



## Thermo Scientific™ Orion™ Laboratory Products Catalog



# thermo scientific orion laboratory products catalog

• pH • ISE • Dissolved Oxygen • Conductivity • Colorimetry • Turbidity • Spectrophotometry

**Алматы** (7273)495-231  
**Ангарск** (3955)60-70-56  
**Архангельск** (8182)63-90-72  
**Астрахань** (8512)99-46-04  
**Барнаул** (3852)73-04-60  
**Белгород** (4722)40-23-64  
**Благовещенск** (4162)22-76-07  
**Брянск** (4832)59-03-52  
**Владивосток** (423)249-28-31  
**Владикавказ** (8672)28-90-48  
**Владимир** (4922)49-43-18  
**Волгоград** (844)278-03-48  
**Вологда** (8172)26-41-59  
**Воронеж** (473)204-51-73  
**Екатеринбург** (343)384-55-89

**Иваново** (4932)77-34-06  
**Ижевск** (3412)26-03-58  
**Иркутск** (395)279-98-46  
**Казань** (843)206-01-48  
**Калининград** (4012)72-03-81  
**Калуга** (4842)92-23-67  
**Кемерово** (3842)65-04-62  
**Киров** (8332)68-02-04  
**Коломна** (4966)23-41-49  
**Кострома** (4942)77-07-48  
**Краснодар** (861)203-40-90  
**Красноярск** (391)204-63-61  
**Курск** (4712)77-13-04  
**Курган** (3522)50-90-47  
**Липецк** (4742)52-20-81

**Магнитогорск** (3519)55-03-13  
**Москва** (495)268-04-70  
**Мурманск** (8152)59-64-93  
**Набережные Челны** (8552)20-53-41  
**Нижний Новгород** (831)429-08-12  
**Новокузнецк** (3843)20-46-81  
**Новый Уренгой** (3496)41-32-12  
**Новосибирск** (383)227-86-73  
**Омск** (3812)21-46-40  
**Орел** (4862)44-53-42  
**Оренбург** (3532)37-68-04  
**Пенза** (8412)22-31-16  
**Петрозаводск** (8142)55-98-37  
**Псков** (8112)59-10-37  
**Пермь** (342)205-81-47

**Ростов-на-Дону** (863)308-18-15  
**Рязань** (4912)46-61-64  
**Самара** (846)206-03-16  
**Санкт-Петербург** (812)309-46-40  
**Саратов** (845)249-38-78  
**Севастополь** (8692)22-31-93  
**Саранск** (8342)22-96-24  
**Симферополь** (3652)67-13-56  
**Смоленск** (4812)29-41-54  
**Сочи** (862)225-72-31  
**Ставрополь** (8652)20-65-13  
**Сургут** (3462)77-98-35  
**Сыктывкар** (8212)25-95-17  
**Тамбов** (4752)50-40-97  
**Тверь** (4822)63-31-35

**Тольятти** (8482)63-91-07  
**Томск** (3822)98-41-53  
**Тула** (4872)33-79-87  
**Тюмень** (3452)66-21-18  
**Ульяновск** (8422)24-23-59  
**Улан-Удэ** (3012)59-97-51  
**Уфа** (347)229-48-12  
**Хабаровск** (4212)92-98-04  
**Чебоксары** (8352)28-53-07  
**Челябинск** (351)202-03-61  
**Череповец** (8202)49-02-64  
**Чита** (3022)38-34-83  
**Якутск** (4112)23-90-97  
**Ярославль** (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +7(7172)727-132

Киргизия +996(312)96-26-47

<https://stabvolt.nt-rt.ru/> || [sos@nt-rt.ru](mailto:sos@nt-rt.ru)

# What's New!

## Unveil a whole new line of Orion products

With over 50 years of innovation and proven performance, Thermo Scientific Orion products provide you a full range of laboratory and on-line water analysis instruments serving markets such as environmental, water and wastewater, power, food and beverage, pharmaceutical and general laboratory.

In this catalog, you will find a comprehensive selection of meters, analyzers, electrodes and solutions that are recognized worldwide and will provide you the security that your quality standards are met.

For a start, here's a little sneak preview.



### Versatility

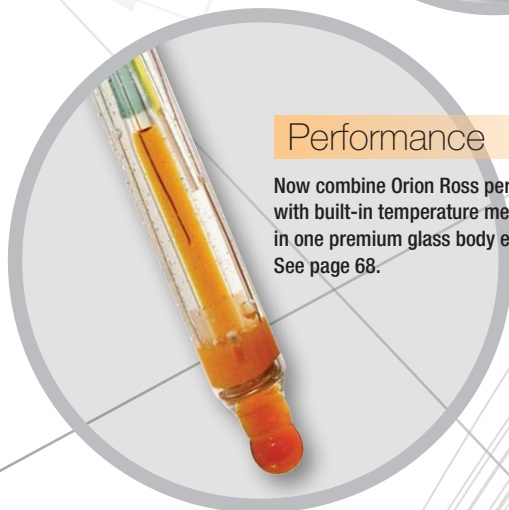
The meter for today's needs and tomorrow's challenges. The Expandable modular Orion VERSA STAR design gives you the flexibility you need. Starting on page 4.

We have the perfect meter for your application.



### Durability

Now more than ever, the Orion line meets requirements for field applications. The Star A meter kits include robust cases and complete accessories. Starting on page 40.



### Performance

Now combine Orion Ross performance with built-in temperature measurement in one premium glass body electrode. See page 68.





## Introduction

Overall Meter Introduction	2-3
----------------------------	-----

## Thermo Scientific Orion Meters

Orion VERSA STAR Introduction	4-5
Orion VERSA STAR 90 pH/ISE/Conductivity/RDO/DO Benchtop	6-7
Orion VERSA STAR 40 pH/ISE Benchtop	8-9
Orion DUAL STAR pH/ISE Benchtop	10-11
Orion Star A214 pH/ISE Benchtop	12-13
Orion VERSA STAR 50 pH/Conductivity Benchtop	14-15
Orion Star A215 pH/Conductivity Benchtop	16-17
Orion Star A216 pH/RDO/DO Benchtop	18-19
Orion VERSA STAR 10 & 80 pH and pH with LogR Benchtop	20-21
Orion Star A211 pH Benchtop	22-23
Orion Star A111 pH Benchtop	24-25
Orion VERSA STAR 20 Conductivity Benchtop	26-27
Orion Star A212 Conductivity Benchtop	28-29
Orion Star A112 Conductivity Benchtop	30-31
Orion VERSA STAR 30 RDO/DO Benchtop	32-33
Orion Star A213 RDO/DO Benchtop	34-35
Orion Star A113 DO Benchtop	36-37
Orion VERSA STAR & Modules	38
Portable Meters Introduction	39
Orion Star A329 pH/ISE/Conductivity/RDO/DO Portable	40-41
Orion Star A324 pH/ISE Portable	42-43
Orion Star A325 pH/Conductivity Portable	44-45
Orion Star A326 pH/RDO/DO Portable	46-47
Orion Star A321 & Star A221 pH Portable	48-49
Orion Star A121 pH Portable	50-51
Orion Star A322 & Star A222 Conductivity Portable	52-53
Orion Star A122 Conductivity Portable	54-55
Orion Star A323 & Star A223 RDO/DO Portable	56-57
Orion Star A123 DO Portable	58
Orion Star A & Orion VERSA STAR Series Accessories	59
Orion Star & Star Plus Accessories	60
Orion Intrinsically Safe Meters	61

## Thermo Scientific Orion pH Electrodes

pH Electrode Features & Styles	62-63
pH Electrode Selection Guide	64-65
ROSS Sure-Flow pH Electrodes	66
Sure-Flow pH Electrodes	67
Triode pH Electrodes	68-69
Glass-Refillable pH Electrodes	70-71
Epoxy Refillable pH Electrodes	72
Micro pH Electrodes	73
Glass Semi Micro pH Electrodes	74
Epoxy Semi Micro pH Electrodes	75
Low Maintenance pH Electrodes	76-77
Flat Surface pH Electrodes	78
Spear Tip pH Electrodes	79

pH Half Cell & Reference Half Cell Electrodes	80
ATC Probes	81
Redox/ORP & ORP Triode Electrodes	82
Silver Billet & Karl Fischer Electrodes	83
Meter-Powered Stirrer Probe	84
Electrode Connectors & Cables	85
pH Buffers & Solutions	86-87
Electrode Fill Solutions & Accessories	88

## Thermo Scientific Orion Ion Selective Electrodes (ISE)

Ion Selective Electrode Introduction	89
Ion Selective Electrode Selection Guide	90-91
Fluoride Ion Selective Electrodes	92
Ammonia Ion Selective Electrodes	93
Nitrate Ion Selective Electrodes	94
Chloride Ion Selective Electrodes	95
ROSS Sodium Ion Selective Electrodes	96
ISE Solutions	97-99

## Thermo Scientific Orion Conductivity Cells

Conductivity Cell Introduction	100
Conductivity Cell Families	101-102
Conductivity Cell Selection Guide	103
Conductivity Standards & Accessories	104

## Thermo Scientific Orion Dissolved Oxygen Probes

Dissolved Oxygen Introduction	105
RDO® Optical Dissolved Oxygen Probes	106
Dissolved Oxygen Probe Families	107
Dissolved Oxygen Probe Selection Guide	108-109
Dissolved Oxygen Solutions & Accessories	110

## Thermo Scientific Orion Colorimetry, Turbidity & Spectrophotometry

Colorimetry, Turbidity & UV-Vis Spectrophotometry Introduction	111-113
Orion AquaMate Spectrophotometers	114-115
Colorimetry & Turbidity Markets	116
Orion AQ3700 Colorimeter	117
Orion AQ4000 Colorimeter	118
Orion AQ3070 Chlorine Meter	119
Orion AQ4500 Turbidity Meter	120
Orion AQ3010 Turbidity Meter	121
COD Test Systems	122
Digestion Test Reagents	123
AQUAfast Colorimeter Reagent Chemistries	124-125

## Customer Services

Cross Reference	126-128
Index	129-132
Service Program Options	133

## Water Quality Specialist Tip

The following icons are designed to help you locate the best product for your application.



**Best,  
Better, Good**  
Electrode  
ratings  
based on  
the electrode  
precision



**Best Seller**  
Our most  
popular  
customer  
products



**TRIS  
Compatible**  
pH electrodes  
for use with  
TRIS, protein  
and sulfide  
samples  
(calomel  
replacements)



**Superior  
Temperature  
Control**  
pH electrodes  
that respond  
exceptionally  
well to sample  
temperature  
changes



**Lead-Free**  
Environmentally  
safe electrodes  
that use  
lead-free  
glass, which  
exceeds the  
requirements  
of RoHS



**Compliant  
with EPA  
testing  
methods**



**Compliant  
with USP  
requirements**



**Hazardous  
Materials**  
Additional  
shipping  
charges  
may apply



## Introducing the latest Thermo Scientific Orion Star Meters

Orion VERSA STAR and Star A Meters

The new Orion Star™ A and VERSA STAR™ meters are built on the quality and expertise you've come to expect from the Orion product line. The expanded offering combines the tried-and-true features relied on by many professionals with new features concentrated on making them easier to use and minimizing the time needed to train others or to refer to instructions.



Orion  
VERSA STAR  
Benchtop  
Series

The Orion VERSA STAR advanced benchtop meter and modules exemplify versatility. Four channels can be configured in any combination. Define the channels as you need them. Some suggestions are: four different parameters for complete multiparameter analysis, two sets of two different parameters for simultaneous dual-parameter testing or even four of the same for really high throughput. The versatility also shows in the large, customizable color display; ability to handle the testing spectrum from simple readings to advanced ISE applications; redesigned electrode holder head and exclusive auto-recognition capability for Orion optical RDO and polarographic DO probes. Orion VERSA STAR meters have all the best features and options to work with any application, even the unexpected.

Orion Star A320 and A200-series meters offer dependability and are an easy choice if you need a dedicated single or multiparameter meter for accurate and repeatable measurements every day. Built with the testing location in mind, the benchtop meters feature an Orion Star stirrer probe port and include the redesigned electrode holder head. The portable meters are waterproof with an IP67-rated housing and have the option to accept AC power. The large, backlit graphic display shows results with plain language prompts. Exclusive auto-recognition capability for Orion optical RDO and polarographic DO probes lets you choose the best probe for your application, not limiting your probe options. These meters are the ideal choice for any lab, for every sample, every day.

Orion Star  
A320 &  
A200 Series



To complement the new meters, we've kept our specialized, industry-proven meters. The Orion DUAL STAR meters are easy-to-use with two channels for simultaneous measurement. For environments that need non-sparking meters, the Orion Intrinsically-Safe Meters meet that criteria and are US intrinsically-safe rated.

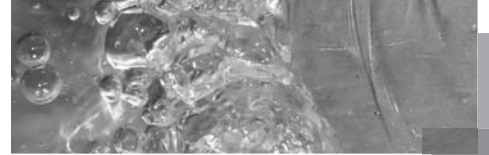
Our 2012 Orion meter offering means no more settling for a meter – get the right fit for your application and testing needs.

Orion Star  
A100 Series



For simplicity and affordability without sacrificing accuracy, look no further than the Orion Star A100-series meters. These single parameter meters are available in benchtop and portable housings. The simple keypad layout combined with the dedicated onscreen messages help with calibration and setup. Orion Star A100-series meters provide just the core information you need.





Model (Benchtop Meters)		Orion VERSA STAR Premium	Orion DUAL STAR Advanced	Orion Star A200 Series Advanced	Orion Star A100 Series Basic
Example Display					
Display Type		Customizable color graphic LCD with step-by-step text prompts	Graphic LCD with step-by-step text prompts	Graphic LCD with step-by-step text prompts	Fixed segment LCD with basic text prompts
Keypad		Numeric with menu-specific function keys	Numeric with menu-specific function keys	Comprehensive with menu-specific function keys	Simple with highlighted measure key
Number of Channels		1 to 4	2	1 to 2	1
Orion Star Stirrer Probe Control		2	1	1	—
Datalog		2000 with date/time	1000 with date/time	2000 with date/time	50
USB Output		2	1	1	—
RS232 Output		1	1	1	—
Methods		10 per channel	10 per channel	10	—
Parameter	pH	Versa Star 10 meter with pH module Versa Star 80 meter with pH/LogR module Versa Star 50 meter with pH, conductivity modules	Dual Star meter with two pH/ISE channels	Star A211 pH meter Star A215 pH/conductivity meter Star A216 pH/RDO/DO meter	Star A111 pH meter
	ISE	Versa Star 40A meter with pH/ISE module Versa Star 40B meter with two pH/ISE modules	Dual Star meter with two pH/ISE channels	Star A214 pH/ISE meter	—
	Conductivity/TDS/Resistivity/Salinity	Versa Star 20 meter with conductivity module Versa Star 50 meter with pH, conductivity modules	—	Star A212 conductivity meter Star A215 pH/conductivity meter	—
	Conductivity, TDS	—	—	—	Star A112 conductivity meter
	RDO Optical & Polarographic Dissolved Oxygen	Versa Star 30 meter with RDO/DO module	—	Star A213 RDO/DO meter Star A216 pH/RDO/DO meter	—
	Polarographic Dissolved Oxygen	—	—	—	Star A113 DO meter
	pH/ISE/Conductivity/RDO/DO	Versa Star 90 meter with pH/ISE, conductivity, RDO/DO modules Versa Star 90 meter with two pH/ISE, conductivity, RDO/DO modules	—	—	—
Selectable Meter Components		Versa Star meter customizable with up to four pH modules • pH • pH/ISE • pH/LogR • Conductivity • RDO/DO	—	—	—

Model (Portable Meters)		Orion Star A300 Series Premium	Orion Star A200 Advanced	Orion Star A100 Series Basic	Orion Intrinsically Safe
Example Display					
Display Type		Graphic LCD with step-by-step text prompts	Graphic LCD with step-by-step text prompts	Fixed segment LCD with basic text prompts	Fixed segment LCD
Keypad		Comprehensive with menu-specific function keys	Comprehensive with menu-specific function keys	Simple with highlighted measure key	Simple
Number of Channels		1 to 3	1	1	100 with date/time (266S, 136S only)
Datalog		5000 with date/time	1000 with date/time	50	100 with date/time on select meters
USB Output		1	1	—	—
RS232 Output		1	1	—	1 (266S, 136S only)
Methods		10	—	—	—
Parameter	pH	Star A321 pH meter Star A325 pH/conductivity meter Star A326 pH/RDO/DO meter	Star A221 pH meter	Star A121 pH meter	261S pH meter 266S pH meter
	ISE	Star A324 pH/ISE meter	—	—	—
	Conductivity/TDS/Resistivity/Salinity	Star A322 conductivity meter Star A325 pH/conductivity meter	Star A222 conductivity meter	—	—
	Conductivity/TDS	—	—	Star A122 conductivity meter	131S conductivity meter 136S conductivity meter
	RDO Optical & Polarographic Dissolved Oxygen	Star A323 RDO/DO meter Star A326 pH/RDO/DO meter	Star A223 RDO/DO meter	—	—
	Polarographic Dissolved Oxygen	—	—	Star A123 DO meter	—
	pH/ISE/Conductivity/RDO/DO	Star A329 pH/ISE/conductivity/RDO/DO meter	—	—	—



## Thermo Scientific Orion VERSA STAR

Advanced Electrochemistry Meter

Visible indicators to quickly show how each of the four channels are assigned

Calibration information with buffer points and electrode slope from last calibration

Function keys that update depending on your screen and shortcut keys on the keypad make this meter easy for anyone to use

Four channels to mix and match in any combination as you need

The large, color graphic display is easy on the eyes and can be seen from any angle

Display information can be customized to show only the information you need



More BIG surprises just for you! Find out on the following pages.

This versatile meter has a large, color graphic LCD display. The informative (and customizable) display shows readings, connections, time, date, sample ID, user ID and calibration information.

### Features and Benefits

- Select from five modules to customize the four channels your way — it's versatile for you to configure how you need it for now or for later
- Anyone can use this meter with its plain language screen prompts, function keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Memory for up to 10 methods per channel allow for customized procedures to differentiate between tests and/or users
- Data transfer and updating meter software is easy with two USB and RS232 ports
- Includes data analysis software for transferring stored results or displaying readings in real-time
- Mix samples without a stir plate with direct control for two Orion Star stirrer probes (096019, sold separately)
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source with the included universal power adapter
- IP54-rated housing handles splashes
- 3 year meter replacement warranty





A variety of modules that you can place in any of the four channels.

- **pH/Temperature Module Allows:**

- Up to 6 point pH calibration with automatic recognition for USA/NIST and DIN buffers
- Fixing of calibration errors without a complete recalibration with calibration editing

- **Use the pH/ISE/Temperature Module for:**

- All the benefits of the pH module
- Fixing pH/ISE calibration errors without a complete recalibration with calibration editing
- Advanced ISE benefits such as auto-blank, timed end point, linear point-to-point, non-linear selectable auto-blank, low-concentration range stability, ISE ID and incremental techniques

- **Conductivity/Temperature Module Offers:**

- Conductivity, TDS, salinity or resistivity capabilities
- Selectable reading reference temperatures of 5, 10, 15, 20 or 25 °C with linear, non-linear, nLFu or USP/EP curve options for conductivity
- Choice of practical salinity or natural sea water curves for salinity readings
- Linear or ISO/EN 27888 curves for TDS

- **Dissolved Oxygen/RDO/Temperature Module:**

- Takes the worry out of DO probe compatibility – the meter accepts and automatically recognizes Orion polarographic and RDO optical/luminescence-based probes
- Compensates automatically for temperature, salinity with manual input and barometric pressure (automatic or manual)
- Allows for calibration using water-saturated air, air-saturated water, a Winkler titration or zero point
- Calculates BOD/DOUR/SOUR readings when combined with the complimentary data analysis software

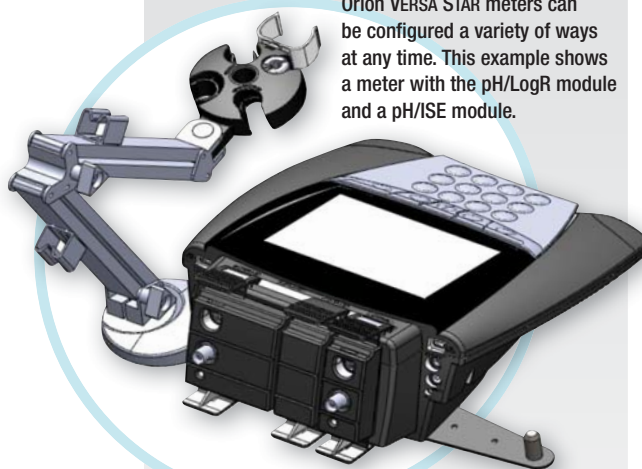
- **Module Featuring LogR Technology:**

- Includes all of the features of the pH module with the added benefits of:
  - The most advanced electrode diagnostics
  - No temperature sensor needed to get temperature-compensated pH readings

Orion VERSA STAR meters are about versatility, even with accessories. Shown here – the electrode arm can be attached on either side.



Orion VERSA STAR meters can be configured a variety of ways at any time. This example shows a meter with the pH/LogR module and a pH/ISE module.



No need to turn off your meter to switch modules – meter automatically recognizes module changes.



## Thermo Scientific Orion VERSA STAR 90

pH/ISE/Conductivity/RDO/Dissolved Oxygen Benchtop Meters

Looking for the top-of-the-line, best meter you can find? Looking for something for everything and meeting all those testing needs? Whether it's one sample that needs a variety of testing or a variety of samples needing one test, the Orion VERSA STAR 90 and 91 advanced multiparameter meters are ready for the job. These meters come fully-loaded and ready to take on multiple measurements.

### Highlighted Features Include:

- Display customization to show only the information you need
- Plain language screen prompts, function keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese make it easy for anyone to use this meter
- Non-volatile memory that holds up to 2000 data points with time and date stamp
- Stores up to 10 methods per channel allow for customized procedures to differentiate between tests and/or users
- Two USB and a RS232 port makes for easy data transfer and updating meter software
- Complimentary data analysis software for easy transferring of stored results, real-time viewing and calculation of BOD, DOUR and SOUR results
- Option to control sample mixing directly from the meter without a separate stir plate when using with the Orion Star stirrer probe
- Increase your productivity – two stirrer probe ports allow for simultaneous stirring and control for two separate samples at the same time
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Working with almost every AC power source through the included universal power adapter
- IP54-rated housing handles splashes and cleans up easily
- 3 year meter replacement warranty

### Product Specifications – Orion VERSA STAR Meter

CE   TUV   EPA		
Maximum Number of Modules		4
Methods		Up to 10
Datalogging	Number of Datalogs	2000 with time and date stamp
	Log Function	Manual, AUTO-READ™, timed interval, single timed reading
Communication Ports		One RS232, two USB ports (one client, one host)
Orion Star Stirrer Probe Ports		2
Power		Universal, AC power adapter, 90-260 VAC, 50-60 Hz

### Product Specifications – pH/ISE Module (VSTAR-ISE)

CE   TUV   EPA		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 6
	Calibration Editing	Yes
	Adjustable ISO Point	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>n</sub> ORP Mode	Yes
ISE	Range	0 to 19999
	Resolution	Up to 4 significant digits
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	Units	ppm, M, mg/L, %, ppb, none
	Calibration Points	Up to 6
	Calibration Editing	Yes
	Adjustable ISO Point	Yes
	Calibration Features	Timed end point, linear point to point, non-linear selectable auto-blank, low concentration range stability
	Incremental Techniques	Single known addition & subtraction, double known addition & subtraction, single analate addition & subtraction
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Inputs	pH/ISE	BNC, reference pin
	ATC	8-pin mini-DIN

### Product Specifications – Conductivity Module (VSTAR-CND)

CE   TUV   EPA		
Conductivity	Range	0.001 µS to 3000 mS
	Resolution	0.001 µS minimum; 4 significant figures minimum
	Relative Accuracy	0.5 % reading ±1 digit
	Reference Temperature	5, 10, 15, 20, 25 °C
	Temperature Compensation	Linear (0 to 10.0 %/°C), nLn, nLFu, USP/EP
	Compatible Cell Constants	0.001 to 199.9
	Calibration Points	Up to 6 points
	Calibration Editing	Yes





Resistivity	Range	2 ohm to 100 meg-ohm
	Resolution	2 ohms-cm
	Relative Accuracy	0.5 % reading $\pm 1$ digit
Salinity	Type	Practical salinity or natural sea water
	Range	0.01 to 80.0 psu 0.01 to 42 ppt sea water
	Resolution	0.01
	Relative Accuracy	$\pm 0.1$
TDS	Range	0 to 200 ppt
	Resolution	4 significant digits
	Relative Accuracy	$\pm 0.5$ % reading $\pm 1$ digit
	TDS Factor Range	Linear 0.01 to 10.00
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	$\pm 0.1$
	Offset Calibration	1 point
Input		8-pin mini-DIN

#### Product Specifications – RDO/DO Module (VSTAR-RD)

CE   TUV   EPA		
Dissolved Oxygen	<b>Concentration - Polarographic</b>	
	Range	0 to 90 mg/L
	Resolution	0.01, 0.1
	Relative Accuracy	$\pm 0.2$
	<b>% Saturation - Polarographic</b>	
	Range	0 to 600
	Resolution	0.1, 1
	Relative Accuracy	$\pm 2$ %
	<b>Concentration - RDO</b>	
	Range	0 to 50 mg/L
	Resolution	0.01, 0.1
	Relative Accuracy	$\pm 0.1$ mg/L up to 8 mg/L; $\pm 0.2$ mg/L from 8 to 20 mg/L; 10 % of reading, 20 to 50 mg/L
	<b>% Saturation - RDO</b>	
	Range	0 to 500
	Resolution	0.1, 1
	Relative Accuracy	$\pm 2$ %
	Automatic Barometric Pressure Correction	450.0 to 850.0 mm Hg
Temperature	Salinity Factor Correction	Automatic when used with conductivity module and probe or manual; 0 to 45 ppt
	Calibration Features	Water saturated air, air saturated water, manual (Winkler) and zero point
	Probe Type	Polarographic or RDO
	Range	0 to 50 °C, 32 to 122 °F
	Resolution	0.1
Temperature	Relative Accuracy	$\pm 0.1$
	Offset Calibration	1 point
Input		9-pin mini-DIN

#### Meter Ordering Information

Cat. No.	Description
VSTAR90	<b>Orion VERSA STAR pH/ISE/Conductivity/RDO/Dissolved Oxygen Benchtop Multiparameter Meter Set</b> - Orion VERSA STAR meter - Orion VERSA STAR pH/ISE/temperature module - Orion VERSA STAR conductivity/temperature module - Orion VERSA STAR dissolved oxygen/temperature module - Electrode arm with redesigned holder - Universal power adapter
VSTAR91	<b>Orion VERSA STAR pH/ISE/Conductivity/RDO/Dissolved Oxygen Ultimate Benchtop Multiparameter Meter Set</b> - Orion VERSA STAR meter - Two Orion VERSA STAR pH/ISE/temperature modules - Orion VERSA STAR conductivity/temperature module - Orion VERSA STAR dissolved oxygen/temperature module - Electrode arm with redesigned holder - Universal power adapter
VSTAR92	<b>Orion VERSA STAR pH/ISE/Conductivity/RDO/Dissolved Oxygen Benchtop Multiparameter Meter Kit</b> - Orion VERSA STAR meter - Orion VERSA STAR pH/ISE/temperature module - Orion VERSA STAR conductivity/temperature module - Orion VERSA STAR dissolved oxygen/temperature module - 8157BNUMD Orion ROSS Ultra Triode pH/ATC probe - 013005MD Orion DuraProbe conductivity cell, K=0.475 - 083005MD Orion polarographic DO probe - 096019 Orion Star stirrer probe - 080017 calibration sleeve for DO probe - 080513 DO probe maintenance kit - BOD adapter, funnel and stirrer - 810199 ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - 011007 conductivity standard, 1413 $\mu$ S, 5 x 60 mL - Electrode arm with redesigned holder - Universal power adapter
VSTAR93	<b>Orion VERSA STAR pH/ISE/Conductivity/RDO/Dissolved Oxygen Ultimate Benchtop Multiparameter Meter Kit</b> - Orion VERSA STAR meter - Two Orion VERSA STAR pH/ISE/temperature modules - Orion VERSA STAR conductivity/temperature module - Orion VERSA STAR dissolved oxygen/temperature module - 8157BNUMD Orion ROSS Ultra Triode pH/ATC probe - 013005MD Orion DuraProbe conductivity cell, K=0.475 - 083005MD Orion polarographic DO probe - 096019 Orion Star stirrer probe - 080017 calibration sleeve for DO probe - 080513 DO probe maintenance kit - BOD adapter, funnel and stirrer - 810199 ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - 011007 conductivity standard, 1413 $\mu$ S, 5 x 60 mL - Electrode arm with redesigned holder - Universal power adapter



- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp



## Thermo Scientific Orion VERSA STAR 40

### pH/ISE Benchtop Meters

Measuring pH/ISE has never looked so good or been so easy. The large color display is easy on to read and easy on the eyes. Prompts make accuracy and repeatability easy for even the most complicated testing. If you need to add more channels for more or obtain more parameters from the same, simply remove the protective individual channel cover and add the new module.

#### Features and Benefits

- Versatility is the name of the game
  - Change out modules to create the meter you need at any time
  - Customize the display to show only the information you need
- Up to 6 point pH calibration with automatic recognition for USA/NIST and DIN buffers and electrode identification
- This meter features advanced ISE capabilities to work with all ISE testing applications, even the most complex
  - Up to 6 point ISE calibration with timed end point and point-to-point or linear regression slope
  - Non-linear selectable auto-blank and low-concentration range stability
  - Incremental techniques for known or analyte addition and subtraction
  - Adjustable isopoint for temperature-compensated ISE results
- Fix errors without a complete recalibration with the calibration editing function
- Anyone can use this meter with its plain language screen prompts, function keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals or just once with single-shot mode
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Stores up to 10 methods per channel allow for customized procedures to differentiate between tests and/or users
- Two USB and a RS232 port makes for easy data transfer and updating meter software
- Includes data analysis software for easy transferring of stored results or real-time viewing
- Increase your productivity – two Orion Star stirrer probe ports allow for simultaneous stirring and control for two separate samples at the same time
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source through the included universal power adapter
- IP54-rated housing handles splashes and cleans up easily
- 3 year meter replacement warranty

#### Product Specifications – Orion VERSA STAR Meter

CE   TUV   EPA		
Maximum Number of Modules		4
Methods		Up to 10
Datalogging	Number of Datalogs	2000 with time and date stamp
	Log Function	Manual, AUTO-READ™, timed interval, single timed reading
Communication Ports		One RS232, two USB ports (one client, one host)
Orion Star Stirrer Probe Ports		2
Power		Universal, AC power adapter, 90-260 VAC, 50-60 Hz

#### Product Specifications – pH/ISE Module (VSTAR-ISE)

CE   TUV   EPA		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 6
	Calibration Editing	Yes
	Adjustable ISO Point	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>n</sub> ORP Mode	Yes
ISE	Range	0 to 19999
	Resolution	Up to 4 significant digits
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	Units	ppm, M, mg/L, %, ppb, none
	Calibration Points	Up to 6
	Calibration Editing	Yes
	Adjustable ISO Point	Yes
	Calibration Features	Timed end point, linear point to point, non-linear selectable auto-blank, low concentration range stability
	Incremental Techniques	Single known addition & subtraction, double known addition & subtraction, single analyte addition & subtraction
	Advanced Features	Displays electrode type, temperature compensation
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Inputs	pH/ISE	BNC, reference pin
	ATC	8-pin mini-DIN





That's not all.  
We have more to  
show you.

## Meter Ordering Information

Cat. No.	Description
<b>VSTAR40A</b>	<b>Orion VERSA STAR pH/ISE Benchtop Meter Set</b> - Orion VERSA STAR meter - Orion VERSA STAR pH/ISE/temperature module - Electrode arm with redesigned holder - Universal power adapter
<b>VSTAR40A2</b>	<b>Orion VERSA STAR pH/ISE Benchtop Meter Kit</b> - Orion VERSA STAR meter - Orion VERSA STAR pH/ISE/temperature module - 8102BNUWP Orion ROSS Ultra pH electrode - 096019 Orion Star stirrer probe - 927007MD ATC probe, stainless steel - ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - Electrode arm with redesigned holder - Universal power adapter
<b>VSTAR40B</b>	<b>Orion VERSA STAR Benchtop Meter with Two pH/ISE Modules Set</b> - Orion VERSA STAR meter - Two Orion VERSA STAR pH/ISE/temperature modules - Electrode arm with redesigned holder - Universal power adapter
<b>VSTAR40B2</b>	<b>Orion VERSA STAR Benchtop Meter with Two pH/ISE Modules Kit</b> - Orion VERSA STAR meter - Two Orion VERSA STAR pH/ISE/temperature modules - 8102BNUWP Orion ROSS Ultra pH electrode - 096019 Orion Star stirrer probe - 927007MD ATC probe, stainless steel - ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - Two electrode arms with redesigned holders - Universal power adapter

## Accessories

Cat. No.	Description
<b>VSTAR-PH</b>	Orion VERSA STAR pH/temperature module
<b>VSTAR-ISE</b>	Orion VERSA STAR pH/ISE/temperature module
<b>VSTAR-CND</b>	Orion VERSA STAR conductivity/temperature module
<b>VSTAR-RD</b>	Orion VERSA STAR RDO/DO/temperature module
<b>VSTAR-LR</b>	Orion VERSA STAR pH/temperature with LogR technology module
<b>STARA-BEA</b>	Benchtop electrode arm for Orion Star A-series meters
<b>STARA-HB</b>	Freestanding base for use with Orion Star A-series benchtop electrode arm
<b>STARA-PWR</b>	Replacement universal power adapter for Orion VERSA STAR meters
<b>096019</b>	Orion Star stirrer probe
<b>8102BNUWP</b>	Orion ROSS Ultra pH electrode, refillable, glass body
<b>8172BNWP</b>	Orion ROSS Sure-Flow pH electrode, glass body
<b>8156BNUWP</b>	Orion ROSS Ultra refillable pH electrode, epoxy body
<b>8157BNUMD</b>	Orion ROSS Triode pH/ATC electrode, refillable, epoxy body
<b>8302BNUMD</b>	Orion ROSS Triode pH/ATC electrode, refillable, glass body
<b>927007MD</b>	Orion ATC probe, stainless steel body
<b>927005MD</b>	Orion ATC probe, epoxy body
<b>013005MD</b>	Orion DuraProbe conductivity cell, 4-cell, K=0.475
<b>013016MD</b>	Orion conductivity cell, flow through, K=0.1
<b>083005MD</b>	Orion dissolved oxygen probe, polarographic
<b>086030MD</b>	Orion auto-stir DO/BOD probe, polarographic
<b>087010MD</b>	Orion RDO optical DO probe, 3 m cable
<b>810199</b>	Orion ROSS all-in-one pH buffer kit
<b>910104</b>	Orion pH 4.01 buffer, 475 mL
<b>910107</b>	Orion pH 7.00 buffer, 475 mL
<b>910110</b>	Orion pH 10.01 buffer, 475 mL
<b>011008</b>	Orion conductivity standard, 100 µS/cm, 5 x 60 mL bottles
<b>011007</b>	Orion conductivity standard, 1413 µS/cm, 5 x 60 mL bottles
<b>011006</b>	Orion conductivity standard, 12.9 mS/cm, 5 x 60 mL bottles
<b>1010001</b>	Orion conductivity calibration resistor kit
<b>9512HPBNWP</b>	Orion high-performance ammonia ISE
<b>9512BNWP</b>	Orion standard ammonia ISE
<b>951007</b>	Ammonia standard, 1000 ppm, 475 mL
<b>951210</b>	Low-level ammonia ISA
<b>951211</b>	Ammonia ISA, 475 mL
<b>951209</b>	Fill solution for Orion high-performance ammonia ISE, 60 mL
<b>951202</b>	Fill solution for standard ammonia ISE, 60 mL
<b>951213</b>	Ammonia ISE storage solution
<b>9609BNWP</b>	Orion fluoride combination ISE
<b>040906</b>	Fluoride standard, 1 ppm with TISAB II, 475 mL
<b>040907</b>	Fluoride standard, 2 ppm with TISAB II, 475 mL
<b>040908</b>	Fluoride standard, 10 ppm with TISAB II, 475 mL
<b>940909</b>	TISAB II, 1 gallon
<b>8611BNWP</b>	Orion ROSS sodium combination ISE with sodium standards



pH ■  
ISE ■  
ORP ■  
Cond ■  
RDO ■  
DO ■  
Temp ■



## Thermo Scientific Orion DUAL STAR™

Dual Channel pH/ISE Benchtop Meter

Display shows results, electrode status, ATC temperature and channel settings. If a method is selected, the number shows as well

Power key turns on/off the meter and adjusts backlighting

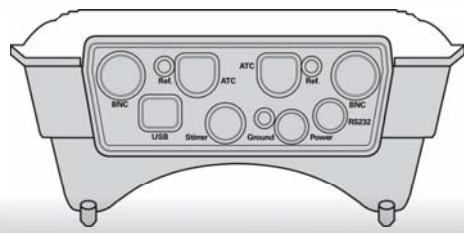
Shortcut keys for direct access to commonly used functions

Channel key toggles display to show both channels simultaneously or just one

Single channel display also shows electrode serial number, sample ID, date and time

Function keys update according to the menu for easy selection

Numeric keypad for easy data entry in submenus



### Features and Benefits

- Dual channel with simultaneously displayed measurements
- Low concentration range reading stability
- Known addition and subtraction incremental methods
- 5 language choices: English, Spanish, French, German and Italian
- Meter prompts and shortcut keys
- Thermo Scientific Orion EZ Startup™ for quick and easy meter set-up
- Thermo Scientific Orion SMART STABILITY™ and SMART AVERAGING™ for accurate and fast results
- E<sub>H</sub> ORP calibration capability
- 10 methods stored per channel – retains calibrations among multiple electrodes
- 1000 point datalogging with time and date stamping
- Calibration, high point and low point alarms
- Calibration graph with slope data for on-screen viewing
- Star stirrer probe controlled directly from the meter
- Autosampler compatibility
- 3 year meter replacement warranty





## Product Specifications

CE   TUV   EPA		
pH	Range	-2.000 to 19.999
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	1 to 6
	Auto-Buffer Recognition	USA/NIST and EURO/DIN
ISE	Range	0 to 19999
	Resolution	1,2 or 3 significant digits
	Relative Accuracy	±0.2 mV or 0.05 %, whichever is greater
	Units	ppm, ppb, M, % or unitless
	Technique Options	Single known addition and subtraction Double known addition and subtraction
	Calibration Points	2 to 6
mV/ Rel mV/ ORP	Calibration Options	Linear, point to point, non-linear selectable auto-bank
	Range	±1999.9
	Resolution	0.1
	Relative Accuracy	±0.2 or 0.05 %, whichever is greater
Temperature	E <sub>n</sub> Calibration Capability	Yes
	Range	-5 to 105 °C
	Resolution	0.1
	Relative Accuracy	±0.1 °C

## Features

Backlight	5 adjustable levels
Method Storage	20 (10 per channel with calibration data)
Password Protection	Yes
Datalog Points	1000 with time/date stamp
Data Transfer	RS232, USB
IP Rating	IP54
Power	Universal AC adapter (110V/220V/240V) included with meter
Warranty	36 months replacement

## Meter Ordering Information

Cat. No.	Description
2115000	- Orion DUAL STAR pH/ISE meter - Stainless steel ATC probe (927007MD) - Swing arm electrode stand (090043) - RS232 cable (1010053) - Universal power adapter - User guide
2115101	- Orion DUAL STAR pH/ISE meter - 8102BNUWP ROSS Ultra® pH electrode - Stainless steel ATC probe (927007MD) - RS232 cable (1010053) - Swing arm electrode stand (090043) - Universal power adapter - User guide
2115102	- Orion DUAL STAR pH/ISE meter - 8157BNUMD ROSS Ultra pH/ATC Triode™ refillable electrode - RS232 cable (1010053) - Universal power adapter - User guide
2115001	- Orion DUAL STAR pH/ISE meter - 8102BNUWP ROSS Ultra pH electrode - Stainless steel ATC probe (927007MD) - RS232 cable (1010053) - Swing arm electrode stand (090043) - Pint of pH 4.01 buffer (910104) - Pint of pH 7.00 buffer (910107) - Pint of pH 10.01 buffer (910110) - Pint of ROSS® electrode storage solution (810001) - Universal power adapter - User guide

## Accessories

Cat. No.	Description
096019	Thermo Scientific Orion stirrer probe with paddle
910104	pH 4.01 buffer, 475 mL
910107	pH 7.00 buffer, 475 mL
910110	pH 10.01 buffer, 475 mL



- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp



## Thermo Scientific Orion Star A214 pH/ISE Benchtop Meter

The Thermo Scientific Orion Star A214 pH/ISE Benchtop Meter is the ideal choice for dedicated ISE analysis. Whether you use ISE infrequently or have multiple samples every day, get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows pH/mV/RmV/ISE results and temperature along with electrode status, time, date, sample ID, user ID and calibration points. For advanced users, features such as stability and averaging choices provide additional options.

Keep turning the pages for more great finds.



### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Up to 5 point pH calibration with automatic recognition for USA/NIST and DIN buffers
- Up to 5 point ISE calibration with advanced features such as timed end point, linear point-to-point, non-linear selectable auto-blank and low-concentration range stability
- Fix errors without a complete recalibration with the calibration editing function
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Mix samples without a stir plate with direct control of the Orion Star stirrer probe (096019, sold separately)
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source with the included universal power adapter, or use four AA batteries (sold separately) to run the meter on DC power
- IP54-rated housing handles splashes and is wall-mountable if table space is a problem
- 3 year meter replacement warranty



## Product Specifications

CE   TUV   FCC		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 5
	Calibration Editing	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>n</sub> ORP Mode	Yes
ISE	Range	0 to 19999
	Resolution	Up to 3 significant digits
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	Units	ppm, M, mg/L, %, ppb, none
	Calibration Points	Up to 5
	Calibration Editing	Yes
	Calibration Features	Timed end point, linear point to point, non-linear selectable auto-blank, low concentration range stability
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Datalogging	Number of Datalogs	2000 with time and date stamp
	Log Function	Manual, ready (include AUTO-READ™), timed
Inputs	pH Electrode	BNC, reference pin
	ATC Probe	8-pin mini-DIN
Output		RS232, USB
Power	AC Adapter	Included – universal, 100-240 VAC
	Battery Power	Optional – 4 AAs
	Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
STARA2140	<b>Orion Star A214 pH/ISE Benchtop Meter</b> - Electrode arm with redesigned holder - Universal power adapter
STARA2145	<b>Orion Star A214 pH/ISE Benchtop Meter Kit</b> - 8102BNUWP Orion ROSS Ultra pH electrode - 927007MD ATC probe, stainless steel - 096019 Orion Star stirrer probe - 810199 ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - Electrode arm with redesigned holder - Universal power adapter
STARA2146	<b>Orion Star A214 pH/ISE Benchtop Meter Kit for Ammonia</b> - 8102BNUWP Orion ROSS Ultra pH electrode - 9512HPBNWP Orion high-performance Ammonia ISE - 927007MD ATC probe, stainless steel - 096019 Orion Star stirrer probe - 951007 Orion Ammonia 1000 ppm standard, 475 mL - 951210 Orion Low-level Ammonia ISA - 951213 Ammonia ISE storage solution - Electrode arm with redesigned holder - Universal power adapter
STARA2147	<b>Orion Star A214 pH/ISE Benchtop Meter Kit for Fluoride</b> - 8102BNUWP Orion ROSS Ultra pH electrode - 9609BNWP Orion fluoride ISE - 927007MD ATC probe, stainless steel - 096019 Orion Star stirrer probe - 040906 Orion fluoride standard, 1 ppm with TISABII, 475 mL - 040907 Orion fluoride standard, 2 ppm with TISABII, 475 mL - 040908 Orion fluoride standard, 10 ppm with TISAB II, 475 mL - 940909 Orion TISABII solution, 1 gallon - Electrode arm with redesigned holder - Universal power adapter
STARA2148	<b>Orion Star A214 pH/ISE Benchtop Meter Kit for Sodium</b> - 8102BNUWP Orion ROSS Ultra pH electrode - 8611BNWP Orion ROSS sodium ISE with sodium standards - 927007MD ATC probe, stainless steel - 096019 Orion Star stirrer probe - Electrode arm with redesigned holder - Universal power adapter

## Accessories

Cat. No.	Description
810199	Orion ROSS All-in-One pH buffer kit
951007	Ammonia standard, 1000 ppm, 475 mL
951210	Low-level ammonia ISA
951211	Ammonia ISA, 475 mL
040906	Fluoride standard, 1 ppm with TISAB II, 475 mL
040907	Fluoride standard, 2 ppm with TISAB II, 475 mL
040908	Fluoride standard, 10 ppm with TISAB II, 475 mL
940909	TISAB II, 1 gallon

pH

ISE

ORP

Cond

RDO

DO

Temp





## Thermo Scientific Orion VERSA STAR 50

### pH/Conductivity Benchtop Meters

Ideal for checking solution conductivity and follow-up pH testing. The large color display is easy to read and easy on the eyes. Prompts make accuracy and repeatability easy for even the most complicated testing. If you need to add more channels for more or obtain more parameters from the same, simply remove the protective individual channel cover and add the new module.

#### Features and Benefits

- Versatility is the name of the game
  - Customize the display to show only the information you need
  - Change out modules to create the meter you need at any time
- Up to 6 point pH calibration with automatic recognition for USA/NIST and DIN buffers and electrode identification
- Fix errors without a complete recalibration with the calibration editing function
- Conductivity, TDS, salinity or resistivity capabilities
  - Selectable reading reference temperatures of 5, 10, 15, 20 or 25 °C
  - Linear, non-linear, nLFu or USP/EP curve options to get the most accurate conductivity result for your sample and temperature
  - Choice of practical salinity or natural sea water curves for salinity readings
  - Linear or ISO/EN 27888 curves for TDS
- Anyone can use this meter with its plain language screen prompts, function keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals or just once with the single-shot mode
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Stores up to 10 methods per channel allow for customized procedures to differentiate between tests and/or users
- Two USB and a RS232 port makes for easy data transfer and updating meter software
- Includes data analysis software for easy transferring of stored results or real-time viewing
- Control sample mixing directly from the meter without a separate stir plate when using with the Orion Star stirrer probe (cat. no. 096019, sold separately)
- Increase your productivity – with two stirrer probe ports, add stirrers and modules to analyze two separate samples at the same time
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source through the included universal power adapter
- IP54-rated housing handles splashes and cleans up easily
- 3 year meter replacement warranty

#### Product Specifications – Orion VERSA STAR Meter

CE   TUV   EPA		
Maximum Number of Modules		4
Methods		Up to 10
Datalogging	Number of Datalogs	2000 with time and date stamp
	Log Function	Manual, AUTO-READ™, timed interval, single timed reading
Communication Ports		One RS232, two USB ports (one client, one host)
Orion Star Stirrer Probe Ports		2
Power		Universal, AC power adapter, 90-260 VAC, 50-60 Hz

#### Product Specifications – pH Module (VSTAR-PH)

CE   TUV   EPA		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 6
	Calibration Editing	Yes
	Adjustable ISO Point	Yes
mV/Rel mV/ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>n</sub> ORP Mode	Yes
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Inputs	pH/ISE	BNC, reference pin
	ATC	8-pin mini-DIN



## Product Specifications – Conductivity Module (VSTAR-CND) Meter Ordering Information

CE   TUV   EPA		
Conductivity	Range	0.001 $\mu$ S to 3000 mS
	Resolution	0.001 $\mu$ S minimum; 4 significant figures minimum
	Relative Accuracy	0.5 % reading $\pm$ 1 digit
	Reference Temperature	5, 10, 15, 20, 25 $^{\circ}$ C
	Temperature Compensation	Linear (0 to 10.0 $\%$ / $^{\circ}$ C), nLn, nLFu, USP/EP
	Compatible Cell Constants	0.001 to 199.9
	Calibration Points	Up to 6 points
Resistivity	Calibration Editing	Yes
	Range	2 ohm to 100 meg-ohm
	Resolution	2 ohms-cm
Salinity	Relative Accuracy	0.5 % reading $\pm$ 1 digit
	Type	Practical salinity or natural sea water
	Range	0.01 to 80.0 psu 0.01 to 42 ppt sea water
	Resolution	0.01
TDS	Relative Accuracy	$\pm$ 0.1
	Range	0 to 200 ppt
	Resolution	4 significant digits
	Relative Accuracy	$\pm$ 0.5 % reading $\pm$ 1 digit
Temperature	TDS Factor Range	Linear 0.01 to 10.00
	Range	-5 to 105 $^{\circ}$ C, 23 to 221 $^{\circ}$ F
	Resolution	0.1
	Relative Accuracy	$\pm$ 0.1
Inputs	Offset Calibration	1 point
	Inputs	8-pin mini-DIN

Cat. No.	Description
VSTAR50	<b>Orion VERSA STAR pH/Conductivity Benchtop Meter Set</b> - Orion VERSA STAR meter - Orion VERSA STAR pH/temperature module - Orion VERSA STAR conductivity/temperature module - Electrode arm with redesigned holder - Universal power adapter
	<b>Orion VERSA STAR pH/Conductivity Benchtop Meter Kit</b> - Orion VERSA STAR meter with pH/temperature module - Orion VERSA STAR conductivity/temperature module - 8157BNUMD Orion ROSS Ultra Triode pH/ATC probe - 013005MD Orion DuraProbe conductivity cell, K=0.475 - 810199 ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - 011007 conductivity standard, 1413 $\mu$ S, 5 x 60 mL - Electrode arm with redesigned holder - Universal power adapter

### Accessories

Cat. No.	Description
VSTAR-PH	Orion VERSA STAR pH/temperature module
VSTAR-ISE	Orion VERSA STAR pH/ISE/temperature module
VSTAR-CND	Orion VERSA STAR conductivity/temperature module
VSTAR-RD	Orion VERSA STAR RDO/DO/temperature module
VSTAR-LR	Orion VERSA STAR pH/temperature with LogR technology module
STARA-BEA	Benchtop electrode arm for Orion Star A-series meters
STARA-HB	Freestanding base for use with Orion Star A-series benchtop electrode arm
STARA-PWR	Replacement universal power adapter for Orion VERSA STAR meters
096019	Orion Star stirrer probe
8102BNUWP	Orion ROSS Ultra pH electrode, refillable, glass body
8172BNWP	Orion ROSS Sure-Flow pH electrode, glass body
8156BNUWP	Orion ROSS Ultra refillable pH electrode, epoxy body
8157BNUMD	Orion ROSS Triode pH/ATC electrode, refillable, epoxy body
8302BNUMD	Orion ROSS Triode pH/ATC electrode, refillable, glass body
927007MD	Orion ATC probe, stainless steel body
927005MD	Orion ATC probe, epoxy body
013005MD	Orion DuraProbe conductivity cell, 4-cell, K=0.475
013016MD	Orion conductivity cell, flow through, K=0.1
810199	Orion ROSS all-in-one pH buffer kit
910104	Orion pH 4.01 buffer, 475 mL
910107	Orion pH 7.00 buffer, 475 mL
910110	Orion pH 10.01 buffer, 475 mL
011008	Orion conductivity standard, 100 $\mu$ S/cm, 5 x 60 mL bottles
011007	Orion conductivity standard, 1413 $\mu$ S/cm, 5 x 60 mL bottles
011006	Orion conductivity standard, 12.9 mS/cm, 5 x 60 mL bottles
1010001	Orion conductivity calibration resistor kit



pH

ISE

ORP

Cond

RDO

DO

Temp



## Thermo Scientific Orion Star A215 pH/Conductivity Benchtop Meter

The Thermo Scientific Orion Star A215 pH/Conductivity Benchtop Meter is the ideal choice for any pharmacology lab. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows individual pH/mV/RmV or conductivity/TDS/salinity/resistivity results with temperature, or all results at once. Additional helpful information includes electrode status, time, date, sample ID, user ID and calibration. For advanced users, features such as stability and averaging choices provide additional options.



### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Up to 5 point pH calibration with automatic recognition for USA/NIST and DIN buffers and calibration editing to fix errors without a complete recalibration
- Selectable cell constant allows for use with 2- or 4-cell conductivity cells
- For accurate conductivity results, selectable reading reference temperatures of 5, 10, 15, 20 or 25 °C with linear, non-linear, nLFu or USP/EP curve options
- Choice of practical salinity or natural sea water curves for salinity readings
- Linear or ISO/EN 27888 curves for TDS
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Mix samples without a stir plate with direct control of the Orion Star stirrer probe (096019, sold separately)
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source with the included universal power adapter, or use four AA batteries (sold separately) to run the meter on DC power
- IP54-rated housing handles splashes and is wall-mountable if table space is a problem
- 3 year meter replacement warranty





## Product Specifications

CE   TUV   FCC		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 5
	Calibration Editing	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>r</sub> ORP Mode	Yes
Conductivity	Range	0.001 µS to 3000 mS
	Resolution	0.001 µS minimum; 4 significant figures minimum
	Relative Accuracy	0.5 % reading ±1 digit
	Reference Temperature	5, 10, 15, 20, 25 °C (default)
	Temperature Compensation	Linear (0 to 10.0 %/°C), nLn, nLFu, USP/EP
	Compatible Cell Constants	0.001 to 199.9
	Calibration Points	Up to 5 points
	Calibration Editing	Yes
Resistivity	Range	2 ohm to 100 meg-ohm
	Resolution	2 ohms-cm
	Relative Accuracy	0.5 % reading ±1 digit
Salinity	Type	Practical salinity or natural sea water
	Range	0.01 to 80.0 psu 0.01 to 42 ppt sea water
	Resolution	0.01
	Relative Accuracy	±0.1
TDS	Range	1 to 200 ppt
	Resolution	4 significant digits
	Relative Accuracy	0.5 % reading ±1 digit
	TDS Factor Range	Linear 0.01 to 10.00, default 0.49
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Datalogging	Number of Datalogs	2000 with time and date stamp
	Log Function	Manual, ready (include AUTO-READ™), timed
Inputs	pH Electrode	BNC, reference pin
	Conductivity with Temperature Probe or ATC Probe	8-pin mini-DIN
	Output	RS232, USB
Power	AC Adapter	Included – universal, 100-240 VAC
	Battery Power	Optional – 4 AAs
	Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
STARA2150	<b>Orion Star A215 pH/Conductivity Benchtop Multiparameter Meter</b> - Electrode arm with redesigned holder - Universal power adapter
STARA2155	<b>Orion Star A215 pH/Conductivity Benchtop Multiparameter Meter Kit</b> - 8157BNUMD Orion ROSS Ultra Triode pH/ATC electrode - 013005MD Orion DuraProbe conductivity cell - ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - 011007 Orion 1413 µS conductivity standard, 5 x 60 mL - Electrode arm with redesigned holder - Universal power adapter

## Accessories

Cat. No.	Description
096019	Orion Star stirrer probe
STARA-BEA	Benchtop electrode arm for Orion Star A-series meters
STARA-HB	Freestanding base for use with Orion Star A-series benchtop electrode arm
8302BNUMD	Orion ROSS Triode 3-in-1 pH/ATC probe, refillable, glass body
8102BNUWP	Orion ROSS Ultra refillable pH electrode, glass body
927007MD	Orion ATC probe, stainless steel
810199	Orion ROSS All-in-One pH buffer kit
910104	Orion pH 4.01 buffer, 475 mL
910107	Orion pH 7.00 buffer, 475 mL
910110	Orion pH 10.01 buffer, 475 mL
013005MD	Orion DuraProbe conductivity cell, 4-cell, K=0.475
013016MD	Orion 2-electrode conductivity cell with flow cell, K=0.1
011008	Orion conductivity standard, 100 µS/cm, 5 x 60 mL bottles
011007	Orion conductivity standard, 1413 µS/cm, 5 x 60 mL bottles
011006	Orion conductivity standard, 12.9 mS/cm, 5 x 60 mL bottles
1010001	Orion conductivity calibration resistor kit

We have more to excite you. Turn the page to find out!

- pH ■
- ISE ■
- ORP ■
- Cond ■
- RDO ■
- DO ■
- Temp ■



## Thermo Scientific Orion Star A216

### pH/RDO/Dissolved Oxygen Benchtop Meter

The Thermo Scientific Orion Star A216 pH/RDO/Dissolved Oxygen Benchtop Meter is great for checking pH and dissolved oxygen levels at the same time from various wastewater samples. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows individual pH/mV/RmV result, dissolved oxygen in percent saturation or concentration results with temperature, or all results at once. Additional helpful information includes electrode status, time, date, sample ID, user ID and calibration. For advanced users, features such as stability and averaging choices provide additional options.



### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Up to 5 point pH calibration with automatic recognition for USA/NIST and DIN buffers and calibration editing to fix errors without a complete recalibration
- No need to worry about DO probe compatibility – the meter accepts and automatically recognizes Orion polarographic and RDO optical/luminescence-based probes
- Accurate DO results are easier with automatic temperature, manual salinity and automatic/manual barometric pressure compensation
- Calibrate DO by using water-saturated air, air-saturated water, a Winkler titration or zero point calibration
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- To mix samples without a stir plate or for faster BOD readings, meter can directly control the 096019 Orion Star stirrer or 086030MD Orion AUTO-STIR™ DO probes (each sold separately)
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source with the included universal power adapter, or use four AA batteries (sold separately) to run the meter on DC power
- IP54-rated housing handles splashes and is wall-mountable if table space is a problem
- 3 year meter replacement warranty



## Product Specifications

CE   TUV   FCC		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 5
	Calibration Editing	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>n</sub> ORP Mode	Yes
Dissolved Oxygen	<b>Concentration - Polarographic</b>	
	Range	0 to 90 mg/L
	Resolution	0.01, 0.1
	Relative Accuracy	±0.2
	<b>% Saturation - Polarographic</b>	
	Range	0 to 600
	Resolution	0.1, 1
	Relative Accuracy	±2 %
	<b>Concentration - RDO</b>	
	Range	0 to 50 mg/L
	Resolution	0.01, 0.1
	Relative Accuracy	±0.1 mg/L up to 8 mg/L; ±0.2 mg/L from 8 to 20 mg/L; 10 % of reading from 20 to 50 mg/L
	<b>% Saturation - RDO</b>	
	Range	0 to 500
	Resolution	0.1, 1
	Relative Accuracy	±2 %
	Manual Barometric Pressure Correction	450.0 to 850.0 mm Hg
	Manual Salinity Factor Correction	0 to 45 ppt
	Calibration Features	Water-saturated air, air saturated water, manual (Winkler) and zero point
	Probe Characteristics	Polarographic or RDO
Temperature	Range	0 to 50 °C, 32 to 122 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Datalogging	Number of Datalogs	2000 with time and date stamp
	Log Function	Manual, ready (includes AUTO-READ™), timed
Inputs	pH Electrode	BNC, reference pin
	DO with Temp. Probe	9-pin mini-DIN
Output		RS232, USB
Power	AC Adapter	Optional – universal, 100-240 VAC
	Battery Power	Optional – 4 AAs
	Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
STARA2160	<b>Orion Star A216 pH/Dissolved Oxygen Benchtop Multiparameter Meter</b> - Electrode arm with redesigned holder - Universal power adapter
STARA2165	<b>Orion Star A216 pH/Dissolved Oxygen Benchtop Multiparameter Meter Kit</b> - 8157BNUMD Orion ROSS Ultra Triode pH/ATC electrode - 083005MD Orion polarographic DO probe with calibration sleeve - 080513 polarographic DO probe maintenance kit - BOD adapter, funnel and stirrer - 810199 ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - Electrode arm with redesigned holder - Universal power adapter

## Accessories

Cat. No.	Description
096019	Orion Star stirrer probe
STARA-BEA	Benchtop electrode arm for Orion Star A-series meters
STARA-HB	Freestanding base for use with Orion Star A-series benchtop electrode arm
8302BNUMD	Orion ROSS Triode 3-in-1 pH/ATC probe, refillable, glass body
8102BNUWP	Orion ROSS Ultra refillable pH electrode, glass body
927007MD	Orion ATC probe, stainless steel
810199	Orion ROSS All-in-One pH buffer kit
910104	Orion pH 4.01 buffer, 475 mL
910107	Orion pH 7.00 buffer, 475 mL
910110	Orion pH 10.01 buffer, 475 mL
083005MD	Orion polarographic DO probe, 1.5m cable
086030MD	Orion polarographic AUTO-STIR DO/BOD probe, 1.5m cable
087010MD	Orion RDO optical DO probe, 3m cable with stainless steel guard and calibration sleeve
970802	Orion BOD funnel and stirrer for use with polarographic probes
080360	Orion BOD bottle adapter for use with polarographic probes

- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp





## Thermo Scientific Orion VERSA STAR 10 & 80 pH and pH with LogR™ Technology Benchtop Meters

Routine pH measurements are quick and easy with the Orion VERSA STAR 10 and 80 pH benchtop meters. The large color display is easy on to read and easy on the eyes. Prompts make accuracy and repeatability easy for even the most complicated testing. If you need to add more channels for more or obtain more parameters from the same, simply remove the protective individual channel cover and add the new module.

The Orion VERSA STAR 10 pH benchtop meter comes complete with a single channel pH module, offering:

- Up to 6 point pH calibration with automatic recognition for USA/NIST and DIN buffers and electrode identification
- The time-saving option to fix errors without a complete recalibration with the calibration editing function

The Orion VERSA STAR 80 pH with LogR technology benchtop meter includes one LogR module, which fits easily into two channel slots. This technology allows for:

- Having all the features of the VERSA STAR 10 pH benchtop meter
- Preventing wasted efforts and time from bad electrodes by offering the most advanced electrode diagnostics
- Using even less of those expensive samples for testing and still getting accurate pH results since LogR technology allows for temperature-compensated pH readings without a temperature sensor

### Features and Benefits

- Versatility is the name of the game
  - Customize the display to show only the information you need
  - Change out modules to create the meter you need at any time
- Anyone can use this meter with its plain language screen prompts, function keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals or just once with single-shot mode
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Stores up to 10 methods per channel allow for customized procedures to differentiate between tests and/or users
- Two USB and a RS232 port makes for easy data transfer and updating meter software
- Includes data analysis software for easy transferring of stored results or real-time viewing

- Control sample mixing directly from the meter without a separate stir plate when using with the Orion Star stirrer probe (cat. no. 096019, sold separately)
- Increase your productivity – with two Orion stirrer probe ports, add stirrers and modules to analyze two separate samples at the same time
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source through the included universal power adapter
- IP54-rated housing handles splashes and cleans up easily
- 3 year meter replacement warranty

### Product Specifications – Orion VERSA STAR Meter

CE   TUV   EPA		
Maximum Number of Modules		4
Methods		Up to 10
Datalogging	Number of Datalogs	2000 with time and date stamp
	Log Function	Manual, AUTO-READ™, timed interval, single timed reading
Communication Ports		One RS232, two USB ports (one client, one host)
Orion Star Stirrer Probe Ports		2
Power		Universal, AC power adapter, 90-260 VAC, 50-60 Hz





## Product Specifications – pH Module (VSTAR-PH)

CE   TUV   EPA		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 6
	Calibration Editing	Yes
	Adjustable ISO Point	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>n</sub> ORP Mode	Yes
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Inputs	pH/ISE	BNC, reference pin
	ATC	8-pin mini-DIN

## Product Specifications – pH/LogR Module (VSTAR-LR)

CE   TUV   EPA		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 6
	Calibration Editing	Yes
	Adjustable ISO Point	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>n</sub> ORP Mode	Yes
LogR Temperature	Range	0 to 100 °C, 32 to 212 °F
	Resolution	0.1
	Relative Accuracy	±0.5
	Resistance Range	0 to 6000 MΩ
	Resistance Resolution	0.1 MΩ up to 1999.9 MΩ, 1 MΩ above 1999.9 MΩ
	Offset Calibration	Up to 3 points
	Calibration Options	ATC probe, NIST reference
	Range	-5 to 105 °C, 23 to 221 °F
Temperature Measurement without LogR In-Use	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
	Range	-5 to 105 °C, 23 to 221 °F
Inputs	pH	BNC, reference pin
	ATC	8-pin mini-DIN

## Meter Ordering Information

Cat. No.	Description
VSTAR10	<b>Orion VERSA STAR pH Benchtop Meter Set</b> - Orion VERSA STAR meter with pH/temperature module - Electrode arm with redesigned holder - Universal power adapter
VSTAR12	<b>Orion VERSA STAR pH Benchtop Meter Kit</b> - Orion VERSA STAR meter with pH/temperature module - 8302BNUMD Orion ROSS Triode pH/ATC probe - 096019 Orion Star stirrer probe - 810199 ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - Electrode arm with redesigned holder - Universal power adapter
VSTAR80	<b>Orion VERSA STAR pH with LogR Benchtop Meter Set</b> - Orion VERSA STAR meter - Orion VERSA STAR pH/temperature with LogR technology module - 927007MD ATC probe, stainless steel - Electrode arm with redesigned holder - Universal power adapter
VSTAR82	<b>Orion VERSA STAR pH Benchtop Meter Kit</b> - Orion VERSA STAR meter - Orion VERSA STAR pH/temperature with LogR technology module - 8172BNWP Orion ROSS Sure-Flow pH electrode - 927007MD ATC probe, stainless steel - ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - 810007 ROSS fill solution, 5 x 60 mL - Electrode arm with redesigned holder - Universal power adapter

Continue flipping through to discover more!

## Accessories

Cat. No.	Description
VSTAR-ISE	Orion VERSA STAR pH/ISE/temperature module
VSTAR-CND	Orion VERSA STAR conductivity/temperature module
VSTAR-RD	Orion VERSA STAR RDO/DO/temperature module
096019	Orion Star stirrer probe
8102BNUWP	Orion ROSS Ultra pH electrode, refillable, glass body
8172BNWP	Orion ROSS Sure-Flow pH electrode, glass body
8156BNUWP	Orion ROSS Ultra refillable pH electrode, epoxy body
8157BNUMD	Orion ROSS Triode pH/ATC electrode, refillable, epoxy body
8302BNUMD	Orion ROSS Triode pH/ATC electrode, refillable, glass body
927007MD	Orion ATC probe, stainless steel body
927005MD	Orion ATC probe, epoxy body
810199	Orion ROSS all-in-one pH buffer kit
910104	Orion pH 4.01 buffer, 475 mL
910107	Orion pH 7.00 buffer, 475 mL
910110	Orion pH 10.01 buffer, 475 mL

pH ■  
ISE ■  
ORP ■  
Cond ■  
RDO ■  
DO ■  
Temp ■



## Thermo Scientific Orion Star A211 pH Benchtop Meter

The Thermo Scientific Orion Star A211 pH Benchtop Meter is the ideal choice for dedicated pH testing in water, process, research and QA/QC samples. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows pH/mV/RmV and temperature along with electrode status, time, date, sample ID, user ID and calibration points. For advanced users, features such as stability and averaging choices provide additional options.



### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Up to 5 point pH calibration with automatic recognition for USA/NIST and DIN buffers
- Fix calibration errors without a complete recalibration with calibration editing
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Mix samples without a stir plate with direct control of the Orion Star stirrer probe (096019, sold separately)
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source with the included universal power adapter, or use four AA batteries (sold separately) to run the meter on DC power
- IP54-rated housing handles splashes and is wall-mountable if table space is a problem
- 3 year meter replacement warranty







## Product Specifications

CE   TUV   FCC		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 5
	Calibration Editing	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>a</sub> ORP Mode	Yes
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Datalogging	Number of Datalogs	2000 with time and date stamp
	Log Function	Manual, ready (includes AUTO-READ™), timed
Inputs	pH Electrode	BNC, reference pin
	ATC Probe	8-pin mini-DIN
Output		RS232, USB
Power	AC Adapter	Included – universal, 100-240 VAC
	Battery Power	Optional – 4 AAs
	Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
STARA2110	<b>Orion Star A211 pH Benchtop Meter</b> - Electrode arm with redesigned holder - Universal power adapter
STARA2115	<b>Orion Star A211 pH Benchtop Meter Kit</b> - 8302BNUMD Orion ROSS Triode 3-in-1 pH/ATC probe - 810199 ROSS solution kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; cleaning solution; and pH electrode storage bottle) - Electrode arm with redesigned holder - Universal power adapter
STARA2116	<b>Orion Star A211 pH Benchtop Meter Kit with pH/ATC Triode Electrode</b> - 8157BNUMD Orion ROSS Ultra pH/ATC Triode electrode with epoxy body, refillable - 810199 All-in-One pH Buffer Kit (475 mL each of pH 4, 7 and 10 buffers; storage solution; and pH electrode storage bottle) - Electrode arm with redesigned holder - Universal power adapter

## Accessories

Cat. No.	Description
096019	Orion Star stirrer probe
STARA-BEA	Benchtop electrode arm for Orion Star A-series meters
STARA-HB	Freestanding base for use with Orion Star A-series benchtop electrode arm
8302BNUMD	Orion ROSS Triode 3-in-1 pH/ATC probe, refillable, glass body
8102BNUWP	Orion ROSS Ultra refillable pH electrode, glass body
927007MD	Orion ATC probe, stainless steel
810199	Orion ROSS All-in-One pH buffer kit
910199	Orion Standard All-in-One pH buffer kit
910104	Orion pH 4.01 buffer, 475 mL
910107	Orion pH 7.00 buffer, 475 mL
910110	Orion pH 10.01 buffer, 475 mL

pH

ISE

ORP

Cond

RDO

DO

Temp



## Thermo Scientific Orion Star A111 pH Benchtop Meter

Thermo Scientific Orion Star A111 pH Benchtop Meters combine simplicity with accuracy for dedicated pH applications. A large LCD displays pH or mV readings along with temperature. Icons provide quick updates on battery life, electrode status and calibration information. Simple button layout and onscreen messages help with calibration and setup menu choices.

### Features and Benefits

- Large, informative screen clearly shows the main information, including pH or mV reading, temperature in °C or °F, meter mode, calibration information and power source
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen and ready indicator alerts when readings are stable
- Up to 3 point pH calibration
- Automatic recognition of USA/NIST and DIN buffers
- Easily recall calibration slope data for procedure checks
- Non-volatile memory holds up to 50 data points
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Plug the meter into almost any power outlet with the included universal power adapter, or use four AA batteries (sold separately) to run the meter on DC power
- The IP54-rated housing can handle splashes and can be wall-mounted if table space is a problem
- 3 year meter replacement warranty





## Product Specifications

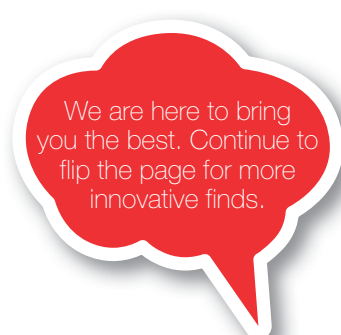
CE   TUV   FCC		
pH	Range	-2.00 to 16.00
	Resolution	0.1, 0.01
	Relative Accuracy	±0.01
	pH Calibration Points	Up to 3
mV/Rel mV/ ORP	Range - mV	±1600.0 mV
	Range - RmV	±1999.9 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>n</sub> ORP Mode	No
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Temperature Compensation	Automatic or manual
Datalogging	Temperature Offset Calibration	Yes
	Number of Datalogs	50
Inputs	Log Function	Manual, Automatic with AUTO-READ™
	pH Electrode	BNC
Power	ATC Probe	8-pin mini-DIN
	AC Adapter	Included – universal, 100-240 VAC
	Battery Power	Optional – 4 AAs
	Battery Life	2000 hrs

## Meter Ordering Information

Cat. No.	Description
STARA1110	<b>Orion Star A111 pH Benchtop Meter</b> - Electrode arm with redesigned holder - Universal power adapter
STARA1115	<b>Orion Star A111 pH Benchtop Meter Kit</b> - 9157BNMD Orion Triode 3-in-1 pH/ATC probe - Solution kit (60 mL each of pH 4, 7 and 10 buffers; storage solution and cleaning solution) - Electrode arm with redesigned holder - Universal power adapter
STARA1116	<b>Orion Star A111 pH Benchtop Meter Kit with TRIS-compatible Electrode</b> - GD9156BNWP Orion Green combination double-junction refillable pH electrode with epoxy body - 927007MD stainless steel ATC probe - Electrode arm with redesigned holder - Universal power adapter

## Accessories

Cat. No.	Description
STARA-BEA	Benchtop electrode arm for Orion Star A-series meters
STARA-HB	Freestanding base for use with Orion Star A-series benchtop electrode arm
9157BNMD	Orion Triode 3-in-1 pH/ATC probe, refillable, epoxy body
9107BNMD	Orion Triode 3-in-1 pH/ATC probe, gel-filled, epoxy body
910199	Orion Standard All-in-One pH buffer kit - 475 mL each of 4.01, 7.00 and 10.01 buffers and pH electrode storage solution with pH electrode storage bottle
810199	Orion ROSS All-in-One pH buffer kit
910104	Orion pH 4.01 buffer, 475 mL
910107	Orion pH 7.00 buffer, 475 mL
910110	Orion pH 10.01 buffer, 475 mL
910001	Orion pH electrode storage solution, 475 mL
916099	Orion pH buffer assortment pack – 60 mL each of pH 4, 7 and 10 buffers; storage solution and cleaning solution D



- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp



## Thermo Scientific Orion VERSA STAR 20

Conductivity Benchtop Meters

Conductivity tests can be as clear as ultrapure water samples. The large color display is easy on to read and easy on the eyes. Prompts make accuracy and repeatability easy for even the most complicated testing. If you need to add more channels for more or obtain more parameters from the same, simply remove the protective individual channel cover and add the new module.



### Features and Benefits

- Versatility is the name of the game
  - Customize the display to show only the information you need
  - Change modules to create the meter you need at any time
- Selectable reading reference temperatures of 5, 10, 15, 20 or 25 °C
- Linear, non-linear, nLFu or USP/EP curve options to get the most accurate conductivity result for your sample and temperature
- Choice of practical salinity or natural sea water curves for salinity readings
- Linear or ISO/EN 27888 curves for TDS
- Anyone can use this meter with its plain language screen prompts, function keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals or just once with single-shot mode
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Stores up to 10 methods per channel allow for customized procedures to differentiate between tests and/or users
- Two USB and a RS232 port makes for easy data transfer and updating meter software
- Includes data analysis software for easy transferring of stored results or real-time viewing
- Control sample mixing directly from the meter without a separate stir plate when using with the Orion Star stirrer probe (cat. no. 096019, sold separately)
- Increase your productivity – with two Orion stirrer probe ports, add stirrers and modules to analyze two separate samples at the same time
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source through the included universal power adapter
- IP54-rated housing handles splashes and cleans up easily
- 3 year meter replacement warranty





## Product Specifications – Orion VERSA STAR Meter

		CE   TUV   EPA
Maximum Number of Modules		4
Methods		Up to 10
Datalogging	Number of Datalogs	2000 with time and date stamp
	Log Function	Manual, AUTO-READ™, timed interval, single timed reading
Communication Ports		One RS232, two USB ports (one client, one host)
Orion Star Stirrer Probe Ports		2
Power		Universal, AC power adapter, 90-260 VAC, 50-60 Hz

## Meter Ordering Information

Cat. No.	Description
VSTAR20	<b>Orion VERSA STAR Conductivity Benchtop Meter Set</b> - Orion VERSA STAR meter - Orion VERSA STAR conductivity/temperature module - Electrode arm with redesigned holder - Universal power adapter
	<b>Orion VERSA STAR Conductivity Benchtop Meter Kit</b> - Orion VERSA STAR meter - Orion VERSA STAR conductivity/temperature module - 013005MD Orion DuraProbe conductivity cell, K=0.475 - 011007 conductivity standard, 1413 µS, 5 x 60 mL - Electrode arm with redesigned holder - Universal power adapter

## Product Specifications – Conductivity Module (VSTAR-CND)

CE   TUV   EPA		
Conductivity	Range	0.001 µS to 3000 mS
	Resolution	0.001 µS minimum; 4 significant figures minimum
	Relative Accuracy	0.5 % reading ±1 digit
	Reference Temperature	5, 10, 15, 20, 25 °C
	Temperature Compensation	Linear (0 to 10.0 %/°C), nLn, nLFu, USP/EP
	Compatible Cell Constants	0.001 to 199.9
	Calibration Points	Up to 6 points
	Calibration Editing	Yes
Resistivity	Range	2 ohm to 100 meg-ohm
	Resolution	2 ohms-cm
	Relative Accuracy	0.5 % reading ±1 digit
Salinity	Type	Practical salinity or natural sea water
	Range	0.01 to 80.0 psu 0.01 to 42 ppt sea water
	Resolution	0.01
	Relative Accuracy	±0.1
TDS	Range	0 to 200 ppt
	Resolution	4 significant digits
	Relative Accuracy	±0.5 % reading ±1 digit
	TDS Factor Range	Linear 0.01 to 10.00
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Input		8-pin mini-DIN

## Accessories

Cat. No.	Description
VSTAR-PH	Orion VERSA STAR pH/temperature module
VSTAR-ISE	Orion VERSA STAR pH/ISE/temperature module
VSTAR-CND	Orion VERSA STAR conductivity/temperature module
VSTAR-RD	Orion VERSA STAR RDO/DO/temperature module
VSTAR-LR	Orion VERSA STAR pH/temperature with LogR technology module
STARA-BEA	Benchtop electrode arm for Orion Star A-series meters
STARA-HB	Freestanding base for use with Orion Star A-series benchtop electrode arm
STARA-PWR	Replacement universal power adapter for Orion VERSA STAR meters
096019	Orion Star stirrer probe
013005MD	Orion DuraProbe conductivity cell, 4-cell, K=0.475
013016MD	Orion conductivity cell, flow through, K=0.1
011008	Orion conductivity standard, 100 µS/cm, 5 x 60 mL bottles
011007	Orion conductivity standard, 1413 µS/cm, 5 x 60 mL bottles
011006	Orion conductivity standard, 12.9 mS/cm, 5 x 60 mL bottles
1010001	Orion conductivity calibration resistor kit

pH ■  
ISE ■  
ORP ■  
Cond ■  
RDO ■  
DO ■  
Temp ■



## Thermo Scientific Orion Star A212

### Conductivity Benchtop Meter

The Thermo Scientific Orion Star A212 Conductivity Benchtop Meter is the ideal choice to help meet USP requirements. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows conductivity/TDS/salinity/resistivity and temperature along with time, date, sample ID, user ID and calibration information. For advanced users, features such as stability and averaging choices provide additional options.



#### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Selectable cell constant allows for use with 2- or 4-cell conductivity cells
- For accurate results, selectable reading reference temperatures of 5, 10, 15, 20 or 25 °C with linear, non-linear, nLFu or USP/EP curve options
- Choice of practical salinity or natural sea water curves for salinity readings
- Linear or ISO/EN 27888 curves for TDS
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Mix samples without a stir plate with direct control of the Orion Star stirrer probe (096019, sold separately)
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source with the included universal power adapter, or use four AA batteries (sold separately) to run the meter on DC power
- IP54-rated housing handles splashes and is wall-mountable if table space is a problem
- 3 year meter replacement warranty



## Product Specifications

CE   TUV   FCC		
Conductivity	Range	0.001 $\mu$ S to 3000 mS
	Resolution	0.001 $\mu$ S minimum; 4 significant figures minimum
	Relative Accuracy	0.5 % reading $\pm$ 1 digit
	Reference Temperature	5, 10, 15, 20, 25 $^{\circ}$ C
	Temperature Compensation	Linear (0 to 10.0 $\%$ / $^{\circ}$ C), nLn, nLFu, USP/EP
	Compatible Cell Constants	0.001 to 199.9
	Calibration Points	Up to 5 points
	Calibration Editing	Yes
Resistivity	Range	2 ohm to 100 meg-ohm
	Resolution	2 ohms-cm
	Relative Accuracy	0.5 % reading $\pm$ 1 digit
Salinity	Type	Practical salinity or natural sea water
	Range	0.01 to 80.0 psu 0.01 to 42 ppt sea water
	Resolution	0.01
	Relative Accuracy	$\pm$ 0.1
TDS	Range	1 to 200 ppt
	Resolution	4 significant digits
	Relative Accuracy	$\pm$ 0.5 % reading $\pm$ 1 digit
	TDS Factor Range	Linear, 0.01 to 10.00
Temperature	Range	-5 to 105 $^{\circ}$ C, 23 to 221 $^{\circ}$ F
	Resolution	0.1
	Relative Accuracy	$\pm$ 0.1
	Offset Calibration	1 point
Datalogging	Number of Datalogs	2000 with time and date stamp
	Log Function	Manual, ready (includes AUTO-READ <sup>™</sup> ), timed
Inputs	Conductivity with Temperature Probe	8-pin mini-DIN
Output		RS232, USB
Power	AC Adapter	Included – universal, 100-240 VAC
	Battery Power	Optional – 4 AAs
	Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
STARA2120	<b>Orion Star A212 Conductivity Benchtop Meter</b> - Electrode arm with redesigned holder - Universal power adapter
STARA2125	<b>Orion Star A212 Conductivity Benchtop Meter Kit</b> - 013005MD Orion DuraProbe conductivity probe, K=0.475 - 011007 conductivity standard, 1413 $\mu$ S, 5 x 60 mL - Electrode arm with redesigned holder - Universal power adapter
STARA2126	<b>Orion Star A212 Conductivity Benchtop Meter Kit for Ultrapure Water</b> - 013016MD Orion conductivity probe with flow-through cell, K=0.1 - 011008 conductivity standard, 100 $\mu$ S, 5 x 60 mL - Electrode arm with redesigned holder - Universal power adapter

## Accessories

Cat. No.	Description
STARA-BEA	Benchtop electrode arm for Orion Star A-series meters
STARA-HB	Freestanding base for use with Orion Star A-series benchtop electrode arm
013005MD	Orion DuraProbe conductivity probe, 4-cell, K=0.475
013016MD	Orion 2-electrode conductivity probe with flow cell, K=0.1
011008	Orion conductivity standard, 100 $\mu$ S/cm, 5 x 60 mL bottles
011007	Orion conductivity standard, 1413 $\mu$ S/cm, 5 x 60 mL bottles
011006	Orion conductivity standard, 12.9 mS/cm, 5 x 60 mL bottles
1010001	Orion conductivity calibration resistor kit

Keep going to learn more about our newest meters.

- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp



## Thermo Scientific Orion Star A112

Conductivity Benchtop Meter

Thermo Scientific Orion Star A112 Conductivity Benchtop Meters combine simplicity with accuracy for dedicated conductivity measurements. A large LCD displays conductivity or TDS readings along with temperature. Icons provide quick updates on battery life and completed calibration status. Simple button layout and onscreen messages help with calibration and setup menu choices.

### Features and Benefits

- Large, informative screen clearly shows the main information, including conductivity or TDS reading, temperature in °C or °F, meter mode and power source
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen and ready indicator alerts when readings are stable
- Selectable cell constant
- Selectable reading reference temperatures of 20 °C or 25 °C for an accurate result
- Included electrode arm and newly-designed holder make it easier to maintain and place probes into samples
- Plug the meter into almost any power outlet with the included universal power adapter, or use four AA batteries (sold separately) to run the meter on DC power
- Non-volatile memory holds up to 50 data points
- The IP54-rated housing can handle splashes and can be wall-mounted if table space is a problem
- 3 year meter replacement warranty







## Product Specifications

CE   TUV   FCC		
Conductivity	Range	0.1 $\mu\text{S}/\text{cm}$ to 200 $\text{mS}/\text{cm}$
	Resolution	0.01 $\mu\text{S}$ minimum; 3 significant figures minimum
	Relative Accuracy	0.5 % reading $\pm 1$ digit
	Reference Temperature	20, 25 $^{\circ}\text{C}$ (default)
	Temperature Compensation	Linear (0.0 to 10.0 $\%/^{\circ}\text{C}$ )
	Compatible Cell Constants	0.001 to 10
	Calibration Points	1
TDS	Range	1 to 19,999 $\text{mg}/\text{L}$
	Resolution	4 significant digits
	Relative Accuracy	0.5 % reading $\pm 1$ digit
	TDS Factor Range	Linear, 0.01 to 10.00, default 0.49
Temperature	Range	-5 to 105 $^{\circ}\text{C}$ , 23 to 221 $^{\circ}\text{F}$
	Resolution	0.1
	Relative Accuracy	$\pm 0.1$
	Offset Calibration	Yes
Datalogging	Number of Datalogs	50
	Log Function	Manual, Automatic with AUTO-READ™
Inputs	Conductivity with Temperature Probe	8-pin mini-DIN
Power	AC Adapter	Included – universal, 100-240 VAC
	Battery Power	Optional – 4 AAs
	Battery Life	2000 hrs

## Meter Ordering Information

Cat. No.	Description
STARA1120	<b>Orion Star A112 Conductivity Benchtop Meter</b> - Electrode arm with redesigned holder - Universal power adapter
STARA1125	<b>Orion Star A112 Conductivity Benchtop Meter Kit</b> - 011050MD orion conductivity cell, K=1.0 - 011007 conductivity standard, 1413 $\mu\text{S}$ , 5 x 60 mL - Electrode arm with redesigned holder - Universal power adapter

## Accessories

Cat. No.	Description
STARA-BEA	Benchtop electrode arm for Orion Star A-series meters
STARA-HB	Freestanding base for use with Orion Star A-series benchtop electrode arm
011050MD	Orion 2-electrode conductivity cell, K=1.0
013016MD	Orion 2-electrode conductivity cell with flow cell, K=0.1
011008	Orion conductivity standard, 100 $\mu\text{S}/\text{cm}$ , 5 x 60 mL bottles
011007	Orion conductivity standard, 1413 $\mu\text{S}/\text{cm}$ , 5 x 60 mL bottles
011006	Orion conductivity standard, 12.9 $\text{mS}/\text{cm}$ , 5 x 60 mL bottles
1010001	Orion conductivity calibration resistor kit



pH ■  
ISE ■  
ORP ■

Cond ■  
RDO ■  
DO ■  
Temp ■



## Thermo Scientific Orion VERSA STAR 30

RDO/Dissolved Oxygen Benchtop Meters

BOD testing is complicated enough – no need for the meter to add to the confusion. The large color display is easy on to read and easy on the eyes. Prompts make accuracy and repeatability easy for even the most complicated testing. If you need to add more channels for more or obtain more parameters from the same, simply remove the protective individual channel cover and add the new module.

Discover the most advanced features in our new Orion VERSA STAR meters.



### Features and Benefits

- Versatility is the name of the game
  - Customize the display to show only the information you need
  - Change modules to create the meter you need at any time
- Takes the worry out of DO probe compatibility – the meter accepts and automatically recognizes Orion polarographic and RDO optical/luminescence-based probes
- Compensates automatically for temperature, salinity with manual input and barometric pressure (automatic or manual)
- Allows for calibration using water-saturated air, air-saturated water, a Winkler titration or zero point
- Anyone can use this meter with its plain language screen prompts, function keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals or just once with single-shot mode
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Stores up to 10 methods per channel allow for customized procedures to differentiate between tests and/or users
- Two USB and a RS232 port makes for easy data transfer and updating meter software
- Complimentary data analysis software for easy transferring of stored results, real-time viewing and calculation of BOD, DOUR and SOUR results
- Control sample mixing directly from the meter without a separate stir plate when using with the Orion Star stirrer probe (cat. no. 096019, sold separately)
- Increase your productivity – with two Orion Star stirrer probe ports, add stirrers and modules to analyze two separate samples at the same time
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source through the included universal power adapter
- IP54-rated housing handles splashes and cleans up easily
- 3 year meter replacement warranty



## Product Specifications – Orion VERSA STAR Meter

CE   TUV   EPA	
Maximum Number of Modules	4
Methods	Up to 10
Datalogging	Number of Datalogs
	Log Function
Communication Ports	One RS232, two USB ports (one client, one host)
Orion Star Stirrer Probe Ports	2
Power	Universal, AC power adapter, 90-260 VAC, 50-60 Hz

## Meter Ordering Information

Cat. No.	Description
VSTAR30	<b>Orion VERSA STAR RDO/Dissolved Oxygen Benchtop Meter Set</b> - Orion VERSA STAR meter - Orion VERSA STAR dissolved oxygen/temperature module - Electrode arm with redesigned holder - Universal power adapter
	<b>Orion VERSA STAR RDO/Dissolved Oxygen Benchtop Meter Kit</b> - Orion VERSA STAR meter - Orion VERSA STAR dissolved oxygen/temperature module - 083005MD Orion polarographic DO probe - 080017 calibration sleeve for DO probe - 080513 DO probe maintenance kit - BOD adapter, funnel and stirrer - Electrode arm with redesigned holder - Universal power adapter

## Product Specifications – RDO/DO Module (VSTAR-RD)

CE   TUV   EPA	
Dissolved Oxygen	Concentration - Polarographic
	Range
	Resolution
	Relative Accuracy
	% Saturation - Polarographic
	Range
	Resolution
	Relative Accuracy
	Concentration - RDO
	Range
	Resolution
	Relative Accuracy
	% Saturation - RDO
	Range
	Resolution
	Relative Accuracy
	Automatic Barometric Pressure Correction
	Salinity Factor Correction
	Calibration Features
	Probe Type
Temperature	Range
	Resolution
	Relative Accuracy
	Offset Calibration
Input	9-pin mini-DIN

## Accessories

Cat. No.	Description
VSTAR-PH	Orion VERSA STAR pH/temperature module
VSTAR-ISE	Orion VERSA STAR pH/ISE/temperature module
VSTAR-CND	Orion VERSA STAR conductivity/temperature module
VSTAR-RD	Orion VERSA STAR RDO/DO/temperature module
VSTAR-LR	Orion VERSA STAR pH/temperature with LogR technology module
STARA-BEA	Benchtop electrode arm for Orion Star A-series meters
STARA-HB	Freestanding base for use with Orion Star A-series benchtop electrode arm
STARA-PWR	Replacement universal power adapter for Orion VERSA STAR meters
096019	Orion Star stirrer probe
083005MD	Orion dissolved oxygen probe, polarographic
086030MD	Orion auto-stir DO/BOD probe, polarographic
087010MD	Orion RDO optical DO probe, 3 m cable
080513	Maintenance kit, includes electrolyte solution, polishing disk, and two membrane caps for 083005MD and 086030MD
080514	Polarographic electrolyte solution for 083005MD and 086030MD
086021A	Replacement calibration chamber/stand for 086030MD
087001	Replacement optical/luminescence-based cap

- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp



## Thermo Scientific Orion Star A213

RDO/Dissolved Oxygen Benchtop Meter

The Thermo Scientific Orion Star A213 RDO/Dissolved Oxygen (DO) Benchtop Meter is the ideal choice to ensure proper oxygen levels. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows dissolved oxygen in percent saturation or concentration and temperature along with time, date, sample ID, user ID and calibration information. For advanced users, features such as stability and averaging choices provide additional options.



### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- No need to worry about DO probe compatibility – the meter accepts and automatically recognizes Orion polarographic and RDO optical/luminescence-based probes
- Accurate results are easy with automatic temperature, manual salinity and your choice of automatic or manual barometric pressure compensation
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Calibrate using water-saturated air, air-saturated water, a Winkler titration or zero point calibration
- Non-volatile memory holds up to 2000 data points with time and date stamp
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- For faster BOD readings, control the Orion AUTO-STIR™ polarographic DO probe (086030MD, sold separately) directly from the meter
- Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples
- Works with almost every AC power source with the included universal power adapter, or use four AA batteries (sold separately) to run the meter on DC power
- IP54-rated housing handles splashes and is wall-mountable if table space is a problem
- 3 year meter replacement warranty





## Product Specifications

CE   TUV   FCC	
Dissolved Oxygen	<b>Concentration - Polarographic</b>
	<b>Range</b> 0 to 90 mg/L
	<b>Resolution</b> 0.01, 0.1
	<b>Relative Accuracy</b> ±0.2
	<b>% Saturation - Polarographic</b>
	<b>Range</b> 0 to 600
	<b>Resolution</b> 0.1, 1
	<b>Relative Accuracy</b> ±2 %
	<b>Concentration - RDO</b>
	<b>Range</b> 0 to 50 mg/L
	<b>Resolution</b> 0.01, 0.1
	<b>Relative Accuracy</b> ±0.1 mg/L up to 8 mg/L; ±0.2 mg/L from 8 to 20 mg/L; 10 % of reading from 20 to 50 mg/L
	<b>% Saturation - RDO</b>
	<b>Range</b> 0 to 500
	<b>Resolution</b> 0.1, 1
	<b>Relative Accuracy</b> ±2 %
Automatic Barometric Pressure Correction	450.0 to 850.0 mm Hg
	<b>Manual Salinity Factor Correction</b>
	0 to 45 ppt
	<b>Calibration Features</b>
	Water-saturated air, air saturated water, manual (Winkler) and zero point
Probe Characteristics	Polarographic or RDO
	<b>Range</b>
	0 to 50 °C, 32 to 122 °F
	<b>Resolution</b>
	0.1
Relative Accuracy	±0.1
	<b>Offset Calibration</b>
	1 point
Datalogging	<b>Number of Datalogs</b>
	2000 with time and date stamp
Log Function	Manual, ready (includes AUTO-READ™), timed
Inputs	<b>DO with Temperature Probe</b>
	9-pin mini-DIN
Output	RS232, USB
Power	<b>AC Adapter</b>
	Included – universal, 100-240 VAC
	<b>Battery Power</b>
	Optional – 4 AAs
Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
<b>STARA2130</b>	<b>Orion Star A213 Dissolved Oxygen Benchtop Meter</b> - Electrode arm with redesigned holder - Universal power adapter
<b>STARA2135</b>	<b>Orion Star A213 Dissolved Oxygen Benchtop Meter Kit</b> - 083005MD Orion polarographic DO probe with calibration sleeve - 080513 polarographic DO probe maintenance kit - BOD adapter, funnel and stirrer - Electrode arm with redesigned holder - Universal power adapter
<b>STARA2136</b>	<b>Orion Star A213 Dissolved Oxygen Benchtop Meter Kit with Self-Stirring Probe</b> - 086030MD Orion polarographic AUTO-STIR DO/BOD probe - 080513 DO probe maintenance kit - 080514 polarographic DO probe electrolyte solution - Electrode arm with redesigned holder - Universal power adapter

## Accessories

Cat. No.	Description
<b>STARA-BEA</b>	Benchtop electrode arm for Orion Star A-series meters
<b>STARA-HB</b>	Freestanding base for use with Orion Star A-series benchtop electrode arm
<b>083005MD</b>	Orion polarographic DO probe, 1.5m cable
<b>086030MD</b>	Orion polarographic AUTO-STIR DO/BOD probe, 1.5m cable
<b>087010MD</b>	Orion RDO optical DO probe, 3m cable with stainless steel guard and calibration sleeve
<b>080513</b>	Orion polarographic DO probe maintenance kit
<b>080514</b>	Orion polarographic DO probe electrolyte solution, 60 mL
<b>080017</b>	Calibration sleeve for Orion polarographic DO probes
<b>087003</b>	Replacement calibration sleeve for Orion RDO optical probes
<b>087001</b>	Replacement optical cap for Orion RDO probes
<b>970802</b>	Orion BOD funnel and stirrer for use with polarographic probes
<b>080360</b>	Orion BOD bottle adapter for use with polarographic probes

- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp



## Thermo Scientific Orion Star A113

Dissolved Oxygen Benchtop Meter

Thermo Scientific Orion Star A113 Dissolved Oxygen Benchtop Meters combine simplicity with accuracy for dedicated DO testing. Icons provide quick updates on battery life and completed calibration status. Simple button layout and onscreen messages help with calibration and setup menu choices.

### Features and Benefits

- Large, informative screen clearly shows the main information, including DO reading in mg/L or % saturation, temperature in °C or °F, meter mode and power source
- Automatic temperature, manual salinity input and manual barometric pressure compensation for an accurate result
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen and ready indicator alerts when readings are stable
- Two calibration options to meet your requirements: water-saturated air method or a Winkler titration
- Accepts Thermo Scientific Orion polarographic dissolved oxygen probes
- Non-volatile memory holds up to 50 data points
- Included electrode arm and newly-designed holder make it easier to maintain and place probes into samples
- Plug the meter into almost any power outlet with the included universal power adapter, or use four AA batteries (sold separately)
- The IP54-rated housing can handle splashes and can be wall-mounted if table space is a problem
- 3 year meter replacement warranty





## Product Specifications

CE   TUV   FCC		
Dissolved Oxygen	<b>Concentration</b>	
	Range	0 to 20 mg/L
	Resolution	0.01, 0.1
	Relative Accuracy	±0.2
	<b>% Saturation</b>	
	Range	0 to 200
	Resolution	0.1, 1
	Relative Accuracy	±2 %
	Manual Barometric Pressure Correction	450.0 to 850.0 mm Hg
	Manual Salinity Factor Correction	0 to 45 ppt
Temperature	Calibration Features	Water-saturated air, manual (Winkler)
	Sensor Type	Polarographic
	Range	0 to 50 °C, 32 to 122 °F
	Resolution	0.1
	Relative Accuracy	±0.1
Datalogging	Offset Calibration	Yes
	Number of Datalogs	50
Inputs	Log Function	Manual, Automatic with AUTO-READ™
	DO with Temperature Probe	9-pin mini-DIN
Power	Power Cord	Included – universal, 100-240 VAC
	Battery Power	Optional – 4 AAs
	Battery Life	2000 hrs

## Meter Ordering Information

Cat. No.	Description
<b>STARA1130</b>	<b>Orion Star A113 Dissolved Oxygen Benchtop Meter</b> - Electrode arm with redesigned holder - Universal power adapter
<b>STARA1135</b>	<b>Orion Star A113 Dissolved Oxygen Benchtop Meter Kit</b> - 083005MD Orion polarographic DO probe - 080017 calibration sleeve for DO probe - 080513 DO probe maintenance kit - Electrode arm with redesigned holder - Universal power adapter

## Accessories

Cat. No.	Description
<b>STARA-BEA</b>	Benchtop electrode arm for Orion Star A-series meters
<b>STARA-HB</b>	Freestanding base for use with Orion Star A-series benchtop electrode arm
<b>083005MD</b>	Orion polarographic DO probe, 1.5m cable
<b>080513</b>	Orion polarographic DO probe maintenance kit
<b>080017</b>	Calibration sleeve for Orion polarographic DO probes
<b>970802</b>	Orion BOD funnel and stirrer for use with polarographic probes
<b>080360</b>	Orion BOD bottle adapter for use with polarographic probes

For accurate testing outside the lab, check out the Orion Star A portable meters on the following pages.

- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp



## Thermo Scientific Orion VERSA STAR Advanced Electrochemistry Benchtop Meter & Modules

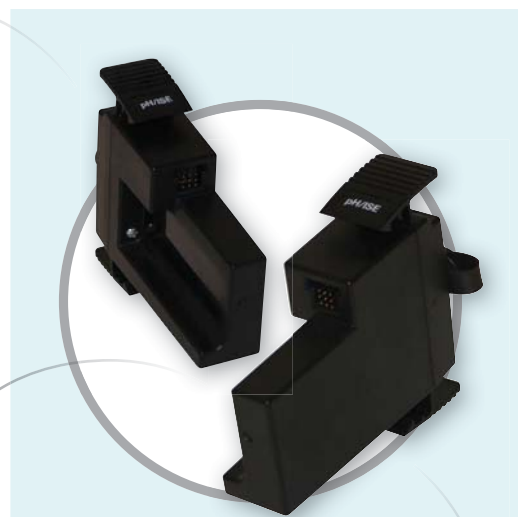
Don't see the benchtop meter parameter combination you need for your application? No problem – simply order the Orion VERSA STAR meter and choose the modules you need.

With versatility being the name of the game, you can also choose modules to add or change your existing Orion VERSA STAR meter to meet your latest testing needs. Simply swap out the modules when you need to and no need to wait to power down. The meter automatically recognizes the changes and datalogs remain unchanged and stored in the meter.

Each module includes the necessary probe connections for the measurement parameter. The meter includes two Orion Star stirrer probe ports, one RS232 port, two USB ports, power port and grounding port. Included with the meter are the benchtop electrode arm and individual channel covers to protect the channels not in use.

### Meter and Module Ordering Information

Cat. No.	Description
<b>VSTAR00</b>	<b>Orion VERSA STAR Benchtop Meter</b> - Electrode arm with redesigned holder - Universal power adapter
<b>VSTAR-PH</b>	Orion VERSA STAR pH/temperature module
<b>VSTAR-ISE</b>	Orion VERSA STAR pH/ISE/temperature module
<b>VSTAR-CND</b>	Orion VERSA STAR conductivity/temperature module
<b>VSTAR-RD</b>	Orion VERSA STAR RDO/DO/temperature module
<b>VSTAR-LR</b>	Orion VERSA STAR pH/temperature with LogR technology module
<b>STARA-BEA</b>	Benchtop electrode arm
<b>STARA-HB</b>	Free-standing, weighted base for use with benchtop electrode arm (sold separately)



No need to turn off your meter to switch modules – meter automatically recognizes module changes.

- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp





## Thermo Scientific Orion Star A320, A220 and A120-Series Portable Meters

Outside the laboratory, testing brings enough of its own challenges from getting the sample to taking the reading. Just because you test outside the laboratory doesn't mean your testing accuracy or quality needs to suffer. The new Orion Star A series of portable meters features a variety of advantages to handle testing in difficult environments.



Protective plugs cover RS232 and USB ports to prevent corrosion

Bright, backlit LCD display clearly shows results on those bright, sunny days as well as the dark, rainy ones and in dark areas of the plant

IP-67 waterproof housing

Ergonomic design allows for one-handed operation and features a recessed groove in the back of the meter to fit fingers easily wrapping around the meter

Keypad texture works well with gloved and wet hands

Advanced meter design prevents water ingress through all connector ports.

Do you have access to an AC power source while testing?  
Save battery life by running the meter off AC power with the optional adapter





## Thermo Scientific Orion Star A329

pH/ISE/Conductivity/RDO/Dissolved Oxygen Portable Meter

The Thermo Scientific Orion Star A329 pH/ISE/Conductivity/RDO/Dissolved Oxygen Portable Meter is the top choice for advanced multiparameter measurements on location. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display can show each parameter with temperature individually or all three with temperature on one screen. Additional helpful icons include electrode status, time, date, sample ID, user ID and calibration points. Advanced features such as stability and averaging options provide additional options allowing for laboratory accuracy everywhere you need it.

### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Up to 5 point pH calibration with automatic recognition for USA/NIST and DIN buffers
- Fix pH and ISE calibration errors without a complete recalibration with calibration editing
- No need to worry about DO probe compatibility – the meter accepts and automatically recognizes Orion polarographic and RDO optical/luminescence-based probes
- It's easy to get accurate DO results with automatic temperature, automatic/manual barometric pressure and automatic salinity compensation when used with simultaneously with conductivity
- Calibrate for DO using water-saturated air, air-saturated water, a Winkler titration or zero point calibration
- Selectable cell constant allows for use with 2- or 4-cell conductivity cells
- For advanced accuracy in conductivity readings, selectable reading reference temperatures of 5, 10, 15, 20 or 25 °C with linear, non-linear, nLFu or USP/EP curve options
- Choice of practical salinity or natural sea water curves for salinity readings
- Linear or ISO/EN 27888 curves for TDS
- Whether you use ISE infrequently or have multiple samples every day – up to 5 point ISE calibration with advanced features such as timed end point, linear point-to-point, non-linear selectable auto-blank and low-concentration range stability
- Non-volatile memory holds up to 5000 data points with time and date stamp

- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- User and sample ID fields for additional data accuracy
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Four AA batteries (included) provide over 800 hours of operation or purchase the universal power adapter (sold separately) to use AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty

### Product Specifications

CE   TUV   FCC		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 5
	Calibration Editing	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>h</sub> ORP Mode	Yes
ISE	Range	0 to 19999
	Resolution	Up to 3 significant digits
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	Units	ppm, M, mg/L, %, ppb, none
	Calibration Points	Up to 5
	Calibration Editing	Yes
	Calibration Features	Timed end point, linear point to point, non-linear selectable auto-blank, low concentration range stability
Conductivity	Range	0.001 µS to 3000 mS
	Resolution	0.001 µS minimum; 4 significant figures minimum
	Relative Accuracy	0.5 % reading ±1 digit
	Reference Temperature	5, 10, 15, 20, 25 °C (default)
	Temperature Compensation	Linear (0 to 10.0 %/°C), nLn, nLFu, USP/EP
	Compatible Cell Constants	0.001 to 199.9
	Calibration Points	Up to 5 points
	Calibration Editing	Yes
Resistivity	Range	2 ohm to 100 meg-ohm
	Resolution	2 ohms-cm
	Relative Accuracy	0.5 % reading ±1 digit





Please turn the page...  
this is just the  
beginning of the  
portable meters.

## Product Specifications (Continued)

CE   TUV   FCC		
Salinity	Type	Practical salinity or natural sea water
	Range	0.01 to 80.0 psu 0.01 to 42 ppt sea water
	Resolution	0.01
	Relative Accuracy	±0.1
TDS	Range	1 to 200 ppt
	Resolution	4 significant digits
	Relative Accuracy	±0.5 % reading ±1 digit
	TDS Factor Range	Linear 0.01 to 10.00, default 0.49
Dissolved Oxygen	<b>Concentration - Polarographic</b>	
	Range	0 to 90 mg/L
	Resolution	0.01, 0.1
	Relative Accuracy	±0.2
	<b>% Saturation - Polarographic</b>	
	Range	0 to 600
	Resolution	0.1, 1
	Relative Accuracy	±2 %
	<b>Concentration - RDO</b>	
	Range	0 to 50 mg/L
	Resolution	0.01, 0.1
	Relative Accuracy	±0.1 mg/L up to 8 mg/L; ±0.2 mg/L from 8 to 20 mg/L; 10 % of reading from 20 to 50 mg/L
	<b>% Saturation - RDO</b>	
	Range	0 to 500
	Resolution	0.1, 1
	Relative Accuracy	±2 %
	Automatic Barometric Pressure Correction	450.0 to 850.0 mm Hg
	Salinity Factor Correction	Automatic with separate conductivity probe or manual; 0 to 45 ppt
	Calibration Features	Water-saturated air, air saturated water, manual (Winkler) and zero point
	Probe Characteristics	Polarographic or RDO
Temperature	Range	-5 to 105 °C, 23 to 221 °F (0 to 50 °C, 32 to 122 °F with RDO)
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Datalogging	Number of Datalogs	5000 with time and date stamp
	Log Function	Manual, ready (includes AUTO-READ™), timed
Inputs	pH Electrode	BNC, reference pin
	Conductivity with Temperature Probe or ATC Probe	8-pin mini-DIN
	DO with Temperature Probe	9-pin mini-DIN
	Output	RS232, USB
Power	AC Adapter	Optional – universal, 100-240 VAC
	Battery Power	Included – 4 AAs
	Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
<b>STARA3290</b>	<b>Orion Star A329 pH/ISE/Conductivity/Dissolved Oxygen Portable Multiparameter Meter</b> - Four AA batteries (installed)
<b>STARA3295</b>	<b>Orion Star A329 pH/ISE/Conductivity/Dissolved Oxygen Portable Multiparameter Meter Kit</b> - 8107UWMD Orion ROSS Triode 3-in-1 pH/ATC probe, 3m cable - 013010MD Orion DuraProbe conductivity cell, 3m cable - 087010MD Orion RDO optical/luminescence-based probe with 3m cable, stainless steel guard, calibration sleeve and optical/luminescence-based cap - 910410 Orion pH 4.01 buffer, 10 pouches - 910710 Orion pH 7.00 buffer, 10 pouches - 911010 Orion pH 10.01 buffer, 10 pouches - 810001 Orion ROSS electrode storage solution, 475 mL - 01100710 Orion 1413 µS conductivity standard, 10 pouches - 911110 rinse solution, 10 pouches - Protective armor with probe holders - Hard carrying case - Four AA batteries (installed)

## Accessories

Cat. No.	Description
<b>STARA-CS</b>	Hard carrying case for Orion Star A-series portable meters
<b>1210005</b>	Soft carrying case for Orion Star, Star Plus and Star A-series portable meters
<b>STARA-AR</b>	Armor for Orion Star A-series portable meters, includes electrode holders for pH, conductivity and DO probes
<b>STARA-ESPH</b>	pH electrode holder for Orion Star A-series armor
<b>STARA-ESCD</b>	Conductivity and DO probe holder for Orion Star A-series armor
<b>1010003</b>	Optional universal power adapter, 100-240 V, 50/60 Hz
<b>8107UWMD</b>	Orion ROSS Triode 3-in-1 pH/ATC probe, gel-filled, 3m cable
<b>910410</b>	Orion pH 4.01 buffer pouches, 10/pk
<b>910710</b>	Orion pH 7.00 buffer pouches, 10/pk
<b>911010</b>	Orion pH 10.01 buffer pouches, 10/pk
<b>911110</b>	Orion pH rinse solution pouches, 10/pk
<b>013010MD</b>	Orion DuraProbe conductivity cell with 3m cable, 4-cell, K=0.475
<b>013020MD</b>	Orion DuraProbe conductivity cell with 6m cable, 4-cell, K=0.475
<b>013025MD</b>	Orion DuraProbe conductivity cell with 10m cable, 4-cell, K=0.475
<b>011008</b>	Orion conductivity standard, 100 µS/cm, 5 x 60 mL bottles
<b>01100710</b>	Orion conductivity standard pouches, 1413 µS/cm, 10/pk
<b>01100610</b>	Orion conductivity standard pouches, 12.9 mS/cm, 10/pk
<b>1010001</b>	Orion conductivity calibration resistor kit
<b>087010MD</b>	Orion RDO optical DO probe, 3m cable with stainless steel guard and calibration sleeve
<b>087020MD</b>	Orion RDO optical DO probe, 6m cable with stainless steel guard and calibration sleeve
<b>087030MD</b>	Orion RDO optical DO probe, 10m cable with stainless steel guard and calibration sleeve
<b>087050MD</b>	Orion RDO optical DO probe, 15m cable with stainless steel guard and calibration sleeve
<b>087100MD</b>	Orion RDO optical DO probe, 30m cable with stainless steel guard and calibration sleeve
<b>083005MD</b>	Orion polarographic DO probe, 1.5m cable
<b>080513</b>	Orion polarographic DO probe maintenance kit
<b>080514</b>	Orion polarographic DO probe electrolyte solution, 60 mL
<b>080017</b>	Calibration sleeve for Orion polarographic DO probes
<b>087003</b>	Replacement calibration sleeve for Orion RDO optical probes
<b>087001</b>	Replacement optical cap for Orion RDO probes

pH ■  
ISE ■  
ORP ■  
Cond ■  
RDO ■  
DO ■  
Temp ■



## Thermo Scientific Orion Star A324

### pH/ISE Portable Meter

The Thermo Scientific Orion Star A324 pH/ISE Portable Meters is the top choice for advanced pH/ISE measurements on location. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows pH/mV/RmV and temperature along with electrode status, time, date, sample ID, user ID and calibration points. Advanced features such as stability and averaging options provide additional options allowing for laboratory accuracy everywhere you need it.



### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Up to 5 point pH calibration with automatic recognition for USA/NIST and DIN buffers
- Whether you use ISE infrequently or have multiple samples every day – up to 5 point ISE calibration with advanced features such as timed end point, linear point-to-point, non-linear selectable auto-blank and low-concentration range stability
- Fix errors without a complete recalibration with the calibration editing function
- Non-volatile memory holds up to 5000 data points with time and date stamp
- User and sample ID fields for additional data accuracy
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Four AA batteries (included) provide over 800 hours of operation or purchase the universal power adapter (sold separately) to use AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty





## Product Specifications

CE   TUV   FCC		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 5
	Calibration Editing	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>n</sub> ORP Mode	Yes
ISE	Range	0 to 19999
	Resolution	Up to 3 significant digits
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	Units	ppm, M, mg/L, %, ppb, none
	Calibration Points	Up to 5
	Calibration Editing	Yes
	Calibration Features	Timed end point, linear point to point, non-linear selectable auto-blank, low concentration range stability
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Datalogging	Number of Datalogs	5000 with time and date stamp
	Log Function	Manual, ready (include AUTO-READ™), timed
Inputs	pH Electrode	BNC, reference pin
	ATC Probe	8-pin mini-DIN
Output		RS232, USB
Power	AC Adapter	Optional – universal, 100-240 VAC
	Battery Power	Included – 4 AAs
	Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
STARA3240	<b>Orion Star A324 pH/ISE Portable Meter</b> - Four AA batteries (installed)
STARA3245	<b>Orion Star A324 pH/ISE Portable Meter Kit</b> - 8107UWMMD Orion ROSS Triode 3-in-1 pH/ATC Probe - Orion pH 4, 7 and 10 buffers, 10 pouches of each value - 810001 Orion ROSS electrode storage solution - 911110 Rinse solution, 10 pouches - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)

## Accessories

Cat. No.	Description
STARA-CS	Hard carrying case for Orion Star A-series portable meters
1210005	Soft carrying case for Orion Star, Star Plus and Star A-series portable meters
STARA-AR	Armor for Orion Star A-series portable meters, includes electrode holders for pH, conductivity and DO probes
STARA-ESPH	pH electrode holder for Orion Star A-series armor
STARA-ESCD	Conductivity and DO probe holder for Orion Star A-series armor
8107UWMMD	Orion ROSS Triode 3-in-1 pH/ATC probe, gel-filled, 3m cable
1010003	Optional universal power adapter, 100-240 V, 50/60 Hz
910410	Orion pH 4.01 buffer pouches, 10/pk
910710	Orion pH 7.00 buffer pouches, 10/pk
911010	Orion pH 10.01 buffer pouches, 10/pk
911110	Orion pH rinse solution pouches, 10/pk
9512HPBNWP	Orion high-performance ammonia ISE
9512BNWP	Orion standard ammonia ISE
951007	Ammonia standard, 1000 ppm, 475 mL
951210	Low-level ammonia ISA
951211	Ammonia ISA, 475 mL
951209	Fill solution for Orion high-performance ammonia ISE, 60 mL
951202	Fill Solution for standard ammonia ISE, 60 mL
951213	Ammonia ISE storage solution
9609BNWP	Orion fluoride combination ISE
040906	Fluoride standard, 1 ppm with TISAB II, 475 mL
040907	Fluoride standard, 2 ppm with TISAB II, 475 mL
040908	Fluoride standard, 10 ppm with TISAB II, 475 mL
940909	TISAB II, 1 gallon
8611BNWP	Orion ROSS sodium combination ISE

- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp



## Thermo Scientific Orion Star A325

### pH/Conductivity Portable Meter

The Thermo Scientific Orion Star A325 pH/Conductivity Portable Meter is the top choice for advanced pH and conductivity measurements on location. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows individual pH/mV/RmV or conductivity/TDS/salinity/resistivity results with temperature, or all results at once. Additional helpful information include electrode status, time, date, sample ID, user ID and calibration points. Advanced features such as stability and averaging options provide additional options allowing for laboratory accuracy everywhere you need it.

### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Up to 5 point pH calibration with automatic recognition for USA/NIST and DIN buffers
- Fix pH calibration errors without a complete recalibration with calibration editing
- Selectable cell constant allows for use with 2- or 4-cell conductivity cells
- For advanced accuracy in conductivity readings, selectable reading reference temperatures of 5, 10, 15, 20 or 25 °C with linear, non-linear, nLFu or USP/EP curve options
- Choice of practical salinity or natural sea water curves for salinity readings
- Linear or ISO/EN 27888 curves for TDS
- Non-volatile memory holds up to 5000 data points with time and date stamp
- User and sample ID fields for additional data accuracy
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Four AA batteries (included) provide over 800 hours of operation or purchase the universal power adapter (sold separately) to use AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty





## Product Specifications

CE   TUV   FCC		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 5
	Calibration Editing	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>o</sub> ORP Mode	Yes
Conductivity	Range	0.001 µS to 3000 mS
	Resolution	0.001 µS minimum; 4 significant figures minimum
	Relative Accuracy	0.5 % reading ±1 digit
	Reference Temperature	5, 10, 15, 20, 25 °C (default)
	Temperature Compensation	Linear (0 to 10.0 %/°C), nLn, nLFu, USP/EP
	Compatible Cell Constants	0.001 to 199.9
	Calibration Points	Up to 5 points
	Calibration Editing	Yes
Resistivity	Range	2 ohm to 100 meg-ohm
	Resolution	2 ohms-cm
	Relative Accuracy	0.5 % reading ±1 digit
Salinity	Type	Practical salinity or natural sea water
	Range	0.01 to 80.0 psu 0.01 to 42 ppt sea water
	Resolution	0.01
	Relative Accuracy	±0.1
TDS	Range	0 to 200 ppt
	Resolution	4 significant digits
	Relative Accuracy	±0.5 % reading ±1 digit
	TDS Factor Range	Linear 0.01 to 10.00, default 0.49
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Datalogging	Number of Datalogs	5000 with time and date stamp
	Log Function	Manual, ready (include AUTO-READ™), timed
Inputs	pH Electrode	BNC, reference pin
	Conductivity with Temperature Probe or ATC Probe	8-pin mini-DIN
Output		RS232, USB
Power	AC Adapter	Optional – universal, 100-240 VAC
	Battery Power	Included – 4 AAs
	Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
STARA3250	<b>Orion Star A325 pH/Conductivity Portable Multiparameter Meter</b> - Four AA batteries (installed)
STARA3255	<b>Orion Star A325 pH/Conductivity Portable Multiparameter Meter Kit</b> - 8107UWMMMD Orion ROSS Triode 3-in-1 pH/ATC probe, 3m cable - 013010MD Orion DuraProbe conductivity cell, 3m cable - 910410 Orion pH 4.01 buffer, 10 pouches - 910710 Orion pH 7.00 buffer, 10 pouches - 911010 Orion pH 10.01 buffer, 10 pouches - 810001 Orion ROSS electrode storage solution, 475 mL - 01100710 Orion 1413 µS conductivity standard, 10 pouches - 911110 rinse solution, 10 pouches - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)

## Accessories

Cat. No.	Description
STARA-CS	Hard carrying case for Orion Star A-series portable meters
STARA-AR	Armor for Orion Star A-series portable meters, includes electrode holders for pH, conductivity and DO probes
STARA-ESPH	pH electrode holder for Orion Star A-series armor
STARA-ESCD	Conductivity and DO probe holder for Orion Star A-series armor
8107UWMMMD	Orion ROSS Triode 3-in-1 pH/ATC probe, gel-filled, 3m cable
013010MD	Orion DuraProbe conductivity cell with 3m cable, 4-cell, K=0.475
1010003	Optional universal power adapter, 100-240 V, 50/60 Hz
910410	Orion pH 4.01 buffer pouches, 10/pk
910710	Orion pH 7.00 buffer pouches, 10/pk
911010	Orion pH 10.01 buffer pouches, 10/pk
911110	Orion pH rinse solution pouches, 10/pk
011008	Orion conductivity standard, 100 µS/cm, 5 x 60 mL bottles
01100710	Orion conductivity standard pouches, 1413 µS/cm, 10/pk
01100610	Orion conductivity standard pouches, 12.9 mS/cm, 10/pk
1010001	Orion conductivity calibration resistor kit

Keep going to find more portable meters.

- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp



## Thermo Scientific Orion Star A326

### pH/RDO/Dissolved Oxygen Portable Meter

The Thermo Scientific Orion Star A326 pH/RDO/Dissolved Oxygen Portable Meter is the top choice for advanced pH and dissolved oxygen measurements on location. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows individual pH/mV/RmV or dissolved oxygen in percent saturation or concentration results with temperature, or all results at once. Additional helpful information include electrode status, time, date, sample ID, user ID and calibration points. Advanced features such as stability and averaging options provide additional options allowing for laboratory accuracy everywhere you need it.



### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Up to 5 point pH calibration with automatic recognition for USA/NIST and DIN buffers
- Fix pH calibration errors without a complete recalibration with calibration editing
- No need to worry about DO probe compatibility – the meter accepts and automatically recognizes Orion polarographic and RDO optical/luminescence-based probes
- Easily get accurate DO results with automatic temperature, manual salinity and automatic/manual barometric pressure correction
- Calibrate DO using water-saturated air, air-saturated water, a Winkler titration or zero point calibration
- Non-volatile memory holds up to 5000 data points with time and date stamp
- User and sample ID fields for additional data accuracy
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Four AA batteries (included) provide over 800 hours of operation or purchase the universal power adapter (sold separately) to use on AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty





## Product Specifications

CE   TUV   FCC		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 5
	Calibration Editing	Yes
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>o</sub> ORP Mode	Yes
Dissolved Oxygen	<b>Concentration - Polarographic</b>	
	Range	0 to 90 mg/L
	Resolution	0.01, 0.1
	Relative Accuracy	±0.2
	<b>% Saturation - Polarographic</b>	
	Range	0 to 600
	Resolution	0.1, 1
	Relative Accuracy	±2 %
	<b>Concentration - RDO</b>	
	Range	0 to 50 mg/L
	Resolution	0.01, 0.1
	Relative Accuracy	±0.1 mg/L up to 8 mg/L; ±0.2 mg/L from 8 to 20 mg/L; 10 % of reading from 20 to 50 mg/L
	<b>% Saturation - RDO</b>	
	Range	0 to 500
	Resolution	0.1, 1
	Relative Accuracy	±2 %
	Manual Barometric Pressure Correction	450.0 to 850.0 mm Hg
	Manual Salinity Factor Correction	0 to 45 ppt
	Calibration Features	Water-saturated air, air saturated water, manual (Winkler) and zero point
	Probe Characteristics	Polarographic or RDO
Temperature	Range	0 to 50 °C, 32 to 122 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Datalogging	Number of Datalogs	5000 with time and date stamp
	Log Function	Manual, ready (includes AUTO-READ™), timed
Inputs	pH Electrode	BNC, reference pin
	DO with Temp. Probe	9-pin mini-DIN
Output		RS232, USB
Power	AC Adapter	Optional – universal, 100-240 VAC
	Battery Power	Optional – 4 AAs
	Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
STARA3260	<b>Orion Star A326 pH/RDO/Dissolved Oxygen Portable Multiparameter Meter</b> - Four AA batteries (installed)
STARA3265	<b>Orion Star A326 pH/RDO/Dissolved Oxygen Portable Multiparameter Meter Kit</b> - 8107UWMMD Orion ROSS Triode 3-in-1 pH/ATC probe, 3m cable - 087010MD Orion RDO optical/luminescence-based probe with 3m cable, stainless steel guard, calibration sleeve and optical/luminescence-based cap - 910410 Orion pH 4.01 buffer, 10 pouches - 910710 Orion pH 7.00 buffer, 10 pouches - 911010 Orion pH 10.01 buffer, 10 pouches - 810001 Orion ROSS electrode storage solution, 475 mL - 01100710 Orion 1413 µS conductivity standard, 10 pouches - 911110 rinse solution, 10 pouches - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)

## Accessories

Cat. No.	Description
STARA-CS	Hard carrying case for Orion Star A-series portable meters
STARA-AR	Armor for Orion Star A-series portable meters, includes electrode holders for pH, conductivity and DO probes
STARA-ESPH	pH electrode holder for Orion Star A-series armor
STARA-ESCD	Conductivity and DO probe holder for Orion Star A-series armor
8107UWMMD	Orion ROSS Triode 3-in-1 pH/ATC probe, gel-filled, 3m cable
087020MD	Orion RDO optical DO probe, 6m cable with stainless steel guard and calibration sleeve
087030MD	Orion RDO optical DO probe, 10m cable with stainless steel guard and calibration sleeve
087050MD	Orion RDO optical DO probe, 15m cable with stainless steel guard and calibration sleeve
087100MD	Orion RDO optical DO probe, 30m cable with stainless steel guard and calibration sleeve
1010003	Optional universal power adapter, 100-240 V, 50/60 Hz
910410	Orion pH 4.01 buffer pouches, 10/pk
910710	Orion pH 7.00 buffer pouches, 10/pk
911010	Orion pH 10.01 buffer pouches, 10/pk
911110	Orion pH rinse solution pouches, 10/pk
087010MD	Orion RDO optical DO probe, 3m cable with stainless steel guard and calibration sleeve
083005MD	Orion polarographic DO probe, 1.5m cable

pH

ISE

ORP

Cond

RDO

DO

Temp



## Thermo Scientific Orion Star A321 & Star A221 pH Portable Meters

### Orion Star A321

The Thermo Scientific Orion Star A321 pH Portable Meter is the top choice for advanced pH measurements on location. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows pH/mV/RmV and temperature along with electrode status, time, date, sample ID, user ID and calibration points. Advanced features such as stability and averaging options provide additional options allowing for laboratory accuracy everywhere you need it.

#### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading — AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Up to 5 point pH calibration with automatic recognition for USA/NIST and DIN buffers
- Fix errors without a complete recalibration with calibration editing
- Non-volatile memory holds up to 5000 data points with time and date stamp
- User and sample ID fields for additional data accuracy
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Four AA batteries (included) provide over 800 hours of operation or purchase the universal power adapter (sold separately) to use AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty



### Orion Star A221

Get the readings that you need where you need them with the Thermo Scientific Orion Star A221 pH Portable Meter. The large, backlit graphic LCD display shows pH/mV/RmV and temperature along with electrode status, time, date and calibration points.

#### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading — AUTO-READ™ locks in the stable reading on your screen and ready indicator alerts when readings are stable
- Up to 5 point pH calibration with automatic recognition for USA/NIST and DIN buffers
- Non-volatile memory holds up to 1000 data points with time and date stamp
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Four AA batteries (included) provide over 800 hours of operation or purchase the universal power adapter (sold separately) to use AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty



## Product Specifications (Orion Star A321 & Star A221)

CE   TUV   FCC		
pH	Range	-2.000 to 20.000
	Resolution	0.1, 0.01, 0.001
	Relative Accuracy	±0.002
	Calibration Points	Up to 5
	Calibration Editing	Orion Star A321: Yes Orion Star A221: No
mV/Rel mV/ ORP	Range	±2000.0 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
	E <sub>a</sub> ORP Mode	Yes
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Datalogging	Number of Datalogs	Orion Star A321: 5000 with time and date stamp Orion Star A221: 1000 with time and date stamp
	Log Function	Orion Star A321: Manual, ready (includes AUTO-READ™), timed Orion Star A221: Manual, Automatic with AUTO-READ™
Inputs	pH Electrode	BNC, reference pin
	ATC Probe	8-pin mini-DIN
Output		RS232, USB
Power	AC Adapter	Optional – universal, 100-240 VAC
	Battery Power	Included – 4 AAs
	Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
STARA3210	<b>Orion Star A321 pH Portable Meter</b> - Four AA batteries (installed)
STARA3215	<b>Orion Star A321 pH Portable Meter Kit</b> - 8107UWMMD Orion ROSS Triode 3-in-1 pH/ATC probe - 910410 Orion pH 4.01 buffer, 10 pouches - 910710 Orion pH 7.00 buffer, 10 pouches - 911010 Orion pH 10.01 buffer, 10 pouches - 810001 Orion ROSS electrode storage solution, 475 mL - 911110 rinse solution, 10 pouches - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)
STARA2210	<b>Orion Star A221 pH Portable Meter</b> - Four AA batteries (installed)
STARA2215	<b>Orion Star A221 pH Portable Meter Kit</b> - 8107UWMMD Orion ROSS Triode 3-in-1 pH/ATC probe - 910410 Orion pH 4.01 buffer, 10 pouches - 910710 Orion pH 7.00 buffer, 10 pouches - 911010 Orion pH 10.01 buffer, 10 pouches - 810001 Orion ROSS electrode storage solution, 475 mL - 911110 rinse solution, 10 pouches - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)

## Accessories

Cat. No.	Description
STARA-CS	Hard carrying case for Orion Star A-series portable meters
STARA-AR	Armor for Orion Star A-series portable meters, includes electrode holders for pH, conductivity and DO probes
STARA-ESPH	pH electrode holder for Orion Star A-series armor
STARA-ESCD	Conductivity and DO probe holder for Orion Star A-series armor
8107UWMMD	Orion ROSS Triode 3-in-1 pH/ATC probe, gel-filled, 3m cable
1010003	Optional universal power adapter, 100-240 V, 50/60 Hz
910410	Orion pH 4.01 buffer pouches, 10/pk
910710	Orion pH 7.00 buffer pouches, 10/pk
911010	Orion pH 10.01 buffer pouches, 10/pk
911110	Orion pH rinse solution pouches, 10/pk

We told you we've expanded the line. The new Orion Star A series line still has more options on the following pages.

- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp



## Thermo Scientific Orion Star A121 pH Portable Meter

Thermo Scientific Orion Star A121 pH Portable Meters combine simplicity with accuracy. A large LCD displays pH or mV readings along with temperature. Icons provide quick updates on battery life, electrode status and calibration information. Simple button layout and onscreen messages help with calibration and setup menu choices.



### Features and Benefits

- Large, informative screen clearly shows the main information, including pH or mV reading, temperature in °C or °F, meter mode, calibration information and battery life
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen and ready indicator alerts when readings are stable
- Up to 3 point pH calibration
- Automatic recognition of USA/NIST and DIN buffers
- Easily recall calibration slope data for procedure checks
- Non-volatile memory holds up to 50 data points
- Four AA batteries (included) provide over 2000 hours of operation or purchase the universal power adapter (sold separately) to run meter on AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty





## Product Specifications

CE   TUV   FCC		
pH	Range	-2.00 to 16.00
	Resolution	0.1, 0.01
	Relative Accuracy	±0.01
	pH Calibration Points	Up to 3
mV/Rel mV/ ORP	Range - mV	±1600.0 mV
	Range - RmV	±1999.9 mV
	Resolution	0.1
	Relative Accuracy	±0.2 mV or ±0.05 % of reading whichever is greater
Temperature	E <sub>n</sub> ORP Mode	No
	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Temperature Compensation	Automatic or manual
Datalogging	Temperature Offset Calibration	Yes
	Number of Datalogs	50
Inputs	Log Function	Manual, Automatic with AUTO-READ™
	pH Electrode	BNC
Power	ATC Probe	8-pin mini-DIN
	AC Adapter	Optional – universal, 100-240 VAC
	Battery Power	Included – 4 AAs
	Battery Life	2000 hrs

## Meter Ordering Information

Cat. No.	Description
STARA1210	<b>Orion Star A121 pH Portable Meter</b> - Four AA batteries (installed)
STARA1215	<b>Orion Star A121 pH Portable Meter Kit</b> - 9107BNMD Orion Triode 3-in-1 pH/ATC probe - Solution kit (60 mL each of pH 4, 7 and 10 buffers; storage solution and cleaning solution) - 911110 rinse solution, 10 pouches - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)

## Accessories

Cat. No.	Description
STARA-CS	Hard carrying case for Orion Star A-series portable meters
STARA-AR	Armor for Orion Star A-series portable meters, includes electrode holders for pH, conductivity and DO probes
STARA-ESPH	pH electrode holder for Orion Star A-series armor
STARA-ESCD	Conductivity and DO probe holder for Orion Star A-series armor
9157BNMD	Orion Triode 3-in-1 pH/ATC probe, refillable, epoxy body
9107BNMD	Orion Triode 3-in-1 pH/ATC probe, gel-filled, epoxy body
1010003	Optional universal power adapter, 100-240 V, 50/60 Hz
910410	Orion pH 4.01 buffer pouches, 10/pk
910710	Orion pH 7.00 buffer pouches, 10/pk
911010	Orion pH 10.01 buffer pouches, 10/pk
911110	Orion pH rinse solution pouches, 10/pk
916099	Orion pH buffer assortment pack - 60 mL each of pH 4, 7 and 10 buffers; storage solution and cleaning solution D

pH

ISE

ORP

Cond

RDO

DO

Temp



## Thermo Scientific Orion Star A322 & Star A222

Conductivity Portable Meters

### Orion Star A322

The Thermo Scientific Orion Star A322 Conductivity Portable Meter is the top choice for advanced measurements on location. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows conductivity/TDS/salinity resistivity and temperature along with electrode status, time, date, sample ID, user ID and calibration points. Advanced features such as stability and averaging options provide additional options allowing for laboratory accuracy everywhere you need it.

#### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Selectable cell constant allows for use with 2- or 4-cell conductivity cells
- For advanced accuracy, selectable reading reference temperatures of 5, 10, 15, 20 or 25 °C with linear, non-linear, nLFu or USP/EP curve options
- Choice of practical salinity or natural sea water curves for salinity readings
- Linear or ISO/EN 27888 curves for TDS
- Non-volatile memory holds up to 5000 data points with time and date stamp
- User and sample ID fields for additional data accuracy
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Four AA batteries (included) provide over 800 hours of operation or purchase the universal power adapter (sold separately) to use AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty

### Orion Star A222

Get the readings that you need where you need them with the Thermo Scientific Orion Star A222 Conductivity Portable Meter. The large, backlit graphic LCD display shows conductivity/TDS/salinity/resistivity and temperature along with electrode status, time, date and calibration points.

#### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen and ready indicator alerts when readings are stable
- Selectable cell constant allows for use with 2- or 4-cell conductivity cells
- Selectable reading reference temperatures of 15, 20 or 25 °C with linear or non-linear curve options
- Includes the standard practical salinity curve for salinity readings
- Linear or ISO/EN 27888 curves for TDS
- Non-volatile memory holds up to 1000 data points with time and date stamp
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Four AA batteries (included) provide over 800 hours of operation or purchase the universal power adapter (sold separately) to use AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty





## Product Specifications (Orion Star A322 & Star A222)

CE   TUV   FCC		
Conductivity	Range	0.001 µS to 3000 mS
	Resolution	0.001 µS minimum; 4 significant figures minimum
	Relative Accuracy	0.5 % reading ±1 digit
	Reference Temperature	Orion Star A322: 5, 10, 15, 20, 25 °C Orion Star A222: 15, 20, 25 °C
	Temperature Compensation	Orion Star A322: Linear (0 to 10.0 %/°C), nLn, nLFu, USP/EP Orion Star A222: Linear (0 to 10.0 %/°C), nLn
	Compatible Cell Constants	0.001 to 199.9
	Calibration Points	Up to 5 points
	Calibration Editing	Orion Star A322: Yes Orion Star A222: –
Resistivity	Range	2 ohm to 100 meg-ohm
	Resolution	2 ohms-cm
	Relative Accuracy	0.5 % reading ±1 digit
Salinity	Type	Orion Star A322: Practical salinity or natural sea water Orion Star A222: Practical salinity
	Range	0.01 to 80.0 psu 0.01 to 42 ppt sea water
	Resolution	0.01
	Relative Accuracy	±0.1
TDS	Range	0 to 200 ppt
	Resolution	4 significant digits
	Relative Accuracy	±0.5 % reading ±1 digit
	TDS Factor Range	Linear, 0.01 to 10.00
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	1 point
Datalogging	Number of Datalogs	Orion Star A322: 5000 with time and date stamp Orion Star A222: 1000 with time and date stamp
	Log Function	Orion Star A322: Manual, ready (includes AUTO-READ™), timed Orion Star A222: Manual, Automatic with AUTO-READ™
Inputs	Conductivity with Temperature Probe	8-pin mini-DIN
Output		RS232, USB
Power	AC Adapter	Optional – universal, 100-240 VAC
	Battery Power	Included – 4 AAs
	Battery Life	800 hrs

## Meter Ordering Information

Cat. No.	Description
STARA3220	<b>Orion Star A322 Conductivity Portable Meter</b> - Four AA batteries (installed)
STARA3225	<b>Orion Star A322 Conductivity Portable Meter Kit</b> - 013010MD Orion DuraProbe conductivity cell with 3m cable, K=0.475 - 01100710 conductivity standard pouches, 1413 µS, pack of 10 - 911110 rinse solution, pack of 10 - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)
STARA2220	<b>Orion Star A222 Conductivity Portable Meter</b> - Four AA batteries (installed)
STARA2225	<b>Orion Star A222 Conductivity Portable Meter Kit</b> - 013010MD Orion DuraProbe conductivity cell with 3m cable, K=0.475 - 01100710 conductivity standard pouches, 1413 µS, pack of 10 - 911110 rinse solution, pack of 10 - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)

## Accessories

Cat. No.	Description
STARA-CS	Hard carrying case for Orion Star A-series portable meters
1210005	Soft carrying case for Orion Star, Star Plus and Star A-series portable meters
STARA-AR	Armor for Orion Star A-series portable meters, includes electrode holders for pH, conductivity and DO probes
STARA-ESCD	Conductivity and DO probe holder for Orion Star A-series armor
STARA-ESPH	pH electrode holder for Orion Star A-series armor
013005MD	Orion DuraProbe conductivity cell with 1.5m cable, 4-cell, K=0.475
013010MD	Orion DuraProbe conductivity cell with 3m cable, 4-cell, K=0.475
013020MD	Orion DuraProbe conductivity cell with 6m cable, 4-cell, K=0.475
013025MD	Orion DuraProbe conductivity cell with 10m cable, 4-cell, K=0.475
1010003	Optional universal power adapter, 100-240 V, 50/60 Hz
011008	Orion conductivity standard, 100 µS/cm, 5 x 60 mL bottles
01100710	Orion conductivity standard pouches, 1413 µS/cm, 10/pk
01100610	Orion conductivity standard pouches, 12.9 mS/cm, 10/pk
911110	Orion rinse solution pouches, 10/pk
1010001	Orion conductivity calibration resistor kit

That's not all. We have more new meters on the following pages.

pH ■  
ISE ■  
ORP ■  
Cond ■  
RDO ■  
DO ■  
Temp ■



## Thermo Scientific Orion Star A122

Conductivity Portable Meter

Thermo Scientific Orion Star A122 Conductivity Portable Meters combine simplicity with accuracy. A large LCD displays conductivity or TDS readings along with temperature. Icons provide quick updates on battery life and completed calibration status. Simple button layout and onscreen messages help with calibration and setup menu choices.

### Features and Benefits

- Large, informative screen clearly shows the main information, including conductivity or TDS reading, temperature in °C or °F, meter mode and battery life
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen and ready indicator alerts when readings are stable
- Selectable cell constant
- Manual calibration or automatic calibration when using a Thermo Scientific Orion conductivity standard (sold separately)
- Selectable reading reference temperatures of 20 °C or 25 °C for an accurate result
- Non-volatile memory holds up to 50 data points
- Four AA batteries (included) provide over 2000 hours of operation or purchase the universal power adapter (sold separately) to run meter on AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty







## Product Specifications

CE   TUV   FCC		
Conductivity	Range	0.1 µS/cm to 200 mS/cm
	Resolution	0.01 µS minimum; 3 significant figures minimum
	Relative Accuracy	0.5 % reading ±1 digit
	Reference Temperature	20, 25 °C (default)
	Temperature Compensation	Linear (0.0 to 10.0 %/°C)
	Compatible Cell Constants	0.001 to 10
	Calibration Points	1
TDS	Range	1 to 19,999 mg/L
	Resolution	4 significant digits
	Relative Accuracy	0.5 % reading ±1 digit
	TDS Factor Range	Linear, 0.01 to 10.00, default 0.49
Temperature	Range	-5 to 105 °C, 23 to 221 °F
	Resolution	0.1
	Relative Accuracy	±0.1
	Offset Calibration	Yes
Datalogging	Number of Datalogs	50
	Log Function	Manual, Automatic with AUTO-READ™
Inputs	Conductivity	8-pin mini-DIN
Power	AC Adapter	Optional – universal, 100-240 VAC
	Battery Power	Included – 4 AAs
	Battery Life	2000 hrs

## Meter Ordering Information

Cat. No.	Description
STARA1220	<b>Orion Star A122 Conductivity Portable Meter</b> - Four AA batteries (installed)
STARA1225	<b>Orion Star A122 Conductivity Portable Meter Kit</b> - 011050MD Orion conductivity cell, K=1.0 - 011007 conductivity standard, 1413 µS, 5 x 60 mL - 911110 rinse solution, 10 pouches - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)

## Accessories

Cat. No.	Description
STARA-CS	Hard carrying case for Orion Star A-series portable meters
STARA-AR	Armor for Orion Star A-series portable meters, includes electrode holders for pH, conductivity and DO probes
STARA-ESCD	Conductivity and DO probe holder for Orion Star A-series armor
STARA-ESPH	pH electrode holder for Orion Star A-series armor
011050MD	Orion 2-electrode conductivity cell, K=1.0
1010003	Optional universal power adapter, 100-240 V, 50/60 Hz
011008	Orion conductivity standard, 100 µS/cm, 5 x 60 mL bottles
01100710	Orion conductivity standard pouches, 1413 µS/cm, 10/pk
01100610	Orion conductivity standard pouches, 12.9 mS/cm, 10/pk
911110	Rinse solution, 10/pk
1010001	Orion conductivity calibration resistor kit

pH

ISE

ORP

Cond

RDO

DO

Temp



## Thermo Scientific Orion Star A323 & Star A223

RDO/Dissolved Oxygen Portable Meters

### Orion Star A323

The Thermo Scientific Orion Star A323 RDO/Dissolved Oxygen Portable Meter is the top choice for ensuring proper oxygen levels for maximum process control on location. Get the information you need quickly and easily from the large, backlit graphic LCD display. Informative display shows dissolved oxygen in percent saturation or concentration with temperature and electrode status, time, date, sample ID, user ID and calibration points. Advanced features such as stability and averaging options provide additional options allowing for laboratory accuracy everywhere you need it.

#### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- No need to worry about DO probe compatibility – the meter accepts and automatically recognizes Orion polarographic and RDO optical/luminescence-based probes
- Accurate results are easy with automatic temperature, manual salinity and automatic/manual barometric pressure compensation
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen, ready indicator alerts when readings are stable and timed reading gathers data in specific time intervals
- Calibrate using water-saturated air, air-saturated water, a Winkler titration or zero point calibration
- Non-volatile memory holds up to 5000 data points with time and date stamp
- User and sample ID fields for additional data accuracy
- Stores up to 10 methods allow for customized procedures to differentiate between tests and/or users
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Four AA batteries (included) provide over 800 hours of operation or purchase the universal power adapter (sold separately) to use AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty



### Orion Star A223

Get the readings that you need where you need them with the Thermo Scientific Orion Star A223 RDO/Dissolved Oxygen Portable Meter. The large, backlit graphic LCD display shows dissolved oxygen in percent saturation or concentration with temperature and electrode status, time, date and calibration points.

#### Features and Benefits

- Anyone can use this meter with its plain language screen prompts, soft keys that update for easy selection and a multilanguage interface that supports English, Spanish, French, Italian, German and Chinese
- No need to worry about DO probe compatibility – the meter accepts and automatically recognizes Orion polarographic and RDO optical/luminescence-based probes
- Accurate results are easy with automatic temperature, manual salinity and automatic/manual barometric pressure compensation
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen and ready indicator alerts when readings are stable
- Calibrate using water-saturated air, air-saturated water, a Winkler titration or zero point calibration
- Non-volatile memory holds up to 1000 data points with time and date stamp
- Easily transfer data and keep meter software up-to-date with the USB and RS232 ports and complimentary data analysis software
- Four AA batteries (included) provide over 800 hours of operation or purchase the universal power adapter (sold separately) to use AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty



## Product Specifications (Orion Star A323 & Star A223)

CE   TUV   FCC		
Dissolved Oxygen	<b>Concentration - Polarographic</b>	
	Range	0 to 90 mg/L
	Resolution	0.01, 0.1
	Relative Accuracy	±0.2
	<b>% Saturation - Polarographic</b>	
	Range	0 to 600
	Resolution	0.1, 1
	Relative Accuracy	±2 %
	<b>Concentration - RDO</b>	
	Range	0 to 50 mg/L
	Resolution	0.01, 0.1
	Relative Accuracy	±0.1 mg/L up to 8 mg/L; ±0.2 mg/L from 8 to 20 mg/L; 10 % of reading from 20 to 50 mg/L
	<b>% Saturation - RDO</b>	
	Range	0 to 500
	Resolution	0.1, 1
	Relative Accuracy	±2 %
Manual Barometric Pressure Correction	450.0 to 850.0 mm Hg	
	Manual Salinity Factor Correction	
	0 to 45 ppt	
	Calibration Features	
Temperature	Water saturated air, air saturated water, manual (Winkler) and zero point	
	Probe Characteristics	
	Polarographic or RDO	
	Range	
Datalogging	0 to 50 °C, 32 to 122 °F	
	Resolution	
	0.1	
	Relative Accuracy	
Inputs	±0.1	
	Offset Calibration	
	1 point	
	Number of Datalogs	
Output	Orion Star A323: 5000 with time and date stamp Orion Star A223: 1000 with time and date stamp	
	Log Function	
	Orion Star A323: Manual, automatic (with Auto-Read™), timed Orion Star A223: Manual, automatic (with Auto-Read™)	
	DO with Temperature Probe	
Power	9-pin mini-DIN	
	RS232, USB	
	Power Cord	
	Optional – universal, 100-240 VAC	
Battery Power	Included – 4 AAs	
	Battery Life	
	800 hrs	

## Meter Ordering Information

Cat. No.	Description
STARA3230	<b>Orion Star A323 Dissolved Oxygen Portable Meter</b> - Four AA batteries (installed)
STARA3235	<b>Orion Star A323 Dissolved Oxygen Portable Meter Kit</b> - 087010MD Orion RDO optical/luminescence-based probe with 3m cable, stainless steel guard, calibration sleeve and optical/luminescence-based cap - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)
STARA2230	<b>Orion Star A223 RDO/Dissolved Oxygen Portable Meter</b> - Four AA batteries (installed)
STARA2235	<b>Orion Star A223 RDO/Dissolved Oxygen Portable Meter Kit</b> - 087010MD Orion RDO optical/luminescence-based probe with 3m cable, stainless steel guard, calibration sleeve and optical/luminescence-based cap - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)

## Accessories

Cat. No.	Description
STARA-CS	Hard carrying case for Orion Star A-series portable meters
STARA-AR	Armor for Orion Star A-series portable meters, includes electrode holders for pH, conductivity and DO probes
STARA-ESCD	Conductivity and DO probe holder for Orion Star A-series armor
STARA-ESPH	pH electrode holder for Orion Star A-series armor
1010003	Optional universal power adapter, 100-240 V, 50/60 Hz
087010MD	Orion RDO optical DO probe, 3m cable with stainless steel guard and calibration sleeve
087020MD	Orion RDO optical DO probe, 6m cable with stainless steel guard and calibration sleeve
087030MD	Orion RDO optical DO probe, 10m cable with stainless steel guard and calibration sleeve
087050MD	Orion RDO optical DO probe, 15m cable with stainless steel guard and calibration sleeve
087100MD	Orion RDO optical DO probe, 30m cable with stainless steel guard and calibration sleeve
083005MD	Orion polarographic DO probe, 1.5m cable
080513	Orion polarographic DO probe maintenance kit
080514	Orion polarographic DO probe electrolyte solution, 60 mL
080017	Calibration sleeve for Orion polarographic DO probes
087003	Replacement calibration sleeve for Orion RDO optical probes
087001	Replacement optical cap for Orion RDO probes

Looking for more?  
Please turn the page.

- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp



## Thermo Scientific Orion Star A123

### Dissolved Oxygen Portable Meter

Thermo Scientific Orion Star A123 Dissolved Oxygen Portable Meters combine simplicity with accuracy. A large LCD displays dissolved oxygen readings along with temperature. Icons provide quick updates on battery life and completed calibration status. Simple button layout and onscreen messages help with calibration and setup menu choices.

