signal

JOFRA™ CSC200

Compact
Signal
Calibrator

Your solution to easy temperature signal calibration!

The JOFRA CSC200 handheld calibrator offers you an easy-to-operate interface including a knob for precise and rapid adjustment. With features including a large display and an auto stepping signal, the CSC200 makes troubleshooting and calibration of your temperature sensors a snap.

Input and Output
RTD: 14 types, TC:13 types
Resistance: 0 to 4,000 Ω (read)
5 to 4,000 Ω (source)
mV: -10 to 75 mV

High level of protection
Fuse-less protection for internal circuitry - a common cause of failure in other units without this protection

CJC
Selectable feature - use with or without cold junction compensation depending on application

Setpoints
User-defined - make testing easier by storing the necessary settings for repeated test points and sequences

High accuracy
Accuracy up to ±0.2°C / 0.36°F - including programmed curves for easy use in most any application

Easy connections
Jacks for 2, 3, or 4-wire RTDs and a dedicated TC plug - allows for connection of sensur-under-test

Complete marine program
Part of a complete program of marine approved temperature, pressure and signal calibrators; including temperature sensors
See more at www.jofra.com

ISO 9001 Manufacturer

PRODUCT DESCRIPTION

The CSC line of signal calibrators are dedicated units designed to make your calibration and maintenance tasks easier to perform. The JOFRA CSC200 is engineered for the calibration of temperature instruments offering the ability to measure and simulate several different types of RTDs and TCs. This instrument makes the job easy by ulitizing a thermocouple plug for easy connection and can work with 2, 3, or 4-wire RTDs.

The CSC200 also offers features such as user-defined setpoints with a recall function, selectable cold junction compensation, and installed curves for 14 RTD and 13 TC types. These handy time savers are combined in a package offering an easy-to-read, two line display and an intuitive keypad with a knob for fine adjustments.

This calibrator is more than a simple tool but it is as straightforward as any device that you have in your toolbox. The CSC200 signal calibrator offers you the accuracy and features that you need in a convenient, compact, and easy-to-use package.

AMETEK®
CALIBRATION INSTRUMENTS

JOFRA CSC200 LAYOUT

Clear dual line display

Large digits display the temperature or signal value. The mode of operation is displayed with dedicated icons. The type of sensor is shown on the second line and the icons show the engineering units. The engineering units are selectable at start-up and are retained after each use.

Electrical connections

Inputs for 2, 3, and 4-wire RTD probes, TC jack, and switch test connections.

TC/RTD

Selects between the RTD and TC functions.

ON / OFF

Auto shut-off to extend battery life (user programmable).

Type

This is used to scroll through the various types of sensors that are installed in the CSC200 firmware.

Adjustment Knob

Allows for easy adjustment of values. Combined with the Arrow Keys, reaching the desired value is easy.

Left / Right arrows

Move the cursor left or right to allow for adjustment of the desired decade.

I/O

Selects whether the CSC200 is reading or sourcing values.

Recall

Recalls the user-defined setpoints to allow for stepping through calibration and validation routines.

Set

Allows for user-defined setpoints for stepping through calibrations and validations.

JOFRA CSC200

Overview

The CSC200 is a temperature signal calibrator; it is designed to source and read RTDs, TCs, Resistance, and mV for temperaure signal calibration. This unit is a handy calibrator that can meet applications such as simulating a temperature sensor, measuring temperature with a sensor, and checking the sensor output.

The CSC200 is not simply a calibrator but an effective troubleshooting and test device. This versatile instrument was designed for calibration and validation of temperaure sensors but that does not mean that you will not find other applications for this unit. For example, you can combine the CSC200 with a JOFRA dry-block calibrator for a portable onsite calibration system.

RTD modes

The CSC200 offers the ability to source and read 14 types of RTDs. The formulas (curves) for the different types of RTDs are programmed into the firmware of this unit. This means that you can select the curve that matches your sensor and perform the test routine without the need for mathematical conversions. The CSC200 can be used with 2, 3, or 4-wire RTDs making it flexible enough for virtually all of your RTD calibrations.

