

# User's Guide



Shop online at



*omega.com*

*e-mail: info@omega.com*

*For latest product manuals:  
omegamanual.info*



## CL-200 Series BLOCK HEATER



**OMEGAnet® Online Service**  
**omega.com**

**Internet e-mail**  
**info@omega.com**

### **Servicing North America:**

**U.S.A.:**  
ISO 9001 Certified

Omega Engineering, Inc., One Omega Drive, P.O. Box 4047  
Stamford, CT 06907-0047 USA  
Toll Free: 1-800-826-6342                      TEL: (203) 359-1660  
FAX: (203) 359-7700                              e-mail: info@omega.com

**Canada:**

976 Bergar  
Laval (Quebec), Canada H7L 5A1  
Toll-Free: 1-800-826-6342                      TEL: (514) 856-6928  
FAX: (514) 856-6886                              e-mail: info@omega.ca

### **For immediate technical or application assistance:**

**U.S.A. and Canada:** Sales Service: 1-800-826-6342/1-800-TC-OMEGA®  
Customer Service: 1-800-622-2378/1-800-622-BEST®  
Engineering Service: 1-800-872-9436/1-800-USA-WHEN®

**Mexico:**

En Español: 001 (203) 359-7803                      FAX: (001) 203-359-7807  
info@omega.com.mx                              e-mail: espanol@omega.com

### **Servicing Europe:**

**Benelux:**

Managed by the United Kingdom Office  
Toll-Free: 0800 099 3344                      TEL: +31 20 347 21 21  
FAX: +31 20 643 46 43                              e-mail: sales@omega.nl

**Czech Republic:**

Frystatska 184  
733 01 Karviná, Czech Republic  
Toll-Free: 0800-1-66342                      TEL: +420-59-6311899  
FAX: +420-59-6311114                              e-mail: info@omegashop.cz

**France:**

Managed by the United Kingdom Office  
Toll-Free: 0800 466 342                      TEL: +33 (0) 161 37 29 00  
FAX: +33 (0) 130 57 54 27                      e-mail: sales@omega.fr

**Germany/Austria:**

Daimlerstrasse 26  
D-75392 Deckenpfronn, Germany  
Toll-Free: 0 800 6397678                      TEL: +49 (0) 7059 9398-0  
FAX: +49 (0) 7056 9398-29                      e-mail: info@omega.de

**United Kingdom:**  
ISO 9001 Certified

OMEGA Engineering Ltd.  
One Omega Drive, River Bend Technology Centre, Northbank  
Irlam, Manchester M44 5BD England  
Toll-Free: 0800-488-488                      TEL: +44 (0)161 777-6611  
FAX: +44 (0)161 777-6622                      e-mail: sales@omega.co.uk

---

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.

## BEFORE USE:

Please read the following instructions:



Examine the integrity of the box before open. If box is broken, please check whether the instrument damaged. If so, please call your local distributors immediately. Do not try to plug into power outlet!



Read the Manual first before operating the instrument



For indoor use only



Use in a well-ventilated area



Ambient temperature range +5°C to +40°C



Relative humidity not exceeding 80%



Temperature Adjustment supply fluctuation not exceeding 10%

## Warning



*ALL UNITS MUST BE GROUNDED*

**Check the line supply is sufficient to meet the power requirement of the unit!**

## Overview

CL-201 and CL-202 are designed to accommodate three different format aluminum blocks. And it comes with block handling tool (see Figure 2) and glass thermometer.

CL-201 has the digital display and simple operation buttons to fit the needs of users in the lab and has two lights to indicate the status of the operation and process.

## Operation

**For the digital: CL-201, CL-204, CL-205 and CL-207:**

1. Put the block into the blocks compartment (see Figure 1A), use block handling tool (Figure 1B) to add and remove the block
2. Plug the power cord to the source, and make sure that the plug is firmly pressed. Turning on the switch on the back, and the light in the front will be on. The light will be flashing until the temperature reaches equilibrium. Use thermometer measuring the temperature, turn the knob to adjust temperature. Leave the Heated Block on to keep the temperature at stable level. It takes sometimes to reach the equilibrium.

