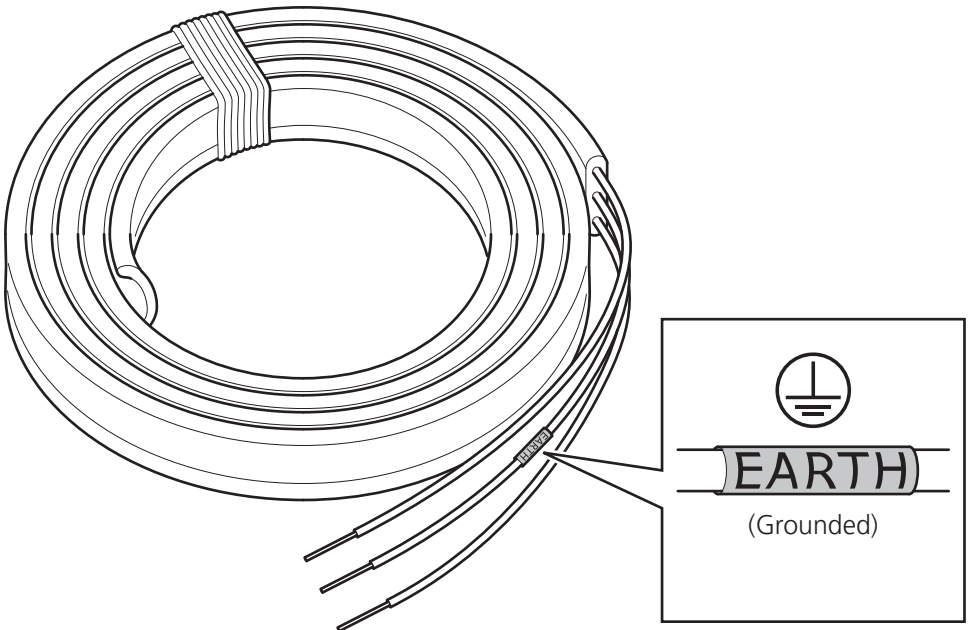


Instruction Manual
ET0002 / Version 1.0

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NOTE: Heating Tapes are supplied with bare wires and **MUST** be connected to an external temperature control device (not included) and protected by an adequate circuit breaker or fuse.

Introduction

Thank you for purchasing this Electrothermal product. To get the best performance from the equipment, and for your own safety, please read these instructions carefully before use.

Before discarding the packaging check that all parts are present and correct.

This equipment is designed to operate under the following conditions:

- ❖ For indoor use only
- ❖ Use in a well ventilated area
- ❖ Ambient temperature range 5°C to 40°C (41°F to 104°F)
- ❖ Altitude to 2000 m (6500 ft)
- ❖ Relative humidity not exceeding 80%
- ❖ Mains supply fluctuations not exceeding 10% of nominal
- ❖ Overvoltage category II IEC60364-4-443
- ❖ Pollution degree 2 IEC664
- ❖ Use with a minimum distance all round of 200 mm (8 in.) from walls or other items

If the equipment is not used in the manner described in this manual and with accessories other than those recommended by the manufacturer, the protection provided may be impaired.

General Description

Electrothermal Heating Tapes are a range of flexible resistance heater elements for use in a wide range of commercial/industrial surface heating applications. The flexible heaters are ideal for heating columns, pipes, valves and transfer lines.

All tapes are constructed of an element covered in glass fibre and a braided earth (ground) wire which is enclosed in a glass sleeve. Lengths range from 61cm (2ft.) to 976cm (32ft.) with a linear loading of 50W/ft (164W/M). Heating tapes are available in 120 V and 230 V versions up to 488cm (16ft.) and in 230 V only for 732cm (24ft.) and 976cm (32ft.) lengths. Product is suitable for use in dry conditions only, is not water resistant and has a maximum element temperature of up to 450°C and has a minimum helix diameter of 50mm (2 in.). The following tables identify the different sizes and groups within the Heating Tape range:

120 V Models	Length
HT95502X1	61cm (2ft.)
HT95503X1	91cm (3ft.)
HT95504X1	122cm (4ft.)
HT95506X1	183cm (6ft.)
HT95508X1	244cm (8ft.)
HT95512X1	366cm (12ft.)
HT95516X1	488cm (16ft.)

230 V Models	Length
HT95502	61cm (2ft.)
HT95503	91cm (3ft.)
HT95504	122cm (4ft.)
HT95506	183cm (6ft.)
HT95508	244cm (8ft.)
HT95512	366cm (12ft.)
HT95516	488cm (16ft.)
HT95524	732cm (24ft.)
HT95532	976cm (32ft.)

