



**IEC 61010-1: 2001, Second Edition
EN 61010-1: 2001, Second Edition**

TEST REPORT

FOR

RF IC TEST SYSTEM

MODEL NUMBER: RI8568B

REPORT NUMBER: 11U13842-2

ISSUE DATE: JULY 14, 2011

Prepared for

**ROOS INSTRUMENTS, INC.
2285 MARTIN AVENUE, SUITE C
SANTA CLARA, CA 95050, U.S.A.**

Prepared by

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Revision History

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ROOS INSTRUMENTS, INC.
2285 MARTIN AVENUE, SUITE C
SANTA CLARA, CA 95050, U.S.A.

EUT DESCRIPTION: RF IC TEST SYSTEM

MODEL: RI8568B

SERIAL NUMBER: ENGINEERING SAMPLE

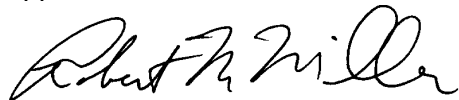
DATE TESTED: MAY 31, 2011 and JUNE 1 & 2, 2011

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
IEC 61010-1: 2001, Second Edition	Pass
EN 61010-1: 2001, Second Edition	Pass

Compliance Certification Services, Inc. (UL CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

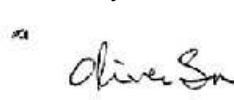
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:



BOB MILLER
SINOR STAFF ENGINEER
UL CCS

Tested By:



OLIVER SU
SAFETY ENGINEER, SUPERVISOR
UL CCS

2. TEST METHODOLOGY

All tests were performed in accordance with the procedures documented in IEC 61010-1: 2001, Second Edition, "Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements" and EN 61010-1: 2001, Second Edition, "Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements".

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. INSTRUMENTS AND CALIBRATION

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	Manufacturer	Model	Asset	Cal Date	Cal Due
MULTIMETER	JOHN FLUKE	FLUKE 45	C00502	8/30/2010	8/30/2012
TRUE RMS MULTIMETER	FLUKE	26III	N/A	3/28/2011	12/28/2012
TEMPERATURE RECORDER	FLUKE	HYDRA SERIES II 2620A	C01152	3/1/2011	12/1/2012
ELECTRONIC LOAD	KIKUSUI	PLZ300W	N02877	10/6/2009	10/6/2011
ELECTRONIC LOAD	KIKUSUI	PLZ300W	N02880	10/6/2009	10/6/2011
ELECTRONIC LOAD	KIKUSUI	PLZ1002W	N02646	4/26/2011	1/26/2013
DIGITAL POWER ANALYZER	VALHALA SCIENTIFIC	2100	C01151	6/23/2011	3/23/2013
DIGIMATIC CALIPER	MITUTOYO	500-96, CD-6"	N02612	1/27/2010	1/27/2012
OSCILLOSCOPE	AGILENT/HP	54601A	C00853	2/22/2010	2/22/2012
PROBE, 100X	TEKTRONIX	P5100	N02404	2/3/2011	2/3/2013
CURRENT LEAKAGE TESTER	SIMPSON	228	CCS-0148	2/14/2011	5/14/2012
CURRENT SHUNT	WESTON / TRANSCAT	HA 5050	N/A	2/24/2011	2/24/2012
AC SOURCE	PSC INC.	30D	C02484	NCR	NCR
AC POWER SOURCE	APC	AFP2-8KVA	C00921	NCR	NCR
IR & AC/DC HI-POT TESTER	ASSOCIATED RESEARCH	3570D	C00904	2/4/2011	2/4/2013

5. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

5.1.1. TEST ITEM DESCRIPTION

Trademark	See Photo (on page 65 of this report)
Manufacturer	ROOS Instruments, Inc.
Factory	2285 Martin Avenue, Suite C, Santa Clara, CA 95050, U.S.A.
Model and/or type reference	R18568B
Serial number	GAL7XZY4
Rating(s)	100-240V AC, 50-60Hz, 0.75KVA

5.1.2 DESCRIPTION OF MODEL DIFFERENCES

Not available.

5.1.2. MAXIMUM NORMAL LOAD (MNL)

EUT is connected with 9 pieces of test modules, and running software to activate these test modules provided by the manufacturer.

5.1.3. COPY OF MARKING PLATE



5.1.4. PARTICULARS: TEST ITEM VS. TEST REQUIREMENTS

Equipment mobility	Fixed equipment & movable
Operating condition	continuous
Mains supply tolerance (%)	+/- 10 %
Tested for IT power systems	No
IT testing, phase-phase voltage (V)	Not applicable
Class of equipment	Class I
Maximum Operating Temperature (Tma, deg C)	30
Mass of equipment (kg)	180
Protection against ingress of water	IPX0

5.1.5. TESTING

Date of receipt of test item	May 31, 2011
Date(s) of performance of test	May 31, 2011 & June 1-2, 2011

6. RESULTS

6.1. GENERAL REMARKS

"see enclosure #" refers to additional information appended to the report.

