



Test Report issued under  
the responsibility of:



**TEST REPORT**  
**IEC 60950-1**  
**Information technology equipment - Safety -**  
**Part 1: General requirements**

**Report Reference No** ..... : E474577-A1

Date of issue ..... :

Total number of pages ..... : 29

**CB Testing Laboratory** ..... : UL Northbrook

Address ..... : 333 Pfingsten Road, Northbrook, IL, 60062-2096, USA

**Applicant's name** ..... : ALEPH OBJECTS INC

Address ..... : 626 WEST 66TH STREET  
LOVELAND CO 80538  
UNITED STATES

**Test specification:**

Standard ..... : IEC 60950-1:2005 (2nd Edition); Am 1:2009

Test procedure ..... : CB Scheme

Non-standard test method ..... : N/A

**Test Report Form No.** ..... : IEC60950\_1C

Test Report Form originator ..... : SGS Fimko Ltd

Master TRF ..... : 2012-08

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

<b>Test item description</b> .....	: Desktop 3D Printer
Trade Mark .....	: 
Manufacturer .....	: ALEPH OBJECTS INC 626 WEST 66TH STREET LOVELAND CO 80538 UNITED STATES
Model/Type reference .....	: KT-PR0035-XXXX (where X can be any numeric character or blank)
Ratings .....	: 100-240V~, 50-60Hz, 3.2A

DRAFT

<b>Testing procedure and testing location:</b>	
<input checked="" type="checkbox"/> <b>CB Testing Laboratory</b>	Testing location / address .....: UL Northbrook 333 Pfingsten Road, Northbrook, IL, 60062-2096, USA
<input type="checkbox"/> <b>Associated CB Test Laboratory</b>	Testing location / address .....: Tested by (name + signature) .....: Approved by (name + signature).....:
<input type="checkbox"/> <b>Testing Procedure: TMP</b>	Tested by (name + signature) .....: Approved by (+ signature) .....: Testing location / address .....:
<input type="checkbox"/> <b>Testing Procedure: WMT</b>	Tested by (name + signature) .....: Witnessed by (+ signature) .....: Approved by (+ signature) .....: Testing location / address .....:
<input type="checkbox"/> <b>Testing Procedure: SMT</b>	Tested by (name + signature) .....: Approved by (+ signature) .....: Supervised by (+ signature) .....: Testing location / address .....:
<input type="checkbox"/> <b>Testing Procedure: RMT</b>	Tested by (name + signature) .....: Approved by (+ signature) .....: Supervised by (+ signature) .....: Testing location / address .....:

**List of Attachments**

National Differences (37 pages)  
Enclosures ( pages)

**Summary Of Testing**

Unless otherwise indicated, all tests were conducted at UL Northbrook 333 Pfingsten Road, Northbrook, IL, 60062-2096, USA.

<b>Tests to be performed (name of test and test clause)</b>	<b>Testing location / Comments</b>
End Product Reference Page	
General Guidelines	
Input: Single-Phase (1.6.2)	
Durability of Marking (1.7.11)	
Limited Power Source Measurements (2.5)	
Protective Bonding I (2.6.3.4, 2.6.1).7)	
Drop (4.2.6, 4.2.1)	
Stress Relief (4.2.7, 4.2.1)	
Heating (4.5.1, 1.4.12, 1.4.13)	
Touch Current (Single-Phase; TN/TT System) (5.1, Annex D)	
Electric Strength (5.2.2)	
Abnormal Operation (5.3.1 - 5.3.9)	

**Summary of Compliance with National Differences:**

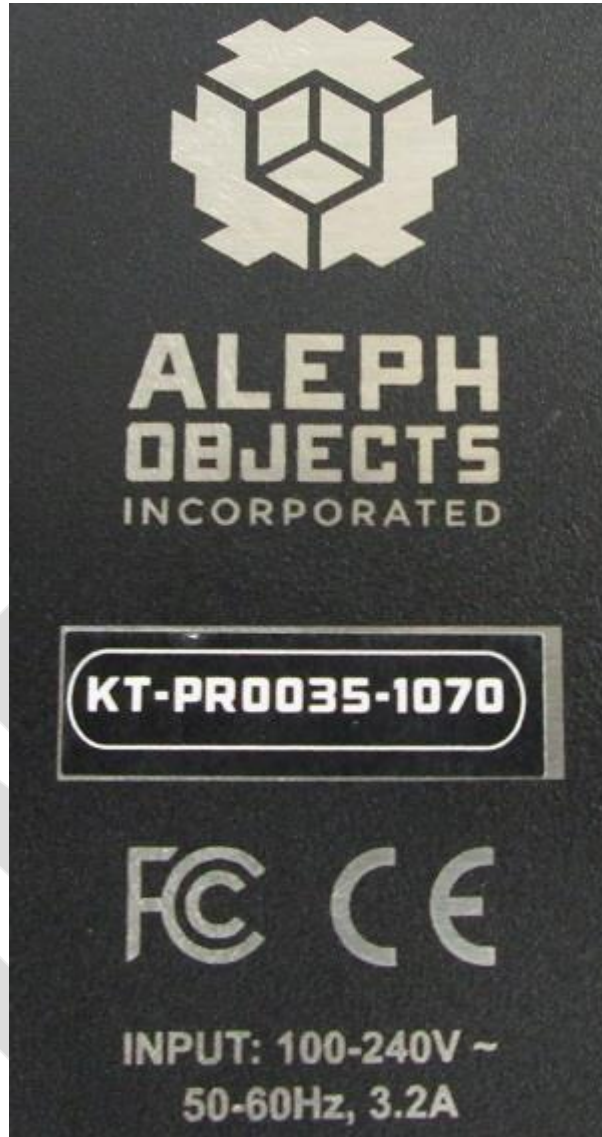
Countries outside the CB Scheme membership may also accept this report.

List of countries addressed: AT, BE, BG, BY, CA, CH, CN, CZ, DE, DK, ES, EU, FI, FR, GB, GR, HU, IE, IL, IT, JP, KR, NL, NO, PL, PT, RO, SE, SG, SI, SK, UA, US

The product fulfills the requirements of: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).

### 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 .....	movable
Connection to the mains .....	pluggable A
Operating condition .....	continuous
Access location .....	operator accessible
Over voltage category (OVC) .....	OVC II
Mains supply tolerance (%) or absolute mains supply values .....	+10%, -10%
Tested for IT power systems .....	No
IT testing, phase-phase voltage (V) .....	N/A
Class of equipment .....	Class I (earthed)
Considered current rating of protective device as part of the building installation (A) .....	20
Pollution degree (PD) .....	PD 2
IP protection class .....	IP X0
Altitude of operation (m) .....	3000m
Altitude of test laboratory (m) .....	189
Mass of equipment (kg) .....	8.55kg

**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(s) of receipt of test item .....	2015-02-13
Date(s) of Performance of tests .....	

**General remarks:**

The test results presented in this report relate only to the object tested.  
 This report shall not be reproduced, except in full, without the written approval of the testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report.  
 "(see appended table)" refers to a table appended to the report.

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

**Manufacturer's Declaration per Sub Clause 4.2.5 of IEC 60335-1:**

The application for obtaining a CB Test Certificate includes more than one factory 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 .....

Not  
Applicable

When differences exist, they shall be identified in the General Product Information section.

**Name and address of Factory(ies):** ALEPH OBJECTS INC  
 626 WEST 66TH STREET  
 LOVELAND CO 80538  
 UNITED STATES

**GENERAL PRODUCT INFORMATION:**

**Report Summary**

All applicable tests according to the referenced standard(s) have been carried out.

**Product Description**

Model KT-PR0035-XXXXXX is a high performance desktop 3D printer employing an R/C (QQGQ2) Power Supply, various SELV circuitries, motors, gears, fans, extruders and movable heat table.

**Model Differences**

All models are the same except for model designation. KT-PR0035-XXXXXX (where X represents Serial Number and it could be any numeric character or blank)

**Additional Information**

N/A

**Technical Considerations**

- The product was submitted and evaluated for use at the maximum ambient temperature (T<sub>ma</sub>) permitted by the manufacturer's specification of: TBD
- The means of connection to the mains supply is: Pluggable A, Detachable power cord
- The product is intended for use on the following power systems: TN
- The equipment disconnect device is considered to be: Appliance inlet
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).
- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS): USB port
- The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual
- The power supply in this equipment was: Not investigated. A test report for the power supply may be required when submitting this CB Report to a National Certification Body (NCB) to obtain a national mark.
- LEDs provided in the product are considered low power devices: Yes

Abbreviations used in the report:

- normal condition .....	N.C.	- single fault condition .....	S.F.C
- operational insulation .....	OP	- basic insulation .....	BI
- basic insulation between parts of opposite polarity:	BOP	- supplementary insulation .....	SI
- double insulation .....	DI	- reinforced insulation .....	RI

Indicate used abbreviations (if any)

1	<b>GENERAL</b>		Pass
1.5	Components		Fail
1.5.1	General		Fail
	Comply with IEC 60950-1 or relevant component standard		Pass
1.5.2	Evaluation and testing of components		Requires Testing
1.5.3	Thermal controls		N/A
1.5.4	Transformers	Evaluated during a separate power supply investigation.	N/A
1.5.5	Interconnecting cables	Not supplied as part of the equipment	N/A
1.5.6	Capacitors bridging insulation	Evaluated during a separate power supply investigation.	N/A
1.5.7	Resistors bridging insulation	Evaluated during a separate power supply investigation.	N/A
1.5.7.1	Resistors bridging functional, basic or supplementary insulation		N/A
1.5.7.2	Resistors bridging double or reinforced insulation between a.c. mains and other circuits		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		N/A
1.5.9	Surge suppressors	Evaluated during a separate power supply investigation.	N/A
1.5.9.1	General		N/A
1.5.9.2	Protection of VDRs		N/A
1.5.9.3	Bridging of functional insulation by a VDR		N/A
1.5.9.4	Bridging of basic insulation by a VDR		N/A
1.5.9.5	Bridging of supplementary, double or reinforced insulation by a VDR		N/A

1.6	<b>Power interface</b>		Pass
1.6.1	AC power distribution systems		Pass
1.6.2	Input current	(see appended table 1.6.2)	Pass
1.6.3	Voltage limit of hand-held equipment		N/A
1.6.4	Neutral conductor		N/A

1.7	<b>Marking and instructions</b>		Pass
1.7.1	Power rating and identification markings		Pass
1.7.1.1	Power rating mark		Pass



