THERMACOT™

TC400™ Mk I

MOBILE COT AND INTEGRAL RADIANT WARMER

Appleyard and Sons
Leeds, Yorkshire
(0532) 502917

MANUFACTURERS
HANDBOOK

THERMACOT™

TC400™ Mk I

DESIGNED AND MANUFACTURED IN ENGLAND

BY

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APPLEYARD AND SONS will only accept responsibility for the safety, reliability,and performance of the equipment if;-

Assembly operations, repairs, adjustments and modifications are carried out by authorised engineers,

The electrical installation of the relevant room complies with the 'Regulations for electrical equipment of buildings' PUBLISHED BY THE INSTITUTION OF ELECTRICAL ENGINEERS,

The equipment is used in accordance with the instructions for use,

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ILLUSTRATIONS

1.0 WARNINGS

The TC400 THERMACOT™ must be earthed at all times during operation.

Lethal voltages exist within the radiant warmer, always switch off the mains power before removing the access cover of the radiant warmer.

During periods of prolonged useage of the radiant warmer some areas of the outer cover may become very warm, therefore caution should be exercised when handling the heater housing.

The ventilation louvres of the radiant warmer must never be obstructed and under no circumstances should any blankets, sheets etc. be draped over the radiant warmer

2.0 SAFETY PRECAUTIONS

Ensure that the electrical installation of the room complies with the 'Regulations for electrical equipment of buildings' PUBLISHED BY THE INSTITUTION OF ELECTRICAL ENGINEERS.

It is recommended that the patients temperature is monitored during operation.

Before operating the TC400 THERMACOT™ always apply and lock the castor brakes.

Before connecting the unit to the mains ensure that the radiant warmer power cable and mains plug are undamaged

Should the TC400 THERMACOT™ malfunction, immediately disconnect from the mains supply and contact an authorised engineer.

The TC400 THERMACOT™ must never be operated with any of the covers removed except by an authorised engineer

All maintenance, modifications and adjustments are only to be carried out by an authorised engineer.

3.0 TECHNICAL DATA

3.1 Overall dimensioms (Nominal)

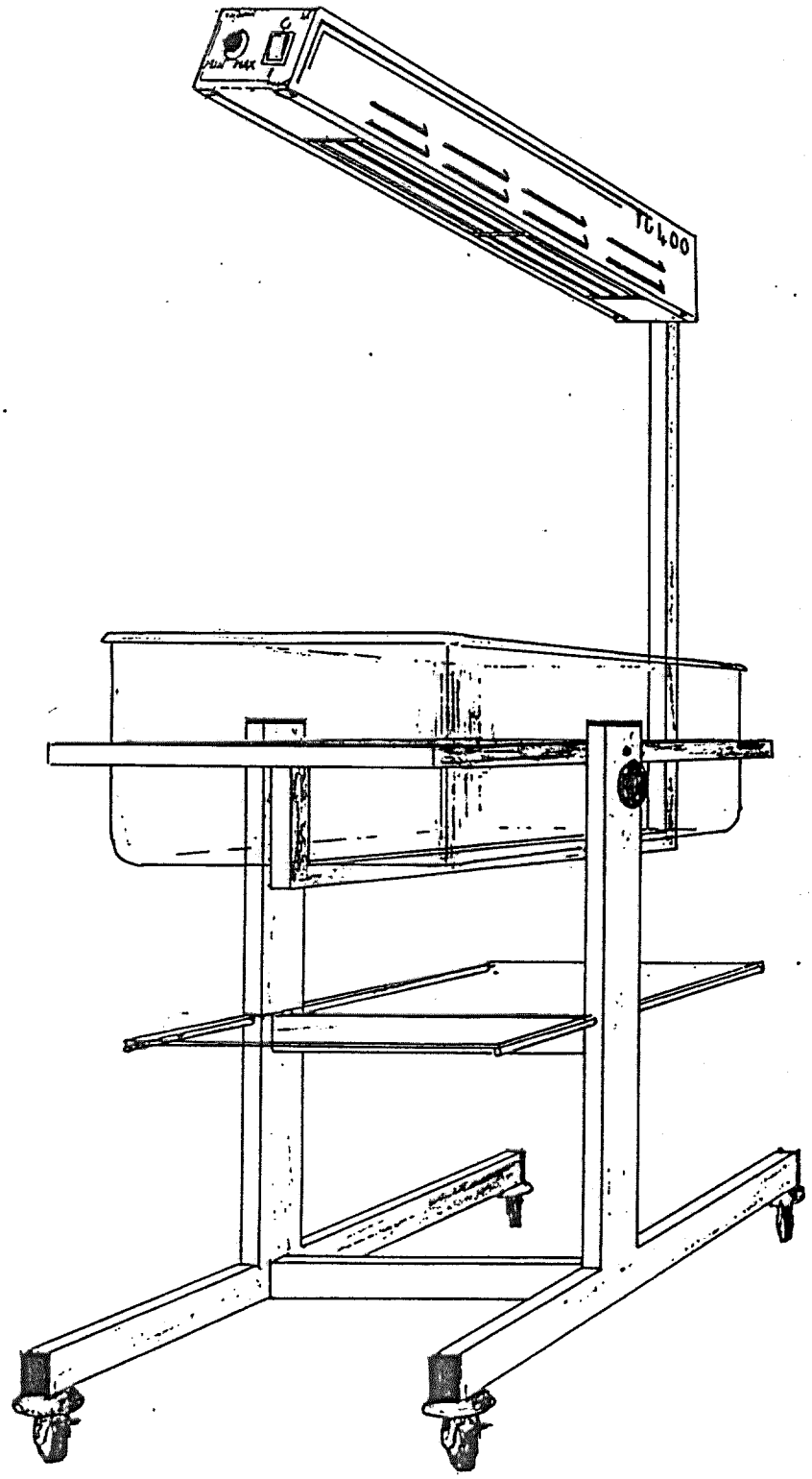
Length	865mm/34in
Width	470mm/18.5in
Height	1700mm/67in
Cot-Heater tilt	0 to 15°
Weight	25Kg/56lb
Heater operating height above baby	660mm/26in-fixed.

