1.0 Reference and Address			
Report Number	103838525LAX-001	Original Issued: 28-Mar-2019	Revised: None
Standard(s)	UL 60950-1 Information Technology Equipment Safety Part 1: General Requirements >Valid without technical revision: 01Jan2022< [UL 60950-1:2007 Ed.2 +R:14Oct2014] CSA C22.2 # 60950-1 Information Technology Equipment Safety Part 1: General Requirements (R2016) >Valid without technical revision: 01Jan2022< [CSA C22.2#60950-1:2007 Ed.2+A1;A2]		

Applicant	Aleph Objects Inc.	Manufacturer	**Aleph Objects Inc.**
Address	626 W 66th St, Loveland, CO 80538	Address	626 W 66th St, Loveland, CO 80538
Country	USA	Country	USA
Contact	Dani Giroux	Contact	Dani Giroux
Phone	970-377-1111	Phone	970-377-1111
FAX	N/A	FAX	N/A
Email	intertek@alephobjects.com	Email	intertek@alephobjects.com

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2.0 Product Description	
Product	3D Printer
Brand name	Lulzbot
Description	Product covered under this report is 3D printer, intended for indoor use only. Unit is provided with appliance inlet for the AC mains connection.
Models	TAZ Pro
Model Similarity	NA
Ratings	100-240V, 7A, 50-60Hz
Other Ratings	NA