"see appended table" refers to a table appended to the report.

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

TEST CASE VERDICTS

Test case does not apply to the test object	N (Not Applicable)
Test item does meet the requirement	P (Pass)
Test item does not meet the requirement	F (Fail)

6.2. TEST RESULTS

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
5	MARKING AND DOCUMENTATION		P
5.1.1	General		P
	Required equipment markings are:	Manufacturer name, model number, ratings	P
	visible:		P
	From the exterior; or		P
	After removing a cover; or		N
	Opening a door		N
	After removal from a rack or panel		P
	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		N
5.1.2	Identification		P
	Equipment is identified by:		-
5.1.2a)	Manufacturer's or supplier's name or trademark		P
5.1.2b)	Model number, name or other means		P
	Manufacturing location identified	Silk-screen printed on the enclosure of product	
5.1.3a)	Nature of supply:		
	1) a.c. RATED mains frequency or range of frequencies		P
	2) d.c. with symbol 1		N
5.1.3b)	RATED supply voltage(s) or range		N
5.1.3c)	Max. RATED power (W or VA) or input current :	0.75 KVA	P
	The measured value not more than 110 %		P
	If more than one voltage range:		
	Separate values marked; or		N
	Values differ by less than 20 %		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
5.1.3d)	OPERATOR-set for different RATED supply voltages:		
	Indicates the equipment set voltage		N
	PORTABLE EQUIPMENT indication is visible from the exterior		N
	Changing the setting changes the indication		N
5.1.3e)	Accessory mains socket-outlets accepting standard mains plugs are marked:		
	With the voltage if it is different from the mains supply voltage		N
	For use only with specific equipment		N
	If not marked for specific equipment it is marked with:		
	The maximum RATED current or power; or		N
	Symbol 14 with full details in the documentation		N
5.1.4	Fuses		
	OPERATOR replaceable fuse marking (see also 5.4.5)	No operator replaceable fuse	N
5.1.5	TERMINALS, connections and operating devices		
	Where necessary for safety, indication of purpose of TERMINALS, connectors, controls and indicators marked		P
	If insufficient space, symbol 14 used		P
5.1.5.1	TERMINALS		P
	Mains supply TERMINALS identified		N
	Other TERMINAL marking		P
5.1.5.1a)	FUNCTIONAL EARTH TERMINALS (symbol 5 used)		N
5.1.5.1b)	PROTECTIVE CONDUCTOR TERMINALS:	The PROTECTIVE CONDUCTOR TERMINAL is part of IEC 60320 approved MAINS appliance inlet.	P
	Symbol 6 is placed close to or on the TERMINAL; OR		N
	Part of appliance inlet		P
5.1.5.1c)	TERMINALS of measuring and control circuits (symbol 7 used)		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
5.1.5.1d)	HAZARDOUS LIVE TERMINALS supplied from the interior		
	Standard MAINS socket outlet; or		N
	RATINGS marked; or		N
	Symbol 14 used		N
5.1.5.1e)	ACCESSIBLE FUNCTIONAL EARTH TERMINALS:		N
	Self-evident; or		N
	Indication (symbol 8 acceptable)		N
5.1.5.2	Measuring circuit TERMINALS	Measuring circuit TERMINALS are less than 50V a.c. or 120V d.c.	
	For TERMINALS other than those permanently connected and not ACCESSIBLE:		
	RATED voltage or current marked		
	Unless clear indication that below limits:		
	Maximum RATED voltage to earth is marked; or		N
	For specific connection to other equipment TERMINALS only, and means for identifying provided		N
	Appropriate measurement category marked (CAT II, CAT III or CAT IV); or		N
	No measurement category marked (CAT I)		N
	Required markings are adjacent to TERMINALS; OR		N
	If insufficient space:		
	On the RATING plate or scale plate; or		N
	TERMINAL is marked with symbol 14		N
5.1.6	Switches and circuit breakers		
	If disconnecting device, on or off position marked		P
5.1.7	Equipment protected by DOUBLE INSULATION or REINFORCED INSULATION	Protected by BASIC INSULATION	
	Protected throughout (symbol 11 used)		N
	Only partially protected (symbol 11 not used)		N
5.1.8	Field-wiring TERMINAL boxes	None used	

