VIAMED

HEAT RADIATOR CERATHERM 600-2.

SERVICING MANUAL.

CE 0123

INDEX.

1. Precautions.

The heat radiator must not be used in rooms where there is a risk of explosion, i.e. in the immediate vicinity of explosive anaesthetic gases or mixtures.

The distance between the surface on which the patient lies and the lower edge of the radiator must not be less than 80cm. If this instruction is not followed, prolonged exposure to the heat radiation may cause burns.

"Danger of burns" : Contact with the protective grating and the reflector should be avoided.

"Danger of fire" : The protective grating on the upper side of the radiator must remain unobstructed at all times in order to ensure adequate heat loss.
Do not place anything on the protective grating.

If the type of cover on the surface is changed for example, the use of a dark sheet or heating cushions, etc., the support surface may reach excessively high temperatures and thus influence the body temperature of the infant or patient.

After the radiator has been switched on, an acoustic and visual alarm is given after 15 minutes. This can be reset for a further 15 minutes with the red button.

The infant or patient must never be left unattended under the operating heat radiator.

When using the heat radiator over incubators, care must be taken to ensure that there is sufficient space between the lower edge of the radiator and heat sensitive material, such as perspex or acrylic glass. The distance must not be less than 50cm. Set the heating power to a maximum of Level 3.

Care should be taken to ensure that the upper portion of the stand and radiant warmer is supported before the height adjuster locking knob is released and the stand height altered.

If the radiator housing is removed, there is a danger of electric shock. Only trained personnel should carry out maintenance and servicing.

2. Definitions & Symbols.

Note, Important, Caution and Warning.

Note : The remark "Note" is used in the text to indicate procedures or conditions which might otherwise be overlooked or incorrectly understood. A note may also be used to clarify apparently contradictory or confusing situations.

Important : Similar to note, but used when greater emphasis is necessary.

Caution : The remark "Caution" is used to draw attention to a procedure, which must be followed exactly in order to avoid damaging or destroying the equipment.

Warning: The remark "Warning" is used in the text to draw attention to dangerous situations in connection with the operation, cleaning or maintenance of the equipment if there is a possibility of injury or danger of death to the operator or patient.

Attention : Consult accompanying documents

AC power

Danger! High voltage!

Type B equipment

Attention : Hot surface

I

Power ON

O

Power OFF

3. General.

3.1 Introduction.

This manual contains operator instructions for the erection, use and maintenance of the Ceratherm 600-2 Heat Radiator. Viamed Ltd are not liable for the proper functioning of the heat radiator if it is not operated according to the instructions, if the maintenance recommendations in this manual are not followed or if repairs are carried out using non-approved components.

Only trained personnel should perform calibration and repairs. Maintenance documents are obtainable from Viamed Ltd.

The personnel who work with this heater should read this manual carefully and should fully understand all instructions contained therein. The manual should be kept so that it can be easily inspected; it is advisable to store it in an easily accessible place. Contact Viamed Ltd should you require any further information.

3.2 Technical data.

The technical data for the Ceratherm heat radiator are shown in Table A. All technical data may be changed without prior notice.

Table A.

Current requirement.	220-240V AC 50/60Hz 630W.
Protection class.	1.
Degree of protection.	B. IP 20.
Test provision.	IEC 601-2 TUV / CE.
Size.	Width 21cm, Length 55cm, Height 90cm.
Weight.	4.9 Kg (heat radiator only).
Trolley.	Width 61cm, Length 82cm, Height 10cm.
Upright tube.	170 / 195cm maximum height.
Height adjustment.	25cm.
Swivel range of the arm.	45°.

4. Operating Instructions.

4.1 Structure and use.

The heat radiator is intended for warming baby changing tables and for maintaining the body temperature of infants. The built-in ceramic radiator has very good radiation properties and generates invisible infrared radiation in the region of 3 micro/M. The skin very readily absorbs this radiation spectrum and the patients' skin colour is not altered.

4.2 General description.

Refer to front / rear diagrams and Table B on page 7.

The Ceratherm 600-2 heat radiator has 4 heat output settings, which can be individually set in the range 20% - 99%.

These output settings are indicated by the yellow indicator's (1 - 4). Only one heat output settings can be active during operation. The choice of output setting is made by pressing the reverse button (5) or the forward button (6). The heating monitor indicator (10) lights when the element is being heated.

When the unit is switched on, a time interval begins. After 15 minutes a 5 second audible alarm and continuous visual alarm (flashing red indicator 7) are triggered. 8 seconds later, the heat output of the radiator reduces to a pre-set value (the safety setting), with a corresponding change in the duty cycle* of heating monitor indicator. If the alarm is cancelled with button (7), the time interval starts again and the heat radiator returns to the original heat output setting. Alarm cancellation also deactivates the flashing red alarm.

(*) Duty Cycle : the relative length of time when the heating monitor indicator is lit compared to the length of time when it is unlit.

4.3 Wall mounting.

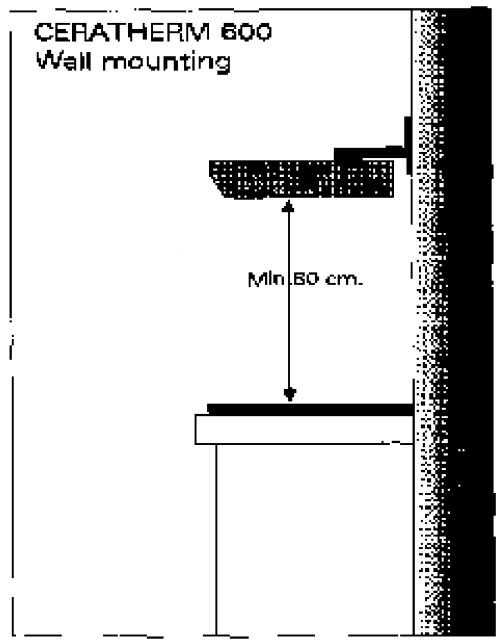
After removing the packaging, compare the instrument data on the type plate with the available connection data. Electrical connection is via a 220V AC 50/60 Hz mains socket and a 6A connected load.

