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

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 Gauges
- ☑ Load Cells & Pressure Gauges
- ☑ 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

CE

User's Guide

OMEGA®
An OMEGA Technologies Company
http://www.omega.com
e-mail: info@omega.com

M-2890
CL-730A, CL-720A, CL-710A

omega.com™
OMEGA®

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Toll Free in England: 0800-488-488
e-mail: uk@omega.com

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.

CONTENTS

Omega Calibrator Operator's Manual

OMEGA®
An OMEGA Technologies Company

CE

Declaration of Conformity

Omega Units Omega CL-730A, Omega CL-720A and Omega CL-710A have been designed to comply with the following European Standards:

EN 50081-1:1992 Electromagnetic Compatibility; Generic emission standard.

EN 50082-1:1992 Electromagnetic Compatibility; Generic immunity standard (Performance criterion B).

EN 61010-1:1993 Safety requirements for electrical equipment for measurement, control and laboratory use.

EN 61010-2-010:1995 Particular requirements for laboratory equipment for the heating of materials.

I have made all reasonable enquiries regarding the unit stated and its conformance to the following EU directives:

Low Voltage directive, 73/23/EEC and amendment 93/68/EEC, and

EMC Directive 89/336/EEC and amendments 91/263/EEC 92/31/EEC and 93/68/EEC.

To the best of my knowledge and belief these units conform to these directives.

ISO 9001 CERTIFIED

This Declaration is controlled under an ISO 9001:1994 system certificated by BSI Quality Assurance, certificate number FM13585.

MADE IN USA

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of 13 months from the date of purchase. OMEGA 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 should malfunction, 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 being 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, 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, 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. P.O. 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. P.O. 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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Aluminium Bronze Inserts for the Omega CL-710A

Immersion Depth 6"

CL701A	5 of 1/4"
CL702A	1 of each 3/8", 5/16", 1/4", 3/16", 1/8"
CL703A	2 of 1/4", 2 of 3/8"
CL704A	2 of 1/4", 2 of 1/2"
CL705A	1 of 1/4"
CL707A	1 of 9/16", 1 of 1/4"
CL708A	1 of 5/8", 1 of 1/4"
CL710A	1 of 3/4", 1 of 1/4"
CL709A	1 of 11/16", 1 of 1/4"
BLANK	
CL706A	BLANK

Introduction

Please read all the information in this booklet before using the unit.

Warning

HIGH TEMPERATURES ARE DANGEROUS: they can cause serious burns to operators and ignite combustible material.

Omega have taken great care in the design of these units to protect operators from hazards, but users 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 users of Omega 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 user may be impaired.

All Omega units have been designed to conform to international safety requirements and are fitted with an overtemperature cut-out. On some models, the cut-out is adjustable and should be set to suit the application. On all other models the cut-out is preset to protect the unit.

If a safety problem should be 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. This may be integral or plug-in.
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 earthed to ensure proper electrical safety.**

Connections	*220/240V*	*110/120V*
Live	Brown	Black
Neutral	Blue	White
Earth	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 10 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.
5. Note that the folowing symbols may be next to the indicator lamps on the front panel of the units and have the following meanings:

~ : the power indicator

: the heater indicator

: the over-temperature indicator

6. Symbols on or near the power switch of the unit have the following meanings:

I : mains switch On

O : mains switch Off

After use

When you have finished heating samples, remember that parts of the unit – the tubes, blocks and associated accessories – may be very hot. Take the precautions listed earlier.

Guarantee

The unit is guaranteed against any defect in material or workmanship for the period specified on the enclosed guarantee card. This period is from the date of purchase, and within this period all defective parts will be replaced free of charge provided that the defect is not the result of misuse, accident or negligence. Servicing under this guarantee should be obtained from the supplier.

Notwithstanding the description and specification(s) of the units contained in the Operator's Manual, Omega hereby reserves the right to make such changes as it sees fit to the units or to any component of the units.

This Manual has been prepared solely for the convenience of Omega customers and nothing in this Instruction Book shall be taken as a warranty, condition or representation concerning the description, merchantability, fitness for purpose or otherwise of the units or components.

User maintenance

NOTE THAT THIS EQUIMENT SHOULD ONLY BE DISMANTALED BY PROPERLY TRAINED PERSONNEL.

REMOVING THE SIDE, FRONT OR REAR PANELS EXPOSES POTENTIALLY LETHAL MAINS VOLTAGES.

THERE ARE NO USER 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 accept no responsibilty for damage to units which are not properly packed for shipping: if in doubt, contact your supplier. See the De-contamination Certificate supplied with your unit.

1. **Cleaning**

Before cleaning your unit ALWAYS disconnect from the power supply and allow 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 one or two fuses. These 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.

Introduction

Veuillez lire attentivement toutes les instructions de ce document avant d'utiliser l'appareil.

Avertissement

DANGER DE TEMPERATURES ELEVEES : les opérateurs peuvent subir de graves brûlures et les matériaux combustibles risquent de prendre feu.

Omega a apporté un soin tout particulier à la conception de ces appareils de façon à assurer une protection maximale des opérateurs, mais il est recommandé aux utilisateurs de porter une attention spéciale aux points suivants :

- PROCEDER AVEC SOIN ET PORTER DES GANTS POUR SE PROTEGER LES MAINS.
- NE PAS poser d'objets chauds sur ou près de matériaux combustibles.
- NE PAS utiliser l'appareil à proximité de liquides ou de gaz inflammables.
- NE PAS verser de liquide directement dans l'appareil.
- FAIRE TOUJOURS PREUVE DE BON SENS.