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	If TERMINAL or ENCLOSURE exceeds 60 °C:		
	Cable temperature RATING marked		N
	Marking visible or beside TERMINAL		N
5.2	Warning markings	None provided	
	Visible when ready for NORMAL USE		N
	Are near or on applicable parts		N
	Symbols and text correct dimensions and colour		N
	If necessary marked with symbol 14		
	Statement to isolate or disconnect		N
5.3	Durability of markings		
	The required markings remain clear and legible in NORMAL USE		P
5.4	Documentation		
5.4.1	General		P
	Equipment is accompanied by documentation which includes:		
5.4.1a)	Intended use		P
5.4.1b)	Technical specification		P
5.4.1c)	Instructions for use		P
5.4.1d)	Name and address of manufacturer or supplier		P
5.4.1e)	Information specified in 5.4.2 to 5.4.5		
5.4.1f)	If marking of TERMINALS required, definition of measurement category		N
5.4.1g)	If CAT 1:		
	Warning		N
	RATINGS		N
	Warning statements and a clear explanation of warning symbols:		
	Provided in the documentation; or		N
	Information is marked on the equipment		N
5.4.2	Equipment RATINGS		
	Documentation includes:		
5.4.2a)	Supply voltage or voltage range	100-240 VAC	P

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Frequency or frequency range	50 or 60 Hz	P
	Power or current RATING	0.75 KVA	P
5.4.2b)	Description of all input and output connections	In operation manual	P
5.4.2c)	RATING of insulation of external circuits, when such circuits are nowhere ACCESSIBLE		N
5.4.2d)	Statement of the range of environmental conditions	Operating temperature range 10-35°C; 8-80% RH.	P
5.4.2e)	Degree of protection (IEC 60529)	Ordinary	N
5.4.3	Equipment installation		
	Documentation includes instructions for:		
5.4.3a)	Assembly, location and mounting		P
5.4.3b)	Protective earthing		N
5.4.3c)	Connections to supply		P
5.4.3d)	PERMANENTLY CONNECTED EQUIPMENT:		
	1) Supply wiring requirements		N
	2) If external switch or circuit-breaker, requirements and location recommendation		N
5.4.3e)	Ventilation requirements		N
5.4.3f)	Special services (e. g. air, cooling liquid)	Requires compressed air 80-120 PSI	P
5.4.3g)	Maximum sound power level		N
5.4.3h)	Instructions about sound pressure		N
5.4.3i)	Permanently connected measuring TERMINALS:		
	Measurement category		N
	RATED maximum WORKING VOLTAGE or current		N
5.4.4	Equipment operation		
	Instructions for use include:		
5.4.4a)	Identification of operating controls		P
5.4.4b)	Positioning for disconnection		N
5.4.4c)	Interconnection		P
5.4.4d)	Specification of intermittent operation limits		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
5.4.4e)	Explanation of symbols used		N
5.4.4f)	Replacement of consumable materials		N
5.4.4g)	Cleaning and decontamination (see 11.2)		N
5.4.4h)	Listing of any poisonous or injurious gases and quantities		N
5.4.4i)	Risk-reduction procedures relating to flammable liquids		N
	A statement about protection impairment if used in a manner not specified by the manufacturer		N
5.4.5	Equipment maintenance		
	Instructions include:		
	Sufficient preventive maintenance and inspection information	In operation manual	P
	Replacement of hoses, etc.		N
	Specific battery type		N
	Any manufacturer specified parts		N
	RATING and characteristics of fuses	No user replaceable fuse	N
6	PROTECTION AGAINST ELECTRIC SHOCK		
6.1	General		
6.1.1	Requirements		
	ACCESSIBLE parts not HAZARDOUS LIVE in NORMAL CONDITION and SINGLE FAULT CONDITION		P
	Conformity is checked by the determination of 6.2 and 6.3 followed by the tests of 6.4 to 6.11		
6.1.2	Exceptions		
	Capacitance test		P
	Parts not HAZARDOUS LIVE 10 s after interruption of supply	After 0.5 s, voltage was 0 V measured.	P
6.2	Determination of ACCESSIBLE parts		
6.2.1	General examination		P
6.2.2	Openings above parts that are HAZARDOUS LIVE	None	P