**ALWAYS KEEP THE MACHINE AWAY FROM DRAFTY AREA TO AVOID THE EFFECT OF THE ENVIRONMENTAL TEMPERAURE ON THE TEMPERATURE CONTROL OF THE BLOCK HEATERS!**

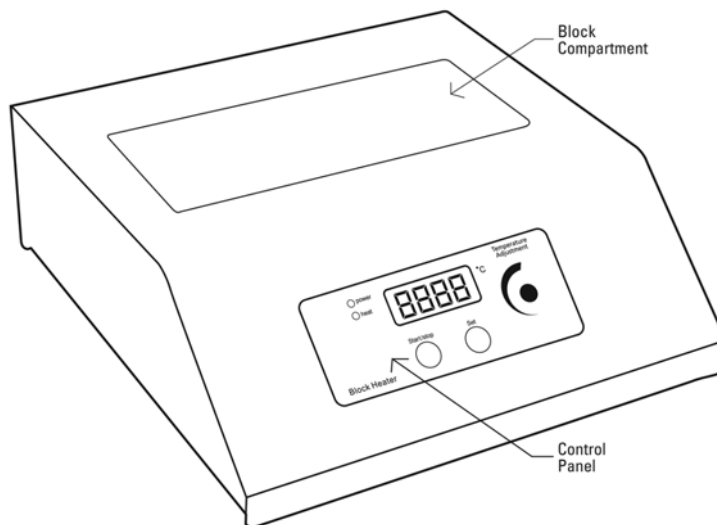


Figure1A.

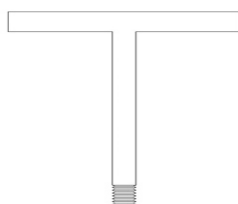


Figure1B. Removing Tool CL-200-RT

2. Plug the power cord to the source, and make sure that the plug is firmly pressed. Turn on the machine by switching the on/off switch (see Figure 2).



**Figure 2: The rear view of the Block Heater. 1, on/off switch; 2, IEC power inlet; 3, fuse holder**

3. When turning on the machine, the display will immediately shows “\_ \_ \_ \_”, and then shows the actual temperature in Celsius. The “power” light is off at this time, and when the block temperature is over 50 °C, the “heat” light is on, otherwise, it is off, too.



**Figure 3: the front panel view of the CL-201**

4. To set the temperature, press the “Set” key, and turn the “Temperature Adjustment” knob to desired temperature point, and release the “Set” button.

5. Press “Start/stop” button to start the operation. The “power” light is on and “heat” light is flashing at this point. When reaching the equilibrium, the “heat” light is steady on. The equilibrium point is set @ 0.1 degree of the accuracy. It might take longer time to reach.

**Caution: when putting the cold test tubes or other vials, it may cause the tubes/vials to break!**

6. When running, i.e. the “power” light on, the set point of the heated block could not be changed. To change the set point of the temperature, press “Start/stop” button to stop the run (the “power” light will go off), and then change the set point as indicated in the step 4.
7. The CL-201 always shows the actual temperature reading. To see the set point temperature, press the “Set” button, and the LED will show the set point temperature.
8. After use, wait until the block cool down to below 50 degree (the “heat” light is off) and turn off the block heater.

### **Calibration**

The digital types of Block Heaters can easily be calibrated to show any blocks/vials and tubes’ temperature in the displayed LED. Due to the differences in the mass of the various aluminum blocks, environmental air temperature, thermal radiation, and many other factors, the Block Heater may need to be re-calibrated when switching different blocks and when the environmental changed. The CL-201 has been calibrated based on 16 mm Blocks.

CL-201 can be calibrated using one to five points. The calibration steps are described in the followings:

1. Prepare the thermistor, or thermometer temperature measurement devices. You can calibrate the block or even the temperature of the solution in the vials/tubes. Make sure the thermistor or sensor well contacted with the blocks or vials/tubes solution.
2. Calibration could not be made during running (i.e. the “Power” light on). Press “Start/stop” button first to stop run if the machine is running.
3. Press “Temperature Adjustment” turning knob (please note that it should be “press” not “turn”)first, then press “Start/stop” button, simultaneously release both, the display will show “C \_ \_ X”, which X indicates the stage of the calibration. For example, in the first calibration, it will display “C \_ \_ 1”.
4. Press “set” button, and turn the “Temperature Adjustment” turning knob to the desired temperature calibration point, release the “set” button, and press “Temperature Adjustment” to start the calibration. In this time, the “power” light will be on, and the “heat” light will be flashing. The display showed “C \_ \_ X” flashing.
5. When reaching the equilibrium set temperature, the display will stop flashing. In this stage, you can enter the actual block or vial temperature from reading the block or vial temperature from external temperature measurement device: Press “set” button and turning the “Temperature Adjustment” knob to the actual temperature value, release the “set” button, and press the “Temperature Adjustment” knob. The machine will take the real value to take effect in the next run. In this case the CL-201 will display “C \_ \_ X+1” (X + 1 indicates the next number of the

calibration stage) and continue to flash: Repeat the step 4 to enter the next calibration set temperature.

