JOFRA® calibration

» **Wide temperature range**
From -90 to 125°C (-130 to 257°F)

» **High accuracy**
Down to ±0.07°C (±0.013°F) using the external reference sensor. 4-wire True-Ohm-Measurement technology is used

» **Most stable cooler calibration on the market**
±0.03°C (±0.054°F)

» **Fastest calibration possible**
The efficient free piston stirling cooler (FPSC) technology is used to secure fast cooling and heating temperature changes

» **Easy to carry**
Weighing only 15.2 kg (33.5 lb), the PTC-125 is by far the lightest and most portable cooler on the market

» **Intelligent reference sensor communication**
JOFRA reference sensors are supplied with intelligent plugs, holding the calibration data (coefficients) of the reference sensor. This is a truly plug & play calibration system

» **USB connector for communication**
All PTC calibrators communicate via an easy-to-use USB port

ISO 9001 Manufacturer

Specification Sheet, SS-PTC-125

Professional Temperature Calibrator
PTC-125 Cooler

Intuitive calibration

Reach -80°C in 75 minutes

The professional dry-block temperature calibrator – the JOFRA® PTC-125, is a versatile temperature calibrator available with a temperature range that makes it especially ideal for use in the health care, medical, pharmaceutical, biotechnology and food industries.

The PTC-125 offers many advantages, such as:

- **Relevant for many applications**
  With its wide temperature reach, the PTC-125 can be used in many applications where either high heat or low cooling is needed

- **User friendly**
  Intuitive to use and easy to run, the PTC-125 is equipped with a large informative, easy-to-read color display, which makes reading error a thing of the past

- **Ergonomically correct**
  Lightweight and easy-to-carry, the PTC-125 is easy to move from job to job

- **Mechanically stable**
  With its high-tech design the PTC-125 ensures durability and lasting quality

The PTC-125 is the newest member of the well-known JOFRA PTC family that can meet any type of industrial temperature calibration need within the -90 to +660°C (-130 to 1220°F) temperature range.

AMETEK®
TEST & CALIBRATION INSTRUMENTS

Standard features

Great temperature homogeneity

The PTC series of calibrators provides precision temperature calibration of sensors, whatever the type or format.

The JOFRA PTC-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 any type of mechanical sensors.

Wide temperature range

The PTC-125 performs calibration over a wide temperature range starting from -90°C and up to 125°C (-130 to 257°F). This makes it possible to perform calibration of sensors in applications ranging from ultra-coolers to sterilization sensors (SIP).

Fastest temperature calibration

Time is money! This is why all the new PTC calibrators heat and cool faster than all other calibrators on the market. This saves you both in production downtime and general calibration costs.

NEW!
Plug & play

Intelligent reference sensor communication

The JOFRA STS-150 intelligent reference sensor contains all individual calibration data regarding the sensor.

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

With these intelligent reference sensors, AMETEK has eliminated a source of error and the system is now a fail-safe plug & play calibration system.

Intelligent recalibration information, IRI

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

USB connector for communication

Another PTC feature is the USB connection that facilitates easy communication with the calibration management software JOFRACAL. 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 for 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.

Efficient cooling technology

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

It is much more efficient than thermo-electric (Peltier) coolers.

Easy to read & user friendly

The new 5.7" full color VGA display is large, bright and very easy to read – even from a distance. 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 important information needed for the current function in use. The communication window pops up and is followed by discrete sound messages.

The display contains detailed information at a glance, such as:

• Stability status
• Real time clock
• Serial number of reference sensor
• Sensor-under-test status
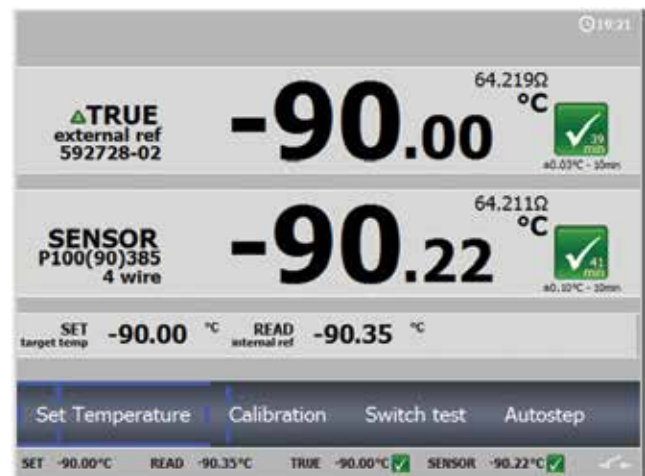
Easy to carry

A calibrator is carried from one job to another and therefore it needs to weigh as little as possible. AMETEK has designed the PTC calibrators to be lightweight and easy to carry, without compromising quality, durability or functionality.

The PTC-125 weighs only 15.2 kg, making it one of the lightest ultra coolers on the market.

SET-Follows-TRUE (Models B & C only)

The "SET-Follows-TRUE" mode makes the instrument tune in to 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 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) and thermostats.

PTC calibrators can be user-programmed from the keyboard for fully-automatic sensor calibrations. Once the unit is programmed, the instrument is self-operating and performs the configured calibration routine. All calibration data and results are stored and can be read on the display.

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 20 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 read the results for the sensor-under-test on the PTC display. Results from twenty auto-step calibrations can be held.

The "Set temperature" feature allows the user to set the exact desired temperature with a resolution of 0.01°C (0.002°F).

Instrument setups

The PTC series allows the user to store up to 10 complete instrument setups. You may store all types 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 temperatures

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 reduce sensor drift from exposure to too high temperatures. This feature can be locked with an access code.

Enhanced stability

A stability indicator shows when the PTC 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 read-out.

Specially-designed carrying case

AMETEK has designed an all-in-one carrying case that makes it possible to store the STS reference sensor in the carrying case with optimal 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.

All compartments are specially designed to hold the above-mentioned items (5 inserts). This makes it easy to keep track of all your accessories.

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

JOFRACAL calibration software

JOFRACAL is a highly versatile calibration software that is supplied together with the PTC calibrator. The software ensures easy calibration of all kind of temperature sensors, such as RTD´s, thermocouples, transmitters and thermoswitches.
Furthermore, it can be used for pressure calibration i.e. pressure gauges and pressure switches.

In conjunction with JOFRACAL, PTC calibrators can:

- 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 JOFRACAL for printing of certificates. The data collected may 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.

Free download at www.jofra.com

Optional features

Unique reference sensors

The STS-150 reference sensor is designed with a 90°-angled rod to fit the calibrator so it is only slightly higher than the top of the PTC calibrator.

The unique design makes it possible to calibrate threaded sensors and sensors with connection heads without any problems. STS-150 reference sensors also alert you when your calibration has expired.

Increased capacity with JOFRA ASM

Using the PTC 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 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.

Sensor support rod

The support rod is lightweight and easy to mount on the PTC. Two fixing holes are integrated in the calibrator where the support rods can be mounted.

Multi-hole insert kits

Two special multi-hole insert kits have been developed to comply with calibration of almost any sensor diameter without having to buy numerous inserts.

The first kit is a metric insert kit consisting of four inserts covering all diameters from 3 to 13 mm. The other is an imperial insert kit consisting of three inserts covering six different sizes from 1/8" to 7/16".