3.0 Product Photographs

Photo 1 - External front view of model

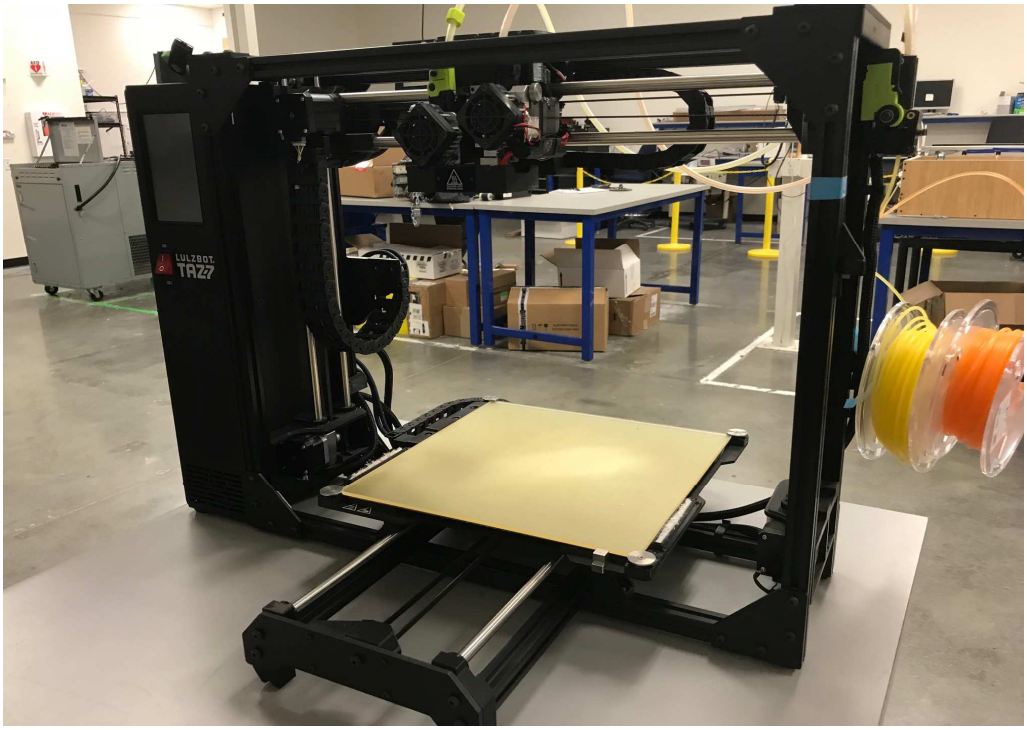