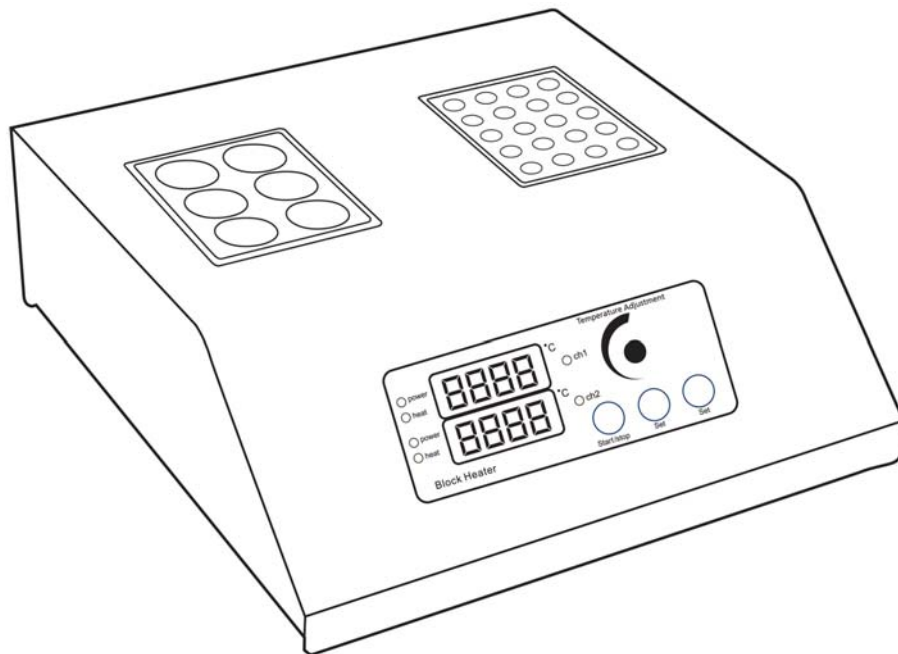
The maximum calibration point is five. When finishing five point of the calibration, the machine will automatically exit from the calibration program and return to the pre-start status: the “power” light will go off and the “heat” light will go “on” when temperature is over 50 °C.

6. The calibration can be interrupted anytime by pressing “Start/stop” button and “Temperature Adjustment” knob as indicated in step 3: If the process interrupted before the completion of the calibration stage, the machine will only take the previous calibration point. For example, if the process interrupted between the first and second point calibration stages, then the machine will take the first calibration point and becomes one-point calibration; If the process interrupted between stage 4 and 5, then the machine will take the previous 4 points data as the calibrated value, and becomes 4-points calibration.

7. During calibration, the calibration set point could not be changed unless interrupting the process by pressing the “Start/stop” and “Temperature Adjustment” knob as indicated in the step 3.

8. Always using the same type of the block to avoid the discrepancy. The calibrated displayed value only accurately indicates the value of the block/vial that actually measured from external temperature measurement device.

**For CL-205:**



**Figure 4: CL-205 Overview: Ch1: The left hand side (with six holes block); Ch2: The right hand side with 20 holes block)**

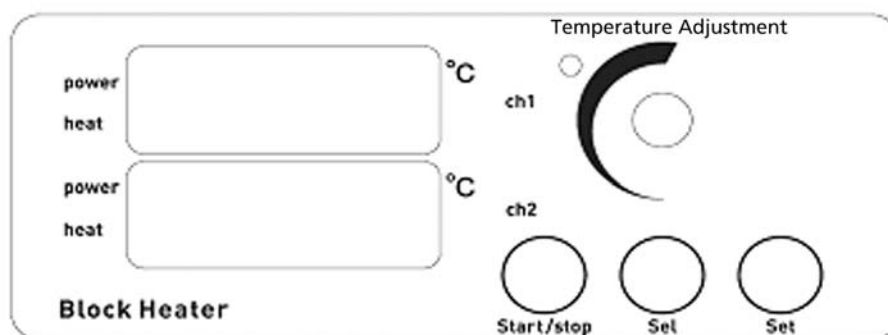


Figure 5: the front panel view of the CL-205

Please make sure that the correct channel corresponding to the designated block before to do the operation. The CL-205 comes with additional LED display and “sel” button for users to select the channel. All operation and calibration is the same as in CL-201, but before to do that, please press the “sel” button to select the channel (the LED light will be ON when the channel got selected).