Important Safety Advice

Users should be aware of the following safety advice:

- ❖ **SHOCK HAZARDS OR UNSAFE PRACTICES ARE DANGEROUS** as they can cause severe personal injury, fire or death.
- ❖ **DO NOT** expose the element to liquids.
- ❖ **DO NOT** use combustible substances near hot objects.
- ❖ **DO NOT** use the equipment in hazardous atmospheres.
- ❖ **DO NOT** attempt to shorten, cut or allow sharp metal objects near the element.
- ❖ **DO NOT** operate or handle any part of the product with wet hands or use on surfaces that may become flooded.
- ❖ **DO NOT** overlap, kink, pinch or twist the heating tape or allow any portion to sag from the surface.
- ❖ **DO NOT** use worn or damaged elements or attempt to repair the element.
- ❖ **NEVER** move the product while still connected to the power supply.
- ❖ **NEVER** connect product directly to the mains supply, these are designed for use with an external temperature controller.
- ❖ **ALWAYS** use with protective earth (ground) bonded installation when applied to electrically conductive vessels.
- ❖ **HIGH TEMPERATURES ARE DANGEROUS** as they can cause serious burns to operators and ignite combustible material. Users should be aware of the following safety advice:
- ❖ **USE CARE AND WEAR PROTECTIVE GLOVES TO PROTECT HANDS.**
- ❖ **NEVER** lift or carry the instrument until it has been switched off and allowed to cool.
- ❖ **DO NOT** position the element such that it is difficult to disconnect it from the power supply.
- ❖ **DO NOT** leave equipment switched on and it is not recommended to leave any heating apparatus unattended during operation.
- ❖ **DO NOT** apply severe physical stress or use at temperatures above the rated value.
- ❖ **NOT RECOMMENDED** for use on plastic pipes.

Symbols Defined



WARNING



HOT
SURFACE



RISK OF
ELECTRIC SHOCK



EARTH



BIOHAZARD

Electrical Requirements



THIS INSTRUMENT MUST BE EARTHED/GROUNDED

Before connection please ensure that the line supply corresponds to the power requirements below:

120 V Models	Length	Volts	Watts
HT95502X1	61cm (2ft.)	120 V	100W
HT95503X1	91cm (3ft.)	120 V	150W
HT95504X1	122cm (4ft.)	120 V	200W
HT95506X1	183cm (6ft.)	120 V	300W
HT95508X1	244cm (8ft.)	120 V	400W
HT95512X1	366cm (12ft.)	120 V	600W
HT95516X1	488cm (16ft.)	120 V	800W

230 V Models	Length	Volts	Watts
HT95502	61cm (2ft.)	230 V	100W
HT95503	91cm (3ft.)	230 V	150W
HT95504	122cm (4ft.)	230 V	200W
HT95506	183cm (6ft.)	230 V	300W
HT95508	244cm (8ft.)	230 V	400W
HT95512	366cm (12ft.)	230 V	600W
HT95516	488cm (16ft.)	230 V	800W
HT95524	732cm (24ft.)	230 V	1200W
HT95532	976cm (32ft.)	230 V	1600W

THIS OPERATION SHOULD ONLY BE UNDERTAKEN BY A QUALIFIED ELECTRICIAN.

- NOTE:** Refer to the equipment rating label to ensure that the plug and fusing are suitable for the voltage and wattage stated.
- NOTE:** Only qualified personnel are allowed to connect the electrical wiring. Installation must follow electrical codes and final inspection by the appropriate local authority.
- NOTE:** The end-user is responsible for providing suitable electrical protection device and disconnecting device. It is recommended this unit be connected to a mains supply source which incorporates an RCD (residual current device) or GFCI (ground fault circuit interrupt) device.
- NOTE:** This product requires the use of a temperature control device (not included). For example, the Electrothermal MC controller range (optional purchase) is supplied with a moulded cord and plug set wired as follows:

**The wires in the power cable (120 V)
are coloured as follows:**

- BLACK - HOT/LIVE
- WHITE - NEUTRAL
- GREEN – EARTH

**The wires in the power cable (230 V)
are coloured as follows:**

- BROWN - HOT/LIVE
- BLUE - NEUTRAL
- GREEN/YELLOW – EARTH



IF IN DOUBT CONSULT A QUALIFIED ELECTRICIAN

The appropriate controller and power cable should be connected BEFORE connection to the power supply.