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
6.2.3	Openings for pre-set controls	None	
6.3	Permissible limits for ACCESSIBLE parts		
6.3.1	Values in NORMAL CONDITION	Less than 33Vrms and 46.7Vpeak or 70Vdc	P
6.3.2	Values in SINGLE FAULT CONDITION	Less than 55Vrms and 78 Vpeak or 140Vdc	P
6.4	Protection in NORMAL CONDITION (see 6.2, 6.3.1, 6.7, 6.8 and 8.1)	BASIC INSULATION and Enclosures	P
6.5	Protection in SINGLE FAULT CONDITION		
	Additional protection is provided by:		
	One or more of 6.5.1 to 6.5.3; or	Protective bonding	P
	Automatic disconnection of the supply (6.5.4)		N
6.5.1	Protective BONDING		
	ACCESSIBLE conductive parts:		
	Separated by DOUBLE INSULATION or REINFORCED INSULATION; or		N
	Bonded to the PROTECTIVE CONDUCTOR TERMINAL; or		P
	Separated by screen or BARRIER bonded to PROTECTIVE CONDUCTOR TERMINAL from parts which are HAZARDOUS LIVE		N
6.5.1.1	Integrity of PROTECTIVE BONDING		
6.5.1.1a)	PROTECTIVE BONDING consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses		P
6.5.1.1b)	Soldered connections:		
	Independently secured		P
	Not used for other purposes		P
	Screw connections are secured		P
6.5.1.1c)	PROTECTIVE BONDING not interrupted		P
6.5.1.1d)	Any moveable connection specifically designed, and meets 6.5.1.3		N
6.5.1.1e)	No external metal braid of cables used		P
6.5.1.1f)	If MAINS supply passes through:		
	Means provided for passing protective conductor;		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Impedance meets 6.5.1.3.		N
6.5.1.1g)	Protective conductors bare or insulated, if insulated, green/yellow		P
	Exceptions:		
	1) earthing braids;		N
	2) internal protective conductors etc.;		N
	Green/yellow not used for other purposes		P
6.5.1.1h)	TERMINAL suitable, and meets 6.5.1.2		N
6.5.1.2	Protective conductor terminal		
6.5.1.2a)	Contact surfaces are metal		N
6.5.1.2b)	Appliance inlet used	Protective conductor terminal is integral part of Appliance Inlet	P
6.5.1.2c)	For rewirable cords and PERMANENTLY CONNECTED EQUIPMENT, PROTECTIVE CONDUCTOR TERMINAL is close to MAINS supply TERMINALS	Equipment has no provision for rewirable flexible cord	N
6.5.1.2d)	If no MAINS supply is required, any PROTECTIVE CONDUCTOR TERMINAL:		
	Is near TERMINALS of circuit for which protective earthing is necessary		N
	External if other TERMINALS external		N
6.5.1.2e)	Equivalent current-carrying capacity to MAINS supply TERMINALS		P
6.5.1.2f)	If plug-in, makes first and breaks last		P
6.5.1.2g)	If also used for other bonding purposes, protective conductor:		
	Applied first;		N
	Secured independently;		N
	Unlikely to be removed by servicing; or		N
	Warning marking requires replacement of protective conductor		N
6.5.1.2h)	Protective conductor of measuring circuit:		
	1) Current RATING;		P
	2) PROTECTIVE BONDING:		
	Not interrupted; or		P

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Indirect bonding used (see 6.5.1.5)		N
6.5.1.2i)	FUNCTIONAL EARTH TERMINALS allow independent connection		P
6.5.1.2j)	If a binding screw:		
	Suitable size for bond wire		P
	Not smaller than M 4 (No. 6)		P
	At least 3 turns of screw engaged		P
	Contact pressure not capable of reduction by deformation of materials		N
	Passes tightening torque test		N
6.5.1.3	Impedance of PROTECTIVE BONDING of plug-connected equipment	Less than 0.1 Ω	P
6.5.1.4	Bonding impedance of PERMANENTLY CONNECTED EQUIPMENT	Not PERMANENTLY CONNECTED EQUIPMENT	N
6.5.1.5	Indirect bonding for measuring and test equipment	Not provided in this product	N
6.5.2	DOUBLE INSULATION and REINFORCED INSULATION (see 6.7, 6.8 and 6.9.2)		
6.5.3	PROTECTIVE IMPEDANCE		P
6.5.3a)	HIGH-INTEGRITY single component used (see 14.6); or		N
6.5.3b)	A combination of components used; or		N
6.5.3c)	A combination of BASIC INSULATION and current- or voltage-limiting device used		P
	Components, wires and connections are RATED as required		P
6.5.4	Automatic disconnection of the supply	Not provided in this product	N
	If used, it meets :		
6.5.4a)	Supplied with the equipment; or		N
	Specified by installation instruction		N
6.5.4b)	RATED disconnecting time within limit specified		N
6.5.4c)	RATED for maximum RATED LOAD		N
6.6	Connections to external circuits		P
6.6.1	General		

