

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **25 months** from 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 in which wear is not warranted, include but are 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 the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED 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.

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 or calibration,
2. Model and serial number of the 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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5

| Menu 00 | Menu 01 | Menu 02 | Menu 03 | Menu 04 | Menu 05 |
|----------|----------|------------|-------------|-------------|------------|
| Key Lock | SETPOINT | Ac.Cd = 02 | Ac.Cd = 03 | Ac.Cd = 04 | Ac.Cd = 05 |
| | | Gn.o1 113 | ALr1 1900 | id.no 01 | SnSr c.A |
| | | Gr.o2 | ALr2 | bAUd 12.o.7 | Sn.00 |
| | | rAIE 24 | Cy.t1 01 | CAL.L | dEC.P |
| | | rSEt 122 | Cy.t2 | CAL.H | FILt |
| | | H.Hys | SP.tt OFF | | OUt.1 Ht.P |
| | | HyS.1 | L.SP.L 212 | | OUt.2 Alr |
| | | C.HyS | L.SCL | | CoL.t nor |
| | | HyS.2 | U.SP.L 1800 | | A1.HL HI |
| | | C.SP.r | H.SCL | | A1.Pd Pr |
| | | SP.r.2 | | | A1.OP LAt |
| | | dPnG NI | | | A2.HL HI |
| | | | | | A2.Pd Pr |
| | | | | | A2.OP OFF |
| | | | | | Unit F |

Menu Hierarchy Showing Factory Default Settings

Changing the Controller's Parameter Settings

1. Press the  key to enter the programming mode. The lower display will alternately display the menu level and "Ac.Cd."
2. Use the  and  keys to change to the desired menu level.
3. Once you have chosen the desired menu use the  key to scroll through the parameters. To change the setting of a given parameter, use the  and  keys.
4. To save settings press the  key. The controller now exits the programming menu and return to the normal operating mode.
5. To change settings on other menu levels, you must re-enter the programming menu (from step #1).

Reference Probe

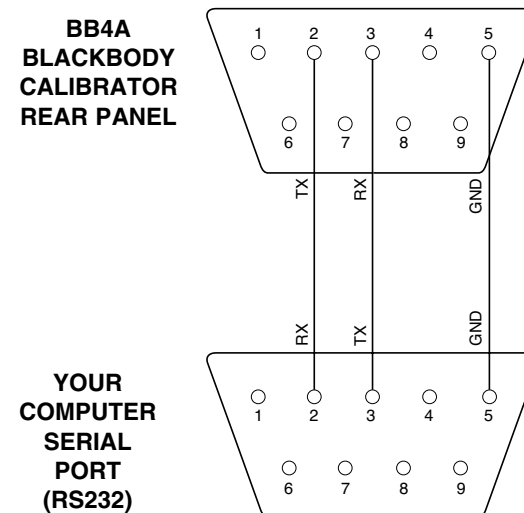
A thermocouple reference port is provided for monitoring cavity temperature with an external instrument. A standard thermocouple panel jack is provided (OMEGA# RSJ-K-R). If a voltmeter is used to read the output, be sure to use an Icepoint reference call (TRCIII A) or a cold junction compensator (CJ, MCJ, SMCJ).

6

RS232 Communication

The RS232 port provides the customer with bi-directional data transfer via a three-conductor cable consisting of signal ground, receive input, and transmit output. It is recommended that less than fifty feet of shielded cable be used between the computer and this instrument. Use a straight DB9 (female) to DB9 (male) connector cable to connect your computer to the BB-4A. The cable should be attached only when the computer and BB-4A are off.

For detailed RS232 communication functionality, refer to the User's Guide (M3014).



Connecting the BB-4A to a Computer's Serial Port

QUICK START

www.omega.com/manuals/manualpdf/M3014.pdf

2 YEAR WARRANTY



BB-4A Blackbody Calibrator

OMEGA
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Servicing North America:

U.S.A. Headquarters: Omega Engineering, Inc.
Toll-Free: 1-800-826-6342 (USA & Canada only)
Customer Service: 1-800-622-2378 (USA & Canada only)
Engineering Service: 1-800-872-9436 (USA & Canada only)
Tel: (203) 359-1660 Fax: (203) 359-7700
e-mail: info@omega.com

For Other Locations Visit omega.com/worldwide

The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

Using This Quick Start Manual

Use this Quick Start Manual with your BB-4A Blackbody Calibrator for easy installation and basic operation. For detailed information, refer to the User's Guide (Manual # M3264).

PRECAUTIONS:

- Follow all safety precautions and operating instructions outlined in this quick start and accompanying User's Guide.
- Never leave your calibrator unattended when in use.
- Keep out of reach of all children.
- Remove the cavity wood shipping plug before use.
- Never touch the heater cavity 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.
- 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 serial port or reference probe port to equipment with exposed, hazardous, live voltages.
- Protect from moisture and rain.
- The operator of this instrument is advised that if the equipment is used in a manner not specified in this manual, the protection provided by the equipment may be impaired.

