



*(2 bank unit).*

## **MACRO-KJELDAHL EQUIPMENT (MQ SERIES). MK II**

### **INSTRUCTION BOOK.**

**Please take your time to read this Instructions book in order to understand the safe and correct use of your new Bibby Scientific product.**

**It is recommended the responsible Body for the use of this equipment reads this instruction book and ensures the user(s) are suitably trained in its operation.**

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*In the interest of continued development Bibby Scientific Limited reserve the right to alter or modify the design and /or assembly process of their products without prior notification.*

**This product is manufactured in Great Britain by Electrothermal, part of the Bibby Scientific Group of companies.**

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## 1. INTRODUCTION.

The Macro-Kjeldahl Equipment.

The Bibby Scientific MQ Series of products has been designed for Kjeldahl extraction on a macro scale.

These multibank units are available with either 2 or 6 recesses. The units have a stainless steel housing. There are two capacity sizes available, one for 100-300ml vessels and the second for 500-800ml vessels.

The lower part of the unit houses the control equipment. This is separated from the heating element by a stainless steel tray and a well ventilated air space.

Each heating mantle has its own energy regulator incorporating an ON/OFF switch and an amber, mains to heater neon indicator. There is also a mains On indicator (clear) on the front panel. The units are also fused on the supply line and neutral except MQ3868B/Ex1 which has no fuse ( see Section 5).

Note: MQ products incorporate earth screen and are CE marked.

The six recessed versions when specified for use with 500-800ml vessels is only available in a 230 V~AC rating. All other MQ's are available in 115V~AC or 230V~AC. **Note** the MQ3868B/Ex1 is only for sale outside of Europe and is not CE approved.

## 2. SYMBOLS AND USING THIS INSTRUCTION BOOK.

2.1. Throughout this Instruction book the following symbols are shown to identify conditions which pose a hazard to the user, or to identify actions that should be observed. These symbols are also shown on the product, or its packaging. When a symbol is shown next to a paragraph or statement it is recommended the user takes particular note of that instruction in order to prevent damage to the equipment or to prevent injury to one's self or other people.

**The Responsible Body and the Operator should read and be familiar with this Instruction book in order preserve the protection afforded by the equipment.**

**To prevent injury or equipment damage it is the manufacturers recommendation that all persons using this equipment are suitably trained before use.**

### 2.2. Symbols defined.



Caution, risk of danger. See note or adjacent symbol.



Protective conductor terminal to be earthed.  
**(Do not loosen or disconnect).**



Caution / risk of electric shock



Recyclable Packing Material.



Do not dispose of product in normal domestic waste.



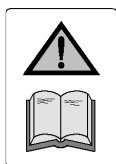
Caution. Hot surface.



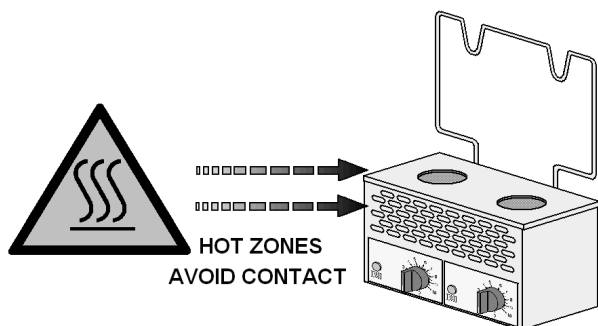
Material irritant to skin. When handling wear face mask to BS/EN 149 and protective gloves



Bio Chemical Hazard. Caution required. Will require decontamination.



Refer to Instruction book



Hot Zone on  
MQ product.

### 3. SAFETY INFORMATION.

This product has been designed for safe operation when used as detailed in accordance with the Manufacturers instructions.

**NOTE:** Failure to use this equipment in accordance with the manufactures instruction book may compromise your basic safety protection afforded by the equipment and may invalidate the warranty / guarantee. The warranty / guarantee does not cover damaged caused by faulty installation or misuse of the equipment

#### 3.1. Prevention of Fire and Electric Shock.



To prevent a risk of fire or electric shock, **DO NOT** open your *product* case without authorisation. Only qualified Service personnel should attempt to repair this product.



Replace fuses only with the type as listed in section, 'Technical Specifications and Parts and Accessories' (See fuse type and rating).



Ensure the Mains Power Supply conforms to rating found on the data plate located on the back of this product.



