Low Voltage Directive Report

鼎安科技股份有限公司
SUPERIOR PRODUCT CONSULTING,INC
3F,NO.10,ALLEY 6,LANE 235,PAO CHIAO RD.,HSIEN TIEN,TAIPEI,TAIWAN R.O.C.
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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

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 EN 60 065:1993+A11

International Standards

IEC 60 950: 1991+A1+A2+A3+A4	IEC 60 065:1998 IEC 60 065:1985 +A1+A2+A3

Taipei, 6 November 2001

i.A.

David C. M. Lee, Auditor

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 Computer**
Model Designation ..... :	**EH-3051XXXX. Where the X can be any alphanumeric character 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. ..... :	SPCLVD20838
Compiled by (+ signature) ..... :	Peter Lai
	Group Leader
Reviewed by (+ signature) ..... :	Allen Huang
	Manager
Date of issue ..... :	November 12, 2002

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 ..... :	Superior Product Consulting, INC.
Address ..... :	3F, No. 10, Alley 6, Lane 235, Pao Chiao Rd., Hsien Tien, Taipei, Taiwan, R.O.C.

Client name ..... :	Advantech Co., Ltd.
Address ..... :	4th Fl, No. 108-3, Ming-Chuan Rd, Shing-Tien City, Taipei Hsien, Taiwan.

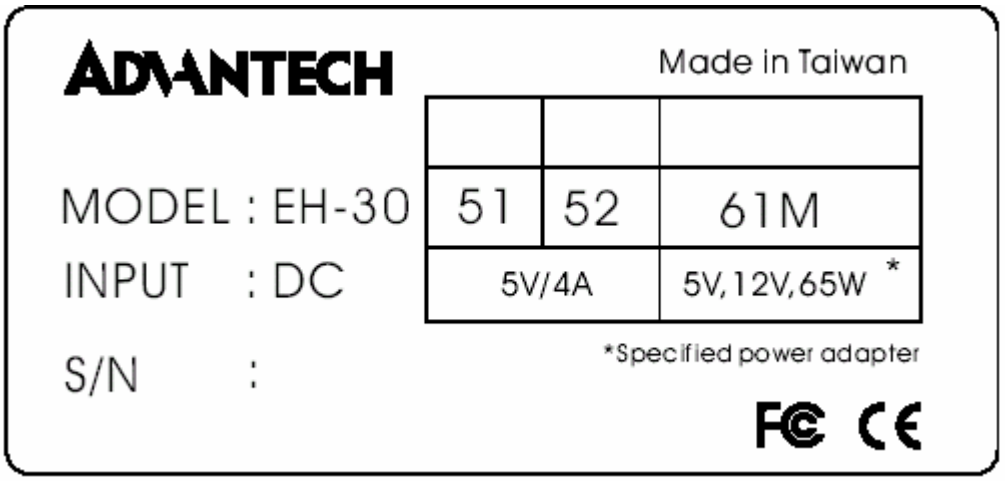
Standard ..... :	IEC 60950, 3rd Edition (1999)
Test procedure ..... :	Informative Test Report
Procedure deviation ..... :	N/A
Non-standard test method ..... :	N/A

Test Report Form/blank test report

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

Test item description ..... :	Server
Trademark ..... :	ADVANTECH
Model and/or type reference ..... :	EH-3051XXXX, Where the X can be any alphanumeric character or blank.
Manufacturer ..... :	Same as Applicant
Rating(s) ..... :	5 Vdc, 4 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 III (double reinforced).
Mass of equipment (kg)	2 Kg
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 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 not certified are used in accordance with their ratings and they comply with applicable parts of IEC 60950 and the relevant component Standard. Components, for which no relevant IEC-Standard exist, have been tested under the conditions occurring in the equipment, using applicable parts of IEC 60950. Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard.	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.	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

