

Ircon BCH BCL BCN Series Blackbody Calibration Systems

Introduction

The Ircon BCH, BCL, and BCN Series Blackbody Calibration Systems are used to check the calibration of non-contact infrared thermometers and, when necessary, to perform complete calibration procedures on them.

The BCL Series provides calibration test points over the range from room temperature to a maximum of 1500°F (800°C). The BCH Series covers higher temperatures in the range from 1200 to 2200°F (650 to 1200°C). The BCN Series has a larger aperture (1.75 inches) than the other Series so it can be used with thermometers that have large spot sizes such as the Ircon Modline 4. It covers the range from room temperature to a maximum of 1300°F (700°C).

Features

- Fast warm-up time for Blackbody Source— 60 to 90 minutes—from ambient to maximum temperature
- Large digital display eliminates ambiguity in displayed temperature
- Indication with 1° F or C resolution
- Full three-mode proportional PID control of Blackbody Source temperature
- Digital set point adjustment, including 8 preset set points
- No mechanical relays used—ensures high reliability during continuous-duty operation
- Convenient size and weight
- Certificate of Calibration traceable to NIST is optionally available



BCH Series: High Temperature



BCL Series: Low Temperature



BCN Series: Large Aperture

BCH BCL BCN Series

Description

Each Ircon Blackbody System consists of two modules: the Indicator/Controller and the Blackbody Source.

The Indicator/Controller module has the same dimensions and appearance for all three Series. The front panel includes a digital temperature display, adjustment controls for the blackbody set point and the PID controller settings, percentage deviation from set point indicators, and a heater status indicator. The Indicator/Controller module measures 8"H x 8"W x 11"D (203 x 203 x 280 mm) and is provided with a carrying handle on top and a flip-up bail on the bottom for easy bench-top use.

The Blackbody Source module dimensions are unique for each series:

- BCL:** 8" H x 8" W x 11" D (203 x 203 x 280 mm)
- BCN:** 8" H x 8" W x 14" D (203 x 203 x 356 mm)
- BCH:** 14" H x 12" W x 17" D (356 x 305 x 432 mm)

The BCL Blackbody Source module has a carrying handle and flip-up bail. The BCN Blackbody Source module is supplied with a Calibration Mounting Accessory, a 9.25" (235 mm) long by 3.5" (89 mm) diameter aluminum pipe used to position thermometers (such as the Modline 4) that does not have through-the-lens viewing.



Fig. 1 - BCN Blackbody Source module (left) and Calibration Mounting Accessory (right). Mounting Accessory screws on to threaded ring around aperture of Blackbody Source module.

The two modules of each system are interconnected by two 6-foot (1.8 m) long cables. The cables are easily detachable at the Indicator/Controller module and are keyed to ensure a proper connection. The Indicator/Controller also has a detachable AC power cord. There are no screw terminals; all the connections are made with connectors. This simplifies transport from bench to bench or from lab to plant.

Operation

The Blackbody Source module houses a blackbody cavity that emits infrared (heat) radiation. Each source is designed to provide radiative characteristics approaching those of an ideal, blackbody radiator.

Optical access to the cavity aperture for the BCL Blackbody Source is 0.5" (12.7 mm). The BCH Blackbody Source has a 1" (25.4 mm) cavity aperture. The BCN Blackbody Source cavity aperture is 1.75" (44.4 mm).

The blackbody set point temperature is set using the front-panel controls on the Indicator/Controller module. The PID three-mode controller cycles the power to the blackbody core heaters so that the set point temperature is accurately maintained. Actual blackbody cavity temperature is sent to the PID Controller input and is displayed on the Indicator/Controller module digital display.