3.2 Specification

Power supply (input)	240V~, 50Hz (Mains)
Protection against electric shock :-	
Type	Class I
Degree	Type B
Mode of operation	Continuous
Aux. power output socket (maximum)	3A/240V~
Heater rating	240V~-400Watts nominal
Heater element	Tubalox element Incalox sheathed.
Fuse type	20mm Cartridge (20x5mm)
Fuse rating	2 Amp Antisurge Time delay (T)
Temperature rise within baby 'cot' area.	Approx 10° C above ambient (nominal) with heat control set to maximum.

3.3 Electrical Safety

Designed to comply with BS5724:Part 1 regarding the safety of electrical medical equipment.



THE THERMACOT TC400™ Mk 1

4.0 GENERAL DESCRIPTION

The **THERMACOT TC400™** is a mobile cot and integral radiant warmer, designed to provide a simple effective method of reducing radiant heat loss from infants nursed on the paediatric ward or special care baby units.

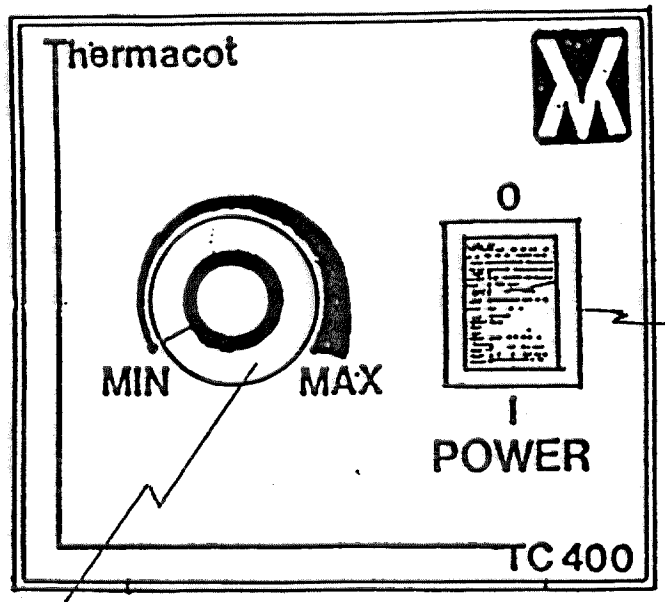
The 400 Watt radiant warmer is mounted at a fixed distance above the cot. It is operated by a mains power switch and a variable heat control which facilitates the reduction of heater output when required and enables standby operation.

