temperature

JOFRA calibration

# Advanced Temperature Calibrator

# ATC-125

Patented!


The ATC-125 ultra cooler is the first dry-block calibrator on the market offering the widest temperature range ever for cooling dry-blocks from 125°C down to -90°C!

The unique free piston stirling cooler technology sets new standards for optimum temperature calibrations in frozen and deep frozen applicatons.

The ATC-125 features a unique technology for optimum performance and superior temperature homogeneity throughout the block at very low temperatures. It has a performance equivalent to a liquid temperature bath and features the widest temperature range for any cooling dry-block on the market today.

The ATC-125 calibrator may be used to perform fully automatic calibration routines without using an external computer. It is also possible to use the computer for full upload and download capabilities. It may also be supplied with inputs for external reference sensors and for sensors-under-test.

**» Wide temperature range**
ATC-125 ultra cooler:
-90°C to 125°C / -130°F to 257°F

**» Patented technology**
Patented cutting edge technology has been implemented to perform a unique combination of calibrating vary low temperatures and at the same time perform a very large calibration span of 215ºC / 420ºF.
Patent No. DK 176506

**» Portable calibration at low temperature**
State of the art cooling technology ensures energy efficiency, environmental friendliness and portable calibration

**» High accuracy**
Using the internal reference or the external reference probe. 4-wire True-Ohm-Measurement technology is used

**» Improved temperature homogeneity**
Unique dual-zone block ensures good temperature homogeneity in the critical calibration zone

**» Cost effective calibration system**
Stand-alone operation eliminates the need for secondary equipment and PC. Universal inputs handle multiple type temperature sensors

**» Timesaving features**
Up- and download complete calibration tasks. Auto-stepping, switch testing and many more features make the daily use smooth and fast

**» Documentation made easy**
RS232 communication and JOFRACAL calibration software are included in the standard delivery

**» Complete marine program**
Part of a complete program of marine approved temperature, pressure and signal calibrators; including temperature sensors

**ISO 9001 Manufacturer**

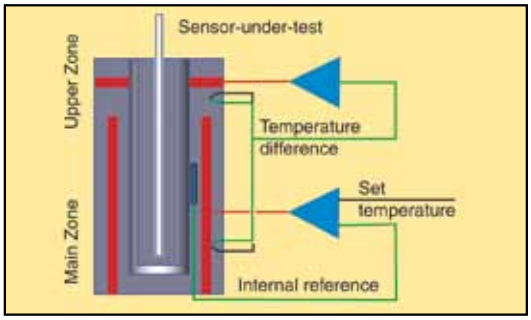
Specification Sheet
SS-ATC-125

AMETEK®
TEST & CALIBRATION INSTRUMENTS

## Unique temperature performance

The ATC calibrator provides precision temperature calibration of sensors; whatever the type or format. This is accomplished through an innovative dual-zone technology.

The JOFRA ATC-125 features dual-zone technology. Each zone is 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 temperature distribution throughout the entire calibration zone. The upper zone compensates for heat loss from the sensor-under-test.




## Efficient cooling techniques

The ATC-125 with both heating and cooling capabilities features the FPSC (Free piston stirling cooler) as cooling source.

The FPSC is a Stirling heat pump that uses a small amount helium gas as a heat transport medium, instead of standard refrigerants. The FPSC has an advantage, over traditional cooling systems, both in energy efficiency and environmental friendliness. These advantages are accomplished using state of the art technology and by virtue of being Freon, CFC and HFC free.

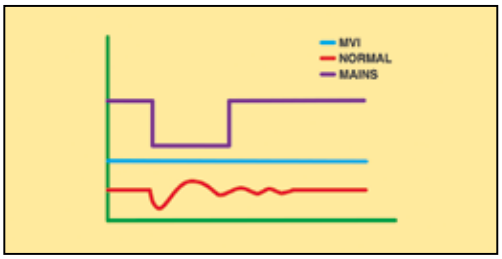
The FPSC has two major moving parts (piston and displacer) that oscillate in a linear motion along the same axis within a single cylinder which is installed in a stainless steel casing. The piston repeatedly compresses and expands the helium gas to cool the tip (cold head) of the extended part of the casing. The FPSC can be used to cool an object down to a temperature between -50°C and -100°C at an ambient temperature condition of 23°C.

The FPSC has a high efficiency. It can be as much as 6 times higher than thermoelectric (Peltier) coolers.

## MVI - Improved temperature stability

MVI stands for ''Mains power Variance Immunity''.

Unstable mains power supplies are 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.




The ATC-125 calibrator employ the MVI by running on stabilized DC voltage, thus avoiding any stability problems (MVI).

## Highest accuracy (model B only)

ATC series calibrators may be supplied with a built-in reference thermometer for use with an external probe. This feature allows one instrument to provide the freedom and flexibility to perform calibrations at the process site while maintaining a high accuracy.

A special 90° angled external reference sensor has been designed to accommodate sensors with a transmitter head, top connector or similar arrangement.

The user can decide whether to read the built-in reference sensor or the more accurate external reference sensor from the calibrator's large, easy-to-read LCD display. The external sensor and the internal sensor are independent of one another. Downloading of reference sensor linearization is done via a personal computer.

## SET-Follows-TRUE (model B only)

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

This feature is ideal when calibrating gas correctors or other custody transfer applications. It is also extremely useful to calculation procedures.

