# Test report

**IEC 60950 and/or EN 60950**

**Safety of information technology equipment**

CE

**R904.013.1**

**Kontron**

**Single board computer**

LEUE CMP/VE-600

**Costumer:**

Kontron
Embedded Modules GmbH
Brunnwiesenstrasse 16
94469 Deggendorf
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# TEST REPORT

## IEC 60950 and/or EN 60950

## Safety of information technology equipment

| | | |
|---|---|---|
| Report reference No ..... : | R904.013.1 | Total Pages: 38 |
| Tested by (printed name and signature) ..... : | Marian Majewski | |
| Approved by (printed name and signature) ..... : | Carsten König | |
| Date of issue ..... : | 2004-03-15 | |

| | | |
|---|---|---|
| Testing Laboratory Name ..... : | EMV **TESTHAUS** GmbH | |
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| Accreditation | Deutscher Akkreditierungs Rat DAR | Nr.: TTI–P–G 101/95 |

| | |
|---|---|
| Applicant's Name ..... : | Kontron<br>Embedded Modules GmbH |
| Address ..... : | Brunnwiesenstrasse 16 |
| ..... : | 94469 Deggendorf |

| | |
|---|---|
| Test specification | |
| Standard..... : | IEC 60950:1999 (3rd Edition) + Corr. Jan. 2000 and/or EN 60950:2000 + Corr. Febr. 2002 |
| Test procedure ..... : | CB- and/or CCA-scheme |
| Procedure deviation ..... : | none |
| Non-standard test method ..... : | none |

| | |
|---|---|
| Test Report Form No. ..... : | IECEN60950A |
| TRF originator ..... : | SGS Fimko Ltd |
| Master TRF ..... : | dated 2003-03 |



| | |
|---|---|
| Test item description ..... : | Single board computer |
| Manufacturer ..... : | Kontron Embedded Modules GmbH |
| Trademark ..... : | Kontron |
| Model and/or type reference ..... : | LEUE CMP/VE-600 |
| Serial number ..... : | YW332004 |
| Rating(s) ..... : | 5V DC +/- 5% |

| | |
|---|---|
| Particulars: test item vs. test requirements | |
| Equipment mobility ..... : | for building-in |
| Operating condition..... : | continuous |
| Mains supply tolerance (%)..... : | SELV supplied by external power supply. |
| Tested for IT power systems ..... : | - |
| IT testing, phase-phase voltage (V) ..... : | - |
| Class of equipment ..... : | Class III |
| Mass of equipment (kg) ..... : | 0.270 kg |
| Protection against ingress of water ..... : | - |
| Test case verdicts | |
| Test case does not apply to the test object : | N/A |
| Test item does meet the requirement ..... : | P(ass) |
| Test item does not meet the requirement . : | F(ail) |
| Testing | |
| Date of receipt of test item ..... : | 13.02.2004 |
| Date(s) of performance of test ..... : | week 08, 2004 |

General remarks

**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by a NCB, in accordance with IECEE 02.**

This report shall not be reproduced except in full without the written approval of the testing laboratory.

The test results presented in this report relate only to the item(s) tested.

"(see appended table)" refers to a table appended to the report.
“(see remark #)” refers to a remark appended to the report.
“(see Annex #) refers to an annex appended to the report.

Throughout this report a comma (point) is used as the decimal separator.

General product information:

The single board computer integrates the functionality of a motherboard with CPU, System-BIOS, memory, keyboard-controller, real time clock, COM-port, LPT1, Floppy- and Hard disk-interface, USB and Ethernet access and onboard high-performance PCI-SVGA with LCD interface.

A power adapter is needed to supply the unit with SELV. This power adapter is not included in this test.

The single board computer can be installed by the Operator.

