

Australian/New Zealand Standard™

Medical electrical equipment

Part 2.38: Particular requirements for safety—Electrically and manually operated medical beds for adult use (IEC 60601-2-38, Ed.1.0(1996) MOD)



AS/NZS 3200.2.38:2007

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee HE-027, Hospital Beds. It was approved on behalf of the Council of Standards Australia on 20 September 2007 and on behalf of the Council of Standards New Zealand on 2 November 2007.

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Australian/New Zealand Standard™

Medical electrical equipment

Part 2.38: Particular requirements for safety—Electrically and manually operated medical beds for adult use (IEC 60601-2-38, Ed.1.0(1996) MOD)

Originated as AS/NZS 3200.2.38:1997.
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee HE-027, Hospital Beds to supersede AS/NZS 3200.2.38:1997, *Approval and test specification—Medical electrical equipment, Part 2.38: Particular requirements for safety—Electrically operated hospital beds*.

The objective of this revision is to incorporate IEC Amendment No. 1:1999, which includes safety requirements for side rails and prevention of entrapment, and to introduce variations for Australian/New Zealand use.

The principal differences between this Standard and the 1997 edition are as follows:

- (a) Mechanical bed requirements have been included.
- (b) Emergency back rest requirements have been specified.
- (c) Tests for side rail safety and patient entrapment have been included.

This Standard is an adoption with national modifications and has been reproduced from IEC 60601-2-38, Ed.1.0(1996), *Medical electrical equipment – Part 2-38: Particular requirements for the safety of electrically operated hospital beds*, incorporating its Amendment 1:1999, and has been varied as indicated to take account of Australian/New Zealand conditions.

Variations to IEC 60601-2-38, Ed.1.0(1996) are indicated at the appropriate places throughout this Standard. Strikethrough (~~example~~) identifies IEC text, tables and figures which, for the purposes of this Australian/New Zealand Standard, are deleted. Where text, tables or figures are added, each is set in its proper place and identified by shading (**example**). Added figures are not themselves shaded, but are identified by a shaded border.

National variations for use in Australia and New Zealand are listed also in Appendix ZZ, for easy reference. Appendix ZA contains additional references.

IEC 60601-2-38 modifies and supplements the corresponding clauses of IEC 60601-1:1988, *Medical electrical equipment – Part 1: General requirements for safety*, which has been adopted as AS/NZS 3200.1.0:1998, *Medical electrical equipment, Part 1.0: General requirements for safety—Parent Standard* and is hereinafter referred to as the General Standard. The requirements of a Particular Standard take priority, where appropriate, over those of the General Standard.

The General Standard details electrical safety requirements for the design and manufacture of medical electrical equipment which makes physical or electrical contact with the patient. A Particular Standard details additional safety requirements for a medical device or related group of medical devices. A Collateral Standard details additional safety requirements for a range of devices within the scope of the General Standard which may not be related but share common problems.

It is recommended that, to interpret a Particular Standard or a Collateral Standard, a copy of the General Standard should be readily available.

As this Standard is reproduced from an International Standard, the following modifications apply:

- (i) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (ii) A full point should be substituted for a comma when referring to a decimal marker.

In this Standard, the following print types are used:

- (A) Requirements, compliance with which can be tested and definitions: in arial type.
- (B) Test specifications: *in italic type*.
- (C) Notes, explanations, advice, introductions, general statements, exceptions and references: in smaller arial type.
- (D) Terms defined in Clause 2 of the Parent Standard, AS/NZS 3200.1.0 or this Particular Standard: SMALL CAPITALS.

An asterisk (*) is placed before each clause for which rationale is included in Annex AA.

The terms 'normative' and 'informative' are used to define the application of the annex or appendix to which they apply. A normative annex or appendix is an integral part of a standard, whereas an informative annex or appendix is only for information and guidance.

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Australian/New Zealand Standard**Medical electrical equipment****Part 2.38: Particular requirements for safety—Electrically and manually operated medical beds for adult use (IEC 60601-2-38, Ed.1.0(1996) MOD)**

Any table, figure or text of the international standard that is struck through is not part of this standard. Any Australian/New Zealand table, figure or text that is added is part of this standard and is identified by shading.

