JOFRA calibration
AMETEK

RTCt-159

Reference Temperature Calibrator

ULTRA COOLER

Advanced Touchscreen • Wireless Connectivity
• Extreme Cooling

Temperature Range: –100 to 155°C (–148 to 311°F)

Designed for Versatility

he RTCt models usher in a new era of precision and user-centricity in temperature calibration by offering a comprehensive feature set meticulously designed to improve your workflows. Experience the easy, intuitive navigation through the touchscreen interface. Wireless connectivity streamlines data transfer and facilitates remote monitoring, while innovative graphical presentations enhance clarity and expedite analysis.

The RTCt-159 provides the optimal combination of accuracy, ultra-stable performance, and unmatched speed across an extended temperature range, merging the RTCt platform with the extreme cooling capabilities of the original RTC-159. The features and benefits of the popular RTC series are fully maintained – and enhanced – in the RTCt-159, to name a few:

- Patented DLC (Dynamic Load Compensation) system for perfect temperature uniformity in the insert.
- Fast heating and cooling to reduce calibration time.
- Lightweight and easy to carry around.
- High profile design and well-known, long lasting Jofra quality.

Advanced Touchscreen Display: Provides an intuitive navigation, operation and all relevant data at your fingertips. Experience clear numerical values, step-by-step instructions, and graphical representations that elevate your calibration process.

Wireless Connectivity: Monitor, control and analyze calibration data in real-time through a web browser interface, from anywhere in your facility or even remotely. This wireless functionality reduces the need to be physically present at the calibrator, saving time and ensuring efficient calibration processes.

Two Sensor Under Test Inputs: With the ability to simultaneously calibrate two sensors, the RTCt-159 offers a comprehensive solution for even complex calibrations effectively doubling the calibration capacity per run.

Designed for Versatility: The RTCt-159 is an essential tools across industries such as pharmaceuticals, food and beverage, aerospace, automotive, and power generation. These calibrators ensure precise and reliable sensor calibration for regulated environments, high-throughput manufacturing, and critical quality control, meeting the demands of both laboratory and field applications with unmatched accuracy and ease of use.

Intelligent Reference Sensors: Jofra reference sensors are supplied with intelligent plugs, holding the calibration data (coefficients, serial number and calibration date) of the reference sensor. This is a truly plug n' play calibration system.

Enhanced Efficiency, Time and Sustainability: The RTCt-159 temperature calibrator is designed with enhanced sustainability features, prioritizing efficiency and reducing environmental impact. Compared to previous models, the RTCt-159 offers shorter cooling times, reducing overall operational time for each calibration. Additionally, its optimized power consumption lowers energy usage while maintaining top-tier performance.

EURAMET: Best performing dry-block with regard to the EURAMET/cg-13 guideline for the testing of dry-blocks.

Optimized Calibration Workflows

The RTCt temperature calibrator is designed to support efficient calibration workflows through features that focus on usability, configurability, and clear data handling. This section describes how the RTCt platform supports calibration efficiency through user-defined setpoints, configurable interfaces, and structured data management..

User-Defined Setpoints for Streamlined Calibration

Define up to six custom temperature points to precisely match your specific sensor requirements. This eliminates the need for repetitive reentries of often used calibration temperatures, which streamlines workflow and maximizing efficiency.

User-Configurable Interface for Optimized Workflow

The RTCt platform offers a configurable user interface that can be adapted to different calibration tasks. By selecting the preferred UI view, users can prioritize the information most relevant to the current task, helping reduce distractions and support efficient operation during calibration.

Intuitive Data Management for Effortless Retrieval

The RTCt improves data management by introducing a user-definable data naming convention. Eliminate confusion from generic labels by implementing a system that reflects your unique calibration procedures. Assign meaningful names to your data sets, enabling effortless searching and retrieval. Say goodbye to time-consuming data mining and streamline your calibration workflow with the RTCt's intuitive data management capabilities.

Optimized Calibration Workflows

The RTCt temperature calibrator supports wireless connectivity, allowing monitoring and analysis of calibration data through a web browser interface. This enables users to follow calibration progress locally or remotely and can reduce the need to remain physically at the calibrator during longer calibration sequences.

Remote Access via Web Interface & Build-in Wi-Fi Hotspot

For wireless operation, the RTCt includes a Wi-Fi dongle, enabling cable-free connectivity and remote access. This supports flexible instrument placement and integration into different calibration environments. Built-in hotspot provides a secure, standalone connection.

Multiple Communication Interfaces

The RTCt platform supports several communication interfaces, including:

- Wi-Fi (via dongle)
- Ethernet
- USB

Open Communication Protocols

The RTCt supports ASCII-based communication protocols, enabling integration with external systems for automation, remote control, and data exchange. This supports use across industries such as pharmaceutical, food & beverage, energy, and manufacturing.

Scan for Hotspot

Scan for Browser Access

The Wi-Fi dongle is standard equipment in all RTCts

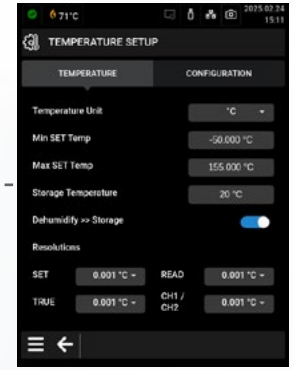
Touchscreen User Interface

The RTCt touchscreen user interface is designed to provide a clear overview of the calibration process and consistent access to key operating functions. The interface supports efficient setup, execution, and monitoring of calibration tasks through structured screens and visual indicators.
The following screens illustrate how calibration status, settings, and operating modes are presented during use.

The RTCt startup menu provides a simple and user-friendly interface, ensuring quick access to essential functions. Users can effortlessly select between: Calibration / Auto Calibration/ Switch Test/ Auto Step.

The RTCt main screen provides a clear, real-time view of the ongoing calibration with live progress, setpoints, and stability indicators. The intuitive graph dynamically adjusts for enhanced precision and deviation detection. Learn more on the next page.