	Multiple mains supply connections .....		N/A
	Rated voltage(s) or voltage range(s) (V) .....	See Models and Ratings page	Pass
	Symbol for nature of supply, for d.c. only .....		N/A
	Rated frequency or rated frequency range (Hz) .....	See Models and Ratings page	Pass
	Rated current (mA or A).....	See Models and Ratings page	Pass
1.7.1.2	Identification markings	TBD	Need More Information
	Manufacturer's name or trademark or identification mark .....	See Trademark	Pass
	Model identification or type reference.....		Need More Information
	Symbol for Class II equipment only .....		N/A
	Other markings and symbols .....		N/A
1.7.2	Safety instructions and marking		Pass
1.7.2.1	General		Pass
1.7.2.2	Disconnect devices	Appliance Inlet	Pass
1.7.2.3	Overcurrent protective device	Pluggable A	N/A
1.7.2.4	IT Power distribution systems		N/A
1.7.2.5	Operator access with a tool		Pass
1.7.2.6	Ozone		N/A
1.7.3	Short duty cycles		N/A
1.7.4	Supply voltage adjustment.....		N/A
	Method and means of adjustment; reference to installation instructions.....		N/A
1.7.5	Power outlets on the equipment .....		N/A
1.7.6	Fuse identification (marking, special fusing characteristics, cross-reference).....	Evaluated during a separate power supply investigation.	N/A
1.7.7	Wiring terminals		Pass
1.7.7.1	Protective earthing and bonding terminals .....	PE Terminal provided in the IEC inlet	Pass
1.7.7.2	Terminals for a.c. mains supply conductors		Pass
1.7.7.3	Terminals for d.c. mains supply conductors		N/A
1.7.8	Controls and indicators		Pass
1.7.8.1	Identification, location and marking .....	The function of controls affecting safety is obvious regardless of language.	Pass
1.7.8.2	Colours.....	Only functional indicators use color.	Pass
1.7.8.3	Symbols according to IEC 60417 .....	I and O used	Pass
1.7.8.4	Markings using figures.....		N/A
1.7.9	Isolation of multiple power sources .....		N/A
1.7.10	Thermostats and other regulating devices .....		N/A

1.7.11	Durability		Requires Testing
1.7.12	Removable parts		N/A
1.7.13	Replaceable batteries .....		N/A
	Language(s).....		-
1.7.14	Equipment for restricted access locations .....		N/A

2	<b>PROTECTION FROM HAZARDS</b>		Pass
2.1	Protection from electric shock and energy hazards		Pass
2.1.1	Protection in operator access areas		Pass
2.1.1.1	Access to energized parts		Pass
	Test by inspection .....	Power supply outputs are <240 VA.	Pass
	Test with test finger (Figure 2A) .....	No Contact	Pass
	Test with test pin (Figure 2B).....	No Contact	Pass
	Test with test probe (Figure 2C) .....	No Contact	Pass
2.1.1.2	Battery compartments		N/A
2.1.1.3	Access to ELV wiring		N/A
	Working voltage (V <sub>peak</sub> or V <sub>rms</sub> ); minimum distance through insulation (mm) .....		-
2.1.1.4	Access to hazardous voltage circuit wiring		Pass
2.1.1.5	Energy hazards.....	Power supply outputs are <240 VA.	Pass
2.1.1.6	Manual controls		N/A
2.1.1.7	Discharge of capacitors in equipment		Pass
	Measured voltage (V); time-constant (s) .....	Evaluated in the R/C internal power supply.	-
2.1.1.8	Energy hazards - d.c. mains supply		N/A
	a) Capacitor connected to the d.c. mains supply ..		N/A
	b) Internal battery connected to the mains supply.:		N/A
2.1.1.9	Audio amplifiers .....		N/A
2.1.2	Protection in service access areas	Service person is directed to remove power before servicing in hazardous voltage areas, and hazardous energy areas.	Pass
2.1.3	Protection in restricted access locations		N/A

2.2	<b>SELV circuits</b>		Pass
2.2.1	General requirements	Outputs of the Power supply are SELV. Evaluated in the R/C internal power supply. All	N/A

		accessible circuits are SELV.	
2.2.2	Voltages under normal conditions (V) .....		N/A
2.2.3	Voltages under fault conditions (V).....		N/A
2.2.4	Connection of SELV circuits to other circuits.....	SELV to SELV or Ground	Pass

2.3	<b>TNV circuits</b>		N/A
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2.4	<b>Limited current circuits</b>		N/A
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2.5	<b>Limited power sources</b>		Requires Testing
	a) Inherently limited output		Need More Information
	b) Impedance limited output		Need More Information
	c) Regulating network limited output under normal operating and single fault condition		Need More Information
	d) Overcurrent protective device limited output		Need More Information
	Max. output voltage (V), max. output current (A), max. apparent power (VA) .....	(see appended table 2.5)	-
	Current rating of overcurrent protective device (A) :		-
	Use of integrated circuit (IC) current limiters .....		-

2.6	<b>Provisions for earthing and bonding</b>		Pass
2.6.1	Protective earthing		Pass
2.6.2	Functional earthing		Pass
2.6.3	Protective earthing and protective bonding conductors		Pass
2.6.3.1	General		Pass
2.6.3.2	Size of protective earthing conductors		Pass
	Rated current (A), cross-sectional area (mm <sup>2</sup> ), AWG .....	16AWG	-
2.6.3.3	Size of protective bonding conductors		Pass
	Rated current (A), cross-sectional area (mm <sup>2</sup> ), AWG .....	3.2A, 16AWG	-
	Protective current rating (A), cross-sectional area (mm <sup>2</sup> ), AWG.....	3.2A, 16AWG	-
2.6.3.4	Resistance of earthing conductors and their terminations; resistance (ohm), voltage drop (V), test current (A), duration (min).....		Requires Testing

2.6.3.5	Colour of insulation .....	bonding conductor is green only	Fail
2.6.4	Terminals	Not Field Wired. Provided with an Appliance Inlet	Pass
2.6.4.1	General		Pass
2.6.4.2	Protective earthing and bonding terminals		Pass
	Rated current (A), type, nominal thread diameter (mm).....	3.2A, stud type, 3mm nominal tread	-
2.6.4.3	Separation of the protective earthing conductor from protective bonding conductors		Pass
2.6.5	Integrity of protective earthing		Pass
2.6.5.1	Interconnection of equipment		N/A
2.6.5.2	Components in protective earthing conductors and protective bonding conductors		N/A
2.6.5.3	Disconnection of protective earth		Pass
2.6.5.4	Parts that can be removed by an operator	It is not possible to disconnect earth without disconnecting mains.	Pass
2.6.5.5	Parts removed during servicing	Connections to protective earthing cannot be removed unless hazardous voltage is removed from the part simultaneously.	Pass
2.6.5.6	Corrosion resistance		Pass
2.6.5.7	Screws for protective bonding		N/A
2.6.5.8	Reliance on telecommunication network or cable distribution system		N/A

2.7	<b>Overcurrent and earth fault protection in primary circuits</b>		Pass
2.7.1	Basic requirements		Pass
	Instructions when protection relies on building installation		Pass
2.7.2	Faults not covered in 5.3.7		Pass
2.7.3	Short-circuit backup protection		Pass
2.7.4	Number and location of protective devices.....		N/A
2.7.5	Protection by several devices		N/A
2.7.6	Warning to service personnel .....		N/A

2.8	<b>Safety interlocks</b>		N/A
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2.9	<b>Electrical insulation</b>		Pass
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2.9.1	Properties of insulating materials		Pass
2.9.2	Humidity conditioning		N/A
	Relative humidity (%), temperature (°C)..... :	Evaluated during a separate power supply investigation.	-
2.9.3	Grade of insulation		Pass
2.9.4	Separation from hazardous voltages		Pass
	Method(s) used..... :	Method 1.	-

2.10	<b>Clearances, creepage distances and distances through insulation</b>		Pass
2.10.1	General	After the R/C Appliance inlet and R/C Switch, all Creepages and Clearances have been evaluated in the R/C internal power supply.	Pass
2.10.1.1	Frequency..... :	Switching Frequency of power supply is above 30 kHz	Pass
2.10.1.2	Pollution degrees..... :	PD 2	Pass
2.10.1.3	Reduced values for functional insulation		N/A
2.10.1.4	Intervening unconnected conductive parts		N/A
2.10.1.5	Insulation with varying dimensions		N/A
2.10.1.6	Special separation requirements		N/A
2.10.1.7	Insulation in circuits generating starting pulses		N/A
2.10.2	Determination of working voltage		N/A
2.10.2.1	General		N/A
2.10.2.2	RMS working voltage		N/A
2.10.2.3	Peak working voltage		N/A
2.10.3	Clearances		Pass
2.10.3.1	General		Pass
2.10.3.2	Mains transient voltages		Pass
	a) AC mains supply..... :	2500	Pass
	b) Earthed d.c. mains supplies..... :		N/A
	c) Unearthed d.c. mains supplies..... :		N/A
	d) Battery operation..... :		N/A
2.10.3.3	Clearances in primary circuits		N/A
2.10.3.4	Clearances in secondary circuits		See 5.3.4
2.10.3.5	Clearances in circuits having starting pulses		N/A
2.10.3.6	Transients from a.c. mains supply..... :	1500	Pass
2.10.3.7	Transients from d.c. mains supply..... :		N/A
2.10.3.8	Transients from telecommunication networks and cable distribution systems..... :		N/A
2.10.3.9	Measurement of transient voltage levels		N/A

	a) Transients from a mains supply		N/A
	For an a.c. mains supply..... :		N/A
	For a d.c. mains supply..... :		N/A
	b) Transients from a telecommunication network		N/A
2.10.4	Creepage distances	Evaluated during a separate power supply investigation.	Pass
2.10.4.1	General		Pass
2.10.4.2	Material group and comparative tracking index		N/A
	CTI tests..... :	IIIb	-
2.10.4.3	Minimum creepage distances		N/A
2.10.5	Solid insulation		N/A
2.10.5.1	General		N/A
2.10.5.2	Distances through insulation		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		N/A
2.10.5.6	Thin sheet material - General	Evaluated during a separate power supply investigation.	N/A
2.10.5.7	Separable thin sheet material		N/A
	Number of layers (pcs) ..... :		-
2.10.5.8	Non-separable thin sheet material		N/A
2.10.5.9	Thin sheet material - standard test procedure		N/A
	Electric strength test ..... :		-
2.10.5.10	Thin sheet material - alternative test procedure		N/A
	Electric strength test ..... :		-
2.10.5.11	Insulation in wound components		N/A
2.10.5.12	Wire in wound components		N/A
	Working voltage ..... :		N/A
	a) Basic insulation not under stress..... :		N/A
	b) Basic, supplementary, reinforced insulation..... :		N/A
	c) Compliance with Annex U..... :		N/A
	Two wires in contact inside wound component; angle between 45° and 90° ..... :		N/A
2.10.5.13	Wire with solvent-based enamel in wound components		N/A
	Electric strength test ..... :		-
	Routine test		N/A
2.10.5.14	Additional insulation in wound components		N/A
	Working voltage ..... :		N/A
	- Basic insulation not under stress..... :		N/A

	- Supplementary, reinforced insulation .....		N/A
2.10.6	Construction of printed boards		N/A
2.10.6.1	Uncoated printed boards		N/A
2.10.6.2	Coated printed boards		N/A
2.10.6.3	Insulation between conductors on the same inner surface of a printed board		N/A
2.10.6.4	Insulation between conductors on different layers of a printed board		N/A
	Distance through insulation		N/A
	Number of insulation layers (pcs) .....		N/A
2.10.7	Component external terminations		N/A
2.10.8	Tests on coated printed boards and coated components		N/A
2.10.8.1	Sample preparation and preliminary inspection		N/A
2.10.8.2	Thermal conditioning		N/A
2.10.8.3	Electric strength test		N/A
2.10.8.4	Abrasion resistance test		N/A
2.10.9	Thermal cycling		N/A
2.10.10	Test for Pollution Degree 1 environment and insulating compound		N/A
2.10.11	Tests for semiconductor devices and cemented joints	Evaluated during a separate power supply investigation.	N/A
2.10.12	Enclosed and sealed parts		N/A