All inserts have holes for STS reference sensors.

Optional PTC firmware package, U1

Optional feature for B model only. See Option U1 in ordering code.

The PTC calibrator can be supplied with additional functionality.

1. Engineering units in display
2. Work order functionality
3. Additional sensor under test input types*

*Pt10(90)385, Pt50(90)385, Pt200(90)385, Pt500(90)385, Pt50(90)391, M50(90)428, M100(90)428, Pt100 Mill and YSI-400

Upon buying the User Interface functionality, U1, the following three capabilities are enabled.

Documenting temperature calibrator

Optional feature for B model only. See Option U1 in ordering code.

The PTC calibrator can store calibration procedures and may be taken out to the process site without bringing a personal computer.

This allows the PTC calibrator to:

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

As found/As left

Optional feature for B model only. See Option U1 in ordering code.

On the B model you can, when running a calibration initiated from a work order, select the calibration as an As Found or an As Left calibration.

Calibration of indication devices

Optional feature for B model only. See Option U1 in ordering code.

When calibrating the B model 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.

Superiour Temperature Reference Sensor JOFRA STS-150

SPECIFICATIONS STS-150 A 912

Temperature range

All sensors................................-90 to 125°C/-130 to 257°F

Accuracy

Hysteresis[1] @ 0°C / 32°F .... 0.01°C / 0.02°F
Long term stability[2] @ 0°C / 32°F.... typ. 0.016°C / 0.029°F
Repeatability[1].. 0.004°C / 0.007°F

[1] When used in the range -90 to 125°C / -130 to 257°F

[2] When exposed to 125°C / 257°F for 100 hours. Stability will depend on actual use of the sensor.

Sensing element

Type..PT100

Response time

STS-150 A (4 mm / 0.16 in): $\tau_{0.5}$ (50%) ....7 sec.
STS-150 A (4 mm / 0.16 in): $\tau_{0.9}$ (90%) ....18 sec.

Dimensions

Diameter .... 4 mm
Length .... 192 mm
Max height on calibrator top....................................22 mm

Standard delivery

STS-150 A sensor
Plastic protection case
Accredited certificate
Cable
Manual

Compatible JOFRA instruments

DTI-050

JOFRA calibration

FUNCTIONAL SPECIFICATIONS

Temperature range

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

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

PTC-125 B & C.. ±0.07°C/±0.13°F
12-month period. Relative to reference standard. Specifications by use of the external JOFRA STS-150 reference sensor.

Accuracy with internal reference sensor

PTC-125 A, B & C .... ±0.30°C/±0.54°F

Stability

PTC-125 ....±0.03°C/±0.054°F[1]
Measured after the stability indicator has been on for 15 minutes. Measuring time is 30 minutes.

Radial homogeneity (difference between holes)

PTC-125 ....0.01°C/0.02°F

Resolution (user-selectable)

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

Heating time

PTC-125   -90 to 23°C/-130 to 73°F............. 15 minutes
            23 to 125°C/73 to 257°F............. 13 minutes

Cooling time

PTC-125   125 to 23°C/257 to 73°F............. 40 minutes
            23 to -80°C/73 to -112°F............. 75 minutes
            -80 to -90°C/-112 to -130°F .... 30 minutes
            23 to -90°C/73 to -130°F........... 105 minutes
            125 to -90°C/257 to -130°F....... 145 minutes

Time to stability (approx.)

PTC-125 .... 10 minutes

Immersion depth

PTC-125 .... 190 mm/6.3 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). Input specifications are not applicable to the PTC-A models.

RTD reference input (B & C models only)

Type................. 4-wire RTD with true ohm measurements[1]
F.S. (Full Scale) .... 400 ohm
Accuracy (12 months) .... ±(0.003% rdg. + 0.0007% F.S.)

RTD Type	Temperature		12 months	
	°C	°F	°C	°F
Pt100 reference	-90	-130	±0.02	±0.03
	0	32	±0.02	±0.03
	125	257	±0.02	±0.04

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

RTD sensor-under-test input (B model only)

F.S. (range) .... 400 ohm
Accuracy (12 months)................. ±(0.006% Rdg.+0.015% F.S.)
F.S. (range) .... 4000 ohm
Accuracy (12 months) .... ±(0.005% Rdg. + 0.005% F.S.)
2-wire .... add 50 mOhm

RTD Type	Temperature		12 months	
	°C	°F	°C	°F
Pt1000	-90	-130	±0.06	±0.11
	0	32	±0.07	±0.12
	125	257	±0.08	±0.14
Pt500	-90	-130	±0.11	±0.20
	0	32	±0.13	±0.22
	125	257	±0.13	±0.24
Pt100	-90	-130	±0.03	±0.06
	0	32	±0.04	±0.06
	125	257	±0.05	±0.08

Thermocouple input

Thermocouple types .... E, J, L, K, N, R, S, T, U, B
Range .... ±78 mV
F.S. (Full Scale) .... 78 mV
Accuracy (12 months) .... ±(0.02% Rdg. + 0.01% F.S.)

TC Type	Temperature		12 months*	
	°C	°F	°C	°F
E	-90	-130	±0.19	±0.34
	0	32	±0.13	±0.24
	125	257	±0.14	±0.24
J	-90	-130	±0.21	±0.37
	0	32	±0.15	±0.28
	125	257	±0.17	±0.30
K	-90	-130	±0.27	±0.49
	0	32	±0.20	±0.35
	125	257	±0.22	±0.39
T	-90	-130	±0.29	±0.52
	0	32	±0.20	±0.36
	125	257	±0.18	±0.33
R	-50	-58	±2.06	±3.72
	0	32	±1.44	±2.60
	125	257	±1.01	±1.82
S	-50	-58	±1.87	±3.36
	0	32	±1.42	±2.55
	125	257	±1.03	±1.86
N	-90	-130	±0.38	±0.69
	0	32	±0.30	±0.54
	125	257	±0.28	±0.50
U	-90	-130	±0.27	±0.49
	0	32	±0.20	±0.35
	125	257	±0.19	±0.34

* 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) ....±(0.02% Rdg. +0.01% 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.) ....450 VA

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 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

PHYSICAL SPECIFICATIONS

Weight and instrument size (L x W x H)

PTC-125 .... 15.2 kg/33.5 lb
PTC-125 ....531 x 169 x 432 mm/20.9 x 6.65 x 17.0 in

Shipping (including carrying case)

PTC-125 .... 38 kg/83.8 lb
PTC-125 ....800 x 500 x 800 mm/31.5 x 19.7 x 31.5 in

Note: Shipped on ½ pallet, binded.

INSERTS

Insert dimensions

PTC-125 outer diameter ....29.7 mm/1.17 in
PTC-125 inner diameter ....25.6 mm/1.01 in
PTC-125 length ....150 mm/5.91 in

Weight of non-drilled insert (approx.)