Easily set and manage calibration temperatures with six customizable presets for quick selection. Effortlessly prepare for storage temperature setting for future use. The controller ON/OFF function provides seamless control, ensuring efficient operation and precision.



Easily configure system, temperature, and communication settings with an intuitive interface.

The RTCt UI ensures a clear and intuitive input experience, with active inputs highlighted in green and unavailable selections greyed out, eliminating any risk of incorrect connections.

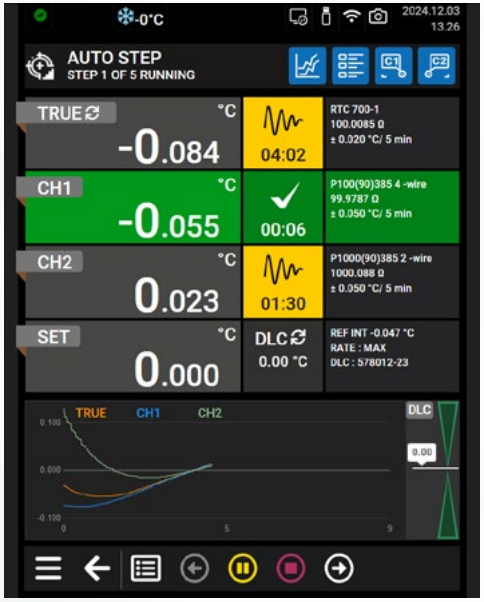
RTCt Series – Real-Time Calibration Graph (Patent Pending)

Traditional calibrators can display temperature over time. The RTCt Series adds a real-time calibration graph that adapts automatically based on the calibration phase and stability status.compliance.

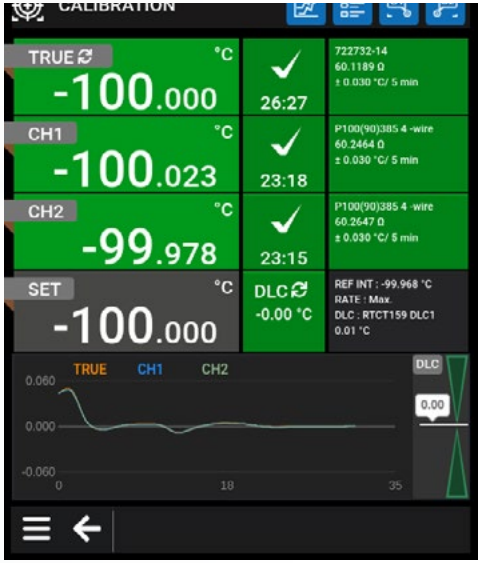
Exclusive Real-Time Calibration Graph – Patent Pending

Traditional calibrators can plot temperature over time, but they don't adapt dynamically. The RTCt Series introduces the first-ever real-time graphing system that adjusts automatically based on calibration stability.

- **Overview of the Calibration Process:** The calibration process begins with a broad full-cycle graph, which provides a clear, real-time view of your calibration's progression, helping users track temperature trends at a glance.
- **Setpoint Reference Line:** A dedicated line marks your set temperature, so you can instantly see when the calibrator reaches and maintains stability.
- **Automatic Precision Mode:** Once the calibrator reaches the setpoint and meets the stability criteria, the RTCt's graph intelligently shifts to a high-resolution relative view, magnifying even the smallest deviations.
- **Deviation Visibility:** The relative graph magnifies even the smallest variations, making it possible to detect tiny fluctuations that are otherwise difficult to see.
- **Patent-Pending Technology:** Only in RTCt – No other calibrator dynamically adjusts its graph based on calibration stability, giving you unrivaled visual confidence in your results.
- **Customizable Display:** All blue icons at the top of the screen can be easily toggled on or off, allowing users to focus only on the most relevant calibration data. This flexibility ensures a clutter-free interface tailored to individual workflows.
- **Seamless Documentation:** With a single tap of the print screen button, all on-screen information is instantly documented, preserving calibration data and highlighting even the most minute fluctuations for post-analysis.



See the entire calibration process at a glance, with a clear setpoint reference line for easy stability monitoring.



Automatically zooms in on micro-deviations once stability is reached, ensuring unmatched accuracy and confidence.

Precision Switch Testing – Clear, Reliable, and Fully Documented

Temperature switches are critical for safety, system control, and process reliability. Ensuring they activate at the correct setpoints is essential to prevent false alarms, avoid equipment failures, and minimize costly downtime. The RTCt Series takes switch testing to the next level with an advanced, highly visual switch test display, delivering instant clarity, precision, and comprehensive documentation.

- **Graph and Table Data on One Screen:**

The RTCt displays both the switch test graph and the test results table simultaneously. The graph plots switch activation points over time, making it easy to detect drift, response delays, or anomalies. The table logs exact activation and deactivation temperatures, ensuring precise traceability.

- **Hysteresis & Repeatability Analysis:**

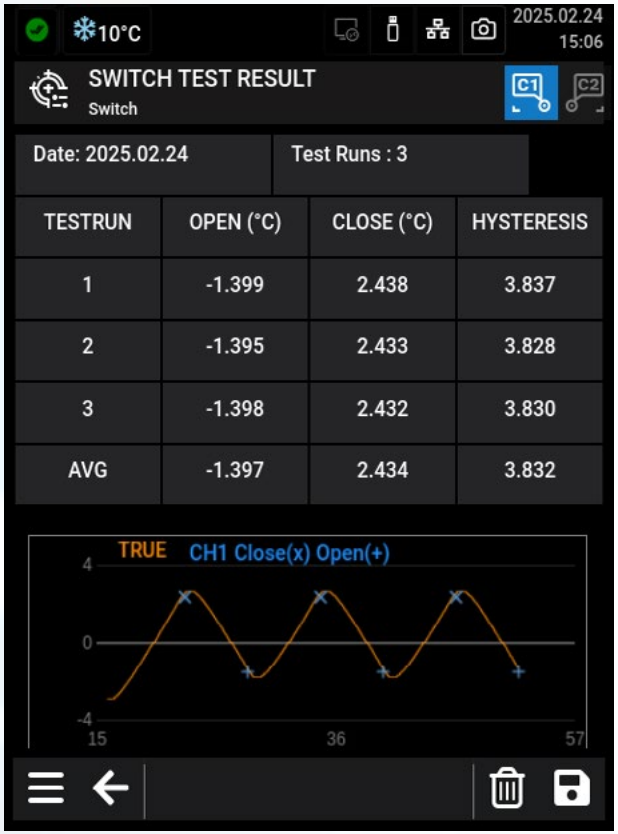
Understanding switch behavior isn't just about activation temperature; it's also about how consistently it triggers under repeated cycles. The RTCt makes it simple to see:

Hysteresis – The difference between activation and reset points.

