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British Standard

# Medical electrical equipment

Part 2. Particular requirements for safety

## Section 2.25 Specification for servo-controlled infant radiant warmers

Appareils électromédicaux
Partie 2. Règles particulières de sécurité
Section 2.25 Couveuses électriques asservies pour bébés — Spécifications

Elektromedizinische Geräte
Teil 2. Besondere Sicherheitsanforderungen
Abschnitt 2.25 Inkubatoren mit Servoregelung

British Standards Institution

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*Only clauses with text differing from that given in BS 5724 : Part 1 are included in this list.

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## Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Health Care Standards Committee (HCC/-) to Technical Committee HCC/91, upon which the following bodies were represented:

Association of British Paediatric Nurses
Biological Engineering Society
British Anaesthetic and Respiratory Equipment Manufacturers' Association
British Paediatric Association
Department of Health and Social Security
Electro Medical Trade Association Limited
Hospital Physicists Association
Ministry of Defence
Royal College of Midwives

## Amendments issued since publication

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## Publications referred to

BS 5724 Medical electrical equipment
Part 1 Specification for general safety requirements
BS 5969 Specification for sound level meters

## Foreword

This British Standard has been prepared under the direction of the Health Care Standards Committee.

The Technical Committee responsible for this standard has been aware of a suggestion made in 1985 that there may be a link between the incidence of retrolental fibroplasia neonates and the use of infant warmers. In the absence of further medical evidence, the committee decided to recommend the publication of this British Standard, but also to carry out investigations into the spectral irradiance of radiant heaters with a view to writing requirements and test methods for clause **33**. If it is decided that such requirements are justified, it is intended to issue an amendment.

The format used in this British Standard follows that used in other standards in Section 2 of the BS 5724 series which themselves are identical with or based on Parts of IEC 601.

This Particular Standard is one of a series based on BS 5724 : Part 1 and it amends and supplements BS 5724 : Part 1, hereinafter called the General Standard. As stated in **1.3** of the General Standard, the requirements of this Particular Standard take precedence over those of the General Standard.

As in the General Standard the requirements are followed by compliance tests. The numbers of the sections and clauses in this Particular Standard refer to the related sections and clauses in the General Standard. Clauses, sub-clauses or figures that are additional to those of the General Standard are numbered starting from 101 and additional items are lettered (aa), (bb), etc. The changes from the text of the General Standard are specified by the use of the following words.

'Replacement' means that the clause, sub-clause or specified paragraph of the General Standard is replaced completely by the text of this standard.

'Amendment' means that the clause, sub-clause or specified paragraph of the General Standard is amended as indicated by the text of this standard.

Addition' means that the text of this standard is additional to the requirements of the General Standard.

**Terminology and conventions.** The following print types are used in this standard.

Requirements, compliance with which can be tested, and definitions: in roman type.

Explanations, advice, general statements and references: in small roman type.

*Test procedures: in italic type.*

Terms defined in clause 2 of the General Standard and this Particular Standard: small capitals.

NOTE. The titles of the publications referred to in this standard are listed on the inside back cover.

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

British Standard

# Medical electrical equipment

## Part 2. Particular requirements for safety
## Section 2.25 Specification for servo-controlled infant radiant warmers

SECTION ONE – GENERAL

1. **Scope and object**

This clause of the General Standard applies except as follows:

1.1 *Scope*

*Addition:*

This Particular Standard specifies requirements for SERVO-CONTROLLED INFANT RADIANT WARMERS as defined in 2.2.102.

Requirements for INFANT RADIANT WARMERS intended for use outside a hospital baby care environment, NON SERVO-CONTROLLED INFANT RADIANT WARMERS, INFANT RADIANT WARMERS having a heated mattress and INFANT RADIANT WARMERS powered by an INTERNAL ELECTRICAL POWER SOURCE are not included in this Particular Standard.

1.4 *Environmental conditions*

Item *b) Operation*

*1) Environment*

*a)* (including note)

*Replacement:*

An ambient temperature between +20 °C and +30 °C.

2. **Terminology and definitions**

This clause of the General Standard applies except as follows:

*Replacement:*

2.1.5 *APPLIED PART*

All parts accessible to the infant.

*Additional definitions:*

2.1.101 *SKIN TEMPERATURE SENSOR*

A sensing device, part of the INFANT RADIANT WARMER, comprising one or more transducers which measures and provides for an indication of the infant's skin temperature.