Sécurité de l'opérateur

Tous les utilisateurs de produits Omega doivent avoir pris connaissance des manuels et instructions nécessaires à la garantie de leur sécurité.

Important : cet appareil doit impérativement être manipulé par un personnel qualifié et utilisé selon les instructions données dans ce document, en accord avec les normes et procédures de sécurité générales. Dans le cas où cet appareil ne serait pas utilisé selon les consignes précisées par Omega, la protection pour l'utilisateur ne serait alors plus garantie.

Tous les appareils Omega sont conçus pour répondre aux normes de sécurité internationales et sont dotés d'un coupe-circuit en cas d'excès de température. Sur certains modèles, ce coupe-circuit est réglable pour s'adapter à l'application désirée. Sur d'autres modèles, il est pré-réglée en usine pour assurer la protection de l'appareil.

Dans le cas d'un problème de sécurité, coupez l'alimentation électrique au niveau de la prise murale et enlevez la prise connectée à l'appareil.

Installation

1. Tous les appareils Omega sont livrés avec un câble d'alimentation qui peut être intégré à l'appareil ou à raccorder.
2. Avant de brancher l'appareil, vérifiez la tension requise indiquée sur la plaque d'identification. Raccordez le câble électrique à la prise appropriée en vous reportant au tableau ci-dessous. **Il est important que l'appareil soit relié à la terre pour assurer la protection électrique requise.**

Connexions	220/240 V	110/120 V
Phase	Marron	Noir
Neutre	Blue	Blanc
Terre	Vert/juane	Vert

   Le fusible à l'intérieur de l'appareil est destiné à assurer la protection de l'appareil et de l'opérateur.

   Remarque : les appareils dont la plaque indique 230 V peuvent fonctionner sur 220 V, et ceux dont la plaque indique 120 V peuvent fonctionner sur 110 V. Dans les deux cas cependant, le capacité de chauffage diminuera d'environ 8 %. La plaque d'identification se trouve à l'arrière de l'appareil.
3. Raccordez le câble d'alimentation à la prise située à l'arrière de l'appareil.
4. Placez l'appareil sur un plan de travail ou surface plane, ou le cas échéant, dans une hotte d'aspiration, en s'assurant que les trous d'aération situés sous l'appareil ne sont pas obstrués.
5. Les symboles ci-dessous situés à côté des témoins lumineux sur la face avant de l'appareil ont la signification suivante :

   ~ : témoin d'alimentation

   : témoin de chauffage

   : témoin d'excès de température
6. Les symboles situés sur ou à côté de l'interrupteur de l'appareil ont la signification suivante :

   I : arrêt

   O : marche

Après utilisation

Lorsque vous avez fini de chauffer les échantillons, n'oubliez pas que certaines parties de l'appareil - les éprouvettes, leurs supports et autres accessoires - risquent d'être très chaudes. Il est donc recommandé de toujours prendre les précautions citées plus haut.

Garantie

L'appareil est garanti contre tout défaut ou vice de fabrication pour la durée figurant sur la carte de garantie, à compter de la date d'achat de l'appareil. Au cours de cette période, toutes les pièces défectueuses seront remplacées gratuitement, dans la mesure où la défaillance n'est pas due à une mauvaise utilisation, un accident ou une négligence. Toute réparation sous garantie sera effectuée par le fournisseur.

Malgré la description et les spécifications de l'appareil données dans le manuel de l'utilisateur, Omega se réserve le droit d'effectuer les changements nécessaires à l'appareil ou à tout élément qui entre dans sa composition.

Ce manuel a été exclusivement rédigé à l'attention des clients de Omega, et aucun élément de ce guide d'instructions ne peut être utilisé comme garantie, condition ou représentation concernant la description, commercialisation, adaptation aux conditions d'utilisation ou autre des appareils ou de leurs composants.

Entretien utilisateur

IMPORTANT : CET APPAREIL NE PEUT ETRE DEMONTE QUE PAR DU PERSONNEL QUALIFIE.

LORSQUE LES PANNEAUX AVANT, ARRIERE ET LATERAUX SONT DEMONTES, L'OPERATEUR EST EXPOSE A DES TENSIONS QUI PEUVENT ETRE MORTELLES.

CET APPAREIL NE CONTIENT AUCUN ELEMENT QUI DEMANDE UN ENTRETIEN DE LA PART DE L'UTILISATEUR.

Dans le cas peu probable où votre appareil présente un défaut de fonctionnement auquel il est difficile de remédier, il est alors préférable de contacter votre fournisseur et, le cas échéant, de renvoyer le matériel. Veuillez inclure une description détaillée du problème constaté et retourner l'appareil dans son emballage d'origine. Omega ne sera pas tenu responsable des dommages subis par tout appareil dont l'emballage est inadéquat pour le transport. Pour plus de sûreté, contactez votre fournisseur. Voir le certificat de décontamination livré avec le produit.

1. Nettoyage

Avant de nettoyer l'appareil, assurez-vous TOUJOURS que le câble d'alimentation est déconnecté et laissez la température redescendre en dessous de 50 °C.