Switch consistency – Does it switch at the same temperature every time?

- **Documentation at the Push of a Button**

With built-in print screen functionality, all displayed information – including graphs, test results, and activation trends – can be instantly documented for audits, compliance, and traceability.



Track switch activation points with dynamic status indicators, a real-time graph, and precise test results—all in one clear, intuitive display.

Precision Calibration through Dual-Zone and DLC Technology

The RTCt Series sets new standards for precision and uniformity in temperature calibration, thanks to AMETEK's proprietary Dual-Zone Heating Technology, Dual-Sensor calibration capability, and the Dynamic Load Compensation (DLC) system. These advanced technologies work together to deliver unparalleled temperature stability across the calibration zone, supporting complex and high-accuracy calibration needs.

Patent Pending

Active Dual-Zone Heating Technology

This innovative feature allows independent control over two heating zones within the calibration block, providing a precisely regulated environment. By maintaining consistent temperatures across both zones, the calibrator can minimize temperature gradients, even with variable sensor sizes or types. This technology is particularly valuable in applications where uniformity is critical, such as pharmaceuticals and quality control laboratories.

This technology is especially valuable for applications where temperature uniformity is critical, such as regulated industries, R&D laboratories, and high-throughput manufacturing environments.

Dual-Sensor Input for Parallel Calibration

The RTCt serie empower users to simultaneously calibrate two sensors, significantly boosting efficiency and productivity. This dual-input system eliminates the need for sequential calibration, allowing for parallel processes that streamline workflows and reduce downtime.

Patented Dynamic Load Compensation (DLC)

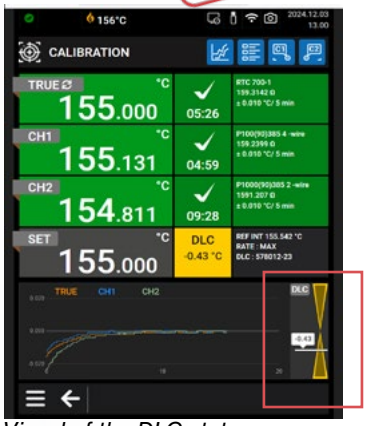
The DLC system dynamically adjusts for any thermal inconsistencies that may arise from different sensor loads or large sensor arrays. By continuously monitoring and compensating for load variations, DLC technology creates an exceptionally homogeneous temperature field. This capability allows for 'close-to-laboratory' performance, even in challenging industrial settings where diverse sensors are calibrated simultaneously.

DLC Indicator for Real-Time Monitoring

The RTCt screen features a Dynamic Load Compensation (DLC) indicator, providing instant feedback on calibration stability. Users can set custom DLC values, ensuring precise control over load compensation.

The DLC status is clearly displayed in three formats:

- **Visual Diagram** – Instantly track stability with a graphical representation.
- **Color Indicators** – Green (within threshold), Yellow (outside threshold), and Grey (no check for DLC threshold) for quick assessment. (The DLC threshold functionality is a patent pending feature.)
- **Data Table** – Numerical values provide detailed insights for accurate calibration decisions.



Visual of the DLC status

Enhanced Precision for Large or Multiple Sensors

The combination of dual-zone control and DLC technology makes the RTCt series ideal for calibrating large sensors or multiple sensors in a single run. By maintaining uniform heat distribution, these calibrators ensure that each sensor experiences the same stable temperature, regardless of load or configuration, leading to faster calibration and greater confidence in the results.

Why Dual-Zone and DLC Matter

These technologies address common issues like temperature inhomogenity and uneven sensor heating, which can lead to errors in calibration results. With Dual-Zone and DLC, the RTCt serie provide a level of stability and accuracy that meets even the most stringent industry standards, from EURAMET guidelines to specific regulatory requirements. This makes them invaluable tools for industries where accurate, repeatable calibration is essential, enabling users to achieve high-quality outcomes that support compliance and operational excellence.

AMETEK SENSORS, TEST & CALIBRATION

Intelligent Reference Sensors, Unique Sensor Design, and Multi-Hole Insert Kits

The RTCt temperature calibrators come equipped with specialized features that enhance their precision, versatility, and ease of use. These include intelligent reference sensors, uniquely designed sensors for varied applications, and multi-hole insert kits, all of which contribute to efficient and reliable calibration for a diverse range of sensor types and sizes.

Intelligent Reference Sensors

Each intelligent reference sensor stores its calibration data directly within the sensor itself, enabling true plug-and-play calibration. By automatically communicating its unique calibration coefficients to the RTCt unit, the sensor minimizes setup time, reduces error potential, and simplifies recalibration workflows. This innovation ensures every calibration is precise and traceable, supporting compliance with rigorous industry standards and reducing the need for manual data entry.

Sensor Design for Application Flexibility

The STS-200 reference sensors and the DLC sensors have been specially designed. They are both angled 90˚ and have been customized to fit the calibrator so they are only slightly higher than the top of the RTCt calibrator. The unique design makes it possible to calibrate threaded sensors and sensors with connection heads without any problems.

Sanitary Sensor and Insert.