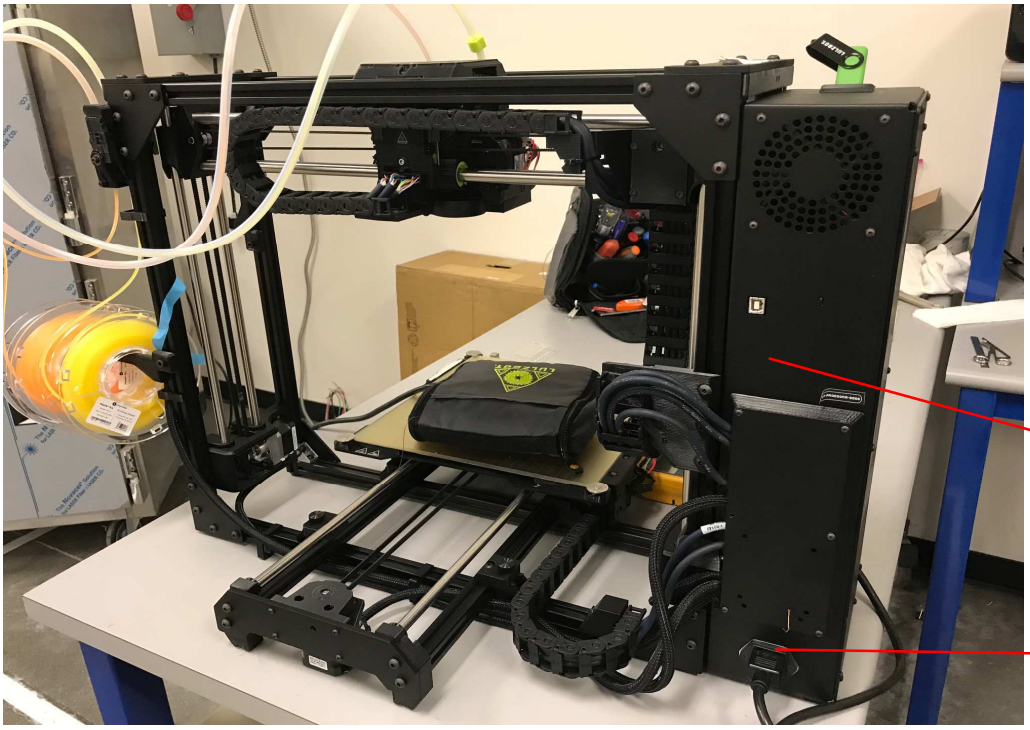
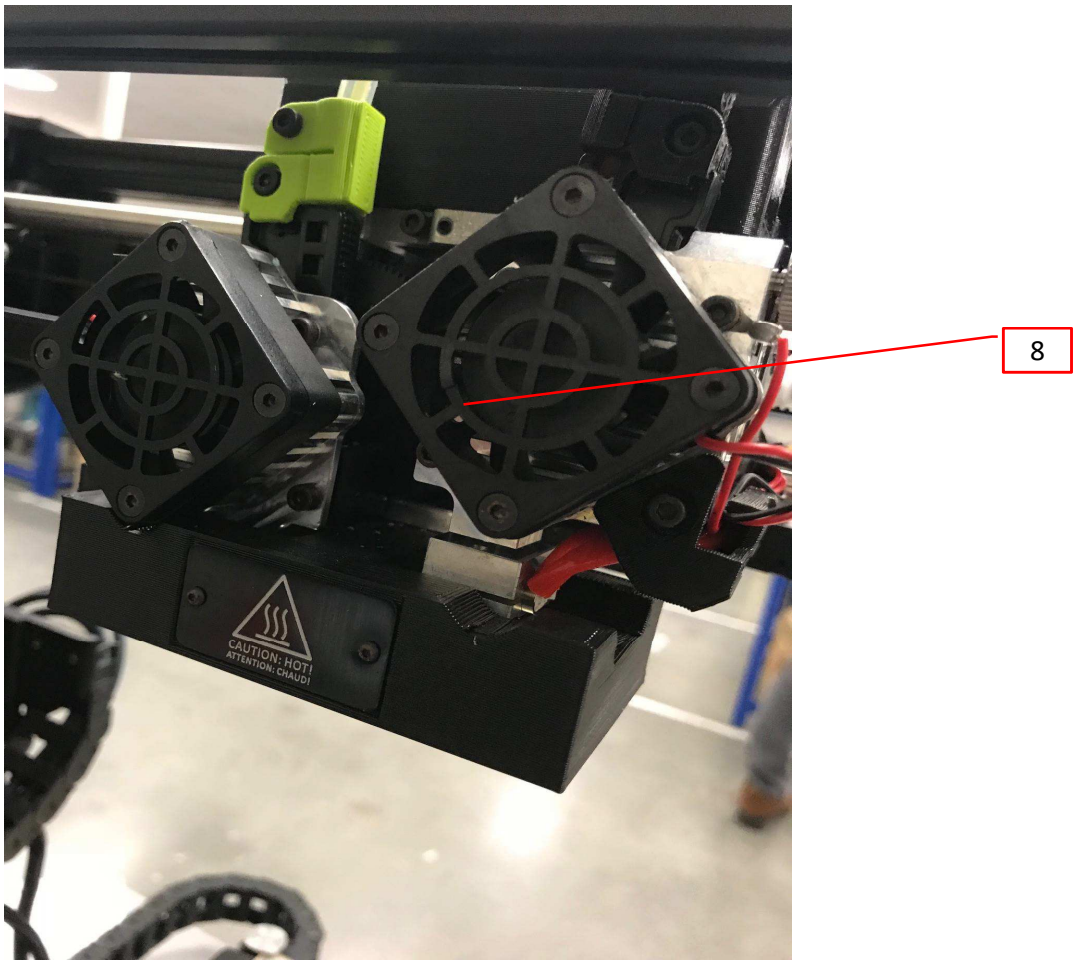