The wall holder (fixed or movable) must be fastened in solid masonry (chalky sandstone, brickwork or concrete) with suitable wall plugs and screws.

Mount the radiator in such a way that there is a distance of at least 80cm and not more than 100 cm between the surface on which the patient lies and the lower edge of the radiator.

WARNING!

The distance between the surface on which the patient lies and the lower edge of the radiator must not be less than 80cm. If this instruction is not observed, prolonged exposure to heat radiation may cause burns.



Mounting possibilities.

Wall mounting with fixed holder.
Wall mounting with moveable arm.
Ceiling stand with rotatable extension arm.
Wall stand with pivotable extension arm.
Special version.

4.4 Start up.

1. Switch main heater switch (9) to ON.
The heater is now switched on.

2. Using the forward and reverse buttons (6 and 5), set the desired heat output to level 1 to 4.
The current heat output setting is shown by lit yellow indicator 1, 2, 3 or 4.
After about 5 - 10 minutes, the treatment surface will have been preheated.

Note : The heat output of the radiator is set to zero when the reverse button is repeatedly pressed until all yellow indicators (1 - 4) are extinguished.

3. Set the light switch (8) to ON.
The non dazzling halogen light is used for illuminating the treatment area.

4.5 Setting the heating power.

The heat output can be set in accordance with actual requirements using the four heat output settings (1 - 4). The factory set levels corresponds to the following settings :

Level 1 = 25%	Level 2 = 50%	Level 3 = 75%	Level 4 = 99%

The heating output of the individual steps 1 - 4 can be set for special applications, e.g. :

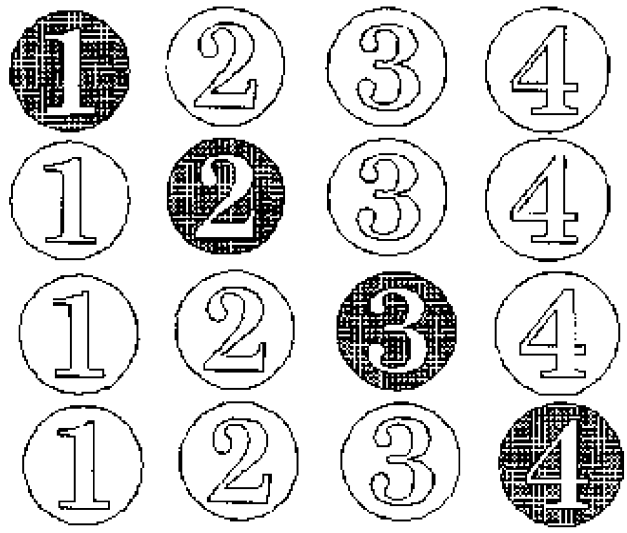
Level 1 = 20%	Level 2 = 40%	Level 3 = 60%	Level 4 = 80%

Level 1 = 25%

Level 2 = 50%

Level 3 = 75%

Level 4 = 99%



The various power levels can be used as follows :-

Level 1 : To keep the support surface warm for continuous operation.
Level 2 : For normal operation on changing and examination areas.
Level 3 : Additional warmth for resuscitation, for the labour room or for the operating theatre.
Level 4 : For increased heat in the operating theatre, during anaesthesia or for adults.

4.6 LED heating indicator.

When the LED heating indicator (10) is lit, the radiator element is being heated. When high heat levels are selected, the LED heating indicator is lit for a longer period of time than when lower heat levels are selected. The relative time that the LED heating indicator is on compared to when it is off, reflects the level of heat being generated by the radiator.

4.7 Alarm monitoring.

When the unit is switched on, a time interval begins which after 15 minutes triggers a 5 seconds audible alarm and a continuous visual alarm by flashing alarm indicator (7).

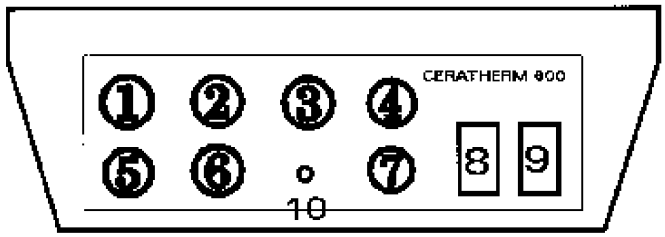
The alarm can be cancelled with the red button (7), causing the alarm indicator to extinguish and the audible alarm signal to stop (if cancellation is carried out within the 5 second audible alarm period). If the alarm is not cancelled within 8 seconds, the heat output of the radiator is reduced to a pre-set value (the safety setting - factory set to 20%). The red alarm indicator flashes continuously.

WARNING!
A child must not be left unattended on a bed with radiator switched on.

4.6 Controllers, displays and connections.

This section of the manual describes the controllers, displays and connections of the Ceratherm 600-2 heat radiator.

Front



Rear

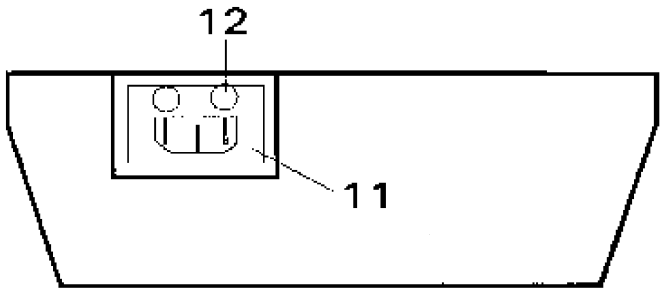


Table B.

Part no.	Designation	Function
1, 2, 3 & 4	Yellow LED	Display of selected output setting
5 & 6	Forward / reverse buttons	Buttons for selecting output setting
7	Alarm button	Display and reset button for alarm
8	Lighting switch	Switching on halogen light
9	Main on / off switch	Switching unit on and off
10	LED heating indicator	Display indicating that heating is active
11	Unit supply socket	Socket for 220/240V 50Hz connection
12	Fuses	Mains fuses, 2 x 3.15Amp.

5. Ceratherm 600-2 Mobile Heat Radiator.

5.0 Scope of delivery of standard version.

The delivery consists of the following individual parts :-

- Trolley with 3 castors (not anti-staticas standard).
- Bottom tubular stand with fastening flange.
- Top tubular stand with articulating arm, locking device, mains cable and fastening flange.

