




Test Report issued under the responsibility of:



TEST REPORT EN 60950-1 Information technology equipment – Safety – Part 1: General requirements	
Report Number.....	103838525LAX-002
Date of issue	Mar 28, 2019
Total number of pages	79
Applicant's name	Aleph Objects Inc.
Address	626 W 66th St, Loveland, CO 80538-1210, USA
Test specification:	
Standard	EN 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013
Test procedure	IEC Test report
Non-standard test method.....	N/A
Test Report Form No.....	IEC60950_1F
Test Report Form(s) Originator	SGS Fimko Ltd
Master TRF.....	Dated 2014-02
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Test item description.....	: 3D Printer
Trade Mark.....	: 
Manufacturer.....	: Aleph Objects Inc.
Model/Type reference.....	: TAZ Pro
Ratings.....	: 100-240V, 50-60Hz, 7A
Testing procedure and testing location:	
<input checked="" type="checkbox"/> CB Testing Laboratory:	Intertek Testing Services, NA Inc
Testing location/ address.....	: 25800 Comercentre Drive, Lake Forest, CA 92630, USA
<input type="checkbox"/> Associated CB Testing Laboratory:	N/A
Testing location/ address.....	:
Tested by (name + signature).....	: Bhavin Parikh 
Approved by (name + signature).....	: Vikram Gupta 
<input type="checkbox"/> Testing procedure: TMP/CTF Stage 1:	N/A
Testing location/ address.....	:
Tested by (name + signature).....	:
Approved by (name + signature).....	:
<input type="checkbox"/> Testing procedure: WMT/CTF Stage 2:	N/A
Testing location/ address.....	:
Tested by (name + signature).....	:
Witnessed by (name + signature).....	:
Approved by (name + signature).....	:
<input type="checkbox"/> Testing procedure: SMT/CTF Stage 3 or 4:	N/A
Testing location/ address.....	:
Tested by (name + signature).....	:
Witnessed by (name + signature).....	:
Approved by (name + signature).....	:
Supervised by (name + signature).....	:



List of Attachments (including a total number of pages in each attachment):

Attachment # 1 (National group Differences) 40 Pages
Attachment # 2 (Photographs of System) 2 Pages

Summary of testing:

Tests performed (name of test and test clause):	Testing location:
Input Current Test 1.6.2	Intertek Testing Services, NA Inc
Durability of Markings Test 1.7.11	
Capacitor Discharge Test 2.1.1.7	25800 Comercentre Drive,
Protective Bonding Test 2.6.3.4	Lake Forest, CA 92630, USA
Humidity Conditioning 2.9.2	
Clearance and Creepage Measurement 2.10.3, 2.10.4	
Stability 4.1	
Mechanical Strength 4.2.4	
Impact Test 4.2.5	
Temperature Test 4.5.1	
Touch Current Test 5.1	
Electric Strength Test 5.2	
Abnormal Operation Test 5.3	

Summary of compliance with National Differences:

List of countries addressed

US, CA, AU, CENELEC

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.





Test item particulars	
Equipment mobility.....	<input checked="" type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains.....	<input checked="" type="checkbox"/> pluggable equipment <input checked="" type="checkbox"/> type A <input type="checkbox"/> type B <input type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input type="checkbox"/> not directly connected to the mains
Operating condition.....	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location	<input checked="" type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Mains supply tolerance (%) or absolute mains supply values	+/- 10%
Tested for IT power systems	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IT testing, phase-phase voltage (V)	N/A
Class of equipment	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A)	15A
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	IPX0
Altitude during operation (m)	2000 max
Altitude of test laboratory (m)	200
Mass of equipment (kg)	15

Possible test case verdicts:	
- test case does not apply to the test object	: N/A
- test object does meet the requirement	: P (Pass)
- test object does not meet the requirement	: F (Fail)
Testing.....	
Date of receipt of test item.....	: Feb 25, 2019
Date (s) of performance of tests.....	: Mar 1, 2019 to Mar 22, 2019



General remarks:			
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</p>			
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 02:			
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable		
When differences exist; they shall be identified in the General product information section.			
Name and address of factory (ies)..... : Same as the applicant			
General product information: Product covered under this report is 3D printer model TAZ Pro, intended for indoor use only. Unit is provided with appliance inlet for the AC mains connection.			
Abbreviations used in the report:			
- normal conditions	N.C.	- single fault conditions	S.F.C
- functional insulation	OP	- basic insulation	BI
- double insulation	DI	- supplementary insulation	SI
- between parts of opposite polarity	BOP	- reinforced insulation	RI
Indicate used abbreviations (if any)			



IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1	GENERAL		P
1.5	Components		P
1.5.1	General		P
	Comply with IEC 60950-1 or relevant component standard	(see appended tables 1.5.1)	P
1.5.2	Evaluation and testing of components	Critical components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard.	P
1.5.3	Thermal controls	No thermal controls	NA
1.5.4	Transformers	Part of approved power supply	P
1.5.5	Interconnecting cables	Interconnection cables are not provided	N/A
1.5.6	Capacitors bridging insulation	Part of approved power supply	P
1.5.7	Resistors bridging insulation	Part of approved power supply	P
1.5.7.1	Resistors bridging functional, basic or supplementary insulation	Functional insulation only	P
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits	Not provided.	N/A
1.5.7.3	Resistors bridging double or reinforced insulation between a.c. mains and antenna or coaxial cable		N/A
1.5.8	Components in equipment for IT power systems	Not considered for IT power.	N/A
1.5.9	Surge suppressors	Part of approved power supply	P
1.5.9.1	General		P
1.5.9.2	Protection of VDRs		P
1.5.9.3	Bridging of functional insulation by a VDR		P
1.5.9.4	Bridging of basic insulation by a VDR	Not used	N/A
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N/A
1.6	Power interface		P
1.6.1	AC power distribution systems		P
1.6.2	Input current	(see appended table 1.6.2)	P
1.6.3	Voltage limit of hand-held equipment	Not hand-held equipment	NA
1.6.4	Neutral conductor	Neutral is insulated from earth and body throughout equipment and components rated accordingly.	P



IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7	Marking and instructions		P
1.7.1	Power rating and identification markings		P
1.7.1.1	Power rating marking		P
	Multiple mains supply connections.....:	Single supply	N/A
	Rated voltage(s) or voltage range(s) (V)	100-240 Vac	P
	Symbol for nature of supply, for d.c. only	Not this type	N/A
	Rated frequency or rated frequency range (Hz)	50 - 60 Hz	P
	Rated current (mA or A)	7A	P
1.7.1.2	Identification markings	Model number is provided	P
	Manufacturer's name or trade-mark or identification mark	Trade mark is used	P
	Model identification or type reference	100-240 Vac	P
	Symbol for Class II equipment only	Not Class II equipment.	N/A
	Other markings and symbols		N/A
1.7.1.3	Use of graphical symbols	Operating/safety instructions made available to the user.	P
1.7.2	Safety instructions and marking		P
1.7.2.1	General		P
1.7.2.2	Disconnect devices	Appliance coupler	P
1.7.2.3	Overcurrent protective device	Part of approved power supply	P
1.7.2.4	IT power distribution systems	Not intended for IT power distribution systems	N/A
1.7.2.5	Operator access with a tool	No operator access with a tool.	P
1.7.2.6	Ozone	No such Ozone generator	N/A
1.7.3	Short duty cycles	Intended for continue operation	N/A
1.7.4	Supply voltage adjustment	No such Voltage adjumsent is required	N/A
	Methods and means of adjustment; reference to installation instructions		N/A
1.7.5	Power outlets on the equipment	No power outlets provided.	N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference)	Fuses are part of approved power supply	P
1.7.7	Wiring terminals		P
1.7.7.1	Protective earthing and bonding terminals	Part of the power inlet	P
1.7.7.2	Terminals for a.c. mains supply conductors	Unit is provided with IEC60320 approved appliance inlet.	N/A
1.7.7.3	Terminals for d.c. mains supply conductors		N/A



IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.8	Controls and indicators		N/A
1.7.8.1	Identification, location and marking:	Not obviously necessarily to have identification. The function is obvious	N/A
1.7.8.2	Colours:	Only functional indicators	N/A
1.7.8.3	Symbols according to IEC 60417.....:	Caution Hot symbol in accordance with IEC 60417	P
1.7.8.4	Markings using figures	No Figures are used	N/A
1.7.9	Isolation of multiple power sources	One power supply is used	N/A
1.7.10	Thermostats and other regulating devices	No such thermostat and other regulating devices	N/A
1.7.11	Durability		P
1.7.12	Removable parts	Labels are not located in removable parts	P
1.7.13	Replaceable batteries	No Batteries	N/A
	Language(s)		—
1.7.14	Equipment for restricted access locations.....:	Unit is not to be installed in restricted area	N/A

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in operator access areas		P
2.1.1.1	Access to energized parts	Only SELV circuit and dead metal are accessible	P
	Test by inspection	No energized part are accessible, tests waived	P
	Test with test finger (Figure 2A)	See above	P
	Test with test pin (Figure 2B)	See above	P
	Test with test probe (Figure 2C)	Not TNV circuit	N/A
2.1.1.2	Battery compartments	No such battery compartment	N/A
2.1.1.3	Access to ELV wiring	No ELV voltage	N/A
	Working voltage (V _{peak} or V _{rms}); minimum distance through insulation (mm)		—
2.1.1.4	Access to hazardous voltage circuit wiring	No Hazardous voltage wires are accessible	N/A
2.1.1.5	Energy hazards	The maximum energy available at the output is not hazardous	P
2.1.1.6	Manual controls	No such manual controllers.	N/A
2.1.1.7	Discharge of capacitors in equipment		P
	Measured voltage (V); time-constant (s)	8.9mS	—



IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.1.1.8	Energy hazards – d.c. mains supply		N/A
	a) Capacitor connected to the d.c. mains supply ...:	No d.c Main supply	N/A
	b) Internal battery connected to the d.c. mains supply ...:		N/A
2.1.1.9	Audio amplifiers	No Audio amplifire	N/A
2.1.2	Protection in service access areas	Unit passed discharge of capacitor test, in addition Bare parts operating at Hazardous voltages are located/guarded that unintentional contact with such parts is unlikely during servicing operations involving other equipment. Any guard for compliance within this sub clause are easy to remove for servicing.	P
2.1.3	Protection in restricted access locations	Not intended to be installed in restricted locations	N/A

2.2	SELV circuits		P
2.2.1	General requirements	(see appended table 2.2)	P
2.2.2	Voltages under normal conditions (V)	All accessible voltages are less than 42.4Vpk or 60Vdc and are classified as SELV. Evaluated as part of the power supply approval.	P
2.2.3	Voltages under fault conditions (V)	Evaluated as part of the power supply approval.	P
2.2.4	Connection of SELV circuits to other circuits	SELV circuits only connected to other SELV circuits	P

2.3	TNV circuits		N/A
2.3.1	Limits	No such TNV circuits	N/A
	Type of TNV circuits		—
2.3.2	Separation from other circuits and from accessible parts		N/A
2.3.2.1	General requirements		N/A
2.3.2.2	Protection by basic insulation		N/A
2.3.2.3	Protection by earthing		N/A
2.3.2.4	Protection by other constructions		N/A
2.3.3	Separation from hazardous voltages		N/A
	Insulation employed.....		—
2.3.4	Connection of TNV circuits to other circuits		N/A



IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
	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	No Such Limited current circuit	N/A
2.4.2	Limit values		N/A
	Frequency (Hz).....:		—
	Measured current (mA).....:		—
	Measured voltage (V).....:		—
	Measured circuit capacitance (nF or μ F).....:		—
2.4.3	Connection of limited current circuits to other circuits		N/A
2.5	Limited power sources		P
	a) Inherently limited output		N/A
	b) Impedance limited output		P
	c) Regulating network or IC current limiter, limits output under normal operating and single fault condition		N/A
	Use of integrated circuit (IC) current limiters		N/A
	d) Overcurrent protective device limited output		N/A
	Max. output voltage (V), max. output current (A), max. apparent power (VA)..... :		—
	Current rating of overcurrent protective device (A) ..:		—
2.6	Provisions for earthing and bonding		P
2.6.1	Protective earthing	All accessible metals are connected to the main protective earthing terminal	P
2.6.2	Functional earthing	Not provided	N/A
	Use of symbol for functional earthing.....:		N/A
2.6.3	Protective earthing and protective bonding conductors	The product protective earthing conductive has sufficient current carrying capacity.	P
2.6.3.1	General		P
2.6.3.2	Size of protective earthing conductors		P
	Rated current (A), cross-sectional area (mm^2), AWG..... :	18 AWG,	—
2.6.3.3	Size of protective bonding conductors		P



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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current (A), cross-sectional area (mm ²), AWG	1.1A, 0.75 mm ² , 18 AWG	—
	Protective current rating (A), cross-sectional area (mm ²), AWG		
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (Ω), voltage drop (V), test current (A), duration (min)	40A, 2 min, 63.4m Ω , 2.53V	P
2.6.3.5	Colour of insulation	Green with yellow strips colour is used for the grounding conductors	P
2.6.4	Terminals		P
2.6.4.1	General		P
2.6.4.2	Protective earthing and bonding terminals	Power inlet and stud is provided	P
	Rated current (A), type, nominal thread diameter (mm)	1.1A, 3.0 mm	—
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		P
2.6.5	Integrity of protective earthing		P
2.6.5.1	Interconnection of equipment		N/A
2.6.5.2	Components in protective earthing conductors and protective bonding conductors	No switches or fuses in the grounding and bonding path.	P
2.6.5.3	Disconnection of protective earth		P
2.6.5.4	Parts that can be removed by an operator		P
2.6.5.5	Parts removed during servicing	Connections to protective earthing cannot be removed unless hazardous voltage is removed from the part simultaneously.	P
2.6.5.6	Corrosion resistance	No risk of corrosion.	P
2.6.5.7	Screws for protective bonding		N/A
2.6.5.8	Reliance on telecommunication network or cable distribution system	Does not rely on telecommunication network or cable distribution systems.	N/A
2.7	Overcurrent and earth fault protection in primary circuits		P
2.7.1	Basic requirements		N/A
	Instructions when protection relies on building installation		P
2.7.2	Faults not simulated in 5.3.7	Protection devices well dimensioned and mounted.	N/A
2.7.3	Short-circuit backup protection	Equipment is pluggable, Type A. Building is considered backup short-circuit protection.	P