Photo 2 - External view of model



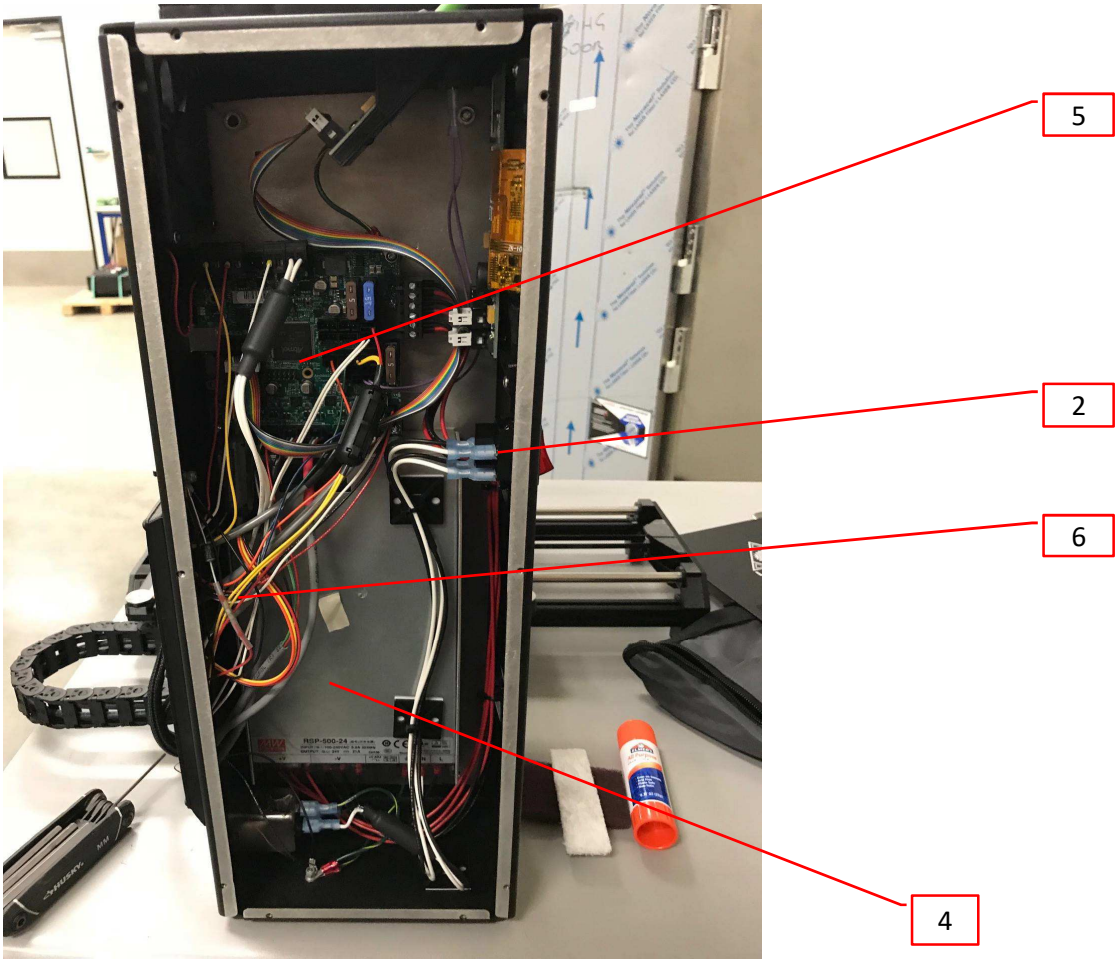
3.0 Product Photographs

Photo 3 - Internal view



3.0 Product Photographs

Photo 4 - Internal view of electrical enclosure



4.0 Critical Components						
Photo #	Item no.[1]	Name	Manufacturer/ trademark[2]	Type / model[2]	Technical data and securement means	Mark(s) of conformity [3]
2	1	Electrical Enclosure	Various	Various	Powder coated steel. Overall approximate dimensions are (140mm W X 480mm H X 170mm D), minimum thickness is 1 mm.	NR
4	2	On/Off Switch	e-switch	R5BBLKREDFF 2	10A @250V, 15A @ 125V. Operating temperature -20°C to 55°C	cURus
2	3	Appliance Inlet	Schaffner	FN 9260	10A max, 250V	UR, CSA
4	4	Power Supply	Mean Well	RSP-500-24	Input: 100-240Vac, 50-60Hz, 5.9A Output: 24Vdc, 21A	cURus
4	5	Main PCB	Various	Various	Flammability rating is V-0. minimum thickness 1 mm	cURus
4	6	Internal wires	Various	Various	minimum 18 AWG, 300V, 80°C	cULus
2	7	Cooling fan (Not Shown)	PTI Pelonis	C8015L24BPLP 1b-7	24Vdc, 0.049A, 1.17W, 2400 RPM, 24.45 CFM	cURus
3	8	Extruder DC fan	PTI Pelonis	C4010L05BPLB 1b-7	5 Vdc, 0.078A, 0.39W, 4400 RPM, 3.87 CFM. Located in the center to cool down the print	cURus
3	9	Extruder DC fan (Not Shown)	PTI Pelonis	RB5015	12Vdc, 0.14A, 4.4CFM max	cURus
2	10	LCD PWB (Not Shown)	Various	Various	Flammability rating is V-0. minimum thickness 1 mm	cURus
2	11	Thermistor (Not Shown)	Honeywell	135-104LAG-J01	Operating temperature -60°C to 300°C. Resistance 100,000 Ohm.	NR
2	12	Extruder heater (Not Shown)	E3D	PR-A0-HEATER-24V-40W	24 Vdc, 40W	NR
2	13	Bed Heater (Not Shown)	TEMPCO ELECTRIC HEATER CORP	AS-HB0006	24VDc, 360W	cURus
2	14	Stepper motors (Not shown)	Shanghai Moons' Electric Co., Ltd.	MS17HD6P4150-01	3.3 Vdc, 1.5A, Class B (130°C).	NR
				MS17HD4P4150-07	2.55Vdc, 1.5A, Class B (130°C)	
			Lin Engineering	4118S-08P-07RO	5Vdc max, 1.34A	NR
4	15	Connectors (Not shown)	Various	Various	Minimum flammability rating of V-1	cURus