#### Features and Benefits

- Large, informative screen clearly shows the main information, including DO reading in mg/L or % saturation, temperature in °C or °F, meter mode and battery life
- Automatic temperature, manual salinity input and manual barometric pressure compensation for an accurate result
- Don't miss a reading – AUTO-READ™ locks in the stable reading on your screen and ready indicator alerts when readings are stable
- Two calibration options to meet your procedural requirements: water-saturated air method or a Winkler titration
- Accepts Thermo Scientific Orion polarographic dissolved oxygen probes
- Non-volatile memory holds up to 50 data points
- Four AA batteries (included) provide over 2000 hours of operation or purchase the universal power adapter (sold separately) to run meter on AC power
- Perfectly portable, waterproof and protected to take anywhere with a IP67-rated housing
- 3 year meter replacement warranty



- pH
- ISE
- ORP
- Cond
- RDO
- DO
- Temp

#### Product Specifications

CE   TUV   FCC	
Dissolved Oxygen	<b>Concentration</b>
	<b>Range</b> 0 to 20 mg/L
	<b>Resolution</b> 0.01, 0.1
	<b>Relative Accuracy</b> ±0.2
	<b>% Saturation</b>
	<b>Range</b> 0 to 200
	<b>Resolution</b> 0.1, 1
	<b>Relative Accuracy</b> ±2 %
	<b>Manual Barometric Pressure Correction</b> 450.0 to 850.0 mm Hg
Temperature	<b>Manual Salinity Factor Correction</b> 0 to 45
	<b>Calibration Features</b> Water-saturated air, manual (Winkler)
	<b>Sensor Type</b> Polarographic
	<b>Range</b> 0 to 50 °C, 32 to 122 °F
	<b>Resolution</b> 0.1
Datalogging	<b>Relative Accuracy</b> ±0.1
	<b>Offset Calibration</b> Yes
Inputs	<b>Number of Datalogs</b> 50
	<b>Log Function</b> Manual, Automatic with AUTO-READ™
Power	<b>DO with Temperature Probe</b> 9-pin mini-DIN
	<b>Power Cord</b> Optional – universal, 100-240 VAC
	<b>Battery Power</b> Included – 4 AAs
	<b>Battery Life</b> 2000 hrs

#### Meter Ordering Information

Cat. No.	Description
STARA1230	<b>Orion Star A123 Dissolved Oxygen Portable Meter</b> - Four AA batteries (installed)
STARA1235	<b>Orion Star A123 Dissolved Oxygen Portable Meter Kit</b> - 083005MD Orion polarographic DO probe - 080017 calibration sleeve for DO probe - 080513 DO probe maintenance kit - Protective armor with electrode holder - Hard carrying case - Four AA batteries (installed)

#### Accessories

Cat. No.	Description
STARA-CS	Hard carrying case for Orion Star A-series portable meters
STARA-AR	Armor for Orion Star A-series portable meters, includes electrode holders for pH, conductivity and DO probes
STARA-ESCD	Conductivity and DO probe holder for Orion Star A-series armor
STARA-ESPH	pH electrode holder for Orion Star A-series armor
083005MD	Orion polarographic DO probe, 1.5 m cable
080513	Orion polarographic DO probe maintenance kit
080017	Calibration sleeve for Orion polarographic DO probes
1010003	Optional universal power adapter, 100-240 V, 50/60 Hz





## Thermo Scientific Orion Meter Accessories

For Orion Star A and VERSA STAR Series

With the new Orion meters, no details were too small. Even our accessories have undergone a redesign.

### Accessories

Cat. No.	Description
STARA-CS	Hard field case
1210005	Soft field case
STARA-AR	Armor for Orion Star A portable meters (includes pH electrode storage sleeve and holders for pH, conductivity and DO probes)
STARA-ESPH	Replacement pH electrode storage sleeve holder (for use with armor)
STARA-ESCD	Replacement conductivity and DO storage sleeves holder (for use with armor)
STARA-BEA	Orion Star A electrode arm and holder head
STARA-HB	Weighted, detached base for electrode arm and holder head
STARA-ELHD	Orion Star A electrode holder head (attaches to existing Orion Star electrode arm)
1010003	Universal power adapter (for Orion Star A benchtop and portable meters)
STARA-PWR	Replacement universal power adapter for Orion VERSA STAR
1010004	RS232 computer and printer cable set
1010006	Star series inkjet printer, 110V/220V and cable
1010008	Ink cartridge for Orion Star series printer
1010009	Paper for Orion Star series printer
1010053	RS232 computer cable
096019	Orion Star stirrer probe (automatic stirrer probe with paddle for benchtop Orion Star series meters)
096021	Replacement paddles for 096019 - 3 pack
090045	BNC shorting cap



Armor (cat. no. STARA-AR) adds extra meter protection. The strap can attach to a belt or pipe to keep the meter close to the tester or test site. The built-in stand in the armor works great for additional hands-free operation.



The redesigned electrode holder head (cat. no. STARA-ELHD, sold separately or included with cat. no. STARA-BEA) reduces the amount of sample needed for testing since the probe heights are adjustable.



## Thermo Scientific Orion Meter Accessories

For Orion Star, Star Plus, Aplus and PerpHecT Meter Series

To make sure you have everything you need to attain accurate results for your applications, we offer a multitude of accessories for both field and lab applications. From printers to field cases, electrode stands and stirrers, we have it all. Below are the top selling accessories – for complete details, please visit

### Aplus™ and PerpHecT® Meter Accessories

Cat. No.	Description
020125	110 V power adapter
020130	220 V power adapter
020135	240 V power adapter
090043	Swing arm electrode stand
090070	Basic electrode stand and holder
910002	Universal electrode holder for basic electrode stand
090045	BNC shorting cap
0900A0	900A thermal printer for Aplus meters, 110 V
0900A1	900A thermal printer for Aplus meters, 220 V
0900A7	900A thermal printer for Aplus meters, 240 V
0900A4	Paper for 900A printer
0900A6	Battery pack for 900A printer
PRT300	PRT300 ink printer and cable for Aplus and PerpHecT meters, 110 V
PRT301	PRT300 ink printer and cable for Aplus and PerpHecT meters, 220 V
PRT302	Ink ribbon for PRT300 printer
OACBL0	RS232 computer cable for Aplus and PerpHecT meters
OPBLSK	Aplus portable meter starter kit – includes field case, field stand, beaker, 2 x 60 mL bottles each of pH 4.01, 7.00, and 10.01 buffers, and 1 x 60 mL bottle of pH storage solution
OBCHSK	Aplus benchtop meter starter kit – includes basic electrode stand and holder, 917005 epoxy ATC probe, and 1 x 475 mL bottle each of pH 4.01, 7.00, and 10.01 buffers and pH storage solution
0607CA	607 multi-channel electrode switchbox and cables, 110 V
0607CI	607 multi-channel electrode switchbox and cables, 220 V

Orion Star Stirrer Probe, Cat. No. 096019  
and Swing Arm Stand, Cat. No. 090043



Orion Star Stirrer Probe in action –  
sample mixing without separate stirrer



Hard Field Case, Cat. No. 1210004



Soft Field Case, Cat. No. 1210005

### Orion Star™ Series Meter Accessories

Cat. No.	Description
1010003	Universal power adapter
1010004	RS232 computer and printer cable set
1010005	RS232 to USB cable adapter
1010006	Orion Star series inkjet printer, 110 V/220 V and cable
1010008	Ink cartridge for Orion Star series printer
1010009	Paper for Orion Star series printer
1010053	RS232 computer cable
1210001	Portable star series electrode stand
1210002	Meter impact jacket and electrode storage chamber
1210003	Electrode storage chamber (for meter impact jacket)
1210004	Hard field case
1210005	Soft field case
096019	Orion Star stirrer probe (automatic stirrer probe with paddle for benchtop Orion Star series meters)
096021	Replacement paddles for 096019 – 3 pack
090043	Swing arm electrode stand
090044	Electrode holder head with 15mm dia cond cell slot, for use with 090043
090045	BNC shorting cap
1010050	Adapter – MiniDIN ATC probe to 3.5 mm phono tip meters (310, 320, 330, 350, 370, 555A, 550A, 535A, and 162A)
1010051	Adapter – MiniDIN ATC probe to 8 pin DIN meters (210Aplus, 230Aplus, 250Aplus, 290Aplus, 410Aplus, 420Aplus, 520Aplus, 525Aplus, 710Aplus, 720Aplus, and 920Aplus)
1010800	Adapter – MiniDIN DO probe to 8 pin waterproof DIN DO meters (830A, 835A and 862A)
1010801	Adapter – MiniDIN DO probe to 8 pin DIN DO meters (805Aplus, 810Aplus, and 850Aplus)
1010900	Adapter – MiniDIN conductivity probe to 8 pin waterproof DIN conductivity meters (1230, 555A, 550A, 162A, 135A, and 130A)
1010901	Adapter – MiniDIN conductivity probe to 8 pin DIN conductivity meters (150Aplus, 145Aplus, 125Aplus, 115Aplus, and 105Aplus)

## Thermo Scientific Orion Intrinsicly Safe\* Meters



### Features and Benefits

- For use where non-sparking equipment is desired, these carry US intrinsically safe approval rating by Factory Mutual (FM)\*
- Waterproof, portable models for basic field measurements
- 266S and 136S meters include RS232 output, advanced GLPdoc 100 point datalogger with time and date stamp and includes software program for simplified data collection and remote operation on a computer
- Accepts Waterproof DIN, dual banana plug connections
- Units use 3 AA batteries
- 131S and 136S meters offer linear and non-linear temperature compensation for natural and ultrapure water applications
- 3 year meter warranty

\* Does not meet European Intrinsically Safe specification.

### Accessories

Cat. No.	Description
013655	Electrode clip

### Product Specifications

		266S/261S	136S/131S
pH	Range	-2.00 to 16.00	—
	Resolution	0.1, 0.01	—
	Relative Accuracy	±0.01	—
	Auto-Buffer Recognition	Dependent on buffer set (7 pre-programmed sets)	—
	Calibration Points	3	—
mV	Range	±1300.0	—
	Resolution	±0.1	—
	Relative Accuracy	±0.1 % of value +0.3 mV	—
Cond	Range	—	0.00 to 500 mS
	Resolution	—	0.01 up to 99.99 µS/cm 0.1 above 99.99 µS/cm
	Relative Accuracy	—	±0.5 % of measured value + 1 count
	Calibration Points	—	1
	Cell Constants	—	0.010 to 199.0 cm <sup>-1</sup>
Salinity	Range	—	0 to 45.0 (10 to 30 °C) g/kg
	Resolution	—	0.1
TDS	Range	—	0 to 1999 mg/L (10 to 40 °C)
	Resolution	—	1
Temp	Range	-20 to 120 °C	-20 to 120 °C
	Resolution	0.1	0.1
	Relative Accuracy	±0.3 °C	±0.3 °C

### Portable Meter and Electrode

Cat. No.	Meter	Sensor (s)
0261S0	261S	9109WVP low maintenance pH/ATC Triode™
0266S0	266S	9109WVP low maintenance pH/ATC Triode
0131S0	131S	013010A DuraProbe™ conductivity cell
0136S0	136S	013010A DuraProbe conductivity cell

### Portable Meter, Electrode and Field Kit

Cat. No.	Meter	Sensor (s)	Accessories & Solutions
0261S3	261S	9109WVP low maintenance pH/ATC Triode	Neck strap, field case, stand, electrode holder, beakers, 4, 7 and 10 buffers
0266S3	266S	9109WVP low maintenance pH/ATC Triode	Neck strap, field case, stand, electrode holder, beakers, 4, 7 and 10 buffers, RS232 cable and software
0131S3	131S	013010A DuraProbe conductivity cell	Beakers, standards
0136S3	136S	013010A DuraProbe conductivity cell	Beakers, standards, RS232 cable and software

We have more to present in our newly revamped electrodes & accessories sections. Keep going!

pH

ISE

ORP

Cond

DO



Temp

## Thermo Scientific Orion pH Electrode Features

Select features to meet the needs of your applications

The Thermo Scientific Orion electrode line offers a wide variety of quality pH electrodes to choose from. There are many different factors to consider when you selecting a pH electrode to ensure you select the electrode that will suit your needs. You will need to consider body materials, body styles, and sample requirements. Below is a quick guide to help you choose the correct pH electrode. If you still require assistance, please contact our technical service department at 800-225-1480 or 978-232-6000.

### Body Materials

Glass Body	Epoxy Body
	
Compatible with virtually any sample, including solvents	Extremely durable, rugged body prevents breakage
Easy to clean	Electrode bulb protected by bulb guard
Can handle higher temperature	Low-maintenance gel-filled can be used in higher temperatures than glass low-maintenance electrodes

### pH Body Style

Standard	Semi-Micro
	
12 mm diameter	6-8 mm diameter
Used in a wide variety of samples	For small samples sizes down to 200 µL
Micro	Rugged Bulb
	
1-5 mm diameter	Glass body
For samples as small as 0.5 µL and containers as small as 384 well plates	Extra durable pH bulb to prevent breakage
Spear Tip	Flat Surface
	
For piercing solid or semi-solid samples	For measuring surfaces of solid or gel samples
Can be used for small volumes	For use with small volumes

### Fill Type

Refillable (Glass or Epoxy Body)	Polymer Filled (Sealed Glass or Epoxy Body)	Gel Filled (Sealed Epoxy Body)
Filling solution required	No filling solution needed	No filling solution needed
Easy maintenance, periodic filling and draining needed	Low maintenance, sealed reference	Low maintenance, sealed reference
Longer expected life	Easy to use	Easy to use
For use in a wide variety of applications	For use in a wide variety of applications	General purpose for everyday use
Best precision, 0.01 to 0.02 pH	0.02 pH precision	0.05 to 0.1 pH precision
Most rapid response time	Better response time	Good response time
Longest warranty, 1-2 years (6 months for Ag/AgCl micro electrodes)	1 year warranty	3-6 month warranty (18 months for ROSS 8107 models)

### Reference Styles

ROSS Ultra®/ROSS Reference®	Double Junction Ag/AgCl	Single Junction Ag/AgCl
0.01 pH precision	0.02 pH precision	0.02 to 0.1 pH precision
Best measurement response time	Better measurement response time	Good measurement response time
Best temperature response	Good temperature response	Good temperature response
Ideal for TRIS, protein and sulfide samples	Ideal for TRIS, protein and sulfide samples	General purpose for everyday use
Variety of body styles and types	Variety of body styles and types	Variety of body styles and types
Refillable or gel filled design	Refillable, polymer or gel filled design	Refillable or gel filled design

### Junctions – Sure-Flow, Sleeve, Open, Ceramic, Wick and Glass Fiber

Sure-Flow®, Sleeve and Open	Ceramic and Glass Capillary	Wick and Glass Fiber
Best junction for dirty, difficult samples and demanding lab use	Better junction for routine lab use in a variety of samples	Good junction for routine lab use or field use in buffers and aqueous samples
Junction is clog free, easy to clean and has longest use life	Junction is high quality and durable	Good junction with durability
Ideal for thick or viscous samples, compatible with all sample types	Ideal for most lab applications and sample types	Ideal for basic lab applications and aqueous samples





## Thermo Scientific Electrode Styles

### Thermo Scientific Orion Electrode Families and Types

Thermo Scientific Orion pH electrodes have a variety of different family of electrodes available to help with your measurements needs. They are designed to meet all your measurement needs.

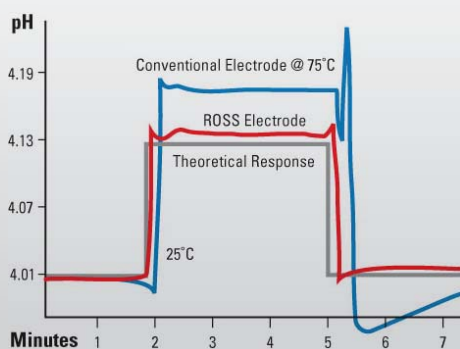
#### Triodes

Combination pH electrode with built-in temperature sensor. Convenience with being able to measure pH and temperature with one electrode. BNC connector for pH measurement and alternative connector for temperature measurement. Compatible with only Thermo Scientific Orion pH meters as temperature connector and temperature element are unique to meter model.

#### ROSS Ultra® and ROSS® Electrodes

The best electrode available anywhere! Has the fastest response, best accuracy and reproducibility despite sample composition. Exhibits unmatched response to temperature variations. Double junction reference for complex samples such as biological media, foods, pharmaceuticals, TRIS, sulfides and proteins. Available in all body styles. ROSS Ultra electrodes have an industry best warranty.

The graph shows how ROSS electrodes respond versus the best of conventional pH electrodes. The ROSS electrode continues to show fast reproducibility and accuracy after many dramatic temperature changes.



Temperature Response of the ROSS Ultra® and ROSS® Electrodes vs. Conventional Electrodes

### AquaPro Professional pH Electrodes

Low maintenance polymer filled double junction electrode. For use in TRIS, sulfides, proteins and biological media. Has an extended life, fast response and clog resistant open junction. Available in standard, semi-micro, rugged bulb and flat surface body styles. The junction must be kept wet.

#### Double Junction

Isolated Ag/AgCl reference system which prevents silver from coming in contact with the sample. Great for measuring TRIS buffer, sulfide and protein samples. Available in standard and micro body styles.

#### No Cal®

Unique reference system that provides quick and accurate measurements. Great for measuring TRIS buffers sulfide and protein samples. No calibration required and accurate to 0.1 pH without calibration. Has the benefit of having a ceramic junction in an epoxy body and also a built-in temperature sensor.

#### Standard

A large variety of electrodes for a wide range of applications. Includes specialty pH electrodes for unique or challenging pH measurements. Available in most body styles. Micro electrodes capable of measuring samples as small as 0.5 µL in containers as small as 384 well plates.

#### KNipHE®

The pH electrode is housed in a body with a stainless steel blade for measuring meat, cheese and sludge samples.

#### Economy or Low-Maintenance

Good performance, valued priced, durable and low maintenance gel-filled pH electrodes. Available in standard, semi-micro and flat surface body styles.

#### Redox/ORP

The ideal choice for measuring the oxidation reduction potential of samples and performing redox titrations.

#### ATC Probes

Automatic temperature compensation probes measure sample temperatures and adjust pH measurements by correcting the electrode slope according to the measured temperature.



## Thermo Scientific Orion pH Electrode Selection Guide

Sample Type	Electrode Recommendations
<b>pH Precision</b>	
<b>Biological/Pharmaceutical – TRIS buffer, proteins, enzymes</b>	Electrodes should have a ROSS or double junction Ag/AgCl reference (no sample contact with silver)
<b>Education/Student Use</b>	Electrodes should have an epoxy body for added durability
<b>Emulsions – Foods, cosmetics, oils</b>	Electrodes should have a Sure-Flow or open junction to prevent the electrode from clogging
<b>Emulsions – Petroleum products, paint</b>	Electrodes should have a glass body that resists damage from the sample and a Sure-Flow or open junction to prevent the electrode from clogging
<b>Flat Surfaces – Cheese, meat, agar</b>	Electrodes should have a flat-surface tip and ROSS or double junction Ag/AgCl reference (no sample contact with silver)
<b>Flat Surfaces – Paper</b>	Electrodes should have a flat-surface tip
<b>General Purpose – Most sample types</b>	All electrodes are suitable for general purpose measurements
<b>Harsh Environments – Field or plant use, rugged use</b>	Electrodes should have an epoxy body for added durability and be polymer or gel filled for easy maintenance
<b>High Ionic Strength – Acids, bases, brines, pH &gt; 12 or pH &lt; 2</b>	Electrodes should have a Sure-Flow or open junction for better contact with the sample and more stable measurements
<b>Large Sample Sizes – Tall flasks</b>	Electrodes should have a long body that fits the container
<b>Low Ionic Strength – Treated effluent, deionized water, distilled water</b>	Electrodes should be refillable for better contact with the sample and more stable measurements
<b>Non-aqueous – Solvents, alcohols</b>	Electrodes should have a glass body that resists damage from the sample and a Sure-Flow junction for better contact with the sample and more stable measurements
<b>Semi-solids – Fruit, meat, cheese</b>	Electrodes should have a spear tip for piercing samples and a ROSS or double junction Ag/AgCl reference
<b>Small Sample Size – Micro-titer plates</b>	Electrodes should have a small diameter that fits the container
<b>Small Sample Size – NMR tubes</b>	Electrodes should have a small diameter that fits the container
<b>Small Sample Size – Test tubes, small flasks and beakers</b>	Electrodes should have a small diameter that fits the container
<b>Small Sample Size – TRIS buffer, proteins, sulfides</b>	Electrodes should have a small diameter that fits the container and a ROSS or double junction Ag/AgCl reference
<b>Titration</b>	Electrodes should have a Sure-Flow or sleeve junction for better contact with the sample and more stable measurements
<b>Viscous Liquids – Slurries, suspended solids sludges</b>	Electrodes should have a Sure-Flow or open junction to prevent the electrode from clogging
<b>Waters – Acid rain, boiler feed water, distilled water, rain water, well water</b>	Electrodes should have a ROSS or double junction Ag/AgCl reference and be refillable for better contact with the sample
<b>Waters – Drinking water, tap water</b>	Electrodes should have an epoxy body for added durability
<b>Waters – Wastewater, seawater</b>	Electrodes should have a ROSS or double junction Ag/AgCl reference and have an epoxy body for added durability



Electrode  
Rating



BEST



BETTER



GOOD

ROSS Ultra®	ROSS®	AquaPro	Standard Ag/AgCl	Green	Micro Ag/AgCl	Double Junction	Economy/Basic
0.01	0.01	0.02	0.02	0.02 to 0.05	0.02	0.02	0.05 to 0.1
8102BNUWP 8107BNUMD 8156BNUWP 8157BNUMD	8102BN 8104BN 815600 8165BNWP 8172BNWP	9102AP 9104APWP 9107APMD 9156APWP		GD9106BNWP GD9156BNWP		9102DJWP 9156DJWP	
8107BNUMD 8156BNUWP 8157BNUMD	815600 8165BNWP	9107APMD 9156APWP	9107BNMD 9156BNWP 9157BNMD	GS9106BNWP GD9106BNWP		9156DJWP	9106BNWP
	8165BNWP 8172BNWP	9104APWP 9107APMD	9165BNWP 9172BNWP				
	8172BNWP	9102AP 9104APWP	9172BNWP				
8135BNUWP	8135BN	9135APWP					
8135BNUWP	8135BN	9135APWP					913600
8102BNUWP 8107BNUMD 8156BNUWP 8157BNUMD	8102BN 8104BN 815600 8165BNWP 8172BNWP	9102AP 9104APWP 9107APMD 9156APWP	9102BNWP 9107BNMD 9156BNWP 9157BNMD	GS9106BNWP GD9106BNWP GS9156BNWP GD9156BNWP		9102DJWP 9156DJWP	9106BNWP
8107BNUMD		9107APMD 9156APWP	9107BNMD	GS9106BNWP GD9106BNWP		9156DJWP	9106BNWP
	8165BNWP 8172BNWP	9104APWP 9107APMD 9102AP	9165BNWP 9172BNWP				912600
8102BNUWP 8156BNUWP 8157BNUMD	8102BN 815600 8165BNWP 8172BNWP		9165BNWP 9172BNWP	GS9156BNWP GD9156BNWP		9102DJWP	
	8172BNWP		9172BNWP				
	8163BNWP					9120APWP	
	8220BNWP				9810BN		
					9826BN		
8103BNUWP 8115BNUWP	8103BN 8115BN 8175BNWP	9103APWP 9115APWP	9103BNWP		9810BN 9826BN	9110DJWP	911600 912600
8103BNUWP 8115BNUWP	8103BN 8115BN 8175BNWP	9103APWP 9115APWP				9110DJWP	
	8162SC 8165BNWP 8172BNWP						
	8165BNWP 8172BNWP	9104APWP 9107APMD	9165BNWP 9172BNWP				
8102BNUWP 8156BNUWP 8157BNUMD	8102BN 815600 8165BNWP 8172BNWP		9165BNWP 9172BNWP	GS9156BNWP GD9156BNWP		9102DJWP	
8156BNUWP 8157BNUMD	815600 8165BNWP	9107APMD 9156APWP	9156BNWP 9165BNWP	GS9106BNWP GD9106BNWP		9156DJWP	9106BNWP
8156BNUWP 8157BNUMD	815600 8165BNWP	9107APMD 9156APWP	9165BNWP	GD9106BNWP GD9156BNWP		9156DJWP	



## Thermo Scientific Orion ROSS pH Electrodes

The Best Choice For Superior Stability, Rapid Response, Accurate and Reproducible pH Measurements

ROSS pH electrodes offer unmatched benefits that you will not find in any other pH electrode. For more than 30 years, ROSS pH electrodes have been providing the best accuracy, stability and response you will find in a pH electrode. Before selecting an electrode, consider the advantages you will have if you choose a ROSS electrode.

### Rapid Response and Superior Stability

Compared to conventional electrodes, the proven ROSS reference system exhibits superior stability in measurements, faster response, greater accuracy and precision when measuring samples that vary in temperature or when calibrating in temperatures that differ from your samples.

ROSS electrodes are much more stable over time and avoid the long term drift that other electrodes exhibit. Electrodes drift by less than 0.002 pH per day so recalibration is minimized.

### Temperature Response

Most ROSS electrodes have a temperature range of 0 to 100 °C and show rapid response and stability even when measuring samples that differ by as much as 50 °C. The readings are much more accurate than standard electrodes in samples with extreme temperature variations. ROSS electrodes provide the correct reading within 30 seconds while standard electrodes are still trying to equilibrate and provide the correct reading after 3 minutes. The graph on page 63 illustrates this response.

### No Sample Contamination

Standard silver chloride electrodes leach metal into the fill solution and eventually into the sample. ROSS electrodes do not contain any silver or mercury to react with the sample or to clog the electrode junction which causes sluggish response or inaccurate readings while also reducing electrode life. ROSS pH electrodes can be used in samples such as biological media, foodstuffs and pharmaceuticals where trace amount of metals cannot be tolerated.

### Double Junction Design

This design allows you more control over an important variable. In order to minimize errors caused by junction potential, you can use a solution that is similar to the sample. The user also has the ability to change filling solutions to minimize contamination when potassium or chloride in the sample are undesirable.

ROSS electrodes have two main families to choose from. Each family has a variety of electrode options to choose from to ensure you have the correct electrode for your measurement needs. All contain the advantages mentioned previously.

### ROSS Ultra®

ROSS Ultra electrodes offer the best stability and drift free measurements of all ROSS electrodes. The reference system is designed to provide an enhanced life. We are so confident of it that the warranty is double that of standard ROSS electrodes. Refillable ROSS Ultra electrodes have a 2 year warranty while the low-maintenance triode™ has an 18 month warranty.

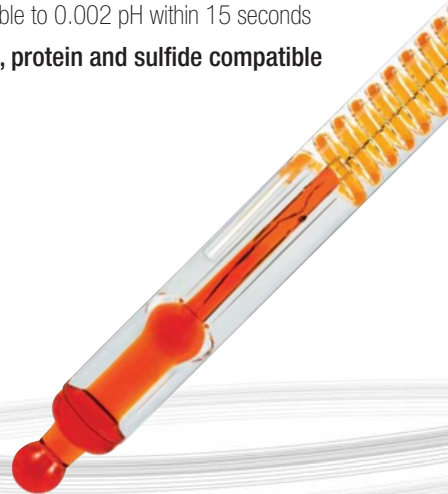
The ROSS Ultra line features glass or epoxy electrodes, refillable or low-maintenance design, flat surface and semi-micro designs. ROSS Ultra Triodes include a built-in temperature sensor and provide faster temperature response than other 3-in-1 electrodes.

### ROSS®

Standard ROSS electrodes provide the same rapid response, accuracy and temperature response of all ROSS electrodes. The reference system provides excellent stability. These electrodes provide a one year warranty. They are available in a variety of styles such as the clog free Sure-Flow junction, glass or epoxy electrodes, flat surface, semi-micro, micro and spear tip designs. All standard ROSS electrodes have a refillable design and do not contain a built-in-temperature element.

### ROSS Electrode Specifications:

- **Slope:** 92-102 % of theoretical Nernst slope
- **Isopotential Point:** pH 7
- **Accuracy of measuring a pH 6.86 buffer after standardization at 25 °C:** Accurate within 0.03 pH for buffer at any temperature between 0-100 °C using automatic temperature compensation
- **Speed of Response in 6.86 buffer going from 25 to 75 °C:** Response stable to 0.01 pH within 30 seconds
- **Speed of Response between 6.86 and 4.01 buffers at 25 °C:** Response stable to 0.002 pH within 15 seconds
- **Mercury free, TRIS, protein and sulfide compatible**







# Thermo Scientific Orion Sure-Flow pH Electrodes

Clog Free Long Lasting Junction

## Sure-Flow® Junction

The unique, free-flowing liquid-to-liquid junction assures you of the most stable, drift-free measurements. The easy-to-clean junction never clogs, simply press the cap and flush the junction area. Release the cap and the junction is reset. Now even the most problematic, dirty or viscous samples can be easily measured without a clogged junction! The Sure-Flow junction has proven reliability and extends the electrode life.

ROSS electrodes provide unmatched accuracy and response to extreme temperature changes. They are compatible with samples containing organic compounds, proteins, heavy metals, and other compounds that react with silver such as bromides, iodides, cyanides and sulfides.

Silver chloride sure-flow electrodes can be used on tough samples that do not require a double junction electrode to prevent contact with silver.

ROSS Sure-Flows are also available as semi-micro pH and reference half cell electrodes on pages 75 and 80.

## High performance in all samples



### ROSS® Sure-Flow® combination pH electrode with glass body

- Sure-Flow junction prevents clogging
- For soil, sludge, colloids, viscous material and organic solvents

## Fast response – even in difficult samples



### ROSS® Sure-Flow® combination pH electrode with epoxy body

- Ideal for soil samples
- Durable epoxy design
- For TRIS, sulfides and proteins

## For all samples including solvents



### Sure-Flow® combination pH electrode with glass body

- For soil, sludge, colloids, and viscous material
- Chemical resistant glass body

## Fast response in difficult samples & soils



### Sure-Flow® combination pH electrode with epoxy body

- Rugged, durable epoxy design
- Has removable bulb guard

Cat. No.	8172BNWP	8165BNWP 8165DN	9172BNWP	9165BNWP
pH Range	0-14	0-14	0-14	0-14
pH Precision	0.01	0.01	0.02	0.02
Temp. Range	0-100 °C	0-100 °C	0-100 °C	0-100 °C
Internal Reference	ROSS	ROSS	Ag/AgCl	Ag/AgCl
Junction	Sure-Flow	Sure-Flow	Sure-Flow	Sure-Flow
Fill Solution (Cat. No.)	3 M KCl (810007)	3 M KCl (810007)	4 M KCl w/ Ag/AgCl (900011)	4 M KCl w/ Ag/AgCl (900011)
Dimension D (Dia) L (Length) T (Tip)	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm
Connector Type	BNC Waterproof	BNC Waterproof EDIN Waterproof	BNC Waterproof	BNC Waterproof

Cat. No.	Recommended Accessories
810001	ROSS storage solution
810007	ROSS fill solution
900011	Ag/AgCl fill solution
910001	Ag/AgCl storage solution



## Key Information

ROSS electrodes are environmentally-safe mercury-free option for TRIS, protein and sulfide. All cap diameters are 16 mm at bottom of cap. All cable lengths are 1 meter.

## Thermo Scientific Orion Triode pH Electrodes

Measures pH and Temperature with One Electrode

All Thermo Scientific Orion Triodes™ have built-in temperature sensors allowing you to measure pH and temperature with one electrode. There are a variety of electrodes based on your sample and application.

The ROSS Ultra Triodes offer such great stability and drift that the warranty period is double other electrodes. The refillable electrodes have a two year replacement warranty. The gel-filled ROSS Ultra Triode electrodes have an 18 month warranty.

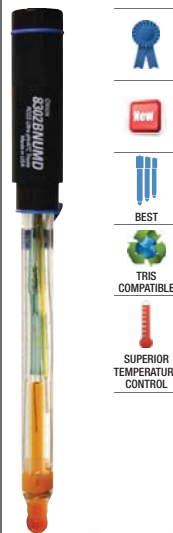
Complex samples, such as biological media, foods and pharmaceuticals, can be measured easily. All ROSS Ultra electrodes can be used in samples that contain TRIS, sulfides or proteins.

ROSS Ultra electrodes offer the best temperature performance of all other electrodes in repeated, varying temperatures.

The AquaPro Triode has the advantage of having an open junction that does not clog and double junction reference. For use in samples with TRIS, protein and sulfides.

Ag/AgCl Triodes have good response and are ideal for routine measurements.

### Top performance with glass body



#### ROSS Ultra® pH/ATC Triode with glass body

- High performance for QC and research
- Chemical resistant glass body

### Low maintenance with extended life



#### ROSS Ultra® pH/ATC Triode with epoxy body, low maintenance gel

- Low maintenance gel
- Rugged epoxy body

### Refillable, convenience and durable



#### ROSS Ultra® pH/ATC Triode with epoxy body

- General purpose, high performance
- Rugged epoxy body

Cat. No.	8302BNUMD (Star)	8107BNUMD (Star)* 8107UWMMMD (Star)	8157BNUMD (Star)* 8157UWMMMD (Star)
<b>pH Range</b>	0-14	0-14	0-14
<b>pH Precision</b>	0.01	0.01	0.01
<b>Temp. Range</b>	0-100 °C	0-80 °C	0-100 °C
<b>Temp. Accuracy</b>	±1.0 °C	±1.0 °C	±1.0 °C
<b>Internal Reference</b>	ROSS	ROSS	ROSS
<b>Junction</b>	Ceramic	Glass capillary	Glass fiber
<b>Fill Solution (Cat. No.)</b>	3 M KCl (810007)	—	3 M KCl (810007)
<b>Dimension D (Dia) L (Length) T (Tip)</b>	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm
<b>Connector Type</b>	BNC Waterproof - MiniDIN (Star)	BNC Waterproof - MiniDIN (Star)* BNC Waterproof - MiniDIN (Star)* 3 m	BNC Waterproof - MiniDIN (Star)* BNC Waterproof - MiniDIN (Star)* 3 m

Cat. No.	Recommended Accessories
810001	ROSS storage solution
810007	ROSS fill solution
900001	Ag/AgCl fill solution
910001	Ag/AgCl storage solution



**Electrode maintains calibration for one year**



**No Cal® combination pH electrode with epoxy body and built-in ATC**

- Designed for stable, high performance pH analysis in the field
- Accurate to 0.1 pH without calibration

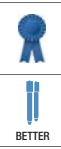
**Rugged design with clog free open junction**



**AquaPro pH/ATC Triode™ with low maintenance polymer, epoxy body**

- Low maintenance for Star meters

**Low maintenance**



**pH/ATC Triode™ with epoxy body, low maintenance gel**

- Low maintenance gel
- Epoxy body for ruggedness

**Low maintenance**



**pH/ATC Triode™ with epoxy body, low maintenance**

- Low maintenance gel
- Epoxy body for ruggedness

**Refillable and durable**



**pH/ATC Triode™ with epoxy body, refillable**

- Long-lasting
- Epoxy body for ruggedness

**Low maintenance and reliable**



**pH/ATC Triode™ with epoxy body, low maintenance gel**

- General purpose
- For Russell RL060P meter

5107BNMD (Star) 5107NC (A+ Series)	9107APMD (Star)	9107BNMD (Star)* 9107WMMMD (Star)* 9107WLMD (Star)* 9107BN (A+ Series) 9107WP†	9109WP 9109WL	9157BNMD (Star) 9157BN (A+ Series)	9147BN
0-14	0-14	0-14	0-14	0-14	0-14
0.01	0.02	0.02	0.02	0.02	0.1
0-100 °C	0-60 °C	0-80 °C	0-80 °C	0-90 °C	0-50 °C
±1.0 °C	±2.0 °C	±2.0 °C	±2.0 °C	±2.0 °C	±2.0 °C
Platinum	Ag/AgCl Double junction	Ag/AgCl	Ag/AgCl	Ag/AgCl	Ag/AgCl
Ceramic	Open	Wick	Wick	Glass fiber	HDPE pin
No Cal (510011)	—	—	—	4 M KCl w/ Ag/AgCl (900011)	—
L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm Cap D - 22 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm
BNC - MiniDIN (Star) BNC - 8 Pin (A+ Series)	BNC - MiniDIN (Star)	BNC - MiniDIN (Star) BNC - 8 Pin (A+ Series)†	EDIN Waterproof Banana Plug	BNC - MiniDIN (Star) BNC - 8 Pin (A+ Series)	BNC 2.5 mm Phono Tip



BNC Waterproof



BNC



2.5 mm Phono Tip



MiniDIN (Star)



8 Pin (A+ Series)



Banana Plug



EDIN Waterproof

#### Key Information

Cable lengths range from 1 to 6 meters  
WMMMD = 3 meters, WLMD = 6 meters,  
9109WL = 6 meters  
9109 cap is for intrinsically safe meters

# Thermo Scientific Orion Glass Refillable pH Electrodes

Chemical Resistant Glass Bodies

Glass body electrodes offer superior chemical resistance. They are also able to withstand higher temperatures than epoxy electrodes, with some models able to be used up to 100 °C. Glass electrodes are also easy to clean as they are compatible with most solvents and inorganic materials.

ROSS Ultra and ROSS electrodes provide unmatched ROSS accuracy and rapid response to temperature extremes. All are TRIS compatible. ROSS Ultra glass electrodes have an industry best 2 years warranty.

AquaPro refillable electrodes are TRIS compatible and have an open junction that does not clog.

Double junction electrodes are recommended for samples containing organic compounds, proteins, heavy metals and other compounds that interact with silver.

Single junction electrodes provide a reliable option for routine pH measurement.

**Top performance for QC and research**



**ROSS Ultra® combination pH electrode with extended life**

- For precise pH determinations
- General purpose, high performance

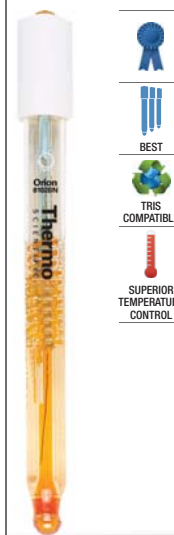
**Precise yet durable, for QC and research**



**ROSS Ultra® combination pH electrode with rugged bulb, extended life**

- Toughened bulb for rugged lab use

**For precise and reproducible pH determinations**



**ROSS® combination pH electrode**

- General purpose, high performance
- For QC and research applications

**Durable, for precise pH analysis**



**ROSS® combination pH electrode with glass body, rugged bulb**

- Toughened bulb for rugged lab use
- For QC and research applications

Cat. No.	8102BNUWP	8104BNUWP	8102BN 8102SC	8104BN 8104SC
<b>pH Range</b>	0-14	0-14	0-14	0-14
<b>pH Precision</b>	0.01	0.01	0.01	0.01
<b>Temp. Range</b>	0-100 °C	0-100 °C	0-100 °C	0-100 °C
<b>Internal Reference</b>	ROSS	ROSS	ROSS	ROSS
<b>Junction</b>	Ceramic	Ceramic	Ceramic	Ceramic
<b>Fill Solution (Cat. No.)</b>	3 M KCl (810007)	3 M KCl (810007)	3 M KCl (810007)	3 M KCl (810007)
<b>Dimension D (Dia) L (Length) T (Tip)</b>	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm
<b>Connector Type</b>	BNC Waterproof	BNC Waterproof	BNC Screw Cap	BNC Screw Cap

Cat. No.	Recommended Accessories
910001	Ag/AgCl storage solution
900011	Ag/AgCl fill solution
910008-WA	3 M KCl double junction fill solution

Cat. No.	Recommended Accessories
810001	ROSS storage solution
810007	ROSS fill solution





**For accurate pH analysis and titrations**



**ROSS® combination pH electrode with 14/15 standard taper**

- For titrators or vessels that require a standard taper joint

**Accurate and reliable**



**Double Junction combination pH electrode**

- General purpose
- Easy-to-clean design

**General purpose for everyday use**



**Combination pH electrode**

- For routine or research applications

**Durable and reliable**



**Combination pH electrode with rugged bulb**

- Toughened bulb for rugged lab use

**General purpose and reliable**



**Combination pH electrode**

- General purpose
- Easy-to-clean design

8162SC	9102DJWP	9102BNWP 9102SC	9104BNWP 9104SC	9142BN
0-14	0-14	0-14	0-14	0-14
0.01	0.02	0.02	0.02	0.1
0-100 °C	0-60 °C	0-90 °C	0-90 °C	0-90 °C
ROSS	Ag/AgCl Double junction	Ag/AgCl	Ag/AgCl	Ag/AgCl
Sleeve	Ceramic	Ceramic	Ceramic	Ceramic
3 M KCl (810007)	3 M KCl (910008-WA)	4 M KCl w/ Ag/AgCl (900011)	4 M KCl w/ Ag/AgCl (900011)	4 M KCl w/ Ag/AgCl (900011)
L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm
Screw Cap	BNC Waterproof	BNC Waterproof Screw Cap	BNC Waterproof Screw Cap	BNC



BNC Waterproof



BNC



Screw Cap

**Key Information**

All cap diameters are 16 mm  
All cable lengths are 1 meter

## Thermo Scientific Orion Epoxy Refillable pH Electrodes

### Rugged Epoxy Body Prevents Breakage

Epoxy body electrodes are ideal for field measurements or situations where they will be exposed to rugged handling. The electrode body surrounds the glass pH bulb providing further protection.

ROSS Ultra and ROSS electrodes exhibit unmatched accuracy and rapid response to extreme temperature variations. All are TRIS compatible. The ROSS Ultra electrode has an unprecedented 2 year warranty.

Green electrodes are the first lab electrode to contain no lead, mercury or other hazardous substances and are completely ROHS compliant. They are available in single or double junction designs.

Silver chloride epoxy electrodes provide excellent response and performance in routine samples.

#### Top performance – precise pH analysis with durability



#### ROSS Ultra® combination pH electrode with epoxy body

- Top accuracy and rapid response to temperature extremes
- General purpose, high performance
- Extended life

#### Durable for precise pH applications



#### ROSS® combination pH electrode with epoxy body

- Top accuracy and rapid response to temperature extremes
- General purpose, high performance

#### Refillable, double junction



#### Green combination double junction refillable pH electrode with epoxy body

- Ideal for routine or research applications
- Use in dirty water or TRIS, sulfide and protein samples
- Contains no lead

#### Refillable, rugged epoxy body



#### Green combination refillable pH electrode with epoxy body

- Ideal for routine or research applications
- Contains no lead

#### General purpose and reliable



#### Combination pH electrode with epoxy body

- For routine or research applications
- Reliable and durable

Cat. No.	8156BNUWP	815600 8155SC	GD9156BNWP	GS9156BNWP	9156BNWP 9156SC
<b>pH Range</b>	0-14	0-14	0-14	0-14	0-14
<b>pH Precision</b>	0.01	0.01	0.02	0.02	0.02
<b>Temp. Range</b>	0-100 °C	0-100 °C	0-90 °C	0-90 °C	0-90 °C
<b>Temp. Accuracy</b>	–	–	–	–	–
<b>Internal Reference</b>	ROSS	ROSS	Ag/AgCl Double junction	Ag/AgCl	Ag/AgCl
<b>Junction</b>	Glass fiber	Glass fiber	Glass fiber	Glass fiber	Glass fiber
<b>Fill Solution (Cat. No.)</b>	3 M KCl (810007)	3 M KCl (810007)	3 M KCl (910008-WA)	4 M KCl w/ Ag/AgCl (900011)	4 M KCl w/ Ag/AgCl (900011)
<b>Dimension D (Dia) L (Length) T (Tip)</b>	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm
<b>Connector Type</b>	BNC Waterproof	BNC Screw Cap	BNC Waterproof	BNC Waterproof	BNC Waterproof Screw Cap

Cat. No.	Recommended Accessories
900011	Ag/AgCl fill solution
810007	ROSS fill solution
910008-WA	3M KCl double junction fill solution



Screw Cap



BNC Waterproof



BNC



## Thermo Scientific Orion Micro pH Electrodes

Delicate Electrode for Small Volumes, Fits 384 Microwell Plates

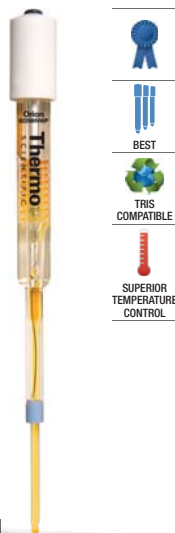
Micro electrodes are designed to measure small volumes down to 0.5  $\mu\text{L}$ . These are extremely delicate electrodes because of their size and should be treated as such. The small stem and bulb diameter allow the electrode to be inserted into small devices such as 384 microwell plates. There are a variety to choose from based on your measurement needs.

The ROSS 8220BNWP micro electrode provides the best accuracy and response time of the micro electrodes. It can be used in biological samples. The 8220BNWP is more durable than the silver chloride electrodes.

Silver chloride micro electrodes are single junction electrodes. They are available to measure samples as small as 0.5  $\mu\text{L}$ , for use in NMR tubes and available with a stainless steel needle tip over the glass stem and bulb.

The double junction micro electrode is for moderate size samples. The double junction design is good for use when measuring TRIS samples, proteins, sulfides or biologicals.

### Accurate in extremely small samples



#### PerpHecT® ROSS® combination pH electrode with glass body, micro

- Measures samples as small as 15  $\mu\text{L}$  in 384 well plates
- Minimum depth of immersion is 4.5 mm
- Durable tip design

### Measure samples as small as 0.5 $\mu\text{L}$



#### Micro combination pH electrode with glass body, small tip

- Designed for gels and small sample volumes
- Measure samples as small as 0.5  $\mu\text{L}$

### For use in NMR tubes



#### Micro combination pH electrode with glass body, long length

- Ideal for measurements in extremely small vessels

### For piercing septa



#### Micro combination pH electrode with needle tip

- 16 gauge stainless steel bevel tip

### For samples with size limitations



#### Double Junction combination pH electrode with glass body, semi-micro tip

- Measure samples as small as 0.2 mL
- Easy-to-clean refillable design

Cat. No.	8220BNWP	9810BN	9826BN	9863BN	9110DJWP
pH Range	0-14	0-14	0-14	0-14	0-14
pH Precision	0.01	0.02	0.02	0.02	0.02
Temp. Range	0-100 °C	0-80 °C	0-80 °C	0-80 °C	0-60 °C
Temp. Accuracy	±0.5 °C	—	—	—	—
Internal Reference	ROSS	Ag/AgCl	Ag/AgCl	Ag/AgCl	Ag/AgCl Double junction
Junction	Sleeve	Ceramic	Ceramic	Ceramic	Ceramic
Fill Solution (Cat. No.)	3 M KCl (810007)	4 M KCl w/ Ag/AgCl (900011)	4 M KCl w/ Ag/AgCl (900011)	4 M KCl w/ Ag/AgCl (900011)	3 M KCl (910008-WA)
Dimension D (Dia) L (Length) T (Tip)	L - 155 mm T - 3 mm x 40 mm L	L - 120 mm T - 1.3 mm x 37 mm L	L - 228 mm T - 2.5 mm x 2.5 mm L	L - 137 mm T - 1.7 mm x 40 mm L	L - 150 mm T - 4.5 mm x 90 mm L
Depth of Immersion	4.5 mm	1 mm	2 mm	3 mm	—
Connector Type	BNC Waterproof	BNC	BNC	BNC	BNC Waterproof



BNC Waterproof



BNC

#### Key Information

All cap diameters are 16 mm at bottom of cap except 9810BN, 9826BN & 9863BN  
All cable lengths are 1 meter

## Thermo Scientific Orion Glass Semi Micro pH Electrodes

Measures Samples As Small As 0.2 mL. Fits Test Tubes and Small Containers

Glass body semi-micro pH electrodes provide superior chemical resistance and can withstand high temperatures extremes. There are a variety of options to choose from.

ROSS Ultra and ROSS semi-micro pH electrodes provide optimum accuracy and unmatched response in samples of varying temperatures. They are available in chemical resistant glass bodies. All ROSS electrodes are TRIS compatible.

AquaPro semi-micro electrodes have a clog free open junction and are TRIS compatible.

Silver chloride semi-micro electrodes are durable and provide reliable and accurate measurements of routine samples.

**Ideal for QC samples with size limitations**



**ROSS Ultra® combination pH electrode with glass body, semi-micro tip**

- Extended life
- TRIS compatible
- Fast response at temperature extremes

**Fast, reliable results in small samples**



**ROSS® combination pH electrode with glass body, semi-micro tip**

- TRIS compatible
- Fast response at temperature extremes

**Fast response in small samples**



**AquaPro combination pH electrode with low maintenance polymer, glass body, semi-micro tip**

- TRIS compatible
- Open junction prevents clogging

**For samples with size constraints**



**Combination pH electrode with glass body, semi-micro tip**

- For routine or research applications

Cat. No.	8103BNUWP	8103BN 8103SC	9103APWP	9103BNWP 9103SC
pH Range	0-14	0-14	0-14	0-14
pH Precision	0.01	0.01	0.02	0.02
Temp. Range	0-100 °C	0-100 °C	0-60 °C	0-90 °C
Internal Reference	ROSS	ROSS	Ag/AgCl Double junction	Ag/AgCl
Junction	Ceramic	Ceramic	Open	Ceramic
Fill Solution (Cat. No.)	3 M KCl (810007)	3 M KCl (810007)	—	4 M KCl w/ Ag/AgCl (900011)
Dimension D (Dia) L (Length) T (Tip)	L - 165 mm T - 6 mm x 95 mm L	L - 165 mm D - 6 mm x 95 mm L	L - 165 mm T - 6.5 mm x 100 mm L	L - 165 mm T - 6.5 mm x 100 mm L
Connector Type	BNC Waterproof	BNC Screw Cap	BNC Waterproof	BNC Waterproof Screw Cap

Cat. No.	Recommended Accessories
910001	Electrode storage solution
900011	Ag/AgCl fill solution
810001	ROSS storage solution
810007	ROSS fill solution



Screw Cap



BNC Waterproof



BNC

### Key Information

All cap diameters are 16 mm  
All cable lengths are 1 meter





# Thermo Scientific Orion Epoxy Semi Micro pH Electrodes

Rugged Body for Small Samples or Narrow Containers

Epoxy body semi-micro pH electrodes provide a rugged design. They are available in double junction or single junction designs as well as refillable or low-maintenance options.