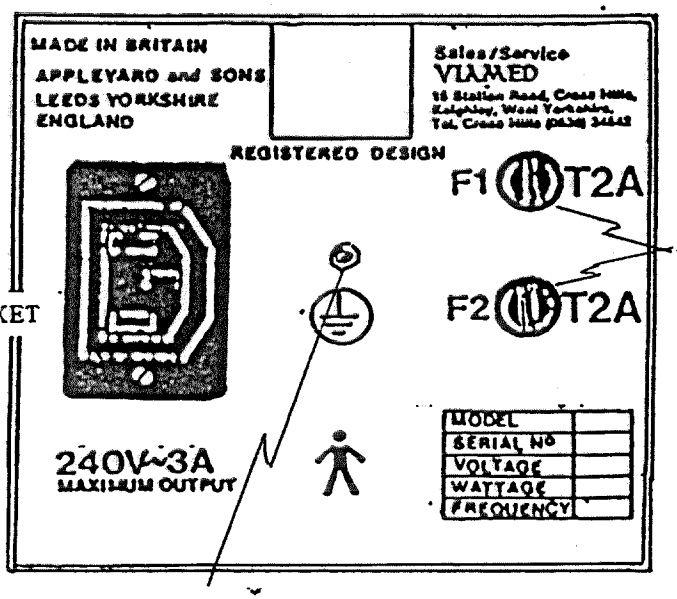
The combination of a 400 Watt heating element and an efficient reflector ensures a safe and uniform warmth within the cot area, raising the surface temperature by about 10°C above the ambient temperature at maximum output.

Mounted on a lightweight mobile stand, the cot and the integral radiant warmer can be angled forward from the horizontal to a maximum of 15 degrees.

A shuttered IEC/CEE outlet socket is provided on the rear panel of the radiant warmer. (Maximum output 3A/240V~)

The **THERMACOT TC400™** is supplied with a standard clear acrylic basinette, a rewirable non-detachable mains cable, four antistatic castors (two incorporating locking brakes) a useful clear acrylic shelf and a manufacturers handbook.





FRONT AND REAR PANELS

5.0 INSTRUCTIONS FOR USE

Prior to operating the TC400 THERMACOT™ the warnings and safety precautions printed on page iii MUST be observed.

5.1 Operation of the brakes

Foot brakes are fitted to the front anti-static castors.

To operate:- press the red foot pedal fully down - the castor is now locked.
To release:- lift the red foot pedal up.

Note
The brakes must be applied at all times when operating the TC400 THERMACOT™.

5.2 Tilting the cot

A special feature of the TC400 THERMACOT™ is the capability of the cot and radiant warmer to be tilted to a maximum of 15° from the horizontal.

To tilt the cot and radiant warmer:- slacken the friction locks, situated at each side of the cot, by turning both black knobs anti-clockwise.

Tilt the cot and radiant warmer to the desired angle then tighten the friction locks by turning the black knobs clockwise.

Should the friction locks become inoperative for any reason, the cot and radiant warmer will naturally return to its horizontal position.

5.3 Operation of the Radiant Warmer

The TC400 THERMACOT™ has been designed for continuous operation. Connection to a suitable 240V~ 50Hz mains supply is required, and the equipment MUST be earthed to an approved safety earth via the non-detachable mains cable.

Mains cable colour code:-

Brown.....Live
Blue.....Neutral
Green/Yellow.....Earth

At the rear of the radiant warmer a shuttered IEC/CEE outlet socket (maximum output 3A/240V~) has been provided. Power IS available from this outlet whenever input power is being supplied, regardless of the position of the front panel ON-OFF switch.

Two controls are situated on the front panel of the radiant warmer, these are:-

1. Illuminated on-off switch
2. Variable temperature control

Before switching the radiant warmer on, turn the temperature control knob anti-clockwise to the MIN position.

To switch the radiant warmer ON, depress the green rocker switch toward the 'I' symbol. The switch will now be illuminated, indicating that power is available to the heating element.

Rotate the temperature control knob clockwise to the desired temperature setting. (NB. The type of heating element fitted to the radiant warmer does not respond instantaneously to changes of the temperature control.) It is recommended that the patient's temperature is monitored during operation

To switch the radiant warmer OFF, depress the green rocker switch toward the 'O' symbol. The switch will not be illuminated.

Whenever the **TC400 THERMACOT™** is switched off disconnect the mains input from the supply.

6.0 USER MAINTENANCE

Regularly monitor the **TC400 THERMACOT™** during its operation to ensure satisfactory functioning.
Check the power switch is illuminated.
Check that the louvres of the radiant warmer are not obstructed and there are no indications of unit overheating.
Check the mains supply cable is not trapped or damaged.

