The outer packaging is fitted with a TIP and TELL label. Check there is no dye in top of the label. If this is the case DO NOT switch the unit on but leave standing upright for 24 hours.

THE *Clifton* RANGE

Immersion Dip Cooler
DC Series

IMPORTANT:
1. Always keep the Immersion Dip Cooler upright at all times.

Contents

About this Manual

This user Manual contains instructions which must be followed in order that the product is operated correctly.

General Notes

Please observe the following safety precautions:

1. Connect only to a power supply with the corresponding voltage to that specified on the rating label positioned on the rear of the unit.
3. Ensure the power supply has a safety earth (ground) terminal.
4. Ensure the mains switch and power supply connector are accessible during use.
5. The mains supply cord fitted to this products is a heat resistant type and should be replaced by an equivalent type.
6. Do not block ventilation slots during use.
7. Always follow good laboratory practice by ensuring substances being heated present no risk of a hazard (explosion, implosion or release of toxic or flammable gases) or that these have been addressed. When heating substances where liberation of gases occurs suitable extraction should be used.
8. Use only liquids specified in this Instruction Manual within their specified temperature range.
9. Always ensure the liquid being cooled is covered to achieve optimum performance.
10. Use a thermometer to check the temperature - do not touch liquid.
11. If this product is not used in accordance with these instructions, then basic safety protection may be affected.
12. Before using any cleaning or decontamination method except those recommended, check with your distributor that the proposed method will not damage the equipment.

Amendments

Issue 1	Sep	1991	Initial issue
Issue 2	Apr	1995	New HFC refrigerants, instead of CFC's, no ODP.
Issue 3	May	1996	Update address.
Issue 4	Aug	2002	Combined DC1-300 and DC1-700 into one model DC1-300.
Issue 5	Aug	2006	Updated book.
Issue 6	Sep	2006	DC2-300 released.

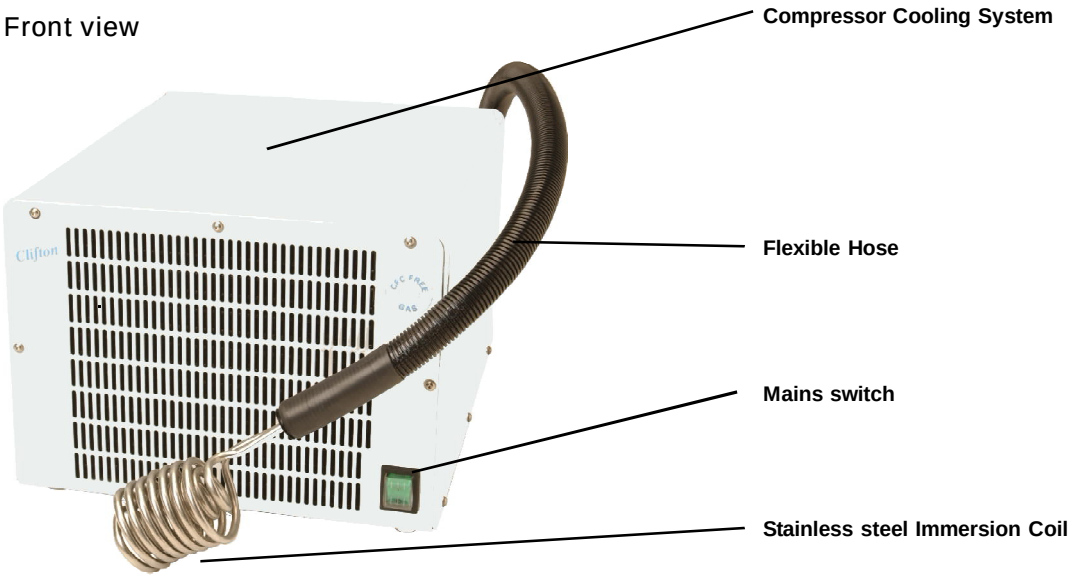
Symbols/Beschriftungssymbole/Simboli/Symboles/Símbolos

Caution refer to Instruction
Vorsicht! - siehe entsprechenden Hinweis.
Attenzione, fare riferimento al manuale.
Attention, se reporter aux instructions.
Precaución, consultar las instrucciones.