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

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

PREDRILLED INSERTS FOR PTC-125

All predrilled inserts have holes for:
4 mm reference sensor • ¼" reference sensor • 3 mm hole for a sensor
All inserts are supplied with an insulation plug drilled with the necessary holes.
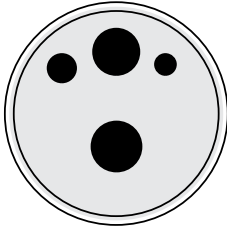
Spare part no. for predrilled inserts with reference holes	Instrument	
Sensor diameter	Insert code [1]	PTC-125 A/B/C
3 mm	003	128477
4 mm	004	128478
5 mm	005	128479
6 mm	006	128480
7 mm	007	128481
8 mm	008	128482
9 mm	009	128483
10 mm	010	128484
11 mm	011	128485
12 mm	012	128486
13 mm	013	128487
14 mm	014	128488
15 mm	015	128489
16 mm	016	128490
Package of the above inserts	SMM	128492

Spare part no. for predrilled inserts with reference holes	Instrument	
Sensor diameter	Insert code [1]	PTC-125 A/B/C
1/8 in	125	128468
3/16 in	187	128469
1/4 in	250	128470
5/16 in	312	128471
3/8 in	375	128472
7/16 in	437	128473
1/2 in	500	128474
9/16 in	562	128475
5/8 in	625	128476
Package of the above inserts	SIM	128491

Note 1: Use the insert code, when ordering a JOFRA standard insert together with the PTC calibrator.

UNDRILLED INSERTS FOR PTC SERIES
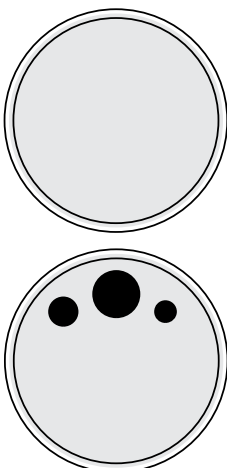
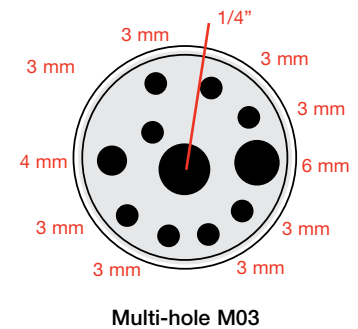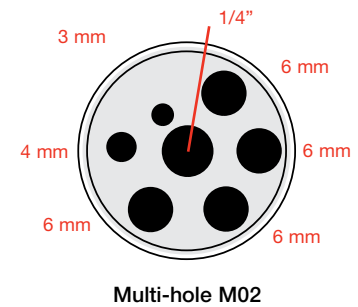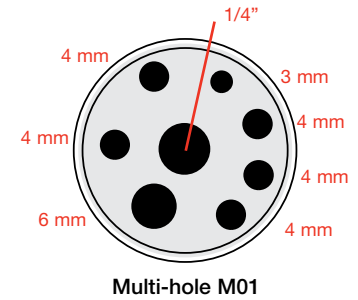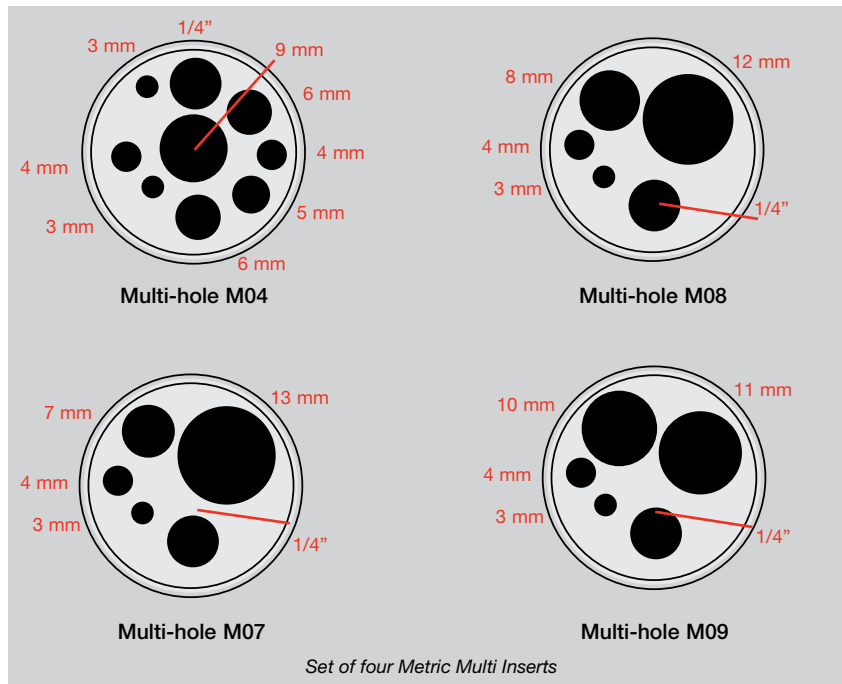| Inserts, undrilled incl. insulation plugs		Instrument	
Inserts		Insert code[1]	PTC-125 A/B/C
5-pack, undrilled inserts with no holes		UN1	128453
5-pack, undrilled inserts with two holes for STS reference sensors (4mm & ¼") and a 3 mm hole		UN3	128455
Undrilled insulation plug			126040

Note 1: Use the insert code, when ordering a JOFRA standard undrilled insert together with the PTC calibrator.

MULTI-HOLE INSERTS FOR PTC-125 - 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	**Insert code[1]**	**PTC-125 A/B/C**
Multi-hole type 1	M01	128456
Multi-hole type 2	M02	128457
Multi-hole type 3	M03	128458
Multi-hole type 4	M04	128459
Multi-hole type 7	M07	128462
Multi-hole type 8	M08	128463
Multi-hole type 9	M09	128464
Set of four Metric Multi Inserts, 3mm to 13mm (M04, M07, M08 & M09)	SMX	128466

Note 1: Use the insert code, when ordering a JOFRA standard multi-hole insert together with the PTC calibrator.

Multi-hole M01

Multi-hole M04

Multi-hole M08

Multi-hole M02

Multi-hole M07

Multi-hole M09

Multi-hole M03

Set of four Metric Multi Inserts

MULTI-HOLE INSERTS FOR PTC-125 - 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 code	**Insert code[1]**	**PTC-125 A/B/C**
Multi-hole type 5	M05	128460
Multi-hole type 6	M06	128461
Multi-hole type 10	M10	128465
Set of three Imperial Multi Inserts, 1/8 to 7/16" (Incl. M05, M06 & M10)	SIX	128467

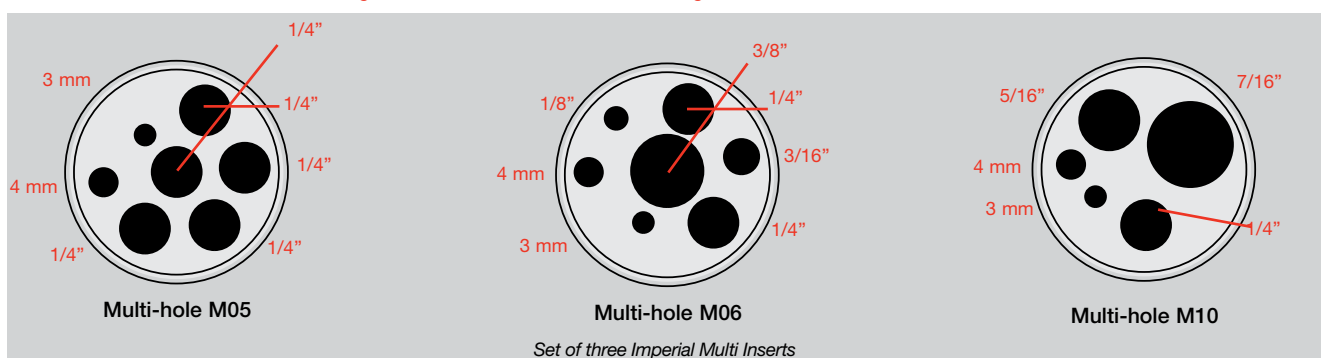Note 1: Use the insert code, when ordering a JOFRA standard multi-hole insert together with the PTC calibrator.

