# *Low Voltage Directive Report*

鼎安科技股份有限公司
SUPERIOR PRODUCT CONSULTING,INC
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*The test results of this report relate only to the tested sample identified in this report.*
此份報告之測試結果只適用於報告中所述之那台測試樣機

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TÜV Rheinland Taiwan Ltd.

TÜV

# Certificate

of

# Appointment

for

**Superior Product Consulting, Inc.**
**3F, No. 10, Alley 6, Lane 235, Pao Chiao Road,**
**Hsien Tien, Taipei, Taiwan, R.O.C.**

has been authorized to carry out Safety tests by order and under supervision of TÜV Rheinland. It has successfully demonstrated capability to conduct measurements and to process test data according to:

**European and International Safety Standards as listed in the Scope of Authorization on the attachment to this certificate**

An assessment of the facility was conducted according to ISO 17025 by a TÜV Rheinland auditor

The certificate is valid until the next scheduled inspection or up to 15 month, at the discretion of TÜV Rheinland

TÜV Rheinland Taiwan Ltd.
Taipei, 6 November 2001

Dipl.-Ing. A. Klinker

i.A.

David Lee

TÜV

Attachment to

# Certificate
of Appointment

SCOPE OF AUTHORIZATION

for

**Superior Product Consulting, Inc.**
**3F, No. 10, Alley 6, Lane 235, Pao Chiao Road,**
**Hsien Tien, Taipei, Taiwan, R.O.C.**

## European Standards

| | |
|---|---|
| EN 60 950: 1992+A1+A2+A3+A4+A11 | EN 60 065:1998<br>EN 60 065:1993+A11 |

## International Standards

| | |
|---|---|
| IEC 60 950: 1991+A1+A2+A3+A4 | IEC 60 065:1998<br>IEC 60 065:1985 +A1+A2+A3 |

Taipei, 6 November 2001

i.A.

David C. M. Lee, Auditor

Nemko

# QUALIFIED INDEPENDENT LABORATORY

This is to confirm that:

## Superior Product Consulting Inc.

(Taipei, TAIWAN)

has in the course of current cooperation projects with Nemko shown to be qualified in safety testing of electrical equipment to the following standards:

## IEC 60950 / EN 60950

This statement is also supported by our assessment of the laboratory testing equipment, -facilities and -procedures relative to the requirements of EN 45001 and ISO/IEC Guide 25.

NEMKO
IT and Electronics

Jon Ivar Tidemann
Head of dept. Data and Electronics

# DECLARATION OF CONFORMITY

According to the Low Voltage Directive 73/23/EEC and the Amendment Directive 93/68/EEC

| | |
|---|---|
| Type of Product ..... : | **Industrial Panel Computer** |
| Model Designation ..... : | **ES-200XXXX series, where X=0-9, A-Z, or blank** |
| Manufacturer' s Name..... : | **Advantech Co., Ltd.** |
| Manufacturer' s Address... : | **4th Fl, No. 108-3, Ming-Chung Rd, Shing-Tien City, Taipei Hsien, Taiwan** |

Is herewith confirmed to comply with the requirements set out in the Council Directive 73/23/EEC for electrical equipment used within certain voltage limits and the Amendment Directive 93/68/EEC. For the evaluation of the compliance with these Directive, the following standard was applied:

IEC 60950, 3rd Edition (1999)

EN 60950, 3rd Edition (2000)

*Person responsible for making this declaration*

Name, Surname ..... :

Position/Title ..... :

CE

| (Place) | (Date) | (Company stamp and signature) |
|---|---|---|

# TEST REPORT
# IEC 60950
# Safety of information technology equipment

| | |
|---|---|
| **Report** Reference No..... : | SPCLVD30776 |
| Compiled by (+ signature) ..... : | Eddie Shue |
| | Engineer |
| Reviewed by (+ signature) ..... : | Peter Lai |
| | Supervisor |
| Date of issue..... : | August 25, 2003 |

This report is based on a blank test report that was prepared by FIMKO using information obtained from the TRF originator (see below).

| | |
|---|---|
| **Testing laboratory** name..... : | Superior Product Consulting, Inc. |
| Address..... : | 3F, No.10, Alley 6, Lane 235, Pao Chiao Rd., Hsien Tien, Taipei, Taiwan, R.O.C |
| Testing location..... : | Same as above |
| Address..... : | Same as above |
| **Client** name ..... : | Advantech Co., Ltd. |
| Address..... : | 4th Fl, No. 108-3, Ming-Chuan Rd, Shing-Tien City, Taipei Hsien, Taiwan. |
| Standard..... : | IEC 60950, 3rd Edition (1999) |
| | EN 60950, 3rd Edition (2000) |
| Test procedure ..... : | Informative Test Report |
| Procedure deviation ..... : | N/A |
| Non-standard test method ..... : | N/A |

**Test Report Form/blank test report**

| | |
|---|---|
| Test Report Form No. ..... : | I950___F/00-03 |
| TRF originator. ..... : | FIMKO |
| Master TRF..... : | dated 00-02 |

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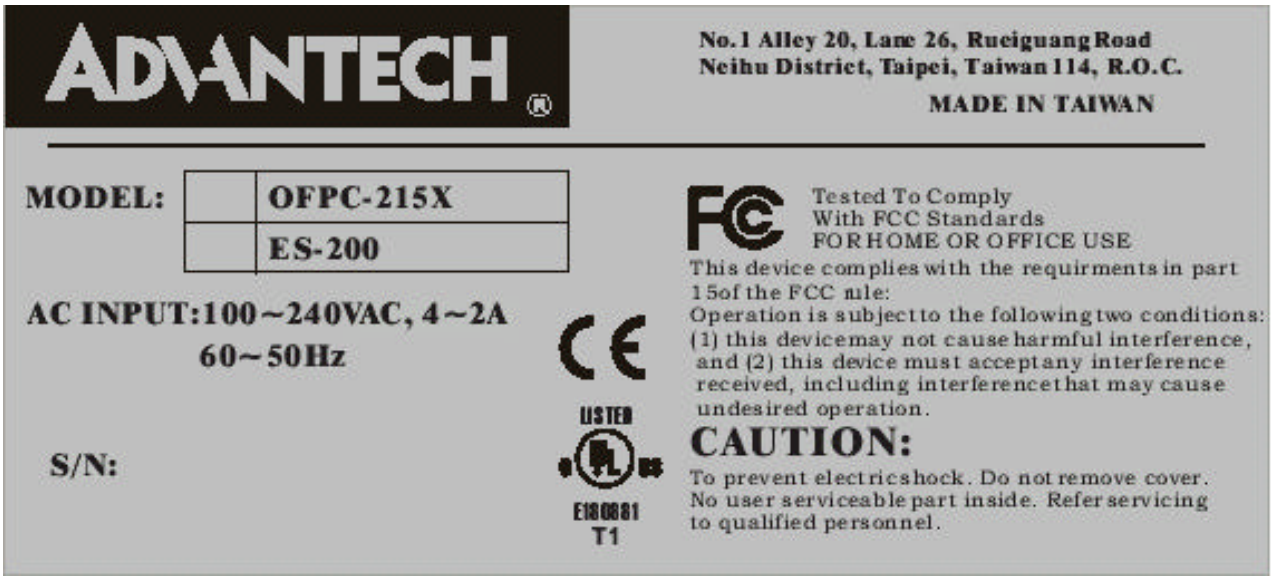
| | |
|---|---|
| **Test item** description ..... : | Panel PC |
| Trademark ..... : | ADVANTECH |
| Model and/or type reference ..... : | ES-200XXXX series, where X=0-9, A-Z, or blank |
| Manufacturer..... : | Same as Applicant |
| Rating(s)..... : | 100-240 Vac, 60-50 Hz, 4-2 A |

Copy of marking plate and summary of test results (information/comments):



**Particulars: test item vs. test requirements**

| | |
|---|---|
| Equipment mobility | Movable |
| Operating condition | Continuous |
| Mains supply tolerance (%) | +10%, -10% |
| Tested for IT power systems | No |
| IT testing, phase-phase voltage (V) | N/A |
| Class of equipment | Class I (earthed). |
| Mass of equipment (kg) | 4.1Kg |
| Protection against ingress of water | IPX0 |

**Possible test case verdicts:**

| | |
|---|---|
| - test case does not apply to the test object | N / A |
| - test object does meet the requirement | Pass |
| - test object does not meet the requirement | Fail |

**General remarks:**

- "(see Enclosure #)" refers to additional information appended to the Report.
- "(see appended table)" refers to a table appended to the Report.
- Throughout this report a point is used as the decimal separator.

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
This report is not valid as a CB Test Report unless appended to a CB Test Certificate issued by a NCB in accordance with IECEE 02.

**General product information:**

This product is a industrial panel computer. It is specified for use in a Tmra of 50°C maximum.

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| 1 | **GENERAL** | | Pass |

| | | | |
|---|---|---|---|
| 1.5 | **Components** | | Pass |
| 1.5.1 | Comply with IEC 950 or relevant component standard | (see appended table) | Pass |
| 1.5.2 | Evaluation and testing of components | Components, for which no relevant IEC-Standard exist, have been tested under the conditions occurring in the equipment, using applicable parts of IEC 60950.<br><br>Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standards. | Pass |
| | Dimensions (mm) of mains plug for direct plug-in ..... : | Not direct plug-in equipment. | N/A |
| | Torque and pull test of mains plug for direct plug-in; torque (Nm); pull (N)..... : | Not direct plug-in equipment. | N/A |
| 1.5.3 | Thermal controls | There are no thermal controls facilitated in the unit. | N/A |
| 1.5.4 | Transformers | Evaluated during separate certification of power supply. | N/A |
| 1.5.5 | Interconnecting cables | Interconnecting cables comply with the relevant requirements of this standard. | Pass |
| 1.5.6 | Capacitors in primary circuits ..... : | Evaluated during separate certification of power supply. | N/A |
| 1.5.7 | Double or reinforced insulation bridged by components | Evaluated during separate certification of power supply. | N/A |
| 1.5.7.1 | Bridging capacitors | Evaluated during separate certification of power supply. | N/A |
| 1.5.7.2 | Bridging resistors | Evaluated during separate certification of power supply. | N/A |
| 1.5.7.3 | Accessible parts | Evaluated as part of the power supply. | Pass |
| 1.5.8 | Components in equipment for IT power systems | Not for use on IT systems. | N/A |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.6 | **Power interface** | | Pass |
| 1.6.1 | AC power distribution systems | AC power distribution systems are classify as TN. | Pass |
| 1.6.2 | Input current | The steady state input current of the equipment did not exceed the RATED CURRENT by more than 10% under NORMAL LOAD.<br>(See enclosed test record) | Pass |
| 1.6.3 | Voltage limit of hand-held equipment | The unit is not a hand-held equipment. | N/A |
| 1.6.4 | Neutral conductor | Neutral insulation is provided in the approval power supply. | N/A |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| 1.7 | **Marking and instructions** | | Pass |
| 1.7.1 | Power rating | Rating marking readily visible to operator. | Pass |
| | Rated voltage(s) or voltage range(s) (V) ..... : | 100 - 240 V | Pass |
| | Symbol for nature of supply for d.c. ..... : | AC Source. | N/A |
| | Rated frequency or frequency range (Hz) ..... : | 50-60 Hz. | Pass |
| | Rated current (A) ..... : | 2-4 A. | Pass |
| | Manufacturer' s name/Trademark ..... : | ADVANTECH | Pass |
| | Type/model ..... : | ES-200XXXX series, where "X"=0-9, A-Z, or blank | Pass |
| | Symbol of Class II ..... : | Class I equipment. | N/A |
| | Other symbols ..... : | Additional symbols may be provided and conformed with ISO 7000 or IEC 60417-1. | N/A |
| | Certification marks ..... : | CE. | Pass |
| 1.7.2 | Safety instructions | Safety instruction in English.<br>Other languages will be provided when submitted for national approval.<br><br>Operating/safety instructions made available to the user. | Pass |
| 1.7.3 | Short duty cycles | The equipment is intended for continuous operation. | N/A |
| 1.7.4 | Supply voltage adjustment ..... : | Equipment is auto-ranging. | N/A |
| 1.7.5 | Power outlets on the equipment ..... : | No standard power outlets are provided. | N/A |
| 1.7.6 | Fuse identification ..... : | Fuse marking located at the UL and TUV listed power supply. | Pass |
| 1.7.7 | Wiring terminals | See below. | Pass |
| 1.7.7.1 | Protective earthing and bonding terminals | Evaluated in EN60950 approved power supply. | Pass |
| 1.7.7.2 | Terminal for a.c. mains supply conductors | Terminals intended for connection of the primary power neutral conductor indicated by the capital letter N. | Pass |
| 1.7.8 | Controls and indicators | Safety clearly not involved. | Pass |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 1.7.8.1 | Identification, location and marking ..... : | The function of controls affecting safety is obvious regardless of language. | Pass |
| 1.7.8.2 | Colours ..... : | A green LED is illuminated when the unit is operating. | Pass |
| 1.7.8.3 | Symbols according to IEC 60417 ..... : | The push-push switch is marked with the symbols: (60417-1-IEC-5010). | Pass |
| 1.7.8.4 | Markings using figures ..... : | Figures are not used for indicating different positions of controls. | N/A |
| 1.7.9 | Isolation of multiple power sources ..... : | There is only one connection to hazardous voltages. | N/A |
| 1.7.10 | IT power system | Not intended for use on IT power systems. | N/A |
| 1.7.11 | Thermostats and other regulating devices | No thermostats or similar regulating devices. | N/A |
| 1.7.12 | Language ..... : | Reviewed only English markings/instructions.<br><br>May be provided in other languages when the equipment will be applied for other national certificated. | — |
| 1.7.13 | Durability | All markings provided on UL Recognized Component labels suitable for surface they are applied upon. | Pass |
| 1.7.14 | Removable parts | No marking is located on (a) removable part(s). | Pass |
| 1.7.15 | Replaceable batteries | The lithium battery is not located in an Operator Access Area. | N/A |
| | Language..... : | | — |
| 1.7.16 | Operator access with a tool ..... : | No operator access areas require the use of a tool. | Pass |
| 1.7.17 | Equipment for restricted access locations ..... : | Equipment not intended for installation in a RESTRICTED ACCESS LOCATION. | N/A |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2 | **PROTECTION FROM HAZARDS** | | Pass |
| 2.1 | **Protection from electric shock and energy hazards** | | Pass |
| 2.1.1 | Protection in OPERATOR access areas | The construction of this metal enclosure prevents the accessibility to any parts with only basic insulation to ELV or hazardous voltage with test pin or test finger. | Pass |
| 2.1.1.1 | Access to energized parts | The operator has access to bare parts of SELV CIRCUITS.<br><br>No operator access to energized parts. | Pass |
| | Test by inspection ..... : | Operator cannot contact with any parts with only basic insulation to ELV or hazardous voltage. | Pass |
| | Test with test finger ..... : | The test finger was unable to contact bare hazardous parts, basic insulation, or ELV circuits. | Pass |
| | Test with test pin ..... : | The test pin was unable to contact bare hazardous parts. | Pass |
| | Test with test probe ..... : | No TNV present. | N/A |
| 2.1.1.2 | Battery compartments..... : | No battery components. | N/A |
| 2.1.1.3 | Access to ELV wiring | Internal wiring in an ELV circuit is not user accessible. | N/A |
| | Working voltage (V); distance (mm) through insulation | | — |
| 2.1.1.4 | Access to hazardous voltage circuit wiring | No internal wiring accessible to the user. | N/A |
| 2.1.1.5 | Energy hazards ..... : | No hazardous voltage wiring in operator accessible area. | Pass |
| 2.1.1.6 | Manual controls | No shafts or knobs, etc. at ELV, TNV or hazardous voltage. | N/A |
| 2.1.1.7 | Discharge of capacitors in the primary circuit | The capacitance of the input circuit is >0.1 uF. See enclosed test record. | Pass |
| | Time-constant (s); measured voltage (V)..... : | See enclosed test record. | — |
| 2.1.2 | Protection in service access areas | No bare parts operating at HAZARDOUS VOLTAGES in a service access area. | N/A |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.1.3 | Protection in restricted access locations | The unit is not intended to be used in restricted locations. | N/A |
| 2.2 | **SELV circuits** | | Pass |
| 2.2.1 | General requirements | SELV levels are maintained after single fault condition. | Pass |
| 2.2.2 | Voltages under normal conditions (V)..... : | All accessible voltages are less than 42.4 Vp or 60 V dc and are classified as SELV. | Pass |
| 2.2.3 | Voltages under fault conditions (V)..... : | Evaluated during separate certification of power supply.<br><br>Under fault conditions voltages never exceed 71V peak and 120Vdc and do not exceed 42.4V peak or 60V dc for more than 0.2 sec. | Pass |
| 2.2.3.1 | Separation by double or reinforced insulation (method 1) | UL, TUV listed build-in power supply with fire enclosure used in the unit. The output of the power supply is SELV.<br><br>Hazardous voltage wiring which may contact SELV parts provided with double or reinforced insulation. See 2.10.5. | Pass |
| 2.2.3.2 | Separation by earthed screen (method 2) | Method 1 used. | N/A |
| 2.2.3.3 | Protection by earthing of the SELV circuit (method 3) | Method 1 used. | N/A |
| 2.2.4 | Connection of SELV circuits to other circuits.....: | SELV circuit and all interconnected circuits separated from primary by Reinforced/Double insulation.<br>The SELV circuit does not exceed the SELV limits under normal and fault conditions.<br><br>SELV circuits are only connected to other secondary circuits. | Pass |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| 2.3 | **TNV circuits** | | N/A |
| 2.3.1 | Limits | | N/A |
| | Type of TNV circuits..... : | | — |
| 2.3.2 | Separation from other circuits and from accessible parts | | N/A |
| | Insulation employed ..... : | | — |
| 2.3.3 | Separation from hazardous voltages | | N/A |
| | Insulation employed ..... : | | — |
| 2.3.4 | Connection of TNV circuits to other circuits | | N/A |
| | Insulation employed ..... : | | — |
| 2.3.5 | Test for operating voltages generated externally | | N/A |