2.1.102 *CORE TEMPERATURE SENSOR*

A sensing device, part of the INFANT RADIANT WARMER, comprising a transducer which measures and provides for an indication of the infant's internal temperature.

2.1.103 *TEST DEVICE*

A totally matt blackened disc used as a reproducible receiver of radiant energy during testing of the INFANT RADIANT WARMER. (See figure 101.)

2.1.104 *TEST LOAD*

An array of five TEST DEVICES used in a specified configuration (see figure 102) for performance tests of the INFANT RADIANT WARMER.

2.2.101 *INFANT RADIANT WARMER*

An electrically powered device intended to maintain a thermal balance of an infant PATIENT by direct radiation of energy in the infra-red region of the electromagnetic spectrum.

2.2.102 *SERVO-CONTROLLED INFANT RADIANT WARMER (Hereafter referred to as EQUIPMENT)*

An INFANT RADIANT WARMER which automatically varies its power output to maintain the temperature measured by the SKIN TEMPERATURE SENSOR close to a value set by the USER.

2.2.103 *NON SERVO-CONTROLLED INFANT RADIANT WARMER*

An INFANT RADIANT WARMER in which MANUAL CONTROL is the only mode of operation.

2.2.104 *MANUAL CONTROL*

A mode of operation in which the heater output is a proportion of its maximum output when its control is set by the USER.

2.10.101 *STEADY TEMPERATURE CONDITION*

A condition which is reached when the temperature measured at the centre of the TEST DEVICE positioned on the mid point of the EQUIPMENT mattress does not vary by more than 1 °C over a period of 1 h.

2.10.102 *TEST DEVICE AVERAGE TEMPERATURE* ($T_1, T_2, \ldots T_M$)

The average temperature reading taken during a STEADY TEMPERATURE CONDITION at regular intervals at the centre of a TEST DEVICE.

2.10.103 *MID POINT AVERAGE TEMPERATURE* ($T_M$)

The TEST DEVICE AVERAGE TEMPERATURE of the TEST DEVICE positioned at the mid point of the EQUIPMENT mattress.

2.10.104 *CONTROL TEMPERATURE*

The temperature set at the temperature control.

Clause 3 of the General Standard applies.

## 4. General requirements for tests

This clause of the General Standard applies except as follows:

4.5 *Ambient temperature, humidity, atmospheric pressure*

Item *a)*

*Amendment:*

In line 3 replace '*an ambient temperature within the range 15 °C to 35 °C*' by '*an ambient temperature within the range 20 °C to 30 °C*'.

4.6 *Other conditions*

*Additional item:*

*aa) During tests the CONTROL TEMPERATURE shall always exceed the ambient temperature by at least 3 °C.*

## 5. Classification

This clause of the General Standard applies except as follows:

5.1 *Amendment:*

In item *a)* delete '– CLASS III EQUIPMENT'.

Delete item *b)*.

5.6 *Amendment:*

Delete all items except for ' – CONTINUOUS OPERATION'.

## 6. Identification, marking and documents

This clause of the General Standard applies except as follows:

6.3 *Marking of controls*

*Additional item:*

*aa)* Means shall be provided for the clear selection and indication of CONTROL TEMPERATURE on or adjacent to the controls. The means provided shall allow resolution at intervals not greater than 0.2 °C.

6.7 *Indicator lights and push-buttons*

*Additional item:*

*aa)* Where indicator lamps are incorporated as a warning of danger or an indication of the need for urgent action they shall be red.

6.8 *Accompanying documents*

6.8.2 *Instructions for use*

*Additional item:*

*aa)* The instructions for use shall additionally contain the following.