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Connections do not cause ACCESSIBLE parts of the following to become HAZARDOUS LIVE in NORMAL CONDITION or SINGLE FAULT CONDITION:		
6.6.1a)	The external circuits		P
6.6.1b)	The equipment		P
	Separation of circuits provided; or		P
	Short circuit of separation does not cause a Hazard	Maximum 3.25 V dc measured	P
	Instructions or markings include:		
	1) RATED conditions for TERMINAL		N
	2) Required RATING of external circuit insulation		N
6.6.2	TERMINALS for external circuits		
	TERMINALS which receive a charge from an internal capacitor are not HAZARDOUS LIVE	No HAZARDOUS LIVE voltage presented on TERMINALS for external circuits	P
	High voltage TERMINALS energized from the interior are:		
	Not ACCESSIBLE if connected; or	Not present	N
	Unmated HAZARDOUS LIVE TERMINALS not ACCESSIBLE ; or		N
	marked with symbol 12		N
6.6.3	Circuits with TERMINALS which are HAZARDOUS LIVE	Not present	
	These circuits are:		
	Not connected to ACCESSIBLE conductive parts; or		N
	Connected to ACCESSIBLE conductive parts, but are not MAINS CIRCUITS and have one TERMINAL contact at earth potential		N
	No ACCESSIBLE conductive parts are HAZARDOUS LIVE		N
6.6.4	ACCESSIBLE TERMINALS for stranded conductors	No ACCESSIBLE TERMINALS for stranded conductors are used	
6.6.4a)	No risk of accidental contact because:		
	Located or shielded		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Self-evident or marked whether connected to ACCESSIBLE conductive parts		N
6.6.4b)	ACCESSIBLE TERMINALS will not work loose		N
6.7	CLEARANCES and CREEPAGE DISTANCES	All components related to the requirements are investigated in the separate certification.	P
6.8	Procedure for dielectric strength tests		P
6.9	Constructional requirements for protection against electric shock		
6.9.1	General		
	If a failure could cause a HAZARD:		
6.9.1a)	Security of wiring connections		P
6.9.1b)	Screws securing removable covers		P
6.9.1c)	Accidental loosening		P
	Easily damaged materials not used		P
	Non-impregnated hydroscopic materials not used		P
6.9.2	ENCLOSURES of equipment with DOUBLE INSULATION or REINFORCED INSULATION		
	ENCLOSURE surrounds all metal parts except for small metal parts which are separated		N
	ENCLOSURES or parts made of insulating material		N
	Protection for metal ENCLOSURES or parts by:		
6.9.2a)	An insulating coating or BARRIER on the inside; or		N
6.9.2b)	CLEARANCES and CREEPAGE DISTANCES cannot be reduced by loosening of parts or wires		N
6.9.3	Over-range indication		
	Unambiguous		N
6.10	Connection to MAINS supply source and connections between parts of equipment		
6.10.1	MAINS supply cords		
6.10.1a)	RATED for maximum equipment current (see 5.1.3c)	Mains supply cord is rated 16A, 250V; and maximum currents measured are 4A at 90V and 1.6A at 240V.	P

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Cable complies with IEC 60227 or IEC 60245	Mains supply cord used is approved to IEC 60227	P
6.10.1b)	Heat-resistant if likely to contact hot parts		N
6.10.1c)	Temperature RATING (cord and inlet)		N
6.10.1d)	Green/yellow used only for connection to PROTECTIVE CONDUCTOR TERMINALS	Mains supply cord used is approved to IEC 60227	P
	Detachable cords with IEC 60320 MAINS connectors:		
	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		
	Non-detachable cord protection:		
a)	Inlet or bushing smoothly rounded; or	Inlet provided	P
b)	Insulated cord guard protruding $\geq 5D$		N
	The protective earth conductor is the last to take the strain		N
	Cord anchorages:		
6.10.2a)	Cord is not clamped by direct pressure from a screw		N
6.10.2b)	Knots are not used		N
6.10.2c)	Cannot push the cord into the equipment to cause a hazard		N
6.10.2d)	No failure of cord insulation in anchorage with metal parts		N
6.10.2e)	compression bushing:		
	1) Clamps all types and sizes of MAINS cords; and		N
	2) Is suitable:		
6.10.3	Plugs and connectors		
6.10.3a)	MAINS supply plugs, connectors etc., conform with relevant specifications		P
6.10.3b)	If equipment supplied at voltages below 6.3.2.a) or from a sole source:		
	Plugs of supply cords do not fit MAINS sockets above RATED supply voltage		N
	MAINS-type plugs used only for connection to MAINS supply		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
6.10.3c)	Plug pins which receive a charge from an internal capacitor	0 Vac measured after 0.5s	P
6.10.3d)	Accessory MAINS socket outlets:	Not provided	
	1) Marking if accepts a standard MAINS plug (see 5.1.3e)		N
	2) Input has a protective earth conductor if outlet has earth TERMINAL contact		N
6.11	Disconnection from supply source		
6.11.1	General		
	Disconnects all current carrying conductors		P
6.11.1.1	Exceptions		
6.11.1.1a)	Equipment supplied by low energy source; or		N
6.11.1.1b)	Equipment connected to impedance protected supply; or		N
6.11.1.1c)	Equipment constitutes an impedance protected load		N
6.11.2	Requirements according to type of equipment		
6.11.2.1	PERMANENTLY CONNECTED EQUIPMENT and multi-phase equipment		
	Employs switch or circuit-breaker		N
	If switch or circuit-breaker is not part of the equipment, documentation specifies:		
6.11.2.1a)	Switch or circuit-breaker to be included in building installation		N
6.11.2.1b)	Location		N
6.11.2.1c)	Marking		N
6.11.2.2	Single-phase cord-connected equipment		
	Equipment is provided with:		
6.11.2.2a)	Switch or circuit-breaker; or	Switch (circuit breaker) is provided on the equipment	P
6.11.2.2b)	Appliance coupler (disconnectable without TOOL); or		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
6.11.2.2c)	Separable plug (without locking device)	A separable plug is provided on Mains supply cord	P
6.11.2.3	HAZARDS arising from function		
	Emergency switch	Provided	P
	Emergency switch ≤ 1 m from the moving part		P
6.11.3	Disconnecting devices		
	Electrically close to the supply		P
6.11.3.1	Switches and circuit-breakers		
	When used as disconnection device:		
	Meets IEC 60947-1 and IEC 60947-3	Circuit breakers are certified to IEC 60934; per IEC 60947-2, paragraph 1.1 says “The requirements for circuit-breaker for equipment are contained in IEC 60934.	P
	Marked to indicate function		P
	Not incorporated in MAINS cord		P
	Does not interrupt protective earth conductor		N
	If has other contacts meets separation requirements of 6.6 and 6.7		N
6.11.3.2	Appliance couplers and plugs		
	Where an appliance coupler or separable plug is used as the disconnecting device (see 6.11.2.2):		
	Readily identifiable and easily reached by the OPERATOR		P
	Single-phase PORTABLE EQUIPMENT cord length ≤ 3 m	Mains supply power cord is 2.5 m long.	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 7.6		P