ROSS electrodes offer optimum accuracy and temperature response. AquaPro electrodes provide maintenance-free use. Silver chloride electrodes are for routine measurements.

**For difficult samples with size limitations**



**ROSS® Sure-Flow® combination pH electrode with epoxy body, semi-micro tip**

- Sure-Flow junction prevents clogging
- Measure samples as small as 0.2 mL

**For aqueous samples with size constraints**



**ROSS Ultra® combination pH electrode with epoxy body, semi-micro tip**

- Measures samples as small as 0.2 mL
- Epoxy body for ruggedness and durability

**Dependable results in small samples**



**ROSS® combination pH electrode with epoxy body, semi-micro tip**

- Epoxy body for ruggedness and durability
- Measures samples as small as 0.2 mL

**Fast response in small samples**



**AquaPro combination pH electrode with low maintenance polymer, epoxy body, semi-micro tip**

- TRIS compatible
- Open junction prevents clogging

**For everyday use in small samples**



**Combination pH electrode with epoxy body, low maintenance gel, semi-micro tip**

- Measure samples as small as 0.2 mL

**For everyday use in tall containers**



**Combination pH electrode with epoxy body, low maintenance gel, flask length**

- Designed for use in long-necked flasks

Cat. No.	8175BNWP	8115BNUWP	8115BN 8115SC	9115APWP	911600	912600
<b>pH Range</b>	0-14	0-14	0-14	0-14	0-12	0-12
<b>pH Precision</b>	0.01	0.01	0.01	0.02	0.1	0.1
<b>Temp. Range</b>	0-100 °C	0-100 °C	0-100 °C	0-60 °C	0-80 °C	0-80 °C
<b>Internal Reference</b>	ROSS	ROSS	ROSS	Ag/AgCl Double junction	Ag/AgCl	Ag/AgCl
<b>Junction</b>	Sure-Flow	Glass fiber	Glass fiber	Open	Wick	Wick
<b>Fill Solution (Cat. No.)</b>	3 M KCl (810007)	3 M KCl (810007)	3 M KCl (810007)	—	—	—
<b>Dimension D (Dia) L (Length) T (Tip)</b>	L - 165 mm T - 8 mm x 95 mm L	L - 165 mm T - 8 mm x 95 mm L	L - 165 mm T - 8 mm x 95 mm L	L - 160 mm T - 8 mm x 90 mm L	L - 145 mm D - 6 mm	L - 305 mm D - 8 mm
<b>Connector Type</b>	BNC Waterproof	BNC Waterproof	BNC Screw Cap	BNC Waterproof	BNC	BNC



Screw Cap



BNC Waterproof



BNC

## Key Information

All cap diameters are 16 mm except 911600  
All cable lengths are 1 meter

## Thermo Scientific Orion Low Maintenance pH Electrodes

Never Requires Fill Solution

Low maintenance pH electrodes are easy to use and require minimal maintenance. Since the reference chamber is sealed, you never need to replace fill solution or clean and rinse the reference chamber. You may choose from many styles such as AquaPro, Green electrodes, double junction or silver chloride electrodes to suit your measurement needs.

AquaPro low maintenance pH electrodes offer open junctions that do not clog. Choose between chemical resistant glass bodies or durable epoxy bodies. All AquaPro electrodes are TRIS compatible.

Green electrodes contain no hazardous substances such as mercury or lead and are ROHS compliant.

Double junction electrodes are TRIS compatible and you do not have to worry about interfering substances.

Silver chloride electrodes offer low maintenance as well as reliable measurements for everyday use.

### Reliable and accurate



**AquaPro combination pH electrode with low maintenance polymer, glass body**

- General purpose, high performance

### Precise and durable



**AquaPro combination pH electrode with low maintenance polymer, glass body, rugged bulb**

- Toughened bulb for rugged lab use

### Rugged and accurate



**AquaPro combination pH electrode with low maintenance polymer, epoxy body**

- General purpose, high performance

### Low maintenance, double junction



**Green combination double junction pH electrode, gel with epoxy body**

- Ideal for education, plant or field use
- Use in dirty water or TRIS, sulfide and protein samples
- Contains no lead

Cat. No.	9102AP	9104APWP	9156APWP	GD9106BNWP
pH Range	0-14	0-14	0-14	0-14
pH Precision	0.02	0.02	0.02	0.02
Temp. Range	0-60 °C	0-60 °C	0-60 °C	0-90 °C
Internal Reference	Ag/AgCl Double junction	Ag/AgCl Double junction	Ag/AgCl Double junction	Ag/AgCl Double junction
Junction	Open	Open	Open	Glass capillary
Dimension D (Dia) L (Length) T (Tip)	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm
Connector Type	BNC	BNC Waterproof	BNC Waterproof	BNC Waterproof

Cat. No.	Recommended Accessories
910001	Electrode storage solution
910199	All-in-one pH buffer kit



**Low maintenance, rugged epoxy body**



**Green combination pH electrode, gel with epoxy body**

- Ideal for education, plant or field use
- Contains no lead

**GS9106BNWP**

0-14
0.05
0-90 °C
Ag/AgCl
Glass capillary
L - 120 mm D - 12 mm
BNC Waterproof

**Durable and low maintenance**



**Double Junction combination pH electrode with epoxy body, low maintenance gel**

- Low maintenance gel with durable epoxy body

**9156DJWP**

0-14
0.02
0-60 °C
Ag/AgCl Double junction
Wick
L - 120 mm D - 12 mm
BNC Waterproof

**For rugged, everyday use**



**Combination pH electrode with epoxy body, low maintenance gel**

- Ideal for field, plant, or educational applications

**9106BNWP**

0-14
0.05
0-80 °C
Ag/AgCl
Wick
L - 120 mm D - 12 mm
BNC Waterproof

**Reliable every day use**



**Combination pH electrode with epoxy body, low maintenance gel**

- General purpose use
- Removable bulb guard makes cleaning easy

**9146BN**

0-14
0.1
0-80 °C
Ag/AgCl
Wick
L - 120 mm D - 12 mm
BNC



BNC Waterproof



BNC

**Key Information**

All cap diameters are 16 mm  
All cable lengths are 1 meter

## Thermo Scientific Orion Flat Surface pH Electrodes

Measure Moist Surfaces Such As Agar Gel Plates, Meats and Cheese

Flat surface electrodes are epoxy body electrodes with a flat pH bulb that allow you to measure moist solid samples or small volumes. They can be used on samples such as meats, cheese or in agar gel plates. Flat surface pH electrodes are available in single or double junction designs allowing you to measure samples such as TRIS buffers or samples containing protein, sulfides or other compounds that react with silver. You may also choose from refillable or low maintenance designs.

Thermo Scientific Orion ROSS Ultra and ROSS flat surface electrodes provide optimum accuracy and stability while being TRIS compatible. The ROSS Ultra flat surface electrode has a 2 year warranty.

The AquaPro flat surface electrode is TRIS compatible and has an open junction that does not clog. The 9135APWP AquaPro flat surface electrode is a low maintenance model never requiring fill solution.

The silver chloride 913600 flat surface electrode is a low maintenance electrode that is ideal for routine measurements.

**Ideal for soft solid and semi-solid samples**



**ROSS Ultra® combination pH electrode with epoxy body, flat surface**

- Extended life and 2 year warranty
- Rapid response to temperature extremes

**For soft solid and semi-solid samples**



**ROSS® combination pH electrode with epoxy body, flat surface**

- Premium performance
- Rapid response to temperature extremes

**For soft solids and semi-solids**



**AquaPro combination pH electrode with low maintenance polymer, epoxy body, flat surface**

- Clog free junction for tough samples

**For solids and semi-solids**



**Combination pH electrode with epoxy body, low maintenance gel, flat surface**

- For routine flat surface measurements

Cat. No.	8135BNUWP	8135BN 8135SC	9135APWP	913600
<b>pH Range</b>	0-14	0-14	0-14	0-12
<b>pH Precision</b>	0.01	0.01	0.02	0.1
<b>Temp. Range</b>	0-100 °C	0-100 °C	0-60 °C	0-80 °C
<b>Internal Reference</b>	ROSS	ROSS	Ag/AgCl Double junction	Ag/AgCl
<b>Junction</b>	Glass fiber	Glass fiber	Open	Wick
<b>Fill Solution (Cat. No.)</b>	3 M KCl (810007)	3 M KCl (810007)	—	—
<b>Dimension D (Dia) L (Length) T (Tip)</b>	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 110 mm D - 12 mm
<b>Connector Type</b>	BNC Waterproof	BNC Screw Cap	BNC Waterproof	BNC

Cat. No.	Recommended Accessories
910001	Electrode storage solution
900011	Ag/AgCl fill solution
810007	ROSS fill solution
910008-WA	3 M KCl fill solution



Screw Cap



BNC Waterproof



BNC

### Key Information

All cable lengths are 1 meter



# Thermo Scientific Orion Spear Tip pH Electrodes

For Piercing Fruits, Cheese and Meats

Spear tip pH electrodes can be used for piercing soft samples like cheese or fruit or cutting through tougher samples such as meat. All have refillable designs. They are available in single junction or double junction designs which can be used with TRIS samples, proteins or sulfides.

The ROSS spear tip electrode offers the proven accuracy and response that ROSS electrodes are known for and is a double junction electrode. It is suited for semi-solid samples.

The 9163SC is suited for routine measurements and is for use in semi-solid samples.

The KNiPHE electrode has a glass electrode that is encased in a stainless steel housing with a cutting blade at the tip. It is used for tough samples such as meat. It has a double junction design.

The 9162BNWP can be used for soft samples or routine clean water measurements. It has a single junction design.

**For piercing semi-solid samples**



**ROSS® combination pH electrode with glass body, spear tip**

- For cheese, meat, and fruit samples
- Measure samples as small as 100 µL
- Double junction for TRIS samples

**For piercing soft samples**



**Combination pH electrode, glass body, spear tip**

- For cheese, meat, and fruit samples
- Measure samples as small as 100 µL

**For meat, cheese and sludge samples**



**KNiPHE® Double Junction combination pH electrode with stainless steel cutting blade**

- For meat, cheese and sludge where glass alone may break
- Replacement electrode Cat. No. 9121APWP
- Replacement blade Cat. No. 712001
- Replacement sheath Cat. No. 712002

**Rugged with an easy-to-clean bulb**



**Low resistance combination pH electrode with glass body, rugged bulb**

- For routine or clean water measurements
- For soft samples

Cat. No.	8163BNWP 8163SC	9163SC	9120APWP	9162BNWP
<b>pH Range</b>	0-14	0-14	0-14	0-14
<b>pH Precision</b>	0.01	0.02	0.02	0.02
<b>Temp. Range</b>	0-100 °C	0-90 °C	0-60 °C	0-90 °C
<b>Internal Reference</b>	ROSS	Ag/AgCl	Ag/AgCl Double junction	Ag/AgCl
<b>Junction</b>	Ceramic	Ceramic	Ceramic	Ceramic
<b>Fill Solution (Cat. No.)</b>	3 M KCl (810007)	4 M KCl w/ Ag/AgCl (900011)	3 M KCl (910008-WA)	4 M KCl w/ Ag/AgCl (900011)
<b>Dimension D (Dia) L (Length) T (Tip)</b>	L - 110 mm T - 4.5 mm x 20 mm L	L - 95 mm D - 6.5 mm x 25 mm L	L - 215 mm D - 16 mm	L - 120 mm D - 12 mm
<b>Connector Type</b>	BNC Waterproof Screw Cap	Screw Cap	BNC Waterproof	BNC Waterproof

Cat. No.	Recommended Accessories
900011	Ag/AgCl fill solution
810007	ROSS fill solution
910008	3M KCl fill solution



Screw Cap



BNC Waterproof

## Key Information

All cap diameters are 16 mm  
All cable lengths are 1 meter



## Thermo Scientific Orion pH Half Cell and Reference Half Cell Electrodes

pH half cells require the use of a reference half cell electrode.

Reference half cells are for use with either a pH half cell sensing electrode or an ISE half cell reference electrode. They are available as single or double reference designs. Clog free Sure-flow junctions are also available extending the life of your electrode.

Ross half cells should be paired together. 900100 and 900200 are silver chloride references for pH and ISE electrodes.

**Accurate, ROSS rapid response in a half-cell design**



**ROSS® pH half-cell with glass body**

- Use with 800300 ROSS Sure-Flow or 800500U ROSS Ultra reference electrodes

**Accurate results in a half-cell**



**pH half-cell with glass body**

- Use with 900100 single junction or 900200 double junctions reference electrodes

**Top performance and long life**



**ROSS Ultra® reference half-cell with glass body**

- Use with 8101BNWP or 8101SC ROSS pH half-cell or 8411BN ROSS sodium half-cell electrodes

**For all samples including solvents**



**ROSS® Sure-Flow® reference half-cell with glass body**

- Sure-Flow junction prevents clogging
- Use with 8101BNWP or 8101SC ROSS pH half-cell or 8411BN ROSS sodium half-cell electrodes

**For use with ISE half-cell or pH electrodes**



**Double Junction Sure-Flow® reference half-cell with epoxy body**

- Sure-Flow junction prevents clogging
- Double junction allows a variety of filling solutions to be used

**For routine pH and many ISE measurements**



**Single Junction Sure-Flow® reference half-cell with epoxy body**

- Use with 9101BN and 9101SC pH half-cell electrodes
- Compatible with several ISEs

Cat. No.	8101BNWP 8101SC	9101BN 9101SC	800500U	800300	900200	900100
<b>pH Range</b>	0-14	0-14	0-14	0-14	0-14	0-14
<b>pH Precision</b>	0.01	0.02	—	—	—	—
<b>Temp. Range</b>	0-100 °C	0-90 °C	0-100 °C	0-100 °C	0-100 °C	0-100 °C
<b>Internal Reference</b>	ROSS	Ag/AgCl	ROSS	ROSS	Ag/AgCl Double junction	Ag/AgCl
<b>Junction</b>	—	—	Ceramic	Sure-Flow	Sure-Flow	Sure-Flow
<b>Fill Solution (Cat. No.)</b>	—	—	3 M KCl (810007)	3 M KCl (810007)	Equitransferent solution (900002) outer (900003)	Equitransferent solution w/ Ag/AgCl (900001)
<b>Dimension D (Dia) L (Length) T (Tip)</b>	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 110 mm D - 13 mm	L - 110 mm D - 13 mm
<b>Connector Type</b>	BNC Waterproof Screw Cap	BNC Screw Cap	Pin Tip	Pin Tip	Pin Tip	Pin Tip

Cat. No.	Recommended Accessories
810007	ROSS fill solution
900001	Single junction reference fill solution
900002	Double junction reference inner fill solution
900003	Double junction reference outer fill solution



Screw Cap



BNC Waterproof



BNC



Pin Tip

### Key Information

All cap diameters are 16 mm at bottom of cap  
All cable lengths are 1 meter

# Thermo Scientific Orion ATC Probes

Accurate Temperature Measurement

ATC probes will measure the temperature of your sample quickly and accurately. They are extremely durable. There are a variety of options available to you to use depending on your application. Choose from a micro ATC probe, stainless steel, glass or epoxy body probe. The connector must be compatible with the meter you are using.

**Fastest temperature response**



**Micro ATC probe with stainless steel tip and epoxy body**

- For critical temperature monitoring
- Measures samples as small as 10 µL
- Minimum depth of immersion is 3 mm

**Rugged stainless steel**



**ATC probe with stainless steel body**

- Extremely durable body
- For field, plant, and food applications

**Solvent-resistant glass**



**ATC probe with glass body**

- For solutions that contain organic solvents

**Durable epoxy**



**ATC probe with epoxy body**

- General purpose
- For aqueous samples, intermittent use in methanol or ethanol

**Small diameter rugged stainless steel**



**ATC probe with stainless steel body**

- Extremely durable body
- For field, plant, and food applications
- For use with Russell meters

Cat. No.	928007MD (Star)	927007MD (Star) 917007 (A+ Series) 927007 (PerpHecT)	927006MD (Star) 917006 (A+ Series) 927006 (PerpHecT)	927005MD (Star) 917005 (A+ Series) 927005 (PerpHecT) 917001 (Older Orion Meters)	917004
Temp. Range	0-100 °C	0-100 °C	0-100 °C	0-80 °C	0-100 °C
Temp. Accuracy	±1 °C	±2 °C	±2 °C	±2 °C	±2 °C
Dimension D (Dia) L (Length) T (Tip)	L - 117 mm D - 5 mm D - 1 mm x 38 mm L	L - 120 mm D - 6 mm	L - 120 mm D - 8 mm	L - 120 mm D - 6 mm	L - 120 mm D - 3 mm
Connector Type	MiniDIN for Star	MiniDIN (Star) 8 Pin DIN (A+ Series) <sup>†</sup> Phono Tip (PerpHecT)	MiniDIN (Star) 8 Pin DIN (A+ Series) <sup>†</sup> Phono Tip (PerpHecT)	MiniDIN (Star) 8 Pin DIN (A+ Series) <sup>†</sup> Phono Tip (PerpHecT) Dual Banana Plug (Older Orion Meters)	2.5 mm Phono Jack for Russell meters



2.5 mm Phono Tip



Dual Banana Plug



Phono Tip (PerpHecT)



MiniDIN (Star)



8 Pin DIN (A Series)

## Key Information

All cap diameters are 16 mm except 928007MD  
All cable lengths are 1 meter

## Thermo Scientific Orion Redox/ORP and ORP Triode Electrodes

### Reliable Redox Measurements

ORP measurements are easily made with your choice of ORP electrodes. Use our reliable ORP standard and compare your results to the Standard Hydrogen Electrode.

The 9678BNWP is a durable epoxy body electrode with a non-clog Sure-Flow junction. The 9778BNWP offers a chemical resistant glass body. ORP triodes have a durable epoxy body and can measure temperature also. They are available in refillable design or low-maintenance gel filled styles.

#### Durable and clog-free



#### Sure-Flow® combination redox/ORP electrode with epoxy body

- For use in water, wastewater, metal plating, and biotech samples
- Sure-Flow junction prevents clogging

#### Solvent-resistant glass body



#### Combination redox/ORP electrode with glass body

- For use in water, wastewater, metal plating and organic solvent samples

#### Easy-to-clean with built-in ATC



#### ORP/ATC Triode™ with epoxy body, refillable

- For use in water and wastewater
- Epoxy body for ruggedness and durability

#### Low maintenance with built-in ATC



#### ORP/ATC Triode™ with epoxy body, low maintenance gel

- For use in water and wastewater
- Epoxy body for ruggedness and durability

Cat. No.	9678BNWP	9778BNWP	9180BNMD (Star) 9180BN (A+ Series)	9179BNMD (Star) 9179BN (A+ Series)
pH Range	—	—	—	—
Temp. Range	0-90 °C	0-100 °C	0-90 °C	0-80 °C
Temp. Accuracy	—	—	±2.0 °C	±2.0 °C
Internal Reference	Ag/AgCl	Ag/AgCl	Ag/AgCl	Ag/AgCl
Junction	Sure-Flow	Ceramic	Glass Fiber	Wick
Fill Solution (Cat. No.)	4 M KCl w/ Ag/AgCl (900011)	4 M KCl w/ Ag/AgCl (900011)	4 M KCl w/ Ag/AgCl (900011)	—
Dimension D (Dia) L (Length) T (Tip)	L - 110 mm D - 13 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm	L - 120 mm D - 12 mm
Connector Type	BNC Waterproof	BNC Waterproof	BNC Waterproof - MiniDIN (Star) BNC Waterproof - 8 Pin (A+ Series)	BNC Waterproof - MiniDIN (Star) BNC Waterproof - 8 Pin (A+ Series)

Cat. No.	Recommended Accessories
900011	Ag/AgCl fill solution
967901	ORP standard 475 mL
967961	ORP standard 5 x 60 mL



BNC Waterproof



MiniDIN (Star)



8 Pin DIN (A Series)

#### Key Information

All cap diameters are 16 mm at bottom of cap

All cable lengths are 1 meter



## Thermo Scientific Orion Silver Billet and Karl Fischer Electrodes

Electrodes for Titrations and Speciality Applications

The 977900 is a double platinum chemical resistant glass electrode for use with Karl Fischer titrations. It has a ground glass joint on the body to fit into titration vessels.

The 9780SC is a glass silver billet electrode used in halide titrations.

### Thermo Scientific Orion Storage Sleeve and Base

If you ever have had an electrode drop on a lab bench and break you will want to use the storage sleeve and base, 810017.

#### Features and Benefits

- Protects electrode from breakage when not in use
- Covers entire glass body of standard size pH electrodes (12 x 120 mm)
- pH bulb stays conditioned when not in use
- Weighted base prevents electrode from tipping
- Sleeve can be removed from base to store in electrode holder



Storage Sleeve and Base 810017

For Karl Fischer titrations



For halide titrations



Karl Fischer double platinum electrode with glass body

- For accurate Karl Fischer titrations

Silver Billet combination electrode

- For accurate and reliable halide titrations

Cat. No.	977900	9780SC
pH Range	Endpoint Indicator	Endpoint Indicator
Temp. Range	0-40 °C	0-80 °C
Internal Reference	Platinum	Ag/AgCl
Junction	—	Ceramic
Fill Solution (Cat. No.)	—	4 M KCl w/ Ag/AgCl (900011)
Dimension D (Dia) L (Length) T (Tip)	L - 120 mm D - 12 mm	L - 150 mm D - 12 mm
Connector Type	Dual Pin Tip	Screw Cap



Screw Cap



Dual Pin Tip

#### Key Information

Environmentally-safe mercury-free  
All cap diameters are 16 mm at bottom of cap  
All cable lengths are 1 meter

## Thermo Scientific Orion Star Stirrer Probe

Ideal for laboratory pH and ISE measurements



### Orion Star Automatic Stirrer Probe

Thermo Scientific Orion Star Stirrer probes are the answer to economical and convenient stirring.

- Use with the following Orion benchtop meters for automatic control and stirring:
  - Orion VERSA STAR
  - Orion DUAL STAR
  - Orion Star A210-series
  - Orion 3-, 4- and 5-Star/Star Plus benchtop
- Eliminates the hassles of magnetic stir plates and stir bars
- No heat transfer from stir plate
- No need to capture & wash stir bars
- No potential electrode bulb damage from stir bars
- Competitive pricing allows you to take advantage of the stirrer probe benefits at half the price of similar models
- Conveniently plugs into the back panel of the compatible benchtop meters for stirrer power, speed and control

It is so easy-to-use! Plug the stirring probe into the back panel of an Orion VERSA STAR, DUAL STAR, Star A210-series or benchtop 3-, 4- and 5- Star/Star Plus meter and place it into an electrode stand with the measuring electrode. Control the on/off function and stirring speed using the meter controls. Simply insert the stirring probe into a sample and rinse it between measurements.

### Stirring Probes with Paddles

Cat. No.	Description
096019	Orion Star Stirrer probe with paddle
096021	Replacement paddles, 3 pack



### Accessories

#### Orion DUAL STAR™

Pages 10-11

For easy ISE testing, pair the automatic stirrer probe with an Orion DUAL STAR meter.



# Thermo Scientific Orion Electrode Connectors and Cables

Connectors that stay dry and connected



If you ever lost an electrode because of a failed connection, you'll appreciate the Orion Star Series' proprietary waterproof BNC and MiniDIN locking connectors. Adapter cables can be used to connect Orion Star Series electrodes to a wide variety of other meters.



## Electrode Adapter Cables

Cat. No.	Meter Input	Electrode Connector	Adapter Needed
090033	BNC	U.S. standard	US standard to BNC adapter
91CBNC	BNC	Screw cap	Detachable cable to BNC connector
090048	BNC	Karl Fischer double pin tip	Karl Fischer adapter
090032	U.S. standard	BNC	BNC to U.S. standard adapter
91USCB	U.S. standard	Combination electrode with screw cap	Detachable cable to U.S. standard connector
91USHC	U.S. standard	Half-cell electrode with screw cap	Detachable cable to half-cell U.S. std. connector
090036	F LEMO (Metrohm)	BNC	BNC to F LEMO adapter
090035	LEMO miniature (Mettler)	BNC	BNC to LEMO miniature adapter
91CLMO	LEMO miniature (Mettler)	Screw cap	Detachable cable to LEMO connector
090034	E DIN (Knick, Schott, WTW)	BNC	BNC to E DIN adapter
91CDIN	E DIN (Knick, Schott, WTW)	Screw cap	Detachable cable to E Din connector
090037	Radiometer no. 7	BNC	BNC to radiometer adapter
91USRF	2 mm pin tip	Screw cap	Detachable cable to 2.5 mm pin tip connector
91CBNT	Other	Screw cap	Detachable cable to stripped end

## Electrode Extension Cables

Cat. No.	Description
910026-WA	15 ft. extension cable, pin tip connector
910027	15 ft. extension cable, BNC connector
910028	15 ft. extension cable, 8 pin DIN connector for 917005, 917006 and 917007 ATC probes
910029-WA	15 ft. extension cable, 3.5 mm phono tip connector for 927005, 927006 and 927007
910030	15 ft. extension cable, BNC and 3.5 mm phono tip connectors for 9207BN pH/ATC Triode
910031	15 ft. extension cable, banana jack connector for 917001 and 917002 ATC probes
910032	15 ft. extension cable, 8 pin mini DIN for ATC probes for star series meters

## Adapter Cables (For Star Series Electrodes to Older Meters)

Cat. No.	Description	Meter Capabilities
1010050-WA	MiniDIN ATC probe to 3.5 mm phono tip meter	Use on 310 320, 330, 350 370, 555A 550A, 535A and 162A meters
1010051	MiniDIN ATC probe to 8 pin DIN meter	Use on 210A+, 230A+ 250A+, 290A+ 410A+, 420A+ 520A+, 525A+ 710A+, 720A+ and 920A+ meters
1010800	MiniDIN DO probe to 8 pin waterproof DIN DO meter	Use on 830A 835A and 862A meters
1010801	MiniDIN DO probe to 8 pin DIN DO meter	Use on 805A+, 810A+ and 850A+ meters
1010900-WA	MiniDIN conductivity probe to 8 pin waterproof DIN conductivity meter	Use on 555A 550A, 162A 135A, and 130A meters
1010901	MiniDIN conductivity probe to 8 pin DIN conductivity meter	Use on 150A+, 145A+ 125A+, 115A+ and 105A+ meters



## Thermo Scientific Orion pH Buffers and Solutions

We have the pH buffers, storage solutions, cleaning solutions, kits and pH electrode filling solutions for every application. All Orion pH buffers and standards are traceable to NIST reference materials. A wide variety of sizes are available from 15 mL single use pouches to large volume 19 L cubitainers.



### pH Buffers in 475 mL (1 Pint) Bottles

Great for standard laboratory applications and everyday use

Cat. No.	Description
<b>810199</b>	<b>ROSS All-in-One pH Buffer Kit</b> 475 mL each of pH 4.01, 7.00 and 10.01 buffers; 475 mL of ROSS pH electrode storage solution (810001); 60 mL of pH electrode cleaning solution; and 12 mm diameter electrode storage bottle
<b>910199</b>	<b>Standard All-in-One pH Buffer Kit</b> 475 mL each of pH 4.01, 7.00 and 10.01 buffers; 475 mL of pH electrode storage solution (910001); and 12 mm diameter electrode storage bottle
<b>910168</b>	pH 1.68 buffer, NIST traceable, 475 mL
<b>910104</b>	pH 4.01 buffer, color coded red, NIST traceable, 475 mL
<b>910105</b>	pH 5.00 buffer, color coded orange, NIST traceable, 475 mL
<b>910686</b>	pH 6.86 buffer, DIN standard, NIST traceable, 475 mL
<b>910107</b>	pH 7.00 buffer, color coded yellow, NIST traceable, 475 mL
<b>910918</b>	pH 9.18 buffer, DIN standard, NIST traceable, 475 mL
<b>910110</b>	pH 10.01 buffer, color coded blue, NIST traceable, 475 mL
<b>910112</b>	pH 12.46 buffer, NIST traceable, 475 mL



### pH Buffers in 5 x 60 mL (5 x 2 Oz) Bottles

Perfect for field measurements, occasional pH analysis or limited lab space

Cat. No.	Description
<b>916099</b>	<b>All-in-One 60 mL pH Buffer Kit</b> 60 mL each of pH 4.01, 7.00 and 10.01 buffers; 60 mL of pH electrode storage solution (910060); and 60 mL of pH electrode cleaning solution (900024)
<b>9116860</b>	pH 1.68 buffer, NIST traceable, 5 x 60 mL
<b>910460</b>	pH 4.01 buffer, color coded red, NIST traceable, 5 x 60 mL
<b>916860</b>	pH 6.86 buffer, DIN standard, NIST traceable, 5 x 60 mL
<b>910760</b>	pH 7.00 buffer, color coded yellow, NIST traceable, 5 x 60 mL
<b>9191860</b>	pH 9.18 buffer, DIN Standard, NIST traceable, 5 x 60 mL
<b>911060</b>	pH 10.01 buffer, color coded blue, NIST traceable, 5 x 60 mL
<b>911260-WA</b>	pH 12.46 buffer, NIST traceable, 5 x 60 mL



**pH Buffers and Rinse Solution in Individual Use Pouches**  
Ideal for field measurements, pharma applications or single use buffer requirements

Cat. No.	Description
<b>910410-WA</b>	<b>pH 4.01 Buffer, Color Coded Red, NIST Traceable</b> Individual use pouches, 10 x 15 mL
<b>910425</b>	Individual use pouches, 25 x 15 mL
<b>910710</b>	<b>pH 7.00 Buffer, Color Coded Yellow, NIST Traceable</b> Individual use pouches, 10 x 15 mL
<b>910725</b>	Individual use pouches, 25 x 15 mL
<b>911010</b>	<b>pH 10.01 Buffer, Color Coded Blue, NIST Traceable</b> Individual use pouches, 10 x 15 mL
<b>911025-WA</b>	Individual use pouches, 25 x 15 mL
<b>911110</b>	<b>pH Electrode Rinse Solution</b> Individual use pouches, 10 x 15 mL
<b>911125</b>	Individual use pouches, 25 x 15 mL



### pH Buffers in 19 L (5 Gallon) Cubitainers with Easy-Pour Spout

Excellent for large laboratories and multiple users

Cat. No.	Description
<b>9104CB</b>	pH 4.01 buffer, color coded red, NIST traceable, 19 L (5 gallon) cubitainer
<b>9107CB</b>	pH 7.00 buffer, color coded yellow, NIST traceable, 19 L (5 gallon) cubitainer
<b>9110CB</b>	pH 10.01 buffer, color coded blue, NIST traceable, 19 L (5 gallon) cubitainer



### pH Electrode Storage Solution and ROSS pH Electrode Storage Solution

Get the fastest, most reliable performance from your pH electrode

Cat. No.	Description
<b>810199</b>	<b>ROSS All-in-One pH Buffer Kit</b> 475 mL each of pH 4.01, 7.00 and 10.01 buffers; 475 mL of ROSS pH electrode storage solution (810001); 60 mL of pH electrode cleaning solution; and 12 mm diameter electrode storage bottle
<b>910199</b>	<b>Standard All-in-One pH Buffer Kit</b> 475 mL each of pH 4.01, 7.00 and 10.01 buffers; 475 mL of pH electrode storage solution (910001); and 12 mm diameter electrode storage bottle
<b>916099</b>	<b>All-in-One 60 mL pH Buffer Kit</b> 60 mL each of pH 4.01, 7.00 and 10.01 buffers; 60 mL of pH electrode storage solution (910060); and 60 mL of pH electrode cleaning solution (900024)
<b>810001</b>	<b>ROSS pH Electrode Storage Solution</b> 475 mL
<b>910001</b> <b>910060</b> <b>9100CB</b>	<b>pH Electrode Storage Solution</b> 475 mL 5 x 60 mL 19 L (5 gallon) cubitainer



### pH Electrode Cleaning Solutions

Specially formulated cleaning solutions for slow, dirty or clogged pH electrodes

Cat. No.	Description
<b>900020</b>	<b>pH Electrode Cleaning Kit</b> – 30 mL of cleaning solution A and C, 60 mL of cleaning solution B and D, beaker and pipet
<b>900021-WA</b>	pH electrode cleaning solution A for protein removal, 4 x 30 mL, beaker and pipet
<b>900022-WA</b>	pH electrode cleaning solution B for bacteria removal, 4 x 60 mL, beaker and pipet
<b>900023</b>	pH electrode cleaning solution C for general cleaning, 4 x 30 mL, beaker and pipet
<b>900024</b>	pH electrode cleaning solution D for general cleaning and oil and grease removal, 4 x 60 mL, beaker and pipet
<b>510015</b>	Stain lifter solution for no cal fill solution and ORP standard stain removal, 60 mL



### pH Specialty Solutions and ORP Standards

Cat. No.	Description
<b>700001</b>	<b>Pure Water Low Ionic Strength pH Test Kit</b> – 4 x 475 mL of pH 6.97 buffer, 2 x 475 mL of pH 4.10 buffer, 2 x 60 mL of pHISA adjuster and app note
<b>700003</b>	Pure water pHISA low ionic strength adjuster, 5 x 60 mL
<b>700402</b>	Pure water pH 4.10 buffer B for low ionic strength pH samples, 4 x 475 mL
<b>700702</b>	Pure water pH 6.97 buffer A for low ionic strength pH samples, 4 x 475 mL
<b>700902</b>	Pure water pH 9.15 buffer C for low ionic strength pH samples, 4 x 475 mL
<b>700010</b>	<b>Total Alkalinity Test Kit</b> – 475 mL of alkalinity reagent (700011-WA), 475 mL of alkalinity standard (700012), conversion chart and app note
<b>700011-WA</b>	Total alkalinity reagent refill, 4 x 475 mL
<b>700012</b>	Total alkalinity standard/control refill, 475 mL
<b>967901</b>	<b>ORP Standard</b> , +420 mV vs. standard hydrogen electrode (EH), +220 mV vs. Ag/AgCl electrode using 900011 fill solution, 475 mL
<b>967961</b>	<b>ORP Standard</b> , +420 mV vs. standard hydrogen electrode (EH), +220 mV vs. Ag/AgCl electrode using 900011 fill solution, 5 x 60 mL



**Pure Water® pH Test Kit:** Get fast, accurate pH results in high purity waters such as well, rain, distilled/deionized, boiler feed and process. The kit includes special low ionic strength buffers and pHISA additive that increases sample ionic strength without changing the pH. For best results, a high quality pH electrode such as the ROSS Ultra 8102BNUWP is recommended (purchase separately).



**Total Alkalinity Test Kit:** A two-step direct measurement of total alkalinity and pH. Calibrate for pH, add alkalinity reagent and read total alkalinity of 0-200 ppm  $\text{CaCO}_3$  from the included pH conversion chart.



## Thermo Scientific Orion Electrode Fill Solutions and Accessories



### pH Electrode and Reference Electrode Fill Solutions

Ensure the proper performance and function from your electrode by using our specially formulated fill solutions

Cat. No.	Description	Use With Electrodes
810007	ROSS electrode fill solution, 3 M KCl, 5 x 60 mL	<b>ROSS Ultra, ROSS and Micro ROSS Electrodes</b> 800300, 800500U, 8102BN, 8102BNUWP, 8103BN, 8103BNUWP, 8104BN, 8104BNUWP, 8115BN, 8115BNUWP, 8135BN, 8135BNUWP, 815600, 8156BNUWP, 8157BNU, 8157BNUMD, 8157UWMMD, 8163BNWP, 8165BNWP, 8172BNWP, 8175BNWP, 8220BNWP, 8302BNUMD
900011	Silver Chloride pH electrode fill solution, 4 M KCl with Ag/AgCl, 5 x 60 mL	<b>Standard, Specialty, Single Junction Refillable Green, Micro and ORP Electrodes</b> 9102BNWP, 9103BNWP, 9104BNWP, 9156BNWP, 9157BN, 9157BNMD, 9162BNWP, 9165BNWP, 9172BNWP, 9180BN, 9180BNMD, 9678BNWP, 9778BNWP, 9780SC, 9810BN, 9826BN, 9863BN, GS9156BNWP
900004	Silver Chloride pH electrode (low level) fill solution, 2 M KCl with Ag/AgCl, 5 x 60 mL	<b>Standard, Specialty, Single Junction Refillable Green, Micro and ORP Electrodes (low ionic strength samples)</b> 9102BNWP, 9103BNWP, 9104BNWP, 9156BNWP, 9157BN, 9157BNMD, 9162BNWP, 9165BNWP, 9172BNWP, 9180BN, 9180BNMD, 9678BNWP, 9778BNWP, 9780SC, 9810BN, 9826BN, 9863BN, GS9156BNWP
910008-WA	Double junction pH electrode fill solution, 3 M KCl, 5 x 60 mL	<b>Double Junction, Double Junction Refillable Green and KnpHE Electrodes</b> 9102DJWP, 9110DJWP, 9120APWP, GD9156BNWP
510011	No Cal pH electrode fill solution, 5 x 60 mL	<b>No Cal Electrodes</b> 5107BNMD, 5107NC
610001	pHuture pH electrode fill solution, 5 x 60 mL	<b>pHuture Electrodes</b>
900001	Single junction reference electrode fill solution, equitransferent solution with Ag/AgCl, 5 x 60 mL	<b>Single Junction Reference Electrode</b> 900100
900002	Double junction reference electrode inner fill solution, equitransferent solution with Ag/AgCl, 5 x 60 mL	<b>Double Junction Reference Electrode</b> 900200
900003	Double junction reference electrode outer fill solution, 10 % KNO <sub>3</sub> , 5 x 60 mL	<b>Double Junction Reference Electrode</b> 900200

### pH Accessories

Cat. No.	Description
020017	No Cal electrode storage chamber
810017	Storage sleeve and base for 12 mm x 120 mm electrodes
910003	12 mm electrode storage bottles, 3 pack
910004	8 mm electrode storage bottles, 3 pack
910005	Bulb guard for glass pH electrode, 5 pack
910006	6 mm electrode storage bottles, 3 pack





## Thermo Scientific Orion Ion Selective Electrodes

Ion Selective Electrodes (ISE) are easy to use and provide you the best performance and reliability

Measurement by ISE can be performed in virtually every laboratory. ISEs measure ion concentrations in samples such as water, food, pharmaceuticals and biological samples. There have been many analytical methods that have been developed and published world-wide for the use of ISEs. The variety of methods available is the main advantage of using ISE technology.

### Efficient and Economical

Electrode measurements are simpler and faster than other analytical techniques. Time consuming sample steps such as filtration and distillations are rarely needed. Analysis time is typically under 1 minute. Typically the cost per test is only a few cents. Compared to other methods such as atomic absorption or ion chromatography, there is a small setup cost and it does not require additional expensive readout equipment. Sample color or turbidity do not affect the measurement.

### Measurement Techniques

**Direct Measurement** is a simple procedure for measuring a large number of samples. Each sample only requires one reading. Only a small sample volume is required. Calibration is performed on a series of standards. The concentration is then determined by comparison to the standards. Ionic strength adjustor is added to all solutions to ensure samples and standards have similar ionic strength, proper pH and reduce the effect of interfering ions. Orion ISE meters calculate and store the calibration curves.

**Low Level Measurement** is a similar method to direct measurement. It is recommended when the sample is not in the linear response range. A minimum 3 point calibration is recommended to compensate for the non-linear response. Calibration is performed in one beaker reducing the chance of cross contamination of the standards.

**Know Addition** is a useful method for measuring samples since calibration is not required. This method is recommended when measuring only a few samples, when samples have a high ionic strength ( $>0.1$  M) or when there is a complicated background matrix. An aliquot of standard solution containing the measured species is added to the sample. The sample concentration is determined by the changes in potential before and after the addition. Orion ISE meters automatically calculate the result.

**Analate Subtraction** is also a useful method for measuring samples since calibration is not required. The electrodes are immersed in a reagent solution that contains a species that the electrode senses and then it reacts with the sample. It is useful when sample size is small, for samples for which a standard is difficult to prepare, and for viscous or very concentrated samples. The method is not suited for very diluted samples. It is also necessary to know the stoichiometric ration between sample and standard.

**Titration**s are quantitative analytical techniques for measuring the concentration of a species by incremental addition of a reagent (titrant) that reacts with the sample species. Sensing electrodes can be used for determination of the titration end point. Ion selective electrodes are useful as end point detectors because they are unaffected by sample color or turbidity.

### Half Cell Ion Selective Electrodes

Solid-State Half-Cell ISE		Fluoride, Chloride, Cyanide, Silver-Sulfide, Lead, Bromide, Cadmium, Cupric, Iodide, Thiocyanate
Epoxy body		
Require separate reference		
Temperature range 0-80 °C		
Plastic Membrane Half-Cell ISE		Nitrate, Potassium, Calcium, Ammonium, Fluoroborate
PVC body		
Require separate reference		
Temperature range 0-40 °C		
ROSS® Half-Cell ISE		Sodium
Glass body		
Requires ROSS half-cell reference		
Temperature range 0-100 °C		

### Combination Ion Selective Electrodes

Sure-Flow® Reference makes electrode easy to clean and long lasting

















<b>Ionplus® Sure-Flow® Combination ISE</b>	Fluoride, Chloride, Cyanide, Silver-Sulfide, Lead, Bromide, Cadmium, Cupric, Iodide
Epoxy body	
Temperature range 0-80 °C	
<b>Ionplus Sure-Flow Combination Plastic Membrane ISE</b>	Nitrate, Potassium, Calcium
PVC body	
Temperature range 0-40 °C	
<b>ROSS Sure-Flow® Combination ISE</b>	Sodium
Glass body	
Temperature range 0-100 °C	

### Various ISE Applications

<b>Agriculture</b>	Nitrate, chloride, ammonia, potassium, calcium, iodide, cyanide in soil, fertilizer and feedstuffs
<b>Biomedical</b>	Calcium, carbon dioxide and ammonia in biological cultures (not in vitro or in vivo)
<b>Dairy Products</b>	Chloride, fluoride, iodide, calcium, potassium
<b>Dental</b>	Fluoride, calcium in teeth and toothpaste
<b>Education</b>	Various ISEs in teaching and research labs
<b>Food &amp; Beverage</b>	Chloride, nitrate, sodium, calcium, potassium
<b>Geology</b>	Fluoride and calcium in rocks
<b>Metal Plating</b>	Fluoride, copper, cyanide, chloride
<b>Plant Tissue</b>	Nitrate, chloride, fluoride, iodide, cyanide, calcium, potassium and sodium
<b>Power, Steam Generators</b>	Chloride, sodium and residual chlorine in boiler feeds
<b>Pulp and Paper</b>	Sodium, chloride, sulfide and calcium in liquors
<b>Soil</b>	Nitrate, calcium, sodium, potassium, bromide, chloride, ammonia, fluoride
<b>Water, Drinking</b>	Nitrate, residual chlorine, fluoride, cyanide, sulfide, ammonia
<b>Water, Sea</b>	Sodium, chloride, fluoride, nitrate, ammonia
<b>Water, Waste</b>	Nitrate, ammonia, residual chlorine, sulfides
<b>Wine</b>	Potassium, sodium, fluoride, calcium



## Thermo Scientific Orion Ion Selective Electrode Selection Guide

Species	Cat. No.	Construction	Measurement Range	Optimum Temperature Range	Required Reference Electrode	Reference Filling Solution	Calibration Standards	Required ISA
<b>Ammonia standard (NH<sub>3</sub>)</b> 	9512BNWP <sup>1</sup>	Gas sensing combination	5 x 10 <sup>-7</sup> to 1.0 M 0.01 to 17,000 ppm	0 to 50 °C	Included	951202	0.1 M NH <sub>4</sub> Cl / 951006	951211 
<b>Ammonia high performance</b> 	9512HPBNWP <sup>1</sup>	Gas sensing combination	5 x 10 <sup>-7</sup> to 1.0 M 0.01 to 17,000 ppm	0 to 50 °C	Included	951209	0.1 M NH <sub>4</sub> Cl / 951006	951210 
<b>Ammonium (NH<sub>4</sub><sup>+</sup>)</b>	931801 <sup>8</sup>	Plastic membrane half-cell	5 x 10 <sup>-7</sup> to 1.0 M 0.01 to 17,000 ppm	0 to 40 °C	900200	900002 inner/ 900018-WA outer	1000 ppm as N / 951007	—
<b>Bromide (Br<sup>-</sup>) ionplus Design</b>	9635BNWP <sup>1</sup>	ionplus sure-flow solid state combination	5 x 10 <sup>-6</sup> to 1.0 M 0.40 to 79,900 ppm	0 to 80 °C	Included	900063	0.1 M NaBr / 943506	940011
<b>Bromide (Br<sup>-</sup>)</b>	9435BN <sup>2</sup> 9435SC <sup>3</sup>	Solid state half-cell	5 x 10 <sup>-6</sup> to 1.0 M 0.40 to 79,900 ppm	0 to 80 °C	900200	900002 inner / 900003 outer	0.1 M NaBr / 943506	940011
<b>Cadmium (Cd<sup>2+</sup>) ionplus Design</b>	9648BNWP <sup>1</sup>	ionplus sure-flow solid state combination	1 x 10 <sup>-7</sup> to 0.1 M 0.01 to 11,200 ppm	0 to 80 °C	Included	900061	Consult user guide	940011
<b>Cadmium (Cd<sup>2+</sup>)</b>	9448BN <sup>2</sup> 9448SC <sup>3</sup>	Solid state half-cell	1 x 10 <sup>-7</sup> to 0.1 M 0.01 to 11,200 ppm	0 to 80 °C	900200	900002 inner / 900003 outer	Consult user guide	940011
<b>Calcium (Ca<sup>2+</sup>) ionplus Design</b>	9720BNWP <sup>1</sup>	ionplus sure-flow plastic membrane combination	5 x 10 <sup>-7</sup> to 1.0 M 0.02 to 40,100 ppm	0 to 40 °C	Included	900061	0.1 M CaCl <sub>2</sub> / 922006 100 ppm CaCO <sub>3</sub> / 923206	932011
<b>Calcium (Ca<sup>2+</sup>)</b>	9320BN <sup>2</sup>	Plastic membrane half-cell	5 x 10 <sup>-7</sup> to 1.0 M 0.02 to 40,100 ppm	0 to 40 °C	900100	900011	0.1 M CaCl <sub>2</sub> / 922006 100 ppm CaCO <sub>3</sub> / 923206	932011
<b>Carbon Dioxide (CO<sub>2</sub>)</b>	9502BNWP <sup>1</sup>	Gas sensing combination	1 x 10 <sup>-4</sup> to 1 x 10 <sup>-2</sup> M 4.4 to 440 ppm	0 to 50 °C	Included	950202	0.1 M NaHCO <sub>3</sub> / 950206 1000 ppm as CaCO <sub>3</sub> / 950207	950210
<b>Chloride (Cl<sup>-</sup>) ionplus Design</b> 	9617BNWP <sup>1</sup>	ionplus sure-flow solid state combination	5 x 10 <sup>-6</sup> to 1.0 M 1.8 to 35,500 ppm	0 to 80 °C	Included	900062	0.1 M NaCl / 941706 100 ppm Cl <sup>-</sup> / 941707 1000 ppm Cl <sup>-</sup> / 941708	940011 or 941709 / CISA 
<b>Chloride (Cl<sup>-</sup>)</b> 	9417BN <sup>2</sup> 9417SC <sup>3</sup>	Solid state half-cell	5 x 10 <sup>-6</sup> to 1.0 M 1.8 to 35,500 ppm	0 to 80 °C	900200	900002 inner / 900003 outer	0.1 M NaCl / 941706 100 ppm Cl <sup>-</sup> / 941707 1000 ppm Cl <sup>-</sup> / 941708	940011 or 941709 / CISA 
<b>Chlorine (Cl<sub>2</sub>)</b> 	9770BNWP <sup>1</sup> 9770SC <sup>3</sup>	Solid state combination	1 x 10 <sup>-7</sup> to 3 x 10 <sup>-4</sup> M 0.01 to 20 ppm	0 to 50 °C	Included	None required	100 ppm as Cl <sub>2</sub> / 977007	977010 / iodide reagent 977011 / acid reagent 
<b>Cupric (Cu<sup>2+</sup>) ionplus Design</b>	9629BNWP <sup>1</sup>	ionplus sure-flow solid state combination	1 x 10 <sup>-8</sup> to 0.1 M 6.4 x 10 <sup>-4</sup> to 6350 ppm	0 to 80 °C	Included	900063	0.1 M Cu(NO <sub>3</sub> ) <sub>2</sub> / 942906	940011
<b>Cupric (Cu<sup>2+</sup>)</b>	9429BN <sup>2</sup> 9429SC <sup>3</sup>	Solid state half-cell	1 x 10 <sup>-8</sup> to 0.1 M 6.4 x 10 <sup>-4</sup> to 6350 ppm	0 to 80 °C	900200	900002 inner / 900003 outer	0.1 M Cu(NO <sub>3</sub> ) <sub>2</sub> / 942906	940011
<b>Cyanide (CN<sup>-</sup>) ionplus Design</b> 	9606BNWP <sup>1</sup>	ionplus sure-flow solid state combination	8 x 10 <sup>-6</sup> to 1 x 10 <sup>-2</sup> M 0.2 to 260 ppm	0 to 80 °C	Included	900062	Consult user guide	951011 
<b>Cyanide (CN<sup>-</sup>)</b> 	9406BN <sup>2</sup> 9406SC <sup>3</sup>	Solid state half-cell	8 x 10 <sup>-6</sup> to 1 x 10 <sup>-2</sup> M 0.2 to 260 ppm	0 to 80 °C	900200	900002 inner / 900003 outer	Consult user guide	951011 
<b>Fluoride (F<sup>-</sup>) ionplus Design</b> 	9609BNWP <sup>1</sup>	ionplus sure-flow solid state combination	1 x 10 <sup>-6</sup> M to saturated 0.02 ppm to saturated	0 to 80 °C	Included	900061	0.1 M NaF / 940906 100 ppm F <sup>-</sup> / 940907 1 ppm F <sup>-</sup> w/ TISAB II / 040906 2 ppm F <sup>-</sup> w/ TISAB II / 040907 10 ppm F <sup>-</sup> w/ TISAB II / 040908	940909 / TISAB II 940911 / TISAB III
<b>Fluoride (F<sup>-</sup>)</b> 	9409BN <sup>2</sup> 9409SC <sup>3</sup>	Solid state half-cell	1 x 10 <sup>-6</sup> M to saturated 0.02 ppm to saturated	0 to 80 °C	900100	900001	0.1 M NaF / 940906 100 ppm F <sup>-</sup> / 940907 1 ppm F <sup>-</sup> w/ TISAB II / 040906 2 ppm F <sup>-</sup> w/ TISAB II / 040907 10 ppm F <sup>-</sup> w/ TISAB II / 040908	940909 / TISAB II 940911 / TISAB III