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

The ATC series model B is equipped with built-in converters (inputs) that enables measurement of virtually any type of temperature sensor including:

- thermostats
- resistance thermometers (RTD)
- thermocouples (TC)
- transmitters
- milliamps (mA)
- voltage (V)

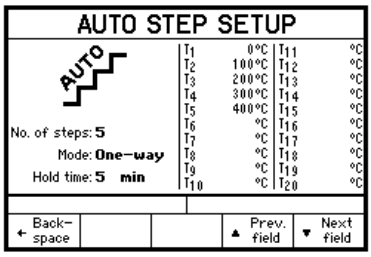
The ATC calibrators can be user-programmed for completely automated temperature calibrations. Once the unit is programmed, the instrument operates itself by performing the configured calibration routine. All calibration data is stored and available for uploading and generating exact calibration certificates or reports.

## Switch test (model B only)

Users may perform a thermoswitch test and find “Open”, “Closed” and the hysteresis (deadband) automatically. The instrument retains the last five tests.

## 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. Up to five (5) auto step results are stored.




## Easy-to-use, intuitive operation

All instrument settings can be performed from the front panel. The heat source is positioned away from the panel which helps protect the operator.

The ATC keyboard is equipped with five, positive feedback function keys. They correspond to the text in the display and change functionality based on instrument operations. There are also dedicated function keys with permanent functions.


The easy-to-read, backlit display is large with a high contrast that is readible even in high ambient light conditions. The display is easily read from all angles and from a distance without parallax problems. The display also features icons which help identifying instrument conditions and operational steps, making it more intuitive to work with.

## Set temperature

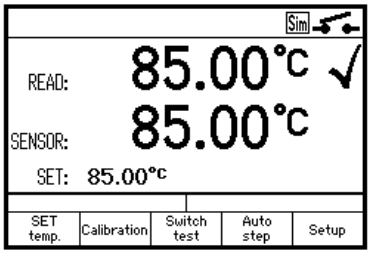
The “Set temperature” feature allows the user to set the exact desired temperature with a resolution of 0.01°.

## Enhanced stability

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

## Instrument setups

The ATC series allows the user to store up to nine (9) complete instrument setups. You may store all sorts of information including temperature units, stability criteria, use of external reference sensor, resolution, sensor-under-test (SUT), conversion to temperature, display contrast, etc. The setup may be recalled at any time.




## Maximum temperature

From the setup menu, the user can select the maximum temperature limit for the calibrator. This function prevents damage to the sensor-under-test caused by the application of excessive temperatures. The feature also aids in reducing drift resulting from extended periods of exposures to high temperatures. This feature can be locked with an access code.

## JOFRACAL CALIBRATION SOFTWARE

JOFRACAL calibration software ensures easy calibration of RTD´s, thermocouples, transmitters, thermoswithes, pressure gauges and pressure switches. JOFRACAL can be used with HPC, DPC-500, APC, CPC and IPI pressure calibrators, all JOFRA temperature calibrators, as well as JOFRA AMC900, ASC300 multi signal calibrator and ASM-800 signal multi scanner.

JOFRACAL calibration software may 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 calibration data collected may be stored on a PC for later recall or analysis. The ATC calibrator stores the calibration procedure and may be taken out to the process site without using a personal computer.

This allows the ATC calibrator to:

- Operate as a stand-alone instrument, using advanced calibration routines without the assistance of a personal computer on site;
- 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 JOFRACAL calibration software for post-processing and printing of certificates. The calibration data collected may be stored on the personal computer for later recall or analysis.

The JOFRACAL temperature calibration software may be donwloaded free of charge from our web-page www.jofra.com.

### As found/as left (model B only)

The JOFRA ATC series calibrator automatically handles “As Found/As Left” calibrations. The calibrator stores both results. The first performed calibration is “As found” and the last performed calibration is the “As left”, regardless of the number of calibrations/adjustments that may have been made in between.

### SYNC output

An output is located directly on the front of the ATC calibrator. This 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 your calibrations when calibrating external reading devices.

### Calibration (model B only)

Users may perform or read the results of the calibration tasks directly on the instrument. When calibrating an indicating device, 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 JOFRA ATC 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 the same time. It can handle signals from 2-, 3- and 4 wire RTD’s, TC’s, transmitters, thermisters, temperature switches and voltage.

Please also see more in specification sheet SS-CP-2360, which can be found at www.jofra.com

### JOFRACAL software

Minimum hardware requirements for JOFRACAL calibration software.

- INTEL™ 486 processor
- (PENTIUM™ 800 MHz recommended)
- 32 MB RAM (64 MB recommended)
- 80 MB free disk space on hard disk prior to installation
- Standard VGA (800 x 600, 16 colors) compatible screen
- (1024 x 786, 256 colors recommended)
- CD-ROM drive for installation of the program
- 1 free RS232 serial port