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
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
1.6	**Power interface**		Pass
1.6.1	AC power distribution systems	Class III equipment.	N/A
1.6.2	Input current	(see appended table)	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
1.7	**Marking and instructions**		Pass
1.7.1	Power rating	Rating marking readily visible to operator. See below for details.	Pass
	Rated voltage(s) or voltage range(s) (V) ..... :	5 Vdc.	Pass
	Symbol for nature of supply for d.c. ..... :	Symbol for DC voltage is located on the rating label.	Pass
	Rated frequency or frequency range (Hz) ..... :	DC supplied.	N/A
	Rated current (A) ..... :	4 A.	Pass
	Manufacturer' s name/Trademark ..... :	ADVANTECH	Pass
	Type/model ..... :	EH-3051XXXX. Where the X can be any alphanumeric character or blank.	Pass
	Symbol of Class II ..... :	The equipment is regarded as Class III.	N/A
	Other symbols ..... :	Additional symbols may be provided when submitted for national approval.	N/A
	Certification marks ..... :	CE.	Pass

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.2	Safety instructions	Safety instruction in English. Other languages will be provided when submitted for national approval.	Pass
1.7.3	Short duty cycles	The equipment is intended for continuous operation.	N/A
1.7.4	Supply voltage adjustment ..... :	The equipment is regarded as Class III.	N/A
1.7.5	Power outlets on the equipment ..... :	The equipment is regarded as Class III.	N/A
1.7.6	Fuse identification ..... :	Fuse marking on the approved power supply.	Pass
1.7.7	Wiring terminals	See below.	Pass
1.7.7.1	Protective earthing and bonding terminals	Class III product, not connected to protective earth.	N/A
1.7.7.2	Terminal for a.c. mains supply conductors	The equipment is regarded as Class III.	N/A
1.7.8	Controls and indicators	Safety clearly not involved.	N/A
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 ..... :	No indicators with colors.	N/A
1.7.8.3	Symbols according to IEC 60417 ..... :	The mains switch is marked with the symbols: "0" and "I" (60417-1-IEC-5007 and IEC-5008).	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 SELV only.	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. May be provided in other languages when the equipment will be applied for other national certificated.	—

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.13	Durability	The marking(s) withstood the required test.	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.	Pass
	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
2	**PROTECTION FROM HAZARDS**		N/A
2.1	**Protection from electric shock and energy hazards**		N/A
2.1.1	Protection in OPERATOR access areas	The equipment is regarded as Class III.	Pass
2.1.1.1	Access to energized parts	The operator has access to bare parts of SELV CIRCUITS. No operator access to energized parts.	N/A
	Test by inspection ..... :	The equipment is regarded as Class III.	N/A
	Test with test finger ..... :	The equipment is regarded as Class III.	N/A
	Test with test pin ..... :	The equipment is regarded as Class III.	N/A
	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.	N/A

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
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 equipment is regarded as Class III.	N/A
	Time-constant (s); measured voltage (V)..... :		—
2.1.2	Protection in service access areas	No bare parts operating at HAZARDOUS VOLTAGES in a service access area.	N/A
2.1.3	Protection in restricted access locations	The unit 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. 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)	The equipment is regarded as Class III.	Pass
2.2.3.2	Separation by earthed screen (method 2)		N/A
2.2.3.3	Protection by earthing of the SELV circuit (method 3)		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. The SELV circuit does not exceed the SELV limits under normal and fault conditions. SELV circuits are only connected to other secondary circuits.	Pass

