



Orion Process Products 1100 Series Monitors



Ease-of-use and reliability aren't just features-they're fundamentals.

Analyze • Detect • Measure • Control™

Thermo
ELECTRON CORPORATION



One Source. Total Solution

Thermo Electron's Orion Process Products are recognized worldwide for industry leading quality and accuracy, used across a broad range of power generation and environmental applications. The New Orion 1100 series for pH, ORP, dissolved oxygen and conductivity bring a new level of reliability and ease of measurements to applications including:

Markets:

- Power
- Pulp and paper
- Semiconductor
- Pharmaceutical
- Drinking water
- Chemical processing
- Wastewater

Applications:

- Feed Water
- Water Treatment
- Boiler Water
- Steam Condensate
- Cooling Water
- Wastewater Treatment

Power generation encompasses a variety of challenging applications, many of them of critical importance to maintain turbine integrity and efficiency. Monitoring power plant effluent and regulating wastewater treatment measurements are vital to human health and the protection of our surrounding environment. Orion products are also built to stand up to the demands of on-line continuous use, often under the most severe conditions. 1100 Series offers flexibility at an excellent price point. Used with either the 1100 series gel-filled electrodes or our premium Orion ROSS® electrode technology - we make it quick and easy to select exactly the right Orion product for the task at hand. We offer everything you need; monitor, electrode, ATC probe, buffers, standards, and the appropriate accessories all built to work together, flawlessly.

ROSS and the COIL tradenames are trademarks of Thermo Electron Corporation. US Patent 6,793,787

**Ease-of-use
and reliability
aren't just
features-they're
fundamentals.**



Orion 1100 Series Monitors:

The new Orion 1100 Series monitors combine simple six-button operation with exceptional long-life performance. Rugged enough for the most challenging on-line environments, and offered with a complement of features:

- User-customization through advanced set up menu matches user specific requirements for optimal performance.
- Fast installation with easy to wire detachable plug in connectors
- Safeguard against power failures using non-volatile memory to retain all stored parameters and calibration data
- 22 mA signal to indicate error conditions
- Accessory expandable system provides useful 12VDC output from controller
- IP 65-NEMA 4X Environmental Rating offers protection and reliability in harsh industrial environments
- Secures data and access to critical settings and configurations via two level password protection
- Built for maximum reliability and long service life, the Orion 1100 Series offers easy operation, advanced capabilities, and flexible configurations to enhance performance while saving you time and money!

**Results you
can count
on every time!**



Orion 1102PH On-line pH and ORP monitor:

Why purchase two monitors when a single monitor can do the job better? ORP or pH capabilities allow you to exactly match your monitor's functionality to your particular analysis.

This single channel monitor uses software selectable modes to measure pH or ORP. Calibration is quick and easy with the large dual display showing pH or ORP with temperature simultaneously. In ORP mode, the 1102PH is able to measure in mV or as % concentration, with independent calibration modes. Automatic calibration with Auto-Buffer recognition and sensor status-eliminates mistakes during calibration and saves valuable time. Orion 1102PH offers flexibility of sensor selection and can be used

with our reliable 1100 series gel-filled electrodes, polymer Aqua Pro electrodes or our premium ROSS® electrode technology to maximize performance in a variety of applications.

Orion 1102pH emulates advanced capabilities, flexible configurations and an economic design to exceed the performance of many high cost systems used to monitor and control pH/ORP in harsh industrial environments.

Raising the standard for price conscious monitoring systems, the Orion 1102PH delivers superior performance in on-line measurements requiring accurate and reliable pH/ORP control.