## FUNCTIONAL COMPARISON

| ATC series | | ATC-125 A | ATC-125 B | ATC-140 A | ATC-140 B | ATC-156 A | ATC-156 B | ATC-157 A | ATC-157 B | ATC-250 A | ATC-250 B | ATC-320 A | ATC-320 B | ATC-650 A | ATC-650 B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Temperature range @ ambient 23°C / 73°F** | | | | | | | | | | | | | | | |
| -90 to 125°C | -130 to 257°F | X | X | | | | | | | | | | | | |
| -20 to 140°C | -4 to 284°F | | | X | X | | | | | | | | | | |
| -24 to 155°C | -11 to 311°F | | | | | X | X | | | | | | | | |
| -45 to 155°C | -49 to 311°F | | | | | | | X | X | | | | | | |
| 28 to 250°C | 82 to 482°F | | | | | | | | | X | X | | | | |
| 33 to 320°C | 91 to 608°F | | | | | | | | | | | X | X | | |
| 33 to 650°C | 91 to 1202°F | | | | | | | | | | | | | X | X |
| **Temperature stability** | | | | | | | | | | | | | | | |
| ±0.01°C | ±0.018°F | | | | | S | S | S | S | | | S | S | | |
| ±0.02°C | ±0.036°F | | | X | X | | | | | X | X | | | S | S |
| ±0.03°C | ±0.054°F | X | X | | | | | | | | | | | | |
| **Accuracy incl. external STS reference sensor** | | | | | | | | | | | | | | | |
| ±0.04°C | ±0.07°F | | | | X [1] | | X [1] | | X [1] | | | | | | |
| ±0.06°C | ±0.11°F | X | X | | | | | | | | | | | | |
| ±0.07°C | ±0.13°F | | | | | | | | | | X [1] | | X [1] | | |
| ±0.11°C | ±0.2°F | | | | | | | | | | | | | | X [1] |
| **Accuracy with internal reference sensor** | | | | | | | | | | | | | | | |
| ±0.10°C | ±0.18°F | | | | | S | S | | | | | | | | |
| ±0.13°C | ±0.23°F | | | | | | | S | S | | | | | | |
| ±0.18°C | ±0.32°F | | | S | S | | | | | | | | | | |
| ±0.20°C | ±0.36°F | | | | | | | | | | | S | S | | |
| ±0.28°C | ±0.50°F | | | | | | | | | S | S | | | | |
| ±0.30°C | ±0.54°F | X | X | | | | | | | | | | | | |
| ±0.35°C | ±0.63°F | | | | | | | | | | | | | S | S |
| **Immersion depth** | | | | | | | | | | | | | | | |
| 185 mm | 7.3 in | X | X | | | | | | | | | | | | |
| 180 mm | 7.1 in | | | X [2] | X [2] | | | | | | | | | | |
| 160 mm | 6.3 in | | | | | X | X | X | X | | | | | | |
| 150 mm | 5.9 in | | | X [3] | X [3] | | | | | X [4] | X | X | X | X | X |
| **Insertion tube diameter** | | | | | | | | | | | | | | | |
| 63.5 mm | 2.5 in | | | X | X | | | | | X | X | | | | |
| 30 mm | 1.2 in | X | X | | | X | X | | | | | X | X | X | X |
| 20 mm | 0.8 in | | | | | | | X | X | | | | | | |

| | Model A | Model B |
|---|---|---|
| Dual-zone heating/cooling block | • | • |
| MVI - Mains Variance Immunity (or similar) | • | • |
| Stability indicator | • | • |
| Automatic step function | • | • |
| JOFRACAL Calibration software included as standard | • | • |
| SYNC output (for external recording device) | • | • |
| Display resolution 0.01° | • | • |
| Programmable max. temperature | • | • |
| 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) | | • |
| External precision reference probe input | | • |
| Download of calibration work orders from PC | | • |
| Upload of calibration results (as found & as left) | | • |
| "SET" follows "TRUE" | | • |

### JOFRA ATC-156/157/320/650

### JOFRA ATC-140/250

X = Delivered as standard

S = Improved specifications (from October 01, 2006)

1 Using an external STS reference sensor connected to the reference probe input
2 Immersion depth for ATC-140 as dry-block
3 Immersion depth for ATC-140 as liquid bath
4 Immersion depth for ATC-250 as dry-block and as liquid bath

JOFRA calibration

# FUNCTIONAL SPECIFICATIONS

## Mains specifications

ATC-125 ..... 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.) ATC-125 ..... 300 VA

## Temperature range

ATC-125 Maximum ..... 125°C / 257°F
Minimum @ ambient temp. 0°C / 32°F ..... -90°C / -130°F
Minimum @ ambient temp. 23°C / 73°F ..... -90°C / -130°F
Minimum @ ambient temp. 40°C / 104°F ..... -73°C / -99°F

## Stability

ATC-125 ..... ±0.03°C / ±0.054°F
Measured after the stability indicator has been on for 10 minutes. Measuring time is 30 minutes.
Set-temperature = ambient temperature ±5°C/9°F: ±0.04°C/0.07F

## Time to stability (approximate)

ATC-125 ..... 10 minutes

## Accuracy (model B) with external STS reference sensor

ATC-125 B ..... ±0.06°C / ±0.11°F
12 month period. Relative to reference standard. Specifications by use of the external JOFRA STS-100 reference sensor

## Accuracy (model A+B) with internal reference sensor

ATC-125 A+B ..... ±0.3°C / ±0.54°F

## Resolution (user-selectable)

All temperatures ..... 1° or 0.1° or 0.01°

## Radial homogeneity (difference between holes)

ATC-125 ..... 0.01°C / 0.02°F

## Immersion depth including insulation plug

ATC-125 ..... 185 mm / 7.3 in

## Well diameter

ATC-125 ..... 30 mm / 1.18 in

## Heating time

-90 to 125°C / -130 to 257°F ..... 30 minutes
23 to 125°C / 73 to 257°F ..... 15 minutes

