User's Guide

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BB702-S

Narrow Range Blackbody

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It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply.
OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.
WARNING: These products are not designed for use in, and should not be used for, patient-connected applications.

⚠ This device is marked with the international caution symbol. It is important to read the Setup Guide before installing or commissioning this device as the guide contains important information relating to safety and EMC.

Table of Contents

Table of Figures

Section 1 Introduction

Your BB700 Series Blackbody Calibration Source has been designed for ease of use and reliability whenever you have the need to test or calibrate non-contact infrared temperature instruments. It is important that you read this manual completely and follow all safety precautions before operating this instrument.

1.1 Precautions

- **FOLLOW ALL SAFETY PRECAUTIONS AND OPERATING INSTRUCTIONS OUTLINED IN THIS MANUAL. IF THIS INSTRUMENT IS NOT USED IN A MANNER SPECIFIED BY THE MANUAL THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPARED.**
- **NEVER LEAVE YOUR CALIBRATOR UNATTENDED WHEN IN USE.**
- **KEEP OUT OF REACH OF ALL CHILDREN.**
- **NEVER TOUCH THE TARGET PLATE WHEN HOT.**
- **NEVER PLACE ANY OBJECT WITHIN 3 INCHES OF THE CAVITY OPENING WHEN HOT.**
- **DO NOT OPERATE IN FLAMMABLE OR EXPLOSIVE ENVIRONMENTS.**
- **NEVER OPERATE WITH A POWER CORD OTHER THAN THE ONE PROVIDED WITH YOUR UNIT.**
- **CHECK THAT POWER CORD IS NOT CRACKED, FRAYED OR DAMAGED BEFORE CONNECTING TO DEVICE AND POWERING UP.**
- **REMOVE AND OR DISCONNECT MAIN POWER CORD BEFORE ATTEMPTING ANY MAINTENANCE OR FUSE REPLACEMENT**
- **DO NOT CONNECT AND OR OPERATE THIS UNIT TO A NON-GROUNDED, NON-POLARIZED OUTLET OR POWER SOURCE.**
- **DO NOT CONNECT THE ETHERNET PORT OR REFERENCE PROBE PORT TO EQUIPMENT WITH EXPOSED, HAZARDOUS, LIVE VOLTAGES.**
- **ANY CONNECTIONS TO THE ETHERNET OR REFERENCE PORT SHOULD BE MADE WITH CLASS II INSULATION OR BETTER.**
- **PROTECT FROM MOISTURE AND RAIN.**

NOTE: There are no user serviceable parts inside your unit. Attempting to repair or service your unit may void your warranty.

1.2 Safety Warnings and IEC Symbols

This device is marked with international safety and hazard symbols in accordance with IEC 1010. It is important to read and follow all precautions and instructions in this manual before operating or commissioning this device as it contains important information relating to safety and EMC. Failure to follow all safety precautions may result in injury and or damage to your calibrator. Use of this device in a manner not specified by the manufacturer may impair protection provided within the unit.

IEC symbols	Description
	**CAUTION**, risk of electric shock
	**CAUTION**, refer to accompanying documents
	**CAUTION**, hot surface
	100 to 240 Vac, 50/60Hz

Figure 1. IEC symbols

1.3 Statement on the CE Mark.

It is the policy of OMEGA to comply with all worldwide safety and EMI/EMC regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

1.4 General Description

The **BB702-S** is a highly accurate and stable black body reference source, designed for precise calibration of infrared pyrometers and thermal imaging instruments within a narrow temperature span of 34-44°C (93-111°F).

Operators can easily adjust the setpoint up or down in 0.1° increments by simply pushing the Up or Down buttons. When the operator changes a setpoint, the instrument's sophisticated PID control quickly brings the black body reference to a stable temperature. In real world applications, to better calibrate this black body reference to targets with varying emmissivity, the instrument features a unique programmable offset. To prevent unauthorized changes or tampering in the field, it also features a programmable lockout.