Ceratherm 600-2 heat radiator completely assembled and ready for use.

5.1 Structure and use.

The mobile radiator is used for warming baby changing tables and resuscitation stations, for additional heat supply in incubators and for adults in operating theatre and during anaesthesia. The built-in ceramic radiator has very good radiation properties and generates invisible infrared radiation in the region of 3 micro/M. The skin very readily absorbs this radiation spectrum and the patients' skin colour is not altered.

The radiation intensity can be adjusted in four stages from 25% to 99% by using the forward and reverse selectors (5 & 6), selecting heat output settings shown by lit indicators 1 - 4.

5.2 Assembling the mobile version.

After removing the packaging, check the individual parts for any damage occurring during transport and compare with the packing list.

1. Mount the lower tubular stand (item C) with the flange and four bolts facing downward on the trolley (item A). The tube reinforcement should be at the back.

2. Screw the four nuts and sprung washers on the lower side of the trolley (item A) onto the four bolts and tighten with an appropriate spanner.

3. Turn the securing screw (item 5) and the star grip for locking (item 4) fully outward by turning to the left.

4. Insert the already mounted upper tubular stand (items 9 & 1) into the lower tubular stand. Ensure that the milled nut is fitted on the side of the securing screw.

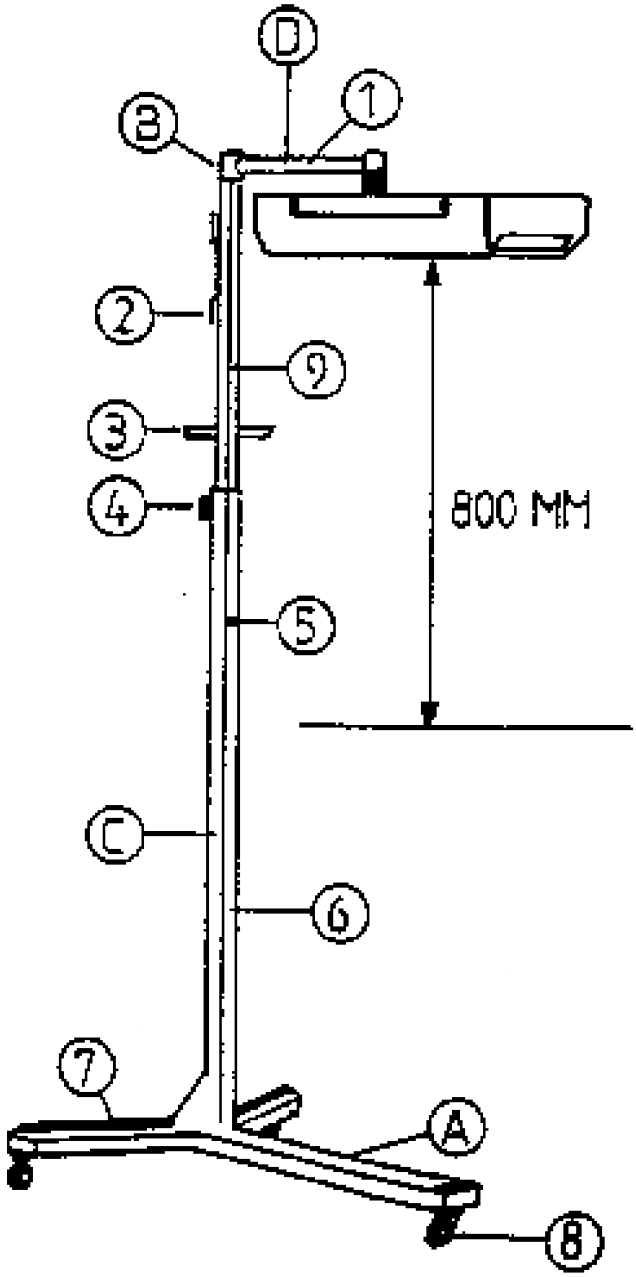
5. The securing screw (item 5) can now be tightened. The tubular stand (item 9) must now only be moved within the groove length. It is essential to check whether the tubular stand is limited at it's highest position and cannot be pulled out any further. Tighten the tubular stand in it's lowest position with the star grip.

6. Fasten the radiator on the flange of the stand arm with the four hexagonal socket screws.

7. Insert the instrument plug on the 220V AC mains cable into the socket on the back of the radiator.

8. After assembly, the mechanical and electrical functioning of the instrument should be checked.

9. The radiator is stared up according to Section 3.1 of the Operating Instructions.



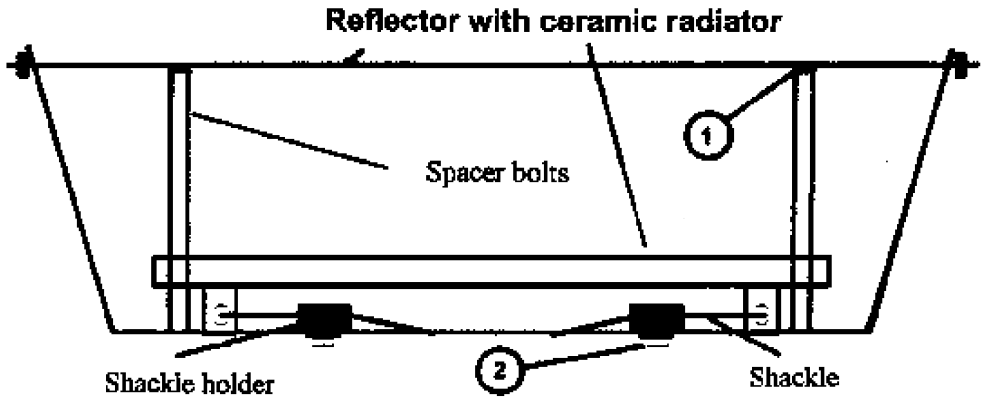
6. Repair and Maintenance.

6.0 Heating.

If the ceramic heating element becomes defective, the housing must be dismantled from the chassis. For that purpose, release the heating screws (x6).

WARNING!