## Cooling time

125 to 100°C / 257 to 212°F ..... 12 minutes
100 to 23°C / 212 to 73°F ..... 28 minutes
23 to -80°C / 73 to -112°F ..... 75 minutes
-80 to -90°C / -112 to -130°F ..... 30 minutes

## SYNC output (dry contact)

Switching voltage ..... Maximum 30 VDC
Switching current ..... Maximum 100 mA

# INPUT SPEC'S (B MODELS ONLY)

All input specifications apply to the calibrator's dry-block running at the respective temperature (stable plus an additional 20 minutes period). Where the input measuring range is out of the calibrator's range, the SET temperature is either MIN. or MAX.

## Transmitter supply

Output voltage ..... 24VDC +10%
Output current ..... Maximum 25 mA

## Transmitter input mA

Range ..... 0 to 24 mA
Accuracy (12 months) ..... ±(0.01% Rdg. ±0.015% F.S.)

## Voltage input VDC

Range: ..... 0 to 12 VDC
Accuracy (12 months) ..... ±(0.005% Rdg. ±0.015% F.S.)

## Switch input

Switch dry contacts
Test voltage ..... Maximum 5 VDC
Test current ..... Maximum 2.5 mA

## RTD reference input (B models only)

Type ..... 4-wire RTD with true ohm measurements[1)]
F.S. (Full Scale) ..... 350 ohm
Accuracy (12 months) ..... ±(0.001% rdg. + 0.002% F.S.)

| RTD Type | Temperature | | 12 months | |
|---|---|---|---|---|
| | °C | °F | °C | °F |
| Pt100 reference | -90 | -130 | ±0.019 | ±0.034 |
| | -50 | -58 | ±0.020 | ±0.036 |
| | 0 | 32 | ±0.021 | ±0.038 |
| | 155 | 311 | ±0.023 | ±0.041 |
| | 225 | 437 | ±0.024 | ±0.043 |
| | 320 | 608 | ±0.026 | ±0.047 |
| | 425 | 797 | ±0.028 | ±0.050 |
| | 650 | 1202 | ±0.032 | ±0.058 |
| | 700 | 1292 | ±0.034 | ±0.061 |

Note 1: True ohm measurements are an effective method to eliminate errors from induced thermoelectrical voltages

## RTD input

Type of RTD ..... 2-wire
F.S. (range) ..... 350 ohm or 2900 ohm
Accuracy (12 months) .....
..... ±(0.005% rdg. + 0.005% F.S. + 50 mΩ)
Type of RTD ..... 3- or 4-wire
F.S. (range) ..... 350 ohm or 2900 ohm
Accuracy (12 months) .....±(0.005% rdg. + 0.005% F.S.)

| RTD Type | Temperature | | 12 months | |
|---|---|---|---|---|
| | °C | °F | °C | °F |
| Pt1000 | -90 | -130 | ±0.043 | ±0.077 |
| | -50 | -58 | ±0.046 | ±0.083 |
| | 0 | 32 | ±0.050 | ±0.090 |
| | 155 | 311 | ±0.061 | ±0.110 |
| | 320 | 608 | ±0.071 | ±0.127 |
| | 500 | 932 | ±0.087 | ±0.157 |
| Pt500 | -90 | -130 | ±0.079 | ±0.142 |
| | -50 | -58 | ±0.083 | ±0.149 |
| | 0 | 32 | ±0.087 | ±0.157 |
| | 155 | 311 | ±0.100 | ±0.180 |
| | 320 | 608 | ±0.111 | ±0.200 |
| | 500 | 932 | ±0.130 | ±0.235 |
| Pt100 | -90 | -130 | ±0.051 | ±0.092 |
| | -50 | -58 | ±0.054 | ±0.097 |
| | 0 | 32 | ±0.058 | ±0.104 |
| | 155 | 311 | ±0.069 | ±0.124 |
| | 320 | 608 | ±0.079 | ±0.142 |
| | 650 | 1202 | ±0.106 | ±0.191 |
| | 700 | 1292 | ±0.112 | ±0.202 |
| Pt50 (only in Russian versions) | -90 | -130 | ±0.095 | ±0.171 |
| | -50 | -58 | ±0.098 | ±0.176 |
| | 0 | 32 | ±0.103 | ±0.185 |
| | 155 | 311 | ±0.116 | ±0.209 |
| | 320 | 608 | ±0.128 | ±0.230 |
| | 650 | 1202 | ±0.161 | ±0.290 |
| | 700 | 1292 | ±0.169 | ±0.303 |
| Pt10 | -50 | -58 | ±0.453 | ±0.815 |
| | 0 | 32 | ±0.462 | ±0.831 |
| | 155 | 311 | ±0.495 | ±0.891 |
| | 320 | 608 | ±0.524 | ±0.943 |
| | 650 | 1202 | ±0.610 | ±1.098 |
| | 700 | 1292 | ±0.620 | ±1.116 |
| Cu100 | -90 | -130 | ±0.047 | ±0.085 |
| | -50 | -58 | ±0.050 | ±0.090 |
| | 0 | 32 | ±0.052 | ±0.094 |
| | 150 | 302 | ±0.060 | ±0.108 |
| Cu50 | -90 | -130 | ±0.087 | ±0.157 |
| | -50 | -58 | ±0.090 | ±0.162 |
| | 0 | 32 | ±0.093 | ±0.167 |
| | 150 | 302 | ±0.100 | ±0.180 |

If automatic cold junction compensation is used, the specification for CJ is ±0.40°C (±0.72°F).