When changing degrees from °C to °F the controller will automatically change the setpoint value to °C or °F as well. The **BB702-S** includes a built-in Ethernet port to enable remote control and data logging. The unit can be easily connected to a single PC, or an Ethernet network. The instrument can be assigned an IP address and serve web pages over a network and the Internet. The **BB702-S** can be controlled locally or remotely with no special software other than a standard web browser.

The larger of the two LED displays indicates the actual temperature of the black body disk. The big 21mm (0.83") ultrabright LED digits are visible from more than 50 meters as well as through a thermal imaging camera. Compatible remote LED displays with digits of up to 102mm (4") can be connected to the Ethernet port or placed anywhere on an Ethernet network. The smaller LED digits display the set point temperature. Under normal conditions both displays are green. The temperature display will change to red on the larger LED if the actual black body temperature deviates from the set point by 0.2° or more. This provides a visual alert for the operator.

Temperature is measured with a high precision Class A, 100 ohm three-wire platinum RTD. A second reference platinum RTD is embedded in the aluminum black body disk and connected to an external jack on the enclosure for easy connection to a separate calibration meter. This portable and rugged unit operates worldwide on virtually any international AC line voltage from 100 to 240 Vac and 50 or 60 Hz. The universal switching power supply adjusts automatically without changing jumpers or switches. It operates in ambient temperatures of 5 to 45°C (41 to 113°F).

Section 2 Installation

2.1 Unpacking

Remove the packing list and verify that you have received all your equipment. If you have any questions about the shipment, please call our Customer Service Department at **203-359-1660**. We can also be reached on the Internet @ http://www.omega.com or e-mail: info@omega.com

When you receive the shipment, inspect the container and equipment for any signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE:

The carrier will not honor any damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

The following items are supplied in the box:

- BB702-S Blackbody Calibration Source
- Users Manual
- Calibration Certificate
- Power Cord
- Reference Port Cord Plug Connector

2.2 Mounting

Mount the unit on a bench, table top or shelf in a horizontal position. Operate at least ten inches from any air obstructions to the fan, front panel, rear panel, bottom and top of the unit. The ambient environment to be between the specified 4°C and 5°C below your setpoint value. **Example: If you have setpoint value of 34°C it can be 34 - 5 = 29°C.**

2.3 Ambient Temperature

The target plate of the BB702-S can achieve any temperature within the specified temperature range when being operated in ambient temperature up to 32.2°C (90°F). **When operating the unit at higher ambient temperatures, the user must not exceed the "Maximum Allowable Target Plate Temperature" shown along the y-axis in Figure 2. Failure to adhere to these guidelines may cause in accuracy or in stability. If the Out "1" light is not blinking ON but there is no decrease in target plate temperature, then the ambient temperature is too high.**