3	<b>WIRING, CONNECTIONS AND SUPPLY</b>		Pass
3.1	General		Pass
3.1.1	Current rating and overcurrent protection		Pass
3.1.2	Protection against mechanical damage		Pass
3.1.3	Securing of internal wiring	Primary wiring is routed, clamped and provided with heat shrink tubing to separate from SELV components and wiring.	Pass
3.1.4	Insulation of conductors		Pass
3.1.5	Beads and ceramic insulators		N/A
3.1.6	Screws for electrical contact pressure		Pass
3.1.7	Insulating materials in electrical connections		Pass
3.1.8	Self-tapping and spaced thread screws		Pass
3.1.9	Termination of conductors		Pass
	10 N pull test		Pass
3.1.10	Sleeving on wiring		Pass

3.2	<b>Connection to mains supply</b>		Pass
3.2.1	Means of connection	Appliance inlet	Pass
3.2.1.1	Connection to an a.c. mains supply		Pass
3.2.1.2	Connection to a d.c. mains supply		N/A
3.2.2	Multiple supply connections		N/A
3.2.3	Permanently connected equipment		N/A
	Number of conductors, diameter of cable and conduits (mm) .....		-
3.2.4	Appliance inlets		Pass
3.2.5	Power supply cords		Pass
3.2.5.1	AC power supply cords		Pass
	Type .....	See Table 1.5.1	-
	Rated current (A), cross-sectional area (mm <sup>2</sup> ), AWG .....	See Table 1.5.1	-
3.2.5.2	DC power supply cords		N/A
3.2.6	Cord anchorages and strain relief		N/A
	Mass of equipment (kg), pull (N) .....		-
	Longitudinal displacement (mm).....		-
3.2.7	Protection against mechanical damage		N/A
3.2.8	Cord guards		N/A
	Diameter of minor dimension D (mm); test mass (g) .....		-
	Radius of curvature of cord (mm) .....		-
3.2.9	Supply wiring space		N/A

3.3	<b>Wiring terminals for connection of external conductors</b>		N/A
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3.4	<b>Disconnection from the mains supply</b>		Pass
3.4.1	General requirement		Pass
3.4.2	Disconnect devices	Appliance Inlet	Pass
3.4.3	Permanently connected equipment		N/A
3.4.4	Parts which remain energized		N/A
3.4.5	Switches in flexible cords	No isolating switch in the cord set.	N/A
3.4.6	Number of poles - single-phase and d.c. equipment		Pass
3.4.7	Number of poles - three-phase equipment		N/A
3.4.8	Switches as disconnect devices	A switch is not considered the disconnect device.	N/A



3.4.9	Plugs as disconnect devices	The plug on the power cord is not considered the disconnect device.	N/A
3.4.10	Interconnected equipment	No interconnection of hazardous voltages or energy levels.	N/A
3.4.11	Multiple power sources	The equipment only receives power from one source.	N/A

3.5	<b>Interconnection of equipment</b>		Pass
3.5.1	General requirements		Pass
3.5.2	Types of interconnection circuits .....	SELV	Pass
3.5.3	ELV circuits as interconnection circuits		N/A
3.5.4	Data ports for additional equipment		Pass

4	<b>PHYSICAL REQUIREMENTS</b>		Fail
4.1	Stability		Pass
	Angle of 10°		Pass
	Test force (N) .....		N/A

4.2	<b>Mechanical strength</b>		Pass
4.2.1	General		Pass
	Rack-mounted equipment		N/A
4.2.2	Steady force test, 10 N		Pass
4.2.3	Steady force test, 30 N		N/A
4.2.4	Steady force test, 250 N		Pass
4.2.5	Impact test		Pass
	Fall test		Requires Testing
	Swing test		Pass
4.2.6	Drop test; height (mm) .....		N/A
4.2.7	Stress relief test		Pass
4.2.8	Cathode ray tubes		N/A
	Picture tube separately certified .....		N/A
4.2.9	High pressure lamps		N/A
4.2.10	Wall or ceiling mounted equipment; force (N) .....		N/A

4.3	<b>Design and construction</b>		Pass
4.3.1	Edges and corners	All edges and corners are	Pass

		judged to be sufficiently well rounded so as not to constitute a hazard.	
4.3.2	Handles and manual controls; force (N) .....		N/A
4.3.3	Adjustable controls		N/A
4.3.4	Securing of parts		Pass
4.3.5	Connection by plugs and sockets		Pass
4.3.6	Direct plug-in equipment		N/A
	Torque.....		N/A
	Compliance with the relevant mains plug standard:		N/A
4.3.7	Heating elements in earthed equipment		Need More Information
4.3.8	Batteries		N/A
	- Overcharging of a rechargeable battery		N/A
	- Unintentional charging of a non-rechargeable battery		N/A
	- Reverse charging of a rechargeable battery		N/A
	- Excessive discharging rate for any battery		N/A
4.3.9	Oil and grease		N/A
4.3.10	Dust, powders, liquids and gases		N/A
4.3.11	Containers for liquids or gases		N/A
4.3.12	Flammable liquids.....		N/A
	Quantity of liquid (l).....		N/A
	Flash point (°C).....		N/A
4.3.13	Radiation		Pass
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		Pass
4.3.13.5.1	Lasers (including laser diodes)		N/A
	Laser class.....		-
4.3.13.5.2	Light emitting diodes (LEDs)		Pass
4.3.13.6	Other types .....		N/A

4.4	<b>Protection against hazardous moving parts</b>		Fail
4.4.1	General		Fail
4.4.2	Protection in operator access areas .....		Fail
	Household and home/office document/media shredders		N/A
4.4.3	Protection in restricted access locations .....		N/A
4.4.4	Protection in service access areas		Fail
4.4.5	Protection against moving fan blades		Pass
4.4.5.1	General		Pass
	Not considered to cause pain or injury. a) .....		Need More Information
	Is considered to cause pain, not injury. b) .....		Need More Information
	Considered to cause injury. c) .....		Need More Information
4.4.5.2	Protection for users		Pass
	Use of symbol or warning .....		N/A
4.4.5.3	Protection for service persons		Need More Information
	Use of symbol or warning .....		N/A

4.5	<b>Thermal requirements</b>		Pass
4.5.1	General		Pass
4.5.2	Temperature tests		Pass
	Normal load condition per Annex L .....	Continuously printing 3D objects	-
4.5.3	Temperature limits for materials		Pass
4.5.4	Touch temperature limits	Hot surface parts that could be touched are marked with the symbol IEC 60417-5041 (DB:2002-10), including the extruder, and x and y axis motors. See Enclosure 3-21 and 4-02 for markings and locations.	Pass
4.5.5	Resistance to abnormal heat .....		N/A

4.6	<b>Openings in enclosures</b>		Pass
4.6.1	Top and side openings		Pass
	Dimensions (mm).....	Openings comply with	-
4.6.2	Bottoms of fire enclosures		Need More Information

	Construction of the bottom, dimensions (mm)..... :		-
4.6.3	Doors or covers in fire enclosures		Pass
4.6.4	Openings in 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		N/A
4.6.5	Adhesives for constructional purposes		N/A
	Conditioning temperature (°C), time (weeks) ..... :		-

4.7	<b>Resistance to fire</b>		Fail
4.7.1	Reducing the risk of ignition and spread of flame		Fail
	Method 1, selection and application of components wiring and materials		Fail
	Method 2, application of all of simulated fault condition tests		N/A
4.7.2	Conditions for a fire enclosure		Pass
4.7.2.1	Parts requiring a fire enclosure	PSU, and USB board	Pass
4.7.2.2	Parts not requiring a fire enclosure		N/A
4.7.3	Materials		Fail
4.7.3.1	General		Fail
4.7.3.2	Materials for fire enclosures	Metal	Pass
4.7.3.3	Materials for components and other parts outside fire enclosures		Fail
4.7.3.4	Materials for components and other parts inside fire enclosures		Fail
4.7.3.5	Materials for air filter assemblies		N/A
4.7.3.6	Materials used in high-voltage components		N/A

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

5.1.5	Test procedure		Pass
5.1.6	Test measurements		Pass
	Supply voltage (V) .....	Previously evaluated under power supply evaluation.	-
	Measured touch current (mA) .....	Previously evaluated under power supply evaluation.	-
	Max. allowed touch current (mA) .....	Previously evaluated under power supply evaluation.	-
	Measured protective conductor current (mA) .....	N/A	-
	Max. allowed protective conductor current (mA) ...	N/A	-
5.1.7	Equipment with touch current exceeding 3,5 mA		N/A
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		N/A
5.1.8.1	Limitation of the touch current to a telecommunication network or to a cable distribution system		N/A
	Supply voltage (V) .....		-
	Measured touch current (mA) .....		-
	Max. allowed touch current (mA) .....		-
5.1.8.2	Summation of touch currents from telecommunication networks		N/A
	a) EUT with earthed telecommunication ports.....		N/A
	b) EUT whose telecommunication ports have no reference to protective earth		N/A

5.2	<b>Electric strength</b>		Requires Testing
5.2.1	General		Requires Testing
5.2.2	Test procedure		Pass

5.3	<b>Abnormal operating and fault conditions</b>		Pass
5.3.1	Protection against overload and abnormal operation		Requires Testing
5.3.2	Motors		N/A
5.3.3	Transformers		N/A
5.3.4	Functional insulation .....	Meets 5.3.4 c	Pass
5.3.5	Electromechanical components		Pass
5.3.6	Audio amplifiers in ITE .....		N/A

5.3.7	Simulation of faults		N/A
5.3.8	Unattended equipment		N/A
5.3.9	Compliance criteria for abnormal operating and fault conditions		Requires Testing
5.3.9.1	During the tests		Need More Information
5.3.9.2	After the tests		Pass
6	<b>CONNECTION TO TELECOMMUNICATION NETWORKS</b>		N/A
6.2	<b>Protection of equipment users from overvoltages on telecommunication networks</b>		N/A
6.3	<b>Protection of the telecommunication wiring system from overheating</b>		N/A
7	<b>CONNECTION TO CABLE DISTRIBUTION SYSTEMS</b>		N/A
A	<b>ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE</b>		N/A
B	<b>ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)</b>		N/A
C	<b>ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)</b>		N/A
D	<b>ANNEX D, MEASURING INSTRUMENTS FOR TOUCH-CURRENT TESTS (see 5.1.4)</b>		N/A
E	<b>ANNEX E, TEMPERATURE RISE OF A WINDING (see 1.4.13)</b>		N/A
F	<b>ANNEX F, MEASUREMENT OF CLEARANCES AND CREEPAGE DISTANCES (see 2.10 and Annex G)</b>		N/A
G	<b>ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES</b>		N/A
H	<b>ANNEX H, IONIZING RADIATION (see 4.3.13)</b>		N/A

J	<b>ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)</b>	Pass
	Metal(s) used ..... : CRS / Zinc Cr on steel	-
K	<b>ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.8)</b>	N/A
L	<b>ANNEX L, NORMAL LOAD CONDITIONS FOR SOME TYPES OF ELECTRICAL BUSINESS EQUIPMENT (see 1.2.2.1 and 4.5.2)</b>	N/A
M	<b>ANNEX M, CRITERIA FOR TELEPHONE RINGING SIGNALS (see 2.3.1)</b>	N/A
N	<b>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)</b>	N/A
P	<b>ANNEX P, NORMATIVE REFERENCES</b>	Pass
Q	<b>ANNEX Q, Voltage dependent resistors (VDRs) (see 1.5.9.1)</b>	N/A
R	<b>ANNEX R, EXAMPLES OF REQUIREMENTS FOR QUALITY CONTROL PROGRAMMES</b>	N/A
S	<b>ANNEX S, PROCEDURE FOR IMPULSE TESTING (see 6.2.2.3)</b>	N/A
T	<b>ANNEX T, GUIDANCE ON PROTECTION AGAINST INGRESS OF WATER (see 1.1.2)</b>	N/A
U	<b>ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)</b>	N/A
V	<b>ANNEX V, AC POWER DISTRIBUTION SYSTEMS (see 1.6.1)</b>	Pass
V.1	Introduction	Pass
V.2	TN power distribution systems	Pass
W	<b>ANNEX W, SUMMATION OF TOUCH CURRENTS</b>	N/A