## Thermocouple input

Range ..... 78 mV
F.S. (Full Scale) ..... 78 mV
Accuracy (12 months) ..... ±(0.01% rdg. + 0.005% F.S.)

| TC Type | Temperature | | 12 months | |
|---|---|---|---|---|
| | °C | °F | °C | °F |
| E | -90 | -130 | ±0.10 | ±0.18 |
| | -50 | -58 | ±0.08 | ±0.14 |
| | 0 | 32 | ±0.07 | ±0.13 |
| | 155 | 311 | ±0.07 | ±0.13 |
| | 320 | 608 | ±0.08 | ±0.14 |
| | 650 | 1202 | ±0.11 | ±0.20 |
| | 1000 | 1832 | ±0.15 | ±0.28 |
| J | -90 | -130 | ±0.10 | ±0.18 |
| | -50 | -58 | ±0.10 | ±0.18 |
| | 0 | 32 | ±0.08 | ±0.14 |
| | 155 | 311 | ±0.08 | ±0.14 |
| | 320 | 608 | ±0.10 | ±0.18 |
| | 650 | 1202 | ±0.12 | ±0.22 |
| | 1200 | 2192 | ±0.19 | ±0.34 |
| K | -90 | -130 | ±0.13 | ±0.24 |
| | -50 | -58 | ±0.11 | ±0.20 |
| | 0 | 32 | ±0.10 | ±0.17 |
| | 155 | 311 | ±0.11 | ±0.20 |
| | 320 | 608 | ±0.12 | ±0.22 |
| | 650 | 1202 | ±0.16 | ±0.28 |
| | 1372 | 2502 | ±0.28 | ±0.50 |
| L | -50 | -58 | ±0.08 | ±0.14 |
| | 0 | 32 | ±0.08 | ±0.14 |
| | 155 | 311 | ±0.08 | ±0.14 |
| | 320 | 608 | ±0.10 | ±0.18 |
| | 600 | 1112 | ±0.13 | ±0.23 |
| | 900 | 1652 | ±0.14 | ±0.25 |
| T | -90 | -130 | ±0.14 | ±0.25 |
| | -50 | -58 | ±0.12 | ±0.22 |
| | 0 | 32 | ±0.10 | ±0.18 |
| | 155 | 311 | ±0.09 | ±0.16 |
| | 320 | 608 | ±0.09 | ±0.16 |
| | 400 | 752 | ±0.10 | ±0.18 |
| R | -50 | -58 | ±1.31 | ±2.35 |
| | 0 | 32 | ±0.78 | ±1.40 |
| | 155 | 311 | ±0.50 | ±0.90 |
| | 320 | 608 | ±0.42 | ±0.75 |
| | 650 | 1202 | ±0.41 | ±0.74 |
| | 1760 | 3200 | ±0.50 | ±0.90 |
| S | -50 | -58 | ±0.98 | ±1.77 |
| | 0 | 32 | ±0.78 | ±1.40 |
| | 155 | 311 | ±0.50 | ±0.90 |
| | 320 | 608 | ±0.46 | ±0.83 |
| | 650 | 1202 | ±0.45 | ±0.81 |
| | 1768 | 3214 | ±0.52 | ±0.94 |
| B | 250 | 482 | ±1.57 | ±2.83 |
| | 320 | 608 | ±0.99 | ±1.78 |
| | 650 | 1202 | ±0.69 | ±1.23 |
| | 1820 | 3308 | ±0.48 | ±0.86 |
| N | -90 | -130 | ±0.20 | ±0.35 |
| | -50 | -58 | ±0.16 | ±0.29 |
| | 0 | 32 | ±0.15 | ±0.27 |
| | 155 | 311 | ±0.14 | ±0.25 |
| | 320 | 608 | ±0.14 | ±0.25 |
| | 650 | 1202 | ±0.16 | ±0.28 |
| | 800 | 1472 | ±0.17 | ±0.31 |
| XK (only in Russian versions) | -90 | -130 | ±0.09 | ±0.16 |
| | -50 | -58 | ±0.07 | ±0.13 |
| | 0 | 32 | ±0.06 | ±0.11 |
| | 155 | 311 | ±0.06 | ±0.11 |
| | 320 | 608 | ±0.07 | ±0.13 |
| | 650 | 1202 | ±0.11 | ±0.19 |
| | 800 | 1472 | ±0.12 | ±0.22 |
| U | -90 | -130 | ±0.16 | ±0.29 |
| | -50 | -58 | ±0.12 | ±0.21 |
| | 0 | 32 | ±0.10 | ±0.18 |
| | 155 | 311 | ±0.09 | ±0.16 |
| | 320 | 608 | ±0.09 | ±0.18 |
| | 600 | 1112 | ±0.10 | ±0.18 |