1) A statement that it is inadvisible to leave an infant unattended under the EQUIPMENT.
2) Recommendations on the permissible distances between the EQUIPMENT heating system and any mattress used with it.
3) Instructions on the recommended positions and methods of use and attachment of the temperature sensors provided for use with the EQUIPMENT.
4) Details of the EQUIPMENT alarms and methods by which they should be routinely tested.
5) For type B EQUIPMENT in which the infant might not be isolated from earth, a warning that particular care should be taken to ensure that additional equipment connected to the infant is electrically safe.
6) A recommendation to the USER regularly to inspect latches and closing devices of barriers.
7) A statement of the maximum loads which can be applied to all supports and mounting brackets for ACCESSORIES and ancillary equipment.
8) Information on the recommended method of establishing, in periods between use, acceptable conditions of cleanliness of equipment items and accessories.
9) Information on the effects of detachment of the SKIN TEMPERATURE SENSOR from the PATIENT'S skin on the functioning of the EQUIPMENT.
10) A statement of whether or not detachment of the SKIN TEMPERATURE SENSOR from the PATIENT'S skin is signalled by an alarm.
11) If no alarm for detachment of the SKIN TEMPERATURE SENSOR from the PATIENT'S skin is fitted, a warning of possible hazards to the PATIENT.
12) If applicable, a statement that a tilt of the mattress from the horizontal can affect the performance of the INFANT RADIANT WARMER in respect of the requirements of sub-clause 50.102.
13) A statement that accessories, e.g. for phototherapy, can affect the performance of the INFANT RADIANT WARMER in respect of the requirements of sub-clause 50.102.

Clause 7 of the General Standard applies.

## SECTION TWO – SAFETY REQUIREMENTS

Clauses 8 to 11 of the General Standard apply.

12. **Single fault conditions**

This clause of the General Standard applies except as follows:

*Addition:*

– Failure of a THERMOSTAT;
– Failure of a SKIN TEMPERATURE SENSOR;
– Disconnection of a SKIN TEMPERATURE SENSOR from the EQUIPMENT;
– Failure of the heater control circuit.

## SECTION THREE – PROTECTION AGAINST ELECTRIC SHOCK HAZARDS

Clause 13 of the General Standard applies.

14. **Requirements related to classification**

This clause of the General Standard applies except as follows:

*Amendment:*

14.3 does not apply.

14.4 *Class I, II and III equipment*

*Amendment:*

Amend title to read 'CLASS I AND II EQUIPMENT'.

Item *a)*

*Amendment:*

Amend the 3rd line to read 'requirements of CLASS I OR II EQUIPMENT (see figures 2 and 3)'.

*Amendment:*

14.5 does not apply.

Clauses 15 to 18 of the General Standard apply.

19. *Continuous LEAKAGE CURRENTS and PATIENT AUXILIARY CURRENTS*

This clause of the General Standard applies except as follows:

19.2 *Single fault conditions*

Item *a)*

*Addition:*

– Each condition that results in the operation of an alarm.

19.4 *Testing*

Item *h) Measurement of the PATIENT LEAKAGE CURRENT*

Item *9)*

*Addition:*

*For PATIENT LEAKAGE CURRENT from and to the mattress, the foil shall have an area equal to the area of the mattress.*

Item *j) Measurement of the PATIENT AUXILIARY CURRENT*

*Addition:*

101 *The PATIENT AUXILIARY CURRENT shall also be measured between the foil on the mattress, as specified in sub-clause 19.4 h) test 9) of this standard, and any electrically conductive surface accessible to the infant.*

20. **Dielectric strength**

This clause of the General Standard applies except as follows:

20.2 *Particular requirements for EQUIPMENT with an APPLIED PART*

Item B-b

*Amendment:*

This item does not apply.

Item B-d

*Addition:*

The reference voltage shall be a minimum of 250 V.

Item B-e

*Addition:*

The test voltage shall be a minimum of 1500 V.

## SECTION FOUR – PROTECTION AGAINST MECHANICAL HAZARDS

21. **Mechanical strength**

This clause of the General Standard applies except as follows:

*Additional sub-clauses:*

21.101 Supports and mounting brackets for ACCESSORIES and ancillary equipment shall meet the manufacturer's recommended maximum loads.

*Compliance shall be checked by inspection of the ACCOMPANYING DOCUMENTS and the following test:*

*Apply a gradually increasing force so as to act vertically through the centre of supports and mounting brackets, for instance an accessory shelf in an extended position. Increase the force from zero in a 5 s to 10 s interval, until it equals three times the weight of the manufacturer's recommended maximum load and is sustained for a period of 1 min. Report whether the supports and mounting brackets show any permanent deformation.*

21.102 Suitable barriers shall be provided to prevent the PATIENT from falling off the mattress. Such barriers as are intended to be opened or removed to allow access to the PATIENT shall latch in their closed positions and shall remain locked under the test conditions.