X	<b>ANNEX X, MAXIMUM HEATING EFFECT IN TRANSFORMER TESTS (see clause C.1)</b>	N/A
Y	<b>ANNEX Y, ULTRAVIOLET LIGHT CONDITIONING TEST (see 4.3.13.3)</b>	N/A
Z	<b>ANNEX Z, OVERVOLTAGE CATEGORIES (see 2.10.3.2 and Clause G.2)</b>	Pass
AA	<b>ANNEX AA, MANDREL TEST (see 2.10.5.8)</b>	N/A
BB	<b>ANNEX BB, CHANGES IN THE SECOND EDITION</b>	Pass
CC	<b>ANNEX CC, EVALUATION OF INTEGRATED CIRCUIT (IC) CURRENT LIMITERS</b>	N/A
DD	<b>ANNEX DD, REQUIREMENTS FOR THE MOUNTING MEANS OF RACK-MOUNTED EQUIPMENT</b>	N/A
EE	<b>ANNEX EE, HOUSEHOLD AND HOME/OFFICE DOCUMENT/MEDIA SHREDDERS</b>	N/A



1.5.1	TABLE: list of critical components				Pass
object/part or Description	manufacturer/ trademark	type/model	technical data	standard (Edition or year)	mark(s) of conformity <sup>1)</sup>
Appliance Inlet	Bulgin	PF0030/63	250Vac, 10A		
Fan	Runda Electronics Co	RSH8015B24N30	24Vdc, 0.14A, 35cfm		
Label	Interchangeable	Interchangeable	Laser engraved	--	--, --
Power supply	Delta Electronics	PMC-24V150W1AA	Input 100-240V~, 3.2A, 50-60Hz; Output 24Vdc, 6.25A	UL60950-1, IEC60950-1, EN60950-1	UR
Switch, (power)	E-Switch	R5BBLKREDF2 (R5 series)	125 V, 20A, 3/4HP, 10K cycles.	UL1054, UL61058-1, IEC60669, IEC61020, IEC61058-1	UR , VDE
Wiring, internal secondary (PSU to USB board)	Interchangeable	Interchangeable	Style 1007, VW-1; min 300V, 80°C, 16AWG	UL758	
Wiring, internal secondary (USB board to heat pad) purple wire	Interchangeable	Interchangeable	Style 1007, VW-1; min 300V, 80°C, 16AWG	UL758	
Heat shrink (on motor wiring)					
Wiring, internal primary	Interchangeable	Interchangeable	Style 1007, VW-1; min 300V, 80°C, 16AWG	UL758	UR
Bonding Conductor	Interchangeable	Interchangeable	Style 1007, VW-1; min 300V, 80°C, 16AWG	UL758	UR
Bonding Terminal	Interchangeable	Interchangeable	self-clinching stud type, 3mm diameter, 10mm length.	--	Further evaluated in this application.
Crimp Connectors	Interchangeable	Interchangeable	300V, 22-16AWG	UL486A	UL
Internal Thermoplastics	Interchangeable	Interchangeable	V-2 minimum		UR
Motors (5 provided)	Changzhou Songyang Machinery & Electronics	SY42STH47-1504A	2.8V, 1.2A		
Heater					
Extrusion fan	Kysan Electronics	69829	24Vdc, 0.06A, 40x40x10mm		
Micro Blower	PTi Technologies (Pelonis)	RBS2218	24Vdc, 0.06A, 22x26x7.5mm		
Switch (6 provided)	Omron	SS-01 series	30Vdc, 3A	UL61058, EN61058	UR, VDE
Printed wiring board	Interchangeable	Interchangeable	Min V-1, 105°C	UL796	UR
Connectors Secondary	Interchangeable	Interchangeable	Copper pins in thermoplastic material rated V-2 minimum.	UL1977	UR
Fuseholder (F1-F3)					
Fuse F1-F2	Littelfuse	287 series (0287005.PXCN)	32Vdc, 5A	UL275A	UL, --
Fuse F3	Littelfuse	287 series (0287015.PXCN)	32Vdc, 15A	UL275A	UL, --
Fuse F5	Eaton/Bussman	PTS181233V075	33V, 0.75A Suitable for providing LPS	UL 1434, UL 60730-1	UR
Thermoplastic material (printing area)	Interchangeable	Interchangeable	HB minimum	UL94	UR

Supplementary information:

<sup>1)</sup> Provided evidence ensures the agreed level of compliance. See OD-CB2039.

The CBTL has verified the component information.

**Enclosure**  
**National Differences**

- Austria\*\***
- Belarus\***
- Belgium\*\***
- Bulgaria\*\***
- China\***
- Czech Republic\*\***
- Denmark**
- Finland**
- France\*\***
- Germany**
- Greece\*\***
- Group**
- Hungary\*\***
- Ireland**
- Israel**
- Italy\*\***
- Japan\***
- Korea**
- Netherlands\*\***
- Norway**
- Poland\*\***
- Portugal\*\***
- Romania\*\***
- Singapore\***
- Slovakia\*\***
- Slovenia\*\***
- Spain**
- Sweden**
- Switzerland**
- USA / Canada**
- Ukraine\***
- United Kingdom**

\* No National Differences Declared

\*\* Only Group Differences

<b>Denmark - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009</b>			
1.2.4.1	In Denmark, certain types of Class I appliances (see sub-clause 3.2.1.1) may be provided with plug not establishing earthing continuity when inserted into Danish socket-outlets.		Pass
1.7.5	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.		N/A
1.7.5	For CLASS II EQUIPMENT the socket outlet shall be in accordance with Standard Sheet DKA 1-4a. (Heavy Current Regulations, Section 107-2-D1)		N/A
3.2.1.1	<p>Supply cord 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 contact 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>		Pass

<b>Finland - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009</b>			
1.5.7.1	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
1.5.9.4	The third dashed sentence is applicable only to equipment as defined by annex, 6.1.2.2.		N/A

1.7.2.1	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. The marking text shall be: "Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan"		N/A
2.3.2	Requirements according to this annex 6.1.2.1 and 6.1.2.2 apply.		N/A
2.10.5.13	Requirements according to this annex 6.1.2.1 and 6.1.2.2 apply.		N/A
5.1.7.1	Touch current measurement results exceeding 3,5 mA r.m.s are permitted only for the following equipment: - STATIONARY PLUGGABLE EQUIPMENT TYPE A that: (1) is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and (2) has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and (3) is provided with instructions for the installation of that conductor by a SERVICE PERSON; - STATIONARY PLUGGABLE EQUIPMENT TYPE B - STATIONARY PERMANENTLY CONNECTED EQUIPMENT		N/A
6.1.2.1	Add the following text between the first and second paragraph of the compliance clause: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either - 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.  Alternatively for components, there is no distance through insulation requirement for the insulation		N/A

	<p>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"> <li>- 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</li> <li>- is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV.</li> </ul> <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 132400:1994 (EN 60384-14:2005), subclass Y2. A capacitor classified Y3 according to EN 132400 [EN 60384-14:2005], may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> <li>- the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400 [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;</li> <li>- the additional testing shall be performed on all the test specimens as described in EN 132400 [EN 60384-14];</li> <li>- the impulse test of 2,5 kV is to be performed before the endurance test in EN 132400 [EN 60384-14], in the sequence of tests as described in EN 132400 [EN 60384-14].</li> </ul>		
6.1.2.2	<p>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 center, 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>Requirements according to this annex 6.1.2.1 and 6.1.2.2 apply with the term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.</p>		N/A

<b>Germany - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009</b>			
1.7.2.1	According to GPSG, section 2, clause 4: If certain rules on the use, supplementation or maintenance of an item of technical work equipment or ready-to-use commodity must be observed in order to guarantee safety and health, instructions for use in German must be supplied when it is brought into circulation.		Pass
<b>Group - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009</b>			
1.1.1	Replace the text of NOTE 3 by the following: NOTE 3 The requirements of EN60065 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, EN60065 applies.		N/A
1.2.3	Add the following definition. 1.2.3.Z1 Portable Sound System Small battery powered audio equipment -whose prime purpose is to listen to recorded or boardcasted sound; and -that uses headphones or earphones that can be worn in or on or around the ears; and -that allows the user to walk around NOTE: Examples are mini-disk or CD players, MP3 audio players or similar equipment.		N/A
1.5.1	Add the following NOTE Z1: The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2002/95/EC		Pass
1.7.2.1	Delete NOTE Z1 and add the following paragraph at the end of the subclause: In addition, for a PORTABLE SOUND SYSTEM, the instructions shall include a a warning that excessive sound pressure from earphones and headphones can cause hearing loss.		Pass
2.7.1	Replace the subclause as follows: Basic requirements 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		N/A

	<p>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> <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>								
2.7.2	Void	Noted	Pass						
3.2.3	Delete the NOTE and conduit sizes in parentheses in Table 3A		N/A						
3.2.5.1	<p>Replace:</p> <p>"60245 IEC 53" by "H05 RR-F"</p> <p>"60227 IEC 52" by "H03 VV-F or H03 VVH2-F"</p> <p>"60227 IEC 53" by "H05 VV-F or H05 VVH2-F"</p> <p>In Table 3B, replace the first four lines by the following:</p> <table> <tr> <td>Up to and including 6</td> <td>0.75 a)</td> </tr> <tr> <td>Over 6 up to and including 10</td> <td>0.75 b) 1.0</td> </tr> <tr> <td>Over 10 up to and including 16</td> <td>1.0 c) 1.5</td> </tr> </table> <p>In the conditions applicable to table 3B, delete the words "in some countries" in condition a).</p> <p>In Note 1, applicable Table 3B, to delete the second sentence.</p>	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		Pass
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								
3.3.4	<p>In table 3D, delete the fourth line: conductor sizes for 10 to 13 A, and replace with the following:</p> <p>"Over 10 up to and including 16      1.5 to 2.5    1.5 to by 4"</p> <p>Delete the fifth line: conductor sizes for 13 to 16A.</p>		N/A						

4.3.13.6	<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). Standards taking into account this Recommendation which demonstrate compliance with the applicable EU Directive are indicated in the OJEC.</p>		N/A
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 <math>\mu\text{Sv/h}</math> (0,1 mR/h) (see NOTE). Account is taken of the background level. Replace the notes as follows: NOTE - These values appear in Directive 96/29/Euratom. Delete NOTE 2.</p>		N/A
Zx	Protection against excessive sound pressure from personal music players		N/A
Zx.1	<p>General - 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 equipment for personal use, that:</p> <ul style="list-style-type: none"> <li>- is designed to allow the user to listen to recorded or broadcast sound or video; and</li> <li>- primarily uses headphones or earphones that can be worn in or on or around the ears; and</li> <li>- allows the user to walk around while in use.</li> </ul> <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. The requirements in this sub-clause are valid for music or video mode only.</p>		N/A