Utilisez un chiffon imprégné d'eau savonneuse pour nettoyer l'appareil. Veillez à ne pas introduire d'eau dans l'appareil. N'utilisez pas de produits abrasifs.

2. Fusibles

La protection de l'appareil est assurée par un ou deux fusibles dont le remplacement ne peut être effectué que par un personnel qualifié.

Si les fusibles sautent sans arrêt, il s'agit d'un problème sérieux. Nous vous conseillons dans ce cas de prendre contact avec votre fournisseur pour réparation.

Inserts

Inserts are made from aluminium or aluminium-bronze and must be ordered separately from the calibrator. Each insert is stamped for identification.

A blank insert is available which may be drilled to suit your application.

Aluminium Inserts for the Omega CL-730A and the Omega CL-720A

Immersion depth 4.5"

NUMBER	*PROBE DIAMETER*
IMPERIAL	
CL701B	5 off 1/4"
CL702B	1 off each 3/8", 5/16", 1/4", 3/16", 1/8"
CL703B	2 off 1/4", 2 off 3/8"
CL704B	2 off 1/4", 2 off 1/2"
CL705B	1 off 1/4"
CL707B	1 off 1/4", 1 off 9/16"
CL708B	1 off 1/4", 1 off 5/8"
CL710B	1 off 1/4", 1 off 3/4"
CL709B	1 off 1/4", 1 off 11/16"
BLANK	
CL706B	BLANK

Replacement parts

Each unit is supplied with an extraction tool, a soft carrying case and a mains cable. The following parts may be purchased if replacements or alternatives are required.

6101058	Insert extractor
FCAB10UK	Mains cable, 230V UK units
FCABLEEU	Mains cable, 230V units
FCABLEUS	Mains cable, 120/100V units
6103711	Soft carrying case

Accessories

Part N°	*Description*
CL7A-PROBE	Cooling Probe
CL7A-SOFT	CALSOFT PC software kit

Einleitung

Bitte lesen Sie diese Bedienungsanleitung komplett bevor Sie dieses Gerät benutzen.

Warnung

HOHE TEMPERATUREN SIND GEFÄHRLICH: sie können dem Bediener ernsthafte Verletzungen zufügen und brennbare Materialien können sich leicht entzünden.

Omega hat bei der Konstruktion dieses Gerätes sehr darauf geachtet, daß der Bediener vor Gefahren geschützt ist. Dennoch sollten Sie auf die folgenden Punkte achten:

- SEIEN SIE VORSICHTIG UND TRAGEN SIE SCHUTZHANDSCHUHE
- Legen Sie heiße Gegenstände NICHT auf oder in die Nähe von leicht brennbaren Materialien; vermeiden Sie Arbeiten in der Nähe von leicht entzündbaren Flüssigkeiten oder Gasen.
- Bringen sie KEINE Flüssigkeiten direkt in Ihr Gerät.
- Benutzen Sie immer den normalen Menschenverstand

Sicherheit des Anwenders

Alle Benutzer von Omega Geräten müssen Zugang zu der entsprechenden Literatur haben, um ihre Sicherheit zu gewähren.

Es ist wichtig, daß diese Geräte nur von entsprechend geschultem Personal betrieben werden, das die in dieser Gebrauchsanweisung enthaltenen Maßnahmen und allgemeine Sicherheitsbestimmungen und -vorkehrungen beachtet. Wenn das Gerät anders eingesetzt wird als vom Hersteller empfohlen, kann dies die persönliche Sicherheit des Anwenders beeinträchtigen. Die Geräte von Omega entsprechen den internationalen Sicherheitsbestimmungen und sind mit einem automatischen Übertemperaturabschalter ausgestattet. Bei einigen Modellen ist der Übertemperaturabschalter verstellbar und sollte je nach Anwendung entsprechend eingestellt werden. Bei allen anderen Modellen ist der Temperaturschutz voreingestellt um Schäden am Gerät zu vermeiden. Wenn ein Sicherheitsproblem auftreten sollte, muß das Gerät ausgeschaltet und vom Stromnetz getrennt werden.

Installation

1. Alle Omega Geräte werden mit einem Stromanschlußkabel geliefert. Dieses ist entweder fest mit dem Gerät verbunden oder zum Einstecken.
2. Vergleichen Sie, ob die Spannung Ihrer Stromversorgung mit den Angaben auf dem Typenschild des Geräte übereinstimmen. Verbinden Sie das Stromanschlußkabel mit einer geeigneten Stromversorgung gemäß der nächstehenden Tabelle. Achtung: Das Gerät muß geerdet sein, um die elektrische Sicherheit zu gewährleisten!

Verbindungen	*220/240V*	*110/120V*
Stromführend	Braun	Schwarz
Neutral	Blau	Weiß
Erde	Grün/Gelb	Grün

   Geräte, die für 230 Volt ausgelegt sind, können auch bei 220 Volt arbeiten, Geräte für 120 Volt auch bei 110 Volt. In beiden Fällen verringert sich die Aufheizrate um ca. 8%. Das Typenschild befindet sich hinten am Gerät.
3. Stecken Sie das Stromkabel in die vorgesehene Buchse hinten am Gerät.
4. Stellen Sie das Gerät auf eine ebene Arbeitsfläche bzw. (falls erforderlich) unter einen Laborabzug. Beachten Sie, daß die Entlüftungsrippen an der Geräteunterseite immer frei zugänglich sind.
5. Wenn die Anzeigenlämpchen an der Vorderseite leuchten, hat dies folgende Bedeutung:

   ~ : Gerät ist eingeschaltet

   : Gerät heizt

   : Übertemperaturschutz ist ausgelöst

6. Die Symbole auf oder neben dem EIN/AUS-Schalter an der Geräterückseite bedeuten:

   I : An

   O : Aus

Nach dem Gebrauch

Vergessen Sie nicht, daß Teile des Gerätes (die Gefäße, die Blöcke und andere Zubehörteile) nach dem Erhitzen von Proben noch sehr heiß sein können. Bitte beachten Sie die oben genannten Vorsichtsmaßnahmen.

