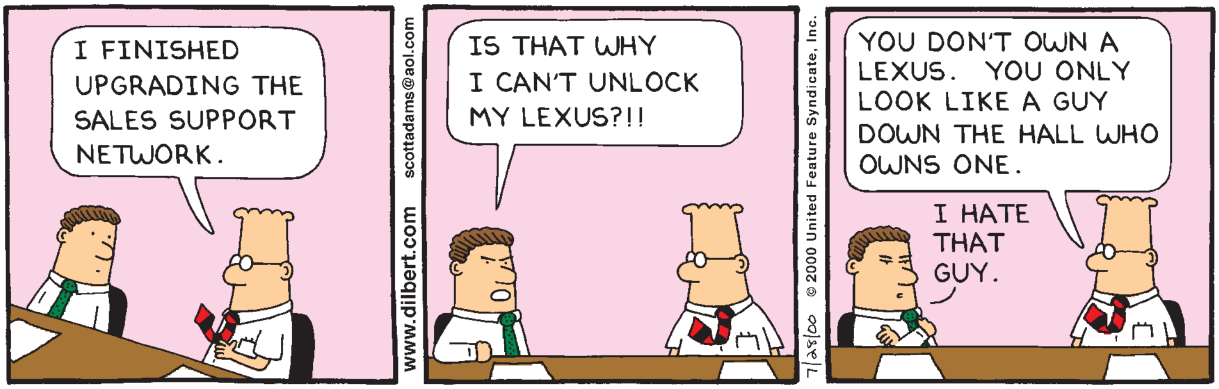
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11

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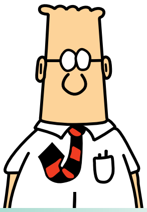

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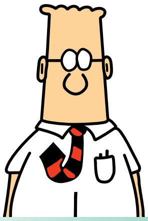
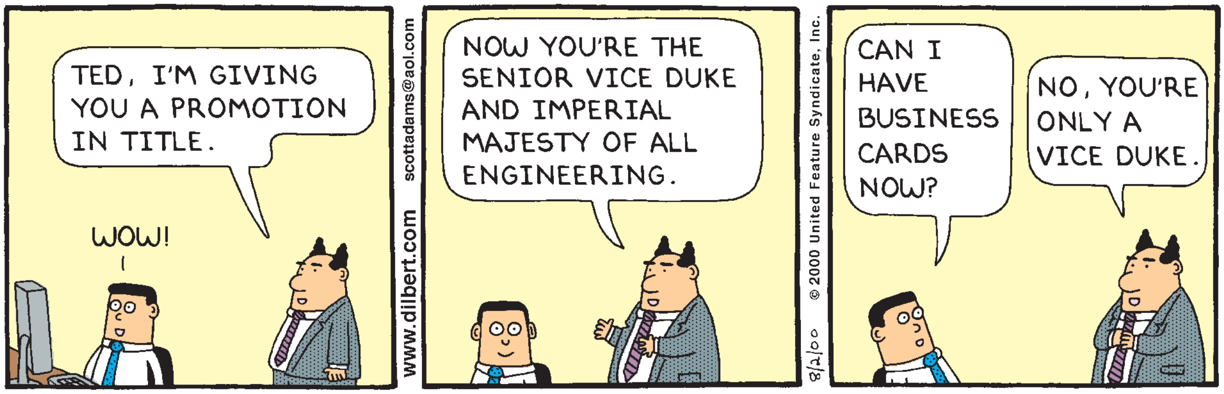
11

Collection Series
#11-001046

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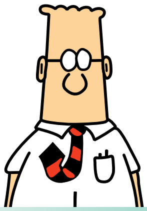

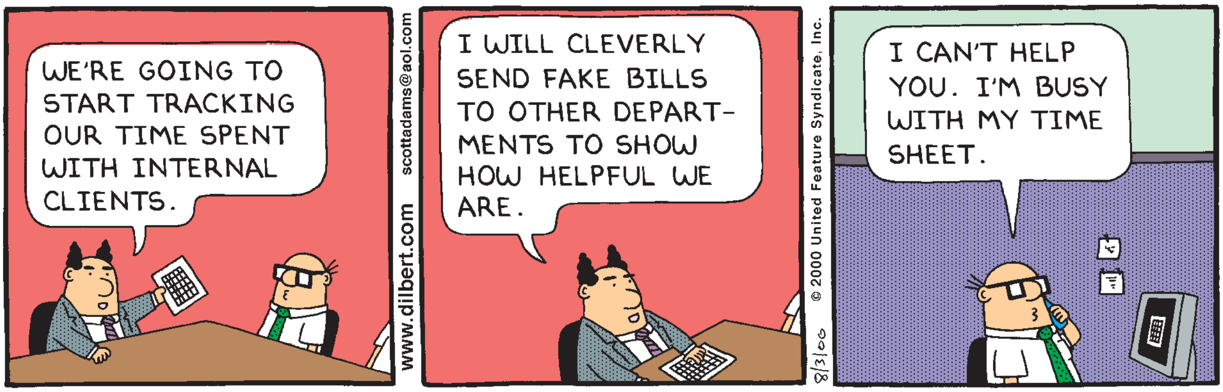
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I WILL CLEVERLY SEND FAKE BILLS TO OTHER DEPARTMENTS TO SHOW HOW HELPFUL WE ARE.
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I CAN'T HELP YOU. I'M BUSY WITH MY TIME SHEET.

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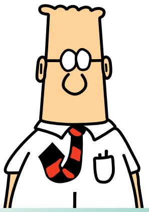

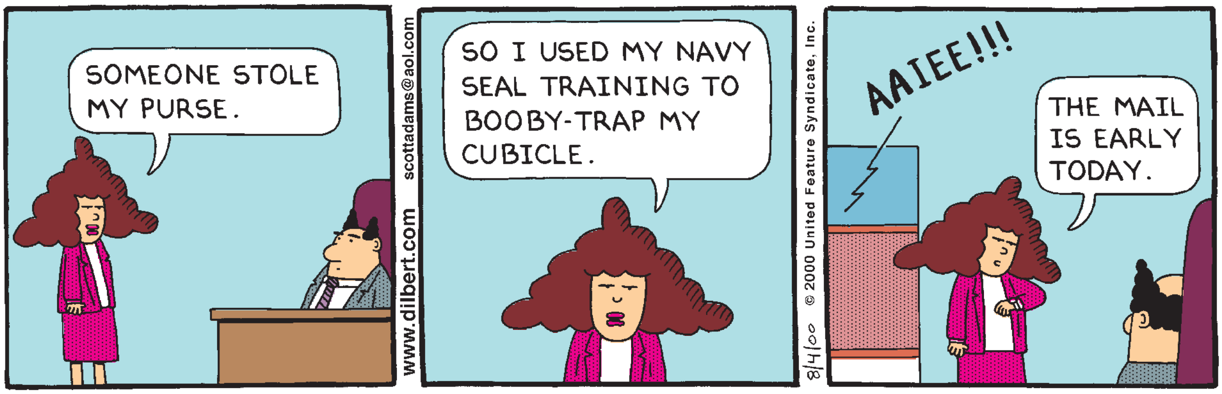
SOMEONE STOLE MY PURSE.
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SO I USED MY NAVY SEAL TRAINING TO BOOBY-TRAP MY CUBICLE.
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AAIEE!!!
THE MAIL IS EARLY TODAY.

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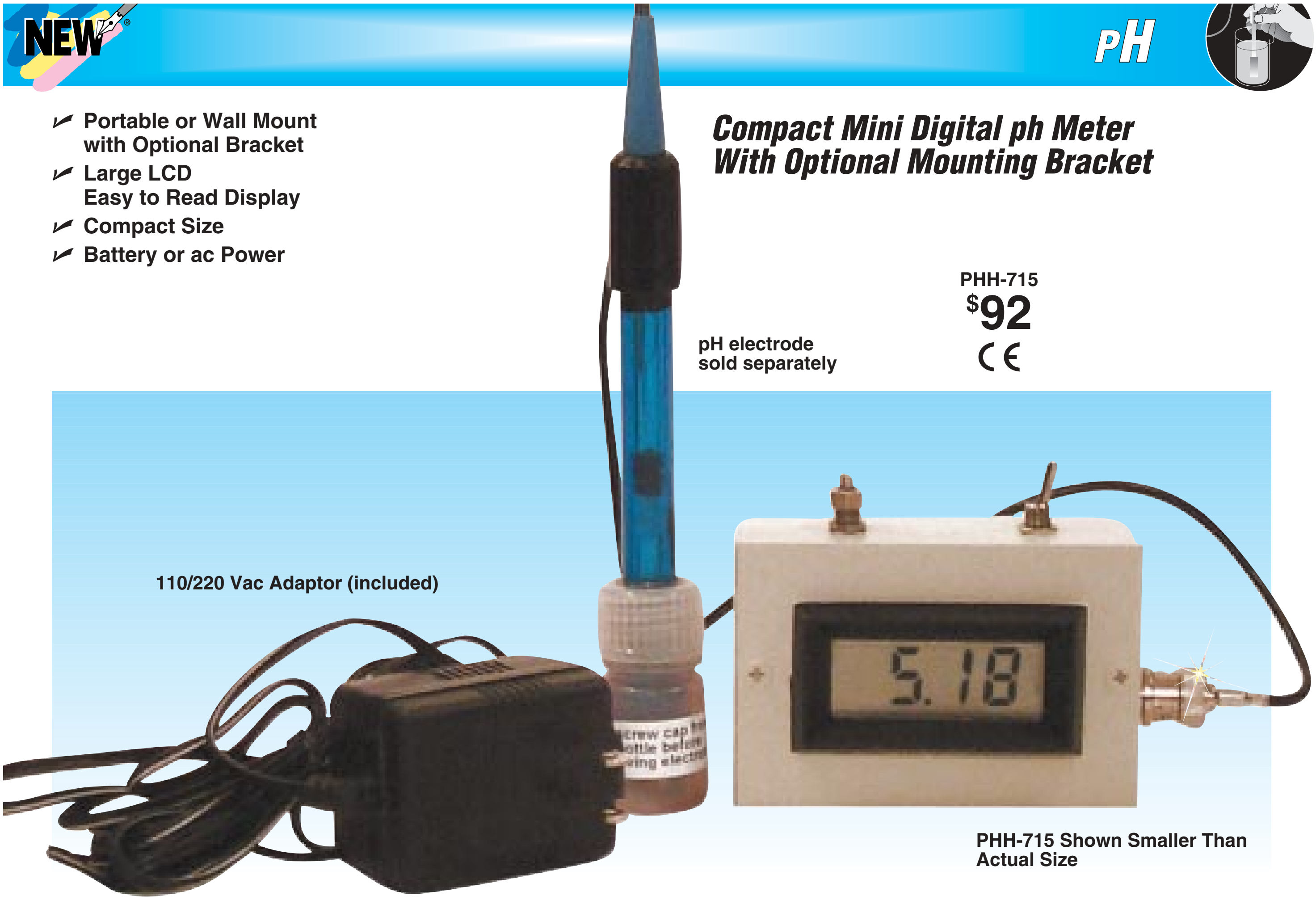
OMEGA®

- Portable or Wall Mount with Optional Bracket
- Large LCD Easy to Read Display
- Compact Size
- Battery or ac Power

Compact Mini Digital ph Meter With Optional Mounting Bracket

PHH-715
$^{\$}$**92**
CE


pH electrode sold separately

110/220 Vac Adaptor (included)

PHH-715 Shown Smaller Than Actual Size

The PHH-715 digital pH meter provides a full scale, 0 to 14 pH measurement. This pH meter has available a bracket for wall mounting or can be used as a portable unit. The PHH-715 can be used with the ac power adaptor or from the supplied 9V NiCAD battery.

Specifications:

Display: 3½ Digit LCD display
Accuracy/Range:
±.01 pH / 0.00 to 14.00 pH
pH Electrode: Optional
Electrode Connection: BNC
Operating Temperature:
0 to 50°C (32 to 122°F)
Power Supply:
9V NiCAD battery (included)
or 110/220 Vac with adaptor (included)
Battery Life: Approx. 500 hours
Dimensions:
Instrument:
89 x 64 x 38 mm (3.5 x 2.5 x 1.5")
Optional Mounting Bracket:
6.3 H x 9.2 W x 3.9 mm D
(2.5" x 3.63" x 1.55")
Weight: Approx. 454 g (1 lb)

To Order *(Specify Model Number)*

▭ MOST POPULAR MODELS HIGHLIGHTED!

Model	Price	Description
PHH-715	$92	Handheld pH meter (pH electrode optional)
PHH-715-BRACKET	35	Optional wall mounting bracket
PHE-1304	32	Optional general purpose pH electrode
PHE-1411	58	Optional double junction pH electrode
PHA-4	5	pH 4.01 Buffer solution, 475 ml bottle
PHA-7	5	pH 7.01 Buffer solution, 475 ml bottle
PHA-10	5	pH 10.01 Buffer solution, 475 ml bottle

All units supplied with battery, ac power adaptor and complete operator's manual.
Ordering Example: PHH-715** pH meter with **PHH-715-BRACKET** mounting bracket, **PHE-1411** double junction electrode and **PHA-4** and **PHA-7** buffer solutions, $92 + 35 + 58 + 5 +5 = **$195.

pH/mV Digital Field or Benchtop Series Meter

PHB-115
$312

- Portable
- Easy to Use
- Accurate

Shown Smaller Than Actual Size

The PHB-115 is a portable pH/mV meter of a metal construction and has a convenient carrying handle for portability. The PHB-115 covers the full 0-14 pH scale with a resolution of .01. The manual temperature compensation range is from 0 to 100°C. The ORP measurement range is -1999 to 1999 mV with a resolution of -2 mV. The PHB-115 can be used for a variety of applications such as water quality testing, wastewater, and laboratory use.

Specifications

Range/Accuracy:
0-14/±0.01

mV Range/Accuracy:
±1990mV/±2mV

Temperature Compensation:
Manual 0-100°C

pH Probe: Supplied

Power/Life:
8 AA batteries/200 hrs

Line Power: 110/220 Vac

Size: 13 H x 21 W x 13 cm D
(5" x 8" x 5")

Shipping Weight:
1.4 kg (3 lb)

Electrode Connection: BNC

pH Probe Dimensions:
1.3 cm (½") Diameter,
13 cm (5") Long,
1.8 m (6') Cable.

▨ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model No.)*

Model No.	Price	Description
PHB-115	**$312**	Digital field benchtop meter with pH electrode
PHB-110-ADAP	**27**	AC adaptor, 110 Vac
PHB-220-ADAP	**33**	AC adaptor, 220 Vac
PHE-1304	**32**	General purpose electrode, 12.5 mm dia., 90 mm long
PHE-1411	**58**	Double junction pH electrode, 12 mm dia., 150 mm long
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

Unit comes complete with pH electrode and complete operator's manual.

Ordering Example: PHB-115**, portable pH meter and **PHB-110-ADAP,** 110 Vac power adaptor, $312 + 27 = **$339.

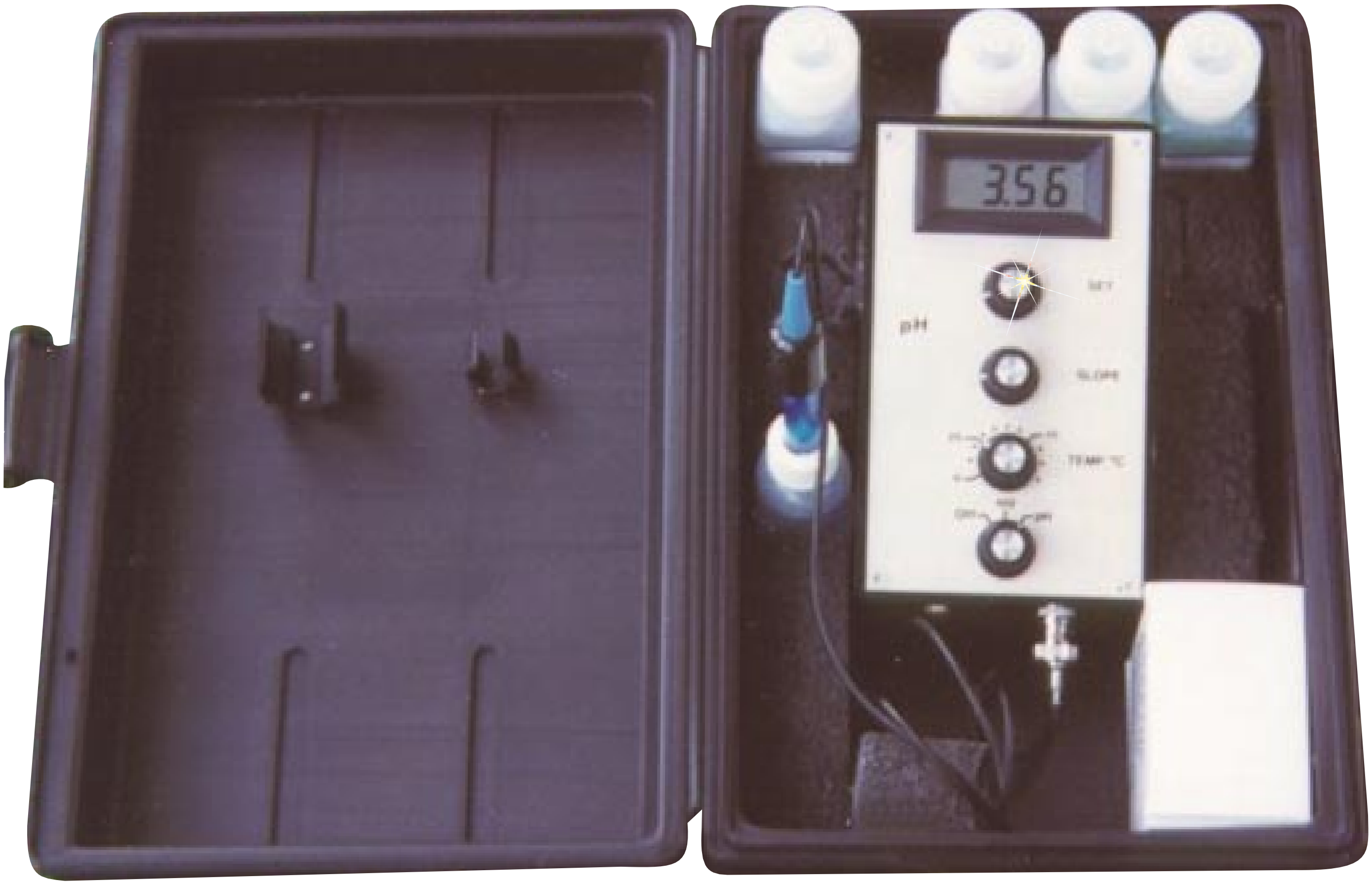
Handheld Portable pH/mV Meter

- Easy to Use
- Complete Kit with Rugged Carrying Case
- 4 pH Buffer Solutions Included
- Precision Electrode Included
- Economical Price

PHH-152
$295
Complete Kit

1 YEAR WARRANTY MADE IN USA CE

Shown smaller than actual size



Specifications

Instrument

Range: 0 to 14 pH / ±1999 mV

Accuracy: ±0.02 pH / ±2 mV

Resolution: 0.1 pH / 1 mV

Display: 3½ Digit LCD, 1.3 cm (0.5") tall

Temp Comp: Manual

Temp Range: 0 to 100°C (32 to 212°F)

Power: 8 “AA” NiCad Rechargeable Batteries (included)

Battery Life: 400 Hours

Power Adaptor/ Recharger: Included

Dimensions: 15 H x 7.6 W x 5 D cm (6 x 3 x 2")

Weight: 1.8 kg (4 lb)

Electrode Type: General Purpose

Electrode Connection: BNC

pH Probe Dimensions:
12.5 mm (½") Diameter,
150 mm (5") long with 1.8m (6 ft) cable

The PHH-152 measures the pH/mV of most solutions. The meter includes all the functions necessary for precise and accurate pH/mV measurements, including set and slope knobs for two or three point calibration, a manual temperature adjustment allowing for temperature compensation and a 3½ digit display.

Rechargeable batteries and an ac adaptor/charger allow versatility for use in the field and in the lab. The batteries will last approximately 400 hours before recharging is required. The LCD display display will give a “BAT” reading to indicate when the batteries are low.

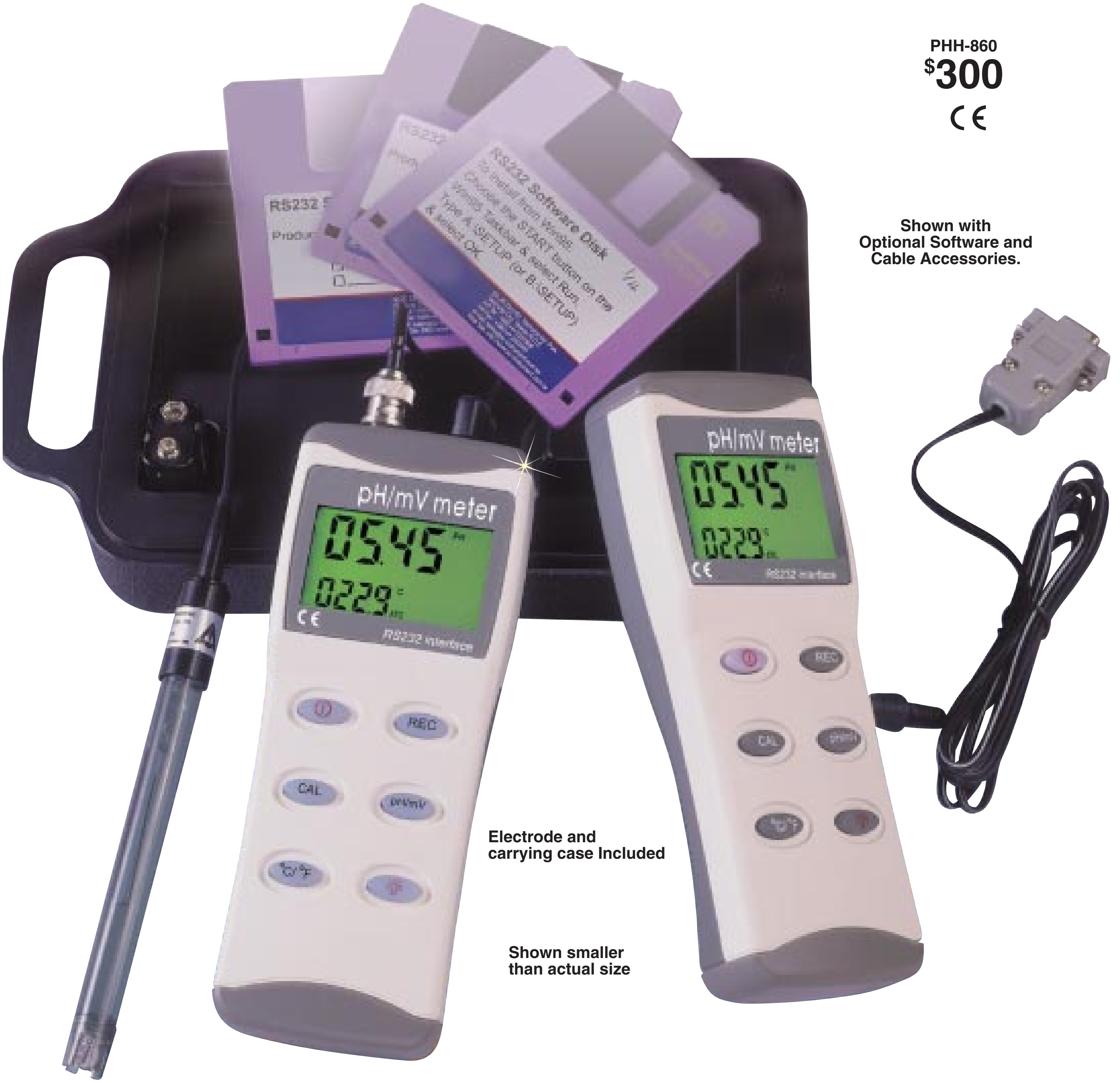
To Order *(Specify Model Number)*

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

Model	Price	Description
PHH-152	**$295**	Handheld pH meter with kit
PHE-1304	**32**	General Purpose pH Electrode
PHE-1411	**58**	Double Junction Electrode 12.5 mm D x 150 mm L
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

Ordering Example: PHH-152**, Handheld pH/mV kit, **$295.
Kit come complete with Meter, Electrode, 4 buffers, rechargeable batteries, power adaptor, carrying case and operator’s manual.

pH/mV/Temp Handheld Meter with RS232 Capability


RS232 Software Disk
pH/mV meter
0545
0229
RS232 interface
REC
CAL
pH/mV
°C/°F

PHH-860
$300

Shown with
Optional Software and
Cable Accessories.

Electrode and
carrying case Included

Shown smaller
than actual size

- ✓ 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.

pH/mV meter
0545
0229
pH/mV meter
0545
0229
RS232 interface
REC
CAL

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: ±499, -5 to 80°C

Accuracy: pH: ±0.02 pH
mV: ±0.2 mV (0.1 to 180.0 mV),
±2 mV (181 to 499 mV)
Temp: ±0.3°C

Resolution: pH: 0.01
mV: 0.1 mV ±(0.1 to 180.0 mV)
1 mV ±(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} Ω

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 x 182 x 30 mm (meter)
(2.8 x 7.2 x 1.2")

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

To Order *(Specify Model Number)*

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

Model No.	Price	Description
PHH-860	**$300**	pH/mV/Temp meter and pH electrode and RS232 port (software and cable optional)
PHH-860-SW	**75**	3.5" software disks for RS232 communication and cable required for RS232 function
PHE-860	**80**	Replacement combination 3 in 1 electrode, 12.7 mm diameter, 108 mm long, 1016mm cable (40")
PHA-4	**5**	Buffer solution, pH 4.01, 475 ml bottle
PHH-860-PS	**12**	dc Power Adapter
PHA-7	**5**	Buffer solution, pH 7.01, 475 ml bottle
PHA-10	**5**	Buffer solution, pH 10.01, 475 ml bottle

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

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

NEW

Compact pH/ORP Single Limit Controller

Model PHCN-40

$395

1 YEAR WARRANTY

- ✓ **High or Low Setpoint**
- ✓ **Easy to Use**
- ✓ **Low Cost**
- ✓ **±500 mV Vendor Output**

The economical PHCN-40 is an analog meter with a relay output for high or low limit control.

The new single limit controller is a general purpose pH/ORP controller for both laboratory and industrial use. It is AC powered, and features two-point calibration with manual temperature compensation. The pH meter's resolution provides accuracies of 0.01 pH and 10 millivolts allowing for very sensitive measurements.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8
+900mV
-900mV
pH / ORP

PHCN-40 Shown Smaller Than Actual Size

Specifications

Readout: 15 cm (6") analog
Operation Modes: pH or mV
pH Measurements:
Range: 0-14 pH
Accuracy: ±0.05 pH
Temperature Compensation:
Manual 0-100°C (32-212°F)
Millivolt/Redox Measurements:
  Range: ±900 mV
  Accuracy: ±10 mV
  Input Impedance:
  >1.5 x 1012 Ohms
  Connector: BNC
  Power: 115 Vac (230 option)
  Weight: 1.4 kg (3 lbs)
  Control Limits:
    High (Hi) pH: 0 to 14, ±900 mV
    Low (Lo) pH: 0 to 14, ±900 mV
    Dead Band: 0.1 pH to 0.6 pH,
    25 mV - 125mV internally adjustable
Controller Output Power:
700 watts at 115 Vac, SPDT relay
Output to Recorder: ±500 mV

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model No.)*

Model No.	Price	Description
PHCN-40	**$395**	pH/ORP Limit Controller
PHE-6510	**110**	Submersible pH Electrode
PHEH-65-10	**41**	Required Mounting Assembly for PHE-6510
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

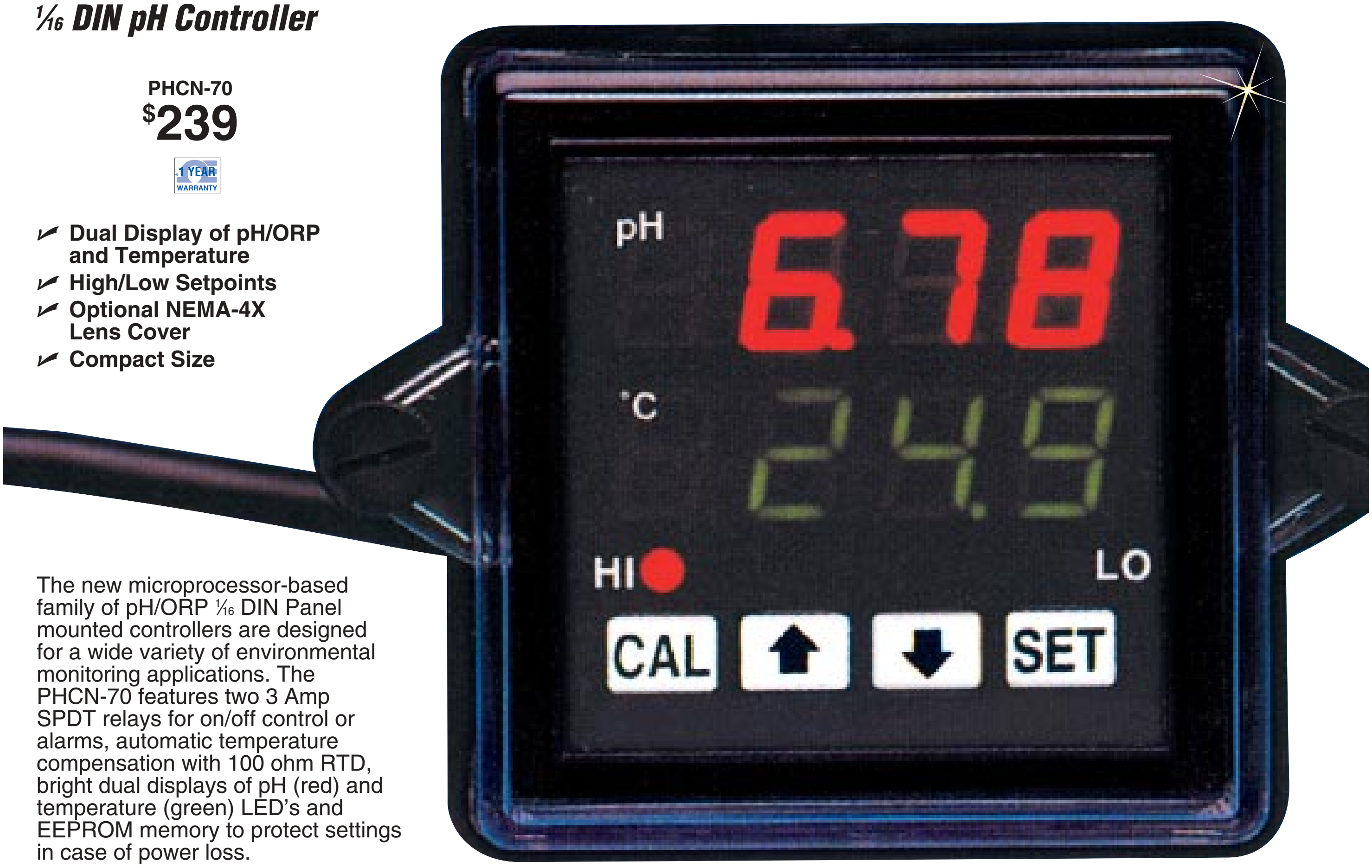
Unit comes with a complete operator's manual.
Ordering Example: PHCN-40** analog pH/ORP limit controller with **PHE-6510,** electrode, and **PHEH-65-10,** mounting assembly, $395 + 110 + 41= **$546.

1/16 DIN pH Controller

PHCN-70
$239

1 YEAR WARRANTY

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



Shown much larger than actual size

The new microprocessor-based family of pH/ORP 1/16 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 x 45 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

▭ *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-5460	**110**	In Line pH Electrode
PHEH-54-10-PT100	**148**	Required mounting assembly for pH probe

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 4.01 Buffer Solution 475 ml
PHA-7	**5**	pH 7.01 Buffer Solution 475 ml
PHA-10	**5**	pH 10.01 Buffer Solution 475 ml

For the complete selection of pH products, refer to The Green Book®

NEW®

PHCN-670 Series pH Analyzer

PHCN-674 ¼ DIN Panel Mount
PHCN-675, 676 ½ DIN NEMA-4X Case

PHCN-674
$595

1 YEAR WARRANTY   MADE IN USA   CE

- pH/ORP Measurement Capability
- Multiple Language Capability
- Menu Guided Operation
- Two 4 to 20 mA dc Outputs
- 2 or 4 Relays
- Relays For On-Off Control or Alarm

The PHCN-674 ¼ DIN panel mounted or the PHCN-675 and PHCN-676 ½ DIN panel or surface mounted pH analyzers are powerful but easy to use. They accept many different types of pH or ORP electrodes including the special PHE-6028-PO preamplified differential sensor. The units feature multiple language capability in English, French, German or Spanish and menu screens which guide you through setup, calibration, operation and test maintenance functions.

RELAY:
7.00 pH
TEMP:+ 24.8°C
MENU
ESC
ENTER
pH: 7.65
Temp: 86.2°F
A B

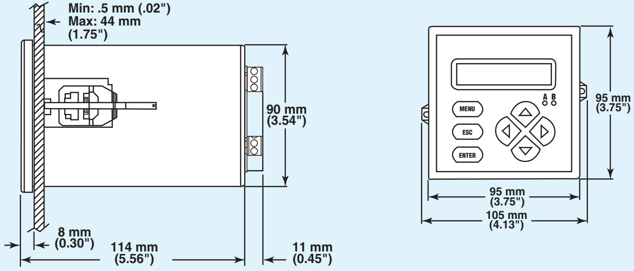
PHCN-675/676

These pH analyzers can be used with any pH electrode as well as the unique PHE-6028-PO differential pH sensor

PHCN-674

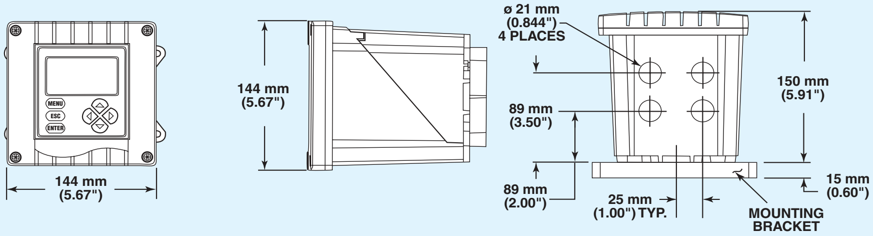
Shown smaller than actual size

PHCN-674


Panel Thickness:
Min: .5 mm (.02")
Max: 44 mm (1.75")
90 mm (3.54")
8 mm (0.30")
114 mm (5.56")
11 mm (0.45")
MENU
ESC
ENTER
A B
95 mm (3.75")
95 mm (3.75")
105 mm (4.13")

Panel Cutout 91 mm (3.59") square

PHCN-675/676


MENU
ESC
ENTER
144 mm (5.67")
144 mm (5.67")
ø 21 mm (0.844") 4 PLACES
89 mm (3.50")
89 mm (2.00")
25 mm (1.00") TYP.
150 mm (5.91")
15 mm (0.60")
MOUNTING BRACKET

Specifications

Display (PHCN-674): Two line 16 character backlit LCD, Graphic dot matrix LCD. (PHCN-675,676) 128 x 64 pixels with LED backlighting; 13 mm (½") main character height; 3 mm (⅛") auxiliary information

Measurement

pH: -2.0 to 14.0 pH or -2.00 to 14.00 pH

ORP: -2100 to 2100 mV

Temperature: -20 to 200°C (-4 to 392°F)

Ambient Conditions

Operation: 20 to 60°C (-4 to 140°F); 0 to 95% RH non-condensing

Storage: -30 to 70°C (-22 to 158°F); 0 to 95% RH non-condensing

Power Requirements:
90 to 130 Vac, 50/60 Hz (10 VA max) or 180 to 260 Vac, 50/60 Hz (10 VA max)

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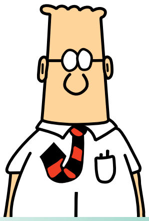

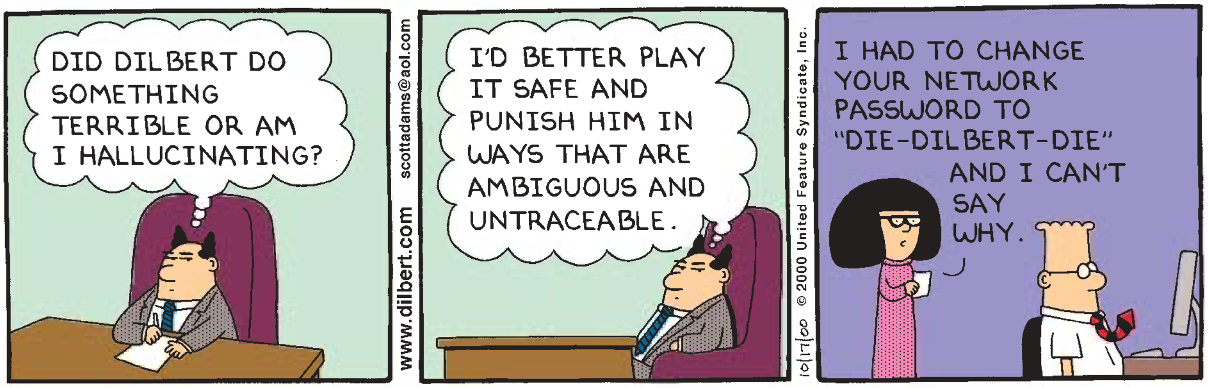
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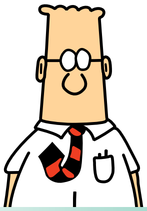

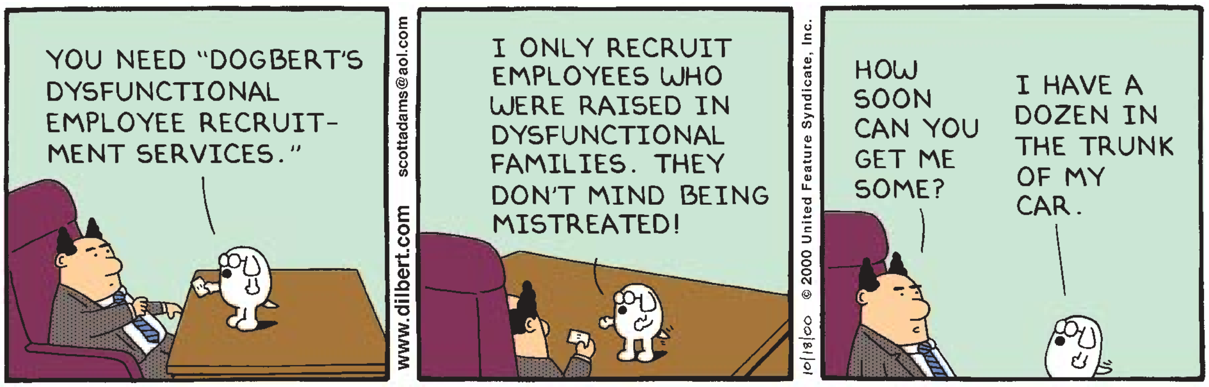
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HOW SOON CAN YOU GET ME SOME?
I HAVE A DOZEN IN THE TRUNK OF MY CAR.

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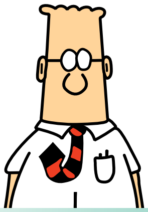

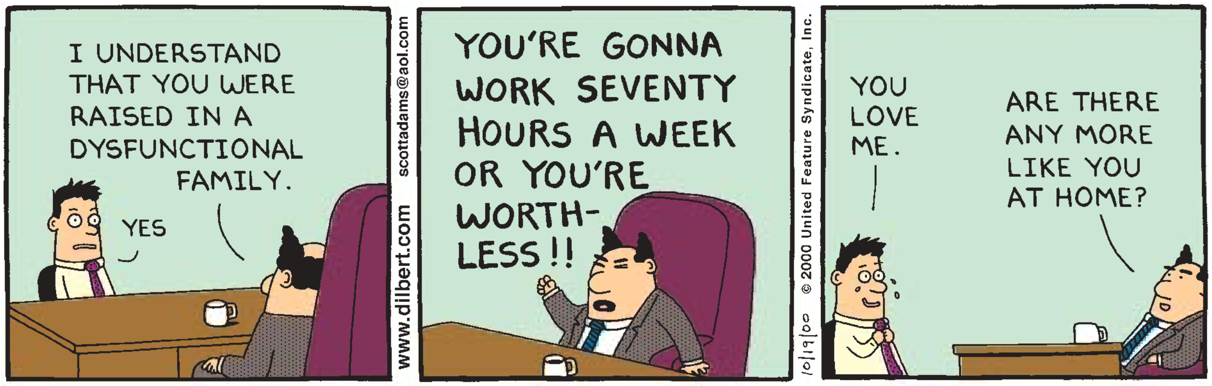
I UNDERSTAND THAT YOU WERE RAISED IN A DYSFUNCTIONAL FAMILY.
YES
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YOU'RE GONNA WORK SEVENTY HOURS A WEEK OR YOU'RE WORTHLESS!!
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10/19/00
YOU LOVE ME.
ARE THERE ANY MORE LIKE YOU AT HOME?

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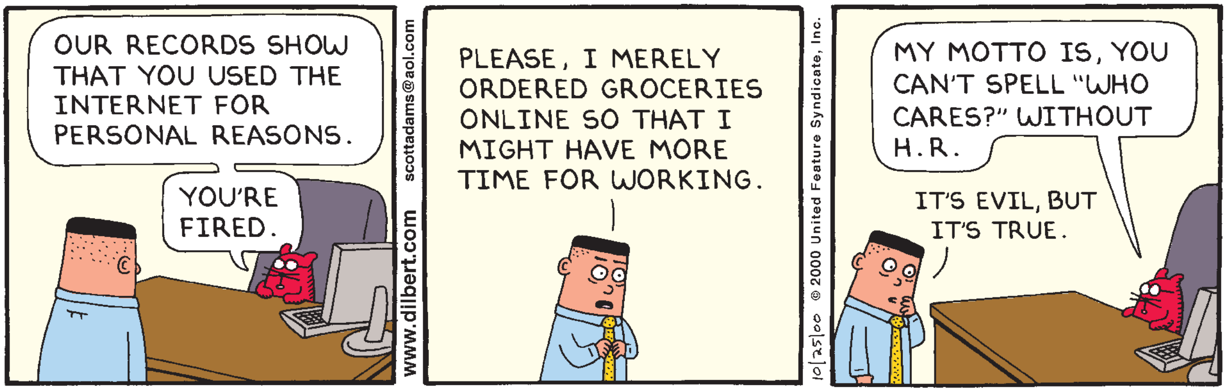
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MY MOTTO IS, YOU CAN'T SPELL "WHO CARES?" WITHOUT H.R.
IT'S EVIL, BUT IT'S TRUE.

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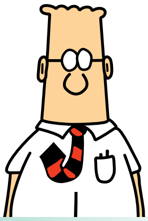
#11-001049



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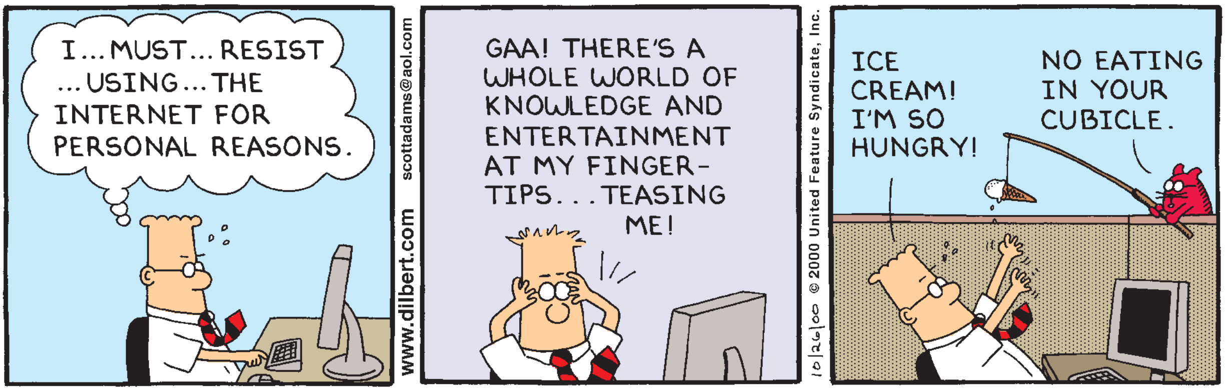
I...MUST...RESIST ...USING...THE INTERNET FOR PERSONAL REASONS.
scottadams@aol.com
www.dilbert.com
GAA! THERE'S A WHOLE WORLD OF KNOWLEDGE AND ENTERTAINMENT AT MY FINGER-TIPS...TEASING ME!
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ICE CREAM! I'M SO HUNGRY!
NO EATING IN YOUR CUBICLE.

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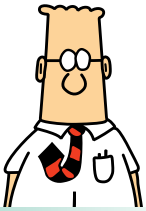
11

Collection Series
#11-001050



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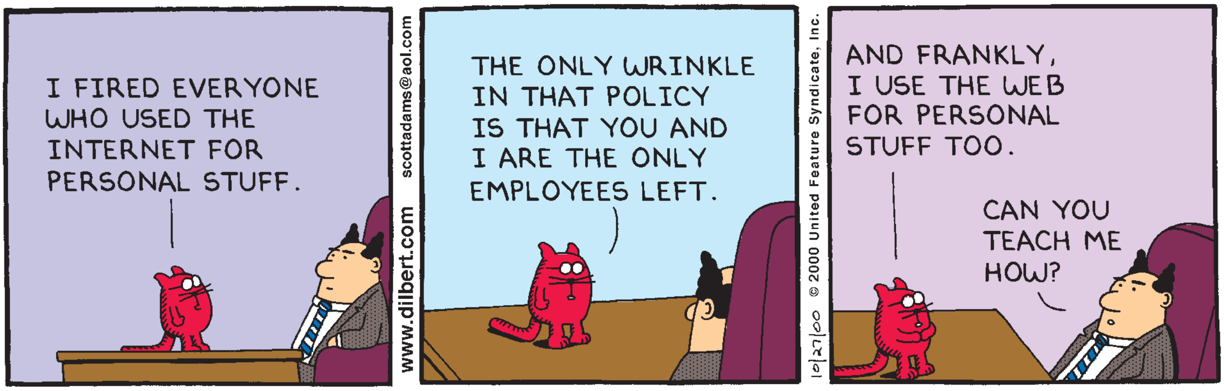
DILBERT® by Scott Adams


I FIRED EVERYONE WHO USED THE INTERNET FOR PERSONAL STUFF.
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www.dilbert.com
THE ONLY WRINKLE IN THAT POLICY IS THAT YOU AND I ARE THE ONLY EMPLOYEES LEFT.
10/27/00 © 2000 United Feature Syndicate, Inc.
AND FRANKLY, I USE THE WEB FOR PERSONAL STUFF TOO.
CAN YOU TEACH ME HOW?

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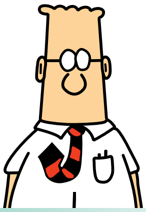
11

Collection Series
#11-001051



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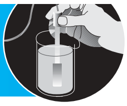


Relays
Types/Outputs: Two or four (PHCN-676) electromechanical relays; SPDT (Form C) contacts; U.L. rated 5A 115/230 Vac, 5A @ 30 Vdc resistive

Functional Modes: Each relay(A, B, C, and D) can be assigned to be driven by the measured pH (or ORP) or temperature

Operating Modes
Control: Settings for high/low phasing, setpoint, deadband, overfeed timer, off delay, and on delay

Alarm: Settings for low alarm point, low alarm point deadband, high alarm point, high alarm point deadband, off delay, and on delay

Temperature Compensation:
Automatic or manual, -10 to 110°C (14 to 230°F) with selection for temperature compensator (Pt1000 Ω RTD, Pt100 Ω RTD, or NTC 300 Ω thermistor)

Calibration Methods:
1 or 2-Point Buffer Method (pH only);
2-Point Sample Method (pH only);
1-Point Sample Method (pH & ORP)

Analog Outputs
Two outputs (#1 and #2) each with 0.004 mA (12-bit) resolution,Isolated 0 to 20 mA or 4 to 20 mA (selectable); 600 Ω max load
NOTE: Each scalable output can be assigned to represent the measured pH (or ORP) or temperature

Electrode Connections: Screw terminals

Analyzer Performance

(Electrical, Analog Outputs):

Accuracy: 0.1% of span

Sensitivity: 0.05% of span

Stability: 0.05% of span per 24 hrs., non-cumulative

Non-Linearity: 0.05% of span

Repeatability: 0.1% of span or better

Temperature Drift:
Zero: less than 0.01% of span per °C;
Span: less than 0.01% of span per °C

Mechanical

PHCN-674

Enclosure: NEMA-4X front panel

Mounting: Panel

Net Weight: 0.8 kg (1.7 lb)

PHCN-675, PHCN-676
Enclosure: NEMA-4X; polycarbonate face panel, epoxy-coated high-quality cast aluminum door and case with four 13 mm (0.5") conduit holes, nylon mounting bracket and stainless steel hardware

Mounting: Panel, surface and pipe (horizontal and vertical) mounting

Net Weight: 1.6 kg (3.5 lb)

Viton® is a registered trademark of DuPont Dow Elastomers.

PHE-6028-PO Differential pH Sensor

- ✓ **Accurate Differential Measurement Technique**
- ✓ **Encapsulated Electronics**
- ✓ **Double Junction**
- ✓ **Universal Mounting**
- ✓ **Chemical Resistant Liquid Crystal Polymer (LCP) Body**
- ✓ **Up to 914 m (3000 ft.) Transmission Distance**

Specifications

Temperature: -5 to 95°C (23 to 203°F)

Max. Pressure: 100 psig

Measuring Range: 0 to 14 pH

Sensitivity: <0.005 pH

Wetted Materials:
LCP body, PVDF junction, Viton O-rings, glass electrode, and titanium ground rod

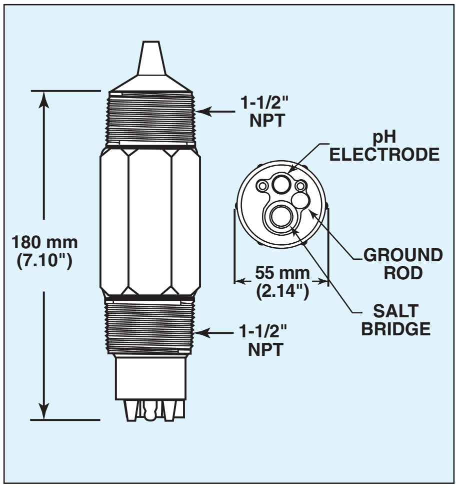
Cable Length: 10 ft

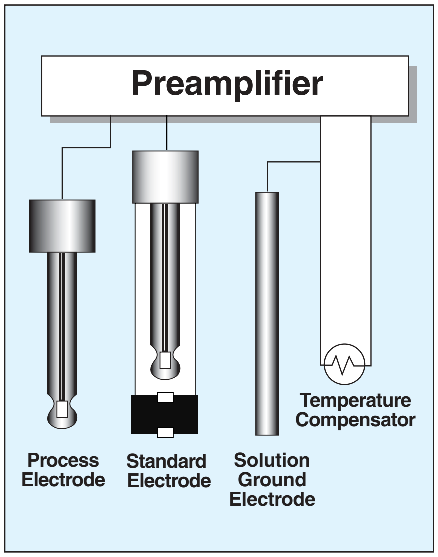
Connector: Stripped Leads

Weight: 0.6 kg (~1.3 lb)

Temp. Compensator:
NTC 300 Ω thermistor

PHE-6028-PO Differential pH Sensor





pH Differential Sensor Technology

The unique differential sensor technology offers many advantages over conventional sensor technology. It uses three measuring electrodes instead of the two contained in conventional pH sensors. The process electrode and standard electrode measure the pH differentially with respect to a third ground electrode. This technique is proven to provide unsurpassed accuracy, reduce reference junction fouling, and virtually eliminate ground loops. The benefit is greater reliability with less downtime and maintenance.

The differential sensor, with its built-in preamplifier, boosts the high impedance mV signals of the electrodes, providing a strong signal which can be transmitted up to 914 m (3000 feet).