TC modes

The CSC200 is also programmed with the formulas for 13 TC types. Like the RTD modes, the unit will source or read TC sensors and provide you with a stable and reliable reading. The unit has a convenient TC plug for easy connection to your TCs and is also equipped with CJC: the CJC may be turned off it desired.

Set and Recall operation

The CSC200 offers you a timesaving feature that is not offered amongst lesser calibrators. You can store up to 3 test points for each of the TC and RTD functions. This means that there is no need to repeatedly set each value for your test needs; just store the setpoints for your test and call them up for each sensor. The Recall button is your “hot key” to retrieve the stored values in sequential order. If you have several types of sensors in your process, the CSC200 makes it easy because you can store set values for each type.

These values are stored in a non-volatile memory location so you only need to set the values once and they are there for your use any time that you need them.

Auto shutdown

The CSC200 offers an automatic shutdown feature. This power saving feature turns the calibrator off after it has been idle for a specified period of time. The time delay is factory set to 30 minutes; however, you can adjust the time to meet your needs.

Large display

The CSC200 features a large two-line display. The upper line shows the measured or sourced temperature, resistance, or mV value. The second line indicates the type of sensor. The display also features several icons to allow for quick recognition of the status of the unit.

CSC200 in soft case

All JOFRA handheld calibrators are supplied in a handy soft case that allows for operation while in the case. The convenient internal storage pocket offers the space for test leads and accessories.

Dry-block calibrators

You may use the CSC200 in conjunction with your JOFRA or other dry-block calibrators. This calibrator will allow you to make full use of your dry-block or calibration bath by offering you the ability to locally read your sensor-under-test. You can easily read the sensor-under-test and record the values, compare the reading with a remote read-out device, or be sure that remote alarms are operating as needed.

AMETEK features three families of dry-block calibrators that do not offer the ability to directly read an instrument-under-test. These portable calibrators do feature easy operation, multiple functions directly on the keypad, stable and accurate readings, and portability for on-site testing; just the type of instrument that you need for your temperature calibration and testing. When combined with the CSC200, you have no need for any other test equipment.

Reference probes

You may need to use a reference probe for validation of your dry-block or calibration bath performance. Use the CSC200 to read a JOFRA reference probe to ensure that you have the proper temperature for your test point. The system accuracy of the CSC200 with a JOFRA reference probe is the stated accuracy for the reference probe type plus the accuracy of the probe. Constants for the probe cannot be entered.

If you already have a JOFRA STS Series reference probe, you will need to verify that you have babana jacks on the termination. If not, we offer a connection cable that you can easily plug into your probe to convert to banana jacks.

AMETEK features a series of dependable, accurate, and stable reference probes: the STS Series. These probes are proven to be realiable instruments for verifying the temperature in a dry-block calibrator or calibration bath. They are available with banana jack connectors allowing for an easy use with your CSC200; just plug in the probe, select the instrument type, and read the temperature.

JOFRA ITC Series

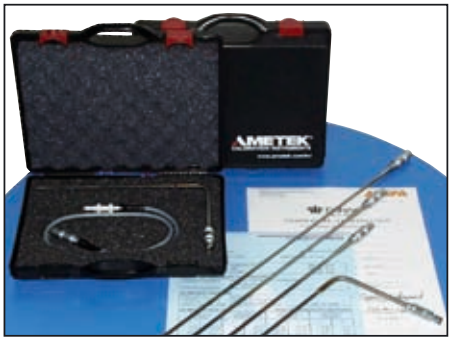
The ITC Series features 3 models and 3 ranges and offers high accuracy and stability.

See Spec. Sheet: SS-CP-2286 at www.jofra.com

JOFRA STS Series

The STS Series of reference probes features several configurations, all with high accuracy and stability.

See Spec. Sheet: SS-CP-2179 at www.jofra.com



JOFRA CTC Series

The CTC Series features 6 models and 4 ranges to meet many in-plant and field applications.