Multi-Hole Insert Kits

For users who frequently calibrate different sensor sizes, the multi-hole insert kits are an invaluable addition. Each kit includes a variety of pre-drilled inserts, covering the most common sensor diameters without requiring multiple individual inserts. Metric and imperial insert options are available, ensuring that each calibration session is efficient and hassle-free. The inserts are designed to accommodate both standard reference sensors and DLC sensors, offering a consistent temperature environment that maintains the homogeneity needed for high-precision calibrations.

Enhanced Stability, Accuracy, and Support Features

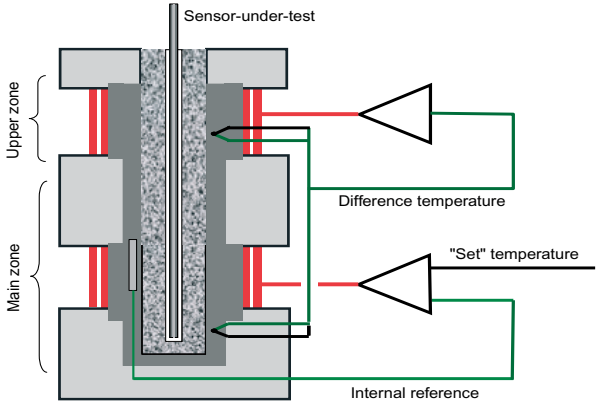
The RTCt temperature calibrators are equipped with innovative support and stability features that maximize accuracy, ease of use, and operational efficiency. These features make them indispensable tools for industrial environments requiring precise and repeatable calibration results.

Auto Stepping for Efficient Multi-Step Calibration

The RTCt series feature an Auto Stepping function, which allows users to pre-program up to 20 temperature steps, with customizable hold times at each step. This hands-off approach enables efficient multi-step calibrations, reducing manual intervention and providing consistent, repeatable results for complex applications. For labs and production environments that require repeat calibrations across set temperatures, auto stepping is particularly useful.

Highest Accuracy Calibration with Set-Follows-True (Models B & C)

Models B and C of the RTCt-159 delivers maximum accuracy through their unique Set-Follows-True function. This feature adjusts the calibration setpoint based on real-time readings from the external reference sensor, ensuring that the calibration zone temperature matches the target precisely. Set-Follows-True is especially valuable when accuracy is critical, as it eliminates the need for manual adjustments and delivers unmatched precision in every calibration.



Set Follows True and dual-zone technology - for improved accuracy.

Support Rod for Sensor Placement

Designed for convenience and ease of use, the optional support rod securely holds sensors in place during calibration, ensuring consistent contact and temperature exposure. Lightweight yet sturdy, the support rod is easy to attach and adjust, providing a stable setup that minimizes measurement errors from sensor movement, even in field conditions.

Direct Reading of Sensor Under Test (Model B Only)

For users who require real-time data from their sensors during calibration, Model B offers direct reading capabilities. This feature allows the calibrator to measure resistance, thermocouple, mA, and voltage directly from the sensor under test, eliminating the need for additional equipment. This capability is essential for applications that require immediate feedback or multi-sensor calibration setups, enhancing flexibility and efficiency.

Regulated DC Supply for Stable Temperature Control

The RTCt-159 operates on a regulated DC power supply, ensuring stable and consistent temperature control without the need for Mains Variance Immunity (MVI) technology. This design provides highly reliable performance in both laboratory and industrial environments.

Predrilled Inserts for Precision Calibration

The RTCt-159 is fully compatible with the RTC-159 insert system, supporting a wide range of sensor diameters for flexible calibration setups. All inserts are supplied with a matching insulation plug drilled with the appropriate holes.

PREDRILLED INSERTS FOR RTCt-159

All predrilled inserts have holes for:

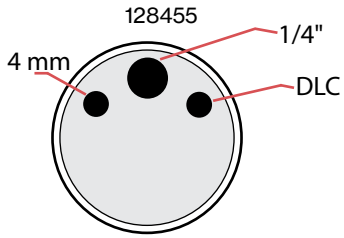
4 mm reference sensor • ¼" reference sensor • 3 mm DLC sensor.

All inserts are supplied with an insulation plug drilled with the necessary holes

Spare part no. for predrilled inserts with reference holes	
	Instrument
Sensor diameter	RTCt-159 A/B/C Order code
3 mm	128477
4 mm	128478
5 mm	128479
6 mm	128480
7 mm	128481
8 mm	128482
9 mm	128483
10 mm	128484
11 mm	128485
12 mm	128486
13 mm	128487
14 mm	128488
15 mm	128489
16 mm	128490
Package of the above inserts	128492

PREDRILLED INSERTS FOR RTCt-159 – IMPERIAL (inch)	
Sensor diameter	RTCt-159 A/B/C
1/8 in	128468
3/16 in	128469
1/4 in	128470
5/16 in	128471
3/8 in	128472
7/16 in	128473
1/2 in	128474
9/16 in	128475
5/8 in	128476
Package of the above inserts	128491

Inserts, undrilled incl. insulation plugs	
	Instrument
Inserts	RTCt-159 A/B/C Order code
5-pack, undrilled inserts with no holes	128453
5-pack, undrilled inserts with hole for DLC sensor	128454
5-pack, undrilled inserts with 2 holes for STS reference sensors (4mm & ¼") and 1 hole for DLC sensor	128455
Undrilled insulation plug	126040



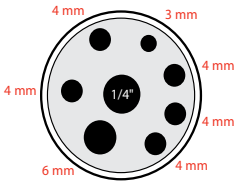
Multi-Hole Inserts for Versatile Calibration

The RTCt Series is designed for maximum adaptability, supporting a wide range of sensor types and diameters through a selection of versatile multi-hole insert kits. These precision-machined inserts help streamline calibration by securely accommodating multiple sensors at once, ensuring consistent temperature distribution and reliable, repeatable results.

MULTI-HOLE INSERTS FOR RTCt-159 - METRIC (MM)

All inserts are supplied with an insulation plug drilled with the necessary holes.