Multi-hole M05

Multi-hole M06

Multi-hole M10

Set of three Imperial Multi Inserts

FUNCTIONAL COMPARISON

	Model A	Model B	Model C
Input	None	ref and SUT	ref
Dual-zone heating/cooling block	•	•	•
MVI - Mains Variance Immunity (or similar)	•	•	•
Stability indicator	•	•	•
Automatic step function	•	•	•
USB communication	•	•	•
Display resolution 0.01°C/°F/K	•	•	•
Programmable max. temperature	•	•	•
External precision reference sensor input		•	•
"SET" follows "TRUE"		•	•
Input for RTD, TC, mA		•	
4-20 mA transmitter input incl. 24 VDC supply		•	
All inputs scalable to temperature		•	
Automatic switch test (open, close and hysteresis)		•	

Ref = Reference sensor, STS-150
SUT = sensor-under-test

STANDARD DELIVERY

	Model A	Model B	Model C
PTC dry-block calibrator (user spcified)	•	•	•
Mains power cable (user specified)	•	•	•
Tool for insertion tubes	•	•	•
JOFRACAL	•	•	•
USB cable	•	•	•
Set of rubber cones for insulation plugs	•	•	•
Carrying case	•	•	•
Manual	•	•	•
Traceable certificate - temperature performance	•	•	•
Traceable certificate - input performance for reference sensor		•	•
Traceable certificate - input performance for sensor-under-test inputs		•	
Test cables (2 x red, 2 x black)		•	

ORDERING INFORMATION

Order number	Description
	Base model number
PTC125	PTC-125 series, -90˚C to 125˚C (-130˚F to 257˚F)
	Model version
A	Basic model, without input
B	Full model, incl. Reference sensor input, Sensor-under-test input
C	Middle model, incl. Reference sensor input
	Power supply (US deliveries 60 Hz only)
115	115VAC
230	230VAC
	Mains power cable
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
NON	No insert selected (standard)
UNX	1 x Undrilled Insert (Please see Insert selection for code)
XXX	1 x Single hole insert (Please see Insert selection for code)
MXX	1 x Multi hole insert (Please see Insert selection for code)
SIX	Set of 3 Imperial multi hole inserts. Covering holes from 1/8" to 7/16"
SMX	Set of 4 Metric multi hole inserts. Covering holes from 3mm to 13mm
SIM	Set of 9 Imperial inserts. Covering holes from 1/8" to 5/8"
SMM	Set of 14 Metric inserts. Covering holes from 3mm to 16mm
	User Interface Functionality
U1	Complete functionality package - workorders, Full Sensor-Under-Test types, Engineering units (B model only)
	External Reference sensor (B & C models only, optional)
R16	STS-150 Ref. sensor. Dia. 4mm. Length 192mm (STS150A912EH)
	Calibration Certificate
F	Traceable Callibration Certificate. (standard)
H	Accredited Calibration Certificate - ISO17025
EA	Full EURAMET Calibration Certificate - ISO17025
FS	Traceable System Calibration Certificate (B & C model only)
HS	Accredited System Calibration Certificate (B & C model only) - ISO17025
EAS	Full EURAMET System Calibration Certificate (B & C model only) - ISO17025
	Accessories
CT	Solid Protective Carrying case with trolley * Carrying case included in stadard delivery
TR	Solid Protective Carrying case with trolley & Support rod set
	Sample order number
PTC125 B 230 A SMX U1 R16 EA TR	JOFRA PTC-125 B with 230VAC, EU power cord, set of metric inserts, User Interface functionality, STS-150 ref. sensor, full EA temp. calibration certificate, and carrying case with trolley & support rod

ACCESSORIES

125066	Extra fixture for sensor grip
125067	Extra sensor grip
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

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.

Chatillon Force Measurement
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.

Newage Testing Instruments
Hardness testers, durometers, optical systems and software for data acquisition and analysis.

AMETEK®
TEST & CALIBRATION INSTRUMENTS

Intuitive and fast calibration!

JOFRA®)(calibration

Professional Temperature Calibrator

PTC-155, PTC-350 & PTC-660

» High accuracy
Down to ±0.06°C (±0.11°F) using the external reference sensor. 4-wire True-Ohm-Measurement technology applied

» Excellent stability 0.01°C

» Wide temperature range
PTC-155 from -25 to 155°C (-22 to 311°F)
PTC-350 from 33 to 350°C (91 to 662°F)
PTC-660 from 33 to 660°C (91 to 1220°F)

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

» Intelligent reference sensors
JOFRA reference sensors are supplied with intelligent plugs, containing calibration data (coefficients) of the reference sensor. A truly plug'n'play calibration system

» USB communication
All PTC calibrators communicate via an easy-to-use USB port

» Time-saving
High speed heating and cooling times. 350°C in only 7 minutes

» Work order functionality
Upload advanced calibration routines to your PTC for troublefree and automatic on-site calibrations

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

The new PTC calibrator comes in three different models: A, B and C
• PTC-A professional temperature calibrator
• PTC-B professional temperature calibrator with input for reference sensor and sensors-under-test
• PTC-C professional temperature calibrator with input for reference sensor

The PTC offers many of the weel-known JOFRA features, such as:
• Easy-to-read color VGA display with perfect overview of the actual calibration status
• Intelligent recalibration information, IRI
• Intuitive, fast and user-friendly navigation
• Lightweight and easy to carry around
• Functional carrying case
• Multi-hole insert kits covering all the most used sensor sizes
• High profile design and the well-known long lasting JOFRA quality

ISO 9001 Manufacturer

Specification Sheet, SS-PTC

AMETEK®

TEST & CALIBRATION INSTRUMENTS

Unique temperature performance

The PTC 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 JOFRA PTC-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.
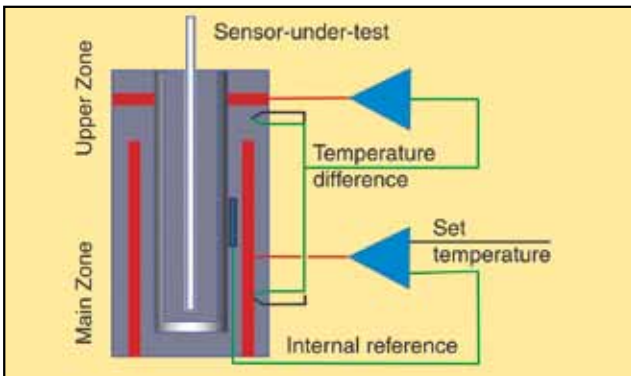
USB connector for communication

The new 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 and USB host connectors for future use.

NEW!