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 1 | GENERAL | | **P** |
| 1.5 | Components | | |
| 1.5.1 | Comply with IEC 950 or relevant component standard | (See appended table 1.5.1) | **P** |
| 1.5.2 | Evaluation and testing of components | Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard. | **P** |
| | Dimensions (mm) of mains plug for direct plug-in .....: | Not a direct plug-in equipment. | **N** |
| | Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N).....: | Not a direct plug-in equipment. | **N** |
| 1.5.3 | Thermal controls | No thermal controls. | **N** |
| 1.5.4 | Transformers | No isolating transformer in the equipment. | **N** |
| 1.5.5 | Interconnecting cables | No interconnecting cables. | **N** |
| 1.5.6 | Capacitors in primary circuits .....: | | **N** |
| 1.5.7 | Double or reinforced insulation bridged by components | | **N** |
| 1.5.7.1 | Bridging capacitors | No such components bridging double or reinforced insulation. | **N** |
| 1.5.7.2 | Bridging resistors | No such components bridging double or reinforced insulation. | **N** |
| 1.5.7.3 | Accessible parts | No such components. | **N** |
| 1.5.8 | Components in equipment for IT power systems | No components connected between line and earth. | **N** |
| 1.6 | Power interface | Power supply not included in test. | |
| 1.6.1 | AC power distribution systems | | **N** |
| 1.6.2 | Input current | | **N** |
| 1.6.3 | Voltage limit of hand-held equipment | | **N** |
| 1.6.4 | Neutral conductor | | **N** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 1.7 | Marking and instructions | Marking will be provided on the packaging. | |
| 1.7.1 | Power rating | | **N** |
| | Rated voltage(s) or voltage range(s) (V) .: | | **N** |
| | Symbol for nature of supply for d.c. .....: | | **N** |
| | Rated frequency or frequency range (Hz) : | | **N** |
| | Rated current (A) .....: | | **N** |
| | Manufacturer's name/Trademark .....: | Kontron | **P** |
| | Type/model .....: | LEUE CMP/VE-600 | **P** |
| | Symbol of Class II .....: | | **N** |
| | Other symbols .....: | There is no additional marking. | **N** |
| | Certification marks .....: | No certification marks. | **N** |
| 1.7.2 | Safety instructions | Must be checked in the end product. | **N** |
| | Operating instructions | See User's Manual. | **P** |
| 1.7.3 | Short duty cycles | Equipment for continuous operation. | **N** |
| 1.7.4 | Supply voltage adjustment .....: | No voltage selector. | **N** |
| 1.7.5 | Power outlets on the equipment .....: | No standard power outlet. | **N** |
| 1.7.6 | Fuse identification .....: | | **N** |
| 1.7.7 | Wiring terminals | Not directly connected to the mains. | **N** |
| 1.7.7.1 | Protective earthing and bonding terminals | | **N** |
| 1.7.7.2 | Terminal for a.c. mains supply conductors | | **N** |
| 1.7.8 | Controls and indicators | No controls and indicators. | **N** |
| 1.7.8.1 | Identification, location and marking .....: | | **N** |
| 1.7.8.2 | Colours .....: | | **N** |
| 1.7.8.3 | Symbols according to IEC 60417.....: | There are no switches in the equipment. | **N** |
| 1.7.8.4 | Markings using figures .....: | No controls. | **N** |
| 1.7.9 | Isolation of multiple power sources .....: | | **N** |
| 1.7.10 | IT power system | Has to be considered in end product. | **N** |
| 1.7.11 | Thermostats and other regulating devices | No thermostats or other regulating devices. | **N** |
| 1.7.12 | Language .....: | English user manual provided. | **P** |
| 1.7.13 | Durability | The marking withstands required tests. | **P** |
| 1.7.14 | Removable parts | No removable parts. | **P** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 1.7.15 | Replaceable batteries | The lithium battery is placed in Operator access area. The required warning is in the operating manual. | **P** |
| | Language.....: | English, Danish, Finnish, Norwegian, Swedish and German. | — |
| 1.7.16 | Operator access with a tool.....: | | **N** |
| 1.7.17 | Equipment for restricted access locations: | | **N** |
| 2 | PROTECTION FROM HAZARDS | | |
| 2.1 | Protection from electric shock and energy hazards | | |
| 2.1.1 | Protection in OPERATOR access areas | Refer below: | — |
| 2.1.1.1 | Access to energized parts | | |
| | Test by inspection .....: | There are no bare parts at ELV or hazardous voltage or parts separated from these with basic or functional insulation only (except protective earth). | **N** |
| | Test with test finger .....: | Protection must be checked in the end product. | **N** |
| | Test with test pin .....: | Protection must be checked in the end product. | **N** |
| | Test with test probe .....: | Protection must be checked in the end product. | **N** |
| 2.1.1.2 | Battery compartments .....: | No TNV circuits in the equipment. | **N** |
| 2.1.1.3 | Access to ELV wiring | No internal wiring at ELV. | **N** |
| | Working voltage (V); distance (mm) through insulation | | — |
| 2.1.1.4 | Access to hazardous voltage circuit wiring | Protection must be checked in the end product. | **N** |
| 2.1.1.5 | Energy hazards .....: | Must be considered for the end product. | **N** |
| 2.1.1.6 | Manual controls | No shafts of knobs etc. at ELV or hazardous voltage. | **N** |
| 2.1.1.7 | Discharge of capacitors in the primary circuit | Not connected to primary circuit. | **N** |
| | Time-constant (s); measured voltage (V).: | | **N** |
| 2.1.2 | Protection in service access areas | | **N** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 2.1.3 | Protection in restricted access locations | | **N** |
| 2.2 | SELV circuits | | |
| 2.2.1 | General requirements | SELV limits are not exceeded under normal condition and after a single fault. | **P** |
| 2.2.2 | Voltages under normal conditions (V) .....: | The voltage between any two conductors and between any one such conductor and earth (see 1.4.9) does not exceed 42.4 V peak or 60 V d.c. | **P** |
| 2.2.3 | Voltages under fault conditions (V) .....: | In the event of a single fault, the voltage between any two conductors and between any one such conductor and earth (see 1.4.9) does not exceed 42.4 V peak or 60 V d.c. for longer than 0.2 sec. and stays below the limit of 71 V peak or 120 V d.c. | **P** |
| 2.2.3.1 | Separation by double or reinforced insulation (method 1) | Separation must be checked in the end product. | **N** |
| 2.2.3.2 | Separation by earthed screen (method 2) | Separation must be checked in the end product. | **N** |
| 2.2.3.3 | Protection by earthing of the SELV circuit (method 3) | Separation must be checked in the end product. | **N** |
| 2.2.4 | Connection of SELV circuits to other circuits .....: | SELV circuits are only connected to other SELV circuits and protective earth. | **P** |
| 2.3 | TNV circuits | No TNV circuits in the equipment. | **N** |
| 2.3.1 | Limits | | **N** |
| | Type of TNV circuits.....: | | **N** |
| 2.3.2 | Separation from other circuits and from accessible parts | | **N** |
| | Insulation employed.....: | | **N** |
| 2.3.3 | Separation from hazardous voltages | | **N** |
| | Insulation employed.....: | | **N** |
| 2.3.4 | Connection of TNV circuits to other circuits | | **N** |
| | Insulation employed.....: | | **N** |
| 2.3.5 | Test for operating voltages generated externally | | **N** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 2.4 | Limited current circuits | No limited current circuits. | **N** |
| 2.4.1 | General requirements | | **N** |
| 2.4.2 | Limit values | | **N** |
| | Frequency (Hz) .....: | | **N** |
| | Measured current (mA) .....: | | **N** |
| | Measured voltage (V).....: | | **N** |
| | Measured capacitance (µF).....: | | **N** |
| 2.4.3 | Connection of limited current circuits to other circuits | | **N** |
| 2.5 | Limited power sources | No limited power source. | **N** |
| | Inherently limited output | | **N** |
| | Impedance limited output | | **N** |
| | Overcurrent protective device limited output | | **N** |
| | Regulating network limited output under normal operating and single fault condition | | **N** |
| | Regulating network limited output under normal operating conditions and overcurrent protective device limited output under single fault condition | | **N** |
| | Output voltage ($U_{oc}$) .....: | | **N** |
| | Output current ($I_{sc}$), apparent power (S) | | **N** |
| | Current rating of overcurrent protective device (A) | | **N** |
| 2.6 | Provisions for earthing and bonding | Has to be considered in end product. | **N** |
| 2.6.1 | Protective earthing | | **N** |
| 2.6.2 | Functional earthing | | **N** |
| 2.6.3 | Protective earthing and protective bonding conductors | | — |
| 2.6.3.1 | Size of protective earthing conductors | | **N** |
| | Rated current (A)..... : Cross-sectional area ($mm^2$), AWG.....: | | **N** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 2.6.3.2 | Size of protective bonding conductors | | **N** |
| | Rated current (A)..... :<br>Cross-sectional area ($mm^2$), AWG.....: | | **N** |
| 2.6.3.3 | Rated current (A)..... :<br>Type and nominal thread diameter (mm)..: | | **N** |
| | Resistance (Ω) of earthing conductors and their terminations.....: | | **N** |
| | Test current (A).....: | | **N** |
| 2.6.3.4 | Colour of insulation.....: | | **N** |
| 2.6.4 | Terminals | | — |
| 2.6.4.1 | Protective earthing and bonding terminals | | **N** |
| | Rated current (A), type and nominal thread diameter (mm).....: | | — |
| 2.6.4.2 | Separation of the protective earthing conductor from protective bonding conductors | | **N** |
| 2.6.5 | Integrity of protective earthing | | — |
| 2.6.5.1 | Interconnection of equipment | | **N** |
| 2.6.5.2 | Components in protective earthing conductors and protective bonding conductors | | **N** |
| 2.6.5.3 | Disconnection of protective earth | | **N** |
| 2.6.5.4 | Parts that can be removed by an operator | | **N** |
| 2.6.5.5 | Parts removed during servicing | | **N** |
| 2.6.5.6 | Corrosion resistance | | **N** |
| 2.6.5.7 | Screws for protective bonding | | **N** |
| 2.6.5.8 | Reliance on telecommunication network | | **N** |
| 2.7 | Overcurrent and earth fault protection in primary circuits | Only SELV circuits | — |
| 2.7.1 | Basic requirements | | **N** |
| | Instructions when protection relies on building installation | | **N** |
| 2.7.2 | Faults not covered in 5.3 (EN 60950: Void) | | **N** |
| 2.7.3 | Short-circuit backup protection | | **N** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 2.7.4 | Number and location of protective devices .....: | | **N** |
| 2.7.5 | Protection by several devices | | **N** |
| 2.7.6 | Warning to service personnel .....: | | **N** |
| 2.8 | Safety interlocks | No safety interlocks | — |
| 2.8.1 | General principles | | **N** |
| 2.8.2 | Protection requirements | | **N** |
| 2.8.3 | Inadvertent reactivation | | **N** |
| 2.8.4 | Fail-safe operation | | **N** |
| 2.8.5 | Interlocks with moving parts | | **N** |
| 2.8.6 | Overriding an interlock | | **N** |
| 2.8.7 | Switches and relays in interlock systems | | **N** |
| 2.8.7.1 | Contact gaps (mm) .....: | | **N** |
| 2.8.7.2 | Overload test | | **N** |
| 2.8.7.3 | Endurance test | | **N** |
| 2.8.7.4 | Electric strength test (V) | | **N** |
| 2.8.8 | Mechanical actuators | | **N** |
| 2.9 | Electrical insulation | | — |
| 2.9.1 | Properties of insulating materials | Neither natural rubber, materials containing asbestos nor hygroscopic materials are used as insulation. No driving belts or couplings used. | **P** |
| 2.9.2 | Humidity conditioning | No hygroscopic materials used. | **N** |
| 2.9.3 | Requirements for insulation | The insulation complies with sub-clauses 4.5.1, 5.2 and 2.10. | **P** |
| 2.9.4 | Insulation parameters | Application of insulation and working voltage are considered. | **P** |
| 2.9.5 | Categories of insulation | Insulation is considered to be functional, basic, supplementary, reinforced or double insulation. | **P** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 2.10 | Clearances, creepage distances and distances through insulation | On the board there is only operational insulation. Distances need not to be measured in case of compliance with conditions of 5.3. | — |
| 2.10.1 | General | | **N** |
| 2.10.2 | Determination of working voltage | Considered. | **N** |
| 2.10.3 | Clearances | See below: | — |
| 2.10.3.1 | General | Not applicable | **N** |
| 2.10.3.2 | Clearances in primary circuit | | **N** |
| 2.10.3.3 | Clearances in secondary circuits | Only functional insulation in secondary circuits, ref. 5.2. | **P** |
| 2.10.3.4 | Measurement of transient levels | Measurement not relevant. | **P** |
| 2.10.4 | Creepage distances | | **N** |
| | CTI tests .....: | Material Group unknown: Group IIIb (100 ≤ CTI < 175) used. | — |
| 2.10.5 | Solid insulation | | **N** |
| 2.10.5.1 | Minimum distance through insulation | No such insulation. | **N** |
| 2.10.5.2 | Thin sheet material | No thin sheet insulation used. | **N** |
| | Number of layers (pcs) .....: | | — |
| | Electric strength test | | — |
| 2.10.5.3 | Printed boards | PCB does not serve as insulation barrier. | **N** |
| | Distance through insulation | No such insulation. | **N** |
| | Electric strength test for thin sheet insulating material | | — |
| | Number of layers (pcs) .....: | | **N** |
| 2.10.5.4 | Wound components | | **N** |
| | Number of layers (pcs) .....: | | **N** |
| | Two wires in contact inside component; angle between 45° and 90° | | **N** |
| 2.10.6 | Coated printed boards | No special coating in order to reduce distances. | **N** |
| 2.10.6.1 | General | | **N** |
| 2.10.6.2 | Sample preparation and preliminary inspection | | **N** |
| 2.10.6.3 | Thermal cycling | | **N** |