## PHYSICAL SPECIFICATIONS

### Instrument dimensions (L x W x H)

ATC-125 ..... 506 x 156 x 449 mm / 19.92 x 6.14 x 17.68 in

### Instrument weight

ATC-125 .....18,8 kg / 41.45 lb

### Insert dimensions

ATC-125 outer diameter ..... 29,7 mm/1.17 in
ATC-125 inner diameter (multi hole) ..... 25,9 mm/1.02 in
ATC-125 inner diameter (single hole)..... 22,0 mm/0.87 in
ATC-125 length ..... 150 mm/5.91 in

### Weight of non-drilled insert (approximate)

ATC-125 .....290 g / 10.2 oz

### Shipping (including carrying case)

ATC-125 .....36.9 kg / 81.2 lb
Size: L x W x H690 x 640 x 420 mm / 27.2 x 25.2 x 16.2 in

### Miscellaneous

Serial data interface ..... RS232 (9-pin male)
Operating 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 class .....IP-10
DNV Marine Approval, Certificate no.....A-10384

## STANDARD DELIVERY

Carrying case included!

- ATC dry-block calibrator (user specified)
- Carrying case
- Mains power cable (user specified)
- Traceable certificate - temperature performance
- Insert (user specified)
- Set of matching insulation plugs
- Set of rubber cones for insulation plug
- Tool for insertion tubes
- RS232 cable
- JOFRACAL calibration software
- AMETRIM-ATC software to adjust the ATC series
- User manual
- Reference manual (English)

**Model B** instruments contain the following extra items:

- Test cables (2 x red, 2 x black)
- Traceable certificate - input performance

### Set of rubber cones

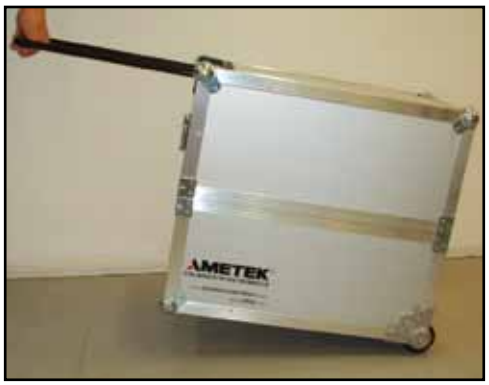
When the ATC-125 is set to a sub-zero temperature it is necessary to use an insulation plug on top of the well. If some of the holes in the insulation plug are not used, we recommend use of the rubber cones, which will minimize the amount of water condensation in the well.

## ACCESSORIES

| | |
|---|---|
| 105496 | Thermal Protection Shield |
| 125068 | Support rod set for sensors, 2 gribs, 2 fixtures |
| 125066 | Extra fixture for sensor grib |
| 125067 | Extra sensor grib |
| 122771 | Mini-Jack Connector for stable relay Output |
| 120516 | Thermocouple Male Plug - Type J - Black |
| 120517 | Thermocouple Male Plug - Type K - Yellow |
| 120514 | Thermocouple Male Plug - Type N - Orange |
| 120515 | Thermocouple Male Plug - Type T - Blue |
| 120518 | Thermocouple Male Plug - Type R / S - Green |
| 120519 | Thermocouple Male Plug - Type Cu-Cu - White |
| 122801 | Cable 0.5 m with LEMO/LEMO connectors |
| 122823 | 2 m Cable Female Banana to LEMO connection |
| 125002 | Edge port Converter with 4 pcs of RS232 ports |
| 126234 | Set of 3 pcs insulation plugs / 4mm ref. Hole<br>* Hole size 6, 10 and 15 mm |
| 126240 | Set of 3 pcs insulation plugs / 1/4 in ref. Hole<br>* Hole size 6, 10 and 15 mm |


### Support rod set (Optional) - 125068

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




### Carrying case

The protective carrying case ensures safe transportation and storage of the instrument and all associated equipment.
The carrying case has built-in wheels and a handle, which ensures an easy and comfortable transportation of the instrument.

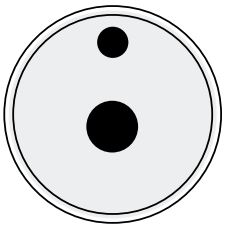
# PREDRILLED INSERTS FOR ATC-125 - 4 MM REFERENCE HOLE

JOFRA dry-block insert compatibility and materials:
ATC-125 = ATC-155 = ATC-156 (made of aluminum)
All specifications on hole sizes are referring to the outer diameter (OD) of the sensor-under-test.
The correct clearance size is applied in all predrilled inserts.

| Spare part no. for predrilled inserts with 4 mm reference hole | | |
|---|---|---|
| **Probe diameter** | **Insert code [1]** | **Insert** |
| **3 mm** | 003 | 105623 |
| **4 mm** | 004 | 105625 |
| **5 mm** | 005 | 105627 |
| **6 mm** | 006 | 105629 |
| **7 mm** | 007 | 105631 |
| **8 mm** | 008 | 105633 |
| **9 mm** | 009 | 105635 |
| **10 mm** | 010 | 105637 |
| **11 mm** | 011 | 105639 |
| **12 mm** | 012 | 105641 |
| **13 mm** | 013 | 105643 |
| **14 mm** | 014 | 105645 |
| **15 mm** | 015 | 105647 |
| **Package of the above inserts** | | 124697 |
| **Set of insulation plugs for 4 mm reference hole** | | 126234 |

| Spare part no. for predrilled inserts with 4 mm reference hole | | |
|---|---|---|
| **Probe diameter** | **Insert code [1]** | **Inserts** |
| **1/8 in** | 125 | 105677 |
| **3/16 in** | 187 | 105679 |
| **1/4 in** | 250 | 105681 |
| **5/16 in** | 312 | 105683 |
| **3/8 in** | 375 | 105685 |
| **7/16 in** | 437 | 105687 |
| **1/2 in** | 500 | 105689 |
| **9/16 in** | 562 | 105691 |
| **Package of the above inserts** | | 124698 |
| **Set of insulation plugs for 4 mm reference hole** | | 126234 |

4 mm
Reference sensor



(ATC-125)

Note: All inserts (metric and inches) are supplied with a hole for the 4 mm OD reference probe.