Species	Cat. No.	Construction	Measurement Range	Optimum Temperature Range	Required Reference Electrode	Reference Filling Solution	Calibration Standards	Required ISA
Fluoroborate ( $\text{BF}_4^-$ )	9305BN <sup>2</sup>	Plastic membrane half-cell	$7 \times 10^{-6}$ to 1.0 M 0.6 to 86,800 ppm	0 to 40 °C	900200	900002 inner / dilute ISA outer	Consult user guide	930711
Iodide ( $\text{I}^-$ ) ionplus Design	9653BNWP <sup>1</sup>	ionplus <sup>®</sup> sure-flow <sup>®</sup> solid state combination	$5 \times 10^{-8}$ to 1.0 M $5 \times 10^{-3}$ to 127,000 ppm	0 to 80 °C	Included	900063	0.1 M NaI / 945306	940011
Iodide ( $\text{I}^-$ )	9453BN <sup>2</sup> 9453SC <sup>3</sup>	Solid state half-cell	$5 \times 10^{-8}$ to 1.0 M $5 \times 10^{-3}$ to 127,000 ppm	0 to 80 °C	900200	900002 inner / 900003 outer	0.1 M NaI / 945306	940011
Lead ( $\text{Pb}^{2+}$ ) ionplus Design	9682BNWP <sup>1</sup>	ionplus sure-flow solid state combination	$1 \times 10^{-6}$ to 0.1 M 0.2 to 20,700 ppm	0 to 80 °C	Included	900062	0.1 M $\text{Pb}(\text{ClO}_4)_2$ / 948206 0.1 M $\text{Na}_2\text{SO}_4$ / 948207	Consult instruction manual
Lead ( $\text{Pb}^{2+}$ )	9482BN <sup>2</sup> 9482SC <sup>3</sup>	Solid state half-cell	$1 \times 10^{-6}$ to 0.1 M 0.2 to 20,700 ppm	0 to 80 °C	900200	900002 inner / 900003 outer	0.1 M $\text{Pb}(\text{ClO}_4)_2$ / 948206 0.1 M $\text{Na}_2\text{SO}_4$ / 948207	Consult instruction manual
Nitrate ( $\text{NO}_3^-$ ) ionplus Design	9707BNWP <sup>1</sup>	ionplus sure-flow plastic membrane combination	$7 \times 10^{-6}$ to 1.0 M 0.1 to 14,000 ppm as N	0 to 40 °C	Included	900046	0.1 M $\text{NaNO}_3$ / 920706 1000 ppm N / 920707 100 ppm N / 930707	930711 or 930710 / nitrate ISS
Nitrate ( $\text{NO}_3^-$ )	9307BNWP <sup>1</sup>	Plastic membrane half-cell	$7 \times 10^{-6}$ to 1.0 M 0.1 to 14,000 ppm as N	0 to 40 °C	900200	900002 inner / 900046 or ISA outer	0.1 M $\text{NaNO}_3$ / 920706 1000 ppm N / 920707 100 ppm N / 930707	930711 or 930710 / nitrate ISS
Potassium ( $\text{K}^+$ ) ionplus Design	9719BNWP <sup>1</sup>	ionplus sure-flow plastic membrane combination	$1 \times 10^{-6}$ to 1.0 M 0.04 to 39,000 ppm	0 to 40 °C	Included	900065	0.1 M KCl / 921906	931911
Potassium ( $\text{K}^+$ )	9319BN <sup>2</sup>	Plastic membrane half-cell	$1 \times 10^{-6}$ to 1.0 M 0.04 to 39,000 ppm	0 to 40 °C	900200	900002 inner / dilute ISA outer	0.1 M KCl / 921906	931911
Silver/Sulfide ( $\text{Ag}^+/\text{S}^{2-}$ ) ionplus Design	9616BNWP <sup>1</sup>	ionplus sure-flow solid state combination	$1 \times 10^{-7}$ to 1.0 M 0.01 to 107,900 ppm as $\text{Ag}^+$ 0.003 to 32,100 ppm as $\text{S}^{2-}$	0 to 80 °C	Included	900062 for $\text{Ag}^+/\text{S}^{2-}$ 900067 for $\text{Ag}^+$ 900061 for $\text{S}^{2-}$	Consult user guide	940011 for $\text{Ag}^+$ 941609 for $\text{S}^{2-}$ ⚠
Silver/Sulfide ( $\text{Ag}^+/\text{S}^{2-}$ )	9416BN <sup>2</sup> 9416SC <sup>3</sup>	Solid state half-cell	$1 \times 10^{-7}$ to 1.0 M 0.01 to 107,900 ppm as $\text{Ag}^+$ 0.003 to 32,100 ppm as $\text{S}^{2-}$	0 to 80 °C	900200	900002 inner / 900003 outer	Consult user guide	940011 for $\text{Ag}^+$ 941609 for $\text{S}^{2-}$ ⚠
Sodium ( $\text{Na}^+$ )	8611BNWP <sup>1</sup>	ROSS <sup>®</sup> sure-flow combination	$1 \times 10^{-6}$ M to saturated 0.02 ppm to saturated	0 to 100 °C	Included	900010 or 900012 for low level $\text{Na}^+$	10 ppm $\text{Na}^+$ / 941105 100 ppm $\text{Na}^+$ / 941107 1000 ppm $\text{Na}^+$ / 841108 KA standard kit, 1 M NaCl with ISA / 650700 0.1 M NaCl / 941706	841111 841113 / reconditioning solution
Sodium ( $\text{Na}^+$ )	8411BN <sup>2</sup>	ROSS half-cell	$1 \times 10^{-6}$ M to saturated 0.02 ppm to saturated	0 to 100 °C	800300 or 800500U	900010 or 900012 for low level $\text{Na}^+$	10 ppm $\text{Na}^+$ / 941105 100 ppm $\text{Na}^+$ / 941107 1000 ppm $\text{Na}^+$ / 841108 KA standard kit, 1 M NaCl with ISA / 650700 0.1 M NaCl / 941706	841111 841113 / reconditioning solution
Sodium ( $\text{Na}^+$ )	9811BN <sup>2</sup>	Micro combination	$1 \times 10^{-6}$ M to saturated 0.02 ppm to saturated	0 to 80 °C	Included	900004	0.1 M NaCl / 941706	841111
Surfactant	9342BN <sup>2</sup>	Plastic membrane half-cell	Endpoint indicator	0 to 40 °C	900200	900002 inner / 810007 outer	0.5 M Hyamine titrant / 654201	654203 / sample additive
Thiocyanate ( $\text{SCN}^-$ )	9458BN <sup>2</sup>	Solid state half-cell	$5 \times 10^{-6}$ to 1.0 M 0.29 to 58,100 ppm	0 to 50 °C	900200	900002 inner / 900003 outer	Consult user guide	940011



#### Key Information

**1** BNC Waterproof Connector **2** BNC Connector

**3** Screw Cap Connector, requires separate cable

**8** Module only, requires separate 93 series electrode handle (9300BNWP or 9300SC)

All cap diameters are 16 mm at bottom of cap

All cable lengths are 1 meter



## Thermo Scientific Orion Fluoride Ion Selective Electrodes

The standard in fluoride ion analysis – EPA compliant

### Approved ASTM Method for Fluoride in Drinking Water and Wastewater

Analyze free fluoride ions in aqueous solutions reliably at low limits of detection. Measurements are quick, simple, accurate and economical.

Thermo Scientific Orion fluoride electrodes feature high quality lanthanum fluoride pellet sensors. Choose from combination electrodes or half cell designs. The fluoride half cell electrode requires a separate half cell reference electrode.

### Other Applications for Fluoride Electrodes

- **Phosphate:** Gran plot titration can determine phosphate in applications from animal feed to cleaning solutions to food and beverage
- **Ammonium Bifluoride:** Multiple known addition (MKA) titration method determines levels without need of removing interfering heavy metal ions
- **Aluminum:** Gran plot titration can determine micro and semi micro levels of aluminum

### Accessories and Solutions

A full line of supporting accessories is offered to meet your measurement needs. A variety of calibration standards are available. Low level standards have the added convenience of being pre-made with total ionic strength adjustor (TISAB) and requiring that TISAB be added only to your samples. TISAB II requires a 50:50 dilution with the sample and is available in gallon bottles. TISAB III is a concentrate and requires a 1:10 dilution.

### Convenient combination with reference



### Combination fluoride ISE with Sure-Flow reference

- Fluoride surface can be easily cleaned using toothpaste and a lint-free wipe
- Built-in Sure-Flow reference provides fast and stable readings

### Half cell reference design provides flexibility



### Half cells – Fluoride ISE and Sure-Flow™ reference

- Fluoride surface can be easily cleaned using toothpaste and a lint-free wipe
- Use with the 900100 single junction or 900200 double junction reference electrodes

Cat. No.	9609BNWP	9409BN 9409SC	900100
Measurement Range	1 x 10 <sup>-6</sup> M to saturated 0.02 ppm to saturated	1 x 10 <sup>-6</sup> M to saturated 0.02 ppm to saturated	–
Temp. Range	0 to 80 °C	0 to 80 °C	0 to 100 °C
Connector Type	BNC Waterproof	BNC Screw Cap	Pin Tip

Cat. No.	Recommended Accessories
940906	0.1 M NaF standard, 475 mL
940907	100 ppm fluoride standard, 475 mL
040906	1 ppm fluoride standard with TISAB II, 475 mL
040907	2 ppm fluoride standard with TISAB II, 475 mL
040908	10 ppm fluoride standard with TISAB II, 475 mL
940909	TISAB II, 1 gallon
940999	TISAB II, 4 x 1 gallon
940911	TISAB III concentrate, 475 mL
900061	Optimum results A electrode fill solution for 9609BNWP, 5 x 60 mL
900001	Fill solution for 900100 used with 9409BN/9409SC, 5 x 60 mL



BNC Waterproof



BNC



Screw Cap



Pin Tip

# Thermo Scientific Orion Ammonia Ion Selective Electrodes

Compliant with EPA testing methods

## EPA Approved ASTM D1426 Method for Ammonia in Wastewater

Measurements are quick, simple, accurate and economical.

Thermo Scientific Orion ammonia electrodes feature time-tested membrane technology. Choose from high performance and standard designs.

The high performance ammonia electrode offers linear response down to the lower limits of detection. The electrode can detect down to 0.01 ppm. The high performance ammonia electrode can achieve response times of 1 minute in samples of 1 ppm or higher. It is rugged and meets the rigorous requirements of waste water and drinking water operators. Supplied with pack of 20 loose membranes, 1 pre-assembled outer body and 2 bottles of fill solution.

## Other Applications for Ammonia Electrodes

- **Ammonium or Nitrogen:** Measure ammonium after conversion to ammonia or nitrogen after Kjeldahl digestion of sample

## Accessories and Solutions

A full line of supporting accessories is offered to meet your measurement needs.

**High performance ammonia electrode**



**Standard ammonia electrode**



Pre-assembled body and membrane simplifies use and achieves optimum performance

Provides reliable results at mid to high ammonia levels

Cat. No.	9512HPBNWP	9512BNWP
Measurement Range	5 x 10 <sup>-7</sup> to 1.0 M 0.01 to 17,000 ppm	5 x 10 <sup>-7</sup> to 1.0 M 0.01 to 17,000 ppm
Temp. Range	0 to 50 °C	0 to 50 °C
Connector Type	BNC Waterproof	BNC Waterproof

### HP Electrode

Cat. No.	Recommended Accessories
951214	Loose membranes for HP electrodes, box of 20
951215	Pre-assembled outer body and membrane cap assembly for HP electrodes, 3 pack
951210	pH adjusting ISA, for samples with no metallic ions, 475 mL
951211	pH adjusting ISA, for samples containing metallic ions, 475 mL
951213	Ammonia electrode storage solution, 475 mL
951209	HP ammonia electrode filling solution, 60 mL
951006	0.1 M NH <sub>4</sub> Cl standard, 475 mL
951007	1000 ppm ammonia as nitrogen standard, 475 mL

### Standard Electrode

Cat. No.	Recommended Accessories
951204	Loose membranes for standard electrodes, box of 20
951205	Bonded membranes for standard electrodes, pack of 3
951210	pH adjusting ISA, for samples with no metallic ions, 475 mL
951211	pH adjusting ISA, for samples containing metallic ions, 475 mL
951213	Ammonia electrode storage solution, 475 mL
951202	Standard ammonia electrode filling solution, 60 mL
951006	0.1 M NH <sub>4</sub> Cl standard, 475 mL
951007	1000 ppm ammonia as nitrogen standard, 475 mL



BNC Waterproof

## Thermo Scientific Orion Nitrate Ion Selective Electrodes

Compliant with EPA testing methods

### The Easy Way to Measure Nitrate Levels in Drinking Water, Wastewater and Soils

Analyze free nitrate ions in aqueous solutions reliably at low limits of detection. Measurements are quick, simple, accurate and economical.

Choose from combination electrodes or half cell designs. The nitrate half cell electrode requires a separate half cell reference electrode.

### Other Applications for Nitrate Electrodes

- **Nitric Acid:** Multiple known addition (MKA) titration method determines levels without need of removing interfering heavy metal ions.

### Accessories and Solutions

A full line of supporting accessories is offered to meet your measurement needs. A variety of calibration standards are available. Replacement modules are available individually or in convenient three packs.

### Convenient combination electrode with replaceable module



### Combination nitrate ISE with Sure-Flow™ reference

- Sure-Flow reference provides stable readings and is easy to clean
- Convenient with small sample sizes

### Half cell reference design provides flexibility



### Half cells – Nitrate ISE and Sure-Flow™ reference

- Reference junction is reliable and easy to maintain
- Replaceable module provides convenience

Cat. No.	9707BNWP	9307BNWP	900200
Measurement Range	7 x 10 <sup>-6</sup> to 1.0 M 0.1 to 14,000 ppm as N	7 x 10 <sup>-6</sup> to 1.0 M 0.1 to 14,000 ppm as N	–
Temp. Range	0 to 40 °C	0 to 40 °C	0 to 100 °C
Connector Type	BNC Waterproof	BNC Waterproof	Pin Tip

Cat. No.	Recommended Accessories
900046	Optimum results F electrode fill solution, 5 x 60 mL. For 9707BNWP and outer fill solution for 900200
900002	Inner chamber fill solution for 900200, 5 x 60 mL
920706	0.1 M NaNO <sub>3</sub> standard solution, 475 mL
920707	1000 ppm nitrate as nitrogen standard, 475 mL
930707	100 ppm nitrate as nitrogen standard, 475 mL
930711	Nitrate ionic strength adjustor (ISA), 475 mL
930710	Nitrate interference suppressor solution (NISS), 475 mL
970701	Replacement module for 9707BNWP (1 each)
930701	Replacement module for 9307BNWP (pack of 3)
930702	Replacement module for 9307BNWP (1 each)



BNC Waterproof



Pin Tip



# Thermo Scientific Orion Chloride Ion Selective Electrodes

Compliant with EPA testing methods

## Approved ASTM Method for Chloride in Wastewater

Easily and reliably analyze free chloride ions in aqueous solutions. Provides quick, accurate and economical measurements. Rugged epoxy body design ensures durability of electrode.

## Other Applications for Chloride Electrodes

- **Salt:** Multiple known addition can be used to determine salt levels in food samples
- **Hydrochloric Acid:** First derivative titration can determine HCl concentrations

## Accessories and Solutions

Thermo Scientific offers a full line of accessories to enhance your measurements. These include calibration standards, two ionic strength adjustors – one to adjust background ionic strength (ISA) and another to minimize complexation interferences and adjust background ionic strength (CISA), and choice of fill solutions depending on sample composition.

Convenient combination with Sure-Flow reference



Half cell reference design provides flexibility



Combination chloride ISE with Sure-Flow® reference

- Durable reference pellet which can be polished to restore electrode performance
- Sure-Flow reference provides easy maintenance and optimum performance

Half cells - Chloride ISE and double junction Sure-Flow reference

- Double junction reference isolates inner reference from sample
- Designed for precision measurements

Cat. No.	9617BNWP	9417BN 9417SC	900200
Measurement Range	5 x 10 <sup>-5</sup> to 1.0 M 1.8 to 35,000 ppm	5 x 10 <sup>-5</sup> to 1.0 M 1.8 to 35,000 ppm	—
Temp. Range	0 to 80 °C	0 to 80 °C	0 to 100 °C
Connector Type	BNC Waterproof	BNC Screw cap	Pin Tip

Cat. No.	Recommended Accessories
940011	Chloride ionic strength adjustor (ISA), 475 mL
941709	Chloride CISA reagent pack, 2 x 2 L
941706	0.1 M NaCl standard, 475 mL
941708	1000 ppm chloride standard, 475 mL
941707	100 ppm chloride standard, 475 mL
900062	Optimum results B fill solution for 9617BNWP, 5 x 60 mL
900017	Chloride electrode fill solution, 5 x 60 mL, for samples more concentrated than 10 <sup>-2</sup> M
900003	Outer chamber fill solution for 900200, 5 x 60 mL
900002	Inner chamber fill solution for 900200, 5 x 60 mL
948201	Polishing strips, pack of 24



BNC Waterproof



BNC



Screw Cap



Pin Tip

# Thermo Scientific Orion ROSS® Sodium Ion Selective Electrodes

ROSS Fast Response and Stability

## Comes with Complete Solution Kit Containing Standards, Reagents, ISA and More!

Quick, accurate and economical measurements of free sodium ions in aqueous solutions. Chemical resistant glass body.

## Applications for Sodium Electrodes

The sodium electrode is commonly used to measure samples such as food, beverages and animal feed.

## Accessories and Solutions

Thermo Scientific provides you all the accessories you need for sodium measurement when you purchase a ROSS sodium electrode. Each electrode comes with electrode fill solution, sodium ionic strength adjustor, 3 different sodium standards, sodium electrode reconditioning solution and sodium electrode storage solution.

## Convenient combination with Sure-Flow reference



## Combination Ross Sodium ISE with Sure-Flow® reference

- Unique redox ROSS reference system provides fast response, better stability and accuracy than conventional sodium electrodes
- Sure-Flow reference prevents clogging while giving fast, stable readings

## Half cell reference design provides flexibility with choice of ROSS references



## Half cells - Chloride ISE and double junction Sure-Flow reference and optimum performance

- Choice of ROSS reference systems: ROSS Sure-Flow reference (800300) with easy to clean and reliable junction
- ROSS Ultra® reference (800500U) with ROSS performance and extended life with 2 year warranty

Cat. No.	8611BNWP	8411BN	800300 800500U
Measurement Range	1 x 10 <sup>-6</sup> M to saturated 0.02 ppm to saturated	1 x 10 <sup>-6</sup> M to saturated 0.02 ppm to saturated	—
Temp. Range	0 to 100 °C	0 to 100 °C	0 to 100 °C
Connector Type	BNC Waterproof	BNC	Pin Tip

Cat. No.	Recommended Accessories
941706	0.1 M NaCl standard, 475 mL
841108	1000 ppm sodium standard, 475 mL
941107	100 ppm sodium standard, 475 mL
941105	10 ppm sodium standard, 475 mL
650700	Known addition kit – 3 x 475 mL of 1 M NaCl standard with ISA and 1 x 475 mL ISA
841109	Known addition standard, 1000 ppm as Na <sup>+</sup> with ISA, 475 mL
841111	Sodium ionic strength adjustor (ISA), 475 mL
841113	Sodium electrode reconditioning solution, 475 mL
841101	Sodium electrode storage solution, 475 mL
900010	Sodium electrode fill solution, 5 x 60 mL
900012	Sodium electrode fill solution for low sodium levels (below 10 <sup>-5</sup> M or 0.2 ppm)



BNC Waterproof



BNC



Pin Tip



## ISE Calibration Standards, Ionic Strength Adjusters (ISA), Reagents and Fill Solutions

All ISE Standards are NIST traceable

Cat. No.	Description
<b>Ammonia, Standard and High Performance</b>	
951006	0.1 M $\text{NH}_4\text{Cl}$ Ammonia standard, 475 mL
951007	1000 ppm Ammonia as Nitrogen (N) standard, 475 mL
951207	100 ppm Ammonia as Nitrogen (N) standard, 475 mL
951211	⚠ Ammonia Ionic Strength Adjuster (ISA) with pH-indicating blue dye, 475 mL
951210	⚠ Ammonia low level Ionic Strength Adjuster (ISA) with pH-indicating blue dye, 475 mL
951213	Ammonia electrode storage solution, 475 mL
951209	Ammonia high perform electrode fill solution, 60 mL
951202	Ammonia standard electrode fill solution, 60 mL
<b>Ammonium</b>	
951007	1000 ppm Ammonium as Nitrogen (N) standard, 475 mL
900018-WA	Ammonium electrode fill solution, 5 x 60 mL
<b>Bromide</b>	
943506	0.1 M NaBr Bromide standard, 475 mL
940011	Bromide Ionic Strength Adjuster (ISA), 475 mL
900063	Optimum results D fill solution for Bromide electrode, 5 x 60 mL
<b>Cadmium</b>	
940011	Cadmium Ionic Strength Adjuster (ISA), 475 mL
900061	Optimum results A fill solution for Cadmium electrode, 5 x 60 mL
<b>Calcium</b>	
922006	0.1 M $\text{CaCl}_2$ Calcium standard, 475 mL
923206	100 ppm as $\text{CaCO}_3$ Calcium standard, 475 mL
932011	Calcium Ionic Strength Adjuster (ISA), 475 mL
900061	Optimum results A fill solution for Calcium electrode, 5 x 60 mL
<b>Carbon Dioxide</b>	
950206	0.1 M $\text{NaHCO}_3$ Carbon Dioxide standard, 475 mL
950207	1000 ppm as $\text{CaCO}_3$ Carbon Dioxide standard, 475 mL
950210	Carbon Dioxide Ionic Strength Adjuster (ISA), 475 mL
950202	Carbon Dioxide electrode fill solution, 60 mL
<b>Chloride</b>	
941706	0.1 M NaCl Chloride standard, 475 mL
941708	1000 ppm Chloride standard, 475 mL
941707	100 ppm Chloride standard, 475 mL
940011	Chloride Ionic Strength Adjuster (ISA), 475 mL
941709	⚠ Chloride Complexation Ionic Strength Adjuster (CISA) reagent pack, 2 x 1 L
900062	Optimum results B fill solution for Chloride electrode, 5 x 60 mL
900017	Chloride electrode fill solution, 5 x 60 mL



### Chlorine, Residual

977007	100 ppm as $\text{Cl}_2$ Residual Chlorine standard, 475 mL
977011	⚠ Residual Chlorine acid reagent, 475 mL
977010	Residual Chlorine iodide reagent, 5 x 50 mL

### Cupric

942906	0.1 M $\text{Cu}(\text{NO}_3)_2$ Cupric standard, 475 mL
940011	Cupric Ionic Strength Adjuster (ISA), 475 mL
900063	Optimum results D fill solution for Cupric electrode, 5 x 60 mL

### Cyanide

951011	⚠ Cyanide alkaline reagent, 10 N NaOH, 475 mL
900062	Optimum results B fill solution for Cyanide electrode, 5 x 60 mL

### Fluoride

940906	0.1 M NaF Fluoride standard, 475 mL
940907	100 ppm Fluoride standard, 475 mL
040908	10 ppm Fluoride standard premixed with TISAB II, color coded blue, 475 mL
040907	2 ppm Fluoride standard premixed with TISAB II, color coded red, 475 mL
040906	1 ppm Fluoride standard premixed with TISAB II, color coded green, 475 mL
940916	Fluoride standard bulk pack – 4 x 475 mL each of 1 ppm Fluoride standard premixed with TISAB II (040906) and 10 ppm Fluoride standard premixed with TISAB II (040908)
940909	TISAB II for Fluoride ISE, 1 gallon
940999	TISAB II for Fluoride ISE, 4 x 1 gallon
940911	TISAB III (concentrated) for Fluoride ISE, 475 mL
900061	Optimum results A fill solution for Fluoride electrode, 5 x 60 mL

### Fluoroborate

930711	Fluoroborate Ionic Strength Adjuster (ISA), 475 mL
--------	--

### Iodide

945306	0.1 M NaI Iodide standard, 475 mL
940011	Iodide Ionic Strength Adjuster (ISA), 475 mL
900063	Optimum results D fill solution for Iodide electrode, 5 x 60 mL

### Lead

948206	0.1 M $\text{Pb}(\text{ClO}_4)_2$ Lead standard, 475 mL
900062	Optimum results B fill solution for Lead electrode, 5 x 60 mL

### Nitrate

920706	0.1 M $\text{NaNO}_3$ Nitrate standard, 475 mL
920707	1000 ppm Nitrate as Nitrogen (N) standard, 475 mL
930707	100 ppm Nitrate as Nitrogen (N) standard, 475 mL
930711	Nitrate Ionic Strength Adjuster (ISA), 475 mL
930710	Nitrate Interference Suppressor Solution (NISS), 475 mL
900046	Optimum results F fill solution for Nitrate electrode, 5 x 60 mL

Nitrate Test Kit	
<b>700005</b>	Nitrate test kit for Ammonia ISE – 2 x 50 mL electrode fill solution (951203), 2 x 475 mL alkaline reagent (951011), 475 mL 100 ppm Nitrate as Nitrogen (N) standard (930707), 475 mL 100 ppm Ammonia as Nitrogen (N) standard (951207), 475 mL reducing reagent (700006) and 2 pipets
<b>700006</b>	Nitrate test kit reducing reagent refill, 475 mL
<b>951203</b>	Nitrate test kit electrode fill solution, 50 mL
Nitrite	
<b>954606</b>	0.1 M NaNO <sub>2</sub> Nitrite standard, 475 mL
<b>934610</b>	Nitrite interference suppressor solution, 475 mL
<b>900046</b>	Optimum results F fill solution for Nitrite electrode, 5 x 60 mL
Nitrogen Oxide	
<b>954606</b>	0.1 M NaNO <sub>2</sub> Nitrogen Oxide standard, 475 mL
<b>956410</b>	Nitrogen Oxide acid buffer, 475 mL
<b>954602</b>	Nitrogen Oxide electrode fill solution, 50 mL
Perchlorate	
<b>930711</b>	Perchlorate Ionic Strength Adjuster (ISA), 475 mL
Potassium	
<b>921906</b>	0.1 M KCl Potassium standard, 475 mL
<b>931911</b>	Potassium Ionic Strength Adjuster (ISA), 475 mL
<b>900065</b>	Optimum results E fill solution for Potassium electrode, 5 x 60 mL
Silver	
<b>940011</b>	Silver Ionic Strength Adjuster (ISA), 475 mL
<b>900062</b>	Optimum results B fill solution for Silver/Sulfide electrode, 5 x 60 mL
<b>900067</b>	Optimum results C fill solution for Silver electrode (when sample temperatures vary), 5 x 60 mL
Sodium	
<b>941706</b>	0.1 M NaCl Sodium standard, 475 mL
<b>841108</b>	1000 ppm Sodium standard, 475 mL
<b>941107</b>	100 ppm Sodium standard, 475 mL
<b>941105</b>	10 ppm Sodium standard, 475 mL
<b>841111</b>	Sodium Ionic Strength Adjuster (ISA), 475 mL
<b>841113</b>	Sodium electrode reconditioning solution, 475 mL
<b>841101</b>	Sodium electrode storage solution, 475 mL
<b>650700</b>	Sodium KAP analysis kit – 3 x 475 mL of 1 M NaCl with ISA and 475 mL of Sodium ISA (841111)
<b>841109</b>	Sodium KAP standard, 1000 ppm with ISA, 475 mL
<b>900010</b>	Sodium electrode fill solution, 5 x 60 mL
<b>900012</b>	Sodium electrode (low level) fill solution, 5 x 60 mL
<b>900004</b>	Sodium micro electrode fill solution, 5 x 60 mL



Sulfate	
<b>948207</b>	0.1 M Na <sub>2</sub> SO <sub>4</sub> sulfate standard for lead electrode, 475 mL
Sulfide	
<b>941609</b>	Sulfide SAOB reagent pack, 4 x 475 mL
<b>900061</b>	Optimum results A fill solution for Sulfide electrode (when sample temperatures vary), 5 x 60 mL
<b>900062</b>	Optimum results B fill solution for Silver/Sulfide electrode, 5 x 60 mL
Surfactant	
<b>654202</b>	0.01 M SLS Surfactant standard, 1 x 60 mL
<b>654201</b>	0.05 M hyamine Surfactant titrant, 475 mL
<b>654205</b>	Non-ionic Surfactant titrant, 475 mL
<b>654203</b>	Surfactant sample additive, tritonX-100, 475 mL
<b>810007</b>	Surfactant electrode fill solution, 5 x 60 mL
Thiocyanate	
<b>940011</b>	Thiocyanate Ionic Strength Adjuster (ISA), 475 mL
Water Hardness	
<b>922006</b>	0.1 M CaCl <sub>2</sub> Water Hardness standard, 475 mL
<b>923206</b>	100 ppm as CaCO <sub>3</sub> Water Hardness standard, 475 mL



## ISE Accessories, Membranes and Modules

Cat. No.	Description
948201	Polishing strips for solid state electrodes
<b>Ammonia, High Performance (9512HPBNWP, 9512HP01)</b>	
951214	20 loose membranes
951215	3 pre-assembled bodies and membrane caps
<b>Ammonia, Standard (9512BNWP, 951201)</b>	
951204	20 loose membranes
951205	3 bonded membranes
<b>Carbon Dioxide (9502BNWP)</b>	
950204	4 membranes with o-rings
<b>Nitrogen Oxide (9546BN)</b>	
954604	20 loose membranes
950015	Spare electrode parts kit
<b>97 Series Plastic Membrane Calcium, Nitrate and Potassium Combination Electrode Accessories</b>	
9700BNWP	97 series electrode body with waterproof BNC connection
972001	Replacement module for calcium combination electrode (9720BNWP)
970701	Replacement module for nitrate combination electrode (9707BNWP)
971901	Replacement module for potassium combination electrode (9719BNWP)
<b>93 Series Plastic Membrane Ammonium, Calcium, Chloride, Fluoroborate, HF Resistant pH, Nitrate, Perchlorate, Potassium and Water Hardness Half-Cell Electrode Accessories</b>	
9300BNWP	93 series electrode body with waterproof BNC connection
930000	93 series electrode body with U.S. standard connection
9300SC	93 series electrode body with screw cap, separate cable required
900100	Single junction reference electrode with pin tip connection
900200	Double junction reference electrode with pin tip connection
931801	Replacement module for ammonium half-cell electrode
932001	Replacement module for calcium half-cell electrode (9320BN)
931701	Replacement module for chloride half-cell electrode
930501	Replacement module for fluoroborate half-cell electrode (9305BN)
930702	Replacement module for nitrate half-cell electrode (9307BNWP)
930701	Replacement modules (3) for nitrate half-cell electrode (9307BNWP)
938101	Replacement module for perchlorate half-cell electrode
930101	Replacement module for HF-resistant pH half-cell electrode
931901	Replacement module for potassium half-cell electrode (9319BN)
933201	Replacement module for water hardness half-cell electrode (9332BNWP)





## Thermo Scientific Orion Conductivity Cells

### Background/Theory

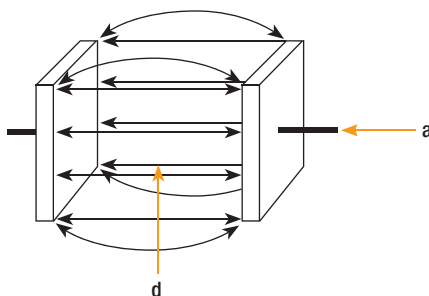
Electrical conductivity is an inherent property of most materials, and ranges from extremely conductive materials such as metals to non-conductive materials like plastic or glass. In between the two extremes are aqueous solutions, such as sea water and plating baths. In metals, the electrical current is carried by electrons while in water it is carried by charged ions. In both cases, the conductivity is determined by the number of charge carriers, how fast they move, and how much charge each one carries. Thus for most water solutions, the higher the concentration of dissolved salts, which will lead to more ions, the higher the conductivity. This effect continues until the solution gets too crowded, restricting the freedom of the ions to move and the conductivity may actually decrease with increasing concentration. This can result in two different concentrations of a salt having the same conductivity.

Conductance is defined as the reciprocal of resistance and is measured in Siemens (S), which was formerly referred to as mhos. Conductivity is an inherent property of any given solution and is derived from conductance by the geometry of the measuring cell. A measurement results in the conductance of the sample and it is converted to conductivity. This is done by measuring the cell constant (K) for each setup using a solution of known conductivity.

Cell conductance X Cell constant (K) = Conductivity

The Cell constant is related to the physical characteristics of the measuring cell. K is defined for 2 flat parallel measuring electrodes as the electrode separation distance (d) divided by the electrode area (a). In practice, the measured cell constant value is entered into the meter and the conversion from conductance to conductivity is done automatically.

$$K = d/A = 1 \text{ cm}^{-1}$$



### Temperature

Temperature can have a substantial effect on conductivity. Raising the temperature makes water less viscous, and the ions can move faster. Because the ions are of different sizes, and carry different amounts of water with them as they move, the temperature effect is different for each ion. Typically the conductivity varies by 1-3 % per degree C.

### Storage

Conductivity cells require minimal storage compared to other electrodes. They can be stored in deionized water in-between measurements. For storage overnight or longer, conductivity cells should be rinsed thoroughly in deionized water and stored dry.

### Maintenance

Conductivity cells should be cleaned periodically to maintain maximum performance. If they become contaminated they should be cleaned. Refer to user guides for specific instructions for different electrode materials.

Contaminant	Cleaning Solution
Water soluble contaminants	Deionized water
Lubricants and oils	Warm water and liquid detergent or ethanol or acetone
Lime or hydroxide	10 % acetic acid or 10 % hydrochloric acid

### Calibration

Cell constants at time of manufacture are listed on many conductivity cells. Calibration is essential since the cell constant can vary by 10 % or more from the nominal value and they do change over time. Once calibrated, they do not change quickly and do not require frequent calibration like a pH electrode. It is important to calibrate 25 °C or know the value of your calibration standard at different temperatures. Thermo Scientific Orion conductivity standards have tables for actual values at different temperatures.

### Benefits of Thermo Scientific Orion 2-Electrode Cells and 4-Electrode Cells

2-Electrode Cell Benefits	4-Electrode Cell Benefits
Available in glass, allows use in most samples	All have durable epoxy bodies
Best for ultra pure water measurements	No error from cable resistance, allowing for longer cable lengths
Multiple cell materials available, graphite, platinum or stainless steel	Minimum effect on accuracy from electrode polarization and contamination
Different cells designed to measure multiple specific ranges	Wide measurement range
Option for flow cell or flow-thru design	Unaffected by deposits on cell surface

# Thermo Scientific Orion Conductivity Cell Families

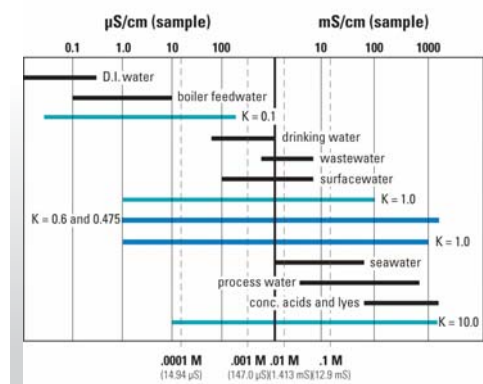
A wide range of conductivity cells are available for every application. These conductivity cells feature built-in temperature compensation; high, standard, and low conductivity measuring ranges; cell constants from 0.1 to 10 cm<sup>-1</sup> and a variety of probe materials including epoxy/graphite, glass/platinum, and stainless steel.

## DuraProbe™ 4-Electrode Conductivity Cells

DuraProbe 4-electrode cells provide the highest accuracy for demanding laboratory or field applications. The 4-electrode design compensates for electrode fouling, cable and connector resistance, polarization errors, and fringe field interference errors. The epoxy/graphite cell material is extremely durable and chemically resistant. DuraProbe conductivity cells are ideal for high and standard conductivity samples and difficult samples such as wastewater, runoff water, and mud.

## 2-Electrode Conductivity Cells

The 2-electrode cells are able to measure low, standard, and high conductivity samples, depending on the cell constant. Cells with a 0.1 cm<sup>-1</sup> cell constant are ideal for low ionic strength solutions, deionized water, and ultra pure water. Glass/platinum cells are the best for chemically reactive conductivity samples, since the cell material is highly chemical resistant.



## Cell Selection Sample Conductivity Range

### Rugged DuraProbe 4-electrode conductivity cell



013005MD<sup>A</sup>  
013010MD<sup>A</sup>  
013020MD<sup>A</sup>  
013025MD<sup>A</sup>  
013005A<sup>F</sup>  
013010A<sup>F</sup>  
013005D<sup>B</sup>

- Widest conductivity range
- For lab and field applications
- Rugged epoxy/graphite body
- Cable lengths from 1.5 to 10 meters

### Reliable DuraProbe 4-electrode conductivity cell



013605MD<sup>A</sup>  
013610MD<sup>A</sup>  
013610<sup>F</sup>

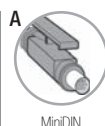
- Wide conductivity range
- For lab and field applications
- Rugged epoxy/graphite

### 2-electrode conductivity cell for ultra-pure water

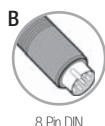


013016MD<sup>A</sup>  
013016A<sup>F</sup>  
013016D<sup>B</sup>

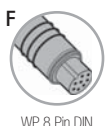
- Low conductivity range
- For ultra pure water applications
- Includes detachable glass flow cell



MiniDIN



8 Pin DIN



WP 8 Pin DIN



2.5 mm Phono Jack

## Key Information

**A** MiniDIN connector (Star) **B** 8 Pin DIN connector (A+ Series)







**F** 8 Pin Waterproof DIN connector (A Series)

**H** BNC and 2.5 mm Phono Jack connector (Russell)

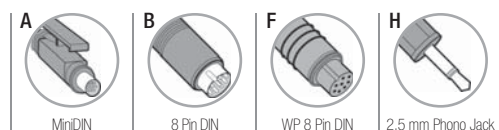
\*Conductivity cell does not have temperature compensation

\*\*3-Electrode Conductivity Cell

## Thermo Scientific Orion Conductivity Cell Families

Platinized 2-electrode conductivity cell	Chemical resistant 2-electrode conductivity cell	Precise 2-electrode conductivity cell	Rugged 2-electrode conductivity cell	High range 2-electrode conductivity cell	Chemical resistant 3-electrode conductivity cell
					
<b>011020<sup>B</sup></b> <b>011020A<sup>F</sup></b>	<b>011010<sup>B</sup></b> <b>011010A<sup>F</sup></b>	<b>011050MD<sup>A</sup></b> <b>011050<sup>B</sup></b>	<b>011510MD<sup>A</sup></b> <b>011510-WA<sup>B</sup></b>	<b>018020MD<sup>A *</sup></b>	<b>014005<sup>H **</sup></b>
<ul style="list-style-type: none"> <li>• Low conductivity range</li> <li>• For ultra pure water applications</li> <li>• Platinized glass/platinum</li> </ul>	<ul style="list-style-type: none"> <li>• Standard conductivity range</li> <li>• For lab applications</li> <li>• Chemical resistant glass body</li> </ul>	<ul style="list-style-type: none"> <li>• Standard conductivity range</li> <li>• For lab and field applications</li> <li>• Platinized epoxy/platinum</li> </ul>	<ul style="list-style-type: none"> <li>• Standard conductivity range</li> <li>• For lab and field applications</li> <li>• Rugged epoxy/graphite</li> </ul>	<ul style="list-style-type: none"> <li>• High conductivity range</li> <li>• For lab applications</li> <li>• Chemical resistant glass body</li> <li>• Flow through or dip cell</li> </ul>	<ul style="list-style-type: none"> <li>• Rugged epoxy/stainless steel</li> <li>• Removable guard</li> </ul>

See page 104 for a full offering of conductivity cell accessories



### Key Information

**A** MiniDIN connector (Star) **B** 8 Pin DIN connector (A+ Series)

**F** 8 Pin Waterproof DIN connector (A Series)

**H** BNC and 2.5 mm Phono Jack connector (Russell)

\*Conductivity cell does not have temperature compensation

\*\*3-Electrode Conductivity Cell

# Thermo Scientific Orion Conductivity Cell Selection Guide

## 4-Electrode Conductivity Cells

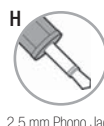
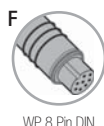
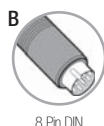
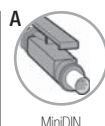
Cat. No.	Cable Length	Meter Compatibility	Measurement Range	Application	Approximate Cell Constant	Cell Material	Dimensions	Min/Max Immersion
013005MD <sup>A</sup>	1.5 m	Star Series	1 $\mu$ S/cm to 200 mS/cm	Lab and field	0.475 cm <sup>-1</sup>	Epoxy/graphite	Dia - 15 mm Length - 120 mm	35/NA mm
013010MD <sup>A</sup>	3 m							
013020MD <sup>A</sup>	6 m							
013025MD <sup>A</sup>	10 m							
013605MD <sup>A</sup>	1.5 m	Star Series	10 $\mu$ S/cm to 200 mS/cm	Lab and field	0.55 cm <sup>-1</sup>	Epoxy/graphite	Dia - 12 mm Length - 120 mm	35/NA mm
013610MD <sup>A</sup>	3 m							
013005A <sup>F</sup>	1.5 m	1230, 555A, 550A, 550, 162A, 162, 142, 136S, 135A, 131S, 130A, 128	1 $\mu$ S/cm to 200 mS/cm	Lab and field	0.475 cm <sup>-1</sup>	Epoxy/graphite	Dia - 15 mm Length - 120 mm	35/NA mm
013010A <sup>F</sup>	3 m							
013005D <sup>B</sup>	1.5 m	150 Aplus, 125 Aplus						
013610 <sup>F</sup>	3 m	555A, 550A, 162A, 136S, 135A, 131S, 130A	10 $\mu$ S/cm to 200 mS/cm	Lab and field	0.55 cm <sup>-1</sup>	Epoxy/graphite	Dia - 12 mm Length - 120 mm	35/NA mm

## 3-Electrode Conductivity Cells

Cat. No.	Cable Length	Meter Compatibility	Measurement Range	Application	Approximate Cell Constant	Cell Material	Dimensions	Min/Max Immersion
014005 <sup>H**</sup>	1 m	RL060C Russell	0 $\mu$ S/cm to 200 $\mu$ S/cm	Field	1.0 cm <sup>-1</sup>	Epoxy/steel	Dia - 13 mm Length - 120 mm	25/120 mm

## 2-Electrode Conductivity Cells

Cat. No.	Cable Length	Meter Compatibility	Measurement Range	Application	Approximate Cell Constant	Cell Material	Dimensions	Min/Max Immersion
013016MD <sup>A</sup>	1.5 m	Star Series	0.01 $\mu$ S/cm to 300 $\mu$ S/cm	Boiler feed water, ultra-pure water Includes flow cell	0.1 cm <sup>-1</sup>	Steel, V4A	Dia - 13 mm Length - 120 mm Flow cell volume - 8-12 mL	35/110 mm
013016A <sup>F</sup>	1 m	555A, 550A, 162A, 136S, 135A, 131S, 130A						
013016D <sup>B</sup>	1 m	150Aplus, 145Aplus, 125Aplus, 115Aplus, 105Aplus						
011510MD <sup>A</sup>	3 m	Star Series	10 $\mu$ S/cm to 200 mS/cm	Lab and Field	1.0 cm <sup>-1</sup>	Epoxy/graphite	Dia - 18 mm Length - 134 mm	35/NA mm
011510-WA <sup>B</sup>	3 m	150Aplus, 145Aplus, 125Aplus, 115Aplus, 105Aplus						
018020MD <sup>A</sup>	1.5 m	Star Series	10 $\mu$ S/cm to 2000 mS/cm	High electrolyte concentrations, acids, lyes, industrial process water, sea water	10 cm <sup>-1</sup>	Glass/platinum, platinized	Dia - 16 mm Length - 115 mm	55/110 mm
011050MD <sup>A</sup>	1.5 m	Star Series	1 $\mu$ S/cm to 20 mS/cm	Lab and Field	1.0 cm <sup>-1</sup>	Epoxy/platinum, platinized	Dia - 12 mm Length - 120 mm	20/90 mm
011050 <sup>B</sup>	1 m	150Aplus, 145Aplus, 125Aplus, 115Aplus, 05Aplus						
011020 <sup>B</sup>	1 m	150Aplus, 145Aplus, 125Aplus, 115Aplus, 05Aplus	0.1 $\mu$ S/cm to 100 $\mu$ S/cm	Boiler feed water, ultra-pure water	0.1 cm <sup>-1</sup>	Glass/platinum, platinized	Tip dia - 17 mm Tip length - 22 mm Dia - 13 mm Length - 120 mm	25/120 mm
011020A <sup>F</sup>	1 m	555A, 550A, 162A, 136S, 135A, 131S, 130A						
011010 <sup>B</sup>	1 m	150Aplus, 145Aplus, 125Aplus, 115Aplus, 05Aplus	1 $\mu$ S/cm to 200 mS/cm	Lab	1.0 cm <sup>-1</sup>	Glass/platinum, platinized	Dia - 13 mm Length - 120 mm	25/120 mm
011010A <sup>F</sup>	1 m	555A, 550A, 162A, 136S, 135A, 131S, 130A						



### Key Information

**A** MiniDIN connector (Star) **B** 8 Pin DIN connector (A+ Series)

**F** 8 Pin Waterproof DIN connector (A Series)

**H** BNC and 2.5 mm Phono Jack connector (Russell)

\*Conductivity cell does not have temperature compensation

\*\*3-Electrode Conductivity Cell

## Thermo Scientific Orion Conductivity Standards and Accessories



Cat. No.	Description
011008	100 $\mu$ S/cm conductivity/TDS standard, 5 x 60 mL
01100910	147 $\mu$ S/cm conductivity standard, 10 pouches
011007	1413 $\mu$ S/cm conductivity/TDS standard, 5 x 60 mL
01100710	1413 $\mu$ S/cm conductivity/TDS standard, 10 pouches
011006	12.9 mS/cm conductivity/TDS standard, 5 x 60 mL
01100610	12.9 mS/cm conductivity/TDS standard, 10 pouches
011005	111.9 mS/cm conductivity standard, 5 x 60 mL
01100510	111.9 mS/cm conductivity standard, 10 pouches
990106	0.1 M KCl conductivity standard, 475 mL
011001	Conditioning solution for 011050, 011050A, and 011050MD conductivity cells
1010001	Conductivity calibration resistor kit for Orion Star and Orion Star A Series conductivity meters, MiniDIN
013017	Replacement flow cell for 013016A, 013016D, and 013016MD
080045	Stainless steel and plastic protective probe guard (for 013005MD, 013010MD, 013025MD, 013005A, 013010A, 013030A, 013060A, 013005D, 013010D)
081045	Plastic protective probe guard (for 013005MD, 013010MD, 013025MD, 013005A, 013010A, 013030A, 013060A, 013005D, 013010D)
090044	5 electrode holder (4 X 12 mm and 1 X 15 mm) to be used with 090043 electrode swing arm and 15 mm conductivity cells







## Thermo Scientific Orion Dissolved Oxygen Probes

### Dissolved Oxygen Background

Dissolved oxygen is often referred to as DO. It is a measure of the amount of oxygen in a solution. While some gases react chemically with water to form new compounds, gases like nitrogen and oxygen dissolve in water, without a chemical reaction and exist as microscopic bubbles between water molecules.