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|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 2.10.6.4 | Thermal ageing (°C) .....: | | **N** |
| 2.10.6.5 | Electric strength test | | — |
| 2.10.6.6 | Abrasion resistance test | | **N** |
| 2.10.7 | Enclosed and sealed parts .....: | No enclosed or hermetically sealed components. | **N** |
| | Temperature $T_1=T_2 + T_{mra} - T_{amb} +10K$ (°C) .....: | | **N** |
| 2.10.8 | Spacings filled by insulating compound....: | No components treated/filled with insulation compound. | **N** |
| | Electric strength test | | — |
| 2.10.9 | Component external terminations | | **N** |
| 2.10.10 | Insulation with varying dimensions | No such transformer used. | **N** |
| 3 | WIRING, CONNECTIONS AND SUPPLY | | — |
| 3.1 | General | | — |
| 3.1.1 | Current rating and overcurrent protection | | **P** |
| 3.1.2 | Protection against mechanical damage | | **N** |
| 3.1.3 | Securing of internal wiring | | **N** |
| 3.1.4 | Insulation of conductors | | **N** |
| 3.1.5 | Beads and ceramic insulators | No beads or similar ceramic insulators on conductors. | **N** |
| 3.1.6 | Screws for electrical contact pressure | | **N** |
| 3.1.7 | Non-metallic materials in electrical connections | | **N** |
| 3.1.8 | Self-tapping and spaced thread screws | | **N** |
| 3.1.9 | Termination of conductors | | **N** |
| | 10 N pull test | | **N** |
| 3.1.10 | Sleeving on wiring | | **N** |
| 3.2 | Connection to a.c. mains supplies | Not directly connected to a.c. mains supply. | — |
| 3.2.1 | Means of connection .....: | | **N** |
| 3.2.2 | Multiple supply connections | | **N** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 3.2.3 | Permanently connected equipment | | **N** |
| | Number of conductors, diameter (mm) of cable and conduits .....: | | — |
| 3.2.4 | Appliance inlets | | **N** |
| 3.2.5 | Power supply cords | | **N** |
| | Type.....: | | — |
| | Rated current (A), cross-sectional area ($mm^2$), AWG.....: | | — |
| 3.2.6 | Cord anchorages and strain relief | | **N** |
| | Mass of equipment (kg), pull (N) .....: | | — |
| | Longitudinal displacement (mm) .....: | | — |
| 3.2.7 | Protection against mechanical damage | | **N** |
| 3.2.8 | Cord guards | | **N** |
| | D (mm); test mass (g) .....: | | — |
| | Radius of curvature of cord (mm) .....: | | — |
| 3.2.9 | Supply wiring space | | **N** |
| 3.3 | Wiring terminals for connection of external conductors | Not directly connected to a.c. mains supply. | — |
| 3.3.1 | Wiring terminals | | **N** |
| 3.3.2 | Connection of non-detachable power supply cords | | **N** |
| 3.3.3 | Screw terminals | | **N** |
| 3.3.4 | Cord/cable type, rated current (A), cross-sectional area ($mm^2$) .....: | | **N** |
| 3.3.5 | Type, rated current (A), nominal thread diameter (mm).....: | | **N** |
| 3.3.6 | Wiring terminals design | | **N** |
| 3.3.7 | Grouping of wiring terminals | | **N** |
| 3.3.8 | Stranded wire | | **N** |
| 3.4 | Disconnection from the a.c. mains supply | Not directly connected to a.c. mains supply. | — |
| 3.4.1 | General requirement | | — |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 3.4.2 | Disconnect devices | | **N** |
| | Contact separation | | **N** |
| 3.4.3 | Permanently connected equipment | | **N** |
| 3.4.4 | Parts which remain energized | | **N** |
| 3.4.5 | Switches in flexible cords | | **N** |
| 3.4.6 | Single-phase equipment | | **N** |
| 3.4.7 | Three-phase equipment | | **N** |
| 3.4.8 | Switches as disconnect devices | | **N** |
| 3.4.9 | Plugs as disconnect devices | | **N** |
| 3.4.10 | Interconnected equipment | | **N** |
| 3.4.11 | Multiple power sources | | **N** |
| 3.5 | Interconnection of equipment | | — |
| 3.5.1 | General requirements | Considered. | — |
| 3.5.2 | Types of interconnection circuits.....: | SELV circuit or limited current circuit. | **P** |
| 3.5.3 | ELV circuits as interconnection circuits | No ELV interconnections. | **N** |
| 4 | PHYSICAL REQUIREMENTS | Have to be considered in end product. | — |
| 4.1 | Stability | | — |
| | Angle of 10° | | **N** |
| | Test: force (N).....: | | **N** |
| 4.2 | Mechanical strength | | — |
| 4.2.1 | General | | — |
| 4.2.2 | Steady force test, 10 N | | **N** |
| 4.2.3 | Steady force test, 30 N | No internal enclosure. | **N** |
| 4.2.4 | Steady force test, 250 N | No external enclosure. | **N** |
| 4.2.5 | Impact test | | **N** |
| 4.2.6 | Drop test | Drop test not applicable. | **N** |
| 4.2.7 | Stress relief | | **N** |
| 4.2.8 | Cathode ray tubes | CRT(s) not used in the equipment. | **N** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |

| | | | |
|---|---|---|---|
| | Picture tube separately certified.....: | | **N** |
| 4.2.9 | High pressure lamps | No high pressure lamps in the equipment. | **N** |
| 4.2.10 | Wall or ceiling mounted equipment; force (N) .....: | | **N** |

| | | | |
|---|---|---|---|
| 4.3 | Design and construction | | — |
| 4.3.1 | Edges and corners | | **N** |
| 4.3.2 | Handles and manual controls; force (N)...: | No knobs, grips, handles, lever etc. | **N** |
| 4.3.3 | Adjustable controls | | **N** |
| 4.3.4 | Securing of parts | | **N** |
| 4.3.5 | Connection of plugs and sockets | SELV connectors do not comply with IEC 60320 or IEC 60083. | **P** |
| 4.3.6 | Direct plug-in equipment | | **N** |
| | Torque (Nm).....: | | — |
| 4.3.7 | Heating elements in earthed equipment | No heating elements provided. | **N** |
| 4.3.8 | Batteries | UL approved battery used. | **P** |
| 4.3.9 | Oil and grease | Insulation is not exposed to oil, grease etc. | **P** |
| 4.3.10 | Dust, powders, liquids and gases | The equipment does not generate ionizing radiation or use a laser, and does not contain flammable liquids or gases. | **P** |
| 4.3.11 | Containers for liquids or gases | No containers for liquids or gases in the equipment. | **N** |
| 4.3.12 | Flammable liquids.....: | The equipment does not contain flammable liquid. | **N** |
| | Quantity of liquid (l).....: | | **N** |
| | Flash point (°C) .....: | | **N** |
| 4.3.13 | Radiation; type of radiation .....: | Unit does not produce radiation. | **N** |
| | Equipment using lasers | | **N** |

| | | | |
|---|---|---|---|
| 4.4 | Protection against hazardous moving parts | No hazardous moving parts. | — |
| 4.4.1 | General | | **N** |
| 4.4.2 | Protection in operator access areas | No moving parts. | **N** |
| 4.4.3 | Protection in restricted access locations | | **N** |
| 4.4.4 | Protection in service access areas | | **N** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 4.5 | Thermal requirements | | — |
| 4.5.1 | Temperature rises | No thermostats, temperature limiters or thermal cut-outs. | **N** |
| | Normal load condition per Annex L .....: | Running program Burn In Test. | **P** |
| 4.5.2 | Resistance to abnormal heat | No thermoplastic parts carrying hazardous voltages. | **P** |
| 4.6 | Openings in enclosures | Has to be considered in end product. | — |
| 4.6.1 | Top and side openings | | **N** |
| | Dimensions (mm) .....: | | — |
| 4.6.2 | Bottoms of fire enclosures | | **N** |
| | Construction of the bottom .....: | | — |
| 4.6.3 | Doors or covers in fire enclosures | | **N** |
| 4.6.4 | Openings in transportable equipment | | **N** |
| 4.6.5 | Adhesives for constructional purposes | | **N** |
| | Conditioning temperature/time.....: | | — |
| 4.7 | Resistance to fire | | — |
| 4.7.1 | Reducing the risk of ignition and spread of flame | Method 1 is used. | **P** |
| 4.7.2 | Conditions for a fire enclosure | Fire enclosure must be considered for the end product. | **N** |
| 4.7.2.1 | Parts requiring a fire enclosure | | **N** |
| 4.7.2.2 | Parts not requiring a fire enclosure | | **N** |
| 4.7.3 | Materials | | — |
| 4.7.3.1 | General | Components and materials have adequate flammability classification. Refer to “List of Critical Components”. | **P** |
| 4.7.3.2 | Materials for fire enclosures | | **N** |
| 4.7.3.3 | Materials for components and other parts outside fire enclosures | Equipment for building-in; must be considered in the end product. | **N** |
| 4.7.3.4 | Materials for components and other parts inside fire enclosures | | **N** |
| 4.7.3.5 | Materials for air filter assemblies | No air filters in the equipment. | **N** |
| 4.7.3.6 | Materials used in high-voltage components | No parts exceeding 4kV. | **N** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 5 | ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS | | — |
| 5.1 | Touch current and protective conductor current | Has to be considered in end product. | **N** |
| 5.1.1 | General | | **N** |
| 5.1.2 | Equipment under test (EUT) | | **N** |
| 5.1.3 | Test circuit | | **N** |
| 5.1.4 | Application of measuring instrument | | **N** |
| 5.1.5 | Test procedure | | **N** |
| 5.1.6 | Test measurements | | **N** |
| | Test voltage (V) .....: | | — |
| | Measured current (mA) .....: | | — |
| | Max. allowed current (mA) .....: | | — |
| 5.1.7 | Equipment with touch current exceeding 3.5 mA .....: | | **N** |
| 5.1.8 | Touch currents to and from telecommunication networks | | **N** |
| 5.1.8.1 | Limitation of the touch current to a telecommunication network | | **N** |
| | Test voltage (V) .....: | | — |
| | Measured current (mA) .....: | | — |
| | Max. allowed current (mA) .....: | | — |
| 5.1.8.2 | Summation of touch currents from telecommunication networks.....: | | **N** |
| 5.2 | Electric strength | SELV is usually connected to ground, therefore no test was made between SELV and ground. | — |
| 5.2.1 | General | | **N** |
| 5.2.2 | Test procedure | | **N** |
| 5.3 | Abnormal operating and fault conditions | | — |
| 5.3.1 | Protection against overload and abnormal operation | | **N** |
| 5.3.2 | Motors | There are no motors in the equipment. | **N** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 5.3.3 | Transformers | | **N** |
| 5.3.4 | Functional insulation.....: | Complies with c). | **P** |
| 5.3.5 | Electromechanical components | No electromechanical components in secondary circuits. | **N** |
| 5.3.6 | Simulation of faults | No short circuit performed because components are mounted on V-0 material. | **P** |
| 5.3.7 | Unattended equipment | No thermostats, temperature limiters or thermal cut-outs. | **N** |
| 5.3.8 | Compliance criteria for abnormal operating and fault conditions | No short circuit performed because components are mounted on V-0 material. | **P** |