	<p>The requirements do not apply:</p> <ul style="list-style-type: none"> <li>- while the personal music player is connected to an external amplifier; or</li> <li>- while the headphones or earphones are not used.</li> </ul> <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"> <li>- hearing aid equipment and professional equipment;</li> </ul> <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> <ul style="list-style-type: none"> <li>- 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.</li> </ul> <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>		
<p>Zx.2</p>	<p>Equipment Requirements - No safety provision is required for equipment that complies with the following:</p> <ul style="list-style-type: none"> <li>- equipment provided as a package (personal music player with its listening device), where the acoustic output LAeq,T is ≤ 85 dBA measured while playing the fixed “programme simulation noise” as described in EN 50332-1; and</li> <li>- 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.</li> </ul> <p>NOTE 1 Wherever the term acoustic output is used in this clause, the 30 s A-weighted equivalent sound pressure level LAeq,T is meant. See also Zx.5 and Annex Zx.</p> <p>All other equipment shall:</p>		<p>N/A</p>

	<p>a) protect the user from unintentional acoustic outputs exceeding those mentioned above; and</p> <p>b) 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</p> <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.</p> <p>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> <p>1) equipment provided as a package (player with its listening device), the acoustic output shall be <math>\leq 100</math> dBA measured while playing the fixed "programme simulation noise" described in EN 50332-1; and</p> <p>2) a personal music player provided with an analogue electrical output socket for a listening device, the electrical output shall be <math>\leq 150</math> mV measured as described in EN 50332-2, while playing the fixed "programme simulation noise" described in EN 50332-1. For music where the average sound pressure (long term LAeq,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 LAeq,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. For example, if the player is set with the programme simulation noise to 85 dBA, but the</p>		
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	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.		
Zx.3	<p>Warning - 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"> <li>- the symbol of Figure 1 (IEC 60417-6044) with a minimum height of 5 mm; and</li> <li>- the following wording, or similar: "To prevent possible hearing damage, do not listen at high volume levels for long periods."</li> </ul> <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
Zx.4.1	<p>Wired listening devices with analogue input With 94 dBA sound pressure output LAeq,T, the input voltage of the fixed "programme simulation noise" described in EN 50332-2 shall be <math>\geq 75</math> 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
Zx.4.2	<p>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 LAeq,T of the listening device shall be <math>\leq 100</math> 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</p>		N/A

	digital input is a USB headphone.		
Zx.4.3	<p>Wireless listening devices In wireless mode:</p> <ul style="list-style-type: none"> <li>- with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1; and</li> <li>- respecting the wireless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and</li> <li>- 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 LAeq,T of the listening device shall be <math>\leq 100</math> dBA.</li> </ul> <p>NOTE An example of a wireless listening device is a Bluetooth headphone.</p>		N/A
Zx.5	<p>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

**Ireland - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009**

4.3.6	<p>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.</p>		N/A
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**Israel - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009**

1.6.1	<p>Add Note: This clause is applicable subject to the Electricity Law, 1954, its regulations and revisions.</p>		Pass
1.7	<p>Add: Sub-clause 1.7.201 shall be added at the beginning of the clause.</p>		Pass

1.7.2.1	Add: All the instructions and warnings related to safety shall also be written in the Hebrew language.		Pass
1.7.201	<p>The marking in the Hebrew language shall be in accordance with the Consumer Protection Order (Marking of goods), 1983. In addition, the marking required by clause 1.7.1, the following details shall be marked in the Hebrew language. The details shall be marked on the apparatus or on its package, or on a label properly attached to the apparatus or on the package, by bonding or sewing, in a manner that the label cannot be easily removed.</p> <ol style="list-style-type: none"> <li>1) name of the apparatus and its commercial designation;</li> <li>2) Manufacturer's name and address. If the apparatus is imported, the importer's name and address;</li> <li>3) Manufacturer's registered trademark, if any;</li> <li>4) Name of the model and serial number, if any;</li> <li>5) country of manufacturer</li> </ol>	Letter of Assurance to be provided	Need More Information
2.9.4	<p>Add: Seven means of protection against electrocution are permitted according to the Electricity Law, 1954, and the Electricity Regulations (Earthing and means of protection against electricity of voltages up to 1,000V) 1991. The seven are</p> <ol style="list-style-type: none"> <li>1) TN-S or TN-C-S</li> <li>2) TT</li> <li>3) IT</li> <li>4) Isolated Transformer</li> <li>5) Safety extra low voltage (SELV or ELV)</li> <li>6) Residual current circuit breaker (30 ma = 1delta)</li> <li>7) reinforced insulation; double insulation (Class II)</li> </ol>		Pass
2.201	Add: Prior to carrying out the tests in accordance with the clauses of this Standard, the compliance of the apparatus with the relevant requirements specified in the appropriate part of the standard series SI 961, shall be checked. The apparatus shall meet the requirements in the appropriate part of the standard series SI 961. If there are components of the apparatus for the prevention of electromagnetic interference, these components shall not reduce the safety level of the apparatus as required by this standard.		N/A
3.2.1.1	Add after the note: The feed plug shall comply with		Pass

	the requirements of Israel Standard SI 32 Part 1.1.		
3.2.1.2	Add: At the end of the first paragraph add the following note: At the time of issue of the standard, there is no Israel Standard for connection accessories to d.c.		N/A

<b>Korea - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009</b>			
1.5.101	Plugs for the connection of the apparatus to the mains supply shall comply with the Korean requirement (KSC 8305)		Pass
8	EMC - The apparatus shall comply with the relevant CISPR standards	Assurance See Letter of	Pass

<b>Norway - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009</b>			
1.2.13.14	Requirements according to this annex 1.7.2.1 and 7.3 apply.		N/A
1.5.7.1	Resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.2. 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	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).	Evaluated during a separate power supply investigation.	N/A
1.5.9.4	The third dashed sentence is applicable only to equipment as defined in 6.1.2.2 of this annex.		N/A
1.7.2.1	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. The marking text shall be: "Apparatet må tilkoples jordet stikkontakt"		N/A

1.7.2.1	<p>In Norway, 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. 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: "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> <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): "Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplest utstyr - og er tilkoplest 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>		N/A
2.2.4	Requirements according to this annex, 1.7.2.1, 6.1.2.1 and 6.1.2.2 apply.		N/A
2.3.2	Requirements according to this annex, 6.1.2.1 and 6.1.2.2 apply.		N/A
2.3.4	Requirements according to this annex, 1.7.2.1, 6.1.2.1 and 6.1.2.2 apply.		N/A
2.10.5.13			N/A

	Requirements according to this annex, 6.1.2.1 and 6.1.2.2 apply.		
5.1.7.1	<p>TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s are permitted only for the following equipment:</p> <ul style="list-style-type: none"> <li>- STATIONARY PLUGGABLE EQUIPMENT TYPE A that: <ul style="list-style-type: none"> <li>(1) is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and</li> <li>(2) has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and</li> <li>(3) is provided with instructions for the installation of that conductor by a SERVICE PERSON;</li> </ul> </li> <li>- STATIONARY PLUGGABLE EQUIPMENT TYPE B</li> <li>- STATIONARY PERMANENTLY CONNECTED EQUIPMENT</li> </ul>		N/A
6.1.2.1	<p>Add the following text between the first and second paragraph of the compliance clause: 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"> <li>- two layers of thin sheet material, each of which shall pass the electric strength test below, or</li> <li>- one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.</li> </ul> <p>Alternatively for components, there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> <li>- 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</li> <li>- is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV.</li> </ul> <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 132400:1994,</p>		N/A



	<p>subclass Y2.</p> <p>A capacitor classified Y3 according to EN 123400 [EN 60384-14:2005], may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> <li>- the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400 [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;</li> <li>- the additional testing shall be performed on all the test specimens as described in EN 132400 [EN 60384-14];</li> <li>- the impulse test of 2,5 kV is to be performed before the endurance test in EN 132400 [EN 60384-14], in the sequence of tests as described in EN 132400 [EN 60384-14.]</li> </ul>		
6.1.2.2	<p>The exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT and 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>Requirements according to this annex, 6.1.2.1 and 6.1.2.2 apply with the term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.</p>		N/A
7.3	<p>Refer to EN 60728-11:2005 for installation conditions</p>		N/A
7.3	<p>Requirements according to this annex 1.2.13.14 and 1.7.2.1 apply.</p>		N/A

<b>Spain - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009</b>			
3.2.1.1	<p>Supply cords of single-phase equipment having a rated current not exceeding 10A shall be provided with a plug according to UNE 20315:1994. Supply cords of single-phase equipment having a rated current not exceeding 2.5A shall be provided with a plug according to UNE-EN 50075:1993. CLASS 1 EQUIPMENT provided with socket-outlets with</p>		Pass

	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. If poly-phase equipment is provided with a supply cord with a plug, this plug shall be in accordance with UNE-EN 60309-2.		
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<b>Sweden - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009</b>			
1.2.13.14	Requirements according to this annex 1.7.2.1 and 7.3 apply.		N/A
1.5.7.1	Resistors bridging BASIC INSULATION in CLASS I PLUGGABLE EQUIPMENT TYPE A must comply with the requirements in 1.5.7.2. In addition when a single resistor is used, the resistor must withstand the resistor test in 1.5.7.2.		N/A
1.5.9.4	The third dashed sentence is applicable only to equipment as defined by this annex, 6.1.2.2		N/A
1.7.2.1	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. The marking text shall be: "Apparaten skall anslutas till jordat uttag"		N/A
1.7.2.1	In 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. 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. 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: "Equipment connected to the protective earthing of the building installation through the mains		N/A

	<p>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> <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 Swedish: "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>		
2.3.2	Requirements according to this annex, 6.1.2.1 and 6.1.2.2 apply.		N/A
2.10.5.13	Requirements according to this annex, 6.1.2.1 and 6.1.2.2 apply.		N/A
5.1.7.1	<p>TOUCH CURRENT measurement results exceeding 3,5 mA r.m.s are permitted only for the following equipment:</p> <p>STATIONARY PLUGGABLE EQUIPMENT TYPE A that:</p> <p>(1) is intended to be used in a RESTRICTED ACCESS LOCATION where equipotential bonding has been applied, for example, in a telecommunication centre; and</p> <p>(2) has provision for a permanently connected PROTECTIVE EARTHING CONDUCTOR; and</p> <p>(3) is provided with instructions for the installation of that conductor by a SERVICE PERSON;</p> <p>- STATIONARY PLUGGABLE TYPE B</p> <p>- STATIONARY PERMANENTLY CONNECTED EQUIPMENT</p>		N/A
6.1.2.1	<p>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> <p>- two layers of thin sheet material, each of which</p>		N/A