1) Not all item numbers are indicated (called out) in the photos, as their location is obvious.
2) “Various“ means any type, from any manufacturer that complies with the "Technical data and securement means" and meets the "Mark(s) of conformity" can be used.
3) Indicates specific marks to be verified, which assures the agreed level of surveillance for the component. "NR" - indicates Unlisted and only visual examination is necessary. "See 5.0" indicates Unlisted components or assemblies to be evaluated periodically refer to section 5.0 for details.

5.0 Critical Unlisted CEC Components

No Unlisted CEC components are used in this report.

6.0 Critical Features

Recognized Component - A component part, which has been previously evaluated by an accredited certification body with restrictions and must be evaluated as part of the basic product considering the restrictions as specified by the Conditions of Acceptability.

Listed Component - A component part, which has been previously Listed or Certified by an accredited Certification Organization with no restrictions and is used in the intended application within its ratings.

Unlisted Component - A part that has not been previously evaluated to the appropriate designated component standard. It may also be a Listed or Recognized component that is being used outside of its evaluated Listing or component recognition.

Critical Features/Components - An essential part, material, subassembly, system, software, or accessory of a product that has a direct bearing on the product's conformance to applicable requirements of the product standard.

Construction Details - For specific construction details, reference should be made to the photographs and descriptions. All dimensions are approximate unless specified as exact or within a tolerance. In addition to the specific construction details described in this Report, the following general requirements also apply.

1. Spacing - In primary circuits, 2.5 mm minimum spacing are maintained through air and over surfaces of insulating material between current-carrying parts of opposite polarity and 2.5 mm minimum between such current-carrying parts and dead-metal parts or low voltage isolated circuits.
2. Mechanical Assembly - Components such as switches, fuseholders, connectors, wiring terminals and display lamps are mounted and prevented from shifting or rotating by the use of lockwashers, starwashers, or other mounting format that prevents turning of the component.
3. Corrosion Protection - All ferrous metal parts are protected against corrosion by painting, plating or the equivalent.
4. Accessibility of Live Parts - All uninsulated live parts in primary circuitry are housed within a metal enclosure constructed with no openings other than those specifically described in Sections 4 and 5.
5. Grounding - All exposed dead-metal parts and all dead-metal parts within the enclosure that are exposed are connected to the grounding lead of the power supply cord
6. Polarized Connection - NA
7. Internal Wiring - Internal wiring is routed away from sharp or moving parts. Internal wiring leads terminating in soldered connections are made mechanically secure prior to soldering. Recognized Component separable (quick disconnect) connectors of the positive detent type, closed loop connectors, or other types specifically described in the text of this report are also acceptable as internal wiring terminals. At points where internal wiring passes through metal walls or partitions, the wiring insulation is protected against abrasion or damage by plastic bushings or grommets. All wiring is minimum 18 AWG, with a minimum rating of 300 V, 105°C.
8. Schematics - NA
9. Markings - The product is marked with
   1- Applicant's name, model number,Manufacture address or date of manufacturer, electrical rating.
   2- For indoor use only
10. Cautionary Markings - Unit is marked with the following Cautionary marking (refer to illustration #1 for cautionary symbols):

    English:
    - CAUTION HOT
    - CAUTION Risk of electric shock. Do not open.