Garantie

Die Garantiedauer des Gerätes ist auf der beiliegenden Garantiekarte angegeben und schließt Fehler im Material oder der Verarbeitung ein. Die Garantiedauer beginnt am Tag des Einkaufs. Sämtliche defekte Teile werden innerhalb dieses Zeitraumes kostenlos ersetzt unter der Voraussetzung, daß dem Defekt keine unsachgemäße Handhabung, Fahrlässigkeit oder ein Unfall zugrundeliegt. Der unter diese Garantie fallende Service wird vom Lieferanten geleistet.

Ungeachtet der in dieser Gebrauchsanweisung enthaltenen Beschreibungen und Spezifikationen, behält sich Omega hiermit das Recht vor, Änderungen an den Geräten bzw. an einzelnen Geräteteilen durchzuführen.

Diese Gebrauchsanleitung wurde ausschließlich dazu erstellt, um Kunden die Handhabung der Omega-Geräte zu erleichtern. Nichts in dieser Gebrauchsanleitung darf als Garantie, Bedingung oder Voraussetzung verstanden werden, sei es die Beschreibung, Marktgängigkeit, Zweckdienlichkeit oder sonstiges bezüglich der Geräte oder deren Bestandteile.

Wartung durch den Bediener

BEACHTEN SIE, DASS DIESES GERÄT NUR VON TECHNISCHEN FACHKRÄFTEN GEÖFFNET UND DEMONTIERT WERDEN DARF.

DURCH ENTFERNEN DES GEHÄUSES ODER GEHÄUSETEILEN SIND BAUTEILE MIT LEBENGEFÄHRLICHEN SPANNUNGEN FREI ZUGÄNGLICH.

IM INNERN DES GERÄTES BEFINDEN SICH KEINE TEILE, DIE VOM ANWENDER GEWARTET WERDEN MÜSSEN.

Falls Ihr Gerät nicht ordnungsgemäß arbeitet, wenden Sie sich an Ihren Lieferanten oder senden Sie das Gerät wenn nötig zurück. Fügen Sie eine genaue Beschreibung des Defektes bei. Verpacken Sie das Gerät möglichst im Originalkarton. Bitte beachten Sie, daß Omega und thermo-DUX keine Haftung bei Transportschäden aufgrund unzureichender Verpackung übernehmen. Setzen Sie sich im Zweifelsfall mit Ihrem Lieferanten in Verbindung. Bitte beachten Sie die Entgiftungsbescheinigung, die Sie mit dem Gerät erhalten haben.

1. Reinigen

Bevor Sie Ihr Gerät reinigen, sollten Sie

•zuerst den Netzstecker ziehen

•das Gerät unter 50°C abkühlen lassen.

Ein feuchtes Tuch mit Seifenlösung reinigt Ihr Gerät am besten. Achten Sie darauf, daß kein Wasser in das Gerät gelangt. Verwenden Sie keine Scheuermittel.

2. Sicherungen

Die Stromzuleitung ist durch ein oder zwei Sicherungen geschützt. Diese sollten nur durch qualifiziertes Fachpersonal ausgetauscht werden. Wenn die Sicherung wiederholt durchbrennt, liegt ein größerer Defekt vor. Das Gerät muß zur Reparatur an Ihren Lieferanten eingesandt werden.

Introducción

Le rogamos lea cuidadosamente la información contenida en este folleto antes de manipular el aparato.

Aviso

LAS TEMPERATURAS ELEVADAS SON PELIGROSAS: pueden causarle graves quemaduras y provocar fuego en materiales combustibles.

Omega ha puesto gran cuidado en el diseño de estos aparatos para proteger al usuario de cualquier peligro; aún así se deberá prestar atención a los siguientes puntos:

- EXTREME LAS PRECAUCIONES Y UTILICE GUANTES PARA PROTEGERSE LAS MANOS;
- NO coloque objetos calientes encima o cerca de objetos combustibles;
- NO maneje el aparato cerca de líquidos inflamables o gases;
- NO introduzca ningún líquido directamente en el aparato;
- UTILICE EL SENTIDO COMUN en todo momento.

Seguridad del usuario

Todos los usuarios de equipos Omega deben disponer de la información necesaria para asegurar su seguridad.

De acuerdo con las instrucciones contenidas en este manual y con las normas y procedimientos generales de seguridad, es muy importante que sólo personal debidamente capacitado opere estos aparatos. De no ser así, la protección que el equipo le proporciona al usuario puede verse reducida.

Todos los equipos Omega han sido diseñados para cumplir con los requisitos internacionales de seguridad y traen incorporados un sistema de desconexión en caso de sobretemperatura. En algunos modelos el sistema de desconexión es variable, lo que le permite elegir la temperatura según sus necesidades. En otros, el sistema de desconexión viene ya ajustado para evitar daños en el equipo.