Intelligent recalibration information, IRI

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

Intelligent reference sensors

The JOFRA STS-150 intelligent reference sensors contain individual calibration data regarding the sensor. This means that the time-consuming coefficient downloading sequence with risk of errors is no longer necessary and that the user can change the reference sensor and be up and running immediately.

With the intelligent sensors, AMETEK has 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-150 reference sensors are angled at 90° and are only slightly higher than the top of the PTC calibrator.

The unique design makes it possible to calibrate threaded sensors and sensors with connection heads without any problems

Only 8.2 kg

Easy to carry

Particularly users that frequently perform on-site calibrations will appreciate the focus on minimizing the weight of the PTC calibrator.

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

Fast temperature calibration

350°C in 7 min.

Time is money! The new PTC calibrators have an increased heating and cooling speed. The PTC-350 go's from 33°C up to 350°C in just 7 minutes. The implication is savings in both production downtime and general calibration costs.

New multi-hole insert kits

Two special multi-hole insert kits have been developed to comply with calibration of almost any sensor diameter without having to buy numerous inserts.

The first kit is a metric insert kit consisting of only four inserts covering all diameters from 3 to 12 mm. The other is an imperial insert kit consisting of only three inserts covering six different sizes from 1/8" to 1/2". All inserts have, beside the holes for the Sensor under test, a 4 mm STS reference sensor hole. With this new insert kit in the carrying case, the user is now able to calibrate all commonly known sensor sizes.

Wide temperature range

The PTC-series can perform calibration over a very wide temperature range starting from -25°C and up to 660°C (-13 to 1220°F). This makes it possible to perform calibration jobs over a range of 685°C (1233°F) with only two calibrators.

Easy-to-read

color display and user-friendly navigation

The 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 in use. The communication windows pop up and are followed by discrete sound messages.

The back-lit display can easily be read in all light conditions.

The large display contains more detailed information, such as:

- Stability status
- Real time clock
- Serial number of reference sensor
- Sensor-under-test status

All-in-one carrying case

The specially designed carrying case makes it possible to store the STS reference sensors in an optimum physical protection. There is room for inserts and insulation plugs to cover all dimensions and a compartment for wires, manuals, certificates, plugs, insert tools etc.

Integrated support rod

The integrated support rod is part of the reduced weight philosophy. It is lightweight and very easy to mount on the PTC. Two fixing holes are integrated in the calibrator where the support rods can be mounted.
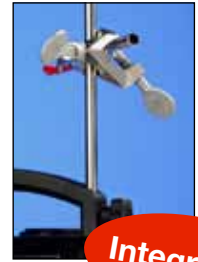
MVI - Secure temperature stability

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.

The JOFRA PTC calibrators all employ the MVI functionality, thus avoiding such stability problems. For the PTC-155 the MVI functionality is obtained by running the calibrator on stabilized DC voltage.
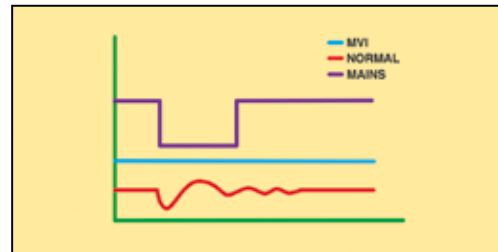
Highest accuracy

The PTC series B and C models are supplied with a built-in reference measuring circuit to be used with an external reference sensor. This feature allows the instrument to perform calibrations on-site, while maintaining a high accuracy.

A special 90° angled external reference sensor is designed to accommodate calibration of 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 angled reference sensor from the large, easy-to-read display. The external and the internal sensor readings are independent of one another.

SET-Follows-TRUE

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

The PTC model B 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) and thermostats.

The PTC calibrators can be user-programmed from the keyboard for fully automatic sensor calibrations. 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

On the B model you can perform a thermoswitch 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 PTC 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 0.01°.

Enhanced stability

A stability indicator shows when the PTC 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 read-out.

Instrument setups

The PTC series allows the user to store up to ten (10) complete instrument setups. You can 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 reduce sensor drift from exposure to high temperatures. This feature can be locked with an access code.

Free download www.jofra.com

JOFRACAL calibration software

JOFRACAL is a highly versatile calibration software that is supplied together with the PTC calibrator. The software ensures easy calibration of all kind of temperature sensors, such as RTD´s, thermocouples, transmitters and thermoswithes. Furthermore, it can be used for pressure calibration i.e. pressure gauges and pressure switches.

This allows the PTC 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 JOFRACAL for printing of certificates. The data collected may 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.

JOFRACAL is compatible with all JOFRA temperature, pressure and signal calibrator instruments.

JOFRACAL may also be used for manual calibrations, as it can be set up to accept manual entry of calibration data together with other brand dry-block heat sources, liquid baths or ice points.

Calibration of up to 24 sensors
with JOFRA ASM

Using the JOFRA PTC 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

- 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)

Optional PTC firmware pakage

Optional PTC firmware package

Optional feature for B model only. See Option U1 in ordering code.

The PTC calibrator can be supplied with additional functionality.

1. Engineering units in display
2. Work order functionality
3. Additional sensor under test input types*

*Pt10(90)385, Pt50(90)385, Pt200(90)385, Pt500(90)385, Pt50(90)391, M50(90)428, M100(90)428, Pt100 Mill and YSI-400

Upon buying the User Interface functionality, U1, the following three capabilities are enabled.

Documenting temperature calibrator

The PTC calibrator can store calibration procedures and may be taken out to the process site without bringing a personal computer.

This allows the PTC 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 JOFRACAL for printing of certificates. The data collected may be stored on the personal computer for later recall or analysis.

As found/As left

On the B model you can, when running a calibration initiated from a work order, select the calibration as an As Found or an As Left calibration.

Calibration of indication devices

When calibrating the B model 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.

FUNCTIONAL SPECIFICATIONS

Temperature range @ 23°C / 73°F

PTC-155 ....-25 to 155°C / -13 to 311°F
PTC-350 ....33 to 350°C / 91 to 662°F
PTC-660 ....33 to 660°C / 91 to 1220°F

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

PTC-155 B & C...±0.06°C/±0.11°F
PTC-350 B & C...±0.08°C/±0.15°F
PTC-660 B & C...±0.15°C/±0.27°F
12-month period. Relative to reference standard. Specifications
by use of the external JOFRA STS-150 reference sensor

Accuracy with internal reference sensor

PTC-155 A, B & C ....±0.18°C/±0.32°F
PTC-350 A, B & C ....±0.20°C/±0.36°F
PTC-660 A, B & C @ 33 to 420°C............±0.30°C/±0.54°F
PTC-660 A, B & C @ 420 to 660°C..........±0.50°C/±0.54°F

Stability

PTC-155 ....±0.01°C/±0.018°F
PTC-350 ....±0.02°C/±0.036°F
PTC-660 ....±0.04°C/±0.072°F
Measured after the stability indicator has been on for 15 minutes.
Measuring time is 30 minutes.