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
7.2	Moving parts		
	Moving parts not able to crush, etc. (see also 6.11.2.3)	1. Test Head and arm mechanism can be vertically raised / lowered by using UP/DOWN buttons on the top of Power Control Unit. User has to press & hold the UP/DOWN buttons to make it works, it is an obvious movement, which is unlikely to crush, cut or pierce parts of the body of an operator. 2. Rotation of Test Head can be manually adjusted, which is unlikely to crush, cut or pierce parts of the body of an operator. 3. Exchanging Test Instrument Modules can be easily removed or loaded, which is unlikely to crush, cut or pierce parts of the body of an operator.	P
7.2a)	Access requires TOOL		N
7.2b)	Statement about training		N
7.2c)	Warning markings or symbol 14		N
7.3	Stability		
	Marking of non-automatic means		N
	Conformity tests:		
7.3a)	10° tilt test		P
7.3b)	multi-directional force test		P
7.3c)	downward force test		N
7.4	Provisions for lifting and carrying	Equipment is mounted with cast rollers on the bottom of enclosure for easier moving	
	Handles or grips withstand four times weight		N
	Equipment >18 kg :		
	Has means for lifting or carrying; or		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Directions in documentation		N
7.5	Wall mounting	Not wall mounted	
	Mounting brackets withstand four times weight		N
7.6	Expelled parts	No such parts	
	Equipment contains or limits the energy		N
	Protection not removable without the aid of a TOOL		N
8	MECHANICAL RESISTANCE TO SHOCK AND IMPACT	Metal enclosure covers all components	
	After the tests of 8.1 to 8.2:		
	Voltage tests		P
	Inspections:		
8a)	HAZARDOUS LIVE parts not accessible		P
8b)	ENCLOSURE shows no cracks (hazard)		P
8c)	CLEARANCES not less than their permitted values		P
8d)	BARRIERS not damaged or loosened		P
8e)	No moving parts exposed, except permitted by 7.2		P
8f)	No damage which could cause spread of fire		P
9	PROTECTION AGAINST THE SPREAD OF FIRE		
	Conformity for each source of HAZARD or area of the equipment is checked by one of the following:	By 9.a) and 9.c)	
9a)	Fault test of 4.4; or		P
9b)	Application of 9.1 (eliminating or reducing the sources of ignition); or		N
9c)	Application of 9.2 (containment of fire within the equipment)		P
9.1	Eliminating or reducing the sources of ignition within the equipment		
9.1a)	1) Limited-energy circuit (see 9.3); or		N
	2) Insulation meets the requirements for BASIC INSULATION; OR		N
	Bridging the insulation does not cause ignition		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
9.1b)	Surface temperature of liquids and parts (see 9.4.a)		N
9.1c)	No ignition in circuits designed to produce heat		N
9.2	Containment of the fire within the equipment, should it occur		
9.2a)	Energizing of the equipment is controlled by an OPERATOR held switch		P
9.2b)	Enclosure is conform with constructional requirements of 9.2.1; and		P
	Requirements of 9.4b) or c) are met		P
9.2.1	Constructional requirements		
9.2.1a)	Insulated wires have flammability classification FV1 or better		P
	Connectors and insulating material have flammability classification FV2 or better		P
9.2.1b)	The enclosure is constructed as follows:		
	1) Bottom constructed with:		
	No openings; or		P
	Extent as specified in figure 7; or		P
	Baffles as specified in figure 6; or		N
	Perforated as specified in Table 12; or		N
	Metal screen with a mesh		N
	2) Sides have no openings as specified in figure 7		N
	3) Material of ENCLOSURE and any baffle or flame barrier is made of:		
	Metal (except magnesium); or		N
	Non metallic materials have flammability classification FV1 or better		P
	4) ENCLOSURE and any baffle or flame barrier have adequate rigidity		P
9.3	Limited-energy circuit		
9.3a)	Potential not more than 30 r.m.s. and 42.4 V peak, or 60 V dc		N
9.3b)	Current limited by one of following means:		
	1) Inherently or by impedance; or		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	2) Overcurrent protective device; or		N
	3) A regulating network limits also in SINGLE FAULT CONDITION		N
9.3c)	Is separated by at least BASIC INSULATION		N
	If overcurrent protective device used:		
	Fuse or a non adjustable electromechanical device		N
9.4	Requirements for equipment containing or using flammable liquids	No flammable liquids are used in the equipment	N
	Flammable liquids contained in or specified for use with equipment do not cause spread of fire		N
	Risk is reduced to a tolerable level :		
9.4a)	The temperature of surface or parts in contact with flammable liquids is 25 °C below fire point		N
9.4b)	The quantity of liquid is limited		N
9.4c)	Flames are contained within the equipment		N
	Detailed instructions for risk-reduction provided		N
9.5	Overcurrent protection	Mains circuit breaker is provided	P
	Devices not in the protective conductor		P
	Fuses or single-pole circuit-breakers not fitted in neutral (multi-phase)		P
9.5.1	PERMANENTLY CONNECTED EQUIPMENT	Not PERMANENTLY CONNECTED EQUIPMENT	N
	Overcurrent device:		
	Fitted within the equipment; or		N
	Specified in manufacturer's instructions		N
9.5.2	Other equipment		P
	Protection within the equipment	Mains circuit breaker is provided within the equipment	P
10	EQUIPMENT TEMPERATURE LIMITS AND RESISTANCE TO HEAT		

