

RTC-158 & RTC-250

Combined Liquid Bath and Dry-Block Calibrator

Both for liquid
bath and dry-
block use



- **Wide Temperature Range**
RTC-158 from -22 to 155°C (-8 to 311 °F)
RTC-250 from 28 to 250°C (82 to 482°F)
- **High Accuracy**
Down to $\pm 0.04^{\circ}\text{C}$ ($\pm 0.013^{\circ}\text{F}$) using the external reference sensor. 4-wire True-Ohm-Measurement technology is used
- **Excellent Stability**
 $\pm 0.01^{\circ}\text{C}$
- **Excellent Temperature Homogeneity**
Unique active dual-zone block ensures good temperature homogeneity in the calibration zone
- **DLC Dynamic Load Compensation**
Perfect temperature uniformity in the insert, even when calibrating large sensors or many sensors at a time (B and C models only)
- **Intelligent Reference Sensor Communication**
- **USB Communication**



We continue to develop new techniques to improve performance, accuracy, convenience and functionality of the well-known calibration products. By doing so, we maintain our position as the leading worldwide manufacturer of temperature dry-block calibrators.

Advantages of the combined liquid bath/dry-block calibrator

Calibration of many sensors at a time due to more space for example in connection with validation of many thermocouples, which saves time

- Automatic calibration of as many as 24 sensors at a time
- For customers, who only want to use liquid baths
- For calibration of odd sizes and shapes of sensors including sanitary sensors
- WET = no need for inserts, that fit the sensors
- DRY = more space for calibration of special sensors
- Industries who need to calibrate many sensors at a time or short sensors can benefit from the big well
- JOFRACAL software and RTC B-models can handle on-line calibration and documentation of multiple sensors calibrated simultaneously

The RTC-158 and RTC-250

We are proud to introduce our new top model RTC (Reference Temperature Calibrator) series, which is even more sophisticated than any existing calibrators.

The RTC offers many new fantastic features, such as:

- Patent pending DLC, Dynamic Load Compensation system, for perfect temperature uniformity in the insert
- Unique intelligent sensors for plug'n'play connection
- USB connector for communication
- Easy-to-read color VGA display with perfect overview of the actual status
- Intuitive, fast and user-friendly navigation
- Lightweight and easy to carry around
- New functional carrying case design
- Multi-hole inserts covering all the most used sensor sizes
- High profile design and the well-known long-lasting quality

The new RTC calibrator comes in three different models – A, B, and C.

- RTC-A reference temperature calibrator
- RTC-B reference temperature calibrator with input for reference sensor, DLC sensor and sensors-under-test
- RTC-C reference temperature calibrator with input for reference sensor and DLC sensor Liquid bath / large diameter insert



Liquid Bath / Large Diameter Insert

The RTC-158/250 are fitted with a 160 mm (6.3 in) deep well with a diameter of 63.5 mm (2.5 in) and can be used both as dry-block calibrators and as liquid calibration baths with a magnetic stirrer.

A liquid bath and a dry-block diameter of 63.5 mm (2.5 in), which is twice the size of any other dry-block, are both new features. With these options, it is now possible to calibrate even more

temperature sensors simultaneously and to calibrate large as well as odd sizes and shapes of sensors, which is not possible with the remaining product range.

RTC-158/250 can be used without an external reference sensor, but if an STS-200 reference sensor is connected directly to a B or C version or the reference thermometer DTI-1000, you will obtain better accuracies and thereby use the full potential of the calibrators.

Liquid bath versus dry-block kit

The basic advantages of the liquid bath configuration versus the dry-block configuration are as follows:

- You do not need insertion tubes for all your different types of sensors
- You can calibrate sensors, which do not fit into insertion tubes
- You can calibrate glass thermometers and gas or liquid filled sensors
- You are ready to calibrate right away no matter what sensor you may have

The basic advantages of the dry-block configuration versus the liquid bath configuration are as follows:

- No hazardous hot liquids
- Easier to handle insertion tubes than liquids
- More convenient to carry than when filled with liquid
- No need for external exhaustion
- 100% repeatability in the sensor position in the block

All specifications given in the liquid bath configuration are based on the silicone oil supplied and recommended by us.





Intelligent Reference Sensors

The STS-200 intelligent reference sensor as well as the new DLC sensor are both containing all individual calibration data regarding the sensor.

Firstly, this means that the time-consuming coefficient downloading sequence with risk of errors is no longer necessary. Secondly, the user can change the reference sensor and be up and running immediately.

