Test Report issued under the responsibility of:

ITC ENGINEERING SERVICES, INC.

IEC 61010-1:2010, Safety Requirements for Electrical Equipment
– For Measurement, Control and Laboratory Use –
– Part 1 General Requirements –

Report Reference No. ..... :	20161018-01-LVD
Date of Issue ..... :	November30, 2016
Total Number of Pages ..... :	50
Testing Laboratory ..... :	ITC Engineering Services, Inc.
Address ..... :	9959 Calaveras Road, Box 543, Sunol CA 94586
Applicant's name..... :	Techniquip Corporation
Address ..... :	530 Boulder Ct., #103, Pleasanton, CA 94588
Contact..... :	Mr. David Wensley
Phone ..... :	925.251.9036
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Test Standard Specification..... :	IEC 61010-1:2010
Test Procedure..... :	Safety Requirements for Electrical Equipment
Judgment..... :	Complies as Tested
Test Item Description ..... :	LED ring light for use with microscope
Trade Mark..... :	TECHNIQUIP
Manufacturer..... :	Techniquip Corporation
Model/Type Reference ..... :	ProLine 8X Series
Input Rating ..... :	AC Adapter Input:,100-240Vac, 50/60 Hz, 0.6A Output : 24Vdc, 0.75A, 18W max

ACCREDITED
TL-718

ISO/IEC 17025: 2005 Accredited Laboratory

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Clause	Requirement + Test	Result - Remark	Verdict

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DOCUMENTATION

5 TESTING LOCATION

☒ ITC Testing Laboratory:	:	ITC Engineering Services, Inc.	
Testing location/ address	:	9959 Calaveras Road, PO Box 543, Sunol, CA 94586, USA	
Prepared by (name + signature)	:	Kevin Scott	Kevin Scott
Tested by (name + signature)	:	Kevin Scott	Kevin Scott
Approved by (name + signature)	:	Michael Gbadebo, PE	M Gbadebo
☐ Manufacturer Facility	:		
Testing location/ address	:		
Tested by (name + signature)	:		
Approved by (+ signature)	:		
☐ 3rd Party Test Facility	:		
Testing location/ address	:		
Tested by (name + signature)	:		
Approved by (+ signature)	:		

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6 TEST ITEM PARTICULARS

Type of Item Tested	:	Laboratory Equipment
Description of Equipment Function	:	LED light source
Installation / Overvoltage Category	:	Category II
Pollution Degree	:	2
Environmental Rating	:	Standard
Equipment Mobility	:	Fixed
Operating Condition	:	Continuous
Overall Size of the Equipment (H x W x D mm)	:	25 x 135 x 97(outside Ring) 44.45 X 152.4 X 101.6 (Control Box)
Mass of Equipment (kg)	:	0.145
Marked Degree of Protection to IEC 60529	:	None
Accessories and Detachable Parts Included in the Evaluation	:	AC/DC Power Supply Adapter, Intensity Control Box

Testing

Date of receipt of test item(s)	:	11/02/16
Dates tests performed	:	11/09/16

Possible test case verdicts:

- Test case does not apply to the test object	:	N / A
- Test object does meet the requirement	:	Pass (P)
- Test object does not meet the requirement	:	Fail (F)

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

General remarks:

- "(See Attachment #)" refers to additional information appended to the report.
- "(See appended table)" refers to a table appended to the report.
- The tests 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.

General product information:

LED light source for illumination of microscope instrumentation

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Clause	Requirement + Test	Result - Remark	Verdict
5	**MARKING AND DOCUMENTATION**		P
5.1	**Marking**		P
5.1.1	General		P
	Required equipment markings are:		p
	Visible:	Marking are visible on label from outside of unit	P
	From the exterior; or		P
	After removing a cover; or		N/A
	Opening a door		N/A
	After removal from a rack or panel		N/A
	Not put on parts which can be removed by an OPERATOR		P
	Letter symbols (IEC 60027) used		P
	Graphic symbols (IEC 61010-1: Table 1) used		P
5.1.2	Identification		P
	Equipment is identified by:		P
	a) Manufacturer's or supplier's name or trademark		P
	b) Model number, name or other means		P
	Manufacturing location identified		P
5.1.3	Mains supply		P
	Equipment is marked as follows:		P
	a) Nature of supply:	~	P
	1) a.c. RATED mains frequency or range of frequencies:	50/60 Hz	P
	2) d.c. with symbol 1	24Vdc, 0.75A, 18W max	P
	b) RATED supply voltage(s) or range ..... :	100-240	P
	c) Max. RATED power (W or VA)or input current ..... :	0.5A	P
	If more than one voltage range:		N/A
	Separate values marked; or		N/A
	Values differ by less than 20 %		N/A
	d) OPERATOR-set for different RATED supply voltages:		N/A
	Indicates the equipment set voltage		N/A
	PORTABLE EQUIPMENT indication is visible from the exterior		N/A
	Changing the setting changes the indication		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5	**MARKING AND DOCUMENTATION**		P
	e) Accessory mains socket-outlets accepting standard mains plugs are marked:		N/A
	With the voltage if it is different from the mains supply voltage		N/A
	For use only with specific equipment		N/A
	If not marked for specific equipment it is marked with:		N/A
	The maximum RATED current or power; or		P
	Symbol 14 with full details in the documentation		P
5.1.4	Fuses		N/A
	OPERATOR replaceable fuse marking (see also 5.4.5) .... :		N/A
5.1.5.1	Terminal ,Connections and operating devices		N/A
	Where necessary for safety, indication of purpose of TERMINALS, connectors, controls and indicators marked		N/A
	Push-button and actuators of Emergency stop devises and indicators used to indicate warning s of danger coloured red		N/A
5.1.5.2	TERMINALS,		N/A
	Where necessary for safety, indication of purpose of TERMINALS, connectors, controls and indicators marked		N/A
	If insufficient space, symbol 14 used		N/A
5.1.5.2	Terminals		N/A
	Mains supply TERMINALS identified		N/A
	The following TERMINALS shall be marked as follows:		N/A
	a) FUNCTIONAL EARTH TERMINALS (symbol 5 used)		N/A
	b) PROTECTIVE CONDUCTOR TERMINALS:		N/A
	Symbol 6 is placed close to or on the TERMINAL; OR		N/A
	Part of appliance inlet		N/A
	c) TERMINALS of measuring and control circuits (symbol 7 used)		N/A
	d) HAZARDOUS LIVE TERMINALS supplied from the interior		N/A
	Symbol 14 used		N/A
5.1.6	Switches and circuit breakers		P
	If the power supply switch or circuit breaker is the disconnecting device, on or off position marked	On/Off is marked adjacent to Switch	P
	If push-button switch used symbol 9 and 15		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5	**MARKING AND DOCUMENTATION**		P
5.1.7	Equipment protected by DOUBLE INSULATION or REINFORCED INSULATION		N/A
	Partially Protected throughout (symbol 11 not used)		N/A
	Only partially protected (symbol 11 not used)		N/A
5.1.8	Field-wiring Terminal Boxes		N/A
	If the temperature of the terminals or the enclosure of a field-wiring terminal box compartment exceeds 60°C in normal condition at an ambient temperature of 40°C, or the maximum rated ambient temperature is higher, there shall be a marking of the minimum temperature rating of the cable to be connected to the terminals.		N/A
5.2	**Warning markings**		P
	Visible when ready for NORMAL USE	UV Light Warning	P
	Are near or on applicable parts		P
	Symbols and text correct dimensions and colour		N/A
	If necessary marked with symbol 14		N/A
	Statement to isolate or disconnect		N/A
5.3	**Durability of markings**		P
	The required markings remain clear and legible in NORMAL USE		P
5.4	**Documentation**		P
5.4.1	General		P
	Equipment is accompanied by documentation which includes:	Information included in operation manual	P
	a) Intended use		P
	b) Technical specification	Information included in operation manual	P
	c) Name and address of manufacturer or supplier		P
	d) Information specified in 5.4.2 to 5.4.6		P
	e) information to mitigate risk		P
	f) Equipment specific accessories		N/A
	g) hazard concerning incorrect reading		N/A
	h) Instruction for lifting and carrying		N/A
	Warning statements and a clear explanation of warning symbols:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5	**MARKING AND DOCUMENTATION**		P
	Provided in the documentation; or		P
	Information is marked on the equipment		P
5.4.2	Equipment RATINGS	Marked on the Equipment	P
	Documentation includes:		P
	a) Supply voltage or voltage range	Included in manual	P
	Frequency or frequency range	Included in manual	P
	Power or current RATING	Included in manual	P
	b)Description of all input and output connections	Included in manual	P
	c) RATING of insulation of external circuits, when such circuits are nowhere ACCESSIBLE		N/A
	d) Statement of the range of environmental conditions	Included in manual	P
	e) Degree of protection (IEC 60529)		N/A
	f) equipment with impact rating less that 5J		N/A
5.4.3	Equipment installation	Included in manual	
	Documentation includes instructions for:		
	a) Assembly, location and mounting	Included in manual	P
	b) Protective earthing		N/A
	c) Connections to supply	Included in manual	P
	d) PERMANENTLY CONNECTED EQUIPMENT:		N/A
	1) Supply wiring requirements		N/A
	2) If external switch or circuit-breaker, requirements and location recommendation		N/A
	e) Ventilation requirements		N/A
	f) Special services (e. g. air, cooling liquid)		N/A
	g) Instruction relating to sound level		N/A
5.4.4	Equipment operation	Included in manual	P
	Instructions for use include:	Included in manual	P
	a) Identification of operating controls	Included in manual	P
	b) Positioning for disconnection	Included in manual	P
	c)Interconnection	Included in manual	P
	d) Specification of intermittent operation limits		N/A
	e) Explanation of symbols used which relate to safety		p