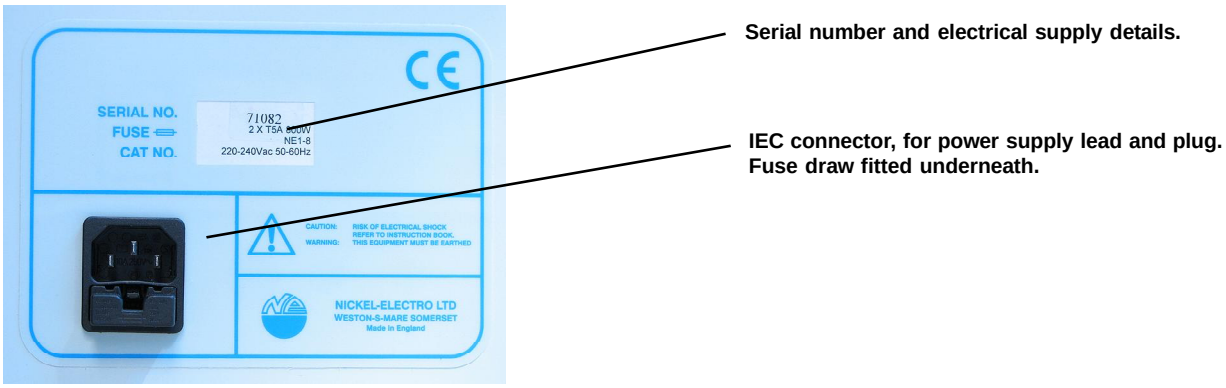
Protective earth conductor terminal.
Schutzleiterklemme
Morsettiera conduttore di massa.
Borne de conducteur de protection par mise à la terre.
Borna conductora protectora de puesta a tierra.

DC1 series Immersion Dip Cooler

Front view



Rear view



Operating Instructions

Switching ON and OFF

Switching ON - the unit may be turned ON (I) at the mains switch located at the front. When ON (I) the switch is illuminated and unit performs a self test.

Switching OFF - the unit may be turned OFF(O) at the mains switch located at the front.

The Immersion Dip Cooler has no temperature control system it relies on either Clifton NE4 series Thermostirrers/Thermocirculators to provide temperature control of bath liquid. These units work against the constant cooling of the Immersion Dip Cooler to achieve set temperature.

Safety

Do not touch any electrical contacts or open any closure panels.
RISK OF ELECTRICAL SHOCK!

Safety devices fitted on the Cooling Compressor system.
1. Motor is fitted with a safety cut out in case of overheating.
[Class 1 - temperature protection]

Power Supply Lead and Connection to Electrical Supply

Fit the power lead by plugging it into the Immersion Dip Cooler and then to mains supply.

Before connecting the product to the electrical supply, check the information on the rating label is compatible.

IF IN DOUBT CONSULT AN ELECTRICIAN. THE PRODUCT MUST BE EARTHED!

Where the mains supply or plug connection differs refer to local regulations or qualified electrician.

Safe operation

The Equipment is designed to operate in following conditions:

1. Indoor use only.
2. In a ventilated area.
3. Ambient temperature range 20°C > 40°C [only for storage and transportation].
4. Ambient temperature range 10°C > 25°C [for normal operating performance].
5. Ambient temperature range 25°C + [degraded cooling performance].
6. Altitude up to 2000m.
7. Relative humidity not exceeding 80%.
8. Mains voltage fluctuations not exceeding 10%.
9. Over voltage category II IEC 60364-4-443
10. Pollution degree 2
11. Use with a minimum distance of 40cm of free air around ventilation slots. DO NOT obstruct.
12. DO NOT use in explosive atmospheres.

The Immersion Dip Cooler is air cooled with air from its surroundings sucked in at the front and warm air expelled out of the rear. To provide good air circulation and operating performance keep the ventilation slots free from obstruction.

For optimum cooling performance reduce the effect of high ambient temperatures as this will otherwise reduce its cooling capacity.

To achieve optimum performance the bath should always be covered with a lid or polypropylene spheres at all times. Accessory information www.nickel-electro.co.uk.

