

CTC Series

Compact Temperature Calibrator

CTC-320B/650B



Fast, timesaving, and reliable

Superior in speed and portability



The CTC series is a fast dry-block that offers both interchangeable inserts, the MVI stability circuitry, and calibration software. Both speed and portability are superior to liquid baths. Dry-block calibrators do not require hazardous liquids and provide a wide temperature range.

High flexibility



You are not limited by fixed holes. Inter-changeable insertion tubes are used to match the diameter of your sensor-under-test.

Wide temperature range



The CTC series covers a wide temperature range from 33 to 1205°C (91 to 2200°F). This makes it sufficient to cover many standard industrial temperature calibration applications.

CTC-320B: 33 to 320°C (91 to 608°F)

CTC-650B: 33 to 650°C (91 to 1202°F)

Timesaving features

Fast one-key-one-function access to the automatic switch test and auto stepping



Fast calibration



All our Jofra temperature calibrators feature a purpose-dedicated temperature regulator. This provides a very fast heating and cooling time as well as a short stabilization time. Performing a three point temperature calibration procedure is fast and saves time.

Liquid filled sensors and switches



The tall CTC models with an immersion depth of 190 mm / 7.5 in are ideal for calibration of liquid filled sensors. The specially designed non-linear heating elements in the CTC-650 B and the increased block mass provide a very homogeneous temperature throughout the block. It is essential for the quality of the calibration/test that the full length of the sensing part of the sensor is exposed to the same temperature. Calibrate analog reading devices or switches with very high repeatability.

Easy-to-read Display

Easy-to-use operation

All instrument controls may be performed from the front panel. The heat source is positioned away from the panel. This design helps to protect the operator. The main functions on the CTC series are designed with one-key-one-function logic. This means that there are no sub-menus or difficult to remember multiple keystrokes necessary to access primary functions. The easy-to-read, backlit display features dedicated icons, which help in identifying instrument conditions and operational steps.

Automatic Switch Test

Operators can save a lot of time using the automatic thermostat test function to find values for the "Open" and "Close" temperatures. Additionally, this feature displays the hysteresis (deadband) between the two points. The feature ensures a very high repeatability when testing thermostats. Simply press the "SWITCH TEST" key to activate the function.



Auto Stepping

This feature saves manpower. The operator may stay in the control room, or another remote location, monitoring the output from the sensor-under-test while the calibrator is placed in the process and automatically changes the temperature using a programmed step value and rate. Up to 9 different temperature steps may be programmed, including the hold time for each step.

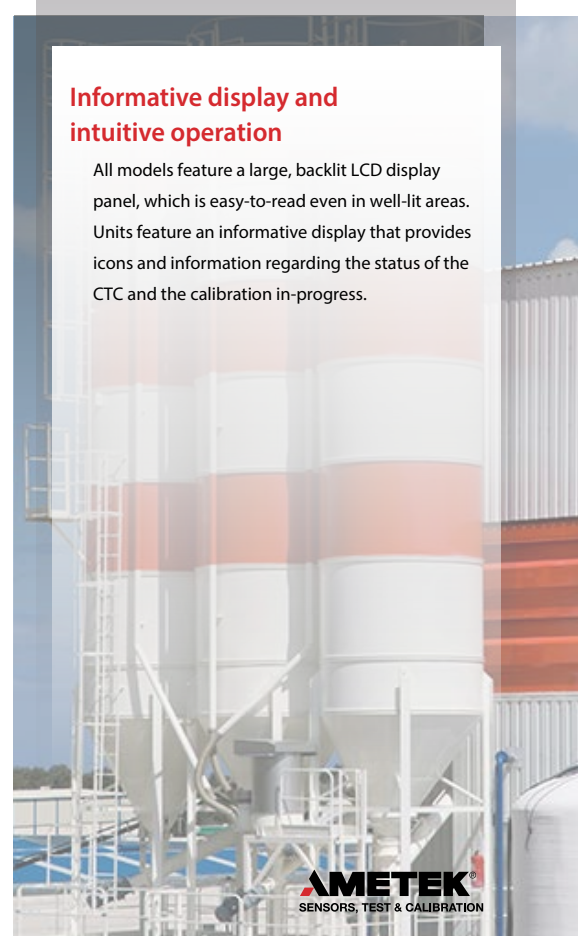
"Up" and "Down" Keys

The "Up" and "Down" arrow keys allow the user to set the exact temperature desired with a resolution of 0.1°.