The heating element may be hot. Do not touch the exposed element. Wait 15 minutes for the element to cool down before touching the surface.



Then release the socket head screws (item 1) which carry the reflector on the spacer bolts. The heating element leads, which are secured to the ceramic terminals must also be detached. After removing the earthing cable, release the two socket head screws (item 2) to separate the shackle holder from the reflector. The heating element can then be removed vertically from the reflector. Replace the heating element.

Reassembling.

the shackles must first be secured onto the heating element, the shackle holders placed on the shackles and the element inserted carefully into the reflector and mounted in position.

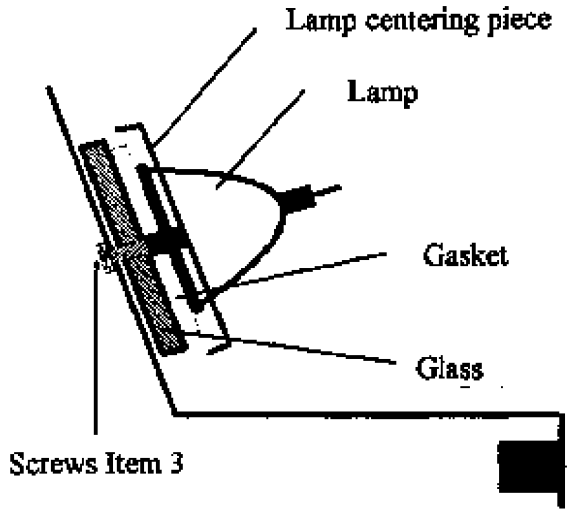
Caution : The screws (item 2) must not touch the heating element.

The reflector is now placed onto the spacer bolts and mounted in position. Push the earthing plug onto the reflector and connect up the two heating element leads again. Reassemble the housing.

To switch on the heating radiator again, proceed as indicated in Section 4.3 of the Operating Instructions.

6.1 Lighting.

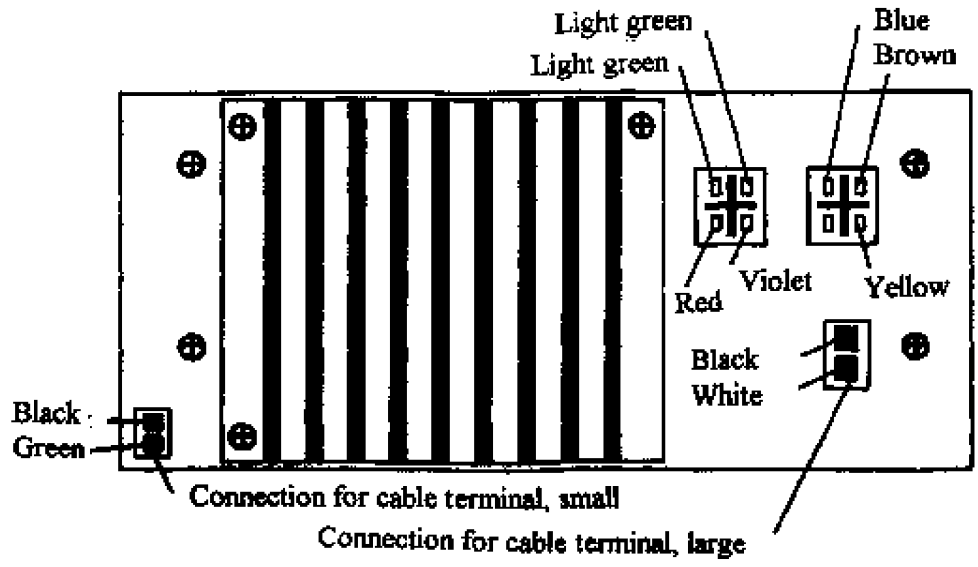
After removing the housing, access to the mounting on which the lamp is fitted is simple. Detach the two screws (item 3) and carefully remove the lamp centring piece with it's contents. To enable the lamp to be detached from the lamp centring piece, the lamp socket must also be removed. The new lamp can now be fitted as shown in the diagram below. When reassembling, make sure that the new lamp glass in the correct position.



6.2 Electronic control.

If the control becomes defective, the housing must be dismantled. To change the control unit, all the AMP plugs must be removed from the heating and light switch, together with the two cable clips. Then release the socket head screws (3 x at front) to enable the front to be removed from the chassis. The complete control unit with the front can now be exchanged. When reassembling, check the cable terminals to make sure that a good contact is obtained.

Control connection diagram (rear view)



6.3 Fuses.

After each repair, the fuses on the instrument socket must be checked and if necessary replaced. There are two slow-acting 3.15A fuses.

6.4 Cleaning and disinfection.

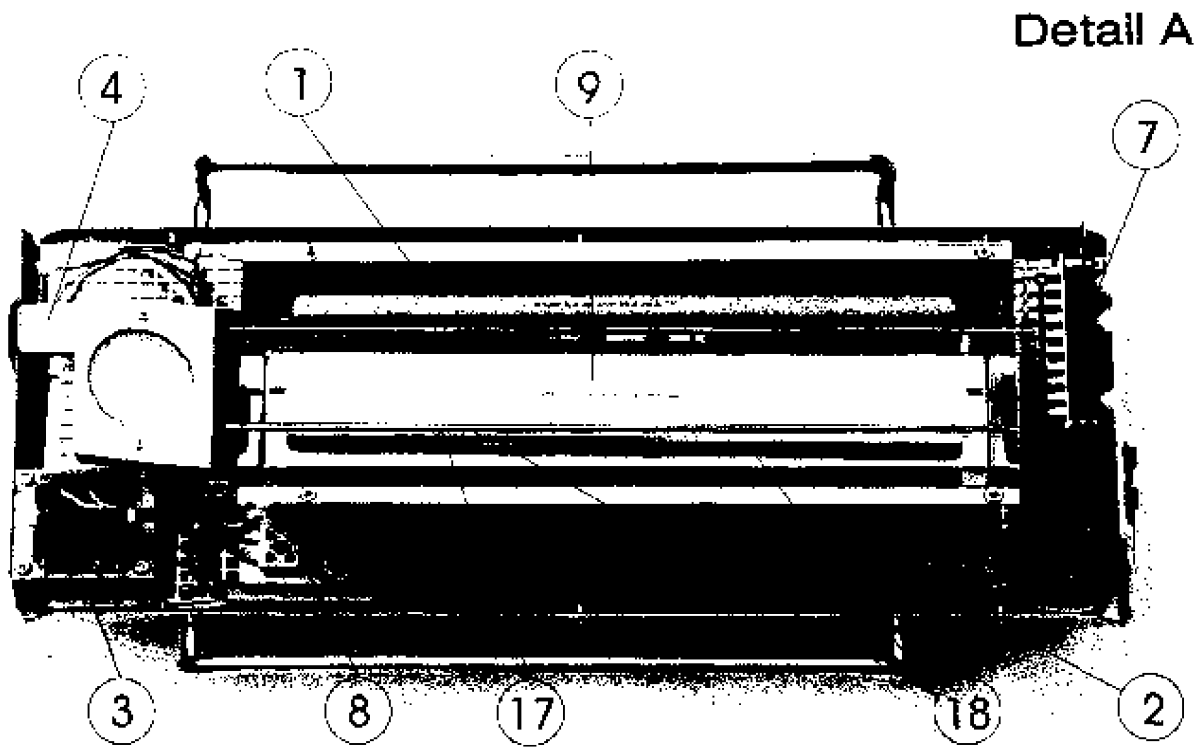
The surfaces should be cleaned with a moist cloth and a cleaning agent or disinfectant. Liquids which enter the instrument may cause damage. After cleaning the surfaces, rub with a dry cloth.