    French:
    - ATTENTION CHAUD
    - ATTENTION Risque d'électrocution. Ne pas ouvrir.
11. Installation, Operating and Safety Instructions - Instructions for installation and use of this product are provided by the manufacturer

7.0 Illustrations

Illustration 1 - Marking

8.0 Test Summary					
Evaluation Period	3/1/19 to 3/22/19			Project No.	G103838525
Sample Rec. Date	25-Feb-2019	Condition	Production	Sample ID.	LAN1902251515-004
Test Location	25800 Commercenter Dr, Lake Forest, CA 92630 USA				
Test Procedure	Testing Lab				
Determination of the result includes consideration of measurement uncertainty from the test equipment and methods. The product was tested as indicated below with results in conformance to the relevant test criteria.					
The following tests were performed:					

Test Description	UL 60950-1 & CSA C22.2 # 60950-1		
Input Current Test	1.6.2		
Durability of Markings Test	1.7.11		
Capacitor Discharge Test	2.1.1.7		
Protective Bonding Test	2.6.3.4		
Humidity Conditioning	2.9.2		
Clerance and Creepage Measurement	2.10.3, 2.10.4		
Stability	4.1		
Mechanical Strength	4.2.4		
Impact Test	4.2.5		
Temperature Test	4.5.1		
Touch Current Test	5.1		
Electric Strength Test	5.2		
Abnormal Operation Test	5.3		

8.1 Signatures			
A representative sample of the product covered by this report has been evaluated and found to comply with the applicable requirements of the standards indicated in Section 1.0.			
Completed by:	Bhavin Parikh	Reviewed by:	Mike Brousseau
Title:	Engineer	Title:	Engineering Manager
Signature:		Signature:	

9.0 Correlation Page For Multiple Listings	
The following products, which are identical to those identified in this report except for model number and Listee name, are authorized to bear the ETL label under provisions of the Intertek Multiple Listing Program.	
BASIC LISTEE	Aleph Objects Inc.
Address	626 W 66th St, Loveland, CO 80538
Country	USA
Product	3D Printer

MULTIPLE LISTEE 1	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 1 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 2	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 2 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 3	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 3 MODELS	BASIC LISTEE MODELS

10.0 General Information

The Applicant and Manufacturer have agreed to produce, test and label ETL Listed products in accordance with the requirements of this Report. The Manufacturer has also agreed to notify Intertek and to request authorization prior to using alternate parts, components or materials.

COMPONENTS

Components used shall be those itemized in this Intertek report covering the product, including any amendments and/or revisions.

LISTING MARK

The ETL Listing mark applied to the products shall either be separable in form, such as labels purchased from Intertek, or on a product nameplate or other media only as specifically authorized by Intertek. Use of the mark is subject to the control of Intertek.

The mark must include the following four items:

1) applicable country identifiers "US" and/or "C" or "US", "C" and "EU"
2) the word "Listed" or "Classified" or "Recognized Component" (whichever is appropriate)
3) a control number issue by Intertek
4) a product descriptor that identifies the standards used for certification. Example:

For US standards, the words, “Conforms to” shall appear with the standard number along with the word, “Standard” or “Std.” Example: “Conforms to ANSI/UL Std. XX.”

For Canadian standards, the words “Certified to CAN/CSA Standard CXX No. XX.” shall be used, or abbreviated, “Cert. to CAN/CSA Std. CXX No. XX.”

Can be used together when both standards are used.

Note: A facsimile must be submitted to Intertek, Attn: Follow-up Services for approval prior to use. The facsimile need not have a control number. A control number will be issued **after signed Certification Agreements** have been received by the Follow-up Services office, approval of the facsimile of your proposed Listing Mark, satisfactory completion of the Listing Report, and scheduling of a factory

MANUFACTURING AND PRODUCTION TESTS

Manufacturing and Production Tests shall be performed as required in this Report.

