

ServiceXXL



INGOLD

Leading Process Analytics

THORNTON

Leading Pure Water Analytics

Depot Services

Conductivity Sensor Calibration

Transmitter Calibration

Sensor & Transmitter Calibration

Cal & System Suitability Testing for TOC

Dissolved O2 Rebuild

Loop Verification

Housing Maintenance

Aftermarket Services
to Ensure Customer Satisfaction

METTLER TOLEDO

Tailored Services to Ensure Product Performance

METTLER TOLEDO specializes in the area of precision instruments and offers the most comprehensive range of services through a global network of dedicated professional staff. As part of the METTLER TOLEDO group, the Process Analytics division with its two business units INGOLD and THORNTON focuses on liquid analytical measurement solutions to control industrial production processes.

INGOLD

Leading Process Analytics

The INGOLD product lines for the measurement of pH, DO/O₂, CO₂, conductivity and turbidity parameters have firmly established METTLER TOLEDO as a worldwide leader in process analytical measurement system technology for the biotechnology, pharmaceutical and food and beverage industries.

THORNTON

Leading Pure Water Analytics

THORNTON has been recognized by the pharmaceutical, semiconductor, and power industries as the technology leader in measurement systems for ultrapure water involving the measurements of conductivity, resistivity, TOC (Total Organic Carbon) and ozone.

Product Lifecycle Support:

Mettler-Toledo Process Analytics provides full service coverage worldwide to its customers, supports them with a customized, lifelong service management and assists them in managing measurement loops throughout the product life-cycle.

Depot Service:

Our Depot-Service center is based at our manufacturing excellence center in Bedford, MA and supports our worldwide sales and service channels. We offer fixed-price calibration and repair services for all our manufactured products as well as some conductivity sensors and transmitters manufactured by our competitors.

In summary, we offer the following depot services:

- Sensor and transmitter recalibration
- TOC calibration and system suitability testing
- Dissolved Oxygen probe membrane/rebuild
- Loop verification
- Ozone Verification Testing
- Standard repair services

Field and Training Service:

For customers who cannot send their products back to our depot services, we offer field service coverage where our certified field service engineers travel to the customer's site to provide services ranging from a simple product commissioning to advanced troubleshooting. This service is especially useful for customers whose processes dictate in-line and real-time maintenance.

Our training services are designed for customers who are interested in learning more about the technology and concepts behind the different measurement points. The training service can either be offered at our facility in Bedford, MA or at the customer's site.

All of the above services can be availed by calling us at 1-800-642-4418 or using our website at www.mt.com/pro

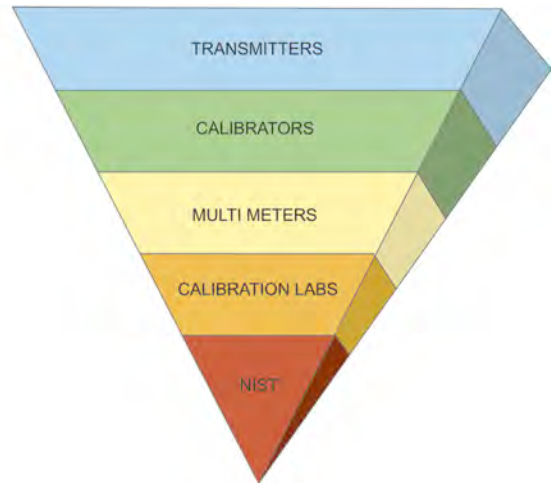


Calibration of sensors & systems

for the Measurement of Conductivity & Resistivity

Our products and calibration equipment are all NIST traceable. All the records and certificates for our calibration equipment are maintained and documented in our ISO quality management system. This helps us to be very responsive to customer requests regarding traceability standards and certificates

For each of the following categories, complete system calibrations can be performed using the customer's transmitters, sensors and/or calibrators in order to reduce any individual component error.



Recalibration	Details
Transmitter and calibrator recalibration	Recalibration with NIST traceability
Sensor/System Calibration	Details
Standard conductivity calibration	Calibration performed on Ultrapure water loop at 25°C (77°F)
Calibration at a specific temperature	Conductivity and temperature calibration performed between 5 and 90°C (41°F and 194°F)
ASTM verification	Standard calibration verified to ASTM D1125 and D5391
ASTM verification with historical data	Verification using previous calibration data
System suitability test and calibration for TOC analyzers	Details
System suitability	Verification that the TOC system meets USP <643> and EP 2.2.44 using Sucrose and Benzoquinone solutions at 500ppb
Calibration	TOC calibration at 250ppb and 500ppb Sucrose and conductivity sensor calibration with ASTM traceability.