Section one – General

The clauses and subclauses of this section of the General Standard apply except as follows:

1 Scope and object

This clause of the General Standard applies, except as follows:

1.1 Scope

Addition:

This Particular Standard specifies requirements for the design, manufacture and safety of electrically operated and manually operated medical beds, herein referred to as BED, as defined in 2.2.101, for general adult use in a range of health and community care environments. It applies to beds in general use in a full range of environments where patients or residents may be cared for, or supervised by, health care professionals.

~~This Particular Standard specifies requirements for safety of ELECTRICALLY OPERATED HOSPITAL BEDS, hereinafter referred to as BED, as defined in 2.2.101.~~

1.2 Object

Replacement:

The object of this Particular Standard for BEDS is to keep the SAFETY HAZARDS to PATIENTS, OPERATORS, and the environment as low as possible, and to describe tests to verify that these requirements are attained.

1.3 Particular Standards

Addition:

This Particular Standard amends and supplements a set of IEC publications, hereinafter referred to as “General Standard”, consisting of IEC 60601-1: 1988, *Medical electrical equipment – Part 1: General requirements for safety*, amendment 1, amendment 2 and IEC 60601-1-1: 1992, *Medical electrical equipment – Part 1 : General requirements for safety – 1. Collateral Standard: Safety requirements for medical electrical systems*.

For brevity, IEC 60601-1 is referred to in this Particular Standard either as the “General Standard” or as the “General Requirement(s)”, and IEC 60601-1-1 as the “Collateral Standard”.

The term “this Standard” covers the Particular Standard, used together with the General Standard and any Collateral Standards.

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The numbering of sections, clauses and subclauses of this Particular Standard corresponds with that of the General Standard. The changes to the text of the General Standard are specified by the use of the following words:

“Replacement” means that the clause or subclause of the General Standard is replaced completely by the text of this Particular Standard.

“Addition” means that the text of this Particular Standard is additional to the requirements of the General Standard.

“Amendment” means that the clause or subclause of the General Standard is amended as indicated by the text of this Particular Standard.

Subclauses or figures which are additional to those of the General Standard are numbered starting from 101, additional annexes are lettered AA, BB, etc., and additional items *aa*), *bb*), etc.

Clauses and subclauses to which there is a rationale are marked with an asterisk *. These rationales can be found in an informative annex AA. Annex AA should be used in determining the relevance of the requirements addressed, but should never be used to establish additional test requirements.

Where there is no corresponding section, clause or subclause in this Particular Standard, the section, clause or subclause of the General Standard or the Collateral Standard applies without modification.

Where it is intended that any part of the General Standard or the Collateral Standard, although possibly relevant, is not to be applied, a statement to that effect is given in this Particular Standard.

A requirement of this Particular Standard replacing or modifying requirements of the General Standard or the Collateral Standard takes precedence over the corresponding General Requirement(s).

2 Terminology and definitions

This clause of the General Standard applies except as follows:

2.1.5 APPLIED PART

Replacement:

All parts of the BED which can intentionally or unintentionally come into contact with the PATIENT, are considered an APPLIED PART. (See figure 111.)

Additional definitions:

2.1.101 PENDANT CONTROL

Means, used by either PATIENT or OPERATOR to control the drives that activate various **electric** BED functions.

2.1.102 SIDE RAIL

Rail mounted to both sides of the BED which, when located in the “up” position, identifies the edge of the MATTRESS SUPPORT PLATFORM and by doing so, reduces the risk of the PATIENT accidentally slipping or rolling off the mattress.

2.1.103 CONTROL SIDE RAIL

SIDE RAIL which incorporates BED function controls for PATIENT activation.

2.1.104 INTEGRATED PATIENT MONITORING/COMMUNICATIONS SYSTEMS CONTROL SIDE RAIL

See 2.1.103. CONTROL SIDE RAIL with the addition of PATIENT/OPERATOR station communication control, and/or PATIENT television/radio entertainment control, and/or PATIENT room lighting control, and/or PATIENT egress detection system, etc.

2.1.105 HEAD/FOOT PANEL ASSEMBLY

Assemblies mounted to BED end which may be used as handles to push the BED.

2.1.106 MOMENTARY CONTACT SWITCH

Control device which initiates and maintains operation of operating elements only as long as the control (actuator) is actuated. The manual control (actuator) returns automatically to the stop position when released. MOMENTARY CONTACT SWITCHES are also known as “hold-to-run control devices”.