*Compliance with the requirements shall be checked by inspection and the following test:*

*Apply to all the barriers ( other than those secured with the use of a TOOL) an outward horizontal force of 20 N to the centre of each barrier for 5 s. Report whether the barriers remain closed.*

Clauses 22 and 23 of the General Standard apply.

24. **Stability and transportability**

This clause of the General Standard applies except as follows:

*Amendment:*

24.3 does not apply.

24.4 *Amendment:*

In item *a)* replace 'shall be provided with the most unfavourable combination of possible detachable parts and accessories' by 'the mounting brackets and shelves shall be unladen'.

Item *c)* does not apply.

*Addition:*

24.101 If the EQUIPMENT is mounted on wheels, the manufacturer shall provide on at least two wheels parking breaks that arrest the EQUIPMENT on a slope of at least 10° to the horizontal.

*Compliance shall be checked by inspection and the following test:*

*Place the EQUIPMENT with its wheels in a locked position and with all accessories fitted, on a plane inclined at an angle of 10 ° to the horizontal. Report whether there is rotation of the wheels.*

Clauses 25 to 28 of the General Standard apply.

## SECTION FIVE – PROTECTION AGAINST HAZARDS FROM UNWANTED OR EXCESSIVE RADIATION

Clauses 29 to 32 of the General Standard apply.

33. **Infra-red radiation**

*Addition:*

No requirement.

NOTE. See foreword.

Clauses 34 to 36 of the General Standard apply.

## SECTION SIX – PROTECTION AGAINST HAZARDS OF EXPLOSIONS IN MEDICALLY USED ROOMS

Clauses 37 to 41 of the General Standard apply.

## SECTION SEVEN – PROTECTION AGAINST EXCESSIVE TEMPERATURES, FIRE AND OTHER HAZARDS, SUCH AS HUMAN ERRORS

42. **Excessive temperatures**

This clause of the General Standard applies except as follows:

42.1 *Amendment:*

In table Xa, under 'Parts' delete 'EQUIPMENT parts which may in NORMAL USE have unintended contact with the PATIENT' and under 'Max. temp.' delete '50'.

42.3 *Replacement:*

The temperature of surfaces accessible to an infant PATIENT on the mattress shall not exceed 40 °C for metal surfaces and 43 °C for other materials when the EQUIPMENT is operating under STEADY TEMPERATURE CONDITION at its maximum CONTROL TEMPERATURE.

Under conditions of warm-up to a STEADY TEMPERATURE CONDITION or that of a SINGLE FAULT CONDITION these surfaces shall not exceed 43 °C for metal or 46 °C for other materials.

Clause 43 of the General Standard applies.

44. **Overflow, spillage, leakage, humidity, etc.**

This clause of the General Standard applies except as follows:

44.3 *Spillage*

*Replacement:*

The EQUIPMENT shall be so constructed that in the event of spillage of water (accidental wetting) no safety hazard shall result from the ingress of water, the equipment shall meet the dielectric strength requirements specified in sub-clauses 20.1 to 20.4 of the General Standard and the EQUIPMENT shall function normally.

*Compliance shall be checked by the following tests:*

*Position the EQUIPMENT in the position of NORMAL USE, with the SKIN TEMPERATURE SENSOR and the CORE TEMPERATURE SENSOR placed at the centre of the upper surface of the mattress.*

*Pour 200 mL of water steadily on the centre of the mattress for a period of 15 s.*

*Inspect for the presence of any water on uninsulated LIVE PARTS and on electrical insulation which is liable to be adversely affected by water. If no water is found, carry out the appropriate dielectric strength tests specified in sub-clauses 20.1 to 20.4 of the General Standard, and if no failure is found, check that the EQUIPMENT functions normally.*

Clause 45 of the General Standard applies.

46. **Human errors**

This clause of the General Standard applies except as follows:

*Additional sub-clauses:*

46.101 Each temperature control, if it has a rotary action, shall be so arranged that a clockwise rotation produces an increase in temperature.

*Compliance shall be checked by inspection.*

46.102 All temperature sensors (including SKIN TEMPERATURE SENSORS and CORE TEMPERATURE SENSORS) shall be clearly marked with their intended function. It shall not be possible to connect a sensor to an inappropriate socket on the EQUIPMENT.

*Compliance shall be checked by inspection.*

Clauses 47 and 48 of the General Standard apply.

49. **Interruption of the power supply**

This clause of the General Standard applies except as follows:

49.2 *Replacement:*

The EQUIPMENT shall be so designed that an interruption and restoration of the power supply does not change the CONTROL TEMPERATURE.