| | | | |
|---|---|---|---|
| 2.4 | **Limited current circuits** | | N/A |
| 2.4.1 | General requirements | | N/A |
| 2.4.2 | Limit values | | N/A |
| | Frequency (Hz)..... : | | — |
| | Measured current (mA)..... : | | — |
| | Measured voltage (V) ..... : | | — |
| | Measured capacitance (µF) ..... : | | — |
| 2.4.3 | Connection of limited current circuits to other circuits | | N/A |

| | | | |
|---|---|---|---|
| 2.5 | **Limited power sources** | | Pass |
| | Inherently limited output | | N/A |
| | Impedance limited output | See Table 1.5.1 for PTC device. | Pass |
| | Overcurrent protective device limited output | | N/A |
| | Regulating network limited output under normal operating and single fault condition | | N/A |
| | Regulating network limited output under normal operating conditions and overcurrent protective device limited output under single fault condition | | N/A |
| | Output voltage (V), output current (A), apparent power (VA)..... : | See enclosed test record. | — |
| | Current rating of overcurrent protective device (A) | | — |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.6 | **Provisions for earthing and bonding** | | Pass |
| 2.6.1 | Protective earthing | Accessible parts are earthed. | Pass |
| 2.6.2 | Functional earthing | The functional earthing (SELV ground) have seperated from hazardous part by Double/Reinforce Insulation and connect to protective earth terminal. | Pass |
| 2.6.3 | Protective earthing and protective bonding conductors | See below. | Pass |
| 2.6.3.1 | Size of protective earthing conductors | Power supply cord suitable for application and subject to country's national code and regulations to be provided by the manufacturer. | Pass |
| | Rated current (A), cross-sectional area ($mm^2$), AWG..... : | | — |
| 2.6.3.2 | Size of protective bonding conductors | Protective bonding conductors evaluated based on 2.6.3.3. | Pass |
| | Rated current (A), cross-sectional area ($mm^2$), AWG..... : | | — |
| 2.6.3.3 | Rated current (A), type and nominal thread diameter (mm)..... : | | Pass |
| | Resistance (Ω) of earthing conductors and their terminations, test current (A)..... : | See enclosed test record. | Pass |
| 2.6.3.4 | Colour of insulation ..... : | Evaluated as part of the power supply.<br><br>Protective earthing conductor is green with yellow stripe. | Pass |
| 2.6.4 | Terminals | Appliance inlet used. | N/A |
| 2.6.4.1 | Protective earthing and bonding terminals | Appliance inlet used and the unit meet the test requirement of 2.6.3.3. | N/A |
| | Rated current (A), type and nominal thread diameter (mm)..... : | | — |
| 2.6.4.2 | Separation of the protective earthing conductor from protective bonding conductors | Appliance inlet used. | Pass |
| 2.6.5 | Integrity of protective earthing | See below. | Pass |
| 2.6.5.1 | Interconnection of equipment | No interconnection of hazardous voltage. | N/A |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.6.5.2 | Components in protective earthing conductors and protective bonding conductors | No switches or fuses in earthing conductors. | Pass |
| 2.6.5.3 | Disconnection of protective earth | It is not possible to disconnect protective earth without disconnecting mains; an appliance inlet is used as disconnect device. | Pass |
| 2.6.5.4 | Parts that can be removed by an operator | It is not possible to disconnect earth without disconnecting mains and protective earth required makes earlier and breaks later than the supply connectors.<br><br>No other operator removable parts with safety critical earth connection. | Pass |
| 2.6.5.5 | Parts removed during servicing | Connections to protective earthing cannot be removed unless hazardous voltage is removed from the part simultaneously. | Pass |
| 2.6.5.6 | Corrosion resistance | No risk of corrosion. Complies with Annex J. | N/A |
| 2.6.5.7 | Screws for protective bonding | Metal thickness at least twice the pitch of the screw. | Pass |
| 2.6.5.8 | Reliance on telecommunication network | | N/A |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| 2.7 | **Overcurrent and earth fault protection in primary circuits** | | Pass |
| 2.7.1 | Basic requirements | Protective devices are integrated in the equipment. | Pass |
| | Instructions when protection relies on building installation | | N/A |
| 2.7.2 | Faults not covered in 5.3 | The protective devices are well dimensioned and mounted. | Pass |
| 2.7.3 | Short-circuit backup protection | The equipment is pluggable Type A. | Pass |
| 2.7.4 | Number and location of protective devices ..... : | One fuse in the "LIVE" phase. | Pass |
| 2.7.5 | Protection by several devices | Only one protective device is provided. | N/A |
| 2.7.6 | Warning to service personnel..... : | No service work necessary. | N/A |

| | | | |
|---|---|---|---|
| 2.8 | **Safety interlocks** | | N/A |
| 2.8.1 | General principles | There is no interlock provided. | N/A |
| 2.8.2 | Protection requirements | | N/A |
| 2.8.3 | Inadvertent reactivation | | N/A |
| 2.8.4 | Fail-safe operation | | N/A |
| 2.8.5 | Interlocks with moving parts | | N/A |
| 2.8.6 | Overriding an interlock | | N/A |
| 2.8.7 | Switches and relays in interlock systems | | N/A |
| 2.8.7.1 | Contact gaps (mm) ..... : | | N/A |
| 2.8.7.2 | Overload test | | N/A |
| 2.8.7.3 | Endurance test | | N/A |
| 2.8.7.4 | Electric strength test (V) | | N/A |
| 2.8.8 | Mechanical actuators | | N/A |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.9 | **Electrical insulation** | | Pass |
| 2.9.1 | Properties of insulating materials | Electric strength test was conducted after the humidity treatment. See 2.9.2. | Pass |
| 2.9.2 | Humidity conditioning | Humidity treatment performed to 120 hrs in condition:<br>91-95%, 40 °C.<br><br>See enclosed test record. | Pass |
| 2.9.3 | Requirements for insulation | Electric strength test was conducted after the humidity treatment. No flash over or breakdown of insulation.<br><br>(see sub-clause 2.10, 4.5.1 and 5.2) | Pass |
| 2.9.4 | Insulation parameters | Both parameters were considered. | Pass |
| 2.9.5 | Categories of insulation | The adequate level of safety insulation is provided and maintained to comply with the requirements of this standard. | Pass |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| 2.10 | **Clearances, creepage distances and distances through insulation** | | Pass |
| 2.10.1 | General | Pollution degree 2 applicable. | Pass |
| 2.10.2 | Determination of working voltage | Considered in UL, TUV listed power supply. | Pass |
| 2.10.3 | Clearances | All critical clearance distances are covered in power supply evaluation. | Pass |
| 2.10.3.1 | General | Considered in approved power supply. | Pass |
| 2.10.3.2 | Clearances in primary circuit | Considered in approved power supply. | Pass |
| 2.10.3.3 | Clearances in secondary circuits | Considered in approved power supply. | Pass |
| 2.10.3.4 | Measurement of transient levels | Transient levels below Overvoltage Category II limits based on 2.10.3.4. | Pass |
| 2.10.4 | Creepage distances | Considered in approved power supply. | Pass |
| | CTI tests..... : | | — |
| 2.10.5 | Solid insulation | Investigated during separate certification of power supply. | N/A |
| 2.10.5.1 | Minimum distance through insulation | Considered in approved power supply. | Pass |
| 2.10.5.2 | Thin sheet material | Considered in approved power supply. | Pass |
| | Number of layers (pcs)..... : | | — |
| | Electric strength test | | — |
| 2.10.5.3 | Printed boards | PWB is not used as reinforced or supplementary insulation. | N/A |
| | Distance through insulation | | N/A |
| | Electric strength test for thin sheet insulating material | | — |
| | Number of layers (pcs)..... : | | N/A |
| 2.10.5.4 | Wound components | | N/A |
| | Number of layers (pcs)..... : | | N/A |
| | Two wires in contact inside component; angle between 45° and 90° | | N/A |
| 2.10.6 | Coated printed boards | | N/A |
| 2.10.6.1 | General | | N/A |
| 2.10.6.2 | Sample preparation and preliminary inspection | | N/A |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 2.10.6.3 | Thermal cycling | | N/A |
| 2.10.6.4 | Thermal ageing (°C) ..... : | | N/A |
| 2.10.6.5 | Electric strength test | | — |
| 2.10.6.6 | Abrasion resistance test | | N/A |
| | Electric strength test | | — |
| 2.10.7 | Enclosed and sealed parts ..... : | | N/A |
| | Temperature $T_1=T_2 + T_{mra} – T_{amb}$ +10K (°C)..... : | | N/A |
| 2.10.8 | Spacings filled by insulating compound..... : | | N/A |
| | Electric strength test | | — |
| 2.10.9 | Component external terminations | | N/A |
| 2.10.10 | Insulation with varying dimensions | | N/A |

| | | | |
|---|---|---|---|
| 3 | **WIRING, CONNECTIONS AND SUPPLY** | | Pass |
| 3.1 | **General** | | Pass |
| 3.1.1 | Current rating and overcurrent protection | All internal wiring used in the distribution of primary power protected against overcurrent and short circuit by suitably rated protective devices. | Pass |
| 3.1.2 | Protection against mechanical damage | The wires are routed away from sharp edges and parts which could damage insulation. | Pass |
| 3.1.3 | Securing of internal wiring | All wiring is reliably routed or separated and secured.<br><br>The wires are positioned in such a manner that prevents excessive strain, loosening of terminal connections and damage of conductor insulation. | Pass |
| 3.1.4 | Insulation of conductors | Insulation on internal conductors is considered to be of adequate quality and suitable for the application and the working voltage involved.<br><br>All internal wirings are UL Recognized and rated minimum 300 Vac. | Pass |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.1.5 | Beads and ceramic insulators | The equipment does not have any beads or similar insulators. | N/A |
| 3.1.6 | Screws for electrical contact pressure | Electrical screw connection is not used. | N/A |
| 3.1.7 | Non-metallic materials in electrical connections | No contact pressure through insulating material. | Pass |
| 3.1.8 | Self-tapping and spaced thread screws | Thread-cutting or space thread screws are not used fro electrical connections. Machine screws only. | N/A |
| 3.1.9 | Termination of conductors | All conductors are reliable secured. | Pass |
| | 10 N pull test | Considered. | Pass |
| 3.1.10 | Sleeving on wiring | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 3.2 | **Connection to a.c. mains supplies** | | Pass |
| 3.2.1 | Means of connection ..... : | The unit is provided with an appliance inlet. | Pass |
| 3.2.2 | Multiple supply connections | Single mains supply. | N/A |
| 3.2.3 | Permanently connected equipment | The equipment is not permanently connected. | N/A |
| | Number of conductors, diameter (mm) of cable and conduits ..... : | | — |
| 3.2.4 | Appliance inlets | The appliance inlet complies with IEC 60320.<br><br>Appliance inlet can be inserted without difficulty and so placed that, after insertion of the connector, the equipment is not supported by the connector for any position of normal use on a flat surface. | Pass |
| 3.2.5 | Power supply cords | Power supply cord suitable for application and subject to country's national code and regulations to be provided by the manufacturer. | Pass |
| | Type..... : | | — |
| | Rated current (A), cross-sectional area ($mm^2$), AWG..... : | | — |
| 3.2.6 | Cord anchorages and strain relief | Appliance inlet is used. | N/A |
| | Mass of equipment (kg), pull (N) ..... : | | — |
| | Longitudinal displacement (mm) ..... : | | — |
| 3.2.7 | Protection against mechanical damage | No parts under this unit likely to damage the power supply cord.<br><br>No sharp edges. | Pass |
| 3.2.8 | Cord guards | The equipment dose not use a non-detachable power supply cord. | N/A |
| | D (mm); test mass (g) ..... : | | — |
| | Radius of curvature of cord (mm)..... : | | — |
| 3.2.9 | Supply wiring space | Equipment provided with an appliance inlet. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| 3.3 | **Wiring terminals for connection of external conductors** | | N/A |
| 3.3.1 | Wiring terminals | Equipment with detachable power supply cord, connected on appliance inlet. | N/A |
| 3.3.2 | Connection of non-detachable power supply cords | | N/A |
| 3.3.3 | Screw terminals | | N/A |
| 3.3.4 | Rated current (A), cord/cable type, cross-sectional area ($mm^2$)..... : | | N/A |
| 3.3.5 | Rated current (A), type and nominal thread diameter (mm)..... : | | N/A |
| 3.3.6 | Wiring terminals design | | N/A |
| 3.3.7 | Grouping of wiring terminals | | N/A |
| 3.3.8 | Stranded wire | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| 3.4 | **Disconnection from the a.c. mains supply** | | Pass |
| 3.4.1 | General requirement | The appliance inlet is considered to be the disconnect device. | Pass |
| 3.4.2 | Disconnect devices | The equipment is provided with an appliance coupler. | Pass |
| 3.4.3 | Permanently connected equipment | Not permanently connected equipment. | N/A |
| 3.4.4 | Parts which remain energized | No parts remain energized when the disconnect device is removed. | N/A |
| 3.4.5 | Switches in flexible cords | No isolating switch in the cord set. | N/A |
| 3.4.6 | Single-phase equipment | Disconnect device disconnects all poles simultaneously. | Pass |
| 3.4.7 | Three-phase equipment | The unit is single-phase equipment. | N/A |
| 3.4.8 | Switches as disconnect devices | A switch is not considered the disconnect device. | N/A |
| 3.4.9 | Plugs as disconnect devices | The appliance inlet is considered to be the disconnect device. | N/A |
| 3.4.10 | Interconnected equipment | No interconnection of hazardous voltages or energy levels. | N/A |
| 3.4.11 | Multiple power sources | The equipment only receives power from one source. | N/A |