Before Use

Please refer to the installation instructions and safety advice and ensure the heating tape selected is of a suitable length and power to fit the application.

Prepare Surface - All vessels and pipes must be checked for sharp edges and cleaned prior to installation. Valves, unions, sharp edges or other fittings can create air spaces and prevent good physical contact of the heater. Any edges or gaps should be rounded off by the use of foam pads or compressed aluminium foil and can be fixed in place with glass fabric adhesive tape.

NOTE: The external temperature controller should be fixed into place prior to applying the heater.

Visual Inspection and Handling - After removing from the packaging, visually inspect the heater tape for any damage. Ensure the heater physically fits the desired pipe or vessel, will be in good contact with the surface and will not overlap itself when installed. Heating tapes are manufactured from glass, ceramic and quartz fibres, and can be easily damaged by poor handling during installation. Care must be taken to ensure there is no twisting or crushing of the loose length of tape during the placement. Any tight bend or twist in the heater may result in rupture or separation of the outer layers of glass yarns and a live element wire may protrude.

NOTE: It is highly recommended that any installation involve two persons for proper handling.

Installation / Tracing

Heating tapes offer a wide range of flexibility for controlling the temperature of variable size and odd geometry items. To aid the installation process, do not fix any parts of the heater in place (other than at the start and finish) until the spiral winding is even and in proper contact over the entire length.

Lower temperatures may be achieved by a simple straight tracing and fixing at 15cm (6 in.) intervals (e.g., taping the heater along the underside of a pipe), see **Figure 1**.

Higher temperatures may be achieved by spiralling the heater around the desired pipe or vessel with glass fabric adhesive tape fixed in 15-25cm (6-10 in.) intervals, see **Figure 2 & 3**.



WARNING: Do not allow the tape to overlap, see **Figure 4**.

Figure 1

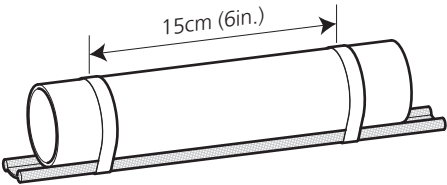


Figure 2

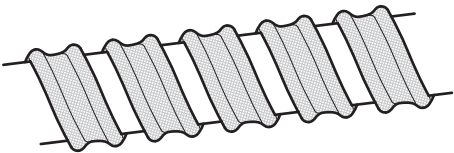


Figure 3

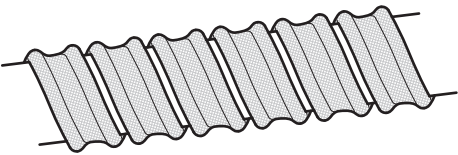
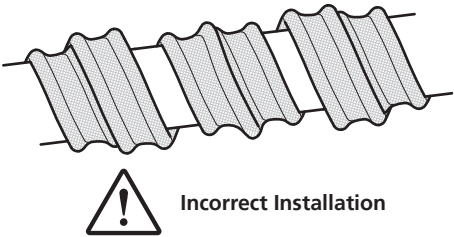


Figure 4



Applying Insulation (Optional)

Most heating systems will benefit from additional thermal insulation, which should be selected to suit the temperatures required. Well fitted insulation decreases heat loss and cover and supports the heater over the whole area. Traditional insulation materials or fibrous insulation, such as wool and ceramic fibre may also be cut to size, enveloped in aluminium foil and the taped into place. In general terms, the thicker the insulation layer, the more efficient the heater will be.

Insulation materials may be considered as follows:

Required Temperature	Insulating Materials	Thickness
Up to 80°C (176F)	PVC/Nitrile rubber foam	10mm (½in.) fibrous insulation
100 to 180°C (212-356F)	Silicon Rubber foam	25mm (1in.) fibrous insulation
180 to 400°C (356-752F)	Rockwool, Glassfibre	50mm (2in.) fibrous insulation
400 to 750°C (752-1382F)	Ceramic fibre blanket	75mm (3in.) fibrous insulation

NOTE: Large amounts of fibrous insulation may absorb moisture when cold and trip circuit breakers.

Selecting a Control System

Any heating system will only be as good and reliable as the control system permits. Various types of control are available and outlined below:

External Power Controller (e.g. Electrothermal MC5*, MC227*, MC228*) - Based upon thermal simmerstats or various types of solid state power control devices. Adjustable rate of energy flow based upon a dial with a pointer on arbitrary scale. Monitoring of temperature is essential, adjustment may be frequent, or temperatures will drift.