2.1.107 MATTRESS SUPPORT PLATFORM

Structural surface on which the PATIENT sleeping surface (for example mattress) rests in NORMAL USE. The MATTRESS SUPPORT PLATFORM articulates or changes positions to facilitate various therapeutic, diagnostic and convenience positions. (See figures 101 and 112.)

***2.1.108 TRENDELENBURG**

With the MATTRESS SUPPORT PLATFORM in the flat position, tilting of the entire MATTRESS SUPPORT PLATFORM a minimum of 12° so that the PATIENT's head is lower than the circulatory centre point of the body.

2.1.109 SQUEEZING and SHEARING POINTS (FOR FINGERS)

Points where the spacing between moveable parts of the BED which in positions of NORMAL USE fail to maintain a clearance of less than or equal to 8 mm, or greater than or equal to 25 mm.

***2.1.110 PATIENT ENTRAPMENT**

The ability for a PATIENT to insert his/her head, neck or chest cavity into a permanent opening in the BED and/or its ACCESSORIES or into a temporary opening created during NORMAL USE, from which the PATIENT cannot remove that portion of his/her anatomy.

***2.2.101 ELECTRICALLY AND MANUALLY OPERATED MEDICAL BEDS (hereinafter referred to as BED) ELECTRICALLY OPERATED HOSPITAL BED (hereinafter referred to as BED)**

BED and its accessories intended for use in the diagnosis, treatment or monitoring of an adult PATIENT whilst under medical supervision.

NOTE – For an explanation of the basis for the definition of ‘adult’, see rationale in Annex AA.

***2.2.102 LIFTING POLE**

Device suspended above the BED and intended to allow the PATIENT to change position by gripping it.

2.2.103 MEDICAL SUPERVISION

Supervision by medical practitioner, registered nurse, occupational therapist or a physiotherapist.

2.2.104 COMMUNITY SETTINGS

Includes residential services and respite care.

2.2.105 RESIDENTIAL AGED CARE FACILITY

Nursing home or hostel.

3 General requirements

This clause of the General Standard applies except as follows:

Addition:

***3.101** If, in order to accomplish other specialized functions which provide benefit to the PATIENT, it is not technically feasible to meet specific requirements in this Particular Standard, the BED shall be accepted only if clear and specific instructions (in the INSTRUCTIONS FOR USE) restrict the NORMAL USE of the BED so that no SAFETY HAZARD exists.

BEDS with active therapeutic/prophylaxis MATTRESS SUPPORT PLATFORM, such as air fluidized, air mattress, or water surfaces and/or INTEGRATED PATIENT MONITORING/COMMUNICATION CONTROL SIDE RAIL are excluded from the requirements of 5.3, 54.101 of this Particular Standard.

Compliance with this requirement is checked by the following test:

If alternative means of construction have been employed or if a requirement of this Particular Standard has not been met, in order to provide benefit to the PATIENT, a risk assessment shall be performed (in accordance with ISO 14971-1) to demonstrate that the overall level of safety has not been compromised.

5 Classification

This clause of the General Standard applies except as follows:

***5.2 Replacement:**

BEDS shall be EQUIPMENT with TYPE B or BF APPLIED PART.

***5.3 Replacement:**

BEDS shall be at least IPX4 in accordance with IEC 60529.

6 Identification, marking and documents

This clause of the General Standard applies except as follows:

6.1 Marking on the outside of EQUIPMENT or EQUIPMENT PARTS

l) Classification

Addition:

- BEDS intended for use with "jet stream" washing machines, high pressure/steam cleaning, etc. shall be so marked.

*u) Mechanical stability

Replacement:

The BED and its ACCESSORIES (intended to support and/or immobilise masses) shall be marked with their own SAFE WORKING LOAD. (See figure 108.)

The marking shall include the name of the manufacturer, year of manufacture, the model name and serial number. Such markings shall be located on non-removable parts and be visible in NORMAL USE.

w) Warnings

Replacement:

When text is used for warning notices, they shall be in the official language of the country where the BED is placed on the market.

Addition:

aa) Emergency back rest

Where an emergency release back rest is fitted, the controls shall be fitted on both sides of the head of the bed, be clearly identifiable with a red label, and be visible from the operator's usual position. Where a function does not meet the requirements of CPR emergency release, it shall not be labelled as such.

bb) Mattress support platform

The mattress support platform shall have a label indicating the size of the mattress required so as to minimize the risk of PATIENT entrapment. The label shall be readily visible by a person standing beside the BED when no mattress is on the BED.