En caso de que surgiera un problema de seguridad, desconecte el equipo de la red.

Instalación

1. Todos los aparatos Omega se suministran con un cable de alimentación. Puede ser fijo o independiente del aparato.
2. Antes de conectarlo, compruebe que el voltaje corresponde al de la placa indicadora. Conecte el cable de alimentación a un enchufe adecuado según la tabla expuesta a continuación. El equipo debe estar conectado a tierra para garantizar la seguridad eléctrica.

Conexiones	220/240V	110/120V
Linea	Marrón	Negro
Neutro	Azul	Blanco
Tierra	Verde/amarillo	Verde

   El fusible una vez instalado protege tanto al equipo como al usuario.

   Asegúrese de que los equipos marcados 230V en la placa indicadora funcionan a 220V y de que los equipos marcados 120V funcionan a 110V. No obstante, en ambos casos la velocidad de calentamiento se verá reducida en un 8% aproximadamente. La placa indicadora está situada en la parte posterior del equipo.
3. Conecte el cable a la toma de tensión en la parte posterior del equipo.
4. Sitúe el aparato en un lugar apropiado tal como una superficie de trabajo plana, o si fuera necesario incluso en una campana con extractor de humos, asegurándose de que las entradas de aire en la parte inferior no queden obstruidas.
5. Los símbolos, que pueden aparecer junto a las luces indicadoras en el panel frontal del equipo, tienen los siguientes significados:

   ~ : Indicador de potencia

   : Indicador del calor

   : Indicador de sobretemperatura

6. Los símbolos que se encuentran en o cerca del interruptor de alimentación tienen los siguientes significados:

   I : Interruptor principal encendido

   O : Interruptor principal apagado

Después de su uso

Cuando haya finalizado el calentamiento de muestras, recuerde que las piezas del equipo, tales como tubos, bloques y demás accesorios, pueden estar muy calientes. Tome las precauciones mencionadas anteriormente.

Garantía

Este aparato está garantizado contra cualquier defecto material o de fabricación durante el periodo especificado en la tarjeta de garantía adjunta. Este plazo inicia a partir de la fecha de compra, y dentro de este periodo todas las piezas defectuosas serán reemplazadas gratuitamente siempre que el defecto no sea resultado de un uso incorrecto, accidente o negligencia. Mientras se encuentre bajo garantía las revisiones las debe llevar a cabo el proveedor.

A pesar de la descripción y las especificaciones de los aparatos contenidas en el Manual del Usuario, Omega se reserva por medio de este documento el derecho a efectuar los cambios que estime oportunos tanto en los aparatos como en cualquier componente de los mismos.

Este manual ha sido preparado exclusivamente para los clientes de Omega y nada de lo especificado en este folleto de instrucciones se tomará como una garantía, condición o aseveración de la descripción, comerciabilidad o adecuación para cualquier fin específico de los aparatos o sus componentes.

Mantenimiento

ESTE APARATO DEBE SER DESMONTADO SOLO Y EXCLUSIVAMENTE POR PERSONAL DEBIDAMENTE CAPACITADO.

EL RETIRAR LOS PANELES LATERALES, FRONTALES O TRASEROS SUPONE DEJAR AL DESCUBIERTO TENSION DE LA RED PELIGROSA.

EL EQUIPO NO CONSTA DE NINGUNA PIEZA DE CUYO MANTENIMIENTO SE PUEDA ENCARGAR EL USUARIO.

En el caso improbable de que experimentara algún problema con su aparato que no pudiera resolver con facilidad, debería ponerse en contacto con su proveedor y devolverlo si fuera necesario. Indique de forma detallada todos los defectos que haya notado y devuelva el equipo en su embalaje original. Omega no aceptará responsabilidad alguna por daños causados en equipos que no estuvieran debidamente embalados para su envío; si tuviera alguna duda, póngase en contacto con su proveedor. Sírvase consultar el Certificado de Descontaminación suministrado con su aparato.

1. **Limpieza**

   Antes de limpiar su aparato, desconéctelo SIEMPRE de la fuente de alimentación y permita que se enfríe por debajo de los 50°C.

   Este aparato se puede limpiar pasándole un paño húmedo enjabonado. Hágalo con cuidado parae evitar que caiga agua dentro del mismo. No utilice limpiadores abrasivos.

2. **Fusibles**

   Su aparato está protegido por uno o dos fusibles. Sólo deben cambiarlos personal debidamente capacitado.

   Si los fusibles se fundieran repetidamente, esto indicaría una avería grave y puede que tuviera que devolverle el aparato a su proveedor para su reparación.

TECHNICAL INFORMATION

Brief fault finding notes and lists of replacement parts, accessories and inserts for the Omega are given in this section.

NOTE THAT THIS EQUIPMENT SHOULD ONLY BE DISMANTLED BY PROPERLY TRAINED PERSONNEL. **REMOVING THE OUTER COVERS OR BASE EXPOSES POTENTIALLY LETHAL MAINS VOLTAGES.**

THERE ARE NO OPERATOR SERVICEABLE PARTS WITHIN THE EQUIPMENT.

General advice

In the unlikely event that you experience any problems with your Omega which cannot be easily 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. The insert must be removed from the unit and packed separately within the case. Omega accept no responsibility for damage to units which are not properly packed for shipping: if in doubt, contact your supplier.