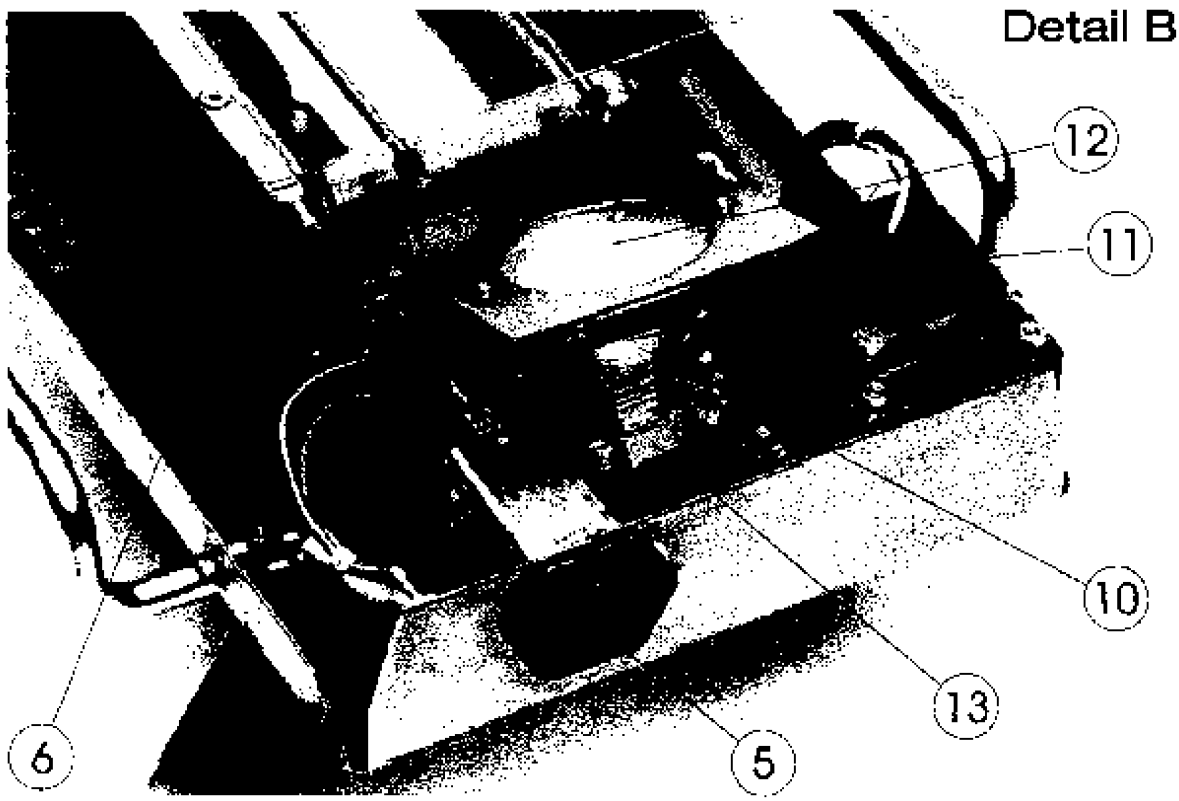
Disinfection should be carried out using only agents which do not attack plastic and aluminium parts. Observe the recommendations of the disinfection manufacturer.