Periodically check the functioning of the castors, brakes and tilt mechanism.

Report all faults immediately to an authorised engineer.

It is recommended that the **TC400 THERMACOT™** should be inspected by an authorised engineer at intervals not exceeding six weeks.

6.1 Recommended cleaning

The radiant warmer housing must only be wiped clean with a DAMP cloth, and dry thoroughly. Never allow the ingress of water into this unit.

The cot stand and basinette may be washed with warm soapy water then thoroughly dried.

7.0 TECHNICAL DESCRIPTION

The **TC400 THERMACOT™** is a mobile self-contained cot and integral radiant warmer designed to comply with BS5724 Part 1 regarding the safety of electrical medical equipment. It is a Class I type B 240V~ 50Hz mains operated equipment, capable of continuous operation.

The complete unit consists of a base frame mounted on four 2½ inch anti-static castors (the front two castors are fitted with brakes), the base frame supports a tiltable cot frame on which is mounted the radiant warmer unit. The **TC400 THERMACOT™** is supplied with a standard basinette which fits into the cot frame and a clear acrylic shelf. A rewireable non-detachable mains cable and cable stowages are attached to the cot frame.

The radiant warmer is mounted at a fixed distance of 26in above the baby. Housed within the radiant warmer is a 400 watt incalox sheathed tubalox element, the output of the element is sufficient to raise the temperature of the baby 'cot' area by approximately 10°C above the ambient air temperature.

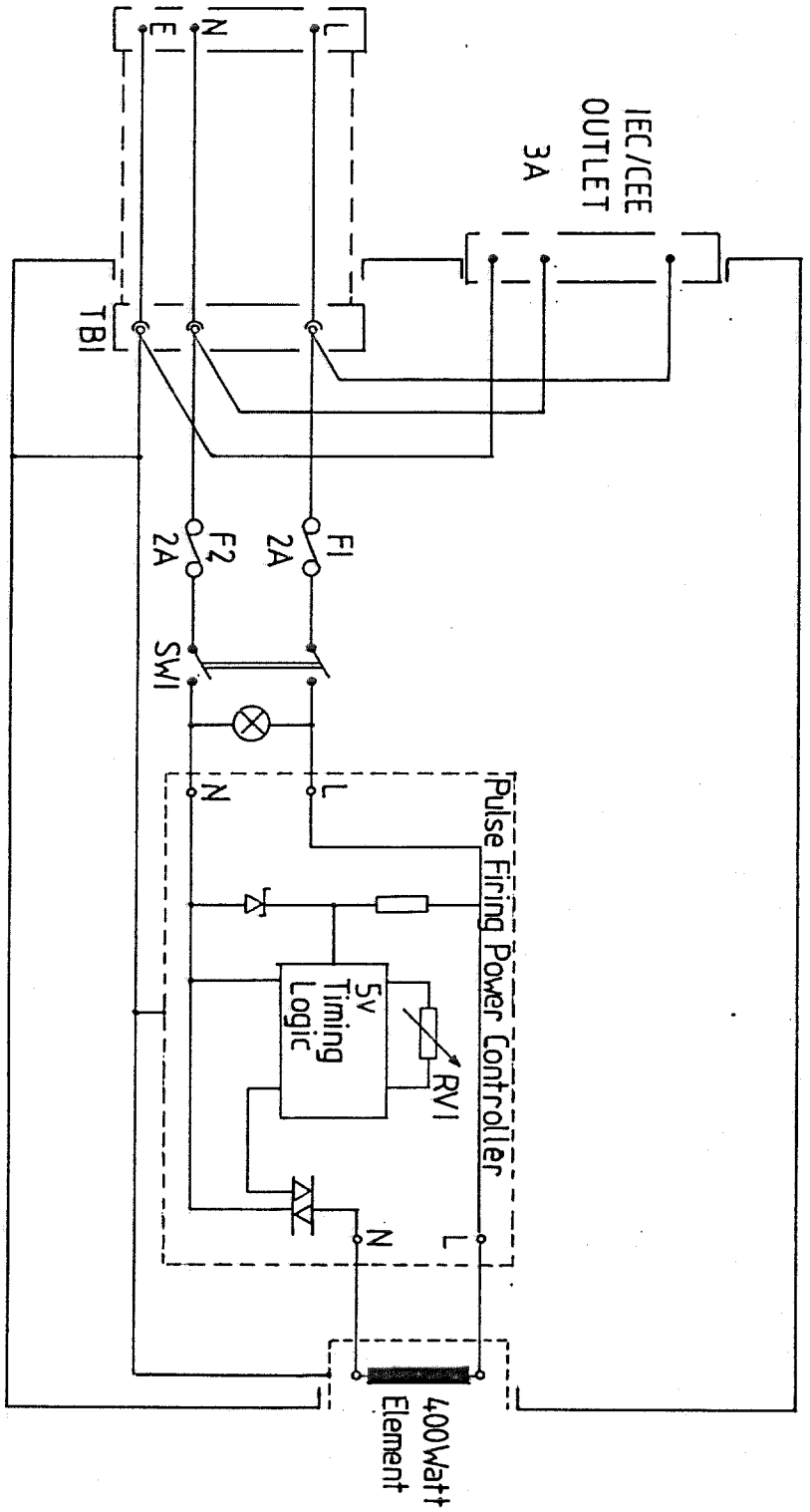
The heater element is controlled by a double pole illuminated rocker "On/Off" switch and a temperature controller mounted on the front panel of the radiant warmer