Spare part no. for multi-hole inserts - metric (mm)	
	Instrument
Insert type	RTCt-159 A/B/C - Order code
Multi-hole type 1	128456
Multi-hole type 2	128457
Multi-hole type 3	128458
Multi-hole type 4	128459
Multi-hole type 7	128462
Multi-hole type 8	128463
Multi-hole type 9	128464
Set of 4 Metric Multi Inserts, 3mm to 13mm (Incl. 127332, 127241, 127242 and 127243)	128466



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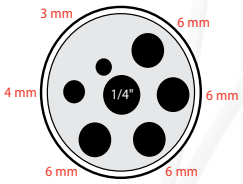

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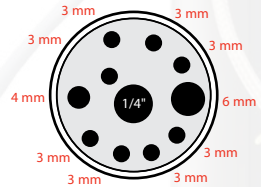

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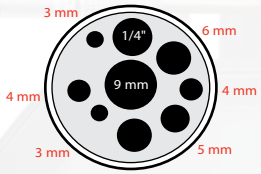

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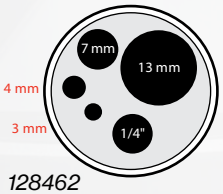

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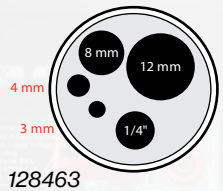

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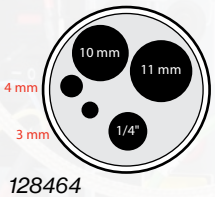

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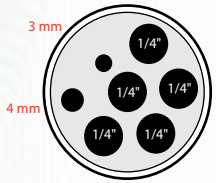
MULTI-HOLE INSERTS FOR RTCt-159 - IMPERIAL (INCH)

All inserts are supplied with an insulation plug drilled with the necessary holes.

Spare part no. for multi-hole inserts - imperial (inch)	
	Instrument
Insert type	RTCt-159A/B/C Order code
Multi-hole type 5	128460
Multi-hole type 6	128461
Multi-hole type 10	128465
Set of 3 Imperial Multi Inserts, 1/8 to 1/2 inch	127311



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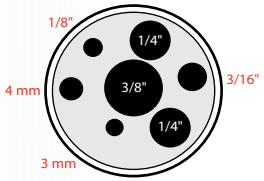

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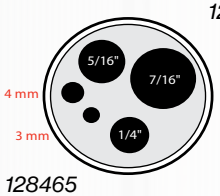
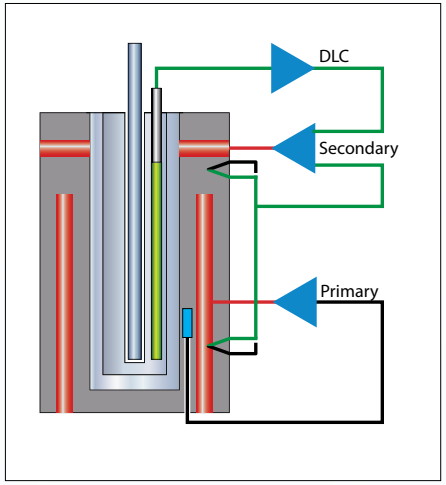


128465

DLC – Dynamic Load Compensation. Making Dry Calibration Accurate and Well Documented



To bring our well documented active dual-zone technology to an even higher level, we have developed the patented DLC system.

This feature makes it possible to perform top calibration specifications without being affected by the actual load, e.g. many sensors or very big sensors.

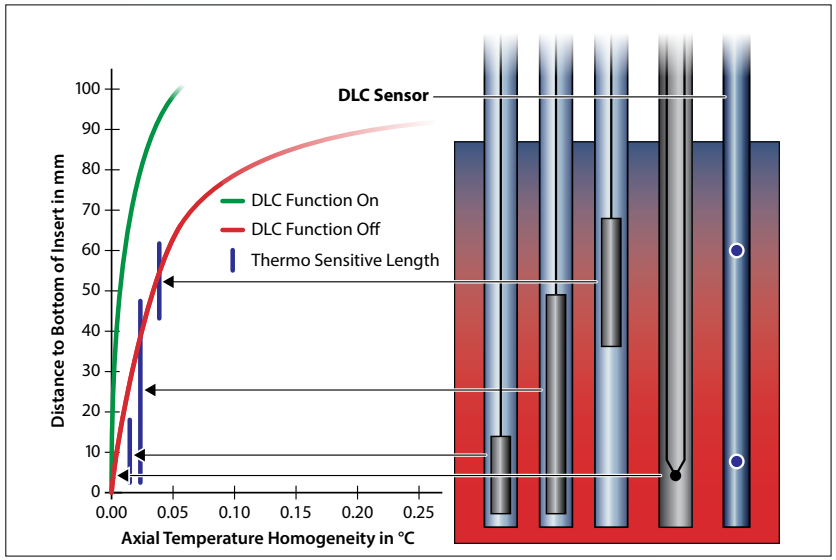
The DLC sensor improves on the RTCt calibrator's already advanced dual-zone technology by controlling the homogeneity in not only the well, but inside the insert where the sensors-under-test are placed during calibration. The DLC sensor measures the temperature homogeneity in the insert and provides feedback to the active dual-zone system, which compensates the temperature difference to a minimum inside the insert. In this way, the DLC function makes the homogeneity independent of the different loads of the insert, making the RTCt the best performing dry-block calibrator on the market when calibrated and tested according to the globally accepted EURAMET/cg-13 guideline for calibration and testing of dryblocks.