FOLLOW-UP SERVICE

Periodic unannounced audits of the manufacturing facility (and any locations authorized to apply the mark) shall be scheduled by Intertek. An audit report shall be issued after each visit. Special attention will be given to the following:

1. Conformance of the manufactured product to the descriptions in this Report.
2. Conformance of the use of the ETL mark with the requirements of this Report and the Certification Agreement.
3. Manufacturing changes.
4. Performance of specified Manufacturing and Production Tests.

In the event that the Intertek representative identifies non-conformance(s) to any provision of this Report, the Applicant shall take one or more of the following actions:

1. Correct the non-conformance.
2. Remove the ETL Mark from non-conforming product.
3. Contact the issuing product safety evaluation center for instructions.

10.1 Evaluation of Unlisted Components

Because Unlisted Components are uncontrolled, and they do not fall under a third party follow up program, Intertek may require these components to be tested and/or evaluated at least once annually, more often for certain components, as part of the independent certification process. The Unlisted Components in Section 5.0 require testing and/or evaluation as indicated.

Note to Intertek Follow Up Inspector: The Component Evaluation Center, CEC, will notify you in writing when these components must be selected and sent to the CEC for re-evaluation

Ship the samples to:
Intertek Testing Services NA Inc.
ETL Component Evaluation Center
45000 Helm Street, Suite 150
Plymouth Twp., MI 48170 USA
Attn: Component Evaluation Center
Sample Disposition: Due to the destructive nature of the testing, all samples will be discarded at the conclusion of testing unless, the manufacturer specifically requests the return of the samples. The request for return must accompany the initial component shipment.

11.0 Manufacturing and Production Tests

The manufacturer agrees to conduct the following Manufacturing and Production Tests as specified:

Required Tests

Dielectric Voltage Withstand Test Grounding Continuity Test

11.1 Dielectric Voltage Withstand Test

Method

One hundred percent of production of the products covered by this Report shall be subjected to a routine production line dielectric withstand test.

The test shall be conducted on products, which are fully assembled. Prior to applying the test potential, all switches, contactors, relays, etc., should be closed so that all primary circuits are energized by the test potential. If all primary circuits cannot be tested at one time, then separate applications of the test potential shall be made.

The test voltage specified below shall be applied between primary circuits and accessible dead-metal parts. The test voltage may be gradually increased to the specified value but must be maintained at the specified value for one second or one minute as required.

Test Equipment

The test equipment shall incorporate a transformer with an essentially sinusoidal output, a means to indicate the applied test potential, and an audible and/or visual indicator of dielectric breakdown.
The test equipment shall incorporate a voltmeter in the output circuit to indicate directly the applied test potential if the rated output of the test equipment is less than 500VA.
If the rated output of the test equipment is 500VA or more, the applied test potential may be indicated by either:
1 - a voltmeter in the primary circuit;
2 - a selector switch marked to indicate the test potential; or
3 - a marking in a readily visible location to indicate the test potential for test equipment having a single test potential output.
In cases 2 and 3, the test equipment shall include a lamp or other visual means to indicate that the test potential is present at the test equipment output. All test equipment shall be maintained in current calibration.

Products Requiring Dielectric Voltage Withstand Test:

Product	Test Voltage	Test Time
All products covered by this Report.	1000V or 1200V	60 s 1 s

11.2 Grounding Continuity Test
Method Each product listed below shall be subjected to a test to determine that there is continuity between accessible dead-metal parts of the product and the grounding pin or blade of the attachment plug. If all accessible dead metal is connected, only a single test need be performed. A visual or audible device (ohmmeter, buzzer, etc.) may be used to indicate grounding continuity.
Products Requiring Grounding Continuity Test:
All products covered by this Report.

12.0 Revision Summary

The following changes are in compliance with the declaration of Section 8.1:

Date/ Proj # Site ID	Project Handler/ Reviewer	Section	Item	Description of Change
				None