With the intelligent sensors, we have eliminated a source of error and the system is now giving a fail-safe plug'n'play calibration system.

Unique Reference Sensors



The new STS-200 reference sensor and the DLC sensor have both been specially designed. They are both angled 90° and customized to fit the calibrator so they are only slightly higher than the top of the RTC calibrator.

The unique design allows calibration of threaded sensors and sensors with connection heads without any problems

Easy to carry

A calibrator is carried from one job to another. Therefore, it is essential that the weight of the calibrator is as low as possible.

We have thoroughly included the weight issue in our design and have developed new design techniques that have made the RTC calibrator lightweight and easy to carry around without compromising its quality, durability and functionality.

The purpose of minimizing the weight of the RTC calibrator is to protect especially frequent users from overload.

Improved temperature calibration

Time is money! This is why all new RTC calibrators have an increased heating and cooling speed. Heating and cooling speed has been increased by up to 25%. The implication is savings in both production downtime and general calibration costs.

Multi-hole inserts

With the purpose of covering all sensor sizes, special multihole inserts have been developed.

Multi-hole inserts come in metric and imperial sizes.

Metric covers all standard sizes from 3 to 12 mm.

Imperial covers all standard sizes from 1/8 to 1/2 in.

These inserts have holes for both the DLC and two reference sensors (4 mm and 1/4"). These holes are marked for correct use.

With this multi-hole insert in the carrying case the user is able to calibrate all the most commonly known sensor sizes.



New Designed Basket

The sensor basket is designed to prevent sensors from interfering with the stirrer. Numerous tests have been carried out to find the optimum design of the sensor basket in regard to create the largest possible temperature homogeneous zone.

This work has resulted in a new sensor basket performing virtually zero axial and radial gradients in the calibration zone.



Intelligent Recalibration Information

In order to comply with ISO, SOP's and FDA it is imperative that the calibration equipment never exceeds the expiry of the calibration certificate. RTC calibrators are constantly checking calibration dates on the calibrator as well as for the connected STS and DLC sensors. If the calibration period has expired, a warning will appear in the display. This feature prevents costly consequence evaluation.

Easy-To-Read Color Display and User-Friendly Navigation

The new 5.7" full color VGA display is very easy to read. The main temperatures, like SET, READ, TRUE and SUT (Sensor under test) are always displayed at all stages of the programming or calibration procedure.

The navigation is menu-driven and very logical to use and the display shows any important information needed for the current function. The communication windows pop up and are followed by discrete sound messages. The display is very bright and the main information can easily be read from a distance.



The large display contains more detailed information at a glance, such as: Stability status • Load compensation status • Real time clock • Serial number of reference sensor • Sensor-under-test status

Integrated Support Rod

The new integrated support rod is part of the reduced weight philosophy. It is lightweight and very easy to mount on the RTC. Two fixing holes are integrated in the calibrator where the support rods can be mounted. The support rod is especially useful in bath calibration.

Special Designed Carrying Case

AMETEK has designed an all-in-one carrying case. We have now made it possible to store both the STS reference sensors and the DLC sensor in the carrying case with an optimum physical protection. There is room for inserts,

insulation plugs and calibration oil as well as compartments for the new integrated support rod set, wires, manuals, certificates, plugs, insert tools, etc.

All rooms are specially designed to hold one of the above mentioned items. This makes it very easy to keep track of any accessories.

For optimum protection of the calibrator and the accessories, the compartments are designed to hold the accessories fixed during transportation.

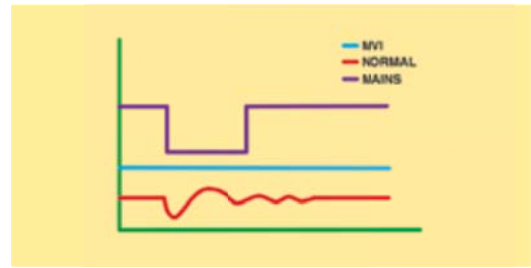
The carrying case comes with integrated wheels for easy transportation.



MVI - Secure Temperature Stability

MVI stands for "Mains power Variance Immunity". Unstable mains power is a major contributor to on-site calibration inaccuracies. Traditional temperature calibrators often become unstable in production environments

where large electrical motors, heating elements, and other devices are periodically cycled on or off. The cycling of supply power can cause the temperature regulator to perform inconsistently, leading to both inaccurate readings and unstable temperatures.