▨ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model No)*

Model No	Price	Description
PHCN-674	$595	¼ DIN panel mounted pH analyzer with 2 relays
PHCN-675	795	½ DIN NEMA-4X pH analyzer with 2 relays
PHCN-676	870	½ DIN NEMA-4X pH analyzer with 4 relays
PHE-6028-PO	545	Differential pH sensor with preamplifier for use with PHCN-674, PHCN-675, PHCN-676

Ordering Example: PHCN-674, *¼ DIN panel mounted pH analyzer with 2 relays,* ***$595*** *and* ***PHE-6028-PO*** *differential pH sensor,* ***$545.*** *$595 + 545 =* ***$1140***

pH/ORP Transmitters Series PHTX-271

PHTX-271 Series
$440
Basic Unit

2 YEAR WARRANTY Electronics Only · MADE IN USA · CE

- Display in °C or°F
- Hold and Simulate Functions
- Integral or Remote Mounting
- Relay Options
- Output Scalability
- Dual Output Option Allows Temperature and pH Signal Transmission
- 2 x 16 Character Dot Matrix LCD
- Chemical Resistant Enclosure and Self-Healing Window
- Large Pushbuttons
- Clearly Marked Terminal Labels Applications
- Neutralization Systems
- Heavy Metals Recovery
- Plating Control
- Scrubber Control
- Environmental Study
- Water Treatment
- Water Quality Monitoring
- Waste Treatment
- Disinfecting

The PHTX-271 Series Transmitter is designed for broad application and ease of setup and use. The unit auto-configures for either pH or ORP use when connected to recommended OMEGA pH or ORP sensors. Multiple mounting options allow for installation best suited to your particular application. The automated "easy-cal" menu features automatic buffer recognition for mistake proof pH or ORP sensor calibrations. Two-line LCD provides sensor diagnostic information for ease in system maintenance.

62.50 uS
25.0°C
Relay 1
Relay 2
ENTER

Model PHTX-271-2P Shown larger than actual size, $580

Specifications

General

Compatible Electrodes: See ordering chart

Preamplifier/Electrodes

Accuracy: ±0.03 pH, ±2mV's ORP

Enclosure:

- **Rating:** NEMA-4X/IP65 front
- **Case:** PBT
- **Window:** Polyurethane coated polycarbonate
- **Keypad:** Sealed 4-Key Silicone Rubber
- **Weight:** Approx. 325 g (12 oz)

Display:

- **Alphanumeric:** 2 x 16 LCD
- **Contrast:** User selected, 5 levels

Environmental

Operating Temperature: -10 to 70°C (14 to 158°F)

Storage Temperature: -15 to 80°C (5 to 176°F)

Relative Humidity: 0 to 95% non-condensing

Standards and Approvals: CSA, CE, UL listed and manufactured under ISO9001

Electrical Sensor Input Range:

pH: 0.00 to 14.00 pH

Temperature: 3K Balco, -25 to 120°C (-13 to 248°F)

ORP: -1000 to +2000 mV, isolated (10K I.D. resistance T+, T-)4 to 20 mA, isolated, fully adjustable and reversible

Power: 12 to 24 Vdc ±5% regulated

Max Loop Impedance: 50Ω max @ 12 V, 325Ω max @ 18 V, 600Ω max @ 24 V

Update Rate: 0.5 seconds

Accuracy: ±0.03 mA @ 25°C, 24 V

Relay Output:

Mechanical SPDT Contacts: Hi, Lo, Pulse, Off

Maximum Voltage Rating: 5 A @ 30 Vdc, or 5 A @ 250 Vac resistive load

Hysteresis: User Adjustable

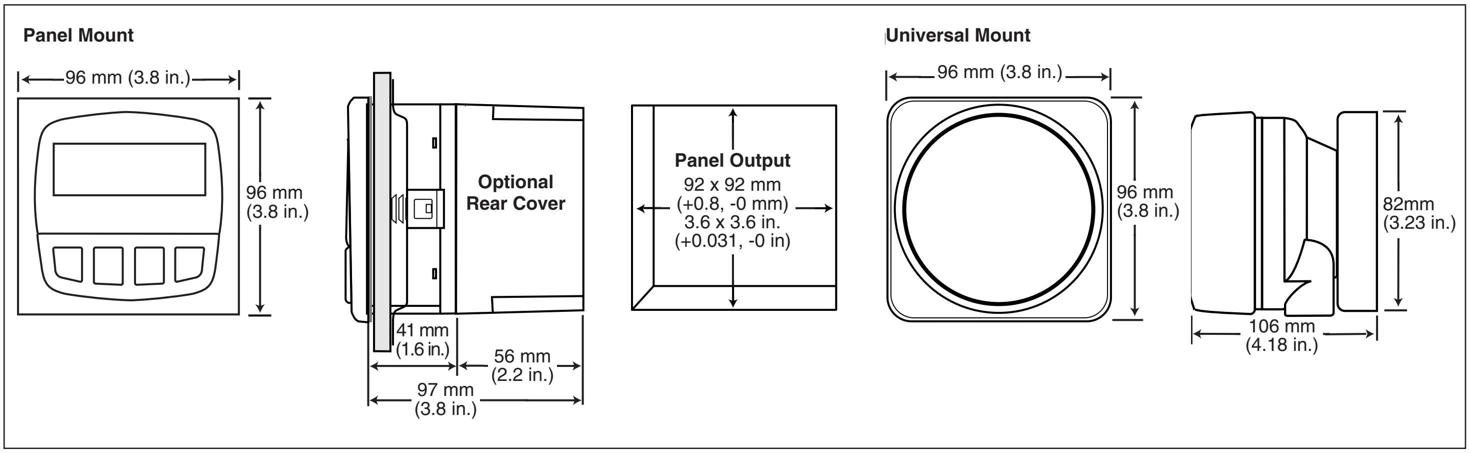
Max 400 pulses/min

Open Collector Output: Hi, Lo, Pulse, Off

Open collector, optically isolated, 50 mA max, sink, 30 Vdc max. pull-up voltage.

Max 400 pulses/min.

Dimensions



All panel mount transmitters PHTX-271-XP include a mounting bracket and gasket for a NEMA-4X watertight panel installation. Panel mount transmitters fit into a standard 1/4 DIN panel cutout. The Universal Mount Kit FP90UM can be ordered separately and includes a conduit base, locking ring, and universal adapter for mounting the transmitter on a pipe wall or other stationary surface.

🟦 ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model No.)*

Model No.	Price	Description
PHTX-271-1	**$440**	pH/ORP Transmitter Field Mount with Open Collector Output*
PHTX-271-2	**580**	pH/ORP Transmitter Field Mount with 2 Relays*
PHTX-271-3	**650**	pH/ORP Transmitter Field Mount with Single Input/Dual Output*
PHTX-271-1P	**440**	pH/ORP Transmitter Panel Mount with Open Collector Output
PHTX-271-2P	**580**	pH/ORP Transmitter Panel Mount with 2 Relays
PHTX-271-3P	**650**	pH/ORP Transmitter Panel Mount with Single Input/Dual Output

** Field Mount Transmitters Require **FP90UM** Universal Mounting Kit.*
Ordering Example: PHTX-271-1P** pH/ORP Transmitter Panel Mount ($440), **PHE-2716** Bulb style pH electrode ($191), **PH-2720-PA** pre-amplifier with 15' cable ($165), **PHA-4** pH 4 buffer solution ($5), **PHA-7** pH 7 buffer solution ($5),$440 + 191 + 165 + 5 + 5 = **$806

Pre-Amplifier and Sensors

Model No.	Price	Description
PH-2720-PA	**$165**	Pre-amplifier with 15' Cable, ¾" FNPT
PHE-3271	**221**	Flat style pH electrode with ATC
PHE-2716	**191**	Bulb style pH electrode with ATC
ORE-2715	**242**	Flat style ORP sensor
ORE-2717	**211**	Bulb style ORP sensor

Accessories

To Order *(Specify Model No.)*

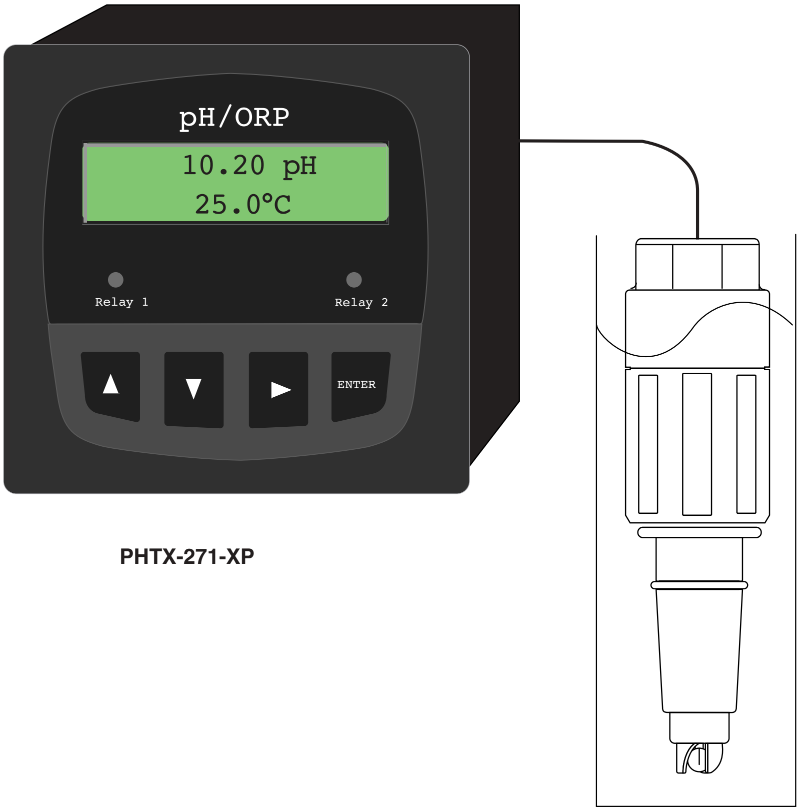
Model No.	Price	Description
FP90UM	**$35**	Universal Mounting Kit
FP90-4X	**38**	NEMA-4X Cover (Panel Mount)
FP90RC	**15**	RC Filter (For Relay Use)
PH-31542-TC	**10**	Threaded cap for in-line installation 1¼ NPT
PHA-4	**5**	PH-4 Calibration Solution 475 ml
PHA-7	**5**	PH-7 Calibration Solution 475 ml
PHA-10	**5**	PH-10 Calibration Solution 475 ml

Installation

The transmitter is available in a panel mount or a field version.
Select the universal mount kit FP90UM to mount the transmitter on a surface near the sensor.

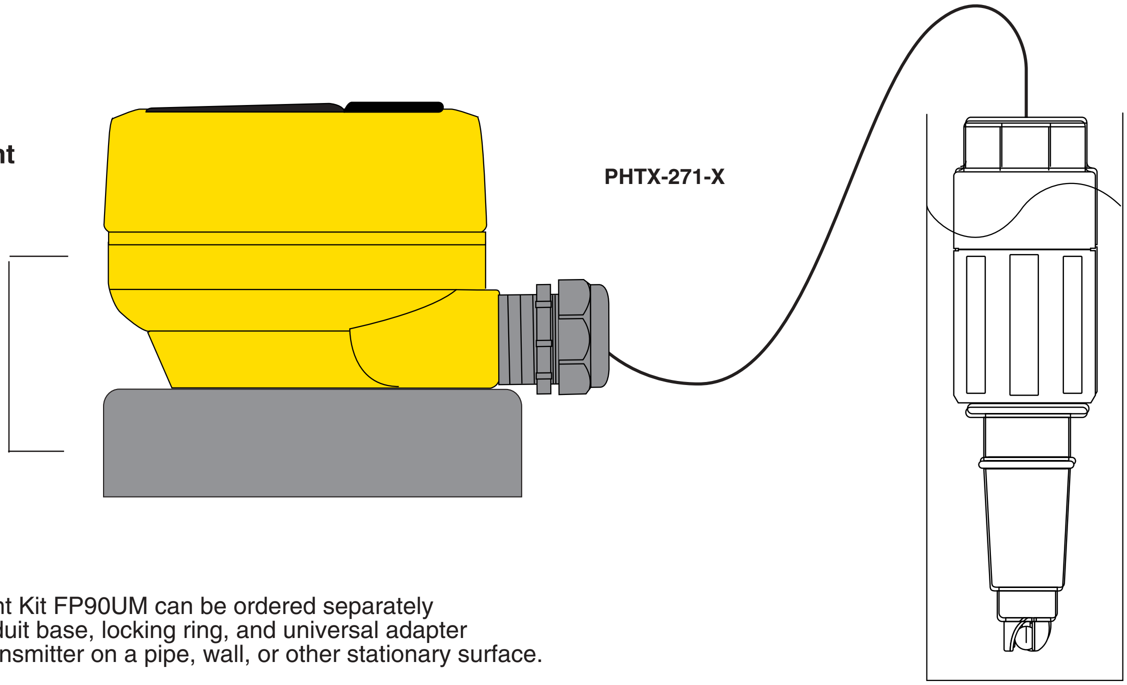
1. Panel Mount

All Panel mount transmitters PHTX-271-XP include a mounting bracket and gasket for a NEMA-4X watertight panel installation. Panel mount transmitters fit into a standard 1/4 DIN panel cutout.



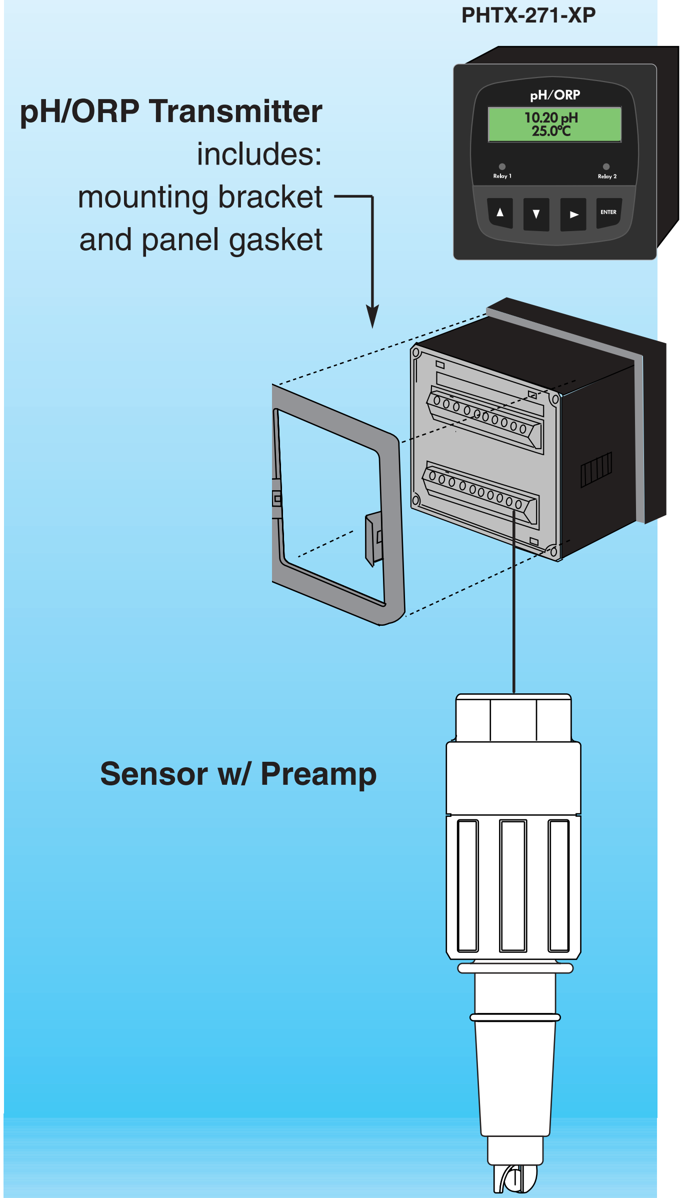
PHTX-271-XP

2. Universal Mount

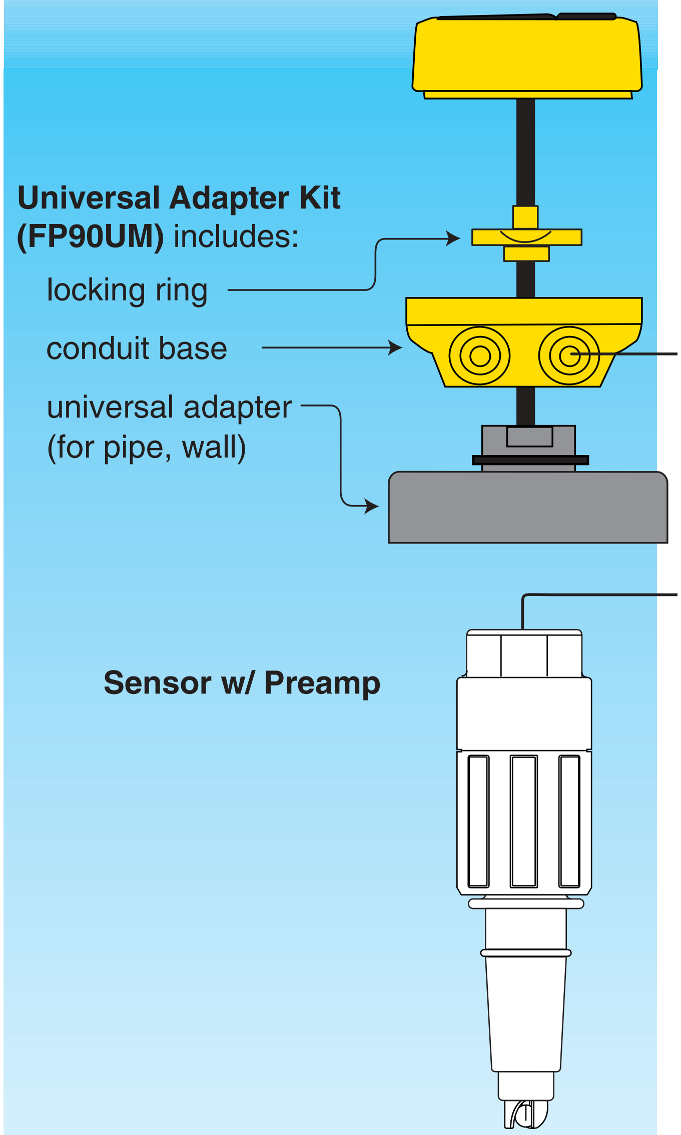


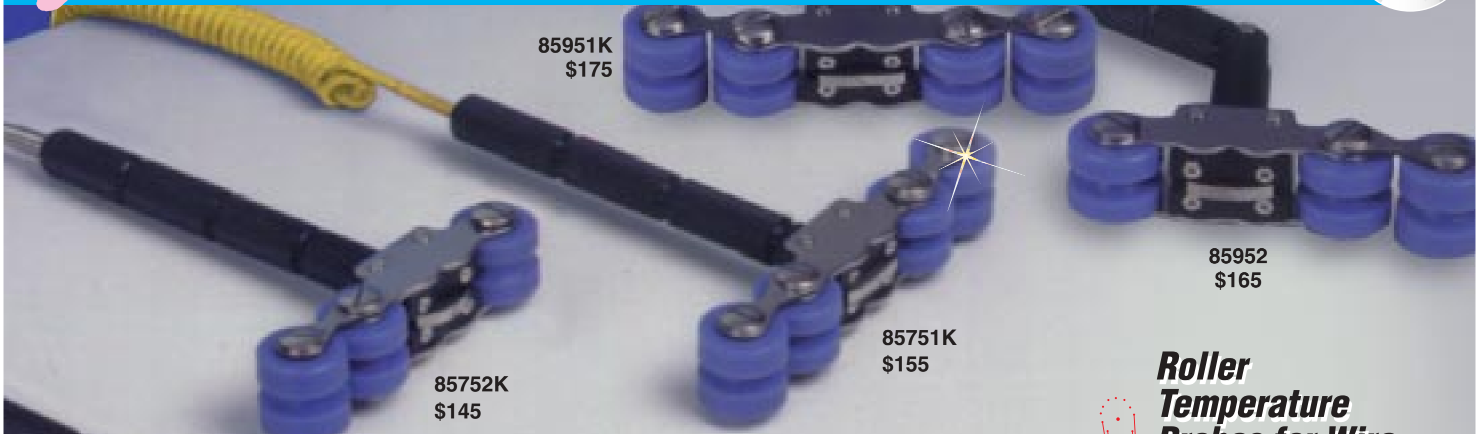
PHTX-271-X

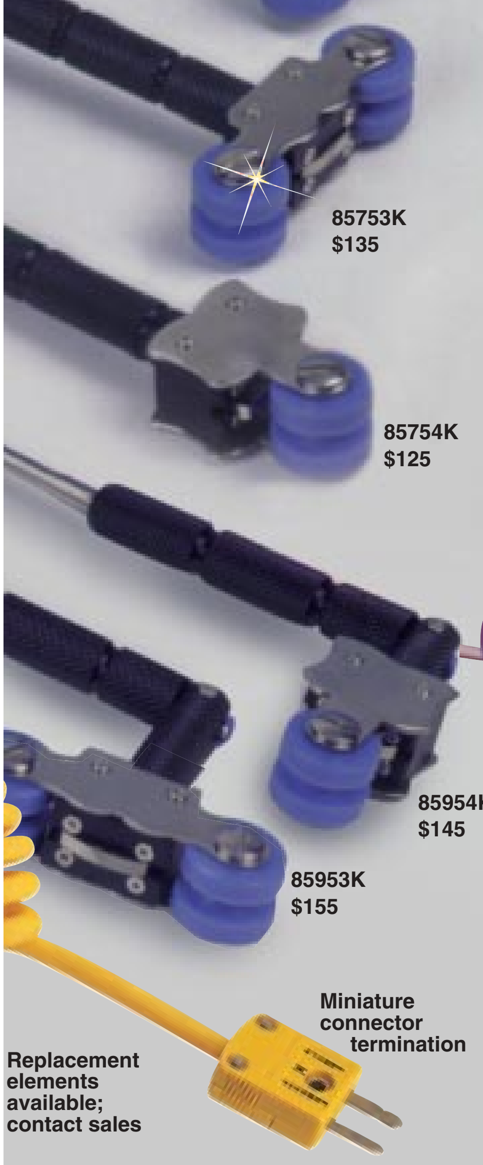
The Universal Mount Kit FP90UM can be ordered separately and includes a conduit base, locking ring, and universal adapter for mounting the transmitter on a pipe, wall, or other stationary surface.


PHTX-271-XP
pH/ORP Transmitter
includes:
mounting bracket
and panel gasket
pH/ORP
10.20 pH
25.0°C
Relay 1
Relay 2
▲
▼
►
ENTER
Sensor w/ Preamp

pH/ORP Transmitter (PHTX-271)


Universal Adapter Kit
(FP90UM) includes:
locking ring
conduit base
universal adapter
(for pipe, wall)
Sensor w/ Preamp


85951K
$175
85952
$165
85751K
$155
85752K
$145


85753K
$135
85754K
$125
85954K
$145
85953K
$155

Miniature connector termination

Replacement elements available; contact sales

Roller Temperature Probes for Wire

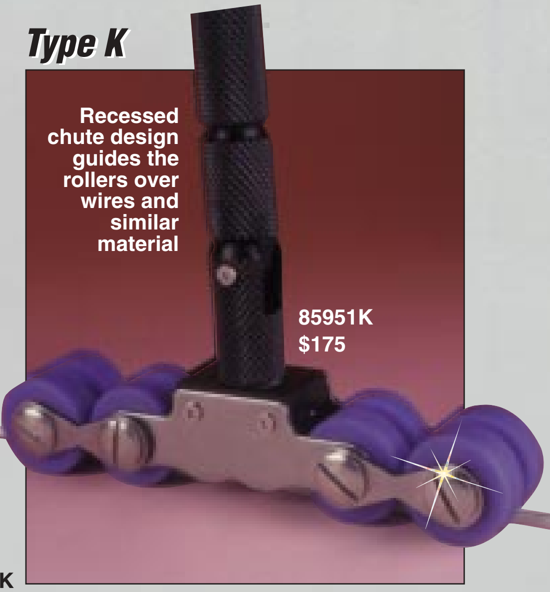
OMEGA Offers a Probe for Every Need!

81000 Series Economical Probes for Education, Training & Demonstration Purposes

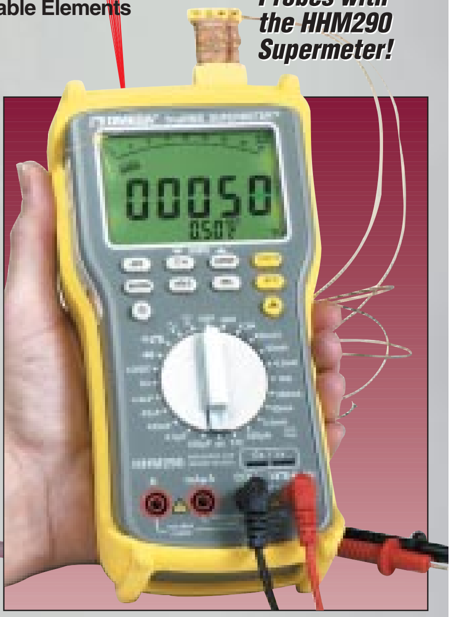
85000 Series General Purpose Probes with Built-in Durability for Routine Industrial Measurements

88000 Series High Performance Probes with the Highest Quality, Longest Cable Stretch and Replaceable Elements

Type K


Recessed chute design guides the rollers over wires and similar material
85951K
$175

Use OMEGA's Probes with the HHM290 Supermeter!



Patent No: 6,095,682
Other U.S. and Foreign Patents Pending

To Order *(Specify Model Number)*

Model No.	Price	Max. Temp.	Remarks	Applications
85951K	$175	250°C (480°F)	swivel head	Type K Thermocouple For measuring wires, coils and cables Cable: Coiled Stretches to 1800 mm (70") with miniature connector
85952K	165	250°C (480°F)	swivel head	
85751K	155	250°C (480°F)	straight head	
85752K	145	250°C (480°F)	straight head	
85753K	135	250°C (480°F)	straight head	
85754K	125	250°C (480°F)	swivel head	
85954K	145	250°C (480°F)	swivel head	
85953K	155	250°C (480°F)	swivel head	

Response time for probes is approx. 5 seconds. Probes come with coiled cable that stretches to 1800 mm (70") and a miniature Type K connector.

Ordering Example: 85951K** roller probe, **$175.

For the complete selection of Temperature Handheld products, refer to The Green Book®

NEW

2-Wire Isolated pH/ORP Transmitter Systems

PHTX-45 System
$1230
Meter and Electrode

1 YEAR WARRANTY

- **PEEK Sensor Body Construction**
- **Dual-Glass Style Sensor**
- **Replaceable Sensor Saltbridge**
- **Electrode Breakage Diagnostic**
- **Universal Mounting Configurations**
- **Microprocessor Based System**
- **Large Dual Display Format**
- **Loop Powered, Fully Isolated**

7.00 pH
+25.0 °C
MENU
ESC
ENTER

Shown smaller than actual size

PHE-45P Electrode, $550 sold separately

Sensor Features

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.

A large volume, dual junction saltbridge is used to maximize the in-service time of the sensor. The annular junction provides a large surface area to minimize the chance of fouling. Large electrolyte volume and dual reference junction minimizes contamination of the reference solution. The replaceable saltbridge allows for easy sensor regeneration.

The reference element of this sensor is a second pH electrode immersed in a reference buffer solution. This glass reference system allows the sensor to be used in applications that poison conventional pH sensors.

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 maximize the distance between sensor and transmitter. Sensor diagnostics are used to alarm the user in the event of electrode breakage, loss of sensor seal integrity, or integral temperature sensor failure.

Sensor electrodes can be user-specified to ensure measurement reliability and maximum sensor lifetime. The type of glass used in the pH electrode can be selected for optimal performance. The metal electrode used for ORP measurements can be platinum or gold, depending on chemical makeup of the process solution.

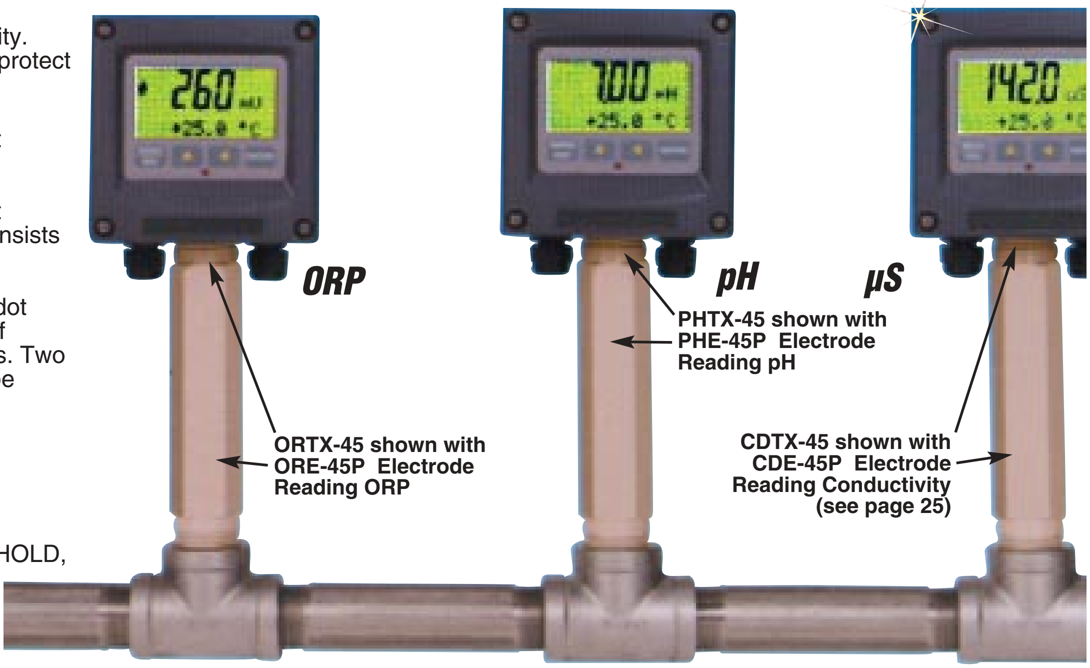
To Order *(Specify Model Number)*

🟦 ***MOST POPULAR MODELS HIGHLIGHTED!***

Model No.	Price	Description
PHTX-45	**$675**	pH Transmitter
PHE-45P	**550**	pH Electrode
ORTX-45	**675**	ORP Transmitter
ORE-45P	**570**	ORP Sensor
U24Y101	**128**	24 Vdc Power Supply
PHTX-45-SMH	**175**	Submersion Mounting Hardware, 1.8 m (6’)
PHTX-45-FBMH	**375**	Float Ball Mounting Hardware
PHTX-45-RK	**50**	pH/ORP Sensor Regeneration Kit: 1 saltbridge plus 1-125 mL bottle of Reference Cell Solution, pH 7.00 (for Models PHE-45P and ORTX-45E sensors only)
PHA-4	**5**	pH 4.01 Buffer Solution, 475ml Bottle
PHA-7	**5**	pH 7.01 Buffer Solution, 475ml Bottle
PHA-10	**5**	pH 10.01 Buffer Solution, 475ml Bottle

All units come with complete operator’s manual.
***Ordering Example: PHTX-45** pH Transmitter, **PHE-45P** electrode and **PHA-4** buffer solution, $675 + 550 + 5= **$1230**.*

PHTX-45 in Line Application Solution



PHTX-45 shown with PHE-45P Electrode Reading pH

ORTX-45 shown with ORE-45P Electrode Reading ORP

CDTX-45 shown with CDE-45P Electrode Reading Conductivity (see page 25)

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 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 two-point and sample calibration options include auto-buffer recognition from thirteen built-in buffer tables. Manual override of the automatic buffer values allows the user to customize calibration values. To ensure high accuracy, all calibration methods include stability monitors that check temperature and main parameter stability before accepting data.

Specifications

PHE-45P Sensor Specifications

Sensor Cable: 10 feet

Measuring Range: 0 to 14.00 pH

Sensitivity: 0.002 pH

Stability: 0.02 pH per 24 hours, non-cumulative

Wetted materials: PEEK, ceramic, titanium, glass, Viton®, EDPM (316 stainless steel with 316SS body option)

Temperature Compensation: Pt1000 **Sensor Cable:** 6 Conductor plus 2 shields

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

Pressure Range: 0 to 100 psig

Maximum Flow Rate: 3 meters (10 feet) per second

Sensor to Transmitter Distance: 914 meters (3000 feet)

Mounting options: 1" NPT convertible, 1¼" insertion, 1½" or 2" sanitary style

Weight/Shipping Weight: 0.45 kilogram (1 pound)

PHTX-45 Transmitter Specifications

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, cord grips and plug included

Weight/Shipping Weight: 0.45 kg (1 lb)

Display: Large, high-contrast, super-Twist (STN) LCD; 4-digit main display with, 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 conductivity 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 EN61326-1

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

PHE-45P Performance Specifications

Displayed Parameters:

Main input: 0 to 14.00 pH;

Sensor voltage: ±500mV;

Loop Current: 4.00 to 20.00 mA;

Sensor Temperature: -10 to 110°C (14 to 230° F)

Main Parameter Range: 0 to 14.00 pH

Input Impedance: Greater than 1013 Ω

Repeatability: 0.1% of 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

Sensor to Transmitter Distance: 914 meters (3000 feet) w/preamp, 9.1 meters (30 feet) w/o preamp

Viton® is a registered trademark of DuPont Dow Elastomers

NEW®

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**

PHH-830

$400

1 YEAR WARRANTY CE

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

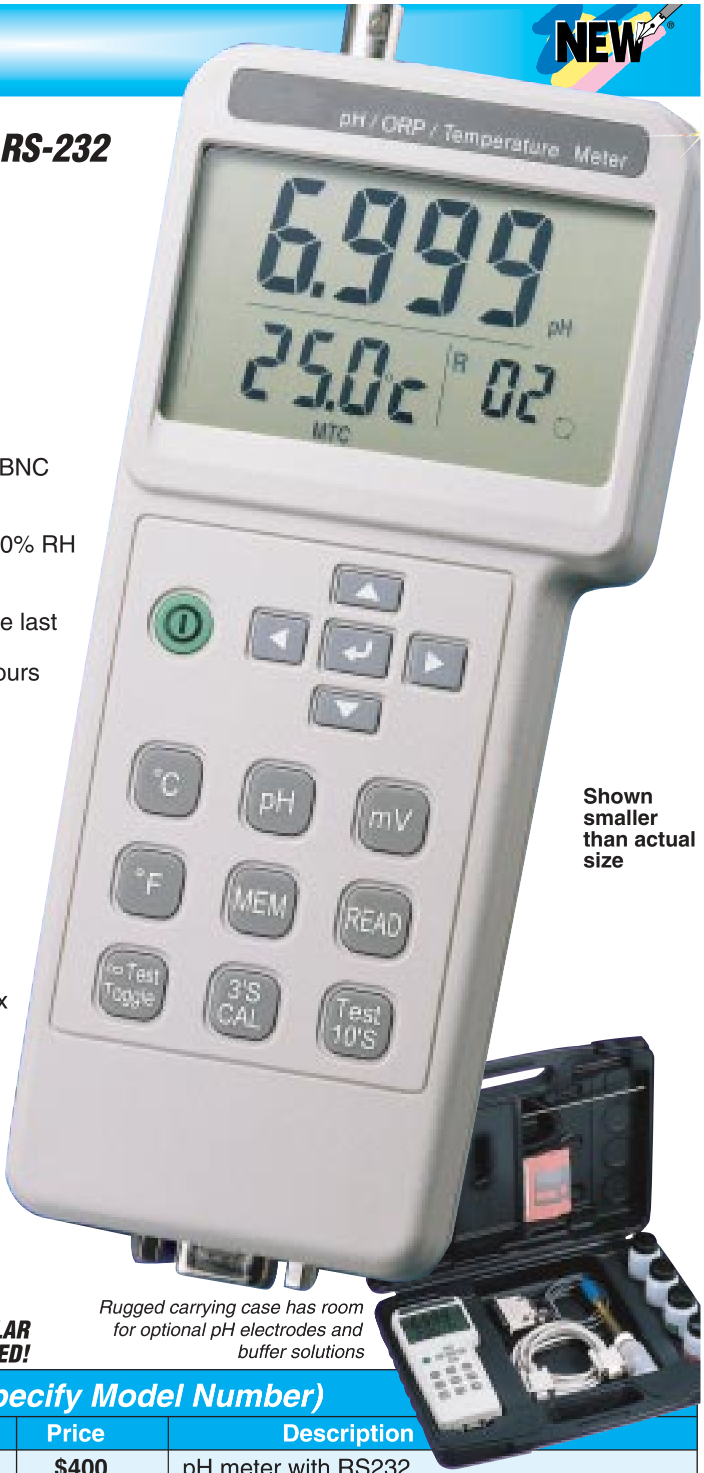
The PHH-830 features an auto data hold. Pressing and holding the “test toggle” key during measurement will cause an “A” to flash and then hold the LCD.

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

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 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 (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.

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.



Shown smaller than actual size

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

▭ ***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 4.01, 475 ml bottle
PHA-7	**5**	Buffer solution, pH 7.01, 475 ml bottle
PHA-10	**5**	Buffer solution, pH 10.01, 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.

Handheld Manometer with RS232 and optional Software

Model
HHP8205
$195

CE

- Gage or Differential Pressure
- Easy to Operate
- RS232/PC Interface
- Auto Power Off Extends Battery Life
- "BAT" Display Indicates when to Replace Battery
- Hold Data Function
- Backlight Display
- Battery Included
- 11 Switchable Units Plus 11 User Defined Units
- Software and PC Cable Optional

Manometer
0026
HOLD
UNIT
REC
REL
RS232 Software Disk

Shown smaller than actual size

Software sold separately

Specifications

Sensor:
Built-in piezoelectric sensor in housing
Maximum Overpressure: See Table
Accuracy: See Table
Linearity & Hysteresis:
±0.2% FS Typ. (Max ±1.0%)
Repeatability: ±0.2% FS (Max 0.5%)
Functions:
Hold Date, Record, Relative Pressure (Gage Pressure), Backlight, Unit Eligible
Switchable Units: psi, inH$_2$O, kPa, bar, mbar, kg/cm^2, mmHg, cmHg, inHg, ftH$_2$O, oz/in
Operating Humidity:
10 to 90% non-condensing
Operating Temperature:
0 to 50°C (32 to 122°C)
Temperature Effects:
Span: 0.5% (Over operating range)
Connection: Tube fitting
Serial Format:
2400 baud, 1 stop bit, 8 data bits
Power: 9 V Battery (included)
Dimensions:
72 x 182 x 30 mm (2.8 x 7.2 x 1.2")
Weight: 150 g (5.3 oz)
Supplied with:
Tubing, battery, instruction manual, hard carrying case

Model No.	HHP8205	HHP8215	HHP8230	HHP8210
Range (psi)	0 to 5	0 to 15	0 to 30	0 to 100
Max Over Pressure (psi)*	20	30	60	150
Accuracy (%FS) *(includes linearity, hysteresis and repeatability)*	±0.3%	±0.3%	±0.3%	±0.3%
Resolution				
psi	0.001	0.01	0.1	0.1
inH$_2$O	0.01	0.1	1	1
inHg	0.001	0.01	0.1	0.1
bar	0.001	0.001	0.001	0.01
mbar	0.1	1	1	1
mmHg	0.1	1	1	1
oz/in	0.01	0.1	1	1
kg/cm^2	0.001	0.001	0.01	0.01
kPa	0.01	0.1	0.1	1
ftH$_2$O	0.001	0.01	0.1	0.1
cmH$_2$O	0.1	1	1	1

**Exceeding maximum pressure will cause permanent sensor damage*

To Order *(Specify Model Number)*

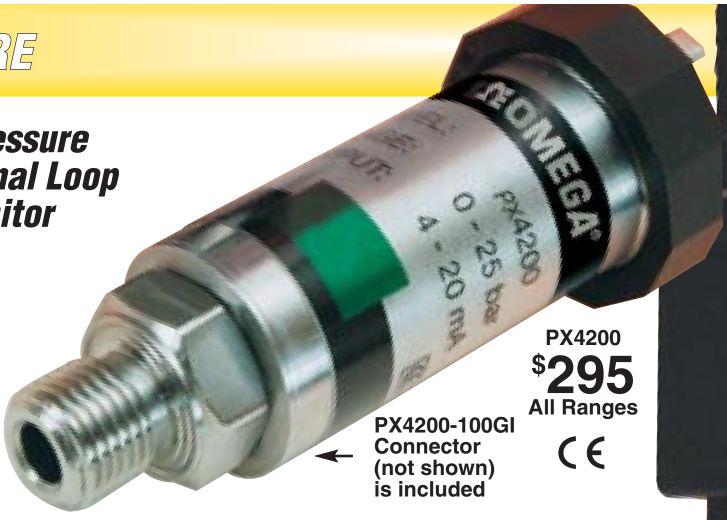
▭ **MOST POPULAR MODELS HIGHLIGHTED!**

Model No.	Price	Description
HHP8205	**$195**	0 to 5 psi high resolution model
HHP8215	**195**	0 to 15 psi standard resolution model
HHP8230	**195**	0 to 30 psi standard resolution model
HHP8210	**195**	0 to 100 psi standard resolution model
PHH-860-SW	**75**	RS232 Software, (disk & PC Cable)
PHH-860-PS	**12**	DC Power Supply Adapter

*Ordering Example: **HHP8205 & PHH-860-SW**, 0 to 5 psi model with 0.001 psi resolution, and RS232 software and PC cable, $195 + 75 = **$270.***
Supplied with connector hose, battery, instruction manual and hard carrying case.

Silicon on Sapphire Pressure Transmitter with Optional Loop Powered Pressure Monitor

- Silicon on Sapphire Construction
- Titanium Wetted Parts
- 0.25% Accuracy
- Optional Plug-on Display with Available Set-point
- High Operating Temperature
- IP65 Enclosure



PX4200
$295
All Ranges

PX4200-100GI Connector (not shown) is included

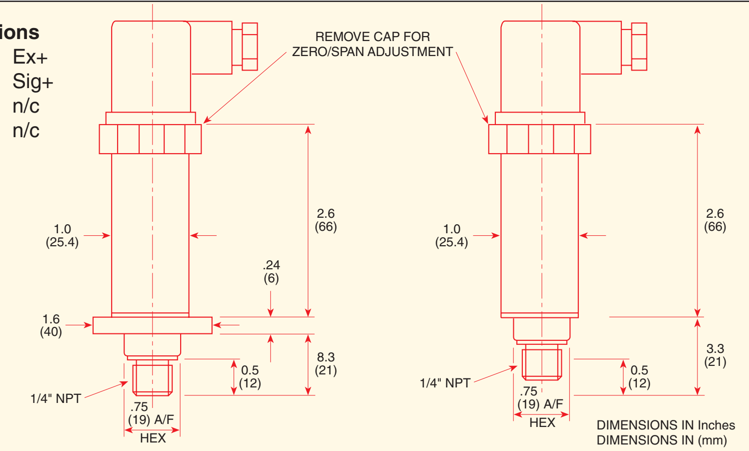
CE

PX4200 Series

Vacuum to 6,000 psi; 4-20 mA Output

Connections

Pin 1	Ex+
Pin 2	Sig+
Pin 3	n/c
Pin 4	n/c



DIMENSIONS IN Inches
DIMENSIONS IN (mm)

150
psi
PX4200-150GI
0-150 psig
4-20mA
OMEGA

PX4200-150GI shown smaller than actual size with Plug-on Loop Powered Pressure Monitor PM1001 attached (shipped as 2 pieces)

NEW®

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model Number)*

Range (psig)	Model No.	Price	Compatible Meters
30 inHg to 0	**PX4200-30VACI**	$295	DP41-E, DP25-E, PM1000
0 to 5	**PX4200-005GI**	295	DP41-E, DP25-E, PM1000
0 to 10	**PX4200-010GI**	295	DP41-E, DP25-E, PM1000
0 to 15	**PX4200-015GI**	295	DP41-E, DP25-E, PM1000
0 to 30	**PX4200-030GI**	295	DP41-E, DP25-E, PM1000
0 to 60	**PX4200-060GI**	295	DP41-E, DP25-E, PM1000
0 to 100	**PX4200-100GI**	295	DP41-E, DP25-E, PM1000
0 to 150	**PX4200-150GI**	295	DP41-E, DP25-E, PM1000
0 to 200	**PX4200-200GI**	295	DP41-E, DP25-E, PM1000
0 to 300	**PX4200-300GI**	295	DP41-E, DP25-E, PM1000
0 to 600	**PX4200-600GI**	295	DP41-E, DP25-E, PM1000
0 to 1K	**PX4200-1KGI**	295	DP41-E, DP25-E, PM1000
0 to 1.5K	**PX4200-1.5KGI**	295	DP41-E, DP25-E, PM1000
0 to 3K	**PX4200-3KGI**	295	DP41-E, DP25-E, DP24-E
0 to 6K	**PX4200-6KGI**	295	DP41-E, DP25-E, DP24-E
Pressure Monitor			
	PM1000	$125	Plug-on display
	PM1001	155	Plug-on display with single set-point

*Ordering Example: **PX4200-100GI**, 0 to 100 psig range with a 4-20 mA current output, and **PM1001** display with set-point, $295 + 155 = **$450.** All models come with complete operator's manual.*

OMEGA's PX4200 Series Transmitters bring state-of-the-art Silicon-on-Sapphire (SOS) sensor technology to the industrial arena. SOS construction uses very stable solid state silicon strain gages on a Sapphire carrier which is glass bonded to a titanium diaphragm. This combination provides a very durable transducer which has excellent stability and corrosion resistance over a wide temperature range.

A loop powered 3½ digit (-1999 to 1999) plug-on display adds versatility to the PX4200 by providing local display plus an available open collector set-point with 60 mA capability.

Specifications

Excitation: 13 to 36 Vdc with PM1000 18 to 36 Vdc reverse polarity protected
Load Driving Capacity: 1150Ω @ 36 Vdc, R_{max} = (Vs-13)/20 with PM1000 R_{max} = (Vs-18) / 20
Output: 4 to 20 mA (2-Wire) with zero and span adjustments
Accuracy: ±0.25% FS includes linearity, and hysteresis
Repeatability: ±0.1% FS
Long Term Stability (1yr): ± 0.2% FS
Media Temperature: -58 to 248°F (-50 to 120°C)
Ambient Temperature: -40 to 175°F (-40 to 80°C)
Thermal Zero Effect: <±0.016% FS/°F
Thermal Span Effect: <±0.016% FS/°F
Humidity: 95% RH non-condensing
Maximum Overpressure: 200% FS
Sensor: Silicon on Sapphire
Wetted Parts: Titanium
Case Material: Stainless Steel, IP65
Pressure Port: ¼" NPT male
Electrical Connection: Din 43650 Plug Mating Connector Supplied
Response Time: 10 ms
Weight: 3.2 oz (90 g)

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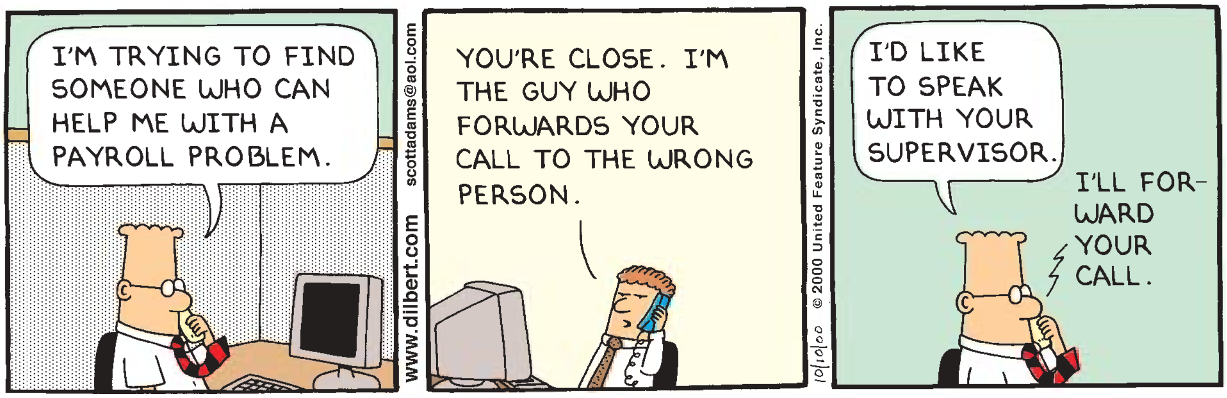
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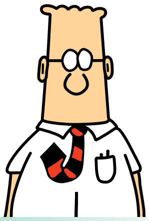

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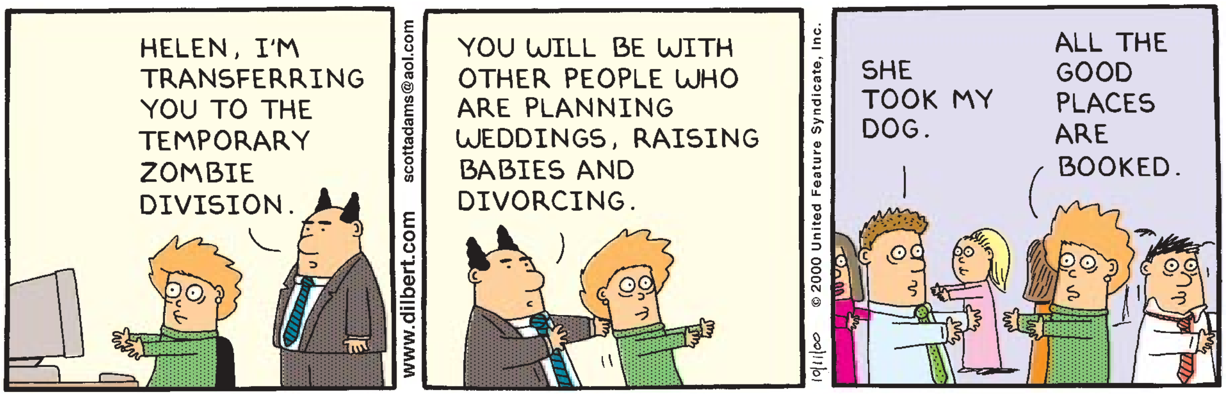
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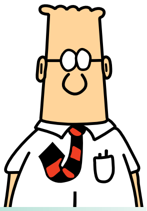

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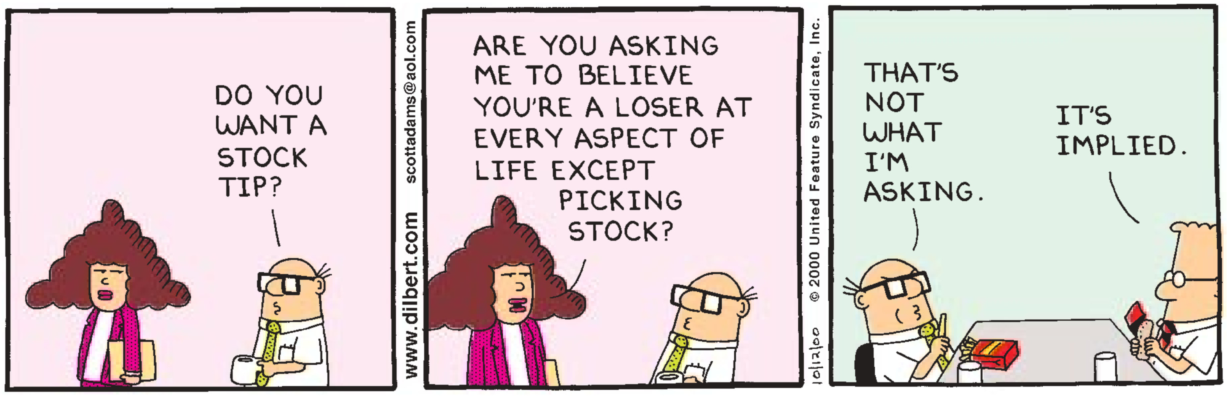
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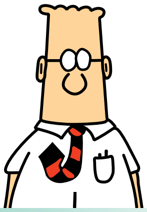

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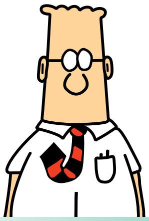

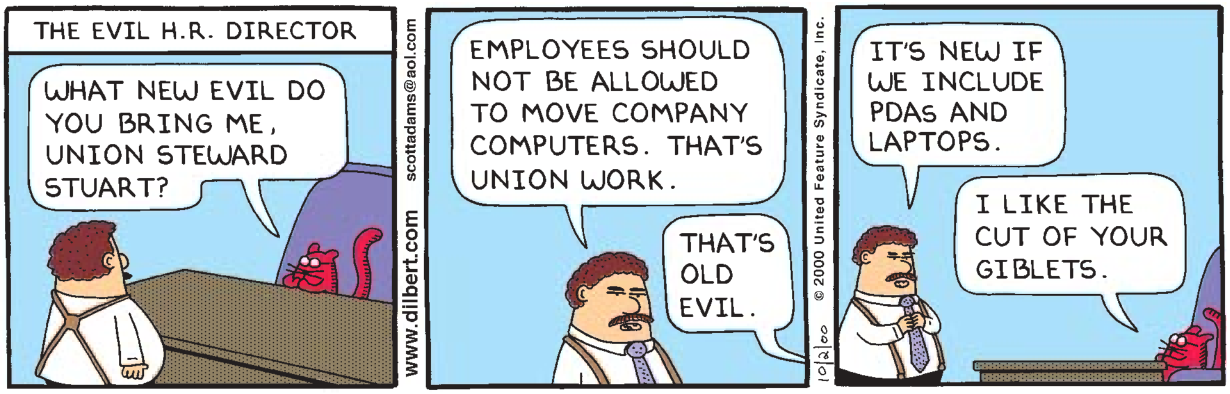
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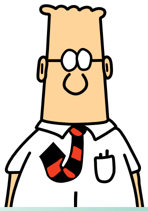

