



# CL-355A Dry-Block Calibrator

MADE IN UK

3 YEAR  
WARRANTY



# User's Guide

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# ***THE CL-355A***

## ***Introduction***

The Omega Engineering CL-355A calibrator heater provides a safe, dry, constant temperature source. It is fast and economical and can be used either on a bench top or as a portable field unit. The weight of the unit is only nine pounds/four kilograms. The unit covers the temperature range from 5°C above ambient up to 400°C using a machined aluminum insert block as the heat transfer medium. The temperature control circuit is built into the unit.

Features include:

- 10 insert formats available
- Maximum temperature of 400°C/752°F
- An independent over-temperature cutout
- Temperature sensor burnout protection

Even though the unit heats up rapidly, highly efficient insulation ensures that the case remains cool enough to handle even at maximum operating temperatures. Omega's calibrator has been designed to comply with all relevant Radio Frequency interference and electrical safety regulations.

## ***Specification***

Figures quoted are at the base of the well at the time of calibration.

Temperature range:	5°C/9°F above ambient to 400°C/752°F
Over-temperature limit:	450°C/842°F (approximately)
Display resolution:	0.1°
Accuracy:	+/-0.6°C (1.1°F)
Stability:	+/-0.15°C (0.27°F)
Heat up time 20° C to 400°C:	12 minutes
Cool down 400°C to 100°C:	21 minutes
Immersion Depth:	4.5" (114.3mm)
Fan Cooling:	Automatic
Weight:	9 lbs (4 Kg)
Dimensions* (H x W x D):	8.75 x 8 x 8 inches/222.25 x 203.2 x 203.2 mm
*excluding the carrying strap	

## **Electrical supply**

<i>Voltage</i>	<i>Cycles</i>	<i>Power</i>
230V	50/60Hz	900W
120V	50/60Hz	900W

**Note:** The above specifications are quoted for an ambient temperature range of 10°C/50°F to 30°C/86°F. Outside this range, the quoted figures may deteriorate but the unit will still work safely.

### ***Working environment***

The calibrator units are designed to work safely under the following conditions:

Ambient temperature range: 5°C/9°F to 40°C/104°F

Humidity: Up to 95% relative humidity, non-condensing

### ***Warning***

Warning:	HIGH TEMPERATURES ARE DANGEROUS
Avertissement:	DANGER DE TEMPERATURES ELEVEES
Warnung:	HOHE TEMPERATUREN SIND GEFÄHRLICH
Aviso:	LAS TEMPERATURAS ELEVADAS SON PELI

HIGH TEMPERATURES ARE DANGEROUS: They can cause serious burns to operators and ignite combustible material. Omega has taken great care in the design of these units to protect operators from hazards, but operators should pay attention to the following points:

- USE CARE AND WEAR PROTECTIVE GLOVES TO PROTECT HANDS
- DO NOT put hot objects on or near combustible objects
- DO NOT operate the unit close to inflammable liquids or gases
- DO NOT place any liquid directly in your unit
- At all times USE COMMON SENSE

### ***Operator Safety***

All operators of Omega Engineering equipment must have available the relevant literature needed to ensure their safety. It is important that only suitably trained personnel operate this equipment in accordance with the instructions contained in this manual and with general safety standards and procedures. If the equipment is used in a manner not specified by Omega, the protection provided by the equipment to the operator may be impaired. All Omega Engineering units have been designed to conform to international safety requirements and are fitted with a preset over-temperature cutout. If a safety problem is encountered, switch off at the mains socket and remove the plug from the supply.

## ***Installation***

1. All Omega units are supplied with a power cable.
2. Before connecting the mains supply, check the voltage against the rating plate. Connect the mains cable to a suitable plug according to the table below. Note that the unit must be earth grounded to ensure proper electrical safety.

Electrical connections:

	<b><i>220V-240V</i></b>	<b><i>110V-120V</i></b>
Live	Brown	Black
Neutral	Blue	White
Earth ground	Green/yellow	Green

The fused plug supplied with the mains lead for use in the UK is fitted with the following value fuse to protect the cable: 230V UK 4 AMP

The fuse in the unit protects the unit and the operator

Note that units marked 230V on the rating plate work at 220V; units marked 120V work at 110V. In both cases, however, the heating rate will degrade by approximately 8%. The rating plate is on the rear of the unit.

3. Plug the mains cable into the socket on the rear of the unit.
4. Place the unit on a suitable bench or flat workspace, or in a fume cupboard if required, ensuring that the air inlet vents on the underside are free from obstruction.  
After use, when you have finished heating samples, remember that parts of the unit may be very hot. Take the precautions listed earlier.