Radial homogeneity (difference between holes)

PTC-155 ....0.01°C/0.018°F
PTC-350 ....0.02°C/0.036°F
PTC-660 ....0.10°C/0.180°F

Resolution (user-selectable)

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

Heating time

PTC-155   -25 to 23°C/-13 to 73°F................. 4 minutes
            23 to 155°C/73 to 311°F............. 12 minutes
PTC-350   33 to 350°C/91 to 662°F................ 7 minutes
PTC-660   33 to 660°C/91 to 1220°F........... 20 minutes

Cooling time

PTC-155   155 to 23°C/311 to 73°F.............. 10 minutes
            23 to -25°C/73 to -13°F............... 15 minutes
PTC-350   350 to 100°C/662 to 212°F.......... 12 minutes
            100 to 50°C/212 to 122°F........... 12 minutes
PTC-660   660 to 100°C/1220 to 212°F........ 36 minutes
            100 to 50°C/212 to 122°F........... 15 minutes

Time to stability (approx.)

PTC-155 .... 10 minutes
PTC-350 .... 10 minutes
PTC-660 .... 10 minutes

Immersion depth

PTC-155 .... 160 mm/6.3 in
PTC-350 .... 140 mm/5.5 in
PTC-660 .... 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 minute period).

Input specifications are not applicable to the PTC-A models

All input specifications are valid for PTC-155, PTC-350, PTC-660.

RTD reference input (B & C models only)

Type.................. 4-wire RTD with true ohm measurements[1]
F.S. (Full Scale) ....400 ohm
Accuracy (12 months) .... ±(0.003% rdg. + 0.0007% F.S.)

RTD Type	Temperature		Accuracy	
	°C	°F	°C	°F
Pt100 reference	-25	-13	±0.014	±0.025
	0	32	±0.015	±0.027
	55	131	±0.017	±0.031
	100	212	±0.018	±0.032
	155	311	±0.020	±0.036
	350	662	±0.028	±0.051
	660	1220	±0.041	±0.074

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

RTD sensor under test input (B model only)

F.S. (range) ....400 ohm
Accuracy (12 months).................. ±(0.006% Rdg.+0.015% F.S.)
F.S. (range) ....4000 ohm
Accuracy (12 months) .... ±(0.005% Rdg. + 0.005% F.S.)
2-wire ....add 50 mOhm

RTD Type	Temperature		Accuracy	
	°C	°F	°C	°F
Pt1000 (90) 385	-25	-13	±0.07	±0.12
	0	32	±0.07	±0.12
	155	311	±0.08	±0.15
	350	662	±0.10	±0.18
	660	1220	±0.13	±0.23
Pt500 (90) 385	-25	-13	±0.12	±0.22
	0	32	±0.12	±0.22
	155	311	±0.14	±0.24
OPTIONAL	350	662	±0.16	±0.28
	660	1220	±0.20	±0.35
Pt100 (90) 385	-25	-13	±0.04	±0.06
	0	32	±0.04	±0.06
	155	311	±0.05	±0.08
	350	662	±0.06	±0.11
	660	1220	±0.08	±0.15

The PTC calibrator has as standard input for resistance sensors
and curves such as:

P100(90)391, P100(90)392, H120(90)672

The PTC can optionally be supplied with input for resistance
sensors and curves such as:

Pt10(90)385, Pt50(90)385, Pt200(90)385, Pt500(90)385,
Pt50(90)391, M50(90)428, M100(90)428, Pt100 Mill and YSI-400

Thermocouple input

Range .... ±78 mV
F.S. (Full Scale) .... 78 mV
Accuracy (12 months) .... ±(0.02% Rdg. + 0.01% F.S.)

TC Type	Temperature		Accuracy*	
	°C	°F	°C	°F
E	0	32	±0.14	±0.25
	155	311	±0.14	±0.25
	350	662	±0.17	±0.31
	660	1220	±0.22	±0.40
J	0	32	±0.17	±0.31
	155	311	±0.17	±0.31
	350	662	±0.23	±0.41
	660	1220	±0.25	±0.45
K	0	32	±0.22	±0.40
	155	311	±0.22	±0.40
	350	662	±0.26	±0.48
	660	1220	±0.32	±0.57
T	0	32	±0.20	±0.36
	155	311	±0.20	±0.36
	350	662	±0.19	±0.35
	400	752	±0.19	±0.35
R	155	311	±1.56	±2.81
	350	662	±0.83	±1.50
	660	1220	±0.75	±1.36
S	155	311	±1.56	±2.81
	350	662	±0.92	±1.66
	660	1220	±0.85	±1.53
B	250	482	±3.17	±5.70
	350	662	±2.42	±4.35
	660	1220	±1.32	±2.37
N	0	32	±0.30	±0.54
	155	311	±0.30	±0.54
	350	662	±0.29	±0.52
	660	1220	±0.32	±0.57
U	0	32	±0.20	±0.36
	155	311	±0.18	±0.33
	350	662	±0.19	±0.35
	600	1112	±0.21	±0.37

* Excl. CJC accuracy ±0.35°C / ±0.63°F

Transmitter supply (B model only)

Output voltage..24VDC ±10%
Output current.. Maximum 28 mA

Transmitter input mA (B model only)

Range .... 0 to 24 mA
Accuracy (12 months) ....±(0.02% Rdg. +0.01% F.S.)

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.) PTC-155.........................400 W
Power consumption (max.) PTC-350/PTC-660 ....1150 W

Switch input (B model only)

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

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*
* for future expansion

Miscellaneous

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

PHYSICAL SPECIFICATIONS

Weight and instrument size (L x W x H)

PTC-155 ....10.3 kg/22.7 lb
PTC-350 ....8.2 kg/18.1 lb
PTC-660 ....8.9 kg/19.6 lb
PTC-ALL..............362 x 171 x 363 mm/14.3 x 6.7 x 14.3 in

Shipping (without carrying case)

PTC-155 ....14.0 kg/30.9 lb
PTC-350 ....11,9 kg/26.2 lb
PTC-660 ....12,6 kg/27.8 lb
PTC-ALL..............580 x 250 x 500 mm/22.8 x 9.8 x 19.7 in

Shipping (including solid protective carrying case) - CX

PTC-155 ....19.0 kg/41.9 lb
PTC-350 ....16.9 kg/37.2 lb
PTC-660 ....17.6 kg/38.8 lb
PTC-ALL............610 x 340 x 495 mm/24.0 x 13.4 x 19.5 in

Shipping (including solid protective trolley carrying case) - CT

PTC-155 ....23.9 kg/52.7 lb
PTC-350 ....21.8 kg/48.1 lb
PTC-660 ....22.5 kg/49.6 lb
PTC-ALL............550 x 440 x 610 mm/21.7 x 17.3 x 24.0 in

Shipping (carrying case only) - CX

Weight ....7.2 kg/15.9 lb
Size....................610 x 340 x 495 mm/25.5 x 13.4 x 19.5 in

Shipping (carrying case only) - CT

Weight ....12.1 kg/26.7 lb
Size....................550 x 440 x 610 mm/21.7 x 17.3 x 24.0 in

INSERTS

Insert dimensions, diameter & length

PTC-155 and PTC-350 ....25.8 x 150 mm/1.02 x 5.91 in
PTC-660 ....24.8 x 160 mm/0.98 x 6.30 in

Insert material

PTC-155 and PTC-350 ....aluminium
PTC-660 .... brass

Weight of non-drilled insert (approx.)

PTC-155 and PTC-350 ....205 g / 7.2 oz
PTC-660 ....630 g / 22.2 oz

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 JOFRA inserts, as they guarantee trouble free operation.