Highest Accuracy (Model B & C Only)

The RTC series calibrators may be supplied with a built-in reference thermometer to be used with an external reference sensor. This feature allows the instrument to perform calibration on-site, while maintaining a high accuracy.

The user can decide whether to read the built-in reference sensor or the more accurate angled reference sensor from the large, easy-to-read LCD display of the calibrator. The external sensor and the internal sensor readings are independent of one another.

SET-Follows-TRUE (Model B & C Only)

Available on B and C models only, the "SET-Follows-TRUE" makes the instrument tune in until the temperature reading of the external reference "TRUE" meets the desired "SET" temperature. This feature is important when it is critical that the temperature of the calibration zone matches the desired temperature when measured with accurate external reference sensors.

Reading of sensor-under-test (model B only)

Model B of the RTC is equipped with a built-in accurate measuring circuit for sensor-under-test (input), which enables measurement of virtually any type of temperature sensors including: Resistance thermometers (RTD), thermocouples (TC), transmitters, milliamps (mA), voltage (V) and thermostats.

The RTC-B calibrators can be programmed from the keyboard for fully automatic sensor calibration. Once the unit is programmed, the instrument is self-operating and performs the configured calibration routine. All calibration data are stored and can be read in the display.



Switch test (model B only)

Users may perform a thermostatic test and find "Open", "Closed" and the hysteresis (deadband) automatically. The instrument retains the last twenty test results.

Auto-stepping

Up to 20 different temperature steps may be programmed including the hold time for each step. Upon completion of an auto step routine, the user can easily read the results for the sensor-under-test on the RTC display. Results from twenty auto-step calibrations are stored. The "Set temperature" feature allows the user to set the exact desired temperature with a resolution of 0.001°.

Enhanced stability

A stability indicator shows when the RTC calibrator has reached the desired temperature and is stable. The user may change the stability criteria for the external reference and the sensor-under-test quickly and simply. The stability criterion is the user's security of a correct calibration. A count-down timer is displayed next to the temperature

Instrument Setups

The RTC series allows the user to store up to ten (10) complete instrument setups. You may store all sorts of information including temperature units, stability criteria, use of external reference sensors, resolutions, sensors-under-test (SUT), conversions to temperature, display contrasts, etc. The setup may be recalled at any time.

Maximum and Minimum Temperature

From the setup menu, the user can select the maximum and minimum temperature limit for the calibrator. This function prevents damage to the sensor-under-test caused by excessive temperatures and it helps reducing sensor drift from exposures of too high temperatures. This feature can be locked with an access code.

Silent Operation

The RTC calibrator can be programmed to run in silent operation. This function is an advantage if calibrating in a laboratory or in an office. During silent operation, the calibrator is not using its full speed potential.

SYNC Output

A synchronization output signals when the instrument is stable and may be used with ancillary devices such as video recorders, digital cameras or as an input to a data logging device. The SYNC output may be useful for automating and documenting calibration when calibrating external reading devices.

Calibration Software

Our software is a highly versatile calibration software supplied with the RTC calibrators. The software ensures easy calibration of all kind of temperature sensors, such as RTD's, thermocouples, transmitters and thermostats. Furthermore, it can be used for pressure calibration i.e. pressure gauges and pressure switches.

JOFRACAL integrates with JOFRA calibration instruments. As for temperature calibrators, it is the whole range of temperature calibrators. Regarding pressure calibrators, it integrates with DPC-500, HPC and IPI pressure calibrators.

JOFRACAL also has full integration with the series of signal calibrators.

JOFRACAL can also be used for manual calibrations, as it can be set up to accept manual entry of calibration data together with other liquid baths, ice points or dry-block heat sources. The collected calibration data can be stored on a PC for later recall or analysis. The RTC calibrator can be programmed to store the calibration procedures and may be taken out to the process site without bringing a personal computer. This feature is named Work Orders.

Work Orders allow the RTC calibrator to:

- Operate as a stand-alone instrument using advanced calibration routines without the assistance of a personal computer on site. The work order functionality
- Prevent unauthorized changes to a calibration routine. Personnel who are not authorized to alter a calibration routine cannot do so.

Once all calibrations are completed, the data may be uploaded to the JOFACAL for printing of certificates. The data collected can of course be stored on the personal computer for later recall or analysis.

JOFRACAL offers extended output formats of the captured calibration data such as PDF file format and ASCII/ semicolon separated text format for further processing and calculation of data in spreadsheets and word processors.