7. Spare Parts List Ceratherm 600-2.

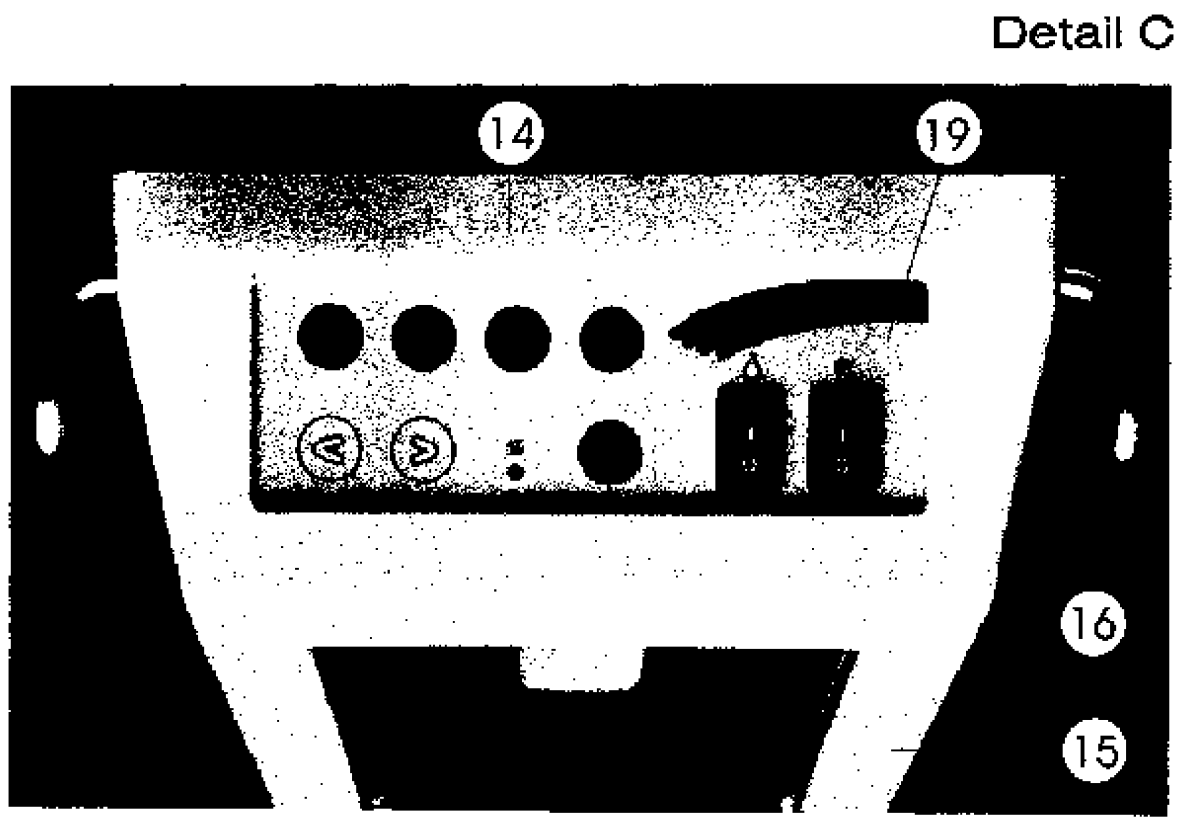
Position	Quantity	Article No.	Item
1	1	521-338001	Chassis with reflector
2	1	521-175001	Cable tree, complete
3	1	521-175502	Transformer, 36VA
4	1	521-175503	Mains input plug
5	2	521-175002	Fuse 3.15AT
6	4	521-965001	Spacer bolt
7	1	521-185001	Electrical control with front
8	2	521-175003	Ceramic terminal, 3 pole
9	1	521-753011	Ceramic heating element 600W
10	1	521-177002	Halogen lamp 12V 20W
11	1	521-965002	Flat gasket for lamp
12	1	521-355001	Protective glass
13	1	521-175004	Lamp socket with cable
14	1	521-965504	Plastic housing
15	2	521-935001	Sticker (side)
16	2	521-338002	Handle
17	2	521-330220	Shackle
18	2	521-330200	Shackle holder
19	1	521-935000	Front foil

Ceratherm 600-2 Warmer Chassis.





Ceratherm 600-2 Housing (Front).



8. Programming (1), (2), (3) & (4) power output levels.

The heat output of the Ceratherm 600-2 can be user set by programming the power levels. Shown below is a guide to programming the output power level for setting (1). If no selections are made in an 8 second period, the heater reverts to normal operating mode.

1. Switch on the unit with switch (9) - all LED's light for about 1 second and alarm beeps.

2. Press the forward and reverse buttons (5 & 6) until output power level (1)* is lit.

3. Setting the decade output power.

Press and hold the alarm indicator / button (7) for approximately 8 seconds until the unit beeps and alarm indicator / button is lit continuously - the output power level indicators (1 - 4) now show the currently memorised decade output power setting for level (1).

Using the forward and reverse buttons (5 & 6), select settings in tens :
e.g. 1 = 1 x 10 = 10%, 2 = 2 x 10 = 20%, etc.
For settings in tens greater than 40%, the illuminated digits are added together :
e.g. 2, 3 & 4 lit = 9 x 10 = 90%.

Example :	To set an output power level of 20%, press the forward and reverse buttons (5 & 6) until the power indicator level (2) is lit.

4. Setting the output power in units.

Press the alarm indicator / button (7) to switch to setting the output power level in units - the output power level indicators (1 - 4) now show the currently memorised output power setting units for level (1).

Using the forward and reverse buttons (5 & 6), select settings in units :
e.g. 1 = 1%, 2 = 2% etc.
For settings in units greater than 4%, the illuminated digits are added together :
e.g. 2, 3 & 4 lit = 9%.

Example :	To set an output power level of 5%, continue pressing the forward and reverse buttons (5 & 6) until the power level indicators (1) and (4) are lit.

5. Press the alarm indicator / button (7), to store the newly set values within 8 seconds.
The system then returns to normal operating mode.

Result in Example :	Power output setting (1) = 25%.

* Program other output power levels by making alternative selections of (2), (3) or (4).

Programming the safety power (version 2.2 onwards).

The safety power of the Ceratherm 600-2 can be user set. The sequence of programming steps is shown below. If no selection is made by the user in an 8 second period, the heater reverts to normal operating mode.

1. Switch on the unit with switch (9) - all indicators light and the alarm sounds for 1 second.
2. Press and hold the alarm indicator / button (7) for approximately 8 seconds until the unit beeps and alarm indicator / button is lit continuously.
Continue to hold the alarm the key until the alarm beeps a further once more.

3. Setting the decade digit for safety power.

Use the forward and reverse buttons (5 & 6) to select the decade digit for safety power :
e.g. 1 = 1 x 10 = 10%, 2 = 2 x 20 = 20%, etc.

For decade powers greater than 40%, the illuminated digits are added together :
e.g. 2, 3 & 4 lit = 9 x 10 = 90%.

Example :	To set the decade digit for safety power to 20%, press the forward and reverse buttons (5 & 6) until the power indicator level (2) is lit.

4. Setting the units digit for safety power.

Press the alarm indicator/button to switch to setting the units digit for safety power.

Use the forward and reverse buttons (5 & 6) to select the units digit for safety power :
e.g. 1 = 1%, 2 = 2%, etc.

For units digit power > 4%, the illuminated numbers are added together.
e.g. 2, 3 & 4 lit = 9%.