WARNING: These devices should NEVER be used unsupervised or in any circumstances where excess temperature could create an unsafe or hazardous situation.

Thermostats and Sensors - Bimetal contact switches, capillary and bulb mechanical thermostats may be used but accuracy is likely to be only +/- 5%. Electronic thermostats offer improved accuracy, usually +/- 1°C, and use a sensor mounted on the pipe or in the vessel. Thermocouples or resistance sensors should be selected to suit the maximum temperatures involved, to be as small as possible, to give fastest response to changes, to be electrically and physically isolated from the heater and firmly fixed to the surface of the pipe or vessel if temperature maintenance is required OR inserted into the fluid/solid matter if process heating is required.

Digital Display Controller (e.g. Electrothermal MC810B*) - An external temperature controller with a digital display and the capacity to pre-programme settings is the best solution for simple and accurate temperature control in non-volatile and non-hazardous applications. They may also be used as an over-temperature device in more sophisticated control systems when heating delicate, volatile or more hazardous substances.

Proportional and PID Control Systems - Delicate materials that require heat input whilst flowing through the system will require a more sophisticated control system.

* For connection instructions, please visit: www.electrothermal.com

NOTE: Need help selecting a control system? Please contact Electrothermal Technical Support for additional advice.



Connecting to a Power Supply

Installation must be by a competent electrician under the direction of the Responsible Body, so that a full knowledge of operational and safety requirements is understood. Installation should be in compliance with all current mandatory regulations.

This product MUST be connected to an external temperature control device (not included) and protected by an adequate circuit breaker or fuse. The end-user is also responsible for providing a suitable electrical protection device and disconnecting device. It is recommended this unit be connected to a mains supply source which incorporates an RCD or GFCI device.



WARNING: Failure to operate the heater at the specified rating and/or with the required controller could result in overheating resulting in fire, burns or other personal injury and loss of property.

Before installation by a qualified electrician, please ensure the following:

- ❖ All metal parts are Protective Earthed (Grounded) to an approved and tested bonding point.
- ❖ All heaters are fused or protected by overcurrent circuit breakers of appropriate rating.
- ❖ All connecting cables meet the current and temperature requirements of the application.
- ❖ Provision has been made to switch off and isolate heating control circuits before installation.
- ❖ Provision for additional safety in the form of a residual current device fitted to the incoming supply should be considered.

Operation

Operation of the heating tape will be as per the instructions for the external controller. It is recommended that once installation is complete and approved for use by a Responsible Body, that written instruction for use be produced as part of the standard operational procedure documentation.

NOTE: Always install mechanical guards and thermal insulation to protect operatives and adjacent equipment.

NOTE: Heating systems can degrade with use. It is essential that regular inspections are carried out and maintenance or replacement of system parts is completed as soon as required.



WARNING: Once the heating element has been installed and energised, the element will set to the form of the enveloped surface. Any attempt to remove the unit after energising will damage the heating element and make it unsafe to use.

Cleaning and Care



HOT: Before attempting cleaning, ensure that the unit is cool, and disconnect from the power supply.



WARNING: Ensure the unit is disconnected from the power supply before attempting maintenance or servicing.

With proper care and operation, the equipment should give reliable service, however contamination or general misuse may reduce the effective life of the product and could cause a hazard.

Preventative maintenance should include keeping the product clean by protecting it from spillage, contamination or corrosive environments. If in doubt, please confirm that any intended method of decontamination will not damage the equipment by contacting Cole-Parmer.

NOTE: Do not use solvents for cleaning any parts of this equipment.

In Case of Accidental Spillage



WARNING: DO NOT TOUCH IF A SPILLAGE/BREAKAGE HAS OCCURRED. DISCONNECT THE POWER DIRECTLY AT THE POWER SUPPLY SOURCE.

If the equipment has been exposed to liquid, it cannot be assumed to meet all the safety requirements of EN 61010-2-010 until the drying out process has been fully completed and all safety requirements are met before the unit is used again.

In Case of Contamination



WARNING: THE FOLLOWING PROCEDURE IS INTENDED AS A GUIDE. SHOULD SPILLAGE OF A TOXIC OR HAZARDOUS FLUID OCCUR, THEN ADDITIONAL SPECIAL PRECAUTIONS MAY BE NECESSARY.

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 that 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.

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 the Distributor/Manufacturer.

At the end of its service life, the product must be accompanied by a Decontamination Certificate.

Servicing and Repair

This product range does not require any routine servicing, but in case of accidental spillage, instructions for cleaning and decontamination are also included. Routine maintenance should include inspection of the power supply unit and mains power lead set.