| | IEC 60950 / EN 60950 | | |
|---|---|---|---|
| Clause | Requirement - Test | Result | Verdict |
| 6 | CONNECTION TO TELECOMMUNICATION NETWORKS | No TNV circuits in the equipment. | **N** |
| 6.1 | Protection of telecommunication network service personnel, and users of other equipment connected to the network, from hazards in the equipment | | — |
| 6.1.1 | Protection from hazardous voltages | | **N** |
| 6.1.2 | Separation of the telecommunication network from earth | | **N** |
| 6.1.2.1 | Requirements | | **N** |
| | Test voltage (V) .....: | | — |
| | Current in the test circuit (mA) .....: | | — |
| 6.1.2.2 | Exclusions.....: | | **N** |
| 6.2 | Protection of equipment users from overvoltages on telecommunication networks | | — |
| 6.2.1 | Separation requirements | | **N** |
| 6.2.2 | Electric strength test procedure | | **N** |
| 6.2.2.1 | Impulse test | | **N** |
| 6.2.2.2 | Steady-state test | | **N** |
| 6.2.2.3 | Compliance criteria | | **N** |
| 6.3 | Protection of telecommunication wiring system from overheating | | **N** |
| | Max. output current (A).....: | | — |
| | Current limiting method.....: | | — |

| | | | |
|---|---|---|---|
| A | ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE | Used materials have adequate flame class according to UL94, no tests performed. | **N** |
| A.1 | Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2) | | **N** |
| A.2 | Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4) | | **N** |
| A.3 | High current arcing ignition test (see 4.7.3.2) | | **N** |
| A.4 | Hot wire ignition test (see 4.7.3.2) | | **N** |
| A.5 | Hot flaming oil test (see 4.6.2) | | **N** |
| A.6 | Flammability tests for classifying materials V-0, V-1 or V-2 | | **N** |
| A.7 | Flammability test for classifying foamed materials HF-1, HF-2 or HFB | | **N** |
| A.8 | Flammability test for classifying materials HB | | **N** |
| A.9 | Flammability test for classifying materials 5V | | **N** |
| A.10 | Stress relief conditioning (see 4.2.7) | | **N** |
| B | ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2) | No motors in the equipment. | **N** |

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|---|---|---|---|
| C | ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3) | No transformers in the equipment. | **N** |
| G | ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES | Method not used. | **N** |
| H | ANNEX H, IONIZING RADIATION (see 4.3.13) | No ionizing radiation. | **N** |
| J | ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6) | | **N** |
| K | ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.7) | No thermostats in the equipment. | **N** |
| M | ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1) | | **N** |
| U | ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4) | | **N** |

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|---|---|---|---|
| | SPECIAL NATIONAL CONDITIONS AND NATIONAL DEVIATIONS<br>S = Special National Condition, A = National Deviation (A-deviation), C = CENELEC Common Modification, F = other information | | |
| | C: delete all the "country" notes that appear on the following pages of the reference document (IEC 60950:1999): 85, 91, 99, 103, 117, 119, 123, 125, 149, 171, 213, 215, 219, 251, 283, 325, 327, 331, 333 and 407 | | |
| 1.2.4.1 | S (DK): certain types of Class I appliances (see subclause 3.2.1) may be provided with a plug not establishing earthing continuity when inserted into Danish socket-outlets | | **N** |
| 1.5.1 | A (CH, SE): add the following:<br>NOTE: Switches containing mercury such as thermostats, relays and level controllers are not allowed | There are no components containing mercury in the equipment. | **P** |
| 1.5.8 | S (NO): due to the IT power system used (see annex V, figure V.7), capacitors are required to be rated for the applicable phase-to phase voltage (230 V) | Considered. | **N** |
| 1.7.2 | S (NO): class I pluggable equipment type A intended for connection to other equipment or a communication network shall, if safety relies on connection to protective earth, require a marking stating that the equipment must be connected to an earthed mains socket outlet | Has to be considered in end product. | **N** |
| | S (SE): if the separation between the mains and SELV terminal relies upon connection to the safety earth, the apparatus shall have a marking stating that it must be connected to an earthed mains socket-outlet.<br>The marking text shall be in Swedish and as follows: "Apparaten skall anslutas till jordat uttag när den ansluts till ett nätverk." | Has to be considered in end product. | **N** |

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| | A (DK): supply cords of Class I equipment, which are delivered without a plug must be provided with a visible tag with the following text:<br>"Vigtigt! Lederen med grøn/gul isolation må kun tilsluttes en klemme mærket  (IEC 417, No. 5019 eller IEC 417, No. 5017)."<br>If essential for the safety of the equipment, the tag must in addition be provided with a diagram, which shows the connection of the other conductors, or be provided with the following text:<br>"For tilslutning af de øvrige ledere, se medfølgende installationsvejledning." | Has to be considered in end product. | **N** |
| 1.7.5 | S (DK): socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment | There are no socket outlets providing power to other appliances. | **N** |
| | A (DK): Class II equipment shall not be fitted with socket-outlets for providing power to other equipment | There are no socket-outlets providing power to other appliances. | **N** |
| 1.7.12 | A (DE): (Gesetz über technische Arbeitsmittel (Gerätesicherheitsgesetz) [Law on technical labour equipment {Equipment safety law}], of 23rd October 1992, Article 3, 3rd paragraph, 2nd sentence, together with the "Allgemeine Verwaltungsvorschrift zur Durchführung des Zweiten Abschnitts des Gerätesicherheitsgesetzes" [General administrative regulation on the execution of the Second Section of the Equipment safety law], of 10th January 1996, article 2, 4th paragraph item 2)<br>Directions for use with rules to prevent certain hazards for (among others) maintenance of the technical labour equipment, also for imported technical labour equipment shall be written in the German language.<br>NOTE: Of this requirement, rules for use even only by service personnel are not exempted | Has to be considered in end product. | **N** |