	<p>shall pass the electric strength test below, or</p> <ul style="list-style-type: none"> <li>- one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.</li> </ul> <p>Alternatively for components, there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that CLEARANCES and CREEPAGE DISTANCES do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition</p> <ul style="list-style-type: none"> <li>- 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</li> <li>- is subject to ROUTINE TESTING for electric strength during manufacturing, using a test voltage of 1,5 kV.</li> </ul> <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 132400:1994, subclass Y2.</p> <p>A capacitor classified Y3 according to EN 132400 [EN 60384-14:2005], may bridge this insulation under the following conditions:</p> <ul style="list-style-type: none"> <li>- the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 132400 [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;</li> <li>- the additional testing shall be performed on all the test specimens as described in EN 132400 [EN 60384-14];</li> <li>- the impulse test of 2,5 kV is to be performed before the endurance test in EN 132400 [EN 60384-14], in the sequence of tests as described in EN 132400 [EN 60384-14.]</li> </ul>		
6.1.2.2	<p>The exclusions are applicable for PERMANENTLY CONNECTED EQUIPMENT and 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	Requirements according to this annex, 6.1.2.1 and 6.1.2.2 apply with the term TELECOMMUNICATION NETWORK in 6.1.2 being replaced by the term CABLE DISTRIBUTION SYSTEM.		N/A
7.3	Requirements according to this annex 1.2.13.14 and 1.7.2.1 apply.		N/A

<b>Switzerland - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009</b>																					
3.2.1.1	<p>Supply cords of equipment having a RATED CURRENT not exceeding 10A shall be provided with a plug complying with SEV 1011 or IEC 60884-1 and one of the following dimension sheets:</p> <table border="0"> <tr> <td>SEV 6532-2 1991</td> <td>Plug Type 15</td> <td>3P+N+PE</td> </tr> <tr> <td>SEV 6533-2 1991</td> <td>Plug Type 11</td> <td>L+N</td> </tr> <tr> <td>SEV 6534-2 1991</td> <td>Plug Type 12</td> <td>L+N+PE</td> </tr> </table> <p>In general, EN 60309 applies for plugs for currents exceeding 10A. However, a 16A 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> <table border="0"> <tr> <td>SEV 5932-2 1998:</td> <td>Plug Type 25</td> <td>3L+N+PE</td> </tr> <tr> <td>SEV 5933-2 1998:</td> <td>Plug Type 21</td> <td>L+N</td> </tr> <tr> <td>SEV 5934-2 1998:</td> <td>Plug Type 23</td> <td>L+N+PE</td> </tr> </table>	SEV 6532-2 1991	Plug Type 15	3P+N+PE	SEV 6533-2 1991	Plug Type 11	L+N	SEV 6534-2 1991	Plug Type 12	L+N+PE	SEV 5932-2 1998:	Plug Type 25	3L+N+PE	SEV 5933-2 1998:	Plug Type 21	L+N	SEV 5934-2 1998:	Plug Type 23	L+N+PE		Pass
SEV 6532-2 1991	Plug Type 15	3P+N+PE																			
SEV 6533-2 1991	Plug Type 11	L+N																			
SEV 6534-2 1991	Plug Type 12	L+N+PE																			
SEV 5932-2 1998:	Plug Type 25	3L+N+PE																			
SEV 5933-2 1998:	Plug Type 21	L+N																			
SEV 5934-2 1998:	Plug Type 23	L+N+PE																			
3.2.4	Requirements according to this annex 3.2.1.1 apply.		Pass																		

<b>USA / Canada - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009</b>			
1.1	Equipment able to be installed in accordance with the National Electrical Code ANSI/NFPA 70 and the Canadian Electrical Code, Part1, and when applicable, the National Electrical Safety Code, IEEE C2.		Pass
1.1.1	Equipment able to be installed in accordance with ANSI/NFPA 75 and NEC Art. 645 unless intended for use outside of computer room and provided with such instructions.		N/A
1.1.2	Equipment in wire-line communication facilities serving high-voltage electric power stations		N/A

	operating at greater than 1kV are excluded.		
1.1.2	Special requirements apply to equipment intended for use outdoors.		N/A
1.4.14	For PLUGGABLE EQUIPMENT TYPE A, the protection in the installation is assumed to be 20 A.		Pass
1.5.1	All IEC standards for components identified in Annex P.1 replaced by the relevant requirements of CSA and UL component standards in Annex P.1.		Pass
1.5.1	All IEC standards for components identified in Annex P.2 alternatively satisfied by the relevant requirements of CSA and UL component standards in Annex P.2.		Pass
1.5.5	Interconnecting cables acceptable for the application regarding voltage, current, temperature, flammability, mechanical serviceability and the like.		N/A
1.5.5	For other than limited power and TNV circuits, the type of output circuit identified for output connector.		N/A
1.5.5	External cable assemblies that exceed 3.05 m in length to be types specified in the NEC and CEC.		N/A
1.5.5	Detachable external interconnecting cables 3.05 m or less in length and provided with equipment marked to identify the responsible organization and the designation for the cable.		N/A
1.5.5	Building wiring and cable for use in ducts, plenums and other air handling space subject to special requirements and excluded from scope.		N/A
1.5.5	Telephone line and extension cords and the like comply with UL 1863 and CSA C22.2 No. 233.		N/A
1.6.1.2	Equipment intended for connection to a d.c. power (mains) distribution system is subject to special		N/A

	circuit classification requirements (e.g., TNV-2)		
1.6.1.2	Earthing of d.c. powered equipment provided.		N/A
1.7	Lamp replacement information indicated on lampholder in operator access area.		N/A
1.7.1	Special marking format for equipment intended for use on a supply system with an earthed neutral and more than one phase conductor.		N/A
1.7.1	Equipment voltage rating not higher than rating of the plug except under special conditions.		Pass
1.7.6	Special fuse replacement marking for operator accessible fuses.		N/A
1.7.7	Identification of terminal connection of the equipment earthing conductor.		N/A
1.7.7	Connectors and field wiring terminals for external Class 2 or Class 3 circuits provided with marking indicating minimum Class of wiring to be used.		N/A
1.7.7	Marking located adjacent to terminals and visible during wiring.		N/A
2.1.1.1	Bare TNV conductive parts in the interior of equipment normally protected against contact by a cover intended for occasional removal are exempt provided instructions include directions for disconnection of TNV prior to removal of the cover.		N/A
2.3.1.b	Other telecommunication signaling systems (e.g., message waiting) than described in 2.3.1(b) are subject to M.4.		N/A
2.3.1.b	For TNV-2 and TNV-3 circuits with other than ringing signals and with voltages exceeding 42.4 Vp or 60 V d.c., the maximum current limit through a 2000 Ohm or greater resistor with loads		N/A

	disconnected is 7.1 mA peak or 30 mA d.c. under normal conditions.		
2.3.1.b	Limits for measurements across 5000 ohm resistor in the event of a single fault are replaced after 200 ms with the limits of M.3.1.4.		N/A
2.3.2.1	In the event of a single fault, the limits of 2.2.3 apply to SELV circuits and accessible conductive parts.		N/A
2.3.2.4	Enamel coating on signal transformer winding wire allowed as an alternative to Basic insulation in specific telecommunication applications when subjected to special construction requirements and routine testing.		N/A
2.5	Overcurrent protection device required for Class 2 and Class 3 limiting in accordance with the NEC, or for a Limited Power Source, not interchangeable with devices of higher ratings if operator replaceable.		N/A
2.6	Equipment having receptacles for output a.c. power connectors generated from an internal separately derived source have the earthed (grounded) circuit conductor suitably bonded to earth.		Pass
2.6.3.3	For PLUGGABLE EQUIPMENT TYPE A, if a) b) or c) are not applicable, the current rating of the circuit is taken as 20 A		Pass
2.6.3.3	The first column on Table 2D requirement: "Smaller of the RATED CURRENT of the equipment or the PROTECTIVE CURRENT RATING of the circuit under consideration."		Pass
2.6.3.4	Capacity of connection between earthing terminal and parts required to be earthed subject to special conditions based on the current rating of the circuit.		N/A
2.6.3.4	Protective bonding conductors and their terminals of non-standard constructions (e.g. PWB traces) evaluated to limited short-circuit test of CSA C22.2		N/A



	No.0.4.		
2.6.4.1	Field wiring terminals for earthing conductors suitable for wire sizes (gauge) used in US and Canada.		N/A
2.7.1	Data for selection of special external branch circuit overcurrent devices marked on the equipment.	Pluggable A	N/A
2.7.1	Standard supply outlets protected by overcurrent device in accordance with the NEC, and CEC, Part 1.		Pass
2.7.1	Overcurrent protection for individual transformers that distribute power to other units over branch circuit wiring.		N/A
2.7.1	Additional requirements for overcurrent protection apply to equipment provided with panelboards.		N/A
2.7.1	Non-motor-operated equipment requiring special overcurrent protective device marked with device rating.		N/A
2.10.5.12	Multi-layer winding wire subject to UL component wire requirements in addition to 2.10.5.12 and Annex U.		N/A
3.1.1	Permissible combinations of internal wiring/external cable sizes for overcurrent and short circuit protection.		Pass
3.1.1	All interconnecting cables protected against overcurrent and short circuit.		N/A
3.2	Wiring methods permit connection of equipment to primary power supply in accordance with the NEC and CEC, Part 1.		Pass
3.2.1	Permitted use for flexible cords and plugs.		Pass

3.2.1	Flexible cords provided with attachment plug rated 125% of equipment current rating.		Pass
3.2.1	Any Class II equipment provided with 15 or 20 A standard supply outlets, Edison-base lampholders or single pole disconnect device provided with a polarized type attachment plug.		N/A
3.2.1.2	Equipment intended for connection to DC mains supply power systems complies with special wiring requirements (e.g., no permanent connection to supply by flexible cord).		N/A
3.2.1.2	Equipment with one pole of the DC mains supply connected to both the equipment mains input terminal and the main protective earthing terminal provided with special instructions and construction provisions for earthing.		N/A
3.2.1.2	Equipment with means for connecting supply to earthing electrode conductor has no switches or protective devices between supply connection and earthing electrode connection.		N/A
3.2.1.2	Special markings and instructions for equipment with provisions to connect earthed conductor of a DC supply circuit to earthing conductor at the equipment.		N/A
3.2.1.2	Special markings and instructions for equipment with earthed conductor of a DC supply circuit connected to the earthing conductor at the equipment.		N/A
3.2.1.2	Terminals and leads provided for permanent connection of DC powered equipment to supply marked to indicate polarity if reverse polarity may result in a hazard.		N/A
3.2.3	Permanently connected equipment has provision for connecting and securing a field wiring system (i.e. conduit, or leads etc.) per the NEC and CEC, Part 1.		N/A

3.2.3	Permanently connected equipment may have terminals or leads not smaller than No. 18 AWG (0.82 mm <sup>2</sup> ) and not less than 150 mm in length for connection of field installed wiring.		N/A
3.2.3	If supply wires exceed 60 °C, marking indicates use of 75 °C or 90 °C wiring for supply connection as appropriate.		N/A
3.2.3	Equipment compatible with suitable trade sizes of conduits and cables.		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.		Pass
3.2.5	Conductors in power supply cords sized according to NEC and CEC, Part I.		Pass
3.2.5	Power supply cords and cord sets incorporate flexible cords suitable for the particular application.		Pass
3.2.6	Strain relief provided for non-detachable interconnecting cables not supplied by a limited power source.		N/A
3.2.9	Adequate wire bending space and volume of field wiring compartment required to properly make the field connections.		N/A
3.2.9	Equipment intended solely for installation in Restricted Access Locations using low voltage d.c. systems may not need provision for connecting and securing a field wiring system. A method of securing wiring or instructions provided to ensure the wiring is protected from abuse.		N/A

