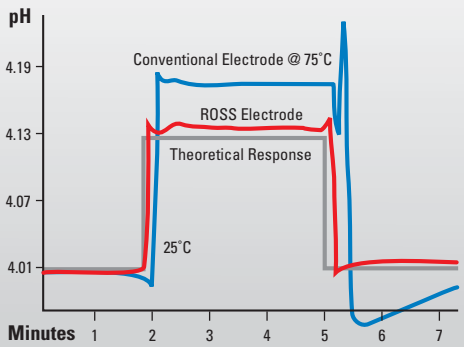
Thermo Scientific Electrode Styles

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 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 ºC and show rapid response and stability even when measuring samples that differ by as much as 50 ºC. 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 that 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 ºC:** Accurate within 0.03 pH for buffer at any temperature between 0-100 ºC using automatic temperature compensation
- **Speed of Response in 6.86 buffer going from 25 to 75 ºC:** Response stable to 0.01 pH within 30 seconds
- **Speed of Response between 6.86 and 4.01 buffers at 25 ºC:** Response stable to 0.002 pH within 15 seconds
- **Mercury free, TRIS, protein and sulfide compatible**