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| 1.7.15 | A (CH): (Ordinance on environmentally hazardous substances SR 814.013) Annex 4.10 of SR 814.013 applies for batteries | There is no battery containing Cd or Hg in the equipment. | **N** |
| | F (ALL): warning texts for lithium batteries | Refer to 1.7.15 in main test report. | **P** |
| | Languages .....: | As above. | — |
| 2.2.4 | S (NO): requirements according to this annex, sub-clauses 1.7.2 and 6.1.2.1 apply | No TNV circuits. | **N** |
| 2.3.2 | S (NO): requirements according to this annex, sub-clause 6.1.2.1 apply | No TNV circuits. | **N** |
| 2.3.3 | S (NO): requirements according to this annex, sub-clause 6.1.2.1 apply | No TNV circuits. | **N** |
| 2.3.4 | S (NO): requirements according to this annex, sub-clauses 1.7.2 and 6.1.2.1 apply | No TNV circuits. | **N** |
| 2.7.1 | C: replace the subclause as follows:<br>Basic requirements<br>To protect against excessive current, short circuits and earth faults in primary circuits, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b), and c):<br>a) Except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as integral parts of the equipment.<br>b) For components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short circuit and earth fault protection may be provided by protective devices in the building installation.<br>c) It is permitted for pluggable equipment type B or permanently connected equipment, to rely on dedicated overcurrent and short circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instruction.<br>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for pluggable equipment type A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet | Has to be considered in end product. | **N** |
| 2.7.2 | C: This subclause has been declared 'void' | Considered. | **N** |

| | | | |
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| 2.10.3.1 | S (NO): due to the IT power distribution system used (see annex V, figure V.7), the a.c. mains supply voltage is considered to be equal to the line-to-line voltage, and will remain at 230 V in case of a single earth fault | Considered. | **N** |
| 3.2.1 | S (CH): supply cords of equipment having a rated current not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 884-1 and one of the following dimensions sheets:<br>- SEV 6532-2:1991: plug type 15, 3P+N+PE 250/400 V, 10 A<br>- SEV 6533-2:1991: plug type 11, L+N 250 V, 10 A<br>- SEV 6534-2:1991: plug type 12, L+N+PE 250 V, 10 A<br>In general, EN 60 309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998: - SEV 5932-2:1998: plug type 25, 3L+N+PE 230/400 V, 16 A<br>- SEV 5933-2:1998: plug type 21, L+N 250 V, 16 A<br>- SEV 5934-2:1998: plug type 23, L+N+PE 250 V, 16 A | Not directly connected to the mains. | **N** |
| | S (DK): supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to the Heavy Current Regulations Section 107-2-D1.<br>Class I equipment provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with Standard Sheet DK 2-1a or DK 2-5a.<br>If poly-phase equipment and single-phase equipment having a rated current exceeding 10 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations Section 107-D1 or EN 60309-2 | Not directly connected to the mains. | **N** |

| | | | |
|---|---|---|---|
| | S (ES): supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994<br><br>Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993<br><br>Class I equipment provided with socket-outlets with earth contacts, or which are intended to be used locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994<br><br>If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2 | Not directly connected to the mains. | **N** |
| | S (GB): apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a "standard plug" in accordance with Statutory Instrument 1768:1994 – The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations.<br><br>NOTE: "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug | Not directly connected to the mains. | **N** |
| | S (IE): apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug shall be fitted with a 13 A plug in accordance with Statutory Instrument 525: 1997 – National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997 | Not directly connected to the mains. | **N** |
| 3.2.3 | C: delete note 1, and in table 3A delete the conduit sizes in parentheses | Considered. | **P** |

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|---|---|---|---|
| 3.2.5 | C: replace "60245 IEC 53" by "H05 RR-F", "60227 IEC 52" by "H03 VV-F or H03 VVH2-F" and "60227 IEC 53" by "H05 VV-F or H05 VVH2-F2"<br><br>In table 3B, replace the first four lines by the following:<br><br>Up to and including 6 0,75 [1)]<br>Over 6; up to and including 10 (0,75)[2)] .... 1,0<br>Over 10 up to and including 16 (1,0)[3)] ..... 1,5<br><br>In the conditions applicable to table 3B, delete the words "in some countries" in condition [1)].<br><br>In NOTE 1, delete the second sentence | Considered. | **P** |
| | S (GB): a power supply cord with conductor of 1,25 mm² is allowed for equipment with rated current over 10 A and up to and including 13 A | Not directly connected to the mains. | **N** |
| 3.3.4 | C: in table 3D, delete the fourth line – conductor sizes for 10 to 13 A, and replace with the following:<br><br>"Over 10 up to and including 16 1.5 to 2,51,5 to 4"<br><br>Delete the fifth line – conductor sizes for 13 to 16 A. | Considered. | **P** |
| | S (GB): the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current of over 10 A up to and including 13 A is:<br><br>- 1,25 mm² to 1,5 mm² nominal cross-sectional area | Considered. | **N** |
| 4.3.6 | S (GB): the torque test is performed using a socket outlet complying with BS 1363 and the plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C | Not a direct plug-in equipment. | **N** |
| | S (IE): direct plug-in equipment is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 – National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997 | Not a direct plug-in equipment. | **N** |

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|---|---|---|---|
| 4.3.13 | C: replace the second compliance paragraph by: For equipment using LEDs or lasers, compliance is checked according to EN 60825-1<br><br>NOTE 1 – If equipment falling within the scope of EN 60950 is inherently a class 1 laser product, i.e. it contains no embedded laser or LED of a higher class number, then a laser warning label or other laser warning statement is not required (see 1.1 of EN 60825-1)<br><br>Renumber the NOTE below the third compliance paragraph as NOTE 2 | No lasers or LED's. | **N** |
| 6.1.2.1 | S (NO, SE): add the following text between the first and second paragraph:<br><br>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either<br><br>- two layers of thin sheet material, each of which shall pass the electric strength test below, or<br><br>- one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.<br><br>If this insulation forms part of a semiconductor component e.g. an optocoupler, there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition:<br><br>- passes the tests and inspection criteria of 2.10.8 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.7 shall be performed using 1,5 kV); and<br><br>- is subjected to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV.<br><br>It is permitted to bridge this insulation with a capacitor complying with EN 132400:1994, subclass Y2 | No TNV circuits. | **N** |

| | | | |
|---|---|---|---|
| 6.1.2.2 | S (FI, NO, SE): the exclusions are applicable for permanently connected equipment and pluggable equipment type B only | No TNV circuits. | **N** |
| G.2 | S (NO): due to the IT power distribution system used (see annex V, figure V.7), the a.c. mains supply voltage is considered to be equal to the line-to-line voltage, and will remain at 230 V in case of a single earth fault | Considered. | **N** |
| Annex H | C: replace the last paragraph of this annex by: At any point 10 cm from the surface of the operator access area, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see note). Account is taken of the background level | The unit does not emit X-ray radiation. | **N** |
| | C: replace the NOTE as follows: NOTE – These values appear in Directive 96/29/Euratom | The unit does not emit X-ray radiation. | **N** |
| | A (DE):<br>(Regulation on protection against hazards by X-ray, of 8th January 1987, Article 5 [Operation of X-ray emission source], clauses 1 to 4)<br>a) A licence is required by those who operate an X-ray emission source.<br>b) A licence in accordance with Cl. 1 is not required by those who operate an X-ray emission source on which the electron acceleration voltage does not exceed 20 kV if<br>1) the local dose rate at a distance of 0,1 m from the surface does not exceed 1 µSv/h and<br>2) it is adequately indicated on the X-ray emission source that<br>i) X-rays are generated and<br>ii) the electron acceleration voltage must not exceed the maximum value stipulated by the manufacturer or importer.<br>c) A license in accordance with Cl. 1 is also not required by persons who operate an X-ray emission source on which the electron acceleration voltage exceeds 20 kV if | The unit does not emit X-ray radiation. | **N** |

| | | | |
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| | 1) the X-ray emission source has been granted a type approval and<br>2) it is adequately indicated on the X-ray emission source that<br>i) X-rays are generated<br>ii) the device stipulated by the manufacturer or importer guarantees that the maximum permissible local dose rate in accordance with the type approval is not exceeded and<br>iii) the electron acceleration voltage must not exceed the maximum value stipulated by the manufacturer or importer.<br>d) Furthermore, a license in accordance with Cl. 1 is also not required by persons who operate X-ray emission sources on which the electron acceleration voltage does not exceed 30 kV if<br>1) the X-rays are generated only by intrinsically safe CRTs complying with Enclosure III, No. 6,<br>2) the values stipulated in accordance with Enclosure III, No. 6.2 are limited by technical measures and specified in the device and<br>3) it is adequately indicated on the X-ray emission source that the X-rays generated are adequately screened by the intrinsically safe CRT | | |
| Annex P | C: replace the text of this annex by: See Annex ZA | Considered. | **P** |