3.3	Field wiring terminals provided for interconnection of units for other than LPS or Class 2 circuits also comply with 3.3.		N/A
3.3	Interconnection of units by LPS or Class 2 conductors may have field wiring connectors other than those specified in 3.3 if wiring is reliably separated.		N/A
3.3.1	Terminals for the connection of neutral conductor identified by a distinctive white marking or other equally effective means.		N/A
3.3.3	Wire binding screw terminal permitted for connection of No. 10 AWG (5.3 mm <sup>2</sup> ) or smaller conductor if provided with upturned lugs, cupped washer or equivalent retention.		N/A
3.3.4	Terminals accept wire sizes (gauge) used in the U.S. and Canada.		N/A
3.3.4	Terminals accept current-carrying conductors rated 125% of the equipment current rating.		N/A
3.3.5	First column of Table 3E requirement: "Smaller of the RATED CURRENT of the equipment or the PROTECTIVE CURRENT RATING of the circuit under consideration."		N/A
3.3.6	Field wiring terminals marked to indicate the material(s) of the conductor appropriate for the terminals used.		N/A
3.3.6	Connection of an aluminum conductor not permitted to terminal for equipment earthing conductor.		N/A
3.3.6	Field wiring connections made through the use of suitable pressure connectors (including set screw type), solder lugs or splices to flexible leads.		N/A

3.4.2	Separate motor control device(s) required for cord-connected equipment rated more than 12 A, or with motor rated more than 1/3 hp or more than 120 V.		N/A
3.4.8	Vertically mounted disconnect devices oriented so up position of handle is "on".		N/A
3.4.11	For computer-room applications, equipment with battery systems capable of supplying 750 VA for 5 min require battery disconnect means.		N/A
4.2.8.1	Special opening restrictions for enclosures around CRTs with face dimension of 160 mm or more.		N/A
4.2.9	Compartment housing high-pressure lamp marked to indicate risk of explosion.		N/A
4.2.11	For equipment intended for mounting on racks and provided with slide/rails allowing the equipment to slide away from the rack for installation, service and maintenance, additional construction, performance and marking requirements are applicable to determine the adequacy of the slide/rails.		N/A
4.3.2	Loading test for equipment with handle(s) used to support more than 9 kg tested at four times the weight of the unit.		N/A
4.3.6	In addition to the IEC requirements, Direct Plug-in Equipment complies with UL 1310 or CSA 223 mechanical assembly requirements.		N/A
4.3.12	The maximum quantity of flammable liquid stored in equipment complies with ANSI/NFPA 30(Table NAE.6).		N/A
4.3.12	Equipment using replenishable liquids marked to indicate type of liquid to be used.		N/A
4.3.13.2	Equipment that produces x-radiation and does not		N/A

	comply with 4.3.12 under all conditions of servicing marked to indicate the presence of radiation where readily visible.		
4.3.13.5	Requirements contained in the applicable national codes and regulations apply to lasers (21 CFR 1040 and REDR C1370).		N/A
4.7	Automated information storage equipment intended to contain more than 0.76 m <sup>3</sup> of combustible media requires provision for automatic sprinklers or a gaseous agent extinguishing system.		N/A
4.7.3.1	Equipment for use in environmental air space other than ducts or plenums provided with metal enclosure or with non-metallic enclosure having adequate fire-resistance and low smoke producing characteristics. Low smoke-producing characteristics evaluated according to UL 2043. Equipment for installation in space used for environmental air as described in Sec. 300-22(c) of the NEC provided with instructions indicating suitability for installation in such locations.		N/A
4.7.3.1	Flame spread rating for external surface of combustible material with exposed area greater than 0.93 m <sup>2</sup> or a single dimension greater than 1.8 m; 50 or less for computer room applications or 200 or less for other applications.		N/A
4.7.3.4	Wire marked "VW-1" or "FT-1" considered equivalent.		Pass
5.1.8.2	Special earthing provisions and instructions for equipment with high touch current due to telecommunication network connections.		N/A
5.1.8.3	Touch current due to ringing voltage for equipment containing telecommunication network leads.		N/A
5.3.7	Overloading of SELV connectors and printed wiring board receptacles accessible to the operator.		Pass
5.3.7	Tests interrupted by opening of a component		N/A

	repeated two additional times.		
5.3.9.1	Test interrupted by opening of wire or trace subject to certain conditions.		N/A
6	Specialized instructions provided for telephones that may be connected to a telecommunications network.		N/A
6	Marking identifying function of telecommunication type connectors not used for connection to a telecommunication network.		N/A
6.3	Equipment remotely powered over telecommunication wiring systems provided with specialized markings adjacent to the connection.		N/A
6.3	Overcurrent protection incorporated into equipment to provide power over telecommunication wiring system not interchangeable with devices of higher ratings if operator replaceable.		N/A
6.4	Additional requirements for equipment intended for connection to a telecommunication network using cable subject to overvoltage from power line failures (Fig. 6C).		N/A
6.4	Where 26 AWG line cord required by Fig. 6C, either the cord is provided with the equipment or described in the safety instructions.		N/A
7	Equipment associated with the cable distribution system may need to be subjected to applicable parts of Chapter 8 of the NEC.	circuits	No Cable N/A
H	Ionizing radiation measurements made under single fault conditions in accordance with the requirements of the Code of Federal Regulations 21 CFR 1020 and the Canadian Radiation Emitting Devices Act, REDR C1370.		N/A
M.2	Continuous ringing signals evaluated to Method A		N/A

	subjected to special accessibility considerations.		
M.4	Special requirements for message waiting and similar telecommunications signals.		N/A
NAC	Equipment intended for use with a generic secondary protector marked with suitable instructions.		N/A
NAC	Equipment intended for use with a specific primary or secondary protector marked with suitable instructions.		N/A
NAD	Acoustic pressure from an ear piece less than 140 dBA for short duration disturbances, and less than 125 dBA for handsets, 118 dBA for headsets and insert earphones, for long duration disturbances.		N/A
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
EE.5	UL articulated accessibility probe (Fig. EE.3) required for assessing accessibility to document/media shredders, instead of Figure 2A test finger.		N/A

<b>United Kingdom - Differences to IEC 60950-1:2005 (2nd Edition); Am 1:2009</b>			
2.6.3.3	The current rating of the circuit shall be taken as 13 A, not 16 A.		Pass
2.7.1	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.		N/A
3.2.1.1			Pass

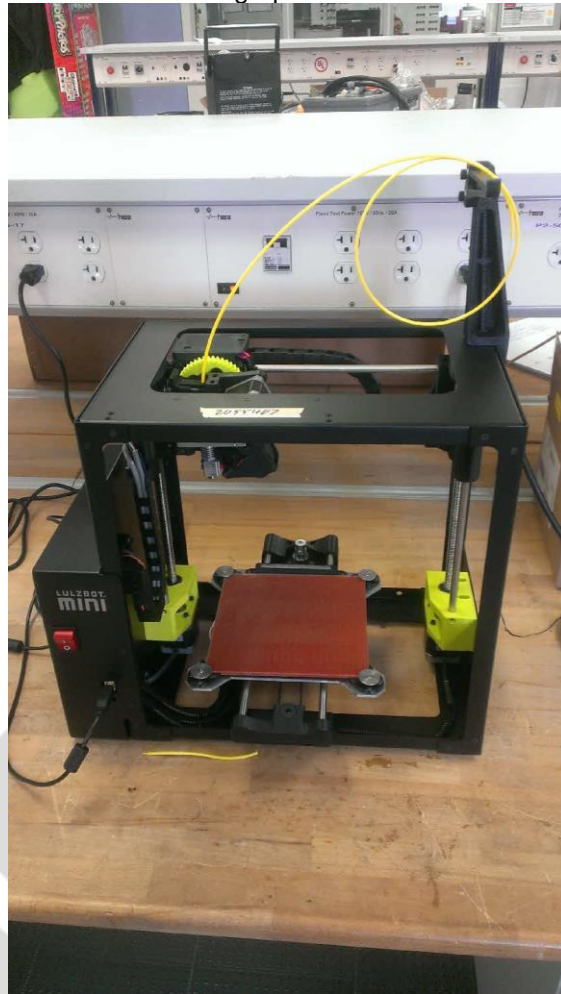


	<p>Apparatus which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord and plug, shall be fitted with a "standard plug" in accordance with Statutory Instrument 1786: 1994 - The Plugs and Sockets etc. (Safety) Regulations 1994, unless exempted by those regulations.</p> <p>NOTE: "Standard plug" is defined in SI 1786: 1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.</p>		
3.2.5.1	A power supply cord with conductor of 1.25 mm <sup>2</sup> is allowed for equipment with a rated current over 10A and up to and including 13A.		N/A
3.3.4	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 <sup>2</sup> to 1.5 mm <sup>2</sup> nominal cross-sectional area.		N/A
4.3.6	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

## Enclosures

<u>Type</u>	<u>Supplement Id</u>	<u>Description</u>
Photographs	3-01	Mini Printer
Photographs	3-02	Mini Printer
Photographs	3-03	USB board
Photographs	3-04	Internal View
Photographs	3-05	Fan
Photographs	3-06	Motor
Diagrams	4-01	Stepper Motor
Schematics + PWB	5-01	USB Board Schematics