See Spec. Sheet: SS-CP-2281 at www.jofra.com

JOFRA ETC Series

The ETC Series features 3 models and 2 ranges; the ultimate in speed and portability.

See Spec. Sheet: SS-CP-2280 at www.jofra.com

CSC200 SPECIFICATIONS

Display

LCD ..... Dual line plus icons
Display resolution ..... 5 digits
Display update ..... 4 times per second

Temperature range

Operating ..... -10 to 50°C / 14 to 122°F
Storage ..... -20 to 60°C / -4 to 140°F

Power supply

Battery ..... 1 x 9 V Alkaline
Battery life ..... Minimum 20 hours
Low battery indicator ..... at 7 V

Instrument dimensions

L x W x H ..... 188 x 84 x 52 mm / 7.4 x 3.3 x 2.1 in
Weight (including battery): ..... 400 g / 14.1 oz

Shipping dimensions

L x W x H ..... 203 x 101 x 64 mm / 8.0 x 4.0 x 2.5 in
Weight (including battery): ..... 567 g / 20 oz

Thermocouple - TC

TC types ..... B C E J K L N R S T U BP XK
Cold Junction Compensation ON/OFF control: ..... Yes

Thermocoupe mV	Range		Accuracy±
	min	max	12 months
TC mV read	-10.000 mV	75.000 mV	0.02% rdg ±10 µV
TC mV source	-10.000 mV	75.000 mV	0.02% rdg ±10 µV
Maximum current output is 1 mA with an output impedance of = 1 Ω			

Thermocouple Cold junction	Range		Accuracy±
	min	max	12 months
CJC compensation	18 °C (64 °F)	28 °C (83 °F)	0.20 °C (0.36 °F)
CJC outside above			0.05 °C (0.09 °F)

Thermo-couple		Range min	Range max	Accuracy± 12 months
B	°C	600.0 °C	800.0 °C	1.40 °C
		800.0 °C	1000.0 °C	1.50 °C
		1000.0 °C	1820.0 °C	1.70 °C
	°F	1112.0 °F	1472.0 °F	2.52 °F
		1472.0 °F	1832.0 °F	2.70 °F
		1832.0 °F	3308.0 °F	3.06 °F
C	°C	0.0 °C	1000.0 °C	0.80 °C
		1000.0 °C	2316.0 °C	2.50 °C
	°F	32.0 °F	1832.0 °F	1.44 °F
		1832.0 °F	4200.8 °F	4.50 °F
E	°C	-250.0 °C	-100.0 °C	0.80 °C
		-100.0 °C	1000.0 °C	0.40 °C
	°F	-482.0 °F	-148.0 °F	1.44 °F
		-148.0 °F	1832.0 °F	1.72 °F
J	°C	-210.0 °C	0.0 °C	0.60 °C
		0.0 °C	800.0 °C	0.40 °C
		800.0 °C	1200.0 °C	0.50 °C
	°F	-346.0 °F	32.0 °F	1.08 °F
		32.0 °F	1472.0 °F	0.72 °F
		1472.0 °F	2192.0 °F	0.90 °F
K	°C	-200.0 °C	0.0 °C	0.80 °C
		0.0 °C	1000.0 °C	0.50 °C
		1000.0 °C	1372.0 °C	0.70 °C
	°F	-346.0 °F	32.0 °F	1.44 °F
		32.0 °F	1832.0 °F	0.90 °F
		1832.0 °F	2501.6 °F	1.26 °F
L	°C	-200.0 °C	0.0 °C	0.45 °C
		0.0 °C	900.0 °C	0.40 °C
	°F	-328.0 °F	32.0 °F	0.81 °F
		32.0 °F	1652.0 °F	0.72 °F

Accuracy includes CJC error, does not include wire error.
CJC error outside of 23°C ±5°C is 0.05°C/°C / 73.4°F ±9°F is 0.05°F/°F.
Accuracies are stated for operation at 23°C ±5°C / 73.4°F ±9°F.
For operation < 18°C or > 28°C add ±0.005% of reading / °C / < 64.4°F or > 68.8°F add ±0.003% of reading / °F.