**Never** Operate this equipment without connection to earth / ground. Ensure the mains supply voltage is correctly earthed / grounded in accordance with current area legislation.

#### 3.2. General Safe Operating Practice.



Always follow good laboratory practice when using this equipment. Give due recognition to your company's safety and legislative health & safety procedures and all associated legislation applicable to your areas of operation. Check laboratory procedures for substances being heated and ensure all hazards (e.g. explosion, implosion or the release of toxic or flammable gases) that might arise have been suitably addressed before proceeding. When heating certain substances the liberation of hazardous gases may require the use of a fume cupboard or other means of extraction.



Ensure equipment is used on a clean, dry, non-combustible, solid work surface with at least 300mm suitable clearance all around from other equipment.



**Do not** position the product so that it is difficult to disconnect from the mains supply.



**Do not** touch the heating element or any glass vessel whilst in use.



**Do not** lean or stretch over equipment, glassware and fixings when in use.



**Do not** immerse unit in water or fluids.



**Do not** spill substances onto the MQ. If spillage does occur, disconnect unit from mains supply and follow instructions as detailed in Maintenance. (Section 9).



**Do not** cover the MQ whilst in use. **Do not** block or obstruct ventilation slots / airways.



Only use an Earth screened mantle with electrically conductive vessels.



**Do not** leave equipment switched on without a charged flask(s).



**Do not** thermally insulate the exposed upper section of the vessel(s), as the insulation used may obstruct the convection cooling airways around the rim of the cartridge enclosure and cause the mantle to overheat.



It is not recommended to leave any heating apparatus unattended during operation.



Only use Original Equipment manufactures spares and accessories. Ref Section 10.



The equipment is not spark, flame or explosion proof and has not been designed for use in hazardous areas in terms of BSEN 60079-14:1997. Keep flammable, low flash point substances away from the apparatus.



**Do not** operate or handle any part of the product with wet hands.



Keep the mains cord away from the heating surface.



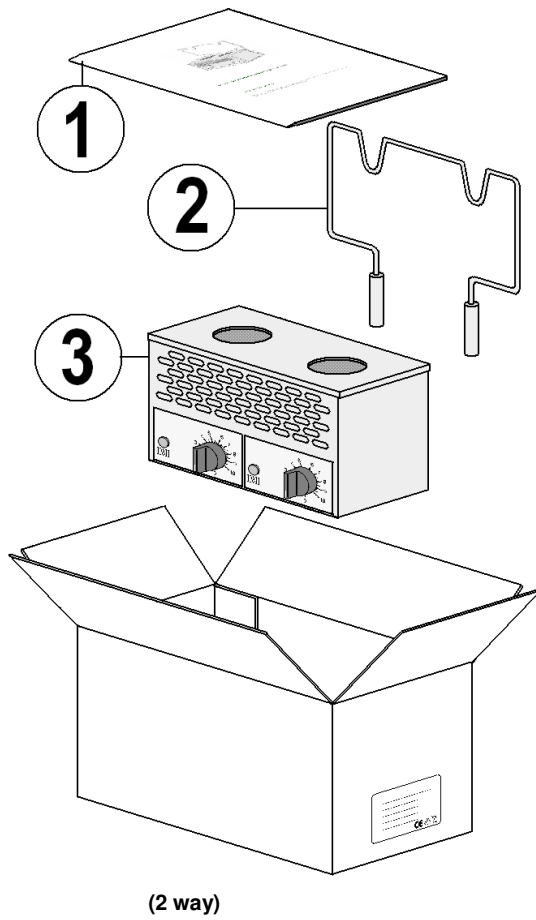
**ATTENTION:-**

With high energy input and certain configurations of glassware in MQ products, where the heating contact to glassware is relatively small, localised heating and subsequent 'bumping' of the fluid being heated may occur. Application advice should be sought from the manufacturer.