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Clause	Requirement + Test	Result - Remark	Verdict

2.7.4	Number and location of protective devices		N/A
2.7.5	Protection by several devices	See above.	N/A
2.7.6	Warning to service personnel	None required.	N/A

2.8	Safety interlocks		N/A
2.8.1	General principles	No such interlock	N/A
2.8.2	Protection requirements		N/A
2.8.3	Inadvertent reactivation		N/A
2.8.4	Fail-safe operation		N/A
	Protection against extreme hazard		N/A
2.8.5	Moving parts		N/A
2.8.6	Overriding		N/A
2.8.7	Switches, relays and their related circuits		N/A
2.8.7.1	Separation distances for contact gaps and their related circuits (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	(see appended table 5.2)	N/A
2.8.8	Mechanical actuators		N/A

2.9	Electrical insulation		P
2.9.1	Properties of insulating materials	Natural rubber, hygroscopic materials and asbestos are not used as insulating materials	P
2.9.2	Humidity conditioning		P
	Relative humidity (%), temperature (°C)	25 °C 93 % H	—
2.9.3	Grade of insulation		P
2.9.4	Separation from hazardous voltages	Part of approved power supply	P
	Method(s) used	Method 1	—

2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General	See below.	P
2.10.1.1	Frequency	50-60 Hz	P
2.10.1.2	Pollution degrees	Unit is considered for pollution degree 2 environment.	P
2.10.1.3	Reduced values for functional insulation	Refer to 5.3.4 (a)	P
2.10.1.4	Intervening unconnected conductive parts	Complied.	P
2.10.1.5	Insulation with varying dimensions	Considered.	P



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Clause	Requirement + Test	Result - Remark	Verdict
2.10.1.6	Special separation requirements	Considered.	P
2.10.1.7	Insulation in circuits generating starting pulses	No ignition lamp present.	N/A
2.10.2	Determination of working voltage	(See appended table 2.10.2)	P
2.10.2.1	General		P
2.10.2.2	RMS working voltage	(See appended table 2.10.2) highest is 240 Vrms	P
2.10.2.3	Peak working voltage	(See appended table 2.10.2) 340 is highest Vpeak.	P
2.10.3	Clearances	See below.	P
2.10.3.1	General	Considered Annex F.	P
2.10.3.2	Mains transient voltages	See below.	P
	a) AC mains supply	2500 Vpeak considered.	P
	b) Earthed d.c. mains supplies	Not connected to d.c. MAINS.	N/A
	c) Unearthed d.c. mains supplies	Not connected to d.c. MAINS.	N/A
	d) Battery operation	No batteries present.	N/A
2.10.3.3	Clearances in primary circuits	5mm min at the appliance inlet. Internal spacings are part of the approved component.	P
2.10.3.4	Clearances in secondary circuits	Refer to 5.3.4	N/A
2.10.3.5	Clearances in circuits having starting pulses		N/A
2.10.3.6	Transients from a.c. mains supply	2500 Vpeak assumed.	P
2.10.3.7	Transients from d.c. mains supply	Not connected to d.c. MAINS.	N/A
2.10.3.8	Transients from telecommunication networks and cable distribution systems	No telecommunications networks or cable distribution systems present.	N/A
2.10.3.9	Measurement of transient voltage levels	Not tested.	N/A
	a) Transients from a mains supply		N/A
	For an a.c. mains supply	Not tested.	N/A
	For a d.c. mains supply	No DC mains supply.	N/A
	b) Transients from a telecommunication network :	Not a telecommunication network	N/A
2.10.4	Creepage distances		P
2.10.4.1	General		P
2.10.4.2	Material group and comparative tracking index	Material group is not known and so IIIb to used.	P
	CTI tests	Material group IIIb is assumed to be used	—
2.10.4.3	Minimum creepage distances	5mm min at the appliance inlet. Internal spacings are part of the approved component.	P
2.10.5	Solid insulation	Part of certified power supply	N/A



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Clause	Requirement + Test	Result - Remark	Verdict
2.10.5.1	General		N/A
2.10.5.2	Distances through insulation	(see appended table 2.10.5)	N/A
2.10.5.3	Insulating compound as solid insulation		N/A
2.10.5.4	Semiconductor devices		N/A
2.10.5.5.	Cemented joints	(see appended table 2.10.3 and 2.10.4)	N/A
2.10.5.6	Thin sheet material – General	Considered (see appended table 2.10.3 and 2.10.4)	N/A
2.10.5.7	Separable thin sheet material	Part of certified power supply	N/A
	Number of layers (pcs)		—
2.10.5.8	Non-separable thin sheet material	No non-separable sheet material used for insulation.	N/A
2.10.5.9	Thin sheet material – standard test procedure	See above.	N/A
	Electric strength test	Not required.	—
2.10.5.10	Thin sheet material – alternative test procedure	See above.	N/A
	Electric strength test	Not required.	—
2.10.5.11	Insulation in wound components	See 2.10.5.12	N/A
2.10.5.12	Wire in wound components	Part of certified power supply	N/A
	Working voltage	See table 2.10.2	N/A
	a) Basic insulation not under stress		N/A
	b) Basic, supplementary, reinforced insulation	Part of certified power supply	P
	c) Compliance with Annex U		P
	Two wires in contact inside wound component; angle between 45° and 90°		P
2.10.5.13	Wire with solvent-based enamel in wound components	No such components present.	N/A
	Electric strength test	Not required.	—
	Routine test	See above.	N/A
2.10.5.14	Additional insulation in wound components	No other wound components present.	N/A
	Working voltage	See above.	N/A
	- Basic insulation not under stress	See above.	N/A
	- Supplementary, reinforced insulation	See above.	N/A
2.10.6	Construction of printed boards		P
2.10.6.1	Uncoated printed boards	(see appended table 2.10.3 and 2.10.4)	P
2.10.6.2	Coated printed boards	(see appended table 2.10.3 and 2.10.4) No coated boards present.	N/A



IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
2.10.6.3	Insulation between conductors on the same inner surface of a printed board	(see appended table 2.10.3 and 2.10.4) Not a multilayer printed board.	N/A
2.10.6.4	Insulation between conductors on different layers of a printed board	No double sided printed board present.	N/A
	Distance through insulation	(see appended table 2.10.5) See above.	N/A
	Number of insulation layers (pcs).....:	See above.	N/A
2.10.7	Component external terminations	(see appended table 2.10.3 and 2.10.4)	P
2.10.8	Tests on coated printed boards and coated components	No coated boards provided.	N/A
2.10.8.1	Sample preparation and preliminary inspection	See above.	N/A
2.10.8.2	Thermal conditioning	See above.	N/A
2.10.8.3	Electric strength test	(see appended table 5.2) See above.	N/A
2.10.8.4	Abrasion resistance test	See above.	N/A
2.10.9	Thermal cycling	Not a coated board used.	N/A
2.10.10	Test for Pollution Degree 1 environment and insulating compound	See above.	P
2.10.11	Tests for semiconductor devices and cemented joints	No such semiconductor devices or joints present.	N/A
2.10.12	Enclosed and sealed parts	Passed 2.10.10.	N/A
3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		P
3.1.1	Current rating and overcurrent protection	All internal wires are UL Recognized, PVC insulated, 300V, Flammability Rating: VW-1, 80°C. Gauge is suitable.	P
3.1.2	Protection against mechanical damage	Wiring does not come in contact with any sharp edges or moving parts.	P
3.1.3	Securing of internal wiring	Wiring is secured in order to protect it from any excessive strain or loosening of connections or damage of insulation.	P
3.1.4	Insulation of conductors	(see appended table 5.2) Suitable for the application and working voltage	P
3.1.5	Beads and ceramic insulators	None present.	N/A
3.1.6	Screws for electrical contact pressure	No such screws.	N/A
3.1.7	Insulating materials in electrical connections	Connections are metal to metal.	P



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Clause	Requirement + Test	Result - Remark	Verdict
3.1.8	Self-tapping and spaced thread screws	No self-tapping or spaced thread screws used.	N/A
3.1.9	Termination of conductors	All conductors are reliably secured.	P
	10 N pull test	All relevant conductors. No new hazard caused.	P
3.1.10	Sleeving on wiring	Sleeving not used as supplementary insulation.	N/A

3.2	Connection to a mains supply		P
3.2.1	Means of connection	Appliance coupler	P
3.2.1.1	Connection to an a.c. mains supply		P
3.2.1.2	Connection to a d.c. mains supply	A.C. mains only.	N/A
3.2.2	Multiple supply connections	Single supply only.	N/A
3.2.3	Permanently connected equipment	Not considered permanently connected.	N/A
	Number of conductors, diameter of cable and conduits (mm)		—
3.2.4	Appliance inlets	Approved -type IEC 60320 inlet.	P
3.2.5	Power supply cords	Not part of the unit	N/A
3.2.5.1	AC power supply cords	Power supply cords are suitable for the application and subject to destination country's national code and regulations. Not evaluated as part of this investigation.	N/A
	Type		—
	Rated current (A), cross-sectional area (mm ²), AWG		—
3.2.5.2	DC power supply cords		N/A
3.2.6	Cord anchorages and strain relief	The equipment does not use a non-detachable power supply cord.	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
	Diameter or minor dimension D (mm); test mass (g)		—
	Radius of curvature of cord (mm).....		—
3.2.9	Supply wiring space		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
3.3	Wiring terminals for connection of external conductors		P
3.3.1	Wiring terminals	Appliance inlet provided.	N/A
3.3.2	Connection of non-detachable power supply cords		P
3.3.3	Screw terminals	Not this type.	N/A
3.3.4	Conductor sizes to be connected		N/A
	Rated current (A), cord/cable type, cross-sectional area (mm ²)..... :		—
3.3.5	Wiring terminal sizes		N/A
	Rated current (A), type, nominal thread diameter (mm) :		—
3.3.6	Wiring terminal design		N/A
3.3.7	Grouping of wiring terminals		N/A
3.3.8	Stranded wire		N/A
3.4	Disconnection from the mains supply		P
3.4.1	General requirement	Relies on appliance inlet	P
3.4.2	Disconnect devices	See above.	N/A
3.4.3	Permanently connected equipment	Not permanently connected.	N/A
3.4.4	Parts which remain energized	No such parts.	N/A
3.4.5	Switches in flexible cords	Not used.	P
3.4.6	Number of poles - single-phase and d.c. equipment	Inlet disconnects LIVE and NEUTRAL at once.	P
3.4.7	Number of poles - three-phase equipment	Single phase power only.	N/A
3.4.8	Switches as disconnect devices	No disconnect switches.	N/A
3.4.9	Plugs as disconnect devices	Inlet disconnect, not plug.	N/A
3.4.10	Interconnected equipment	None.	N/A
3.4.11	Multiple power sources	Single power supply connection.	N/A
3.5	Interconnection of equipment		N/A
3.5.1	General requirements	No Interconnections.	N/A
3.5.2	Types of interconnection circuits :	See above	N/A
3.5.3	ELV circuits as interconnection circuits		N/A
3.5.4	Data ports for additional equipment		N/A
4	PHYSICAL REQUIREMENTS		P
4.1	Stability		P
	Angle of 10°		P



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Clause	Requirement + Test	Result - Remark	Verdict

	Test force (N)	250N	P
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4.2	Mechanical strength		P
4.2.1	General		P
	Rack-mounted equipment.	(see Annex DD)	N/A
4.2.2	Steady force test, 10 N	Not tested.	N/A
4.2.3	Steady force test, 30 N	No internal enclosure.	N/A
4.2.4	Steady force test, 250 N	On top, side.	P
4.2.5	Impact test		P
	Fall test	On all sides.	P
	Swing test	On all sides.	P
4.2.6	Drop test; height (mm)	Not handheld or transportable type	N/A
4.2.7	Stress relief test	No polymeric enclosure.	N/A
4.2.8	Cathode ray tubes	No cathode ray tubes present.	N/A
	Picture tube separately certified	No picture tube used.	N/A
4.2.9	High pressure lamps	No pressure lamps present.	N/A
4.2.10	Wall or ceiling mounted equipment; force (N)	Not intended to be mounted on walls or ceilings.	N/A

4.3	Design and construction		P
4.3.1	Edges and corners	Edges and corners are smooth and rounded.	P
4.3.2	Handles and manual controls; force (N)..... :	No handles or manual controls provided.	N/A
4.3.3	Adjustable controls	None provided.	N/A
4.3.4	Securing of parts	Screws and nuts are secured enough to withstand the stresses in normal use.	P
4.3.5	Connection by plugs and sockets	Plugs and sockets are not interchangeable.	P
4.3.6	Direct plug-in equipment	Not a direct plug-in equipment.	N/A
	Torque		—
	Compliance with the relevant mains plug standard		
4.3.7	Heating elements in earthed equipment	No heating elements.	N/A
4.3.8	Batteries	No battery.	N/A
	- Overcharging of a rechargeable battery		N/A
	- Unintentional charging of a non-rechargeable battery		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	- Reverse charging of a rechargeable battery		N/A
	- Excessive discharging rate for any battery		N/A
4.3.9	Oil and grease	Not exposed to oil or grease.	N/A
4.3.10	Dust, powders, liquids and gases	The equipment does not generate dust or use powders, liquids, or gases.	N/A
4.3.11	Containers for liquids or gases	No containers for liquids or gases.	N/A
4.3.12	Flammable liquids	No flammable liquids.	N/A
	Quantity of liquid (l)		N/A
	Flash point (°C)		N/A
4.3.13	Radiation	No such radiation	N/A
4.3.13.1	General		N/A
4.3.13.2	Ionizing radiation		N/A
	Measured radiation (pA/kg)		—
	Measured high-voltage (kV)		—
	Measured focus voltage (kV)		—
	CRT markings		—
4.3.13.3	Effect of ultraviolet (UV) radiation on materials		N/A
	Part, property, retention after test, flammability classification		N/A
4.3.13.4	Human exposure to ultraviolet (UV) radiation		N/A
4.3.13.5	Lasers (including laser diodes) and LEDs		N/A
4.3.13.5.1	Lasers (including laser diodes)		N/A
	Laser class		—
4.3.13.5.2	Light emitting diodes (LEDs)		
4.3.13.6	Other types		N/A