Thermo-couple		Range min	Range max	Accuracy± 12 months
N	°C	-200.0 °C	0 °C	1.00 °C
		0.0 °C	1300 °C	0.60 °C
	°F	-328.0 °F	32.0 °F	1.80 °F
		32.0 °F	2372.0 °F	1.08 °F
R	°C	0.0 °C	1767.0 °C	1.40 °C
	°F	32.0 °F	3212.6 °F	2.52 °F
S	°C	0.0 °C	1767.0 °C	1.40 °C
	°F	32.0 °F	3212.6 °F	2.52 °F
T	°C	-250.0 °C	0.0 °C	0.80 °C
		0.0 °C	400.0 °C	0.40 °C
	°F	-418.0 °F	32.0 °F	1.44 °F
		32.0 °F	752.0 °F	0.72 °F
U	°C	-200.0 °C	0.0 °C	0.70 °C
		0.0 °C	600.0 °C	0.45 °C
	°F	-328.0 °F	32.0 °F	1.26 °F
		32.0 °F	1112.0 °F	0.81 °F
XK	°C	-200.0 °C	800.0 °C	0.40 °C
	°F	-328.0 °F	1472.0 °F	0.72 °F
BP	°C	0.0 °C	800.0 °C	1.10 °C
		800.0 °C	2500.0 °C	2.50 °C
	°F	32.0 °F	1472.0 °F	1.98 °F
		1472.0 °F	4532.0 °F	4.50 °F

Accuracy includes CJC error, does not include wire error.
CJC error outside of 23°C ±5°C is 0.05°C/°C / 73.4°F ±9°F is 0.05°F/°F.
Accuracies are stated for operation at 23°C ±5°C / 73.4°F ±9°F.
For operation < 18°C or > 28°C add ±0.005% of reading / °C / < 64.4°F or > 68.8°F add ±0.003% of reading / °F.

Resistance Temperature Detector - RTD

RTD Types: Pt10, Pt25, Pt50, Pt100, Pt200, Pt500, Pt1000
..... Cu10, Cu50, Cu100, Ni120, YSI400
Response time: .....≤ 5 mSec
Connection .....2, 3, and 4-wire

Ohm	Range min	Range max	Accuracy± 12 months
Ohm read (low)	0.0 Ω	400.0 Ω	0.025% rdg. ±0.05 Ω
Ohm read (high)	400.1 Ω	4000.0 Ω	0.025% rdg. ±0.5 Ω
Ohm source (low) 0.1 to 0.5 mA 0.5 to 3 mA	 5.0 Ω 5.0 Ω	 400.0 Ω 400.0 Ω	 0.025% rdg. ±0.02/Iexc 0.025% rdg. ±0.05 Ω
Ohm source (high) 0.05 to 0.8 mA 0.05 to 0.4 mA	 400.0 Ω 1500.0 Ω	 1500.0 Ω 4000.0 Ω	 0.025% rdg. ±0.05 Ω 0.025% rdg. ±0.05 Ω
Unit is compatible with pulsed transmitters - Frequency response is ≤ 5 m Sec.			