Air has a constant percentage of oxygen, approximately 20.9 %. When air comes in contact with water, the oxygen in air will dissolve in the water. There are a number of factors that determines how much oxygen dissolves in water:

- Is there sufficient time and adequate mixing to fully saturate the water
- Are substances present in the water that consume the oxygen
- **Water Temperature:** The solubility of oxygen reduces as temperature increases. Therefore the colder the water, the more dissolved oxygen it contains
- **Air Pressure:** As atmospheric pressure decreases with altitude, the amount of dissolved oxygen in water decreases
- **Salt Content:** The amount of dissolved oxygen increases as salinity decreases. Therefore freshwater holds more oxygen than saltwater

Membrane electrodes have been used for a many years to measure DO in water but optical DO probes are becoming more widely used as they offer a number of benefits to the user.

### BOD Background

BOD (Biochemical Oxygen Demand) analysis is typically performed in wastewater plants. This analysis determines the amount of oxygen that microorganisms consume from water when they break down organic matter. The results of this analysis calculate the degree of water pollution and effectiveness of water treatment at wastewater or sewage plants. Properly treated wastewater will have a greatly reduced BOD value when being discharged from a treatment facility compared to when entering.

### Calibration

Calibration of polarographic or RDO optical DO probes can quickly and easily be performed using the water-saturated air method. DO probes are placed in a moist calibration sleeve. Under equilibrium, the partial pressure of oxygen in air-saturated water is equal to the partial pressure of oxygen in water-saturated air. Therefore, a DO probe calibrated in water-saturated air will read the partial pressure of oxygen in water samples. For low concentration samples, a second calibration with a zero standard is recommended.

### Storage

For storage of dissolved oxygen probes, they should be kept in a moist calibration sleeve. Polarographic probes should remain connected to the meter or it will need to be polarized again. For long term storage of polarographic probes, they should be disconnected from the meter, with the membrane cap removed and the sensor rinsed and kept dry.

Thermo Scientific Orion DO probes have calibration sleeves that can be used to protect the electrode between measurements as well as to perform calibrations. Protective guards are also available that will help protect the probe during field use and add weight to the probe to help submerge it when required.

### RDO vs. Polarographic

Polarographic DO probes are often referred to as the Clark cell after it's founder, Dr. Clark, and have been around for over 50 years. Polarographic probes require a voltage to operate from an external source such as your meter and require a polarization period before use. Optical dissolved oxygen is a newer method with some advantages over polarographic probes. There are a number of differences between the 2 measurements and you should evaluate your requirements when choosing which technology to use.

### Differences Between Thermo Scientific Orion Polarographic DO and Optical DO

	Polarographic Probe	Optical Probe
<b>Maintenance</b>	Replace electrolyte and polish cathode ~ every 2 months. Clean probe as needed	Clean, probe, cap and optical window as needed
<b>Storage</b>	In moist calibration sleeve, long term, remove membrane cap and store dry	In moist calibration sleeve
<b>Membrane</b>	Change as needed, ~ every 2 months	Must be replaced every 365 days – do not use with solutions that contain organic solvents
<b>Electrolyte</b>	Change as needed, ~ every 2 months	None required
<b>Warm-Time Required</b>	Required if just connected to meter (30-60 minutes)	None required
<b>Stirring</b>	Required	Not necessary
<b>Interferences</b>	Ozone, sulfides, sulfur dioxide, nitrous oxide and carbon monoxide	Alcohols greater than 5 %, hydrogen peroxide greater than 3 %, sodium hypochlorite greater than 3 %, gaseous sulfur dioxide and gaseous chlorine



## Thermo Scientific Orion RDO Optical Dissolved Oxygen Probes

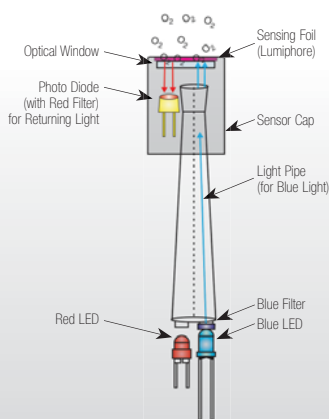
RDO technology meets the requirements of ASTM D888-05 Method C  
Measuring dissolved oxygen with a luminescence-based sensor

**Optical dissolved oxygen is a new technology with many advantages that is rapidly gaining acceptance.**

The Thermo Scientific Orion RDO® probe provides reliable measurements, no warm up time, no stirring, no maintenance (membranes or solution), no thermal shock and less interferences. The sensor cap requires easy annual replacement. The optical sensor cap is durable, able to withstand harsh environments without degradation or effect on performance. The cap has minimal hydration effects and is not prone to photo bleaching. Calibration information is stored in the sensor cap enhancing the ease of use.

All Thermo Scientific RDO probes come with a stainless steel guard and calibration sleeve and are intended for field use.

### Optical Sensor/Luminescence-Based Dissolved Oxygen Sensor



**Optical Probe/Luminescence-based Dissolved Oxygen (LDO) – Newest technology that monitors time to quench an excited lumiphore, which is inversely proportional to the concentration of oxygen**

**Rugged, low maintenance field probe**



**No membranes to change  
Sensor cap replaced annually**

Cat. No.	087010MD	087020MD	087030MD	087050MD	087100MD
Description	Rugged dissolved oxygen probe with 3 meter cable	Rugged dissolved oxygen probe with 6 meter cable	Rugged dissolved oxygen probe with 10 meter cable	Rugged dissolved oxygen probe with 15 meter cable	Rugged dissolved oxygen probe with 30 meter cable
Accuracy	±0.1 mg/L from 0 to 8 mg/mL and ±0.2 mg/L from 8 to 20 mg/mL				
Response Time	T90, 30 seconds and T95, 60 seconds				
Operating Range	0 to 20 mg/L and 0 to 200 %				
Temperature Range	0 to 50 °C				

Cat. No.	Recommended Accessories
087001	Replacement RDO sensor cap
087002	Stainless steel protective guard, for RDO probe
087003	Calibration sleeve for RDO probe

For connector type information, refer to the RDO meter section to determine the correct meter for your application.



## Thermo Scientific Orion Dissolved Oxygen Probe Families

A complete line of polarographic dissolved oxygen probes are available for BOD (Biochemical Oxygen Demand) analysis, beer and wine testing, rugged field applications, and water and wastewater analysis. All DO probes feature automatic temperature compensation and convenient screw on membrane caps that reduce probe servicing time and eliminate assembly problems.

The AUTO-STIR probe fits directly into a standard BOD bottle and has a built-in stirrer. This probe offers convenience, quick response, and long life between servicing.

See page 110 for a complete offering of accessories.

**Durable and accurate DO probes for the lab or field**



**083005MD<sup>A</sup>**  
**083010MD<sup>A</sup>**  
**083025MD<sup>A</sup>**  
**083060MD<sup>A</sup>**

- For lab and field applications
- Cable lengths from 1.5 to 20 meters

**AUTO-STIR™ probe for BOD applications**



**086030MD<sup>A, C</sup>**  
**086020A<sup>G</sup>**

- For lab applications
- Self-stirring with one-touch control

**Reliable DO probes for the lab or field**



**081010MD<sup>A</sup>**

- For lab and field applications
- Rugged epoxy body

**Rugged DO probes plus probe guard**



**080510MD<sup>A</sup>**

- For field applications
- Includes probe guard

**Convert any pH meter into a DO meter**



**970899WP<sup>1</sup>**

- For lab applications
- Works on pH meters with BNC



BNC Waterproof



MiniDIN



3.5 mm Phono  
Tip Stirrer Jack



13 Pin DIN

### Key Information

**1** BNC Waterproof Connector

**A** MiniDIN Connector

**C** 3.5 mm Phono Tip Stirrer Jack Connector

**G** 13 Pin DIN Connector

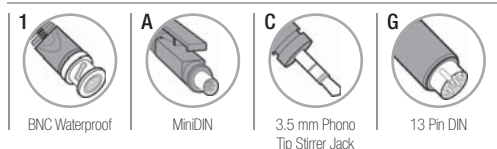
## Thermo Scientific Orion Dissolved Oxygen Probe Selection Guide

### Polarographic Dissolved Oxygen Probes

Cat. No.	Cable Length	Meter Compatibility	Application	Response Time	Minimum Sample Flow	Oxygen Consumption	Maximum Allowed Overpressure	Sample Temperature
083005MD <sup>A</sup>	1.5 m	Star series	Laboratory / field	90 % of final value in 10 seconds; 95 % of final value in 15 seconds; 99 % of final value in 60 seconds	10 cm/sec	0.008 µg/h (mg/L) <sup>-1</sup> at 20 °C	6 BAR	0 to 50 °C
083010MD <sup>A</sup>	3 m	Star series						
083025MD <sup>A</sup>	10 m	Star series						
083060MD <sup>A</sup>	20 m	Star series						
086020A <sup>B</sup>	2 m	862A	Laboratory	90 % of final value in 10 seconds; 95 % of final value in 15 seconds; 99 % of final value in 60 seconds	10 cm/sec	0.008 µg/h (mg/L) <sup>-1</sup> at 20 °C	6 BAR	0 to 50 °C
086030MD <sup>A,C</sup>	2 m	Star series, benchtop models						
081010MD <sup>A</sup>	3 m	Star Series	Laboratory / field	90 % of final value in 10 seconds; 95 % of final value in 16 seconds; 99 % of final value in 60 seconds	20 cm/sec	–	–	0 to 50 °C
080510MD <sup>A</sup>	3 m	Star Series	Field	90 % of final value in 10 seconds; 95 % of final value in 18 seconds; 99 % of final value in 60 seconds	10 cm/sec	0.008 µg/h (mg/L) <sup>-1</sup> at 20 °C	10 BAR	0 to 50 °C
970899WP <sup>†</sup>	1 m	pH meters with BNC connector	Laboratory	96 % response in less than 30 seconds between oxygen-free and air saturated water at 22 °C	–	0.1 mg/hr	–	0 to 45 °C

\*Accuracy – ±0.05 ppm or 2 % of reading, whichever is greater

Battery Life – One year based on 4 hours/day operation





Temperature Sensor	Drift	Electrolyte lifetime	Storage Temperature	Membrane Cap and Solution	Maintenance Kit
Dual, thermally separated	Approximately 0.1 % per day	180 days	-5 to 50 °C	Membrane cap - 080515 Solution - 080514	080513
Dual, thermally separated	Approximately 0.1 % per day	180 days	-5 to 50 °C	Membrane cap - 080515 Solution - 080514	080513
Single thermally separated	< 1 % per day	180 days	-5 to 50 °C	Membrane cap - 081003 Solution - 080514	080113
Dual, thermally separated (080510MD has a single temperature sensor)	Approximately 0.1 % per day	180 days	-5 to 50 °C	Membrane cap for 080510MD - 081003 Membrane cap for 081010F & 083010F - 080515 Solution - 080514	Kit for 080510MD - 080113  Kit for 081010F & 083010F - 080513
Dual, thermally separated	—	—	—	Pre-filled membrane cap - 970801	—



#### Key Information

**1** BNC Waterproof Connector

**A** MiniDIN Connector

**C** 3.5 mm Phono Tip Stirrer Jack Connector

**G** 13 Pin DIN Connector



## Polarographic Dissolved Oxygen Solutions and Accessories

Cat. No.	Description
<b>087001</b>	Replacement RDO optical cap
<b>087002</b>	Stainless steel protective probe guard for RDO probes
<b>087003</b>	Calibration sleeve for RDO probes
<b>080513</b>	Maintenance kit, includes electrolyte solution, polishing disk and 2 membrane caps for 083005MD, 083010MD, 083025MD, 083060MD, 086030MD, 083005A, 083010A, 083005D, 086020A, 081010F
<b>080113</b>	Maintenance kit, includes electrolyte solution, polishing disk and 2 membrane caps for 080510MD, 081010MD, 081010
<b>080515</b>	1 membrane cap for 083005MD, 083010MD, 083025MD, 083060MD, 086030MD, 083005A, 083010A, 083005D, 086020A, 081010F
<b>081003</b>	3 membrane caps for 080510MD, 081010MD, 081010
<b>970801</b>	1 pre-filled membrane cap for 970899WP, 970800
<b>080514</b>	Polarographic electrolyte solution for 083005MD, 083010MD, 083025MD, 083060MD, 086030MD, 083005A, 083010A, 083005D, 086020A, 081010F, 080510MD, 081010MD, 081010
<b>080017</b>	Calibration sleeve for all DO probes excluding AUTO-STIR probes and RDO probe
<b>086021A</b>	Calibration chamber/stand for 086020A, 086030MD AUTO-STIR probes
<b>080360</b>	BOD adapter for 083005MD, 083010MD, 083025MD, 083060MD, 083005A, 083010A, 083005D
<b>080160</b>	BOD adapter for 081010MD, 081010
<b>970802</b>	BOD stir funnel for 970899WP, 970800
<b>970803</b>	2 batteries for 970899WP, 970800
<b>080045</b>	Stainless steel and plastic protective probe guard for 080510MD, 083005MD, 083010MD, 083025MD, 083060MD, 083005A, 083005D, 083010A
<b>081045</b>	Plastic protective probe guard for 080510MD, 083005MD, 083010MD, 083025MD, 083060MD, 083005A, 083005D, 083010A



## Colorimetry, Turbidity and UV-Vis Spectrophotometry – The Optical Measurements

Colorimeters and Turbidity meters both employ optical measurements. Optical measurements use light to quantify the amount of a colored or cloudy sample. Colorimeters are used to measure the concentration of a sample component. Turbidity meters can determine how cloudy the sample is and report a number value for the turbidity.

Colorimetric measurements use a small light source to pass a narrow band of light straight through a reacted test sample in a vial. The light beam exiting the sample vial is collected in a detector at 180 degrees from the initial beam. The detector reading that was measured is converted to a concentration for that specific test. Some single parameter colorimeters have only one measurement performed. Multi-parameter meters require the user to select the appropriate method number to match the test and reagent type being used.

These tests allow you to expand your testing capabilities for species that are not detectable by pH, DO, Conductivity and Ion Selective Electrode (ISE) electrochemical methods. Colorimeters require the use of a reagent in most cases. The reagent will react with the targeted component of the sample. The user can then measure the reacted sample in their colorimeter to determine the concentration of the component in that sample. The sample result is compared to a programmed calibration curve in the meter of reacted, known standard values. The colorimeter measurement can be seen on the display.

Globally, there are many regulations that are in place to ensure our drinking water is safe to drink and our wastewater will not alter or destroy our local ecosystems and oceans. Regulations vary due to the sample components in the area. A disinfectant, used to purify water, is commonly tested by colorimetry. In groundwater that is the source of a drinking water supply, there could be underground iron deposits creating a tint of color to the water. The water may be checked for iron level and also the chemical form of that iron. Water components present that increase maintenance frequency may also be tested regularly to monitor and maximize time online.

Many test reagents are available for measuring parameters that are reported as required on regulatory compliance permits.

Turbidity is a measurement of “cloudiness” or particulates floating in the sample. The more particles present, the higher the sample’s turbidity. Low turbidity sample particles can often not be seen. An instrument is needed to quantify the turbidity present. Turbidity meters require standards to calibrate the meter periodically and to check the calibration by a read-back of the standards. Orion AQ4500 Method is approved for Drinking Water and Wastewater reporting and also satisfies the ISO 7027 measurement reporting with our ISO Nephelometric mode.





## Accurate Results, Within Your Reach

We've got you covered

It's been said that anything worth doing is worth doing right. At Thermo Fisher Scientific we combine intelligent design with quality craftsmanship to give you the tools you need for effective water analysis, whether in the lab or in the field. In essence, we do our job right, so you can do the same.

Recognized worldwide, our water analysis instruments combine accuracy and precision with intuitive operation, dependability and ease of use. Our products are backed by substantial research and development, built with an unmatched standard of excellence.

### Spectrophotometers – Lab Intelligence

A good lab depends on expert equipment.

Thermo Scientific™ Orion™ AquaMate™ Spectrophotometers are the ideal instrument for water and wastewater analysis laboratories, combining innovative technology, compact design and accurate results.

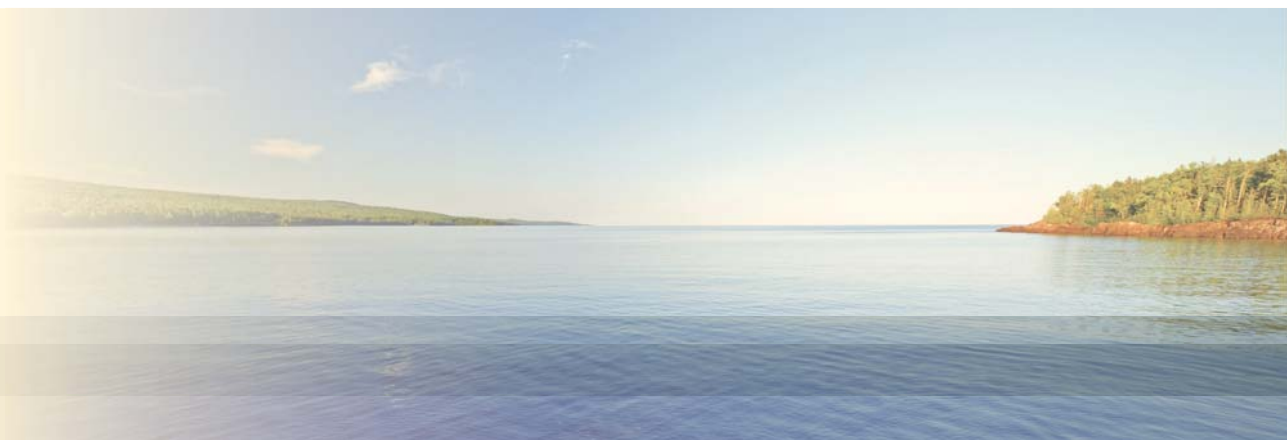
- Spectrophotometers that meet your requirements – choose the AquaMate 8000 UV-Vis or AquaMate 7000 Vis
- Simple and efficient sample analysis using over 260 preprogrammed methods for common reagent chemistries
- One-point calibration adjustment feature ensures the highest accuracy from preprogrammed methods
- User customizable methods for absorbance, % transmittance and concentration testing
- Performance verification tests ensure wavelength accuracy and instrument functionality

### Colorimeters / Turbidity Meters – Fieldwork Essentials

Portable design with uncompromised performances.

Thermo Scientific Orion Colorimeters and Turbidity Meters are accurate, dependable and easy to use, with handheld portability, preprogrammed methods, optimum wavelengths, user-friendly displays, and easy calibration.

- Rugged, handheld portability and waterproof options for fieldwork convenience
- User-friendly interface for quick and easy results processing
- Compatibility with several tests and reagent types
- Approvals and regulatory requirements met in many industries



### Orion AquaMate 7000 Vis Spectrophotometer

The cost-effective solution for accurate, visible-only measurements

The AquaMate 7000 Vis Spectrophotometer offers 325 to 1100 nm selectable wavelengths and 5 nm spectral bandwidth and is ideal for most routine concentration measurements. For its relatively small footprint and lightweight design, it boasts numerous features at a competitive price. The intuitive user interface and simple, single-beam optical geometry generate accurate results.

### Orion AquaMate 8000 UV-Vis Spectrophotometer

The ideal instrument for extensive, full wavelength measurement options

The AquaMate 8000 UV-Vis Spectrophotometer offers 190 to 1100 nm selectable wavelengths and 1.8 nm spectral bandwidth and delivers unsurpassed data quality throughout the entire UV to near-IR region of the spectrum. A dual-beam optical geometry and high-intensity, instant-on xenon lamp are utilized for accurate measurements and up to seven years of maintenance-free operation. Superior signal-to-noise performance and fast wavelength scanning technology allow high-quality spectral data to be acquired quickly and reliably.

### Thermo Scientific offers a full line of Orion Colorimetry and Turbidity Meters

Using optical measurement, Colorimeters measure the concentration of a sample component and Turbidity Meters determine how cloudy a sample is.

Regulations ensure our drinking water is safe and our wastewater will not alter or destroy local ecosystems and oceans. Disinfectants, used to purify water, are commonly tested by colorimetry. Groundwater that is the source of a drinking water supply may be checked for iron level and the chemical form of that iron. Water components that increase maintenance frequency may be tested regularly to monitor and maximize time online. Many test reagents are available for measuring parameters that are reported as required on regulatory compliance permits.



AquaMate 7000



AquaMate 8000



AQ3700 Meter



AQ3070 Meter



AQ4000 Meter





## Thermo Scientific Orion AquaMate Spectrophotometers

### AquaMate 7000 & 8000 Meters

Orion AquaMate Spectrophotometers include over 260 preprogrammed methods for easy and convenient measurements using Orion AQUAfast reagent chemistries or chemistries from other key reagent manufacturers. Methods are stored on the USB memory stick, so they can be added or removed from the instrument as needed. The 3-position holder allows flexibility in vial sizes with an adjustable holder for 13 to 25 mm round vials, a holder for 20 or 50 mm rectangular vials and a holder for 10 mm square vials. AquaMate Spectrophotometers also utilize performance verification tests to ensure wavelength accuracy and instrument functionality.

#### AquaMate 7000 Vis Spectrophotometer

- Selectable wavelengths in the visible range of 325 to 1100 nm
- Single-beam optics and Tungsten-halogen lamp
- 5.0 nm spectral bandwidth, ideal for most routine concentration measurements
- Simple operation, expanded functionality and great value
- 1 year warranty

#### AquaMate 8000 UV-Vis Spectrophotometer

- Selectable wavelengths in the UV and visible range of 190 to 1100 nm
- Dual-beam optics utilizing a Xenon Flash lamp for an average of five years of maintenance-free performance
- 1.8 nm spectral bandwidth for optimal resolution
- Enhanced wavelength scanning technology that acquires high-quality spectral data at speeds up to 4,200 nm per minute
- 1 year warranty

Depending on the needs of your lab, choose the AquaMate 7000 Vis Spectrophotometer for 325 to 1100 nm wavelengths or choose the AquaMate 8000 UV-Vis with full 190 to 1100 nm wavelengths for a greater range of measurement options.

Use your current chemistry reagents – no need to change. The AquaMate preprogrammed methods are compatible with many leading reagent manufacturers.







## Specifications

Specifications		AquaMate 8000 UV-Vis Spectrophotometer	AquaMate 7000 Vis Spectrophotometer
<b>Optical Design</b>		Dual beam – internal reference detector	Single beam
<b>Spectral Bandwidth</b>		1.8 nm	5.0 nm
<b>Light Source (Typical Lifetime)</b>		Xenon flash lamp (5 years)	Tungsten-halogen lamp (1000 hours)
<b>Detector</b>		Dual silicon photodiodes	Silicon photodiode
<b>Wavelength</b>	<b>Range</b>	190 to 1100 nm	325 to 1100 nm
	<b>Accuracy</b>	±1.0 nm	±1.0 nm
	<b>Repeatability</b>	±0.5 nm	±0.5 nm
	<b>Slew Speed</b>	11,000 nm/min	11,000 nm/min
	<b>Scanning Speed</b>	10 to 4,200 nm/min	10 to 4,200 nm/min
	<b>Data Interval</b>	0.2, 0.5, 1.0, 2.0, 3.0, 5.0 nm	1.0, 2.0, 3.0, 5.0 nm
<b>Photometric</b>	<b>Measurement Modes</b>	Absorbance, % transmittance, concentration	Absorbance, % transmittance, concentration
	<b>Range</b>	-0.5 to 5.0 A ; -1.5 to 125 %T ; ±9999 C	-0.1 to 3.0 A ; -0.3 to 125 %T ; ±9999 C
	<b>Linearity</b>	Up to 3.5 A at 260 nm	Up to 3.0 A at 340 nm
	<b>Accuracy</b>	±0.005 A at 1.0 A, <0.00025 at 0.0 A	0.5 % or ±0.005 A, whichever is greater up to 2 A
	<b>Noise</b>	<0.00050 at 1.0 A, <0.00080 at 2.0 A RMS at 260 nm	<0.001 A at 0.0 A, <0.002 A at 2.0 A Peak-to peak at 340 nm
	<b>Drift</b>	<0.0005 A/hr	0.002 A/hr after warm-up
<b>Stray Light</b>		<0.08 %T at 220 nm and 340 nm, <0.1 %T at 340 nm and 400 nm, <1.0 %T at 198 nm	<0.08 %T at 220 nm and 340 nm, <0.1 %T at 340 nm and 400 nm, <1.0 %T at 198 nm
<b>Display</b>		Graphical with LCD backlight – 9.7 x 7.1 cm (3.8 x 2.8 in)	Graphical with LCD backlight – 9.7 x 7.1 cm (3.8 x 2.8 in)
<b>Keypad</b>		Sealed membrane with tactile response keys	Sealed membrane with tactile response keys
<b>Connectivity</b>		USB type A port for USB stick (front panel), USB type B port for computer (rear panel), USB type A port for printer (rear panel)	USB type A port for USB stick (front panel), USB type B port for computer (rear panel), USB type A port for printer (rear panel)
<b>Dimensions</b>		30 W x 40 D x 25 H cm (11.8 x 15.7 x 9.8 in)	30 W x 40 D x 25 H cm (11.8 x 15.7 x 9.8 in)
<b>Weight</b>		8.6 kg (19 lb.)	8.6 kg (19 lb.)
<b>Power Requirements</b>		100 to 240 V ; 50 to 60 Hz	100 to 240 V ; 50 to 60 Hz

## Ordering Information

Cat. No.	Description
<b>AQ8000</b>	AquaMate 8000 UV-Vis Spectrophotometer, includes methods on USB memory stick, 6-position vial holder turret, 3-position vial holder turret, 1-position vial holder turret, user documentation, dust cover, USB cable, and 110 V, 220 V, 240 V power cords
<b>AQ7000</b>	AquaMate 7000 Vis Spectrophotometer, includes methods on USB memory stick, 3-position vial holder turret, user documentation, dust cover, USB cable, and 110 V, 220 V, 240 V power cords
<b>AQ006C</b>	AquaMate 6-position vial holder turret for six 10 mm square vials
<b>AQ003C</b>	AquaMate 3-position vial holder turret for one adjustable 13-25 mm round vial, one adjustable 20-50 mm rectangular vial and one 10 mm square vial
<b>AQ001C</b>	AquaMate 1-position vial holder turret for one 10 mm square vial
<b>AQ0USB</b>	AquaMate methods, USB memory stick
<b>AQCHNV</b>	AquaMate power cord, China, Australia, New Zealand plug
<b>AQ240V</b>	AquaMate power cord, 240 V UK, Singapore plug
<b>AQ220V</b>	AquaMate power cord, 220 V Euro plug
<b>AQ110V</b>	AquaMate power cord, 110 V US, Japan plug
<b>AC2V24</b>	24 mm round vials, 12 pack

**Note:** When ordering the AQ8000 or AQ7000 instruments, the AQCHNV power cord needs to be ordered separately.

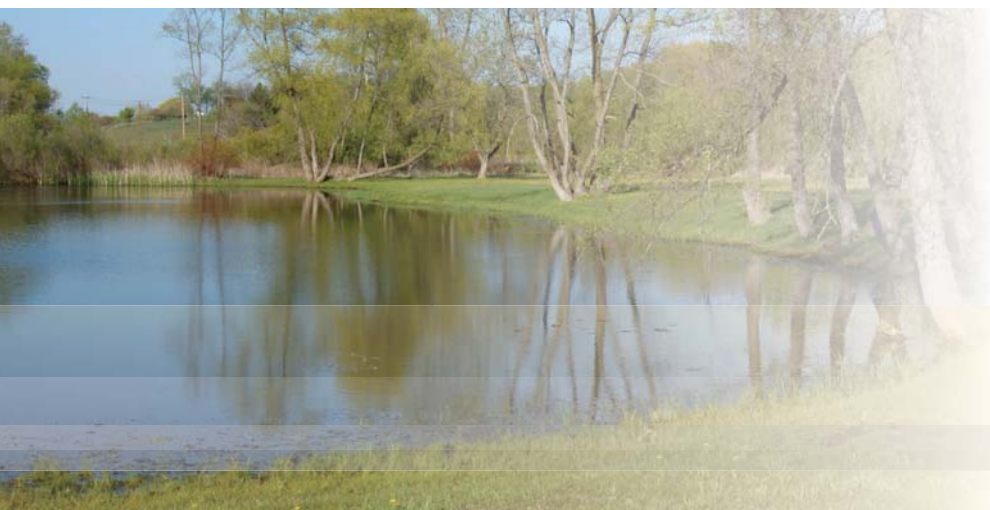
## Thermo Scientific Orion Colorimetry and Turbidity Markets

You can find colorimetry and turbidity measurements in a wide variety of industries. The tests are quick and easy and often cost less than alternative methods. Thermo Scientific Orion colorimetry and turbidity products have approvals and meet the regulatory requirements in many industries. We also have several types of tests for common parameters to give you choices of reagent types, ranges and simplicity to fit your requirements. The reagent table on pages 124 and 125 highlights our EPA approved, accepted and equivalent methods.

Commonly Tested Parameters by Market

Agriculture	Beverage	Drinking Water	Environmental	Wastewater	Aquaculture	Boiler/Cooling Water	Chemical
Ammonia	Bromine	Aluminum	Ammonia	Aluminum	Ammonia	Aluminum	Aluminum
Chlorine	Chlorine	Ammonia	Bromine	Ammonia	Bromine	Ammonia	Ammonia
Iron	Chlorine Dioxide	Bromine	Chlorine	Bromine	Chlorine	Bromine	Copper
Nitrate	Copper	Chloride	COD	Chlorine	Copper	Chlorine	Iron
Nitrite	Fluoride	Chlorine	Copper	COD	Nitrate	Chlorine dioxide	Nitrate
Oxygen	Iron	Chlorine Dioxide	Iron	Copper	Nitrite	Copper	Nitrite
pH	Manganese	Copper	Nitrate	Iron	Oxygen	Hydrazine	pH
Phosphate	Nitrate	Fluoride	Nitrite	Manganese	Ozone	Iron	Phosphate
Silica	Oxygen	Iron	Ozone	Nitrate	pH	Nitrate	Silica
Sulfate	pH	Manganese	pH	Nitrite	Phosphate	Nitrite	Sulfate
Turbidity	Phosphate	Nitrate	Silica	Oxygen	Turbidity	Ozone	Sulfide
	Silica	Nitrite	Sulfate	Ozone		Oxygen	Zinc
	Turbidity	pH	Sulfide	pH		Phosphate	
		Phosphate	Zinc	Phosphate		pH	
		Ozone		Sulfate		Silica	
		Silica		Sulfide		Zinc	
		Sulfate		Zinc			
		Sulfide		Turbidity			
		Zinc					
		Turbidity					

Metal Plating	Mining	Pulp & Paper	Solid Waste/Sludge	Petroleum	Pharmaceutical/Biotech	Semi-conductor
Copper	Copper	Aluminum	Aluminum	Ammonia	Chlorine	Aluminum
Iron	Cyanide	Chlorine	Copper	Chlorine	Cyanide	Copper
pH	Iron	Chlorine dioxide	Nitrate	Iron	Ozone	Fluoride
Phosphate	pH	pH	Nitrite	Nitrate	pH	pH
	Phosphate	Phosphate	pH	pH	Silica	Silica
	Zinc	Silica	Phosphate	Sulfide		
		Zinc	Zinc			





## Thermo Scientific Orion AQ3700 Colorimeter

Featuring digestion tests for nitrogen, phosphate and COD



The Orion AQ3700 is the newest addition to the colorimetry line. With over 70 pre-programmed method options, this IP67 waterproof portable meter offers liquid, powder and tablet tests for expanded ranges and test options. There are six wavelengths generated by the long life LEDs in the meter. This instrument has a graphical display that is easy to understand and can be used in English, Spanish, German, French, Italian, or Polish.

See pages 122-125 for additional AQ3700 reagents.

### Specifications

Specifications	Description
<b>Incident Light Source</b>	6 light emitting diodes (LED)
<b>Wavelengths</b>	430, 530, 560, 580, 610, 660 nm
<b>Photometric Precision</b>	2 % full scale as measured with standard solutions
<b>Photometric Resolution</b>	±0.005 Abs
<b>Software</b>	
<b>Test Methods</b>	Preprogrammed with user prompts and feedback, efficient user's favorite list
<b>Autoranging</b>	Yes
<b>Blank Capability</b>	Per method
<b>Test Reagent Formats</b>	Powder, tablet, liquid, reagent reaction tubes, acid digestion tubes
<b>Datalog Points</b>	Up to 1000, time and date stamp
<b>New Method Upload Capability</b>	Yes, via internal RJ45 port
<b>Meter Hardware</b>	
<b>Display</b>	Backlit, graphic display
<b>Inputs</b>	12 button numeric keypad, plus 3 function keys
<b>Sample Required</b>	10 mL
<b>Sample Cells Accepted</b>	24 mm sample vials; 13 mm ampoules and 16 mm tubes with included adapters
<b>Outputs</b>	IRDA (adapter required)
<b>Auto Shut Down</b>	20 min after last key-press, wakes to last location
<b>Power</b>	4 AA batteries (>3000 tests)
<b>Regulatory and Safety</b>	CE, FCC part 15
<b>Environmental Conditions</b>	5 to 40 °C (30 to 90 % non-condensing at 30 °C)
<b>Meter Waterproof Rating</b>	IP67
<b>Warranty</b>	2 years

### New Reagents for AQ3700

Cat. No.	New Test	Range, mg/L	Reagent Type
AC2002	Alkalinity-m/ Acid Demand pH 4.3	5 to 200/ 0.1-4 mmol/L	Tablet
AC3002P	Alkalinity-p	5 to 500	Tablet
AC4P27	Aluminum, LR	0.01 to 0.25	Tablet & liquid
ACR012	Ammonia, LR	0.02 to 2.5	Powder & reaction tube
ACR011	Ammonia, HR	1 to 50	Powder & reaction tube
AC3072	Chlorine total HR/ Sodium Hypochlorite	5 to 200/ 0.2 to 16 % NaOCl	Tablet
AC3032C	Hardness, Calcium	50 to 900	Tablet
AC3032C2	Hardness, Calcium 2 LR	0 to 500	Tablet
AC3032T	Hardness, total	2 to 50	Tablet
AC4P54	Manganese, LR	0.01 to 0.7	Powder & liquid
ACR007	Nitrate	1.0 to 30.0	Powder pack & reaction tube
AC4P46	Nitrite	0.01 to 0.3	Powder pack
ACD004	Nitrogen, total, LR	0.5 to 25	Powder pack & digestion tube
ACD007	Nitrogen, total, HR	5 to 150	Powder pack & digestion tube
ACR095	Phosphate, ortho	0.06 to 5	Powder pack & reaction tube
ACD095AH	Phosphate, acid hydrolyzable	0.02 to 1.6	Powder pack & digestion tube
ACD095	Phosphate, total	0.02 to 1.1	Powder pack & digestion tube
AC3001TB	pH	8.0 to 9.6	Tablet
AC3072	Sodium hypochlorite	0.2 to 16 % NaOCl	Tablet

### Ordering Information

Cat. No.	Description
AQ3700	Meter kit includes AQ3700 meter, 4 batteries, 4 vials (24 mm), 3 vials (16 mm), 1 adapter each for 16 mm and 13 mm vials, carrying case, user guide with test methods, tablet tampering stir rod and brush. <b>Order reagents and IR adapter separately.</b>

### Accessories for AQ3700 Meter

Cat. No.	Description
AC2V16	Replacement 16 mm vials, package of 10
AC2V24	Replacement 24 mm vials, package of 12
AC37A16	Replacement 16 mm adapter for AQ3700
AC37A13	Replacement 13 mm adapter for AQ3700
AC3ROD	Stir rod, package of 10
AC3C8R	Cleaning brush, package of 5
AC3VSK	Meter verification check standards kit
AQ37IRIM	IR data transfer interface module

Many of our long-standing colorimetry tablet and powder reagents as well as COD tests are already programmed into the AQ3700. See pages 122-125 for additional test parameters, meter accessories, digestion supplies, and more reagent options.

## Thermo Scientific Orion AQ4000 Colorimeter

The most advanced microprocessor-based LED colorimeter on the market today!

The AQ4000 colorimeter stores up to 189 pre-programmed methods and can record 100 data points in the field with a time and date stamp. Download later to a printer or computer in the lab.

The AQ4000 colorimeter takes all the guesswork out of sample preparation with the Auto-Test™ ampoules and the exclusive Auto-ID™ feature.

Quality of the measurement is assured since the ampoules are only opened when a measurement is about to be taken.

- **Auto-ID:** Automatically identifies the species to be measured, selects the method and the wavelength plus initiates the method – no buttons to push!
- **Auto-Test Ampoules:** Pre-measured liquid reagent ampoules are specially designed to work with the AQ4000

### Selection of Display Units is Push-Button Easy

Choose from concentration, absorbance or percent transmittance. The AQ4000 accepts round vials with diameters of 13, 16 or 24 mm. Best of all, the AQ4000 carries a full two year warranty.

### Use the AQ4000 with Our Tablets or Powders


- **Tablets:** Quick dissolve tablets that are easy to add to the sample. Tablets can be used with the AQUAfast II series and AQ4000 colorimeters.
- **Powders:** Pre-measured and ready-to-use packets. Just add the packet to the sample, allow it to dissolve and then take your measurement. Many reagents meet regulatory requirements.
- **COD Reagents:** Available in three measurement ranges – low, mid and high range.

See pages 124 and 125 for reagent chemistries that you can use with the AQ4000 colorimeter.

### AQ4000 Colorimeter and Accessories

Cat. No.	Description
<b>AQ4000</b>	Orion IV colorimeter only (order reagents separately)
<b>AQ40FK</b>	Replacement field case to carry AQ4000 meter, accessories and reagents
<b>AQ4CBL</b>	RS232 cable for data download and software updates
<b>AQ4ZER</b>	AQUAfast zero kit
<b>AC2V16</b>	16 mm vials, 10 pack
<b>AC2V24</b>	24 mm vials, 12 pack

### AQII Series Accessories

Cat. No.	Description
<b>AC2V16</b>	16 mm replacement vials, 10 pack
<b>AC2V24</b>	24 mm replacement vials, 12 pack
<b>AC2T24</b>	24 mm replacement turbidity vials, 12 pack
<b>AC2073</b>	 Chlorine secondary reference standards kit for AQ2070



Versatile AQ4000 Meter

## Thermo Scientific Orion AQ3070 Chlorine Meter

Measures free and total chlorine for EPA reporting – and more!



AQ3070 Meter



AQ3070 Meter Kit

- EPA-approved AC4P71 free chlorine and AC4P72 total chlorine methods for drinking water and wastewater
- Single meter programmed for free chlorine, total chlorine, pH, chlorine dioxide and cyanuric acid measurements
- Additional capability for liquid pH test, chlorine dioxide and cyanuric acid – no need to purchase separate meters for additional tests
- Chlorine dioxide and cyanuric acid tablets feature long shelf lives, so they are ready when you need them

Designed with the user in mind, these small rugged IP67 portable meters have a large easy-to-read display with a very simple user interface. The expanded range for free and total chlorine measurements gives you a real number if you are out of the EPA measurement range to quickly recover your process. The results are accurate and repeatable. You save time while measuring by not having to cover and uncover the vial for each measurement. The field case keeps the meter and test supplies always ready for testing.

### Specifications

Specifications	Description
Display	LCD
Keys	Power, mode, zero, read/enter
Sample Requirement	10 mL
Light Shield Cover Over Vial for Measuring	Not needed
Power with Auto Shutoff	4 x AAA, >3000 tests
Regulatory Approvals	CE, TUV for US and Canada, FCC part 15
Warranty	2 years
Operating Range	0 to 50 °C, 0 to 90 % relative humidity, non-condensing at 30 °C
Test Parameter Ranges	
Free Chlorine	0.02 to 4.0 mg/L; US EPA range 0.03 to 2.0 mg/L
Total Chlorine	0.02 to 4.0 mg/L; US EPA range 0.03 to 2.0 mg/L
Chlorine Dioxide	0 to 11.4 mg/L
pH	5.9 to 8.2 pH
Cyanuric Acid	5 to 90 mg/L

### Ordering Information

Cat. No.	Description	Contents
AQ3070	Orion III chlorine meter kit	Meter, 6 sample vials, AC4P71 free chlorine, AC4P72 total chlorine, batteries, vial cleaning brush, tablet tamping stir rod, user guide, MSDSs, and carrying case
AC4P71	AQUAfast AC4P71 free chlorine powder packets	100 tests
AC4P72	AQUAfast AC4P72 total chlorine powder packets	100 tests
AC2099	Chlorine dioxide tablets	100 tests
AC3001	pH, 2 x 15 mL dropper bottles	60 tests
AC2098	Cyanuric acid, tablets	100 tests
AC3V25	Replacement 25 mm vials, pack of 3	3 vials
AC3ROD	Replacement tablet tamping stir rod	1 package of 10
AC3CBR	Replacement vial cleaning brush	1 package of 5



## Thermo Scientific Orion AQ4500 Turbidity Meter

The AQ4500 features both White and Infrared light sources – so this is the only meter you need for all of your turbidity testing.

**The AQ4500 turbidimeter has dual source LED that allows readings that comply with reporting requirements for both EPA and ISO 7027 methodologies.**

- Nephelometric and ratiometric measurements with autoranging
- IR mode options for measurement of wines and colored samples
- Data log capacity of up to 100 data points
- Reading ranges vary from 0 to 4000 with appropriate units based on test selected
- Includes turbidity standards kit, rugged carrying case, and replacement vials
- The AQ4500 is truly IP67 waterproof to a depth of 3 meters

**For drinking water, our Orion AQ4500 Method has been approved for regulatory reporting and is published in the US Federal Register.**

**For wastewater, our Orion AQ4500 Method has been approved for regulatory reporting and is published in the US Federal Register.**

The IR based methods meet ISO 7027 requirements. Review the measurement information in the user guide to determine the method needed.

### Specifications

Specifications	Description
<b>Light Source</b>	White LED, IR LED
<b>Temperature Effect</b>	LED temperature compensated
<b>Includes Measurement Modes</b>	EPA 180.1, ISO nephelometric, ISO absorbance, IR ratiometric, % transmittance, EPA GLI method 2, EBC (European Brewing Chemists), ASBC (American Society of Brewing Chemists)
<b>Measurement Ranges</b>	0 to 4000 NTU, EPA 0 to 2000 NTU, GLI range 0 to 40 NTU, ISO-7027 0 to 150 FAU, IR Ratio 0 to 4000 NTU, EBC 0 to 24.5, ASBC 0 to 236
<b>Resolution</b>	0.01 (0 to 9.99 NTU), 0.1 (10 to 99.9), 1 (100 to 1000)
<b>Precision</b>	±2 % of reading plus 0.01 NTU from 0 to 500 NTU, ±3 % of reading from 500 to 100 NTU, ±5 % of reading from 1000 to 2000 NTU
<b>Calibration Standards</b>	Provided primary SDVB standards
<b>Sample Size Minimum</b>	10 mL
<b>User Interface</b>	Automatic sample measurement for each measurement with simple user interface
<b>RS232</b>	Bidirectional
<b>Datalog</b>	100 points
<b>Real Time Clock</b>	Yes
<b>Power</b>	Long life – low power consumption – about 2500 hours with 4 alkaline AA batteries or about 10000 with lithium batteries
<b>Waterproof Rating</b>	IP67
<b>Warranty</b>	2 years
<b>Regulatory and Safety</b>	CE, FCC part 15
<b>Operating Temperatures</b>	(-40 °C to 60 °C), 90 % relative humidity at 30.0 °C max

### Ordering Information

Cat. No.	Description
<b>AQ4500</b>	Orion AQ4500 turbidimeter and calibration kit. Kit includes meter, 4 primary standards, standard and sample vials, silicone oil and cloth in carrying case
<b>AQ4CBL</b>	RS232 cable for data download and software updates
<b>AC45FZ</b>	Formazin turbidity standard, 4000 NTU, 475 mL
<b>AC45S1</b>	Silicon oil and cloth kit for AQ4500
<b>AC45ST</b>	Primary turbidity calibration kit for AQ4500 meter only, replacement
<b>AC2T24</b>	24 mm replacement turbidity only vials, 12 pack



AQ4500 Kit

## Thermo Scientific Orion AQ3010 Turbidity Meter



AQ3010 Meter Kit

- Ergonomic IP67 turbidity meter for lab or field use
- Uses Nephelometric principle with 90 ° detection
- In most locations a separate light cap or shield is not needed
- Meets ISO 7027 and offers consistent light source for greater accuracy
- Easy vial indexing with continuous measurement mode
- No mixing or diluting with polymer bead primary standards for faster calibration
- Three year warranty

The Orion AQ3010 Turbidity Meter makes it easy to determine the clarity of your sample with one keystroke and without an extra light shield cap in many environments. With autoranging from 0 - 1000 NTUs, this small waterproof portable meter is very easy to use, plus features a large easy-to-read LCD display. The meter is supplied with ready-to-use, highly stable EPA-approved and ISO accepted polymer bead primary standards. Calibration is easy with step-by-step prompts with the option to choose which points to calibrate. The standards can be used for a calibration check at any time, verifying that your readings are accurate.

The Orion AQ3010 meter comes with everything you need in a field case for easy storage and transport. This meter is covered by a 3 year warranty!

### Specifications

Specifications	Description
Display	LCD
Keys	Power, cal, scroll up, scroll down, read/enter
Automatic Range Selections and Resolution	0.01 to 19.99 NTU with 0.01 NTU resolution
	20.0 to 99.9 NTU with 0.1 NTU resolution
	100-1000 NTU with 1 NTU resolution
Precision	±2 % of reading ±1 LSD for 0-500 NTU
	±3 % of reading ±1 LSD for 501-1000 NTU
Response Time	<6 seconds
Sample Requirement	10 mL
Included Calibration Standards	0.02, 20.0, 100, and 800 NTU
Sample Vials	25 mm diameter with indexing mark
Light Source	IR LED for ISO 7027 turbidity measurement
Power	4 x AAA >3000 tests (4 x AAA lithium >12000 tests)
Battery Conservation Feature	Auto shutoff after 20 minutes of inactivity
Ambient Operating Temperature	0 to 50 °C (0 to 90 % non-condensing relative humidity at 30 °C)
Self Diagnostics	Yes, with troubleshooting error codes
Waterproof Rating	IP67
Regulatory Approvals	CE, TUV 3-in-1 for CSA-US, FCC part 15
Warranty	3 year

### Ordering Information

Cat. No.	Description	Contents
AQ3010	Orion turbidity meter kit	Meter, set of EPA-approved polymer-based primary turbidity standards, batteries, light shield cover, seven vials, lint-free cloth, silicone oil, MSDS and user guide
AC301S	Replacement set of EPA-approved and ISO accepted polymer-based primary turbidity standards	60 mL bottle of 0.02, 20.0, 100, and 800 NTU
AC3SIL	Replacement silicone oil and cloth	1 bottle of silicone oil and one cloth
AC3V25	Replacement 25 mm vials, pack of 3	3 empty 25 mm vials with caps
AC3CBR	Replacement vial cleaning brush	Brush, package of 5

## Thermo Scientific Orion COD Test Systems

COD testing correlated to BOD readings can save time and money



The AQ4000 and AQ3700 colorimeters support additional tests, including chlorine, nitrite and ammonia (see pages 123-125).

- Ideal for environmental and wastewater monitoring with EPA accepted methods
- Three ranges of COD reagents
- COD reactor can digest up to 25 samples simultaneously in 2 hours or less and meet fast COD temperature requirements
- Works with the new AQ3700 multiparameter colorimeter or the AQ4000 advanced colorimeter

Just add the sample to the COD vial, digest sample in the reactor and read results with your Orion colorimeter.

### The AQ4000 and AQ3700 Colorimeters Offer:

- Pre-programmed methods for water quality testing
- Multiple wavelength and more test options
- Datalogging and GLP features
- Bidirectional RS232 interface on AQ4000
- IR Interface on AQ3700 (IRDA required)
- Compatibility with 13, 16 and 24 mm diameter vials
- IP67 waterproof housing
- 2 year warranty

### Select One Meter

Cat. No.	Description
<b>AQ4000</b>	Orion AQ4000 advanced colorimeter with COD
<b>AQ3700</b>	Orion AQ3700 colorimeter with COD, total nitrogen and total phosphate

### Order Digestor

Cat. No.	Description
<b>COD165</b>	Orion thermoreactor for digestion methods to 165 °C

### Select Your Test Reagents by Range and Quantity

Cat. No.	Range	No. of Vials	EPA Approved
<b>CODL00</b>	0 to 150 ppm	25	Yes
<b>CODH00</b>	0 to 1500 ppm	25	Yes
<b>CODHP0</b>	0 to 15000 ppm	25	No requirement

### Select a Standard

Cat. No.	Description
<b>CODS01</b>	AQUAfast 1000 ppm COD standard, 475 mL
<b>CODS10</b>	AQUAfast 10000 ppm COD standard, 475 mL



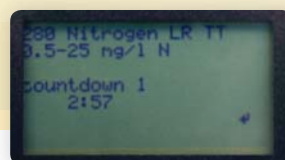
COD Reactor, Test Reagents and Standards with AQ4000 Meter



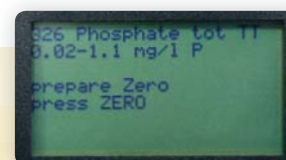
## Thermo Scientific Orion Digestion Test Reagents



Orion AQ3700 Meter



Total Nitrogen LR Test



Total Phosphate Test

### Tube Digestions for Nitrogen and Phosphate Nutrient Removal Process Monitoring

The benefit of efficient operation is important to all production facilities, no matter what they make. By optimizing the process in wastewater treatment, the dirty water can move to the next stage of the process at the perfect time — not prior to the being fully treated and not over-treated. Overtreatment wastes chemicals and slows down the processing. Undertreatment can cause problems if the discharge does not meet the permit levels. Typically total nitrogen and total phosphate and other digestions were very long reflux processes with expensive glassware. Now the results can be ready in an hour or so using persulfate digestion tube methods. This greatly improves the turnaround time for the results. These in process checks of the nutrient removal status can ensure you are on track for the final levels you need to attain or give you timely information to correct the process.