As Found/As left (Model B Only)

When running a calibration initiated from a work order, the user can select the calibration as an As Found or an As Left calibration.



Calibration of Indication Devices

When calibrating an indicating device in the work order mode, users may key in the results during or after the test. Using the "Calibration info" function, the user may view the complete calibration task, including the "Scenario" before the calibration takes place.

Calibration of up to 24 Sensors with JOFRA ASM

Using the RTC 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.

Hardware Requirements

1.1.1 PCs, minimum hardware requirements:

- Intel® Pentium® II 1.4 GHz processor
- 128MB RAM (256MB recommended)
- 512MB free disk space on hard disk (1GB recommended) prior to installation
- Standard VGA (800x600, 256 colors). 1024x768 recommended
- USB port
- One or more free RS-232 serial and USB ports, if using devices requiring RS-232 communication



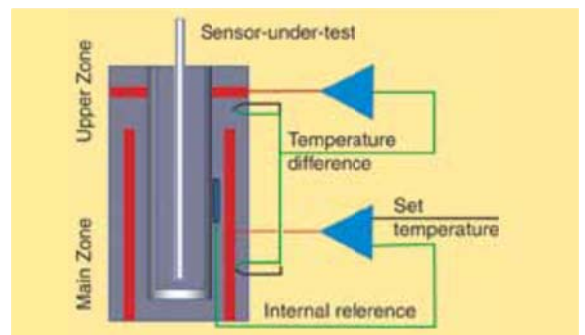
1.1.2 PCs, minimum software requirements:

- Microsoft Windows® ME, Microsoft Windows® XP, Window 7
- System fonts: MS Sans Serif and Arial

Unique Temperature Performance

The RTC series of calibrators provides precision temperature calibration of sensors, whatever the type or format. This is accomplished through an innovative active dual zone heating technology.

The RTC-series features our well-known active dual-zone heating technology. Each heating zone is independently controlled for precision temperature calibration. The homogeneity in the lower part is close to that of a laboratory liquid bath. The lower zone ensures optimum heat dissipation throughout the entire calibration zone. The upper zone compensates for heat loss from the sensor-under-test and from 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.



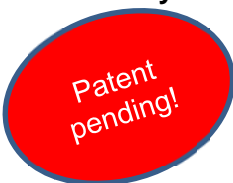
DLC - Dynamic Load Compensation

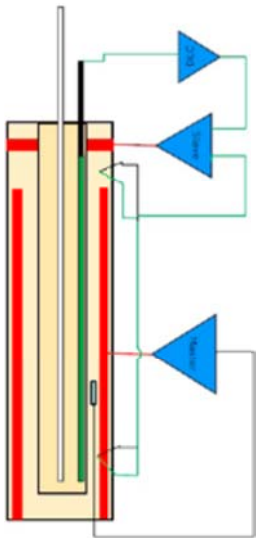
To bring our well documented active dual-zone technology to an even higher level, we have developed the patent pending new DLC system.

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

A new DLC sensor, Dynamic Load Compensation sensor, has been specially developed for this purpose.

The RTC calibrator features the active dual zone temperature control which improves the homogeneity in the well by adjusting the temperature in the top of the well to the same temperature as in the bottom. The dual zone keeps this difference at a minimum.





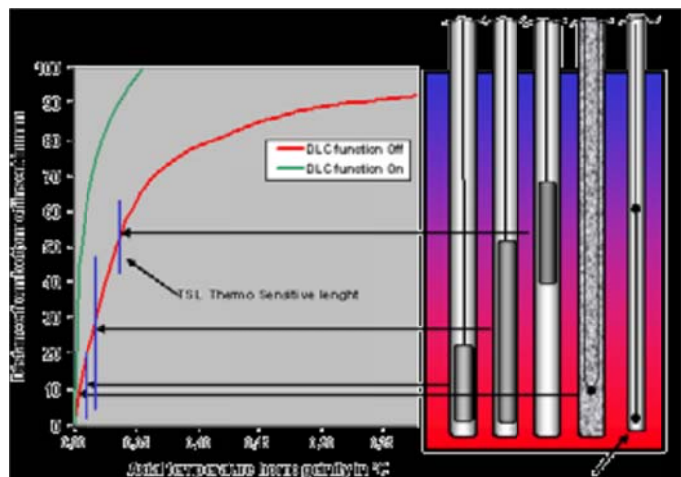
The new DLC sensor improves the homogeneity even more by controlling the homogeneity not only in the well, but also inside the insert, where the sensors-under-test are placed during calibration. The DLC sensor measures the temperature homogeneity in the insert and provides feedback to the active dual-zone system, which now 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. Patent pending! DLC-Based on the new DLC functionality, the RTC is the best performing dry-block calibrator on the market, when being calibrated and tested according to the globally accepted EURAMET/cg-13/v.01 guideline for calibration and testing of dry-blocks.