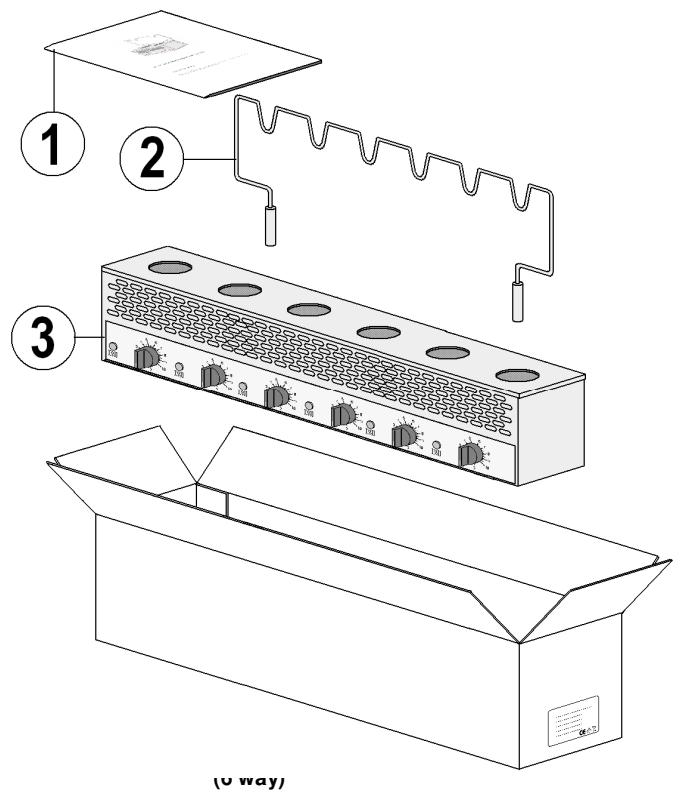
#### 4. UNPACKING AND CONTENTS.

Please check the contents of your carton against the relevant product diagram.

Applicable to all MQ product.



Item No	Description	Qty
1	Instruction book	1
2	Rack	1
3	MQ product	1



<p>For future reference please record your products Serial and Model Numbers.</p>	<i>Serial Number</i>	<i>Unit Model/Cat Number</i>

## 5. INSTALLATION.

### 5.1. Electrical safety and installation.

5.1.1. This equipment is designed to be used safely under the following conditions:-

- Indoor use.
- Altitude up to 2000 meters.
- Temperatures between 5°C and 40°C.
- Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.
- Mains supply voltage fluctuations up to  $\pm 10\%$  of the nominal voltage.
- Transient overvoltages typically present on the mains supply. (Overvoltage category II)
- Applicable rated pollution degree 2.



5.1.2. This equipment must be earthed / grounded to a fixed earth / grounded mains socket outlet. The mains supply is to earthed / grounded in accordance with current legislation. See Technical Specification for recommended fuse ratings.

5.1.3. Ensure only the correct rated mains input fuses are fitted. (Where applicable ensure the correct Mains cord and moulded IEC plug and lead set fuse if fitted). See Technical Information Section 8 of this Instructions book.

5.1.4. Check the voltage on the product data label on this product unit and those of any accompanying electrical accessory. Ensure the rating conforms to your local supply.

5.1.5. This product should be connected to a mains supply source which incorporates a RCD or GFCI device that has a tripping current of 30mA or less. The RCD or GFCI residual Current Device cuts off power to the equipment immediately it detects a current leakage fault. For example, cutting off the power when there is an accidental liquid spillage in a mantle protected with an earth (ground) screen.

5.1.6.   Do not install this product or accessories on a surface which may become flooded.

5.1.7. The units up to and including 1800 watts are fitted with mains cord and plug for supply connection. Wiring colour code as follows:



<b>Green / Yellow</b>	<b>or</b>	<b>Green</b>	<b>=</b>	<b>Earth / Ground</b>
<b>Blue</b>	<b>or</b>	<b>White</b>	<b>=</b>	<b>Neutral</b>
<b>Brown</b>	<b>or</b>	<b>Black</b>	<b>=</b>	<b>Live / line hot.</b>



**Note: MQ Units above 1800 watts (i.e. MQ3868B/E and MQ3868B/EX1) are classified as permanently connected equipment and will need to be hard wired by a competent electrician. Guidance notes as follows**

**MQ3868B/E (230V):** Mains cable is supplied with this model. Free end to be hard wired into a suitable 16Amp rated socket, or isolator unit. (continued)

**MQ3868B/EX1 (115V):** There are no internal fuses on this model. Suitable fuses must be fitted in the building supply / distribution point as part of the installation. Remove the 4 screws holding the terminal mounting plate on the rear of the unit. Feed mains cable (not supplied) through cable gland and connect to Ground, Neutral and Live connection points on the 3 way mains terminal block. Tighten the cable gland in the required position and replace and secure the terminal mounting plate. Hard wire the free end into a fused isolation unit and fit 35Amp fuses.