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
10.1	Surface temperature limits for protection against burns	Refer table 10.4	
	Easily touched surfaces within the limits		P
	Heated surfaces necessary for functional reasons exceeding specified values:		
	Are recognizable as such by appearance or function; or		N
	Are marked with symbol 13		N
	Guards are not removable without TOOL		P
10.2	Temperatures of windings	Not part of this evaluation. (It was investigated in the separate certification of AC-DC Power Supply)	N
	Limits not exceeded in:		
	NORMAL CONDITION		N
	SINGLE FAULT CONDITION		N
10.3	Other temperature measurements		N
	Following measurements conducted if applicable:		
10.3a)	Value of 60 °C of field-wiring TERMINAL box not exceeded		N
10.3b)	Surface of flammable liquids and parts in contact with this liquids		N
10.3c)	Surface of non-metallic ENCLOSURES		P
10.3d)	Parts made of insulating material supporting parts connected to MAINS supply		N
10.3e)	TERMINALS carrying a current more than 0.5 A		N
10.4	Conduct of temperature test	Maximum temperature is determined at 40°C ambient; temperature are measured when steady state has been reached	P
10.5	Resistance to heat		P
10.5.1	Integrity of CLEARANCE and CREEPAGE DISTANCES		P
10.5.2	Non-metallic ENCLOSURES		N
	After treatment:		N
	No HAZARDOUS LIVE parts ACCESSIBLE;		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Tests of 8.1 and 8.2		N
	In case of doubt, tests of 6.8 (without humidity preconditioning)		N
10.5.3	Insulating material	Not part of this evaluation. (It was investigated in the separate certification of AC-DC Power Supply)	P
10.5.3a)	Parts supporting parts connected to MAINS supply		N
10.5.3b)	TERMINALS carrying a current more than 0.5 A		N
	Examination of material data; or		N
	in case of doubt::		
	1) Ball pressure test; or		N
	2) Vicat softening test of ISO 306		N
11	PROTECTION AGAINST HAZARDS FROM FLUIDS		
11.1	General		P
11.2	Cleaning		N
11.3	Spillage		N
11.4	Overflow		N
11.5	Battery electrolyte	Cell battery is used	
	Battery electrolyte leakage presents no hazard	Safety certified cell battery is used in motherboard (Intel) of PC	P
11.6	Specially protected equipment		N
11.7	Fluid pressure and leakage		
11.7.1	Maximum pressure		
	Maximum pressure of any part does not exceed P_{RATED}		N
11.7.2	Leakage and rupture at high pressure		N
	Test to IEC 60335 (refrigeration only)		N
11.7.3	Leakage from low-pressure parts		N
11.7.4	Overpressure safety device		N
	Does not operate in NORMAL USE		N
	Meets ISO 4126-1; and		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	It is conform with:		
11.7.4a)	Connected as close as possible to parts intended to be protected		N
11.7.4b)	Easy access for inspection, maintenance and repair		N
11.7.4c)	Adjustment only with TOOL		N
11.7.4d)	No discharge towards person		N
11.7.4e)	No HAZARD from deposit of discharged material		N
11.7.4f)	Adequate discharge capacity		N
11.7.4g)	No shut-off valve between overpressure safety device and protected parts		N
12	PROTECTION AGAINST RADIATION, INCLUDING LASER SOURCES, AND AGAINST SONIC AND ULTRASONIC PRESSURE	Not provided	
12.1	General		
	Equipment provides protection		N
12.2	Equipment producing ionising radiation		N
12.2.1	Ionising radiation		N
12.2.2	Accelerated electrons		N
12.3	Ultra-violet (UV) radiation		
	No unintentional and HAZARDOUS escape of UV radiation		N
12.4	Micro-wave radiation		
	Power density does not exceed 10 W/m ²		N
12.5	Sonic and ultrasonic pressure		
12.5.1	Sound level		N
12.5.2	Ultrasonic pressure		N
12.6	Laser sources (IEC 60825-1)		N
13	PROTECTION AGAINST LIBERATED GASES, EXPLOSION AND IMPLOSION	Not provided	
13.1	Poisonous and injurious gases		N
	Attached data/test reports demonstrate conformity		N
13.2	Explosion and implosion		