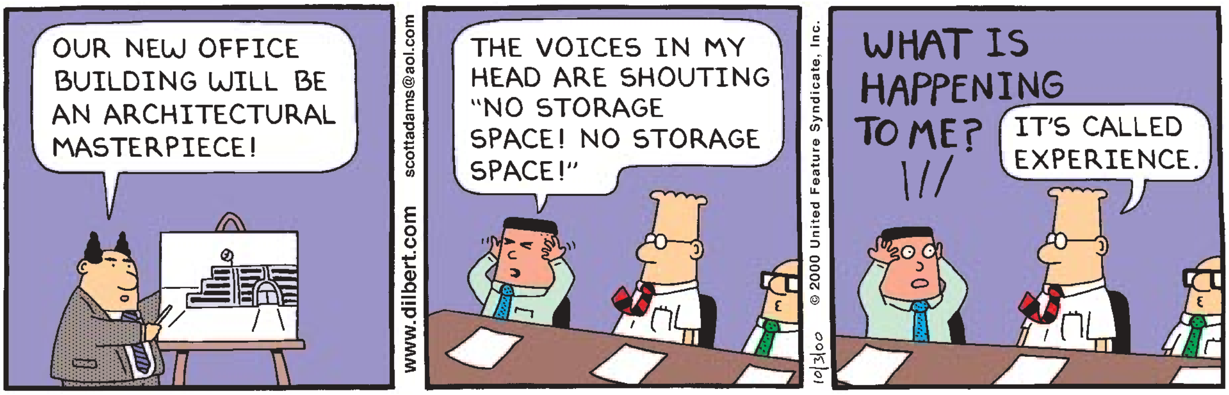
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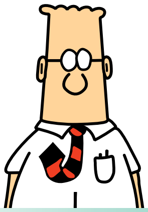

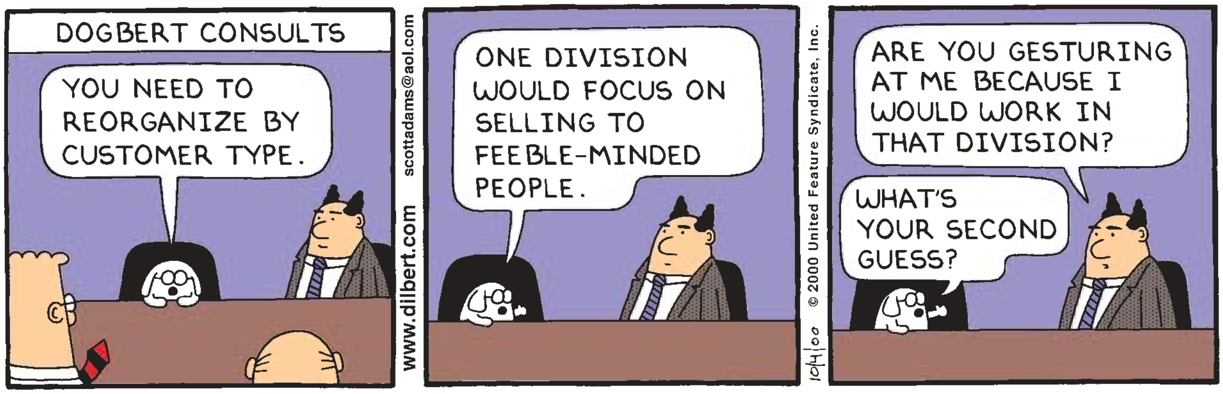
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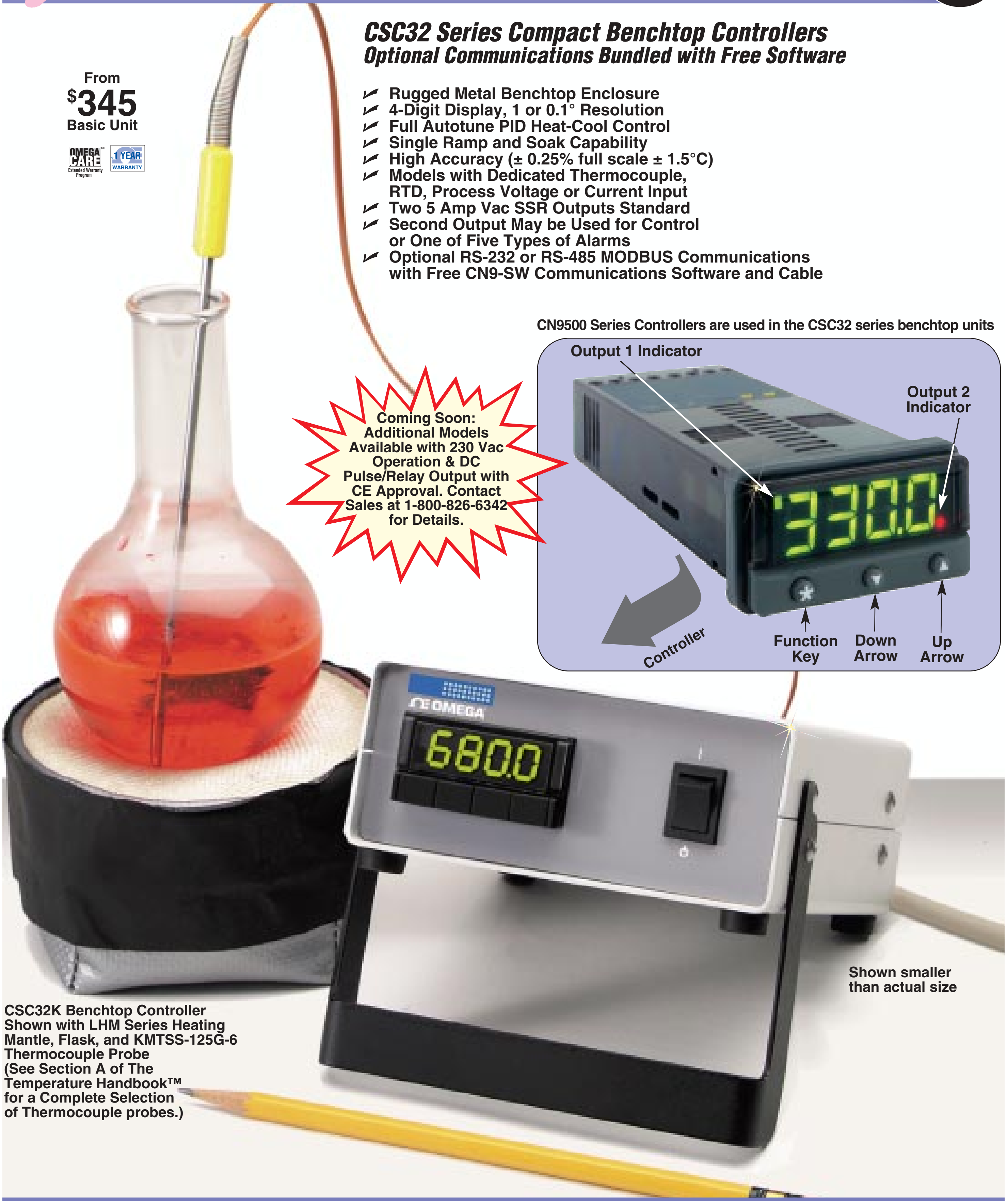
CSC32 Series Compact Benchtop Controllers
Optional Communications Bundled with Free Software

From
$345
Basic Unit

- Rugged Metal Benchtop Enclosure
- 4-Digit Display, 1 or 0.1° Resolution
- Full Autotune PID Heat-Cool Control
- Single Ramp and Soak Capability
- High Accuracy (± 0.25% full scale ± 1.5°C)
- Models with Dedicated Thermocouple, RTD, Process Voltage or Current Input
- Two 5 Amp Vac SSR Outputs Standard
- Second Output May be Used for Control or One of Five Types of Alarms
- Optional RS-232 or RS-485 MODBUS Communications with Free CN9-SW Communications Software and Cable

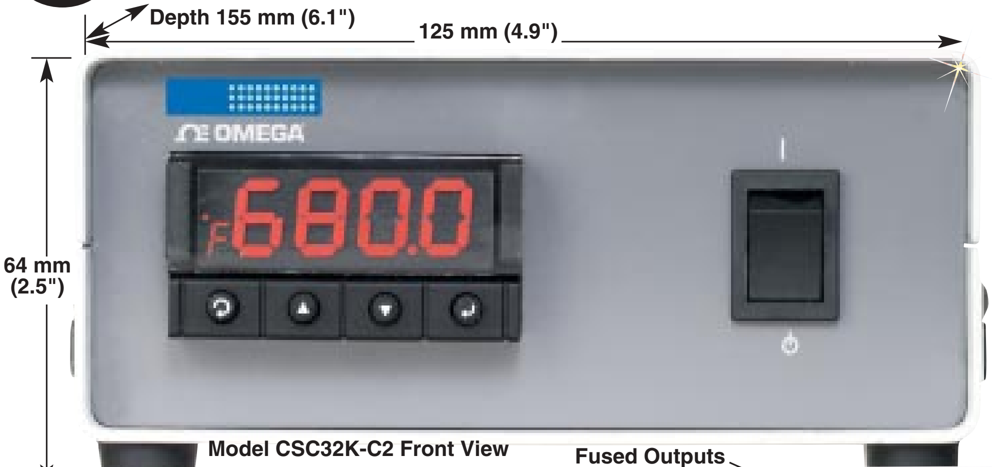
Coming Soon: Additional Models Available with 230 Vac Operation & DC Pulse/Relay Output with CE Approval. Contact Sales at 1-800-826-6342 for Details.

CN9500 Series Controllers are used in the CSC32 series benchtop units

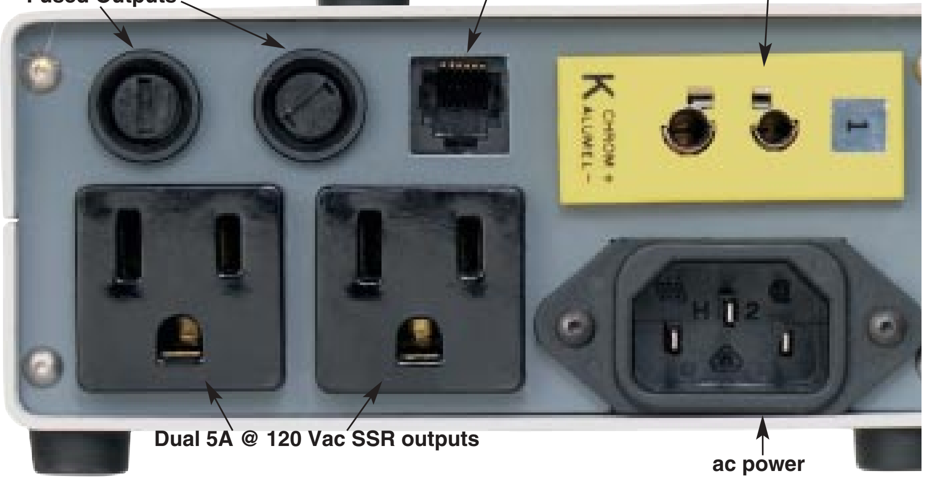


Shown smaller than actual size

CSC32K Benchtop Controller Shown with LHM Series Heating Mantle, Flask, and KMTSS-125G-6 Thermocouple Probe (See Section A of The Temperature Handbook™ for a Complete Selection of Thermocouple probes.)


Depth 155 mm (6.1")
125 mm (4.9")
64 mm (2.5")
OMEGA
°F 680.0

Model CSC32K-C2 Front View


RJ12 RS-232 or RS-485 Communications
The Patented UPJ-K-F Uni-Connector Accepts Either a Miniature or Standard Male Connector
Fused Outputs
K CHROM + ALUMEL –
Dual 5A @ 120 Vac SSR outputs
ac power

Model CSC32K-C2 Rear View

The CSC32 series compact benchtop controllers are ideal for laboratory use and applications requiring portable temperature and process control. Pre-wired input and output receptacles in the rear of the case enable quick and easy connections to power, input, power output and digital communications. These benchtop controllers are factory configured and calibrated for a dedicated input type by model number.

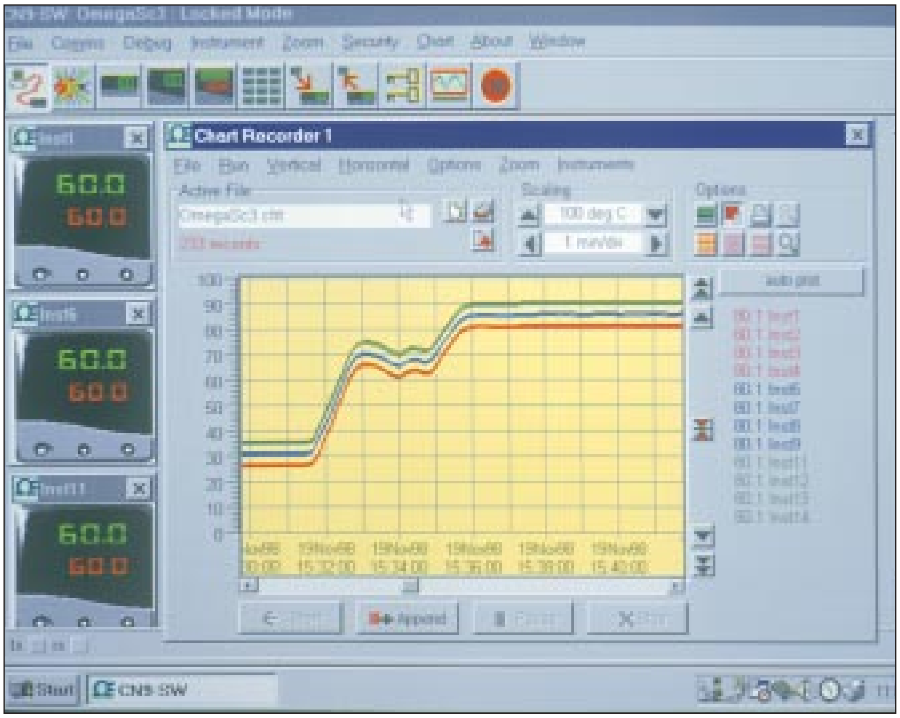
The 1⁄32 DIN CN9500 controller used in this benchtop controller series can be programmed for either On/Off, or PID Autotune Control (with autotune Feature) via the front panel or through the use of a PC and CN9-SW communications software.

CN9-SW software is designed to interface with the CN9300, CN9400, CN9500 and CSC32 Series benchtop controllers with optional communication hardware. Benefits:

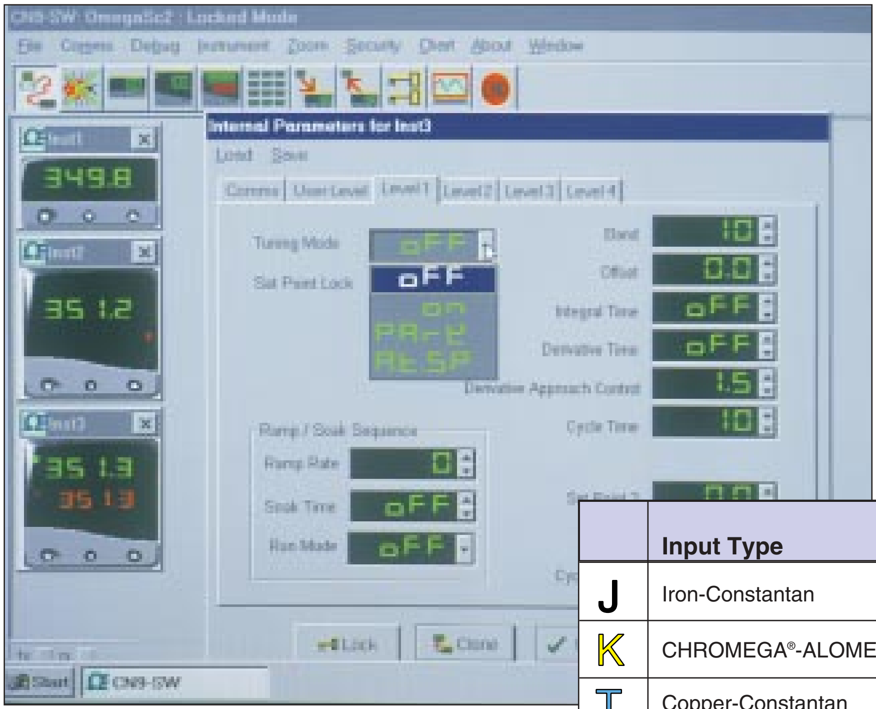
- Time saving benefit and convenience of remotely configuring and adjusting units
- Saving and retrieving settings to and from files
- Highly flexible logging and “real time” charting capability for providing hard copy QA records for ISO-9000 and other management purposes
- Software is capable of logging readings from up to 128 instruments which it stores in data files
- The data can be exported into text files in Comma Separated Variable format
- In addition, up to 12 controllers can be displayed on a single chart, or individual charts can be set up for each instrument
- A virtual full color chart recorder can log process variables such as: °C, °F, Bar, PSI, pH, rH, or user defined engineering units

Specifications

Power: 115 Vac, ±10%, 50/60 Hz
Coming Soon: Optional 230 Vac 50/60 Hz
Display: 4-digit LED, 10 mm (0.4"), high brightness green display
Display Range: -199 to 9999 counts (hi-res mode -199.9 to 999.9)
Range: Sensor limited 2000°C/3500°F; -99.9 to 999.9° in 0.1°resolution
240 V, 50 to 60 Hz


CN9-SW OmegaSc1 : Locked Mode
File Comms Debug Instrument Zoom Security Chart About Window
Inst1
Inst6
Inst11
60.0
60.0
Chart Recorder 1
File Run Vertical Horizontal Options Zoom Instruments
Active File
OmegaSc1.cht
Scaling
100 deg C
1 min/div
Options
auto plot
100
90
80
70
60
50
40
30
20
10
0
19Nov98 15:32:00
19Nov98 15:34:00
19Nov98 15:36:00
19Nov98 15:38:00
19Nov98 15:40:00
Start
Append
Pause
Stop
Start
CN9-SW

Graph Displaying Real Time Charting Using CN9-SW Software


CN9-SW OmegaSc2 : Locked Mode
File Comms Debug Instrument Zoom Security Chart About Window
Internal Parameters for Inst3
Load Save
Comms User Level Level1 Level2 Level3 Level4
Inst1
349.8
Inst2
35 1.2
Inst3
35 1.3
35 13
oFF
on
PA-2
At.SP
Lock
Clone
Start
CN9-SW

Tuning Mode: oFF
Set Point Lock: oFF
Band: 10
Offset: 0.0
Integral Time: oFF
Derivative Time: oFF
Derivative Approach Control: 1.5
Cycle Time: 10
Ramp / Soak Sequence
Ramp Rate: 0
Soak Time: oFF
Run Mode: oFF

Computer screen depicting the internal parameters setup for tuning mode, ramp/soak sequence and security lockouts when using CN9-SW Software. When a satisfactory instrument configuration has been achieved, these settings can be saved to a file for later use or cloned to other instruments on the network.

Display Indicators: Process variable (PV), Setpoint (SP), LED output indicators-flashing Output 1 (SP1 square), green; Output 2 (SP2 round), red; error messages, Function/Option mnemonics
Control Modes:
ID Autotune, ON/OFF, Direct/Reverse
Alarm Modes: deviation high, deviation low, deviation band, full Scale high, or full scale low
Thermocouple External Resistance: 100 Ω max
Thermocouple: See Table
Standards: IPTS/68/DIN43710 RTD Input: Pt100 2-wire (.00385)
Linear Process Inputs: mV range: 0 to 50 mV (1 ohm shunt resistor supplied for mA inputs)
Calibration Accuracy: ±0.25% of Full Scale ±1.5 °C
Sampling Frequency: Input 10 Hz, CJC 2 sec
Common Mode Rejection: Negligible effect up to 140 dB, 240 V, 50 to 60 Hz
Temperature Coefficient: 150 ppm/°C sensor max
Input Connection:
Thermocouple; Accepts both miniature and standard male Thermocouple Connectors (Note: A miniature and standard size male mating connector is included with each benchtop controller RTD, mA or mV; Accepts OMEGA® T series model TA3F Keyed-3-pin Locking Connector. Note: A mating connector is included with each benchtop controller
Outputs: Two solid state relays rated for 5 A @120Vac. (Internally, the controller provides two dc pulse outputs to drive a built-in dual solid state relay.)
Operating Ambient Range: 0 to 50°C (32 to 130°F)
Benchtop Case Material: Aluminum
Controller Case: Flame retardant polycarbonate
Power Connection:
Std. three prong power cord (provided)
Output Connections: Two standard 120 Vac outlets
Weight: 0.9 kg (2 lbs)

Input and Range Table

	Input Type	Linearized Range (Units are °C/°F Switchable)	Linearity °C
J	Iron-Constantan	-0 to 800°C/32 to 1472°F	0.5
K	CHROMEGA®-ALOMEGA®	-50 to -1200°C/-58 to 2192°F	0.25
T	Copper-Constantan	-200 to -250°C/-273 to 482°F	0.25
E	CHROMEGA®-Constantan	0 to 600°C/32 to 1112°F	0.5
R	Pt-13%Rh/Pt	-50 to 40°C/40 to 1768°F	2.0
S	Pt-10%Rh/Pt	0 to 1600°C/32 to 2912°F	2.0
N	OMEGA-P®-OMEGA-N®	-50 to 1200°C/-58 to 2912°F	0.25
RTD	100ΩPt, 2-Wire	-200 to 400°C/-273 to 752°F	0.25
MA	LINEAR CURRENT	0 to 20 mA(-250 to 3000 Max. Scale)	±0.5%
MV	LINEAR VOLTAGE	0 to 20 mV(-250 to 3000 Max. Scale)	±0.5%

To Order *(Specify Model No.)*

Model Number	Price	Description
CSC32(*)	**$345**	Benchtop controller

** Insert Input Code: **J, K, T, E, R, S, N, RTD, MV or MA from Input and Range Table***
Each model comes with an operator's manual and 120 Vac power cord and input connector.
Ordering Example: CSC32K-C2**, benchtop controller, type K input and RS-232 communications option: $345 + 125 = $470. **OCW-1** OMEGACARE℠ extends standard 1-year warranty to a total of 2 years ($47), $470 + 47 = **$517
OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order.

Communications Options (Pre-wired 6' communications cable included)

Suffix	Price	Description
-C2	**$125**	RS-232 communications bundled with free CN9-SW
-C4	**$125**	RS-485 communications bundled with free CN9-SW

Protocol Manual for CN9-SW Software

Model Number	Price	Description
BD9-PROTOCOL*	**N/C**	Modbus Protocol Manual (not required when using the CN9-SW software)

***Note:** This protocol manual provides the address information necessary to communicate with the CN9300/CN9400/CN9500 and CSC32 Series, with communications options installed, when interacting with custom or other commercially available software.*

Static Mixers

A Technical Introduction

FMX7200 Series

Sizes:
3/8˝ - 2˝
diameter

OMEGA® FMX7200 Series mixers are designed for efficient turbulent-flow mixing at low pressure drop. Ideal for admixing water/wastewater treatment chemicals, polymer dilution, and other low-viscosity applications. Mixing elements consist of a series of polypropylene baffles, and are mounted in a PVC housing with FNPT ends. CPVC and clear PVC housings available.

FMX8400 Series

Sizes:
1/8˝ - 2˝
diameter

OMEGA® FMX8400 Series mixers offer efficient mixing of low or high viscosity fluids at low pressure drop. Also ideal for two-phase (gas-liquid) mixing and blending of gases. Elements consist of a series of left and right helixes fabricated from 316SS. 304SS housing is corrosion-resistant, designed for high pressure anc high temperature service. MNPT ends ensure easy installation.

FMX9800 Series Sanitary Mixers

Sizes:
1/2˝ - 3˝
diameter

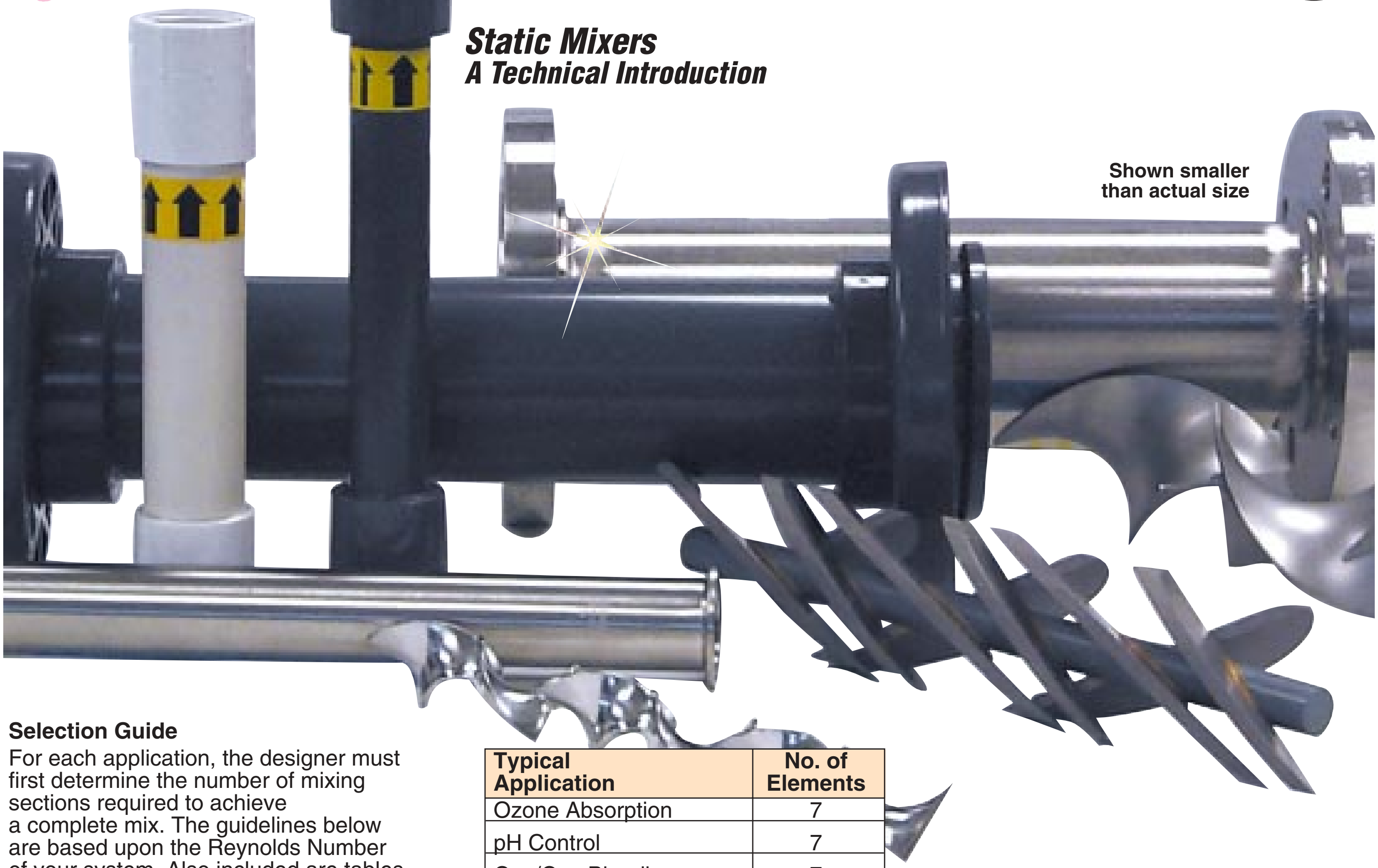
OMEGA® FMX9800 Series mixers are ideal for food and beverage processing, manufacturing pharmaceuticals and cosmetics, and other sanitary in-line applications. Features 3-A, 316LSS tube housing and removable 316LSS elements polished to a mirror finish. Tri-clamp flange ends permit easy removal, cleaning anc reinstallation.

FMX9200/ FMX9400 Series Process Mixers

Sizes:
2˝ - 18˝
diameter

OMEGA® PVC and CPVC mixers, and OMEGA all stainless and carbon steel mixers, are designed for higher flow rates and installations involving 2˝ to 18˝ diameter piping systems. Many standard models provide complete turbulent flow mixing at low pressure drop. Housing ends are 150# flanges. Special configurations to your specifications available.

Static Mixers
A Technical Introduction



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Selection Guide

For each application, the designer must first determine the number of mixing sections required to achieve a complete mix. The guidelines below are based upon the Reynolds Number of your system. Also included are tables with some general application guidelines.

Next, the designer should select a diameter and/or a construction that will give the desired mixing performance without exceeding your system's maximum allowable pressure drop (see item 3 below).

1. Calculate the Reynolds Number. Use the diameter given in the charts. If both inside and outside diameters are supplied, use the inside diameter

$$RE = \frac{3157 \times Q \times S}{D \times MU}$$

2. Select a model based on the Reynolds Number.

FMX7000 Series Mixers:

Reynolds No.	No. of Elements
800-1000	14
>1000	7

Typical Application	No. of Elements
Ozone Absorption	7
pH Control	7
Gas/Gas Blending	7
Dilution of Chemicals	7
Polyelectrolyte Dilution	14

FMX8000 Mixers:

Reynolds No.	No. of Elements
<10	24-32
10-500	16-24
500-2000	8-16
>2000	4-8

Typical Application	No. of Elements
1-1 Epoxies	24
Urethanes/Elastomers	32
Urethane Foam	16
In-line Aeration	8
Admixing of Additives	8

3. Determine the Pressure Drop

Laminar Flow:
Reynolds Number < 500

$$DP = Q \times MU \times L$$

Turbulent Flow:
Reynolds Number > 500

$$DP = Q^2 \times S \times T$$

NOTE: If the pressure drop across the mixer exceeds its maximum rating, a modular mixer is required. For example, if a 24-element FMX8300 mixer is required and the pressure drop exceeds the 250 psi rating, we recommend coupling two 12-element mixers in series.

Symbols

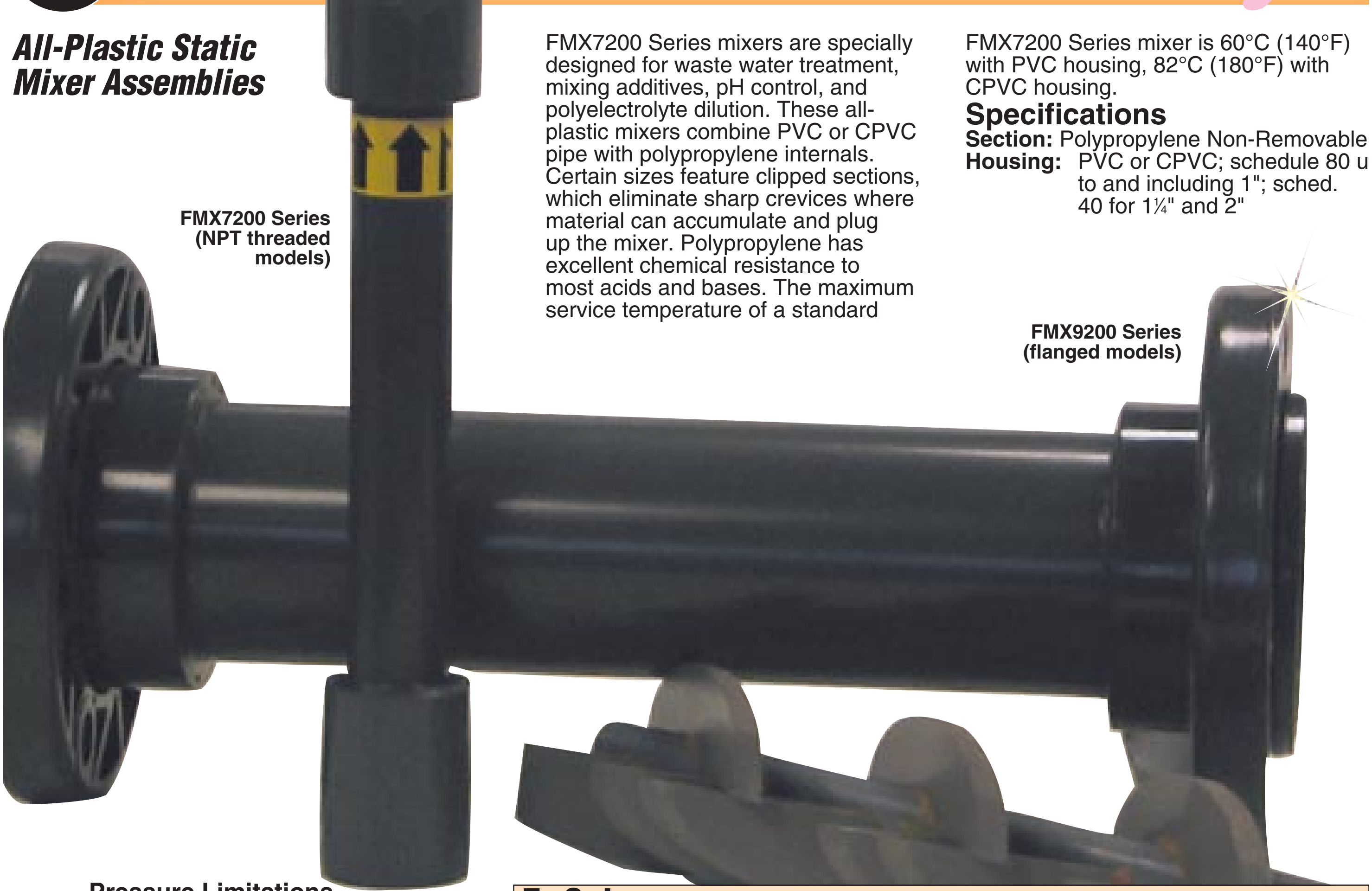
RE = Reynolds Number–Dimensionless
Q = Flowrate in Gallons per Minute
S = Specific Gravity–Dimensionless
MU = Viscosity in Centipoise
D = Diameter in Inches
DP = Pressure Drop in psi
L = Laminar Factor–See Mixer Tables
T = Turbulent Factor–See Mixer Tables

All-Plastic Static Mixer Assemblies

FMX7200 Series mixers are specially designed for waste water treatment, mixing additives, pH control, and polyelectrolyte dilution. These all-plastic mixers combine PVC or CPVC pipe with polypropylene internals. Certain sizes feature clipped sections, which eliminate sharp crevices where material can accumulate and plug up the mixer. Polypropylene has excellent chemical resistance to most acids and bases. The maximum service temperature of a standard FMX7200 Series mixer is 60°C (140°F) with PVC housing, 82°C (180°F) with CPVC housing.

Specifications

Section: Polypropylene Non-Removable
Housing: PVC or CPVC; schedule 80 u to and including 1"; sched. 40 for 1¼" and 2"



FMX7200 Series (NPT threaded models)

FMX9200 Series (flanged models)

Pressure Limitations

Pipe Size	psig @ 24°C (75°F)
⅜"	850
¾"	690
1"	630
1¼"	260
2"	200

The FMX7200 and FMX9200 Series are an effective answer to your mixing requirements. Operating in-line, with no moving parts, these mixers blend and disperse treatment chemicals into waste water streams. Compared to competitive mixers, its unique baffling design ensures complete mixing in a shorter length and lower pressure drop.

The FMX7200 and FMX9200 Series are easily installed in new or existing process lines. They are available in pipe sizes from ⅜" to 18" diameter. Construction materials include PVC, CPVC, and polypropylene.

To Order *(Specify Model Number)*

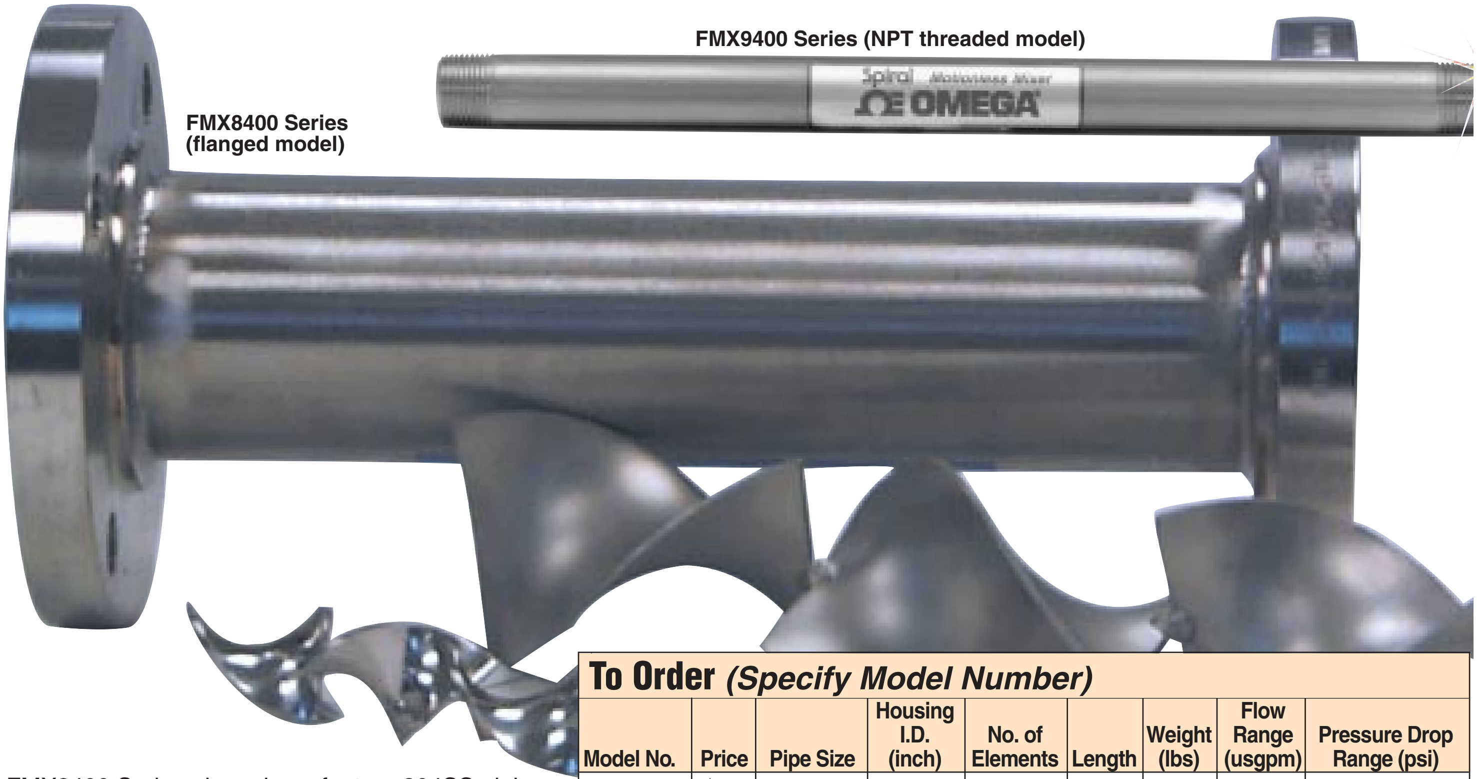
Model Number (PVC)	Price	Model Number (CPVC)	Price	Dia.	No. of Elements	Ends FNPT	Length mm (in)	Factors	
								L	T
FMX7211	**$98**	**FMX7211-CP**	**$142**	.432"	7	⅜"	112 (4.4)	.18	7.6
FMX7212	**105**	**FMX7212-CP**	**152**	.432"	14	⅜"	173 (6.8")	.36	15.2
FMX7221	**111**	**FMX7221-CP**	**161**	.687"	7 clipped	¾"	178 (7.0)	.015	.24
FMX7222	**122**	**FMX7222-CP**	**177**	.687"	14 clipped	¾"	267 (10.5)	.03	.48
FMX7231	**120**	**FMX7231-CP**	**174**	.906"	7 clipped	1"	208 (8.2)	.0066	.08
FMX7232	**135**	**FMX7232-CP**	**196**	.906"	14 clipped	1"	320 (12.6)	.013	.16
FMX7241	**145**	**-**	**n/a**	1.38"	7 clipped	1¼"	262 (10.3)	.0018	.015
FMX7242	**172**	**FMX7242-CP**	**250**	1.38"	14 clipped	1¼"	445 (17.5)	.0036	.03
FMX7251	**162**	**FMX7251-CP**	**235**	2.05"	5	2"	287 (11.3)	.0003	.0016
FMX7252	**190**	**FMX7252-CP**	**275**	2.05"	10	2"	490 (19.3)	.0006	.0032

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

Model Number	Price	Pipe Size	Housing ID Inch	No. of Elements	Length cm (in)	Weight Lb (kg)	Flow Range (usgpm)	Pressure Drop Range (psi)
FMX9201	**$632**	3"Sch80	2.9	3	43 (17)	9 (4)	25 - 200	0.9 - 6
FMX9202	**1048**	3"Sch80	2.9	6	76 (30)	16 (7)	25 - 200	0.18 - 11
FMX9203	**872**	4"Sch80	3.83	3	50 (20)	16 (7)	30 - 500	0.04 -12
FMX9204	**1264**	4"Sch80	3.83	6	89 (35)	22 (10)	30 - 500	0.08 - 23
FMX9205	**1272**	6"Sch80	5.76	3	71 (28)	33 (15)	80 - 1000	0.06 - 9
FMX9206	**1808**	6"Sch80	5.76	6	130 (51)	50 (23)	80 - 1000	0.12 - 18

*Comes with PVC Housing and PVC 150# Van Stone SlipON Flanged Ends, Internal mixing elements are CPVC material. **Ordering Example: FMX9202,** 3" Sch80 flanged model, **$1048.***

All Stainless Steel Static Mixers With Optional Teflon® Coated Elements


FMX9400 Series (NPT threaded model)

FMX8400 Series (flanged model)

FMX8400 Series pipe mixers feature 304SS piping (schedule 40 nominal) with 316SS elements. This series is available with Teflon® coating or non-coated stainless elements. Teflon® coating does not impart greater chemical resistance than stainless steel. The coating simply enhances the cleanability of the mixing elements. For routine maintenance, the elements can be pushed out and cleaned.

The leading and trailing edges of the mixers are "Knife Edged" to flush clean with less solvent, having no flat leading edges to accumulate material.

The FMX8400 and FMX9400 Series are an effective motionless mixer. When combined with metering pumps, these mixers replace expensive treatment tanks and dynamic mixers. Consider these advantages: Zero Maintenance, Low Cost, Easy Installation and Low Energy Consumption

Typical applications include both laminar or turbulent blending, liquid/gas contacting and enhanced heat transfer. The mixing process is modular: the more difficult the application, the greater number of elements required.

FMX8400 Pressure Limitations

Pipe Size	psig @ 24°C (75°F)
⅛"	8750
¼"	8500
⅜"	7250
½"	7250
¾"	6000
1"	4500
1½"	3000
2"	2500

Teflon® is a registered trademark of DuPont.

To Order *(Specify Model Number)*

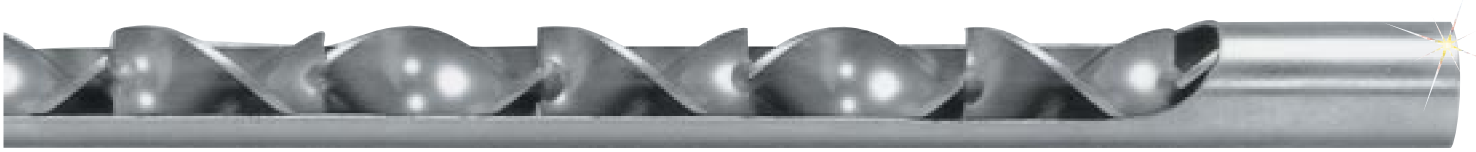
Model No.	Price	Pipe Size	Housing I.D. (inch)	No. of Elements	Length	Weight (lbs)	Flow Range (usgpm)	Pressure Drop Range (psi)
FMX9401	**$864**	2"Sch40	2.05	3	10.7"	15	5-100	0.02-8
FMX9402	**1000**	2"Sch40	2.05	6	18.5"	19	5-100	0.04-2
FMX9403	**1752**	3"Sch40	3.07	3	15.8"	33	25-250	0.07-7
FMX9404	**2576**	3"Sch40	3.07	6	28"	42	25-250	0.14-13
FMX9405	**2368**	4"Sch40	4.03	3	20"	54	30-300	0.04-9
FMX9406	**3112**	4"Sch40	4.03	6	38"	68	30-300	0.08-17
FMX9407	**2832**	6"Sch40	6.06	3	29"	95	80-1000	0.05-6
FMX9408	**4192**	6"Sch40	6.06	6	56"	140	80-1000	0.10-12

MOST POPULAR MODELS HIGHLIGHTED!

To Order *(Specify Model Number)*

Model No. 316SS Elements	Price	Model No. F.P. Coated Elements	Price	I.D.	No. of Elements	Ends MNPT	Length	Factors L	T
FMX8441S	**$106**	**FMX8441T**	**$134**	.28"	6	⅛"	2.7"	.0588	6.1
FMX8442S	**141**	**FMX8442T**	**170**	.28"	12	⅛"	5.4"	.1176	12.2
FMX8451S	**114**	**FMX8451T**	**144**	.37"	6	¼"	3.7"	.0237	1.9
FMX8452S	**153**	**FMX8452T**	**185**	.37"	12	¼"	7.0"	.0474	3.8
FMX8461S	**122**	**FMX8461T**	**156**	.51"	6	⅜"	5.0"	.0092	.55
FMX8462S	**163**	**FMX8462T**	**200**	.51"	12	⅜"	9.5"	.0184	1.1
FMX8481S	**143**	**FMX8481T**	**175**	.64"	6	½"	5.7"	.0049	.22
FMX8482S	**192**	**FMX8482T**	**229**	.64"	12	½"	11.0"	.0098	.44
FMX8411S	**156**	**FMX8411T**	**199**	.80"	6	¾"	7.7"	.0023	.04
FMX8412S	**209**	**FMX8412T**	**274**	.80"	12	¾"	14.7"	.0046	.08
FMX8413S	**198**	**FMX8413T**	**254**	1.06"	6	1"	9.5"	.001	.024
FMX8414S	**264**	**FMX8414T**	**328**	1.06"	12	1"	18.5"	.002	.048
FMX8415S	**281**	**FMX8415T**	**368**	1.61"	6	1½"	14.0"	.0002	.004
FMX8416S	**392**	**FMX8416T**	**451**	1.61"	12	1½"	27.2"	.0004	.008
FMX8421S	**341**	**FMX8421T**	**425**	2.07"	6	2"	17.5"	.0001	.0013
FMX8422S	**462**	**FMX8422T**	**643**	2.07"	12	2"	34.5"	.0002	.0026

Stainless tube and Spiral Sanitary Mixers *FMX9600 Series/FMX9800 Series*



FMX9600 Series

The FMX9600 Series Spiral mixers are designed for high-pressure applications such as two component adhesives and sealants. The mixers consist of a series of left and right hand spiral elements which have been “edge-sealed” into a tube. The spiral tube mixer is available in four diameters and with 15 to 32 elements. The elements have been nicrobrazed along their complete length and cannot be removed from the tube. Consider the advantages of this all-stainless steel assembly: the moderate price offers significant savings over competitive mixers, the contour of the elements ensures that the mixer flushes clean with less solvent, and the tube mixers are manufactured with heavy walled tubing, which resists warpage during furnace cleaning and increases the life of the mixer.

Specifications

Elements: 316 stainless steel, non-removable

Housing: 304 stainless steel with plain ends

☐ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model Number)*

		Element			Housing						
		Diameter		Mixing	Length		Outside Dia.		Pressure Limitation		L Factor to Calc.
Model No.	Price	inch	mm	Elements	inch	cm	inch	mm	psi@300°F	bar@150°C	Pressure Drop
FMX9601	**$126**	.113	2.87	17	4.88	12.40	.187	4.75	6900	476	2.000
FMX9602	**129**	.113	2.87	21	6.00	15.24	.187	4.75	6900	476	2.470
FMX9603	**136**	.113	2.87	27	7.50	19.05	.187	4.75	6900	476	3.180
FMX9604	**130**	.187	4.75	21	7.00	17.78	.250	6.35	4200	290	0.540
FMX9605	**144**	.187	4.75	27	9.25	23.50	.250	6.35	4200	290	0.700
FMX9606	**156**	.187	4.75	34	11.50	29.21	.250	6.35	4200	290	0.880
FMX9607	**132**	.292	7.42	21	11.00	27.94	.375	9.53	3600	248	0.084
FMX9608	**146**	.292	7.42	27	14.00	35.56	.375	9.53	3600	248	0.110
FMX9609	**162**	.418	10.62	15	11.88	30.18	.500	12.70	2800	193	0.036
FMX9610	**178**	.418	10.62	21	16.38	41.61	.500	12.70	2800	193	0.050
FMX9611	**198**	.418	10.62	32	24.75	62.87	.500	12.70	2800	193	0.077

The mixer comes with plain ends. The elements are edgesealed to the housing to handle the mixing of high pressure or highly viscous materials. Elements are 316SS and the housing is 304SS.
Ordering Example: FMX9601, *spiral mixer,* ***$126.***

FMX9800 Series

The FMX9800 Series Sanitary Mixers are ideal for processing foods, pharmaceuticals, cosmetics and beverages. Compared with dynamic mixers, which involve agitators, motors and seals, motionless mixers have no moving parts. The mixer consists of a series of spiral elements. The elements convert the tube into a maze or labyrinth. As the fluids are pumped through the mixer, they are progressively divided and recombined. The result is efficient in-line mixing.

The FMX9800 Series can be quickly installed in new or existing process lines. The interior mixing elements can be easily removed for cleaning. This assembly meets 3A sanitary requirements.