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5	**MARKING AND DOCUMENTATION**		P
	f) Replacement of consumable materials		N/A
	g) Cleaning and decontamination (see 11.2)		P
	h) Listing of any poisonous or injurious gases and quantities		N/A
	i) Risk-reduction procedures relating to flammable liquids		N/A
	i) Risk-reduction procedures relating to risk of burns		N/A
	If equipment conforming to IEC 60950 is used …….		N/A
	A statement about protection impairment if used in a manner not specified by the manufacturer		N/A
5.4.5	Equipment maintenance	Included in manual	
	Instructions include:		
	Sufficient preventive maintenance and inspection information	Included in manual	P
	Replacement of mains cords, etc.		N/A
	Specific battery type		N/A
	Any manufacturer specified parts		N/A
	RATING and characteristics of fuses		N/A
	INSTRUCTION FOR SERVICE PERSONAL:		N/A
	a) product –specific RISKS)		N/A
	b)protective measures		N/A
	c)verification of the safe state after repair		N/A
5.4.6	Integration into systems or effects resulting from special conditions		N/A
	Aspects from special ambient or application conditions described		N/A

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6	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
6.1	**General**		**P**
6.1.1	Requirements		**P**
	Protection maintained in NORMAL and Single fault Conditions (see 6.4 and 6.5)		**P**
	ACCESSIBLE parts not HAZARDOUS LIVE in NORMAL CONDITION and SINGLE FAULT CONDITION	Verified by inspection	**P**
	Conformity is checked by the determination of 6.2 and 6.3 followed by the tests of 6.4 to 6.11		**P**
6.1.2	Exceptions		**N/A**
	If it is not feasible for operating reasons to prevent the following parts being both Accessible and Hazardous Live, they are permitted to be Accessible to the Operator during Normal Use while they are Hazardous Live:		**N/A**
	a) Parts of lamps and lamp sockets after lamp removal;		**N/A**
	b) Parts intended to be replaced by the operator and which may be hazardous live during the replacement or other operator action, but only if they are accessible only by means of a tool and have a warning marking (See 5.2);		**N/A**
	Capacitance test		**N/A**
6.2	**Determination of ACCESSIBLE parts**		**P**
6.2.1	General examination		**P**
6.2.2	Examination	ACCESSIBLE PARTS are not Hazardous live	**N/A**
6.2.3	Openings above parts that are Hazardous live	No such openings	**N/A**
6.2.4	Opening for preset controls		**P**
6.3	**Limits for ACCESSIBLE parts**		**P**
6.3.1	Levels in NORMAL CONDITION		**P**
6.3.2	Values in SINGLE FAULT CONDITION		**P**
6.4	**Primary means of protection**		**P**
	Accessible parts shall be prevented from becoming hazardous live by one or more of the following means:		
	a) Enclosures or Barriers;		**P**
	b) Basic Insulation;		**P**
	c) Impedance.		**P**
6.4.2	**Enclosures and Protective Barriers**		**P**

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Clause	Requirement + Test	Result - Remark	Verdict
6	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
	Shall meet rigidity requirements		**P**
	If provides protection by insulation shall meet basic insulation	UL Listed & TUV, CE Certified AC adapter provided to power equipment	**P**
	If enclosure provides protection by limiting access clearance and creepage between accessible and hazardous live shall meet requirements for basic insulation		**P**
6.4.3	**Basic Insulation**		**P**
	Clearances and Creepage distances and solid insulation forming basic between accessible parts and hazardous live parts shall meet requirements of 6.7 (Insulation Requirements)	UL Listed & TUV, CE Certified AC adapter provided to power equipment	**P**
6.4.4	**Impedance**		**P**
	Impedance used as a primary means of protection :		**P**
	a) shall limit the current or voltage to not more that applicable level of 6.3.2		**P**
	b)shall be rated for the maximum working voltage and amount of power dissipated		**P**
	C) clearance and creepage distances between termination of impedance shall meet requirements of 6.7 for basic insulation		**P**
6.5	**Additional means of protection in case of Single Fault Conditions**		**P**
6.5.1	ACCESSIBLE parts shall be prevented from becoming Hazardous Live in Singe Fault ConditionPrimary means shall be supplemental one of the following (a-d) Alternatively one the single means shall be used (e-f):		**P**
	a)Protective Bonding		**P**
	b)Supplementary Insulation		**P**
	c) automatic disconnection		**N/A**
	d)current or voltage limiting device	UL Listed & TUV, CE Certified AC adapter provided to power equipment	**P**
	e)Reinforced Insulation	UL Listed & TUV, CE Certified AC adapter provided to power equipment	**P**
	f)protective impedance	UL Listed & TUV, CE Certified AC adapter provided to power equipment	**P**
6.5.2	**Protective BONDING**		

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Clause	Requirement + Test	Result - Remark	Verdict
6	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
6.5.2.1	ACCESSIBLE CONDUCTIVE parts shall be bonded to the protective conductor terminal if they could become hazardous live		**P**
	Alternatively Accessible parts separated conductive protective screen bonded to protective conductor terminal		**P**
6.5.2.2	Integrity of PROTECTIVE BONDING		**P**
	a) protective bonding consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses	Provided by UL Listed & TUV, CE Certified AC adapter	**P**
	b) Soldered connections:		**N/A**
	c)Screw connections are secured		**P**
	d) protective bonding not interrupted		**N/A**
	e) Any moveable connection specifically designed, and meets 6.5.2.4		**N/A**
	f) No external metal braid of cables used	Verified by inspection	**P**
	g) If mains supply passes through equipment :		
	▪ Means provided for passing protective conductor;		**N/A**
	▪ Impedance meets 6.5.2.4		**N/A**
	h) Protective conductors bare or insulated, if insulated, green/yellow	Verified by inspection	**P**
	Exceptions:		
	1) earthing braids;		**N/A**
	2) internal protective conductors etc.;		**P**
	Green/yellow not used for other purposes		**P**
	terminal suitable, and meets 6.5.2.3		**N/A**
6.5.2.3	Protective conductor terminal		**P**
	a) Contact surfaces are metal	Verified by inspection	**P**
	b) Appliance inlet used		**P**
	c) For rewirable cords and permanently connected equipment, protective conductor terminal is close to mains supply terminals		**N/A**
	d) If connection to mains supply is not required, any protective conductor terminal:		**N/A**
	Is near terminals of circuit for which protective earthing is necessary		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict
6	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
	Protective Conductor Terminal shall be external if other terminals external		**N/A**
	e) Equivalent current-carrying capacity to mains supply terminals		**N/A**
	f) If plug-in, makes first and breaks last		**N/A**
	g) If also used for other bonding purposes, protective conductor:		**N/A**
	Applied first;		**N/A**
	Secured independently;		**N/A**
	Unlikely to be removed by servicing; or		**N/A**
	Warning marking requires replacement of protective conductor		**N/A**
	h) Protective conductor of measuring circuit:		**N/A**
	1) Current rating;		**N/A**
	2) protective bonding:		**N/A**
	▪ Not interrupted; or		**N/A**
	▪ Indirect bonding used (see 6.5.1.5)		**N/A**
	i) functional earth terminals allow independent connection		**N/A**
	j) If a binding screw:		**N/A**
	Suitable size for bond wire		**N/A**
	Not smaller than M 4 (No. 6)		**N/A**
	At least 3 turns of screw engaged		**N/A**
	k)Contact pressure not capable of reduction by deformation of materials		**N/A**
	Passes tightening torque test		**N/A**
6.5.2.4	Impedance of protective bonding of plug-connected equipment		**P**
6.5.2.5	Impedance of Protective Bonding of Permanently Connected Equipment		**N/A**
6.5.2.6	Transformer Protective Bonding		**N/A**
6.5.3	Supplementary Insulation and Reinforced Insulation (see 6.7,)		**N/A**
6.5.4	Protective impedance		**P**

