## Key Description

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ⊙ | **power** | △ | **up arrow** | ☰ | **line select** | ☎ | **view log** |
| ⌁ | **calibrate** | ▽ | **down arrow** | ⚙ | **setup** | ▤ | **stir** |
| ⌱ | **measure** | ▦ | **digits** | | | | |

All connectors on the 5-Star benchtop meter are depicted below. All connectors on the 5-Star portable meter are highlighted in gray.

The 3-Star and 4-Star meters will have fewer connectors. For example, the 4-Star portable pH/ISE meter will only have BNC, 8 pin miniDIN (ATC), and RS232 connectors.

## Meter Connections

Stirrer Jack
DO AUTO-STIR™
or Stir Probe

BNC
pH/ISE

RS232          Power

Pin Tip
Reference

8 Pin MiniDIN
Cond/ATC

9 Pin
MiniDIN DO     Ground

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**Thermo Scientific
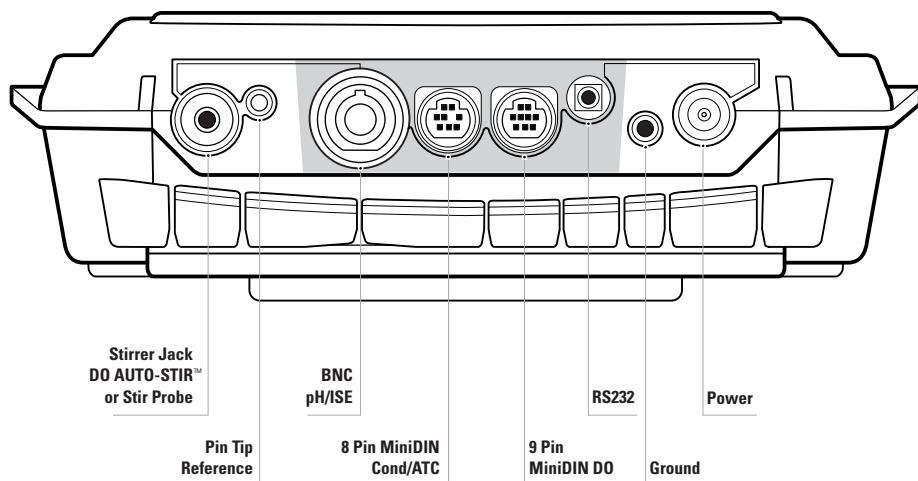Orion Star™ Series ISE Meter**

**ISE**   Quick Start Guide

## Preparation

1. Power adapter (benchtop models only) - Select the appropriate wall socket plug and slide the plug plate into the groove on the back of the adapter. **See A**.

   Batteries - Select four AA Alkaline batteries. Confirm that the meter is powered off and remove the battery cover. Orient and insert the batteries as depicted in the battery compartment housing. Replace the cover. **See B & C**.

2. Prepare the electrode according to the directions in the electrode instruction manual. In general, these steps include:

   • Gently remove the protective cap from the sensing element and save for storage.

   • For refillable electrode, remove the fill hole cover and fill the electrode with the appropriate fill solution. **See D**.

   • Soak the electrode in the storage solution specified in the electrode instruction manual. **See E**.
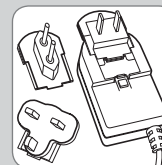
3. Meter connections - Connect the power adapter to the meter and then to the wall socket (benchtop meters only). **See F**. Connect the ISE electrode to the BNC input on the meter. **See G**. Connect the stir probe to the stir jack input on the meter (benchtop meters only). **See H**.

   *NOTE: Make sure that all unused inputs on the meter are covered with the black caps.* ▲
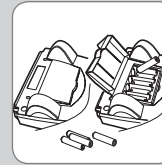
## Meter Overview

1. To power on the meter press the **power** key

2. Press the **line select** key to choose the top, middle, or bottom display line. The ▶ icon will point to the selected line.

3. In the measurement screen press the **up arrow** key to change the value on the top display line to ISE, pH, RmV, mV, or a blank line.

4. To escape out of any meter function press and hold the **measure** key until the meter returns to the measurement mode.

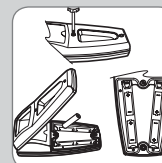5. The 4-Star and 5-Star ISE meters can be calibrated using up to five standards.
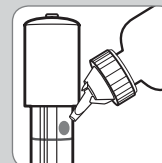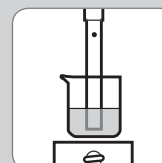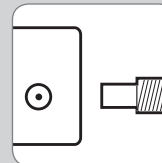
A

B

C

D

E

F

G
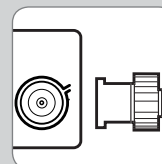
H
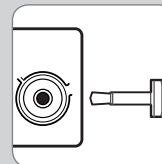
**Thermo**
S C I E N T I F I C