The temperature controller, which is a 15 Amp encapsulated pulse firing power controller, will maintain the output of the heating element at any set level up to a maximum of 400 Watts.

The radiant warmer is protected by two 2 Ampere anti-surge time delay(T) 20x5mm cartridge fuses housed in low profile fuseholders located on the rear panel.

A standard IEC/CEE shuttered outlet socket (maximum output 3A/240v~ 50Hz) to power auxiliary equipment and an earthing stud for electrical tests, are provided on the rear panel of the radiant warmer

The cot and radiant warmer can be tilted forward and locked at any angle up to a maximum of 15 degrees from the horizontal.



CIRCUIT DIAGRAM

8.0 CIRCUIT DESCRIPTION

The 240V~ 50Hz mains input voltage is fed via the rewireable non-detachable mains cable to barrier terminal block TB1.

The protective earth of the mains cable is attached to the cot frame, a protective earth conductor links the cot frame to TB1. From TB1 protective earth conductors bond the power controller, heater housing radiant warmer chassis and the incalox sheath of the heating element.

Tri-rated live and neutral conductors feed the mains voltage from TB1 via 2 Ampere anti-surge time delay fuses F1/F2 and a double pole illuminated switch SW1 to the live and neutral input terminals of the pulse firing power controller.

The duty cycle of the output triac of the power controller is controlled by an internally generated square wave with an adjustable mark-space ratio which is varied using the potentiometer RV1 to achieve a range of duty cycle from 0% to 100%. Triac switching takes place at the zero voltage point on each cycle virtually eliminating any radio frequency interference.

The live and neutral outputs of the power controller are fed to the resistive 400 Watt tubalox heating element via high temperature appliance conductors

Tri-rated live neutral and earth conductors link terminal block TB1 and the shuttered IEC/CEE mains outlet.

9.0 MAINTENANCE INSTRUCTIONS

Routine maintenance, assembly, repairs, adjustments and modifications are only to be carried out by authorised engineers.

9.1 Routine Maintenance

It is recommended that the following maintenance routine should be carried out at intervals not exceeding six weeks

1. Thoroughly clean the stand unit, cot units and the exterior and interior of the radiant warmer.
2. Inspect the mains plug, mains cable, stand unit, cot unit and radiant warmer for damage.
3. Functionally test the castors, brakes and tilt mechanism for correct operation.
4. Inspect all connectors and conductors within the radiant warmer for security and damage.
5. Carry out earth leakage tests in accordance with BS5724:Part 1.
6. Carry out insulation tests in accordance with BS5724:Part 1.
7. Functionally test the radiant warmer to ensure satisfactory operation.

9.2 Replacement of Fuses

1. Disconnect the TC400 THERMACOT™ from the mains supply.
2. Fuse holders F1 and F2 are situated on the rear panel of the radiant heater.
3. Using a suitable screwdriver unscrew the slotted fuse cap from the low profile fuseholder.
4. After ascertaining the cause of a fuse failure, replace defective fuses with B.S.I. approved 2 Ampere anti-surge time delay(T) 20x5mm cartridge fuses.