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Clause	Requirement + Test	Result - Remark	Verdict
6	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
	a) An appropriate single component constructed :	UL Listed & TUV, CE Certified adapter provided to power equipment provides protective impedance for system	**P**
	1)rated twice maximum working voltage		P
	2) if resistor rated twice power dissipation for the maximum working voltage		**N/A**
	c) A combination of components		**N/A**
6.5.5	Automatic disconnection of the supply		**N/A**
	If used, it meets :		**N/A**
	a) Rated disconnecting time within limit specified		**N/A**
	Specified by installation instruction		**N/A**
	b) Rated for maximum rated load		**N/A**
6.5.6	Current or Voltage limiting device		**P**
	Shall meet all of the following:		
	a) shall be rated to limit current or voltage to levels not exceeding values 6. 3.2	UL Listed & TUV, CE Certified adapter provided to power equipment provides protective impedance for system	**P**
	b)shall be rated for maximum working voltage and if applicable maximum operational current		**P**
	c) clearance and creepage distance between the terminations of the current or voltage limit device meet requirements of 6.7 for supplementary insulation		**P**
6.6	**Connections to External Circuits**		**N/A**
6.6.1	General		**N/A**
	In normal conditions and in single fault conditions of the equipment no accessible parts of an external circuit shall become Hazardous Live as a result of connecting the external circuit to the equipment		**N/A**
	Proctection achieved by seperation of circuit		**N/A**
	Short circuit of separation does not cause a Hazard		**N/A**
	Instructions or markings include:		
	a) rated conditions for terminal		**N/A**
	b) Required rating of external circuit insulation		**N/A**
6.6.2	Terminals for external circuits		

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Clause	Requirement + Test	Result - Remark	Verdict
6	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
	Terminals which receive a charge from an internal capacitor are not hazardous live 10s after interruption		**N/A**
6.6.3	Circuits with terminals which are hazardous live		**N/A**
	These circuits are:		
	Not connected to accessible conductive parts; or		**N/A**
	Except for circuits which are not mains circuit Connected to accessible conductive parts, but are not mains circuits and have one terminal contact at earth potential		**N/A**
	No accessible conductive parts are hazardous live		**N/A**
6.6.4	Terminals for stranded conductors		**N/A**
	No risk of accidental contact because:		**N/A**
	Self-evident or marked whether connected to accessible conductive parts		**N/A**
	Terminals of circuits carrying Hazardous Live Voltage shall be anchored		**N/A**
6.7	**Insulation Requirements**	Addressed by TUV, CE Certified power supply provided to power equipment	**P**
6.8	**Procedure for Voltage Test**		**P**
6.9	**Constructional Requirements for Protection Against Electric Shock**		**P**
6.9.1	General		**P**
	If a failure could cause a hazard:		
	a) Security of wiring connections		**P**
	b) Screws securing removable covers		**P**
	c) Accidental loosening		**P**
	d) Clearance and Creepage distances shall not be reduced Easily damaged materials not used		**P**
6.9.2	Insulating Materials		
	Following shall not be used :		
	a) material which can easily be damaged		**P**
	b)Non-impregnated hydroscopic materials not used		**P**
6.9.3	Colour Coding		**P**
	Green and yellow insulation shall not be used except		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict
6	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
	a) protective earth conductor	Addressed by CE & TUV Certified AC adapter inlet provided to power equipment	**P**
	b)protective bonding conductors		**P**
	c)potential equalization conductors for safety purposes		**N/A**
	d) functional earth conductors		**N/A**
6.10	**Connection to Mains Supply Source and Connections Between Parts of Equipment**		**P**
6.10.1	Mains supply cords	UL Certified power supply cord	**P**
	Rated for maximum equipment current		**P**
	Cables complies with IEC 60227 or IEC 60245		**N/A**
	Heat-resistant if likely to contact hot parts		**P**
	Temperature rating (cord and inlet)		**P**
	Green/yellow used only for connection to protective conductor terminals		**P**
	Detachable cords with IEC 60320 mains connectors:		**P**
	Conform to IEC 60799; or		**P**
	Have the current rating of the mains connector		**P**
6.10.2	Fitting of non-detachable mains supply cords		**N/A**
6.10.2.1	Cord entry		**N/A**
	Mains cords at point it enters equipment shall be protected by one of the following:		
	a) Inlet or bushing smoothly rounded; or		**N/A**
	b) reliably fixed flexible cord guard 5x overall cord diameter		**N/A**
6.10.2.2	Cord anchorage		**N/A**
	2) Cord anchorages:		**N/A**
	a) Cord is not clamped by direct pressure from a screw		**N/A**
	b) Knots are not used		**N/A**
	c) Cannot push the cord into the equipment to cause a hazard		**N/A**
	d) No failure of cord insulation in anchorage with metal parts		**N/A**
	e) shall not be possible to loosen cord anchorage with the use of a tool		**N/A**

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6	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
	f) Cord replacement does not cause a hazard and method of strain relief is clear		**N/A**
	compression bushing not uses unless it is suitable for use with the mains supply cord suupplied		**N/A**
	Push-pull test		**N/A**
6.10.3	Plugs and connectors		**P**
	Mains supply plugs, connectors etc., conform with relevant specifications	Standard CE certified appliance coupler required	**P**
	If equipment supplied at voltages below 6.3.2.a) or from a sole source:		**N/A**
	Plug pins which receive a charge from an internal capacitor not hazardous live 5s after disconnection		**P**
	Accessory mains socket outlets:		**N/A**
	a)Marking if accepts a standard mains plug (see 5.1.3e)		**N/A**
	b)Input has a protective earth conductor if outlet has earth terminal contact		**N/A**
6.11	**Disconnection from Supply Source**		
6.11.1	General		
	Disconnects all current carrying conductors		**P**
6.11.2	Exceptions		
	a) Equipment supplied by low energy source; or		**N/A**
	b) Equipment connected to impedance protected supply; or		**N/A**
	c) Equipment constitutes an impedance protected load		**N/A**
6.11.3	**Requirements according to type of equipment**		
6.11.3.1	Permanently connected equipment and multi-phase equipment		**N/A**
	Employs switch or circuit-breaker		**N/A**
	If switch or circuit-breaker is not part of the equipment, documentation specifies:		**N/A**
	a) Switch or circuit-breaker to be included in building installation		**N/A**
	b) Location		**N/A**
	c) Marking		**N/A**
6.11.3.2	Single-phase cord-connected equipment		

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Clause	Requirement + Test	Result - Remark	Verdict
6	**PROTECTION AGAINST ELECTRIC SHOCK**		**P**
	Equipment is provided with:		
	a) Switch or circuit-breaker; or		**P**
	b) Appliance coupler (disconnectable without tool); or		**P**
	c) Separable plug (without locking device)		**N/A**
6.11.4	**Disconnecting devices**		
6.11.4.1	Electrically close to the supply		**P**
6.11.4.2	**Switches and circuit-breakers**		
	When used as disconnection device:		
	Meets IEC 60947-1 and IEC 60947-3		**P**
	Marked to indicate function		**P**
	Not incorporated in mains cord		**P**
	Does not interrupt protective earth conductor		**P**
6.11.4.3	**Appliance couplers and plugs**		
	Where an appliance coupler or separable plug is used as the disconnecting device		**P**
	Readily identifiable and easily reached by the operator		**P**
	Single-phase portable equipment cord length ≤ 3 m		**P**
	Protective earth conductor connected first and disconnected last		**P**
7	**PROTECTION AGAINST MECHANICAL HAZARDS**		
7.1	**General**		
	Conformity is checked by 7.2 to 7.7		**P**
7.2	**Sharp Edges**		
	Easily touched parts shall be smooth and rounded		**P**
	Shall not cause injury in single fault condition		**P**
7.3	Moving Parts		
	Hazard from moving parts shall not exceed a tolerable level except as specified in 7.3.2	No moving parts provided in system	**N/A**
	Conditions of 7.3.4 and 7.3.5 represent tolerable levels. If these are not met Risk assessment shall be carried out according to 7.3.3 or clause 17		**N/A**
7.3.2	**Exceptions**		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict
7	**PROTECTION AGAINST MECHANICAL HAZARDS**		
	If not feasible to prevent certain moving parts from causing potential hazards , access is permitted in the following circumstances:		**N/A**
	a) equipment with easily touched moving parts which are obviously intended to operate on parts or materials external to the equipment (drilling, mixing equipment)		**N/A**
	b) if during routine maintenance outside normal use it is unavoidable for technical reason for an operator to access moving parts access is permitted if all of the following precautions have been taken:		**N/A**
	1)access not possible without use of tool		**N/A**
	2)instructions for the responsible body include statement that operator must be trained		**N/A**
	3)there are warning markings on cover or parts which have been remover to obtain access		**N/A**
7.3.3	**Risk assessment or mechanical hazard to body parts**	No moving parts provided in system	**N/A**
	Risk shall be reduce to tolerable level by as least minimum protective measure of Table 12		**N/A**
7.3.4	**Limitation of force and pressure**	No moving parts provided in system	**N/A**
7.3.5	**Gap limitation between MOVING PARTS**		
7.3.5.1	**Gap limitation between MOVING PARTS- Access normally allowed**		**N/A**
	The force of the moving part cannot exceed the limits of 7.3.4 and the width of the gap shall not decrease from value larger than the minimum gap of Table 13 for that body part to a value smaller than the minimum gap in normal and single fault condition		**N/A**
7.3.5.2	**Gap limitation between MOVING PARTS- Access normally prevented**		**N/A**
	While parts are moving gaps between moving parts into which body part can be inserted shall not increase to more than the acceptable gap of Table 14 in normal and single fault condition.		**N/A**
7.4	**Stability**		
	Equipment and assemblies of equipment not secure to the building structure before operation shall be physically stable in Normal Use.		**P**