PREDRILLED INSERTS FOR PTC series

All predrilled inserts have holes for 4 mm reference sensor
All inserts for PTC-155 are supplied with an insulation plug drilled with the necessary holes
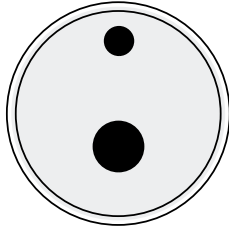
| Spare part no. for predrilled inserts with reference holes				
		Instrument		
Sensor diameter	Insert code [1]	PTC-155 A/B/C	PTC-350 A/B/C	PTC-660 A/B/C
3 mm	003	127937	127990	128031
4 mm	004	127938	127991	128032
5 mm	005	127939	127992	128033
6 mm	006	127940	127993	128034
7 mm	007	127941	127994	128035
8 mm	008	127942	127995	128036
9 mm	009	127943	127996	128037
10 mm	010	127944	127997	128038
11 mm	011	127945	127998	128039
12 mm	012	127946	127999	128040
13 mm	013	127947	128000	128041
14 mm	014	127948	128001	128042
15 mm	015	127949	128002	128043
Package of the above inserts	SMM	127951	128004	128045

Spare part no. for predrilled inserts with reference holes				
		Instrument		
Sensor diameter	Insert code [1]	PTC-155 A/B/C	PTC-350 A/B/C	PTC-660 A/B/C
1/8 in	125	127952	128005	128046
3/16 in	187	127953	128006	128047
1/4 in	250	127954	128007	128048
5/16 in	312	127955	128008	128049
3/8 in	375	127956	128009	128050
7/16 in	437	127957	128010	128051
1/2 in	500	127958	128011	128052
9/16 in	562	127959	128012	128053
5/8 in	625	127960	128013	not possible
Package of the above inserts	SIM	127961	128014	128055

Note 1: Use the insert code, when ordering a JOFRA standard insert together with the PTC calibrator

UNDRILLED INSERTS FOR PTC SERIES
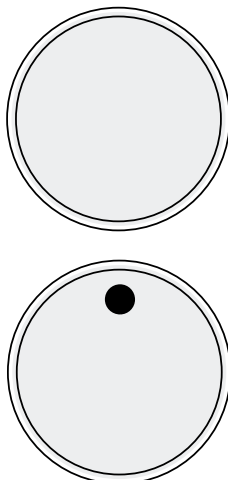
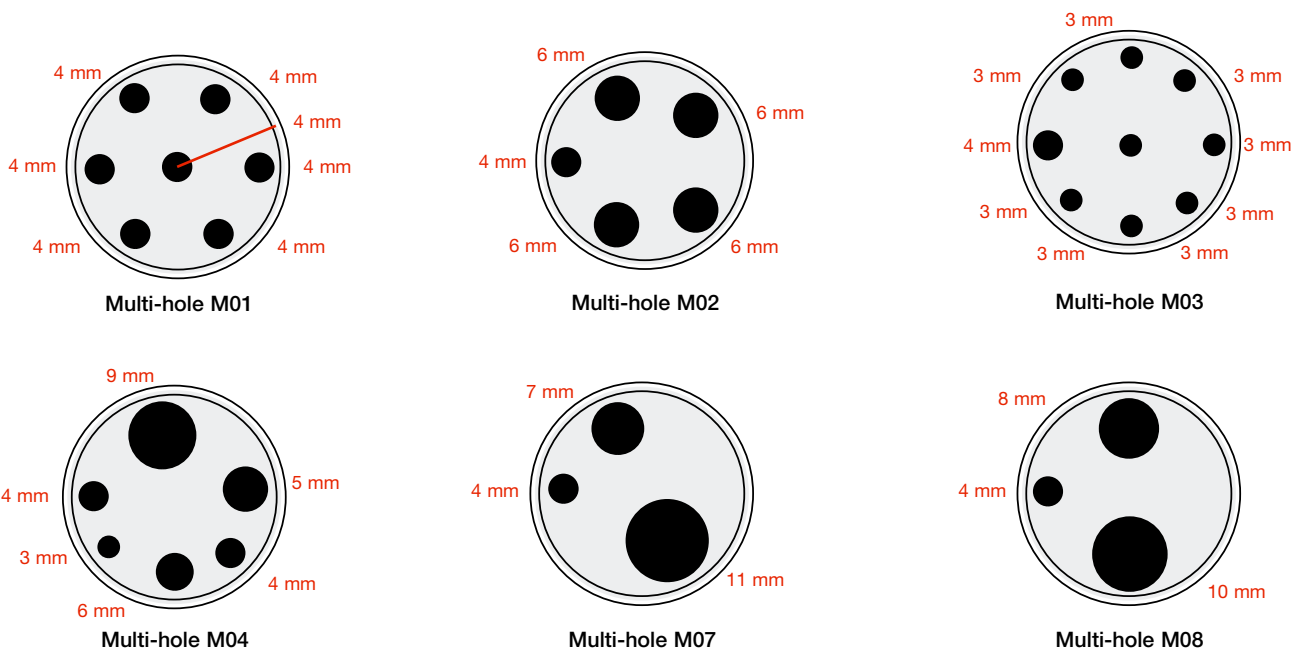| Inserts, undrilled incl. insulation plugs				
		Instrument		
Inserts	Insert code[1]	PTC-155 A/B/C	PTC-350 A/B/C	PTC-660 A/B/C
5-pack, undrilled inserts with no holes	UN1	127935	127988	128029
5-pack, undrilled inserts with hole for 4 mm reference sensor	UN2	127936	128989	128030
Undrilled insulation plug		127969	Not possible	Not possible

Note 1: Use the insert code, when ordering a JOFRA standard undrilled insert together with the PTC calibrator

MULTI-HOLE INSERTS FOR PTC SERIES - METRIC (MM)

All inserts for PTC-155 are supplied with an insulation plug drilled with the necessary holes

Spare part no. for multi-hole inserts - metric (mm)		Instrument		
Insert type	Insert code[1]	PTC-155 A/B/C	PTC-350 A/B/C	PTC-660 A/B/C
Multi-hole type 1	M01	127962	128015	128056
Multi-hole type 2	M02	127963	128016	128057
Multi-hole type 3	M03	127964	128017	128058
Multi-hole type 4	M04	127965	128018	128059
Multi-hole type 7	M07	127966	128019	128060
Multi-hole type 8	M08	127967	128020	128061
Set of 4 Metric Multi Inserts, 3mm to 12mm	SMX	127976	128022	128067

Note 1: Use the insert code, when ordering a JOFRA standard multi-hole insert together with the PTC calibrator

Multi-hole M01

Multi-hole M02

Multi-hole M03

Multi-hole M04

Multi-hole M07

Multi-hole M08

MULTI-HOLE INSERTS FOR PTC SERIES - IMPERIAL (INCH)

All inserts for PTC-155 are supplied with an insulation plug drilled with the necessary holes

Spare part no. for multi-hole inserts - imperial (inch)		Instrument		
Insert code	Insert code[1]	PTC-155 A/B/C	PTC-350 A/B/C	PTC-660 A/B/C
Multi-hole type 5	M05	127970	128023	128063
Multi-hole type 6	M06	127972	128025	128065
Multi-hole type 10	M10	127973	128026	128066
Multi-hole type 11	M11	127971	128024	128064
Set of 3 Imperial Multi Inserts, 1/8 to 1/2 inch	SIX	127977	128027	128068