Specifications

Tube Mixers ½" through 3"

Elements: 316LSS removable, highly polished to 32Ra or better finish

Housing: 316LSS, 3A sanitary design

Ends: 316LSS tri-clamp flange (clamps, gaskets not included)

☐ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model Number)*

Model Number	Price	Mixing Elements	I.D. Inch	O.D. Inch	L Inch	Tri-Clamp O.D. Inch	Flow Range (gpm)	Pressure Drop Drop Range
FMX9801	**$475**	6	0.37	0.50	4.50	.984	0.5-5	0.2-8.4
FMX9802	**635**	6	0.62	0.75	7.00	.984	2.0-10	0.8-12
FMX9803	**660**	6	0.87	1.00	11.00	1.980	2.0-15	0.3-11
FMX9804	**1090**	6	1.37	1.50	14.00	1.980	5.0-50	0.4-13
FMX9805	**1125**	6	1.87	2.00	19.00	2.480	5.0-75	0.1-12
FMX9806	**1450**	6	2.37	250	23.50	3.047	10.0-150	0.1-14
FMX9807	**1650**	6	2.87	3.00	30.00	3.580	10.0-200	0.0-10

Sanitary mixers comes with AAA BWG016 housing with internal mirror polished 6 spiral elements. For 12 elements recommend installing 2 mixers in series for ease of installation and cleaning.
Ordering Example: FMX9801, *sanitary mixing element,* ***$475.***

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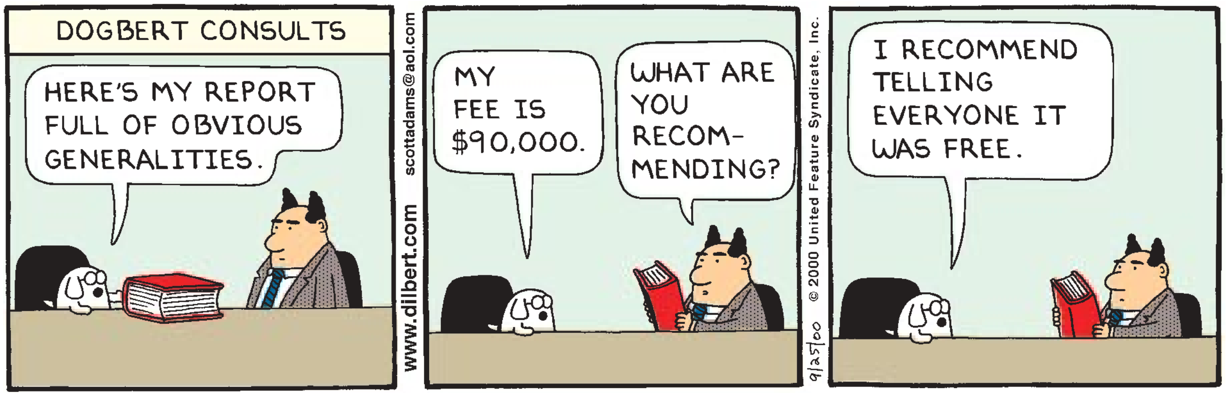
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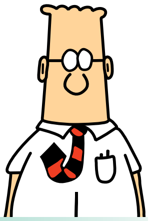

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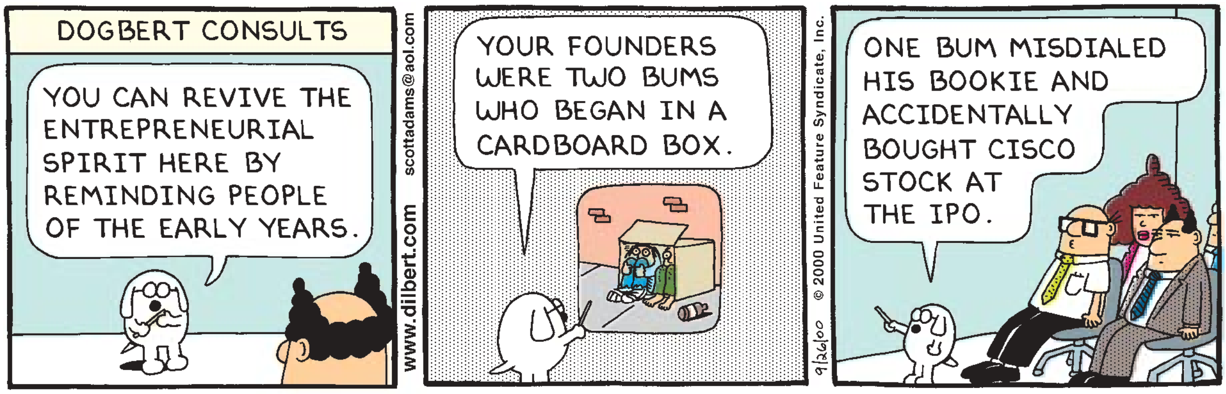
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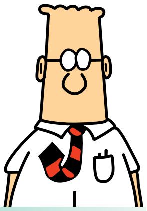

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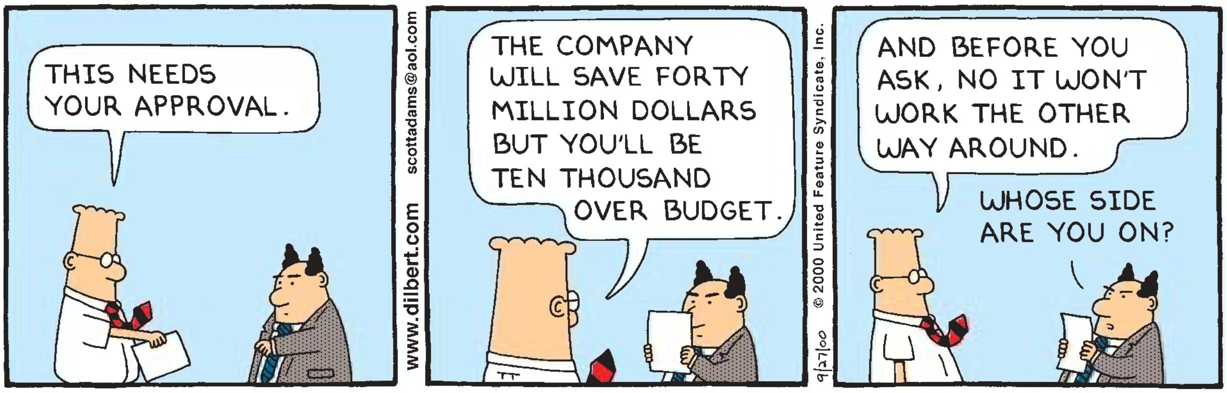
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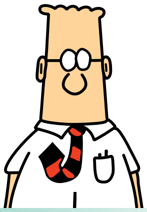

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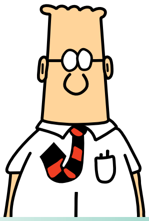

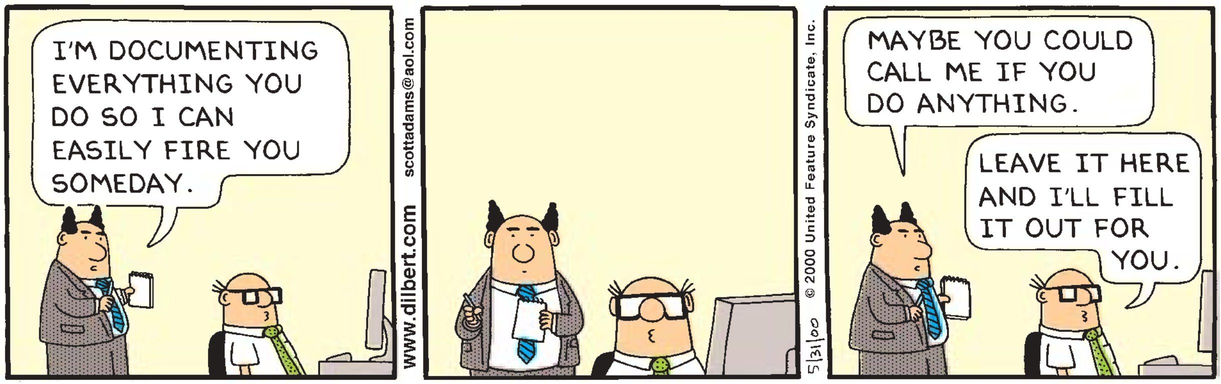
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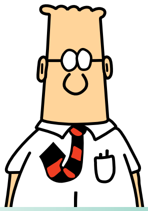
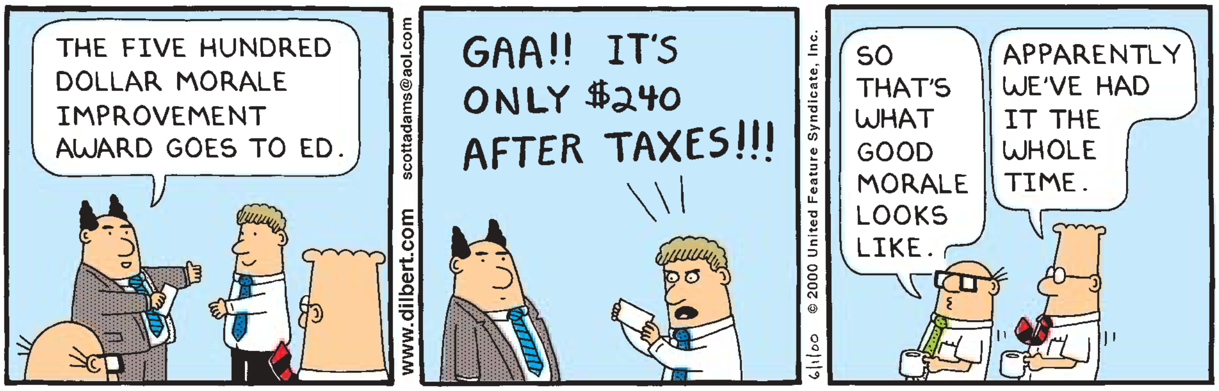
Collection Series

#11-001065




THE FIVE HUNDRED DOLLAR MORALE IMPROVEMENT AWARD GOES TO ED.
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scottadams@aol.com
GAA!! IT'S ONLY $240 AFTER TAXES!!!
SO THAT'S WHAT GOOD MORALE LOOKS LIKE.
APPARENTLY WE'VE HAD IT THE WHOLE TIME.
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6/1/00

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

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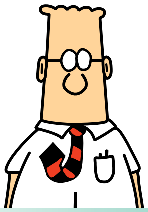
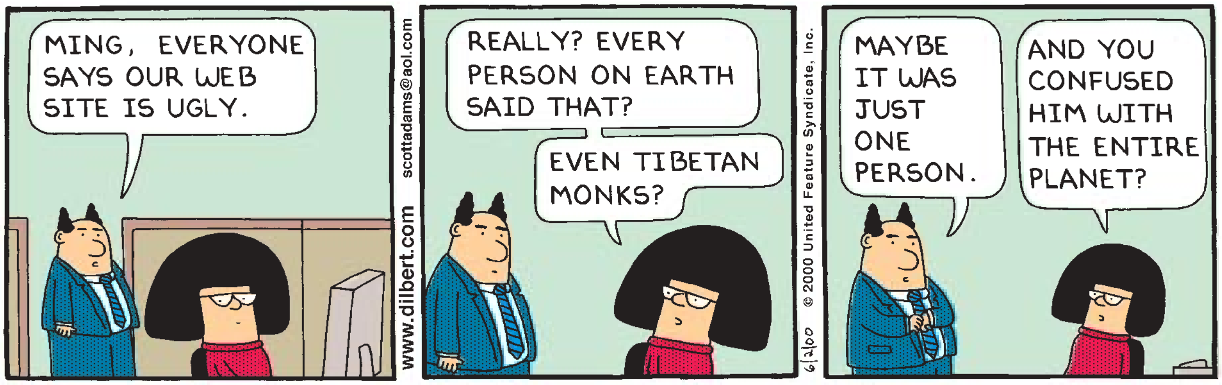
DILBERT® by Scott Adams

11

Collection Series

#11-001066




MING, EVERYONE SAYS OUR WEB SITE IS UGLY.
www.dilbert.com
scottadams@aol.com
REALLY? EVERY PERSON ON EARTH SAID THAT?
EVEN TIBETAN MONKS?
MAYBE IT WAS JUST ONE PERSON.
AND YOU CONFUSED HIM WITH THE ENTIRE PLANET?
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6/2/00

6/02/00 DILBERT © United Feature Syndicate, Inc.

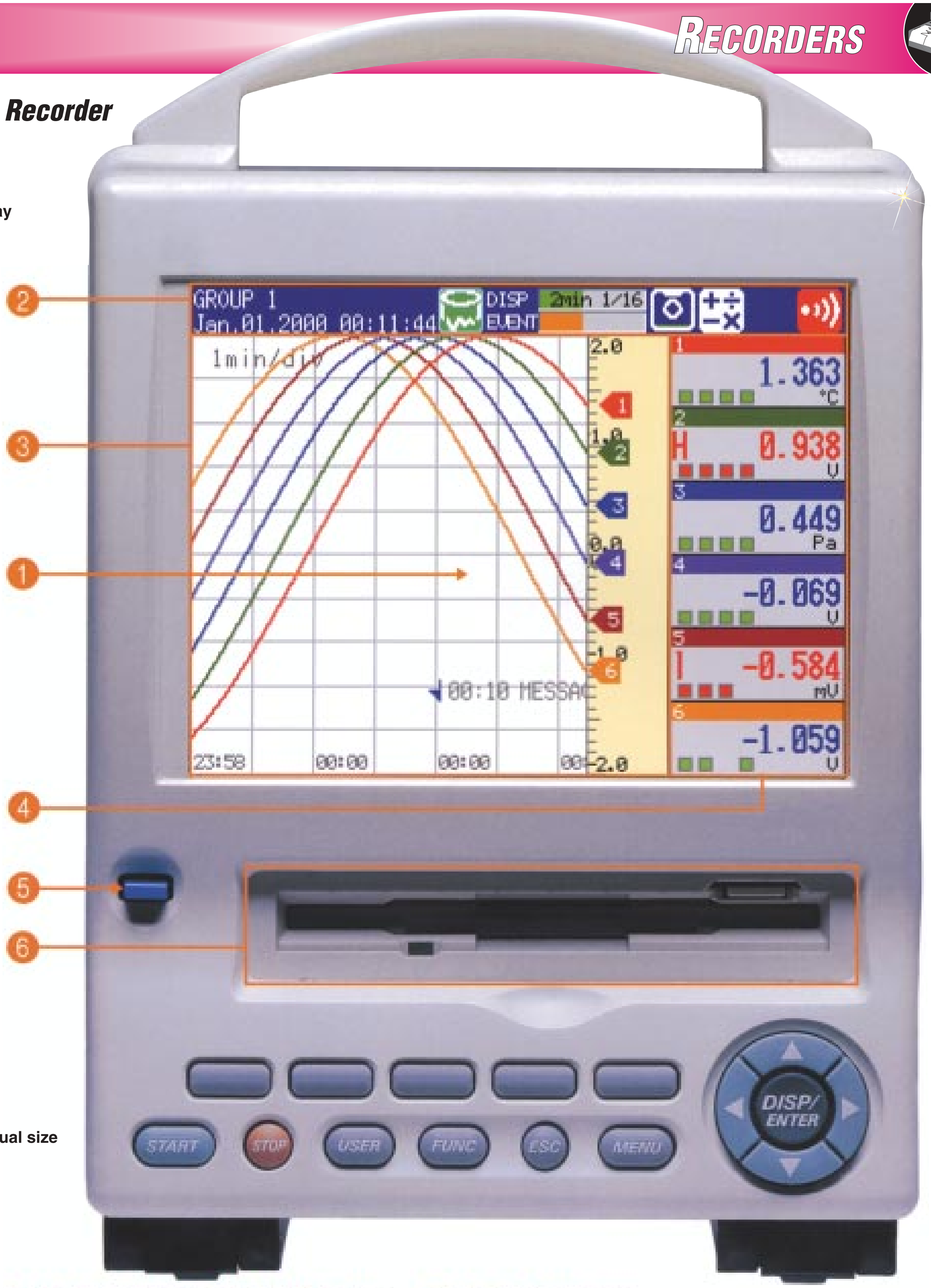
One Omega Drive, P.O. 4047
Stamford, CT 06907-0047

omega.com® ΩOMEGA®

Paperless Recorder

RD-MV100
5.5" TFT Display
$2400
Basic Unit

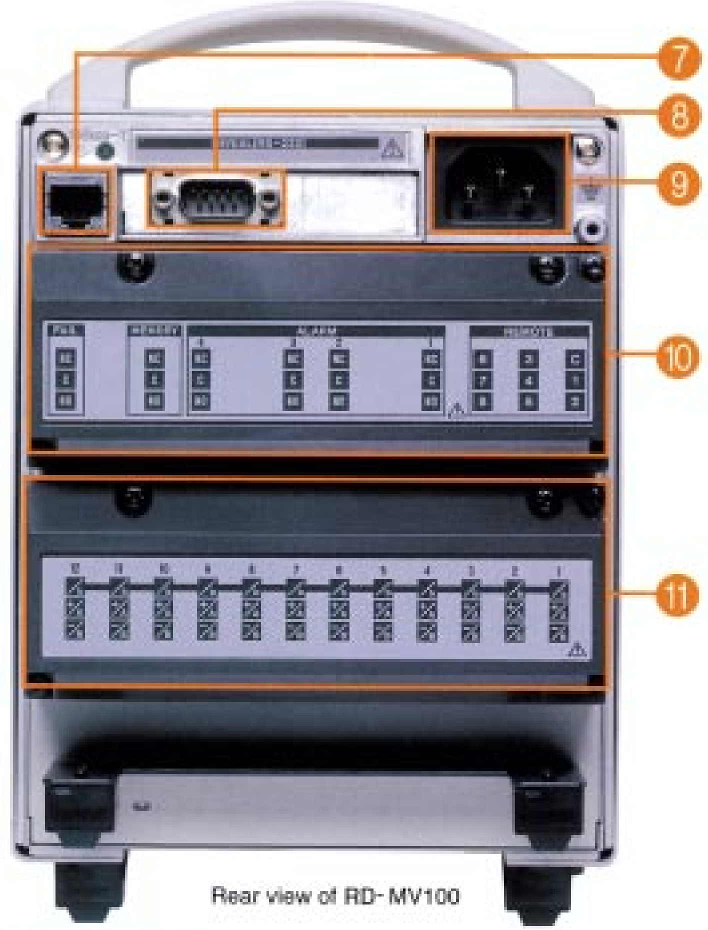
RD-MV200
10.4" Display
$3800
Basic Unit


2
3
1
4
5
6
GROUP 1
Jan.01.2000 00:11:44
DISP
EVENT
2min 1/16
1min/div
00:10 MESSAGE
23:58
00:00
00:00
2.0
1.0
0.0
-1.0
-2.0
1.363 °C
H 0.938 V
0.449 Pa
-0.069 V
-0.584 mV
-1.059 V
START
STOP
USER
FUNC
ESC
MENU
DISP/ENTER

Shown actual size

- ❶ **5.5-inch wide-viewing-angle color LCD display**
- ❷ **RD-MV100 status display area**
- ❸ **Trend display area**
  The fastest trend display updating rate is 1 min/div (approximately 615 mm/h in terms of display speed).
- ❹ **Digital display area**
  The display updating interval is 1 second.
- ❺ **Power ON/OFF switch**
- ❻ **Removable storage drive**

NEW



Rear view of RD-MV100

⑦ Ethernet (10BASE-T)

⑧ RS-232, RS-422-A/485 (optional)

⑨ Power inlet

⑩ Alarm output, remote control, etc. (optional)

⑪ Input modules

DC voltage, TC, RTD, and digital inputs (can be mixed). Clamp terminals (screw terminals are optional).

● DC model (specify when placing order)

The main unit operates on DC power only.

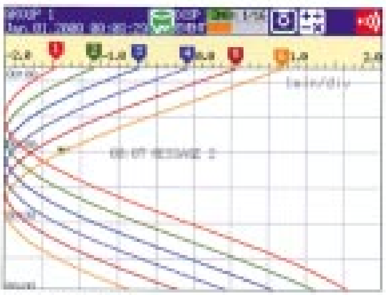
RD-MV200 features a larger 10.4" display!

To Order *(Specify Model Number)*

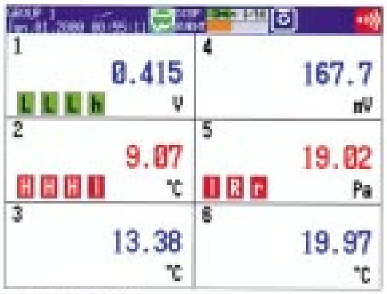
Model No.	Price	Description
RD-MV102-1	$2400	2-Channel, 5.5" Paperless Recorder
RD-MV106-1	2500	6-Channel, 5.5" Paperless Recorder
RD-MV112-1	3500	12-Channel, 5.5" Paperless Recorder
RD-MV204-1	3800	4-Channel, 10.4" Paperless Recorder
RD-MV210-1	4000	10-Channel, 10.4" Paperless Recorder
RD-MV220-1	4750	20-Channel, 10.4" Paperless Recorder
RD-MV230-1	5500	30-Channel, 10.4" Paperless Recorder
OPTIONS (add as suffix)		
/A3	375	Alarm Relay Output - 6 points
/C2	170	RS-232 Interface
/C3	170	RS-422-A/485 Interface
/F1	170	FAIL/Memory end detection & output
/M1	200	Math Functions with Report

Standard Models include: 120/240 Vac power and floppy disk storage.
*To Order with zip disc or ATA Flash Card change the "-1" suffix to "-2" or "-3" respectively, add **$150** to price. To order with 12 VDC power, add **$350** and other options available, consult Sales.*
Mutually Exclusive Options: /A1, /A2, /A3; /A3, /F1; /C2, /C3
Ordering Example: RD-MV106-1/A3/C3,** 6-Channel 120/240 Vac model with floppy disc storage, alarm relay output with 6-points and RS422-A485 Interface, $2500 + 375 + 170 = **$3045.

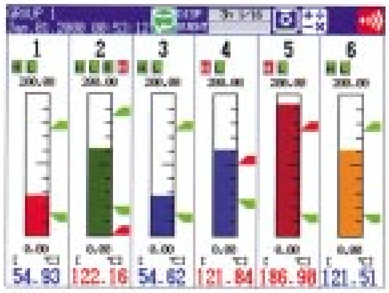
Display Type



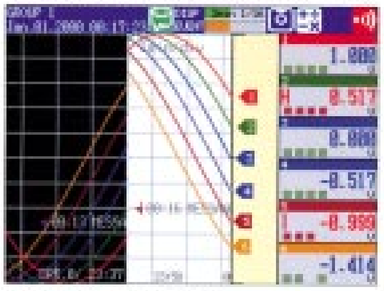
Trend display
(maximum 12 simultaneous channels)
The trend display direction (vertical, horizontal) and background color (white, black) can be switched.



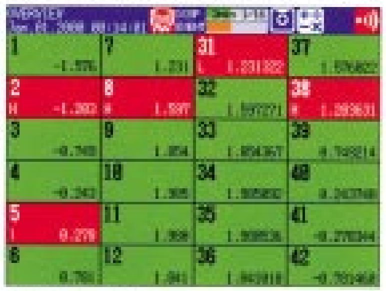
Digital display
(maximum 6-channel switching display)
Displays digital measurements, as well as channel/tag numbers, engineering units, and alarm statuses.



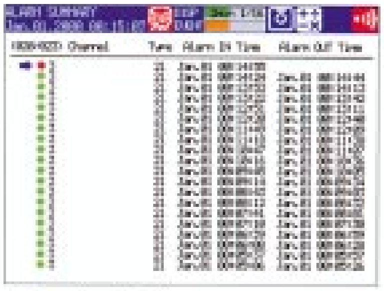
Bar graph display
(maximum 6-channel switching display)
Vertical and horizontal bar graphs can be selected.



Historical trend display
Allows past data saved in memory to be played back. In addition, historical and current trends can be viewed at the same time.



Overview display
Allows digital readings and alarm statuses on all channels (including calculation channels) to be monitored.

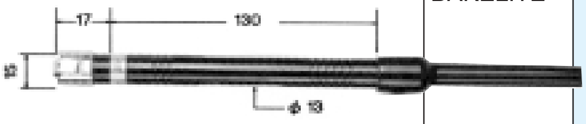
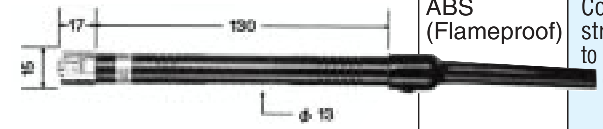
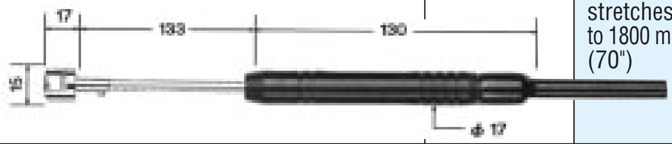
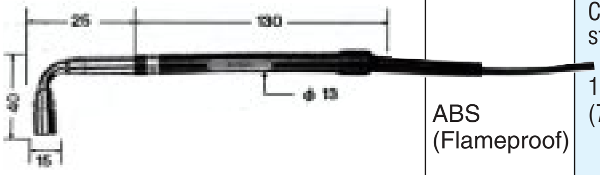
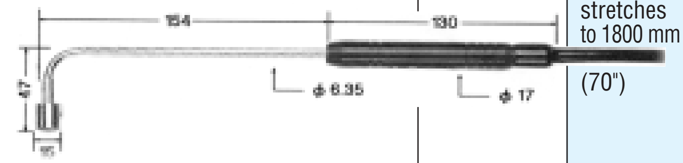
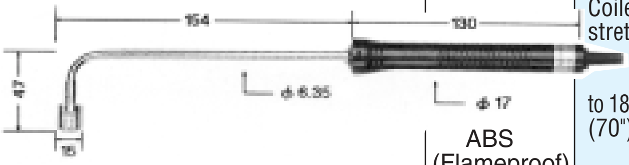
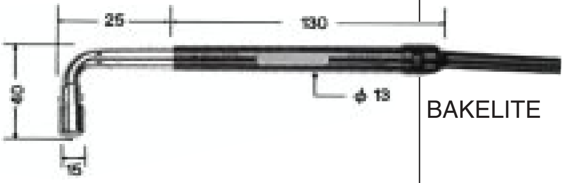
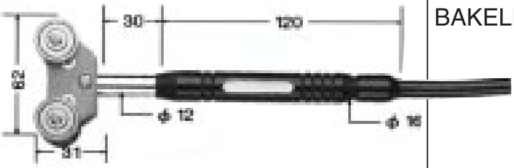
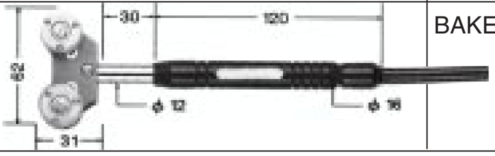


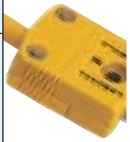
Information display
Displays an alarm summary, message summary, and report data.

Visit the *omega.com* website or request a bulletin for additional information

NEW

Economical Surface and Penetration Probes

Model No.	Price	Type	Max Temp.	Dimensions (mm)	Handle	Cable	Application
81006(*)	$90	K E	500°C (932°F)	 17 130 15 ϕ 13	BAKELITE	Coiled, stretches to 1800 mm (70")	Surfaces
81007(*)	95	K E	400°C (752°F)	 17 130 15 ϕ 13	ABS (Flameproof)	Coiled, stretches to 1800 mm (70")	Surfaces
81010(*)	140	K E	500°C (932°F)	 17 133 130 15 ϕ 17	BAKELITE	Coiled, stretches to 1800 mm (70")	Surfaces of high temperature
81406(*)	160	K E	400°C (752°F)	 25 130 40 ϕ 13 15	ABS (Flameproof)	Coiled, stretches to 1800 mm (70")	Surfaces Hard-to-reach surfaces
81107(*)	160	K E	500°C (932°F)	 154 130 47 ϕ 6.35 ϕ 17 15	BAKELITE	Coiled, stretches to 1800 mm (70")	Surfaces Hard-to-reach surfaces
81108(*)	165	K E	400°C (752°F)	 154 130 47 ϕ 6.35 ϕ 17 15	ABS (Flameproof)	Coiled, stretches to 1800 mm (70")	Surfaces Hard-to-reach surfaces
81106(*)	160	K E	800°C (1472°F)	 25 130 40 ϕ 13 15	BAKELITE	Coiled, stretches to 1800 mm (70")	Surfaces, hard-to-reach surfaces
81202(*)	125	K E	400°C (752°F)	 30 120 62 ϕ 12 ϕ 16 31	BAKELITE	Coiled, stretches to 1800 mm (70")	Moving rollers, steel up to 500 m/min
81402(*)	125	K E	250°C (482°F)	 30 120 62 ϕ 12 ϕ 16 31	BAKELITE	Coiled, stretches to 1800 mm (70")	Moving rollers, Teflon® cover, up to 500 m/min



Replacement Elements Available; Contact Sales

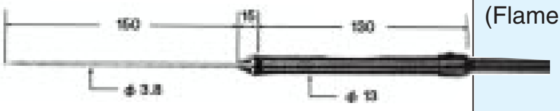
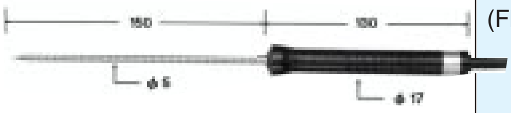
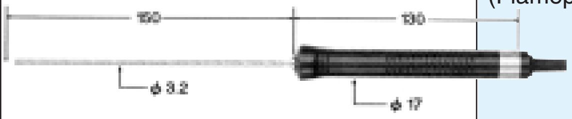
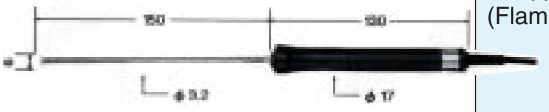
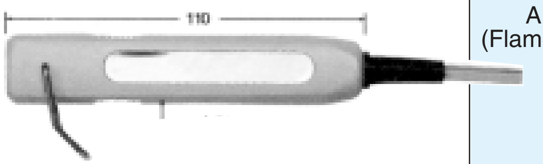
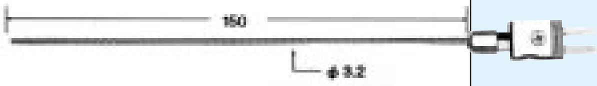
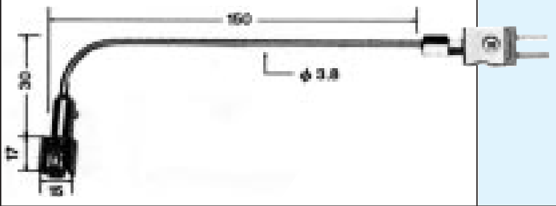
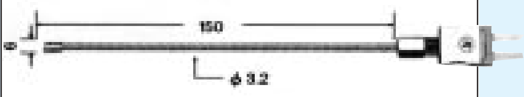
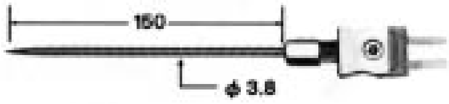
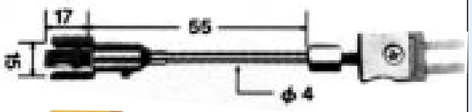
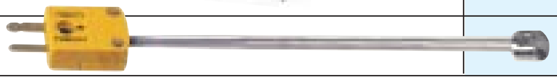
** Specify calibration K,E*

***Specify calibration K,E, or J*

All probes terminated with miniatu thermocoup connector

Ordering Example:

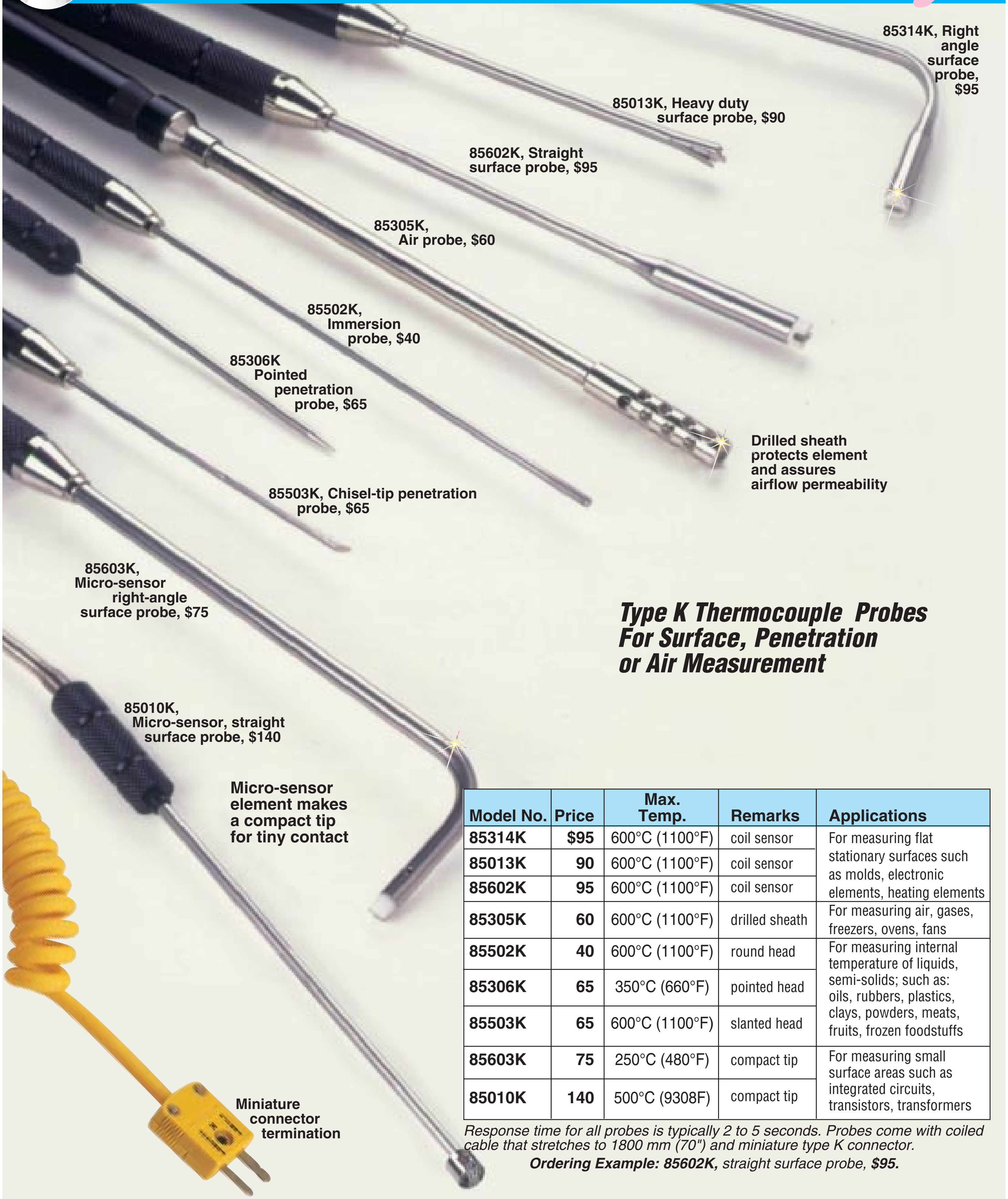
81202K,** surface probe, **$125.

Model No.	Price	Type	Max. Temp.	Dimensions (mm)	Handle	Cable	Application
81307(**)	$65	K E J	600°C (1112°F)		ABS (Flameproof)	Coiled, stretches to 1800 mm (70")	Air or Gases, liquids, semi-solids 304SS
81301(**)	65	K E J	800°C (1472°F)		ABS (Flameproof)	Coiled, stretches to 1800 mm (70")	Air or Gases, liquids, semi-solids 304SS
81530(**)	35	K E J	700°C (1292°F)		ABS (Flameproof)	Coiled, stretches to 1800 mm (70")	Liquids, Semi-solids Sheath 316SS
81545(**)	40	K E J	600°C (1112°F)		ABS (Flameproof)	Coiled, stretches to 1800 mm (70")	Surfaces of high temperature
81000K-Handle	30	K	Probes sold separately		ABS (Flameproof)	Coiled, stretches to 1800 mm (70")	Socket handle for multi- applications
81S30K	25	K	700°C (1292°F)				Liquids, Semi-solids Sheath 316SS
81S33(**)	100	K E J	400°C (752°F)				Surfaces Hard-to-reach surfaces
81S39(**)	30	K E J	700°C (1292°F)				Air or Gases liquids semi-solids 314SS
81S45(**)	30	K E J	600°C (1112°F)				Surfaces of high temperature
81S31(**)	55	K E J	400°C (752°F)				Surfaces
81S62K	60	K	500°C (930°F)				Surfaces

*Ordering Example: **81307K**, penetration probe, **$65.***

NEW

Type K Thermocouple Probes For Surface, Penetration or Air Measurement

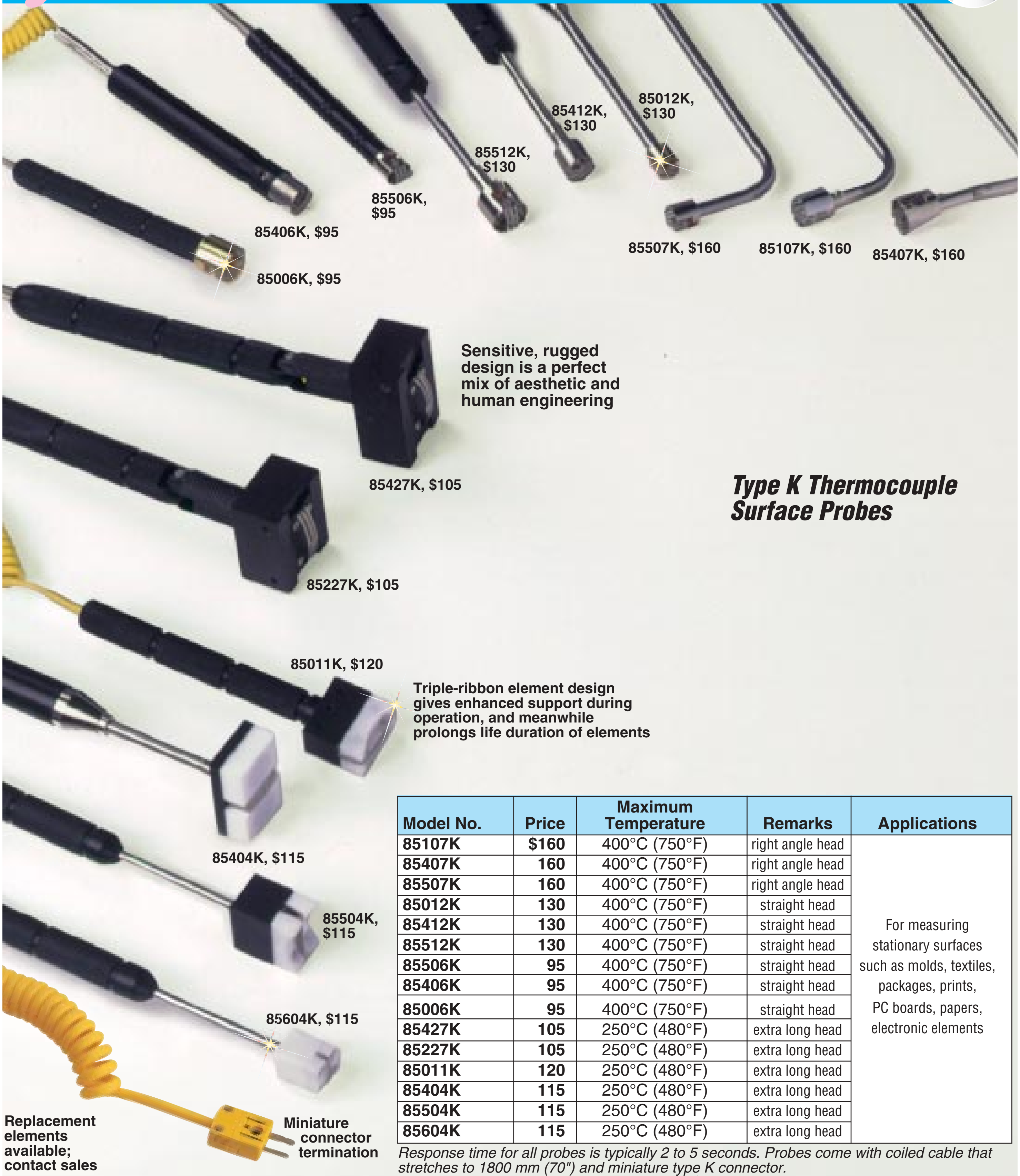

85314K, Right angle surface probe, $95
85013K, Heavy duty surface probe, $90
85602K, Straight surface probe, $95
85305K, Air probe, $60
85502K, Immersion probe, $40
85306K Pointed penetration probe, $65
Drilled sheath protects element and assures airflow permeability
85503K, Chisel-tip penetration probe, $65
85603K, Micro-sensor right-angle surface probe, $75
85010K, Micro-sensor, straight surface probe, $140
Micro-sensor element makes a compact tip for tiny contact
Miniature connector termination

Model No.	Price	Max. Temp.	Remarks	Applications
85314K	$95	600°C (1100°F)	coil sensor	For measuring flat stationary surfaces such as molds, electronic elements, heating elements
85013K	90	600°C (1100°F)	coil sensor	
85602K	95	600°C (1100°F)	coil sensor	
85305K	60	600°C (1100°F)	drilled sheath	For measuring air, gases, freezers, ovens, fans
85502K	40	600°C (1100°F)	round head	For measuring internal temperature of liquids, semi-solids; such as: oils, rubbers, plastics, clays, powders, meats, fruits, frozen foodstuffs
85306K	65	350°C (660°F)	pointed head	
85503K	65	600°C (1100°F)	slanted head	
85603K	75	250°C (480°F)	compact tip	For measuring small surface areas such as integrated circuits, transistors, transformers
85010K	140	500°C (9308F)	compact tip	

Response time for all probes is typically 2 to 5 seconds. Probes come with coiled cable that stretches to 1800 mm (70") and miniature type K connector.

Ordering Example: 85602K, *straight surface probe,* ***$95.***

Type K Thermocouple Surface Probes


85412K, $130
85012K, $130
85512K, $130
85506K, $95
85406K, $95
85006K, $95
85507K, $160
85107K, $160
85407K, $160
85427K, $105
85227K, $105
85011K, $120
85404K, $115
85504K, $115
85604K, $115

Sensitive, rugged design is a perfect mix of aesthetic and human engineering

Triple-ribbon element design gives enhanced support during operation, and meanwhile prolongs life duration of elements

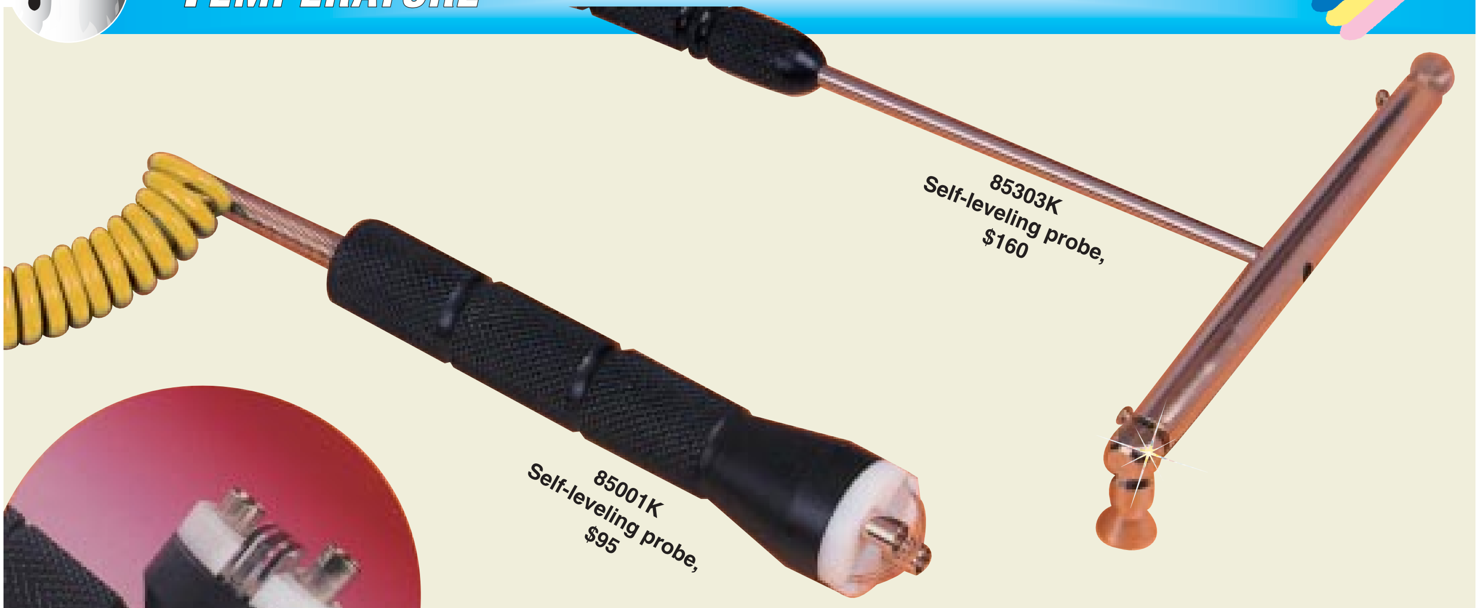
Replacement elements available; contact sales

Miniature connector termination

Model No.	Price	Maximum Temperature	Remarks	Applications
85107K	**$160**	400°C (750°F)	right angle head	For measuring stationary surfaces such as molds, textiles, packages, prints, PC boards, papers, electronic elements
85407K	**160**	400°C (750°F)	right angle head	
85507K	**160**	400°C (750°F)	right angle head	
85012K	**130**	400°C (750°F)	straight head	
85412K	**130**	400°C (750°F)	straight head	
85512K	**130**	400°C (750°F)	straight head	
85506K	**95**	400°C (750°F)	straight head	
85406K	**95**	400°C (750°F)	straight head	
85006K	**95**	400°C (750°F)	straight head	
85427K	**105**	250°C (480°F)	extra long head	
85227K	**105**	250°C (480°F)	extra long head	
85011K	**120**	250°C (480°F)	extra long head	
85404K	**115**	250°C (480°F)	extra long head	
85504K	**115**	250°C (480°F)	extra long head	
85604K	**115**	250°C (480°F)	extra long head	

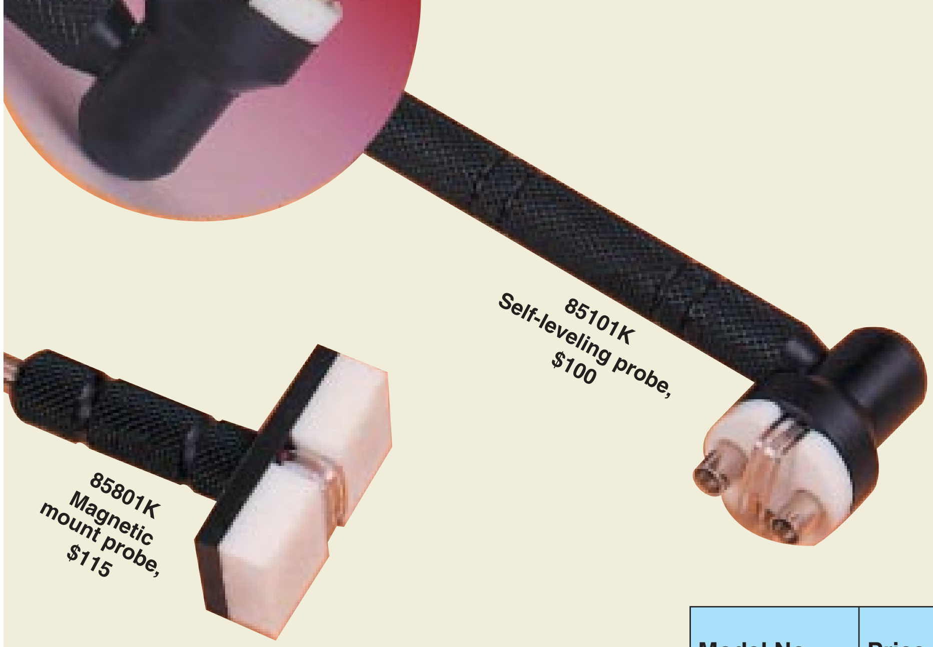
Response time for all probes is typically 2 to 5 seconds. Probes come with coiled cable that stretches to 1800 mm (70") and miniature type K connector.
Ordering Example: 85170K, *surface probe,* ***$160.***

NEW



85303K
Self-leveling probe,
$160

85001K
Self-leveling probe,
$95



85101K
Self-leveling probe,
$100

85801K
Magnetic
mount probe,
$115

85802K
Magnetic
mount probe,
$115

Miniature connector termination

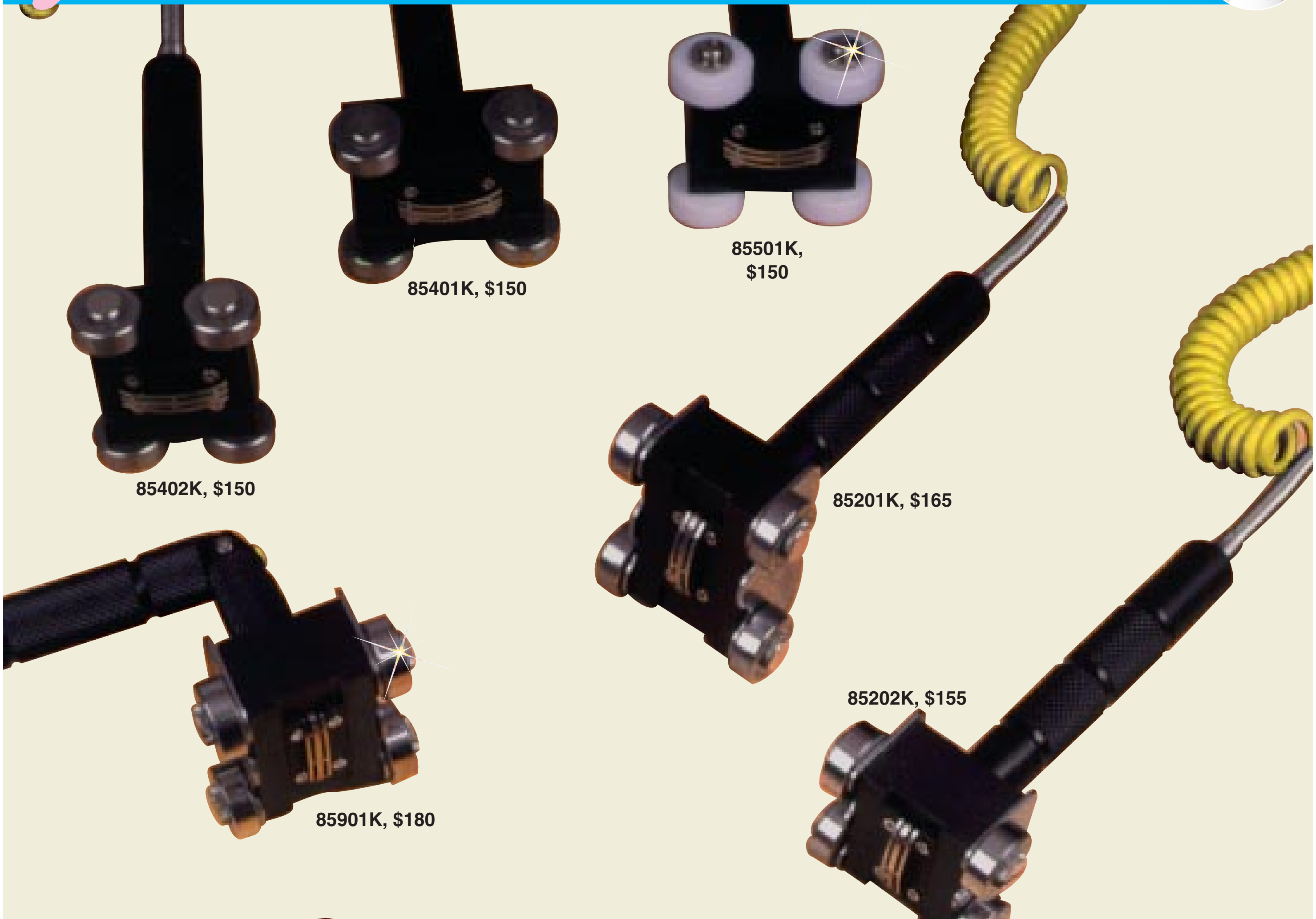
Unique Type K Thermocouple Surface Probes

Model 85303K Long arched element with spring-loaded supporters creates high flexibility to assure full surface contact

Model No.	Price	Max. Temp.	Remarks	Applications
85303K	**$160**	550°C (1020°F)	Right angle head	For measuring curved or flat stationary surfaces; such as pipes, heating elements.
85001K	**95**	250°C (480°F)	straight head	For measuring stationary surfaces; such as molds, textiles, packages, papers, angle prints, pc boards electronic elements.
85101K	**100**	250°C (480°F)	Right angle head	
85801K	**115**	250°C (480°F)	straight head	For measuring magnetic surfaces; such as motors, dryers, blast furnaces, transformers, heating elements.
85802K	**115**	250°C (480°F)	straight head	

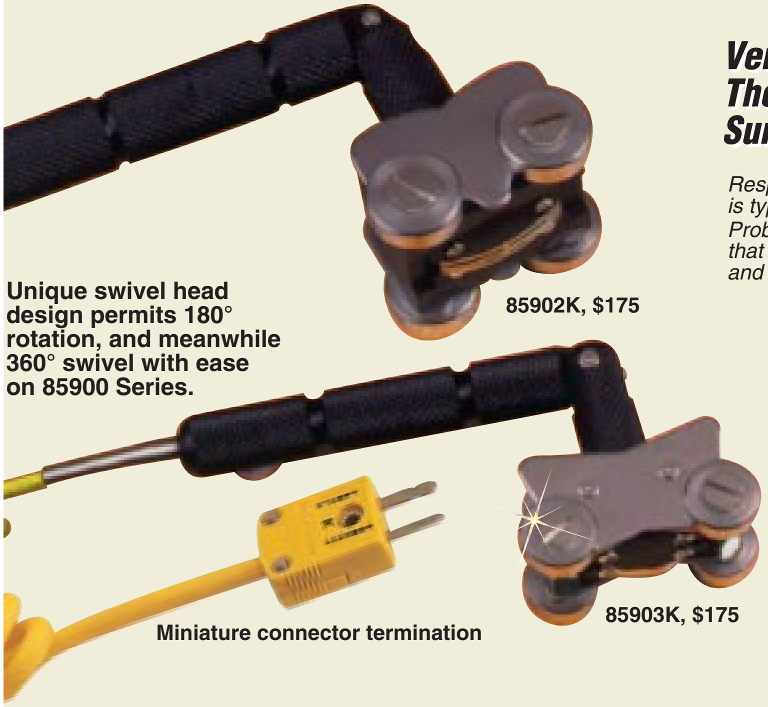
Response time for all probes is typically 2 to 5 seconds. Probes come with coiled cable that stretches to 1800 mm (70") and miniature type K connector.
Ordering Example: 85201K, *roller probe,* ***$165.***

For the complete selection of Temperature Handheld products, refer to The Green Book®


85401K, $150
85501K,
$150
85402K, $150
85201K, $165
85202K, $155
85901K, $180

Versatile Type K Thermocouple Roller Surface Probes

Response time for all probes is typically 2 to 5 seconds
Probes come with coiled cable that stretches to 1800 mm (70") and miniature type K connector.

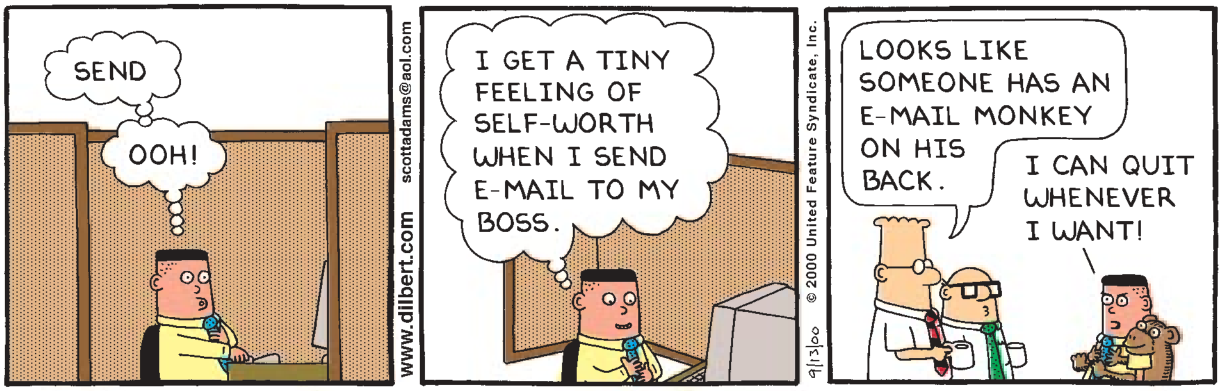

85902K, $175
85903K, $175
Miniature connector termination

Unique swivel head design permits 180° rotation, and meanwhile 360° swivel with ease on 85900 Series.