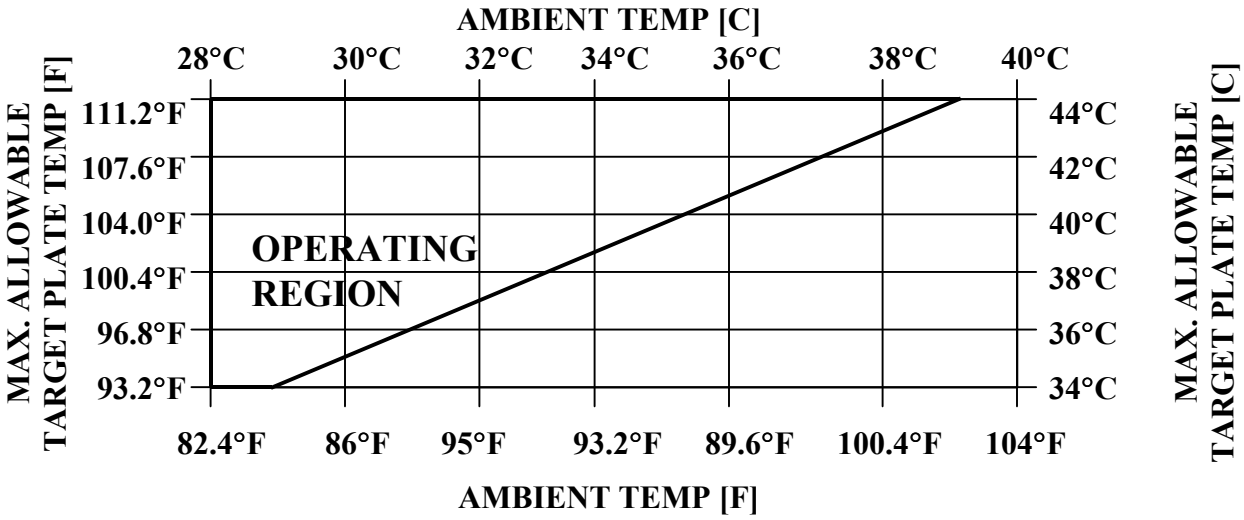

Figure 2. Limitation of Maximum Setpoint Temperature at Elevated Ambient Temperature.

2.4 Power Connection

Standard (110 to 240 Vac~, 50/60 Hz)

The BB702-S comes with a standard North American 3-prong AC power cord. Do not use any other power cord other than the one provided. This cord provides the proper grounding and has been safety tested by the proper safety agencies.

CAUTION:

- **LINE VOLTAGE VARIATIONS ARE NOT TO EXCEED ±10% OF THE RATED INPUT VOLTAGE.**
- **ELECTRICAL CONNECTIONS AND WIRING SHOULD BE PERFORMED ONLY BY SUITABLY TRAINED PERSONNEL.**
- **TO SHUT DOWN THE UNIT IN AN EMERGENCY, THE POWER CORD CAN BE DISCONNECTED FROM THE AC OUTLET OR REAR OF THE UNIT.**