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
2.3	**TNV circuits** No TNV circuits in the equipment.		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** No 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 specifications.	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**		N/A
2.6.1	Protective earthing	The equipment is regarded as Class III.	N/A
2.6.2	Functional earthing		N/A
2.6.3	Protective earthing and protective bonding conductors		N/A
2.6.3.1	Size of protective earthing conductors		N/A
	Rated current (A), cross-sectional area (mm^2), AWG..... :		—
2.6.3.2	Size of protective bonding conductors		N/A
	Rated current (A), cross-sectional area (mm^2), AWG..... :		—
2.6.3.3	Rated current (A), type and nominal thread diameter (mm)..... :		N/A
	Resistance (Ω) of earthing conductors and their terminations, test current (A)..... :		N/A
2.6.3.4	Colour of insulation ..... :		N/A
2.6.4	Terminals		N/A
2.6.4.1	Protective earthing and bonding terminals		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		N/A
2.6.5	Integrity of protective earthing		N/A
2.6.5.1	Interconnection of equipment		N/A
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		N/A
2.6.5.3	Disconnection of protective earth		N/A
2.6.5.4	Parts that can be removed by an operator		N/A
2.6.5.5	Parts removed during servicing		N/A
2.6.5.6	Corrosion resistance		N/A
2.6.5.7	Screws for protective bonding		N/A
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**		N/A
2.7.1	Basic requirements	The equipment is regarded as Class III.	N/A
	Instructions when protection relies on building installation		N/A
2.7.2	Faults not covered in 5.3		N/A
2.7.3	Short-circuit backup protection		N/A
2.7.4	Number and location of protective devices ..... :		N/A
2.7.5	Protection by several devices		N/A
2.7.6	Warning to service personnel..... :		N/A
2.8	**Safety interlocks** No safety interlocks in the equipment.		N/A
2.8.1	General principles		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
2.9	**Electrical insulation**		N/A
2.9.1	Properties of insulating materials	The equipment is regarded as Class III.	N/A
2.9.2	Humidity conditioning		N/A
2.9.3	Requirements for insulation		N/A
2.9.4	Insulation parameters		N/A
2.9.5	Categories of insulation		N/A

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
2.10	**Clearances, creepage distances and distances through insulation**		N/A
2.10.1	General	The equipment is regarded as Class III.	N/A
2.10.2	Determination of working voltage		N/A
2.10.3	Clearances		N/A
2.10.3.1	General		N/A
2.10.3.2	Clearances in primary circuit		N/A
2.10.3.3	Clearances in secondary circuits		N/A
2.10.3.4	Measurement of transient levels		N/A
2.10.4	Creepage distances		N/A
	CTI tests..... :		—
2.10.5	Solid insulation		N/A
2.10.5.1	Minimum distance through insulation		N/A
2.10.5.2	Thin sheet material		N/A
	Number of layers (pcs)..... :		—
	Electric strength test		—
2.10.5.3	Printed boards		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
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

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
	Electric strength test		—
2.10.9	Component external terminations		N/A
2.10.10	Insulation with varying dimensions		N/A

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
3	**WIRING, CONNECTIONS AND SUPPLY**		Pass
3.1	**General**		Pass
3.1.1	Current rating and overcurrent protection	The equipment is regarded as Class III.	N/A
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. 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. All internal wirings are UL Recognized and rated minimum 300 Vac.	Pass
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		N/A
	10 N pull test		N/A
3.1.10	Sleeving on wiring	Sleeving is not used as supplementary insulation.	N/A

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
3.2	**Connection to a.c. mains supplies**		N/A
3.2.1	Means of connection ..... :	The equipment is regarded as Class III.	N/A
3.2.2	Multiple supply connections		N/A
3.2.3	Permanently connected equipment		N/A
	Number of conductors, diameter (mm) of cable and conduits ..... :		—
3.2.4	Appliance inlets		N/A
3.2.5	Power supply cords		N/A
	Type..... :		—
	Rated current (A), cross-sectional area (mm^2), AWG..... :		—
3.2.6	Cord anchorages and strain relief		N/A
	Mass of equipment (kg), pull (N) ..... :		—
	Longitudinal displacement (mm) ..... :		—
3.2.7	Protection against mechanical damage		N/A
3.2.8	Cord guards		N/A
	D (mm); test mass (g) ..... :		—
	Radius of curvature of cord (mm)..... :		—
3.2.9	Supply wiring space		N/A

3.3	**Wiring terminals for connection of external conductors**		N/A
3.3.1	Wiring terminals	The equipment is regarded as Class III.	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