Model No.	Price	Maximum Temperature	Remarks	Applications
85201K	**$165**	400°C (750°F)	straight head	For measuring, moving, rotating stationary surfaces such as outside walls of smooth plastic or steel pipes, moving conveyors for molds, textiles, packages, prints, PC boards, papers
85202K	**155**	400°C (750°F)		
85203K	**155**	600°C (1100°F)		
85401K	**150**	400°C (750°F)		
85402K	**150**	400°C (750°F)		
85501K	**150**	250°C (480°F)		
85901K	**180**	400°C (750°F)	swivel head	
85902K	**175**	400°C (750°F)		
85903K	**175**	600°C (1100°F)		

Ordering Example: 85303K, *self-leveling probe,* ***$160.***

DILBERT® by Scott Adams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I CAN QUIT WHENEVER I WANT!

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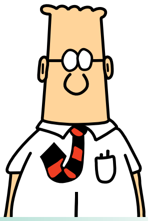
11

Collection Series
#11-001067



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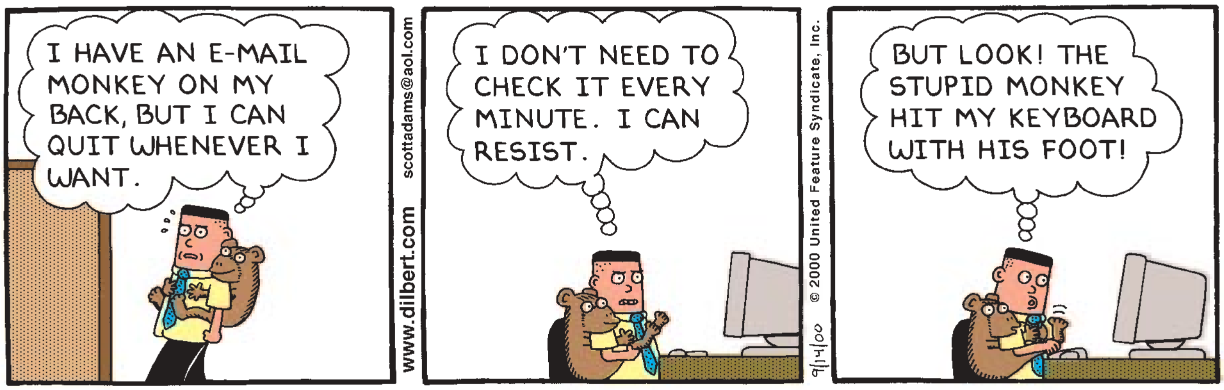
I HAVE AN E-MAIL MONKEY ON MY BACK, BUT I CAN QUIT WHENEVER I WANT.
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I DON'T NEED TO CHECK IT EVERY MINUTE. I CAN RESIST.
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9/14/00
BUT LOOK! THE STUPID MONKEY HIT MY KEYBOARD WITH HIS FOOT!

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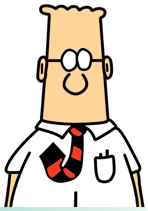
11

Collection Series
#11-001068



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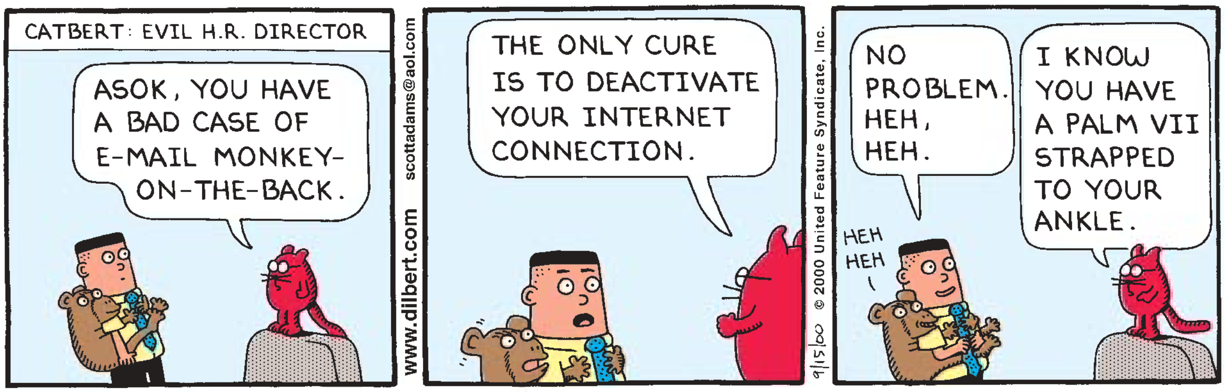
CATBERT: EVIL H.R. DIRECTOR
ASOK, YOU HAVE A BAD CASE OF E-MAIL MONKEY-ON-THE-BACK.
scottadams@aol.com
www.dilbert.com
THE ONLY CURE IS TO DEACTIVATE YOUR INTERNET CONNECTION.
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9/15/00
NO PROBLEM. HEH, HEH.
HEH HEH
I KNOW YOU HAVE A PALM VII STRAPPED TO YOUR ANKLE.

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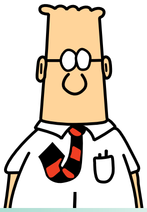
11

Collection Series
#11-001069



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NEW

Economical Environmental Wall Mount Sensors Stylish Office/Laboratory Design

- **Thermocouple, RTD or Thermistor Sensor Models**
- **Temperature, Temperature/Humidity and Barometric Pressure Transmitter Models**
- **Stylish Design Blends in Well with Office, Computer Room or Laboratory Décor**

OMEGA's new low cost environmental wall mount sensors offer the perfect solution for keeping your office, computer room or laboratory's décor looking great at an economical price. These miniature units come in 6 models that will interface directly with most process meters, controllers, recorders, data loggers and data acquisition systems. Thermocouple, RTD and Thermistor models come with 914 mm (36") leads standard. Temperature, temperature/ humidity and pressure units come with user selectable industry standard 4-20 mA or 1-5 Vdc output.

Specifications

General

Enclosure Material:
Acrylonitrile Butadiene Styrene
Dimensions: 79 x 54 x 45 mm
(3.12 L x 2.12 W x 1.78" H)

THERMOCOUPLE SENSORS

Max. Temperature: 60°C (140°F)
Accuracy: ±1.1°C (1.98°F)
Sensor Types: J,K,T,E
Sensor Lead Length: 914 mm (36")
Lead Material: 24 AWG, Teflon® coated

RTD SENSOR

Max. Temperature: 60°C (140°F)
Accuracy: ±1°C (1.8°F)
Sensor Type: 100 Ohm Pt. .00385
Sensor Lead Length: 914 mm (36")
Lead Material: Teflon insulated
3 conductor 26 AWG stranded
Nickel Plated Copper

THERMISTOR SENSOR

Max. Temperature: 60°C (140°F)
Accuracy: ±.2°C (.36°F)
Sensor Type:
OMEGA® "400" Series 2252 Ω @ 25°C
Sensor Lead Length: 914 mm (36")
Lead Material: PVC insulated
2 conductor 22 AWG stranded
Nickel Plated Copper

TEMPERATURE TRANSMITTER

Temperature Specifications:
Range: -15 to 60°C (5 to 140°F)
Accuracy@ 25°C:
In Still Air: ±1.2°F(0.7°C)@24°C;
±2.5°F(1.4°C) across full range
In Moving Air: ±2.5°F(1.4°C)@25°C;
±3°F(1.7°C) across full range
Note: Not recommended for fast moving air applications
Repeatability: ±0.5°F (0.3°C)
Output: 4-20 mA or 1 to 5 Vdc (scaled across range)
Temp Time Constant: (for 63.2% response);
9 sec. in moving air (1M/sec.); 30 sec. in still air
Power: 8 to 24 Vdc @ 20 mA
Max. Loop Resistance:
Ohms = (V supply - 8V)/0.02 A
Sensor Type: Solid State

TEMPERATURE/HUMIDITY TRANSMITTER

Relative Humidity Specifications:
Range:5-95 (non-condensing)
Accuracy@ 25°C: From 5-20%,±4%RH
From 20-80%,±3%RH
From 80-95%,±4%RH
Repeatability: ±1%RH
Temp Compensation Range:
-15 to 60°C (5 to 140°F)
Output: 4-20 mA or 1 to 5 Vdc
(scaled for 0 to 100%RH
Power: 8 to 24 Vdc @ 20 mA
Max. Loop Resistance:
Ohms = (V supply - 8V)/0.02 A
RH Time Constant: 100 sec.,
from 20-90%, 60 sec from 90-20%
Sensor Type:
Thin film polymer capacitor
(See Temperature Transmitter for Temperature Specifications)

BAROMETRIC PRESSURE TRANSMITTER

Pressure Range:
16 to 32 in. of Hg
Temp Compensation:
Across full range
Accuracy: 1% of span
Operating Temp Range:
-18 to 60°C (0 to 140°F)
Output:
User selectable 4-20 mA, 1 to 5 Vdc
Power: 8 to 24 Vdc @ 40 mA
Max. Loop Resistance:
(V supply - 8V)/0.020 A = Ohms
Media Compatibility:
Clean dry air, non-corrosive gases

Teflon® is a registered trademark of DuPont.

OMEGA
Omega Engineering, Inc.

Model EWS-TC-K
$36
Basic Unit

Wall mount sensor shown larger than actual size

**Check for availability of particular models prior to ordering*

To Order *(Specify Model Number)*

ALL MODELS IN STOCK!

Model No.	Price	Description
EWS-TC-(*)	**$36**	Wall mount thermocouple sensor
EWS-RTD	**46**	Wall mount RTD sensor (100 Ω Pt., .00385)
EWS-TH	**46**	Wall mount 400 series thermistor sensor
EWS-TX	**69**	Wall mount temperature transmitter
EWS-RH	**145**	Wall mount temperature/humidity transmitter
EWS-BP-A	**145**	Wall mount barometric pressure transmitter
EWS-MB	**12**	Conduit box mounting bracket/wall plate adaptor kit
PSU-93	**40**	24 Vdc power supply (for transmitter models)
TX4-100	**28.50**	Shielded 4 conductor transmitter cable (100 ft)

Note:** -TC, -RTD and -TH models come with 914 mm (36") of lead wire standard. For longer lead wire add suffix "-(†)ft." and add $1 per ft. to the price. Example: **EWS-TC-K-8ft.**, wall mount type K thermocouple sensor with 8 ft. lead wire, $36 + 5 = **$41
** Insert Thermocouple Type J,K,T,E † Insert desired lead wire length in feet*
Ordering Example: EWS-TX**,Temperature Transmitter, EWS-MB, Bracket/Wall Plate, **PSU-93**, Power Supply, **TX4-100** Transmitter Cable, $69 + 12 + 40 + 28.50 = **$149.50

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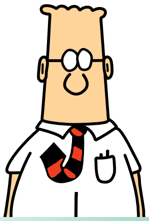
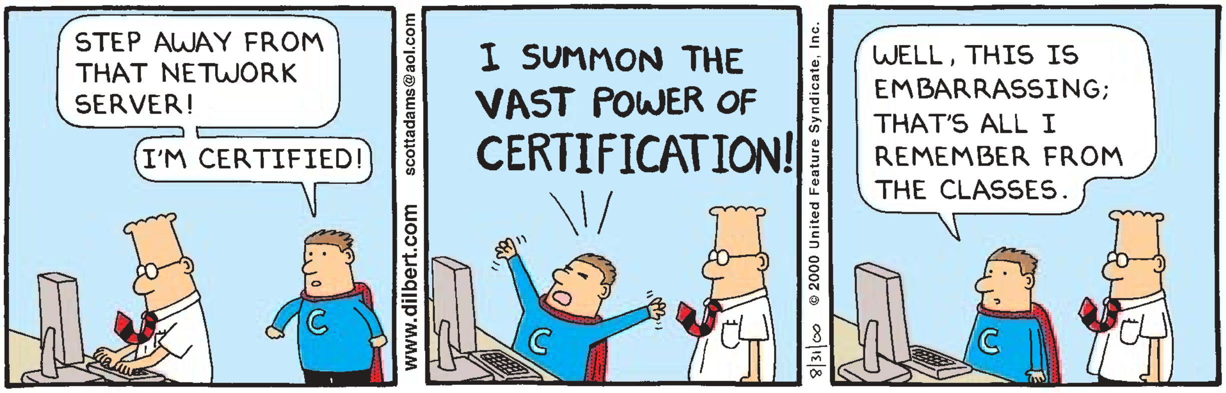
11

Collection Series
#11-001073




STEP AWAY FROM THAT NETWORK SERVER!
I'M CERTIFIED!
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I SUMMON THE VAST POWER OF CERTIFICATION!
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8/31/00
WELL, THIS IS EMBARRASSING; THAT'S ALL I REMEMBER FROM THE CLASSES.

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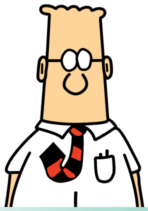
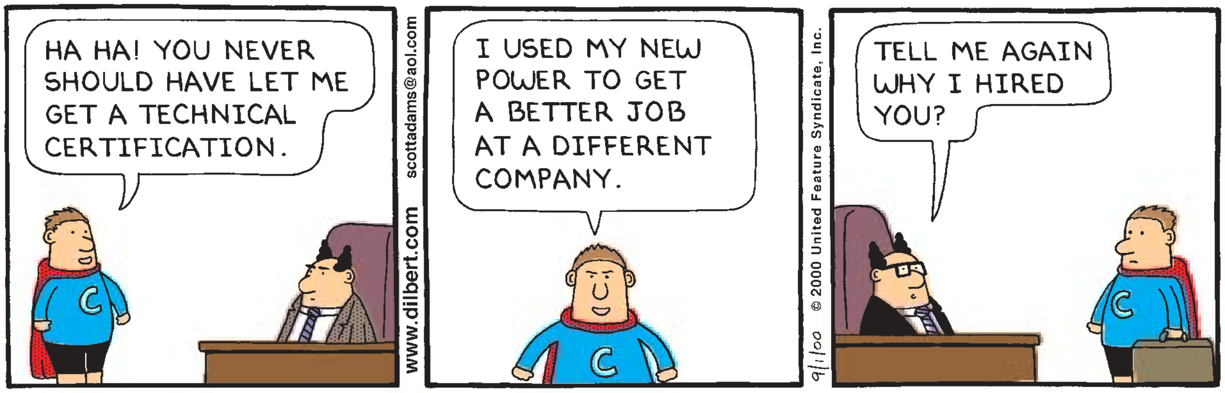
11

Collection Series
#11-001074




HA HA! YOU NEVER SHOULD HAVE LET ME GET A TECHNICAL CERTIFICATION.
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www.dilbert.com
I USED MY NEW POWER TO GET A BETTER JOB AT A DIFFERENT COMPANY.
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9/1/00
TELL ME AGAIN WHY I HIRED YOU?

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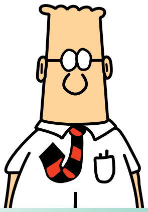
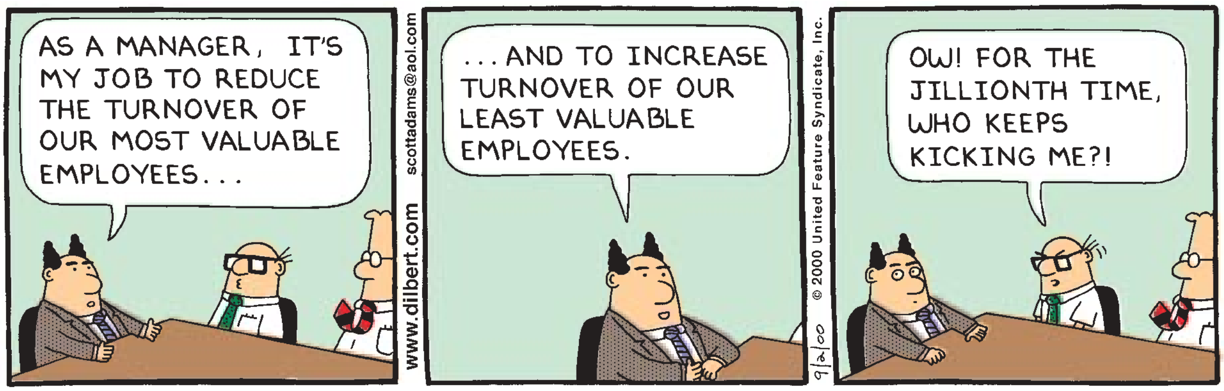
Collection Series
#11-001075




AS A MANAGER, IT'S MY JOB TO REDUCE THE TURNOVER OF OUR MOST VALUABLE EMPLOYEES...
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www.dilbert.com
...AND TO INCREASE TURNOVER OF OUR LEAST VALUABLE EMPLOYEES.
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9/2/00
OW! FOR THE JILLIONTH TIME, WHO KEEPS KICKING ME?!

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

OMEGAETTE™ — Moderately Priced Instruments. Ideal for Education, Training and Demonstration Programs.

HH307/HH308 Mini Thermometer

- **Wide Measurement Range, -200 to 1370°C (-328 to 2498°F)**
- **Auto Ranging**
- **Auto Power Off**
- **Dual Input – HH308**
- **Dual Display – HH308**
- **REL Function**
- **Hold Function**
- **Min/Max function**
- **Resolution 0.1°C/0.1°F**

The HH300 Series is a low cost digital thermometer, small enough to fit in your pocket. They are available in single or dual input models with standard features such as min/max reading, reading hold, and both are °C to °F switchable. Their temperature range is from -200 to 1370°C (-328 to 2498°F). This low cost meter will read Type K thermocouple and accepts any subminiature Type K thermocouple connector.

Specifications

Range:
-200 to 1370°C (-328 to 2498°F)

Accuracy:
-200 to 1370°C ±0.3% Rdg +1°C
-328 to 2498°F ±0.3% Rdg +2°F

Input Protection: 60 Vdc or 24 Vrms ac Maximum

Battery: 9V (included)

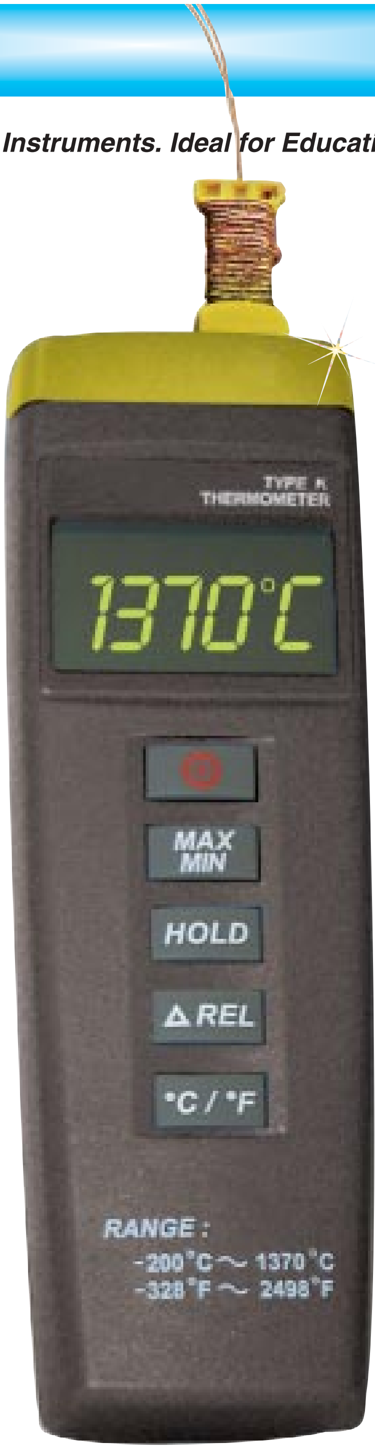
Battery Life: 120 hr (with alkaline)

Operating Range: 0 to 40°C (32 to 104°F) <80% RH

Storage Range: -10 to 60°C (14 to 140°F) <80% RH

Dimensions: 164 x 54 x 34 mm (6.5 x 2.1 x 1.3")

Weight: Approx. 200 g (7 oz)



HH307
$75
Single Input

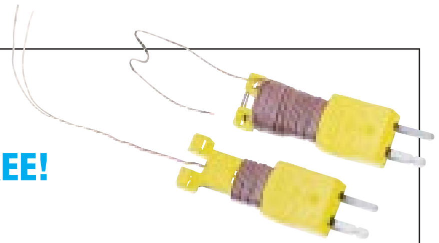
T2
T1
TYPE K THERMOMETER
82.4°F
83.4°F
MAX MIN
HOLD
△REL
°C / °F
RANGE :
-200°C ~ 1370°C
-328°F ~ 2498°F

HH308
$85
Dual Input

Shown smaller than actual size

1 YEAR WARRANTY CE

FREE!



All temperature models include a free 36" type K beaded wire thermocouple with subminiature connector and wire spool caddy (one per channel)
Order a Spare! Model No. SC-GG-K-30-36, $15

To Order *(Specify Model Number)*

MOST POPULAR MODELS HIGHLIGHTED!

Model No.	Price	Description
HH-307	$75	Single input handheld 0.1°C/F thermometer
HH-308	85	Dual input handheld 0.1°C/F thermometer
SC-GG-K-30-36	15	Spare Type K thermocouple

HH300 Series comes complete with beaded wire type K thermocouple (one per input) and instruction manual. Order a Spare! Model No. ***SC-GG-K-30-36, $15***
Ordering Example: HH-308, *dual input type K thermocouple thermometer,* ***$85.***

NEW®

High Accuracy, RS-232 Interface Handheld Thermometers HH506R/7R/9R Series

HH506
K/J/T/E/R/S/N THERMOMETER
88888
88888 8888
ENTER
(SECOND DISPLAY)

Model
HH506R
\$145
Dual Input

Model
HH509R
\$130
Dual Input

OPTICAL INTERFACE RS-232-C
HH509R
K/J/T/E/S THERMOMETER
RECORD MAX MIN AVG REL HOLD
1.8.8.8
ENTER
°C/°F
HOLD
TYPE
MIN MAX
T1
T2
T1-T2
REL
SET
HI/LO LIMITS

All thermocouple probes sold separately.
See Temperature section for more probes!

Free Software and
RS-232 Cable included

Specifications	HH506R	HH507R	HH509R
Backlit LCD	✓	✓	✓
No. of Digits	25000	25000	1999
Probe (Type)	J.K.T,E,R,S,N	K,J,E,T,R,S,N	J,K,T,E,S
Input Channel	2	1	2
Range °C	-210 to 1767°C	-210 to 1767°C	-210 to 1767°C
Range °F	-346 to 3212°F	-346 to 3212°F	-346 to 1999°F
Resolution	0.1°	0.1°	0.1°/1°
Data/Hold	✓	✓	✓
Max/Min	✓	✓	✓
Relative (zero set)	✓	✓	✓
Hi/Lo Limits w/ Beeper Warning	✓	✓	✓
Display	3	3	1
T1-T2	✓		✓
Battery	9V included	9V included	9V included
RS-232C	✓	✓	✓
Auto Power Off	✓	✓	✓
Basic Accuracy %	0.05	0.05	0.01

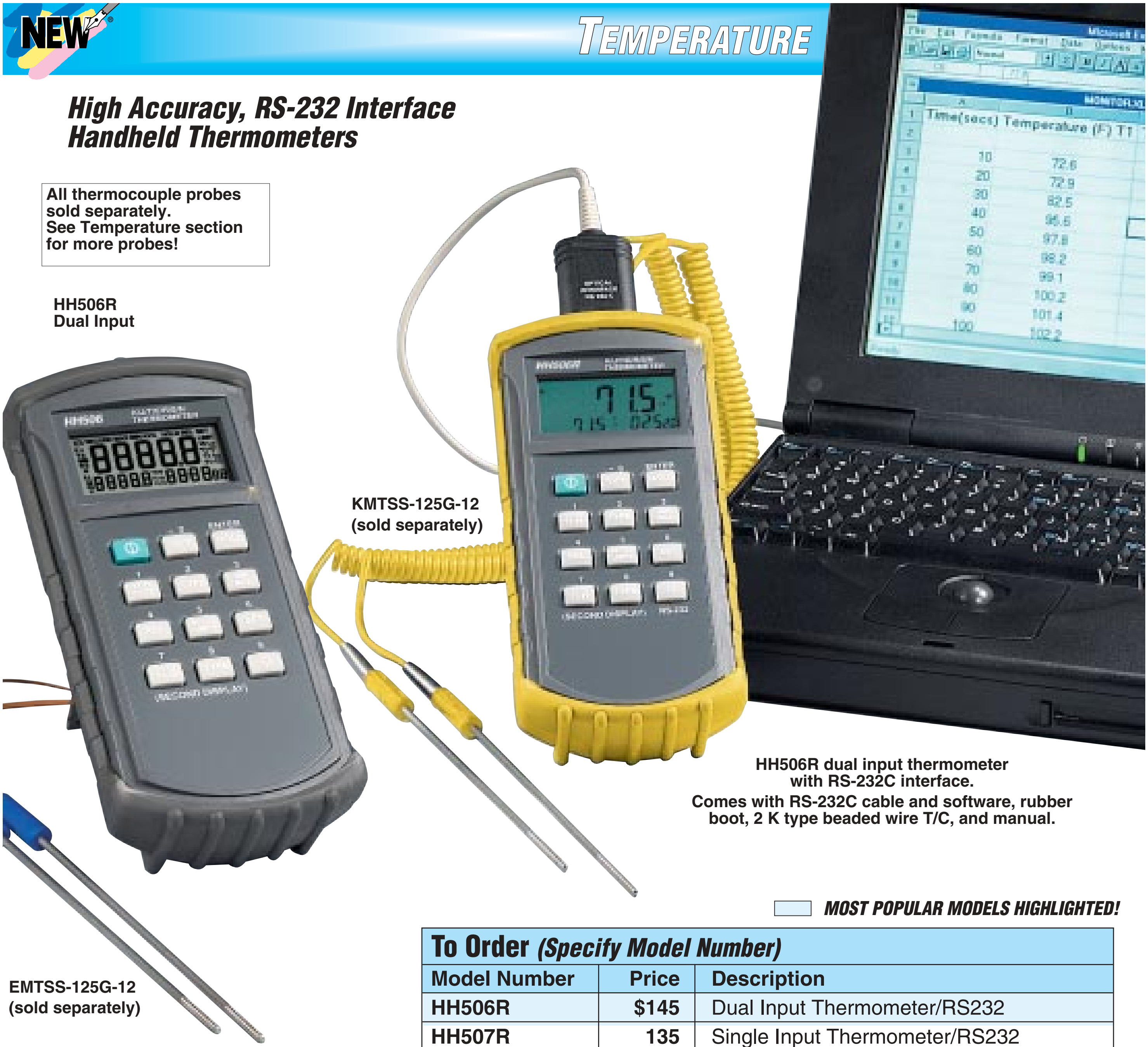
1 YEAR WARRANTY

- ✓ **Software Pkg Included (Cable and Disk)**
- ✓ **NEMA-4x Dustproof**
- ✓ **Water/Splash Resistant**
- ✓ **Clock and Elapsed Time**
- ✓ **Differential Thermocouple Input**
- ✓ **Battery Life: 200 Hours**
- ✓ **Stated Accuracy @ 23±5°C<75%RH**
- ✓ **°C/°F Switchable**

The OMEGA® HH500R Series are low cost feature-packed digital thermometers. Each unit comes complete with software, cable, T/C and batteries. Easy to set-up instructions allow user to measure a broad number of T/C's, MAX/MIN, AVG, REL, Hold Function, T1/T2 (dual input models only).

High Accuracy, RS-232 Interface Handheld Thermometers

**All thermocouple probes sold separately.
See Temperature section for more probes!**

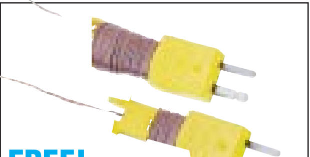


**HH506R
Dual Input**

**KMTSS-125G-12
(sold separately)**

**HH506R dual input thermometer with RS-232C interface.
Comes with RS-232C cable and software, rubber boot, 2 K type beaded wire T/C, and manual.**

**EMTSS-125G-12
(sold separately)**



FREE!
All temperature models include a free 36" type K beaded wire thermocouple with subminiature connector and wire spool caddy (one per channel)

Order a Spare! Model No. SC-GG-K-30-36, $15

Dimensions:
192 H x 91 W x 53 mmD
(7.6 x 3.6 x 2.2")
Weight: approx. 255 g (9 oz)

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model Number)*

Model Number	Price	Description
HH506R	**$145**	Dual Input Thermometer/RS232
HH507R	**135**	Single Input Thermometer/RS232
HH509R	**130**	Dual Input Thermometer/RS232

Accessories for Digital Thermometers

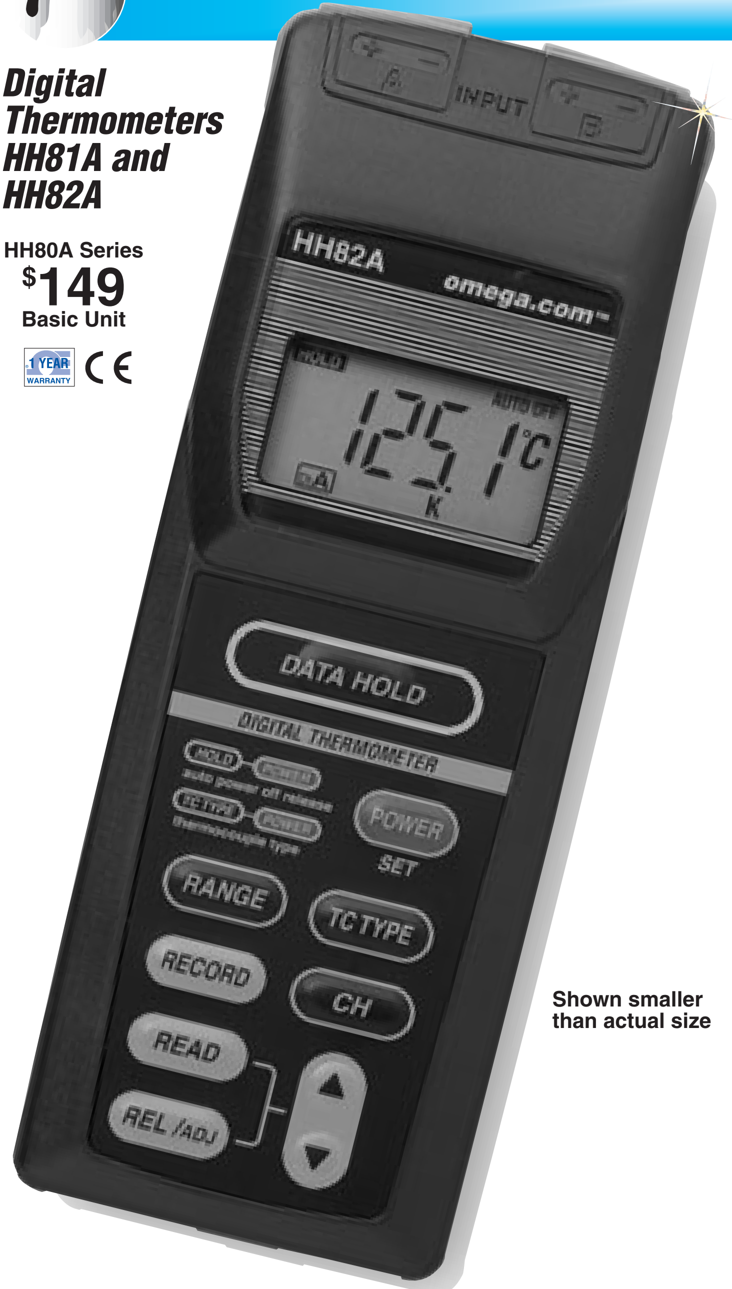
Model Number	Price	Description
SC-HH500	**$12**	Soft Carrying Case
SC-GG-K-30-36	**15**	Extra Type K beaded thermocouple (3' long)
KTSS-HH	**29**	6" long ⅛" diameter stainless steel type K probe with 12" retractable cable (expands to 48") terminating with male subminiature connector
HH-NIST	**55**	NIST Certificate
HH-NIST-DATA	*****	NIST Certificate with temperature data
MN1604	**3**	Extra 9V alkaline battery

** Consult sales for price if custom [points are required.*
Units supplied with 9V battery, beaded type K T/C (one per channel), rubber boot, software, RS-232 Cable and manual.
Ordering Example: HH506R + SC-HH500 *is a dual input thermometer/RS232C interface with a soft vinyl case, $145 + 12 =* ***$157***

Digital Thermometers HH81A and HH82A

HH80A Series
$149
Basic Unit

1 YEAR WARRANTY CE



Shown smaller than actual size

TC TYPE

Thermocouple Type K,E,J,T select key
Press and hold down the this key while pressing the POWER key to enter the TC select mode. Each press of the TC TYPE key switches between TC types. The press POWER key to enter selection. (Type K is factory preset)

CH

Input channel select key (HH82 Model Only)
With each press, the channel switches through the sequence of chA, chB and then chA-chB.

DATA HOLD

Data Hold key
A held value can be stored in the memory of an optional memory number which is selected by the ▲▼ keys.

RECORD

Maximum and Minimum record key
Stores the maximum and minimum values from the time RECORD is pressed.

RANGE

Data Record key
Stores the held measurement values in memory (up to 10 readings.)

Resolution select key
With each press select the resolution of 0.1°C or 1°C.

READ

Maximum and minimum values and stored data read key
Every time this key is pressed, the maximum and minimum values, stored data, and the current measured data are displayed in sequence.

REL/ADJ

Relative display select key
Displays measured values with reference to the value obtained immediately before the key was pressed. Each press of this key can select or release the relative display.

▲▼

Simplified correction mode key
Sets the correction value and selects active/inactive of the simplified correction function.

Data call-up key
Used to select a memory number when calling up stored data. Also used to adjust the correction value for the simplified correction mode.

Specifications

Measuring range (only the main unit)
Thermocouple type: Type K: -200°C to 1372°C (-328°F to 2501.6°F);
Type E: -200°C to 700°C (-328°F to 1292°F);
Type J: -200°C to 1000°C (-328°F to 1832°F);
Type T: -200°C to 400°C (-328°F to 752°F)

Resolution: -200.0°C to 199.9°C; 0.1°C or 1°C (when 1°C resolution is set); +200°C or above: 1°C

Accuracy: -200.0°C to -100.1°C: ±(0.1% of rdg + 1.0°C); -100.0°C to 199.9°C: ±(0.1% of rdg + 0.7°C); +200°C or above, or when 1°C resolution is set: ±(0.2% of rdg + 1°C)

Measurement Interval: Approx. 1 sec. (1 channel measurement). Approx. 2 sec. (2 channel measurement)

Data Storage: Capable of storing up to 10 measured data items

Simplified Correction: Correction range: ±20°C of measured value

Display Items: HOLD, RCD, REL, ADJ, MAX, MIN, MEM, °C; TC type K, J, E, T
Battery alarm, chA, chB, chA-chB (HH82A only)

Other Functions: Auto power-off, battery alarm

Operating Temperature and Humidity: 0°C to 50°C, 20 to 80% RH (no condensation)

Power Requirements: Two AA-size alkaline dry batteries (LR6)

Battery Life: About 450 hours

Construction: Conforms to IP54 (dust-proof and drip-proof requirements of IEC529)

Supplied Accessories: Two AA-size alkaline dry batteries (LR6) and instruction manual

Dimensions: Approx. 151 H x 56 W x 33 mm D (5.9" x 2.2" x 1.3") (excluding protrusions)

Weight: Approx. 180 g (6.3 oz) (including batteries)

To Order (Specify Model Number)

Model	Price	Description
HH81A	$149	1-Channel multifunction thermometer
HH82A	$224	2-Channel multifunction thermometer
Accessories		
WPC-80	25	Waterproof Cover
SC-83	30	Soft Carrying Case

Each unit comes with type K beaded wire thermocouple (1 per channel), 2-AA batteries, manual.
Ordering Example: HH82A** dual input thermometer, **$224.

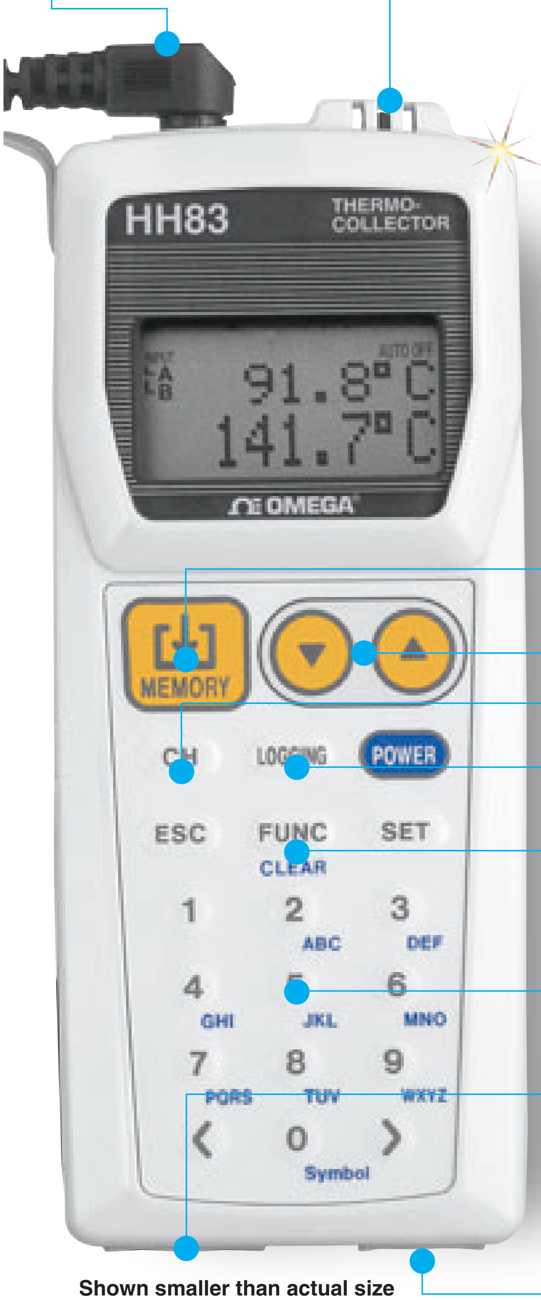
HH80 Series Thermo-Collectors HH83 Thermistor Input

External probes (-30°C to 200°C) [-22°F to 392°F]

There are three types available: a needle probe for mid-point temperature, a rounded end probe for liquid temperature, and a surface probe for surface temperature.

Built-in sensor (-20°C to 50°C) [-4°F to 122°F]

Measures ambient temperature, and allows for continuous measurement inside a warehouse or during transportation.



Shown smaller than actual size

HH83/84 Common Features

Memory key

Each press of this key saves the measured data, along with 3 other monitoring items: the name of the object being measured, operator's name, and date and time of measurement.

Selection of registered tag name

Select from the list of up to 50 registered tag names (objects to be measured).

Input selection key

Collector/Logging mode selector key

Switches between the collector mode (saves measured data when necessary) and logging mode (saves measured data continuously).

- **When used in the collector mode only, saves up to 5000 data items.***
- **When used in the logging mode only, saves up to 20000 data items.***

Measuring interval: 1 second to 24 hours (Under simultaneous 2-channel measurement with the HH84, 2 seconds is the minimum.)

Start-of-measurement time: timer can be set.

*** Under simultaneous 2-channel measurement, the HH84 saves 2 data items for one measurement.**

User-friendly FUNC key

You can select setup items in the same way as you choose options from the built-in menu of a cellular phone.

Selection of operator name

With the (1) key, you can recall a list of up to 10 operator names and can also change any of these names.

Record-keeping on measurement failure handling

By pre-registering a list of up to 32 comments on how to handle particular measurement failures, you can keep records of how the measurement failure was dealt with by selecting the desired comment from the list using the (4) key.

(The HH83 supports this feature with HH83 Version 1.10 when used with application software version 1.30 or later.)

Setup keys

Register tag names, set alarm points, and define measuring conditions, such as the measuring interval for the logging mode. These setting tasks can also be carried out from a PC.

Digital input terminal

For connecting to an optional non-contact probe.

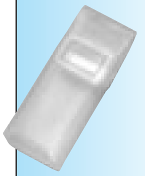
RS-232C I/O terminals

Used to exchange data with a PC or send data to a dedicated printer.

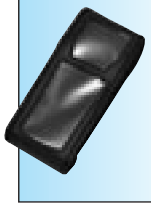
HH83
$580

1 YEAR WARRANTY CE

Waterproof Cover and Soft Carrying Case



Waterproof Cover Model WPC-80, $25
With the waterproof cover, you can keep the HH83 or HH84 clean and increase its use in wet applications



Soft Carrying Case, Model SC-83 for HH83/HH84, **$30**

To Order *(Specify Model Number)*

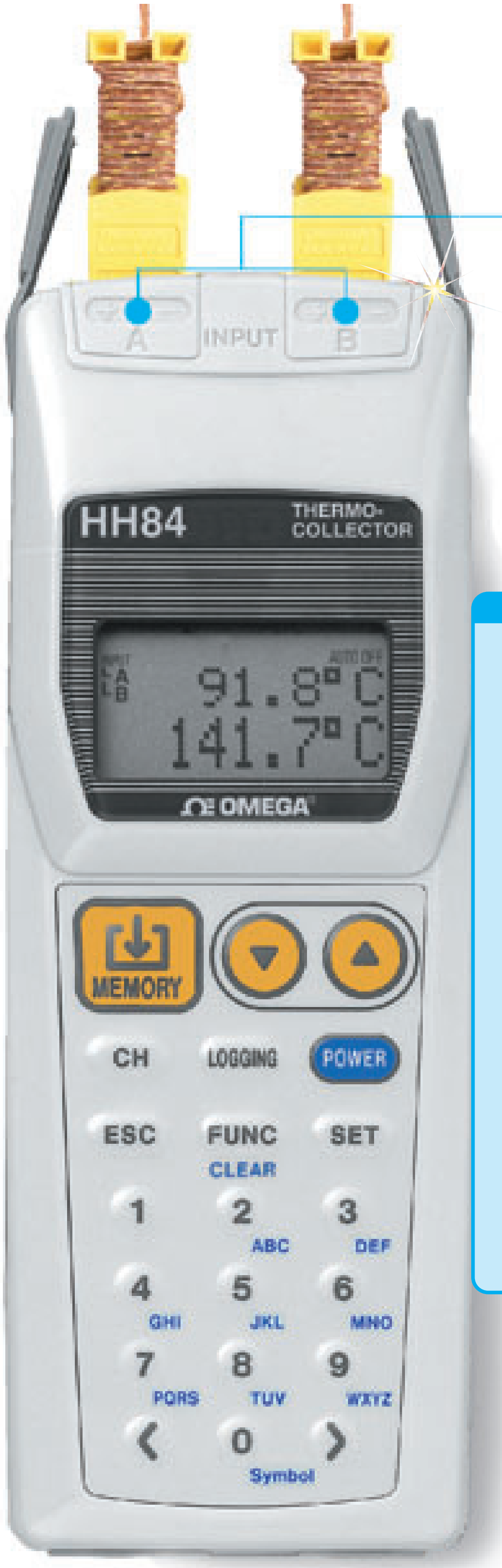
Model No.	Price	Description
HH83	$580	Thermistor thermometer/ datalogger with software and RS232 cable
Accessories		
HH83-NP	$310	Needle Probe
HH83-HSNP	130	HI Speed Needle Probe
HH83-REP	95	Round End Probe
HH83-EP	440	Emission Probe
HH83-SP	170	Surface Probe
WPC-80	25	Waterproof Cover
SC-83	30	Soft Carrying Case

Each unit comes with software, RS232C cable, 2-AA batteries, manual.
Ordering Example:
HH83** Thermistor thermometer with HH83-SP surface probe, $580 + 170 = **$750

Drip-proof construction (HH83/84)

Conforming to IP54 standards, the HH83/84 can still function even if it becomes wet to some degree. In addition, the optional waterproof cover increases waterproofing and protects the instrument against possible dirt contamination.

HH80 Series Thermo-Collectors HH84 Universal Dual Thermocouple Inputs



Shown smaller than actual size

Thermocouple probes (-200°C to 1372°C) [-328°F to 2501.6°F]

Type K : -200°C to 1372°C [-328°F to 2501.6°F]
Type E : -200°C to 700°C [-328°F to 1292°F]
Type J : -200°C to 1000°C [-328°F to 1832°F]
Type T : -200°C to 400°C [-328°F to 752°F]
(Possible temperature ranges with the HH84)

Analog signal input

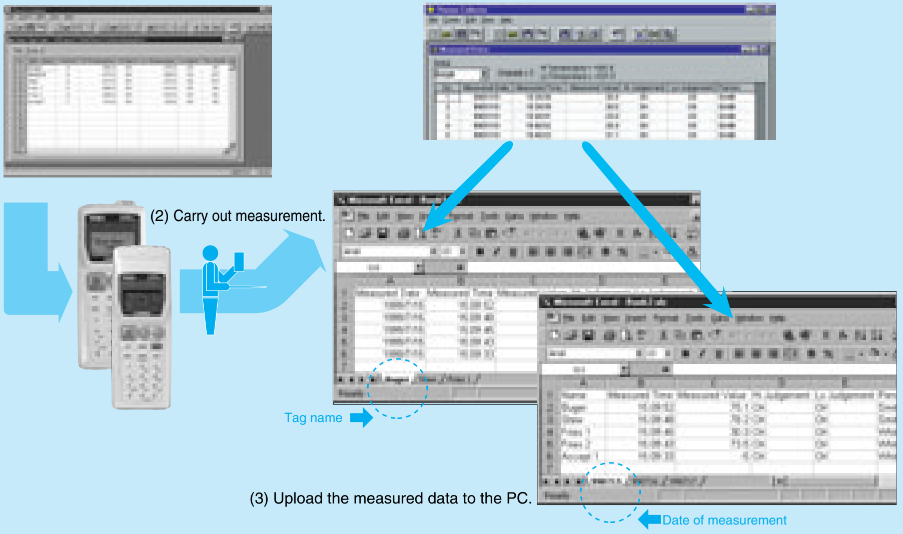
The HH84 can accept inputs from a sensor that outputs voltage signals ranging ±100 mV or ±1 V.
* A U-shaped Omega-type connector is required.

HH84
$580

1 YEAR WARRANTY CE

Easy data management using a PC (data management software included)

Setting measurement conditions from the PC.
(1) Download the measurement conditions to the HH83/84.



(2) Carry out measurement.

(3) Upload the measured data to the PC.

●Microsoft Excel spreadsheets are automatically generated for each object being measured (tag name) and each date of measurement. Data collected later can also be added to these spreadsheets.
The HH83 supports this feature with HH83 Version 1.10 when used with application software version 1.30 or later.

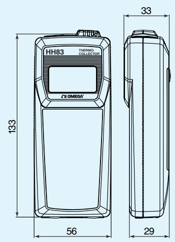
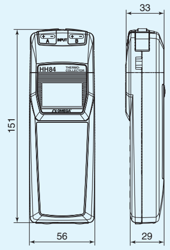
To Order *(Specify Model Number)*

Model No.	Price	Description
HH84	$580	Thermocouple thermometer/datalogger with software and RS232 cable
Accessories		
WPC-80	25	Waterproof Cover
SC-83	30	Soft Carrying Case

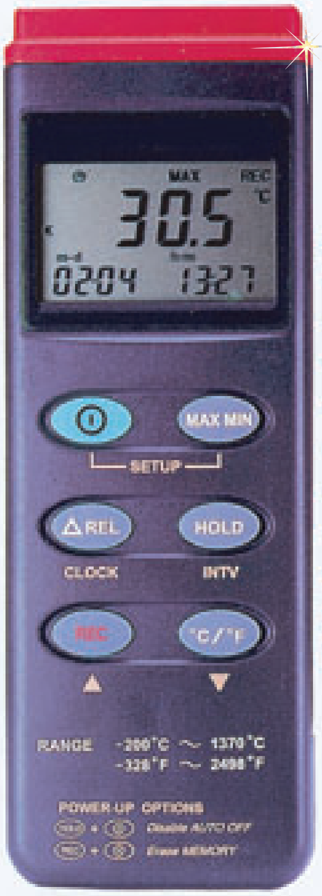
Each unit comes with 2 type K beaded wire thermocouples, 2-AA batteries, software, RS232C cable, manual.
Ordering Example:** HH84 thermometer/datalogger, **$580.