Section 3 Operation

3.1 Front Panel Controls and Indicators

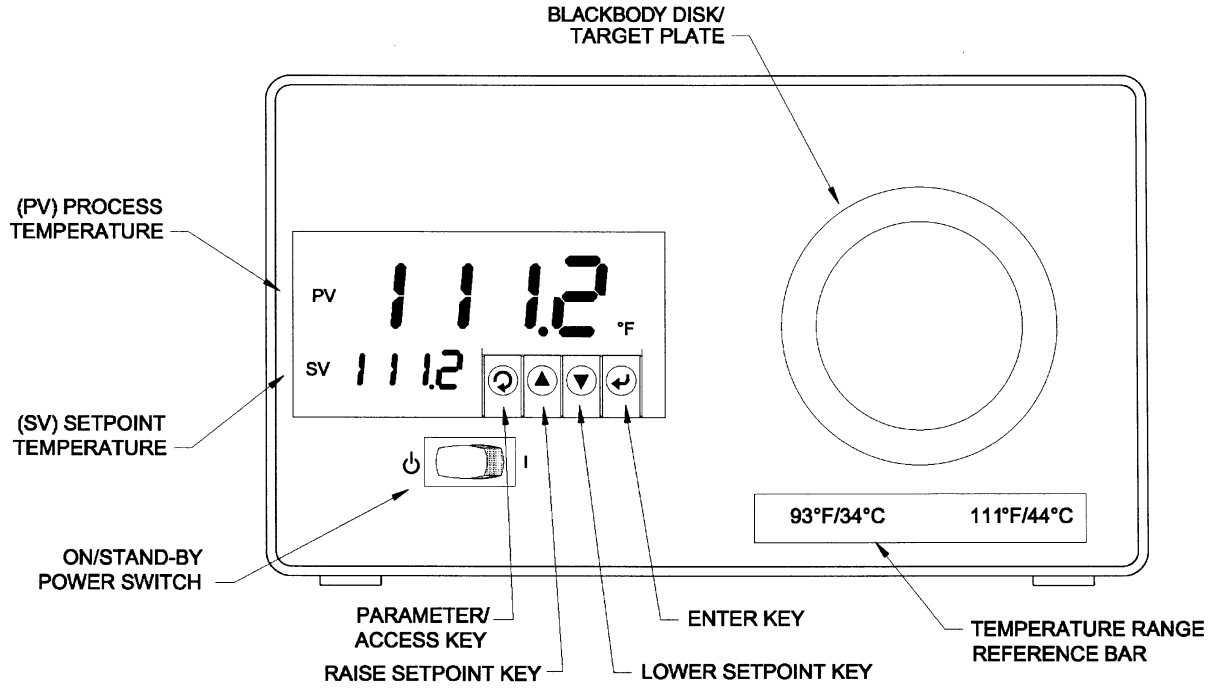

Figure 3. Front panel

Process Temperature:
This field displays the current temperature of the target plate.

Setpoint Temperature:
This field displays the desired target plate temperature. Once the target plate reaches this desired temperature, both displays will read the same value.

Target Plate:
The 2.5" target plate is a near ideal blackbody source. The emissivity of the plate is .95. When calibrating an IR pyrometer, hold the pyrometer perpendicular to the target plate for optimal performance. The proper distance between the IR pyrometer and the target plate depends on the field of view of the pyrometer. If the pyrometer is too far away it will scan unwanted surfaces outside of the perimeter of the target plate. Holding the pyrometer too close could introduce undesirable heat to the IR detector of the pyrometer.

WARNING:

- **The BB702-S's target plate can be set to very high temperatures. Exercise extreme caution when operating the unit. Keep hands and fingers away from the target plate area. Keep flammable products such as paper, plastics and clothing far from the BB702-S.**
- **The BB702-S is a Class II instrument. It is intended to be operated in a laboratory environment only. Never operate the unit outside or around children.**
- **Nothing should come in contact with the target plate. Even when the unit is off.**
- **Never unplug the unit while it is on or during "Cool Down."**

A note on P.I.D. control:
Proportional, integral, derivative control (P.I.D.) is a temperature control algorithm used in high-end temperature controllers. The controller causes the process to attain the desired temperature by turning the process on or off. The process may be a heater or refrigerator. As the process temperature approaches the setpoint temperature the hot or cold process will be pulsed to reduce the corrective measures and minimize overshooting. The controller provides a visual representation of the process status through LED indicators. An indicator may be lit continuously, blink or shut off entirely to indicate that the process is on, being pulsed, or off, respectively.

Parameter/Access Key:

↻

Press to scroll through menu parameters

Raise Key:

▲

Press to increase the selected parameter or scroll upward in the list of possible settings.

Lower Key:

▼

Press to decrease the selected parameter or scroll downward in the list of possible settings.

Enter Key:

↵

Press to save settings and exit a menu.