**1**

**2**

10 ppm | 100 ppm

**3**

**4**

DI

**5**

**6**

25.0°C
▶ 10.00 ISE mg/L
CAL.1

**7**

**8**

DI

**9**

**10**

25.0°C
▶ 100.0 ISE mg/L
CAL.2

**11a**

**11b**
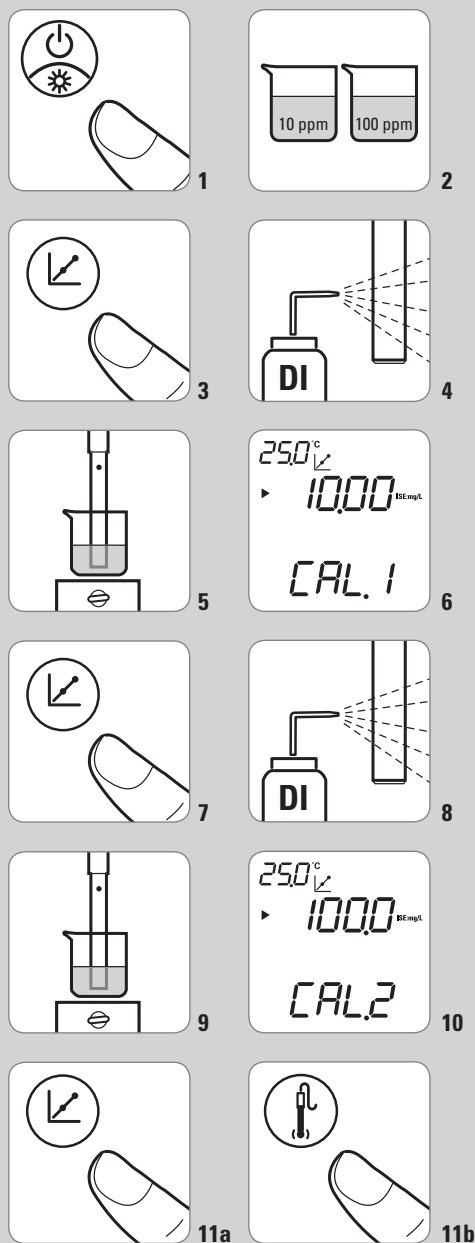
## ISE Calibration with Two Standards

1. Press the **power** key to turn on the meter. **See 1**.

2. Select two standards that bracket the expected sample concentration and are a decade apart in concentration. **See 2**. Always calibrate using the lowest concentration standard first and work up to the highest concentration standard last. Refer to the **ISE Resolution, Unit, and Range Selection** section to set the proper ISE resolution, units, and range.

3. Press the **calibrate** key. **See 3**.

4. Rinse the electrode with deionized water and blot dry with a lint-free tissue. **See 4**.

5. Insert the electrode into the lower concentration standard. **See 5**.

6. Wait for the **ISE** icon to stop flashing and the ▶ icon to start flashing. Enter the concentration of the standard by pressing the **up/down arrow** keys to adjust each digit and the **digits** key to move to the next digit. **See 6**.

7. Press the **calibrate** key. **See 7**.

8. Rinse the electrode with deionized water and blot dry with a lint-free tissue. **See 8**.

9. Insert the electrode into the high concentration standard. **See 9**.

10. Wait for the **ISE** icon to stop flashing and the ▶ icon to start flashing. Enter the concentration of the standard by pressing the **up/down arrow** keys to adjust each digit and the **digits** key to move to the next digit. **See 10**.

11. Press the **calibrate** key and then press the **measure** key to save and end the calibration. The slope will be displayed and then the meter will proceed to the measurement mode. **See 11a & 11b**.

## ISE Resolution, Unit, and Range Selection

1. Press the **setup** key.

2. Press the **up arrow** key until ISE is displayed on the top line.

3. Press the **line select** key to move the ▶ icon to the middle line. Press the **up arrow** key until rES is displayed.

4. Press the **line select** key to move the ▶ icon to the bottom line. Press the **up arrow** key to select the number of significant digits for ISE measurements. 1 is default setting.

5. Press the **line select** key twice to move the ▶ icon to the middle line. Press the **up arrow** key until UnIt is displayed.

6. Press the **line select** key to move the ▶ icon to the bottom line. Press the **up arrow** key to select the ISE measurement units. PPb is default setting.

  PPb = Parts per billion
n0nE = No units
   m = Molar
 mgL = Milligrams per liter (mg/L)
 PEr = Percent

7. Press the **line select** key twice to move the ▶ icon to the middle line. Press the **up arrow** key until rAng is displayed.

8. Press the **line select** key to move the ▶ icon to the bottom line. Press the **up arrow** key to select the ISE calibration range. HIgH is default setting.

 HIgH = Moderate to high level calibration standards
 L0w = Low level calibration standards that require more stabilization time

9. Press the **line select** key to move the ▶ icon to the top line. Press the **measure** key to return to the measurement mode.

## ISE Measurements

AUTO-READ™ is the default measurement mode. Continuous or timed measurement modes can be selected in the setup menu.

1. Rinse the electrode with deionized water, blot dry with a lint-free tissue, and insert the electrode into the sample.

2. If the meter is in AUTO-READ mode, press the **measure** key to take a measurement. Once the reading stabilizes the **AR** icon will stop flashing and the display will freeze. Press the **measure** key again to take a new measurement.

   If a stir probe is connected it will start stirring when the **measure** key is pressed and stop stirring when the **AR** icon stops flashing (benchtop meters only).

3. If the meter is in the continuous or timed measurement modes the meter will continuously take measurements and update the display. Once the reading stabilizes the **ISE** icon will stop flashing.

   If a stir probe is connected press the **stir** key to start stirring and press the **stir** key again to stop stirring (benchtop meters only).

## Printing Data

In the AUTO-READ and continuous measurement modes, every time the **measure** key is pressed the meter logs the data on the display. In the timed measurement mode the meter logs the data at the predetermined time interval.

1. Press the **view log** key

2. Use the **up arrow** key to scroll between CAL0 (print the calibration log) and SEnd (print the measurement log).

3. Press the **line select** key to print the data.

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