HH80 Series Thermo-Collectors

INPUT
A
B
HH84
THERMO-COLLECTOR
91.8°C
141.7°C
OMEGA
MEMORY
CH
LOGGING
POWER
ESC
FUNC
CLEAR
SET

Product name (Model)	**HH83 Thermo-collector Thermistor model**	**HH84 Thermo-collector Thermocouple model**
Number of measuring channels	1 (Selectable from 3 channels) One channel is provided for each of the external thermistor probe, built-in thermistor sensor, and external non-contact probe.	2 (when A and B channels are used for thermocouple or voltage input) 1 (when D channel is used with the non-contact probe)
Measuring range (only the main unit)	External thermistor -30°C to 200°C [-22°F to 392°F] Built-in thermistor -20°C to 50°C [-4°F to 122°F] Thermal emission (external probe) -20°C to 400°C [-4°F to 752°F]	Thermocouple Type K : -200°C to 1372°C [-328°F to 2501.6°F] Type J : -200°C to 1000°C [-328°F to 1832°F] Type E : -200°C to 700°C [-328°F to 1292°F] Type T : -200°C to 400°C [-328°F to 752°F] Thermal emission -20°C to 400°C [-4°F to 752°F] Voltage input ±100 mV, ±1 V
Resolution	External thermistor: 0.1°C Built-in thermistor: 0.1°C Thermal emission (external probe): 1°C	Thermocouple: 0.1°C Thermal emission: 1°C Voltage input: 0.1 mV or 0.001 V
Accuracy (only the main unit)	External thermistor Temperature range (T) — Accuracy -30°C ≤ T < -20°C — ±1.0°C -20°C ≤ T ≤ 0°C — ±0.4°C 0°C < T < 100°C — ±0.3°C 100°C ≤ T < 150°C — ±0.4°C 150°C ≤ T ≤ 200°C — ±0.7°C Built-in thermistor Temperature range (T) — Accuracy -20°C ≤ T ≤ 0°C — ±1.0°C 0°C ≤ T < 40°C — ±0.8°C 40°C ≤ T ≤ 50°C — ±1.0°C * For the accuracy when using a non-contact probe (900 03), see the accuracy ratings of the probe.	Thermocouple -100°C ≤ T: ±(0.1% of rdg + 0.3°C) T < -100°C: ±(0.1% of rdg + 0.6°C) Reference junction compensation is ±0.4°C when the temperature of the input terminal is in equilibrium Thermal emission±(1% of rdg + 1°C) or ±3°C, depending on the accuracy of the non-contact probe. Voltage input ±(0.1% of rdg + 0.2% of range)
Measuring mode	Collector mode or Logging mode	
Measuring interval	Collector mode: 1 second or longer Logging mode: 1 second to 24 hours	Collector mode: 0.5 seconds or longer when 1 channel is used. 1 second or longer when 2 channels are used. Logging mode: 1 second to 24 hours when 1 channel is used. 2 seconds to 24 hours when 2 channels are used.
Data capacity	5000 data items when used in collector mode only. 20000 data items when used in logging mode only. Measurement data obtained in collector mode and logging mode can coexist.	5000 data items when used in collector mode only. 20000 data items when used in logging mode only. Measurement data obtained in collector mode and logging mode can coexist. Under simultaneous 2-channel measurement, 2 data items are recorded at the same time.
Drip-proof construction	Conforms to IP54 standards (dust-proof and drip-proof requirements of IEC529)	
Display	LCD with backlight	
Operating temperature and humidity	-20°C to 50°C, 20 to 80% RH (no condensation)	0°C to 50°C, 20 to 80% RH (no condensation)
Power requirements	Two AA-size alkaline dry batteries (LR6)	
Battery life	Approx. 3 months when operated in logging mode at 10-minute intervals; Approx. 1 month when operated in logging mode at 1-minute intervals; Approx. 2 weeks when operated in collector mode 8 hours a day.	Approx. 1.5 months when operated in logging mode at 10-minute intervals; Approx. 1 month when operated in logging mode at 1-minute intervals; Approx. 5 days when operated in collector mode 8 hours a day including 30 minutes of communication.
Registration of tag names	A maximum of 50, each comprising up to 8 alphanumeric characters	
Registration of operator names	A maximum of 10, each comprising up to 8 alphanumeric characters	
Registration of comments	A maximum of 32, each comprising up to 8 alphanumeric characters	
Alarm function	Upper- and lower-limit alarms	
Computing function	Maximum, minimum, and average	Maximum, minimum, and average Reading of difference between the 2 channels is possible.
Communication function	Conforms to EIA RS-232C standard.	
Simplified correction function	None	Corrects the measured data from thermocouple input within the range of ±20.0°C.
Scaling function	None	Scales the voltage input x according to the formula “Ax + B,” which is defined from the thermo-collector software.
Other functions	Chime, function lock, clock display, auto power-off, and battery alarm	
Thermo-collector software system requirements	CPU: i486DX or higher OS: Windows 95/Windows 98/Windows NT 4.0 FDD: 3.5", 1.44 MB-formatted Required space on the HDD: 10 MB or greater	Recommended memory capacity: 16 MB or greater Serial I/O capability: A serial port conforming to RS-232C standard should be available. Software: Microsoft Excel 95, Microsoft Excel 97
Compliance with standards	EMC standards EMI (interference signal): EN55011;1998, EN61326-1;1998+A1 (Class B, Group 1) EMS (immunity): EN50082-1;1997, EN61326;1998+A1	
External dimensions	 Approx. 133(H) × 56(W) × 33(D) mm (excluding protrusions) Weight: Approx. 170 g (including batteries)	 33 A INPUT B HH84 THERMO-COLLECTOR OMEGA 151 56 29 Approx. 151(H) × 56(W) × 33(D) mm (excluding protrusions) Weight: Approx. 180 g (including batteries)
Supplied accessories	Software, two AA-size alkaline dry batteries (LR6), a waterproof cover, and an instruction manual	

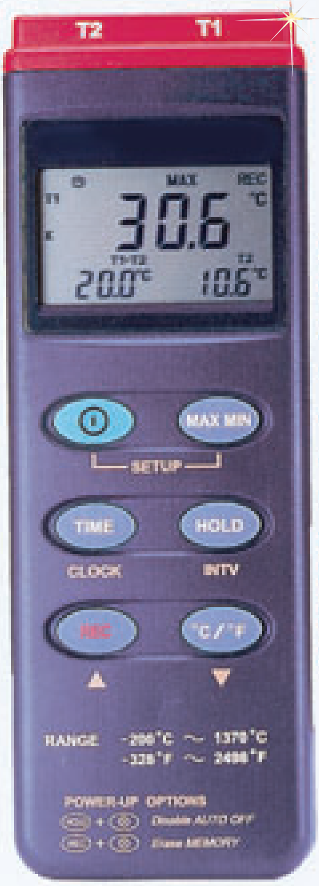
HH305/HH306 Series Datalogger Thermometer


30.5
MAX
REC
0204
1327
MAX MIN
SETUP
REL
HOLD
CLOCK
INTV
REC
°C/°F
RANGE -200°C ~ 1370°C
-328°F ~ 2498°F
POWER-UP OPTIONS
Disable AUTO OFF
Erase MEMORY

Features

- Triple Display
- Time Function
- RS-232 Interface
- With Window Software
- 16,000 Records Data logger
- Auto Power Off
- REL Function
- HOLD Function
- MAX MIN Function
- Resolution 0.1°C 0.1°F
- Low Battery Indication
- Type K thermocouple

HH305
$165


T2
T1
30.6
MAX
REC
20.0°C
10.6°C
MAX MIN
SETUP
TIME
HOLD
CLOCK
INTV
REC
°C/°F
RANGE -200°C ~ 1370°C
-328°F ~ 2498°F
POWER-UP OPTIONS
Disable AUTO OFF
Erase MEMORY

Features

- Dual Input
- Triple Display
- Time Function
- RS-232 Interface
- With Window Software
- 16,000 Records Data logger
- Auto Power Off
- HOLD Function
- MAX MIN Function
- Resolution 0.1°C 0.1°F
- Low Battery Indication
- Type K thermocouple

HH306
$185

Range and Accuracy

-200°C~1370°C..±0.2%rdg+1°C
-328°F~2498°F..±0.2%rdg+2°F

Operation Condition

0°C~50°C(32°F~122°F)
0%~80%RH(0°C~35°C,32°F~95°F)
0%~60%RH(35°C~50°C,95°F~122°F)

Storage Temperature

-20°C~60°C

Input Protection

60V DC or 24Vrms AC Maximum

Battery

9V,NEDA1604,IEC 6F22,JIS 006P

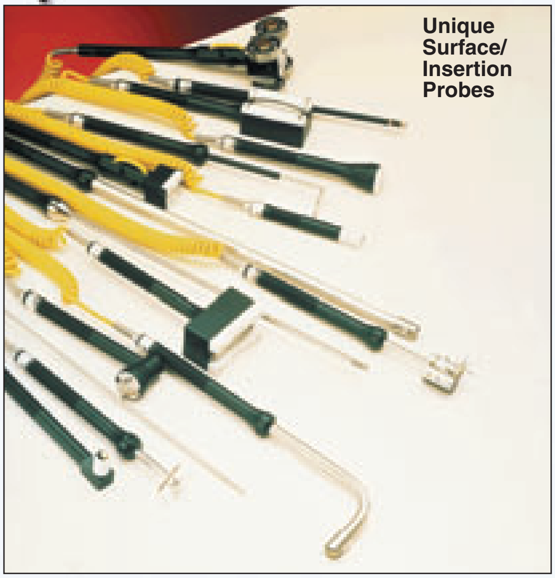
Dimension

184mmX64mmX30mm(7.25"X2.5"X1.2")

Weight

Approx.210g

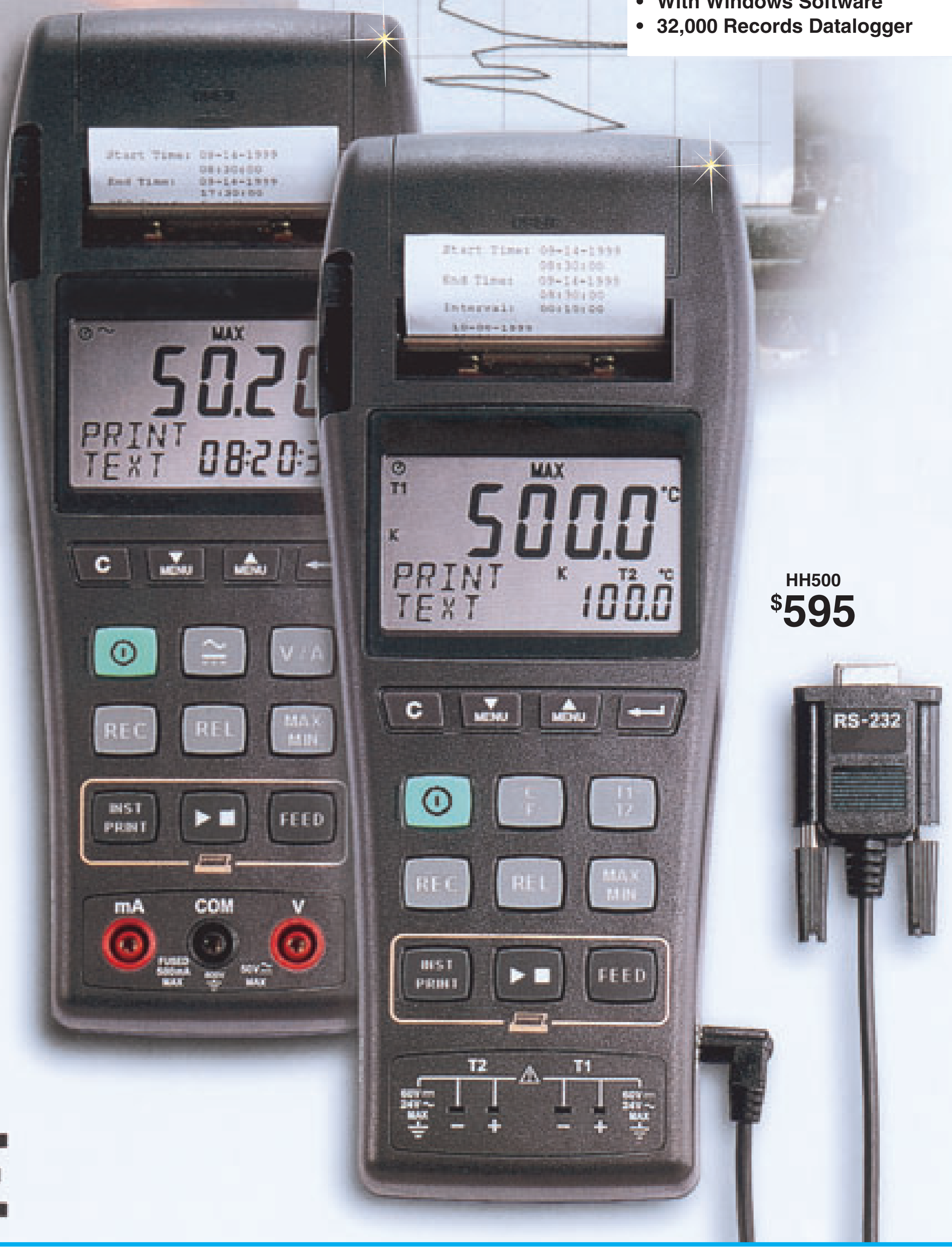
Optional Accessories


Unique
Surface/
Insertion
Probes

Featured on the Web at: www.omega.com

HH500/HH502VC RS-232 Graphic Recorder Temperature/Voltage/Current

- Graphic Print Out
- Text Print Out
- Easy Setup with Text Menu
- Real Time Clock
- RS-232 Interface
- With Windows Software
- 32,000 Records Datalogger


50.20
PRINT TEXT
08:20:3
mA
COM
V
500.0
PRINT TEXT
100.0
T2
T1
RS-232

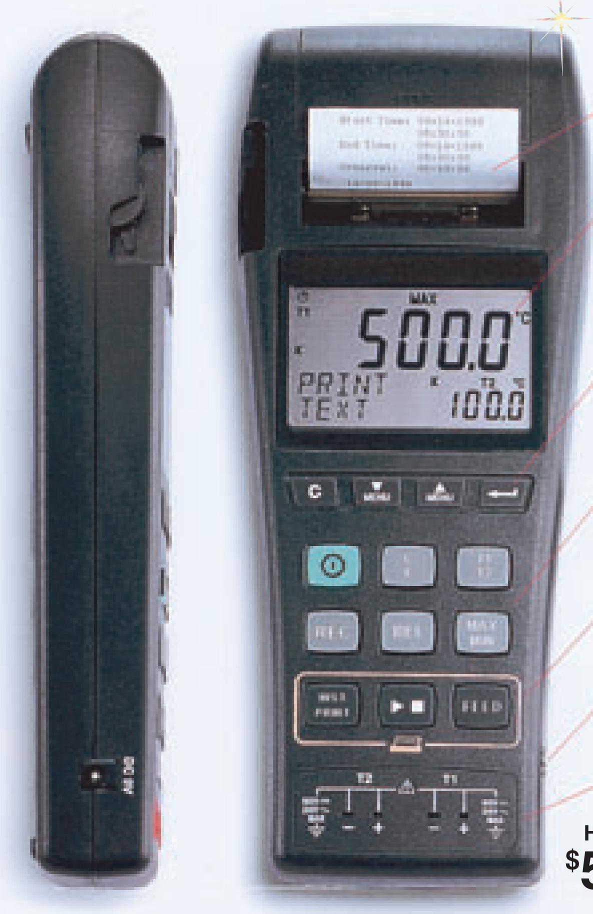
HH502VC
$595

HH500
$595

NEW

HH500/HH502VC Temperature/ Voltage/Current RS-232 Recorder

Features



- Built in thermal printer for text and graphic printout.
- Dual 5 digits big font LCD display to provide simultaneous readout of T1 and T2. 10 character text area provide setup menu for easy setup.
- The easy access menu buttons and text area in the LCD display provide a simple and intuitive hierarchical menu operation for system setup.
- Button group for thermometer provides the direct access to the most commonly used functions for temperature measurement.
- Button group for printer provides direct access to the most commonly used functions for printer control.
- Photo coupler isolated RS-232 port provides the direct connection of data flow to a personal computer with software for Windows 95/98 or Windows NT4.0
- Dual inputs thermal couple connector provides two inputs for K and J type temperature sensors.

HH500
$595

OMEGAETTE™ — Moderately Priced Instruments. Ideal for Education, Training and Demonstration Programs.

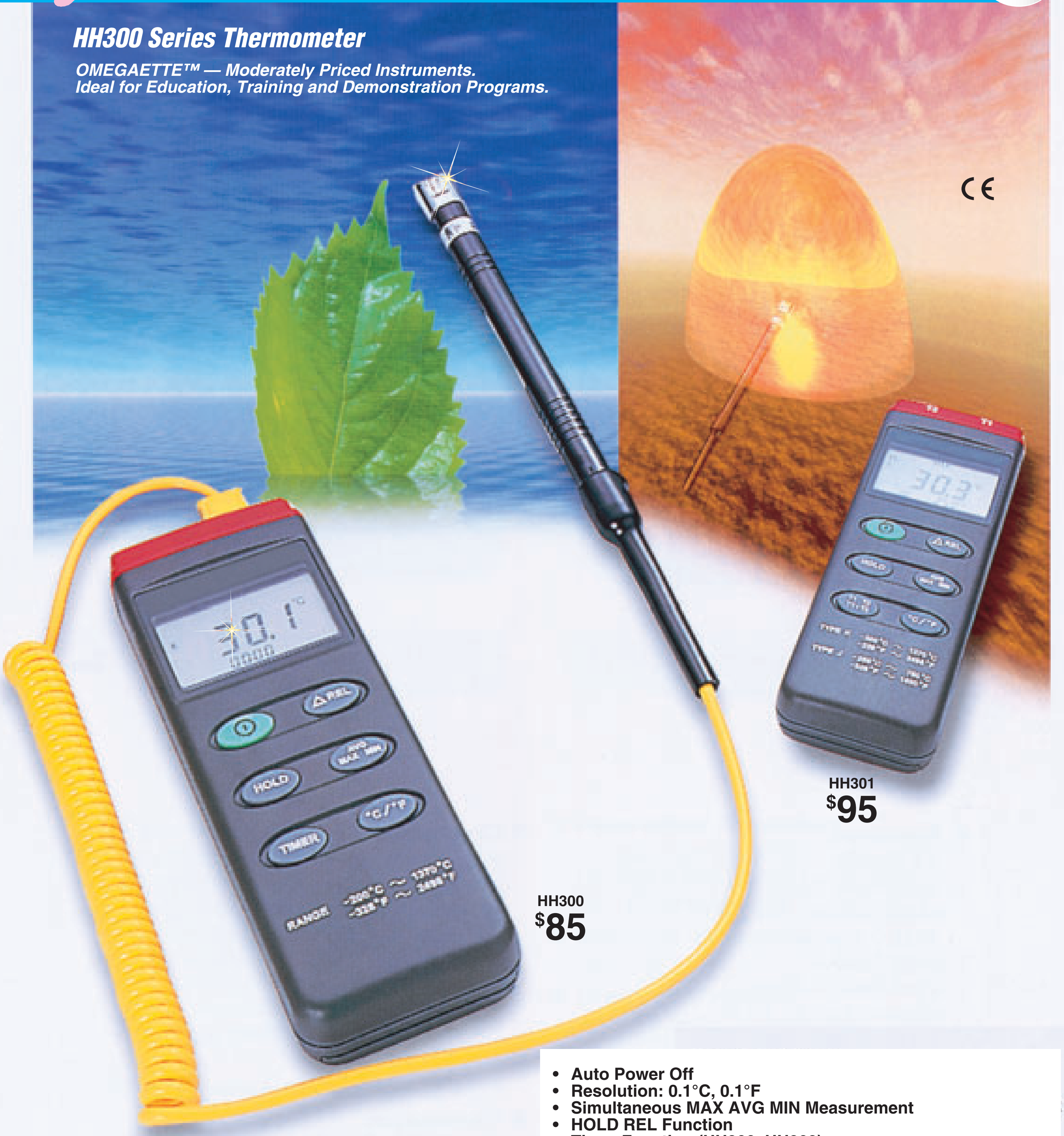
Specifications

Model	HH500 Temperature RECORDER	HH502VC Voltage / Current RECORDER
Range	K Type: -200~1370℃ (-328~2498℉) J Type: -200~ 760℃ (-328~1400℉)	V ≂ → 500mV, 5V, 50V mA ≂ → 50mA, 500mA
Accuracy	-200~1370℃ ... ±0.1%rdg+0.8℃ -328~2498℉ ... ±0.1%rdg+1.6℉	ACV, ACmA ... ±1%rdg+5 dgts DCV, DCmA ... ±1%rdg+3 dgts
Resolution	0.1℃ / 0.1℉	0.1mV / 0.01mA
Memory	32,000 Records	50,000 Records
Input Protection	60V DC or 24Vrms Maximum	600Vrms Maximum
Operation Temp	0℃ ~ 50℃	
Storage Temp	-20℃ ~ 60℃	
Power Supply	Approx. 100Hours	
Battery Life	Size AA 1.5V× 6 Alkaline Batteries	
Dimensions	242(L)× 98(W)× 42(H)mm	
Weight	Approx. 580g	
Accessories	Carrying case, operation manual, battery, 9V adaptor, thermal paper, RS-232 cable, software for Windows, K-type beaded sensor (HH500), test probe (HH502VC)	

For the complete selection of Temperature Handheld products, refer to The Green Book®

HH300 Series Thermometer

OMEGAETTE™ — Moderately Priced Instruments.
Ideal for Education, Training and Demonstration Programs.


30.1°
ΔREL
AVG MAX MIN
HOLD
°C/°F
TIMER
RANGE -200°C ~ 1370°C -328°F ~ 2498°F
30.3
CE

HH300
$85

HH301
$95

- **Auto Power Off**
- **Resolution: 0.1°C, 0.1°F**
- **Simultaneous MAX AVG MIN Measurement**
- **HOLD REL Function**
- **Timer Function (HH300, HH302)**
- **Dual Display(HH301, HH303)**
- **TYPE-K, J Thermocouple Input (HH302, HH303)**

HH300 Series

HH300
$85

HOLD
K
30.0 ℃
12:30 H
REL
HOLD
AVG MAX MIN
TIMER
℃/℉
RANGE -200℃ ~ 1370℃
-328℉ ~ 2498℉

T2
T1
MAX
T1
K
30.1 ℃
T2
25.0℃
REL
HOLD
AVG MAX MIN
T1 T2 T1-T2
℃/℉
RANGE -200℃ ~ 1370℃
-328℉ ~ 2498℉

HH301
$95

*Optional software and cable, HH300-SW, **$50***

Timer Function

CE

Features
- ＊4 digit LCD
- ＊Auto Power Off
- ＊MAX,AVG,MIN, Function
- ＊HOLD Function
- ＊REL Function
- ＊Low Battery Indication
- ＊Resolution 0.1℃, 0.1℉
- ＊External Battery Access Door For Easy Battery Changing

Measurement Range
＊-200℃ ~ 1370℃
＊-328℉ ~ 2498℉

Accuracy
＊-200℃ ~ 1370℃...... ±0.3% rdg + 1℃
＊-328℉ ~ 2498℉...... ±0.3% rdg + 2℉

Dual Input/Dual Display

CE

Operation Condition
0℃ ~ 50℃ (32℉ ~ 122℉)
0% ~ 80% R.H (0℃ ~ 35℃, 32℉ ~ 95℉)
0% ~ 60% R.H (35℃ ~ 50℃, 95℉ ~ 122℉)

Storage Temperature
-20℃ ~ 60℃

Input Protection
60V DC or 24Vrms AC Maximum

Battery
9V, NEDA 1604, IEC 6F22, JIS 006P

Dimension
184mmx64mmx30mm(7.25"x2.5"x1.2")

Weight
Approx. 210g

For the complete selection of Temperature Handheld products, refer to The Green Book®

HH300
Series

HH302
$105

HOLD
K
30.2 °C
12:30 M
REL
HOLD
AVG MAX MIN
TIMER
°C/°F
TYPE K -200°C ~ 1370°C
-328°F ~ 2498°F
TYPE J -200°C ~ 760°C
-328°F ~ 1400°F

HH303
$115

T2
T1
MAX
T1
K
30.3 °C
T2
25.0°C
REL
HOLD
AVG MAX MIN
T1 T2 T1-T2
°C/°F
TYPE K -200°C ~ 1370°C
-328°F ~ 2498°F
TYPE J -200°C ~ 760°C
-328°F ~ 1400°F

Timer Function

CE

Dual Input/Dual Display

CE

Features
- ∗4 digit LCD
- ∗K-Type J-Type Thermocouple
- ∗Auto Power Off
- ∗MAX,AVG,MIN,HOLD,REL Function
- ∗Low Battery Indication
- ∗Resolution 0.1℃, 0.1℉
- ∗External Battery Access Door For Easy Battery Changing

Measurement Range

∗K-Type	-200℃ ~ 1370℃ -328℉ ~ 2498℉
∗J-Type	-200℃ ~ 760℃ -328℉ ~ 1400℉

Accuracy
∗-200℃ ~ 1370℃....... ±0.1% rdg + 0.7℃
∗-328℉ ~ 2498℉....... ±0.1% rdg + 1.4℉

Operation Condition
0℃ ~ 50℃ (32℉ ~ 122℉)
0% ~ 80% R.H (0℃ ~ 35℃, 32℉ ~ 95℉)
0% ~ 60% R.H (35℃ ~ 50℃, 95℉ ~ 122℉)

Storage Temperature
-20℃ ~ 60℃

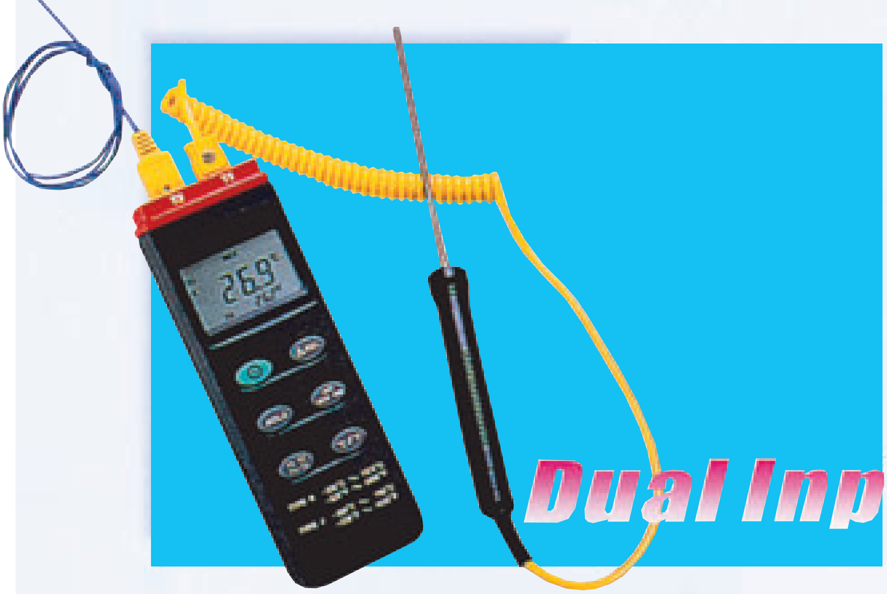
Input Protection
60V DC or 24Vrms AC Maximum

Battery
9V, NEDA 1604, IEC 6F22, JIS 006P

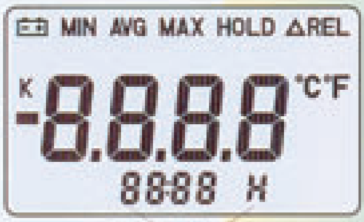
Dimension
184mmx64mmx30mm(7.25"x2.5"x1.2")

Weight
Approx. 210g

*Optional software and cable, HH300-SW, **$50***

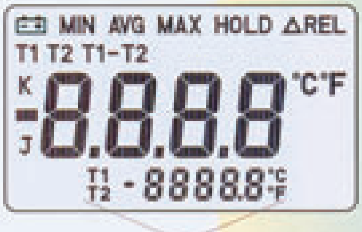


Dual Input

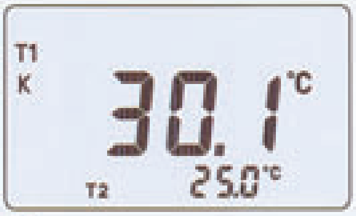

MIN AVG MAX HOLD ΔREL
K
-8.8.8.8
°C°F
8888 H

Timer Display

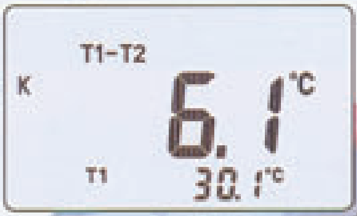
OMEGAETTE™ HH301, HH303

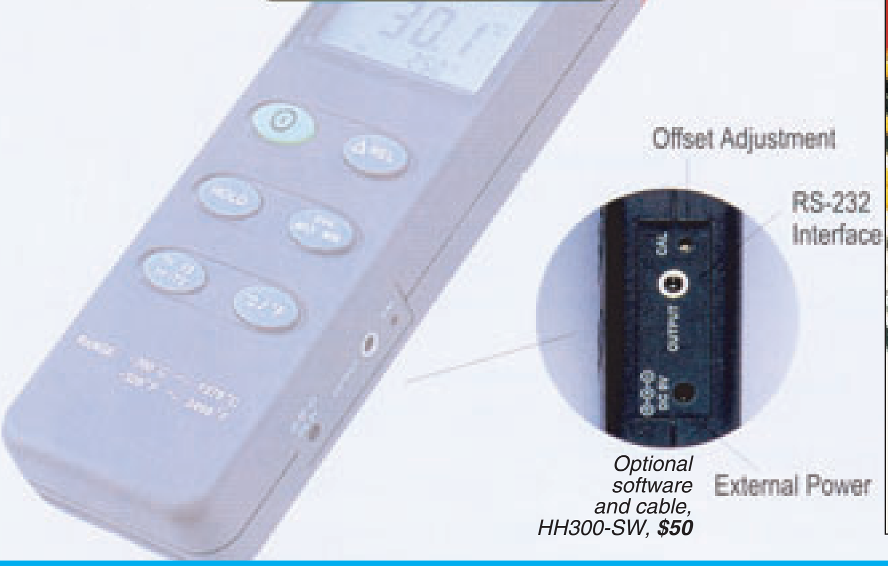

MIN AVG MAX HOLD ΔREL
T1 T2 T1-T2
K
J
-8.8.8.8
°C°F
T1 T2 -8888.8 °C °F

Second Display


T1
K
30.1 °C
T2
25.0 °C

Dual Display


T1-T2
K
6.1 °C
T1
30.1 °C


Offset Adjustment
RS-232 Interface
External Power
CAL
OUTPUT
DC 9V

*Optional software and cable, HH300-SW, **$50***

Optional Accessories

Unique Surface/ Insertion Probes
Featured on the Web at: www.omega.com

OMEGAETTE™ — Moderately Priced Instruments. Ideal for Education, Training and Demonstration Programs.

HH310 Series Humidity Temperature Meter

HH311
$195

- Dual Input
- Triple Display
- RS-232 Interface
- With Window Software
- 16,000 Records Datalogger
- TIMER Function
- Auto Power Off
- REL Function
- TIME Function
- HOLD Function
- MAX MIN Function
- Resolution 0.1°C, 0.1°F

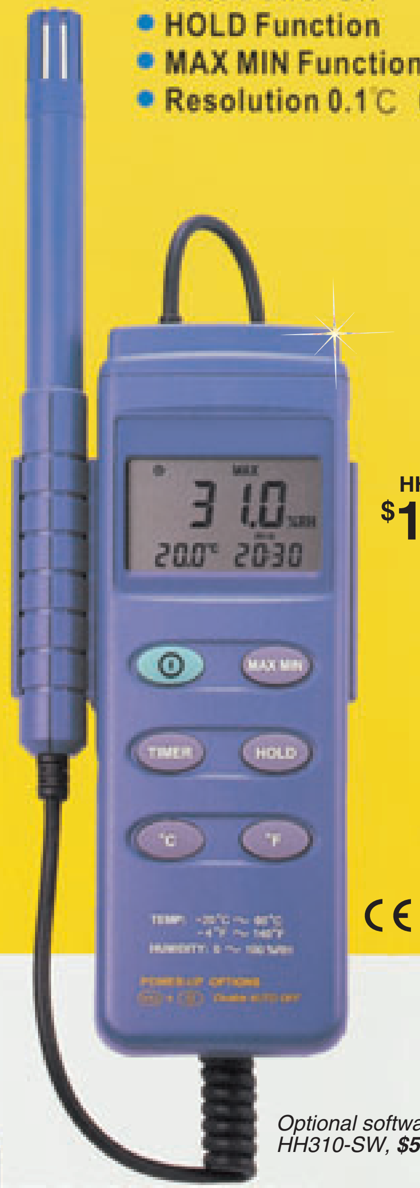
T1
T2 (K-TYPE)
MAX
31.1
%RH
T1
20.0°C
T2
100.8°C
MAX MIN
ΔREL
HOLD
°C
°F
TEMP: -20°C ~ 60°C
-4°F ~ 140°F
(K-TYPE): -200°C ~ 1370°C
-328°F ~ 2498°F
HUMIDITY: 0 ~ 100 %RH
POWER-UP OPTIONS
Disable AUTO OFF
RS-232

HH314 shown

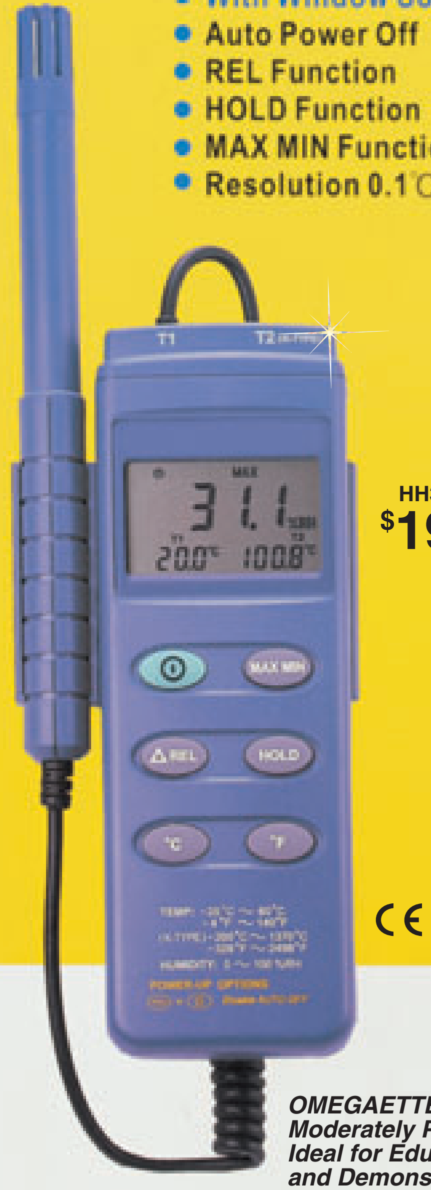
HH310 Series

- Triple Display
- Timer Function
- RS-232 Interface
- Auto Power Off
- HOLD Function
- MAX MIN Function
- Resolution 0.1℃ 0.1℉

- Dual Input
- Triple Display
- RS-232 Interface
- With Window Software(optional)
- Auto Power Off
- REL Function
- HOLD Function
- MAX MIN Function
- Resolution 0.1℃ 0.1℉


MAX
31.0 %RH
20.0℃ 20.30
MAX MIN
TIMER
HOLD
℃
℉
TEMP: -20℃ ~ 60℃
-4℉ ~ 140℉
HUMIDITY: 0 ~ 100 %RH
POWER-UP OPTIONS
Disable AUTO OFF

HH310
$185


T1
T2
MAX
31.1 %RH
20.0℃ 100.8℃
MAX MIN
REL
HOLD
℃
℉
POWER-UP OPTIONS
Disable AUTO OFF

HH311
$195

*Optional software and cable, HH310-SW, **$50***

OMEGAETTE™ — Moderately Priced Instruments. Ideal for Education, Training and Demonstration Programs.

SPECIFICATION

Range and Accuracy

- Temperature
  -20℃~60℃....±0.7℃
  -4℉~140℉....±1.4℉
  (K-Type)
  -200℃~1370℃...±0.3%rdg+1℃
  -328℉~2498℉...±0.3%rdg+2℉
- Humidity
  0~100%RH....±2.5%RH

Input Protection

60V DC or 24Vrms AC Maximum

Battery

9V,NEDA 1604, IEC 6F22, JIS 006P

Dimension:

Meter: 186×64×30mm(7.3"×2.5"×1.2")
Probe: 190mm L ×15mm Dia(7.5"×0.6"Dia)

Weight

Approx. 320g

For the complete selection of Temperature Handheld products, refer to The Green Book®

HH310 Series

- With Window Software
- 16,000 Records Data Logger
- Auto Power Off
- TIME Function
- HOLD Function
- MAX MIN Function
- Resolution 0.1°C 0.1°F

31.3
20.0
MAX MIN
SETUP
TIME
HOLD
CLOCK
INTV
°C/°F

HH313
$245

- Triple Display
- RS-232 Interface
- With Window Software
- 16,000 Records Data Logger
- Auto Power Off
- TIME Function
- HOLD Function
- MAX MIN Function
- Resolution 0.1°C 0.1°F

T1
T2
31.4
20.0
100.8
MAX MIN
SETUP
TIME
HOLD
CLOCK
INTV
°C/°F

HH314
$295

OMEGAETTE™ — Moderately Priced Instruments. Ideal for Education, Training and Demonstration Programs.

SPECIFICATION

Range and Accuracy
- Temperature
  -20℃~60℃....±0.7℃
  -4°F~140°F....±1.4°F
  (K-Type)
  -200℃~1370℃...±0.3%rdg+1℃
  -328°F~2498°F...±0.3%rdg+2°F
- Humidity
  0~100%RH....±2.5%RH

Input Protection
60V DC or 24Vrms AC Maximum

Battery
9V,NEDA 1604, IEC 6F22, JIS 006P

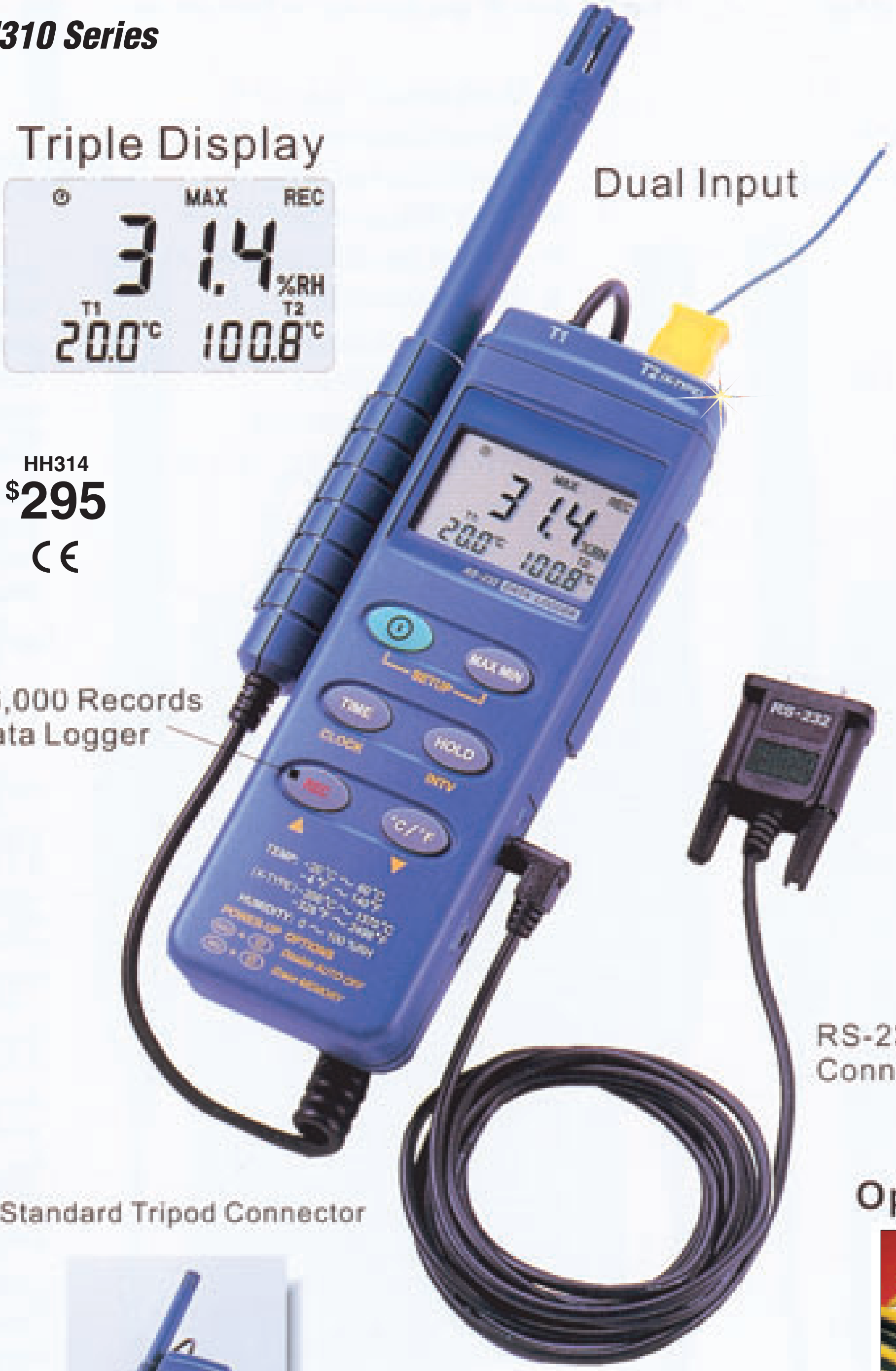
Dimension:
Meter: 186×64×30mm(7.3"×2.5"×1.2")
Probe: 190mm L ×15mm Dia(7.5"×0.6"Dia)

Weight
Approx. 320g

NEW

HH310 Series

Triple Display


MAX
REC
31.4
%RH
T1
T2
20.0°C
100.8°C

HH314
$295
CE

Dual Input
T1
T2
31.4
20.0°C
100.8°C
SETUP
MAX MIN
TIME
CLOCK
HOLD
INTV
REC
°C/°F
RS-232
16,000 Records Data Logger

RS232 Software For Window 95/98 NT4.0

Data Logger

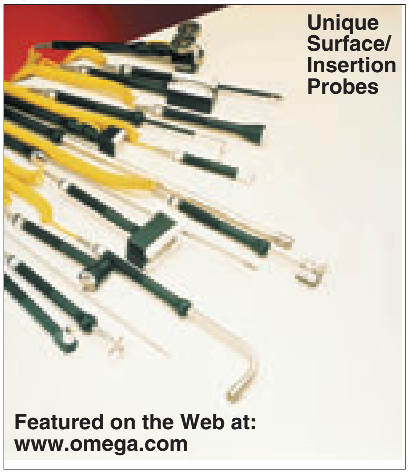
Real Time Data Collecting

OMEGAETTE™ — Moderately Priced Instruments. Ideal for Education, Training and Demonstration Programs.

RS-232 Connection Cable

Standard Tripod Connector

Optional Accessories



Unique Surface/ Insertion Probes

Featured on the Web at:
www.omega.com

Ordering Information

OMEGAETTE™ — Moderately Priced Instruments. Ideal for Education, Training and Demonstration Programs.

30.2
30.3
T2
T1

To Order

Model No.	Price	Description
HH305	**$165**	1 channel type K thermometer with datalogger Contents: meter, carrying case, 1 type K T/C, software, RS-232 interface cable, battery, manual
HH306	**185**	2 channel type K thermometer with datalogger Contents: meter, carrying case, 2 type K T/C's, software, RS-232 interface cable, battery, manual
HH500	**595**	Temperature/RS-232 graphic recorder/datalogger Contents: meter, carrying case, 9V adaptor, thermal paper, software, RS-232 interface cable, 1 type K T/C, battery, manual
HH502VC	**595**	Voltage/current graphic recorder/datalogger contents: meter, carrying case, 9V adaptor, thermal paper, software, RS-232 interface cable, test probe, battery, manual
HH300	**85**	1 channel type K thermometer Contents: meter, carrying case, 1 type K T/C, battery, manual. Software package is optional
HH301	**95**	2 channel type K thermometer Contents: meter, carrying case, 2 type K T/C's, battery, manual. Software package is optional
HH302	**105**	1 channel type J/K thermometer Contents: meter, carrying case, 1 type K T/C, battery, manual. Software package is optional
HH303	**115**	2 channel type J/K thermometer Contents: meter, carrying case, 2 type K T/C's, battery, manual. Software package is optional
HH310	**185**	1 channel RH/Type K thermometer Contents: meter, carrying case, 1 type K T/C, battery, manual. Software package is optional
HH311	**195**	2 channel RH/Type K thermometer Contents: meter, carrying case, 1 type K T/C's, battery, manual. Software package is optional
HH313	**245**	1 channel RH/Type K thermometer/datalogger Contents: meter, carrying case, 1 type K T/C, software, RS-232 interface cable, battery, manual
HH314	**295**	2 channel RH/Type K thermometer/datalogger Contents: meter, carrying case, 1 type K T/C's, software, RS-232 interface cable, battery, manual
HH300-SW	**50**	Software and RS-232 interface cable for use with HH300, HH301, HH302, and HH303
HH310-SW	**50**	Software and RS-232 interface cable for use with HH310 and HH311

On-site Tester Calibrator
CL518

CL518
$^{\$}$1270

NIST 1 YEAR WARRANTY CE

- Measures and Simulates Temperature, Resistance, DC Voltage, Thermocouples, RTDs and Current
- Two Instruments in One: Tester/Calibrator, Stand Alone Logger
- Memory Reading on the Display or Via Analog Output
- Interchangeable Battery, Quick Charge: 3 Hours
- 200,000 Points in Simulation
- Ramp Generator
- Multilanguage

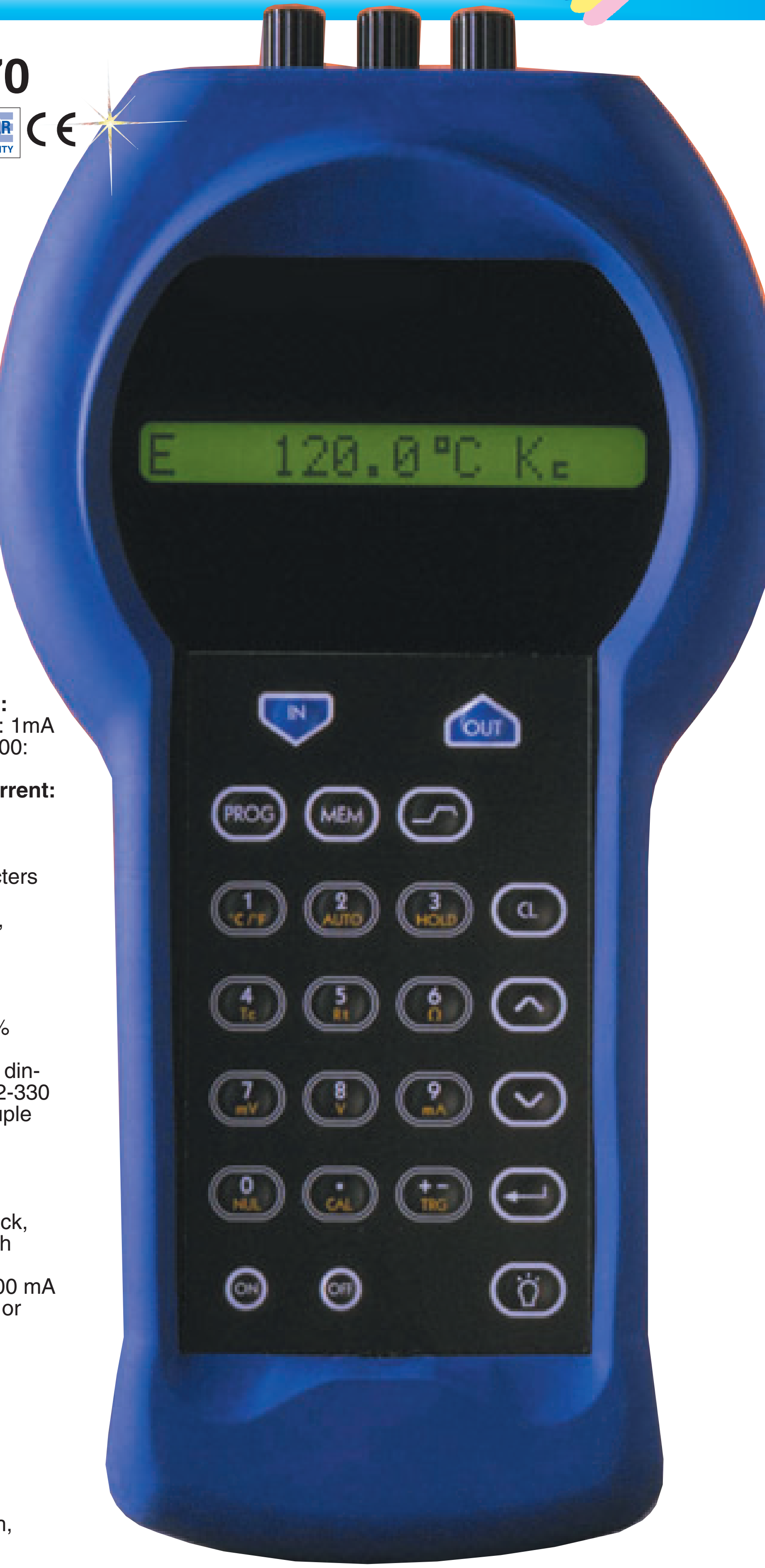
OMEGA's digital tester calibrator CL518 is designed for maintenance and calibration of physical quantities either on-site or in labs.

Functions

The CL518 is designed for checking equipment in telemetry loops, such as sensors, transmitters, positioners, converters, controllers. Delivered with elastomeric enclosure, the CL518 is self-contained thanks to rechargeable battery pack. It can operate on AC power without battery discharge. It includes an alphanumeric display and a very comprehensive 24-key keypad allowing easy programming and processing thanks to help messages available in several languages. It can also store up to 1000 measurements in one or more bursts.

Specifications

DC VOLTAGE, DC CURRENT, RESISTANCE
Measurement: Measurement range up to 120% of range
Voltage, Input Resistance: 1000 MΩ over 50 mV and 500 mV ranges, 10 MΩ over 5 V and 50 V ranges
Normal Mode Rejection Level: > 70 dB at 50/60 Hz
Common Mode Rejection Level: > 120 dB in dc and ac 50 Hz
Max. Permissible Common Mode Voltage: 250 Vrms
Current, Voltage Drop: <1.6 V Current, 24 Vdc may power a loop including a passive transmitter
Resistance, Measuring Current: 1 mA over 500 Ω range. 0.1 mA over 5000 Ω range, 3-wire balanced circuit
EMISSION/SIMULATION
Voltage, Nominal Load Resistance: ≥100 kΩ
Source Resistance: < 0.2 Ω
Resistance, Nominal Current In for the Announced Accuracy: 1 mA (500 Ω Range) or 0.1 mA (5000 Ω range) permissible measuring current 0.5 to 3 mA.
RTD MEASUREMENT
Resolution: 0.1°C
Measuring Current: Pt 100, 200 and Ni 100, 200: 1mA Pt 500, 1000 and Ni 500, 1000: 0.1mA
SIMULATION
Resolution: 0.01°C
Usable Nominal Current In: Pt 100, 200 and Ni 100, 200: 1mA Pt 500, 1000 and Ni 500, 1000: 0.1mA
Permissible Measuring Current: from 0.5 In to 3 mA
Response Time: < 90 ms
DISPLAY
One line of 16 backlit characters
OPERATING CONDITIONS
Reference Range: 23± 1°C, relative humidity 45 to 75%
Operating Normal Range: 0 to 50°C, RH: 20 to 75%
Operating Limit Range: -10 to + 55°C, RH: 10 to 80%
STANDARDS
Platinum probe according to din-IEC Publication 475 (NFC 42-330 and DIN 43760). Thermocouple according to IEC Publication 584-1 (NFC 42-321) or DIN 43710
POWER REQUIREMENTS
Removable NiMH battery pack, (included) quick charge in 3 h
Life: > 10 h
Power Input Block: 12 V/400 mA
External Charger: 120 Vac or 220 Vac, 50/60 Hz
Output: 12 Vdc
FEATURES
ABS casing with elastomer enclosure
Dimensions: 260 mm x 144 mm x 60 mm
24-key keypad control
Weight: < 1.5kg
Languages: French, English, German, Swedish, Italian, Spanish, and Dutch



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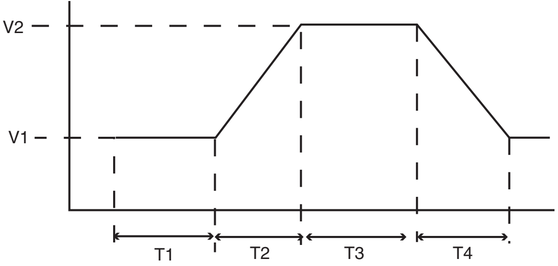
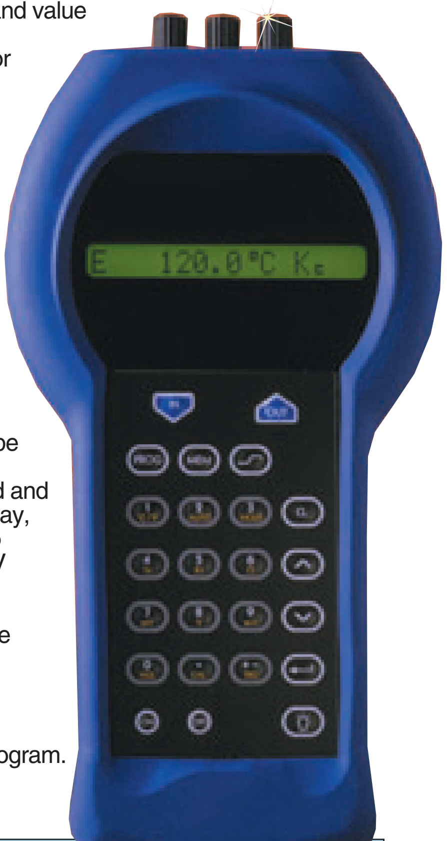
	Measurement Range (°C)	Resolution (°C)	Accuracy (1) (°C)	Simulation Range (2) (°C)	Accuracy (1) (°C)
K	-250 to -200°C	0.5°C	0.05%+1.0°C	-240 to -200°C	1°C
	-200 to -100°C	0.2°C	0.05%+0.4°C	-200 to 0°C	0.15%+0.1
	-100 to 1372°C	0.1°C	0.05%+0.2°C	0 to+1372°C	0.03%+0.1°C
T	-250 to 200°C	0.5°C	0.05%+1°C	-240 to -200°C	1°C
	-200 to -100°C	0.2°C	0.05%+0.4°C	-200 to -0°C	0.15%+0.1°C
	-100 to 400°C	0.1°C	0.05%+0.2°C	0 to -400°C	0.03%+0.1°C
J	-209 to -120°C	0.2°C	0.05%+0.4°C	-210 to -0°C	0.15%+0.1°C
	-120 to 1020	0.1°C	0.05%+0.2°C	0 to +1 200°C	0.04%+0.1°C
E	-250 to -200°C	0.5°C	0.05%+1°C	-240 to -200°C	1°C
	-200 to-100°C	0.2°C	0.05%+0.4°C	-200 to 0°C	0.1% + 0.1°C
	-100 to 755°C	0.1°C	0.05%+0.2°C	0 to 1000°C	0.03% + 0.1°C
N	-240 to -200°C	1°C	0.05%+0.1°C	-240 to -200°C	1.5°C
	-200 to -400°C	0.5°C	0.05%+0.4°C	-200 to 0°C	0.15%+0.2°C
	400 to 1300°C	0.1°C	0.05%+0.2°C	0 to 1300°C	0.03%+0.2°C
U	-200 to -100°C	0.2°C	0.05%+0.4°C	-200 to 0°C	0.1%+0.1°C
	-100 to 600°C	0.1°C	0.05%+0.2°C	0 to +600°C	0.02%+0.1°C
L	-200 to -40°C	0.2°C	0.05%+0.4°C	-200 to 0°C	0.1%+0.1°C
	-40 to 900°C	0.1°C	0.05%+0.2°C	0 to 900°C	0.03%+0.1°C
S	-50 to 450°C	1°C	0.05%+2°C	-50 to 1768°C	1°C
	450 to 1767°C	0.5°C	0.05%+1°C		
R	-50 to+450°C	1°C	0.05%+2°C	-50 to 1768°C	.8°C
	450 to 1767°C	0.5°C	0.05%+1°C		
B	-400 to 900°C	1°C	0.05%+2°C	0 to+1820°C	1°C
	900 to 1820°C	0.5°C	0.05%+1°C		
C	-20 to 300°C	0.5°C	0.05%+1°C	-20 to 0°C	0.3°C
	300 to -1820°C	0.2°C	0.05%+0.5°C	0 to 400°C	0.3%+0.3°C
	1830 to 2 320°C	0.5°C	0.05%+1°C	400 to 2300°C	0.06%+0.3°C
V	50 mV	10µV	0.05%+10µV		
	500 mV	100µV	0.05%+100µV	-30 to 220mV	0.03%+4 µV
	5 V	1mV	0.05%+1mV	-300 to 2200mV	0.02%+20 µV
	50 V	10mV	0.05%+10mV	-2 to 22V	0.02%+0.2mV
mA	50 mA	10µA	0.05%+10 µA	0.1 to 24mA	0.02%+0.3 µA
Ω	500Ω	100mΩ	0.05%+100mΩ	26 to 501Ω	0.02%+10 mΩ
	5000Ω	1Ω	0.05%+1Ω	260 to 5010Ω	0.02%+150 mΩ
Pt 100Ω	-220 to 1200°C		0.05%+0.3°C	-180 to 1200°C	0.02%+0.1°C
Pt 200Ω	-220 to 550°C		0.05%+0.2°C	-210 to 405°C	0.02%+0.05°C
Pt 500Ω	-220 to 1200°C		0.05%+0.5°C	-120 to 1200°C	0.02%+ 0.2°C
Pt 1000Ω	-220 to 1200°C		0.05%+0.3°C	-180 to 1200°C	0.02%+ 0.1°C
Ni 100Ω	-59 to 180°C		0.05%+0.3°C	-60 to 180°C	0.02%+0.1°C
Ni 200Ω	-59 to 180°C		0.05%+0.2°C	-60 to 180°C	0.02%+0.05°C
Ni 500Ω	-59 to 180°C		0.05%+0.5°C	-60 to 180°C	0.02%+0.2°C
Ni 1000Ω	-59 to 180°C		0.05%+0.3°C	-60 to 180°C	0.02%+0.1°C

(1) In ± (% rdg + n digits) at 23 ± 1°C. {90 days}
(2) Thermocouple simulation 0.1° resolution. Accuracies are for 0°C reference junction. Using the internal reference junction, except thermocouple B, add an uncertainty of 0.2°C.