Example :	To set the units digit for safety power to 0%, press the forward and reverse buttons (5 & 6) until no power indicator is lit.

5. Press the alarm indicator / button (7), to store the newly set values within 8 seconds. The system then returns to normal operating mode.

Result in Example :	Power output setting (1) = 20%.

Programming alarm activation (version 2.2 onwards).

Note : If stage 0 is active, the alarm cannot be activated.

1. Switch on the unit with switch (9) - all indicators light and the alarm sounds for 1 second.

2. Press and hold the alarm indicator/button (7) for approximately 8 seconds until the unit beeps and alarm indicator / button is lit continuously.
Continue to hold the alarm indicator/button (7) until the alarm beeps a further twice more.

3. Setting the decade digit for power alarm.

Use the forward and reverse buttons (5 & 6) to select the decade digit for power alarm :
e.g. 1 = 1 x 10 = 10%, 2 = 2 x 20 = 20%, etc.

For decade powers greater than 40%, the illuminated digits are added together.
e.g. 2, 3 & 4 lit = 9 x 10 = 90%.

Example :	To set alarm activation from a decade power of 20% (active only above 21%), the keys must be actuated until power indicator (2) is lit.

4. Setting the units digit for power alarm.

Press the alarm indicator/button to switch to setting the units digit for power alarm.

Use the forward and reverse buttons (5 & 6) to select the units digit for power alarm :
e.g. 1 = 1%, 2 = 2%, etc.

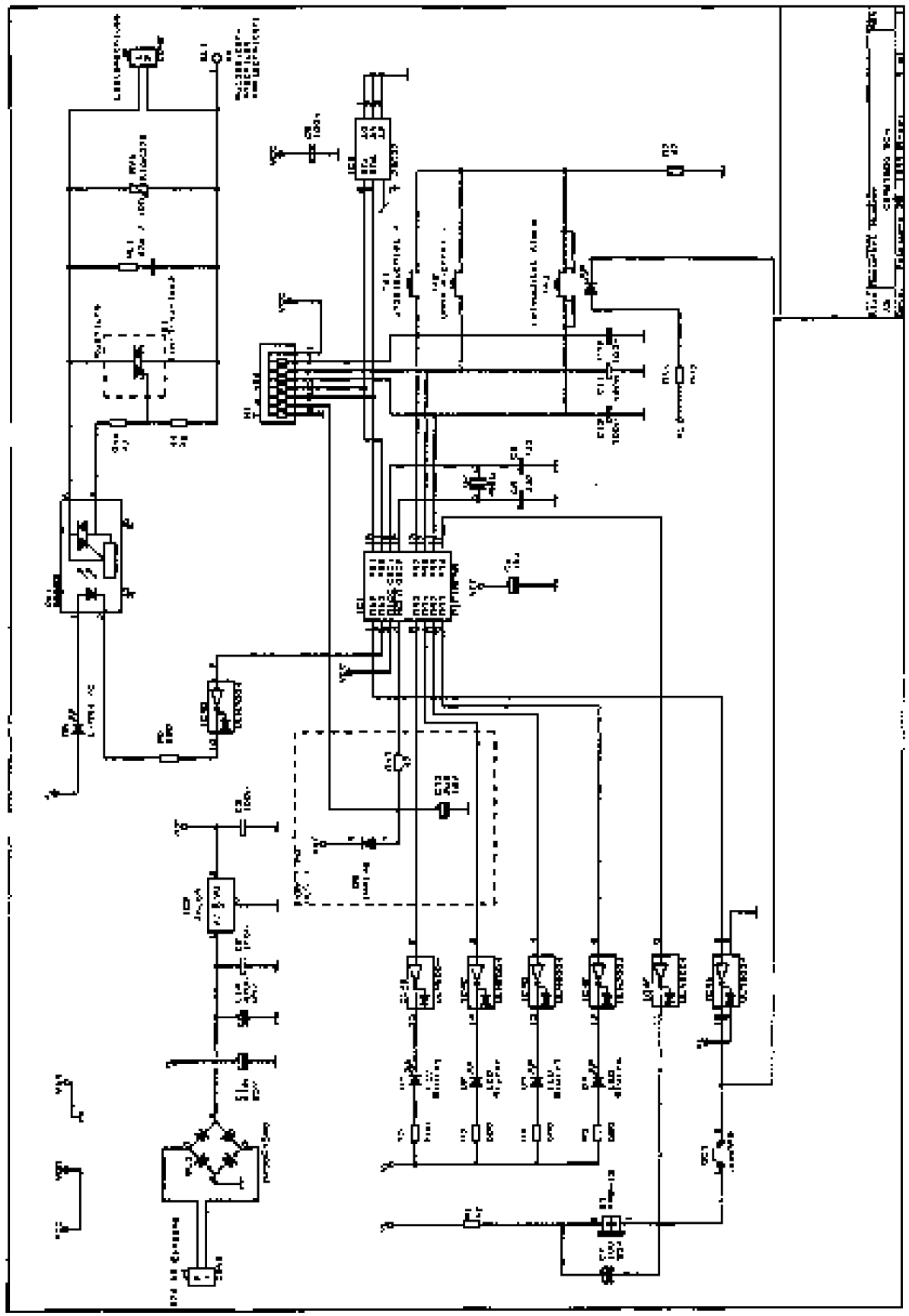
For units digit power greater than 4%, the illuminated numbers are added together.
e.g. 2, 3 & 4 lit = 9%.