3.2 Back Panel Connections

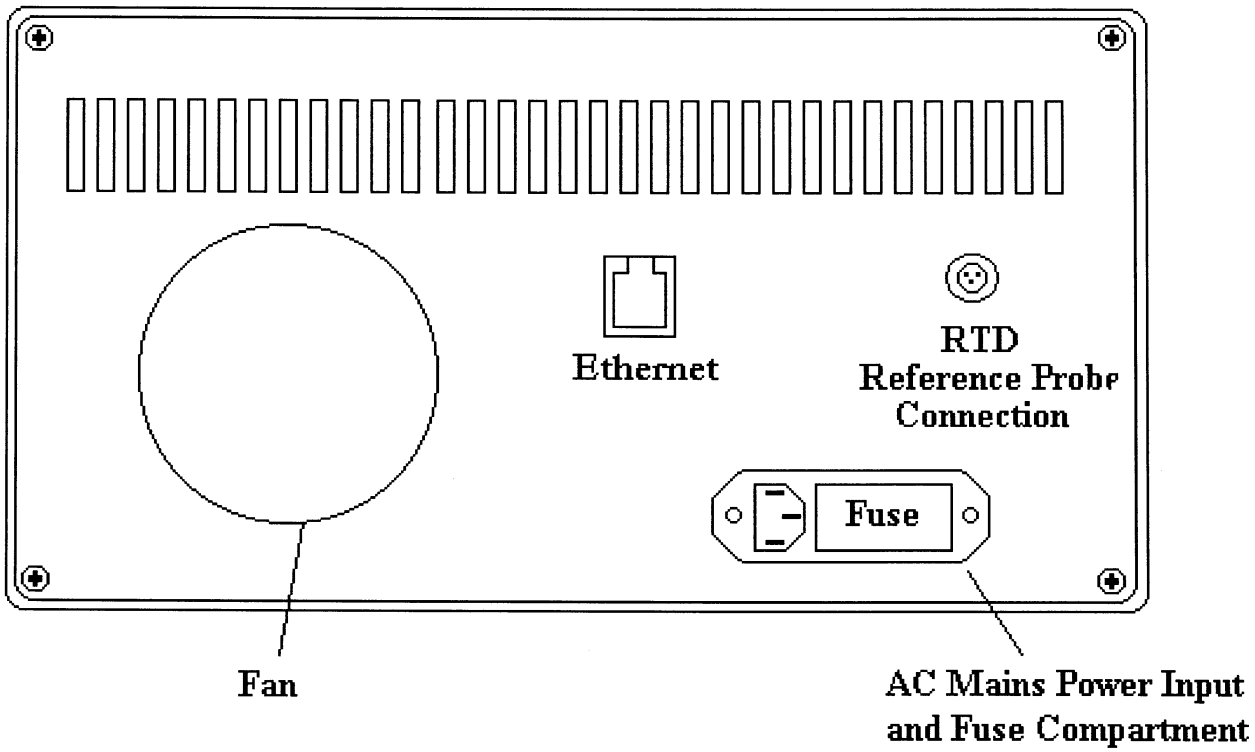

Figure 4. Back Panel

AC Power Mains Input and Fuse Compartment:
The customer connects the power cord to the AC Power Input. As a safety precaution, the power cord cannot be connected if the fuse compartment is open. Refer to Section 5.3 for information on fuse replacement.

Reference Probe Connection:
The reference probe enables the user to monitor the target plate temperature with an external instrument. The wires are connected to a Class A, 0.00385 RTD Sensor.
Refer to Section 6 for pinout details.

RS-232 Ethernet Port:
The Ethernet RJ-45 connector allows the customer to make an Ethernet connection with the BB702-S from any browser. A detailed description is described in the separate Ethernet Owners Manual.

3.3 Changing the Temperature Setpoint

The layout of the front panel is shown in Figure 3. The BB702-S incorporates a PID digital setpoint controller. The upper display indicates the blackbody target plate temperature known as (**PV**) Process Variable, while the lower display indicates the programmed setpoint known as (**SV**) Setpoint Variable. Making changes to the setpoint, units of measure and communication settings are made via the "▲" and "▼" keys. Holding a key in, continuously, will cause the setpoint temperature to advance more quickly to a desired value. Three scanning speeds are provided: slow, medium and fast. When the Enter button ↵ is pressed the Setpoint Variable is stored, and unit starts controlling.

3.4 Changing the Controller Parameter Settings

The BB702-S operates at its optimum performance when left with its factory parameter settings. The only internal parameter that the operator should need to change is the engineering units (°F or °C), or Ethernet parameters.

When the Access button ↻ is pressed the display will flash "**temp**" then if you press the Enter button ↵ the display will show "**°C**" or " **°F**" which can be changed/selected by pressing "▲" or "▼" and stored by pressing ↵**.**

This will change the **PV** as well as the **SV** display.

Changing the controller's parameter settings:

1. Press the ↻ key to enter the programming mode.
2. Use the "▲" and "▼" keys to change the desired value.
3. Once you have chosen the desired value use the ↵ key to enter the parameters. To change the setting of a given parameter, use the "▲" and "▼" keys.
4. To save settings press the ↵ key. The controller now displays "**StRd**" and exits the programming menu and returns to the normal operating mode.