Unpacking

Remove the Immersion Dip Cooler from its packaging by lifting it carefully out of the box - keep the unit upright at all times. LEAVE THE UNIT TO STAND CORRECT WAY UP FOR 2 HOURS BEFORE USE!!

The outer packaging is fitted with a TIP and TELL label. Check there is no dye in top of the label. If this is the case DO NOT switch the unit on but leave standing for a further 24 hours to ensure any compressor oil and refrigerants separate NORMALLY.

Any damage please notify your distributor immediately.

Retain the packaging over the warranty period.

Checking contents of the box

Consists of a Immersion Dip Cooler, power lead and this instruction manual.

Installation in a Clifton water bath

It is recommended the Immersion Dip Cooler is only installed with Stirred, Circulating, Shaking water baths providing liquid movement to avoid localised freezing occuring around the immersion coil which degrades its cooling performance. DO Not use with Unstirred water baths.

1. Where installed with Clifton NE4 Stirred and Circulating water baths the plastic cap fitted behind the Thermostirrer/Thermocirculator [picture below], the cap needs to be removed. Its can be done by unfastening the unit from tank, removing the 4 screws, along right hand side of the tank.

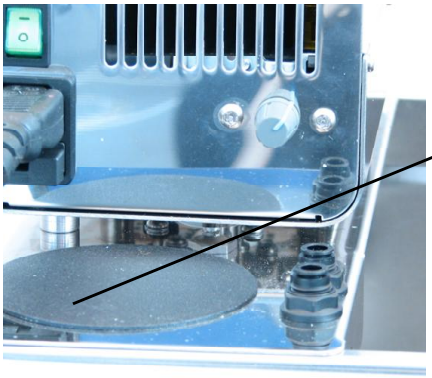
2. Once removed from the Tank the Thermostirrer/Thermocirculator can be turned upside down on a bench top and the round plastic cap popped out. Refit the unit back onto the Tank.

3A. DC1-300 Place the Immersion Dip Cooler to the right hand side of water bath, directly alongside. The Immersion Dip Cooler requires constant air cooling, the ventilation slots/grills must have at least 40cm of free ventilation.

3B. DC2-300 can be installed as 3A. above. Always lock the wheels once sited in correct loaction by depressing the tabs down on each wheel. It can also be installed underneath a water bath either on suitable shelving underneath or onto the floor under a benchtop. Also with this model where benchspace is limited a NE4 Stirred or Circulating water bath, 8 or 14 litre size, can be placed direcly onto the unit as a workstation in its own right as shown below.

4. With the round plastic cap removed the immersion coil can be inserted through the hole into the water bath until it touches the bottom of the tank, now ready for use.

Rear view Clifton NE4 Thermostirrer/Thermocirculator



Round black plastic cap, requiring removal, to insert the immersion coil.

Installation in any other water bath

Following a similar process to above this Immersion Dip Cooler can be fitted to most traditional water baths. DO Not use with Unstirred water baths.

Liquid Level

Always ensure the Immersion coil is covered with liquid at all times for optimal performance.

Disconnect both the Immersion Dip Cooler and an ywater bath from the mains electrical supply when emptying and filling the bath.

Suitable Liquids

Operating temperatures from -20°C to ambient, we recommend either:

100% Heat transfer liquid [The LB range is formulated for temperatures from -45°C to 90°C and provides complete protection from freezing and algae growth and safeguards against corrosion. See accessories.

100% Ethylene glycol [car antifreeze].

Operating Instructions - summary

1. Ensure bath is filled with correct Liquid type for the desired operating temperature and filled to correct liquid level

2. Lid must be fitted. To achieve optimum performance any NE4 Stirred or Circulating bath should always be covered with a SL Lid or BP0368 Polypropylene spheres at all times reducing upto 70% of the heat, from ambient room temperatures, transferring into the bath being cooled. By doubling this layer of polypropylene spheres or using a SL4 Lid and spheres improves this further upto 90%.

3. Start by switching the Immersion Dip Cooler ON - the unit may be turned ON (I) at the mains switch. When ON (I) the switch is illuminated and the refrigeration compressor is now operating and after 5 > 10 minutes will start cooling bath liquid.