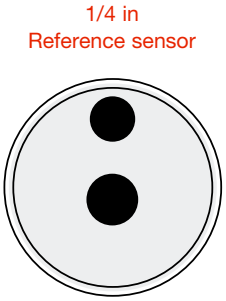
Note: Remember to use matching insulation plugs.

Note 1: Use the insert code, when ordered as the standard insert together with a new calibrator.

Use of other inserts
may reduce performance of the calibrator.
To get the best results out of your calibrator,
the insert dimensions, tolerance and material
is critical. We highly advise using JOFRA inserts,
as they guarantee trouble free operation.

## PREDRILLED INSERTS FOR ATC-125 - 1/4 IN REFERENCE HOLE

| Spare part no. for predrilled inserts with 1/4 in (6.35 mm) reference hole | | |
|---|---|---|
| **Probe diameter** | **Insert code [1]** | **Insert** |
| **3 mm** | 803 | 125260 |
| **4 mm** | 804 | 125262 |
| **5 mm** | 805 | 125264 |
| **6 mm** | 806 | 125266 |
| **7 mm** | 807 | 125268 |
| **8 mm** | 808 | 125270 |
| **9 mm** | 809 | 125272 |
| **10 mm** | 810 | 125274 |
| **11 mm** | 811 | 125278 |
| **12 mm** | 812 | 125280 |
| **13 mm** | 813 | 125282 |
| **14 mm** | 814 | 125284 |
| **15 mm** | 815 | 125286 |
| **Package of the above inserts** | | 125389 |
| **Set of insulation plugs for 1/4 in (6.35 mm) reference hole** | | 126240 |




(ATC-125 A/B)

| Spare part no. for predrilled inserts with 1/4 in (6.35 mm) reference hole | | |
|---|---|---|
| **Probe diameter** | **Insert code [1]** | **Insert** |
| **1/8 in** | 901 | 125297 |
| **3/16 in** | 902 | 125299 |
| **1/4 in** | 903 | 125301 |
| **5/16 in** | 904 | 125304 |
| **3/8 in** | 905 | 125306 |
| **7/16 in** | 906 | 125308 |
| **1/2 in** | 907 | 125310 |
| **9/16 in** | 908 | 125312 |
| **Package of the above inserts** | | 125392 |
| **Set of insulation plugs for 1/4 in (6.35 mm) reference hole** | | 126240 |

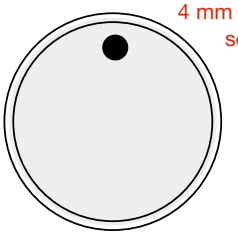
Note: All inserts (metric and inches) are supplied with a hole for the 1/4 in OD reference probe.

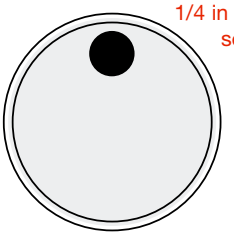
Note: Remember to use matching insulation plugs.

Note 1: Use the insert code, when ordered as the standard insert together with a new calibrator.

## UNDRILLED INSERTS FOR ATC SERIES

| | **Insert** |
|---|---|
| **5-pack, undrilled inserts** | 122720 |
| **5-pack, undrilled inserts with a 4 mm hole for the reference probe** | 122722 |
| **5-pack, undrilled inserts with a 1/4 in hole for the reference probe** | 125288 |
| **Undrilled insulation plugs** | 126040 |



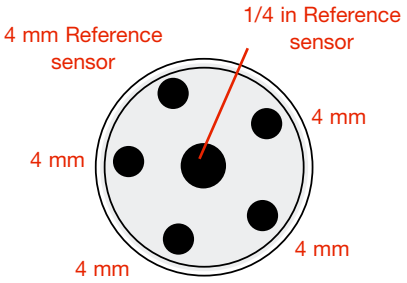
## MULTI-HOLE INSERTS FOR ATC-125 - METRIC (MM)

| Spare part no. for multi-hole inserts - metric (mm) | |
|---|---|
| **Insert code** [1] | **Insert** |
| **M01** | 126272 |
| **M02** | 126273 |
| **M03** | 126274 |
| **M04** | 126275 |

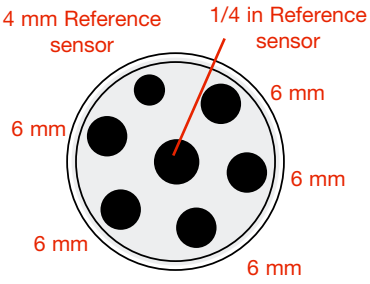
Note: All multi-hole inserts (metric and inches) for ATC-125 are supplied with a matching insulation plug.

Note: Remember to use matching insulation plugs.