Emulates advanced capabilities, flexible configurations and an economic design

**ROSS and the COIL trademarks are trademarks of Thermo Electron Corporation.
US Patent 6,793,787**

Specification Information

1102PH	
pH Range:	- 2.00 to 16.00
Accuracy:	± 0.01 pH
Resolution:	0.01 pH
mV Range:	0 to 100%/-1000 to 1000mV
Accuracy:	± 1.0 mV
Resolution:	1 mV
Temperature:	-10.0 to + 125.0 °C (14.0 to 257.0 °F)
Resolution:	0.1 °C / °F
Relative Accuracy	± 0.5 °C (± 1.0 °F)
Temperature Sensor:	Pt100 / Pt1000 (jumper selectable); 2 or 3 wire
Temperature Compensation:	Auto / manual (reference at 25 °C)
pH input:	BNC (impedance); Asymmetrical / Symmetrical
Set-point and Controller functions - relay 1, 2:	
Function (switchable):	P/PI control (pulse length/pulse frequency); limit control
Integral time:	0 to 999.9 minutes
Adjustable period with pulse length controller:	0.5 to 20 sec.
Adjustable period with pulse frequency controller:	60 to 120 pulses/min
Pickup / Dropout delay:	0 to 2000 seconds
Wash cycle:	0.1 to 199.9 hours
Wash duration:	1 to 1999 seconds
Switching Dissolved oxygen hysteresis:	0 to 10 % of full scale
Contact outputs, controller:	1 SPDT, 3 SPST relays
Switching voltage / current / power:	Max. 250 VAC / Max 3A / Max 600VA - resistive load only
Alarm functions:	
Function (switchable):	Latching / pulse
Pickup delay:	0 to 2000 seconds
Switching voltage / current / power:	Max. 250 VAC / Max 3A / Max 600VA - resistive load only
Alarm control	Steady or pulse
Contact outputs	1 SPDT relay
Display:	
LCD:	UV coat, backlit 14 segments display with symbols for status information On/Off selectable with four level of brightness control
Backlight:	
Electromagnetic compliance (EMC) specifications:	
Emitted interference:	According to EN 50081-1
Immunity to interference:	According to EN 50082-1
Environmental conditions:	
Ambient temperature operating range:	0 to 40 °C
Maximum relative humidity:	80% up to 31°C decreasing linearly to 50% at 40°C
Power supply:	
Input:	80 to 250 VAC/DC 50/60 Hz Approx. 10VA
Main fuse:	250 mA anti-surge, S504 BUSSMANN
Transient overvoltage category:	II
Pollution degree:	2
Electrical data and connections:	
Signal output:	Two 0/4 to 20 mA outputs for pH and temperature, galvanically isolated
Load:	Max. 600 Ω
Connection terminal:	5-pin, 8-pin, 9-pin and 13-pin terminal, detachable blocks
Mechanical specifications:	
Dimensions (W x H x D):	144 x 144 x 111.5 mm
Weight:	745g (unit) / 1100g (Packed)
Environmental rating:	IP 65 (NEMA 4X)



Orion 1103DO On-line Dissolved Oxygen monitor:

Economical single – parameter dissolved oxygen monitor is designed to do one thing extremely well. Orion's 1103DO offers all of the advance features of the 1100 Series to measure at ppm levels for a wide range of dissolved oxygen applications.

Orion 1103DO incorporates superior Galvanic oxygen probe technology where there is no start-up or warm-up time. The probe only takes 40 to 50 seconds to attain 95% of actual readings. Unlike Clark cells where the probe needs to be polarized to 700 ~ 800 mV, in the Galvanic probe, the anode and cathode already carries an electrochemical potential of 800 mV.

Calibration is quick and easy using the atmospheric air as the calibration media for 100% air saturation.

Rugged Galvanic probe for process applications requires minimal maintenance. Frequency between membrane and electrolyte changes is significantly lower than traditional Clark cell systems saving you time and money.

View measured values in mg/l or % air saturation, selectable from the menu – options. A Pt 1000 sensor is incorporated in the D.O. probe, allowing for continuous automatic temperature compensation for reliable measurement you can trust. Input Barometric pressure and Salinity compensation values into the controller, and all D.O. measurements will be correctly compensated first time – every time!