Putting the controller in or out of Standby Mode:

1. To enter the Standby mode press the ↵ key twice until the window flashes "**StbY**".
2. To exit the Standby mode press the ↵ key once until the window flashes "**RUN**".

Figure 6. Programming Procedure

3.5 Heat-Up/Cool-Down Cycle Times

Approximate cycle times for heat up and cool down are given in Figure 7. To find a transition time from one plate temperature to another follow this procedure: Look for an initial temperature in the left column. Next, look for the final temperature along the top row. The intersection of the row and column provides the approximate transition time.

FROM: / **TO:**		34°C	39°C	44°C
		93.2°F	102.2°F	111.2°F
34°C	93.2°F		3 minutes	5 minutes
39°C	102.2°F	6 minutes		10 minutes
44°C	111.2°F	10 minutes	6 minutes	

Figure 7. Heat Up / Cool Down Cycle Time Table.

3.6 Overheat Reset Switch

If the unit is operated at high temperatures in elevated ambient temperatures, an overheat condition may occur. In an overheat situation a mechanical reset switch near the right handle hinge will pop and open the heater circuit. The controller will still have power. While the controller will be demanding heat from the heater, the process temperature will fall continuously until it equalizes with the room temperature. If an overheat condition occurs, let the unit cool off for one hour (leave the unit on), then press the reset button, firmly. If the reset switch keeps resetting, call Omega's Customer Service Department at **203-359-1660.**

Section 4 Ethernet

Refer to the separate Ethernet Owners Manual for hookup and other information.

Section 5 Maintenance

5.1 Calibration

This unit has been fine tuned at the factory and calibrated to give optimum performance of its full temperature range. It is recommended that the unit be returned annually for re-calibration.

5.2 Cleaning

CAUTION: Remove all electrical connections and power before attempting any maintenance or cleaning.

5.2.1 Main Body

Only a damp soft rag with a mild cleaning solution should be used when cleaning the main body of this unit.

5.2.2 Target Plate

Do not attempt to clean the target plate. The target plate has a special coating applied and cleaning may change the emissivity and performance of your unit.

5.2.3 Fan

The fan filter should be cleaned as a minimum monthly by washing the filter with warm water and then blowing dry with air. It can be removed by firmly pulling the black plastic frame outward. The internal protective grill that is seated against the fan can be cleaned with a soft bristle brush.

5.3 Fuse replacement

WARNING: Disconnect all power from source before attempting fuse replacement.

CAUTION: For continued protection against the risk of fire replace with only the same size, type and rating fuse indicated here and on the rear panel of your unit.

For model: **BB702-S** use	1 ea. 250 VAC~, T1A (Time-Lag, 1 Amp) UL./CSA APPROVED (.25 dia. x 1.25 long).

Section 6 Reference Probe

An electrically isolated 100 RTD probe has been embedded into the target plate heater assembly to be used as a reference to check the calibrator's calibration and accuracy. This feature is commonly used in conjunction with a precision thermometer, ohmmeter or temperature recording device. The maximum current being passed through the RTD should never exceed 0.3 mA (constant DC). A connector has been provided with your calibrator for connection to this reference probe. Listed below are a few calibration points and the resistance readings you can expect from the reference probe. Notice that at each temperature, a given resistance will be measured at the reference port. The resistance is measured across PIN1-PIN2 or across PIN1-PIN3. PIN2 and PIN3 are connected to the same side of the RTD.