General Information

The Model BB4A is a portable, rugged, bench-top, blackbody calibrator source with a built-in precision PID digital controller. The calibrator is used to test and calibrate infrared pyrometers. The heater cavity, with 21.66 mm (0.88") aperture, has an emissivity of 0.99 and can be set to any temperature between 100 to 982°C (212 to 1800°F).

Mounting

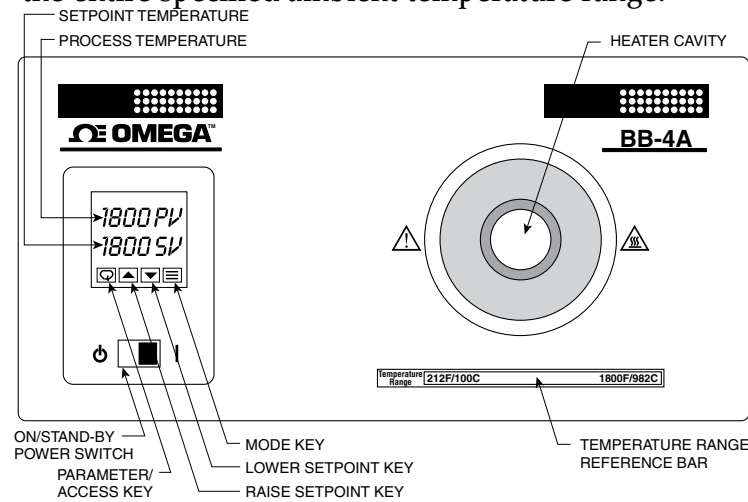
Mount the unit on a bench, table top or shelf in a horizontal position and operate at least ten inches from any air obstructions to the fan, front, rear panel, bottom and top of the unit, in an ambient environment between the specified 0 to 50°C (32 to 122°F).

NOTE:

Your unit was shipped to you with a wood plug installed in the heater cavity to prevent damage during shipping. This plug must be removed before using your calibrator.

Ambient Temperature

The target plate of the BB-4A can achieve any temperature within the specified temperature range when being operated in normal ambient temperature environments. The maximum specified heater cavity temperature of 982°C (1800°F) can be achieved over the entire specified ambient temperature range.



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.



Parameter/Access Key:
Press to scroll through menu parameters.



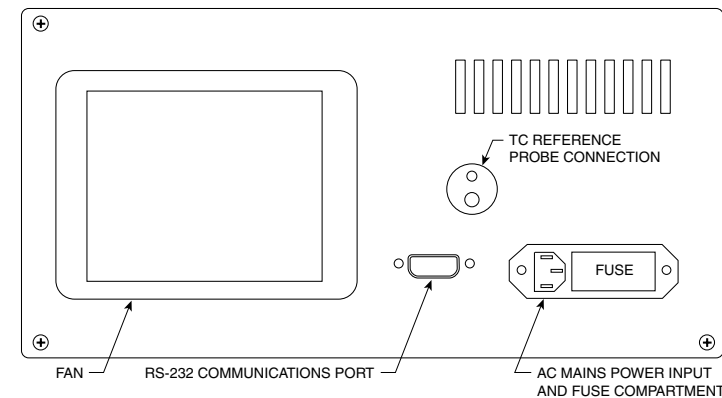
Raise Key:
Press to increase the selected parameter or scroll upward in the list of possible settings.



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



Mode Key:
Press to save settings and exit a menu level.



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 the User's Guide for information on fuse replacement.

Reference Probe Connection:

The reference probe enables the user to monitor the target plate temperature with an external instrument. A "K" type thermocouple reference output is provided.

RS232 Communications Port:

The Female DB-9 port allows the customer to make a 3-wire RS232 interface with the BB-4A.

Thermal Reset Switch

In the event that the target plate temperature and/or ambient temperature exceed the acceptable limit, this reset switch will pop open. The controller will appear to be demanding a temperature increase but the target plate temperature will not rise. Let the unit cool down completely. Locate the hole for the safety switch on the right side of the unit behind the carry handle. Using a non-conductive thin tube or pin, insert it into the hole and press in the safety switch until you hear a click. This will reset the over-temperature protection. If this has no effect, refer to the troubleshooting section in the user's manual.

Changing the Temperature Setpoint

The BB-4A's 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 (°F/°C) and communication settings (BAUD, etc.) 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. The minimum and maximum setpoints are locked.

| | | | | |
|-------|----------|---------|---------|--------|
| TO: | 121°C | 538°C | 982°C | |
| FROM: | 250°F | 1000°F | 1800°F | TO: |
| 121°C | | 25 min. | 40 min. | 250°F |
| 538°C | 60 min. | | 30 min. | 1000°F |
| 982°C | 140 min. | 30 min. | | 1800°F |
| | 250°F | 1000°F | 1800°F | FROM: |

Menu Heat Up/Cool Down Cycle Time Tables

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