RTD		Range min	Range max	Accuracy± 12 months
Pt10 Alpha 385	°C	-200.0 °C	100.0 °C	1.40 °C
		100.0 °C	300.0 °C	1.60 °C
		300.0 °C	600.0 °C	1.80 °C
		600.0 °C	800.0 °C	2.00 °C
	°F	-328.0 °F	212.0 °F	2.52 °F
		212.0 °F	572.0 °F	2.88 °F
		572.0 °F	1112.0 °F	3.24 °F
		1112.0 °F	1472.0 °F	3.60 °F
Pt50 Alpha 385	°C	-200.0 °C	100.0 °C	0.40 °C
		100.0 °C	300.0 °C	0.50 °C
		300.0 °C	600.0 °C	0.60 °C
		600.0 °C	800.0 °C	0.70 °C
	°F	-328.0 °F	212.0 °F	0.72 °F
		212.0 °F	572.0 °F	0.90 °F
		572.0 °F	1112.0 °F	1.08 °F
		1112.0 °F	1472.0 °F	1.26 °F
Pt100 Alpha 385	°C	-200.0 °C	100,0°C	0.20 °C
		100.0 °C	300.0 °C	0.30 °C
		300.0 °C	600.0 °C	0.40 °C
		600.0 °C	800.0 °C	0.50 °C
	°F	-328.0 °F	212.0 °F	0.36 °F
		212.0 °F	572.0 °F	0.54 °F
		572.0 °F	1112.0 °F	0.72 °F
		1112.0 °F	1472.0 °F	0.90 °F
Pt100 Alpha 3926	°C	-200.0 °C	100.0 °C	0.20 °C
		100.0 °C	300.0 °C	0.30 °C
		300.0 °C	630.0 °C	0.40 °C
	°F	-328.0 °F	212.0 °F	0.36 °F
		212.0 °F	572.0 °F	0.54 °F
		572.0 °F	1166.0 °F	0.72 °F

Read accuracy is based on a 4-wire input, for a 3-wire input add 0.005 Ω assuming all leads are matched.
Accuracies are stated for operation at 23°C add ±5°C / 73.4°F.
For operation < 18°C or > 28°C add ±0.005% of reading / °C / < 64.4°F or > 68.8°F add ±0.003% of reading / °F.

RTD		Range min	Range max	Accuracy± 12 months
Pt100 Alpha 3916	°C	-200.0 °C	100.0 °C	0.20 °C
		100.0 °C	300.0 °C	0.30 °C
		300.0 °C	630.0 °C	0.40 °C
	°F	-328.0 °F	212.0 °F	0.36 °F
		212.0 °F	572.0 °F	0.54 °F
		572.0 °F	1166.0 °F	0.72 °F
Pt200 Alpha 385	°C	-200.0 °C	100.0 °C	0.80 °C
		100.0 °C	300.0 °C	0.90 °C
		300.0 °C	630.0 °C	1.00 °C
	°F	-328.0 °F	212.0 °F	1.44 °F
		212.0 °F	572.0 °F	1.62 °F
		572.0 °F	1166.0 °F	1.80 °F
Pt500 Alpha 385	°C	-200.0 °C	100.0 °C	0.40 °C
		100.0 °C	300.0 °C	0.50 °C
		300.0 °C	630.0 °C	0.60 °C
	°F	-328.0 °F	212.0 °F	0.72 °F
		212.0 °F	572.0 °F	0.90 °F
		572.0 °F	1166.0 °F	1.08 °F
Pt1000 Alpha 385	°C	-200.0 °C	100.0 °C	0.20 °C
		100.0 °C	300.0 °C	0.30 °C
		300.0 °C	630.0 °C	0.40 °C
	°F	-328.0 °F	212.0 °F	0.36 °F
		212.0 °F	572.0 °F	0.54 °F
		572.0 °F	1166.0 °F	0.72 °F
Cu10	°C	-100.0 °C	260.0 °C	1.40 °C
	°F	-148.0 °F	500.0 °F	2.52 °F
Cu50	°C	-180.0 °C	200.0 °C	0.40 °C
	°F	-292.0 °F	392.0 °F	0.72 °F
Cu100	°C	-180.0 °C	200.0 °C	0.30 °C
	°F	-292.0 °F	392.0 °F	0.54 °F
YSI400	°C	15.0 °C	50.0 °C	0.10 °C
	°F	59.0 °F	122.0 °F	0.18 °F

Read accuracy is based on a 4-wire input, for a 3-wire input add 0.005 Ω assuming all leads are matched.
Accuracies are stated for operation at 23°C add ±5°C / 73.4°F.
For operation < 18°C or > 28°C add ±0.005% of reading / °C / < 64.4°F or > 68.8°F add ±0.003% of reading / °F.

Temperature coefficient

Stability:..... ± 0.005% of reading / °C outside of 23 °C ±5°C
..... ± 0.003% of reading / °F outside of 73.4 °F ±9°F