4.4	Protection against hazardous moving parts		P
4.4.1	General		P
4.4.2	Protection in operator access areas	Fan blades are adequately enclosed or guarded.	P
	Household and home/office document/media shredders	Not household and home/office document/media shredders	N/A
4.4.3	Protection in restricted access locations	Fan blades are adequately enclosed and guarded.	P
4.4.4	Protection in service access areas	Unintentional contact with hazardous moving parts by service personnel is unlikely.	P
4.4.5	Protection against moving fan blades	Fan are guarded.	P



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Clause	Requirement + Test	Result - Remark	Verdict
4.4.5.1	General		N/A
	Not considered to cause pain or injury. a).....:		N/A
	Is considered to cause pain, not injury. b)		N/A
	Considered to cause injury. c)		N/A
4.4.5.2	Protection for users	Not considered to cause injury	P
	Use of symbol or warning		N/A
4.4.5.3	Protection for service persons	Not considered to cause injury	P
	Use of symbol or warning		N/A
4.5	Thermal requirements		P
4.5.1	General		P
4.5.2	Temperature tests		P
	Normal load condition per Annex L		—
4.5.3	Temperature limits for materials	(see appended table 4.5) The equipment did not attain excessive temperatures during normal and abnormal operations.	P
4.5.4	Touch temperature limits	(see appended table 4.5) The equipment did not attain excessive temperatures during normal and abnormal operations.	P
4.5.5	Resistance to abnormal heat	(see appended table 4.5.5)	N/A
4.6	Openings in enclosures		P
4.6.1	Top and side openings	No top openings. Side openings are less than 5mm in any dimension.	P
	Dimensions (mm)	2.4 mm	—
4.6.2	Bottoms of fire enclosures	No bottom openings.	P
	Construction of the bottom, dimensions (mm) ..	See above.	—
4.6.3	Doors or covers in fire enclosures	No doors or covers.	N/A
4.6.4	Openings in transportable equipment	Not transportable equipment.	N/A
4.6.4.1	Constructional design measures		N/A
	Dimensions (mm)		—
4.6.4.2	Evaluation measures for larger openings		N/A
4.6.4.3	Use of metallized parts	Metallized parts not used.	N/A
4.6.5	Adhesives for constructional purposes	No adhesives for constructional purposes.	N/A
	Conditioning temperature (°C), time (weeks)		—



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Clause	Requirement + Test	Result - Remark	Verdict

4.7	Resistance to fire		P
4.7.1	Reducing the risk of ignition and spread of flame	Method 1 is used. Part of power supply evaluations.	P
	Method 1, selection and application of components wiring and materials		P
	Method 2, application of all of simulated fault condition tests		N/A
4.7.2	Conditions for a fire enclosure		P
4.7.2.1	Parts requiring a fire enclosure	The fire enclosure encloses all parts.	P
4.7.2.2	Parts not requiring a fire enclosure		P
4.7.3	Materials		P
4.7.3.1	General		P
4.7.3.2	Materials for fire enclosures	Fire enclosures are metal.	P
4.7.3.3	Materials for components and other parts outside fire enclosures	Connectors are made of materials of Class V-2 minimum.	P
4.7.3.4	Materials for components and other parts inside fire enclosures	All internal components are rated V-2 or better, or are mounted on a PWB rated V-1 minimum. Internal wires are UL Recognized type, secured by individual cable ties (where needed).	P
4.7.3.5	Materials for air filter assemblies	No air filter assemblies.	N/A
4.7.3.6	Materials used in high-voltage components	There are no high voltage components used in the equipment.	N/A

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		P
5.1.1	General	(see appended Table 5.1)	
5.1.2	Configuration of equipment under test (EUT)		P
5.1.2.1	Single connection to an a.c. mains supply		P
5.1.2.2	Redundant multiple connections to an a.c. mains supply		P
5.1.2.3	Simultaneous multiple connections to an a.c. mains supply		N/A
5.1.3	Test circuit		N/A
5.1.4	Application of measuring instrument		P
5.1.5	Test procedure		P



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Clause	Requirement + Test	Result - Remark	Verdict
5.1.6	Test measurements		P
	Supply voltage (V)		P
	Measured touch current (mA)	264V, 60Hz.	—
	Max. allowed touch current (mA)	3.5 mA	—
	Measured protective conductor current (mA)	0.53 mA	—
	Max. allowed protective conductor current (mA)		—
5.1.7	Equipment with touch current exceeding 3,5 mA		—
5.1.7.1	General		N/A
5.1.7.2	Simultaneous multiple connections to the supply		N/A
5.1.8	Touch currents to telecommunication networks and cable distribution systems and from telecommunication networks	Redundant multiple connections	N/A
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system	No TNV circuits	N/A
	Supply voltage (V)		N/A
	Measured touch current (mA)		—
	Max. allowed touch current (mA)		—
5.1.8.2	Summation of touch currents from telecommunication networks		—
	a) EUT with earthed telecommunication ports		N/A
	b) EUT whose telecommunication ports have no reference to protective earth		N/A
5.2	Electric strength		P
5.2.1	General	(see appended table 5.2)	P
5.2.2	Test procedure		P
5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	P
5.3.2	Motors	SELV fans are approved type. Stepper motors are used	P
5.3.3	Transformers	Part of certified power supply	P
5.3.4	Functional insulation	Functional insulation per methods b) and c), part of power supply approval. The subject equipment, other than the approved power supply, employs functional insulation per method c).	P



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Clause	Requirement + Test	Result - Remark	Verdict
5.3.5	Electromechanical components	No electromechanical components in secondary circuits.	N/A
5.3.6	Audio amplifiers in ITE	No audio amplifiers.	N/A
5.3.7	Simulation of faults		P
5.3.8	Unattended equipment	Considered attended.	N/A
5.3.9	Compliance criteria for abnormal operating and fault conditions		P
5.3.9.1	During the tests	No fire, emission of molten metal or deformation was noted during the fault tests.	P
5.3.9.2	After the tests	No fire, emission of molten metal or deformation was noted during the fault tests. Electric strength tests performed after fault tests with satisfactory results.	P
6	CONNECTION TO TELECOMMUNICATION NETWORKS		N/A
6.1	Protection of telecommunication network service persons, 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	(see appended table 5.2)	N/A
	Supply 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	(see appended table 5.2)	N/A
6.2.2.2	Steady-state test	(see appended table 5.2)	N/A
6.2.2.3	Compliance criteria		N/A
6.3	Protection of the telecommunication wiring system from overheating		N/A
	Max. output current (A)		—
	Current limiting method		—
7	CONNECTION TO CABLE DISTRIBUTION SYSTEMS		N/A
7.1	General		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
7.2	Protection of cable distribution system service persons, and users of other equipment connected to the system, from hazardous voltages in the equipment		N/A
7.3	Protection of equipment users from overvoltages on the cable distribution system		N/A
7.4	Insulation between primary circuits and cable distribution systems		N/A
7.4.1	General		N/A
7.4.2	Voltage surge test	(see appended table 5.2)	N/A
7.4.3	Impulse test	(see appended table 5.2)	N/A

A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE	N/A
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B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)	P	
B.1	General requirements	The SELV DC operated fans are UL Recognized components. They comply with the requirements of B.7	P
	Position	Part of fan tray assembly. See appended table 1.5.1.	—
	Manufacturer	See appended table 1.5.1.	—
	Type	See appended table 1.5.1.	—
	Rated values	See appended table 1.5.1.	—
B.2	Test conditions		N/A
B.3	Maximum temperatures	(see appended table 5.3)	N/A
B.4	Running overload test	(see appended table 5.3)	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 d.c. motors in secondary circuits		N/A
B.6.1	General		N/A
B.6.2	Test procedure		N/A
B.6.3	Alternative test procedure		N/A
B.6.4	Electric strength test; test voltage (V)		N/A
B.7	Locked-rotor overload test for d.c. motors in secondary circuits	Part of fan approval.	P
B.7.1	General	Part of fan approval.	P
B.7.2	Test procedure		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
B.7.3	Alternative test procedure		N/A
B.7.4	Electric strength test; test voltage (V)		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)		—
C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		N/A
	Part of certified power supply.		—
D	ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)		P
D.1	Measuring instrument		P
D.2	Alternative measuring instrument		N/A
E	ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)		N/A
F	ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)		P
G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N/A
H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N/A
J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		N/A
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)		N/A
L	ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)		N/A
M	ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)		N/A
N	ANNEX N, IMPULSE TEST GENERATORS (see 1.5.7.2, 1.5.7.3, 2.10.3.9, 6.2.2.1, 7.3.2, 7.4.3 and Clause G.5)		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
P	ANNEX P, NORMATIVE REFERENCES		—
Q	ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)		P
	- Preferred climatic categories	Part of certified power supply.	P
	- Maximum continuous voltage		P
	- Combination pulse current		P
	Body of the VDR Test according to IEC60695-11-5.....		P
	Body of the VDR. Flammability class of material (min V-1).....		P
R	ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES		N/A
S	ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)		N/A
T	ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)		N/A
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		N/A
		Part of certified power supply.	—
V	ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)		P
V.1	Introduction		P
V.2	TN power distribution systems		P
W	ANNEX W, SUMMATION OF TOUCH CURRENTS		N/A
X	ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)		N/A
		Part of certified power supply.	N/A
Y	ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)		N/A
Z	ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)		N/A
AA	ANNEX AA, MANDREL TEST (see 2.10.5.8)		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
BB	ANNEX BB, CHANGES IN THE SECOND EDITION		—
CC	ANNEX CC, Evaluation of integrated circuit (IC) current limiters		N/A
DD	ANNEX DD, Requirements for the mounting means of rack-mounted equipment		N/A
EE	ANNEX EE, Household and home/office document/media shredders		N/A



IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: List of critical components					P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾	
Enclosure	Interchangeable	Interchangeable	Powder coated steel. Overall approximate dimensions are (140mm W X 480mm H X 170mm D), minimum thickness is 1 mm.	EN60950-1	Evaluated as a part of this evaluation	
On/Off Switch	E-Switch	R5BBLKREDF 2	10A@250V, 15A @125V	UL 1054 UL 61058-1 CSA C22.2# 61058-1 CSA C22.2#55 EN 61058-1	CE VDE UL CSA	
Appliance inlet	Schaffner	FN 9260	10A, 250V	EN 60320-1 UL 60320-1 CSA C22.2 # 60320-1	VDE CE UL CSA	
Power Supply	Mean Well	RSP-500-24	Input: 100-240Vac, 50-60Hz, 5.9A Output: 24Vdc, 21A	EN 60950-1 IEC 60950-1 UL 60950-1 CSA C22.2 # 60950-1	TUV CE UL CSA	
PCB	Interchangeable	Interchangeable	Flammability rating is V-0. minimum thickness 1 mm	UL 94 EN 60950-1	UL Evaluated as part of this evaluation	
Internal wires	Interchangeable	Interchangeable	Minimum 22 AWG, rated 80°C, 300 V.	UL 758 EN 60950-1	UL Evaluated as part of this evaluation	
Cooling fan	PTI Pelonis	C8015L24BPLP 1b-7	24Vdc, 0.049A, 1.17W, 2400 RPM, 24.45 CFM	UL 94 EN 60950-1	UL CE Evaluated as part of this evaluation	



IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

1.5.1	TABLE: List of critical components					P
Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity ¹⁾	
Extruder DC fan	PTI Pelonis	C4010L05BPLB 1b-7	5 Vdc, 0.078A, 0.39W, 4400 RPM, 3.87 CFM. Located in the center to cool down the print	UL 94 EN 60950-1	UL CE Evaluated as part of this evaluation	
Extruder DC fan	PTI Pelonis	RB5015	12Vdc, 0.14A, 4.4CFM max	UL 94 EN 60950-1	UL CE Evaluated as part of this evaluation	
LCD PWB	Interchangeable	Interchangeable	Flammability rating is V-0. minimum thickness 1 mm	UL 94 EN 60950-1	UL Evaluated as part of this evaluation	
Extruder Heater	E3D	PR-A0- HEATER-24V- 40W	24 Vdc, 44 W max	EN 60950-1	Evaluated as part of this evaluation	
Bed Heater	TEMPCO ELECTRIC HEATER CORP	AS-HB0006	24VDC, 360W	UL 499 EN 60950-1 CSA C22.2#64	UL CSA Evaluated as part of this evaluation	
Stepper Motors	Shanghai Moons' Electric Co., Ltd.	MS17HD6P4150 -01-B	3.3 Vdc, 1.5A, Class B (130°C).	EN 60950-1	Evaluated as part of this evaluation	
	Shanghai Moons' Electric Co., Ltd.	MS17HD4P4150 -07	2.55Vdc, 1.5A, Class B (130°C)	EN 60950-1	Evaluated as part of this evaluation	
	Lin Engineering	4118S-08P- 07RO	5Vdc max, 1.34A	EN 60950-1	Evaluated as part of this evaluation	
Connectors	Interchangeable	Interchangeable	Minimum flammability rating of V-1	UL 94 EN 60950-1	UL Evaluated as part of this evaluation	
Thermistor	Honeywell	135-104LAG-J01	Operating temperature - 60°C to 300°C. Resistance 100,000 Ohm.	EN 60950-1	Evaluated as part of this evaluation	

Supplementary information:

¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039.