| | | | |
|---|---|---|---|
| 3.5 | **Interconnection of equipment** | | Pass |
| 3.5.1 | General requirements | | Pass |
| 3.5.2 | Types of interconnection circuits.....: | Interconnection circuits are SELV CIRCUITS. | Pass |
| 3.5.3 | ELV circuits as interconnection circuits | No ELV interconnection. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4 | PHYSICAL REQUIREMENTS | | Pass |
| 4.1 | **Stability** | | Pass |
| | Angle of 10° | The unit with frame intends to screw with other facilities. | N/A |
| | Test: force (N) .....: | Equipment is not a floor-standing unit. | N/A |
| 4.2 | **Mechanical strength** | | Pass |
| 4.2.1 | General | See below. | Pass |
| 4.2.2 | Steady force test, 10 N | 10N were applied to components.<br><br>No energy or other hazards. | Pass |
| 4.2.3 | Steady force test, 30 N | The equipment does not have any internal enclosures. | N/A |
| 4.2.4 | Steady force test, 250 N | 250N were applied to other outer enclosure.<br><br>No energy or other hazards. | Pass |
| 4.2.5 | Impact test | 500g steel sphere ball fall, from 1.3m height onto outer enclosure.<br><br>The test was done with all enclosure. No safety relevant damaged. | Pass |
| 4.2.6 | Drop test | Unit is not hand-held, direct plug-in, or transportable. | N/A |
| 4.2.7 | Stress relief | Enclosure is metal. | N/A |
| 4.2.8 | Cathode ray tubes | The equipment does not have any CRT. | N/A |
| | Picture tube separately certified..... : | | N/A |
| 4.2.9 | High pressure lamps | The equipment does not have any high pressure lamps. | N/A |
| 4.2.10 | Wall or ceiling mounted equipment; force (N) ..... : | Not wall mounted equipment. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.3 | **Design and construction** | | Pass |
| 4.3.1 | Edges and corners | All edges and corners are judged to be sufficiently well rounded so as not to constitute a hazard. | Pass |
| 4.3.2 | Handles and manual controls; force (N)..... : | | N/A |
| 4.3.3 | Adjustable controls | The equipment does not have a voltage selector.<br><br>The equipment is auto-ranging. | N/A |
| 4.3.4 | Securing of parts | No loosening of parts impairing creepage distances or clearances over supplementary or reinforced insulation is likely to occur. | Pass |
| 4.3.5 | Connection of plugs and sockets | The equipment does not have any interchangeable plugs/sockets. | N/A |
| 4.3.6 | Direct plug-in equipment | Not direct plug-in equipment. | N/A |
| | Torque (Nm)..... : | | — |
| 4.3.7 | Heating elements in earthed equipment | The equipment does not have any heating elements. | N/A |
| 4.3.8 | Batteries | Battery is protected against charging current by multiple components within the system clock integrated circuit package. See Critical Components List. | Pass |
| 4.3.9 | Oil and grease | The insulation of the internal wiring is not exposed to oil, grease, etc. | N/A |
| 4.3.10 | Dust, powders, liquids and gases | The equipment does not produce dust or employ powders, liquids or gases. | N/A |
| 4.3.11 | Containers for liquids or gases | The equipment does not contain liquids. | N/A |
| 4.3.12 | Flammable liquids..... : | The equipment does not use any flammable liquids. | N/A |
| | Quantity of liquid (l)..... : | | N/A |
| | Flash point (°C) ..... : | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.3.13 | Radiation; type of radiation ..... : | The equipment does not generate ionizing radiation or contain flammable liquids or gases. | N/A |
| | Equipment using lasers | | N/A |
| 4.4 | **Protection against hazardous moving parts** | | N/A |
| 4.4.1 | General | Equipment does not have any hazardous moving parts. | N/A |
| 4.4.2 | Protection in operator access areas | Equipment does not have any hazardous moving parts. | N/A |
| 4.4.3 | Protection in restricted access locations | Equipment does not have any hazardous moving parts. | N/A |
| 4.4.4 | Protection in service access areas | Unintentional contact with hazardous moving parts by service personnel is unlikely. | N/A |
| 4.5 | **Thermal requirements** | | Pass |
| 4.5.1 | Temperature rises | See appended table | Pass |
| | Normal load condition per Annex L..... : | | N/A |
| 4.5.2 | Resistance to abnormal heat | No parts at hazardous voltage are directly mounted on thermoplastic parts. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.6 | **Openings in enclosures** | | Pass |
| 4.6.1 | Top and side openings | Foreign objects entering the enclosure will not contact bare parts at hazardous voltage or energy. (No hazardous parts within 5° projection). | Pass |
| | Dimensions (mm) ..... : | Left Side: Provided with 20 slots openings for fan, each measures 19.95 mm by 1.95 mm. Provided with several circle openings, each measured 2.9 mm diameter cover area 62.6 mm by 31 mm | — |
| 4.6.2 | Bottoms of fire enclosures | Bottom side: Provided with 15 circle openings located right and left side, measured 2.9 mm diameter covered area 22.9 mm by 12.6 mm. | N/A |
| | Construction of the bottom..... : | | — |
| 4.6.3 | Doors or covers in fire enclosures | The equipment does not have any doors or covers. | N/A |
| 4.6.4 | Openings in transportable equipment | Unit not transportable. | N/A |
| 4.6.5 | Adhesives for constructional purposes | Adhesives not used for securement of internal barriers or screens. | N/A |
| | Conditioning temperature/time..... : | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 4.7 | **Resistance to fire** | | Pass |
| 4.7.1 | Reducing the risk of ignition and spread of flame | Method 1: Selection and application of components and materials which minimize the possibility of ignition and spread of flame. | Pass |
| 4.7.2 | Conditions for a fire enclosure | With having the following components:<br>- approved power supply<br>- wiring<br>- integrated circuit<br>- DC Fan<br>- Lithium Battery<br>- Hard Disk Drive<br>- CD-ROM<br>The fire enclosure is required. | Pass |
| 4.7.2.1 | Parts requiring a fire enclosure | A fire enclosure covers all parts. | Pass |
| 4.7.2.2 | Parts not requiring a fire enclosure | Fire enclosure covers all parts. | Pass |
| 4.7.3 | Materials | | Pass |
| 4.7.3.1 | General | See below. | Pass |
| 4.7.3.2 | Materials for fire enclosures | The fire enclosure is metal. | N/A |
| 4.7.3.3 | Materials for components and other parts outside fire enclosures | Fire enclosure covers all parts. | N/A |
| 4.7.3.4 | Materials for components and other parts inside fire enclosures | All internal materials are rated V-2 or better or are mounted on a PWB rated V-1 or better.<br><br>Internal wiring is UL Recognized, marked VW-1 or FT-1 and strapped by individual cable ties (where needed).<br><br>See Table 1.5 for material information. | Pass |
| 4.7.3.5 | Materials for air filter assemblies | The equipment does not have any air filters. | N/A |
| 4.7.3.6 | Materials used in high-voltage components | No high-voltage components. | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| 5 | **ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS** | | **Pass** |
| 5.1 | **Touch current and protective conductor current** | | Pass |
| 5.1.1 | General | See below. | Pass |
| 5.1.2 | Equipment under test (EUT) | Equipment designed for connection to only one power source. | Pass |
| 5.1.3 | Test circuit | Single phase equipment intended for connection to TN system. | Pass |
| 5.1.4 | Application of measuring instrument | Test made to 10X20 cm metal foil in contact with accessible non-conductive part. | Pass |
| 5.1.5 | Test procedure | | Pass |
| 5.1.6 | Test measurements | See appended test record. | Pass |
| | Test voltage (V) .....: | 264 Vac. | — |
| | Measured current (mA) .....: | See enclosed test record. | — |
| | Max. allowed current (mA) .....: | 3.5 mA. (Class I movable) | — |
| 5.1.7 | Equipment with touch current exceeding 3.5 mA .....: | Touch current is < 3.5 mA. | Pass |
| 5.1.8 | Touch currents to and from telecommunication networks | | N/A |
| 5.1.8.1 | Limitation of the touch current to a telecommunication network | | N/A |
| | Test voltage (V) .....: | | — |
| | Measured current (mA) .....: | | — |
| | Max. allowed current (mA) .....: | | — |
| 5.1.8.2 | Summation of touch currents from telecommunication networks.....: | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.2 | **Electric strength** | | Pass |
| 5.2.1 | General | Based on the electric strength test the use of the insulating materials within the equipment is satisfactory.<br><br>(See enclosed test report) | Pass |
| 5.2.2 | Test procedure | No insulation breakdown detected during the test.<br><br>(see enclosed test record) | Pass |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 5.3 | **Abnormal operating and fault conditions** | | Pass |
| 5.3.1 | Protection against overload and abnormal operation | (see enclosed test record) | Pass |
| 5.3.2 | Motors | Approval DC Fan.<br><br>All disk drive motors evaluated as part of component evaluation. | Pass |
| 5.3.3 | Transformers | Evaluated as part of power supply. | Pass |
| 5.3.4 | Functional insulation ..... : | Functional insulation between the phases before the fuse complies with method (a), other operation insulation complies with method (C).<br><br>Considered in approved SPS. | Pass |
| 5.3.5 | Electromechanical components | The equipment does not have any electromechanical components in the secondary. | N/A |
| 5.3.6 | Simulation of faults | Faults in primary and secondary components and functional insulation were already considered during the approval of the SPS.<br><br>See enclosed test record for abnormal operation tests. | Pass |
| 5.3.7 | Unattended equipment | The equipment does not have any thermostats, temperature limiters, or thermal cut-outs. | N/A |
| 5.3.8 | Compliance criteria for abnormal operating and fault conditions | No fire, emission of molten metal or deformation was noted during the tests.<br><br>Electric strength tests performed after abnormal and fault tests. | Pass |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| 6 | **CONNECTION TO TELECOMMUNICATION NETWORKS** | | N/A |
| 6.1 | **Protection of telecommunication network service personnel, and users of other equipment connected to the network, from hazards in the equipment** | | N/A |
| 6.1.1 | Protection from hazardous voltages | | N/A |
| 6.1.2 | Separation of the telecommunication network from earth | | N/A |
| 6.1.2.1 | Requirements | | N/A |
| | Test voltage (V) ..... : | | — |
| | Current in the test circuit (mA) ..... : | | — |
| 6.1.2.2 | Exclusions ..... : | | N/A |

| | | | |
|---|---|---|---|
| 6.2 | **Protection of equipment users from overvoltages on telecommunication networks** | | N/A |
| 6.2.1 | Separation requirements | | N/A |
| 6.2.2 | Electric strength test procedure | | N/A |
| 6.2.2.1 | Impulse test | | N/A |
| 6.2.2.2 | Steady-state test | | N/A |
| 6.2.2.3 | Compliance criteria | | N/A |

| | | | |
|---|---|---|---|
| 6.3 | **Protection of telecommunication wiring system from overheating** | | N/A |
| | Max. output current (A) ..... : | | — |
| | Current limiting method ..... : | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| A | **ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE** | | N/A |
| 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 |
| A.1.1 | Samples, material..... : | | — |
| | Wall thickness (mm)..... : | | — |
| A.1.2 | Conditioning of samples; temperature (°C)..... : | | N/A |
| A.1.3 | Mounting of samples..... : | | N/A |
| A.1.4 | Test flame | | N/A |
| A.1.5 | Test procedure | | N/A |
| A.1.6 | Compliance criteria | | N/A |
| | Sample 1 burning time (s)..... : | | — |
| | Sample 2 burning time (s)..... : | | — |
| | Sample 3 burning time (s)..... : | | — |
| 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 |
| A.2.1 | Samples, material..... : | | — |
| | Wall thickness (mm)..... : | | — |
| A.2.6 | Compliance criteria | | N/A |
| | Sample 1 burning time (s)..... : | | — |
| | Sample 2 burning time (s)..... : | | — |
| | Sample 3 burning time (s)..... : | | — |
| A.2.7 | Alternative test acc. to IEC 60695-2-2, cl. 4, 8 | | N/A |
| | Sample 1 burning time (s)..... : | | — |
| | Sample 2 burning time (s)..... : | | — |
| | Sample 3 burning time (s)..... : | | — |
| A.3 | **High current arcing ignition test (see 4.7.3.2)** | | N/A |
| A.3.1 | Samples, material ..... : | | — |
| | Wall thickness (mm)..... : | | — |
| A.3.5 | Compliance criteria | | N/A |
| | Sample 1 number of arcs to ignition (pcs)..... : | | — |
| | Sample 2 number of arcs to ignition (pcs)..... : | | — |
| | Sample 3 number of arcs to ignition (pcs)..... : | | — |
| | Sample 4 number of arcs to ignition (pcs)..... : | | — |
| | Sample 5 number of arcs to ignition (pcs)..... : | | — |
| A.4 | **Hot wire ignition test (see 4.7.3.2)** | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| A.4.1 | Samples, material..... : | | — |
| | Wall thickness (mm)..... : | | — |
| A.4.5 | Compliance criteria | | N/A |
| | Sample 1 ignition time (s)..... : | | — |
| | Sample 2 ignition time (s)..... : | | — |
| | Sample 3 ignition time (s)..... : | | — |
| | Sample 4 ignition time (s)..... : | | — |
| | Sample 5 ignition time (s)..... : | | — |
| A.5 | **Hot flaming oil test (see 4.6.2)** | | N/A |
| A.6 | **Flammability tests for classifying materials V-0, V-1 or V-2** | | N/A |
| A.6.1 | Samples, material..... : | | — |
| | Wall thickness (mm)..... : | | — |
| A.6.5 | Compliance criteria | | N/A |
| A.6.6 | Permitted re-test | | N/A |
| A.7 | **Flammability test for classifying foamed materials HF-1, HF-2 or HFB** | | N/A |
| A.7.1 | Sample, material ..... : | | — |
| | Wall thickness (mm)..... : | | — |
| A.7.4 | Compliance criteria | | N/A |
| A.7.5 | Compliance criteria, HF-2 | | N/A |
| A.7.6 | Compliance criteria, HF-1 | | N/A |
| A.7.7 | Compliance criteria, HBF | | N/A |
| A.7.8 | Permitted re-test, HF-1 or HF-2 | | N/A |
| A.7.9 | Permitted re-test, HBF | | N/A |
| A.8 | **Flammability test for classifying materials HB** | | N/A |
| A.8.1 | Samples, material..... : | | — |
| | Sample thickness (mm) ..... : | | — |
| A.8.2 | Conditioning of samples; temperature (°C)..... : | | N/A |
| A.8.4 | Test procedure | | N/A |
| A.8.5 | Compliance criteria | | N/A |
| A.8.6 | Permitted re-test | | N/A |
| A.9 | **Flammability test for classifying materials 5V** | | N/A |
| A.9.1 | Samples, material..... : | | — |
| | Sample thickness (mm) ..... : | | — |
| A.9.4 | Test procedure, test bars | | N/A |
| A.9.5 | Test procedure, test plaques | | N/A |
| A.9.6 | Compliance criteria | | N/A |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| A.9.7 | Permitted re-test | | N/A |
| A.10 | **Stress relief conditioning (see 4.2.7)** | | N/A |
| | Temperature (°C) ..... : | | — |
| B | **ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)** | | Pass |
| B.1 | **General requirements** | Certified DC Fan used. | Pass |
| | Position .....: | Above CPU | — |
| | Manufacturer .....: | See appended Table 1.5.1 | — |
| | Type .....: | Ditto | — |
| | Rated values .....: | Ditto | — |
| B.2 | **Test conditions** | | N/A |
| B.3 | **Maximum temperatures** | | N/A |
| B.4 | **Running overload test** | | N/A |
| B.5 | **Locked-rotor overload test** | | N/A |
| | Test duration (days) .....: | | — |
| | Electric strength test: test voltage (V) .....: | | — |
| B.6 | **Running overload test for DC motors in secondary circuits** | | N/A |
| B.7 | **Locked-rotor overload test for DC motors in secondary circuits** | | N/A |
| B.7.1 | Test procedure | | N/A |
| B.7.2 | Alternative test procedure; test time (h).....: | | N/A |
| B.7.3 | Electric strength test | | N/A |
| B.8 | **Test for motors with capacitors** | | N/A |
| B.9 | **Test for three-phase motors** | | N/A |
| B.10 | **Test for series motors** | | N/A |
| | Operating voltage (V) .....: | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| C | **ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)** | | N/A |
| | Position .....: | | — |
| | Manufacturer .....: | | — |
| | Type .....: | | — |
| | Rated values .....: | | — |
| | Method of protection ..... : | | — |
| C.1 | **Overload test** | | N/A |
| C.2 | **Insulation** | | N/A |
| | Protection from displacement of windings..... : | | N/A |

| | | | |
|---|---|---|---|
| G | **ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES** | | N/A |
| G.1 | **Summary of the procedure for determining minimum clearances** | | N/A |
| G.2 | **Determination of mains transient voltage (V) :** | | N/A |
| G.3 | **Determination of telecommunication network transient voltage (V)..... :** | | N/A |
| G.4 | **Determination of required withstand voltage (V)..... :** | | N/A |
| G.5 | **Measurement of transient levels (V)..... :** | | N/A |
| G.6 | **Determination of minimum clearances..... :** | | N/A |

| | | | |
|---|---|---|---|
| H | **ANNEX H, IONIZING RADIATION (see 4.3.13)** | | N/A |
| | Ionizing radiation | | N/A |
| | Measured radiation (mR/h) .....: | | — |
| | Measured high-voltage (kV) .....: | | — |
| | Measured focus voltage (kV) .....: | | — |
| | CRT markings .....: | | — |