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Clause	Requirement + Test	Result - Remark	Verdict
7	**PROTECTION AGAINST MECHANICAL HAZARDS**		
	If means are provided to ensure that stability is maintained after the opening of drawers, etc. by an operator, either these means shall be automatic or there shall be a warning marking		**N/A**
	Conformity tests:		
	a) 10° tilt test(equipment other than handheld)		**N/A**
	b) Multi-directional force test		**N/A**
	c) downward force test		**N/A**
	d)castors or support foot that supports the greates load is loaded with 4x that load		**N/A**
	e)the castor or support with greatest load is removed from the equipment and the equipment is placed on a flat surface		**N/A**
7.5	**Provisions for Lifting and Carrying**		**N/A**
7.5.1	**General**		**N/A**
	Equipment >18 kg shall be provided with means for lifting and carrying or directions shall be given in the documentation		**N/A**
7.5.2	**Handles and grips**		**N/A**
	Handles or grips withstand four times weight		**N/A**
7.5.3	**Lifting devices and support parts**		**N/A**
	Parts of lifting devices and parts that support heavy load shall be rated for the maximum load or shall be tested to withstand four times the maximum load		**N/A**
7.6	**Wall Mounting**		**N/A**
	Mounting brackets withstand four times weight		**N/A**
7.6	**Expelled Parts**		**N/A**
	Equipment contains or limits the energy		**N/A**
	Protection not removable without the aid of a tool		**N/A**

8	**RESISTANCE TO MECHANICAL STRESSES**		**P**
8.1	Equipment shall not cause hazard when subjected to mechanical stresses likely to occur in normal use		**P**
8.2	**Enclosure Rigidity Test**		
8.2.1	Static Test	Passed 30N force test applied by 12 mm hard rod	**P**
8.2.2	Impact Test		**P**

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Clause	Requirement + Test	Result - Remark	Verdict
8	**RESISTANCE TO MECHANICAL STRESSES**		**P**
8.3	**Drop Test**		
8.3.1	Equipment other than Hand-Held Equipment and Direct Plug-In Equipment		**P**
	a) For Equipment with a mass up to 20 kg		**P**
	b) For Equipment with a mass over 20 kg, but up to 100 kg		**N/A**
8.3.2	**Hand-Held Equipment and Direct Plug-In Equipment**		**P**
9	**PROTECTION AGAINST THE SPREAD OF FIRE**		
9.1	General		
	Conformity for each source of hazard or area of the equipment is checked by one of the following:		
	a) Single Fault test of 4.4; or	No ignition occurred during single fault and shorting output of power supply testing	**P**
	b) Application of 9.2 (eliminating or reducing the sources of ignition); or	Components meets the requirement of 9.2.1B for eliminating source of ignition	**P**
	c) Application of 9.3 (containment of fire within the equipment)	Equipment has enclosure that meets the requirement of 9.2.1C for fire containment	**P**
9.2	**Eliminating or Reducing the Sources of Ignition within the Equipment**		
	1) Limited-energy circuit (see 9.4); or		**N/A**
	2) Insulation meets the requirements for basic insulation; or		**P**
	Bridging the insulation does not cause ignition		**N/A**
	b) Ignition Hazard related to flammable liquids (see 9.4)		**N/A**
	c) No ignition in circuits designed to produce heat		**N/A**
9.3	**Containment of the Fire within the Equipment, Should it Occur**		
9.3.1	**General**		
	a) Energizing of the equipment is controlled by an operator held switch		**P**
	b) Enclosure conforms with constructional requirements of 9.3.2; and		**P**
	Requirements of 9.3.2 and 9.5 are met		**P**
9.3.2	Constructional requirements		

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Clause	Requirement + Test	Result - Remark	Verdict
9	**PROTECTION AGAINST THE SPREAD OF FIRE**		
	a) connectors and insulating material on which components are mounted shall have a flammability classification of V-2 or better		**P**
	b) Insulated wires and cables shall retard propagation		**P**
	c) The enclosure is constructed as follows :		
	1) Bottom and sides of the enclosure within the 5' arc of figure 13 that are not limited circuits constructed with:		**N/A**
	i)No openings; or		**P**
	ii)Perforated as specified in Table 16		**P**
	iii)Metal screen with a mesh		**N/A**
	iv) Opening with Baffles as specified in figure 12;		**N/A**
	Perforated as specified in Table 16; or		**N/A**
	2) Material of ENCLOSURE and any baffle or flame barrier is made of Metal (except magnesium); or		**N/A**
	Non metallic materials have flammability classification FV1 or better		**N/A**
	3) ENCLOSURE and any baffle or flame barrier have adequate rigidity		**P**
9.4	**Limited-Energy Circuit**		
	a) Potential not more than 30 R.M.S. and 42.4 V peak, or 60 V dc		**P**
	b) Current limited by one of following means:		**N/A**
	1) Inherently or by impedance; or		**N/A**
	2) Overcurrent protective device; or		**N/A**
	3) A regulating network limits also in SINGLE FAULT CONDITION		**P**
	c) Is separated by at least BASIC INSULATION		**N/A**
	If overcurrent protective device used:		**N/A**
	Fuse or a non adjustable electromechanical device		**N/A**
9.5	**Requirements for Equipment Containing or Using Flammable Liquids**		**N/A**
	Flammable liquids contained in or specified for use with equipment do not cause spread of fire	No liquids are contained	**N/A**
	Risk is reduced to a tolerable level :		
	a) The temperature of surface or parts in contact with flammable liquids is 25 °C below fire point		**N/A**
	b) The quantity of liquid is limited		**N/A**
	c) Flames are contained within the equipment		**N/A**
	Detailed instructions for risk-reduction provided		**N/A**
9.6	**Overcurrent Protection**		

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Clause	Requirement + Test	Result - Remark	Verdict
9	**PROTECTION AGAINST THE SPREAD OF FIRE**		
9.6.1	Equipment intended to be energized from, or connected to, a Mains supply shall be protected by fuses, circuit-breakers, thermal cut-outs, impedance limiting circuits or similar means, to provide protection against excessive energy being drawn from the Mains in case of a fault in the equipment.		**N/A**
	Fuses or single-pole circuit-breakers not fitted in neutral (multi-phase)		**N/A**
9.6.2	**PERMANENTLY CONNECTED EQUIPMENT**	Unit not permanently connected	**N/A**
	Overcurrent device:		**N/A**
	Fitted within the equipment; or		**N/A**
	Specified in manufacturer's instructions		**N/A**
9.6.3	**Other equipment**		
	Protection within the equipment	Verified by inspection	**P**

10	**EQUIPMENT TEMPERATURE LIMITS AND RESISTANCE TO HEAT**		
10.1	**Surface Temperature Limits for Protection Against Burns**		
	Easily touched surfaces within the limits	See table 25	**P**
	Heated surfaces necessary for functional reasons exceeding specified values:		**N/A**
	Are recognizable as such by appearance or function; or		**N/A**
	Are marked with symbol 13		**N/A**
	Guards are not removable without TOOL		**N/A**
10.2	**Temperatures of Windings**		**N/A**
	Limits not exceeded in:		**N/A**
	NORMAL CONDITION		**N/A**
	SINGLE FAULT CONDITION		**N/A**
10.3	**Other Temperature Measurements**		**N/A**
	Following measurements conducted if applicable:		**N/A**
	a) Value of 60°C of field-wiring TERMINAL box not exceeded		**N/A**
	b) Surface of flammable liquids and parts in contact with this liquids		**N/A**
	c) Surface of non-metallic ENCLOSURES		**N/A**
	d) Parts made of insulating material supporting parts connected to MAINS supply		**P**
	e) TERMINALS carrying a current more than 0.5 A		**N/A**
10.4	**Conduct of Temperature Test**	See table 25	**P**