General fault finding

Over temperature cutout (Omega CL-720A and Omega CL-710A units only)

Your Omega unit is fitted with two independent circuits to protect it from overheating. The unit constantly checks that the block temperature does not exceed its maximum. If for some reason this temperature is exceeded, all power to the block is cut.

Allow the unit to cool to a safe temperature (less than 100°C) before switching off and check for any obvious causes of overheating before switching it back on. Switching off the mains power resets the over-temperature cutout.

Repeated cutouts indicate a serious fault and you should return the unit to your supplier for repair.

HELP display

If HELP is displayed there is a problem with the internal sensing device. The calibrator should be returned to your supplier for repair.

Fuses

If neither the power light nor display (on the front panel) is lit, one of the two fuses may have blown. Make sure there is no external cause (such as a faulty plug or lead).

Fuses should only be changed by suitably qualified personnel. If the fuses blow persistently, a serious fault is indicated and you should return the calibrator to your supplier for repair.

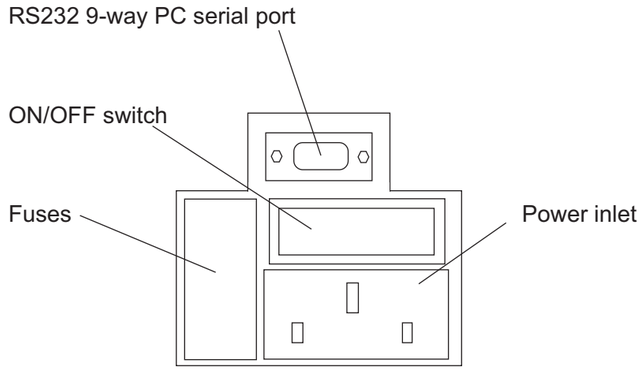
Never fit a fuse rated higher than the value indicated on the unit, serious damage or personal injury may result.

RS232 SERIAL INTERFACE

The calibrator may send data logging information to an IBM PC or compatible computer by connecting the unit and the PC via an RS232 cable, and installing the software. Contact your supplier for details.

Ensure that there is a connection made before the calibrator is switched on.

The RS232 cable must be fitted to both the unit and the PC before either unit is powered up, otherwise, data integrity cannot be guaranteed. Once the cable is fitted, it does not matter which unit is powered up first.



The following tables indicate the cable specifications for a 9-way PC serial port:

Calibrator		**PC**
9-way female D type		*9-way female D type*
pin	signal	pin
Case	F.GND	Case
3	TxD	3
2	RxD	2
7	RTS	7
8	CTS	8
6	DSR	6
1	CD	1
4	DTR	4
5	S.GND	5

Sending data to the PC

The procedure for sending data to the PC is described in the instructions supplied with the software. The PC must be properly connected by the RS232 cable and running the software to accept or display data.

THE CALIBRATOR

The Omega Calibrator is designed to provide safe and convenient calibration of a wide range of thermal sensors. It features fast heat up times, with accuracy and repeatability.

Applications

Before using the Omega, make sure you have read this manual carefully. If you have any queries, contact your supplier.

The Omega unit can calibrate temperature probes without the need to return them to a specialist laboratory. To ensure accuracy the unit must be operated in an environment with a stable ambient temperature.

The thermal sensors are placed in a well in the temperature controlled block. A number of inserts with different dimension wells are available to match standard probe sizes: these are detailed towards the back of this manual.

Maintaining a set temperature

The required temperature is set on the calibrator and the operation of the probe is checked.

A NAMAS certificate can be provided, contact your dealer for details.

Warning

HIGH TEMPERATURES ARE DANGEROUS: they can cause serious burns to operators and ignite combustible material.

Omega have 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 Omega unit;
- DO NOT place the unit into its carrying case if the block temperature exceeds 50°C;
- If you are using a cooling probe, make sure that water is flowing through the cooling probe BEFORE inserting the probe into the block;
- At all times USE COMMON SENSE.

Specification

The figures stated in the specification are as measured 0-50 mm from the base of the well of the insert, using an SPRT, at the time of calibration.

Omega CL-710A

Measuring zone		0 to 50 mm from base of well	0" to 2" from base of well
Depth of well in insert		152.4 mm	6"
Temperature range		20°C above ambient to 650°C	36°F above ambient to 1202°F
Temperature accuracy in measuring zone		±0.2°C	±0.36°F
Temperature uniformity in measuring zone		±1.0°C at 400°C	1.8°F at 752°F
Temperature uniformity in measuring zone		±1.3°C at 650°C	2.3°F at 1202°F
Temperature stability after 1 hr		±0.09°C	±0.16°F
Display resolution		0.1°C	0.1°F
Heat up rate	35 minutes	20°C to 600°C	68°F to 1112°F
Cool down rate	30 minutes	600°C to 200°C	1112°F to 392°F
Fan cooling		Automatic	
Comms Port 9way D type		Full bi-directional RS232	

