

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) 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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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).

Target Plate Air Purge

The BB701 comes with a nitrogen air purge collar that surrounds the target plate. When connected to a nitrogen gas source the target plate is kept free of condensation at lower temperatures. Snow is likely to form on the plate when it is kept at temperatures below freezing temperature. Snow or condensation will change a target's emissivity. The can lead to inaccuracies unless the infrared pyrometer is corrected for this emissivity change. It is therefore recommended that the user take advantage of this feature.

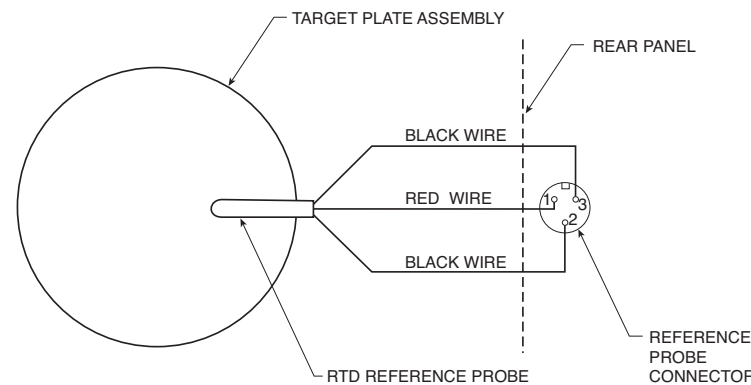
Use dry gas or Nitrogen with a dew point below -20°C (-4.0°F). The rate of gas inlet should be 0.25 to 0.50 m²/hr. (5 to 10 ft³/hr.). Do not exceed the maximum gas inlet rate. The port will accept any flexible tubing (vinyl, rubber, Teflon, latex) with a 1/4" outer diameter, such as OMEGA® #TYVY-1418-100-A.

Reference Probe

An 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. 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.

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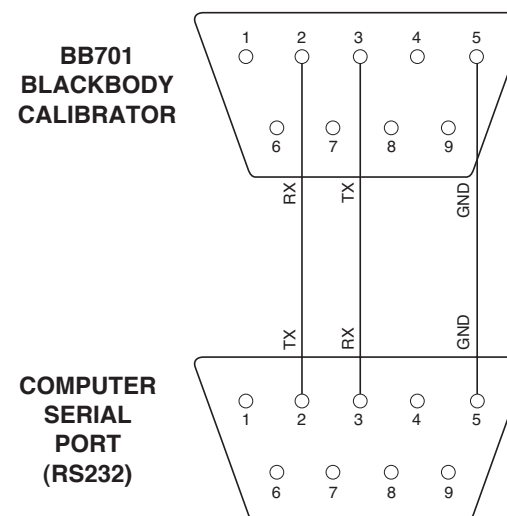
Target Plate Temperature	Reference Probe Resistance
-10°C (14°F)	96.09 Ohms
+10°C (+50°F)	103.90 Ohms
+50°C (+122°F)	119.40 Ohms
+70°C (+158°F)	127.07 Ohms
+100°C (+212°F)	138.05 Ohms
+120°C (+248°F)	146.06 Ohms



Internal Reference Probe Connections

RS232 Communication

The RS232 communications port allows 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 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 BB701. The cable should be attached only when the computer and BB701 are off.



Internal Reference Probe Connections

QUICK START

For complete product manual:
www.omega.com/manuals/manualpdf/M3264.pdf



BB701
Blackbody Calibrator

230 VAC Model Only

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 e-mail: info@omega.com

For Other Locations Visit omega.com/worldwide

It is the policy of OMEGA Engineering, Inc. 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 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, human applications.

Using This Quick Start Manual

Use this Quick Start Manual with your BB701 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 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.
- 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.

General Information

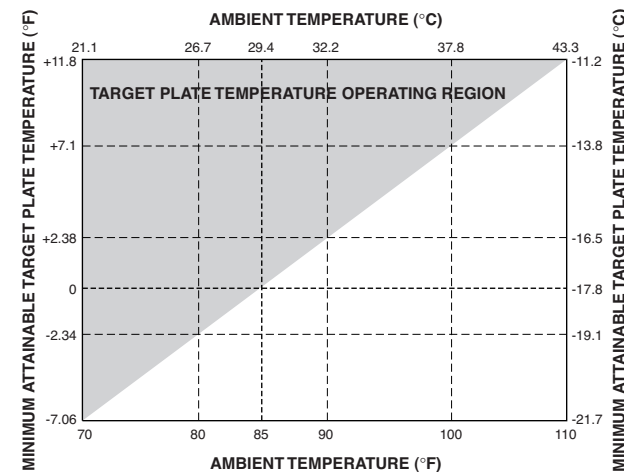
The Model BB701 is a portable, rugged, bench-top, hot/cold blackbody calibration source with a built-in precision PID digital controller. The calibrator is used to test and calibrate infrared pyrometers. The large 2.5 inch diameter target plate has an emissivity of 0.95 and can be set to any temperature between -18 to 149°C (0 to 300°F).