6.4 Symbols

Addition:

- aa) Controls and/or indicators, when possible, should be marked using symbols which will convey the intended function of those controls or indicators without the need for additional text.

NOTE – Figures 107 and 108 are intended as guidelines when designing these symbols. In all cases where standard international symbols exist, they should be used.

6.8.2 Instructions for use

a) General information

Addition:

- Complete instructions for use shall be provided which ensure the safe operation of the BED.
- The instructions for use shall indicate the SAFE WORKING LOAD (sum total mass of the PATIENT, mattress and any other ACCESSORIES) of the BED and its ACCESSORIES intended to support masses and which can be removed during NORMAL USE.
- Mass of the BED.
- Recommended frequency of periodic inspection and maintenance of the BED. It is recommended that frequency of inspection be at least annually.
- If the BED or parts of the BED which can come into contact with the PATIENT are intended for use in jet stream and/or high pressure steam cleaning equipment the permissible range of temperature, spray pressure and allowable chemical application shall be given.
- For BEDS designed for “jet stream” washing machines, high pressure/steam cleaning, which require inspection after the cleaning procedure, the ACCOMPANYING DOCUMENTS shall contain instructions how to ~~ensure~~insure that NORMAL CONDITIONS are still valid.
- Instructions for use shall identify the maximum angles which can be achieved in NORMAL USE by each part of the MATTRESS SUPPORT PLATFORM with reference to horizontal. They shall also identify the maximum and minimum heights from the floor which can be achieved by the MATTRESS SUPPORT PLATFORM in NORMAL USE.
- The instructions for use for the BED shall include a list of all ACCESSORIES which may be attached to or used with the BED.
- The instructions for use shall indicate any restriction with regard to the characteristics of the PATIENT (such as clinical condition, weight or size, etc.) necessary to ~~ensure~~insure safe operation of the BED.
- The instructions for use shall provide a warning that the BED should be left in its lowest position when unattended in order to reduce the risk of injury due to falls whilst getting into or out of the BED, or whilst lying on the BED.
- When the requirements of dimensions D and/or E of figure 114 of this Particular Standard are met only when the MATTRESS SUPPORT PLATFORM is in the flat position, the instructions for use shall include a warning that, when a PATIENT's condition (such as disorientation due to medication or clinical condition) could lead to PATIENT ENTRAPMENT, the MATTRESS SUPPORT PLATFORM should be left in the flat position whilst unattended (except when required otherwise by medical staff for special or particular circumstances).
- The instructions for use for ACCESSORIES (such as mattresses, SIDE RAILS and LIFTING POLES) shall list the BED type or model with which the ACCESSORIES may be used (except when required otherwise by medical staff for special or particular circumstances).

b) Responsibility of the manufacturer

Addition:

Instructions for use shall include a statement on SAFETY HAZARDS which may arise due to improper handling of POWER SUPPLY CORDS, e.g.: driving over cables or cords, crushing between HEAD/FOOT PANEL ASSEMBLY and movable parts.

Additional item:

* aa) If a means to deactivate movement of the APPLIED PARTS (excluding non-energized ACCESSORIES) or MATTRESS SUPPORT PLATFORM is employed to prevent SAFETY HAZARDS created by SINGLE FAULT CONDITIONS, the instructions for use shall include clear directions on how to deactivate any BED function which might cause injury to the PATIENT if movement occurs.

Section two – Environmental conditions

The clauses and subclauses of this section of the General Standard apply.

Section three – Protection against electrical shock hazards

The clauses and subclauses of this section of the General Standard apply except as follows:

17 Separation (Previous title: Insulation and protective impedances)

*c) *Replacement:*

A type BF APPLIED PART shall have no CONDUCTIVE CONNECTION to ACCESSIBLE METAL PARTS.

18 Protective earthing, functional earthing and potential equalization

*e) *Addition:*

- The ACCESSIBLE METAL PARTS of APPLIED PARTS with conductive connections to parts which might become LIVE and which are intended for use together with MEDICAL ELECTRICAL EQUIPMENT connected intravascularly or intracardially to the PATIENT shall be provided with a means for potential equalization connection.
- ACCESSIBLE METAL PARTS of APPLIED PARTS shall have an impedance of less than 0,2 Ω with respect to the potential equalization connection.

Compliance is checked by measurement.