Informative display and intuitive operation

All models feature a large, backlit LCD display panel, which is easy-to-read even in well-lit areas. Units feature an informative display that provides icons and information regarding the status of the CTC and the calibration in-progress.



Useful Features

The CTC is a very versatile calibrator series with many integrated functions.

Stability Indicator

A bold check mark on the display indicates that the calibrator has reached the desired set temperature and is stable. The operator may change the stability criteria and establish a greater sense of security in the calibration results. A convenient countdown timer is activated five minutes before the unit reaches stability.



Instrument setups

The CTC series stores the complete instrument setup, including: engineering units, stability criteria, resolution, display contrast, slope (ramp) rate, auto-step settings, and maximum temperature.

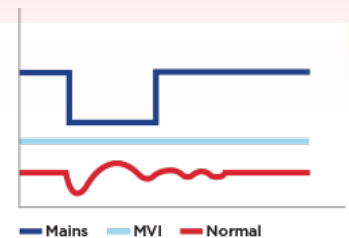
Maximum Temperature

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.

Fast heating and cooling

The CTC-320 B and the CTC-650 B contain an innovative heating block profile. This design heats up the CTC-320 B to maximum temperature in just 20 minutes and the CTC-650 B in only 39 minutes. The fast performance of the heating block is due to the special profile that minimizes mass and yet, still accepts an insertion tube with a 25mm (1in) outer diameter. This design is a balanced compromise between temperature stability / homogeneity and rapid heating / cooling.

MVI - Mains Power Variance Immunity Improves Temperature Stability Unstable mains power supplies are a major contributor to calibration inaccuracies. Traditional temperature calibrators often become unstable in industrial environments where large electrical motors, heating elements, and other devices are periodically cycled on and off. The cycling of supply power can cause lower quality temperature regulators to perform inconsistently, leading to both inaccurate readings and unstable temperatures. The CTC series employ the MVI, thus avoiding such stability problems. The MVI circuitry continuously monitors the supply voltage and ensures a constant energy flow to the heating elements.



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User specified settings

Re-calibration/adjustments

The CTC series has a very easy and straightforward procedure for re-calibration/adjustment. There is no need for a screwdriver or PC software. The only thing you need is a reliable reference thermometer.

Place the probe in the calibrator and follow the instructions on the display.

Support rod set

The support rod can be mounted on all CTC calibrators.

It is used to hold the sensor under test in its position while calibrating. Includes rod, sensor grip and fixture.

Calibrate up to 24 sensors at a time

Using the CTC together with the ASM 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 three 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, thermistors, temperature switches and voltage.

Protective carrying case

Our special designed protective carrying case gives excellent protection for the CTC calibrators. It has compartments for inserts, cables, manuals, plugs etc.

Calibration software included

The CTC is supplied with our highly versatile calibration software JofraCal.

All calibrations can be documented with a certificate, given that the CTC is controlled from a PC. When the calibrator has reached the desired temperature and stability it will prompt you to type in the UUT temperature. JofraCal documents all your calibration needs within temperature, pressure and process calibration.



Specifications CTC-320B

Temperature

Temperature Range

Temp. @ ambient 23°C / 73° F **33 to 320°C / 91 to 608°F**

Accuracy

CTC-320 with internal ref. sensor **±0.5°C / ±0.9°F**
Specification when using the internal reference. (Load 4 mm OD reference probe in the center of the insert).