### Selection of the Aluminum Blocks

We provide various aluminum blocks to accommodate different vials/tubes:

Part Number	Tube size (Diameter or ml)	Number of the holes	Hole sizes (Diameter X Depth) in mm
CL-200-B1	27 mm	6	26.75 X 48
CL-200-B2	0.5 ml	30	7.9 X 15.6 + 11.2, 9° taper
CL-200-B3	0.2 ml	96	6.0 X 17.3, 9° taper
CL-200-B5	1.5 ml	20	10.7 X 22.5 + 13, 9° taper
CL-200-B6	50 ml Flat bottom	2	45 X 46
CL-200-B7	10 mm	20	10.8 X 35
CL-200-B9	2 ml	20	10.5 X 33
CL-200-B10	13 mm	20	13.5 X 47
CL-200-B13	1.5 ml	20	10.7 X 14, 9° taper
CL-200-B15	12 mm	20	12.5 X 47
DB 0015-33	12 mm	20	12.5 X 33
CL-200-B16	16 mm	12	16.5 X 47
CL-200-B17	2 ml	20	10.5 X 47
CL-200-B18	19 mm Block	8	19.5 X 47
CL-200-B19	33 mm Block	4	33.5 X 47



### Technical Specification

Working temperature range Ambient	+5°C to 200°C
Settable temperature range	0.0°C to 200.0°C
Temperature stability	±0.1°C at 40°C
Temperature stability	±0.15°C at 100°C
Temperature display	4 digit LED
Set point resolution	0.1°C
Set point to accuracy	±1°C
<b>Electrical supply</b>	Voltage Cycles Power 230V 50Hz-60Hz 650W or 110V-120V 50Hz-60Hz 650W

## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **36 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to normal **three (3) 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.

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 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.

OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

© Copyright 2009 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without the prior written consent of OMEGA ENGINEERING, INC.

# Where Do I Find Everything I Need for Process Measurement and Control? **OMEGA...Of Course!**

*Shop online at [omega.com](http://omega.com)<sup>SM</sup>*

## **TEMPERATURE**

- ☑ Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- ☑ Wire: Thermocouple, RTD & Thermistor
- ☑ Calibrators & Ice Point References
- ☑ Recorders, Controllers & Process Monitors
- ☑ Infrared Pyrometers

## **PRESSURE, STRAIN AND FORCE**

- ☑ Transducers & Strain Gages
- ☑ Load Cells & Pressure Gages
- ☑ Displacement Transducers
- ☑ Instrumentation & Accessories

## **FLOW/LEVEL**

- ☑ Rotameters, Gas Mass Flowmeters & Flow Computers
- ☑ Air Velocity Indicators
- ☑ Turbine/Paddlewheel Systems
- ☑ Totalizers & Batch Controllers

## **pH/CONDUCTIVITY**

- ☑ pH Electrodes, Testers & Accessories
- ☑ Benchtop/Laboratory Meters
- ☑ Controllers, Calibrators, Simulators & Pumps
- ☑ Industrial pH & Conductivity Equipment

## **DATA ACQUISITION**

- ☑ Data Acquisition & Engineering Software
- ☑ Communications-Based Acquisition Systems
- ☑ Plug-in Cards for Apple, IBM & Compatibles
- ☑ Datalogging Systems
- ☑ Recorders, Printers & Plotters

## **HEATERS**

- ☑ Heating Cable
- ☑ Cartridge & Strip Heaters
- ☑ Immersion & Band Heaters
- ☑ Flexible Heaters
- ☑ Laboratory Heaters

## **ENVIRONMENTAL MONITORING AND CONTROL**

- ☑ Metering & Control Instrumentation
- ☑ Refractometers
- ☑ Pumps & Tubing
- ☑ Air, Soil & Water Monitors
- ☑ Industrial Water & Wastewater Treatment
- ☑ pH, Conductivity & Dissolved Oxygen Instruments