Target Plate Temperature	**Reference Probe Resistance (Ohms)**
34°C (93.2°F)	113.22
35°C (95.0°F)	113.61
36°C (96.8°F)	113.99
37°C (98.6°F)	114.38
38°C (100.4°F)	114.77
39°C (102.2°F)	115.15
40°C (104.0°F)	115.54
41°C (105.8°F)	115.93
42°C (107.6°F)	116.31
43°C (109.4°F)	116.70
44°C (111.2°F)	117.08

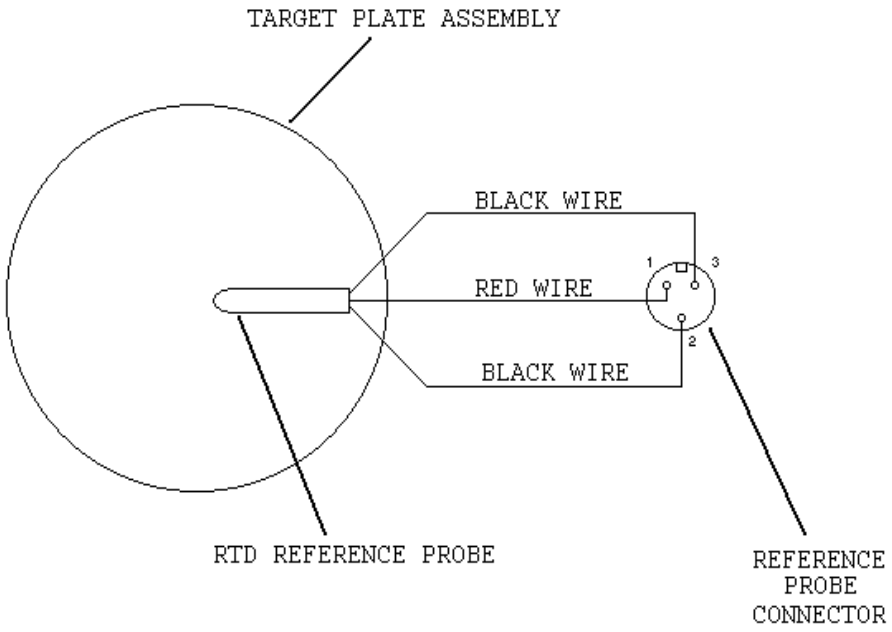

Figure 8. Internal Reference Probe Connections

Section 7 Specifications

Target Plate Temperature Range:	34 to 44°C (93 to 111°F)
Accuracy:	±0.1°C, ±0.25% rdg (±0.2°F, ±0.25% rdg)
Stability:	±0.1°C (±0.2 °F)
Ambient Environmental Conditions	
Temperature:	5 to 45 °C (41 to 113°F)
Humidity:	0 to 90% RH, Non-condensing.
Target Plate Size:	63.5mm (2.5″)
Cavity Emissivity:	0.95 to .96
Internal Control Sensor:	Platinum RTD, Class A, Alpha = 0.00385
Reference Sensor:	Platinum RTD, Class A, Alpha = 0.00385
Warm-up Time:	See Figure 7
Cool-down Time:	See Figure 7
Power	
BB702-S:	100 to 240 Vac~, 50/60 Hz, 75W.
Dimensions:	152 x 305 x 280mm (6″ H x 12″ W x 11″L)
Weight:	7.2kg (16 lbs)
Installation Category II	

Section 8 Troubleshooting Guide

Problem	Solution
1. Unit will not turn on.	a. Check Power Cord connections. b. Check rear panel fuse(s). c. Unit requires service, contact our customer service department.
2. Unit turns on but the target plate will not get hot.	a. Check that you have entered a setpoint between Ambient+20 to 420 Deg. F b. Verify that the controller is set to its factory default settings. c. Unit has overheated causing the thermal reset switch to open. See Section 3.6. d. Unit requires service, contact our customer service department.
3. Controller display shows "Error" and the target plate will not get hot.	a. Unit requires service, contact our customer service department.
4. Cavity cone temperature will not stabilize to within +/- .2 °F of the setpoint temperature.	a. Verify that the controller is set to its factory default settings. b. Unit requires service, contact our customer service department.
5. Unable to communicate with the unit through the Ethernet port.	a. Check that you have made the proper wiring connections between your unit and computer. b. Check for proper settings in the controller and your computer, IP, as well as configuration c. Check that your message string contains the correct letters and characters for the command you want to send. d. Check if ping works. e. Check httpget f. Unit requires service, contact our customer service department.