Stability

CTC-320 **±0.1°C / ±0.18°F**

*Measured after the stability indicator has been on for 10 minutes.
Measuring time is 30 minutes.*

Settings

Resolution **1 or 0.1**
Units **°C or °F**

Heating Time

CTC-320 **23 to 320°C / 73 to 608°F ... 20 minutes**

Cooling Time

CTC-320 **320 to 100°C / 608 to 212°F ... 22 minutes**

Time to Stability (typical)

CTC-320 **8 minutes**

Mains Power

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

Max Power Consumption **600 VA**

Frequency, US deliveries **60 Hz ±5**

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

Physical Specifications

Dimension L x W x H **241x139x408 mm / 9.5x5.5x16.1 in**

Weight

CTC-320 **7 kg / 15.5 lb**

Immersion Depth incl. insulation plug

CTC-320 **190 mm / 7.5 in**

Well diameter

CTC-320 **26 mm / 1.0 in**

Insert Dimensions (diameter x length)

CTC-320 **25,7 mm x 200 mm / 1.0 x 7.9 in**

Electrical

Switch Input (dry contact)

Test Voltage **Maximum 5 VDC**

Test Current **Maximum 2.5 mA**

Digital Interface

RS232 (9-pin Male)

Environmental

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, non-condensing

Protection Class

IP-10



Specifications CTC-650B

Temperature

Temperature Range	
Range	33 to 650°C / 91 to 1202°F
Accuracy	
CTC-650 with internal ref. sensor	±0.6°C / ±1.08°F
Stability	
CTC-650	±0.05°C / ±0.09°F
<small>Measured after the stability indicator has been on for 10 minutes. Measuring time is 30 minutes.</small>	
Settings	
Resolution	1 or 0.1
Units.....	°C or °F
Heating Time	
CTC-650	23 to 650°C / 73 to 1202°F ... 39 minutes
<small>All specifications are given with an ambient temperature 23° C/73.4° F ± 3° C/5.9° F. Specified at 115 V/230 V.</small>	
Cooling Time	
CTC-650	650 to 100°C / 1202 to 212°F ... 65 minutes
Time to Stability (typical)	
CTC-650	8 minutes

Mains Power

Voltage	115 V (105-127) / 230 V (210-254)
Max Power Consumption	1150 VA
Frequency, US deliveries	60 Hz ±5
Frequency, non US deliveries.....	50 Hz ±5, 60 Hz ±5

Physical Specifications

Dimension L x W x H	241x139x408 mm / 9.5x5.5x16.1 in
Weight	
CTC-650	10,5 kg / 23 lb
Immersion Depth	
CTC-650	190 mm / 7.5 in
Well diameter	
CTC-650	26 mm / 1.0 in
Insert Dimensions (diameter x length)	
CTC-650	25,7 mm x 200 mm / 1.0 x 7.9 in

Electrical

Switch Input (dry contact)	
Test Voltage.....	Maximum 5 VDC
Test Current.....	Maximum 2.5 mA
Digital Interface	
RS232 (9-pin Male)	

Environmental

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, non-condensing	
Protection Class	
IP-10	



Inserts

Inserts for CTC-320 B are made of aluminum. Inserts for CTC-650 B are made of brass. All specifications on hole sizes are referring to the outer diameter of the sensor-under-test. The correct clearance size is applied in all pre-drilled inserts.

Predrilled Inserts—metric (mm)

Probe Dia.	Part Numbers		
	Insert Code ¹	CTC-320B	CTC-650B
3 mm	003	n/a	n/a
4 mm	004	60F359	60F423
5 mm	005	123452	123460
6 mm	006	60F361	60F425
7 mm	007	123453	123461
8 mm	008	105190	105195
9 mm	009	105191	105196
10 mm	010	105192	105197
11 mm	011	105193	105198
12 mm	012	105194	105199
13 mm	013	123454	123462
14 mm	014	123455	123463
15 mm	015	123456	123464
16 mm	016	123457	123465
18 mm	018	123458	123466
20 mm	020	123459	123467
Package of the above inserts	—	124583	124687