The DLC system is comprised of a special differential temperature sensor designed especially for the RTCt. The sensor is placed in the insert and connected to the calibrator. When the DLC function is enabled, the calibrator will automatically equalize the temperature homogeneity inside the insert, along with the normal temperature control and stabilization. **Note that DLC functionality can not be used when calibrating sanitary sensors.**

DLC – User Advantages

Calibrating with the DLC sensor offers the following advantages:

1. Calibration of several sensors simultaneously.
2. Calibration of thick sensors.
3. Gives TSL (Thermo Sensitive Length) independency. It is no longer necessary to know the TSL of the sensor.
4. Compensates for sensor production tolerances like the PT100 element being mounted in various positions in the sensor.
5. Trouble free calibration of sensors with PT100 elements up to 60 mm length.
6. The DLC indicator proves that the dual-zone is active and functioning well.
7. Proves that the calibrator is working perfectly. The DLC value should be very close to 0.00 when the calibrator is loaded with DLC sensor and an external reference sensor.
8. Together with the stability indication, the DLC indicates when the calibration values can be read.
9. JOFRA's unique, patented DLC system allows RTCt dryblock calibrators to perform with "close-to-laboratory" liquid bath performance.



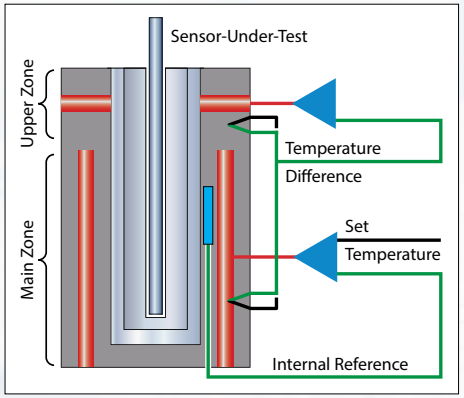
Axial temperature curves for an RTCt calibrator with and without the DLC functionality activated.

AMETEK SENSORS, TEST & CALIBRATION

High Accuracy Temperature Calibrator

Among the many features of the RTCt Series, one of the most important that our customers depend on is its high accuracy. Through years of innovation and patents, we have continued to solve challenges our customers face when calibrating a wide variety of temperature sensors.

Homogeneous Zones



The RTCt series of calibrators provide precision temperature calibration of sensors, whatever the type or format. Our innovative active dual-zone heating technology independently controls each heating zone. This control produces two homogeneous zones, increasing the chances that the sensing element of the sensor-under-test will reach one of these ideal calibration zones. The lower zone ensures optimum heat dissipation throughout the entire calibration zone, while the upper zone compensates for heat loss from the sensor-under-test and the open top. This design also eliminates the need for extra insulation of sensors-under-test and makes it possible to calibrate liquid-filled and other mechanical sensors.

DLC-159 Dynamic Load Compensation Sensor – RTCt-159

The DLC-159 sensor is specifically designed for use with the RTCt-159 calibrator. Positioned directly inside the insert, it measures temperature differences within the calibration zone and enables the patented Dynamic Load Compensation functionality. This ensures uniform temperature distribution across the insert, even when calibrating multiple or heavy sensors, and helps maintain accurate and repeatable results at all temperatures – especially down to –100 °C.

The DLC-159 accessory provides a complete solution for enhanced homogeneity control. It includes:

- DLC-159 differential temperature sensor
- Protective storage case
- Accredited calibration certificate
- User documentation

Reference Sensors

The RTCt-159 supports the JOFRA STS-200 intelligent reference sensors, which store calibration coefficients, serial numbers, and calibration dates internally. This ensures true plug-and-play functionality and eliminates errors from manual data entry. The 90° angled design of the STS-200 sensors allows them to fit perfectly within the 159 insert, even when calibrating threaded or head-mounted sensors.

The combination of STS-200 reference sensors, dual-zone technology, and DLC makes the RTCt-159 a highly accurate and fully traceable calibration system, ensuring stable, repeatable, and compliant calibration results across a broad range of industrial applications.

In addition to the DLC, all JOFRA intelligent reference sensors contain the calibration data inside the sensor. Using these sensors removes a source of error as the technician avoids manually entering calibration details. Special 90° sensors and cable-type sensors provide even more flexibility for unique calibration jobs.

Accessories and Supporting Products

We have a line of accessories and supporting products that further enhance the RTCt-159 temperature calibrator. These products provide options to pick and choose from depending on your application requirements. We have something to support almost any situation, from items that make calibrating and transporting easier to products that change and document the calibration process.

Specially Designed Carrying Case

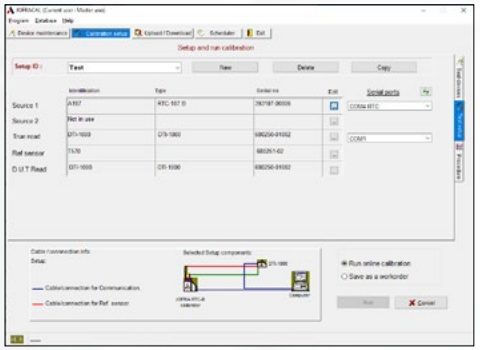
It's AMETEK has designed an all-in-one carrying case that makes it possible to store both the STS reference sensors and DLC sensors in the carrying case with optimum physical protection. There is room for inserts and insulation plugs to cover all sensor-under-test dimensions and compartments for the wires, manuals, certificates, plugs, insert tools, etc.calibrator. Cat. no. 128524.

Multi-Hole Inserts

We offer two multi-hole inserts to fit almost any sensor diameter without buying numerous inserts. One for metric and one for imperial, our inserts include many sizes and room for reference and DLC sensors. See page 11.

Integrated Support Rod

The integrated support rod helps to mount sensors under test. It is lightweight and mounts on two fixing holes integrated into the RTCt calibrator. Cat. no. 127277.



JofraCal Calibration Software

JofraCal is a highly versatile calibration software included with the RTCt calibrators. The software communicates with the RTCt to help ensure easy calibration of all kinds of temperature sensors, such as RTD's, thermocouples, transmitters, and thermoswitches.

JofraCal has a manual set-up that accepts user-entered data or an automatic mode that allows the RTCt to operate as a stand-alone instrument with work orders. The software stores all completed calibration information on the computer for easy retrieval and certificate printing.

For more information and details, visit our JofraCal website here.