The DLC system comprises a special differential temperature sensor designed especially for the RTC. 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 on top of the normal temperature control and stabilization.

DLC - User advantages

Calibrating with DLC sensor has the following advantages:

1. Calibration of several sensors simultaneously
2. Calibration of thick sensors
3. TSL (Thermo Sensitive Length) independency. It is no longer necessary to know the TSL of the sensor
4. Compensation 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 a 60 mm length
6. Verification that the dual-zone is active and well-functioning
7. A perfectly working calibrator. The DLC value should be very close to 0.00 when the calibrator is loaded with a DLC sensor and an external reference sensor
8. Together with the stability indication, the DLC indicates when the calibration values can be read



DLC controlling is automatically disabled when the stirrer is started.



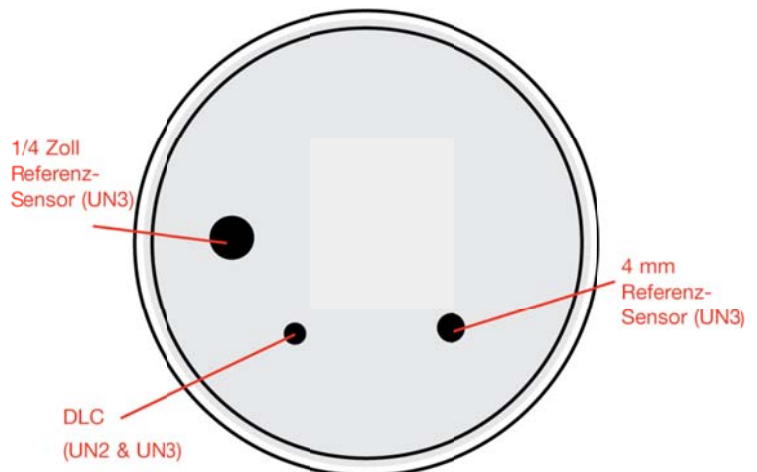
USB connector for communication

Another new RTC feature is the USB connection that facilitates easy communication with our software. The USB connection also supports easy download of future firmware upgrades.

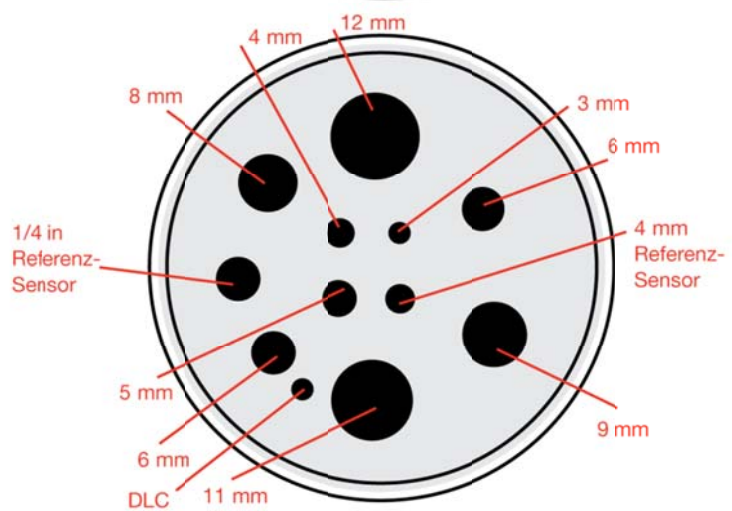
The USB connection provides fast and easy access to all laptops without the need of RS-232 to USB converters. Future-proof through e.g. a flash capability for easy firmware upgrades as well as already integrated LAN communication, SD-card slot and USB host connectors for future use.