With the AQ3700 meter, total nitrogen and total phosphate tube digestion tests are now available. The kit includes the reagents and accessories for the test.

If you are already testing COD levels, you can quickly add these important tests and start reaping the benefits!

### Overview of Nitrogen and Phosphorus Methods

- Persulfate digestion for nitrogen; persulfate/ascorbic acid digestion for phosphorus
- Nitrogen tests require two tubes — one for a blank and one for the test; phosphate test needs just one tube for the blank and test
- 100 °C digestion temperature for 30 minutes and let cool about 10 more minutes for additional reagent reaction times
- Orion COD 165 digester has the temperatures needed for nitrogen and phosphate tests, see page 122

### Nitrogen

Cat. No.	Description	Quantity
ACD004	Total nitrogen LR reagents (0.5 to 25 mg/L)	50 tests
ACD007	Total nitrogen HR reagents (5 to 150 mg/L)	50 tests

### Phosphate

Cat. No.	Description	Quantity
ACD095	Total phosphorous reagents (0.02 to 1.1 mg/L)	50 tests

## Thermo Scientific Orion AQUAfast Colorimeter Reagent Chemistries

### Colour Codes

■ Tablet
 ■ Liquid
 ■ Powder
 ■ Auto-Test Ampoule

Parameter	Reagent Type	Catalog Number	Description	Range	Method	Number of Tests	Meter Models	EPA Approved Methods
<b>Alkalinity-m</b>	Tablet	AC2002	AQUAfast II alkalinity-m	5.0 - 200 mg/L	Acid/indicator	100	AQ4000, AQ3700, AQ2001	–
<b>Aluminum</b>	Auto-Test Ampoule	AC4027	AQUAfast IV aluminum	0.04 - 0.25 mg/L	Eriochrome cyanine R	30	AQ4000	VWV equivalent
	Tablet	AC2027	AQUAfast II aluminum	0.05 - 0.30 mg/L	Eriochrome cyanine R	50	AQ4000, AQ3700, AQ2005, AQ2020	VWV equivalent
<b>Ammonia (Nitrogen)</b>	Powder	AC4P12	AQUAfast ammonia-nitrogen, powder	0.1 - 0.50 mg/L	Salicylate	100	AQ4000, AQ3700	–
	Auto-Test Ampoule	AC4010	AQUAfast IV ammonia (ultra low range)	0.10 - 3.0 mg/L	Salicylate	30	AQ4000	–
	Auto-Test Ampoule	AC4012	AQUAfast IV ammonia (low range)	0.5 - 7.0 mg/L	Nesslerization	30	AQ4000	VWV equivalent
	Auto-Test Ampoule	AC4011	AQUAfast IV ammonia (high range)	1.0 - 14 mg/L	Nesslerization	30	AQ4000	VWV equivalent
	Tablet	AC2012	AQUAfast II ammonia, as nitrogen	0.05 - 1.0 mg/L; 0.5 - 10.0 mg/L	Indophenole/phenate	50	AQ4000, AQ3700, AQ2004	VWV equivalent
<b>Bromine</b>	Tablet	AC2035	AQUAfast II bromine	0.1 - 13.5 mg/L	DDPD	100	AQ3700, AQ2005	No requirement
<b>Chloride</b>	Auto-Test Ampoule	AC4017	AQUAfast IV chloride	2.0 - 40 mg/L	Mercuric nitrate	30	AQ4000	–
	Tablet	AC2017	AQUAfast II chloride	0.5 - 25 mg/L	Silver nitrate/turbidity	50	AQ4000, AQ3700, AQ2005	–
<b>Chlorine Dioxide</b>	Auto-Test Ampoule	AC4099	AQUAfast IV chlorine dioxide	0.80 - 12 mg/L	DPD	30	AQ4000	No requirement
	Tablet	AC2099	AQUAfast II chlorine dioxide	0.04 - 2.8 mg/L	DPD	100	AQ4000, AQ3070, AQ3700, AQ2020	No requirement
<b>Chlorine</b>	Powder	AC4P71	AQUAfast chlorine, free, DPD, powder packets, EPA-approved method	0.03 - 2.00 mg/L	DPD	100	AQ4000, AQ3070, AQ3700	DW
	Powder	AC4P71B	AQUAfast chlorine, free, powder packets bulk packaging, EPA-approved method	0.03 - 2.00 mg/L	DPD	1000	AQ4000, AQ3070, AQ3700	DW
	Tablet	AC2071	AQUAfast II chlorine, DPD, free only	0.05 - 6.0 mg/L	DPD	100	AQ4000, AQ2070, AQ3700	–
	Auto-Test Ampoule	AC4070	AQUAfast IV chlorine, free and total, EPA-approved method	0.05 - 6.0 mg/L	DPD	30	AQ4000	DW
	Tablet	AC2070	AQUAfast II chlorine, free and total	0.05 - 6.0 mg/L	DPD	50 each	AQ4000, AQ3700, AQ2070, AQ2020	–
	Powder	AC4P72	AQUAfast chlorine, total, DPD, powder packets, EPA-approved method	0.03 - 2.00 mg/L	DPD	100	AQ4000, AQ3070, AQ3700	DW & VWV
	Powder	AC4P72B	AQUAfast chlorine, total, powder packets bulk packaging, EPA-approved method	0.03 - 2.00 mg/L	DPD	1000	AQ4000, AQ3070, AQ3700	DW & VWV
	Tablet	AC2072	AQUAfast II chlorine, total, EPA-approved method	0.05 - 6.0 mg/L	DPD	50	AQ4000, AQ3700, AQ2070	DW & VWV
<b>Copper</b>	Powder	AC4P29	AQUAfast copper, bicinchoninate, powder	0.05 - 5.00 mg/L	Bicinchoninate	100	AQ4000, AQ3700	VWV equivalent
	Auto-Test Ampoule	AC4029	AQUAfast IV copper (soluble)	0.5 - 12 mg/L	Bathocuproine	30	AQ4000	VWV equivalent
	Tablet	AC2065	AQUAfast II zinc/copper	0.02 - 1.0 mg/L	Zincon	50	AQ4000, AQ3700, AQ2002	–
	Tablet	AC2029	AQUAfast II copper	0.05 - 5.0 mg/L	Biquinoline	50	AQ4000, AQ3700, AQ2005	–
<b>Cyanide</b>	Auto-Test Ampoule	AC4006	AQUAfast IV cyanide (free)	0.20 - 0.50 mg/L	Pyridine-barbituric acid	30	AQ4000, AQ3700	ETV verified, DW & VWV equivalent
<b>Cyanuric Acid</b>	Tablet	AC2098	AQUAfast II cyanuric acid	5 - 90 mg/L	Melamine	100	AQ3070, AQ3700, AQ2003	–
<b>Fluoride</b>	Liquid	AC2009	AQUAfast II fluoride SPADNS kit, EPA-approved method	0.05 - 2.0 mg/L	SPADNS	50	AQ4000, AQ3700, AQ2009, AQ2020	DW & VWV
<b>Hydrazine</b>	Tablet	AC2030	AQUAfast II hydrazine kit	0.05 - 0.50 mg/L	Dimethylamino-benzaldehyde	100	AQ4000, AQ3700, AQ2003	No requirement







Parameter	Reagent Type	Catalog Number	Description	Range	Method	Number of Tests	Meter Models	EPA Approved Methods
Iron	Powder	AC4P79	AQUAfast iron total TPTZ, powder	0 - 1.80 mg/L	TPTZ	100	AQ4000, AQ3700	–
	Powder	AC4P78	AQUAfast iron total ferro, powder	0 - 3.00 mg/L	1,10 Phenanthroline	100	AQ4000, AQ3700	WW equivalent
	Auto-Test Ampoule	AC4078	AQUAfast IV iron 1 (total & soluble)	0.45 - 7.0 mg/L	1,10 Phenanthroline	30	AQ4000	WW equivalent
	Tablet	AC2078	AQUAfast II iron	0.02 - 1.0 mg/L; 0.2 - 10 mg/L	TPTZ	100	AQ4000, AQ3700, AQ2005	–
Manganese	Powder	AC4P55	AQUAfast manganese HR, powder	0.2 - 20.0 mg/L	Periodate oxidation	100	AQ4000, AQ3700	WW equivalent
	Auto-Test Ampoule	AC4055	AQUAfast IV manganese	1.0 - 30 mg/L	Periodate oxidation	30	AQ4000, AQ3700	WW equivalent
	Tablet	AC2055	AQUAfast II manganese	0.05 - 4 mg/L	Formaloxime	50	AQ4000, AQ3700, AQ2003	–
Molybdate	Powder	AC4P42	AQUAfast molybdenum, molybdate, HR, powder	0 - 40.0 mg/L	Mercaptoacetic acid	100	AQ4000, AQ3700	–
Nitrate	Auto-Test Ampoule	AC4007	AQUAfast IV nitrate 3 (as NO <sub>3</sub> )	5.0 - 50 mg/L	Cadmium reduction	30	AQ4000	DW & WW equivalent
	Auto-Test Ampoule	AC4005	AQUAfast IV nitrate 2 (as N)	0.40 - 3.0 mg/L	Cadmium reduction	30	AQ4000	DW & WW equivalent
	Auto-Test Ampoul	AC4004	AQUAfast IV nitrate (as N) LR	0.20 - 1.5 mg/L	Cadmium reduction	30	AQ4000	DW & WW equivalent
	Tablet	AC2007	AQUAfast II nitrate	1 - 40 mg/L	Zinc reduction	50	AQ4000, AQ3700, AQ2007	–
Nitrite	Powder	AC4P46	AQUAfast nitrite LR, powder	0 - 0.350 mg/L	Diazotization (Azo)	100	AQ4000, AQ3700	DW & WW equivalent
	Auto-Test Ampoule	AC4046	AQUAfast IV nitrite	0.080 - 0.80 mg/L	Diazotization (Azo)	30	AQ4000	DW & WW equivalent
	Tablet	AC2046	AQUAfast II nitrite, EPA-approved method	0.05 - 0.50 mg/L	Diazotization (Azo)	100	AQ4000, AQ3700, AQ2046	DW & WW
Oxygen	Auto-Test Ampoule	AC4008	AQUAfast IV oxygen	2.0 - 15 mg/L	Azo dye	30	AQ4000	–
Ozone	Auto-Test Ampoule	AC4048	AQUAfast IV ozone	0.20 - 2.5 mg/L	DDPD	30	AQ4000	–
	Tablet	AC2048	AQUAfast II ozone	0.05 - 0.5 mg/L	DPD/glycine	100	AQ3700, AQ2001	–
pH	Liquid	AC3001	AQUAfast II pH, dropper bottle	5.9 - 8.2	Phenol red	30	AQ3070, AQ3700	–
	Tablet	AC2001	AQUAfast II pH	6.5 - 8.4	Phenol red	100	AQ4000, AQ3700, AQ2001	–
Phosphate	Powder	AC4P95	AQUAfast phosphorus 3, powder	0.07 - 2.5 mg/L	Phosphomolybdic blue/ascorbic acid	100	AQ4000, AQ3700	DW & WW equivalent
	Auto-Test Ampoule	AC4095	AQUAfast IV phosphate 2-LR	0.75 - 8.0 mg/L	Stannous chloride	30	AQ4000, AQ3700	–
	Tablet	AC2096	AQUAfast II phosphorus HR	10 - 100 mg/L	Phosphomolybdic blue/ascorbic acid	50	AQ4000, AQ3700, AQ2003	DW & WW equivalent
	Tablet	AC2095	AQUAfast II phosphorus LR, EPA approval method	0.05 - 4.0 mg/L	Vanado molybdate	50	AQ4000, AQ3700, AQ2004	DW & WW
Silica	Powder	AC4P60	AQUAfast silica HR, powder packets	1.0 - 75.0 mg/L	Silicomolybdate	100	AQ4000, AQ3700	DW & WW equivalent
	Auto-Test Ampoule	AC4060	AQUAfast IV silica	1.0 - 14 mg/L	Heteropoly blue	30	AQ4000	DW equivalent
	Powder	AC2061	AQUAfast II silica phosphate removal	NA	NA	100	AQ4000, AQ3700, AQ2002	–
	Tablet	AC2060	AQUAfast II silica	0.05 - 4.0 mg/L	Silicomolybdate	50	AQ4000, AQ3700, AQ2002	DW & WW equivalent
Sulfate	Powder	AC4P82	AQUAfast sulfate 4, powder packets	2 - 70 mg/L	Barium sulfate/turbidity	100	AQ4000, AQ3700	DW & WW equivalent
	Auto-Test Ampoule	AC4082	AQUAfast IV sulfate	8.0 - 100 mg/L	Barium sulfate/turbidity	30	AQ4000	DW & WW equivalent
	Tablet	AC2082	AQUAfast II sulfate	5 - 200 mg/L	Barium sulfate/turbidity	100	AQ4000, AQ3700, AQ2005	DW & WW equivalent
Sulfide	Auto-Test Ampoule	AC4016	AQUAfast IV sulfide (soluble)	0.3 - 3.0 mg/L	Methylene blue	30	AQ4000	WW equivalent
	Tablet	AC2016	AQUAfast II sulfide	0.05 - 0.50 mg/L	Methylene blue	50	AQ4000, AQ3700, AQ2004	WW equivalent
Zinc	Auto-Test Ampoule	AC4065	AQUAfast IV zinc	0.30 - 3.0 mg/L	Zincon	30	AQ4000	WW equivalent
	Tablet	AC2065	AQUAfast IV zinc/copper	0.02 - 1.0 mg/L	Zincon	50	AQ4000, AQ3700, AQ2002	WW equivalent

# Orion Part Numbers

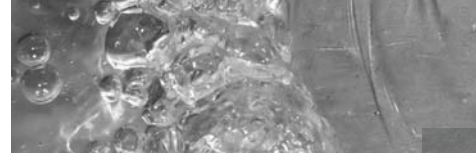
## Cross Reference Guide

Orion Cat. No.	Page No.
011001	104
011005	104
01100510	104
011006	104
01100610	104
011007	104
01100710	104
011008	104
01100910	104
011010	102, 103
011010A	102, 103
011020	102, 103
011020A	102, 103
011050	102, 103
011050MD	102, 103
011510MD	102, 103
011510-WA	102, 103
013005A	101, 103
013005D	101, 103
013005MD	101, 103
013010A	101, 103
013010MD	101, 103
013016A	101, 103
013016D	101, 103
013016MD	101, 103
013017	104
013020MD	101, 103
013025MD	101, 103
0131S0	61
0131S3	61
013605MD	101, 103
013610	101, 103
013610MD	101, 103
013655	61
0136S0	61
0136S3	61
014005	102, 103
018020MD	102, 103
020017	88
020125	60
020130	60
020135	60
0261S0	61
0261S3	61
0266S0	61
0266S3	61
040906	97
040907	97
040908	97
0607CA	60
0607CI	60
080017	110
080045	104, 110
080113	110
080160	110
080360	110

Orion Cat. No.	Page No.
080510MD	107, 108
080513	110
080514	110
080515	110
081003	110
081010MD	107, 108
081045	110
083005MD	107, 108
083010MD	107, 108
083025MD	107, 108
083060MD	107, 108
086020A	107, 108
086021A	110
086030MD	107, 108
087001	110
087002	110
087003	110
087010MD	106
087020MD	106
087030MD	106
087050MD	106
087100MD	106
090032	85
090033	85
090034	85
090035	85
090036	85
090037	85
090043	60
090044	60, 104
090045	59, 60
090048	85
090070	60
0900A0	60
0900A1	60
0900A4	60
0900A6	60
0900A7	60
096019	59, 60, 84
096021	59, 60, 84
0ACBLO	60
0BCHSK	60
0PBLSK	60
1010001	104
1010003	60
1010004	59, 60
1010005	60
1010006	59, 60
1010008	59, 60
1010009	59, 60
1010050	60
1010050-WA	85
1010051	60, 85
1010053	59, 60
1010800	60, 85
1010801	60, 85

Orion Cat. No.	Page No.
1010900	60
1010900-WA	85
1010901	60, 85
1210001	60
1210002	60
1210003	60
1210004	60
1210005	59, 60
2115000	11
2115001	11
2115101	11
2115102	11
510011	88
510015	87
5107BNMD	69
5107NC	69
610001	88
650700	98
654201	98
654202	98
654203	98
654205	98
700001	87
700003	87
700005	98
700006	98
700010	87
700011-WA	87
700012	87
700402	87
700702	87
700902	87
800300	80, 96
800500U	80, 96
810001	87
810007	88, 98
810017	88
810199	86, 87
8101BNWP	80
8101SC	80
8102BN	70
8102BNWP	70
8102SC	70
8103BN	74
8103BNWP	74
8103SC	74
8104BN	70
8104BNWP	70
8104SC	70
8107BNUMD	68
8107UWMMMD	68
8115BN	75
8115BNWP	75
8115SC	75
8135BN	78
8135BNWP	78

Orion Cat. No.	Page No.
8135SC	78
8155SC	72
815600	72
8156BNWP	72
8157BNUMD	68
8157UWMMMD	68
8162SC	71
8163BNWP	79
8163SC	79
8165BNWP	67
8165DN	67
8172BNWP	67
8175BNWP	75
8220BNWP	73
8302BNUMD	68
841101	98
841108	98
841109	98
841111	98
841113	98
8411BN	96
8611BNWP	96
900001	88
900002	88
900003	88
900004	88, 98
900010	98
900011	88
900012	98
900017	97
900018-WA	97
900020	87
900021-WA	87
900022-WA	87
900023	87
900024	87
900046	97, 98
900061	97, 98
900062	97, 98
900063	97
900065	98
900067	98
900100	80, 92, 99
900200	80, 94, 95, 99
910001	87
910002	60
910003	88
910004	88
910005	88
910006	88
910008	88
910008-WA	88
910026-WA	85
910027	85
910028	85
910029-WA	85



Orion Cat. No.	Page No.
910030	85
910031	85
910032	85
910060	87
9100CB	87
910104	86
910105	86
910107	86
910110	86
910112	86
910168	86
910199	86
9101BN	80
9101SC	80
9102AP	76
9102BNWP	71
9102DJWP	71
9102SC	71
9103APWP	74
9103BNWP	74
9103SC	74
910410	41/3/5/7/9, 51
910410-WA	86
910425	86
910460	86
9104APWP	76
9104BNWP	71
9104CB	86
9104SC	71
910686	86
9106BNWP	76
910710	86
910725	86
910760	86
9107APMD	69
9107BN	69
9107BNMD	69
9107CB	86
9107WLMD	69
9107WMMD	69
9107WP	69
910918	86
9109WL	69
9109WP	69
911010	86
911025-WA	86
911060	86
9110CB	86
9110DJWP	73
911110	86
911125	86
911260-WA	86
9115APWP	75
911600	75
9116860	86
9120APWP	79

Orion Cat. No.	Page No.
912600	75
9135APWP	78
913600	78
9142BN	71
9146BN	77
9147BN	69
9156APWP	76
9156BNWP	72
9156DJWP	77
9156SC	72
9157BN	69
9157BNMD	69
916099	86, 87
9162BNWP	79
9163SC	79
9165BNWP	67
916860	86
917001	81
917004	81
917005	81
917006	81
917007	81
9172BNWP	67
9179BN	82
9179BNMD	82
9180BN	82
9180BNMD	82
9191860	86
91CBNC	85
91CBNT	85
91CDIN	85
91CLMO	85
91USCB	85
91USHC	85
91USRF	85
920706	97
920707	97
921906	98
922006	97, 98
923206	97, 98
927005	81
927005MD	81
927006	81
927006MD	81
927007	81
927007MD	81
928007MD	81
930000	99
9300BNWP	99
9300SC	99
930101	99
930501	99
9305BN	91
930701	99
930702	99
930707	97

Orion Cat. No.	Page No.
930710	97
930711	97, 98
9307BNWP	94
931701	99
931801	99
931901	99
931911	98
9319BN	91
932001	99
932011	97
9320BN	90
933201	99
9342BN	91
934610	98
938101	99
940011	97, 98
9406BN	90
9406SC	90
940906	97
940907	97
940909	97
940911	97
940916	97
940999	97
9409BN	90, 92
9409SC	90, 92
941105	98
941107	98
941609	98
9416BN	91
9416SC	91
941706	97, 98
941707	97
941708	97
941709	97
9417BN	90, 95
9417SC	90, 95
942906	97
9429BN	90
9429SC	90
943506	97
9435BN	90
9435SC	90
9448BN	90
9448SC	90
945306	97
9453BN	91
9453SC	91
9458BN	91
948201	99
948206	97
948207	98
9482BN	91
9482SC	91
950015	99
950202	97

Orion Cat. No.	Page No.
950204	99
950206	97
950207	97
950210	97
9502BNWP	90, 99
951006	97
951007	97
951011	97
951202	97
951203	98
951204	99
951205	99
951207	97
951209	97
951210	97
951211	97
951213	97
951214	99
951215	99
9512BNWP	90, 93, 99
9512HPBNWP	90, 93, 99
954602	98
954604	99
954606	98
956410	98
9606BNWP	90
9609BNWP	90, 92
9616BNWP	91
9617BNWP	90, 95
9629BNWP	90
9635BNWP	90
9648BNWP	90
9653BNWP	91
9678BNWP	82
967901	87
967961	87
9682BNWP	91
9700BNWP	99
970701	99
9707BNWP	91, 94
970801	110
970802	110
970803	110
970899WP	107, 108
971901	99
9719BNWP	91
972001	99
9720BNWP	90
977007	97
977010	97
977011	97
9770BNWP	90
9770SC	90
9778BNWP	82
977900	83
9780SC	83

# Orion Part Numbers

## Cross Reference Guide

Orion Cat. No.	Page No.
9810BN	73
9811BN	91
9826BN	73
9863BN	73
990106	104
AC2001	125
AC2002	117, 124
AC2007	125
AC2009	124
AC2012	124
AC2016	125
AC2017	124
AC2027	124
AC2029	124
AC2030	124
AC2035	124
AC2046	125
AC2048	125
AC2055	125
AC2060	125
AC2061	125
AC2065	124, 125
AC2070	124
AC2071	124
AC2072	124
AC2073	118
AC2078	125
AC2082	125
AC2095	125
AC2096	125
AC2098	119, 124
AC2099	119, 124
AC2T24	118, 120
AC2V16	117, 118
AC2V24	115, 117, 118
AC3001	119, 125
AC3001TB	117
AC3002P	117
AC301S	121
AC3032C	117
AC3032C2	117
AC3032T	117
AC3072	117
AC37A13	117
AC37A16	117
AC3CBR	117, 119, 121
AC3ROD	117, 119
AC3SIL	121
AC3V25	119, 121
AC3VSK	117
AC4004	125
AC4005	125
AC4006	124
AC4007	125
AC4008	125
AC4010	124

Orion Cat. No.	Page No.
AC4011	124
AC4012	124
AC4016	125
AC4017	124
AC4027	124
AC4029	124
AC4046	125
AC4048	125
AC4055	125
AC4060	125
AC4065	125
AC4070	124
AC4078	125
AC4082	125
AC4095	125
AC4099	124
AC45FZ	120
AC45S1	120
AC45ST	120
AC4P12	124
AC4P27	117
AC4P29	124
AC4P42	125
AC4P46	117, 125
AC4P54	117
AC4P55	125
AC4P60	125
AC4P71	119, 124
AC4P71B	124
AC4P72	119, 124
AC4P72B	124
AC4P78	125
AC4P79	125
AC4P82	125
AC4P95	125
ACD004	117, 123
ACD007	117, 123
ACD095	117, 123
ACD095AH	117
ACR007	117
ACR011	117
ACR012	117
ACR095	117
AQ001C	115
AQ003C	115
AQ006C	115
AQ0USB	115
AQ110V	115
AQ220V	115
AQ240V	115
AQ3010	121
AQ3070	119, 124, 125
AQ3700	117, 122-125
AQ37IRIM	117
AQ4000	118, 122/4/5
AQ40FK	118

Orion Cat. No.	Page No.
AQ4500	111, 120
AQ4CBL	118, 120
AQ4ZER	118
AQ7000	115
AQ8000	115
AQCHNV	115
COD165	122
CODH00	122
CODHP0	122
CODL00	122
CODS01	122
CODS10	122
GD9106BNWP	76
GD9156BNWP	72
GS9106BNWP	77
GS9156BNWP	72
PRT300	60
PRT301	60
PRT302	60
STARA1110	25
STARA1115	25
STARA1116	25
STARA1120	31
STARA1125	31
STARA1130	37
STARA1135	37
STARA1210	51
STARA1215	51
STARA1220	55
STARA1225	55
STARA1230	58
STARA1235	58
STARA2110	23
STARA2115	23
STARA2116	23
STARA2120	29
STARA2125	29
STARA2126	29
STARA2130	35
STARA2135	35
STARA2136	35
STARA2140	13
STARA2145	13
STARA2146	13
STARA2147	13
STARA2148	13
STARA2150	17
STARA2155	17
STARA2160	19
STARA2165	19
STARA2210	49
STARA2215	49
STARA2220	53
STARA2225	53
STARA2230	57
STARA2235	57

Orion Cat. No.	Page No.
STARA3210	49
STARA3215	49
STARA3220	53
STARA3225	53
STARA3230	57
STARA3235	57
STARA3240	43
STARA3245	43
STARA3250	45
STARA3255	45
STARA3260	47
STARA3265	47
STARA3290	41
STARA3295	41
STARA-AR	59
STARA-BEA	38, 59
STARA-CS	59
STARA-ELHD	59
STARA-ESCD	59
STARA-ESPH	59
STARA-HB	38, 59
STARA-PWR	59
VSTAR00	38
VSTAR10	21
VSTAR12	21
VSTAR20	27
VSTAR22	27
VSTAR30	33
VSTAR32	33
VSTAR40A	9
VSTAR40A2	9
VSTAR40B	9
VSTAR40B2	9
VSTAR50	15
VSTAR52	15
VSTAR80	21
VSTAR82	21
VSTAR90	7
VSTAR91	7
VSTAR92	7
VSTAR93	7
VSTAR-CND	38
VSTAR-ISE	38
VSTAR-LR	38
VSTAR-PH	38
VSTAR-RD	38

# Index

<b>A</b>	<b>Accessories</b>		
	Conductivity Cell	104	
	Dissolved Oxygen Probe	110	
	ISE	97-99	
	Meter	59, 60	
	Orion Aplus	60	
	Orion PerpHecT	60	
	Orion Star A	59	
	Orion Star Plus	59	
	Orion VERSA STAR	59	
	pH Electrode	84-88	
	RDO Optical DO	110	
	<b>Adapters, Electrode</b>	85	
	<b>Adapters, Power</b>	59, 60	
	<b>Alkalinity Test Kit, Total</b>	87	
	<b>All-In-One Buffer Kits</b>	86, 87	
	<b>Ammonia ISE</b>		
	Electrode	90, 93	
	Membranes	93, 99	
	Solutions	90, 93, 97	
	Test Kit, Nitrate Using Ammonia ISE	98	
	<b>Ammonium ISE</b>		
	Handle	99	
	Module	90	
	Solutions	90, 97	
	<b>AQUAfast</b>		
	Chlorine Meter	117, 118	
	Chlorine Reagents	124	
	COD	122	
	Colorimeter	117-119, 122	
	Hardness	118	
	Nutrient Testing	123	
	Test Reagents	123-125	
	Turbidity Meter	120, 121	
<b>B</b>	<b>AquaMate</b>		
	Spectrophotometer	113-115	
	UV-Vis Spectrophotometer	113-115	
	Vis Spectrophotometer	113-115	
	<b>AquaPro Professional pH Electrodes</b>	69, 74-76, 78	
	<b>ATC (Automatic Temp. Compensation) Probes</b>	81	
	<b>Benchtop Meters</b>		
	Accessories	59, 60	
	Concentration	4-13, 38	
	Conductivity	4-7, 14-17, 26-31, 38	
	Dissolved Oxygen	4-7, 18, 19, 32-38	
	ISE	4-13, 38	
	Millivolt (mV)	4-25, 38	
	Multi-Parameter	4-19, 38	
	Orion DUAL STAR	10, 11	
	Orion Star A	12, 13, 16-19, 22-25, 28-31, 34-37	
	Orion VERSA STAR	4-9, 14, 15, 20, 21, 26, 27, 32, 33, 38	
	pH	4-25, 38	
	Selection Guide	3	
<b>C</b>	<b>BNC Shorting Cap</b>	60	
	<b>BOD</b>	(See Also Dissolved Oxygen)	
	Adapters	110	
	AUTO-STIR Probe	107, 108	
	Meter Kits	4-7, 18, 19, 32-38	
	<b>Bromide ISE</b>		
	Electrode	90	
	Solutions	90, 97	
	<b>Buffers, pH</b>	86, 87	
	<b>Bulb Guard, Electrode</b>	88	
	<b>Cables</b>	60	
	<b>Cadmium ISE</b>	60, 85	
	Electrode	90	
	Solutions	90, 97	
	<b>Calcium ISE</b>		
	Electrode	90	
	Modules	99	
	Solutions	90, 97	
	<b>Calibration Standards</b>		
	Conductivity	104	
	ISE	97, 98	
	ORP	87	
	pH Buffers	86, 87	
	<b>Carbon Dioxide ISE</b>		
	Electrode	90	
	Membranes	99	
	Solutions	90, 97	
	<b>Chloride ISE</b>		
	Electrode	90, 95	
	Solutions	90, 95, 97	
	<b>Chlorine ISE</b>		
	Electrode	90	
	Solutions	90, 97	
	<b>Cleaning Solutions, pH Electrode</b>	87	
	<b>COD (Chemical Oxygen Demand)</b>	118	
	<b>Colorimeters</b>	117-119, 122	
	<b>Colorimetry Reagent Chemistries</b>	123-125	
	<b>Computer Cables</b>	59, 60	
	<b>Concentration</b>	(See ISE)	
	<b>Conductivity</b>		
	2-Electrode	101, 102	
	3-Electrode	102	
	4-Electrode	101	
	Accessories	104	
	DuraProbe	101	
	Meter Calibration Kit	104	
	Meters	4-7, 14-17, 26-31, 38, 40, 41, 44, 45, 52-55, 61	
	Selection Guide	103	
	Standards	104	
	USP Kit	26-29	
	<b>Conductivity Standards</b>	104	



# Index

	<b>Cupric ISE</b>	
	Electrode	90
	Solutions	90, 97
	<b>Cyanide ISE</b>	
	Electrode	90
	Solutions	90, 97
<b>D</b>	<b>Dissolved Oxygen</b>	(See Also BOD)
	Accessories	110
	Calibration Sleeve	110
	Maintenance Kits	110
	Membrane Caps	110
	Meters	4-7, 18, 19, 32-38, 40, 41, 46, 47, 56-58
	Optical DO	
	Meters	4-7, 18, 19, 32-36, 40, 41, 46, 47, 56, 57
	RDO Optical Probes	106
	Polarographic Electrolyte	110
	Polarographic Probes	107
	Selection Guide	108, 109
	<b>Dual Channel Meters</b>	4-12, 14-19, 38, 40, 41, 44-47
	<b>DUAL STAR, Orion</b>	10, 11
	<b>DuraProbe Conductivity Cells</b>	101
<b>E</b>	<b>Electrode</b>	(See Also ISE, pH)
	Adapters	85
	Cables	85
	Calibration Solutions	86, 87, 97, 98, 104
	Cleaning Kits	87
	Filling Solutions	88, 97, 98, 110
	ORP/Redox	82
	Reference	80
	Selection Guide	64, 65, 90, 91, 103, 108, 109
	Stands	59, 60
	Storage Bottles	88
	Storage Solutions	87
	Sure-Flow	66, 67
	Triode	68, 69
	<b>Extension Cables</b>	85
<b>F</b>	<b>Filling Solutions</b>	
	DO	110
	ISE	97, 98
	pH	88
	<b>Fluoride ISE</b>	
	Electrode	90, 92
	Solutions	90, 92, 97
	<b>Fluoride Standards Bulk Pack</b>	97
	<b>Fluoroborate ISE</b>	
	Electrode	91
	Module	99
	Solutions	91, 97

<b>G</b>	<b>Gas Sensing Ion Selective Electrodes</b>	90, 93
	<b>GLP Printer</b>	59, 60
	<b>Green Electrodes (Lead Free)</b>	72, 76, 77
	<b>Guards, Electrode</b>	88, 104, 106, 110
<b>H</b>	<b>Half-Cells</b>	
	ISE	90, 91
	pH	80
	Reference	80
<b>I</b>	<b>Interface Cables</b>	59, 60
	<b>Intrinsically Safe Meters</b>	61
	<b>Iodide ISE</b>	
	Electrode	91
	Solutions	91, 97
	<b>Ionic Strength Adjusters (ISA)</b>	97, 98
	<b>ionplus Ion Selective Electrodes</b>	90-92, 94, 95
	<b>ISE (Ion Selective Electrode)</b>	
	Accessories	99
	Calibration Standards	97, 98
	Electrodes	90-96
	Filling Solutions	97, 98
	Handles	99
	Ionic Strength Adjusters (ISA)	97, 98
	Membranes	99
	Meters	4-13, 38, 40-43
<b>K</b>	Modules	99
	Reference Electrodes	80
	Selection Guide	90, 91
	Solutions and Reagents	97, 98
	<b>Karl Fischer Titration Electrode</b>	83
	<b>KNiPHE</b>	
	pH Electrode	79
	Replacement Blade	79
	Replacement Electrode	79
<b>L</b>	<b>Lead ISE</b>	
	Electrode	91
	Solutions	91, 97
	<b>LogR Temperature Compensation</b>	20, 21, 38
<b>M</b>	<b>Maintenance Kits for DO Probes</b>	110
	<b>Membrane Caps for DO Probes</b>	110
	<b>Membranes for Gas Sensing ISE</b>	99
	<b>Meter Calibration Kit for Conductivity</b>	104
	<b>Meters</b>	
	Accessories	59, 60
	Benchtop	4-38
	Colorimeter	117-119, 122

# Index

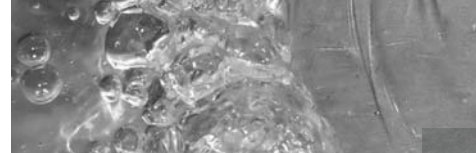
	Concentration	4-13, 38, 40-43
	Conductivity	4-7, 14-17, 26-31, 38, 40, 41, 44, 45, 52-55, 61
	Dissolved Oxygen	4-7, 18, 19, 32-38, 40, 41, 46, 47, 56-58
	ISE	4-13, 38, 40-43
	Millivolt (mV)	4-25, 38, 40-51, 61
	Multi-Parameter	4-11, 14-19, 38, 40, 41, 44-47
	Orion DUAL STAR	10, 11
	Orion Star A	12, 13, 16-19, 22-25, 28-31, 34-37, 40-58
	Orion VERSA STAR	4-9, 14, 15, 20, 21, 26, 27, 32, 33, 38
	pH	4-25, 38, 40-51, 61
	Portable	40-58, 61
	Selection Guide	3
	Turbidity	120, 121
	<b>Micro Electrodes</b>	
	ATC	81
	PerpHecT ROSS	73
	pH	73
	Sodium	91
	<b>Multi-Parameter Meters</b>	4-11, 14-19, 38, 40, 41, 44-47
<b>N</b>	<b>Nitrate ISE</b>	
	Electrode	91, 94
	Modules	91, 94, 99
	Solutions	91, 94, 97
	<b>Nitrate Test Kit for Ammonia ISE</b>	98
	<b>Nitrite Solutions</b>	98
	<b>Nitrogen Oxide Solutions</b>	98
	<b>No Cal pH Electrodes</b>	69
	<b>Nutrient Testing</b>	123
<b>O</b>	<b>Optical DO</b>	(See RDO)
	Orion DUAL STAR	10, 11
	Orion Star A	12, 13, 16-19, 22-25, 28-31, 34-37, 40-58
	Orion VERSA STAR	4-9, 14, 15, 20, 21, 26, 27, 32, 33, 38
	ORP Standards	87
	<b>Oxidation Reduction Potential (ORP)</b>	
	Electrodes	82
	Meters	4-25, 38, 40-51
	Standards	87
	<b>Oxygen Electrodes</b>	(See Dissolved Oxygen, BOD)
<b>P</b>	<b>Perchlorate Solution</b>	98
	<b>PerpHecT</b>	
	Digital LogR Meters	20-31, 38
	ROSS Micro pH Electrode	81
	<b>pH Buffers</b>	86, 87
	<b>pH Electrode</b>	
	Epoxy Refillable Electrodes	72
	Epoxy Semi-Micro Electrodes	75
	Flat Surface Electrodes	78
	Glass Refillable Electrodes	70, 71
	Glass Semi-Micro Electrodes	74

	Low Maintenance Electrodes	76, 77
	Micro Electrodes	73
	pH Half Cell Electrodes	80
	Reference Half Cell Electrodes	80
	Selection Guide	64, 65
	Spear Tip Electrodes	79
	Sure Flow Electrodes	66, 67
	Triodes (pH & Temperature)	68, 69
	<b>pH Electrode Accessories</b>	
	Accessories	84-88
	Buffers	86, 87
	Cables	60, 85
	Cleaning Solution Kits	87
	Filling Solutions	88
	Rinse Solution	86
	Storage Solution	87
	<b>pH Meter</b>	
	Kits	4-25, 38, 40-51
	Selection Guide	3
	<b>pH/ISE Meter</b>	
	Kits	4-13, 38, 40-43
	Selection Guide	3
	<b>Plastic Membrane Ion Selective Electrodes</b>	90, 91, 94, 99
	<b>Polarographic Electrolyte Solution</b>	110
	<b>Portable Meters</b>	
	Accessories	49, 50
	Concentration	40-43
	Conductivity	40, 41, 44, 45, 52-55, 61
	Dissolved Oxygen	40, 41, 46, 47, 56-58
	ISE	40-43
	Millivolt (mV)	40-51, 61
	Multi-Parameter	40, 41, 44-47
	pH	40-51, 61
	Selection Guide	3
	Orion Star A	40-58
	<b>Potassium ISE</b>	
	Electrode	91
	Modules	99
	Solutions	91, 98
	<b>Pouches, Individual Use Solution</b>	
	Conductivity Standards	104
	pH Buffers	86
	Rinse Solution	86
	<b>Power Adapters</b>	49, 50
	<b>Printers</b>	49, 50
	<b>Probes</b>	(See ATC, BOD, Dissolved Oxygen, Conductivity)
	<b>Protective Guards</b>	88, 104, 106, 110
	<b>Pure Water pH Test Kit</b>	87
<b>R</b>	<b>RDO</b>	
	Meters	4-7, 18, 19, 32-35, 38, 40, 41, 46, 47, 56, 57
	Probes	106

# Index

<b>Reagents</b>	
Colorimetry	123-125
ISE	97, 98
<b>Redox/ORP Electrodes</b>	82
<b>Reference Electrodes</b>	
ROSS Sure-Flow	80
ROSS Ultra	80
Sure-Flow	80
<b>Rinse Solution</b>	86
<b>ROSS Electrodes</b>	
Epoxy Refillable pH	72
Epoxy Semi-Micro pH	75
Fill Solution	88
Flat Surface pH	78
Glass Refillable pH	70, 71
Glass Semi-Micro pH	74
Half Cell pH and Reference	80
Low Maintenance pH	68
Micro pH	73
Sodium	91, 96
Spear Tip pH	79
Sure-Flow pH	66, 67, 78
Triodes	68
<b>ROSS Ultra Electrodes</b>	
Fill Solution	88
pH	68, 70, 72, 74, 78, 80
Reference	80
<b>Salinity Meters</b>	
Benchtop	4-7, 14-17, 26-29, 38
Portable	40, 41, 44, 45, 52, 53, 61
<b>Selection Guide</b>	
Conductivity Cell	103
DO Probe	108, 109
ISE	90, 91
Meter	3
pH Electrode	64, 65
<b>Shorting Cap, BNC</b>	59, 60
<b>Silver Billet Electrode</b>	83
<b>Silver/Sulfide ISE</b>	
Electrode	91
Solutions	91, 98
<b>Sodium ISE</b>	
Electrode	91, 96
Micro Electrode	91
Solutions	91, 96, 98
<b>Solid State Ion Selective Electrodes</b>	90-92, 95
<b>Standards</b>	
Conductivity	104
ISE	97, 98
pH Buffers	86, 87
<b>Stands, for Electrodes</b>	59, 60
<b>Star A, Orion Meters</b>	
Accessories	59, 60
Benchtop	4-38

Concentration	4-13, 38, 40-43
Conductivity	4-7, 14-17, 26-31, 38, 40, 41, 44, 45, 52-55, 61
Dissolved Oxygen	4-7, 18, 19, 32-38, 40, 41, 46, 47, 56-58
ISE	4-13, 38, 40-43
Millivolt (mV)	4-25, 38, 40-51, 61
Multi-Parameter	4-11, 14-19, 38, 40, 41, 44-47
Orion Star A	12, 13, 16-19, 22-25, 28-31, 34-37, 40-58
Orion VERSA STAR	4-9, 14, 15, 20, 21, 26, 27, 32, 33, 38
pH	4-25, 38, 40-51, 61
Portable	40-58, 61
Selection Guide	3
<b>Stirrer Probe</b>	59, 60, 84
<b>Storage Solutions</b>	87
<b>Sure-Flow Electrodes</b>	66, 67, 75, 80
<b>Surfactant ISE</b>	
Electrode	91
Solutions	91, 98
<b>TDS (Total Dissolved Solids)</b>	4-7, 14-17, 26-31, 38, 40, 41, 44, 45, 52-55, 61, 104
<b>Temperature Probes</b>	81
<b>Test Kits</b>	
Alkalinity, Total	87
Ammonia	124
Disinfectants	124, 125
Nitrate Test Kit for Ammonia ISE	98
Nitrogen	123, 125
Nutrients	123
Phosphate	123, 125
Pure Water	87
<b>Thiocyanate ISE</b>	
Electrode	91
Solutions	91, 98
<b>Total Alkalinity Test Kit</b>	87
<b>Total Ionic Strength Adjustment Buffer (TISAB)</b>	97
<b>Triode</b>	68, 69
<b>TRIS Compatible pH Electrodes</b>	
AquaPro Professional	69, 74-76, 78
Double Junction	71, 73, 77
Green (Lead Free)	72, 76
KNiPHE	79
No Cal	69
PerpHecT ROSS Micro	73
ROSS	70-72, 74, 75, 78, 79
ROSS Ultra	68, 70, 72, 74, 78
<b>Turbidity Meter</b>	120, 121
<b>Ultra Pure Water Kits</b>	87
<b>USP Kit</b>	26-29
<b>Water Hardness Solutions</b>	98



## Thermo Scientific Orion Service Program Options

Our leadership shows up in everything we do including:

- Minimized ramp up time
  - Ongoing support
- Flexible data reporting and analysis
- Low cost of ownership
- Comprehensive support solutions for all phases of the product life cycle
  - Immediate access to experts worldwide



**Service Programs:** Flexible service programs provide fixed-price solutions, offering benefits over the traditional time and materials, per-quote based model. So you get improved ROI, minimized downtime, unmatched flexibility, better staff utilization and increased productivity.

- Maintenance, Calibration and Validation • Training • Start-Up and Application Assistance • Field Service (Where Applicable)

**Product Service Options:** A variety of service options are now available for all products to get you up and running quickly and to make sure you continue to operate at the highest performance possible. Set-up services and training options are available to minimize ramp up time so results are expedited rapidly and accurately. Avoid downtime by choosing a preventative maintenance program that meets your high demands for quality and accurate results, or select a two or three year extended warranty to ensure you are minimizing the possibility of downtime due to an unforeseen failure.

### Product Service Options

Qualified Systems	Description	Specialized Maintenance programs	Start-Up	Calibration and Validation	IQOQ
AF8 and Turbo II	Karl Fischer Titrators	•	•	•	•
Orion Star, Orion Star Plus, Orion Star A and Orion VERSA STAR	Portable and Bench-Top Meters	•	N/A	•	•
Auto Samplers	Automatic Sampling Systems	•	N/A	•	N/A
10060020	BOD AutoEZ	•	•	•	N/A

**Service Contracts – Contracts for Start-up and Training are available in North America only.**

**Specialized Maintenance Programs – Are available world wide.**

**Call or E-mail our Technical Service Team for more information and current prices for any programs required to assure trouble-free long term performance.**

### “Orion Star, Orion Star Plus, Orion Star A and Orion VERSA STAR” Series Service Options, Calibration and Validation:

You'll feel confident your results are accurate and exact when taking advantage of our calibration and validation options. We have a range of testing, validation and calibration programs to satisfy even the most exacting standard. Our dedicated validation and calibration consultants offer in-depth expertise and a full understanding of compliance requirements. It is recommended that these options be performed annually, based on your application demands.

Stay in specification compliance by simply sending your Orion Star series meter to us, where calibration and validation will be performed to your choice of standards. We will return your meter along with a certificate of validation that includes calibration details and test results.

**IQ/OQ Package:** Save time and money when you purchase the IQ/OQ package to ensure that your meter performs to the manufacturer's published specifications. Full IQ/OQ documentation is available for the Orion Star series meters to perform a comprehensive installation and operation on your meter and satisfy the requirements of regulated industries such as pharmaceutical.

### All Thermo Scientific Orion Products in Warranty Support:

“Orion Star, Orion Star Plus, Orion Star A and Orion VERSA STAR” meters carry a three-year warranty that includes return-to-factory, repair or replace on a reasonable efforts basis, phone support, web support, and any software maintenance releases.

**Spare Parts:** To help you keep your instruments operating at the highest levels of accuracy and efficiency, we offer factory authorized parts at prices comparable to those of generics. All parts, accessories, and consumables are performance-certified and fully warranted to perform to our products' rigorous design specifications.



The specifications, descriptions, drawings, ordering information and part numbers within this document are subject to change without notice.

This publication supersedes all previous publications on this subject.

**Алматы** (7273)495-231  
**Ангарск** (3955)60-70-56  
**Архангельск** (8182)63-90-72  
**Астрахань** (8512)99-46-04  
**Барнаул** (3852)73-04-60  
**Белгород** (4722)40-23-64  
**Благовещенск** (4162)22-76-07  
**Брянск** (4832)59-03-52  
**Владивосток** (423)249-28-31  
**Владикавказ** (8672)28-90-48  
**Владимир** (4922)49-43-18  
**Волгоград** (844)278-03-48  
**Вологда** (8172)26-41-59  
**Воронеж** (473)204-51-73  
**Екатеринбург** (343)384-55-89

**Иваново** (4932)77-34-06  
**Ижевск** (3412)26-03-58  
**Иркутск** (395)279-98-46  
**Казань** (843)206-01-48  
**Калининград** (4012)72-03-81  
**Калуга** (4842)92-23-67  
**Кемерово** (3842)65-04-62  
**Киров** (8332)68-02-04  
**Коломна** (4966)23-41-49  
**Кострома** (4942)77-07-48  
**Краснодар** (861)203-40-90  
**Красноярск** (391)204-63-61  
**Курск** (4712)77-13-04  
**Курган** (3522)50-90-47  
**Липецк** (4742)52-20-81

**Россия** +7(495)268-04-70

**Магнитогорск** (3519)55-03-13  
**Москва** (495)268-04-70  
**Мурманск** (8152)59-64-93  
**Набережные Челны** (8552)20-53-41  
**Нижний Новгород** (831)429-08-12  
**Новокузнецк** (3843)20-46-81  
**Ноябрьск** (3496)41-32-12  
**Новосибирск** (383)227-86-73  
**Омск** (3812)21-46-40  
**Орел** (4862)44-53-42  
**Оренбург** (3532)37-68-04  
**Пенза** (8412)22-31-16  
**Петрозаводск** (8142)55-98-37  
**Псков** (8112)59-10-37  
**Пермь** (342)205-81-47

**Казахстан** +7(7172)727-132

**Ростов-на-Дону** (863)308-18-15  
**Рязань** (4912)46-61-64  
**Самара** (846)206-03-16  
**Санкт-Петербург** (812)309-46-40  
**Саратов** (845)249-38-78  
**Севастополь** (8692)22-31-93  
**Саранск** (8342)22-96-24  
**Симферополь** (3652)67-13-56  
**Смоленск** (4812)29-41-54  
**Сочи** (862)225-72-31  
**Ставрополь** (8652)20-65-13  
**Сургут** (3462)77-98-35  
**Сыктывкар** (8212)25-95-17  
**Тамбов** (4752)50-40-97  
**Тверь** (4822)63-31-35

**Киргизия** +996(312)96-26-47

**Тольятти** (8482)63-91-07  
**Томск** (3822)98-41-53  
**Тула** (4872)33-79-87  
**Тюмень** (3452)66-21-18  
**Ульяновск** (8422)24-23-59  
**Улан-Удэ** (3012)59-97-51  
**Уфа** (347)229-48-12  
**Хабаровск** (4212)92-98-04  
**Чебоксары** (8352)28-53-07  
**Челябинск** (351)202-03-61  
**Череповец** (8202)49-02-64  
**Чита** (3022)38-34-83  
**Якутск** (4112)23-90-97  
**Ярославль** (4852)69-52-93

<https://stabvolt.nt-rt.ru/> || [sos@nt-rt.ru](mailto:sos@nt-rt.ru)