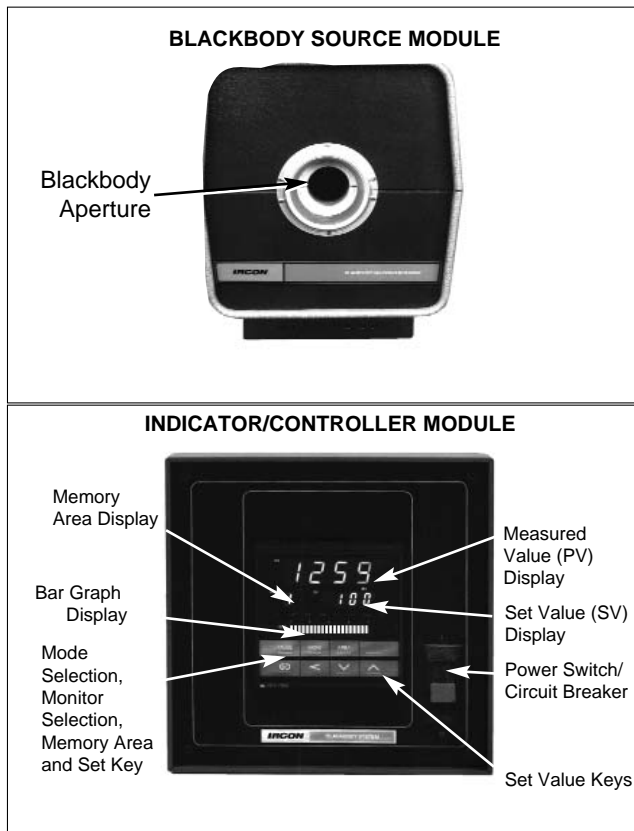


Fig. 2 - BCH System (front view)

BCH BCL BCN Series

The blackbody cavity temperature is measured by a thermocouple (dual element type "K", chromel-alumel for BCL and BCN; type "R", platinum vs. platinum-13% rhodium in alumina protection tube for BCH). The thermocouple is brought out through the back of the Blackbody Source enclosure to a color-coded connector that ensures an error-free interface between the cavity in the Blackbody Source module and the Indicator/Controller module.

As the proportional controller modulates the power on and off, the heater status indicator on the front panel of the Indicator/Controller turns on and off at the modulation frequency. The BCL and BCN Blackbody Source modules include an indicator lamp that illuminates when power is applied to the blackbody core heaters.

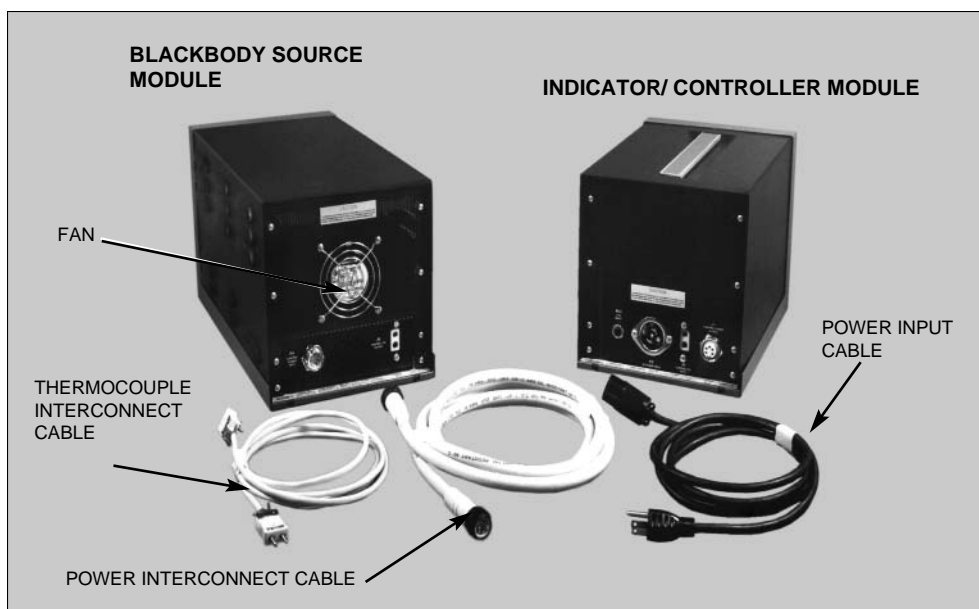


Fig. 3 - BCN System (rear view)