INSERTS AND LIQUID BATH KIT

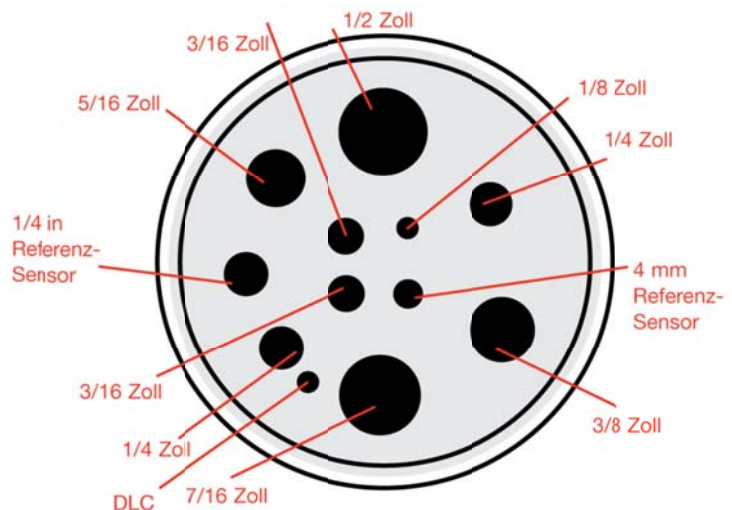
Undrilled inserts for RTC-158/250



**Metric (mm)
Multi-hole inserts for RTC-158/250**



**Imperial (Inch)
Multi-hole inserts for RTC-158/250**



All inserts are supplied with a matching insulation plug.

Liquid Bath Kit

The liquid bath kit for RTC-158/250 contains a sensor basket, 2 covering lids, a magnet, a magnetic remover, a liquid drainage tube and 0.75 l silicone oil.

FUNCTIONAL SPECIFICATIONS

Temperature range

RTC-158

@ ambient temp. 0°C/32°F.....-37 to 155°C/-35 to 311°F

@ ambient temp. 23°C/73°F.....-22 to 155°C/-8 to 311°F

@ ambient temp. 40°C/104°F..... -9 to 155°C/16 to 311°F

RTC-250

@ ambient temp. 0°C/32°F.....5 to 250°C/41 to 482°F

@ ambient temp. 23°C/73°F.....28 to 250°C/82 to 482°F

@ ambient temp. 40°C/104°F.....45 to 250°C/113 to 482°F

Accuracy (model B & C) with external STS ref. sensor

RTC-158 B & C..... ±0.04°C/±0.07°F

RTC-250 B & C..... ±0.07°C/±0.13°F

12-month period. Relative to reference standard. Specs by use of the external STS-200 reference sensor. Excl. sensor drift.

Accuracy with internal reference sensor

RTC-158 A, B & C..... ±0.18°C/±0.32°F

RTC-250 A, B & C..... ±0.28°C/±0.50°F

Stability

RTC-158..... ±0.01°C/±0.018°F

RTC-250..... ±0.02°C/±0.036°F

Measured after the stability indicator has been on for 15 minutes.

Measuring time is 30 minutes.

Radial homogeneity (difference between holes)

RTC-158 @ -22°C/-8°F, Block.....0.03°C/0.05°F

RTC-158 @ 155°C/311°F, Block.....0.05°C/0.09°F

RTC-158 @ range, Bath.....0.015°C/0.03°F

RTC-250 @ range, Block.....0.05°C/0.09°F

RTC-250 @ range, Bath.....0.015°C/0.03°F

Resolution (user-selectable)

All temperatures1° or 0.1° or 0.01° or 0.001°

Heating time

RTC-158 -22 to 23°C/-8 to 73°F..... 9 minutes

23 to 100°C/73 to 212°F..... 23 minutes

100 to 155°C/212 to 311°F..... 28 minutes

RTC-250 28 to 100°C/82 to 212°F..... 3 minutes

50 to 100°C/122 to 212°F..... 2 minutes

100 to 250°C/212 to 482°F..... 9 minutes

Cooling time

RTC-158 155 to 100°C/311 to 212°F..... 9 minutes

100 to 23°C/212 to 73°F..... 24 minutes

23 to 0°C/73 to 32°F..... 15 minutes

0 to -15°C/32 to 5°F..... 21 minutes

RTC-250 250 to 100°C/482 to 212°F..... 27 minutes

100 to 50°C/212 to 122°F..... 27 minutes

50 to 28°C/122 to 82°F..... 28 minutes

Time to stability (approx.)

RTC-158..... 15 minutes

RTC-250..... 15 minutes

Immersion depth

RTC-158/250 incl. insulation plug..... 180 mm/7.1 in

RTC-158/250 bath version..... 150 mm/5.9 in

INPUT SPECIFICATIONS

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

All input specifications are valid for RTC-158 and RTC-250.