*Compliance shall be checked by switching off and on the SUPPLY MAINS, and inspecting the EQUIPMENT.*

## SECTION EIGHT – ACCURACY OF OPERATING DATA AND PROTECTION AGAINST INCORRECT OUTPUT

50. **Accuracy of operating data**

This clause of the General Standard applies except as follows:

*Additional sub-clauses:*

50.101 The temperature measured by the SKIN TEMPERATURE SENSOR shall be continuously displayed and clearly visible. The temperature displayed shall have an accuracy of ± 0.2 °C. If the display is used to present any other parameter this shall only be obtained on demand using a momentary action switch. The range of displayed temperature shall be at least 30 °C to 40 °C.

*Compliance shall be checked by inspection and the following test:*

*Immerse the SKIN TEMPERATURE SENSOR in a water bath maintained at 36 ± 0.1 °C. Position a calibrated thermometer accurate to within 0.05 °C with its bulb adjacent to the SKIN TEMPERATURE SENSOR. Compare the reading of the calibrated thermometer with that of the displayed temperature.*

50.102 The difference between the MID POINT AVERAGE TEMPERATURE and the TEST DEVICE AVERAGE TEMPERATURE of any of the other devices comprising the TEST LOAD shall not exceed 2 °C.

*Compliance shall be checked by the following test:*

*Prepare five TEST DEVICES consisting of aluminium discs each with a mass of 500 ± 10 g and a diameter of 100 ± 2 mm.*

*Drill 5 mm diameter holes 54 mm deep as shown in figure 101 and coat the entire disc surface with non-reflective black paint.*

*NOTE. The disc thickness will be approximately 23 mm.*

*Subject the EQUIPMENT to the following test in a room in which the maximum air velocity is 0.1 m/s and the ambient temperature is maintained at 25 ± 3 °C.*

*Place four individually identified TEST DEVICES, marked 1, 2, 3 and 4 on the horizontal mattress at the centres of each of four rectangles formed by bisecting the length and width of the mattress as shown in figure 102. Place a fifth TEST DEVICE marked 'M' on the mid point of the mattress. Insert a temperature sensor in each of the five TEST DEVICE centres and attach the SKIN TEMPERATURE SENSOR to the upper surface of the TEST DEVICE 'M'. Set the temperature control to a CONTROL TEMPERATURE of 37 °C and operate the EQUIPMENT until a STEADY TEMPERATURE CONDITION is obtained. Take at least 20 readings of temperature of each TEST DEVICE at regular intervals over a 60 min period.*

*Calculate the five values of the TEST DEVICE AVERAGE TEMPERATURE for each TEST DEVICE as follows:*

$T_1 = (t_{11} + t_{12} + t_{13} + t_{14} + \ldots t_{1n})/n$

*where:*

$T_1$ = *the TEST DEVICE AVERAGE TEMPERATURE for TEST DEVICE No. 1.*

$t_{11} \ldots t_{1n}$ = *the individual temperature readings taken of TEST DEVICE No. 1 at regular intervals during the STEADY TEMPERATURE CONDITION.*

$n$ = *the number of readings during the STEADY TEMPERATURE CONDITION.*

*Calculate the remaining TEST DEVICE AVERAGE TEMPERATURES $T_2$, $T_3$, $T_4$ and $T_M$ in the same way.*

*Using the values of $T_1$, $T_2$, $T_3$, $T_4$ and $T_M$ thus obtained, calculate the value of:*

$0.2(T_1 + T_2 + T_3 + T_4 + T_M) - T_M$.

50.103 The EQUIPMENT shall be capable of achieving STEADY TEMPERATURE CONDITION and the MID POINT AVERAGE TEMPERATURE shall not differ from the CONTROL TEMPERATURE by more than 0.5 °C.

*Compliance shall be checked during the tests for 50.102.*

Clause 51 of the General Standard applies.

## SECTION NINE – FAULT CONDITIONS CAUSING OVERHEATING AND/OR MECHANICAL DAMAGE; ENVIRONMENTAL TESTS

Clauses 52 and 53 of the General Standard apply.

## SECTION TEN – CONSTRUCTIONAL REQUIREMENTS

### 54. General

This clause of the General Standard applies except as follows:

*Addition:*

54.101 The maximum CONTROL TEMPERATURE shall not exceed 38 °C.

*Compliance shall be checked by inspection.*

Clause 55 of the General Standard applies.