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
3.4	**Disconnection from the a.c. mains supply**		N/A
3.4.1	General requirement	The equipment is regarded as Class III.	N/A
3.4.2	Disconnect devices		N/A
3.4.3	Permanently connected equipment		N/A
3.4.4	Parts which remain energized		N/A
3.4.5	Switches in flexible cords		N/A
3.4.6	Single-phase equipment		N/A
3.4.7	Three-phase equipment		N/A
3.4.8	Switches as disconnect devices		N/A
3.4.9	Plugs as disconnect devices		N/A
3.4.10	Interconnected equipment		N/A
3.4.11	Multiple power sources		N/A
3.5	**Interconnection of equipment**		Pass
3.5.1	General requirements		Pass
3.5.2	Types of interconnection circuits.....:	SELV.	Pass
3.5.3	ELV circuits as interconnection circuits	No ELV interconnection.	N/A
4	PHYSICAL REQUIREMENTS		Pass
4.1	**Stability**		Pass
	Angle of 10°	This unit is of a stable mechanical construction and does not overbalance when tilted to an angle of 10° from its normal upright position.	Pass
	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. No energy or other hazards.	Pass
4.2.3	Steady force test, 30 N	The equipment does not have any internal enclosures.	N/A

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
4.2.4	Steady force test, 250 N	250N were applied to other outer enclosure. No energy or other hazards.	Pass
4.2.5	Impact test	500g steel sphere ball fall, from 1.3m height onto outer enclosure. 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
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. The equipment is regarded as Class III.	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

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
	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
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. The equipment is regarded as Class III.	N/A
4.4.2	Protection in operator access areas		N/A
4.4.3	Protection in restricted access locations		N/A
4.4.4	Protection in service access areas		N/A

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
4.5	**Thermal requirements**		Pass
4.5.1	Temperature rises	(see appended table).	Pass
	Normal load condition per Annex L..... :	Operated in the most unfavourable way of operation given in the operating instructions until steady conditions established.	Pass
4.5.2	Resistance to abnormal heat	No parts at hazardous voltage are directly mounted on thermoplastic parts.	N/A
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 and Right side: Provided with 45 slots openings, each measures 75 mm by 20 mm.	—
4.6.2	Bottoms of fire enclosures	No openings.	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: - wiring - integrated circuit - Lithium Battery - Hard Disk - Power Switch 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. Internal wiring is UL Recognized, marked VW-1 or FT-1 and strapped by individual cable ties (where needed).	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
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 SELV supplied only.	Pass

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.3	Test circuit	Single phase equipment intended only for connection to SELV supplied.	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 table.	Pass
	Test voltage (V) .....:	5 Vdc.	—
	Measured current (mA) .....:	See appended table.	—
	Max. allowed current (mA) .....:	0.25 mA. (Class III movable)	—
5.1.7	Equipment with touch current exceeding 3.5 mA .....:	Touch current is < 0.25 mA.	N/A
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
5.2	**Electric strength**		N/A
5.2.1	General	The equipment is regarded as Class III.	N/A
5.2.2	Test procedure		N/A
5.3	**Abnormal operating and fault conditions**		Pass
5.3.1	Protection against overload and abnormal operation	The equipment is regarded as Class III.	Pass
5.3.2	Motors	The equipment does not have any motors.	N/A
5.3.3	Transformers	The equipment does not have any isolation transformers.	N/A
5.3.4	Functional insulation.....:	Functional insulation complies with the requirements (a), (b), or (c).	Pass

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
5.3.5	Electromechanical components	The equipment does not have any electromechanical components in the secondary.	N/A
5.3.6	Simulation of faults	No other components where failure could adversely affect SUPPLEMENTARY or FUNCTIONAL INSULATION.	N/A
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. See enclosed test record.	Pass
6	**CONNECTION TO TELECOMMUNICATION NETWORKS** No TNV circuits in the equipment.		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** No TNV circuits in the equipment.		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

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
6.3	**Protection of telecommunication wiring system from overheating** No TNV circuits in the equipment.		N/A
	Max. output current (A) ..... :		—
	Current limiting method ..... :		—
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)..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	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
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

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Clause	Requirement + Test	Result - Remark	Verdict

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
A.9.7	Permitted re-test		N/A
A.10	**Stress relief conditioning (see 4.2.7)**		N/A
	Temperature (°C) ..... :		—

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
B	**ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)** No motors in the unit.		N/A
B.1	**General requirements**		N/A
	Position .....:		—
	Manufacturer .....:		—
	Type .....:		—
	Rated values .....:		—
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) .....:		—

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict
C	**ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)** No transformer used.		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)** No ionizing radiation.		N/A
	Ionizing radiation		N/A
	Measured radiation (mR/h) .....:		—
	Measured high-voltage (kV) .....:		—
	Measured focus voltage (kV) .....:		—
	CRT markings .....:		—