Section four – Protection against mechanical hazards

The clauses and subclauses of this section of the General Standard apply except as follows:

21 Mechanical strength

This clause of the General Standard applies except as follows:

21.3 *Replace the text of this subclause of the General Standard by the following:*

***21.3** BED parts used for the support and/or immobilisation of the PATIENT or for the support of masses which could be hazardous to the PATIENT shall be designed and manufactured so as to minimise the risk of physical injuries and of accidental loosening of fixings. Fixings for ACCESSORIES shall be so designed that the risk of incorrect attachment which could create a SAFETY HAZARD is **eliminated or** minimised.

Addition:

21.3.101 The SAFE WORKING LOAD of the BED shall be listed in the instructions for use and shall be at least 1700 N. This 1700 N load is considered to be the sum of the following:

- 1350 N (PATIENT);
- 200 N (mattress);
- 150 N (ACCESSORIES).

(For testing purposes the load shall be distributed as shown in figure 102.)

***21.3.102** The SAFE WORKING LOAD of a LIFTING POLE shall be at least 750 N

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21.4 *Replace the text of this subclause of the General Standard by the following:*

SIDE RAILS shall be equipped with a means to lock or latch them into the raised/closed position. The operation of the lock or latch mechanism shall be so designed that accidental unlocking or unlatching cannot occur in NORMAL USE and that SIDE RAILS will not remain raised/closed when they are not locked/latched.

21.6 *Replacement:*

BEDS which are intended to be mobile while accommodating a PATIENT shall be subjected to the following:

Impact test – The BED, with HEAD/FOOT PANEL ASSEMBLIES mounted and SAFE WORKING LOAD in place, shall withstand, without permanent deformation or loss of NORMAL USE, three impacts to each end of the BED against a solid hardwood (e.g. oak) vertical wall with the BED moving at a speed of $(0,4 \pm 0,1)$ m/s without loss of NORMAL USE.

***21.6.101** The HEAD/FOOT PANEL ASSEMBLIES shall withstand a static force of 450 N applied along the longitudinal axis of the BED and at the location(s) defined in the ACCOMPANYING DOCUMENTS as transport handholds/push points or, if these points are not defined, the force shall be applied horizontally and centrally at the highest extremity of the HEAD/FOOT PANEL. The load shall be applied over an area of 625 mm². The test shall be applied for 30 s ten times, forwards and backwards, without material failure.

21.6.102 *Threshold test*

BEDS shall withstand the stresses caused by rough handling.

Compliance with this requirement is checked by the following test:

The BED, with the SIDE RAILS in the closed/raised and locked/latched position, with all other ACCESSORIES intended for NORMAL USE during transport attached and with the SAFE WORKING LOAD in place, shall be moved ten times in the forward direction as in NORMAL USE. All castors shall impact a solid vertical plane obstruction which is fixed flat on the floor, with a rectangular cross-section, 20 mm high and 80 mm deep, at a speed of $0,4 \text{ m/s} \pm 0,1 \text{ m/s}$, without loss of function, and without unlocking/unlatching of the SIDE RAILS.

22 Moving parts

This clause of the General Standard applies except as follows:

Addition:

22.2.101 Exposed SQUEEZING and SHEARING POINTS which could constitute a SAFETY HAZARD are permissible for moveable parts below the MATTRESS SUPPORT PLATFORM if their distance from the outermost rigid edge of the MATTRESS SUPPORT PLATFORM (towards the inside) is 200 mm or greater. The 200 mm distance shall be measured around any barrier which separates the PATIENT from a SAFETY HAZARD. (See figures 109 and 110.)

Parts moved vertically which could create a SAFETY HAZARD shall maintain perpendicular clearances to the floor of at least 120 mm unless their distance from the outermost rigid edge of the MATTRESS SUPPORT PLATFORM (towards the inside) is 120 mm or greater.

NOTE - SIDE RAILS are considered to be part of the BED for assessment of exposed SQUEEZING and SHEARING POINTS, if indicated as an accessory.

22.2.102 All BEDS shall incorporate means to deactivate BED function control (BED movement) available to the PATIENT.

The means to deactivate BED movement shall be located such that a PATIENT can not accidentally re-activate any functions.

22.4.101 Electrically powered functional movements of the BED shall be possible only by means of MOMENTARY CONTACT SWITCHES.

22.4.102 The design of THE BED should be such to eliminate or minimize force at impact caused by quick movement of equipment or equipment parts, which may cause injury to the PATIENT or operator, is minimized.