### 56. Components and general assembly

This clause of the General Standard applies except as follows:

56.6 *Temperature control devices*

Item *a) Application*

*Amendment:*

Delete paragraphs 3, 4 and 5 (dashes 3, and associated note, and 4).

*Addition:* (preceding paragraph 1)

After STEADY TEMPERATURE CONDITIONS have been achieved, any sensed temperature deviation exceeding ± 1 °C about the CONTROL TEMPERATURE shall cause an auditory and visual alarm to operate, and the EQUIPMENT shall switch off in the event of an increase in temperature.

*Compliance shall be checked by inspection and both of the following tests:*

*Test 1*

*Set the CONTROL TEMPERATURE to 36 °C and immerse the SKIN TEMPERATURE SENSOR in a water bath maintained at 36 ± 0.1 °C. Position a calibrated thermometer accurate to within 0.05 °C with its bulb adjacent to the SKIN TEMPERATURE SENSOR. After a steady temperature indication is achieved and maintained for at least 10 min, increase the water bath temperature control setting to 38 °C. Report whether the auditory and visual alarms operate at a water bath temperature not exceeding 37 ± 0.2 °C and whether the EQUIPMENT heater switches off.*

*Test 2*

*As for test 1, but in this instance the temperature control setting of the water bath is reduced from 36 ± 0.1 °C to 34 ± 0.1 °C. Report whether the auditory and visual alarms operate above 35 ± 0.2 °C and the EQUIPMENT heater remains in operation.*

The EQUIPMENT shall not permit the skin temperature of the PATIENT to exceed 40 °C under NORMAL CONDITIONS and each SINGLE FAULT CONDITION.

*Compliance shall be checked by the following test:*

*Place a TEST DEVICE at the centre of the mattress, and with the EQUIPMENT operating under STEADY TEMPERATURE CONDITIONS, apply the SINGLE FAULT CONDITIONS one at a time.*

*Report whether the temperature of the TEST DEVICE does not exceed 40 °C without the operation of the auditory and visual alarms, and disconnection of the heater.*

56.10 *Actuating parts of controls*

Item *b) Fixing, prevention of maladjustment*

*Addition:*

If the relative movement of any control knob and its actuating mechanism can affect the indication of the CONTROL TEMPERATURE, they shall be secured together so as to prevent the possibility of mis-alignment.

Item *c) Limitation of movement*

*Addition* (after paragraph 1):

If rotating knobs are provided for the change of CONTROL TEMPERATURE, the stops provided shall withstand the torques specified in Table XIII of the General Standard.

Clauses 57 to 59 of the General Standard apply.

*Additional section and sub-clauses:*

## SECTION 101 – ADDITIONAL REQUIREMENTS

101. **Alarms**

101.1 *Failure of the supply mains*

Auditory and visual alarms shall be provided to give warning for a minimum of 10 min in the event of failure of the SUPPLY MAINS to the EQUIPMENT.

*Compliance shall be checked by disconnecting from the SUPPLY MAINS while the EQUIPMENT is switched on. Report whether the alarm operates for a minimum of 10 min.*

101.2 *Open and short circuit of the SKIN TEMPERATURE SENSOR*

The EQUIPMENT shall be provided with an auditory and visual alarm which operates in the event of the SKIN TEMPERATURE SENSOR having either open circuit or short circuit leads.

Both open and short circuit leads shall disconnect the supply to the heater.

*Compliance shall be checked by simulating both fault conditions and observing the effect.*

101.3 *Detachment of the SKIN TEMPERATURE SENSOR*

NOTE. The EQUIPMENT should be provided with an auditory and visual alarm which operates when the SKIN TEMPERATURE SENSOR is detached from the infant's skin.

1.4 *Sound pressure level*

101.4.1 Auditory alarms shall produce an A-weighted sound pressure level of at least 65 dB at a distance of 3 m from and perpendicular to the front of the EQUIPMENT. Other than the muting specified in 101.5, the auditory alarm shall not to be adjustable without the use of a TOOL.