- 5.2. **Observation:** the surface of the heating element of a mantle cartridge will upon receipt look slightly discoloured. This discolouration is normal and occurs at the factory during test when the mantle is first heated up.

## 6. ENVIRONMENTAL PROTECTION.

- 6.1. Electrothermal has given due consideration to environmental issues within the design and manufacturing process without compromising end product performance and value.



- 6.2. Packaging materials have been selected such that they may be sorted for recycling.



- 6.3. At the end of your product and accessories life, it must not be discarded as domestic waste. Ref: EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment Directive (WEEE). Please contact your distributor / supplier for further information. For end users outside of the EU consult applicable regulations.

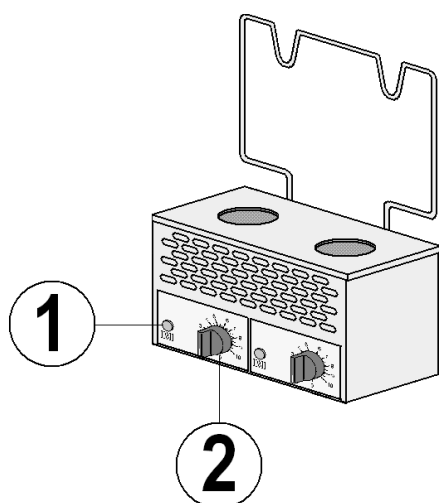
- 6.4. This product should only be dismantled for recycling by an authorised recycling company.




***This product and accessories must be accompanied by a completed Decontamination Certificate prior to any disposal. Copies of the Certificate are available from your distributor of Bibby Scientific products, or you may copy and enlarge from 'Appendix A' of this instruction book.***

*Bibby Scientific's Electrothermal branded product range is registered with the Environment Agency under the name of as Electrothermal Engineering Limited as being a producer of WEEE (Waste Electronic and Electrical Equipment) through b2b Compliance, an authorised waste collection compliance scheme.*

## 7. PRODUCT OPERATION.

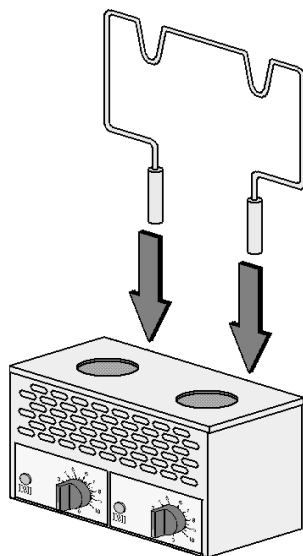


### Item Description.

- |   |   |
|---|---|
| 1 | Mains power on indicator  |
| 2 |  Heating Element temperature control. |

7.1. Place charged, clean dry glass vessels of the size indicated on the label, in the mantle. Where ever possible the vessels should be supported within the mantle by means of a support rod and clamp.

7.2. If a support rod is used, insert it through the clamp onto the bench top.





7.3. Care should be taken to ensure a good contact between the surface of the vessel and the heating element before switching on the power supply. When first used the surface of the heating element will become slightly discoloured. This is due to the dressing in the fabric and will gradually disappear with use.

7.4. Connect to the mains electricity supply ensuring the correct voltage has been applied. See data plate for correct electrical supply voltage.

**NOTE: The mains power on indication neon's on will illuminate for each position when the heaters are operational.**

7.5. Regulate the temperature by turning the control knob up or down.

7.6.   When finished with the MQ turn off from the mains electrical supply. Allow the glassware and unit to cool down. Remove glassware.

## 8. TECHNICAL SPECIFICATION.

### 8.1. Specifications MQ range (General).

Mains input supply voltage (115V~ AC).	'115V – AC ± 10% at 50/60Hz'.
Mains input supply voltage (230V~AC).	230V – AC ± 10% at 50/60Hz.
Plug and Lead set.	3 core 2 meters long. ( <b>'No cable supplied on MQ3868B/Ex1'</b> ).
Fuse type	20mm x 5mm Glass 'Quickblow'. See below for rating.
Operating Ambient Temperature	Up to 40 °C.
Heating Element Construction.	Thermal insulated element wire stitched into a cartridge construction.
Heating Element Temperature.	800°C Max.
MQ case construction.	Stainless Steel.
Thermal Insulation	Ceramic Fibre / Mineral wool.
Clamps for Support rods	12.7mm dia max.