Omega CL-720A

Measuring zone		0 to 50 mm from base of well	0" to 2" from base of well
Depth of well in insert		114.3 mm	4.5"
Temperature range		20°C above ambient to 425°C	36°F above ambient to 797°F
Temperature accuracy in measuring zone		±0.3°C	±0.54°F
Temperature uniformity in measuring zone		±0.2°C at 300°C	0.36°F at 542°F
Temperature uniformity in measuring zone		±0.6°C at 425°C	1.08°F at 797°F
Temperature stability after 1 hr		±0.06°C	±0.108°F
Display resolution		0.1°C	0.1°F
Heat up rate	15 minutes	20°C to 400°C	68°F to 752°F
Cool down rate	25 minutes	400°C to 100°C	752°F to 182°F
Fan cooling		Automatic	
Comms Port 9way D type		Full bi-directional RS232	

Omega CL-730A

Measuring zone		0 to 50 mm from base of well	0" to 2" from base of well
Depth of well in insert		114.3 mm	4.5"
Temperature range		-40°C to 140°C **	-40°F to 284°F **
Temperature accuracy in measuring zone		±0.3°C	±0.54°F
Temperature uniformity in measuring zone		±0.2°C at 100°C	0.36°F at 182°F
Temperature stability after 10 minutes		±0.05°C	±0.09°F
Display resolution		0.1°C	0.1°F
Heat up rate	5 minutes	20°C to 100°C	68°F to 182°F
Cool down rate	9 minutes	100°C to 0°C	182°F to 32°F
Comms Port 9way D type		Full bi-directional RS232	

** The lowest temperatures can only be achieved when the Omega 730 is used with a chilled water supply

3. For the Omega CL-730A
   Power is switched on to the block (and the indicator comes on) if the set temperature is higher or lower than the block temperature.
4. All units
   When the measured temperature approaches the set temperature, the heater indicator will begin to flash. As the measured temperature stabilises the indicator will stay on for shorter periods.
5. There will be a time-lag between the heater block and the insert achieving the set temperature due to thermal contact between them. The display may reach temperature in 2 or 3 minutes while the insert may take 5 minutes or more to reach temperature.

Cooling Probe

Omega CL-720A and Omega CL-710A only

Operating temperatures below ambient can be achieved by using the cooling probe with a chilled water circulator. The cooling probe is supplied as an accessory and can be used in an insert with a 3/8" or 10mm hole (see Accessories). Instructions for its use are included with the probe.

The block should not be operated at temperatures below dewpoint as excessive build up of moisture will occur which may cause damage to the interior of the unit.

Water Cooling

Omega CL-730A only

The Omega 730 unit can be used with a chilled water supply at 4°C, enabling an extended temperature range to -40°C.

Connect a chiller to the calibrator using suitable pipes and clips. Switch on the chiller unit before the calibrator and allow the chiller to stabilise for 15 minutes before performing a calibration. After stabilisation temperatures between -40 and ambient can be used. The cooling fan in the calibrator will automatically switch off if there is a chilled water supply.

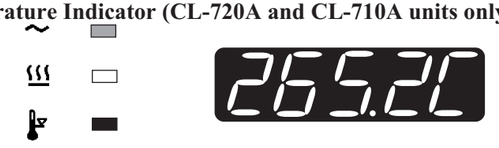
After Use

1. When you have finished heating samples, remember that parts of the unit – inserts and associated accessories – may be very hot. Take the precautions listed earlier. We recommend that the inserts should be allowed to cool to 70°C before being removed from the Omega unit. They will still have to be handled with care
2. If you need to remove an insert while it is hot, fit the extractor tool into the locating holes and lift the insert out carefully. Never leave the extractor tool in the insert while it is being used in the Omega unit.

For the Omega CL-730A

When the set temperature is different to the block temperature this indicator will light. If the light is on continuously the block is getting constant power. The only exception is described under Over-Temperature Indicator. As the temperature approaches the set temperature the indicator will flash. When set temperature is reached the indicator will stay on for shorter periods.

Over-Temperature Indicator (CL-720A and CL-710A units only)



If the unit should, for any reason, exceed the temperature set for the over-temperature cutout (see page 15), the over-temperature indicator will light. The heater will have been switched off and the unit will begin to cool even if the heater light is on (the light staying on or not depends on which circuit has sensed an over-temperature).

Sensor fault Indicator

If, for any reason, there should be a sensor fault, the bottom indicator will light. The power to the block will have been switched off and the unit will begin to return to ambient even if the power light is on (the light staying on or not depends on which circuit has sensed a fault).

Setting the units for temperature

The unit will normally be set to display in °C, if you require it to work and display in °F press both the **UP ARROW** and **DOWN ARROW** buttons at the same time. To convert back, press both buttons again.

Setting the Operating Temperature

1. To display the set temperature on the digital display, press and hold the **SET** Temperature button.
   To adjust the set temperature, press the **SET** Temperature button and hold it while pressing the **UP** or **DOWN** buttons. When the **SET** Temperature button is released, the measured temperature is displayed (in degrees Celsius).
2. For the Omega CL-720A and CL-710A
   The heater (and heater indicator) comes on if the set temperature is higher than the current block temperature. The fan will automatically come on if the set temperature is more than 15°C below the actual temperature of the block.