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Clause	Requirement + Test	Result - Remark	Verdict
10	**EQUIPMENT TEMPERATURE LIMITS AND RESISTANCE TO HEAT**		
10.4.2	**Temperature measurement of heating equipment**		**N/A**
	a) Equipment normally used on a floor or a table is placed as near to the wall as possible;		**N/A**
	b) Equipment normally fixed to a wall is mounted on one of the walls, as near to the other wall and to the floor or ceiling as is likely to occur in NORMAL USE;		**N/A**
	c) Equipment normally fixed to a ceiling is fixed to the ceiling as near to the walls as is likely to occur in NORMAL USE.		**N/A**
10.4.3	**Equipment intended for installation in a cabinet or a wall**		**N/A**
10.5	**Resistance to Heat**		**P**
10.5.1	Integrity of CLEARANCE and CREEPAGE DISTANCES		**P**
10.5.2	Non-metallic ENCLOSURES		**N/A**
	After treatment:		**N/A**
	No HAZARDOUS LIVE parts ACCESSIBLE;		**N/A**
	Tests of 8.1 and 8.2		**N/A**
	In case of doubt, tests of 6.8 (without humidity preconditioning)		**N/A**
10.5.3	Insulating material		**P**
	a) Parts supporting parts connected to MAINS supply		**P**
	b) TERMINALS carrying a current more than 0.5 A		**N/A**
	Examination of material data; or		**N/A**
	in case of doubt::		
	1) Ball pressure test; or		**N/A**
	2) Vicat softening test of ISO 306		**N/A**
11	**PROTECTION AGAINST HAZARDS FROM FLUIDS**		
11.1	**General**		**N/A**
11.2	**Cleaning**	Isopropyl napkin	**P**
11.3	**Spillage**		**N/A**
11.4	**Overflow**		**N/A**
11.5	**Battery Electrolyte**	No batteries provided	**N/A**
	Battery electrolyte leakage presents no hazard		**N/A**
11.6	**Specially Protected Equipment**		**N/A**
11.7	**Fluid Pressure and Leakage**	No fluid contained in unit	**N/A**
11.7.1	**Maximum pressure**		**N/A**
	Maximum pressure of any part does not exceed P_{RATED}		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict
10	**EQUIPMENT TEMPERATURE LIMITS AND RESISTANCE TO HEAT**		
11.7.2	**Leakage and rupture at high pressure**		**N/A**
	Fluid-containing parts of equipment which in Normal use have both the following characteristics shall not cause a Hazard through rupture or leakage:		**N/A**
	a) A product of pressure and volume greater than 200 kPa l;		**N/A**
	b) A pressure greater than 50 kPa.		**N/A**
	Conformity is checked through a hydraulic test		**N/A**
	Test to IEC 60335-2-24 60335-2-89or (fluid containing parts of refrigeration systems only)		**N/A**
11.7.3	Leakage from low-pressure parts		**N/A**
11.7.4	Overpressure safety device		**N/A**
	Does not operate in NORMAL USE		**N/A**
	It is conform with:		**N/A**
	a) Connected as close as possible to parts intended to be protected		**N/A**
	b) Easy access for inspection, maintenance and repair		**N/A**
	c) Adjustment only with TOOL		**N/A**
	d) No discharge towards person		**N/A**
	e) No HAZARD from deposit of discharged material		**N/A**
	f) Adequate discharge capacity		**N/A**
	No shut-off valve between overpressure safety device and protected parts		**N/A**

12	**PROTECTION AGAINST RADIATION, INCLUDING LASER SOURCES, AND AGAINST SONIC AND ULTRASONIC PRESSURE**		**N/A**
12.1	**General**		**N/A**
	Equipment provides protection		**N/A**
12.2	**Equipment Producing Ionizing Radiation**		**N/A**
12.2.1	Ionizing radiation		**N/A**
12.2.1.1	General		**N/A**
	a) if intended to emit radiation it shall me the requirements of 12.2.1.2		**N/A**
	a) if it uses or generates radiation but only emits stray radiation it shall meet the requirements of 12.2.1.3		**N/A**
12.2.1.2	Equipment intended to emit radiation		**N/A**
	a)symbol 17 of table 1		**N/A**
	b)for equipment containing one or more radioactive substances wit he abbreviations of the radionuclides		**N/A**
	c)With the maximum dose rate value at 1m or		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict
12	**PROTECTION AGAINST RADIATION, INCLUDING LASER SOURCES, AND AGAINST SONIC AND ULTRASONIC PRESSURE**		**N/A**
	With a dose rate value at appropriate distance in m		**N/A**
12.2.1.3	Equipment not intended to emit radiation		**N/A**
	Effective dose rate of unintended stray radiation at any easily reached point 100mm from the outer surface shall not exceed 1µSv/h		**N/A**
12.2.2	Accelerated electrons		**N/A**
12.3	**Ultra-Violet (UV) Radiation**		**N/A**
	No unintentional and HAZARDOUS escape of UV radiation		**N/A**
12.4	**Micro-Wave Radiation**		**N/A**
	Power density does not exceed 10 W/m^2 ..... :		**N/A**
12.5	**Sonic and Ultrasonic Pressure**		**N/A**
12.5.1	Sound level		**N/A**
12.5.2	Ultrasonic pressure		**N/A**
12.6	**Laser Sources (IEC 60825-1)**		**N/A**
13	**PROTECTION AGAINST LIBERATED GASES, EXPLOSION AND IMPLOSION**		**N/A**
13.1	**Poisonous and Injurious Gases and Substances**		**N/A**
	Attached data/test reports demonstrate conformity	No poisonous gas provided	**N/A**
13.2	**Explosion and Implosion**		**N/A**
13.2.1	Components		**N/A**
	Components liable to explode:		**N/A**
	Pressure release device provided; or		**N/A**
	Apparatus incorporates OPERATOR protection (see also 7.6)		**N/A**
	Pressure release device:		**N/A**
	Discharge without danger		**N/A**
	Cannot be obstructed		**N/A**
13.2.2	Batteries and battery charging	No batteries provided in unit	**N/A**
	If explosion or fire hazard could occur:		**N/A**
	Protection incorporated in the equipment; or		**N/A**
	Instructions specify batteries with built-in protection		**N/A**
	In case of wrong type of battery used:		**N/A**
	No HAZARD; or		**N/A**
	Warning by marking and within instructions		**N/A**
	Equipment with means to charge rechargeable batteries:		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict
13	**PROTECTION AGAINST LIBERATED GASES, EXPLOSION AND IMPLOSION**		**N/A**
	Warning against the charging of non-rechargeable batteries; and		**N/A**
	Type of rechargeable battery indicated; or		**N/A**
	Symbol 14 used		**N/A**
	Battery compartment design		**N/A**
	Single component failure		**N/A**
	Polarity reversal test		**N/A**
13.2.3	Implosion of cathode ray tubes	No cathode ray tubes provided in unit	**N/A**
	If maximum face dimensions > 160 mm ..... :		**N/A**
	Intrinsically protected and correctly mounted; or		**N/A**
	ENCLOSURE provides protection		**N/A**
	If non-intrinsically protected:		**N/A**
	Screen not removable without TOOL		**N/A**
	If glass screen, not in contact with surface of tube		**N/A**

14	**COMPONENTS**		**P**
14.1	**General**		
	Where safety is involved, components meet relevant requirements	See critical components, Table 37	**P**
14.2	**Motors**		
14.2.1	Motor temperatures		**N/A**
	Does not present a HAZARD when stopped or prevented from starting; or		**N/A**
	Protected by over-temperature or thermal protection device conform with 14.3		**N/A**
14.2.2	Series excitation motors		**N/A**
	Connected direct to device, if over-speeding causes a HAZARD		**N/A**
14.3	**Over-temperature Protection Devices**		**N/A**
	Devices operating in a SINGLE FAULT CONDITION		**N/A**
	a) Reliable function is ensured		**N/A**
	b) RATED to interrupt maximum current and voltage		**N/A**
	c) Does not operate in NORMAL USE		**P**
14.4	**Fuse Holders**		**N/A**
	No access to HAZARDOUS LIVE parts		**P**
14.5	**Mains Voltage Selecting Devices**		**N/A**

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Clause	Requirement + Test	Result - Remark	Verdict
14	**COMPONENTS**		**P**
	Accidental change not possible	Voltage setting non-selectable	**P**
14.6	**Mains Transformers Tested Outside Equipment**		**N/A**
14.7	**Printed Circuit Boards**		**P**
	Printed boards shall be made of material with flammability of V-1 or better of IEC 60695-11-10	PCB boards are UL 94V-0 rated	**P**
14.8	**Circuits or Components Used as Transient Overvoltage Limiting Devices**		**N/A**
	After test, no sign of overload or degradation		**N/A**
15	**PROTECTION BY INTERLOCKS**		**N/A**
15.1	**General**		
	Interlocks are designed to remove a hazard before OPERATOR exposed	No interlocks	**N/A**
15.2	**Prevention of Reactivation**		**N/A**
15.3	**Reliability**		
	Single fault unlikely to occur; or		**N/A**
	Cannot cause a HAZARD		**N/A**
16	**HAZARD RESULTING FROM APPLICATION**		
16.1	**Reasonably foreseeable misuse**		**N/A**
16.2	**Ergonomic aspect**		
	No HAZARD from:		**N/A**
	RATED input voltage combinations		**N/A**
	Settings of functions		**N/A**
	Settings of range controls		**N/A**
17	**RISK ASSESSMENT**		
	Manufacturer's declaration		**N/A**