*Compliance shall be checked by inspection and measurement of the auditory alarm sound pressure level using a sound level meter complying with the requirements for type III specified in BS 5969 placed 1.5 m above the floor and 3 m from the front of the EQUIPMENT. Ensure that the background A-weighted sound pressure level is at least 10 dB below the measured levels.*

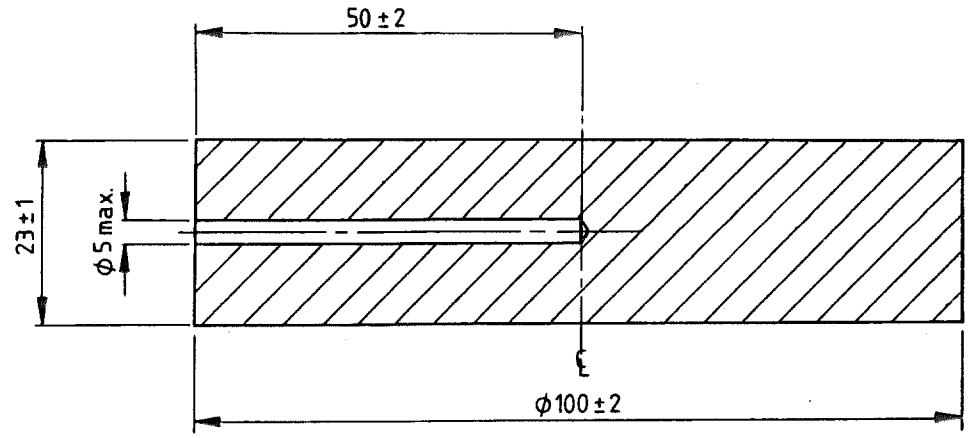
101.4.2 If EQUIPMENT incorporates a MANUAL CONTROL, a re-settable auditory and non-re-settable visual alarm shall operate within 15 min when using this mode. Following the re-setting of the auditory alarm, it shall sound again within a period of 15 min. This sequence shall continue until the MANUAL CONTROL mode is changed.

*Compliance shall be checked by inspection, operating the EQUIPMENT and timing the alarm.*

101.5 *Muting*

With the exception of the alarm specified in 101.1, the auditory alarm shall be capable of being muted or switched to a lower sound pressure level but automatically restored to a full value after not more than 6 min. The visual indication shall continue after the alarm has been muted.

*Compliance shall be checked by inspection, operating the EQUIPMENT and timing the alarm.*




Surface finish: non-reflective black paint
Disc mass: 500 ± 10 g
Disc material: aluminium of density within the range 2.6 g/cm³ to 2.9 g/cm³

All dimensions are in millimetres.

FIG. 101 – Test device

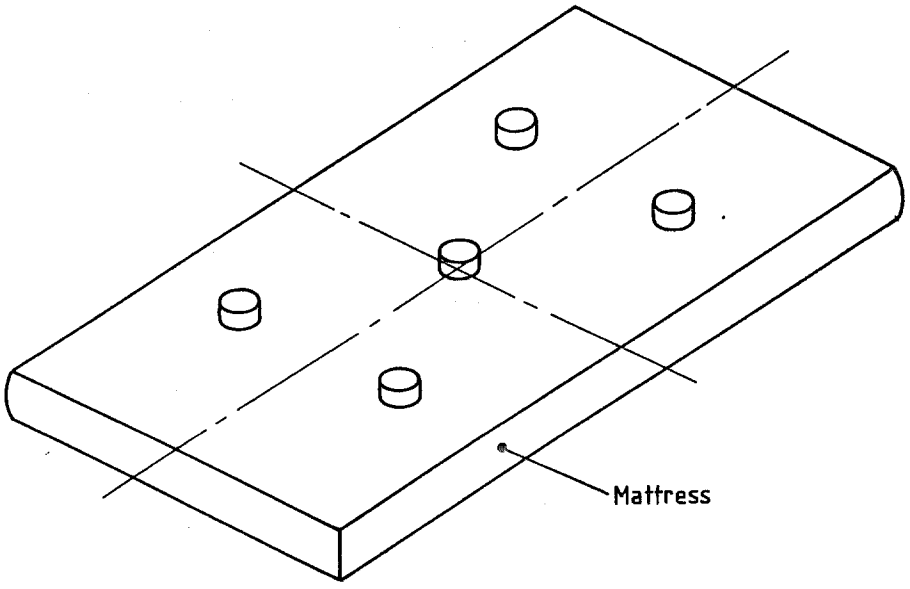



FIG. 102 – Layout of test devices