IEC 60950			
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])
All PCB	--	--	V-1 or better, 105°C min.	UL94	UL
Power Adapter	Phihong Enterprise Co., Ltd.	PSA-30U-050	I/P: 100-240 Vac, 50/60 Hz, 0.5 A, O/P: 5 Vdc/ 4 A, Class I, max. ambient: 40°C	EN 60950 IEC 60950 UL 60950	TÜV, UL
Lithium Battery	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
HDD Drive (Optional)	--	--	12/5Vdc, 1A max.	EN 60950 UL 60950	TÜV, UL, CSA
Polyswitch (FS2, FS3)	Raychem Corp.	miniSMDC110	6V, 1.1A.	UL 8730-1	UL
Power Switch	Solteam	MR-21	6A, 250V	IEC 61058-1	VDE, S, UL
[1]) an asterisk indicates a mark which assures the agreed level of surveillance					

1.6.2	**TABLE: electrical data (in normal conditions)**					N/A
fuse #	I rated (A)	U (V)	P (W)	I (mA)	I fuse (mA)	condition/status
supplementary information:						

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict

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)

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:					

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:						

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict

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**		N/A
test voltage applied between:		test voltage (V)	breakdown Yes / No
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:							

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict

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				

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Clause	Requirement + Test	Result - Remark	Verdict

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			

IEC 60950			
Clause	Requirement + Test	Result - Remark	Verdict

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					

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:					

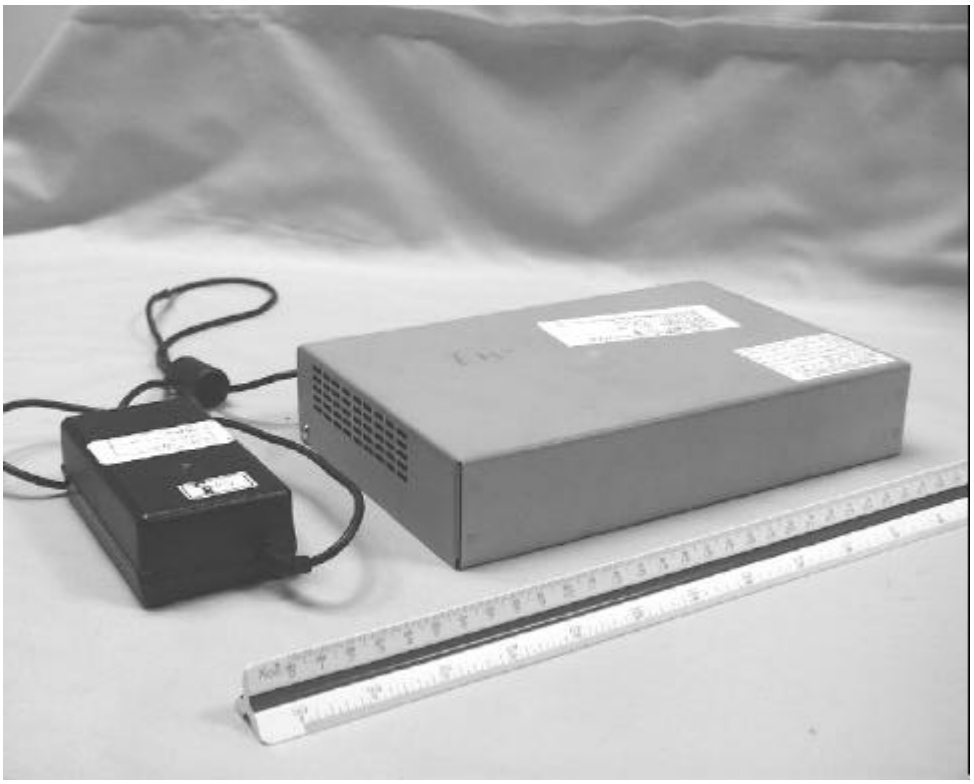
ENCLOSURE No. 1

Photographs

(Total 4 Pages including this Cover Page)

Model EH-3051

Model EH-3051



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