IEC 60950-1							
Clause	Requirement + Test					Result - Remark	Verdict
1.5.1	TABLE: Opto Electronic Devices						N/A
supplementary information							
1.6.2	TABLE: Electrical data (in normal conditions)						P
U (V)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status	
90 @60 Hz	5.031	7	--	--	--	Normal operating mode	
100 @60Hz	2.435	7	--	--	--	Normal operating mode	
120@60Hz	1.920	7	--	--	--	Normal operating mode	
240 @60Hz	1.068	7	--	--	--	Normal operating mode	
264 @60 Hz	0.999	7	--	--	--	Normal operating mode	
90 @50Hz	4.537	7	--	--	--	Normal operating mode	
100 @50Hz	2.388	7	--	--	--	Normal operating mode	
120 @50Hz	2.005	7	--	--	--	Normal operating mode	
240 @50Hz	1.053	7	--	--	--	Normal operating mode	
264 @50Hz	0.961	7	--	--	--	Normal operating mode	
Supplementary information: Tested while printing on normal conditions.							
2.1.1.5 c) 1)	TABLE: max. V, A, VA test						N/A
supplementary information							
2.1.1.5 c) 2)	TABLE: stored energy						N/A
supplementary information							
2.2	TABLE: evaluation of voltage limiting components in SELV circuits						N/A
supplementary information							
2.5	TABLE: Limited power sources						N/A
supplementary information							



IEC 60950-1						
Clause	Requirement + Test	Result - Remark				Verdict
2.10.2	Table: working voltage measurement				N/A	
supplementary information						
2.10.3 and 2.10.4	TABLE: Clearance and creepage distance measurements					P
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)
Basic/supplementary:						
Between live parts and enclosure (appliance inlet to enclosure) primary circuit	339	240	2.0	5.0	2.5	5.0
Between live parts and dead metal	339	240	2.0	5.0	2.5	5.0
Supplementary information:						
2.10.5	TABLE: Distance through insulation measurements				N/A	
Supplementary information:						
4.3.8	TABLE: Batteries				N/A	
Supplementary information:						



IEC 60950-1							
Clause	Requirement + Test					Result - Remark	Verdict
4.5	TABLE: Thermal requirements						P
	Supply voltage (V)	90					—
	Ambient T _{min} (°C)	21.5					—
	Ambient T _{max} (°C)	24.8					—
	Maximum measured temperature T of part/at.....:	T (°C)					Allowed T _{max} (°C)
	Power Supply	31.6					80
	Fan	30.0					75
	Appliance inlet	26.6					85
	Main Switch	29.1					75
	Terminal block	34.3					85
	Internal wires	25.2					90
	Main PCB	52.7					105
	Motor X	53.5					120
	Motor Y	57.8					120
	Motor Z1	45.5					120
	Motor Z2	42.3					120
	Extruder motor1	42.3					120
	Extruder motor2	42.8					120
	Extruder heater fan1	32.1					75
	Extruder heater fan2	33.0					75
	15A Fuse	38.6					75
	Touch screen PCB	32.4					105
	Enclosure	29.3					60
Supplementary information: Tested while printing on normal conditions with both heaters are on							
Supplementary information:							
4.5.5	TABLE: Ball pressure test of thermoplastic parts						N/A
Supplementary information:							
4.7	TABLE: Resistance to fire						N/A
Supplementary information:							



IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.1	TABLE: touch current measurement			P
Measured between:	Measured (mA)	Limit (mA)	Comments/conditions	
Enclosure Normal Polarity, Closed Neutral.	0.275	3.5	240 VAC, 60 Hz Disconnected from Earth Ground.	
Normal Polarity, Open Neutral.	0.540	3.5		
Reverse Polarity, Closed Neutral.	0.284	3.5		
Reverse Polarity, Open Neutral.	0.540	3.5		
supplementary information				

5.2	TABLE: Electric strength tests, impulse tests and voltage surge tests			P
Test voltage applied between:	Voltage shape (AC, DC, impulse, surge)	Test voltage (V)	Breakdown Yes / No	
Basic/supplementary:				
MAINS input to Accessible Metal.	DC	2100	No	
MAINS input to Ground.	DC	2100	No	
Primary to secondary	DC	4000	No	
Supplementary information:				

5.3	TABLE: Fault condition tests					P
	Ambient temperature (°C)				23.5°C	—
	Power source for EUT: Manufacturer, model/type, output rating				90V	—
Component No.	Fault	Supply voltage (V)	Test time	Fuse #	Fuse current (A)	Observation
--	Locked Fan	90	1 hrs	N/A	N/A	No risk of fire or electric shock observed. See temperature table below
--	Closed Vents	90	1 hrs	N/A	N/A	No risk of fire or electric shock observed. See temperature table below
--	Short Circuit Bed heater thermister	90	0.5 hrs	N/A	N/A	Over temperature Error appears on the screen. Unit stopped working. No risk of fire or electric shock observed.
--	Short Circuit Extruder heater thermister	90	0.5 hrs	N/A	N/A	Over temperature Error appears on the screen. Unit stopped working. No risk of fire or electric shock observed.
Supplementary information:						



IEC 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict
C.2	TABLE: transformers		N/A
supplementary information			



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60950-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES Information technology equipment – Safety –	
Part 1: General requirements	
Differences according to.....:	EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013
Attachment Form No.....:	EU_GD_IEC60950_1F
Attachment Originator	SGS Fimko Ltd
Master Attachment.....:	Date 2014-02
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EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013 – CENELEC COMMON MODIFICATIONS		
	Clauses, subclauses, notes, tables and figures which are additional to those in IEC60950-1 and it's amendmets are prefixed "Z"	P
Contents (A2:2013)	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZD (informative) IEC and CENELEC code designations for flexible cords	P
General	Delete all the "country" notes in the reference document (IEC 60950-1:2005) according to the following list: 1.4.8 Note 2 1.5.1 Note 2 & 3 1.5.7.1 Note 1.5.8 Note 2 1.5.9.4 Note 1.7.2.1 Note 4, 5 & 6 2.2.3 Note 2.2.4 Note 2.3.2 Note 2.3.2.1 Note 2 2.3.4 Note 2 2.6.3.3 Note 2 & 3 2.7.1 Note 2.10.3.2 Note 2 2.10.5.13 Note 3 3.2.1.1 Note 3.2.4 Note 3. 2.5.1 Note 2 4.3.6 Note 1 & 2 4.7 Note 4 4.7.2.2 Note 4.7.3.1 Note 2 5.1.7.1 Note 3 & 4 5.3.7 Note 1 6 Note 2 & 5 6.1.2.1 Note 2 6.1.2.2 Note 6.2.2 Note 6.2.2.1 Note 2 6.2.2.2 Note 7.1 Note 3 7.2 Note 7.3 Note 1 & 2 G.2.1 Note 2 Annex H Note 2	P
General (A1:2010)	Delete all the "country" notes in the reference document (IEC 60950-1:2005/A1:2010) according to the following list: 1.5.7.1 Note 6.1.2.1 Note 2 6.2.2.1 Note 2 EE.3 Note	P
General (A2:2013)	Delete all the "country" notes in the reference document (IEC 60950-1:2005/A2:2013) according to the following list: 2.7.1 Note * 2.10.3.1 Note 2 6.2.2. Note * Note of secretary: Text of Common Modification remains unchanged.	P



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
1.1.1 (A1:2010)	Replace the text of NOTE 3 by the following. NOTE 3 The requirements of EN 60065 may also be used to meet safety requirements for multimedia equipment. See IEC Guide 112, Guide on the safety of multimedia equipment. For television sets EN 60065 applies.		P
1.3.Z1	Add the following subclause: 1.3.Z1 Exposure to excessive sound pressure The apparatus shall be so designed and constructed as to present no danger when used for its intended purpose, either in normal operating conditions or under fault conditions, particularly providing protection against exposure to excessive sound pressures from headphones or earphones. NOTE Z1 A new method of measurement is described in EN 50332-1, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 1: General method for "one package equipment", and in EN 50332-2, Sound system equipment: Headphones and earphones associated with portable audio equipment - Maximum sound pressure level measurement methodology and limit considerations - Part 2: Guidelines to associate sets with headphones coming from different manufacturers.		P
(A12:2011)	In EN 60950-1:2006/A12:2011 Delete the addition of 1.3.Z1 / EN 60950-1:2006 Delete the definition 1.2.3.Z1 / EN 60950-1:2006 /A1:2010	Noted	P
1.5.1 (Added info*)	Add the following NOTE: NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC. New Directive 2011/65/11 *	Noted	P
1.7.2.1 (A1:2010)	In addition, for a PORTABLE SOUND SYSTEM, the instructions shall include a warning that excessive sound pressure from earphones and headphones can cause hearing loss.		N/A
1.7.2.1 (A12:2011)	In EN 60950-1:2006/A12:2011 Delete NOTE Z1 and the addition for Portable Sound System. Add the following clause and annex to the existing standard and amendments.		N/A
	Zx Protection against excessive sound pressure from personal music players		N/A




Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>Zx.1 General</p> <p>This sub-clause specifies requirements for protection against excessive sound pressure from personal music players that are closely coupled to the ear. It also specifies requirements for earphones and headphones intended for use with personal music players.</p> <p>A personal music player is a portable equipment² for personal use, that:</p> <ul style="list-style-type: none">– is designed to allow the user to listen to recorded or broadcast sound or video; and– primarily uses headphones or earphones that can be worn in or on or around the ears; and– allows the user to walk around while in use. <p>NOTE 1 Examples are hand-held or body-worn portable CD players, MP3 audio players, mobile phones with MP3 type features, PDA's or similar equipment.</p> <p>A personal music player and earphones or headphones intended to be used with personal music players shall comply with the requirements of this sub-clause.</p> <p>The requirements in this sub-clause are valid for music or video mode only.</p> <p>The requirements do not apply:</p> <ul style="list-style-type: none">– while the personal music player is connected to an external amplifier; or– while the headphones or earphones are not used. <p>NOTE 2 An external amplifier is an amplifier which is not part of the personal music player or the listening device, but which is intended to play the music as a standalone music player.</p> <p>The requirements do not apply to:</p> <ul style="list-style-type: none">– hearing aid equipment and professional equipment; <p>NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores are considered not to be professional equipment.</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>– analogue personal music players (personal music players without any kind of digital processing of the sound signal) that are brought to the market before the end of 2015.</p> <p>NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies.</p> <p>For equipment which is clearly designed or intended for use by young children, the limits of EN 71-1 apply.</p>		N/A
	<p>Zx.2 Equipment requirements</p> <p>No safety provision is required for equipment that complies with the following:</p> <ul style="list-style-type: none">– equipment provided as a package (personal music player with its listening device), where the acoustic output $L_{Aeq,T}$ is ≤ 85 dBA measured while playing the fixed “programme simulation noise” as described in EN 50332-1; and– a personal music player provided with an analogue electrical output socket for a listening device, where the electrical output is ≤ 27 mV measured as described in EN 50332-2, while playing the fixed “programme simulation noise” as described in EN 50332-1. <p>NOTE 1 Wherever the term acoustic output is used in this clause, the 30 s A-weighted equivalent sound pressure level $L_{Aeq,T}$ is meant. See also Zx.5 and Annex Zx.</p> <p>All other equipment shall:</p> <ul style="list-style-type: none">a) protect the user from unintentional acoustic outputs exceeding those mentioned above; andb) have a standard acoustic output level not exceeding those mentioned above, and automatically return to an output level not exceeding those mentioned above when the power is switched off; and		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>c) provide a means to actively inform the user of the increased sound pressure when the equipment is operated with an acoustic output exceeding those mentioned above. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an acoustic output exceeding those mentioned above. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time; and</p> <p>NOTE 2 Examples of means include visual or audible signals. Action from the user is always required. NOTE 3 The 20 h listening time is the accumulative listening time, independent how often and how long the personal music player has been switched off.</p> <p>d) have a warning as specified in Zx.3; and</p> <p>e) not exceed the following:</p> <ol style="list-style-type: none"> 1) equipment provided as a package (player with its listening device), the acoustic output shall be ≤ 100 dBA measured while playing the fixed "programme simulation noise" described in EN 50332-1; and 2) a personal music player provided with an analogue electrical output socket for a listening device, the electrical output shall be ≤ 150 mV measured as described in EN 50332-2, while playing the fixed "programme simulation noise" described in EN 50332-1. <p>For music where the average sound pressure (long term $L_{Aeq,T}$) measured over the duration of the song is lower than the average produced by the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA. In this case T becomes the duration of the song.</p> <p>NOTE 4 Classical music typically has an average sound pressure (long term $L_{Aeq,T}$) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the song and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song is below the basic limit of 85 dBA.</p> <p>For example, if the player is set with the programme simulation noise to 85 dBA, but the average music level of the song is only 65 dBA, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dBA.</p>		N/A

Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>Zx.3 Warning</p> <p>The warning shall be placed on the equipment, or on the packaging, or in the instruction manual and shall consist of the following:</p> <ul style="list-style-type: none"> – the symbol of Figure 1 with a minimum height of 5 mm; and – the following wording, or similar: <p>“To prevent possible hearing damage, do not listen at high volume levels for long periods.”</p> <div style="text-align: center;">  </div> <p>Figure 1 – Warning label (IEC 60417-6044)</p> <p>Alternatively, the entire warning may be given through the equipment display during use, when the user is asked to acknowledge activation of the higher level.</p>		N/A
	Zx.4 Requirements for listening devices (headphones and earphones)		N/A
	<p>Zx.4.1 Wired listening devices with analogue input</p> <p>With 94 dBA sound pressure output $L_{Aeq,T}$, the input voltage of the fixed “programme simulation noise” described in EN 50332-2 shall be ≥ 75 mV.</p> <p>This requirement is applicable in any mode where the headphones can operate (active or passive), including any available setting (for example built-in volume level control).</p> <p>NOTE The values of 94 dBA – 75 mV correspond with 85dBA – 27 mV and 100 dBA – 150 mV.</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>Zx.4.2 Wired listening devices with digital input With any playing device playing the fixed “programme simulation noise” described in EN 50332-1 (and respecting the digital interface standards, where a digital interface standard exists that specifies the equivalent acoustic level), the acoustic output $L_{Aeq,T}$ of the listening device shall be ≤ 100 dBA.</p> <p>This requirement is applicable in any mode where the headphones can operate, including any available setting (for example built-in volume level control, additional sound feature like equalization, etc.).</p> <p>NOTE An example of a wired listening device with digital input is a USB headphone.</p>		N/A
	<p>Zx.4.3 Wireless listening devices In wireless mode: – with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and – respecting the wireless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and – with volume and sound settings in the listening device (for example built-in volume level control, additional sound feature like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the abovementioned programme simulation noise, the acoustic output $L_{Aeq,T}$ of the listening device shall be ≤ 100 dBA.</p> <p>NOTE An example of a wireless listening device is a Bluetooth headphone.</p>		N/A
	<p>Zx.5 Measurement methods Measurements shall be made in accordance with EN 50332-1 or EN 50332-2 as applicable. Unless stated otherwise, the time interval T shall be 30 s.</p> <p>NOTE Test method for wireless equipment provided without listening device should be defined.</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
2.7.1	<p>Replace the subclause as follows:</p> <p>Basic requirements</p> <p>To protect against excessive current, short-circuits and earth faults in PRIMARY CIRCUITS, protective devices shall be included either as integral parts of the equipment or as parts of the building installation, subject to the following, a), b) and c):</p> <p>a) except as detailed in b) and c), protective devices necessary to comply with the requirements of 5.3 shall be included as parts of the equipment;</p> <p>b) for components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, short-circuit and earth fault protection may be provided by protective devices in the building installation;</p>		N/A
	<p>c) it is permitted for PLUGGABLE EQUIPMENT TYPE B or PERMANENTLY CONNECTED EQUIPMENT, to rely on dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, e.g. fuses or circuit breakers, is fully specified in the installation instructions.</p> <p>If reliance is placed on protection in the building installation, the installation instructions shall so state, except that for PLUGGABLE EQUIPMENT TYPE A the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet.</p>		N/A
2.7.2	This subclause has been declared 'void'.		N/A
3.2.3	Delete the NOTE in Table 3A, and delete also in this table the conduit sizes in parentheses.		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.5.1	<p>Replace “60245 IEC 53” by “H05 RR-F”; “60227 IEC 52” by “H03 VV-F or H03 VVH2-F”; “60227 IEC 53” by “H05 VV-F or H05 VVH2-F2”.</p> <p>In Table 3B, replace the first four lines by the following: Up to and including 6 0,75^{a)} Over 6 up to and including 10 (0,75)^{b)} 1,0 Over 10 up to and including 16 (1,0)^{c)} 1,5 </p> <p>In the conditions applicable to Table 3B delete the words “in some countries” in condition^{a)}.</p> <p>In NOTE 1, applicable to Table 3B, delete the second sentence.</p>		N/A
3.2.5.1 (A2:2013)	NOTE Z1 The harmonised code designations corresponding to the IEC cord types are given in Annex ZD		N/A
3.3.4	<p>In Table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following: Over 10 up to and including 16 1,5 to 2,5 1,5 to 4 </p> <p>Delete the fifth line: conductor sizes for 13 to 16 A</p>		N/A
4.3.13.6 (A1:2010)	<p>Replace the existing NOTE by the following: NOTE Z1 Attention is drawn to: 1999/519/EC: Council Recommendation on the limitation of exposure of the general public to electromagnetic fields 0 Hz to 300 GHz, and 2006/25/EC: Directive on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation).</p>		N/A
	Standards taking into account mentioned Recommendation and Directive which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.		N/A
Annex H	<p>Replace the last paragraph of this annex by: At any point 10 cm from the surface of the OPERATOR ACCESS AREA, the dose rate shall not exceed 1 µSv/h (0,1 mR/h) (see NOTE). Account is taken of the background level.</p> <p>Replace the notes as follows: NOTE These values appear in Directive 96/29/Euratom. Delete NOTE 2.</p>		N/A
Bibliography	Additional EN standards.		—



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict

ZA	NORMATIVE REFERENCES TO INTERNATIONAL PUBLICATIONS WITH THEIR CORRESPONDING EUROPEAN PUBLICATIONS		—
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<i>ZB ANNEX (normative)</i> <i>SPECIAL NATIONAL CONDITIONS (EN)</i>			
1.2.4.1	In Denmark, certain types of Class I appliances (see 3.2.1.1) may be provided with a plug not establishing earthing conditions when inserted into Danish socket-outlets.	Appliance inlet is provided	N/A
1.2.13.14 (A11:2009)	In Norway and Sweden, for requirements see 1.7.2.1 and 7.3 of this annex.		P
1.5.7.1 (A11:2009)	In Finland, Norway and Sweden, resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.1. In addition when a single resistor is used, the resistor must withstand the resistor test in 1.5.7.2.		N/A
1.5.8	In Norway, due to the IT power system used (see annex V, Figure V.7), capacitors are required to be rated for the applicable line-to-line voltage (230 V).		N/A
1.5.9.4	In Finland, Norway and Sweden, the third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict

<i>ZB ANNEX (normative)</i> <i>SPECIAL NATIONAL CONDITIONS (EN)</i>			
1.7.2.1	<p>In Finland, Norway and Sweden, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet.</p> <p>The marking text in the applicable countries shall be as follows:</p> <p>In Finland: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"</p> <p>In Norway: "Apparatet må tilkoples jordet stikkontakt"</p> <p>In Sweden: "Apparaten skall anslutas till jordat uttag"</p>		N/A
1.7.2.1 (A11:2009)	<p>In Norway and Sweden, the screen of the cable distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation need to be isolated from the screen of a cable distribution system.</p> <p>It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by e.g. a retailer.</p> <p>The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in:</p> <p>"Equipment connected to the protective earthing of the building installation through the mains connection or through other equipment with a connection to protective earthing – and to a cable distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a cable distribution system has therefore to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)."</p>		



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
<i>ZB ANNEX (normative)</i> <i>SPECIAL NATIONAL CONDITIONS (EN)</i>			
	<p>NOTE In Norway, due to regulation for installations of cable distribution systems, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV r.m.s., 50 Hz or 60 Hz, for 1 min.</p> <p>Translation to Norwegian (the Swedish text will also be accepted in Norway):</p> <p>“Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel- TV nettet.”</p> <p>Translation to Swedish:</p> <p>“Utrustning som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av utrustningen till kabel-TV nät galvanisk isolator finnas mellan utrustningen och kabel-TV nätet.”</p>		N/A
1.7.2.1 (A2:2013)	<p>In Denmark, CLASS I PLUGGABLE EQUIPMENT TYPE A intended for connection to other equipment or a network shall, if safety relies on connection to protective earth or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment must be connected to an earthed mains socket-outlet.</p> <p>The marking text in Denmark shall be as follows:</p> <p>In Denmark: “Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord.”</p>		N/A
1.7.5 1.7.5 (A11:2009)	<p>In Denmark, socket-outlets for providing power to other equipment shall be in accordance with the Heavy Current Regulations, Section 107-2-D1, Standard Sheet DK 1-3a, DK 1-5a or DK 1-7a, when used on Class I equipment. For STATIONARY EQUIPMENT the socket-outlet shall be in accordance with Standard Sheet DK 1-1b or DK 1-5a.</p> <p>For CLASS II EQUIPMENT the socket outlet shall be in accordance with Standard Sheet DKA 1-4a.</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
<i>ZB ANNEX (normative)</i> <i>SPECIAL NATIONAL CONDITIONS (EN)</i>			
1.7.5 (A2:2013)	<p>In Denmark, socket-outlets for providing power to other equipment shall be in accordance with the DS 60884-2-D1:2011. For class I equipment the following Standard Sheets are applicable: DK 1-3a, DK 1-1c, DK 1-1d, DK 1-5a or DK 1-7a, with the exception for STATIONARY EQUIPMENT where the socket-outlets shall be in accordance with Standard Sheet DK 1-1b, DK 1-1c, DK 1-1d or DK 1-5a.</p> <p>Socket outlets intended for providing power to Class II apparatus with a rated current of 2,5 A shall be in accordance with DS 60884-2-D1 standard sheet DKA 1-4a. Other current rating socket outlets shall be in compliance with by DS 60884-2-D1 Standard Sheet DKA 1-3a or DKA 1-3b.</p> <p>Justification the Heavy Current Regulations, 6c</p>		N/A
2.2.4	In Norway, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.	Noted	P
2.3.2	In Finland, Norway and Sweden there are additional requirements for the insulation. See 6.1.2.1 and 6.1.2.2 of this annex.	Noted	P
2.3.4	In Norway, for requirements see 1.7.2.1, 6.1.2.1 and 6.1.2.2 of this annex.	Noted	P
2.6.3.3	In the United Kingdom, the current rating of the circuit shall be taken as 13 A, not 16 A.	Noted	P
2.7.1	In the United Kingdom, to protect against excessive currents and short-circuits in the PRIMARY CIRCUIT of DIRECT PLUG-IN EQUIPMENT, tests according to 5.3 shall be conducted, using an external protective device rated 30 A or 32 A. If these tests fail, suitable protective devices shall be included as integral parts of the DIRECT PLUG-IN EQUIPMENT, so that the requirements of 5.3 are met.	Tested as a part of the power supply	P
2.10.5.13	In Finland, Norway and Sweden, there are additional requirements for the insulation, see 6.1.2.1 and 6.1.2.2 of this annex.	Noted	P
3.2.1.1	<p>In Switzerland, supply cords of equipment having a RATED CURRENT not exceeding 10 A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets:</p> <p>SEV 6532-2.1991 Plug Type 15 3P+N+PE 250/400 V, 10 A</p>	Appliance inlet is used	N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
<i>ZB ANNEX (normative)</i> <i>SPECIAL NATIONAL CONDITIONS (EN)</i>			
	<p>SEV 6533-2.1991 Plug Type 11 L+N 250 V, 10 A</p> <p>SEV 6534-2.1991 Plug Type 12 L+N+PE 250 V, 10 A</p> <p>In general, EN 60309 applies for plugs for currents exceeding 10 A. However, a 16 A plug and socket-outlet system is being introduced in Switzerland, the plugs of which are according to the following dimension sheets, published in February 1998:</p> <p>SEV 5932-2.1998: Plug Type 25 , 3L+N+PE 230/400 V, 16 A</p> <p>SEV 5933-2.1998: Plug Type 21, L+N, 250 V, 16A</p> <p>SEV 5934-2.1998: Plug Type 23, L+N+PE 250 V, 16 A</p>		N/A
3.2.1.1	<p>In Denmark, supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to the Heavy Current Regulations, Section 107-2-D1.</p> <p>CLASS I EQUIPMENT provided with socket- outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If poly-phase equipment and single-phase equipment having a RATED CURRENT exceeding 13 A is provided with a supply cord with a plug, this plug shall be in accordance with the Heavy Current Regulations, Section 107-2-D1 or EN 60309-2.</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
<i>ZB ANNEX (normative)</i> <i>SPECIAL NATIONAL CONDITIONS (EN)</i>			
3.2.1.1 (A2:2013)	<p>In Denmark, supply cords of single-phase equipment having a rated current not exceeding 13 A shall be provided with a plug according to DS 60884-2-D1.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules shall be provided with a plug in accordance with standard sheet DK 2-1a or DK 2-5a.</p> <p>If a single-phase equipment having a RATED CURRENT exceeding 13 A or if a poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with the standard sheets DK 6-1a in DS 60884-2-D1 or EN 60309-2.</p> <p>Justification the Heavy Current Regulations, 6c</p>		N/A
3.2.1.1	<p>In Spain, supply cords of single-phase equipment having a rated current not exceeding 10 A shall be provided with a plug according to UNE 20315:1994.</p> <p>Supply cords of single-phase equipment having a rated current not exceeding 2,5 A shall be provided with a plug according to UNE-EN 50075:1993.</p> <p>CLASS I EQUIPMENT provided with socket-outlets with earth contacts or which are intended to be used in locations where protection against indirect contact is required according to the wiring rules, shall be provided with a plug in accordance with standard UNE 20315:1994.</p> <p>If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
<i>ZB ANNEX (normative)</i> <i>SPECIAL NATIONAL CONDITIONS (EN)</i>			
3.2.1.1	In the United Kingdom, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a 'standard plug' in accordance with Statutory Instrument 1768:1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations. NOTE 'Standard plug' is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		N/A
3.2.1.1	In Ireland, apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to I.S. 411 by means of that flexible cable or cord and plug, shall be fitted with a 13 A plug in accordance with Statutory Instrument 525:1997 - National Standards Authority of Ireland (section 28) (13 A Plugs and Conversion Adaptors for Domestic Use) Regulations 1997.		N/A
3.2.4	In Switzerland, for requirements see 3.2.1.1 of this annex.	Noted	P
3.2.5.1	In the United Kingdom, a power supply cord with conductor of 1,25 mm ² is allowed for equipment with a rated current over 10 A and up to and including 13 A.		N/A
3.3.4	In the United Kingdom, the range of conductor sizes of flexible cords to be accepted by terminals for equipment with a RATED CURRENT of over 10 A up to and including 13 A is: • 1,25 mm ² to 1,5 mm ² nominal cross-sectional area.		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict

<i>ZB ANNEX (normative)</i> <i>SPECIAL NATIONAL CONDITIONS (EN)</i>			
4.3.6	In the United Kingdom, the torque test is performed using a socket outlet complying with BS 1363 part 1:1995, including Amendment 1:1997 and Amendment 2:2003 and the plug part of DIRECT PLUG-IN EQUIPMENT shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16 and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		N/A
4.3.6	In Ireland, DIRECT PLUG-IN EQUIPMENT is known as plug similar devices. Such devices shall comply with Statutory Instrument 526:1997 - National Standards Authority of Ireland (Section 28) (Electrical plugs, plug similar devices and sockets for domestic use) Regulations, 1997.		N/A
5.1.7.1	In Finland, Norway and Sweden TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s. are permitted only for the following equipment: <ul style="list-style-type: none">• STATIONARY PLUGGABLE EQUIPMENT TYPE A that<ul style="list-style-type: none">is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; andhas provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; andis provided with instructions for the installation of that conductor by a SERVICE PERSON;• STATIONARY PLUGGABLE EQUIPMENT TYPE B;• STATIONARY PERMANENTLY CONNECTED EQUIPMENT.		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict

<i>ZB ANNEX (normative)</i> <i>SPECIAL NATIONAL CONDITIONS (EN)</i>			
6.1.2.1 (A1:2010)	<p>In Finland, Norway and Sweden, add the following text between the first and second paragraph of the compliance clause:</p> <p>If this insulation is solid, including insulation forming part of a component, it shall at least consist of either</p> <ul style="list-style-type: none">- two layers of thin sheet material, each of which shall pass the electric strength test below, or- one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below. <p>Alternatively for components, there is no distance through insulation requirements for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none">- passes the tests and inspection criteria of 2.10.11 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 2.10.10 shall be performed using 1,5 kV), and- is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV.		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
<i>ZB ANNEX (normative)</i> <i>SPECIAL NATIONAL CONDITIONS (EN)</i>			
	<p>It is permitted to bridge this insulation with an optocoupler complying with 2.10.5.4 b).</p> <p>It is permitted to bridge this insulation with a capacitor complying with EN 60384-14:2005, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 60384-14:2005, may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none">- the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in EN 60950-1:2006, 6.2.2.1;- the additional testing shall be performed on all the test specimens as described in EN 60384-14:- the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		N/A
6.1.2.2	<p>In Finland, Norway and Sweden, the exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT, PLUGGABLE EQUIPMENT TYPE B and equipment intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, e.g. in a telecommunication centre, and which has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR and is provided with instructions for the installation of that conductor by a SERVICE PERSON.</p>		N/A
7.2	<p>In Finland, Norway and Sweden, for requirements see 6.1.2.1 and 6.1.2.2 of this annex.</p> <p>The term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.</p>		N/A
7.3 (A11:2009)	<p>In Norway and Sweden, for requirements see 1.2.13.14 and 1.7.2.1 of this annex.</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict

Annex ZD
(informative)

IEC and CENELEC code designations for flexible cords

Type of flexible cord	Code designations	
	IEC	CENELEC
PVC insulated cords		
Flat twin tinsel cord	60227 IEC 41	H03VH-Y
Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F
Ordinary polyvinyl chloride sheathed flexible cord	60277 IEC 53	H05VV-F H05VVH2-F
Rubber insulated cords		
Braided cord	60245 IEC 51	H03RT-F
Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F
Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F
Heavy polychloroprene sheathed flexible cord	60245 IEC 66	H07RN-F
Cords having high flexibility		
Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H
Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	H03RV4-H
Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60950-1 with A1: 2009 and A2:2013 U.S.A. NATIONAL DIFFERENCES Information technology equipment – Safety – Part 1: General requirements			
Differences according to.....:	UL 60950-1-07(Second Edition) + A1: 2011 + A2: 2014		
Attachment Form No.:	US_ND_IEC60950_1F		
Attachment Originator.....:	UL		
Master Attachment.....:	Date 2014-07		
Copyright © 2014 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.			
	Special national conditions		P
1.1.1	All equipment is designed as to allow installation in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, Canadian Electrical Code (CEC), Part I, CAN/CSA C22.1, and if applicable, the National Electrical Safety Code, IEEE C2		P
	Also, unless marked or otherwise identified, installation is allowed per the Standard for the Protection of Electronic Computer/Data-Processing Equipment, ANSI/NFPA 75		P
1.1.2	Baby monitors are required to additionally comply with ASTM F2951, Consumer Safety Specification for Baby Monitors		N/A
1.4.14	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A		P
1.5.5	For lengths exceeding 3.05 m, external interconnecting flexible cord and cable assemblies are required to be a suitable cable type (e.g., DP, CL2) specified in the /NEC		N/A
	For lengths 3.05 m or less, external interconnecting flexible cord and cable assemblies that are not types specified in the NEC are required to have special construction features and identification markings		N/A
1.7.1	Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings		N/A
	A voltage rating that exceeds an attachment plug cap rating is only permitted if it does not exceed the extreme operating conditions in Table 2 of CAN/CSA C22.2 No. 235, and		N/A
	- if it is part of a range that extends into the Table 2 "Normal Operating Conditions"		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	Likewise, a voltage rating is not to be lower than the specified "Normal Operating Conditions," unless it is part of a range that extends into the "Normal Operating Conditions"		N/A
1.7.7	Wiring terminals intended to supply Class 2 outputs in accordance with NEC or CEC Part 1 or NEC are marked with the voltage rating and "Class 2" or equivalent		N/A
	- Marking is located adjacent to the terminals		N/A
	- Marking is visible during wiring		N/A
2.5	Fuse providing Class 2, Limited Power Source, or TNV current limiting is not operator-accessible unless it is not interchangeable		N/A
2.6	Equipment with isolated ground (earthing) receptacles is in compliance with NEC 250.146(D) and CEC 10-112 and 10-906(8)		N/A
2.7.1	Suitable NEC/CEC branch circuit protection rated at the maximum circuit rating is provided for all standard supply outlets and receptacles (such as supplied in power distribution units) if the supply branch circuit protection is not suitable.		N/A
	Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, provided with special transformer overcurrent protection		N/A
3.2	Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains is in accordance with the NEC/CEC		P
3.2.1	Attachment plugs of power supply cords are rated not less than 125 percent of the rated current of the equipment		N/A
3.2.1.2	Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment comply with special earthing, wiring, marking and installation instruction requirements		N/A
3.2.3	Permanent connection of equipment to the mains supply by a power supply cord is not permitted, except for certain equipment, such as ATMs		N/A
3.2.5	Power supply cords are no longer than 4.5 m in length		N/A
	Minimum cord length is 1.5 m, with certain constructions such as external power supplies allowed to consider both input and output cord lengths into the requirement		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	Flexible power supply cords are compatible with Article 400 of the NEC, and Tables 11 and 12 of the CEC		N/A
3.2.9	Permanently connected equipment has a suitable wiring compartment and wire bending space		N/A
3.3	Wiring terminals and associated spacings for field wiring connections comply with CSA C22.2 No. 0		P
3.3.3	Wire binding screws are not attached with conductors larger than 10 AWG (5.3 mm ²)		N/A
3.3.4	Terminals for permanent wiring, including protective earthing terminals, are suitable for Canadian/US wire gauge sizes, are		N/A
	- rated 125 per cent of the equipment rating, and		N/A
	- are specially marked when specified (1.7.7)		N/A
3.3.5	Revise first column of Table 3E to “Smaller of the RATED CURRENT of the equipment or the PROTECTIVE CURRENT RATING of the circuit under consideration”	Noted	P
3.4.2	Motor control devices are provided for cord-connected equipment with a motor if the equipment is rated more than 12 A,		N/A
	- or if the motor has a nominal voltage rating greater than 120 V		N/A
	- or is rated more than 1/3 hp (locked rotor current over 43 A)		N/A
3.4.8	Vertically-mounted disconnect switches and circuit breakers have the "on" position indicated by the handle in the up position		P
3.4.11	For computer room applications, equipment with battery systems capable of supplying 750 VA for five minutes have a battery disconnect means that may be connected to the computer room remote power-off circuit		N/A
4.3.12	The maximum quantity of flammable liquid stored in equipment complies with NFPA 30		N/A
4.3.13.5.1	Equipment with lasers meets the U.S. Code of Federal Regulations 21 CFR 1040 (and the Canadian Radiation Emitting Devices Act, REDR C1370).		N/A
4.7	For computer room applications, automated information storage systems with combustible media greater than 0.76 m ³ (27 cu ft) have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9m ² (10 sq ft) or a single dimension greater than 1.8 m (6 ft) have a flame spread rating of 50 or less		N/A
	For other applications, enclosures with the same dimensions require a flame spread rating of 200 or less		N/A
4.7.3.1	Non-metallic enclosures of equipment for use in spaces used for environmental air (plenums) are required to comply with UL 2043		N/A
Annex H	Equipment that produces ionizing radiation complies with U.S. Code of Federal Regulations, 21 CFR 1020 (and the Canadian Radiation Emitting Devices Act, REDR C1370)		N/A
	Other National Differences		P
1.5.1	Some components and materials associated with the risk of fire, electric shock, or personal injury have component or material ratings in accordance with the applicable national (Canadian and/or U.S.) component or material standard requirements. These components include: attachment plugs, battery backup systems, battery packs, cathode ray tubes, circuit breakers, communication circuit accessories, connectors (used for current interruption of non-LPS circuits), cord sets and power supply cords, direct plug-in equipment, electrochemical capacitor modules (energy storage modules with ultracapacitors), enclosures (outdoor), flexible cords and cables, fuses (branch circuit), fuseholders, ground-fault current interrupters, industrial control equipment, insulating tape, interconnecting cables, lampholders, limit controls, printed wiring, protectors for communications circuits, receptacles, solid state controls, supplementary protectors, switches (including interlock switches), thermal cut-offs, thermostats, (multi-layer) transformer winding wire, surge protective devices, tubing, vehicle battery adapters, wire connectors, and wire and cables		P
1.6.1.2	A circuit for connection to the DC Mains Supply is classified as a SELV Circuit, TNV-2 Circuit or Hazardous Voltage Circuit depending on the maximum operating voltage of the supply		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	This maximum operating voltage includes consideration of the battery charging “float voltage” associated with the intended supply system, regardless of the marked power rating of the equipment		N/A
2.3.1	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding $42.4 V_{\text{peak}}$ or 60 Vd.c., the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions		N/A
2.3.2.1	In the event of a single fault between TNV and SELV circuits, the limits of 2.2.3 apply to SELV Circuits and accessible conductive parts		N/A
2.6.2	Equipment with functional earthing marked with the functional earthing symbol (IEC 60417-6092)		N/A
2.6.3.4	Protective bonding conductors of non-standard protective bonding constructions (e.g., printed circuit traces) may be subjected to the additional limited short circuit test conditions specified		N/A
4.2.8.1	Enclosures around CRTs with a face diameter of 160 mm or more reduce the risk of injury due to the implosion of the CRT		N/A
4.3.2	Equipment with handles complies with special loading tests		N/A
4.3.8	Battery packs for both portable and stationary applications comply with special component requirements		N/A
5.1.8.3	Equipment intended to receive telecommunication ringing signals comply with a special touch current measurement tests		N/A
5.3.7	Internal (e.g., card cage) SELV circuit connectors and printed wiring board connectors that are accessible to the operator and that deliver power are overloaded		N/A
	During abnormal operating testing, if a circuit is interrupted by the opening of a component, the test is repeated twice (three tests total) using new components as necessary		N/A
6.4	Equipment intended for connection to telecommunication network outside plant cable is protected against overvoltage from power line crosses in accordance with 6.4 and Annex NAC		N/A
Annex EE	Articulated accessibility probe (Fig EE.3) is used for assessing accessibility to document/media shredders instead of the Figure 2A test finger		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
Annex M.2	Continuous ringing signals up to 16 mA only are permitted if the equipment is subjected to special installation and performance restrictions		N/A
Annex NAD	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear comply with special acoustic pressure requirements		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict

<p align="center">ATTACHMENT TO TEST REPORT IEC 60950-1 with A1:2009 and A2:2013</p> <p align="center">CANADA NATIONAL DIFFERENCES</p> <p align="center">Information technology equipment – Safety – Part 1: General requirements</p>			
Differences according to.....: CAN/CSA-C22.2 No. 60950-1-07, Amd 1:2011, Amd 2:2014			
Attachment Form No.....: CA_ND_IEC60950_1F			
Attachment Originator: CSA			
Master Attachment.....: Date (2015-05)			
Copyright © 2015 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.			
1.1.1	All equipment is to be designed to allow installation in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part I, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2. Also, unless marked or otherwise identified, installation is allowed per the Standard for the Protection of Electronic Computer/Data-Processing Equipment, ANSI/NFPA 75.		P
1.1.2	Baby monitors are required to additionally comply with ASTM F2951, Consumer Safety Specification for Baby Monitors.		P
1.4.14	For Pluggable Equipment Type A, the protection in the installation is assumed to be 20A:	Equipment acceptable for connection to 20 A	P
1.5.5	For lengths exceeding 3.05 m, external interconnecting flexible cord and cable assemblies are required to be a suitable cable type (e.g., DP, CL2) specified in the CEC/NEC. For lengths 3.05 m or less, external interconnecting flexible cord and cable assemblies that are not types specified in the CEC/NEC are required to have special construction features and identification markings.		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
1.7.1	<p>Equipment for use on a.c. mains supply systems with a neutral and more than one phase conductor (e.g. 120/240 V, 3-wire) require a special marking format for electrical ratings.</p> <p>A voltage rating that exceeds an attachment plug cap rating is only permitted if it does not exceed the extreme operating conditions in Table 2 of CAN/CSA C22.2 No. 235, and if it is part of a range that extends into the Table 2 "Normal Operating Conditions." Likewise, a voltage rating shall not be lower than the specified "Normal Operating Conditions," unless it is part of a range that extends into the "Normal Operating Conditions."</p>	See main TRF cl 1.7.1	N/A
1.7.7	<p>Wiring terminals intended to supply Class 2 outputs in accordance with CEC Part 1 or NEC shall be marked with the voltage rating and "Class 2" or equivalent. Marking shall be located adjacent to the terminals and shall be visible during wiring.</p>		N/A
2.5	<p>Where a fuse is used to provide Class 2, Limited Power Source, or TNV current limiting, it shall not be operator-accessible unless it is not interchangeable.</p>		N/A
2.6	<p>Equipment with isolated ground (earthing) receptacles are required to comply with NEC 250.146(D) and CEC 10-112 and 10-906(8).</p>		N/A
2.7.1	<p>Suitable NEC/CEC branch circuit protection rated at the maximum circuit rating is required for all standard supply outlets and receptacles (such as supplied in power distribution units) if the supply branch circuit protection is not suitable.</p> <p>Power distribution transformers distributing power at 100 volts or more, and rated 10 kVA or more, require special transformer overcurrent protection.</p>		N/A
3.2	<p>Wiring methods (terminals, leads, etc.) used for the connection of the equipment to the mains shall be in accordance with the NEC/CEC.</p>		P
3.2.1	<p>Power supply cords are required to have attachment plugs rated not less than 125 percent of the rated current of the equipment.</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
3.2.1.2	Equipment connected to a centralized d.c. power system, and having one pole of the DC mains input terminal connected to the main protective earthing terminal in the equipment, is required to comply with special earthing, wiring, marking and installation instruction requirements.		N/A
3.2.3	Permanent connection of equipment to the mains supply by a power supply cord is not permitted, except for certain equipment, such as ATMs.		N/A
3.2.5	Power supply cords are required to be no longer than 4.5 m in length. Minimum cord length is required to be 1.5 m, with certain constructions such as external power supplies allowed to consider both input and output cord lengths into the requirement. Flexible power supply cords are required to be compatible with Article 400 of the NEC, and Tables 11 and 12 of the CEC.		N/A
3.2.9	Permanently connected equipment is required to have a suitable wiring compartment and wire bending space.		N/A
3.3	Wiring terminals and associated spacings for field wiring connections shall comply with CSA C22.2 No. 0		N/A
3.3.3	Wire binding screws are not permitted to attach conductors larger than 10 AWG (5.3 mm ²).		N/A
3.3.4	Terminals for permanent wiring, including protective earthing terminals, are required to be suitable for US/Canadian wire gauge sizes, rated 125 percent of the equipment rating, and be specially marked when specified (1.7.7).		N/A
3.3.5	First column of Table 3E revised to require "Smaller of the RATED CURRENT of the equipment or the PROTECTIVE CURRENT RATING of the circuit under consideration."	Noted	P
3.4.2	Motor control devices are required for cord-connected equipment with a motor if the equipment is rated more than 12 A, or if the motor has a nominal voltage rating greater than 120 V, or is rated more than 1/3 hp (locked rotor current over 43 A).		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
3.4.8	Vertically-mounted disconnect switches and circuit breakers are required to have the "on" position indicated by the handle in the up position.		P
3.4.11	For computer room applications, equipment with battery systems capable of supplying 750 VA for five minutes are required to have a battery disconnect means that may be connected to the computer room remote power-off circuit.		N/A
4.3.12	The maximum quantity of flammable liquid stored in equipment is required to comply with NFPA 30.		N/A
4.3.13.5.1	Equipment with lasers is required to meet the U.S. Code of Federal Regulations 21 CFR 1040 (and the Canadian Radiation Emitting Devices Act, REDR C1370).		N/A
4.7	For computer room applications, automated information storage systems with combustible media greater than 0.76 m ³ (27 cu ft) are required to have a provision for connection of either automatic sprinklers or a gaseous agent extinguishing system with an extended discharge.		N/A
4.7.3.1	For computer room applications, enclosures with combustible material measuring greater than 0.9 m ² (10 sq ft) or a single dimension greater than 1.8 m (6 ft) are required to have a flame spread rating of 50 or less. For other applications, enclosures with the same dimensions require a flame spread rating of 200 or less.		N/A
	Non-metallic enclosures of equipment for use in spaces used for environmental air (plenums) are required to comply with UL 2043.		N/A
Annex H	Equipment that produces ionizing radiation is required to comply with the U.S. Code of Federal Regulations, 21 CFR 1020 (and the Canadian Radiation Emitting Devices Act, REDR C1370).		N/A
OTHER DIFFERENCES			
The following key national differences are based on requirements other than national regulatory requirements.			