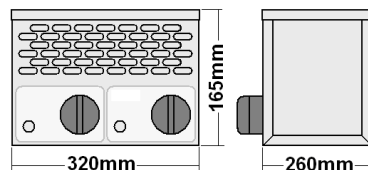
### 8.2. Power Dissipation and Fuse rating.

Capacity		Total Power	Fuse rating (A)	
			230V	115V
MQ3822B/E	100 – 300	600	F5.0 x 2	F7.0 x 2
MQ3824B/E	500 – 800	1100	F7.0 x 2	F15.0 x 2
MQ3866B/E	100 – 300	1800	F5.0 x 4	F10.0 x 4
'MQ3868B/E'	500 – 800	3300	F10.0 x 4	See Note **

**\*\* Note: 35Amp fuses to be fitted at the supply / distribution point (see Section 5).**

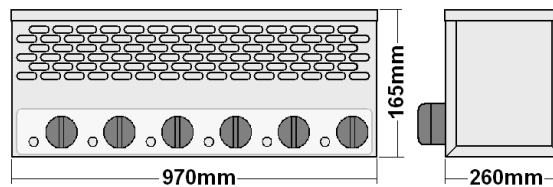
### 8.3. Weight and Dimensions.

#### MQ3822B/E, MQ3824B/E



**Weight 2.0 Kg.**

#### MQ3866B/E, 'MQ3868B/E'



**Weight 5.8Kg.**

**The Ingress protection rating for the MQ product range is IPX0.**

## 9. MAINTENANCE.

### 9.1. General Information.



Unplug the unit from the mains voltage supply and allow it to cool before undertaking any maintenance tasks.



Maintenance should only be carried out under the direction of the Responsible Body, by a competent electrician. Failure to do so may result in damage to the product and in extreme cases be a danger to the end user.

With proper care in operation this equipment has been designed to give many years of reliable service. Contamination or general misuse will reduce the effective life of this product and may cause a hazard.

Maintenance for the unit should include:

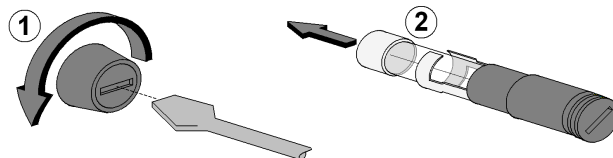
- Periodic electrical safety testing (an annual test is recommended as the minimum requirement).
- Regular inspection for damage with particular attention to the mains lead and plug set.
- Routine cleaning of the equipment should be undertaken using a clean cloth.

### **DO NOT USE SOLVENTS FOR CLEANING ANY PART OF THIS EQUIPMENT.**

### 9.2. Fuse Replacement.

The mains fuse holder is located at rear your product. Refer to Technical specification, 'Fuse Rating' for correct fuse type and rating. Turn your product off and disconnect it from the mains supply.

① Unscrew the fuse holder cap from the fuse housing and ② remove the fuse. Fit replacement fuse of the correct rate and value.



### 9.3. Heater Cartridge Replacement.



**Attention.** The heater contains insulation material made from Refractory Ceramic Fibres (RCF), classified as a category 2 carcinogenic under EU Directive 67/548/EC. Follow the guidelines for working with RCF as laid down under in the ECFIA Code of Practise. Wear suitable protective clothing and gloves.



**MQ mantles contain Rockwool mineral insulation. When handling a suitable face mask which bears the CE mark should be used. A face mask to BS/EN 149 is adequate. When handling, wear gloves. Should skin irritation be experienced it can be lessened by rinsing hands under cold running water before washing. For further information refer to guidance note EH46 published by HMSO and technical data sheets available from Rockwool Limited. Pencoed. Bridgend. CF35 6NY.**

In the event of a heater element becoming damaged or open circuit the follow procedure should be adopted for its replacement.

- 9.3.1. Unplug or disconnect the mantle from the mains electricity supply.
- 9.3.2. Remove the cross-head fixing screws from the lid and lift the lid off.
- 9.3.3. MQ, Disconnect the lid to base earth wire.
- 9.3.4. Remove the three M3 cartridge retention nuts and disconnect the cold leads from the temperature controller PCB.
- 9.3.5. Reverse this process to fit the new cartridge assembly.
- 9.3.6. Replace the earth lead and base and refasten using the previously removed cross-head fixing screws.
- 9.3.7. The responsible body shall check the electrical safety of the product before further use.