Measure at ppm levels for a wide range of dissolved oxygen applications

Specification Information

1103DO	
Dissolved Oxygen measuring range:	0.00 to 25.00 mg/l or 0.0 to 300.0% saturation
Relative accuracy:	± 1.5 % of full scale reading for both ranges
Resolution:	0.01 mg/l or 0.1 %
Temperature measuring range:	-10.0 to + 125.0 °C (14.0 to 257.0 °F)
Resolution:	0.1 °C / °F
Relative accuracy:	± 0.5 °C (± 1.0 °F)
Temperature sensor:	Pt100 /Pt1000 (jumper selectable); 2 or 3 wire
Temperature compensation:	Auto / manual
Pressure compensation:	kPa / mmHg (Manual setting and automatic correction)
Salinity compensation:	0.0 to 50.0 ppt (g/L) (Manual setting and automatic correction)
Dissolved Oxygen input:	Screw terminal
Set-point and Controller functions - relay 1, 2:	
Function (switchable):	P/PI control (pulse length/pulse frequency); limit control
Integral time:	0 to 999.9 minutes
Adjustable period with pulse length controller:	0.5 to 20 sec.
Adjustable period with pulse frequency controller:	60 to 120 pulses/min
Pickup / Dropout delay:	0 to 2000 seconds
Wash cycle:	0.1 to 199.9 hours
Wash duration:	1 to 1999 seconds
Switching Dissolved oxygen hysteresis:	0 to 10 % of full scale
Contact outputs, controller:	1 SPDT, 3 SPST relays
Switching voltage / current / power:	Max. 250 VAC / Max 3A / Max 600VA - resistive load only
Alarm functions:	
Function (switchable):	Latching / pulse
Pickup delay:	0 to 2000 seconds
Switching voltage / current / power:	Max. 250 VAC / Max 3A / Max 600VA - resistive load only
Alarm control:	Steady or pulse
Contact outputs:	1 SPDT relay
Display:	
LCD:	UV coat, backlit 14 segments display with symbols for status information
Backlight:	On/Off selectable with four level of brightness control
Electromagnetic compliance (EMC) specifications:	
Emitted interference:	According to EN 50081-1
Immunity to interference:	According to EN 50082-1
Environmental conditions:	
Ambient temperature operating range:	0 to 40 °C
Maximum relative humidity:	80% up to 31°C decreasing linearly to 50% at 40°C
Power supply:	
Input:	80 to 250 VAC/DC 50/60 Hz Approx. 10VA
Main fuse:	250 mA anti-surge, S504 BUSSMANN
Transient overvoltage category:	II
Pollution degree:	2
Electrical data and connections:	
Signal output:	Two 0/4 to 20 mA outputs for dissolved oxygen and temperature, galvanically isolated
Load:	Max. 600 Ω
Connection terminal:	5-pin, 8-pin, 9-pin and 13-pin terminal, detachable blocks
Mechanical specifications:	
Dimensions (W x H x D):	144 x 144 x 111.5 mm
Weight:	745g (unit) / 1100g (Packed)
Environmental rating:	IP 65 (NEMA 4X)



Orion 1104CD On-Line Conductivity monitor:

Orion 1104CD offers the flexibility of seven ranges in a single controller - up to a maximum measurement range to 1000 mS/cm with proven accuracy and precision. Orion 1104CD Conductivity monitor meets all the demands of harsh industrial environments across a wide variety of applications - for optimal process control.

Our 2-cell stainless steel electrodes with 0.1 or 1.0 cell constants offers flexibility in matching probe capabilities to your plant's requirements- from ultra pure all the way to process water. The cell constant corresponding to the cell connected to the controller can be input independently during calibration. Status of the cell is updated and displayed after every calibration and can be viewed at anytime.

Temperature Coefficients can be set for more precise temperature compensation. Select from 0.0% to 10.0%. Alternatively select Pure water compensation for 0 - 2.0 μ S to correct for the non-linearity of pure water temperature correction curves.