Additional Functions: Temperature in measurements and simulation functions can be expressed either in °C or °F.
Measurement Trigger: Automatic or keypad key; burst triggering can be programmed from 1 to 1000 successive measurements with a time interval from 0.5 to 3400s.
Autoranging with voltage and resistance functions:
Relative Measurements:
The unit reads the deviation regarding a value measured and stored as a reference. L=M-R with L value read, M value measured with the chosen function and range an R reference value.
Display According to a Conversion Law: The unit reads the function L= aM + b with L value read, M value measured with the chosen function and range; a and b are defined by the unit on the basis of the desired L1 and L2 values for the the corresponding values of M1 and M2, the data having previously been entered on the keypad.
Step Generator: The emission signal can vary per step, those amplitude and positive or negative directions are defined using the keypad.
Ramp Generator: The emission signal can vary continuously between two predetermined values, after programming values of level v1 and v2, times T1 to T4 and number of n successive cycles.



Storage of Emission Values: 100 simulation values can be programmed and stored in non-volatile memory. They can be recalled using the keypad.
Measurement Memory: It can store the number, function, range and value of the last 1000 measurements or n bursts of p measurements (E.g.: 250 bursts of one measurement). The unit computes the average and determines the maximum and minimum of the values for each burst.
Recalling Measurements: The values can be either: recalled using the keypad and read on the display, or converted into 4-20 mA or 0-1 V analog signals available on the unit terminals; the time interval between outputs of 2 consecutive measurements is selected by program.



To Order *(Specify Model Number)*

Model No.	Price	Description
CL518	**1270**	Calibrator
CL518-BP	**90**	Battery Pack
CL518-TL	**31**	Test leads (set of 5)
CL518-CLL	**412**	Cigar lighter lead

*CL518 includes unit, ac power cord, batteries, rubber boot, soft carrying case, manual. For 220 Vac, add "-220"; no extra charge. **Ordering Example:** CL518, on-site calibrator, CL518-TL, set of 5 test leads, $1270 + 31= **$1301.***

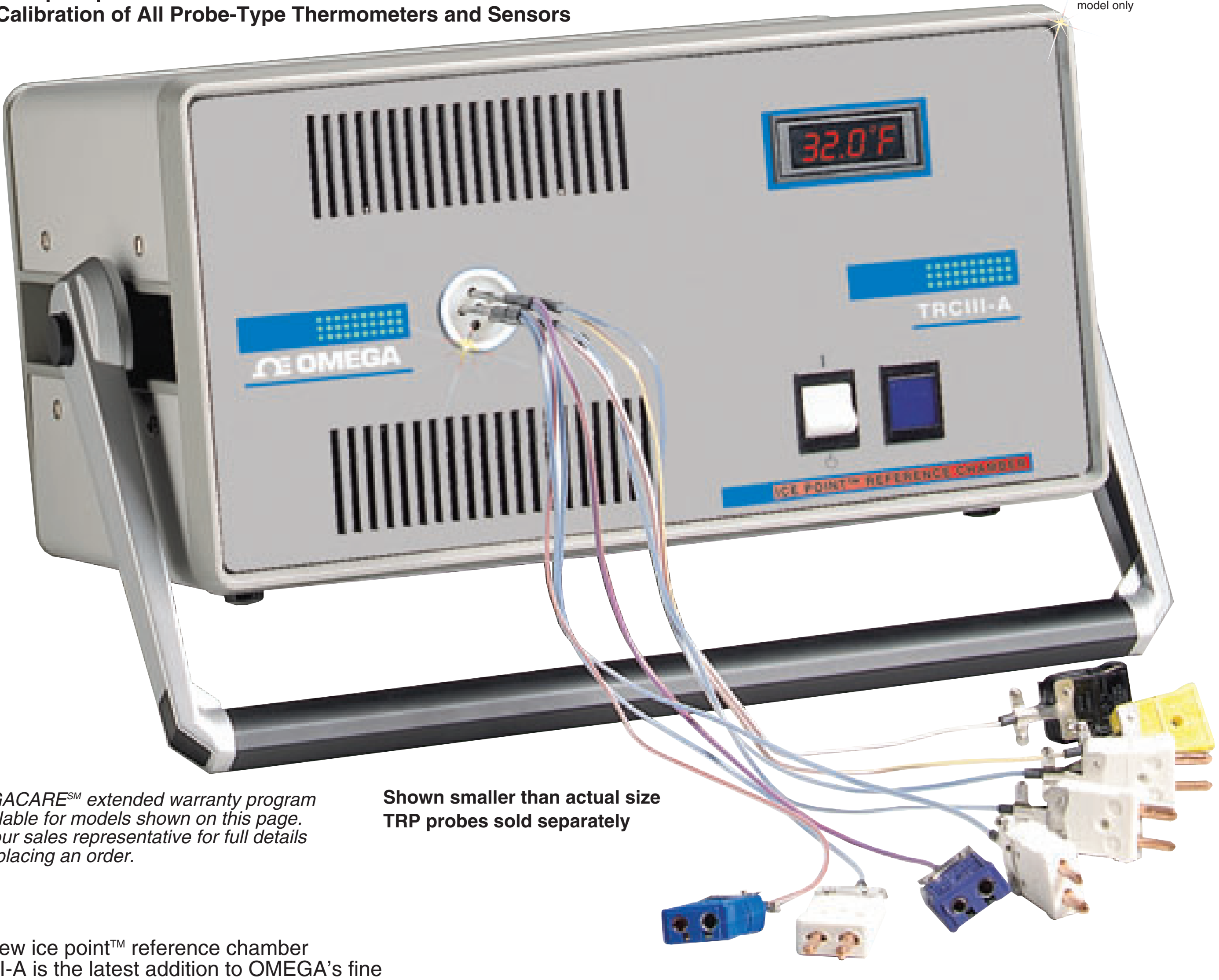
ice point™ Calibration Reference Chamber

High Precision Thermoelectric Chamber Uses Water to Maintain 0°C (32°F) Continuously

Model TRCIII-A
$1475

230 Vac model only

- **New Stylish Design**
- **Portable Rugged Case for Use in the Factory, Calibration Laboratory, or Instrument Shop**
- **Built in Temperature Readout with 0.1 (°F/°C) Resolution**
- **Accepts up to 6 Probes at One Time**
- **Calibration of All Probe-Type Thermometers and Sensors**



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TRP probes sold separately

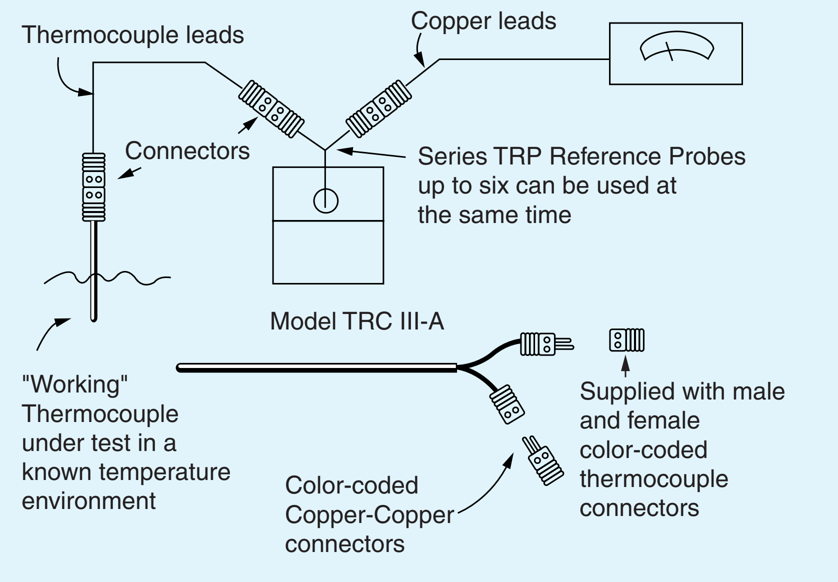
OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order.

The new ice point™ reference chamber TRCIII-A is the latest addition to OMEGA's fine line of calibration reference instrumentation. The TRCIII-A ice point™ reference chamber relies on the equilibrium of ice and distilled, deionized water at atmospheric pressure to maintain six reference wells at precisely 0°C (32°F). Each well extends into a sealed cylindrical chamber containing the distilled deionized water. The outer walls of the chamber are cooled by thermoelectric cooling elements. The increase in volume produced by the creation of ice crystals within the cell is sensed by the expansion of a bellows, which operates a micro switch and controls the cooling elements. The alternate freezing and thawing of the ice accurately maintains a 0°C environment around the reference wells.

NEW FEATURES!

- **230 Vac CE Marked Models**
- **NIST Calibration Certificate Included**
- **Bench-Top Design with Tilt Handle Standard**
- **Illuminated Power Switch**
- **Companion hot point® Dry Block Probe Calibrator Available (Model CL900A/950A)**

TRP Applications


Thermocouple leads
Copper leads
Connectors
Series TRP Reference Probes up to six can be used at the same time
Model TRC III-A
"Working" Thermocouple under test in a known temperature environment
Color-coded Copper-Copper connectors
Supplied with male and female color-coded thermocouple connectors

Specifications

Reference Wells:
Six wells, 4.0 mm (5/32") ID, 95.25 mm (3¾") deep.
Wells are thermally and electrically grounded to each other.
Accepts 3 mm (⅛") OD probes
Reference Temperature:
0°C (32°F)
Accuracy: ±0.1°C (±0.18)
Stability: ±0.03°C (±0.07) for constant ambient
Environmental Ambient:
2 to 32°C (35 to 90°F)
Power: 115/230 Vac, 50 Hz, 104 watts
Stabilization Time:
Two hours after initial power up
Dimensions:
203 H x 419 W x 305 mm D
(8 x 16½ x 12")
Weight: 11.8 kg (26 lb)

Caution: Unit must not be allowed to freeze or damage will result.

We make running changes when technical advances allow. Check at time of ordering for additional features.

To Order *(Specify Model No.)*

Model Number	Price	Description
TRCIII-A	$1475	ice point™ reference cell, 115 Vac operation
TRCIII-A-230VAC	1475	ice point™ reference cell, 230 Vac operation

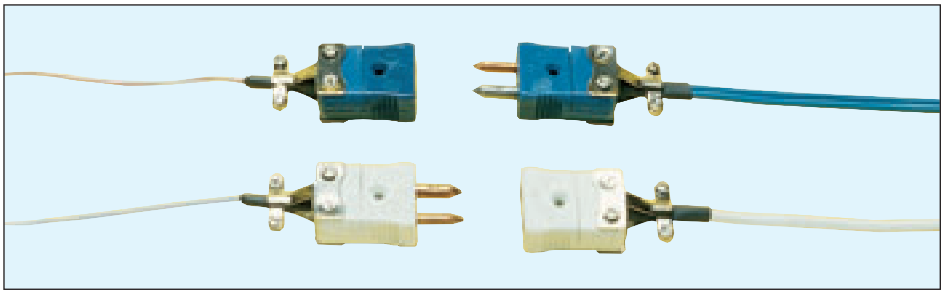
*Ordering Example: **TRCIII-A,** ice point™ reference cell, **TRP-K, TRP-J, TRP-T, TRP-E,** type J, K, T and E temperature reference probes, $1475 + 65 + 65 + 65 + 65 = **$1735.***

***Note:** Only 230 Vac model is available as CE marked.*

TRCIII-A ACCESSORIES

Mercury Glass TRP Features

- ✓ -10 to 10°C in 0.1°C Increments
- ✓ 9" Length with 4" Immersion
- ✓ Accurate to ±0.25°C
- ✓ 4 mm Diameter



Thermocouple TRP Features

- ✓ Made with Special Limits of Error Material
- ✓ All Standard Calibrations Available
- ✓ Comes Complete with Mating Connectors
- ✓ Can Be Ordered with 12", 24" or 36" Leads

Thermocouple TRP's

Model Number	Price	Thermocouple Material Type +	-
TRP-K	$65	CHROMEGA®	ALOMEGA®
TRP-T	65	Copper	Constantan
TRP-E	65	CHROMEGA®	Constantan
TRP-J	65	Iron	Constantan
TRP-S	130	Platinum	Platinum 10% Rh
TRP-R	130	Platinum	Platinum 13% Rh
TRP-B	130	Platinum 30% Rh	Platinum 6% Rh
TRP-C	130	W 5% Re	W 26% Re
TRP-G	130	W	W 26% Re
TRP-D	130	W 3% Re	W 25% Re

*For thermocouple types J, K, T, E, standard length is 12". For 24" or 36" long leads add suffix "**-24**" or "**-36**" to model number, add **$4/ft.** For thermocouple types R, S, B, C, G, D, standard length is 6", add **$37** for each additional 6 inches and appropriate suffix.*

Precision Mercury Glass TRP's

Model No.	Price	Description
TRP-PT	$62	Mercury Temperature Reference Probe
TRP-PT-NIST	124	Mercury Temperature Reference Probe with NIST Traceable Certificate

Thermocouple-to-Analog Connector/Converters

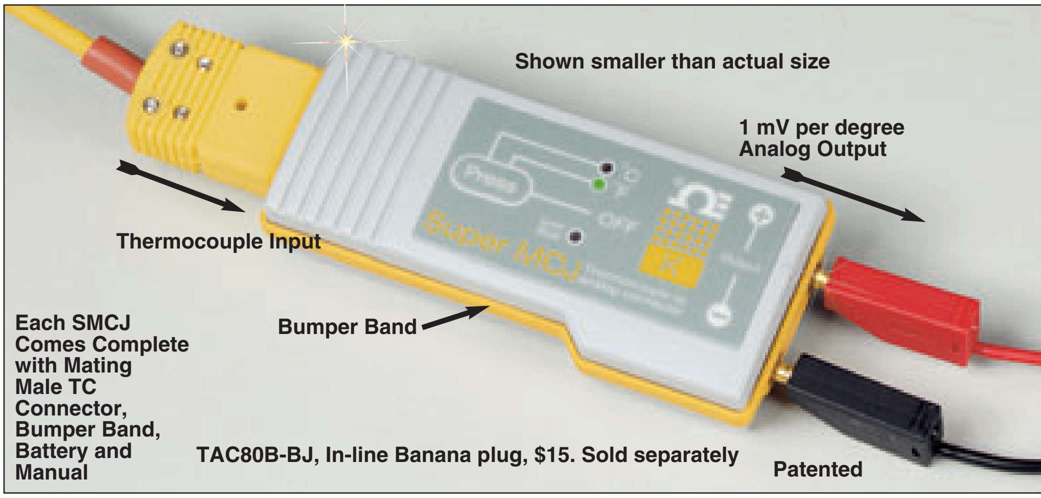
- ✓ High Stability Electronics
- ✓ 1 mV/Degree Linear Output
- ✓ Self-Contained Connector Design
- ✓ One-Button Operation
- ✓ °F/°C Switchable
- ✓ Battery Powered
- ✓ Low Battery Indication
- ✓ Built-In Thermocouple EMI Shielding
- ✓ Water-Resistant Design
- ✓ Patented Built-In Protective Bumper Band

KTSS-316G-6
Thermocouple, $19.
Sold separately; see section A of The Temperature Handbook™.

SMCJ Series
$88
Basic Unit

1 YEAR WARRANTY MADE IN USA CE

The SMCJ converts a thermocouple input signal to a cold junction compensated, linear, amplified analog output for use with DMM's, recorders, dataloggers and other electronic devices. The output signal from the SMCJ is 1 mV/ degree and is user switchable between °C and °F.



Each SMCJ Comes Complete with Mating Male TC Connector, Bumper Band, Battery and Manual

TAC80B-BJ, In-line Banana plug, $15. Sold separately

Specifications

Accuracy: @ 25°C/75°F ambient, across the specified range
Type J: ±1.1°C (2°F); -18 to 538°C (0 to 1000°F)
Type K: ±2°C (3°F) -18 to 1093°C (0 to 2000°F)
Type T: ±1.1°C (2°F) -18 to 260°C (0 to 500°F)
Output: 1 mV/°C or °F
Output Impedance: 1 kΩ min.
Input Connection: SMP or OST Connector
Response Time (0 to 63% Final Value): 150 msec.
Power: 3 to 3.6 V AA Lithium Battery (included)
Battery Life: 1440 hrs (60 days) of continuous operation (no load)
Operating Temperature: 0 to 50°C (32 to 122°F)
Dimensions: 10 L x 5 W x 2.5 cm H (4 x 2 x 1")
Weight: 67 g (2.36 oz)

IN STOCK FOR FAST DELIVERY! ▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model Number)*

Model Number	Price	Thermocouple Input Type	Temperature Range °C	Temperature Range °F
SMCJ-J	$88	J Iron-Constantan	-100 to 750	-148 to 1382
SMCJ-K	88	K CHROMEGA®-ALOMEGA®	-100 to 1250	-148 to 2282
SMCJ-T	88	T Copper-Constantan	-100 to 350	-148 to 662

*Ordering Example: **SMCJ-J**; J calibration signal converter, **$88***

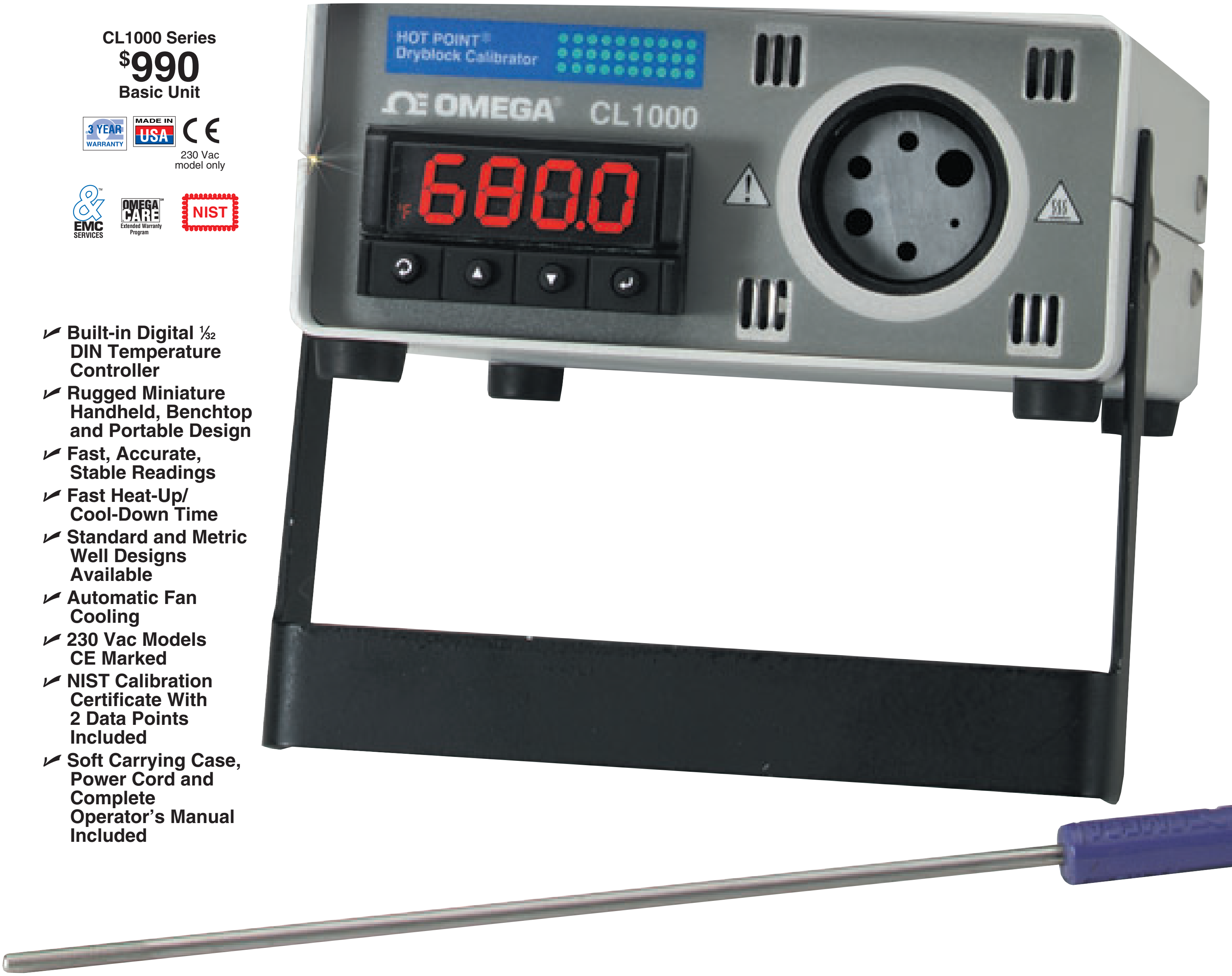
Accessories

Model Number	Price	Description
OM-NOMAD-BATT	$12	Replacement battery
TAC80B-BJ	15	In-line banana plug (red and black)

Mini hot point® Dry Block Probe Calibrator

CL1000 Series
$990
Basic Unit

230 Vac model only



- **Built-in Digital 1⁄32 DIN Temperature Controller**
- **Rugged Miniature Handheld, Benchtop and Portable Design**
- **Fast, Accurate, Stable Readings**
- **Fast Heat-Up/ Cool-Down Time**
- **Standard and Metric Well Designs Available**
- **Automatic Fan Cooling**
- **230 Vac Models CE Marked**
- **NIST Calibration Certificate With 2 Data Points Included**
- **Soft Carrying Case, Power Cord and Complete Operator's Manual Included**

OMEGA's new CL1000 Series mini hot point® dry block probe calibrator offers a fast, accurate, stable solution for calibrating temperature probes in both the laboratory and in the field by providing a lightweight, rugged miniature design. There are 4 different probe well styles available (shown on next page). The CL1000 Series has been engineered into a custom fabricated metal enclosure together with a high performance 1⁄32 DIN controller, and has been designed to meet a high level of quality, reliability and safety. Each 230 Vac unit carries the CE mark and has achieved performance results high above the required levels. The calibrator has a temperature calibration range of ambient +10 to 260°C (ambient +20 to 500°F) and can operate in an environment of 0 to 50°C (32 to 122°F) and a relative humidity of 0 to 90% non-condensing.

Each CL1000 comes complete with power cord, soft carrying case, operator's manual, and calibration certificate

We make running changes when technical advances allow. Check at time of ordering for additional features.

OMEGA CL1000
680.0
Model HH64
680.0
SCL
MTL
Reset
Max Min
OMEGA

CL1000 mini hot point® shown calibrating a thermocouple probe with the HH64 handheld thermometer

Specifications

Temperature Range: Ambient +10 to 260°C (Ambient +20 to 500°F)
Accuracy: ±1.5°C (±2.75°F)
Display Resolution: 0.1°
Ambient Operating Range
Temperature: 0 to 50°C (32 to 122°F)
Humidity: 0 to 90% RH non-condensing
Heat-Up Time: Ambient to 260°C (500°F) in 5 minutes
Cool-Down Time: 260°C (500°F) to ambient (30 minutes)
Well Style: Fixed (4 styles, A-D)
Probe Immersion Depth: 114 mm (4.5")
Fan Cooling: Automatic
Power: 115 Vac, 50/60 Hz or 230 Vac, 50/60 Hz, 275 W
Dimensions: 127 x 56 x 155 mm (5 W x 2.2 H x 6.1" D)
Weight: 1.09 kg (2.4 lb)

OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order.

Caution: To avoid fire hazard or damage to your calibrator, always allow your calibrator to cool down to ambient temperature before returning to storage.

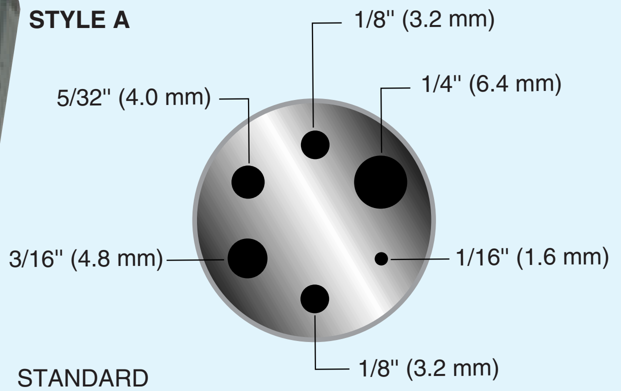
To Order *(Specify Model Number)*

Model Number	Price	Description
CL1000(*)	$990	Mini hot point® dry block probe calibrator, 115 Vac
CL1000(*)-230V	990	Mini hot point® dry block probe calibrator, 230 Vac

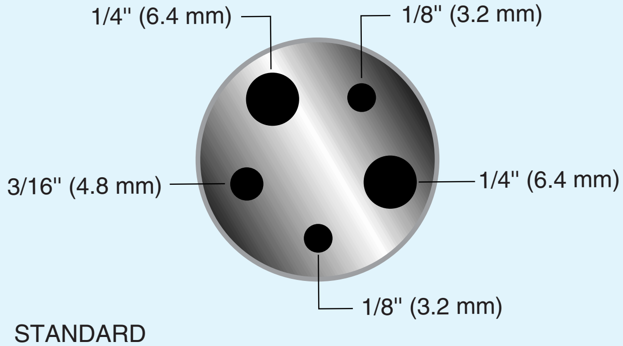
**Insert well style code in place of asterisk.*
***†NOTE:** Only 230 Vac models availabe as CE marked.*
Ordering Example: CL1000A,** Mini hot point® dry block calibrator with well style A, **$990.** OMEGACARE℠ extends standard 3-year warranty to a total of 4 years ($99), $990 + 99 = **$1089.

Available Well Styles†

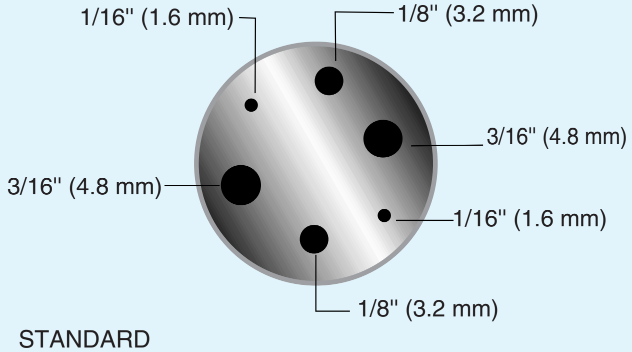
STYLE A


1/8" (3.2 mm)
5/32" (4.0 mm)
1/4" (6.4 mm)
3/16" (4.8 mm)
1/16" (1.6 mm)
1/8" (3.2 mm)
STANDARD

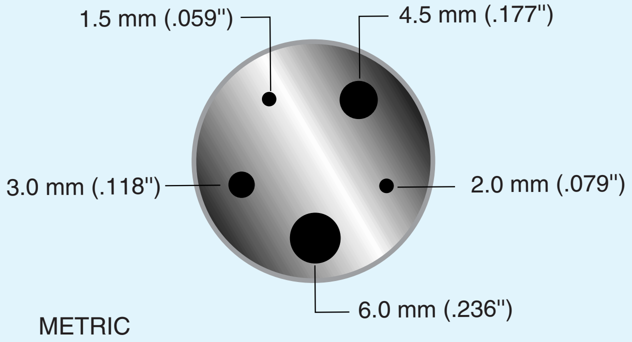
STYLE B


1/4" (6.4 mm)
1/8" (3.2 mm)
3/16" (4.8 mm)
1/4" (6.4 mm)
1/8" (3.2 mm)
STANDARD

STYLE C


1/16" (1.6 mm)
1/8" (3.2 mm)
3/16" (4.8 mm)
3/16" (4.8 mm)
1/16" (1.6 mm)
1/8" (3.2 mm)
STANDARD

STYLE D


1.5 mm (.059")
4.5 mm (.177")
3.0 mm (.118")
2.0 mm (.079")
6.0 mm (.236")
METRIC

hot point® Dry Block Probe Calibrator CL900A/CL950A Series

HOT POINT® Block Calibrator
CAUTION: SURFACE MAY BE HOT
OMEGA
900
900
CL900A SERIES
OMEGA
714

CL900A Series
$3295
Basic Unit

Shown smaller than actual size

CL900A Calibrator, shown with HH-21 handheld meter. Thermocouple probe not included.

230 Vac model only

- **User Selectable °C or °F Display**
- **Calibrates Thermistors, Thermocouples and RTD's in Seconds**
- **Highly Accurate ±0.8°C (±1.5°F) & Exceptional Stability ±0.2°C (±0.3°F) for Precision Calibrations**
- **Completely Portable for Factory, Laboratory and Instrument Shops**
- **Wide Temperature Range: Ambient +22 to 482°C (Ambient +40 to 900°F); Covers Most Industrial Applications**
- **NIST Traceable CAL Certificate with Three Data Points Included**
- **CE Marked Models**
- **RS-232 Standard**
- **Companion ice point™ Reference Cell Available Model TRCIII-A**

OMEGA's hot point® calibrator is part of a new family of calibrators which allows calibration of thermocouple and RTD probes quickly and easily with an accuracy to ±0.8°C (±1.5°F). An integral RTD sensor assures high measurement accuracy and repeatability. A built-in microprocessor-based PID digital controller assures exceptional stability. Setpoint and actual temperature are displayed simultaneously. Temperature can be set in one degree increments from ambient +22 to 482°C (ambient +40 to 900°F).

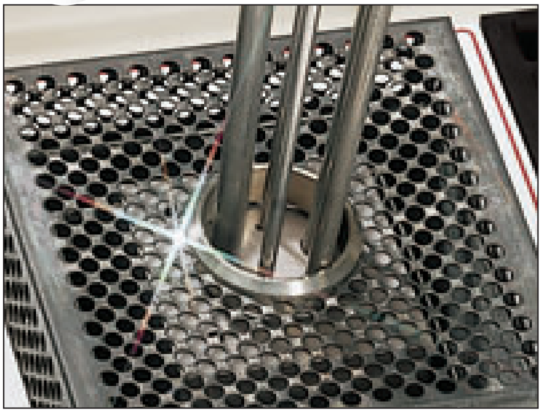
The CL900A calibrator accepts a variety of optional inserts which are available in 4" and 6" depths, and probe diameters from ⅛" to ⅜". An undrilled insert is also available. The CL900A comes complete with a 6" deep insert well for ¼" diameter probes, and insert removal tongs. Additional inserts can be ordered separately as required for other diameter probes. 6" well depth inserts are used for probes 7" and longer. Four inch well depth inserts are used for probes 5" and longer.

The CL950A has a fixed thermal well with 1⁄16", ⅛", 3⁄16" and two ¼" diameter holes. The CL950A-M has metric holes (2 mm, 3 mm, 4.5 and two 6 mm diameter holes).

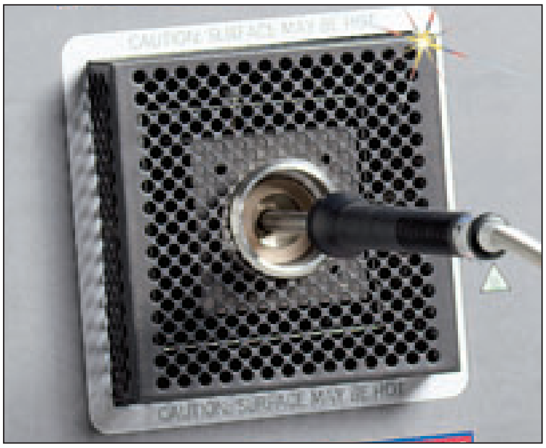
OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order.

Caution: To avoid fire hazard or damage to your calibrator, always allow your calibrator to cool down to ambient temperature before returning to storage.

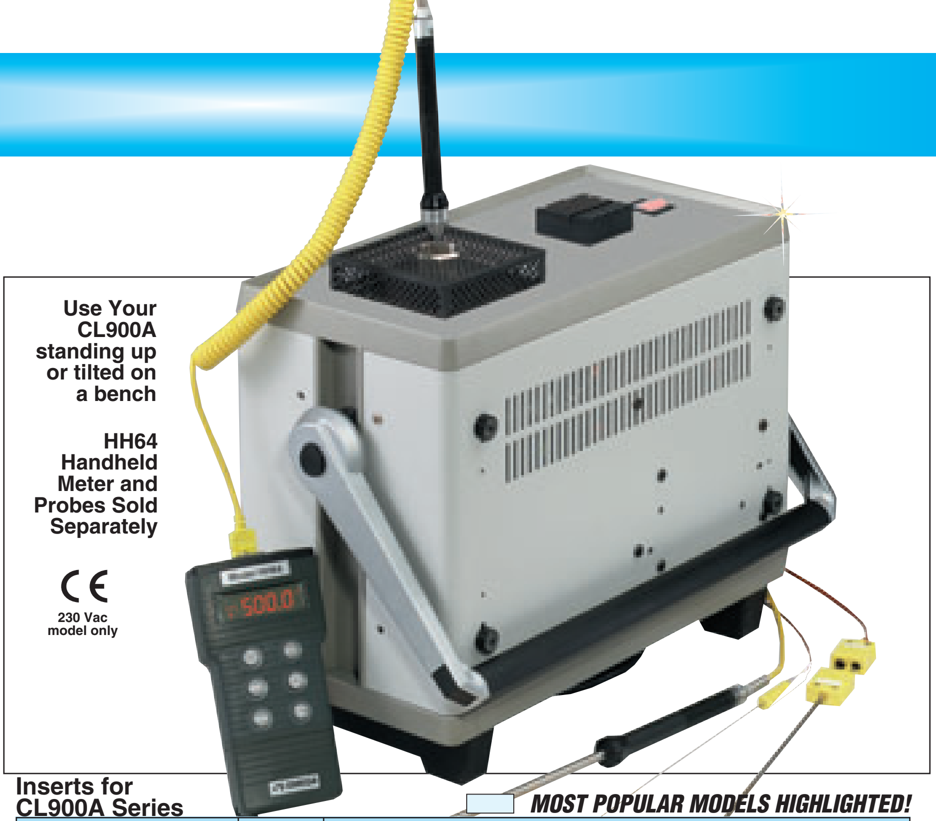
We make running changes when technical advances allow. Check at time of ordering for additional features.



The model CL950A British multi-well accepts up to 5 probes at one time and comes standard with 1/16", ⅛", 3/16" and two ¼" diameter holes.
The model CL950A-M metric multi-well accepts up to 5 probes at one time and comes standard with 2 mm, 3 mm, 4.5 mm, and two 6 mm diameter holes



Model CL900A accepts any insert listed in the table at right



Use Your CL900A standing up or tilted on a bench

HH64 Handheld Meter and Probes Sold Separately

CE 230 Vac model only

Specifications

(All specifications are based on the test probes, being in contact with the bottom of the test well)

Temperature Range: Ambient +22 to 482°C (Ambient +40 to 900°F)

Operating Ambient Temperature Range: 5 to 38°C (40 to 100°F)

Accuracy: (1° resolution) CL900A with 6" test well inserts: ±0.8°C (±1.5°F). CL900A with 4" test well inserts: ±1.7°C (±3°F). CL950A: ±0.8°C (±1.5°F).

Control Stability: ±0.15°C (±0.3°F)

Temperature Uniformity (within the bottom 1" of the test well): CL900A: with 6" test well inserts: ±0.3%rdg with 4" test well inserts: ±0.4%rdg. CL950A; ± 0.3% rdg

Max. Probe Immersion: CL900A: with 6" test well inserts: 150 mm (6"); with 4" test well inserts: 100 mm (4"). CL950A; 150 mm (6")

Control: Microprocessor-based PID digital controller

Power: 115 Vac, 50/60 Hz, 230 Vac, 50/60 Hz, 1050 watts

Dimensions: 312 H x 363 W x 191 mm D (12.3 x 14.3 x 7.5")

Weight: 11.4 kg (25 lb)

Note: Only 230 Vac models are CE marked.

Inserts for CL900A Series

🟦 ***MOST POPULAR MODELS HIGHLIGHTED!***

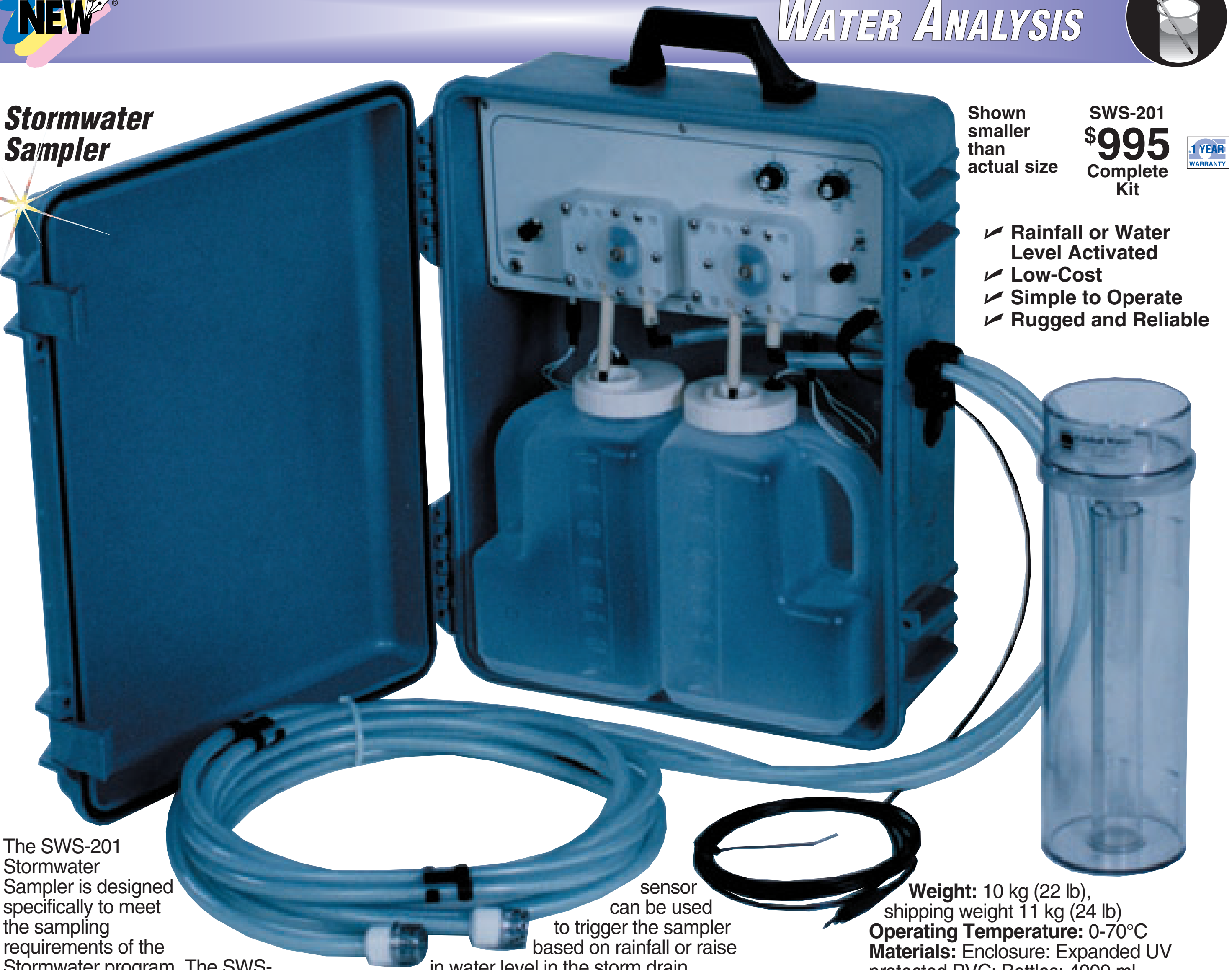
Model Number	Price	Description
CL901	$89	Insert, ⅛" dia. x 4" deep test well
CL901-M	89	Metric insert, 2 mm dia. x 106.6 mm deep test well
CL902	89	Insert, ⅛" dia. x 6" deep test well
CL902-M	89	Metric insert, 2 mm dia. x 152.4 mm deep test well
CL903	89	Insert, 3/16" dia. x 4" deep test well
CL903-M	89	Metric insert, 3 mm dia. x 106.6 mm deep test well
CL904	89	Insert, 3/16" dia. x 6" deep test well
CL904-M	89	Metric insert, 3 mm dia. x 152.4 mm deep test well
CL905	89	Insert, ¼" dia. x 4" deep test well
CL905-M	89	Metric insert, 4.5 mm dia. x 106.6 mm deep test well
CL906	89	Insert, ¼" dia. x 6" deep test well
CL906-M	89	Metric insert, 4.5 mm dia. x 152.4 mm deep test well
CL907	89	Insert, 5/16" dia. x 4" deep test well
CL907-M	89	Metric insert, 6 mm dia. x 106.6 mm deep test well
CL908	89	Insert, 5/16" dia. x 6" deep test well
CL908-M	89	Metric insert, 6 mm dia. x 106.6 mm deep test well
CL909	89	Insert, ⅜" dia. x 4" deep test well
CL910	89	Insert, ⅜" dia. x 6" deep test well
CL911	78	Insert, undrilled

To Order *(Specify Model Number)*

Model Number	Price	Description
CL900A-110	**$3295**	hot point® probe calibrator, 115 Vac
CL900A-220	**3295**	hot point® probe calibrator, 230 Vac
CL950A-110	**3595**	hot point® multi-well British probe calibrator, 115 Vac
CL950A-220	**3595**	hot point® multi-well British probe calibrator, 230 Vac
CL950A-M-110	**3595**	hot point® metric multi-well probe calibrator, 115 V
CL950A-M-220	**3595**	hot point® metric multi-well probe calibrator, 230 V

*Comes with complete operator's manual. Inserts are for CL900 and CL900A hot point® calibrators only. To order NIST Calibration points, add suffix "**-NIST**" to model number and **$175** to price. **Ordering Example: CL900A-110**, hot point® calibrator, 110 Vac, and **CL905** 10 cm (4") test well insert for 6.3 cm (¼") probes, $3295 + 89 = **$3384.***

Stormwater Sampler



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SWS-201
$995
Complete Kit

1 YEAR WARRANTY

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

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 raingauge. The water sensor may be positioned in the raingauge to trigger the sampler after a preset amount of rainfall. Total rainfall for the event is also measured by the raingauge.

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.
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
Battery Life: The battery will power the sampler for a minimum of four months including five 24-hr. storm events before recharging is required

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.

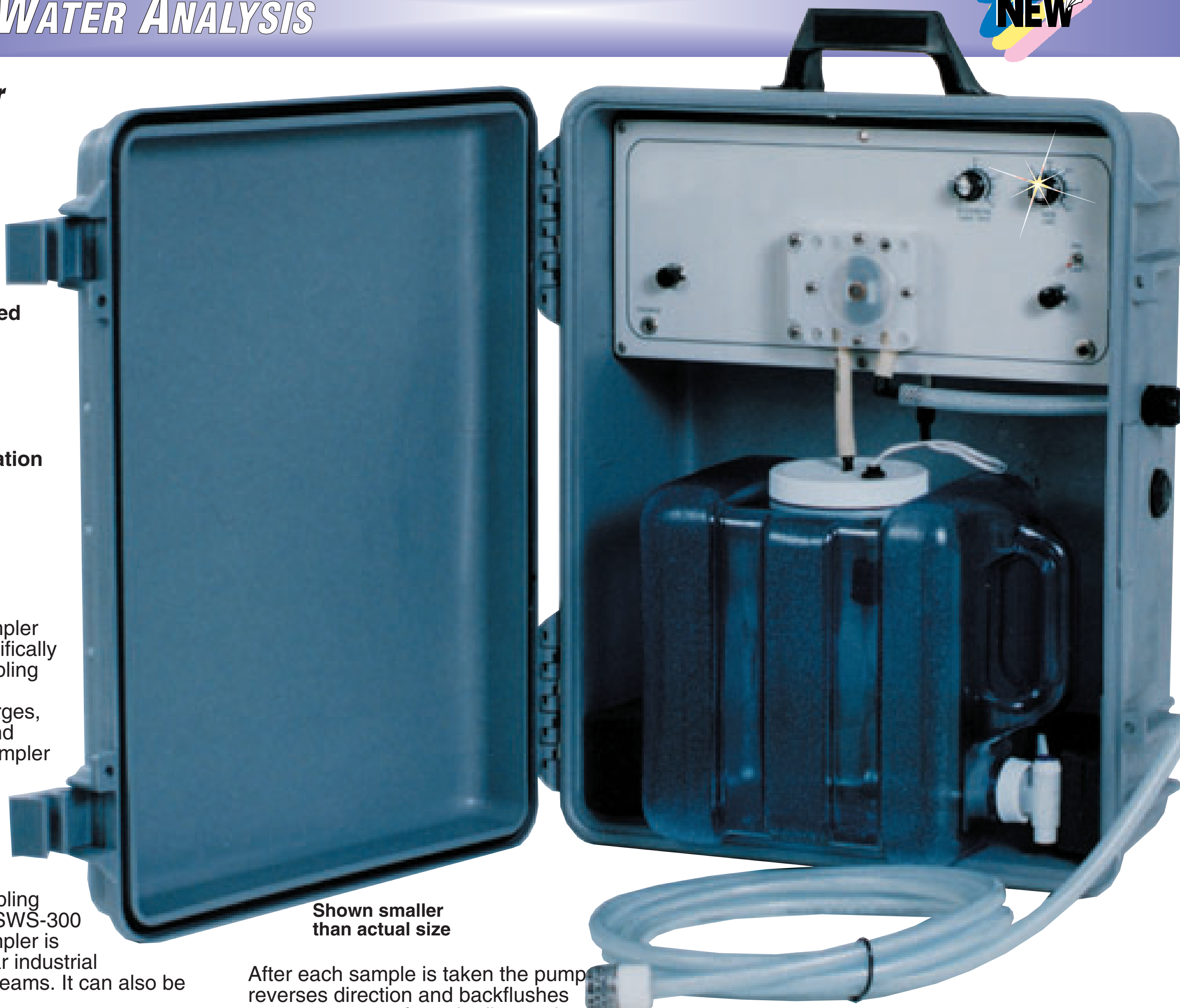
NEW

Wastewater Sampler

SWS-300
$995
Complete Kit

1 YEAR WARRANTY

- **Time Weighted Composite Sample**
- **Backflushes After Each Sample**
- **Portable or Fixed Installation**
- **Rugged and Reliable**



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The SWS-300 Wastewater Sampler is designed specifically to meet the sampling requirements for industrial discharges, sewers, rivers and streams. The Sampler takes a "time weighted" composite sample in a 2 gallon bottle, to meet the wastewater sampling guidelines. The SWS-300 Wastewater Sampler is easily set up near industrial discharges or streams. It can also be suspended in a manhole for sewer flow sampling.

The SWS-300 Wastewater Sampler consists of a rugged, rainproof lockable carrying enclosure. Inside the enclosure is a 2-gallon polyethylene sample bottle for collecting composite samples, a peristaltic sampling pump, the logic timer / controller and a rechargeable gel cell battery. Also provided is a sample pickup hose and a battery charger. Everything you need is provided for a successful sampling program.

The internal rechargeable battery will power the sampler for several months and/or for several sampling events.

The sample bottle is equipped with a float switch that automatically turns off the sampler pump if the bottle becomes full. Be sure the electrical lead from the bottle cap is plugged into the jack on the bottom of the controller housing.

Sample size can be adjusted for 25 ml to 600 ml and sampling internal can be adjusted from 5 minutes to 4 hours.

After each sample is taken the pump reverses direction and backflushes to remove water from the line and clean the intake screen.

Specifications

Sample Size:
Composite: 50 ml to 600 ml samples as set by user. Two gallon composite sample maximum

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: 2 gallon 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).

Sample Hoses: One 4.6 m (15') nylon reinforced 6 mm (¼") ID polyethylene flexible tubing section with intake strainer. Hoses may be extended, as required, using standard 6 mm (¼") tubing and fittings.

Battery: Rechargeable 3 AH Gel Cell

Battery Life: The battery will power the sampler for a minimum of four months including five 24-hr. sample events before recharging is required

To Order *(Specify Model No.)*

Model No.	Price	Description
SWS-300	**$995**	Wastewater Sampler

Unit comes complete as shown with operator's manual.
Ordering Example: SWS-300,** wastewater sampler, **$995.

Multi-Parameter Water Analyzer

PHH-700

$1840

Basic System

1 YEAR WARRANTY

- **Simultaneously Reads pH, Temp, Conductivity, TDS, Dissolved Oxygen and Pressure**
- **For Ground Water Monitoring, Aquaculture, Deep Well Analysis**
- **Easy-to-Use Software Menu on Back Panel**
- **Stores 199 Sets of Readings**
- **Water Resistant**

The PHH-700 is a compact, battery-operated, mobile field unit. It can make multiple measurement of pH, conductivity, dissolved oxygen, and temperature of water and aqueous solutions.

The operator can choose to have either uncompensated measurements or values that have been compensated for extrinsic effects. When using the compensated modes, the conductivity and pH values will be corrected for temperature. Dissolved oxygen readings are corrected for temperature, salinity, and atmospheric pressure.

All of these parameters, except atmospheric pressure, are measured with a single compact probe which is equipped with the following standard length of cables: 3 m, 8 m, 15 m, 30 m (10', 25', 50' and 100'). This allows remote measurements to be taken, without the need to draw a sample.

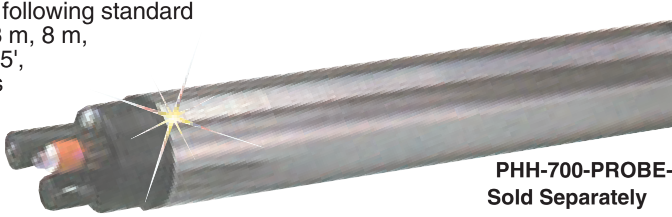
The standard PHH-700 unit comes with:
- Carrying case for meter, probes and charger
- Instruction manual
- A/C adapter-charger
- Rechargeable battery
- Low battery indicator
- Large 4 x 16 LCD display with side light

Additional options:
- Custom back pack for the PHH-700 probe, solutions, water bottle holder, cell phone holder, maps, writing utensils, first aid kit and accessories.