JOFRA ASM Scanner

Using the JOFRA RTCt series together with the ASM, Advanced
Signal Multi-scanner, offers a great time-saving automatic solution to calibrate multiple temperature sensors at the same time. The ASM series is an eight-channel scanner controlled by the JofraCal software on a PC. Up to 3 ASM units can be stacked to calibrate up to 24 sensors at a time. It can handle signals from
2-, 3- and 4 wire RTD's, thermocouples, transmitters, temperature switches, and voltage.

Specifications

Functional Specifications

Temperature Range

@ ambient temp. 0°C / 32°F..... –100 to 155 °C / –148 to 311°F
@ ambient temp. 23°C / 73°F ....–100 to 155 °C / –148 to 311 °F
@ ambient temp. 40°C / 104°F .....–83 to 155 °C / –117 to 311 °F

Accuracy with External STS Ref. Sensor (models B and C)

-100 to 155°C/-148 to311 °F ..... *±0.06 °C / ±0.11 °F
23 to 155°C/73.4 to 311 °F.....**±0.09 °C / ±016 °F
-100 to 23°C/-148 to 73.4°F..... **±0.11 °C / ±0.20 °F

*12-month period. Relative to reference standard. Specifications by use of the external JOFRA STS-200 reference sensor.

* *Total system accuracy, 12 months, incl. STS sensor, and calibration uncertainty with accredited system calibration (RTCt calibrator with STS 200 Reference sensor / ISO/EN/IEC 17025).

Accuracy with Internal Ref. Sensor (models A, B, and C)

±0.25°C / ±0.45 °F
Total accuracy, 12 months, calibration uncertainty with accredited calibration (RTCt calibrator) / ISO/EN/IEC 17025).

Stability

±0.02 °C / ±0.04 °F

Measured after the stability indicator has been on for 15 minutes. Measuring time is 30 minutes

Resolution (user selectable)

All Temperatures..... 1° or 0.1° or 0.01° or 0.001°

Temperature Unit in Display

User Selectable ..... °C, °F, or K

Radial Homogeneity (difference between holes)

0.01°C/0.02°F

Heating Time

-100 to -23°C /-148 to 73°F ..... 12 minutes
23 to 155°C / 73 to 311°F ..... 14 minutes

Cooling Time

80 to -90°C / -176 to -130°F..... 20 minutes (Typ. 15 min.)
-90 to -100°C / -194 to -148°F..... 50 minutes (Typ. 25 min.)
23 to –100 °C / 73 to –148 °F .....135 minutes (Typ. 105 min.)
155 to –100 °C / 311 to –148 °F.....175 minutes (Typ. 145 min.)

Time to Stability (approx.)

10 minutes

Physical Specifications

Weight and Instrument Size (LxWxH)

Weight.....14.2 kg / 31.3 lb
(LxWxH) .....531 x 169 x 432 mm /20.9 x 6.6 x 17.0 in

Shipping (including carrying case)

Weight.....38.8 kg / 85.5 lb
(LxWxH) ..... 775 × 600 × 700 mm / 30.5 × 23.6 × 27.6 in

Shipping (carrying case only)

Weight.....15.5 kg /34.2 lb
(LxWxH) ..... 560 × 400 × 650 mm / 22.0 × 15.7 × 25.6 in

Input Specifications

All input specifications apply to the dry-block of the calibrator running at the respective temperature (stable plus an additional 20 minute period).

All input specifications are valid for the RTCt-168.

RTD Reference Input (models B and C)

Type .....4-wire RTD with true ohm measurements (1)
F.S. (Full Scale).....400 Ω
Accuracy (12 months)..... ±(0.0012% rdg. + 0.0005% F.S.)

	Temperature		12 Months	
RTD Type	°C	°F	°C	°F
Pt100 Reference	-100	-148	± 0.007	± 0.013
	0	32	± 0.008	± 0.015
	155	311	± 0.011	± 0.020

(1) True ohm measurement is an effective method to eliminate errors from induced thermoelectrical voltage.

DLC-159 Sensor Input (models B and C)

	Temperature		12 Months	
TC diff	°C	°F	°C	°F
DLC-159	-100	-148	± 0.014	± 0.025
	0	32	± 0.010	± 0.018
	155	311	± 0.010	± 0.018

Specifications

RTD Sensor Under Test Input (model B)

F.S. (range) . . . . . 400 Ω
Accuracy (12 months) . . . . . ±(0.002% Rdg.+0.001% F.S)
F.S. (range) . . . . . 4000 Ω
Accuracy (12 months) . . . . . ±(0.003% Rdg. + 0.003% F.S.)
2-wire. . . . . add 50mΩ

	Temperature		12 Months	
RTD Type	°C	°F	°C	°F
Pt100(90)385	-100	-148	± 0.013	± 0.024
	0	32	± 0.016	± 0.028
	155	311	± 0.020	± 0.035
Pt500(90)385	-100	-148	± 0.064	± 0.115
	0	32	± 0.070	± 0.125
	155	311	± 0.078	± 0.139
Pt1000(90)385	-100	-148	± 0.035	± 0.062
	0	32	± 0.039	± 0.070
	155	311	± 0.045	± 0.081

Thermocouple Input

Types: E, J, L, K, N, R, S, T, U, B
Range . . . . . –10mV to 78 mV
F.S. (Full Scale). . . . . 78 mV
Accuracy (12 months) . . . . . ±(0.005% Rdg. + 0.005% F.S.)

Transmitter Supply

Output Voltage . . . . . 24VDC ±10%
Output Current . . . . . Maximum 28 mA

Transmitter Input mA (model B)

Range . . . . . 0 to 24 mA
Accuracy (12 months). . . . . ±(0.005% Rdg. +0.010% F.S.)

Voltage Input VDC (model B)

Range . . . . . 0 to 12 VDC
Accuracy (12 months). . . . . ±(0.005% Rdg. +0.010% F.S.)