NOTE: There are no internal user replaceable parts.

NOTE: Periodic electrical safety testing is recommended on a yearly schedule or immediately after any servicing to ensure safe operation.

In the event of product failure, heating tapes CANNOT be repaired. Fitting of non-approved parts may affect the performance of the safety features of the instrument.

If in doubt, please contact:

Cole-Parmer Ltd.
Beacon Road,
Stone, Staffordshire,
ST15 0SA, United Kingdom
Tel: +44 (0)1785 812121
Email: cpservice@coleparmer.com
Web: www.coleparmer.com

Warranty

Cole-Parmer Ltd. warrants this equipment to be free from defects in material and workmanship, when used under normal laboratory conditions, for a period of one (1) year. In the event of a justified claim, Cole-Parmer will replace any defective component or replace the unit free of charge.

This warranty does NOT apply if:

- ❖ Any repair has been made or attempted other than by the manufacturer or its agent.
- ❖ Any minor coating chips or scratches occur during normal use (i.e., wear and tear).
- ❖ Damage is caused by fire, accident, misuse, neglect, incorrect adjustment or repair, damage caused by installation, adaptation, modification or fitting of non-approved parts.

Technical Specification

Voltage	120 V or 230 V @ 50/60 Hz
Applications	Dry Metal or Glassware
Max element temperature	450°C (842°F)
Linear loading	164 Watts per meter (50 Watts per foot)
Surface loading	0.62 Watts/cm ² (4 Watts/in ²)
Connection type	Two Bare Wires plus Earth (Ground) Lead length 3.5in (9cm)
Dimensions	Variable length x 25.4 cm (1 in.) width
Electrical supply	See Power Requirements under Electrical Requirements section on page 4.

Customer and Technical Support

For help and support, contact:

Cole-Parmer Ltd.
Beacon Road,
Stone, Staffordshire,
ST15 0SA, United Kingdom
Tel: +44 (0)1785 812121
Customer Services: cpinfo@coleparmer.com
Sales: cpsales@coleparmer.com
Technical Support: cptechsupport@coleparmer.com
Warranty, Repairs and Service: cpservice@coleparmer.com
Web: www.coleparmer.com

For the America's and Canada, contact:

Cole-Parmer
625 East Bunker Court,
Vernon Hills,
IL 60061-1844
Toll-Free: 800-323-4340
Tel: 847-549-7600
Fax: 847-247-2929
Customer Services: sales@coleparmer.com
Sales: sales@coleparmer.com
Technical Support: techinfo@coleparmer.com
Warranty, Repairs and Service: info@innocalsolutions.com
Web: www.coleparmer.com



This product meets the applicable EC harmonized standards for radio frequency interference and may be expected not to interfere with, or be affected by, other equipment with similar qualifications. We cannot be sure that other equipment used in its vicinity will meet these standards

and so we cannot guarantee that interference will not occur in practice. Where there is a possibility that injury, damage or loss might occur if equipment malfunctions due to radio frequency interference, or for general advice before use, contact the manufacturer.



EU Declaration of Conformity

Product	Laboratory Equipment	File Number	P225
Manufacturer	Cole-Parmer Ltd Beacon Road Stone, Staffordshire ST15 0SA United Kingdom		

This declaration of conformity is issued under the sole responsibility of the manufacturer

Object of Declaration HT9 Series Heating Tape
(reference the attached list of catalogue numbers)

The object of the declaration described above is in conformity with the relevant Union Harmonisation Legislation:

Low Voltage Directive	2014/35/EU
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EC

References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:

IEC/EN 61010-1:2010	Safety requirements for electrical equipment for measurement, control and laboratory use. Part 1: General requirements.
IEC/EN 61010-2-010:2014	Particular requirements for laboratory equipment for the heating of materials.
IEC/EN 61326-1:2013	Electrical equipment for measurement, control and laboratory use. EMC requirements. Part 1: General requirements (Class A).

Signed for and on behalf of the above manufacturer

Additional Information	Year of CE Marking: 1999
Place of Issue	Stone, Staffordshire, UK
Date of Issue	26 January 2017
Authorised Representative	Steve Marriott
Title	Technical Director
Signature	



Thank you for reading this data sheet.

For pricing or for further information, please contact us at our UK Office, using the details below.



UK Office

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Fax: +44 (0)1245 808399

Email: sales@keison.co.uk

Please note - Product designs and specifications are subject to change without notice. The user is responsible for determining the suitability of this product.