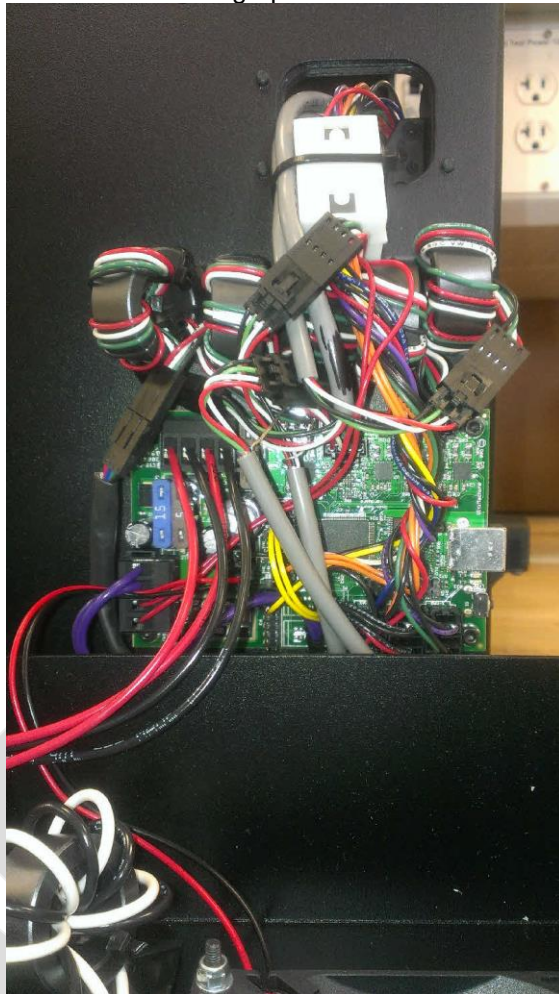
Photographs ID 3-01



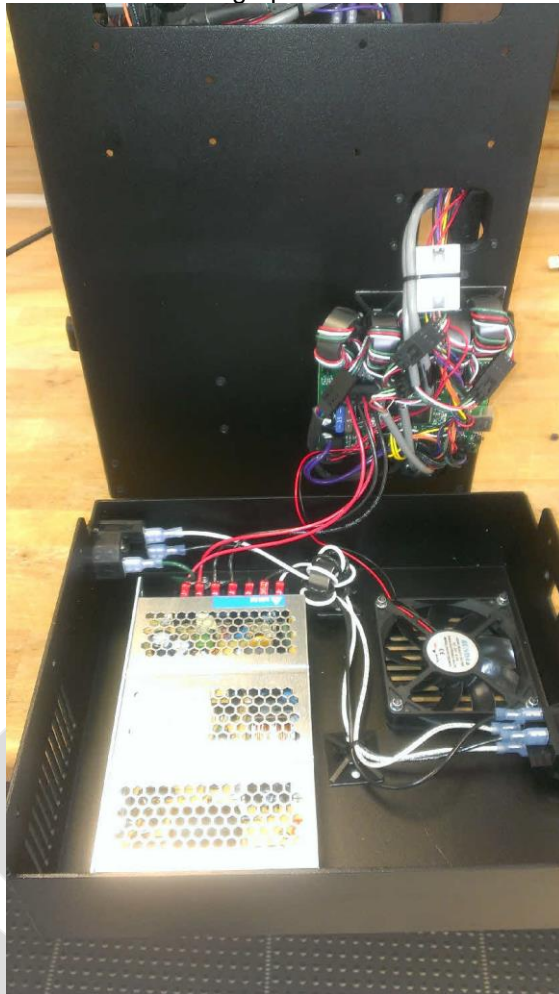
Photographs ID 3-02



Photographs ID 3-03



Photographs ID 3-04



Photographs ID 3-05



Photographs ID 3-06





Diagrams ID 4-01

### HIGH TORQUE HYBRID STEPPING MOTOR SPECIFICATIONS

General specifications		Electrical specifications	
Step Angle (°)	1.8	Rated Voltage (V)	2.8
Temperature Rise (°C)	80 Max (rated current, 2 phase on)	Rated Current (A)	1.5
Ambient Temperature (°C)	-20~+50	Resistance Per Phase ( $\pm 10\%$ Ω)	2.8(25°C)
Number of Phase	2	Inductance Per Phase ( $\pm 20\%$ mH)	4.8
Insulation Resistance (MΩ)	100 Min (500VDC)	Holding Torque (N.cm)	55
Insulation Class	Class B	Detent Torque (N.cm)	2
Max.radial force (N)	28 (20mm from the flange)	Rotor Torque (N.cm)	68
Max.axial force (N)	10		

- Pull out torque curve :  
VOLTAGE: 30VAC, CONSTANT CURRENT: 1.5A, HALF STEP

- Wiring Diagram :

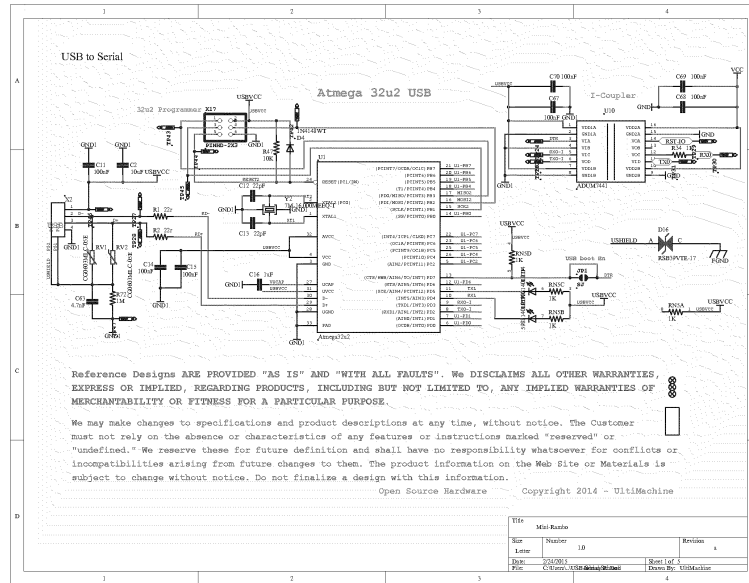
  

- Dimensions:  
(unit=mm)

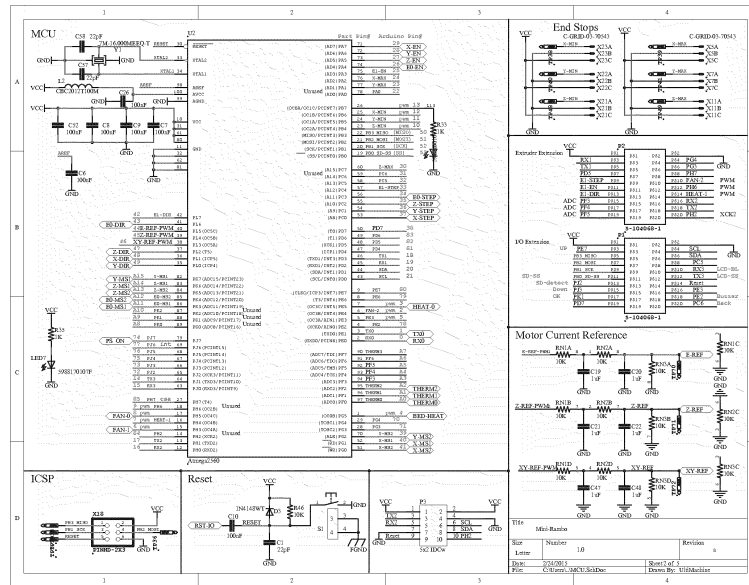
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CHECK					NEW TECHNIC INSTITUTE 060047067
APPROVE					

### Schematics + PWB ID 5-01

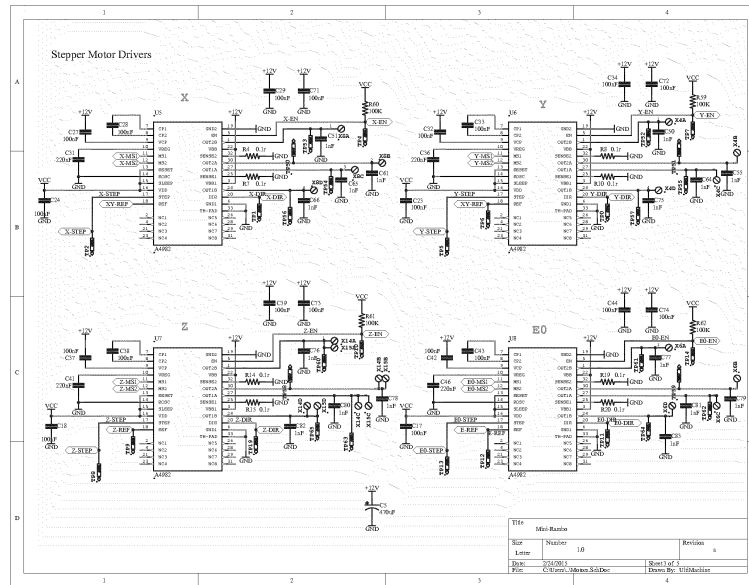


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### Schematics + PWB ID 5-01

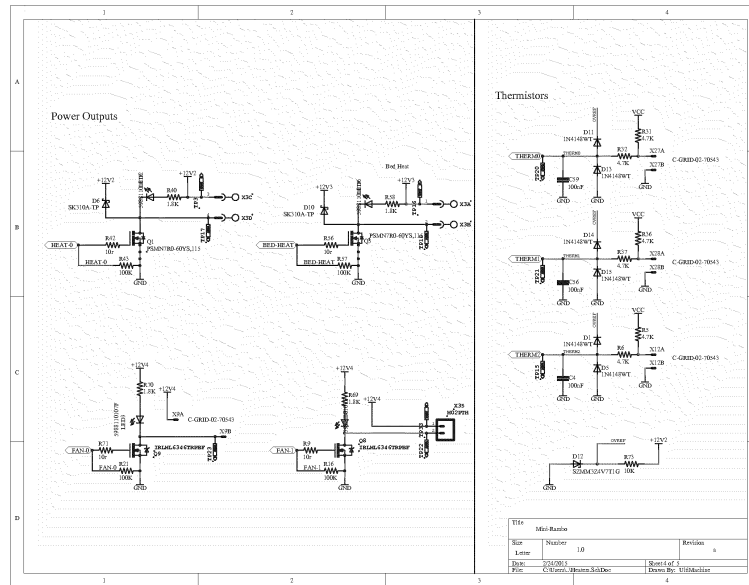


Schematics + PWB ID 5-01



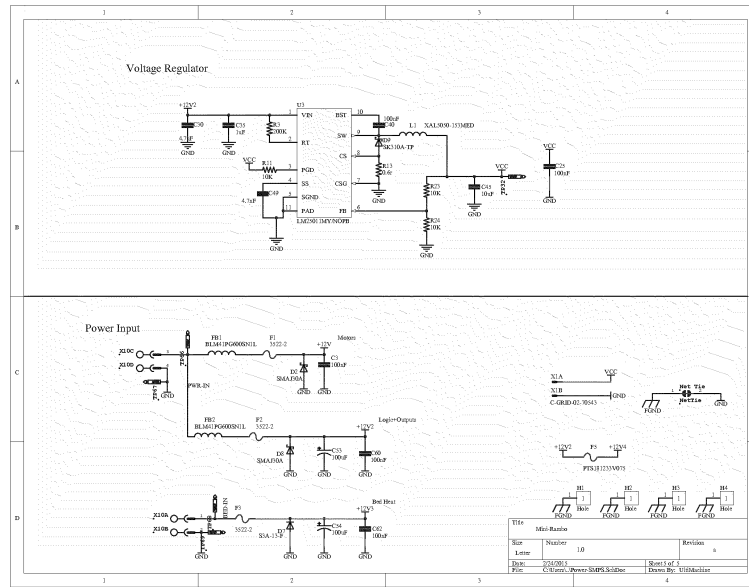
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### Schematics + PWB ID 5-01



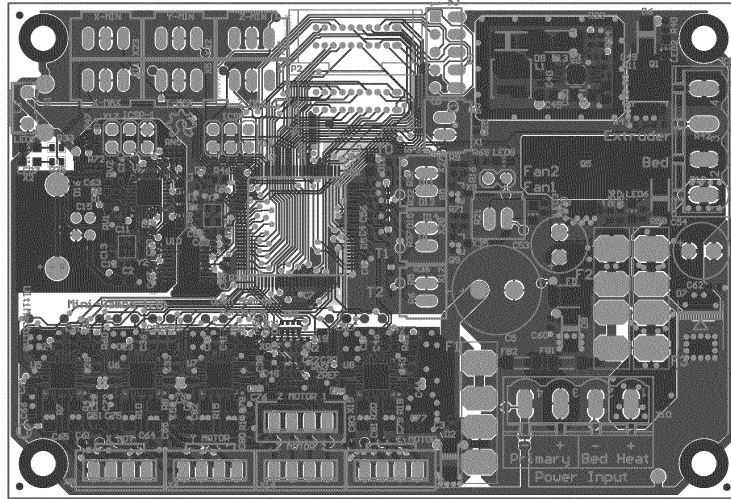
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### Schematics + PWB ID 5-01



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Schematics + PWB ID 5-01



### Schematics + PWB ID 5-01

Part Name	Manufacturer	Part Number	Quantity	Notes
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U101	MAXIM	MAX9845A	1	
U102	MAXIM	MAX9845A	1	
U103	MAXIM	MAX9845A	1	
U104	MAXIM	MAX9845A	1	
U105	MAXIM	MAX9845A	1	
U106	MAXIM	MAX9845A	1	
U107	MAXIM	MAX9845A	1	
U108	MAXIM	MAX9845A	1	
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U199	MAXIM	MAX9845A	1	
U200	MAXIM	MAX9845A	1	