4. Now switch Thermocirculator/Thermostirrer ON - the unit may be turned ON (I) at the mains switch located at the rear. When ON (I) the switch is illuminated and unit performs a self test where all segments of the 3 digit LED display and indictors illuminate.

5. Then Set the temperature/time options required. The Thermocirculator/Thermocirculator provides temperature control of bath liquid, working against the constant cooling of the Immersion Dip Cooler to achieve set temperature.

6. Where no cooling is required or where the set temperature on the Thermocirculator/Thermostirrer is above ambient, switch the Immersion Dip Cooler OFF to save energy and running costs.

Keep out of direct sunlight, away from high ambient temperatures or direct heat sources.

Do not place it where there are corrosive fumes, excessive moisture, high ambient room temperatures, or excessively dusty areas.

For optimum cooling performance reduce the effect of high ambient temperatures as this will otherwise reduce its cooling capacity.

To achieve optimum performance the bath should always be covered with a lid or polypropylene spheres at all times.
Accessory information www.nickel-electro.co.uk.

Warranty - 3 Years

The Immersion Dip Cooler is covered by a 3 Year Warranty against defects in materials and workmanship. In the case of a problem contact your Distributor for advice or our Service Department at Nickel Electro Limited, Oldmixon Crescent, Weston Super Mare, North Somerset BS24 9BL, England, Tel +44 1934 626691 Fax +44 1934 630300.

If returning the Circulator ensure the unit remains upright in its original packaging during transportation. We advise to mark the outside of the carton clearly correct way up and identify it as fragile. Ensure it is adequately packaged. Ask our service department for a Tip'n'Tell label to be sent to you to adhere to packing before its return.

The Immersion Cooler contains refrigerant R134a.

Out of Warranty

Our Service Department has comprehensive stock of charegeable spare parts maintaining working life of equipment or units can be returned for quotation before repairs are undertaken.

End of Life

This symbol indicates that this product should not be disposed of with your waste. Instead, dispose waste electrical equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, in UK please contact Service Department, rest Europe contact your Distributor.
Health & Safety, unless in receipt of a Decontamination Notice or Report the unit cannot be returned or accepted for disposal.
Clifton electrical and electronic equipment has been designed for recycling and takes into account the dismantling and recovery its components and materials. Clifton products are easily recycled with majority of the product constructed from stainless or mild steels, which can readily be re-used or recycled.

It is recommended, refer to qualified refrigeration engineer.

Portable Appliance Testing

When conducting testing, ensure it is conducted by a qualified person.

THIS EQUIPMENT MUST NOT BE FLASH TESTED!

Cleaning

General cleaning

Important - please follow these instructions to avoid possible damage to the unit, otherwise affect its performance and or warranty. Disconnect the product from the electrical supply before cleaning.

The Immersion Dip Cooler must be cleaned at regular intervals wiping casework with a cloth or sponge soaked in warm soapy water.

The stainless steel immersion coil should provide years of valuable service and is resistant to chloride containing solutions it is however important to avoid high concentrations of halogens - especially chloride. It may show symptoms of these halogens as rust, which are deposits from external sources in the water supply.

We recommend always remove immersion coil from liquid after use and wipe dry with a non-abrasive cloth and allow to dry. Any deposits can be removed with nitric acid (10%) on a cloth. *WEAR PROTECTIVE EQUIPMENT!*

It is also recommended to use an accessory lid to prevent contaminates landing in bath liquids.

Descaling

Descale the immersion coil regularly to maintain it in as new condition ensuring the corrosion resistance and normal operating conditions are maintained throughout its working life. Descale by wiping it with a cloth soaked in vinegar and brush the lime away.

Rinse thoroughly afterwards.

Virucidal Disinfectant

We recommend Virkon a powder product for the safe and rapid disinfection of surfaces and equipment in a wide variety of situations available from your distributor..

VIRKON is dissolved in water for use, providing a safe working solution with a faint lemon odor. It has proven efficacy against bacteria (including mycobacteria), viruses, spores and fungi in a variety of independent tests using different protocols. Presents no serious long term health risks to staff – obviating the need for costly ventilation equipment and health monitoring. Also provides high level disinfection of laboratory equipment and instruments where autoclaving is neither practical nor necessary.