RTD reference input (B & C models only)

Type..... 4-wire RTD with true ohm measurements¹⁾

F.S. (Full Scale).....400 ohm

Accuracy (12 months)..... $\pm(0.0012\% \text{ rdg.} + 0.0005\% \text{ F.S.})$

RTD Type	Temperature		12 months	
	°C	°F	°C	°F
Pt100 reference	-22	-8	± 0.008	± 0.015
	0	32	± 0.008	± 0.015
	28	82	± 0.009	± 0.016
	155	311	± 0.011	± 0.020
	250	482	± 0.012	± 0.022

Note 1: True ohm measurement is an effective method to eliminate errors from induced thermoelectrical voltage

DLC sensor input (B & C models only)

RTD Type	Temperature		12 months	
	°C	°F	°C	°F
DLC 155	-22	-58	± 0.014	± 0.025
	0	32	± 0.010	± 0.018
	28	82	± 0.010	± 0.018
	155	311	± 0.008	± 0.015
	250	482	± 0.008	± 0.015

*at 0.00°C / 0.00°F DLC reading

RTD Sensor Under Test Input (B Model Only)

F.S. (range)..... 400 ohm

Accuracy (12 months)..... $\pm(0.002\% \text{ Rdg.} + 0.002\% \text{ F.S.})$

F.S. (range).....4000 ohm

Accuracy (12 months)..... $\pm(0.005\% \text{ Rdg.} + 0.005\% \text{ F.S.})$

2-wire.....add 50 mOhm

RTD Type	Temperature		12 months	
	°C	°F	°C	°F
Pt 100 90 (385) IEC	-22	-8	± 0.025	± 0.045
	0	32	± 0.026	± 0.047
	28	82	± 0.026	± 0.047
	155	311	± 0.030	± 0.054
	250	482	± 0.033	± 0.060
Pt500 90(385) IEC	-22	-58	± 0.113	± 0.203
	0	32	± 0.116	± 0.209
	28	82	± 0.118	± 0.212
	155	311	± 0.129	± 0.232
	250	482	± 0.131	± 0.236

RTD Type	Temperature		12 months	
	°C	°F	°C	°F
Pt1000 90(385) IEC	-22	-8	±0.063	±0.114
	0	32	±0.064	±0.115
	28	82	±0.066	±0.119
	155	311	±0.075	±0.135
	250	482	±0.082	±0.148

Input and curves for many different resistance sensors such as:

0-400Ω

(P10(90)386/P50(90)385/P100(90)385/P50(90)391/
P100(90)391/P100(90)392/M50(90)428/M100(90)428/
H120(90)672/Pt-100 MILL)

0-4000Ω

(P200(90)385/P500(90)385/P1000(90)385/YSI-400)

Thermocouple Input

Range ±78 mV

F.S. (Full Scale)..... 78 mV

Accuracy (12 months)..... ±(0.005% Rdg. + 0.005% F.S.)

TC Type	Temperature		12 months	
	°C	°F	°C	°F
E	-50	-58	±0.09	±0.17
	0	32	±0.06	±0.11
	155	311	±0.06	±0.11
	320	608	±0.07	±0.13
J	-50	-58	±0.10	±0.18
	0	32	±0.08	±0.14
	155	311	±0.09	±0.16
	320	608	±0.09	±0.16
K	-50	-58	±0.14	±0.24
	0	32	±0.10	±0.19
	155	311	±0.11	±0.20
	320	608	±0.11	±0.20
T	-50	-58	±0.15	±0.26
	0	32	±0.10	±0.18
	155	311	±0.08	±0.15
	320	608	±0.08	±0.15
R	-50	-58	±1.30	±2.35
	0	32	±0.78	±1.40
	155	311	±0.47	±0.84
	320	608	±0.40	±0.72
S	-50	-8	±0.98	±1.76
	0	32	±0.78	±1.40
	155	311	±0.49	±0.89
	320	608	±0.45	±0.81

RTD Type	Temperature		12 months	
	°C	°F	°C	°F
N	-50	-58	±0.20	±0.35
	0	32	±0.15	±0.27
	155	311	±0.13	±0.23
	320	608	±0.13	±0.24
U	-50	-58	±0.13	±0.24
	0	32	±0.10	±0.18
	155	311	±0.08	±0.14
	320	608	±0.08	±0.15

* Excl. CJC accuracy ±0.3°C / ±0.54°F

Transmitter supply

Output voltage.....24VDC ±10%

Output current..... Maximum 28 mA

Transmitter input mA (B model only)

Range..... 0 to 24 mA

Accuracy (12 months).....±(0.005% Rdg. +0.010% F.S.)