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| Annex Q | C: Add the following notes for the standards indicated:<br>IEC 60127 series<br>NOTE: Harmonized as EN 60127 series (not modified)<br>IEC 60269-2-1<br>NOTE: Harmonized as HD 630.2.1 S2:1997 (modified) .....<br>IEC 60529<br>NOTE: Harmonized as EN 60529:1991 (not modified)<br>IEC 61032<br>NOTE: Harmonized as EN 61032:1998 (not modified) | Considered. | P |
| Annex ZA | C: This Europen standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate palces in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.<br>NOTE: When an international publication has been modivied by common modifications, indicated by (mod), the relevant EN/HD applies. | Considered. | P |
| | — | IEC 60050-151:1978 | |
| | — | IEC 60050-195:1998 | |
| | EN 60065[1]:1993 + corr. Nov. 1993 | IEC 60065 (mod):1985 | |
| | EN 60073:1996 | IEC 60073:1996 | |
| | HD 566 S1:1990 | IEC 60085:1984 | |
| | HD 214 S2:1980 | IEC 60112:1979 | |
| | HD 21[2] Series | IEC 60227 (mod) Series | |
| | HD 22[3] Series | IEC 60245 (mod) Series | |
| | EN 60309 Series | IEC 60309 Series | |
| | EN 60320 Series | IEC 60320 (mod) Series | |
| | HD 384.3 S2:1995 | IEC 60364-3 (mod):1993 | |
| | HD 384.4.41 S2:1996 | IEC 60364-4-41 (mod):1992 | |
| | — | IEC 60384-14:1993 | |
| | EN 60417-1:1999 | IEC 60417-1:1998 | |

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|---|---|---|---|
| | EN 60417-2:1999 | IEC 60417-2:1998 | |
| | HD 625.1 S1:1996 + corr. Nov. 1996 | IEC 60664-1 (mod):1992 | |
| | EN 60695-2-1/1:1996 | IEC 60695-2-1/1:1994 + corr. May 1995 | |
| | EN 60695-2-2:1994 | IEC 60695-2-2:1991 | |
| | — | IEC 60695-10-2:1995 | |
| | EN 60730-1:1995 | IEC 60730-1 (mod):1993 | |
| | EN 60825-1:1994 + corr. Feb. 1995 + A11:1996 + corr. July 1997 | IEC 60825-1:1993 | |
| | EN 60851-3:1996 | IEC 60851-3:1995 | |
| | EN 60851-5:1996 | IEC 60851-5:1996 | |
| | EN 60851-6:1996 | IEC 60851-6:1996 | |
| | — | IEC 60885-1:1987 | |
| | EN 60990:1999 | IEC 60990:1999 | |
| | — | IEC 61058-1:1996 | |
| | — | ISO 261:1973 | |
| | — | ISO 262:1973 | |
| | — | ISO 3864:1984 | |
| | — | ISO 4046:1978 | |
| | — | ISO 7000:1989 | |
| | ITU-T Recommendation K.17:1988, Tests on power-fed repeaters using solid-state devices in order to check the arrangements for protection from external interference | | |
| | ITU-T Recommendation K.21:1996, Resistibility of subscribers' terminals to overvoltages and overcurrents | | |
| | _____ | | |
| | [1] EN 60065:1993 is superseded by EN 60065:1998 + corrigendum June 1999, which is based on IEC 60065:1998, mod. | | |
| | [2] The HD 21 series is related to, but not directly equivalent with the IEC 60227 series. | | |
| | [3] The HD 22 series is related to, but not directly equivalent with the IEC 60245 series. | | |

| 1.5.1 | TABLE: list of critical components | P |
|---|---|---|

| object/part No. | manufacturer/ trademark | type/model | technical data | standard | mark(s) of conformity[1]) |
|---|---|---|---|---|---|
| PC board | Wuerth Elektronik | 50 | 120°C, 94V-0 | UL 94 | UL E76251 |
| X4, X11, X12, X14, X18, X19, X20, X21, | Plastron | Pin Header | 94 V-0 | UL 94 | UL E159535 |
| X6, X22 | Plastron | Double row male header | 94 V-0 | UL 94 | UL E159535 |
| X8, X17 | JST | box shaped shrouded header top entry | 94 V-0 | UL 94 | 3) |
| X9 | FOXCONN | DSUB Connector 15pin female | 94 V-0 | UL 94 | 3) |
| X10 | Molex | SMD flex cable connector | 94 V-0 | UL 94 | 3) |
| X23 | Molex | straight pin header | 94 V-0 | UL 94 | 3) |
| X25 | Berg (FCI) | Pin Header | 94 V-0 | UL 94 | 3) |
| Batterie | Maxell | CR2032 | 3V, 10mA abnormal | | UL MH12568 |
| SDRAM socket | FOXCONN | DIMM socket | 94 V-0 | UL 94 | 3) |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

[1]) an asterisk indicates a mark which assures the agreed level of surveillance
[2]) PCB-material meets at least flammability class 94V-0 in accordance with manufacturers specification
[3]) used plastic materials declared as 94V-0 in accordance with manufacturers specification

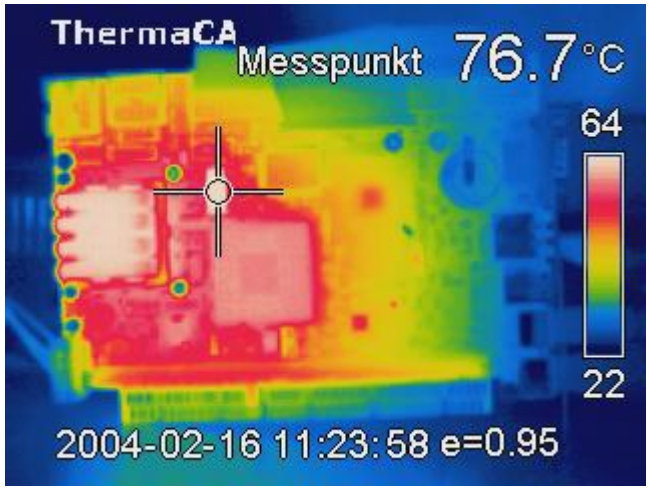
Usage of other components or materials is possible if they have the same flammability class and/or the same ratings as the above listed one.