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
1.5.1	Some components and materials associated with the risk of fire, electric shock, or personal injury are required to have component or material ratings in accordance with the applicable national (Canadian and/or U.S.) component or material standard requirements. These components include: attachment plugs, battery packs (rechargeable type, used with transportable equipment), cathode ray tubes, circuit breakers, communication circuit accessories, connectors (used for current interruption of non-LPS circuits), cord sets and power supply cords, direct plug-in equipment, enclosures (outdoor), flexible cords and cables, fuses (branch circuit), fuseholders, ground-fault current interrupters, industrial control equipment, insulating tape, interconnecting cables, lampholders, limit controls, printed wiring, protectors for communications circuits, receptacles, solid state controls, supplementary protectors, switches (including interlock switches), thermal cutoffs, thermostats, (multi-layer) transformer winding wire, transient voltage surge suppressors, tubing, wire connectors, and wire and cables.	See safety component list	P
1.6.1.2	A circuit for connection to the DC Mains Supply is classified as either a SELV Circuit, TNV-2 Circuit or Hazardous Voltage Circuit depending on the maximum operating voltage of the supply. This maximum operating voltage shall include consideration of the battery charging “float voltage” associated with the intended supply system, regardless of the marked power rating of the equipment.		N/A
2.3.1	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding 42.4 V _{peak} or 60 V _{d.c.} , the maximum acceptable current through a 2000 ohm resistor (or greater) connected across the voltage source with other loads disconnected is 7.1 mA peak or 30 mA d.c. under normal operating conditions.		N/A
2.3.2.1	In the event of a single fault between TNV and SELV circuits, the limits of 2.2.3 apply to SELV Circuits and accessible conductive parts.		N/A
2.6.2	Equipment with functional earthing is required to be marked with the functional earthing symbol (IEC 60417-6092).		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
2.6.3.4	Protective bonding conductors of non-standard protective bonding constructions (e.g., printed circuit traces) may be subjected to the additional limited short circuit test conditions specified.		N/A
4.2.8.1	Enclosures around CRTs with a face diameter of 160 mm or more are required to reduce the risk of injury due to the implosion of the CRT.		N/A
4.3.2	Equipment with handles is required to comply with special loading tests.		N/A
4.3.8	Battery packs for both portable and stationary applications are required to comply with special component requirements.		N/A
5.1.8.3	Equipment intended to receive telecommunication ringing signals is required to comply with a special touch current measurement tests.		N/A
5.3.7	Internal (e.g., card cage) SELV circuit connectors and printed wiring board connectors that are accessible to the operator and that deliver power are to be overloaded. During abnormal operating testing, if a circuit is interrupted by the opening of a component, the test shall be repeated twice (three tests total) using new components as necessary.		N/A
6.4	Equipment intended for connection to telecommunication network outside plant cable is required to be protected against overvoltage from power line crosses in accordance with 6.4 and Annex NAC.		N/A
Annex EE	UL articulated accessibility probe (Fig EE.3) required for assessing accessibility to document/media shredders instead of the Figure 2A test finger.		N/A
M.2	Continuous ringing signals up to 16 mA only are permitted if the equipment is subjected to special installation and performance restrictions.		N/A
Annex NAD	Equipment connected to a telecommunication and cable distribution networks and supplied with an earphone intended to be held against, or in the ear is required to comply with special acoustic pressure requirements.		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict

IEC60950_1F ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
ATTACHMENT TO TEST REPORT IEC 60950-1 (AUSTRALIA/NEW ZEALAND) NATIONAL DIFFERENCES (Information technology equipment-safety)			
Differences according to : AS/NZS 60950.1:2015			
Attachment Form No. : AU_NZ_ND_IEC60950_1F			
Attachment Originator..... : JAS-ANZ			
Master Attachment : 2017-06			
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	National Differences		P
Appendix ZZ	Variations to IEC 60950-1, Ed 2.2 (2013) for Australia and New Zealand		P
1.2	DEFINITIONS		P
	After definition 'PERSON, SERVICE', insert the following new definition: POTENTIAL IGNITION SOURCE.....1.2.12.201		N/A
1.5	COMPONENTS		P
1.5.1	1.....First paragraph, insert the following text after the words 'IEC component standard: or the relevant Australian/New Zealand Standard 2..... In the Note, insert the following text after the word standard: or the relevant Australian/New Zealand Standard 3..... Second paragraph, delete the words 'without further evaluation'	Noted	P



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
1.5.2	1First paragraph, insert the following text after the word 'standard' or an Australian/New Zealand Standard 2First paragraph, second dash item, second line, insert the following text after the word 'standard' or an Australian/New Zealand Standard 3First paragraph, second dash item, last line, insert the following text after the word 'standard': or an Australian/New Zealand Standard	Noted	P
1.7	MARKINGS AND INSTRUCTIONS		P

1.7.1.3	<i>Delete</i> existing text and <i>replace</i> with the following: Graphical symbols placed on the equipment as a requirement of this standard, shall be in accordance with IEC 60417 or ISO 3864-2 or ISO 7000, if available. In the absence of suitable symbols, the manufacturer may design specific graphical symbols. Symbols as required by this standard placed on the equipment shall be explained in the user manual		P												
2.9	ELECTRICAL INSULATION		P												
2.9.2	Variation Second paragraph, <i>delete</i> the word 'designated'		P												
3.2.5	POWER SUPPLY CORDS		N/A												
Table 3B	Variation 1 <i>Delete</i> the first four rows and replace with the following: <table border="1" data-bbox="395 1429 1010 1704"> <tbody> <tr> <td>Over 0.2 up to and including 3</td> <td>0.5^a</td> <td>18 [0.8]</td> </tr> <tr> <td>Over 3 up to and including 7.5</td> <td>0.75</td> <td>16 [1.3]</td> </tr> <tr> <td>Over 7.5 up to including 10</td> <td>(0.75)^b 1.00</td> <td>16 [1.3]</td> </tr> <tr> <td>Over 10 up to including 16</td> <td>(1.0)^c 1.5</td> <td>14 [2]</td> </tr> </tbody> </table>	Over 0.2 up to and including 3	0.5 ^a	18 [0.8]	Over 3 up to and including 7.5	0.75	16 [1.3]	Over 7.5 up to including 10	(0.75) ^b 1.00	16 [1.3]	Over 10 up to including 16	(1.0) ^c 1.5	14 [2]		N/A
Over 0.2 up to and including 3	0.5 ^a	18 [0.8]													
Over 3 up to and including 7.5	0.75	16 [1.3]													
Over 7.5 up to including 10	(0.75) ^b 1.00	16 [1.3]													
Over 10 up to including 16	(1.0) ^c 1.5	14 [2]													
	2 <i>Delete</i> NOTE 1 and renumber existing NOTE 2 as 'NOTE'		N/A												



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>3.<i>Delete</i> Footnote ^a and replace with the following: ^a This nominal cross-sectional area is only allowed for Class II appliances if the length of the power supply cord, measured between the point where the cord, or cord guard, enters the appliance, and the to the plug does not exceed 2 m (0,5 mm² three-core supply flexible cords are not permitted; see AS/NZS 3191)</p>		N/A
4.3	DESIGN AND CONSTRUCTION		P
4.3.6	<p>Variation <i>Delete</i> the third paragraph and <i>replace</i> with the following: <i>Equipment with a plug portion, suitable for insertion into a 10 A 3-pin flat-pin socket-outlet complying with AS/NZS 3112 shall comply with the requirements in AS/NZS 3112 for equipment with integral pins for insertion into socket-outlets</i></p>	Noted	P
	<p><i>Equipment with a plug portion, suitable for insertion into a 10 A 3-pin flat-pin socket-outlet complying with AS/NZS 3112 shall comply with the requirements in AS/NZS 3112 for equipment with integral pins for insertion into socket-outlets</i></p>		N/A
4.3.8	<p>Addition Eighth paragraph, <i>insert</i> the following new note after the first dash item:</p>		N/A
	<p>NOTE 6.201 In cases where the voltage source is provided by power from an unassociated power source, consideration should be given to the effects of possible single fault conditions in the unassociated equipment. If the power source is unknown then it should be assumed that the maximum limit of SELV may be applied to the source input under assumed single fault conditions in the source when assessing the charging circuit in the equipment under test.</p>		N/A
4.3.13.5.1	<p>Variation <i>Delete</i> the first paragraph and <i>replace</i> with the following: Except as permitted below, equipment shall be classified and labelled according to IEC 60825-1 or AS/NZS 60825.1, IEC 60825-2 or AS/NZS 60825.2 and IEC 60825-12, as applicable</p>		N/A
	<p>Third paragraph, first sentence, after 'IEC 60825-1', <i>insert</i> the following text: or AS/NZS 60825.1</p>		N/A
	<p>Fourth paragraph, after 'IEC 60825-1', <i>insert</i> the following text: or AS/NZS 60825.1</p>		N/A
4.7	RESISTANCE TO FIRE		P
4.7	<p>Addition At the end of Clause 4.7, <i>insert</i> the following text: For alternate tests refer to Clause 4.7.201</p>		N/A
6	CONNECTION TO TELECOMMUNICATIONS NETWORKS		N/A
6.2.2	<p>Variation For Australia only, <i>delete</i> the first paragraph and Note, and <i>replace</i> with the following: In Australia only, compliance with 6.2.2 shall be checked by the tests of both 6.2.2.1 and 6.2.2.2</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
6.2.2.1	<p>Variation</p> <p>For Australia only, <i>delete</i> the first paragraph including the Notes, and <i>replace</i> with the following: In Australia only, the electrical separation is subjected to 10 impulses of alternating polarity, using the impulse test generator Reference 1 of Table N.1. The interval between successive impulses is 60 s and the initial voltage, U_c, is:</p> <p>(i)..... for 6.2.1 a): 7.0 kV for hand-held telephones and for headsets and 2.5 kV for other equipment; and</p> <p>(ii)..... For 6.2.1 b) and 6.2.1 c): 1.5kV</p>		N/A
	NOTE 201 The 7 kV impulse simulates lightning surges on typical rural and semi-rural network lines		N/A
	NOTE 202 The value of 2.5 kV for 6.2.1 a) was chosen to ensure the adequacy of the insulation concerned and does not necessarily simulate likely overvoltages		N/A
6.2.2.2	<p>Variation</p> <p>For Australia only, delete the second paragraph including the Note, and replace with the following: In Australia only, the a.c. test voltage is</p> <p>(i).....for 6.2.1 a): 3kV; and</p> <p>(ii).....for 6.2.1b) and 6.2.1c): 1.5kV</p>		N/A
	NOTE 201 Where there are capacitors across the insulation under test, it is recommended that d.c. test voltages are used.		N/A
	NOTE 202 The 3 kV and 1.5 kV values have been determined considering the low frequency induced voltages from the power supply distribution system.		N/A
7	CONNECTION TO CABLE DISTRIBUTION NETWORK		N/A
7.3	<p>Addition</p> <p><i>Add</i> the following before the first paragraph: Equipment providing functions that fall only within the scope of AS/NZS 60065 and that incorporate a PSTN interface, are not required to comply with this Clause where the only ports provided on the equipment, in addition to a coaxial cable connection and a PSTN interface, are audio or video ports and analogue or data ports not intended to be used for telecommunications purposes</p>		N/A
Annex P	<p>Addition</p> <p><i>Add</i> the following Normative References: AS/NZS 3191, Electric flexible cords AS/NZS 3112, Approval and test specification— Plugs and socket-outlets</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	<i>Special national conditions (if any)</i>		P
1.2.12	FLAMMABILITY		
1.2.12.15	Addition After Clause 1.2.12.15, <i>insert</i> the following new clause:	Noted	P
1.2.12.201	POTENTIAL IGNITION SOURCE Possible fault which can start a fire if the open-circuit voltage measured across an interruption or faulty contact exceeds a value of 50 V (peak) a.c. or d.c. and the product of the peak value of this voltage and the measured r.m.s. current under normal operating conditions exceeds 15 VA		P
	Such a faulty contact or interruption in an electrical connection includes those which may occur in CONDUCTIVE PATTERNS on PRINTED BOARDS		N/A
	NOTE 1 An electronic protection circuit may be used to prevent such a fault from becoming a POTENTIAL IGNITION SOURCE		N/A
	NOTE 2 This definition is from AS/NZS 60065:2012, Clause 2.8.11.		N/A
4	PHYSICAL REQUIREMENTS		P
4.1	Addition After Clause 4.1, <i>insert</i> new Clause 4.1.201 as follows:	Noted	P
4.1.201	Display devices used for television purposes Display devices which may be used for television purposes, with a mass of 7 kg or more, shall comply with the requirements for stability and mechanical hazards, including the additional stability requirements for television receivers, specified in AS/NZS 60065		N/A
4.3	DESIGN AND CONSTRUCTION		P
4.3.8	Addition After Clause 4.3.8, <i>add</i> the following new clause as follows	Noted	P
4.3.8.201	Products containing coin/button cell batteries and batteries designated R1 The requirements of AS/NZS 60065:2012 Amendment 1:2015, Clause 14.10.201 apply for this Clause.		N/A
4.7	RESISTANCE TO FIRE		P
4.7.3.6	Addition After Clause 4.7.3.6, <i>add</i> new clauses as follows:	Noted	P
4.7.201	Resistance to fire—Alternative tests		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.201.1	<p>General</p> <p>Parts of non-metallic material shall be resistant to ignition and spread of fire. This requirement does not apply to decorative trims, knobs and other parts unlikely to be ignited or to propagate flames from inside the apparatus, or the following:</p> <p>a) Components that are contained in an enclosure having a flammability category of V-0 according to AS/NZS 60695.11.10 and having openings only for the connecting wires filling the openings completely, and for ventilation not exceeding 1 mm in width regardless of length.</p>		N/A
	<p>b) The following parts which would contribute negligible fuel to a fire:</p> <ul style="list-style-type: none">– small mechanical parts, the mass of which does not exceed 4 g, such as mounting parts, gears, cams, belts and bearings;– small electrical components, such as capacitors with a volume not exceeding 1,750 mm³, integrated circuits, transistors and optocoupler packages, if these components are mounted on material of flammability category V-1, or better, according to AS/NZS 60695.11.10		N/A
	<p>NOTE In considering how to minimize propagation of fire and what 'small parts' are, account should be taken of the cumulative effect of small parts adjacent to each other for the possible effect of propagating the fire from one part to another</p>		N/A
	<p><i>Compliance shall be checked by the tests of 4.7.201.2, 4.7.201.3, 4.7.201.4 and 4.7.201.5</i></p>		N/A
	<p><i>For the base material of printed boards, compliance shall be checked by the test of 4.7.201.5</i></p>		N/A
	<p>The tests shall be carried out on parts of non-metallic material which have been removed from the apparatus. When the glow-wire test is carried out, the parts shall be placed in the same orientation as they would be in normal use.</p> <p>These tests are not carried out on internal wiring</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
4.7.201.2	<p>Testing of non-metallic materials</p> <p>Parts of non-metallic material shall be subject to the glow-wire test of AS/NZS 60695.2.11 which shall be carried out at 550°C</p> <p>Parts for which the glow-wire test cannot be carried out, such as those made of soft or foamy material, shall meet the requirements specified in ISO 9772 for category FH-3 material. The glow-wire test shall be not carried out on parts of material classified at least FH-3 according to ISO 9772 provided that the sample tested was not thicker than the relevant part.</p>		N/A
4.7.201.3	<p>Testing of insulating materials</p> <p>Parts of insulating material supporting POTENTIAL IGNITION SOURCES shall be subject to the glow-wire test of AS/NZS 60695.2.11 which shall be carried out at 750°C. The test shall be also carried out on other parts of insulating material which are within a distance of 3 mm of the connection.</p> <p>NOTE Contacts in components such as switch contacts are considered to be connections.</p> <p>For parts which withstand the glow-wire test but produce a flame, other parts above the connection within the envelope of a vertical cylinder having a diameter of 20 mm and a height of 50 mm shall be subjected to the needle-flame test. However, parts shielded by a barrier which meets the needle-flame test shall not be tested.</p> <p>The needle-flame test shall be made in accordance with AS/NZS 60695.11.5 with the following modifications:</p>		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	Clause of AS/NZS 60695.11.5	Change	N/A
	9 Test procedure		
	9.2 Application of Needle-flame	<i>Delete</i> the first and second paragraphs and <i>replace</i> with the following: The specimen shall be arranged so that the flame can be applied to a vertical or horizontal edge as shown in the examples of Figure 1. If possible the flame shall be applied at least 10 mm from a corner. The duration of application of the test flame shall be 30 s \pm 1 s	
	9.3 Number of test specimens	<i>Delete</i> existing text and <i>replace</i> with the following: The test shall be made on one specimen. If the specimen does not withstand the test, the test may be repeated on two further specimens, both of which shall withstand the test.	
	11 Evaluation of test results	<i>Delete</i> existing text and <i>replace</i> with the following: The duration of burning (tb) shall not exceed 30 s. However, for printed circuit boards, it shall not exceed 15s	