Voltage input VDC (B model only)

Range:..... 0 to 12 VDC

Accuracy (12 months).....±(0.005% Rdg. +0.010% F.S.)

Switch input (B model only)

Switch dry contacts

Test voltage.....Maximum 5 VDC

Test current.....Maximum 2.5 mA

Mains specifications

Voltage.....115V (90-127) / 230V (180-254)

Frequency, non US deliveries.....50 Hz ±5, 60 Hz ±5

Frequency, US deliveries.....60 Hz ±5

Power consumption (max.), RTC-158.....400 W

Power consumption (max.), RTC-250.....1150 W

Communication interface

Serial data interface.....USB 2.0 device port

Serial data interface.....USB 2.0 host double port*

LAN..... Ethernet MAC 10/100 Base-T*

SD..... SD slot*

* for future expansion

Miscellaneous

Operating ambient temperature.....0 to 40°C/32 to 104°F

Storage temperature..... -20 to 50°C/-4 to 122°F

Humidity 0 to 90% RH

Protection classIP-10

PHYSICAL SPECIFICATIONS

Weight and instrument size (L x W x H)

RTC-158..... 11 kg/24.3 lb

RTC-250.....9.9 kg/ 21.8 lb

RTC-158/250..... 366 x 171 x 363 mm / 14.4 x 6.7 x 14.3 in

Shipping (without carrying case)

RTC-158..... 17 kg/37.5 lb

RTC-250..... 16 kg/35.3 lb

Size.....580 x 250 x 500 mm/22.8 x 9.8 x 19.7 in

Shipping (including optional carrying case)

RTC-158.....	28 kg/61.7 lb
RTC-250.....	27 kg/59.6 lb
Size.....	550 x 430 x 660 mm/21.7 x 16.9 x 26.0 in

INSERTS**Insert dimensions**

RTC-158/250 outer diameter.....	63.5 mm/2.5 in
RTC-158/250 length.....	160 mm/6.3 in

Weight of non-drilled insert (approx.)

RTC-158/250.....	1200 g/42.3 oz
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Alloy

RTC-158/250.....	Special aluminium alloy
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Use of other inserts may reduce performance of the calibrator.

To get the best results out of the calibrator, the insert dimensions, tolerance and material is critical.

We highly advise using inserts, as they guarantee trouble free operation.

STANDARD DELIVERY

Model A, B and C:

- RTC dry-block calibrator (user specified)
- Mains power cable (user specified)
- Traceable certificate - temperature performance
- Tool for insertion tubes
- JOFRACAL
- AMETRIM
- USB cable
- Set of rubber cones for insulation plugs
- Manuals

Model B contains the following extra items:

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

Model C contains the following extra items:

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

EXTRA PARTS

Support rod set for sensors, 2 gribs, 2 fixtures

Extra fixture for sensor grib

Extra sensor grib

Mini-Jack connector for stable relay output

Thermocouple Male Plug - Type J - Black

Thermocouple Male Plug - Type K - Yellow

Thermocouple Male Plug - Type N - Orange

Thermocouple Male Plug - Type T - Blue

Thermocouple Male Plug - Type R / S - Green

Thermocouple Male Plug - Type Cu-Cu - White

Silicone oil, Type 200/10cSt, 0.75 L, RTC-158

Silicone oil, Type 200/50cSt, 0.75 L, RTC-250

Liquid Bath Kit, RTC-158

Liquid Bath Kit, RTC-250

Carrying case with Trolley

ACCESSORIES

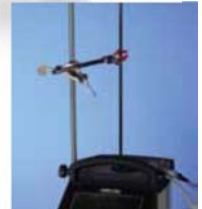
Carrying Case - Option CT

With our new special designed carrying case it is now possible to store all your sensors in the case with an optimum physical protection.
An improved integrated trolley system for easy and safe transportation.



Support Rod Set - Option SR

Support rod for sensors to be mounted on all JOFRA RTC dry-block calibrators. Holds the sensor under test in the right position, while calibrating. Includes 2 sensor grips and 2 fixtures for sensor grips.



FUNCTIONAL COMPARISON

	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	•	•	•
SYNC output (for external recording device)	•	•	•
Calibration of short sensors in special insert		•	•
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)		•	