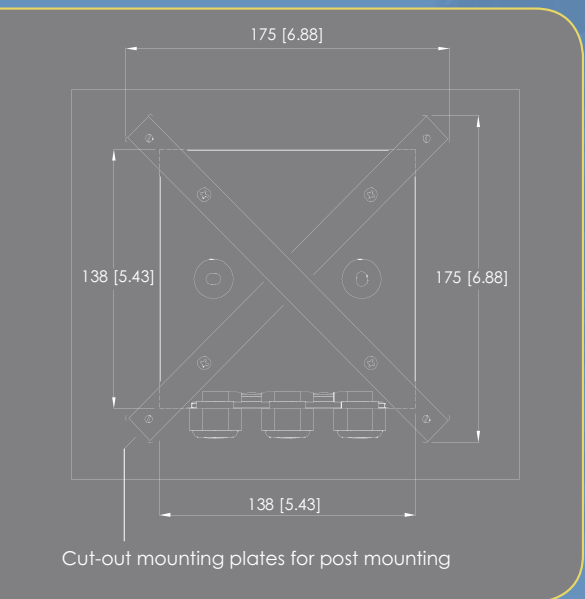
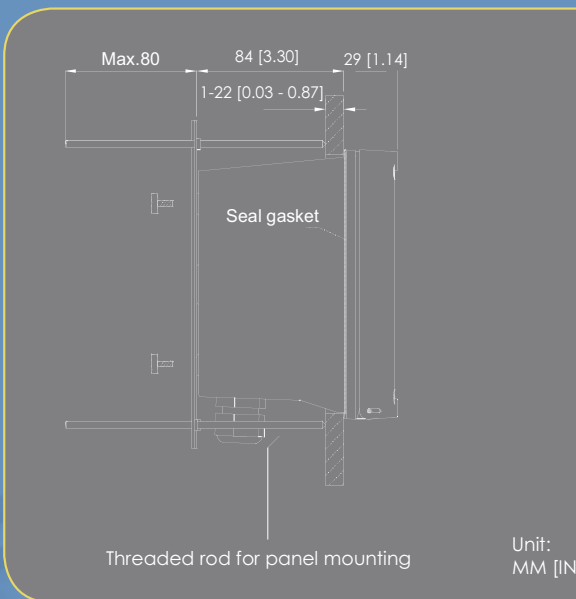
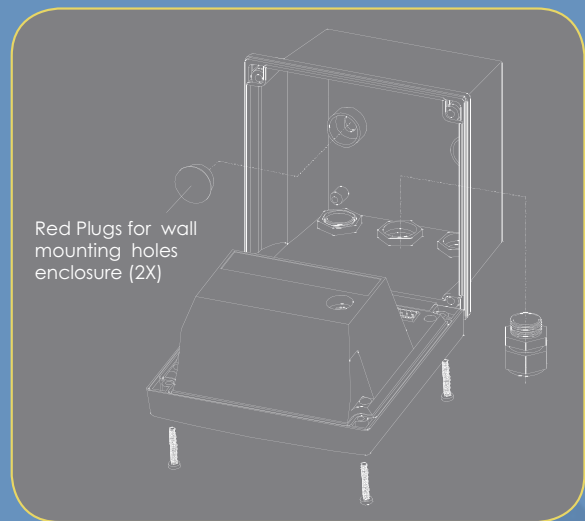
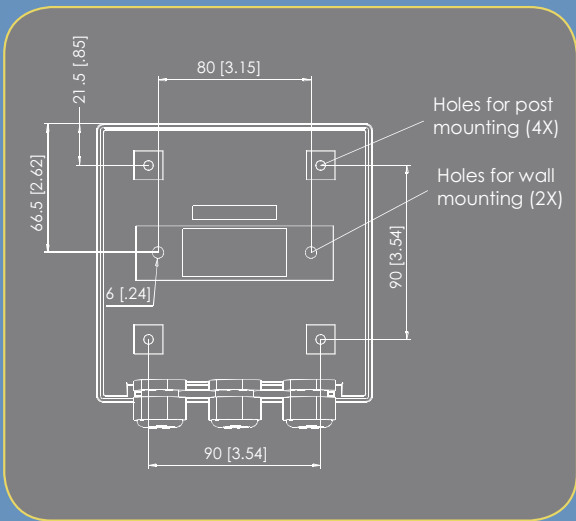
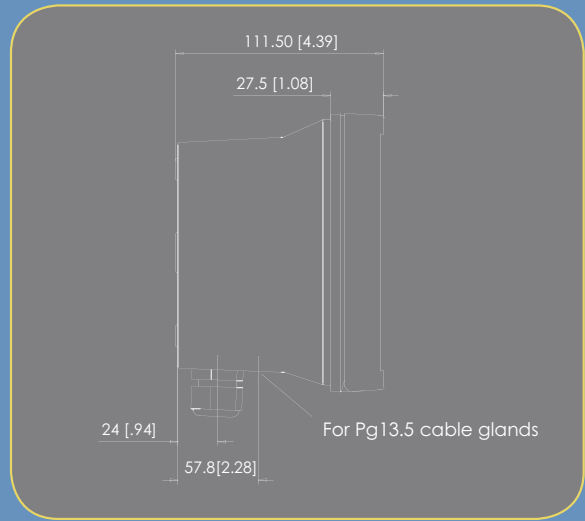
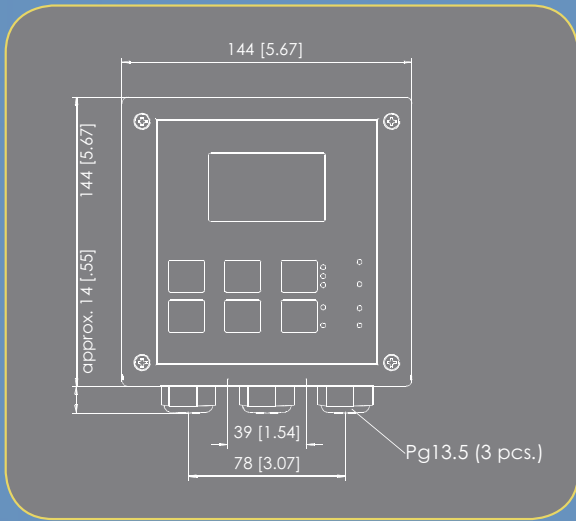
Orion 1104CD is quick and easy to customize via the advanced setup menu with secure password protection - producing optimal performance and results you can trust. Simple operation, flexibility and durability are the fundamental features of the 1104CD conductivity monitors - the ideal choice for industrial applications.