9.3 Removal of the Radiant Warmer

1. Disconnect the TC400 THERMACOT™ from the mains supply.

2. Remove the six screws on the top and the four screws on the underside of the unit.

3. Slide the outer cover forward to expose the barrier terminal block TB1 situated beneath the fuseholders F1/2.

4. Disconnect the Live, Neutral and Earth input conductors from TB1. (snap on terminals)

5. Support and slide the radiant warmer unit forward and off its support arm.

6. Withdraw the heater assembly from the rear of the outer cover.

7. Replacement of the radiant warmer is a reversal of the above procedure.

9.4 Replacement of the Heater Element

Replacement Heating Element Kits are only available from :- **VIAMED 15 Station Road, Cross Hills, Keighley, W. Yorkshire. Tel (0535)34542** ***and should only be replaced by a company service engineer or other authorised engineer.***

1. Carry out the procedure 9.3 "Removal of the Radiant Warmer".

2. Cut away the heat shrink tubing from the spade terminals at each end of the heater element. Disconnect the high temperature conductors from the element by pulling off the spade terminals.

3. Unscrew the four screws holding the heater housing to the radiant warmer inner mounting plate then pull the heater housing clear.

4. Using a spanner unscrew the heater element clamp nut and withdraw the element from the heater housing, remove the 'olive' from the element.

5. Pass the replacement element into the heater housing, refit the 'olive', replace and tighten the element clamp nut. Ensuring that there is a minimum of 4 mm between each end of the element and the element holder/clamp.

6. Re-attach the heater housing to the radiant warmer mounting plate.

7. Pass the replacement heat shrink tubing over the high temperature conductors and push the spade connectors onto the element terminals. Using a suitable heat gun shrink the heat shrink tubing over the exposed metal terminals.

10.0 DEFINITIONS

Class I Equipment

Equipment in which protection against electric shock does not rely on basic insulation only, but which includes an additional safety precaution in such a way that means are provided for the connection of accessible conductive parts to the protective (earth) conductor in the fixed wiring of the installation in such a way that the accessible conductive parts cannot become live in the event of a failure of the basic insulation.

Type B Equipment

Class I,II or III equipment or equipment with an internal power source providing an adequate degree of protection against electric shock particularly regarding:

-allowable leakage currents:

-reliability of the protective earth connection (if present).

Continuous operation

Operation under normal load for an unlimited period, without the specified limits of temperature rise being exceeded.

Protective Earth Conductor

Conductor to be connected between the protective earth terminal and an external protective earthing system.

Protective Earth Terminal

Terminal connected to conductive parts of Class I equipment for safety purposes. This terminal is intended to be connected to an external protective earthing system by a protective earth conductor.

11.0 SYMBOLS

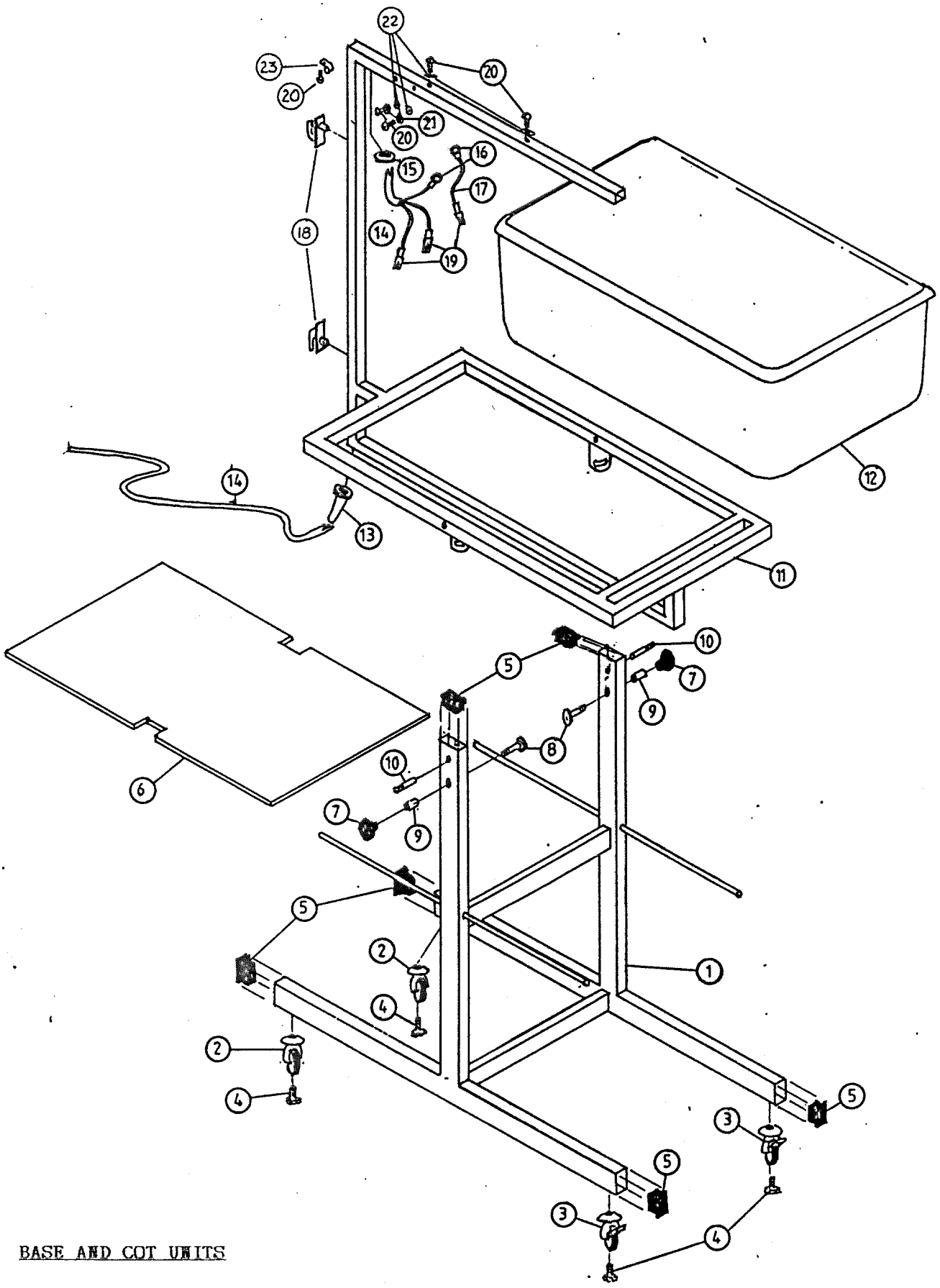
SYMBOL	MEANING
	Alternating current
	Protective earth (ground)
	Off (power disconnection from the mains)
	On (power connection to the mains)
	Type B Equipment