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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| J | **ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)** | | N/A |
| | Metal used .....: | | — |

| | | | |
|---|---|---|---|
| K | **ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.7)** | | N/A |
| K.1 | **Making and breaking capacity** | | N/A |
| K.2 | **Thermostat reliability; operating voltage (V). :** | | N/A |
| K.3 | **Thermostat endurance test; operating voltage (V) ..... :** | | N/A |
| K.4 | **Temperature limiter endurance; operating voltage (V) ..... :** | | N/A |
| K.5 | **Thermal cut-out reliability** | | N/A |
| K.6 | **Stability of operation** | | N/A |

| | | | |
|---|---|---|---|
| M | **ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)** | | N/A |
| M.2 | **Method A** | | N/A |
| M.3 | **Method B** | | N/A |
| M.3.1 | Ringing signal | | N/A |
| M.3.1.1 | Frequency (f)..... : | | — |
| M.3.1.2 | Voltage (V) ..... : | | — |
| M.3.1.3 | Cadence; time (s), voltage (V) ..... : | | — |
| M.3.1.4 | Single fault current (mA)..... : | | — |
| M.3.2 | Tripping device and monitoring voltage ..... : | | N/A |
| M.3.2.1 | Conditions for use of a tripping device or a monitoring voltage | | N/A |
| M.3.2.2 | Tripping device | | N/A |
| M.3.2.3 | Monitoring voltage (V)..... : | | N/A |

| | | | |
|---|---|---|---|
| U | **ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)** | | N/A |
| | Separate test report | | N/A |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 1.5.1 | **TABLE: list of critical components** | | | | Pass |
|---|---|---|---|---|---|
| object/part No. | manufacturer/ trademark | type/model | technical data | standard | mark(s) of conformity[1]) |
| Power supply | FSP Group Inc. | FSP180-50PLA | 100-240V a.c, 4A | EN 60950<br>IEC 60950 | UL, Nemko |
| RTC Battery | MATSUSHITA ELECTRIC INDUSTRIAL CO LTD | BR2032 | 3Vdc, 195mAh Max Abnormal Charging Current 5 mA | UL1642 | UL |
| | Toshiba | CR2032 | 3 V, 220 mAh. Max. Abnormal Charging Current 10mA | UL 1642 | UL |
| | Rayovac | BR2032 | 3 V, 195 mAh. Max. Abnormal Charging Current 4 mA | UL 1642 | UL |
| Polyswitch (FS1, FS2, FS3, FS4, FS5) | Raychem Corp., Electronics OEM division Circuit Protection Product | SMD100-2018 | 15V d.c., 1.03A at 25℃ | UL1434 | UL |
| HDD Drive (Optional) | -- | -- | 5Vdc, 0.52A max. | EN 60950 | TÜV, UL, CSA |
| FDD Drive (Optional) | -- | -- | 5Vdc, 1A max. | EN 60950 | TÜV, UL, CSA |
| CD-ROM Drive (Optional) | -- | -- | 5Vdc, 1.5A max. | EN 60950 | TÜV, UL, CSA |
| System Fan | Bi-Sonic Technology Corp. | BS402012H | 12Vdc, 0.16A | IEC 60950 | TUV, UL, CSA |
| DC Fan for CPU | Bi-Sonic Technology Corp. | BP601012H | 12Vdc, 0.21A | IEC 60950 | TÜV, UL |

[1]) an asterisk indicates a mark which assures the agreed level of surveillance

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 1.6.2 | **TABLE: electrical data (in normal conditions)** | | | | | | Pass |
|---|---|---|---|---|---|---|---|
| fuse # | I rated (A) | U (V) | P (W) | I (mA) | I fuse (mA) | condition/status | |
| | | | | | | See enclosed test record | |
| | | | | | | | |
| supplementary information: | | | | | | | |

| 2.10.3 and 2.10.4 | **TABLE: clearance and creepage distance measurements** | | | | | N/A |
|---|---|---|---|---|---|---|
| clearance cl and creepage distance dcr at/of: | Up (V) | U r.m.s. (V) | required cl (mm) | cl (mm) | required dcr (mm) | dcr (mm) |
| Primary to ground | | | | | | |
| Primary to secondary | | | | | | |

| 2.10.5 | **TABLE: distance through insulation measurements** | | | N/A |
|---|---|---|---|---|
| distance through insulation di at/of: | U r.m.s. (V) | test voltage (V) | required di (mm) | di (mm) |
| | | | | |
| | | | | |
| supplementary information: | | | | |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | |
|---|---|---|---|---|---|
| 4.5 | **TABLE: temperature rise measurements** | | | | Pass |
| | test voltage (V) .....: | See enclosed test record. | | | — |
| | t1 (°C) .....: | -- | | | — |
| | t2 (°C) .....: | -- | | | — |
| temperature rise dT of part/at: | | dT (K) | | required dT (K) | |
| See enclosed test record | | | | | |
| | | | | | |
| temperature rise dT of winding: | $R_1$ (Ω) | $R_2$ (Ω) | dT (K) | required dT (K) | insulation class |
| | | | | | |
| | | | | | |
| supplementary information: | | | | | |

| | | | |
|---|---|---|---|
| 4.5.2 | **TABLE: ball pressure test of thermoplastics** | | N/A |
| | allowed impression diameter (mm) .....: | | — |
| part | | test temperature (°C) | impression diameter (mm) |
| | | | |
| | | | |
| supplementary information: | | | |

| | | | |
|---|---|---|---|
| 5.2 | **TABLE: electric strength tests and impulse tests** | | Pass |
| test voltage applied between: | | test voltage (V) | breakdown Yes / No |
| See enclosed test record | | | |
| | | | |
| supplementary information: | | | |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| 5.3 | **TABLE: fault condition tests** | | | | | Pass |
| | ambient temperature (°C) .....: | | | | 25°C | — |
| | model/type of power supply .....: | | | | See Table 1.5.1 | — |
| | manufacturer of power supply .....: | | | | ditto. | — |
| | rated markings of power supply .....: | | | | ditto. | — |
| component No. | fault | test voltage (V) | test time | fuse No. | fuse current (A) | result |
| | | | | | | See enclosed test record |
| | | | | | | |
| supplementary information: | | | | | | |

| A.6.5 | **TABLE: flammability test for classifying materials V-0, V-1 or V-2** | N/A |
|---|---|---|
| sample No. / ref. | afterflame time (s) $t_1$ or $t_2$ | afterflame + afterglow (s) after 2nd flame application $t_2 + t_3$ |
| 1/A | | |
| 2/A | | |
| 3/A | | |
| 4/A | | |
| 5/A | | |
| 6/B | | |
| 7/B | | |
| 8/B | | |
| 9/B | | |
| 10/B | | |

| A.6.6 | **TABLE: flammability re-test for classifying materials V-0, V-1 or V-2** | N/A |
|---|---|---|
| sample No. | afterflame time (s) $t_1$ or $t_2$ | afterflame + afterglow (s) after 2nd flame application $t_2 + t_3$ |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 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 |
|---|---|---|---|---|
| sample No. / ref. | flame time (s) | glow time (s) | flaming/glowing distance from the end (mm) | comment (for A.7.7 burning rate mm/min) |
| 1/A | | | | |
| 2/A | | | | |
| 3/A | | | | |
| 4/A | | | | |
| 5/A | | | | |
| 6/B | | | | |
| 7/B | | | | |
| 8/B | | | | |
| 9/B | | | | |
| 10/B | | | | |

| A.7.8 | **TABLE: flammability re-test for classifying foam materials HF-1 or HF-2** | | | N/A |
|---|---|---|---|---|
| sample No. | flame time (s) | glow time (s) | flaming/glowing distance from the end (mm) | comment |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |

| A.7.9 | **TABLE: flammability re-test for classifying foam materials HBF** | | | N/A |
|---|---|---|---|---|
| sample No. | flame time (s) | glow time (s) | flaming/glowing distance from the end (mm) | comment (for A.7.7 burning rate mm/min) |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| A.8.5 | **TABLE: flammability test for classifying materials HB** | N/A |
|---|---|---|
| sample No. | flaming/glowing rate mm/min | flaming/glowing distance from reference mark (mm) |
| 1 | | |
| 2 | | |
| 3 | | |

| A.8.6 | **TABLE: flammability re-test for classifying materials HB** | N/A |
|---|---|---|
| sample No. | flaming/glowing rate mm/min | flaming/glowing distance from reference mark (mm) |
| 4 | | |
| 5 | | |
| 6 | | |

| A.9.6 | **TABLE: flammability test for classifying materials 5V** | | | | N/A |
|---|---|---|---|---|---|
| sample | test bars | | test plaques | | |
| No./ref. | flaming + glowing time (s) | burning distance (mm) | position | flaming + glowing time (s) | burning distance (mm) |
| 1/A | | | A | | |
| 2/A | | | B | | |
| 3/A | | | C | | |
| 4/A | | | D | | |
| 5/A | | | | | |
| 6/B | | | A | | |
| 7/B | | | B | | |
| 8/B | | | C | | |
| 9/B | | | D | | |
| 10/B | | | | | |

| IEC 60950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

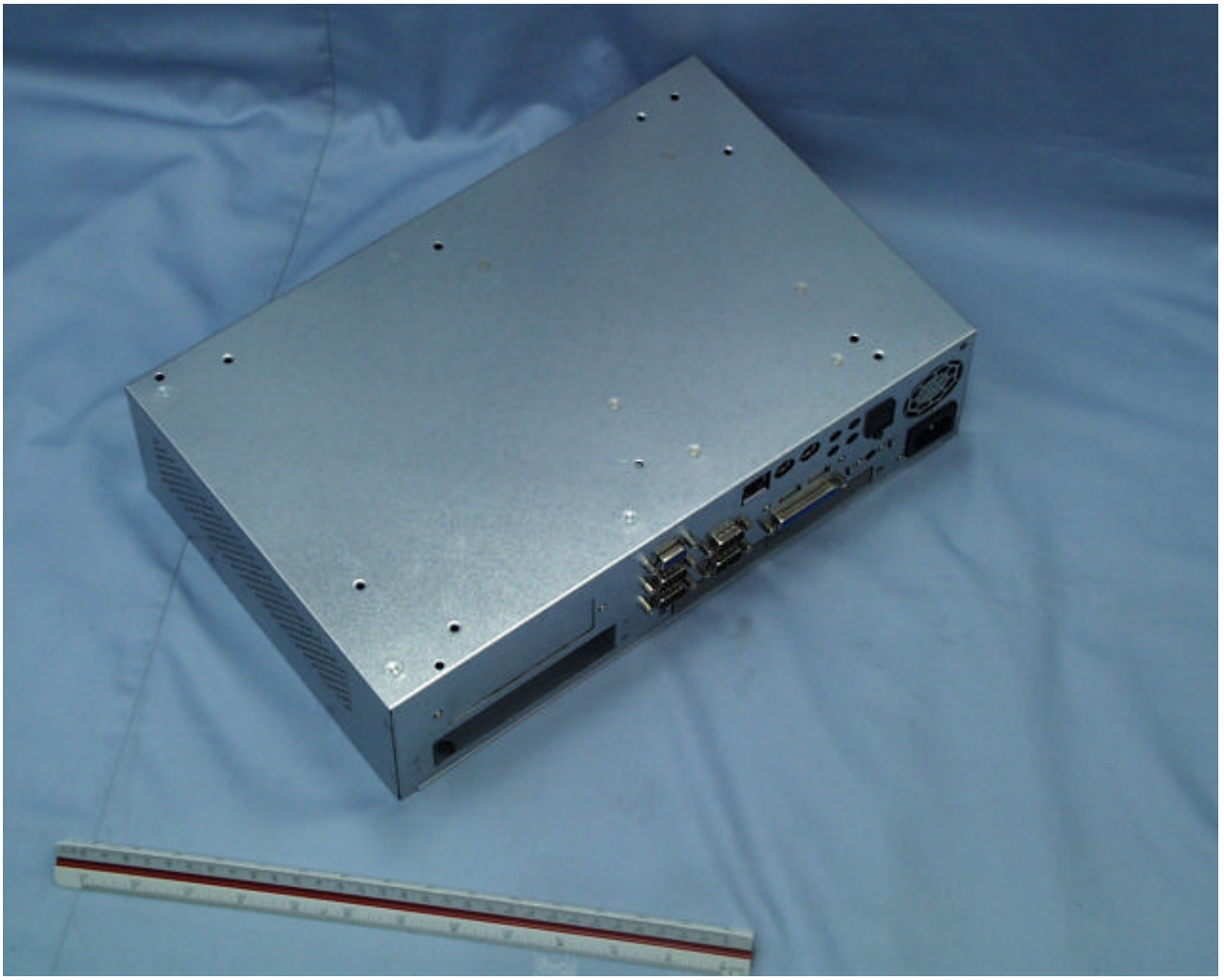
| A.9.7 | **TABLE: flammability re-test for classifying materials 5V** | | | | N/A |
|---|---|---|---|---|---|
| sample | test bars | | test plaques | | |
| No. | flaming + glowing time (s) | burning distance (mm) | position | flaming + glowing time (s) | burning distance (mm) |
| 11 | | | A | | |
| 12 | | | B | | |
| 13 | | | C | | |
| 14 | | | D | | |
| 15 | | | | | |
| | | | | | |
| supplementary information: | | | | | |