TABLES

TABLE 1: SUMMARY OF SINGLE FAULT CONDITIONS				P
4.4.2 Single Fault Conditions				
Sub-clause	**Title**	**Does Not Apply**	**Carried Out**	**Comments**
4.4.2.2	Protective Impedance		**No**	Protection is relied upon by UL/TUV, CE marked AC adapter provided to power system
4.4.2.3	Protective conductor		**X**	The measured leakage current is below the allowable maximum limits. See Table 10
4.4.2.4	Equipment or parts for short-term or intermittent operation		**X**	Equipment classified for continuous use
4.4.2.5	Motors	**N/A**		
4.4.2.6	Capacitors	**N/A**		No capacitors in the auxiliary winding circuits of motors.
4.4.2.7	Mains transformers		**X**	Mains transformer are part of UL/TUV, CE marked power supply
4.4.2.8	Outputs	**N/A**		
4.4.2.9	Equipment for more than one supply		**X**	Equipment rated for one supply
4.4.2.10	Cooling	**N/A**		
	– air holes closed			
	– fans stopped	**N/A**		
	– coolant stopped	**N/A**		
4.4.2.11	Heating devices	**N/A**		
	– timer overridden	**N/A**		The equipment does not use No heating devices provided.
	– temperature controller overridden	**N/A**		No temperature controllers provided
	– loss of cooling liquid	**N/A**		No cooling liquids provided
	– overfilled or empty or both	**N/A**		
4.4.2.12	Insulation between circuits and parts		**X**	Basic Insulation is provided.
4.4.2.13	Interlocks	**N/A**		The equipment does not provide interlocks.
4.4.2.13	Voltage Selector	**N/A**		

TABLE 2: TESTING IN SINGLE FAULT CONDITIONS – RESULTS (REF 4.4)					P
Test Sub-clause	**Fault No.**	**Fault Description**	**Td 4.4.3 (NOTE)**	**How test was terminated / Comments**	**Meets 4.4.4**
4.4.2.3	1	Protective Conductor Interruption	0:05:00	The measured leakage current is below the allowable maximum limits. See Table 10	**P**

Supplementary information:

NOTE Td = Test duration in h:min:s
Record dielectric strength test on Table 18 and temperature tests on Tables 25 & 26.
Record in the comments column for each test whether carried out during or after SINGLE FAULT CONDITION.

TABLE 3: MAINS TRANSFORMERS (REF 4.4.2.6)				P
4.4.2.6.1 Short Circuit			UL/TUV, CE marked Power supply provided	–
14.7.1 Mains Transformers Tested Outside Equipment			Mains transformers are part of UL/TUV, CE marked Power supply	–
Type.....				–
Manufacturer				–
Test in Equipment				–
Test on Bench				–
Test Repeated Inside Equipment (See 14.7)				–
Optional – Insulation Class (IEC 60085) of the Lowest Rated Winding ...				–
Winding Identification:				
Type of Protector for Winding (Note 1):				
Elapsed Time:				
Specimen Burns to Holding Clamp:				
Current, A – Primary:				
Current, A – Secondary:				
Winding Temperature, °C – Primary:				
Winding Temperature, °C – Secondary:				

Voltage Tests (See Note 3)			

Supplementary information:

Note1: PF = Primary Fuse ( )A;
SF = Secondary Fuse ( )A;
OP = Over-temperature Protection ( )°C
Z = Impedance Protection
Note2: Indicate method of measurement;
TC = With Thermocouple;
R = Resistance Method*;
*If Resistance Method is used, record resistance in cold and warm condition in Table 26.
Note3: Record the voltage applied and the type of voltage (R.M.S. / DC / Peak) and for results use:
NB = No Breakdown;
B = Breakdown

TABLE 4: MAINS SUPPLY (REF 5.1.3C)		P
Marked rating ..... :	100-240VAC	–
Phase ..... :	1ø	–
Frequency ..... :	50/60Hz	–
Current ..... :	0.5A	–
Output Power ..... :	18W	–
Output Voltage ..... :	24Vdc	–

Test No.	Voltage (V)	Frequency (Hz)	Current (mA)	Power In (W)	Power In	Comments
	90	60	170	9		UV Model
	100	60	161	9		UV Model
	120	60	139	9		UV Model
	220	60	92	9		UV Model
	240	60	90	9		UV Model
	264	60	80	9		UV Model
	220	50	87	9		UV Model
	240	50	82	9.4		UV Model
	264	50	77	9.5		UV Model
	90	60	171	9		Day Light Model
	100	60	160	9.		Day Light Model
	120	60	140	9		Day Light Model
	220	60	89	9		Day Light Model
	240	60	86	9.4		Day Light Model
	264	60	81	9.5		Day Light Model
	220	50	87	9		Day Light Model
	240	50	82	9.4		Day Light Model
	264	50	77	9.5		Day Light Model

Supplementary information:

Note: Measurements are only required for marked ratings.

TABLE 6: DURABILITY OF MARKINGS (REF 5.3)	P

Marking Method (See NOTE)	Agent
1. Ink on adhesive backed material	**A:** Water
2.Silk Screen marking	**B:** Isopropyl Alcohol
3.	**C:** (Specify Agent)
4.	**D:** (Specify Agent)
5.	**E:** (Specify Agent)

NOTE – Where applicable include print method, label material, ink or paint type, fixing method, adhesive and surface to which marking is fixed.

Marking Location	Marking Method (See Above)
Identification (5.1.2)	**Black ink marking, ink on adhesive backed paper**
Mains supply (5.1.3)	**Ink on adhesive backed paper**
Fuses (5.1.4)	**N/A**
TERMINALS and operating devices (5.1.5.1)	**N/A**
Measuring circuit TERMINALS (5.1.5.2)	**N/A**
Switches and circuit breakers (5.1.6)	**Silk Screen White ink marking**
DOUBLE/REINFORCED equipment (5.1.7)	**N/A**
Field wiring TERMINAL boxes (5.1.8)	**N/A**
Warning marking (5.2)	**Ink on adhesive backed paper**
Battery charging (13.2.2)	**N/A**

Method	Test Agent	Remains Legible / Verdict	Label Loose / Verdict	Curled Edges / Verdict	Comments
1	B	P	P	P	Labels remained intact and legible
2	B	P	N/A	N/A	Silk Screen marking legible

Supplementary information:

NOTE: 61010-1:2004 Edition stipulates only the use of Isopropyl Alcohol.

TABLE 7: PROTECTION AGAINST ELECTRIC SHOCK – (REF CLAUSE 6)		P
Pollution Degree .....:	2	–
Installation Category .....:	II	–

Location / Description	Insulation Type[1]	Maximum Working[2]	Creepage Distance[3]				Clearance (mm)[3]	Test Voltage (V)[2]	Comments
			PWB (mm)	CTI	Other (mm)	CTI			
Line to ground	BI	240						2100 VDC	**No breakdown**

[1] Type of Insulation	[2] Type of Voltage	[3] Installation Categories (Overvoltage Categories)
BI : Basic Insulation	AC	**Overvoltage category II**
DI : Double Insulation		
PI : Protective Impedance		
RI : Reinforced Insulation		
SI : Supplementary Insulation		

Supplementary information: CE marked AC adapter provided to power system

Note: Measurements are only required for marked ratings.

TABLE 8: LIST OF ACCESSIBLE PARTS		P
6.1.2 Exceptions .....:		–
6.2 Determination of Accessible Parts .....:		–

Item	Description	Determination Method (Note 5)	Exception Under 6.1.2 (Note 4)
1. Enclosure		Visual, obvious	
2.			
3.			
4.			

Note 1: Test fingers and pins are to be applied without force unless a force is specified (see 6.2.1)
Note 2: Special consideration should be given to inadequate insulation and high voltage parts (see 6.2)
Note 3: Parts are considered to be ACCESSIBLE if they could be touched in the absence of any covering which is not considered to provide suitable insulation (see note to paragraph 1 of 6.4).
Note 4: Capacitor test may be required (see Table 9).
Note 5: The determination methods are: visual; rigid test finger; jointed test finger; pin 3 mm diameter; pin 4 mm diameter.

Supplementary information:

TABLE 9: VALUES IN NORMAL CONDITION		P
6.1.2 Exceptions .....:	N/A	–
6.3.1 Values in Normal Condition[1] .....:	P	–
6.6.2 Terminals for External Circuit .....:	N/A	–
6.10.3 Plugs and Connections .....:	N/A	–
11.2 Cleaning and Decontamination.....:	N/A	–
11.3 Spillage .....:	N/A	–
11.4 Overflow .....:	N/A	–

Item	Voltage (V)			Current				Capacitance		10 s Test[2]			Comments
	R.M.S.	Peak	DC	Test Circuit A1/A2/A3	mA R.M.S.	mA Peak	mA DC	µC	mJ	V	µC	mJ	
1	240			A2		0.005							Protective Earth Leakage

Supplementary information:
[1]: The requirements of 6.3.1 include drying out (if specified). For permanently connected equipment, the current values are 1.5 times the specified values.
[2]: Table 7: s test is specified in 6.10.3c).