Shown Smaller than Actual Size

32.7°C
6.81PH
10uS
0.0PPM
On/Off
Up
Enter
Store
Down
Range
Cal
Exit
Play
Record
Rewind
Stop

PHH-703 Water Analyzer with Universal Voice Recording System



PHH-700-PROBE-10 Sold Separately

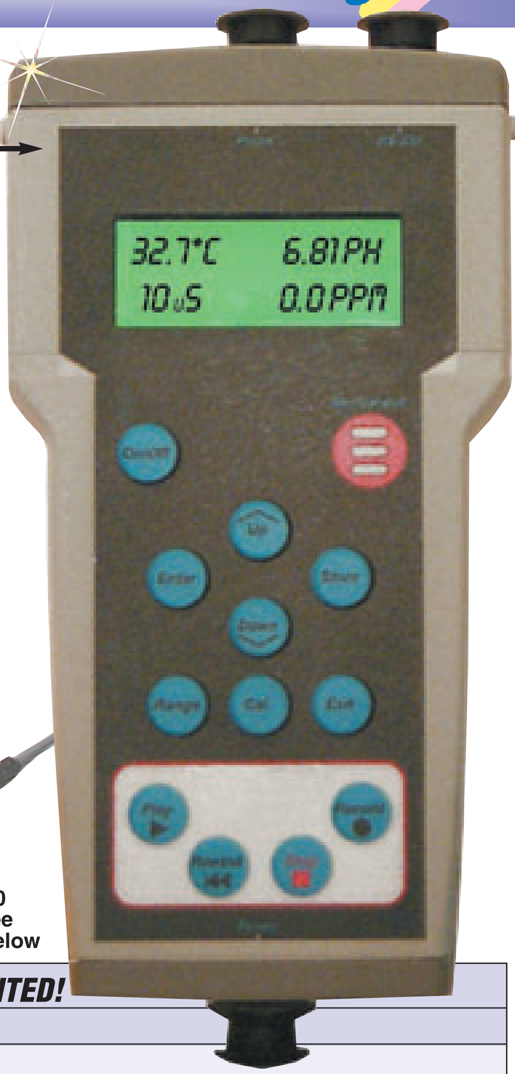
Specifications

SENSOR	UNIT	RANGE	RESOLUTION	ACCURACY	COMPENSATION
pH	pH	1-13	0.01	.02	Temperature/None
	mV	±500 mV	1 mV	±2%	None
Temperature	°C	0-50°C	0.1°C	1°	None
	°F	32-122°F	0.1°F	1.8°	None
Conductivity	MHOS/Siemans	10-99.9μS	0.1μS	±3%	Temperature/None
		100-999.9μS	1μS	±3%	Temperature/None
		1-9.99μS	0.01μS	±3%	Temperature/None
		10-99.9μS	0.1μS	±3%	Temperature/None
	TDS	5-49.8 ppm	0.1 ppm	±3%	Temperature/None
		50-498 ppm	1 ppm	±3%	Temperature/None
		0.5-4.98 ppt	0.01 ppt	±3%	Temperature/None
		5-49.8 ppt	0.1 ppt	±3%	Temperature/None
Oxygen	ppm	0.0-20.0 ppm	0.1 ppm	±2-5%	Temperature/None Salinity
	mg/L	0.0-20.0mg/L	0.1 mg/L	±2-5%	Temperature/None Salinity
	%SAT	0.0-150.0%	0.1%	±2-5%	Temperature/None Salinity/Barometric
Barometer	mm Hg	400-1000mmHg	1mmHg	±5%	None
	In. Hg	15.8-39.3inHg	.1inHg	±5%	None

- RS232-IS Serial RS232 port allowing connection to a computer. It has a real time clock for time stamping of the measurements. The PHH-700 also includes extended memory which increases stored amounts of up to 2000 measurements, and includes the data acquisition software.
- Barometer-Pressure sensor to automatically compensate for localized barometric pressure.
- UVR System-Universal Voice Recorder System. It's like having a tape recorder in the field. It allows you to store up to 16 minutes of speaking time. Simple operation.
- 12 Volt automobile cigarette lighter adapter.
- A second battery will double the usage time of the meter. Factory installed only.

NEW

PHH-700-A Field Back Pack shown with accessories (accessories sold separately)



PHH-703 Water Analyzer with Universal Voice Recording System

PHH-700-PROBE-10 Sold Separately; see "To Order" chart below

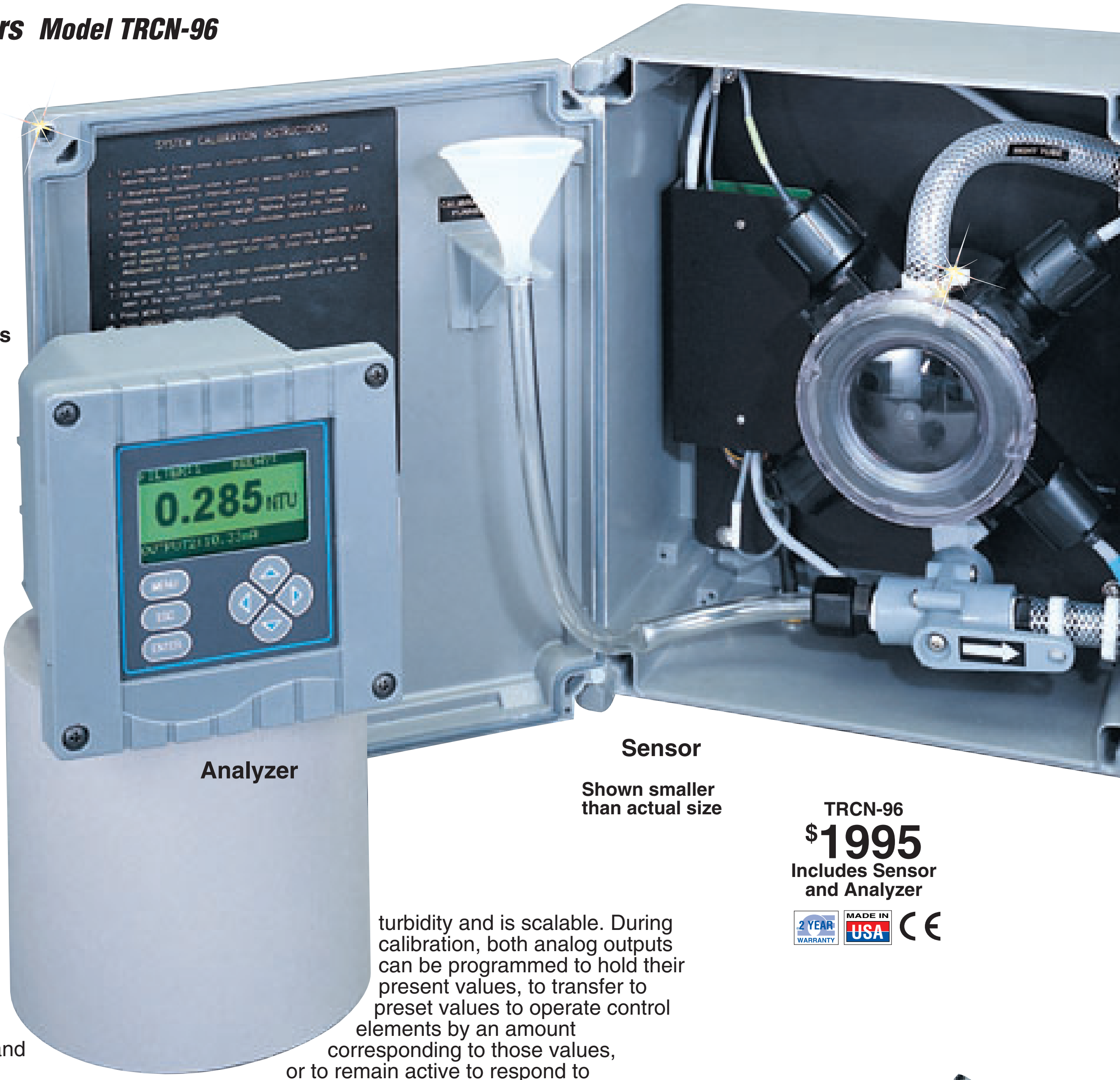
To Order *(Specify Model No.)* ***MOST POPULAR MODELS HIGHLIGHTED!***

Model No.	Price	Description
PHH-700	**$999**	Water Analyzer (110 Vac)
PHH-700-220VAC	**999**	Water Analyzer (220 Vac)
PHH-701	**1194**	PHH-700 with RS232
PHH-702	**1194**	PHH-700 with Auto Barometer
PHH-703	**1194**	PHH-700 with Universal Voice Recording System
PHH-700-PROBE-10	**999**	Probe with 3 m (10') Cable
PHH-700-PROBE-25	**1045**	Probe with 8 m (25') Cable
PHH-700-PROBE-50	**1199**	Probe with 15 m (50') Cable
PHH-700-PROBE-100	**1399**	Probe with 30 m (100') Cable
PHH-700-RE-02	**200**	Replacement 02 Sensor
PHH-700-RE-PH/ORP	**120**	Replacement pH Sensor
PHH-700-RE-CO	**125**	Replacement Conductivity Sensor
PHH-700-A	**99**	Field Back Pack
PHH-700-B	**30**	Cigarette Lighter Adapter with 3 m (10') Cable
PHH-700-C	**25**	AC Adaptor 110 Volt
PHH-700-D	**35**	AC Adaptor 220 Volt
PHH-700-KIT	**180**	Calibration kit: Oxygen filling solution, 1.25 oz, one oxygen membrane cap, 4, 7, 10 pH buffers, DI water, pH boot solution, 1 pint each autocalibration solution 4 pH/5.0mS 1 pint 100µS, 1000µS, 10000µS, cond. standards, 1 pint ea.

The PHH-700 includes carrying case, A/C adaptor charger, rechargeable battery, complete operator's manual.
Ordering Example:* PHH-700** *water analyzer and* **PHH-700-PROBE-10** *probe with 3 m (10') cable, $999 + 999 =* ***$1998.

Turbidity Analyzers Model TRCN-96

- ✓ Four Relays
- ✓ Two 4-20 mA dc Outputs
- ✓ NEMA-4X
- ✓ Menu Guided Operation
- ✓ Multiple Language Prompts (English, German, French and Spanish)
- ✓ Built-In Advanced System Diagnostics
- ✓ Long-Lasting LED Light Source
- ✓ Four-Beam Ratiometric Turbidity Measurement Provides Unparalleled Stability
- ✓ High Resolution at Ultra-Low Turbidity Levels
- ✓ Microprocessor-Based with Self Diagnostics
- ✓ 0 to 100 NTU Measuring Range with Auto-Ranging
- ✓ Bubble Rejecting Sample Chamber
- ✓ Automatic Color Compensation



Shown smaller than actual size

TRCN-96
$1995
Includes Sensor and Analyzer

2 YEAR WARRANTY MADE IN USA CE

The TRCN-96 low-range turbidimeter system employs a technologically advanced sensor to provide high measurement accuracy and stability, while reducing maintenance requirements. It is designed to meet the International Standards For Measurement of Turbidity [ISO 7027-1984(E)] and USEPA-approved method. This system has an auto-ranging measuring scale, enabling continuous monitoring over a 0.000 to100.0 NTU range with automatic decimal point positioning. The TRCN-96 low-range turbidimeter system automatically provides increasing display resolution as measured turbidity decreases. To further ensure high measuring accuracy, the sensor eliminates air or gas bubbles in the sample with its built-in bubble trap. The system is ideal for critical monitoring and controlling applications including potable water, filtered water, and final product clarity.

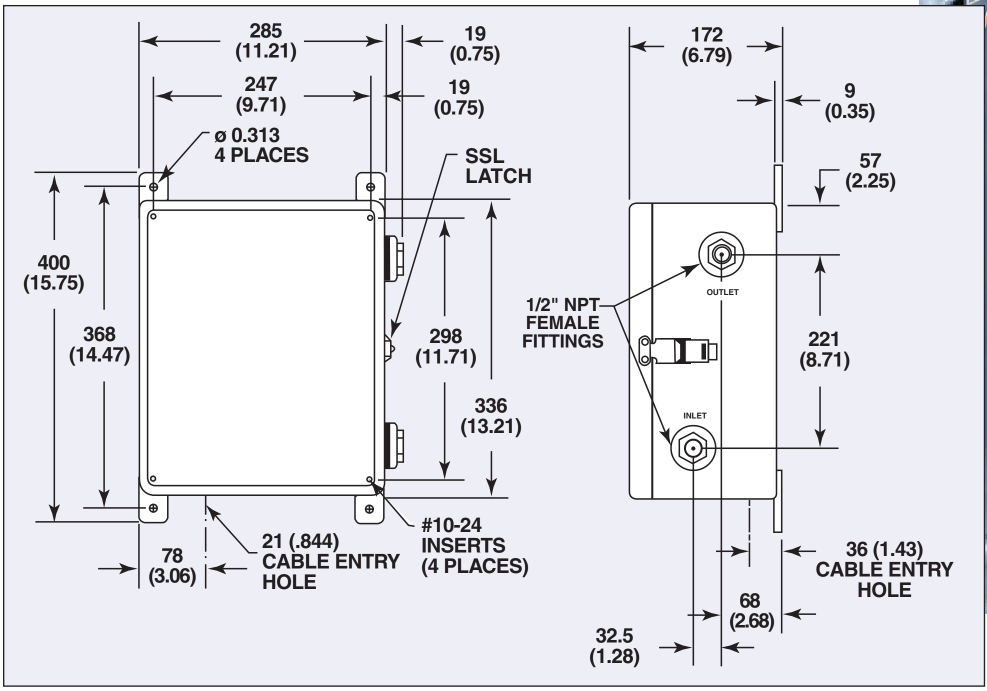
The analyzer provides two isolated analog outputs. Each output represents measured turbidity and is scalable. During calibration, both analog outputs can be programmed to hold their present values, to transfer to preset values to operate control elements by an amount corresponding to those values, or to remain active to respond to measured turbidity. The analyzer has four electromechanical relays, all with SPDT contacts. Each relay can be set to function as a control relay, as a dual-alarm relay, or as a status relay.

Calibrating the TRCN-96 is simple. A funnel assembly included with the sensor enables calibration with a traditional liquid turbidity standard such as Formazin. A unique, optical calibration cube is also available for easier calibration. This contains a specially formulated turbid glass standard which maintains its turbidity value indefinitely.

The only required maintenance is an occasional, simple cleaning of the sensor flow chamber. (System diagnostics automatically alert the operator when to clean the sensor flow chamber.)

TR-8220 Optional Calibration Cube $450

Turbidity Sensor-Installation Dimension Details, in mm (in)



TRCN-96
Sensor

Specifications

Turbidity Sensor

Operational

Flowrate: 0.05 to 7 GPM (0.19 to 26.5 LPM)

Ambient Conditions: 0 to 60°C (32 to 140°F)

Sample Temperature Range: 0 to 60°C (32 to 140°F)

Pressure Range: 0 to 3.4 bar at 20°C (0 to 50 psig at 68°F)

Pressure Drop: 0.0017 psig at 0.1 GPM; (0.0001 bar at 0.36 LPM)

Residence Time: 9.5 seconds at 1 GPM (3.8 LPM)

Air Venting: Integral bubble trap for 0.05 to 5.0 GPM (0.19 to 1.8 LPM) flows. Installation of restrictor valve on the sensor outlet is recommended for flows above 0.5 GPM (1.8 LPM) with air in sample.

Mechanical

Light Sources: Two near-infrared (860 nM wavelength) LEDs

Sensor Flow Configuration: Flow-through design

Process Connections: ½" NPT female standard; adaptable to ⅜" or ¼" NPT, barb or tube fittings

Wetted Materials: PVC, polycarbonate, polystyrene, PPO, nitrile and Buna-N

Cleaning Method: Water rinse, wipe surface

Enclosure: NEMA-4X, compression-molded and fiberglass reinforced polyester

Mounting Configurations: Surface or pipe mount

Net Weight: 4.5 kg (10 lb), approximately

Turbidity Analyzer

Operational

Display: Graphic dot matrix LCD, 128 x 64 pixels with LED backlighting; 13 mm (1⁄2") main character height; 3 mm (1⁄8") auxiliary character height

Measurement (Auto Ranging Scale)

Turbidity: 0.000 to 100.0 NTU with auto-ranging and decimal point shift above 1.000 NTU and 10.00 NTU

mA Outputs (#1 and #2): 0.00 to 20.00 mA or 4.00 to 20.00 mA

Ambient Conditions

Operation: -20 to 60°C (-4 to 140°F); 0 to 95% RH, non-condensing

Storage: -30 to 70°C (-22 to 158°F); 0 to 95% RH, non-condensing

Relays: Types/Outputs: Four electromechanical relays; SPDT (Form C) contacts; U.L. rated 5 A 115/230 Vac, 5A @ 30 Vdc resistive

Operational Mode: Each relay (A, B, C and D) can be driven by the measured turbidity, or by any of seven detected system diagnostic conditions

Function Modes

Control: Settings for high/low phasing, setpoint, deadband, overfeed timer, off delay, and on delay

Alarm: Settings for low alarm point, low alarm point deadband, high alarm point, high alarm point deadband, off delay, and on delay

Status: Not configurable; relay only activates when any of these diagnostic warning conditions exist: sensor needs cleaning, analyzer failure, sensor failure, light source 1 failure, light source 2 failure, detector 1 failure, or detector 2 failure

Sensor-To-Analyzer Distance: 9 m (30 ft) maximum (consult engineering for distances more than 20 ft)

Power Requirements: 90 to 130 Vac, 50/60 Hz (10 VA max) or 180 to 260 Vac, 50/60 Hz (10 VA max)

Calibration Methods

Primary: Enter one primary standard value (Formazin suspension is recommended)

Cube Cal: Temporarily insert an optional Cal-Cube assembly into the sensor and enter its factory-certified standard value

Sample: Enter one sample value determined by laboratory analysis or calibrated portable meter

Outputs

Analog: Two outputs isolated 0/4-20 mA (600 Ω max load)

Mechanical

Enclosure: NEMA-4X; polycarbonate face panel, epoxy-coated cast aluminum door and case with four 13 mm (1⁄2") conduit holes, nylon mounting bracket, and stainless hardware

Mounting Configurations: Panel, surface and pipe mounting

Net Weight: 2.3 kg (5 lb), approximately

System Accuracy: ±2% of reading, all ranges

Sensitivity: 0.001 NTU

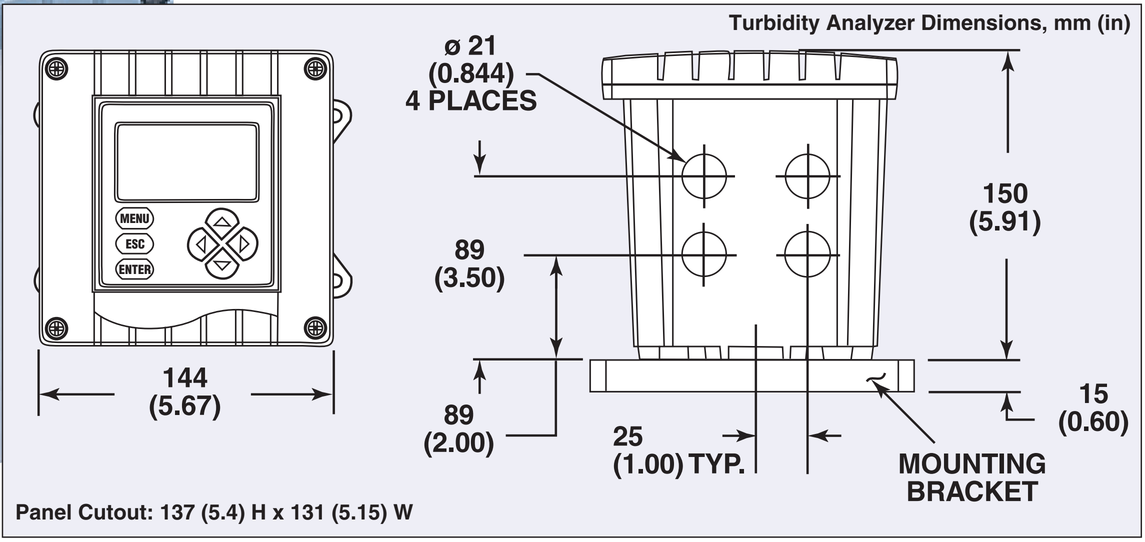
Repeatability: 0.1% of span or better

Temperature Drift: Zero and Span: 0.01% of span per °C

NEW
0.285 NTU
MENU
ESC
ENTER

TRCN-96
Analyzer

Typical Applications
- ✓ Drinking Water
- ✓ Filtered Water
- ✓ Final Product Clarity
- ✓ Wastewater Treatment Plant Effluent


Turbidity Analyzer Dimensions, mm (in)
ø 21
(0.844)
4 PLACES
MENU
ESC
ENTER
150
(5.91)
89
(3.50)
144
(5.67)
89
(2.00)
25
(1.00) TYP.
15
(0.60)
MOUNTING
BRACKET

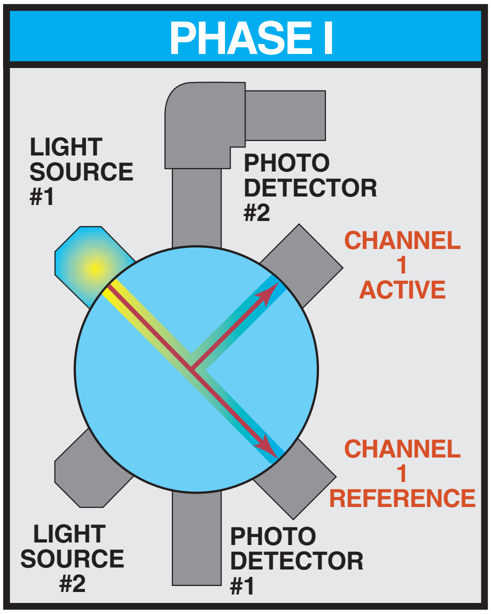
Panel Cutout: 137 (5.4) H x 131 (5.15) W

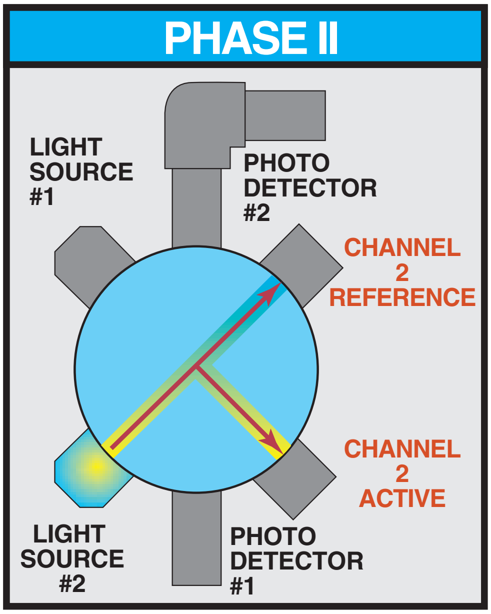
Four-Beam Technology
The four-beam method uses two light sources and two photodetectors spaced at 90° intervals around the sample chamber. Two measurement phases provide four independent measurements from two light sources.

During phase I, photodetector #2 provides a 90° scattered light active signal, while photodetector #1 provides a forward scattered light reference signal. During phase II the process is reversed.

The microprocessor uses a ratiometric algorithm to calculate the turbidity value from the four readings.

This method mathematically cancels error effects from aging or fouling of components, and compensates for color effects. Even as detector sensitivity changes with age, the four-beam method neutralizes the effects of these changes without calibration.


PHASE I
LIGHT SOURCE #1
PHOTO DETECTOR #2
CHANNEL 1 ACTIVE
CHANNEL 1 REFERENCE
LIGHT SOURCE #2
PHOTO DETECTOR #1


PHASE II
LIGHT SOURCE #1
PHOTO DETECTOR #2
CHANNEL 2 REFERENCE
CHANNEL 2 ACTIVE
LIGHT SOURCE #2
PHOTO DETECTOR #1

☐ ***MOST POPULAR MODELS HIGHLIGHTED!***

To Order *(Specify Model No.)*

Model No.	Price	Description
TRCN-96	**$1995**	Turbidity sensor and analyzer with 0.6 m (20') cable
TRCN-96-CE	**2145**	TRCN-96 with CE Approval
TRCN-96-PM	**40**	Pipe mounting kit
TR-8220	**450**	Calibration standard cube

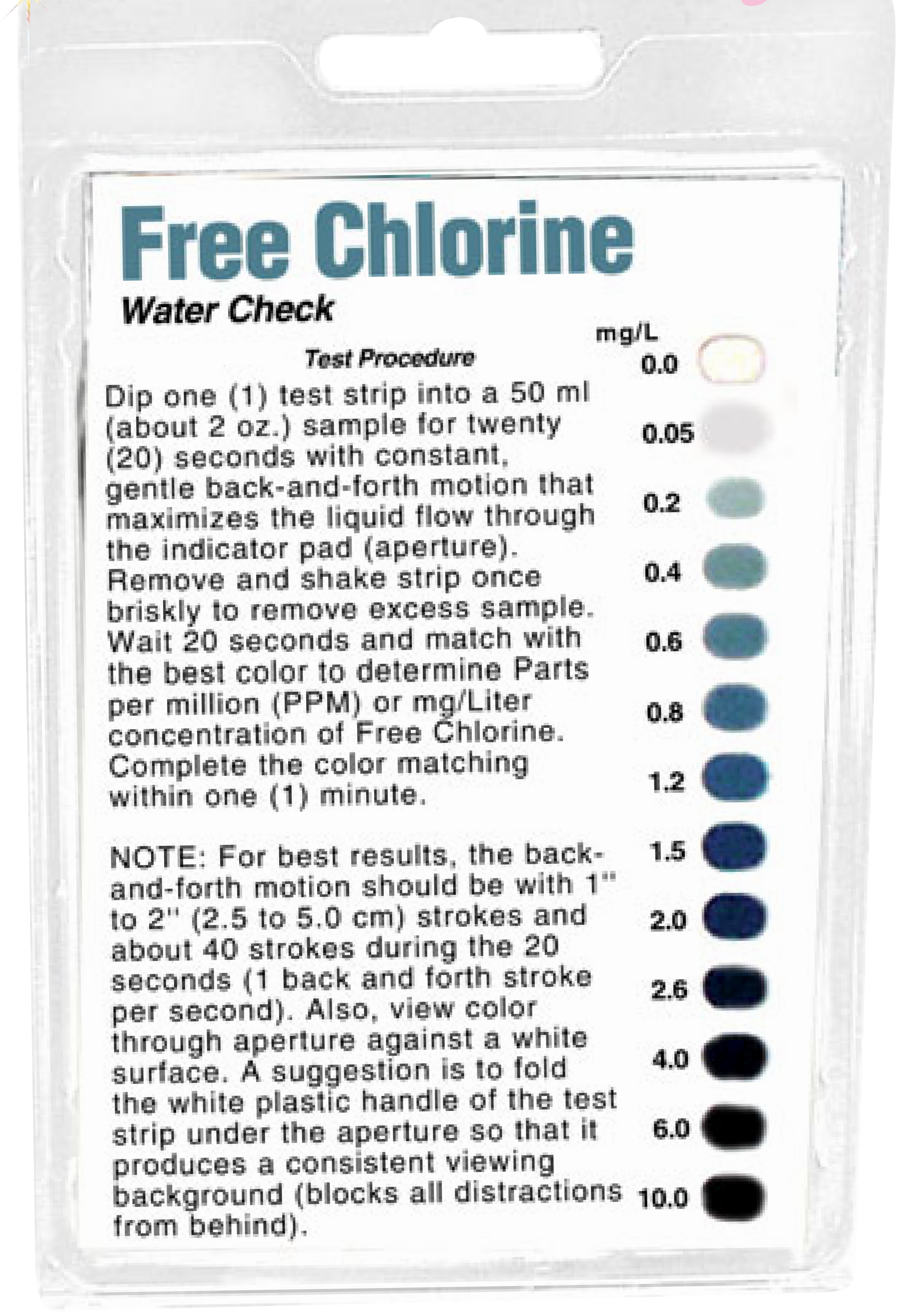
Ordering Example: TRCN-96**, turbidity sensor and analyzer, **$1995

NEW

Water Quality Test Strips
Free Chlorine Water Check

WTS Series
$13.95
Basic Unit

- **Quick and Easy-to-Run with No Setup Time Completely Portable for Field Use**
- **Minimum Technical Know-How Required Since No Sample Mixing or Reagent Mixing is Required**
- **Safe Since Chemical Weight on One Strip is Only 3% of What One "Powder Pillow" Contains**
- **Ideal for Measuring Cloudy and Colored Water Samples with Negligible Effect on Test Results**



Free Chlorine

Water Check

Test Procedure

Dip one (1) test strip into a 50 ml (about 2 oz.) sample for twenty (20) seconds with constant, gentle back-and-forth motion that maximizes the liquid flow through the indicator pad (aperture). Remove and shake strip once briskly to remove excess sample. Wait 20 seconds and match with the best color to determine Parts per million (PPM) or mg/Liter concentration of Free Chlorine. Complete the color matching within one (1) minute.

NOTE: For best results, the back-and-forth motion should be with 1" to 2" (2.5 to 5.0 cm) strokes and about 40 strokes during the 20 seconds (1 back and forth stroke per second). Also, view color through aperture against a white surface. A suggestion is to fold the white plastic handle of the test strip under the aperture so that it produces a consistent viewing background (blocks all distractions from behind).

mg/L
0.0
0.05
0.2
0.4
0.6
0.8
1.2
1.5
2.0
2.6
4.0
6.0
10.0

Free Chlorine Water Check

The latest product in a line of continuous product innovations, the Free Chlorine Water Check offers the user an extremely comprehensive testing system. Currently under US EPA evaluation, the test offers a range of 0.05 to 10 PPM (mg/L) with no monochloramine interference. With accurate and reproducible results in under 1 minute, the Free Chlorine Water Check (Models: WTS-481026 and WTS-481126) is sure to revolutionize Free Chlorine testing as you know it.

Free Chlorine

These water quality tests are the sensitive and safe alternative to wet chemical free chlorine tests. A mechanical reader is not required, even for the 0.05 PPM or mg/L sensitivity. The unique indicator is reactive only to free Chlorine; therefore, no interference to monochloramines occurs. Accurate results are achieved in under 1 minute. Products are available with ranges from 0.05 to 750 PPM (mg/L).

Most test strip products are available in two different packages; individual packets with a detailed color chart card or in bottles labeled with a color chart. No mater which option you choose, all products offer the same high level of quality and reliability.

To Order *(Specify Model Number)*

▭ ***MOST POPULAR MODELS HIGHLIGHTED!***

Model No.	Price	Description	Detection Levels PPM (mg/L)
WTS-480002	**$15.95**	Free Chlorine, Bottle of 50	0, 0.05, 0.1, 0.2, 0.4, 0.5, 0.8, 1.0, 2.0, 5.0
WTS-480022	**13.95**	Free Chlorine HR*, Bottle of 50	1.0, 2.0, 5.0, 10, 20, 40, 80, 120
WTS-480023	**15.95**	Free Chlorine Check , Bottle of 50	0.0, 0.25, 0.5, 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 15, 20, 25
WTS-480024	**13.95**	Free Chlorine Check HR*, Bottle of 50	0.0, 25, 50, 100, 200, 300, 400, 500, 750
WTS-481026	**15.95**	Free Chlorine Water Check, Bottle of 50	0, 0.05, 0.2, 0.4, 0.6, 0.8, 1.2, 1.5, 2.0, 2.6, 4.0, 6.0, 10
WTS-481126	**15.95**	Free Chlorine Water Check, 30 pkts of 1	0, 0.05, 0.2, 0.4, 0.6, 0.8, 1.2, 1.5, 2.0, 2.6, 4.0, 6.0, 10

** High Range*

Ordering Example: WTS-481126, *Free Chlorine water check, 30 individual packets of 1 ea.,* ***$15.95***

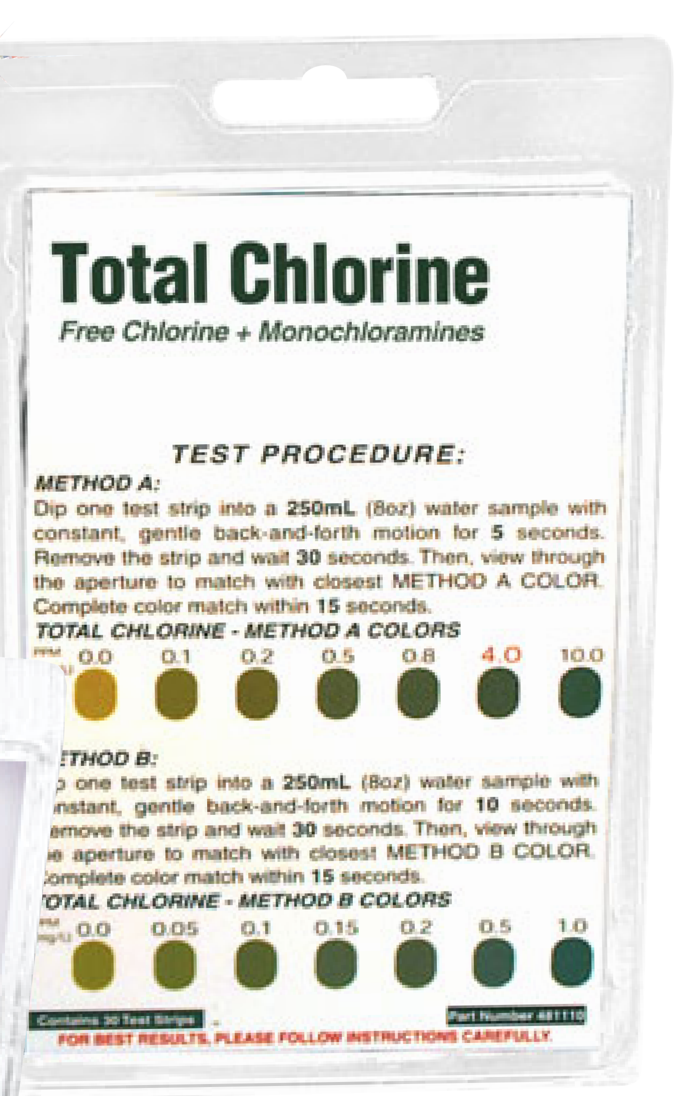
Water Quality Test Strips

Total Chlorine

Most products are available in bottles of 50 strips or 30 individual foil packets with a detailed color chart card. Total Chlorine test strips offer both versatility and sensitivity without compromising accuracy. Ranging from 0.05 to 80 PPM (mg/L), Total Chlorine strips use patented technology to make your testing easier. With results being achieved in under 1 minute, Total Chlorine test strips save you time and money.

To Order *(Specify Model Number)*

Model No.	Price	Description Detection Levels PPM (mg/L)
WTS-480010	$15.95	Total Chlorine, Bottle of 50. 0, 0.05, 0.075, .1, 0.125, 0.15, 0.175, 0.2, 0.3, 0.5, 0.8, 4.0, 10
WTS-481110	15.95	Total Chlorine, 30 pkts of 1. 0, 0.05, 0.075, 0.1, 0.125, 0.15, 0.175, 0.2, 0.3, 0.5, 0.8, 4.0, 10
WTS-480033	13.95	Total Chlorine High Range, Bottle of 50. 0, 5, 10, 20, 30, 40, 60, 80


Total Chlorine
Free Chlorine + Monochloramines

TEST PROCEDURE:

METHOD A:
Dip one test strip into a 250mL (8oz) water sample with constant, gentle back-and-forth motion for 5 seconds. Remove the strip and wait 30 seconds. Then, view through the aperture to match with closest METHOD A COLOR. Complete color match within 15 seconds.

TOTAL CHLORINE - METHOD A COLORS

0.0
0.1
0.2
0.5
0.8
4.0
10.0

ETHOD B:
one test strip into a 250mL (8oz) water sample with nstant, gentle back-and-forth motion for 10 seconds. emove the strip and wait 30 seconds. Then, view through e aperture to match with closest METHOD B COLOR. omplete color match within 15 seconds.

OTAL CHLORINE - METHOD B COLORS

0.0
0.05
0.1
0.15
0.2
0.5
1.0
Contains 30 Test Strips
Part Number 481110

FOR BEST RESULTS, PLEASE FOLLOW INSTRUCTIONS CAREFULLY.

Water Quality Test Strips
Safe & Accurate
Easy-to-Use
Verify EPS Guidelines
30 TEST STRIPS ENCLOSED
Water Quality Test Strips
Safe & Accurate
Easy-to-Use
Verify EPS Guidelines

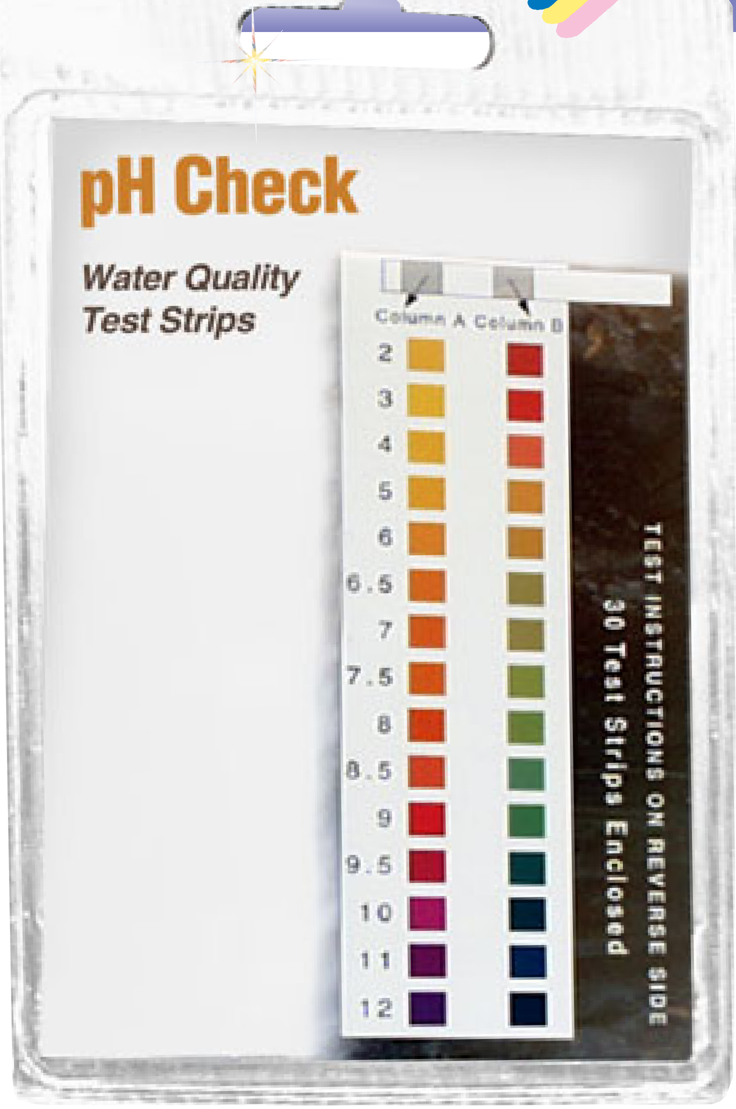
Specialty Combination Strips

Testing multiple parameters in water takes time and money. With these combination test strips you can reduce testing time and expenses. Testing for free and total chlorine on the same strip, the WTS-480655, offers accuracy and reliability. If more parameters are required, the 4-in-1 water check tests for total chlorine, pH, total hardness and total alkalinity. The 5-in-1 strips test for pH, total alkalinity, total hardness, free chlorine and total chlorine, all on one strip!

To Order *(Specify Model Number)*

Model No.	Price	Description	Detection Levels PPM (mg/L)
WTS-480655	$17.95	Free and Total Chlorine, 30 pkts of 1	0, 0.1, 0.2, 0.5, 1.0, 2.5, 5.0
WTS-480115	19.95	5-in-1 Strip, 30 pkts of 1	See WTS-480655, 480008 and 480005 for Specs
WTS-481133	15.95	4-in-1 Strip, 30 pkts of 1	See: pH, Total Alkalinity, Total Chlorine, Total Hardness

Water Quality Test Strips



pH and Total Alkalinity

pH is a natural part of water chemistry. pH Check test strips are designed to offer highly accurate results with minimal cost. For a more comprehensive test try the combination pH/total Alkalinity test strips.

To Order *(Specify Model Number)*

Model No.	Price	Description	Detection Levels PPM (mg/L)
WTS-480104	$9.95	pH Check, 30 pkts of 18	2, 3, 4, 5, 6, 6.5, 7, 7.5, 8.5, 9, 9.5, 10, 11, 12
WTS-481104	9.95	pH Check, bottle of 50	pH: 2-11
WTS-480005	10.95	pH/Total Alkalinity, bottle of 50	pH: 6, 6.5, 7, 7.5, 8.5, 9 TA: 0, 80, 120, 180, 240, 360 PPM

Total Hardness

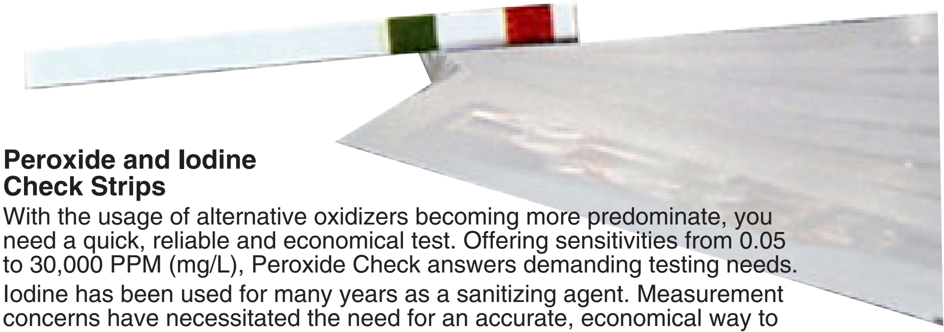
Calcium is found in water naturally from leaching. A typical sign of high calcium is scale that can build up in your bathtub. Accurate calcium measurement is very important to prolong the life of appliances and plumbing. The Total Hardness test strip provides accurate and reliable measurement without sacrificing time and money. This product produces accurate results in only one second!

TOTAL HARDNESS

To Order *(Specify Model Number)*

Model No.	Price	Description	Detection Levels PPM (mg/L)
WTS-480008	$8.95	Total Hardness, bottle of 50	40, 80, 120, 180, 250, 425
WTS-481108	$9.95	Total Hardness, 30 pkts of 1	40, 80, 120, 180, 250, 425 and 0, 2, 5, 7, 11, 15, 25 gpg

Iodine
50 Test Strips
Peroxide Test
50 Test Strips



Peroxide and Iodine Check Strips

With the usage of alternative oxidizers becoming more predominate, you need a quick, reliable and economical test. Offering sensitivities from 0.05 to 30,000 PPM (mg/L), Peroxide Check answers demanding testing needs.

Iodine has been used for many years as a sanitizing agent. Measurement concerns have necessitated the need for an accurate, economical way to check Iodine levels. Iodine Check offers the user a wide range of sensitivity, 0.02 to 300 PPM (mg.L), while still remaining accurate and affordable.

Manufactured under exacting conditions, all of these products provide accurate results ideal for the food, medical, industrial, and potable water industries.

To Order *(Specify Model Number)*

Model No.	Price	Description	Detection Levels PPM (mg/L)
WTS-480018	$15.95	Iodine, bottle of 50	0, 0.02, 0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 1.0, 2.0, 3.0, 4.0, 5.0
WTS-480064	13.95	Iodine Check, bottle of 50	0, 5, 10, 15, 20, 30, 40, 50, 75, 100, 150, 200, 250, 300
WTS-480014	12.95	Peroxide Check, bottle of 50	0.5 to 100

Iron and Copper Test Strips

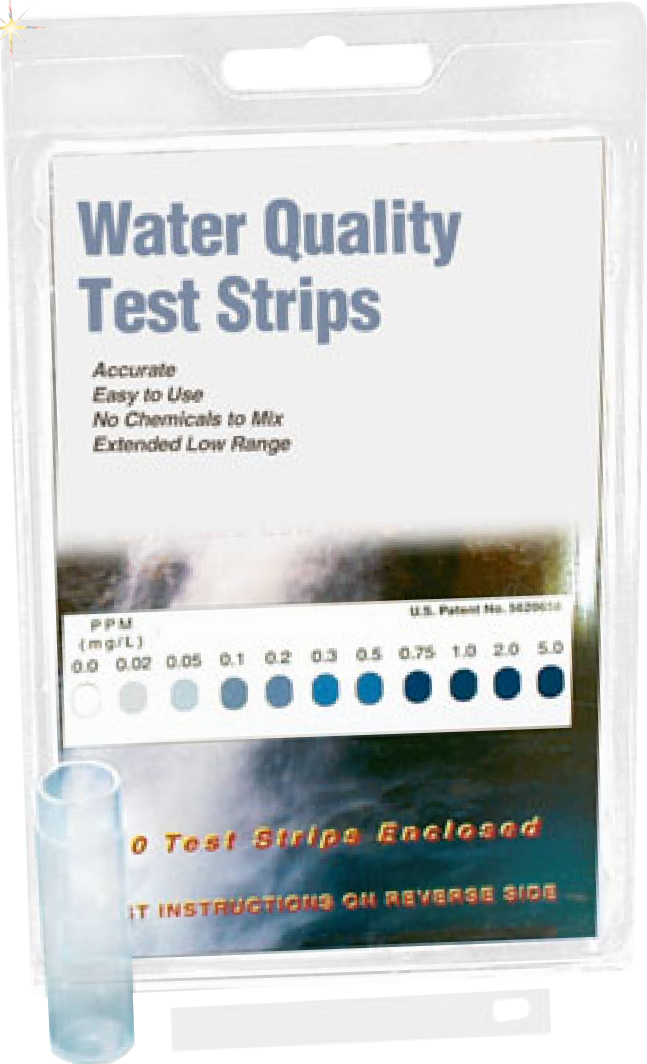
Whether you are testing for Iron or Copper on surfaces or in water, OMEGA has a solution for you. Iron and Copper tests make short work of an otherwise frustrating project.

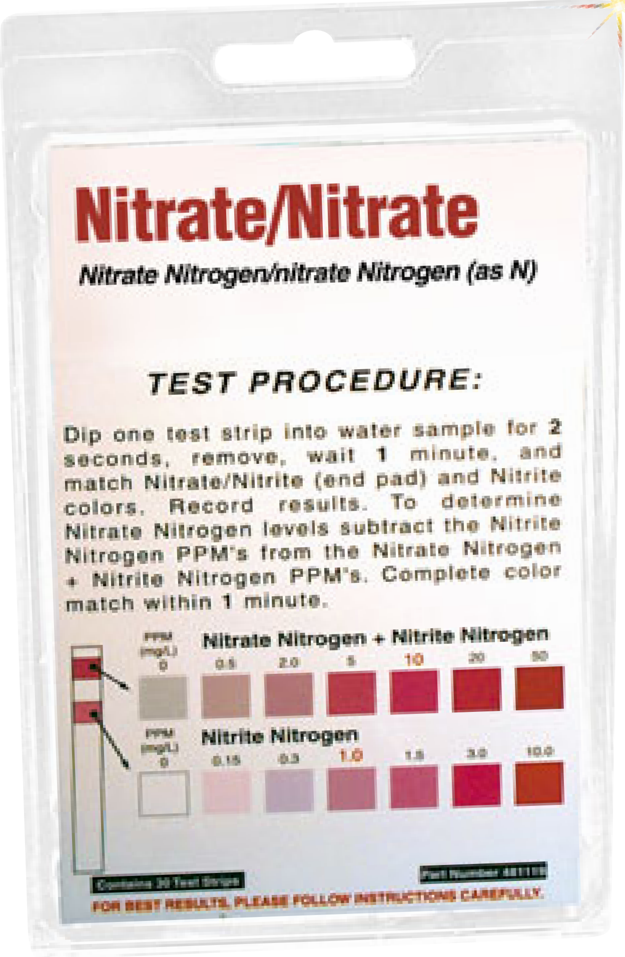
Requiring no mechanical reader or extra reagents, Iron test is an extremely accurate and sensitive test for measuring from 0.02 to 5.0 PPM (mg/L) in water.

Designed to complement the Iron test product, Copper test strips report results from 0.5 to 10.0 PPM (mg/L) without the need for a mechanical reader or hazardous reagents to mix.

To Order *(Specify Model Number)*

Model No.	Price	Description	Detection Levels PPM (mg/L)
WTS-480125	$19.95	Iron test, 30 pkts of 1	0, 0.02, 0.05, 0.1, 0.2, 0.3, 0.5, 0.75, 1.0, 2.0, 5.0
WTS-480025	$13.95	Iron test, bottle of 25	0, 0.02, 0.05, 0.1, 0.2, 0.3, 0.5, 0.75, 1.0, 2.0, 5.0
WTS-480011	13.95	Copper test, bottle of 25	0, 0.5, 1.0, 2.5, 5.0, 10.0


Water Quality Test Strips
Accurate
Easy to Use
No Chemicals to Mix
Extended Low Range
U.S. Patent No.
PPM (mg/L)
0.0
0.02
0.05
0.1
0.2
0.3
0.5
0.75
1.0
2.0
5.0
0 Test Strips Enclosed
T INSTRUCTIONS ON REVERSE SIDE


Nitrate/Nitrate
Nitrate Nitrogen/nitrate Nitrogen (as N)
TEST PROCEDURE:

Dip one test strip into water sample for 2 seconds, remove, wait 1 minute, and match Nitrate/Nitrite (end pad) and Nitrite colors. Record results. To determine Nitrate Nitrogen levels subtract the Nitrite Nitrogen PPM's from the Nitrate Nitrogen + Nitrite Nitrogen PPM's. Complete color match within 1 minute.

PPM (mg/L)
Nitrate Nitrogen + Nitrite Nitrogen
0
0.5
2.0
5
10
20
50
PPM (mg/L)
Nitrite Nitrogen
0
0.15
0.3
1.0
1.5
3.0
10.0
Contains 30 Test Strips
Part Number 481109
FOR BEST RESULTS, PLEASE FOLLOW INSTRUCTIONS CAREFULLY.

Nitrate Nitrogen and Nitrite Nitrogen

Nitrate Nitrogen and Nitrite Nitrogen can be very harmful in water. Side effects range from a lack of energy all the way to severe illness and, sometimes, death. Quickly and accurately determining the presence and levels of Nitrates and Nitrites in your water can save more than time and money. Nitrate/Nitrite Nitrogen test strips offer the user more than accurate, cost-effective results. The precise measuring tools offer the user peace-of-mind and safety. Ideal for the potable water industry, food industry, medical industry and educational classes. Nitrate/Nitrite Nitrogen test strips offer a sensitivity of 0 to 50 PPM (mg/L) for Nitrates, and 0.15 to 10 PPM (mg/L) for Nitrite Nitrogen. With a large, easy to read color chart and an economical price, Nitrate/Nitrite Nitrogen test strips are a must for any scientific tool kit.

To Order *(Specify Model Number)*

Model No.	Price	Description	Detection Levels PPM (mg/L)
WTS-480009	$12.95	Nitrate/Nitrite as Nitrogen, bottle of 50	Nitrate: 0, 0.5, 2.0, 5, 10, 20, 50 Nitrite: 0.0, 0.15, 0.3, 0.9, 1.5, 3, 10
WTS-481109	13.95	Nitrate/Nitrite as Nitrogen, 30 pkts of 1	Nitrate: 0, 0.5, 2.0, 5, 10, 20, 50 Nitrite: 0.0, 0.15, 0.3, 0.9, 1.5, 3, 10

WATER ANALYSIS
Portable Turbidity Meters

220 V
Version Only

- EPA Compliant
- For Field and Lab Use
- For Range 0 to 1100 NTU
- RS-232 Interface
- Very Economical
- Micro-Processor Based
- User-Friendly Calibration and Operation

0.14
TURBIDIMETER
CAL
READ
LaMOTTE

Shown Smaller Than Actual Size

The TRB-2020 combines laboratory accuracy and reliability in an extremely compact, portable instrument for turbidity measurement over the wide range of 0 to 1100 NTUs.

A multi-detector optical configuration assures long term stability and minimizes stray light and color interference. All readings are determined by the process of signal-averaging over a 5-second period minimizing fluctuations in readings attributable to large particles and enabling rapid, highly repeatable measurements.

Supplied with a 9 volt alkaline battery and an ac power adaptor, the TRB-2020 is an ideal choice for regulatory monitoring, process water testing, and environmental water analysis in the field or laboratory.

This nephelometric turbidity instrument meets or exceeds EPA design specifications for NPDWR and NPDES turbidity monitoring programs (as specified by USEPA method 180.1). There is also an EPA compliance reading mode which rounds the readings to meet EPA reporting requirements.

Range:
0 to 1100 NTUs. The microprocessor enables auto-ranging over the full range of 0 to 1100 nephelometric turbidity units (NTUs) and provides direct digital readout with a resolution of 0.01 for the lowest range and an accuracy of ±2%.

The simple calibration procedure involves activating the UP or DOWN arrow keys until the reading matches the standard. The microprocessor adjusts the factory-programmed calibration curve accordingly. Two primary turbidity standards are provided.

Model TRB-2020
$795
Basic System

An RS-232 port is provided to interface with a datalogger or computer.

Attractively priced, the TRB-2020 portable turbidity meter comes with AC adaptor, four optically selected sample vials with screw caps, standardization package consisting of 1.0 NTU and 10.0 NTU AMCO standards, and illustrated instruction manual, all in a sturdy carrying case.

SPECIFICATIONS

Instrument Type: Nephelometric turbidity; calibrated in NTUs
Range: 0 to 1100 NTU
Resolution: 0.01 on 0 to 11 range, 0.1 on 11 to 110 range, 1 on 110 to 1100 range
Response Time: 5 seconds
Reading Stability: Within 1% of final value
Accuracy: 0.05 NTU or ±2% reading below 100 NTU, ±3% above 100 NTU
Display: 3½-digit LCD, Battery and Lamp status
Light Source: Tungsten filament lamp
Sample Chamber: Accepts 25 mm (1") diameter flat-bottom, screw capped, sample tubes
Serial Interface: RS-232
Power: Battery operation:120V/60 Hz or 220V/50Hz, 100 mA, with included adaptor

To Order *(Specify Model Number)*

Model No.	Price	Description
TRB-2020	**$795**	Portable turbidity meter with 110 Vac adaptor
TRB-2020-220V	**795**	Portable turbidity meter with 220 Vac adaptor, CE approved

Ordering Example: TRB-2020, *Portable turbidity meter,* ***$795***

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