Replacement:

22.5 End stops or other means to limit movement shall be provided and their strength shall be adequate for the intended function. Compliance is checked by review of the manufacturer's design and test data.

22.8 Where a CPR emergency release function is fitted, the back rest of the BED shall return in a controlled manner to a fully lowered position within 10 s.

23 Surfaces, corners and edges

This clause of the General Standard applies except as follows:

Addition:

***23.101 Protection against PATIENT ENTRAPMENT**

Openings within the perimeter of SIDE RAILS, and between SIDE RAILS and parts of the BED, shall meet the dimensional requirements of figure 114 where a risk of PATIENT ENTRAPMENT exists.

Compliance is checked by the following test:

After completion of the tests required in 28.4.103, the dimensional requirements of items A and F of figure 114 are checked by inserting the test cone shown in figure 115, with a force of 50 N, at the points indicated in figure 114, without allowing the cone to pass through the opening. The tests are performed with the SIDE RAILS in the raised/closed position, and with the worst case NORMAL USE configuration and positions of ACCESSORIES.

A risk assessment shall also be performed (in accordance with ISO 14971-1) to evaluate the SIDE RAILS with regard to entrapment and all other safety issues. When SIDE RAILS cover less than the full length of the MATTRESS SUPPORT PLATFORM, they shall be positioned toward the head end.

24 Stability in NORMAL USE

This clause of the General Standard applies except as follows:

24.3 Addition:

***aa)** With the BED, castors and side rails (if either are incorporated in the BED design) in their worst case position of NORMAL USE and the SAFE WORKING LOAD in place (as shown in figure 102), the BED shall not overbalance when:

– *Lateral stability test:*

A load of 2250 N is located on the edge of the flat MATTRESS SUPPORT PLATFORM, centred at a distance 125 mm from the outer edge. (See figures 103/105.)

– *Longitudinal stability test:*

A load of 1500 N is located at the foot end of the MATTRESS SUPPORT PLATFORM centred at a distance 125 mm from the outer edge. (See figures 104/106.)

A load of 1500 N is located at the head end of the MATTRESS SUPPORT PLATFORM centred at a distance 125 mm from the outer edge.

*bb) The BED shall not become unstable when the LIFTING POLE is loaded as in NORMAL USE.

Compliance is checked by the following test:

Without the SAFE WORKING LOAD of the BED in place, the LIFTING POLE in its worst case position of NORMAL USE shall be loaded with its SAFE WORKING LOAD. The BED and LIFTING POLE shall not overbalance.

24.4 The BED shall be fitted with means (such as locking devices on castors) to prevent any self-movement (with respect to the floor) in the transport position of the BED. Each castor shall be fitted with a locking mechanism. Directional steering mechanism shall be provided.

Compliance is checked by following test:

The BED is placed in its transport position (or in the worst case NORMAL USE position if no transport position is defined in the INSTRUCTIONS FOR USE) with the SAFE WORKING LOAD in place (as shown in figure 102), and the locking device (e.g.: brakes) applied, on a surface inclined at 10° from horizontal. If the BED incorporates pivoting casters, they shall be pivoting to their worst case position. No movement of the BED greater than 10 mm (in relation to the inclined surface) shall occur.

26 Vibration and noise

This clause of the General Standard applies except as follows:

Addition:

26.101 The noise of movement of the BED with the SAFE WORKING LOAD in place (see figure 102) should not exceed 65 dB(A) at a distance of one meter. If this requirement is not met, a statement shall be placed in the USER's manual indicating maximum sound pressure levels produced in NORMAL USE.

Compliance is checked by measurements made in accordance with ISO 2204.

28 Suspended masses

This clause of the General Standard applies except as follows:

28.4 Suspension systems of metal without SAFETY DEVICES

2) Replacement:

The BED shall be capable of withstanding a uniformly distributed static load equal to twice the SAFE WORKING LOAD or 4000 N, whichever is greater. Permanent deformation is acceptable only if the BED is in compliance with its NORMAL CONDITION.

The static load shall be applied for at least 1 hour. Loss of function test is to be performed after the BED is unloaded (see figure 102 for load position definition).

3) Replacement:

When impairment by wear, corrosion, material fatigue or ageing is expected, relevant supporting parts shall have a SAFETY FACTOR not less than four times the SAFE WORKING LOAD.

Compliance with the requirements of 28.3 and 28.4 is checked by inspection of design data or testing as described in 28.4 item 2).