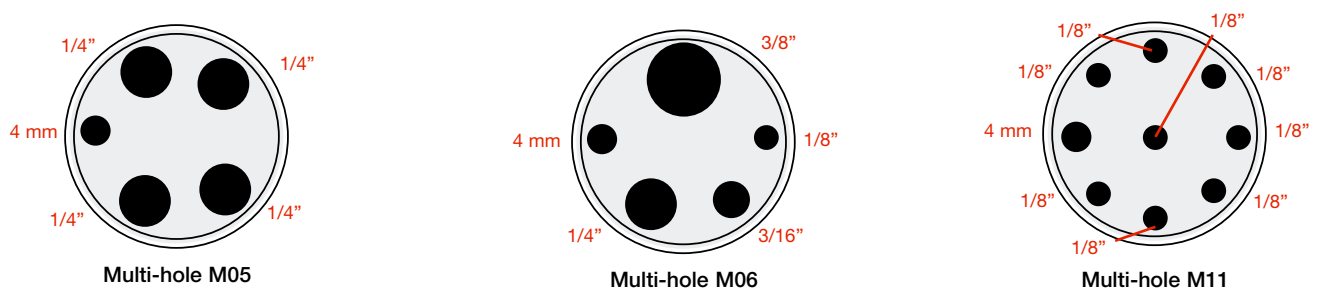Note 1: Use the insert code, when ordering a JOFRA standard multi-hole insert together with the PTC calibrator

Multi-hole M10

Multi-hole M05

Multi-hole M06

Multi-hole M11

STANDARD DELIVERY

Model A, B and C:
- PTC dry-block calibrator (user specified)
- Mains power cable (user specified)
- Traceable certificate
- Tool for insertion tubes
- Heat shield - PTC-350 and PTC-660
- JOFRACAL
- USB cable
- Set of rubber cones for insulation plugs - PTC-155
- Manual

Model B instruments contain the following extra items:
- Test cables (2 x red, 2 x black)
- Traceable certificate - for reference sensor input
- Traceable certificate - for sensor-under-test input

Model C instruments contain the following extra items:
- Traceable certificate - for reference sensor input

ACCESSORIES

125066	Extra fixture for sensor grip
125067	Extra sensor grip
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

OPTIONS

Carrying Case - Option CX

Our new developed protective carrying case gives excellent protection to the PTC calibrator and holds room for inserts, cables etc.

Trolley Carrying Case - Option CT

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

Support rod set - Option SR

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

Model A   Model B   Model C

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 0.01˚C	•	•	•
Programmable max. temperature	•	•	•
External precision reference sensor input		•	•
"SET" follows "TRUE"		•	•
Input for RTD, TC, V, mA		•	
4-20 mA transmitter input incl. 24 VDC supply		•	
All sensor-under test inputs scalable to temperature		•	
Automatic switch test (open, close and hysteresis)		•	
OPTIONAL functionality by choosing Optional PTC Firmware Package - U1			
Download of calibration work orders from PC		•	
Upload of calibration results (as found & as left)		•	
Engineering units visible in display		•	
Additional sensor-under-test input types		•	

Order number									Description
									Base model number
PTC155									PTC-155 Series, -25 to 155°C (-22 to 311°F)
PTC350									PTC-350 Series, 33 to 350°C (91 to 662°F)
PTC660									PTC-660 Series, 33 to 660°C (91 to 1220°F)
									Model version
	A								Basic model, without input
	B								Full model, incl. Reference sensor input, Sensor-under-test input
	C								Middle model, incl. Reference sensor input
									Power supply (US deliveries 60 Hz only)
		115							115VAC
		230							230VAC
									Mains power cable
			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
				NON					No insert selected (standard)
				UNX					1 x Undrilled Insert (Please see Insert selection for code)
				XXX					1 x Single hole insert (Please see Insert selection for code)
				MXX					1 x Multi hole insert (Please see Insert selection for code)
				SIX					Set of 3 Imperial multi hole inserts. Covering holes from 1/8" to 1/2"
				SMX					Set of 4 Metric multi hole inserts. Covering holes from 3mm to 12mm
				SIM					Set of 9 Imperial inserts. Covering holes from 1/8" to 5/8" / for PTC-660 set of 8 inserts only up to 9/16"
				SMM					Set of 13 Metric inserts. Covering holes from 3mm to 15mm
									User Interface Functionality (optional)
					U1				Workorders, Complete Sensor-under-Test types, ect.
									STS Reference sensor (B & C models only, optional)
						R1			STS-102 Ref. sensor. Dia. 4mm. Length 30mm (STS102A030EH)
						R11			STS-150 Ref. sensor. Dia. 4mm. Length 180mm. For PTC-155 only (STS150A915EH)
						R12			STS-150 Ref. sensor. Dia. 4mm. Length 165mm. For PTC-350 only (STS150A935EH)
						R13			STS-150 Ref. sensor. Dia. 4mm. Length 203mm. For PTC-660 only (STS150A966EH)
									Calibration Certificate
							F		Traceable Callibration Certificate. (standard)
							H		Accredited Calibration Certificate
							EA		Full EURAMET Accredited Calibration Certificate
							FS		Traceable System Calibration Certificate (B & C model only)
							HS		Accredited System Calibration Certificate (B & C model only)
							EAS		Full EURAMET Accredited System Calibration Certificate (B & C model only)
									Accessories
								CX	Protective Carrying case
								CT	Solid Protective Carrying case with trolley
								SR	Support rod set
								CR	Protective Carrying case with Support rod set
								TR	Solid Protective Carrying case with trolley & Support rod set
PTC155	B	230	A	SMX	U1	R11	EA	CT	**Sample order number** PTC-155 B with 230VAC, EU power cord, set of metric inserts, workorders, STS-150 ref. sensor, full EA temp. calibration certificate, and carrying case with trolley.

Reference sensors to the PTC series of calibrators

Temperature ranges
For PTC-155: STS-102A030EH .... -45 to 155 °C
For PTC-155: STS-150A915EH .... -25 to 155 °C
For PTC-350: STS-150A935EH ....   0 to 350 °C
For PTC-660: STS-150A966EH ....   0 to 660 °C

Diameter and length
STS-102A030EH .... 4 x   30 mm
STS-150A915EH .... 4 x 180 mm
STS-150A935EH .... 4 x 165 mm
STS-150A966EH .... 4 x 203 mm

Calibration points
STS-102A030EH .... -45, -20, 0, 50, 100, 155 °C
STS-150A915EH .... -25, -18, -12, 0, 50, 100, 155 °C
STS-150A935EH .... 0, 100, 200, 275, 350 °C
STS-150A966EH .... 0, 100, 250, 400, 660 °C

Certificate...Standard: Accredited

Plug with memory   Holding information as:
                              1. Measuring range
                              2. Ro value
                              3. Sensor coefficients
                              4. Calibration date
                              5. Serial no.

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.

Chatillon Force Measurement
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.

Newage Testing Instruments
Hardness testers, durometers, optical systems and software for data acquisition and analysis.

AMETEK®
TEST & CALIBRATION INSTRUMENTS