# ENCLOSURE No. 1

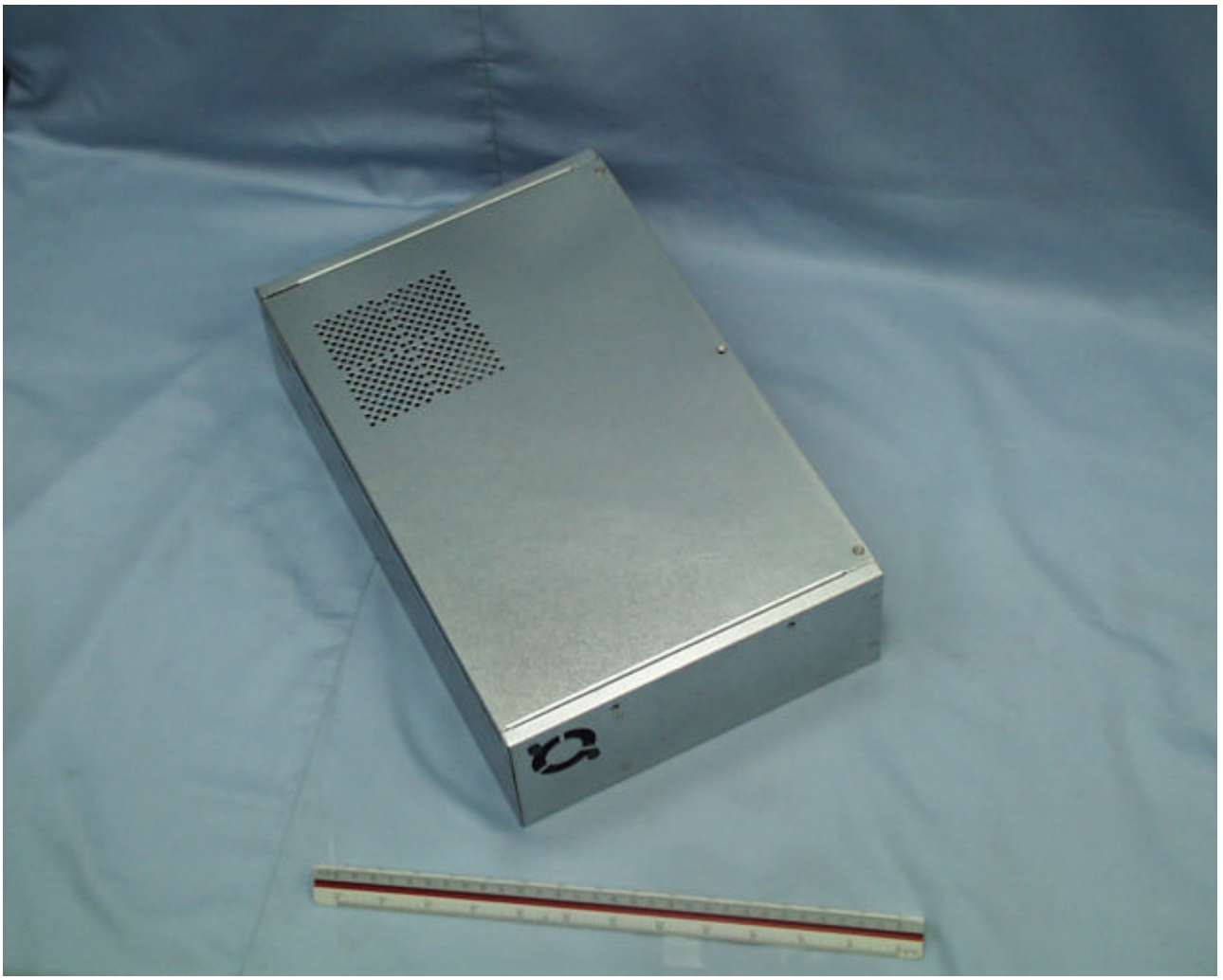
# Photographs

**(Total 4 Pages including this Cover Page)**

# Model: ES-200XXXX



# Model: ES-200XXXX



# Model: ES-200XXXX

# ENCLOSURE No. 2

# Additional Test Data

**(Total 35 Pages including this Cover Page)**

**Measuring and Test Instruments**

Applied For Safety Inspection



**Company/Test Institute**: Superior Product Consulting, Inc.

**Address of Test Site**: 3Fl.,No. 10, Alley 6,Lane 235, Pao Chiao Road, Hsin Tien City, Taipei, Taiwan, R.O.C.

**Person responsible for**

**Maintenance & Calibration :** Terry wang/ Team Leader

**Division/Department :** Test Lab.

**Date and Signature :** Terry Wang 7/28/03

**REV: A** **DATE:JUL,28, 2003**

| Item | Kind of Instrument Precision Class SPC Property No. | Manufacturer | Model Serial No. | Range Used &Function | Calibrated until |
|---|---|---|---|---|---|
| 1 | AC Power Meter | YOKOGAWA | 2433 | 20A | 22, JUN. 2004 |
| | SPC029 | | 68LD0039 | 600V | 23, JUN. 2003 |
| 2 | AC Power Meter | YOKOGAWA | 2433 | 20A | 22, JUN. 2004 |
| | SPC009 | | 61LD0248 | 600V | 23, JUN. 2003 |
| 4 | LEAKAGE CURRENT METER | SIMPSON | 228 | 0-100mA | 13, APR. 2004 |
| | SPC103 | | 20433 | | 14, APR. 2003 |
| 5 | PUSH/PULL SCALE | IMADA | FB-30 | 30KG | 23, JUN. 2004 |
| | SPC004 | | 207330 | | 24, JUN. 2003 |
| | | | | | |
| | | | | | |
| 8 | DC ELECTRONIC LOAD | PRODIGIT | 3301A | 60V/60A | 04, MAR. 2004 |
| | SPC069 | | 80201A011 | | 05, MAR. 2003 |
| 9 | CALIPER | MITUTOYO | 500-321 | 150mm | 10, FEB. 2004 |
| | SPC019 | | 7217225 | | 11, FEB. 2003 |
| 10 | TEMP. RECORDER | YOKOGAWA | UR180 | -200℃ TO | 17, OCT. 2003 |
| | SPC014 | | 48YP0718 | 400℃ | 18, OCT. 2002 |
| 11 | TEMP. RECORDER | YOKOGAWA | UR180 | -200℃ TO | 19, NOV. 2003 |
| | SPC012 | | 48YP0719 | 400℃ | 20, NOV. 2002 |
| 12 | TEMP. RECORDER | YOKOGAWA | UR180 | -200℃ TO | 14, AUG. 2003 |
| | SPC033 | | 42YS0028 | 400℃ | 15, AUG. 2002 |
| 13 | TEMP. RECORDER | FLUKE | 52 | -200℃ TO | 24, JUL. 2004 |
| * | SPC099 | | 4795005 | 760℃ | 25, JUL. 2003 |
| 14 | DIGITIZING OSCILLOSCOPE | TEKTRONIX | TDS410 | 150MHz | 08, JAN. 2004 |
| | SPC047 | | B010359 | 100MS/s | 09, JAN. 2003 |
| 15 | DUAL DISPLAY MULTIMETER | FLUKE | 45 | 750Vac | 10, FEB. 2004 |
| | SPC018 | | 5120082 | 10A | 11, FEB. 2003 |
| | | | | | |
| | | | | | |
| 17 | THERMO-HYGROMETER | ISUZU | 3-3122 | -15℃- +40℃ | 22, JUN. 2004 |
| * | SPC067 | | 80660571 | 0-100% RH | 23, JUN. 2003 |
| 18 | DC ELECTRONIC LOAD | PRODIGIT | 3301 | 60V/60A | 01, MAY. 2004 |
| | SPC028 | | 205010035 | 250V/10A | 02, MAY. 2003 |
| 19 | DC ELECTRONIC LOAD | PRODIGIT | 3301 | 60V/60A | 01, MAY. 2004 |
| | SPC035 | | 210010074 | 250V/10A | 02, MAY. 2003 |
| 20 | AC/DC CURRENT PROBE | TEKTRONIX | A622 | 70Arms | 01, MAY. 2004 |
| | SPC047 | | 06-14-94 | 100Apk | 02, MAY. 2003 |
| | | | | | |
| | | | | | |
| 22 | DC ELECTRONIC LOAD | PRODIGIT | 3321 | 60V/60A | 23, JUL. 2004 |
| * | SPC089 | | 607020097 | | 24, JUL. 2003 |
| 23 | DIGITIZING POWER METER | PRODIGIT | 4011 | 600V/20A | 25, JUL. 2004 |
| * | SPC059 | | 964011133 | | 26, JUL. 2003 |
| | | | | | |
| | | | | | |
| 25 | DIGITIZING MUTIMETER | GOOD WILL | GDM-8055 | 750Vac | 22, JUN. 2004 |
| * | SPC060 | | 6040254 | 2A 20MΩ | 23, JUN. 2003 |
| 27 | POWER ANALYSER | AVPOWER | PA2100 | 650Vrms | 10, APR. 2004 |
| | SPC063 | | 621-0597 | 20A | 11, APR. 2003 |
| 28 | DC ELECTRONIC LOAD | PRODIGIT | 3301A | 60V/60A | 16, OCT. 2003 |
| | SPC066 | | 70601A022 | 250V/10A | 17, OCT. 2002 |

File E

Project SPC LVD 30776

SPC PROJECT NO 30773

| Item | Kind of Instrument Precision Class SPC Property No. | Manufacturer | Model Serial No. | Range Used &Function | Calibrated until |
|---|---|---|---|---|---|
| 29 | TEST FINGER | UL | SM471 | UL1950 | 21, MAR. 2004 |
| | SPC039 | | S002 | FIG. 19 | 22, MAR. 2002 |
| 30 | BALL PRESSURE | UL | S1598 | UL1950 | 21, MAR. 2004 |
| | SPC041 | | S004 | FIG. 21 | 22, MAR. 2002 |
| 31 | IMPACT BALL | UL | — | 50mm | 21, MAR. 2004 |
| | — | | S003 | 500g | 22, MAR. 2002 |
| 32 | TEST PIN | UL | S2962 | UL1950 | 21, MAR. 2004 |
| | SPC040 | | S001 | FIG. 20 | 22, MAR. 2002 |
| 33 | DC ELECTRONIC LOAD | PRODIGIT | 3301A | 60V/60A | 16, AUG. 2003 |
| | SPC077 | | 80701A043 | | 17, AUG. 2002 |
| 34 | DC ELECTRONIC LOAD | PRODIGIT | 3301A | 60V/60A | 28, AUG. 2003 |
| | SPC079 | | 80701A042 | | 29, AUG. 2002 |
| 35 | DC ELECTRONIC LOAD | PRODIGIT | 3302A | 60V/30A | 16, AUG. 2003 |
| | SPC080 | | 808020375 | | 17, AUG. 2002 |
| 36 | DC ELECTRONIC LOAD | PRODIGIT | 3302 | 60V/30A | 16, OCT. 2003 |
| | SPC081 | | 808020378 | | 17, OCT. 2002 |
| 37 | DC ELECTRONIC LOAD | ZENTECH | 2600R | 60V/60A | 16, AUG. 2003 |
| | SPC078 | | 809055 | 300V/10A | 17, AUG. 2002 |
| 38 | TEMP. RECORDER | YOKOGAWA | UR1800 | -200℃ TO | 11, FEB. 2004 |
| | SPC082 | | 4370GE038 | 400 | 12, FEB. 2003 |
| 39 | TEMP. RECORDER | YOKOGAWA | UR1800 | -200℃ TO | 07, JAN. 2004 |
| | SPC083 | | 4370GE037 | 400 | 08, JAN. 2003 |
| 40 | TEMP. RECORDER | YOKOGAWA | UR1800 | -200℃ TO | 07, JAN. 2004 |
| | SPC090 | | 4370GE046 | 400 | 08, JAN. 2003 |
| 41 | DC ELECTRONIC LOAD | PRODIGIT | 3302A | 60V/30A | 16, OCT. 2003 |
| | SPC091 | | 811020578 | | 17, OCT. 2002 |
| 42 | DC ELECTRONIC LOAD | PRODIGIT | 3302A | 60V/30A | 16, OCT. 2003 |
| | SPC088 | | 811020580 | | 17, OCT. 2002 |
| 43 | DC ELECTRONIC LOAD | PRODIGIT | 3301A | 60V/60A | 13, NOV. 2003 |
| | SPC098 | | 80901A045 | | 14, NOV. 2002 |
| 44 | TEST FINGER | UL | FIGURE 19 | UL1950 | 21, MAR. 2004 |
| | SPC070 | | 2346 | FIG. 19 | 22, MAR. 2002 |
| 45 | DC ELECTRONIC LOAD | PRODIGIT | 3301A | 60V/60A | 16, OCT. 2003 |
| | SPC092 | | 80901A046 | | 17, OCT. 2002 |
| 46 | DIGITIZING OSCILLOSCOPE | TEKTRONIX | TDS360 | 200MHz | 26, AUG. 2003 |
| | SPC093 | | B019983 | 1GS/s | 27, AUG. 2002 |
| 47 | DUAL DISPLAY MULTIMETER | FLUKE | 45 | 750Vac | 07, JAN. 2004 |
| | SPC094 | | 7079032 | 10A | 08, JAN. 2003 |
| 48 | HI-POT TESTER | ZENTECH | ZT9072A | 10mA | 28, AUG. 2003 |
| | SPC095 | | 809549 | 5KV | 29, AUG. 2002 |
| 49 | GROUNDING TESTER | ZENTECH | ZT9570 | 12V | 26, NOV. 2003 |
| | SPC096 | | 807786 | 40A | 27, NOV. 2002 |
| 50 | LEAKAGE CURRENT METER | SIMPSON | 228 | 0-100mA | 17, OCT. 2003 |
| | SPC097 | | 20988 | | 18, OCT. 2002 |
| 51 | DIGITIZING POWER METER | PRODIGIT | 4011 | 600V/20A | 11, FEB. 2004 |
| | SPC094 | | 984011034 | | 12, FEB. 2003 |
| 52 | CALIPER | MITUTOYO | CD-6"CS | 150mm | 19, NOV. 2003 |
| | SPC084 | | 0305366 | | 20, NOV. 2002 |
| 53 | TEMP. RECORDER | YOKOGAWA | UR1800 | -200℃ TO | 19, NOV. 2003 |
| | SPC072 | | 4370GC179 | 400 | 20, NOV. 2002 |
| 54 | AC POWER METER | YOKOGAWA | 2433 | 20A | 07, JAN. 2004 |
| | SPC101 | | 68LD0040 | 600V | 08, JAN. 2003 |
| 56 | TEMP. RECORDER | YOKOGAWA | UR1800 | -200℃ TO | 11, FEB. 2004 |
| | SPC104 | | 12W732059 | 400 | 12, FEB. 2003 |
| 57 | TEMP. RECORDER | FLUKE | 52 | -200℃ TO | 06, MAR. 2004 |
| | SPC106 | | 73990047 | 760℃ | 07, MAR. 2003 |
| 58 | DIGITIZING POWER METER | CHYNG HONG | CP-350 | 500V/50A | 09, MAR. 2004 |
| | SPC107 | | 355952 | | 10, MAR. 2003 |
| 59 | DIGITIZING POWER METER | CHYNG HONG | CP-350 | 500V/50A | 09, MAR. 2004 |
| | SPC105 | | 355953 | | 10, MAR. 2003 |
| 60 | Temperature/Humidity Test Chamber | KAO TIEH | KT-7005-A | 25°C to 40°C | 07, OCT. 2003 |
| | SPC005 | | 72867 | 93%R.H. to 95%R.H. | 08, OCT. 2002 |

File E

Project spc LVD 30776

SPC PROJECT NO 30776

SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SPC LVD 30775 Page 3 of 34

TEST RECORD NO. _____ Vol.____ Sec.____ Issued:_____

TEST PROGRAM DETAILS:

The manufacturer submitted

( ) a sample representing production of _____

(X) representative production samples of _____

Model(s) ES-200

( ) employing the alternate _____

(X) The following tests were conducted in accordance with
(X) the Standard for Safety of Information Technology Equipment.
(X) CSA C22.2, No. 60950/UL60950, Third Edition.
( ) IEC 60950, Third Edition ( ) Including Amendments _____
( ) Including National Deviations from _____

( ) VDE 0805/05.90
( ) AS 3260
( ) EN 41 003
( ) TS 001-1990
( ) _____

( ) Only the following tests were deemed necessary.

(X) Tests were conducted by (co. name & location) **Superior Product Consulting, Inc, Taipei, Taiwan, R.O.C.**
( ) and witnessed by a member of the UL staff.

(X) Tests were conducted under ~~WTDP/CTDP/COMPASS Program/TCL~~/CAP.
( ) Tests noted by the initials "UL" were conducted at UL/witnessed by UL staff member.