TABLE 10: VALUES IN SINGLE FAULT CONDITION (REF 6.3.2)												P
Item	Sub-Clause & Fault No.	Voltage (V)			Current				Capacitance [1]	Transient[1]		Comments
		R.M.S	Peak	DC	Test Circuit A1/A2/A3	mA R.M.S	mA Peak	mA DC	µC	V	s	
1	4.4.3 FAULT 1	240			A2		0.017					Protective Earth Leakage

Supplementary information:
[1]: The requirements of 6.3.1 include drying out (if specified). For permanently connected equipment, the current values are 1.5 times the specified values.

TABLE 11: CROSS-SECTIONAL AREA OF BONDING CONDUCTORS (REF 6.5.1.1)		N/A
Conductor Location	**Cross-Sectional Area (mm^2)**	**Verdict**
Supplementary information:		

TABLE 12: TIGHTENING TORQUE TEST (REF 6.5.1.2)			N/A
Conductor Location	**Size of Screw**	**Tightening Torque Nm**	**Verdict**
Supplementary information:			

TABLE 13: BONDING IMPEDANCE OF PLUG CONNECTED EQUIPMENT (REF 6.5.1.3)				P
Accessible Part Under Test	**Test Current (A)**	**Voltage attained after 1 min (V)**	**Calculated Resistance (MAX Allowed 0.1Ω) Ω**	**Verdict**
PS Enclosure	25	1.25V	0.05Ω	**P**
Supplementary information:				

TABLE 14: BONDING IMPEDANCE OF PERMANENTLY CONNECTED EQUIPMENT (REF 6.5.1.4)			N/A
Accessible Part Under Test	**Test Current (A)**	**Voltage attained after 1 min (MAX 10 V) V**	**Verdict**
Supplementary information:			

TABLE 15: INDIRECT BONDING FOR MEASURING AND TEST EQUIPMENT (REF 6.5.1.5)			N/A
Accessible Part Under Test	**Voltage Attained (s)**	**Time for Voltage to Drop to Allowable Levels (s)**	**Verdict**
Supplementary information:			

TABLE 16: PROTECTIVE IMPEDANCE (REF 6.5.3)			P
A HIGH INTEGRITY Single Component			
Component	**Location**	**Comments**	
POWER	AC Adapter	UL/TUV, CE marked AC inlet adapter provided	
A Combination of Components			
Component	**Location**	**Comments**	
A Combination of BASIC INSULATION and a Current or Voltage Limiting Device			
Component	**Location**	**Comments**	
Supplementary information:			

TABLE 17: CLEARANCES AND CREEPAGE DISTANCES (REF 6.7)									P
8 Mechanical Resistance to Shock and Impact .....:						N/A			–
10.5.1 Integrity of Clearances and Creepage Distances.....:						>3, 3			–
Location	Measured (Initial 6.7)		Current			Test at MAX Rated Ambient (10.5.1)	Measured after test (if required)		Verdict
	Creepage Distance (mm)	Clearance (mm)	Applied Force (6.7) N	Rigidity (8.1)	Drop (8.2)		Creepage Distance	Clearance	
Line to enclosure	>3	>3				40°C	>3	>3	P
Supplementary information: Note: Refer to Table 18 for dielectric strength tests following the above tests.									

TABLE 18: DIELECTRIC STRENGTH TESTS (REF 6.8)							P
4.4.4.1b Conformity after Application of Fault Conditions[1] .....:						P	–
6.4 Protection in Normal Condition .....:						P	–
6.5.2 Double Insulation and Reinforced Insulation.....:						N/A	–
6.6.1 Connections to External Circuits .....:						N/A	–
6.10.2.5 Fitting of Non-Detachable Mains Supply Cords[1] .....:						N/A	–
8 Mechanical Resistance to Shock and Impact .....:						N/A	–
9.1a2 Eliminating or Reducing the Sources of Ignition within the Equipment .....:						N/A	–
9.3c Limited-Energy Circuit .....:						N/A	–
11.2 Cleaning[1] .....:						P	–
11.3 Spillage[1] .....:						N/A	–
11.4 Overflow[1] .....:						N/A	–
11.6 Specially Protected Equipment[1] .....:						N/A	–
[1] Record the fault, test or treatment applied before the dielectric strength test							
Test Site Altitude .....:							–
Test Voltage Correction Factor .....:							–
Location	**Clause or Sub-Clause**	**Humidity Yes / No**	**Working Voltage (V)**	**Test Voltage R.M.S/Peak/DC**	**Comments**		**Verdict**
Line to ground	4.4.4.1b	NO	264 VAC	2100 VDC	No breakdown		**P**
	6.4	NO	264 VAC	2100 VDC	No breakdown		**P**
	6.8.2	YES	264 VAC	2100 VDC	No breakdown		**P**
Supplementary information:							

TABLE 19: CORD ANCHORAGES (REF 6.10.2)						N/A
Location	**Mass (kg)**	**Pull (N)**	**Verdict**	**Torque (Nm)**	**Verdict**	**Comments**
Supplementary information:						

TABLE 20: MECHANICAL RESISTANCE TO SHOCK AND IMPACT (REF CLAUSE 8)												P
11 Protection Against Hazards from Fluids .....:									N/A			–
10.5.1 Integrity of Clearances and Creepage Distances.....:									P			–
Location	**Clause 8 Tests**				**Clause 11 Tests**				**Test Voltage (Vdc)**	**Comments**		**Verdict**
	Static	**Dynamic**	**Drop**	**Hand-held Plug-In**	**Cleaning (11.2)**	**Spillage (11.3)**	**Over-flow (11.4)**	**IEC 60529 (11.6)**				
Line to ground									2100	Equipment operated at maximum rated ambient		**P**
Supplementary information: Note1: Voltage tests can be carried out once after performing the tests of clause **8** and clause **11**. However, if voltage tests are carried out separately after each set of tests, two forms may be used. Note2: Use R.M.S, DC or Peak to indicate the used test voltage.												

TABLE 21: PROTECTION AGAINST THE SPREAD OF FIRE (REF CLAUSE 9)				P
Item	**Source of Hazard or area of equipment considered (circuit, component, liquid, etc)**	**Protection Method (9a, 9b or 9c)**	**Protection Details**	**Verdict**
Enclosure	Power supply	9b,	Power supply provided with system to power EUT is UL/TUV, CE marked and meet the separation requirements for insulation	**P**
Supplementary information:				

TABLE 22: CONSTRUCTIONAL REQUIREMENTS (REF 9.2.1)		P
14.8 Printed Circuit Boards .....:	PCB boards are UL 94V-0 approved	–
All PCB rated for min. V-0		
Material Tested .....:		–
Generic Name .....:		–
Material Manufacturer .....:		–
Type .....:		–
Color.....:		–
Conditioning Details .....:		–

Test Type		Sample 1	Sample 2	Sample 3
Thickness of Specimen	**mm**			
Duration of Flaming after First Application	**s**			
Duration of Flaming Plus Glowing after Second Application	**s**			
Specimen Burns to Holding Clamp	**Yes/No**			
Cotton Ignited	**Yes/No**			
Sample Result	**Pass/Fail**			
Supplementary information:				

TABLE 23: LIMITED-ENERGY CIRCUIT (REF 9.3)						N/A
Item	**9.3a MAX Potential in Circuit Voltage (Vdc)**	**9.3b – Current & Power Limitations**			**9.3c Circuit Separation**	**Comments**
		MAX Available Current (A)	**MAX Available Power (VA)**	**Overload Protection after 60 s (A)**		
Supplementary information:						

TABLE 24: REQUIREMENTS FOR EQUIPMENT CONTAINING OR USING FLAMMABLE LIQUIDS (REF 9.4)			N/A
Type of Liquid	**Quantity**	**Containment**	**Verdict**
Supplementary information:			

TABLE 25: TEMPERATURE MEASUREMENTS (REF CLAUSE 10)		P
10.1 Surface Temperature Limits – Normal Condition &/or Single Fault Condition .....:	P	–
10.2 Temperature of Windings – Normal Condition & / or Single Fault Condition .....:		–
10.3 Other Temperature Measurements.....:		–
Operating Conditions .....:		–
Frequency .....:	60Hz	–
Voltage .....:	120 Vac	–
Test Room Ambient (t_a) .....:	19°C	–
Test Duration .....:	4Hr.	–

Part / Location	t_m (°C)	t_c (°C)	t_{max} (°C)	Comments	Verdict
Enclosure(control Box)	40		85	Day Light model	P
Power Supply Enclosure	28		85	Day Light model	P
Enclosure (Light Fixture)	37		85	Day Light model	P
Enclosure(control Box)	40		85	UV model	P
Power Supply Enclosure	28		85	UV model	P
Enclosure (Light Fixture)	37		85	UV model	P

Supplementary information:

Note: t_m = Measured Temperature;

t_{max} = Maximum Permitted Temperature;

t_c = tm corrected ($t_m - t_a$ + 40°C or MAX rated ambient)