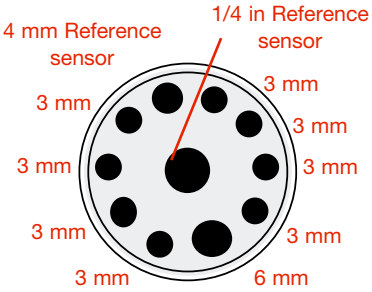
Note 1: Use the insert code, when ordered as the standard insert together with a new calibrator.



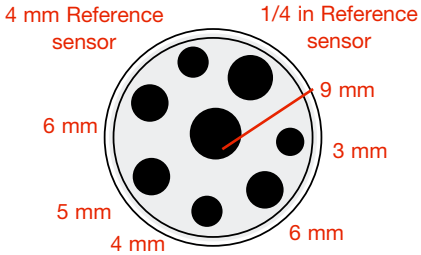

Multi-hole M01
(ATC-125 A/B)




Multi-hole M02
(ATC-125 A/B)




Multi-hole M03
(ATC-125 A/B)




Multi-hole M04
(ATC-125 A/B)

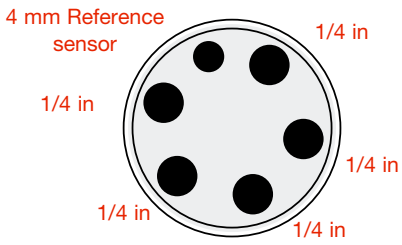
## MULTI-HOLE INSERTS FOR ATC-125 - IMPERIAL (INCH)

| Spare part no. for multi-hole inserts - imperial (inch) | |
|---|---|
| **Insert code** [1] | **Insert** |
| **M05** | 126276 |
| **M06** | 126277 |

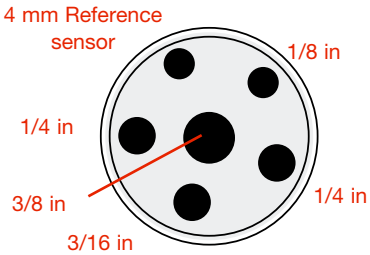
Note: All multi-hole inserts (metric and inches) for ATC-125 are supplied with a matching insulation plug.

Note: Remember to use matching insulation plugs.

Note 1: Use the insert code, when ordered as the standard insert together with a new calibrator.




Multi-hole M05
(ATC-125 A/B)




Multi-hole M06
(ATC-125 A/B)

## ORDERING INFORMATION

| Order number | Description |
|---|---|
| | **Base model number** |
| ATC125 | ATC-125 series, -90 to 125°C (-130 to 257°F) including carrying case |
| | **Model version** |
| A | Basic model (no sensor-under-test or reference probe input) |
| B | Including sensor-under-test and reference probe input |
| | **Power supply (US deliveries 60 Hz only)** |
| 115 | 115VAC |
| 230 | 230VAC |
| | **Mains power cable type** |
| A | European, 230V, |
| B | USA/CANADA, 115V |
| C | UK, 240V |
| D | South Africa, 220V |
| E | Italy, 220V |
| F | Australia, 240V |
| G | Denmark, 230V |
| H | Switzerland, 220V |
| I | Israel, 230V |
| | **Insert type and size** |
| XXX | 1 x Insert is included in the standard delivery (please see the previous insert pages for the right insert codes) |
| | **Calibration certificate** |
| F | NPL Traceable temperature certificate (standard for Europe, Asia, Australia and Africa) |
| G | NIST traceable temperature certificate (standard for Americas) |
| H | Accredited certificate (optional) |
| | **Options** |
| R | 4 mm 90° angled STS-100 reference probe with accredited certificate in temperature range: -90°C to 125°C / -130°F to 257°F |
| X | No option used |
| **ATC125B230AM01FX** | **Sample order number** JOFRA ATC-125 B including carrying case, standard accessories, 230VAC, European power cord, multihole insert type M01, and NPL traceable temperature certificate |

**Carrying case included in standard delivery**

**AMETEK Test & Calibration Instruments**
A business unit of AMETEK Measurement & Calibration Technologies Division offering the following industry leading brands for test and calibration instrumentation.

**JOFRA Calibration Instruments**
*Temperature Calibrators*
Portable dry-block calibrators, precision thermometers and liquid baths. Temperature ranges from -90°C(-130°F) to 1205°C(2200°F). Temperature sensors for industrial and marine use.
*Pressure Calibrators*
Convenient electronic systems ranging from -25 mbar to 1000 bar - fully temperature-compensated for problem-free and accurate field use.
*Signal Instruments*
Process signal measurement and simulation for easy control loop calibration and measurement tasks.

**M&G Pressure Testers & Pumps**
Pneumatic floating-ball or hydraulic piston dead weight testers with accuracies to 0.015% of reading. Pressure generators delivering up to 1,000 bar.

**Lloyd Instruments**
Materials testing machines and software from Lloyd Instruments guarantees expert materials testing solutions. The comprehensive program also covers Texture Analysers to perform rapid, general food testing and detailed texture analysis on a diverse range of foods and cosmetics.

**Davenport Polymer Test Equipment**
Allows measurement and characterization of moisture-sensitive PET polymers and polymer density.

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The hand held force gauges and motorized testers have earned their reputation for quality, reliability and accuracy and they represent the de facto standard for force measurement.

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