12.0 SERVICING AND SPARES

All Servicing of the TC400 THERMACOT™ is only to be carried out by suitably qualified personnel, instructed in the operation and maintenance of the TC400 THERMACOT™ and approved by a representative of the manufacturer or his agent.

Servicing information, assistance and spares may be obtained by contacting:-

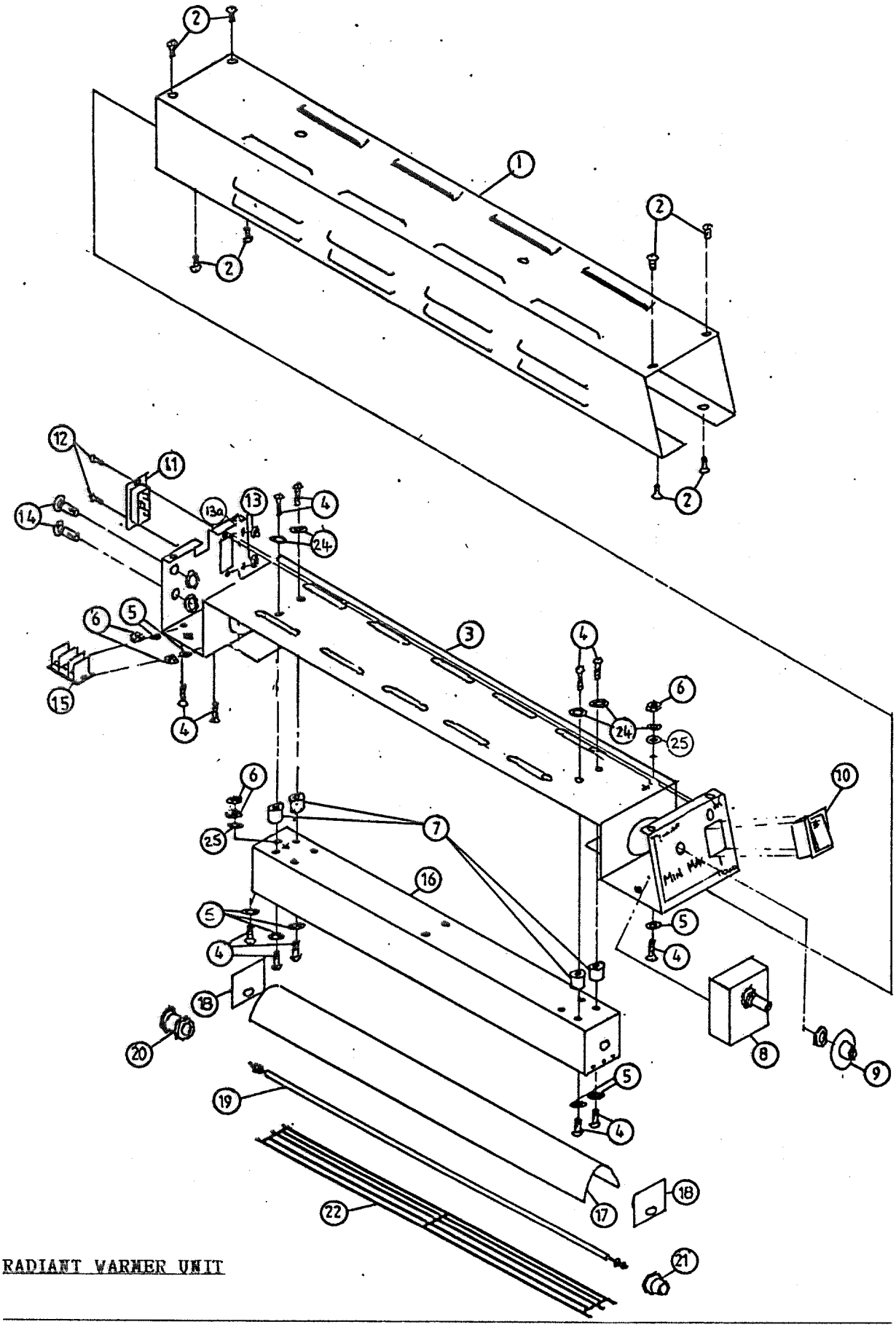
VIAMED
15 Station Road, Cross Hills,
Keighley, West Yorkshire.
Tel:(0535) 34542