#### **9.4. Spillage and Decontamination.**

In the event of spillage switch off and unplug this product from the mains electrical supply. Wipe off all excess liquid from the reaction block and surrounding area using an absorbent soft cloth. Allow sufficient time for any ingressed liquid to evaporate before commencing with use.

If in doubt please consult Customer Support. Refer to section 11.



**If the equipment has been exposed to contamination, the Responsible Body is responsible for carrying out appropriate decontamination. If hazardous material has been spilt on or inside the equipment, decontamination should only be undertaken under the control of the Responsible Body with due recognition of possible hazards. Before using any cleaning or decontamination method, the Responsible Body should check with the manufacturer the proposed method will not damage the equipment.**

**Prior to further use, the Responsible Body shall check the electrical safety of the unit. Only if all safety requirements are met can the unit be used again. The above procedure is intended as a guide. Should spillage occur with a toxic or hazardous fluid then special precautions may be necessary.**

#### **Decontamination Certificate.**

**Note:** In the event of this equipment or any part of the unit becoming damaged, or requiring service, the item(s) should be returned to the manufacturer for repair accompanied by a decontamination certificate. **Copies of the Certificate are available from Distributor/Manufacturer. Appendix A of this instructions book may be copied and enlarged.**

**At the end of life, this product must be accompanied by a Decontamination Certificate. See section 6.3 and 6.4**

## 10. SPARES AND ACCESSORIES.

<b>MQ Model Type</b>		<b>Replacement Heater Cartridge.</b>
MQ3822B/E	Order	REMQ3822/66B/E
MQ3824B/E	Order	REMQ3824/68B/E
MQ3866B/E	Order	REMQ3822/66B/E
MQ3868B/E	Order	REMQ3824/68B/E
MQ3822B/EX1	Order	REMQ3822/66BEX1
MQ3824B/EX1	Order	REMQ3824/68BEX1
MQ3866B/EX1	Order	REMQ3822/66BEX1
MQ3868B/EX1	Order	REMQ3824/68BEX1

**Please specify voltage when ordering.**

### 10.1. Replaceable parts.

<b>Order Number</b>	<b>Description.</b>	<b>Quantity</b>
<b>AZ9033</b>	Fuse: F15A	<b>10</b>
<b>AZ9034</b>	Fuse: F10A	<b>10</b>
<b>AZ9125</b>	Fuse: F20A	<b>10</b>
<b>CRM5607</b>	Neon: Clear (230V)	<b>1</b>
<b>CRM5608</b>	Neon: Amber (230V)	<b>1</b>
<b>CRM5619</b>	Neon: Clear (115V)	<b>1</b>
<b>CRM5620</b>	Neon: Amber (115V)	<b>1</b>

## 11. CUSTOMER SUPPORT

For help and support in using this product, please contact Customer Services at the following address.

**Bibby Scientific Limited.**

Beacon Road,  
Stone,  
Staffordshire ST15 0SA,  
Great Britain.

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**For the America's and Canada, contact:**

**Techne Incorporated**, 3 Terri Lane,  
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Toll free:800-225-9243Tel: 609-589-2560  
Fax: 609-589-2571  
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Http [www.techneusa.com](http://www.techneusa.com)

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- Order enquiries :  
[sales@bibby-scientific.com](mailto:sales@bibby-scientific.com)
- Technical support :  
[electrothermalhelp@bibby-scientific.com](mailto:electrothermalhelp@bibby-scientific.com)
- [www.electrothermal.com](http://www.electrothermal.com)





## 12. NOTES.



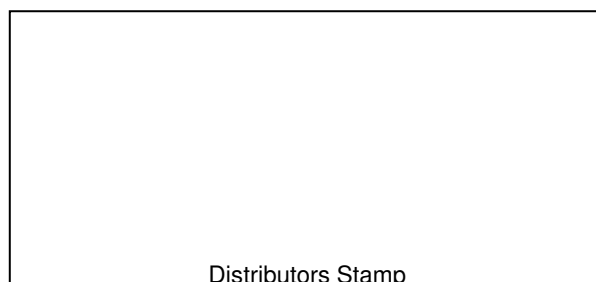


### 13. EC DECLARATION OF CONFORMITY.

CE marked products and associated accessories covered by this Instruction book conform to the essential requirements of the following directives:

EMC Directive.  
Low Voltage Directive.

A full copy of the EC Declaration / Conformity document can be obtained from the manufacture at the email address : [info@bibby-scientific.com](mailto:info@bibby-scientific.com)



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