## ***OPERATION***

### ***Preparation***

1. The heater design, temperature sensor and control circuit give good temperature control and uniformity, but make sure that there is a close fit of the probes in the block to allow efficient heat transfer.
2. Plug the power cable into the socket in the back of the unit. Connect the mains cable to the electricity supply.

### ***Setting the operating temperature***

1. To set the temperature required, press and hold the star button and either the up or down button depending on the direction you need to take the set point.
2. When you have the correct set temperature displayed, release the up or down button and the unit will start to heat or cool to the set point.
3. Once the process value/actual temperature reaches the set point, allow the block to stabilize for 15 minutes before performing a calibration.
4. The controller is factory pre-set and only the set-temperature should be changed.

**THE CONTROLLER MUST NOT BE SET TO CONTROL ABOVE 400°C/752°F OR DAMAGE TO THE UNIT MAY RESULT.**

### ***After use***

1. When you have finished calibrating, remember that parts of the unit and the probe may be very hot, so precautions should be taken to prevent injury.
2. For safety, set the set temperature and allow the unit to cool to below 50°C/122°F before placing the unit in a carrying case or shipping carton.

### ***Changing from °C to °F***

The controller is preset to display/operate in degrees C; however it may be changed to read in Degrees F. Refer to the CN9400 User's guide for instructions on changing from *C to °F*.

**Be careful not to change any of the other settings in the configuration menu as performance will be affected and/or damage to the unit will occur!**

## ***Operator maintenance***

NOTE THAT THIS EQUIPMENT SHOULD ONLY BE DISMANTLED BY PROPERLY TRAINED PERSONNEL. REMOVING THE FRONT OR REAR PANELS EXPOSES POTENTIALLY LETHAL MAINS VOLTAGES. THERE ARE NO OPERATOR MAINTAINABLE PARTS WITHIN THE EQUIPMENT.

In the unlikely event that you experience any problems with your unit which cannot easily be remedied, you should contact your supplier and return the unit if necessary. Please include any details of the fault observed and remember to return the unit in its original packing. Omega will accept no responsibility for any damage to units that are improperly packed for shipment. If in doubt, contact your supplier. See the Decontamination Certificate supplied with your unit.

1. Cleaning: Before cleaning your unit, ALWAYS disconnect it from the power supply and allow it to cool below 50° C. Your unit can be cleaned by wiping with a damp soapy cloth. Care should be exercised to prevent water from running inside the unit. Do not use abrasive cleaners.
2. Fuses: Your unit is protected by two fuses. They should only be changed by suitably qualified personnel. If the fuses blow persistently, a serious fault is indicated and you may need to return the unit to your supplier for repair.

## ***ADDITIONAL INFORMATION***

The controller is factory preset. See the Controller book for further details.

For safety reasons, the configuration settings of the controller are password protected.

Please contact your dealer for further information.

Listed below are important control parameters for the unit.

Level 1 > band=11, int.t =1.5, dEr.t=12, DAC=1.0, Cyc.t=0.3, Bnd.2=15, Cyc.2=20,

Level 2 > SP2.A=cool, diSP=0.1, Hi.Sc=400.0, inpt=rtd,

Level 3 > SP1.d=SSR, SP3.d=rly

## ***Replacement Parts***

The following parts may be obtained from Omega Engineering if replacements or alternatives are required:

<i>Part Number</i>	<i>Description</i>
FCABLEUK	UK 240 volt Mains cable with 13amp UK plug (5 amp fuse)
FCABLEEU	Euro style 240 volt Mains cable with R/A Schuko plug
7002705	US 120 volt Mains cable
7032722	insert extractor
7032718	Carrying case

<i>Part Number</i>	<b><u>Available inserts</u></b>	<i>Insert well Sizes</i>
CL701B		insert 5 x 1/4"
CL702B		insert 1 each 1/8", 3/16", 1/4", 5/16", 3/8"
CL703B		insert 2 x 1/4" & 2 x 3/8"
CL704B		insert 2 x 1/4" & 2 x 1/2"
CL705B		insert 1 x 1/4"
CL706B		insert blank
CL707B		insert 1 x 9/16" & 1 x 1/4"
CL708B		insert 1 x 5/8" & 1 x 1/4"
CL709B		insert 1 x 11/16" & 1 x 1/4"
CL710B		insert 1 x 3/4" & 1 x 1/4"

<i>Part Number</i>	<b><u>Spare Parts</u></b>	<i>Description</i>
7002695		225 watt, 120 volt heater
7002697		PRT
7002698		Solid state relay
7007201		8 amp fuse (120 volt units)
6500131		4 amp fuse (240 volt units)



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## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **37 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the 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.

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## 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.

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