( ) The following tests were conducted by _____ under the Memorandum of Understanding (MOU)/CB Scheme _____;
(CB Certificate No. _____; Tracking No. _____)

_____ _____

_____ _____

_____ _____

TB:bd - UL 60950, 3rd Data Sheets
Document: 005.Eng

Form Issued: 10-02-00
Revised: 00-00-00



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SPC PROJECT NO.: 30775

SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SPC LVD 30776 Page 4 of 34

The test methods and results of the following tests have been reviewed and found to be in accordance with the requirements in the Standards noted above. Test results are valid only for the tested equipment.

( ) The following D3 Deviations from UL 1950, Second Edition, were used for testing: _____, _____, _____, _____, _____, _____, _____, _____, _____.

( ) The card cage contained _____ boards and had _____ empty slots.

( ) The CPU was Model _____.

( ) The unit was configured as follows: _____

"Maximum normal load" was defined as follows: Hard Disk and CD-ROM were seeking, USB Port load 0.5A.

( ) Horizontal scanning frequency: _____ KHz

Vertical scanning frequency: _____ Hz

The unit weighs approximately 4.1 kg and was considered ~~Direct Plug-In/building-in/transportable/ handheld~~/ movable/ ~~fixed/ stationary~~ with exposed/ ~~unexposed~~ SELV/ ~~secondary low voltage/ TNV~~ circuits.

( ) The unit was considered rack-mountable.

(X) Tmra 50 °C.

(X) Unless otherwise indicated, all tests were conducted on Model _____ 65-200

( ) Tests performed on Model _____ were considered to be representative of Model(s) _____

TB:bd - UL 60950, 3rd Data Sheets
Document: 005.Eng

Form Issued: 10-02-00
Revised: 00-00-00

Form Page 11

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SPC PROJECT NO.: 30776

SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SPC LVD 30776 Page 5/34
Tested by: Judy Jung Date 8/5/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 43.59.

1.6.2 - INPUT TEST:
SINGLE-PHASE

METHOD

The unit was connected to a variable voltage as indicated and then operated normally under the conditions noted below until well warmed. The input current and average power were measured.

(X) RESULTS

| Operating Condition | Input Condition Volts | Input Condition Hz | Input Current, A Rated | Input Current, A Measured | Average Power Watts |
|---|---|---|---|---|---|
| ***Max. Normal Load*** | 90 | 50 | — | 1.69 | 151 |
| " | 90 | 60 | — | 1.69 | 149 |
| " | 100 | 50 | 4 | 1.50 | 148 |
| " | 100 | 60 | 4 | 1.51 | 148 |
| " | >40 | 50 | 2 | 0.63 | 141 |
| " | >40 | 60 | 2 | 0.63 | 141 |
| " | >64 | 50 | — | 0.58 | 141 |
| " | >64 | 60 | — | 0.58 | 141 |
| | | | | | |
| | | | | | |

The steady-state input current ~~did~~/did not exceed the rated current at the rated voltage by more than 10% under the maximum normal load.

Comments: (X) ***Test on model:*** ES-200
Power Supply For Model = FSP, Type FSP-180-50PLA

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SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SPC LVD 30776 Page 6/34
Tested by: Judy Jeng Date 8/8/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 46.

2.1.1.7 - CAPACITANCE DISCHARGE TEST:

METHOD

The unit was connected to >64 V ac, 60 Hz/~~dc~~. A storage oscilloscope was connected across the external point of disconnection of the mains supply. With all switches in the unit initially set to the "OFF" position, the unit was disconnected from the supply source. The voltage at the time of disconnection, $V_o$, and the voltage, $V_{tc}$, at 1.0/~~10.0~~ second~~(s)~~ was/~~were~~ recorded.

(X) A photograph or printout of the scope waveform was provided.

( ) The test was repeated with the primary fuse removed.

( ) The test was repeated with all switches in all possible positions.

RESULTS

| Measurement Locations | Fuse In/Out | Switch Position | $V_o$ (V pk) | 37% $V_o$ (V pk) | $V_{tc}$ (V pk) | time at 37% Vo (second) |
|---|---|---|---|---|---|---|
| Line - Neutral | In | N/A | 380 | 140.6 | 4 | 0.004 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

The voltage across-line capacitors did/~~did not~~ decay to less than 37 percent of its original value in 1.0/~~10.0~~ second~~(s)~~.

. . . . . .

NOTES TO LAB:

1. Discharge through the test probe should be minimized. One possible action is to use a high impedance probe.

2. *X-Cap.* (_____) _____ uF; (_____) _____ uF
   *X-Cap.* (_____) _____ uF; (_____) _____ uF

3. ***Bleeder resistor*** (_____) _____ Ω

Power Supply For Model= FSP, Type FSP180-50PLA

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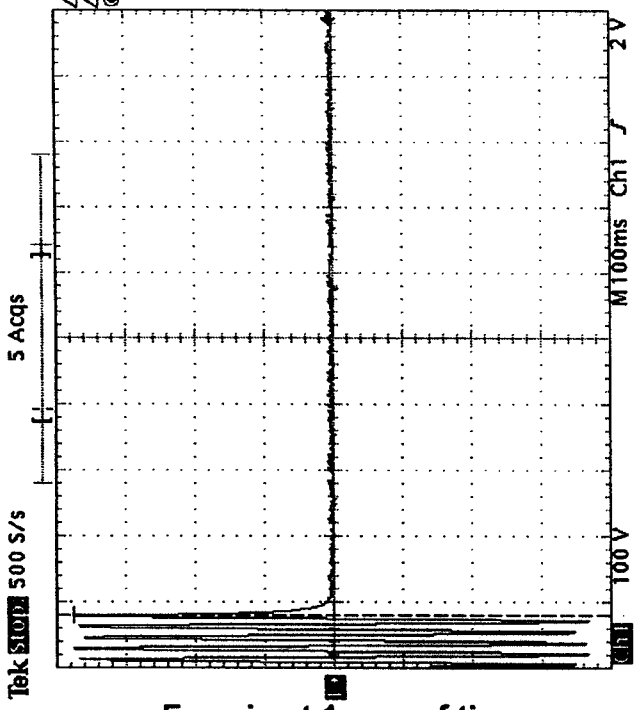
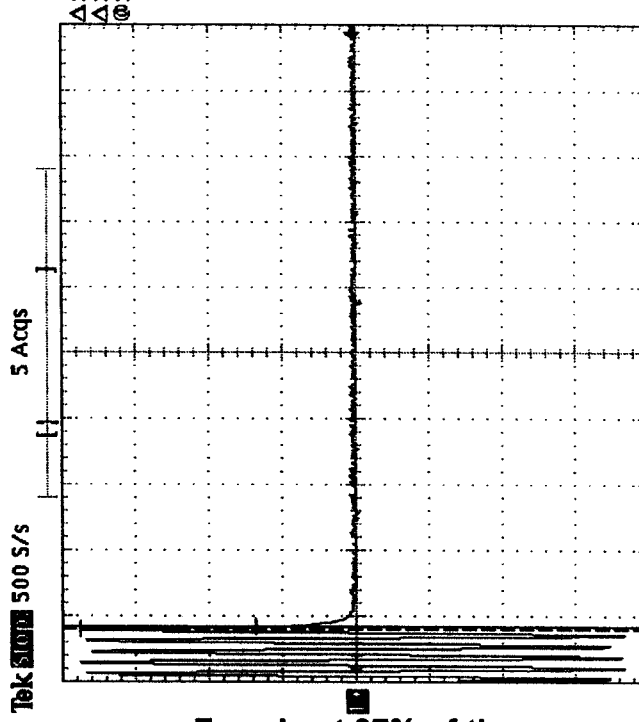
**SPC PROJECT NO.:** 30776

File:
Project: SPC LVD 30776
SPC PROJECT NO.: 30776
Sample #: 1/1

Tested by (signature): Judy Jeng
Tested by (print): Judy Jeng
Test date: 8/8/03
Instrument Code / Range: 46.




Fuse in at 1 sec. of time




Fuse in at 37% of time

SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File ~~E~~ (TJ) Project SPC LVD 30776 Page 8/34
Tested by: Andy Jung Date 8/11/03
(Printed Name) (Signature)

Sample # _____ Instr Code/Range: _____

2.5 - LIMITED POWER SOURCE MEASUREMENTS:

(X) METHOD (Inherently Limited)

A sample of the ~~power~~ Power supply/~~transformer~~, Model ES-200 /~~Operator Accessible Connector~~ was connected to 264 V ac, 60 Hz/~~dc~~. After each of the following output measurements, the values were compared with the appropriate tables:

A. The open circuit voltage ($U_{oc}$), with all load circuits disconnected.

B. The output current ($I_{sc}$) after 60 seconds of operation with the load adjusted to maintain the $I_{sc}$ current limit (8.0 A or $150/U_{oc}$, as applicable). Output circuits other than the circuit under test were unloaded during the $I_{sc}$ measurements.

C. The maximum output Volt-Ampere (VA), after 60 seconds of operation with the load adjusted to maintain the VA limit (5 x $U_{oc}$, or 100, as applicable). Output circuits other than the circuit under test were unloaded during the VA measurement.

(X) If a regulating network limited the output in compliance with Table 2B under normal operating conditions, then measurements (A), (B), and (C) were repeated under single fault conditions. The faults were placed in any part of the regulating network, including power supply pulse width modulation circuitry.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Data Sheet

File _____ Project SPC LVD 30776 Page 9/34
Tested by: Judy Jung Date 8/11/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 4359

RESULTS

| Output Tested | Measured From | Measured To | Single Fault Condition | $U_{oc}$ | Maximum $I_{sc}$ | VA | Limited VA |
|---|---|---|---|---|---|---|---|
| USB 1 | Output(+) | Output(-) | Normal | 4.72 | 1.70 | 6.71 | >3.6 |
| USB 2 | = | = | = | 4.70 | 1.70 | 6.69 | >3.5 |
| Keyboard | Pin4 | = | = | 4.89 | 1.20 | 4.75 | >4.45 |
| Mouse | Pin4 | = | = | 4.85 | 1.25 | 4.93 | >4.25 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

(X) ~~The following~~/All output(s) complied with the limited power source requirements:

Comments: ( ) ***Test on model:***

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File _____ Project SPC L-VD 30[illegible] Page 10/34
Tested by: Jacky Jang Date 8/12/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 49.

2.6.3.3, 2.6.1 - EARTHING TEST II:

METHOD II - For circuit under test with a current rating exceeding 16 A.

Using a maximum 12 V ac\~~dc~~ power source, a current of >5, 40 A, was passed between the equipment earthing terminal and the part in the equipment that is required by 2.6.1 to be earthed listed below for a period of 1.2 minutes. The voltage drop from the earthing terminal to the accessible metal part required to be earthed was recorded.

RESULTS II

| Accessible Conductive Part | Current (Amps) | Voltage Drop (Volts) |
|---|---|---|
| Earth Pin of AC Inlet to Chassis | >5 | 0.22 |
| = | 40 | 0.35 |
| | | |
| | | |
| | | |
| | | |

The voltage drop ~~did~~/did not exceed 2.5 V from any accessible conductive part and earth.

Comments: ( ) ***Test on model:***

. . . . . .

NOTES TO ENGINEER:

1. The test current was two times the current rating of the circuit under test.

2. The time was as specified in Subclause 2.6.3.3.



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File _____ Project SPC EVD 30776 Page 11/34
Tested by: Andy Jung Date 8/2/03~8/8/03
(Printed Name) (Signature)

Sample # _____ Instr Code/Range: _____

2.9.1, 2.9.2, 5.2.2 -- HUMIDITY TEST:

METHOD

A humidity chamber was maintained ~~within 1°C of temperature "t" between 20 and 30°C~~/at a temperature of 40 °C. The unit and any other separate components were brought to a temperature between t°C and t°C + 4°C. They were then placed in the chamber and held at a relative humidity of 93 ± 2 percent/ ~~_____ percent~~ for a period of ~~48 hours~~/ 120 hours. Prior to conditioning, parts of the unit (covers) which could be removed without the use of tools were removed and separately placed in the chamber. During conditioning, cable entrances and/or a conduit opening were left open. During this treatment, the unit was not energized.

While still in the humidity chamber, but after all parts have been placed back on the unit, a dielectric potential was applied and maintained for a period of one minute between the points indicated below. During this test, all switching devices (switches, relays, triacs, etc.) in the primary circuit were closed.

| | Location From | Location To | Potential Used, (V) | | | |
|---|---|---|---|---|---|---|
| A | Primary | Secondary | ( ) _____ | ac | (X) 4242 | dc |
| B | Primary | Earth | ( ) _____ | ac | (X) 3313 | dc |
| C | _____ | _____ | ( ) _____ | ac | ( ) _____ | dc |
| D | _____ | _____ | ( ) _____ | ac | ( ) _____ | dc |


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SPC PROJECT NO.: 30776

SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SPCLVD 30776 Page 12/34
Tested by: Judy Jung Date 8/4/03 ~ 8/8/03
(Printed Name) (Signature)

Sample # 4 Instr Code/Range: 60,48,

RESULTS

The chamber temperature was 40 °C.

The relative humidity was 93 ± 2 percent.

(X) There was no indication of dielectric breakdown.

( ) There was breakdown between the following points.

| Location | Breakdown Voltage | Breakdown Time |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

NOTES TO LAB:

1. If circuit capacitance causes false breakdowns, a dc potential equal to 1.414 times the ac potential may be applied.

2. Components providing a dc path in parallel with the insulation being tested may be disconnected prior to testing.

NOTES TO ENGINEER:

1. National Deviations for Singapore require the Humidity Test to be conducted per Clause 10.2 of IEC60065. The humidity treatment is to be conducted for 120 hrs (5 days) at 40°C, relative humidity 90 to 95%, to comply with this deviation.



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File _____ Project SPC LVD 30776 Page 13/34
Tested by: Judy Jung Date 8/12/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 1559.

4.3.8 - LITHIUM BATTERY REVERSE CURRENT MEASUREMENT TEST:

METHOD

With the lithium battery removed from the circuit, the sample was connected to 264 V ac, 60 Hz/~~dc~~. A dc ammeter replaced the battery in the circuit and the normal reverse (charging) current was measured. The reverse current protection component was shorted and the abnormal reverse (charging) current was measured.

RESULTS

| Battery Type | Normal Reverse (Charging) Current (mA) | Abnormal Condition | Abnormal Reverse Current (mA) |
|---|---|---|---|
| RAYOVAC, Type BR2032 | 0.001 | D16 short | 2.952 |
| " | 0.001 | R114 short | 0.001 |
| | | | |
| | | | |

Comments: _____

. . . . . .

NOTES TO LAB:

1. CAUTION: Risk of explosion. Remove battery before performing this test.
2. Notify engineer if maximum abnormal charging current exceeds 5 mA.



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File _____ Project SPC LVD 30776 Page 14/34
Tested by: _____ Andy Jung Date 8/6/03
(Printed Name) (Signature)

Sample # _____ Instr Code/Range: _____

4.5.1, 1.4.12, 1.4.13 - HEATING TEST:

METHOD

The sample was connected to a source of supply, as noted below, and operated until temperatures became stable. Temperatures were measured using the thermocouple method. ( )Rise in temperature of windings of motors and transformers were additionally determined by the change-of-resistance method.

( ) Before starting the Heating Test, each special non-detachable power supply cord connection was pulled with a force of 5 N (1.12 lbs) for one minute. During the Heating Test, the temperature of its connections were recorded. (Maximum 60°C rise per 3.3.2.)

The sample operated under normal load as follows:

(X) Continuous operation, until steady conditions were established.

( ) Rated intermittent operation of _____ on _____ off, until steady conditions were established.

( ) Rated short-time operation of _____.

(X) The test conditions were as follows:

Max. Normal load

Tmra was 50 °C.

( ) *#Note:*
*Cooling fan CFM (min):* _____.

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SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SPC LVD 30776 Page 15 of 34
Tested by: Judy Jung Date 8/6/03 ~ 8/7/03
Printed Name Signature

Sample # 1/1 Instr Code/Range: 38, 59, 43.