Meets all the demands of harsh industrial environments across a wide variety of applications

Specification Information

1104CD	
Conductivity measuring range:	Conductivity Measuring Range
1	to 2.000 µS/cm
2	to 20.00 µS/cm
3	to 200.0 µS/cm
4	to 2000 µS/cm
5	to 20.00 mS/cm
6	to 200.0 mS/cm
7	to 1000 mS/cm
Relative accuracy:	± 1. % of full scale reading (± 2 % > 500 mS/cm)
System accuracy:	Total system accuracy dependent upon sensor specification
Temperature/Measuring Range:	-10.0 to + 125.0 °C (14.0 to 257.0 °F)
Resolution:	0.1 °C / °F
Relative accuracy	± 0.5 °C (± 1.0 °F)
Temperature sensor:	Pt100 /Pt1000 (jumper selectable); 2 or 3 wire
Temperature compensation:	Auto / manual
Conductivity input	Screw terminal
Set-point and Controller functions - relay 1, 2:	
Function (switchable):	P/PI control (pulse length/pulse frequency); limit control
Integral time:	0 to 999.9 minutes
Adjustable period with pulse length controller:	0.5 to 20 sec
Adjustable period with pulse frequency controller:	60 to 120 pulses/min
Pickup / Dropout delay:	0 to 2000 seconds
Wash cycle:	0.1 to 199.9 hours
Wash duration:	1 to 1999 seconds
Switching Dissolved oxygen hysteresis:	0 to 10 % of full scale
Contact outputs, controller:	1 SPDT, 3 SPST relays
Switching voltage / current / power:	Max. 250 VAC / Max 3A / Max 600VA - resistive load only
Alarm functions:	
Function (switchable):	Latching / pulse
Pickup delay:	0 to 2000 seconds
Switching voltage / current / power:	Max. 250 VAC / Max 3A / Max 600VA - resistive load only
Alarm control	Steady or pulse
Contact outputs	1 SPDT relay
Display:	
LCD:	UV coat, backlit 14 segments display with symbols for status information
Backlight:	On/Off selectable with four level of brightness control
Electromagnetic compliance (EMC) specifications:	
Emitted interference:	According to EN 50081-1
Immunity to interference:	According to EN 50082-1
Environmental conditions:	
Ambient temperature operating range:	0 to 40 °C
Maximum relative humidity:	80% up to 31°C decreasing linearly to 50% at 40°C
Power supply:	
Input:	80 to 250 VAC/DC 50/60 Hz Approx. 10VA
Main fuse:	250 mA anti-surge, S504 BUSSMANN
Transient overvoltage category:	II
Pollution degree:	2
Electrical data and connections:	
Signal output:	Two 0/4 to 20 mA outputs for conductivity and temperature, galvanically isolated
Load:	Max. 600 Ω
Connection terminal:	5-pin, 8-pin, 9-pin and 13-pin terminal, detachable blocks
Mechanical specifications:	
Dimensions (W x H x D):	144 x 144 x 111.5 mm
Weight:	745g (unit) / 1100g (Packed)
Environmental rating:	IP 65 (NEMA 4X)

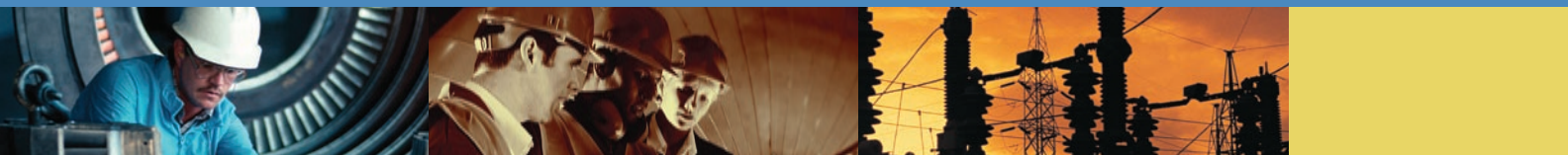
Mounting the Unit



Unit:
MM [INCH]