Conductivity sensor calibration

for Precise Measurement & Regulatory Compliance

The customer's sensor performance is compared to a known standard, and calibrated to match ASTM & NIST standard, if necessary. All the below re-calibrations come with a Certificate of Calibration that provides "as found" and "after calibration" data, enabling the customer to monitor the sensor performance.

Re-calibration- for 0.1cm-1 or 0.01cm-1 sensor: Provides ASTM-traceable calibrations of cell constant to $\pm 1\%$ at 18.2M Ω -cm (0.055 μ S/cm) and NIST-traceable calibration of temperature to $\pm 0.1^\circ$ C at 25°C. Specify CAL-20.

Re-calibration- for 10cm-1, 50cm-1 or 4-electrode sensor: Provides ASTM-traceable calibrations of the cell constant and NIST-traceable calibrations of the temperature measurement at ambient temperature (22°C \pm 5°C). This calibration is for conductivity sensors that measure high conductivity solutions (10 μ S/cm to 1S/cm). Specify CAL-21

Calibration at a Specified Temperature- Provides NIST-traceable calibration of temperature to within 5°C of a user-specified temperature between 5°C and 90°C, and ASTM-traceable calibration to $\pm 1\%$ in pure water at the specified temperature. This calibration is recommended where highly accurate elevated temperature measurements are required such as in hot deionized water. Includes calibration report. Specify calibration temperature with CAL-31.

ASTM Verification- Sensors are calibrated per Standard Calibration (as detailed above), then are verified directly in ASTM D1125 Solution D (146.9 μ S/cm). This calibration is recommended where direct ASTM traceability and/or verification over a range is required, such as USP Purified Water or Water for Injection (WFI). Includes the calibration report. Specify CAL-32.

ASTM Verification with Historical Data- Sensors are calibrated per ASTM Verification (as detailed above). Also included with this calibration is the performance in ASTM D1125 Solution D using previous calibration values. This calibration is recommended where direct ASTM traceability and/or verification over a wide conductivity range is required along with an historical record of performance in the ASTM solution. Specify CAL-33.

Conductivity Recalibration of 10 cm-1, 50 cm-1, and 4-Electrode Conductivity Sensors- Provides ASTM-traceable calibrations of the cell constant and NIST-traceable calibrations of the temperature measurement. This calibration is for conductivity sensors that measure high conductivity solutions (10mS/cm to 1 S/cm). This calibration includes "As Found" and "As Left" readings taken at ambient temperature and at a single customer-specified conductivity value. Specify CAL-34.

Parameter	Measured	Reference	Deviation	Limit (+/-)	Status
Cell Constant	0.0000	0.0000	0.0000	0.0000	PASS
Temperature Coefficient	18.137	17.879	-0.258	0.009	PASS
Temperature (°C)	24.95	24.95	0.00	0.02	PASS

Transmitter and Calibrator calibrations to Reduce Individual Component Error

All transmitters and calibrators require periodic calibration to ensure that the products are working to the specified performance limits. Calibration of the transmitter and calibrators ensures accurate performance of the total measurement loop. In many instances, a good working sensor has been discarded due to a wrong reading at the transmitter.

Transmitter calibration

Calibrations are performed at our facility in Bedford, MA. Each calibrated instrument is supplied with a Certificate of Calibration that provides "as found" and "after calibration" data, enabling the customer to monitor the transmitter performance.



M300 and 770MAX

The following transmitters can be re-calibrated:

- M300
- 770MAX
- 200/2000 series
- DOT 2, 740 series, 770PC, and 800 series



M300 Conductivity Calibrator

Calibrator calibrations

Calibration modules for 200CR, 2000 & 770PC are recalibrated and certified with NIST traceability for resistance, temperature, and voltage as applicable. Specify one CAL-10 for each plug-in module.

1875 Smart Calibrator for 770MAX is recalibrated and certified with NIST traceability for resistance, temperature, voltage, and frequency. Specify CAL-11.