Mounting

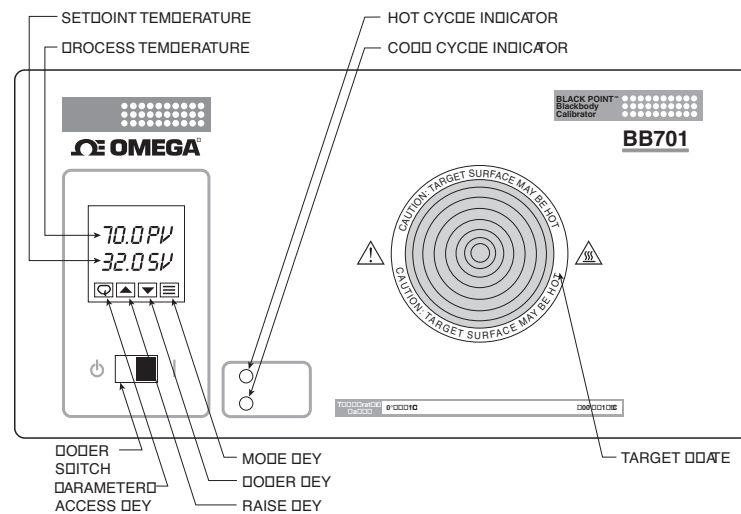
Mount the unit on a bench, table top or shelf in a horizontal position and operate at least ten inches from any air obstructions to the fan, front panel, rear panel, and top of the unit. Operate the unit in an ambient environment between the specified 4.4 and 43°C (40 to 110°F).

Ambient Temperature

The target plate of the BB701 can achieve any temperature within the specified temperature range of -18 to 149°C (0 to 300°F) when being operated in normal ambient temperature environments. The maximum specified target plate temperature of 149°C (300°F) can be achieved over the entire specified ambient temperature range. However, lower target plate temperatures are more difficult to attain at increased ambient temperatures. As long as the ambient temperature does not exceed 29.4°C (85°F), the target plate will achieve its lower limit temperature of -18°C (0°F). The minimum target plate temperature the unit can achieve is proportionally worse with increased ambient temperature. An increase of 1°C is accompanied by an increase in minimum target plate temperature of 0.3°C (An increase of 1°F is accompanied by an increase in minimum target plate temperature of 0.5°F).



The Effect of Increased Ambient Temperature On Operating Temperatures



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.

Hot Cycle Indicator:

When this Amber L.E.D. is illuminated, the unit is heating up the target plate.

Cold Cycle Indicator:

When this Blue L.E.D. is illuminated, the unit is cooling down the target plate.



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.

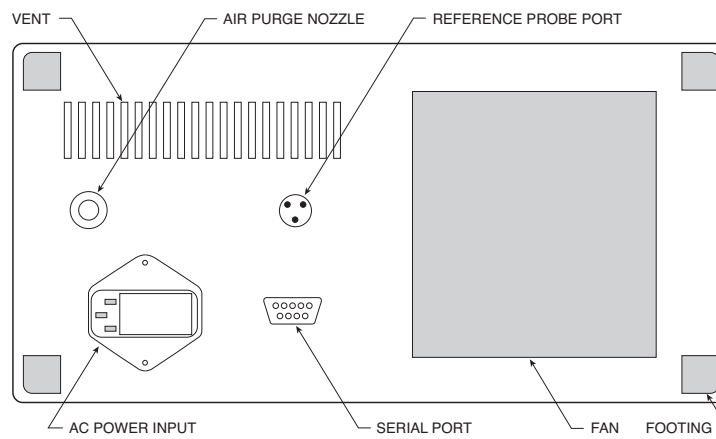


Lower Key: Press to decrease the selected parameter or scroll downward in the list of possible settings.



Mode Key:

Press to save settings and exit a menu level.



Back Panel

AC Power Input:

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.

Reference Probe Port:

The reference probe port enables the user to monitor the target plate temperature with an external instrument. The wires are connected to a platinum 3-wire RTD.

Air Purge Nozzle:

A dry gas source can be connected to this nozzle in order to minimize condensation on the target plate when operating at low temperatures.

Serial Port:

The female DB-9 port allows the customer to make a 3-wire RS232 interface with the BB701.

Calibrating An IR Pyrometer

The 2.5" target plate is a near ideal blackbody source. The emissivity of the plate is 0.95. 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.

Changing the Temperature Setpoint

The BB701'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 can be 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 at 0 and 300°F, respectively. While these max. and min. settings are changeable, it is strongly advised not to adjust these parameters.