Switch Input (model B)

Switch Dry Contacts

Test Voltage. . . . . Maximum 2.5 VDC
Test Current. . . . . Maximum 0.7 mA

Mains Specifications

Voltage . . . . . 115V (90-127) / 230V (180-254)
Frequency, non US Deliveries . . . . . 50/60 Hz (47-63 Hz)
Frequency, US Deliveries . . . . . 60 Hz (57-63 Hz)
Power Consumption (max.) 350VA

Communications Interface

Serial Data Interface. . . . . USB 2.0 Device Port
Serial Data Interface. . . . . USB 2.0 Host Port (3x)*
LAN. . . . . Ethernet MAC 10/100 Base-T*

Miscellaneous

Operating Ambient Temperature. . . . . 0 to 40°C / 32 to 104°F
Storage Temperature. . . . . -10 to 50°C / 14 to 122°F
Humidity . . . . . 0 to 90% RH
Protection Class. IP-10

Inserts

All inserts are supplied with a matching insulation plug, except for custom designed Sanitary Sensor inserts.

Immersion Depth

190 mm/6.3 in

Insert Dimensions (Standard Insert)

Outer Diameter . . . . . 29.7 mm / 1.17 in
Inner Diameter (multi hole) . . . . . 25.6 mm / 1.01 in
Outer Diameter (single hole) . . . . . 22.0 mm / 0.877 in
Length. . . . . 150 mm / 5.91 in

Weight of Non-Drilled Insert (approx.)

290 g / 10.2 oz

Options & Accessories

Standard Delivery

Models A, B, and C Include:

- RTCt-159 dry-block calibrator (user specified)
- Mains power cable (user specified)
- Wi-Fi Dongle
- Accredited certificate - temperature performance
- Tool for insertion tubes
- JOFRACAL
- USB cable
- Set of rubber cones for insulation plugs
- Manual

Model B Instruments Also Include:

- Test cables (2 x red / 2 x black, with test clips)
- Accredited certificate - input performance for reference sensor and DLC sensor
- Accredited certificate - input performance for sensor-under-test inputs

Model C Instruments Also Include:

- Accredited certificate - input performance for reference sensor and DLC sensor

Accessories

Wi-Fi Dongle (Included as standard), ... **130817**
Extra fixture for sensor grip. **125066**
Extra sensor grip **125067**
Thermocouple Male Plug — Type J — Black. **120516**
Thermocouple Male Plug — Type K — Yellow **120517**
Thermocouple Male Plug — Type N — Orange. **120514**
Thermocouple Male Plug — Type T — Blue **120515**
Thermocouple Male Plug — Type R / S — Green **120518**
Thermocouple Male Plug — Type Cu-Cu — White **120519**
Carrying Case with Trolley. **128524**

Functional Comparison

Model A

RTCt-A reference temperature calibrator.

Model B

RTCt-B reference temperature calibrator with input for reference sensor, DLC sensor, and two sensors-under-test.

Model C

RTCt-C reference temperature calibrator with input for reference sensor and DLC sensor.

Models	Model A	Model B	Model C
Dual-zone heating/cooling block	■	■	■
MVI — Mains Variance Immunity (or similar)	■	■	■
Stability indicator	■	■	■
Automatic step function	■	■	■
USB communication	■	■	■
Display resolution 0.001°	■	■	■
Programmable max. temperature	■	■	■
External precision reference sensor input		■	■
External precision DLC reference sensor input		■	■
"SET" follows "TRUE"		■	■
Load compensation functionality		■	■
Input for RTD, TC, V, mA		■	
4-20 mA transmitter input incl. 24 VDC supply		■	
All inputs scalable to temperature		■	
Automatic switch test (open, close, and hysteresis)		■	
Download of calibration work orders from PC	■	■	■
Upload of calibration results (as found & as left)	■	■	■

Ordering Information

Base Model Number	
RTCt159	RTCt-159 series

Model Version	
A	Basic model, without input
B	Full model, incl. DLC sensor input, Reference sensor input, Sensor-under-test input
C	Middle model, incl. DLC sensor input, Reference sensor input

Power Supply (US deliveries 60 Hz only)	
115	115 VAC
230	230 VAC

Mains Power Cable	
A	European, 230 V
B	USA/Canada, 115 V
C	UK, 240 V
D	South Africa, 220 V
E	Italy, 220 V
F	Australia, 240 V
G	Denmark, 230 V
H	Switzerland, 220 V
I	Israel, 230 V

Insert Type and Size	
NON	NON, The inserts must be ordered separately (Page 11 and 12)

Dynamic Load Compensation (B and C models only—optional)	
DLC	DLC sensor

STS Reference Sensor (B and C models only—optional)	
R14	STS-200 Ref. sensor. Dia. 4mm. Length 192mm (STS200A917EH)
R15	STS-200 Ref. sensor. Dia. 1/4". Length 192mm (STS200B917EH

Calibration Certificate	
H	Accredited Certificate — ISO17025
EA	Full EURAMET Accredited Certificate — ISO17025
HS	System Calibration — Accredited Certificate — ISO17025 (B & C model only)
EAS	System Calibration — Full EURAMET Accredited Certificate — ISO17025 (B & C model only)
EASD	System Calibration — Full EURAMET Accredited Certificate with DLC — ISO17025 (B & C model only)

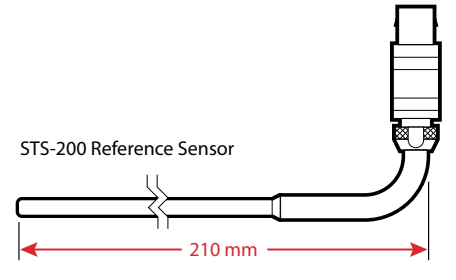
Base Model Number	
CT	Solid Protective Carrying case with trolley (Carrying case included in standard delivery)
TR	Solid Protective Carrying case with trolley & Support rod set

RTCt159 B 230 A NON DLC R2 EA CT

Sample Order Number

RTCt159B230ANONDLCR14EACT

JOFRA RTCt-159 B with 230VAC, EU power cord, no insert (to be ordered separately), DLC, 4 mm diameter STS-200 reference sensor, full EA temperature calibration certificate, and carrying case with trolley.



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