M300 calibrator for the M300 transmitter is recalibrated for resistance and temperature values. Specify CAL-12



1875 Smart Calibrator

System Calibrations to Meet Your Stringent Quality requirements

Standard System Calibration- A standard sensor calibration ($\pm 1\%$ cell constant at 25°C) that uses the customer's calibrator, transmitter, and sensor to perform a system calibration, thus minimizing individual component error. The customer's patch cord may also be included in the system if desired. Includes calibration report of system accuracy at $18.2\text{M}\Omega\text{-cm}$ (0.055 S/cm). Specify CAL-40.

Specified Temperature Calibration- The same as the Calibration at a Specified Temperature (CAL-31) but the customer's calibrator, transmitter, and sensor are used to perform a system calibration at the user-specified temperature between 5°C and 90°C . This calibration is recommended where highly accurate elevated temperature measurements are required such as in hot deionized water. Includes calibration report. Specify calibration temperature with CAL-41.

ASTM Verification Calibration- The same as the ASTM Verification (CAL-32) but the customer's calibrator, transmitter, and sensor are used to perform a system calibration, which minimizes individual component error. This calibration is recommended where direct ASTM traceability and/or verification over a wide conductivity range is required. Includes calibration report. Specify CAL-42.

Conductivity Recalibration of 10 cm-1, 50 cm-1, and 4-Electrode Conductivity Sensors- The same as CAL-34 but the customer's calibrator, transmitter, and sensor are used to perform a system calibration, which minimizes individual component error. Provides ASTM-traceable calibrations of the cell constant and NIST-traceable calibrations of the temperature measurement. This calibration is for conductivity sensors that measure high conductivity solutions (10mS/cm to 1 S/cm). This calibration includes "As Found" and "As Left" readings taken at ambient temperature and at a single customer-specified conductivity value. Specify CAL-43.

Two-Point Temperature Calibration- A NIST-traceable two-point temperature calibration near 0°C and 100°C and resistivity calibration at $18.2\text{M}\Omega\text{-cm}$. Includes calibration report. Specify CAL-44.

System Calibration of Meter and Two Sensors- The same procedure as CAL-40 but allows for TWO sensors (0.01 cm-1 or 0.1 cm-1 styles only) on a single transmitter. Includes a system calibration report for each sensor. Specify CAL-45.



Calibration & System Suitability Testing For Total Organic Carbon Products

The United States Pharmacopoeia (USP) <643> and European Pharmacopoeia (EP) 2.2.44 require that TOC analyzers used to measure Water for Injection (WFI), Purified Water (PW) and Highly Purified Water (HPW), be periodically challenged with two known concentrations of carbon to assure system performance. The two compounds required by both USP and EP are 500µg/L (ppb) of carbon as sucrose and 500µg/L of carbon as p-benzoquinone, which must be freshly prepared prior to the test. The ratio of response to the two compounds must be within 85-115%.

Mettler-Toledo Thornton offers in-factory services to support the 550TOC Analyzers and the 5000TOC Sensor. The 550 TOC Analyzers require routine calibration and calibration to ensure proper operation and to optimize performance. Documentation of this service includes a Certificate of Calibration provided with each calibrated analyzer.

The 5000TOC Sensor requires periodic system suitability testing and calibration to ensure optimal performance and to demonstrate compliance with USP and EP requirements. The services performed use methods and equipment traceable to national standards.

– System Suitability Testing is available at our depot service center before the TOC analyzer is shipped or when the analyzer is returned for routine maintenance and/or calibration. All the solutions required for the suitability testing and calibration are freshly prepared in our solutions laboratory before their usage.



Complete Sensor Rebuilds for Dissolved Oxygen Products

We offer anode/cathode replacements for all the Dissolved Oxygen Products manufactured by Mettler-Toledo. The rebuild includes replacing the existing components with new anode/cathodes, new o-rings and new membranes. All the returned products are cleaned, rebuilt and tested prior to shipment. All the rebuilt products come with a six month warranty against manufacturer's defects.



Loop Verification

This service verifies that the loop, which consists of a sensor, transmitter and a cable, is functioning to the specifications as listed by the product specifications. This service is especially useful for pharmaceutical customers, system fabricators and engineering firms who have to follow stringent regulatory and customer requirements.

A 'Certificate of Verification' will be shipped along with the products.

Housing Maintenance

For optimal process endurance, we recommend a periodic maintenance schedule of your Housing products. Our maintenance service performs the following functions:

- Cleaning the housing thoroughly to remove any dirt sticking to the insides of the housing.
- Changing the o-rings
- Checking for alignment
- Pressure testing to ensure product performance

A service report accompanies every serviced product for the customer's reference and documentation.

www.mt.com/thornton

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