Predrilled Inserts—imperial (in)

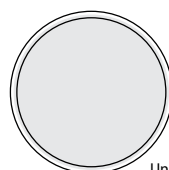
Probe Dia.	Part Numbers		
	Insert Code ¹	CTC-320B	CTC-650B
1/8 in	125	60F358	60F422
3/16 in	187	60F360	60F424
1/4 in	250	60F362	60F426
5/16 in	312	60F364	60F428
3/8 in	375	60F366	60F430
7/16 in	437	60F368	60F432
1/2 in	500	60F370	60F434
9/16 in	562	60F372	60F436
5/8 in	625	60F374	60F438
11/16 in	688	60F376	60F440
3/4 in	750	60F378	60F442
13/16 in	813	105184	60F444
7/8 in	875	60F377	60F446
Package of the above inserts	—	124684	124688

¹ Use insert code, when ordered as standard insert together with a calibrator.

Undrilled Inserts

Inserts	Part Numbers	
	CTC-320B	CTC-650B
5-pack	60F356	60F420
insulation plug	n/a	n/a

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.



Undrilled CTC-350/660

Do you need a customized insert?
Please contact us for more information.

Ordering Information

Base Model Number	
CTC320B	CTC-320B, 33 to 320°C (91 to 608°F)
CTC650B	CTC-650B, 33 to 650°C (91 to 1202°F)
Power Supply (US delivers 60 Hz only)	
115	115 VAC
230	230 VAC
Mains Power Cable Type	
A	European 230 V
B	USA/Canada 115 V
C	UK 240 V
D	South Africa 220 V
E	Italy 220 V
F	Australia 240 V
G	Denmark 230 V
H	Switzerland 220 V
I	Israel 230 V
Insert Type and Size	
XXX	1 x Single hole Insert (Please see insert section for correct code)
Calibration Certificate	
F	Traceable Certificate to International standards (standard)
H	Accredited Certificate - ISO17025
Accessories	
C	Carrying Case

CTC650B 230 A 006 H C CTC-650B with standard accessories, 230 VAC power with European power cord and insert:
Pre-drilled 1x6 mm, Accredited certificate and carrying case

JOFRA
calibration

Standard Delivery

- CTC dry-block calibrator (user specified)
- Mains power cable (user specified)
- Traceable certificate - temperature performance
- Insert (user specified)
- Tool for insertion tubes
- User manual
- Test cables (1 x red, 1 x black)
- RS232 cable (9-pin)
- JofraCal calibration software

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Accessories

- 122832**...Cleaning Brushes - 4mm - Package of 3 pcs
- 60F174**...Cleaning Brushes - 6mm - Package of 3 pcs
- 122822**...Cleaning Brushes - 8mm - Package of 3 pcs
- 65-F100**...Insulation in Tube, 100mm x Ø25mm
- 65-F101**...Insulation in Tube, 150mm x Ø25mm
- 65-F102**...Insulation in Tube, 200mm x Ø25mm
- 65-F103**...Insulation in Tube, 250mm x Ø25mm
- 65-F104**...Insulation in Tube, 300mm x Ø25mm
- 65-F105**...Insulation in Tube, 350mm x Ø25mm
- 65-F106**...Insulation in Tube, 400mm x Ø25mm
- 65-F107**...Insulation in Tube, 450mm x Ø25mm
- 105173**...Set of Insulation Plates (10 pcs)
- 125066**...Extra fixture for sensor grib
- 125067**...Extra sensor grib
- 125002**...Edgeport Converter with 4 pcs of RS232 ports
- 123409**...Carrying Case



EN ISO/IEC 17025 Laboratory accreditation

AMETEK Sensors, Test & Calibration has two EN ISO/IEC 17025 accredited laboratories that issues accredited certificates in accordance with international standards. Laboratory accreditation is a reliable indicator of technical competence assuring customers the most accurate documentation. We believe in being clear about our capabilities, our accuracy, and about what you can expect from us.

Because calibration is a matter of confidence!

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