Section 9 Glossary of Terms Used in This Manual

Blackbody
A theoretical object that radiates the maximum amount of energy at a given temperature, and absorbs all the energy incident upon it.

Calibration
The process of adjusting an instrument or compiling a deviation chart so that its reading can be correlated to the actual value being measured.

Emissivity
The ratio of energy emitted by a surface to the energy emitted by a blackbody at the same temperature.

IEC
International Electrotechnical Commision

Infrared (IR)
A range of the electromagnetic spectrum extending beyond red visible light from 760 nanometters to 1000 microns.

NIST
National Institute of Standards and Technology

PID
Proportional, Integral, Derivative. A three mode control action where the controller has time proportioning, integral (auto reset) and derivative rate action.

RTD
Resistance temperature detector

The OMEGA® Family of Blackbody Calibrators

Listed below is a selection guide of Omega's current line of blackbody calibration sources in addition to the one you have selected. This family of rugged, portable and accurate calibrators cover a wide range of temperatures, target plate sizes and features making them perfect for infrared pyrometer field service testing and laboratory calibrations.

BB701 Hot/Cold Blackbody Calibration Source (DOC # 1733)

Calibration Range: -18 to 149°C (0 to 300°F) **Accuracy:** ±0.8°C (±1.4°F)
Emissivity: .95 **Amb. Temp.:** 4-43°C (40 - 110°F)
Cavity size: 63.5 mm (2.5 in.) **Power:** 115/230V, 50/60 Hz, 175W

BB702 Blackbody Calibration Source (DOC # 1730)

Cal. Range: amb.+10 to 215°C (amb.+20 to 420°F) **Accuracy:** ±0.5°C (±0.9°F), ±0.25% rdg
Emissivity: .95 **Ambient Temp.:**5-45°C (41-113°F)
Cavity size: 63.5mm (2.5 in.) **Power:** 115/230V, 50/60 Hz, 75W

BB703 Mini Blackbody Calibration Source (DOC # 1789)

Cal. Range: amb.+10 to 400°C (amb.+20 to 752°F) **Accuracy:** ±1.4°C (±2.5°F)
Emissivity: .95 **Ambient Temp.:** 0-40°C (32-104°F)
Cavity size: 28.6mm (1.125 in.) **Power:** 115/230V, 50/60 Hz, 175W

BB704 4^2 Target Plate Blackbody Calibration Source (DOC # 1788)

Calibration Range: 100 to 400°C (212 to 752°F) **Accuracy:** ±0.8°C (±1.4°F)
Emissivity: .95 **Ambient Temp.:** 0-50°C (32-122°F)
Cavity size: 101.6mm (4 in.) **Power:** 115/230V, 50/60 Hz, 425W

BB-4A High Temperature Blackbody Calibration Source (DOC # 1730)

Calibration Range: 100 to 982°C (212 to 1800°F) **Accuracy:** ±1°C, ±0.25% rdg
Emissivity: .99 **Ambient Temp.:** 0-35°C (32-122°F)
Cavity Aperture Diameter: 22.2 mm (0.88 inches) **Power:** 115/230V, 50/60 Hz, 400W

BB705 Laboratory Grade Blackbody Calibration Source (DOC # 1759)

Calibration Range: 100-1046°C (212 to 1915°F) **Accuracy:** ±1°C (±1.8°F), ±0.25% rdg
Emissivity: .99 **Ambient Temp.:** 0-35°C (32-95°F)
Cavity Aperture Diameter: 44.4 mm (1.75 in.) **Power:** 115/230V, 50/60 Hz, 1100W

To receive by fax, a complete updated specification sheet and price on any of the calibrators listed here call the OMEGAFAX On-line Publishing Service 1-800-848-4271 and request the DOC# shown with each unit. Please call our sales or customer service department for information and pricing on any new models available.

MADE IN USA

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **25 months** from the date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **two (2) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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