RESULTS

| Test | Operating Condition | Input Conditions Volts | Hz | Duration |
|---|---|---|---|---|
| A | Max. Normal load | 90 | 60 | 2.5hrs |
| B | " | 264 | 50 | 2 hrs |
| C | " (Blocked Opening) | 240 | 60 | 2 hrs |
| D | " (Stalled fan) | 240 | 60 | 1.5hrs |
| E | | | | |
| F | | | | |

| Thermocouple Locations | Maximum Temperature °C Test A | Test B | Test C | Test D | Test E | Test F |
|---|---|---|---|---|---|---|
| 1. LF1 coil | 68 | 67 | 70 | 68 | | |
| 2. T1 coil | 64 | 65 | 70 | 67 | | |
| 3. T2 coil | 46 | 46 | 57 | 48 | | |
| 4. PCB near U14 | 46 | 48 | 60 | 58 | | |
| 5. PCB near CPU | 46 | 48 | 60 | 57 | | |
| 6. HDD Body | 41 | 39 | 47 | 50 | | |
| 7. CD-ROM | 36 | 37 | 41 | 41 | | |
| 8. Enclosure | 33 | 30 | 35 | 36 | | |
| 9. Ambient | 26 | 24 | 26 | 26 | | |

Note: (X) Test on model: ES-200 (CH4 to CH8)
Power Supply For Model= FSP, Type FSP180-50PLA (CH1 to CH3)

**SPC PROJECT NO.: 30776**


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SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File No. _____ Project No. SpcLVD30776 SPC Project No. 30776 Page 16 of 34

## HEATING (TEMPERATURE) TEST

Prepared by: Judy Jing

| Thermocouple Locations (refer to Heating Test) | dT (K) Test A 90 V 60 Hz | Test B 264 V 50 Hz | Test C ___V ___Hz | Test D ___V ___Hz | Test E ___V ___Hz | Test F ___V ___Hz | Required dT (K) |
|---|---|---|---|---|---|---|---|
| 1. | 42 | 43 | | | | | 55 |
| 2. | 38 | 41 | | | | | 60 |
| 3. | >20 | 22 | | | | | 60 |
| 4. | >20 | >24 | | | | | 55 |
| 5. | >20 | >24 | | | | | 55 |
| 6. | 15 | 15 | | | | | — |
| 7. | 10 | 13 | | | | | — |
| 8. | 7 | 6 | | | | | >20 |
| 9. | | | | | | | |
| 10. | | | | | | | |
| 11. | | | | | | | |
| 12. | | | | | | | |
| 13. | | | | | | | |
| 14. | | | | | | | |
| 15. | | | | | | | |
| 16. | | | | | | | |
| 17. | | | | | | | |
| 18. | | | | | | | |
| Room ambient | 26 °C | 24 °C | °C | °C | °C | °C | --- |
| **Test on model:** | ES-200 | | | | | | |

Max. ambient temperature (Tmra).....: 50 °C (Manufacturer's specification)

**Insulating winding component s(Transformer):**

☐ Class A (T ).. 75K - 10K - (_____ – 25)K = _____ K
☒ Class B (T 1, 2).. 95K - 10K - (50 – 25)K = 60 K
☐ Class F (T ): 115K - 10K - (_____ – 25)K = _____ K
☐ Class H (T ): 140K - 10K - (_____ – 25)K = _____ K

*變壓器使用Triple wire且用UL R/C (OBJY2) Insulation System時, 須確認是否只有Class 120 °(E)?

☐ Class E (T ).....: 90K - 10K - (_____ – 25)K = _____ K

Components:

☒ PCB (105 °C)..... (105 – 50)K = 55 K
☒ Choke (105 °C)..... (105 – 50)K = 55 K
☐ Choke ( °C)..... (_____ – _____)K = _____ K
☐ Choke ( °C)..... (_____ -10 – _____)K = _____ K

* 如Choke之溫度等級(Class)於120°C以上, 必須量測PCB之溫度。 (NEMKO, 計算choke時減 10, 用thermocouples)

☐ Electrolyte cap. (85°C)..... (85°C – _____)K = _____ K
☐ Electrolyte cap. (105°C)... (105°C – _____)K = _____ K
☐ Inlet (65 /70/75°C)..... (_____ – _____)K = _____ K
☐ X-Cap (85/100°C)..... (_____ – _____)K = _____ K
☐ Y-Cap (85/100°C)..... (_____ – _____)K = _____ K
☐ Opto-coupler (85/100°C)... (_____ – _____)K = _____ K

User Touchable Surface:

☐ Plastic..... 70K – (_____ – 25)K = _____ K
☒ Metal..... 45K – (50 – 25)K = >20 K

Notes:
1. For plastic Enclosure (Stress Relief Test)
   ☐ The oven temperature is _____°C (ΔT _____ + 10°C + max ambient _____°C ) or ☐ 70°C
2. 如果Heat Sink量測得之溫度超過PCB之限制值, 則必須量測PCB之溫度。

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Data Sheet

Project SPC LVP 30776 Page 17/34

Tested by: Judy Jung Date 8/6/03

(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 38.59.43

Advantech Inc.

264V/50HZ

Model= ES-200

Power Supply For Model= FSP Type FSP180-50PLA

SPC PROJECT NO.: 30776

SUPERIOR PRODUCT CONSULTANTS, INC.
Data Sheet

To _____ Project SPC LVD 30776 Page 18/34
sted by: Judy Jung Date 8/6/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 38.59.43

Adamtech Inc.

90V/60HZ

Model = ES-200

Power Supply For Model = Fsp, Type FSP180-50PLA

SPC PROJECT NO.: 30776

Data Sheet

30776

Project SPC LVD

Page 19/34

Date 8/1/03

(Printed Name) (Signature)

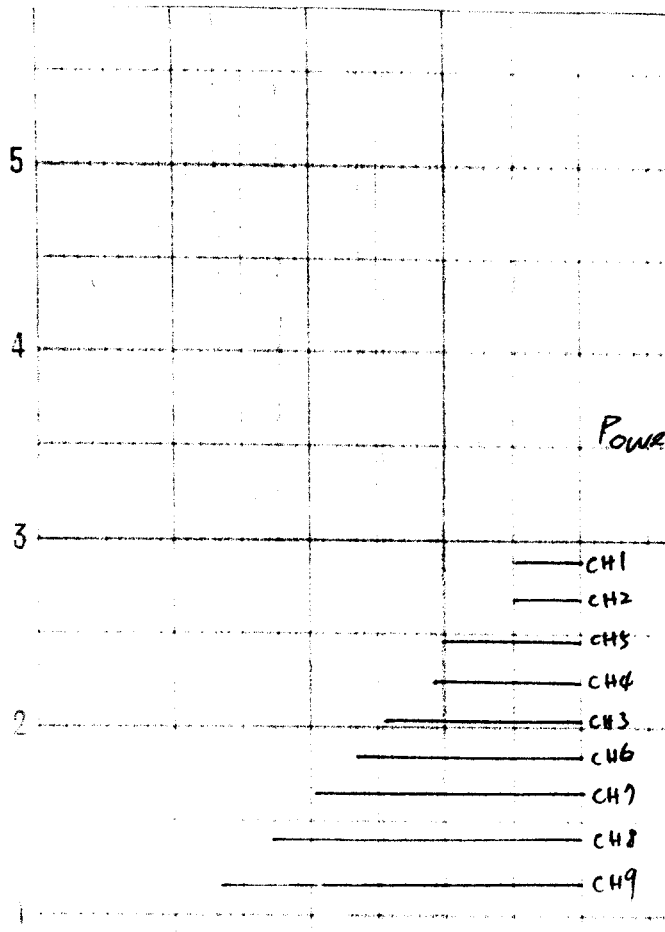
Sample # 1/1 Instr Code/Range: 38, 54, 48, 43.

Advantech Inc.

Blocked Opening

Model: ES-200

Power Supply For Model: FSP, Type FSP150-~~F~~50PLD (II)



SPC PROJECT NO.: 30776

Data Sheet

le _____ Project SPC LVD 30776 Page 20/34

sted by: Andy Jang Date 8/7/03

(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 38, 54, 48, 43.

Advantech Inc,

Sealed fan

Model= ES-200

Power Supply For Model= FSP Type FSP180-50PLA

SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SPC LVD 30776 Page 21/34
Tested by: Judy Jung Date 8/8/03
(Printed Name) (Signature)

Sample # _____ Instr Code/Range: _____

5.1, ANNEX D - TOUCH CURRENT TEST:
(Single-Phase/Polyphase; TN/TT System)

METHOD

The equipment was connected to 260 V ac, 60 Hz. The equipment was placed on an insulating surface and all connections to external equipment were disconnected to prevent stray leakage paths. The unit protective earthing connection was broken during the test. ( ) An isolating transformer was used.

The tests were conducted using the measuring instrument for touch current tests (meter), described in Annex D of UL 60950, Third Edition. Terminal B of the measuring instrument was connected to the earthed (neutral) conductor of the supply (see Figure 5A or 5B).

Primary power switches (i.e., "ON/OFF" switches and voltage selector switches) which can be operated during normal use, were opened and closed in all possible combinations.

For an accessible non-conductive part, the test was made to metal foil having dimensions of 10 by 20 cm in contact with the part. If the area of the foil is smaller than the surface under test, the foil was moved so as to test all parts of the surface. Where adhesive metal foil was used, the adhesive was conductive. Precautions were taken to prevent the metal foil from affecting the heat dissipation of the equipment.

Accessible conductive parts that are incidentally connected to other parts were tested both as connected and disconnected parts.

(X) For equipment having a protective earthing connection or a functional earthing connection, terminal A of the measuring instrument was connected via measurement switch "s" to the equipment earthing terminal of the EUT, with the earthing conductor switch "e" open.

( ) The test was conducted on all equipment, with terminal A of the measuring network connected via measurement switch "s" to each unearthed or non-conductive accessible part and each unearthed accessible circuit, in turn, with the earthing conductor switch "e" closed.

Measuring instrument used:

(X) Annex D.1 (X) Simpson Meter 228
( ) _____

( ) Annex D.2 ( ) Simpson Meter 229-2
( ) _____



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Data Sheet

File _____ Project SPC LVD 30776 Page 22/34
Tested by: Judy Jung Date 8/8/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 59.50.

(X) For single-phase equipment, the test circuit of Fig. 5A was used.

The test was made in all combinations to the normal and reverse polarity of the supply circuit (Polarity Switch P1).

| Terminal A of Measuring Instrument Connected to: | Switch "e" Position | Touch Current (mA r.m.s.) Polarity P1/Primary Switch Condition | | | |
|---|---|---|---|---|---|
| | | Normal/On | Normal/Off | Reverse/On | Reverse/Off |
| Earth | open | 0.68 | — | 0.55 | — |
| | | | | | |
| | | | | | |
| | | | | | |

The touch current ~~did~~/did not exceed 3.5 mA r.m.s.

( ) For three-phase equipment, the test circuit of Fig. 5B was used.

Any components used for EMC purposes and connected between line and earth were disconnected one at a time; for this purpose, groups of components in parallel connection through a single connection were treated as single components. Each time a line-to-earth component was disconnected, the sequence of switch operations was repeated.

| Terminal A of Measuring Instrument Connected to: | Switch "e" Position | Component Disconnected | Touch Current (mA r.m.s.) Polarity P1/Primary Switch Condition | | | |
|---|---|---|---|---|---|---|
| | | | Normal/On | Normal/Off | Reverse/On | Reverse/Off |
| | | | | | | |
| | | | | | | |
| | | | | | | |

The touch current did/did not exceed _____ mA r.m.s.

*Note: Y-Cap.* (_____) _____ *pF;* (_____) _____ *pF*

*Y-Cap.* (_____) _____ *pF;* (_____) _____ *pF*

*Bridging-Cap.* (_____) _____ *pF;* (_____) _____ *pF*

Power Supply For Model: FSP, Type FSP180-50PLA

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File _____ Project SPC LVD 30778 Page 23/34
Tested by: Andy Jang Date 8/12/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 48,

5.2.2 - ELECTRIC STRENGTH TEST:

METHOD

While the unit was in a well heated condition, an ac or dc potential was gradually increased from zero to the test potential given below. The voltage was applied and maintained for a period of one minute between the points indicated. All switches, relays, contactors, triacs or equivalent in the test circuit were closed or shunted.

| | | | | | |
|---|---|---|---|---|---|
| Product/ Component | Unit | Unit | | | |
| From | Primary | Primary | | | |
| To | Secondary | Earth | | | |
| Insl. Type (O, B, S, R) | R | B | | | |
| ( ) Working Voltage | – | – | | | |
| Test Voltage | 4242 | 3313 | | | |
| ac/dc | dc | dc | | | |

RESULTS

| | | | | | |
|---|---|---|---|---|---|
| Breakdown? | No | No | | | |
| If yes, | | | | | |
| Voltage | | | | | |
| Location | | | | | |
| Time | | | | | |

(X) There was no indication of breakdown.

Comments: Power Supply For Model: FSP, Type FSP180-50PLA

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SPC PROJECT NO.: 30778

SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SPC LVD 30776 Page 24/34
Tested by: Judy Jung Date 8/7/03
(Printed Name) (Signature)

Sample # _____ Instr Code/Range: _____

5.3.1 - 5.3.8.2 - ABNORMAL OPERATION TESTS:

METHOD

The unit was operated continuously under the abnormal condition(s) noted below.

(X) The unit was placed on a tissue paper covered softwood surface and covered with cheesecloth.

( ) The following unreliable controls, thermostats and/or thermal cutouts were short-circuited: _____

( ) If a wire or printed wiring board trace in the primary circuit opened, the gap was electrically shorted and the test continued until ultimate results occurred.

( ) If a trace in a secondary circuit designed to intentionally open in a reliable manner operated during the test, the test was repeated two times (three times total).

| | Test No. | |
|---|---|---|
| ( ) | ____ | Mechanical movement disabled. |
| ( ) | ____ | Misloaded unit. |
| ( ) | ____ | Drive motor stalled or overloaded (i.e., paper jam). |
| (X) | 1 | Stalled fan or blower. |
| ( ) | ____ | Disconnected fan or blower. |
| ( ) | ____ | Foreseeable misuse of operating devices (knobs, levers, keys, etc.). |
| (X) | 2 | Blocked ventilation openings. |
| ( ) | ____ | Disabled timer switch. |
| ( ) | ____ | Contact(s) malfunctioned. |
| ( ) | ____ | Thermostat(s) malfunctioned. |
| ( ) | ____ | Thermal cutout(s) malfunctioned. |
| ( ) | ____ | Solenoid plunger locked. |
| ( ) | ____ | Clutch - continuous operation. |
| ( ) | ____ | Voltage mismatch. |
| ( ) | ____ | _____ |



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Tested by: Andy Jung Date 8/7/03
(Printed Name) (Signature)

Sample # _____ Instr Code/Range: _____

(X) At the end of the test, an Electric Strength (ES) potential was applied as indicated below for one minute.

| ES Code | Location From | Location To | | Potential Used (V) | | | |
|---|---|---|---|---|---|---|---|
| A | Primary | Secondary | ( ) | _____ | ac | (X) | 4242 dc |
| B | Primary | Earth | ( ) | _____ | ac | (X) | 3313 dc |

The following key and corresponding comments may be used to describe the final results.