BASE AND COT UNITS

BASE AND COT UNITS

DRAWING N°	ITEM	QTY	PART N°
1	Base Unit	1	TC4000
2	2½ inch anti-static castor	2	TC4001
3	2½ inch anti-static castor with brake	2	TC4002
4	Bolt	4	TC4003
5	500mm x 250mm plastic end cap	6	TC4004
6	Clear acrylic shelf	1	TC4005
7	Knob	2	TC4006
8	Friction lock bolt	2	TC4007
9	Friction lock inner sleeve	2	TC4008
10	Pivot screws	2	TC4009
11	Cot unit	1	TC4010
12	Basinette	1	TC4011
13	Cable grommet	1	TC4012
14	Cable	3m	TC4013
15	Cable grommet	1	TC4014
16	Ring Terminal	2	TC4015
17	Earth conductor	1	TC4016
18	Cable stowage	2	TC4017
19	Snap On terminal	4	TC4018
20	Screw	5	TC4019
21	Washer Spring	2	TC4020
22	Washer shakeproof	4	TC4021
23	P clip	1	TC4022



RADIANT WARMER UNIT

RADIANT WARMER UNIT

DRAWING N°	ITEM	QTY	PART N°
	Radiant heater unit	1	TC4200
1	Access Cover	1	TC4201
2	Screws	8	TC4202
3	Mounting plate	1	TC4203
4	Screw	8	TC4204
5	Washer Plain	4	TC4205
6	Nut	6	TC4206
7	Insulating spacer	4	TC4207
8	Power contoller	1	TC4208
9	Knob	1	TC4209
10	Switch	1	TC4210
11	Outlet socket	1	TC4211
12	Screw	2	TC4212
13	Nut	2	TC4213
13a	Washer	2	TC4214
14	Fuse holder	2	TC4215
15	Terminal block	1	TC4216
16	Heater housing	1	TC4217
17	Reflector	1	TC4218
18	Reflector end plates	2	TC4219
19	400 Watt element	1	TC4220
20	Element clamp	1	TC4221
21	Element holder	1	TC4222
22	Grille	1	TC4223
23	Screw	5	TC4224
24	Washer Spring	5	TC4020
25	Washer shakeproof	6	TC4021
26	Snap on terminal	15	TC4018
27	Ring Terminal	4	TC4225
	Tri rated Earth conductor		TC4016
	Tri rated Live conductor		TC4226
	Tri rated Neutral conductor		TC4227
	High temperature conductor		TC4228
	Heat shrink tubing		TC4227
	Heat shrink tubing High Temp		TC4228
	Cable ties		TC4229