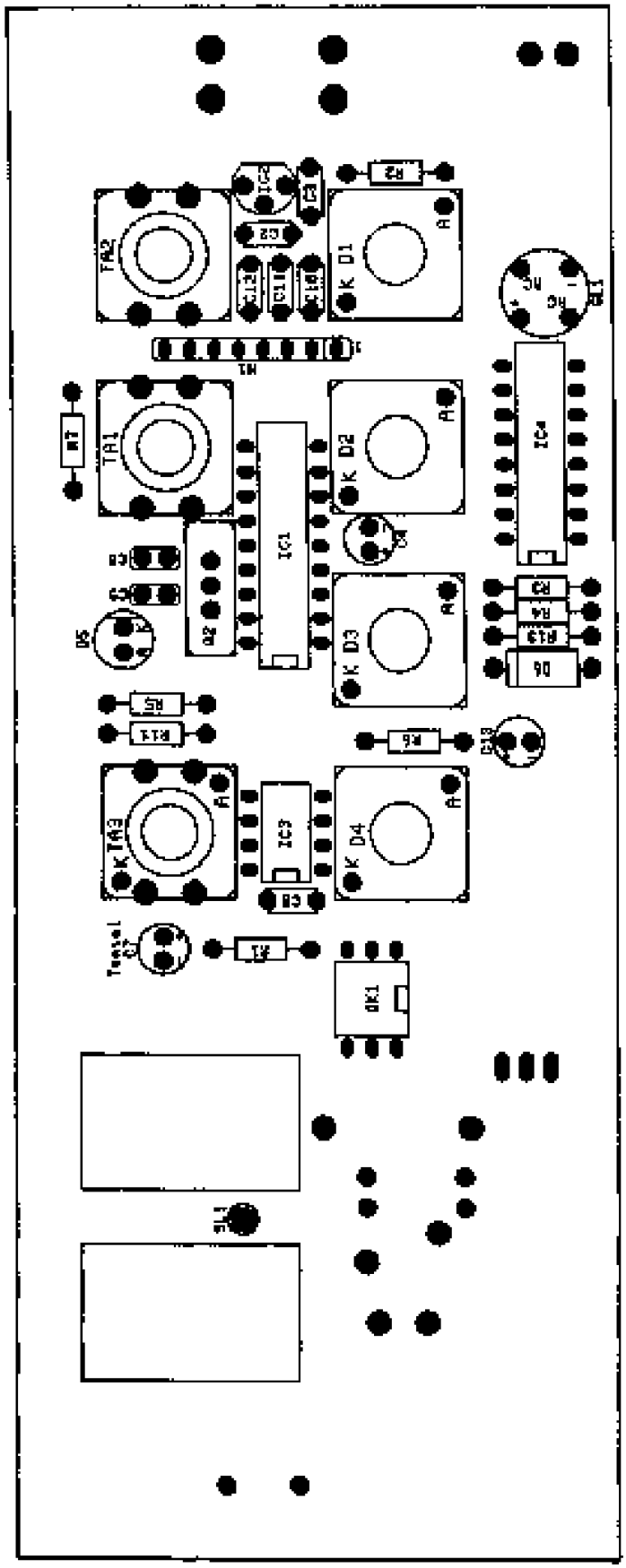
Example :	To set alarm activation from units digit power of 0% (active only above 1%), the keys must be actuated until no power indicator is lit.

5. Press the alarm indicator / button (7), to store the newly set values within 8 seconds.
The system then returns to normal operating mode.

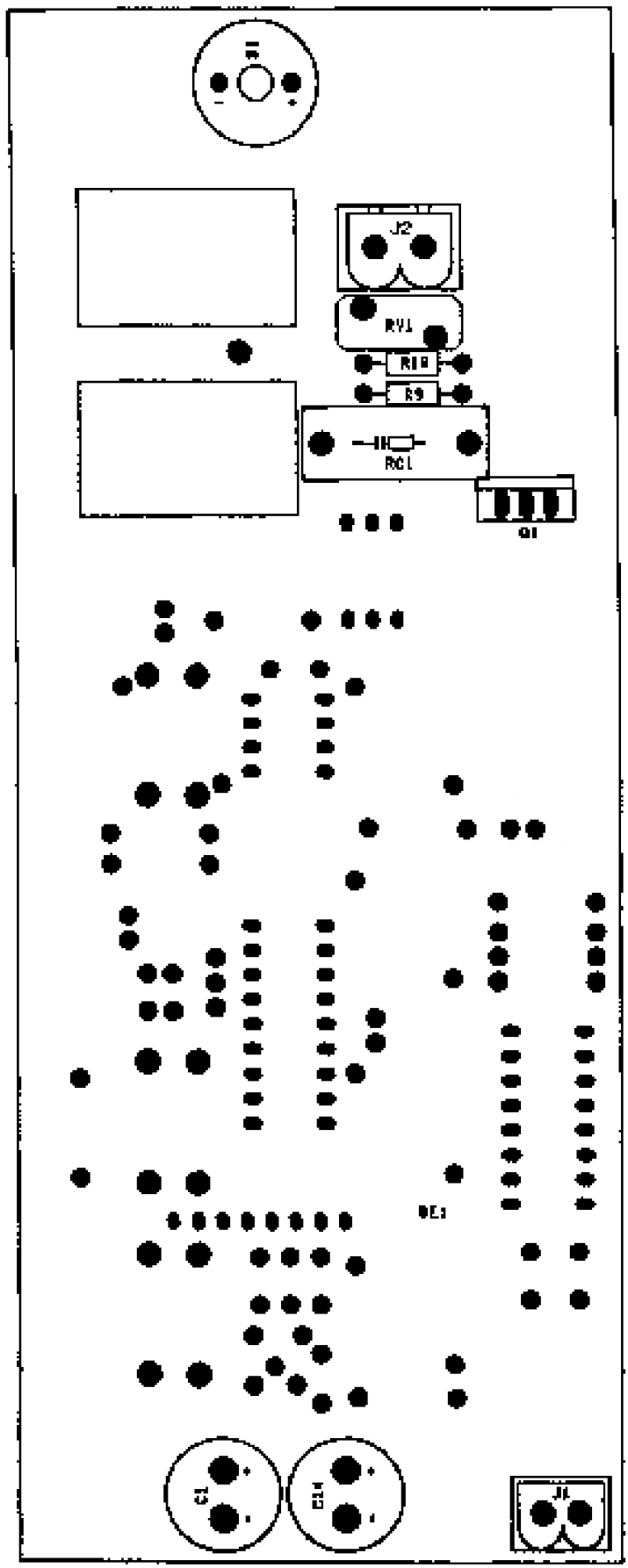
Result in Example :	Alarm activated above 21% power (after 15 minutes).

Note : The values set in examples correspond to the default values on delivery of the unit.





Schematic electronic control board (top-view)



Schematic electronic control board (bottom-view)

9. Company Details.

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