AVAILABLE MODULES

<u>Model No.</u>	<u>Temperature Range</u>	<u>Power Requirements</u>
BCL-15F-0	Room temperature to 1500°F	115 Vac, 50/60 Hz
BCL-08C-0	Room temperature to 800 °C	115 Vac, 50/60 Hz
BCL-15F-1	Room temperature to 1500°F	230 Vac, 50/60 Hz
BCL-08C-1	Room temperature to 800°C	230 Vac, 50/60 Hz
BCH-22F-1*	1200 to 2200°F	230 Vac, 50/60 Hz
BCH-12C-1*	650 to 1200°C	230 Vac, 50/60 Hz
BCN-13F-0	Room temperature to 1300°F	115 Vac, 50/60 Hz
BCN-07C-0	Room temperature to 700°C	115 Vac, 50/60 Hz
BCN-13F-1	Room temperature to 1300°F	230 Vac, 50/60 Hz
BCN-07C-1	Room temperature to 700°C	230 Vac, 50/60 Hz

* Note: only available in 230 Vac version

BCH BCL BCN Specifications

BCL	BCH	BCN
Temperature Range Room temperature to 1500°F (800°C)	1200 to 2200°F (650 to 1200°C)	Room temperature to 1300°F (700°C)
Emissivity ≥ 0.99	≥ 0.99	≥ 0.99
Aperture Diameter 0.5 inch (12.7 mm)	1 inch (25.4 mm)	1.75 inches (44.4 mm)
Indicated Temperature Accuracy Within 0.5% of indicated temperature above 600°F (316°C); within 4°F below 600°F (316°C)	Within 0.5% of indicated temperature	Within 0.5% of indicated temperature above 600°F (316°C); within 4°F below 600°F (316°C)
Power Requirements 115 or 230 Vac, ± 10% 50/60 Hz, 175 VA	230 Vac, ± 10% 50/60 Hz, single phase, 2350 VA	115 or 230 Vac, ± 10% 50/60 Hz 1250 VA
Operating Ambient 65 to 85°F (18 to 30°C)	65 to 85°F (18 to 30°C)	65 to 85°F (18 to 30°C)
Dimensions Indicator/Controller module 8" H x 8" W x 11" D (203 mm H x 203 mm W x 280 mm D)	8" H x 8" W x 11" D (203 mm H x 203 mm W x 280 mm D)	8" H x 8" W x 11" D (203 mm H x 203 mm W x 280 mm D)
Blackbody Source module 8" H x 8" W x 11" D (203 mm H x 203 mm W 280 mm D)	14" H x 12" W x 17" D (356 mm H x 305mm W x 432 mm D)	8" H x 8" W x 14" D (203 mm H x 203 mm W x 356 mm D)

Ircon Technical Service Center

The Ircon Technical Service Center in Niles, Illinois, offers Calibration Services for both blackbody systems and infrared thermometers. Calibration providing results traceable to the National Institute of Standards and Technology (formerly the National Bureau of Standards) is an available option.

For more information, call us toll free at 1-800-323-7660 (U.S. and Canada), fax us at 1-847-647-0948; visit our web site at www.ircon.com; or e-mail us at info@ircon.com

ISO 9001 : 2000

Quality System
Certified

NIST Calibration Provider



World Headquarters

7300 N. Natchez Ave. • Niles, IL 60714 USA
 Phone: 847 967 5151 or 800 323 7660 • Fax: 847 647 0948
 Web site: www.ircon.com • E-mail: info@ircon.com

European Headquarters

Databankweg 6c • 3821 AL • Amersfoort • The Netherlands
 Phone: 31 33 450 4321 • Fax: 31 33 450 4320
 E-mail: info@ircon.nl