| | | |
|---|---|---|
| 1.6.2 | TABLE: electrical data (in normal conditions) | N |
| 2.10.3 and 2.10.4 | TABLE: clearance and creepage distance measurements | N |
| 2.10.5 | TABLE: distance through insulation measurements | N |
| 4.5 | TABLE: temperature rise measurements | N |
| 4.5.2 | TABLE: ball pressure test of thermoplastic parts | N |
| 5.2 | TABLE: electric strength tests and impulse tests | N |
| 5.3 | TABLE: fault condition tests | N |
| A.6.5 | TABLE: flammability test for classifying materials V-0, V-1 or V-2 | N |
| A.6.6 | TABLE: flammability re-test for classifying materials V-0, V-1 or V-2 | N |
| A.7.4, A.7.5, A.7.6 and A.7.7 | TABLE: flammability test for classifying foam materials HF-1, HF-2 or HBF | N |
| A.7.8 | TABLE: flammability re-test for classifying foam materials HF-1 or HF-2 | N |
| A.7.9 | TABLE: flammability re-test for classifying foam materials HBF | N |
| A.8.5 | TABLE: flammability test for classifying materials HB | N |
| A.8.6 | TABLE: flammability re-test for classifying materials HB | N |
| A.9.6 | TABLE: flammability test for classifying materials 5V | N |
| A.9.7 | TABLE: flammability re-test for classifying materials 5V | N |

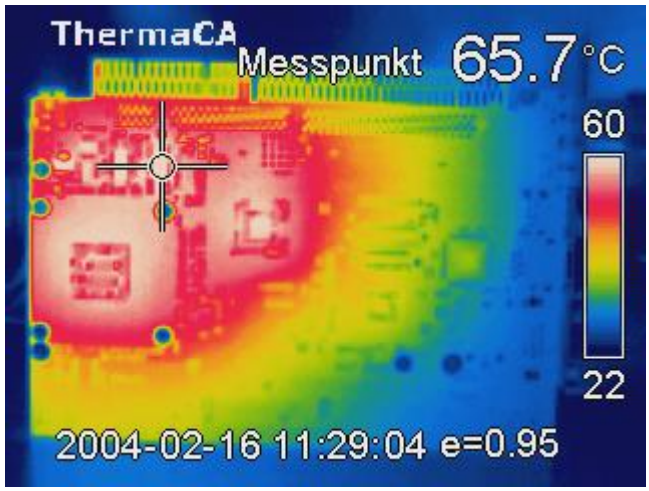
| | | | |
|---|---|---|---|
| APPENDIX | **BATTERIES (4.3.8)** | Approved battery used,<br>no additional test performed | N |

## Thermograph view

normal operating without enclosure

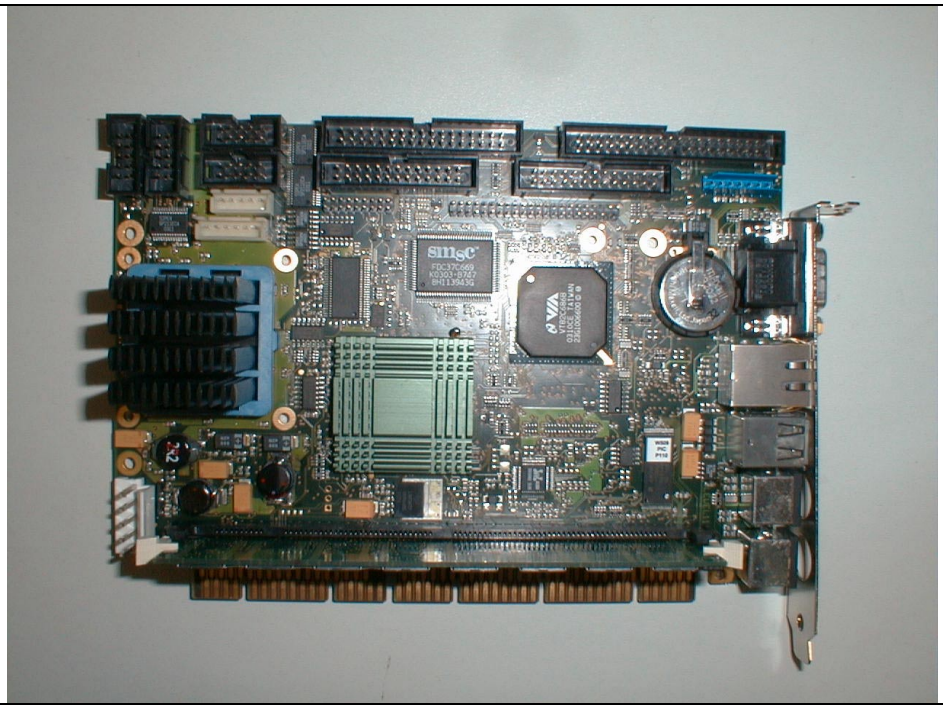



Top sight

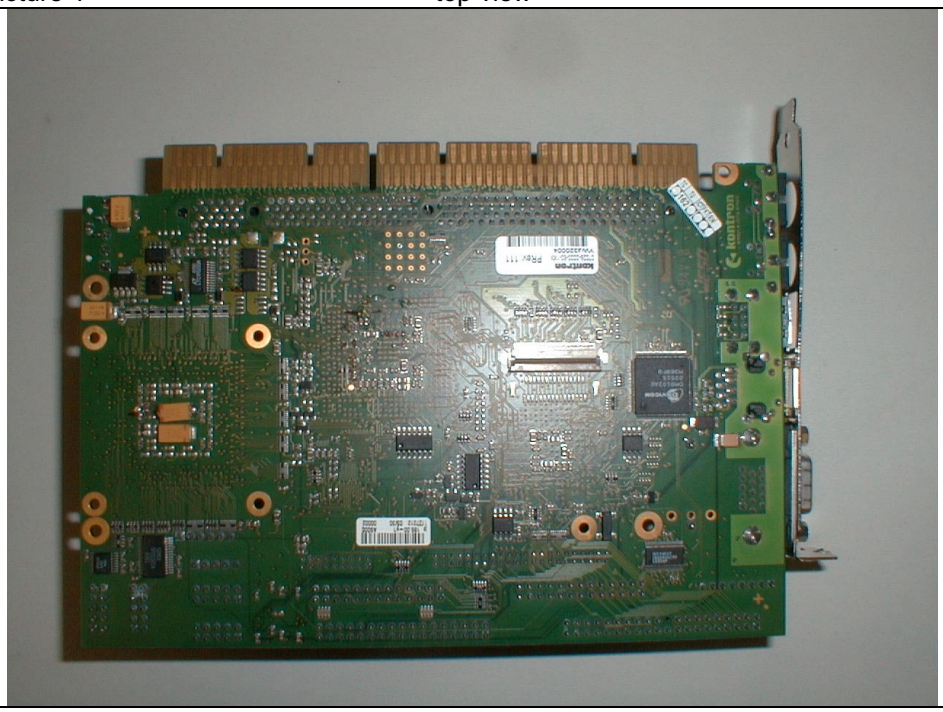



Bottom sight (head over)

## Photo report



Picture 1 top view



Picture 2 bottom view