Ordering Information

	Cat. No.	Description
pH/ORP	1102PH	Single channel pH/ORP monitor/controller only
	110201PH	Single channel pH/ORP monitor/controller-complete with 110201 combination pH electrode w/ATC
	110202PH	Single channel pH/ORP monitor/controller-complete with 110202 combination pH electrode
	110250ORP	Single channel pH/ORP monitor/controller-complete with 110250 ORP probe
	110201	General-purpose combination pH sensor with rugged bulb, with Platinum ground and Pt1000 ATC thermistor. Electrode has double junction, Ag/AgCl, gel filled, with ¾ inch MNPT threads on outer body with 5 meter cable length
	110202	General-purpose combination pH sensor with flat glass. Electrode has double junction, Ag/AgCl, gel filled, with ¾ inch MNPT threads on outer body with 5 meter cable length
	110250	General-purpose combination ORP (REDOX) sensor, platinum with platinum ground. Electrode will have double junction, Ag/AgCl, gel filled, with ¾ inch MNPT threads on outer body with 5M cable length
	2001TM	ATC probe, stainless steel, PT1000 (1K) 5 meter cable
	PHAMP1	Battery operated Pre-Amp for use with 2001 & 1102PH pH monitors
	967961	ORP Standard, 5 pack, 60 mL (2 oz) bottles
	900023	pH Electrode cleaning solution. (for general cleaning) Four 1 oz. bottles
	900024	pH Electrode cleaning solution (for removing oil and grease contaminant's) Four 2 oz. bottles
	910104	pH 4.00 Buffer, 475 mL (Pint) bottle
	910107	pH 7.00 Buffer, 475 mL (Pint) bottle
	910110	pH 10.00 Buffer, 475 mL (Pint) bottle
	Dissolved Oxygen	9104CB
9107CB		pH 7.00 Buffer, Cubitainers are 19 L (5 gallon)
9110CB		pH 10.00 Buffer, Cubitainers are 19 L (5 gallon)
1103DO		Single channel dissolved oxygen monitor/controller only
110301DO		Single channel dissolved oxygen monitor/controller with 110301 dissolved oxygen electrode w/ATC with 3 meter cable
110301		Dissolved oxygen sensor, Zinc Anode, HDPE (high density polyethylene) membrane, Pt 1000 RTD ATC with 3 meter cable
110301MK		DO HDPE kit, replacement tool, 500 mL DO electrolyte, 5 pack of HDPE membranes and O-rings
110301E		500 mL DO electrolyte
110301M5		5 pack of HDPE membranes
110301M25		25 pack of HDPE membranes
Conductivity	1103MT	Membrane replacement tool
	1104CD	Single channel conductivity monitor/controller only
	110401CD	Single channel conductivity monitor/controller complete with 110401 conductivity probe w/ATC with 5 meter cable
	110402CD	Single channel conductivity monitor/controller complete with 110402 conductivity probe w/ATC with 5 meter cable
	110401	Stainless steel (0.1 K) 2-cell conductivity probe w/PT1000 ATC, 5M cable
	110402	Stainless steel (1.0 K) 2- cell conductivity probe w/PT1000 ATC, 5M cable
	011005	111.9 mS/cm conductivity standard, five pack 2 oz. Bottles
	011006	12.9 mS/cm conductivity standard, five pack 2 oz. Bottles
	011007	1413 uS/cm conductivity standard, five pack 2 oz. Bottles
	011008	100 uS/cm conductivity standard, five pack 2 oz. Bottles
	1100PK	Bracket accessory kit for panel mounting for use with 1102PH, 1103DO, 1104CD monitors



Environmental Instruments

Water Analysis Instruments

North America

166 Cummings Center
Beverly, MA 01915 USA
Toll Free: 1-800-225-1480
Tel: 1-978-232-6000
Dom. Fax: 1-978-232-6015
Int'l Fax: 978-232-6031
www.thermo.com/water

Europe

12-16 Sedgeway Business Park
Witchford, Cambridgeshire
England, CB6 2HY
Tel: 44-1353-666111
Fax: 44-1353-666001



© 2006 Thermo Electron Corporation.
All rights reserved.

www.thermo.com

B-1100PRO-E 0806 RevA

Analyze • Detect • Measure • Control™

Thermo
ELECTRON CORPORATION