The ultimate high level surface disinfectant.

Its chemistry is a balanced stabilized blend of peroxygen compounds, surfactant, organic acids and an inorganic buffer system. Mode of action is by oxidation of proteins and other components of cell protoplasm, resulting in inhibition of enzyme systems and loss of cell wall integrity.

Virkon is Registered in accordance with the requirements of the Medical Devices Directive, (93/42/EEC) as a Medical Device.

Cooling Compressor system

To maintain the full cooling performance qualified engineer should either remove the cover and vacuum all dust and dirt from inside or blow compressed air through the ventilation slots. DO NOT DAMAGE the condensor fins otherwise could lead to reduced performance.

NOTE: The motor of the cooling compressor is equiped with overload protection device which operates with excessive temperature. Poor air circulation such as incorrect placement, cooling vents obstructed or radiator fins with high levels of dust/dirst accumulated.

DC1-300 *Clifton* Immersion Dip Cooler

The coil diameter 65mm fitted on end of a 900mm long flexible cooling line.

Class leading Cooling Power:

20°C = 1000W

5°C = 560W

0°C = 480W

-10°C=330W

-20°C=215W

This refrigeration Immersion Dip Cooler has no temperature control, being easy to use makes this model an ideal instruments for a variety of cooling applications, suiting an immersion cooling coil. The immersion cooler runs continuously providing counter cooling with bath providing temperature control.

Stainless steel immersion coil - corrosion resistant.

Replaces wasteful use of cold water cooling.

CFC free gas.

Quiet in operation.

Bench top model.

Flexible hose.

DC2-300 *Clifton* Immersion Dip Cooler

The coil diameter 65mm fitted on end of a 900mm long flexible cooling line.

Class leading Cooling Power:

10°C = 1400W

0°C = 1040W

-10°C=730W

-20°C=460W

This more powerful refrigeration Immersion Cooler, with no temperature control, is designed to be used in conjunction with any stirred or circulating water bath providing constant counter cooling. Its is also an ideal instrument for a variety of cooling applications, suiting an immersion cooling coil.

With an operating range from ambient to -20°C and its additional operating performance over the DC1-300 makes it particularly beneficial at these lower liquid temperatures especially in elevated ambient temperatures or larger volume stirred or circulating water baths.

This model features a flexible 900mm long stainless steel pipe with a protective outer shield, exiting from top of the unit, making the stainless steel cooling coil naturally stand in the corner of any Clifton NE4 Stirred or Circulating water bath. This maximises the working area within the bath and reduces the chance of 'cold shock', a chance of the freezing cold coil accidentally intruding or touching and spoiling work. The stainless steel immersion coil is corrosion resistant.

The immersion cooler runs continuously providing counter cooling with a Clifton NE4 Stirred or Circulating water bath providing temperature control.

The unit is fitted with casters, which can be locked when sited, for easy mobility. Suitable for bench top or under-bench use or as a dedicated workstation with a NE4 Stirred or Circulating water bath, 8 or 14 litre sizes, running on top saving bench space.

The DC2-300 replaces wasteful use of cold water-cooling, uses R134a gas and is quiet in operation.

EC Declaration of Conformity

We herewith confirm the following product

DC Immersion Dip Cooler range

Conforms with the requirements outlined by following European Directives.

Low Voltage Directive (73/23/EEC)

EMC Directive (89/336/EEC)

We confirm the declaration

NICKEL-ELECTRO Ltd.
Manufacturers of laboratory, medical and clinical equipment.
Oldmixon Crescent, Weston-super-Mare,
North Somerset, BS24 9BL, United Kingdom.
Tel: +44 (0)1934 626691
Fax: +44 (0)1934 630300
Email: clifton@nickel-electro.co.uk
www.nickel-electro.co.uk

Conforms with the requirements of following Standards

BS EN 61010:1:1993
BS EN 61010:2.010:1995
Safety requirements for electrical equipment for measurement, control and laboratory use.

BS EN 61326:1997
Electrical equipment for measurement control and laboratory use - EMC requirements.

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