Dimensions

Height	272mm	10.7"
Width	185mm	7.28"
Depth	439mm	17.28"

Wells in the block:

Central Well for inserts in CL-720A and CL-730A*

Depth	130mm	5.1"
Diameter	38.2mm	1.5"

Reference well in CL-720A only*

Depth	101.6mm	4"
Diameter	6.6mm	0.26"

Central Well for inserts in CL-710A*

Depth	159mm	6.25"
Diameter	38.2mm	1.5"

Reference well for CL-710A only*

Depth	146mm	5.7"
Diameter	6.6mm	0.26"

* See the list of inserts at the back of this book

Working conditions

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

Ambient temperature range	5°C to 40°C
Humidity	Up to 95% relative humidity, non-condensing

Note: The control specifications are quoted at an ambient temperature of 20°C. The specification may deteriorate outside an ambient temperature range of 10°C to 30°C.

Radio frequency interference tested and passed to EN50081-1.

Immunity Tested and passed to EN50082-1

Cleaning your Omega unit

Before cleaning your unit, disconnect from the power supply and allow to cool to ambient temperature.

You can clean the case of the Omega with a cloth dipped in water or ethanol (methanol can also be used). No part of the case or cover should be immersed in the solvents.

Do not use acetone or abrasive cleaners.

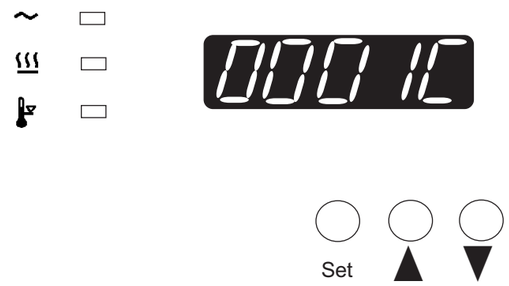
Packing

When you receive your unit, make sure you keep the original packing in case you ever need to return it for service or repair. When returning a unit, remember to remove the insert from the temperature controlled block.

The unit must be transported in the original packing to avoid damage. The packing comprises; the unit in the soft carrying case packed with foam into an outer cardboard box. Omega accepts no responsibility for damage incurred unless the unit is correctly packed and transported in this way.

WHEN YOU SWITCH ON

When you first switch on, the display will show the edition of the software which your unit uses. For example software issue "1" would be shown as follows:

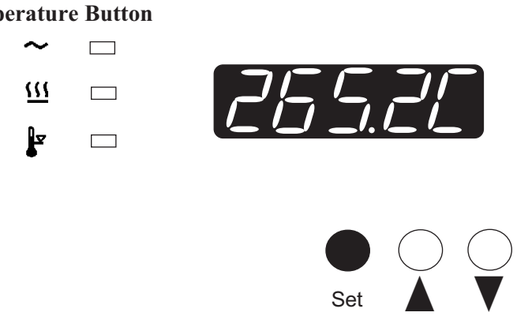


It will display this for 1 second, then the actual temperature of the block will be indicated.

The Front Panel Controls

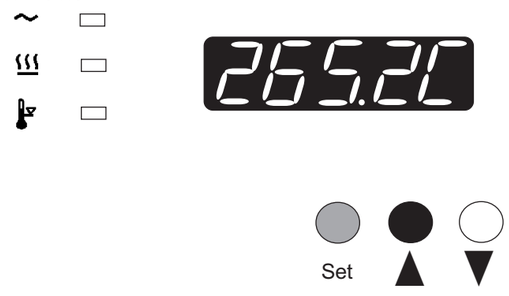
The front panel controls consist of three buttons for controlling the display, a five digit LED display and three indicators.

The SET temperature Button



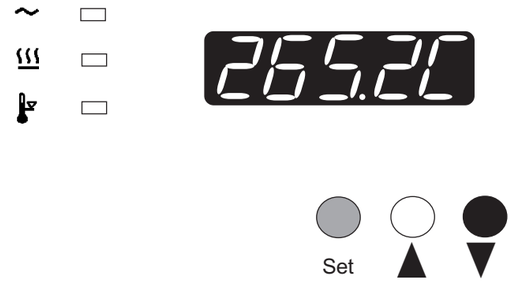
The **SET** temperature button displays the set temperature when pressed.

The UP ARROW Button



When the **SET** temperature button is held down and the **UP ARROW** button is pressed, the set temperature is increased.

The DOWN ARROW Button

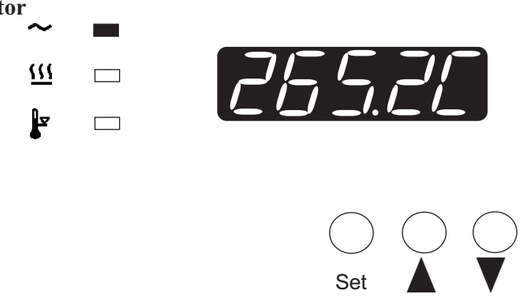


When the **SET** temperature button is held down and the **DOWN ARROW** button is pressed, the set temperature is decreased.

Speed of Change of Set Temperature

Each press of the **UP ARROW** or **DOWN ARROW** buttons will increase or decrease the set temperature by 0.1°C. If the buttons are held down the temperature change will accelerate to 5° per second

Power Indicator



The top indicator shows that there is power to the unit

Power to the Block Indicator

The next indicator shows when there is power to the block.

For the Omega CL-720A and Omega CL-710A

When the set temperature is higher than the block temperature this indicator will light. If the light is on continuously the heater is getting constant power. The only exception is described under Over-Temperature Indicator. As the temperature approaches the set temperature the indicator will flash. When set temperature is reached the indicator will stay on for shorter periods. If the block temperature is above the set temperature then the indicator will be off, as the heater is not getting any power.