TABLE 26: TEMPERATURE OF WINDINGS (RESISTANCE METHOD TEMP. MEASUREMENTS) (REF 10.2)		N/A
4.4.2.6 MAINS Transformers	N/A	–
14.2.1 Motor Temperatures	N/A	–
Operating Conditions		–
Frequency		–
Voltage		–
Test Room Ambient (t_{a1} / t_{a2})		–
Test Duration		–

Part	R_{cold} (Ω)	R_{warm} (Ω)	Current (A)	t_m (°C)	t_c (°C)	t_{max} (°C)	Comments	Verdict

Supplementary information: Mains transformers are part of CE marked power supply provided to power unit

Note 1: R_{cold} = Initial Resistance;
R_{warm} = Final Resitance;
t_m= Measured Temperature;
t_{max} = Maximum Permitted Temperature;
t_c = tm corrected (t_m – t_a + 40°C or MAX rated ambient)
Note 2: Indicate Insulation Class (IEC 85) Under Comments (Optional)
Note 3: Record Values for Normal Condition and / or Single Fault Condition in this Table

TABLE 27: LEAKAGE AND RUPTURE AT HIGH PRESSURE (REF 11.7.2)					N/A
Part	MAX permissible working pressure (MPa)	Test Pressure (MPa)	Leakage (Yes / No)	Burst (Yes / No)	Verdict

Supplementary information:

TABLE 28: LEAKAGE FROM LOW-PRESSURE PARTS (REF 11.7.3)			N/A
Part	Test Pressure (MPa)	Leakage (Yes / No)	Verdict
Supplementary information:			

TABLE 29: IONIZING RADIATION (REF 12.2.1)			N/A
Locations Tested	Measured Values (µSv/h)	Comments	Verdict
Supplementary information:			

TABLE 30: SOUND LEVEL (REF 12.5.1)			N/A
Locations Tested (At operator's normal position and bystanders' positions)	Measured Values (dBA)	MAX Sound Pressure Level (dBA)	Verdict
a)			
b)			
c)			
d)			
e)			
Supplementary information:			

TABLE 31: ULTRASONIC PRESSURE (REF 12.5.2)				N/A
Locations Tested (At operator's normal position at 1 m from the enclosure)	Measured Values		Comments	Verdict
	dB	kHz		
a)				
b)				
c)				
Supplementary information: Note: No limit is specified at present, but a limit of 110 dB above the reference pressure value of 20 μPa is under consideration for applicable frequencies between 20 kHz and 100 kHz				

TABLE 32: BATTERIES (REF 13.2.2)			N/A
Battery Load and Charging Circuit Diagram:			–
Battery Type .....:			–
Battery Manufacturer/ Model/ Catalogue No. .....:			–
Battery Ratings .....:			–
Reverse Polarity Instalment Test .....:			–
Single Component Failures	**Verdict**		
Component	**Open Circuit**	**Short-Circuit**	
Supplementary information: Note 1: NSR = Non-Self Resetting (10 Times); NR = Non-Resetting (1 Time); SR = Self-Resetting (200 Times)			

TABLE 33: OVERTEMPERATURE PROTECTION DEVICES (REF 14.3)			N/A
Reliability Test			
Component	**Type (Note)**	**Comments**	**Verdict**
Supplementary information: Thermal switch is VDE certified			

TABLE 34: CURRENT MEASURING CIRCUITS (CURRENT TRANSFORMERS) (REF 16.1A)					N/A
Type / Model	Rated Current (A)	Test Current (A)	Interrupt (Yes / No)	Comments	Verdict
Supplementary information:					

TABLE 35: CURRENT MEASURING CIRCUITS (RANGE CHANGING SWITCHES) (REF 16.1B)			N/A
Type / Model	MAX Rated Current of Switch (A)	Comments	Cycling Test Verdict
Supplementary information:			

TABLE 36: MULTIFUNCTIONAL METERS AND SIMILAR EQUIPMENT (REF 16.2)		N/A
Operating Conditions .....:		–
Maximum Rated Voltage Applied (V) .....:		–
Measurement Category .....:		–
Test Source Limit (KVA) .....:		–

Function	Range	Verdict
Supplementary information:		

TABLE 37: CRITICAL COMPONENTS TABLE					P
OBJECT/PART NO.	**MANUFACTURER/ TRADEMARK**	**TYPE/MODEL**	**TECHNICAL DATA**	**STANDARD**	**MARK(S) OF CONFORMITY**
AC/DC Power Supply	Meanwell	GST18A24-P1J	100-240Vac, 50/60Hz, 0.5A, Output 24Vdc, 0.75A		UL, TUV, CE
PCB (Light Ring and Control Box)	Various	Various	Flammability Rating 94V-0 min		UL
Power Cord	Various	Various	250V, 5A		UL
Enclosure (Control Box)	Aides Prospector	POLYLAC® PA-765	Acrylonitrile Butadiene Styrene 94 V-0		UL

PHOTOS

FIGURE 1: PROLINE 8X SERIES SYSTEM

(typical for all models evaluated)

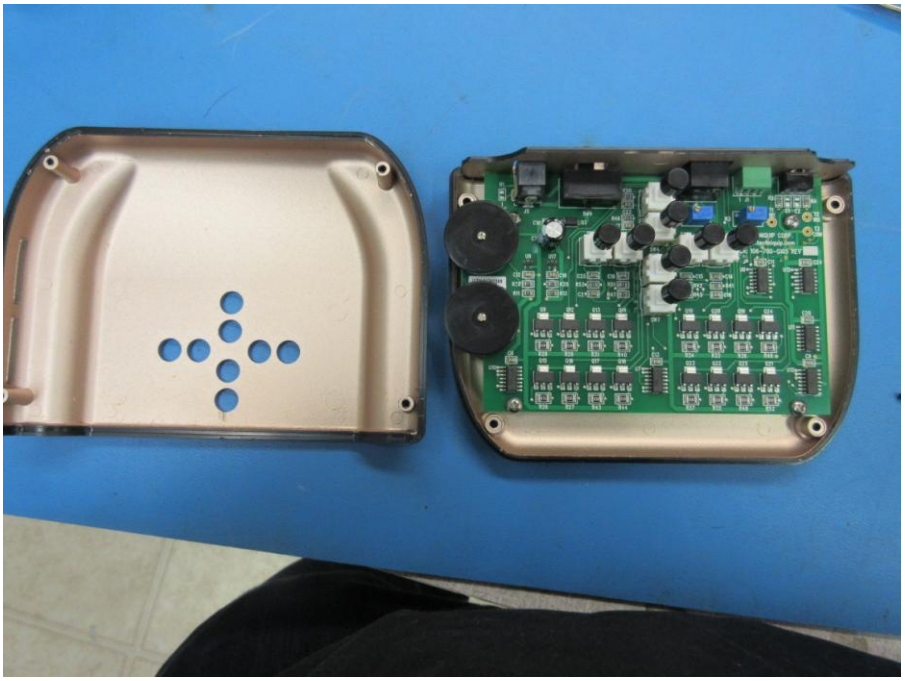

FIGURE 2: CONTROL BOX (INTERNAL)

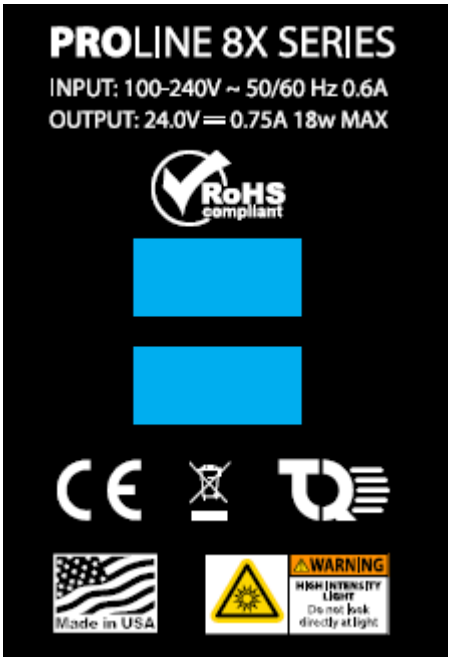

FIGURE 3: RATING LABEL

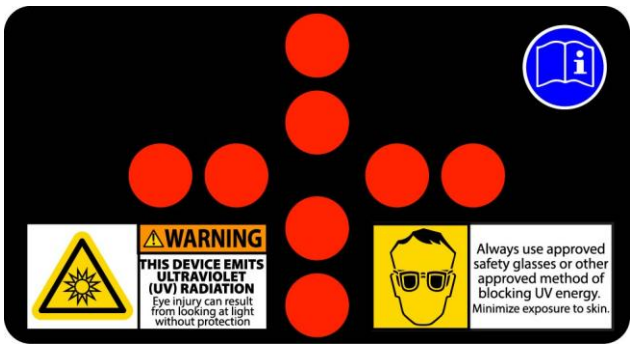

FIGURE 4: LIGHT RING (UV) HAZARD WARNING LABEL