Comments Key:

NB - No indication of dielectric breakdown

YB - Dielectric breakdown (indicate time and location)

NC - Cheesecloth remained intact

YC - Cheesecloth charred or flamed

NT - Tissue paper remained intact

YT - Tissue paper charred or flamed



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Data Sheet

File _____ Project SPC LVD 30776 Page 26/34
Tested by: Andy Jung Date 8/7/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 43.38.54.48

RESULTS

| Test | Component | Abnormal Condition | Input V/Hz | Duration | ES Code |
|---|---|---|---|---|---|
| 1 | Unit | stalled fan | 240/60 | 1.5hrs | A.B |

Comments: Temp. was stable, Input Current = 0.62A, Temp. See Heating Test Result for details, NB, NC, NJ

| | | | | | |
|---|---|---|---|---|---|
| 2 | Unit | Blocked Opening | 240/60 | 2hrs | A.B |

Comments: Temp. was stable, Input Current = 0.62A, Temp. See Heating Test Result for details, NB, NC, NJ

Comments:

Comments:

Comments:

Comments:

Power Supply For Model = FSP, Type FSP180-50PLA

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SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project Spc LVD 30776 Page 27/34
Tested by: Judy Jung Date 8/8/07
(Printed Name) (Signature)

Sample # _____ Instr Code/Range: _____

5.3.6 - OVERLOAD OF OPERATOR ACCESSIBLE CONNECTOR TEST:

METHOD

The sample was covered with one layer of cheesecloth and placed on a pinewood board covered with one layer of tissue paper. The sample had a complete enclosure.

The sample was connected to 264 V ac, 60 Hz/~~dc~~.

(X) The voltage potential was measured on the connector pins. Circuits that measured 0 V were not tested.

( ) The impedance was measured between each accessible connector pin that had greater than 0 V and its power supply voltage source. Where there was 10,000 ohm or more of series impedance between the output connector pin and the power supply voltage source of 125 V or less, the circuit was not tested. Where there was 20,000 ohm or more of series impedance between the output connector pin and the power supply voltage source was greater than 125 V, but not greater than 250 V, the circuit was not tested.

(X) A suitable variable resistor was connected between the connector pin tested and ground. The maximum available current was measured at each pin. If the current was less than or equal to 12.5 mA, the circuit was not tested. When the maximum available current was greater than 12.5 mA, the load was adjusted for maximum available current and maintained for one hour.

( ) Output circuits, which exceeded LPS limits in Clause 2.5 testing, were subjected to this test for at least one hour. The non-LPS output was loaded to draw the maximum current.

The maximum available current was considered to be the lower of (1) the short-circuit current, (2) that current just below the trip point of any overcurrent or overtemperature protective device, or (3) that current that was just below the point at which the power supply circuitry limited the output current. The trip point of overcurrent protective devices was considered to be 110 percent of their current rating.


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Data Sheet

File _____ Project SPCLVD 30776 Page 28/34
Tested by: Judy Jung Date 8/8/03
(Printed Name) (Signature)

Sample # _____ Instr Code/Range: _____

If the circuit was interrupted by the opening of an unreliable component, the test was repeated twice (three times total) using new components as necessary. If a wire or printed wiring board trace in the primary circuit opened, the gap was electrically shorted and the test continued until ultimate results occurred.

( ) If a trace in a secondary circuit designed to intentionally open in a repeatable manner operated during the test, the test was repeated two time (three times total).

If after one hour there was no indication of an abnormal condition, but it appeared possible that a condition of risk would result, the test was continued for 7 hours.

(X) At the end of the test, an Electric Strength (ES) potential was applied as indicated below for one minute.

| ES Code | Location From | Location To | Potential Used (V) | | | | |
|---|---|---|---|---|---|---|---|
| A | Primary | Secondary | ( ) | _____ | ac | (X) 4242 | dc |
| B | Primary | Earth | ( ) | _____ | ac | (X) 3313 | dc |

The following key and corresponding comments may be used to describe the final results.

Comments Key:

NB - No indication of dielectric breakdown
YB - Dielectric breakdown (indicate time and location)
NC - Cheesecloth remained intact
YC - Cheesecloth charred or flamed
NT - Tissue paper remained intact
YT - Tissue paper charred or flamed
A - Circuit measures 10 KS or more series impedance
B - Circuit measures less than 12.5 mA
C - Circuit measures 0 Volts
D - Other. Please explain.



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SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SPC LVD 30776 Page 29/34
Tested by: Judy Jung Date 8/8/03
(Printed Name) (Signature)

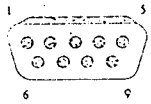
Sample # 1/1 Instr Code/Range: 47.48.

RESULTS

| Connector | Pin #s | Open Circuit Voltage (V) | Maximum Available Current (mA) | Length of Test | Comments |
|---|---|---|---|---|---|
| RS-232 1 | 1 | Ø | – | – | C |
| : | 2 | Ø | – | – | C |
| : | 3 | Ø | – | – | C |
| : | 4 | Ø | – | – | C |
| : | 5 | Ø | – | – | C |
| : | 6 | Ø | – | – | C |
| : | 7 | Ø | – | – | C |
| : | 8 | Ø | – | – | C |
| : | 9 | Ø | – | – | C |
| RS-232 2 | 1 | Ø | – | – | C |
| : | 2 | Ø | – | – | C |
| : | 3 | Ø | – | – | C |
| : | 4 | Ø | – | – | C |
| : | 5 | Ø | – | – | C |
| : | 6 | Ø | – | – | C |
| : | 7 | Ø | – | – | C |
| : | 8 | Ø | – | – | C |
| : | 9 | Ø | – | – | C |

*Note: Not describe parts were not tested. Because the results were comply wit not tested rules in this test. (The results refer to Energy Hazard Measurements)*

RS-232

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**SPC PROJECT NO.: 30776**

SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SpcLVD 30776 Page 30/34
Tested by: Andy Jung Date 8/8/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 47, 48.

RESULTS

| Connector | Pin #s | Open Circuit Voltage (V) | Maximum Available Current (mA) | Length of Test | Comments |
|---|---|---|---|---|---|
| RS-232 3 | 1 | ∞ | – | – | C |
| " | 2 | ∞ | – | – | C |
| " | 3 | ∞ | – | – | C |
| " | 4 | ∞ | – | – | C |
| " | 5 | ∞ | – | – | C |
| " | 6 | ∞ | – | – | C |
| " | 7 | ∞ | – | – | C |
| " | 8 | ∞ | – | – | C |
| " | 9 | ∞ | – | – | C |
| RS-232 4 | 1 | ∞ | – | – | C |
| " | 2 | ∞ | – | – | C |
| " | 3 | ∞ | – | – | C |
| " | 4 | 8.91 | 19.5 | 1hr | NB, NC, NJ |
| " | 5 | ∞ | – | – | C |
| " | 6 | ∞ | – | – | C |
| " | 7 | 8.91 | 19.2 | 1hr | NB, NC, NJ |
| " | 8 | ∞ | – | – | C |
| " | 9 | ∞ | – | – | C |

*Note: Not describe parts were not tested. Because the results were comply wit not tested rules in this test. (The results refer to Energy Hazard Measurements)*

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SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SPC LVD 30776 Page 31/34
Tested by: Jody Jung Date 8/8/03
(Printed Name) (Signature)

Sample # 1 Instr Code/Range: 47.68

RESULTS

| Connector | Pin #s | Open Circuit Voltage (V) | Maximum Available Current (mA) | Length of Test | Comments |
|---|---|---|---|---|---|
| USB 1 | 1 | 5.01 | ~~[illegible]~~ 1350 | 1hr | NB, NC, NT |
| " | 2 | 0 | – | – | C |
| " | 3 | 0 | – | – | C |
| " | 4 | 0 | – | – | C |
| USB 2 | 1 | 5.01 | 136 | 1hr | NB, NC, NT |
| " | 2 | 0 | – | – | C |
| " | 3 | 0 | – | – | C |
| " | 4 | 0 | – | – | C |
| RJ-45 | 1 | 0 | – | – | C |
| " | 2 | 0 | – | – | C |
| " | 3 | 0 | – | – | C |
| " | 4 | 0 | – | – | C |
| " | 5 | 0 | – | – | C |
| " | 6 | 0 | – | – | C |
| " | 7 | 0 | – | – | C |
| " | 8 | 0 | – | – | C |
| | | | | | |
| | | | | | |

*Note: Not describe parts were not tested. Because the results were comply wit not tested rules in this test. (The results refer to Energy Hazard Measurements)*

USB

RJ-45

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Data Sheet

File _____ Project SPC LVD 30776 Page 32/34
Tested by: _____ Date 8/8/03
(Printed Name) (Signature)

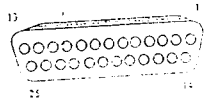
Sample # 1 Instr Code/Range: 4248

RESULTS

| Connector | Pin #s | Open Circuit Voltage (V) | Maximum Available Current (mA) | Length of Test | Comments |
|---|---|---|---|---|---|
| Printer | 1 | 4.95 | 4.96 | — | B |
| = | 2 | 3.28 | 72.81 | 1hr | NB, NC, NT |
| = | 3 | 3.28 | 72.77 | 1hr | NB, NC, NT |
| = | 4 | 3.28 | 73.47 | 1hr | NB, NC, NT |
| = | 5 | 3.28 | 72.75 | 1hr | NB, NC, NT |
| = | 6 | 3.28 | 68.24 | 1hr | NB, NC, NT |
| = | 7 | 3.28 | 72.98 | 1hr | NB, NC, NT |
| = | 8 | 3.28 | 74.05 | 1hr | NB, NC, NT |
| = | 9 | 3.28 | 73.74 | 1hr | NB, NC, NT |
| = | 10 | 4.95 | 4.81 | — | B |
| = | 11 | 4.95 | 4.82 | — | B |
| = | 12 | 4.95 | 4.84 | — | B |
| = | 13 | 4.95 | 4.83 | — | B |
| = | 14 | 4.95 | 4.82 | — | B |
| = | 15 | 4.95 | 4.83 | — | B |
| = | 16 | 4.95 | 4.84 | — | B |
| = | 17 | 0 | — | — | C |
| = | 18 | 0 | — | — | C |

*Note: Not describe parts were not tested. Because the results were comply wit not tested rules in this test. (The results refer to Energy Hazard Measurements)*

Printer



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SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

File _____ Project SPC LVD 30776 Page 33/34
Tested by: Andy Jung Date 8/8/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 47, 48.

RESULTS

| Connector | Pin #s | Open Circuit Voltage (V) | Maximum Available Current (mA) | Length of Test | Comments |
|---|---|---|---|---|---|
| Printer | 19 | ⊗ | – | – | C |
| 2 | 20 | ⊗ | – | – | C |
| 2 | 21 | ⊗ | – | – | C |
| 2 | 22 | ⊗ | – | – | C |
| 2 | 23 | ⊗ | – | – | C |
| 2 | 24 | ⊗ | – | – | C |
| 2 | 25 | ⊗ | – | – | C |

*Note: Not describe parts were not tested. Because the results were comply wit not tested rules in this test. (The results refer to Energy Hazard Measurements)*

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SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet

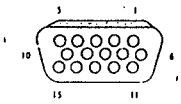
File _____ Project SPC LVD 30776 Page 34/34
Tested by: Andy Jung Date 8/8/03
(Printed Name) (Signature)

Sample # 1/1 Instr Code/Range: 47,48

RESULTS

| Connector | Pin #s | Open Circuit Voltage (V) | Maximum Available Current (mA) | Length of Test | Comments |
|---|---|---|---|---|---|
| VGA | 1 | 0 | – | – | C |
| " | 2 | 0 | – | – | C |
| " | 3 | 0 | – | – | C |
| " | 4 | 0 | – | – | C |
| " | 5 | 0 | – | – | C |
| " | 6 | 0 | – | – | C |
| " | 7 | 0 | – | – | C |
| " | 8 | 0 | – | – | C |
| " | 9 | 0 | – | – | C |
| " | 10 | 0 | – | – | C |
| " | 11 | 0 | – | – | C |
| " | 12 | 3.13 | 0.69 | – | B |
| " | 13 | 0 | – | – | C |
| " | 14 | 0 | – | – | C |
| " | 15 | 3.13 | 0.69 | – | B |
| | | | | | |
| | | | | | |
| | | | | | |

*Note: Not describe parts were not tested. Because the results were comply wit not tested rules in this test. (The results refer to Energy Hazard Measurements)*



VGA

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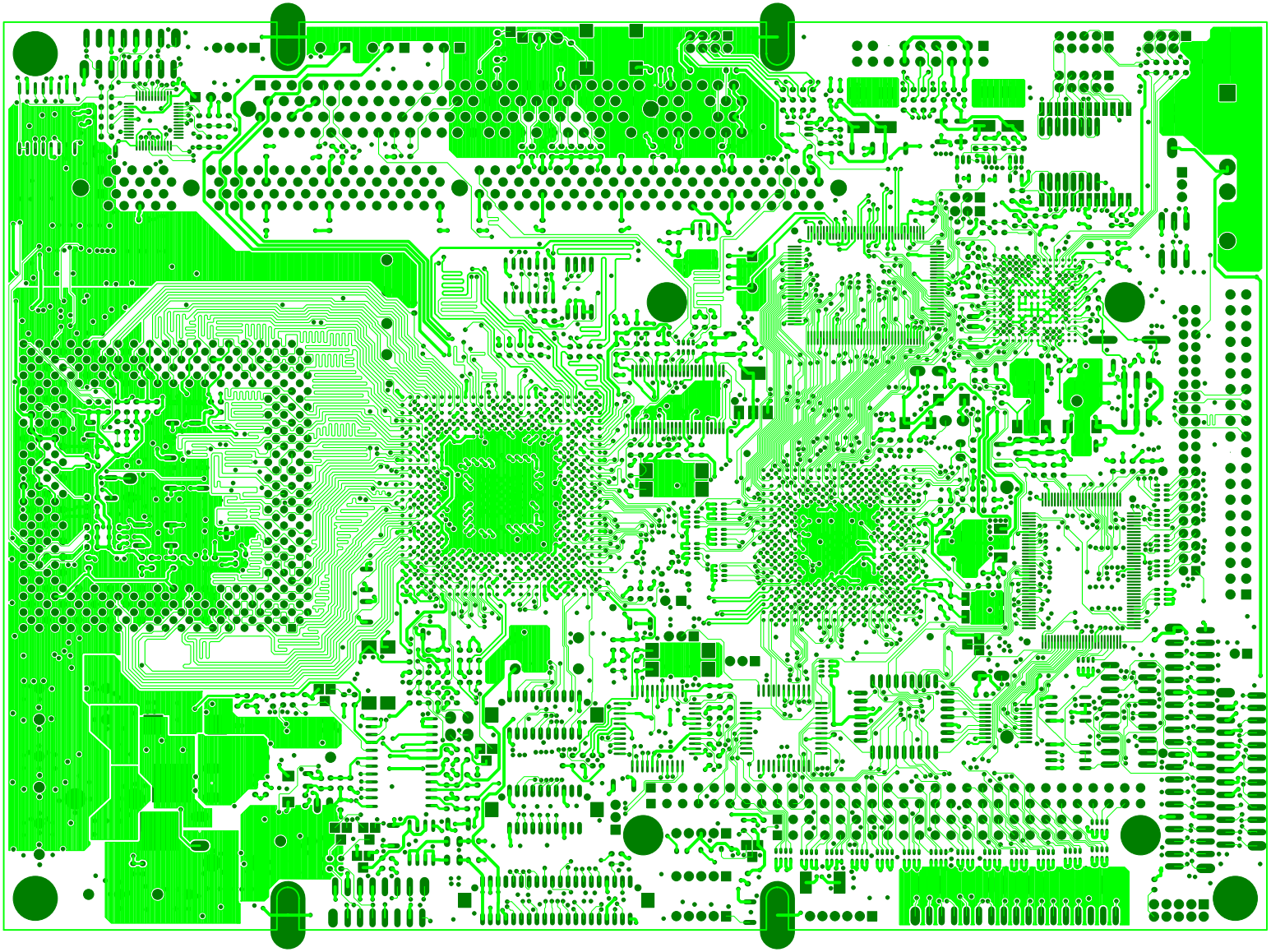
**SPC PROJECT NO.: 30776**

# ENCLOSURE No. 3

## Component Layouts

**(Total 5 Pages including this Cover Page)**



ADVANTECH

| Project name | REV | LAYER STACK |
|---|---|---|
| A01602_PCM9577 | A1 | COMPONENT SIDE |