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	The needle-flame test shall not be carried out on parts of material classified as V-0 or V-1 according to AS/NZS 60695.11.10, provided that the sample tested was not thicker than the relevant part		N/A
4.7.201.4	Testing in the event of non-extinguishing material If parts, other than enclosures, do not withstand the glow wire tests of 4.7.201.3 by failure to extinguish within 30 s after the removal of the glow-wire tip, the needle-flame test detailed in 4.7.201.3 shall be made on all parts of non-metallic material which are within a distance of 50 mm or which are likely to be impinged upon by flame during the tests of 4.7.201.3. Parts shielded by a separate barrier which meets the needle-flame test need not be tested.		N/A
	NOTE 1 If the enclosure does not withstand the glow-wire test the equipment is considered to have failed to meet the requirements of Clause 4.7.201 without the need for consequential testing.		N/A
	NOTE 2 If other parts do not withstand the glow-wire test due to ignition of the tissue paper and if this indicates that burning or glowing particles can fall onto an external surface underneath the equipment, the equipment is considered to have failed to meet the requirements of Clause 4.7.201 without the need for consequential testing		N/A
	NOTE 3 Parts likely to be impinged upon by the flame are considered to be those within the envelope of a vertical cylinder having a radius of 10 mm and a height equal to the height of the flame, positioned above the point of the material supporting, in contact with, or in close proximity to, connections.		N/A
4.7.201.5	Testing of printed boards The base material of printed boards shall be subjected to the needle-flame test of Clause 4.7.201.3. The flame shall be applied to the edge of the board where the heat sink effect is lowest when the board is positioned as in normal use. The flame shall not be applied to an edge, consisting of broken perforations, unless the edge is less than 3 mm from a POTENTIAL IGNITION SOURCE.		N/A



Attachment #1 – National Group Differences			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>The test is not carried out if the</p> <ul style="list-style-type: none">– Printed board does not carry any POTENTIAL IGNITION SOURCE;– Base material of printed boards, on which the available apparent power at a connection exceeds 15 VA operating at a voltage exceeding 50 V and equal or less than 400 V (peak) a.c. or d.c. under normal operating conditions, is of flammability category V-1 or better according to AS/NZS 60695.11.10, or the printed boards are protected by an enclosure meeting the flammability category V-0 according to AS/NZS 60695.11.10, or made of metal, having openings only for connecting wires which fill the openings completely; or– Base material of printed boards, on which the available apparatus power at a connection exceeds 15 VA operating at a voltage exceeding 400 V (peak) a.c. or d.c. under normal operating conditions, and base material of printed boards supporting spark gaps which provides protection against overvoltages, is of flammability category V-0 according to AS/NZS 60695.11.10 or the printed boards are contained in a metal enclosure, having openings only for connecting wires which fill the openings completely <p>.</p> <p><i>Compliance shall be determined using the smallest thickness of the material.</i></p>		N/A
	<p>NOTE Available apparent power is the maximum apparent power which can be drawn from the supplying circuit through a resistive load whose value is chosen to maximise the apparent power for more than 2 m when the circuit supplied is disconnected.</p>		N/A



Attachment # 2 – Photographs of System

Photo 1 - External front view of mode

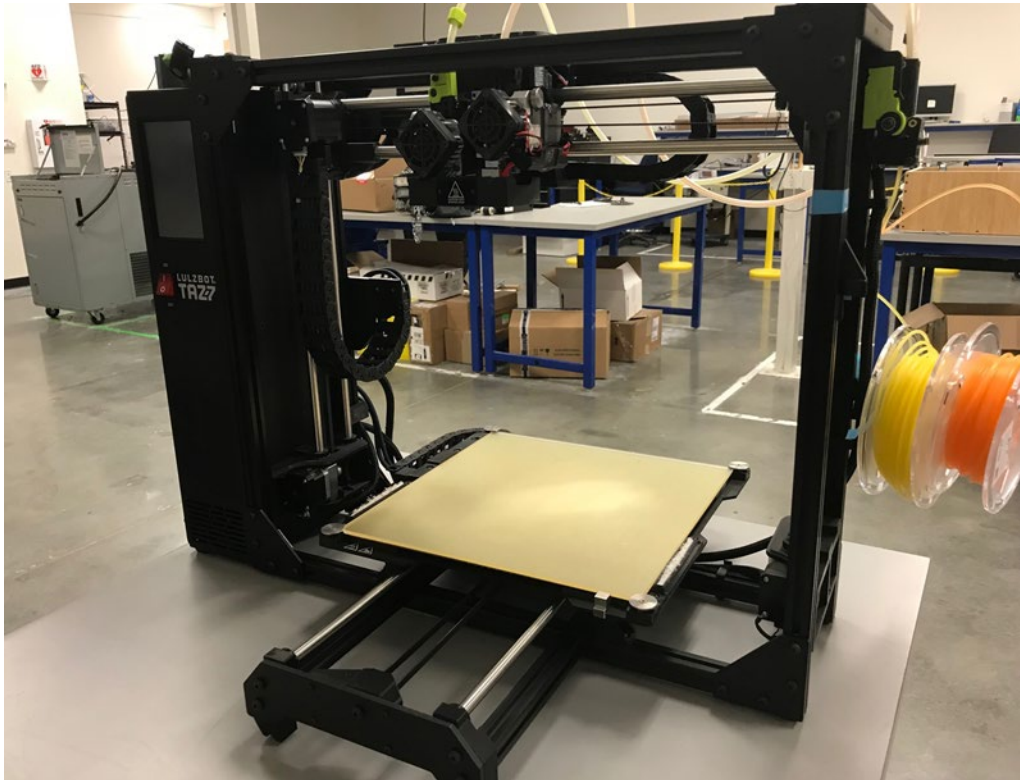
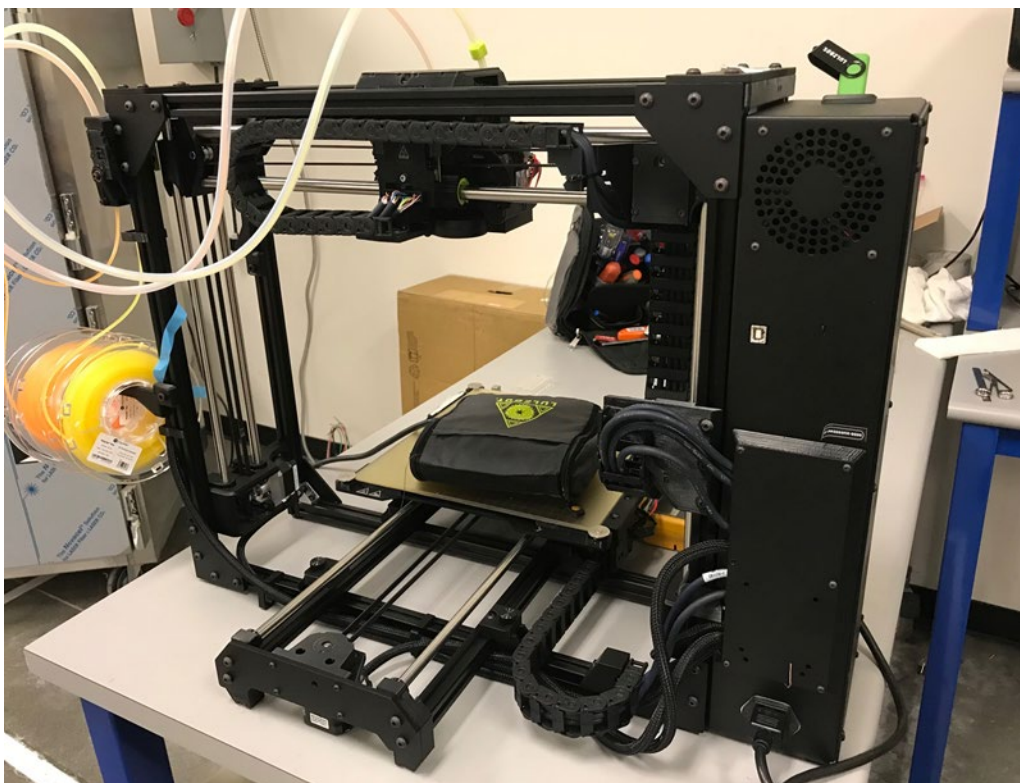


Photo 2 - External view of model





Attachment # 2 – Photographs of System

Photo 3 - Internal view

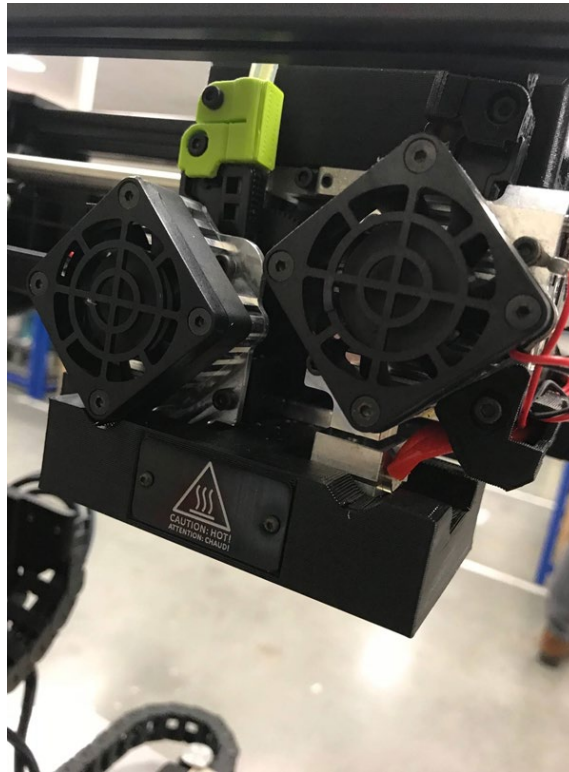


Photo 4 - Internal view of electrical enclosure