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
13.2.1	Components		
	Components liable to explode:		
	Pressure release device provided; or		N
	Apparatus incorporates OPERATOR protection (see also 7.6)		N
	Pressure release device:		
	Discharge without danger		N
	Cannot be obstructed		N
13.2.2	Batteries and battery charging	Cell battery (Lithium) is provided on motherboard (safety certified)	
	If explosion or fire hazard could occur:		
	Protection incorporated in the equipment; or	Cell battery is located on the motherboard of PC, which is UL approved.	P
	Instructions specify batteries with built-in protection		N
	In case of wrong type of battery used:		
	No HAZARD; or		N
	Warning by marking and within instructions		N
	Equipment with means to charge rechargeable batteries:		
	Warning against the charging of non-rechargeable batteries; and		N
	Type of rechargeable battery indicated; or		N
	Symbol 14 used		N
	Battery compartment design	(See Form A.27)	N
	Single component failure		N
	Polarity reversal test		N
13.2.3	Implosion of cathode ray tubes		
	If maximum face dimensions > 160 mm.....		
	Intrinsically protected and correctly mounted; or		N
	ENCLOSURE provides protection:		N
	If non-intrinsically protected:		
	Screen not removable without TOOL		N

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	If glass screen, not in contact with surface of tube		N
13.2.4	Equipment RATED for high pressure (See 11.7)		N
14	COMPONENTS		P
14.1	General	Components comply with relevant IEC / EN standards	P
	Where safety is involved, components meet relevant requirements	(see Table 14)	P
14.2	Motors	(of DC Fan, Stepper motor)	
14.2.1	Motor temperatures		—
	Does not present a HAZARD when stopped or prevented from starting; or	(See Form A.2)	P
14.2.2	Series excitation motors		
	Connected direct to device, if overspeeding causes a HAZARD		N
14.3	Overtemperature protection devices		N
	Devices operating in a SINGLE FAULT CONDITION	(See Form A.28)	N
14.3a)	Reliable function is ensured		N
14.3b)	RATED to interrupt maximum current and voltage		N
14.3c)	Does not operate in NORMAL USE		N
14.4	Fuse holders		N
	No access to HAZARDOUS LIVE parts		N
14.5	Mains voltage selecting devices		N
	Accidental change not possible		N
14.6	HIGH INTEGRITY components		N
	Used in applicable positions (see Table 3)		N
	Conforms with IEC publications		N
	Single electronic device not used		N
14.7	Mains transformers tested outside equipment	See Forms A.29 and A.30	N
14.8	Printed circuit boards	Rated FV-0	P
	Data shows conformity with FV-1 of IEC 60707 or better; or		P

IEC 61010-1 / EN 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	Test shows conformity with FV-1 of IEC 60707 or better; or	See Form A.17	P
	Thin film flexible PCB with limited-energy circuit used		N
14.9	Circuits or components used as transient overvoltage limiting devices		
	After test, no sign of overload or degradation		N
15	PROTECTION BY INTERLOCKS		
15.1	General		
	Interlocks are designed to remove a hazard before OPERATOR exposed		N
15.2	Prevention of reactivation		N
15.3	Reliability		
	Single fault unlikely to occur; or		N
	Cannot cause a HAZARD		N
16	TEST AND MEASUREMENT EQUIPMENT		N
16.1	Current measuring circuits	(see Form A.31)	N
16.2	Multifunction meters and similar equipment	(see Form A.32)	N
	No HAZARD from:		
	RATED input voltage combinations		N
	Settings of functions		N
	Settings of range controls		N
ANNEX F	ROUTINE TESTS		N

6.3. APPENDED TABLES

4.4.2		TABLE: Summary of SINGLE FAULT CONDITIONS			Form A.1	—
Subclause	Title	Does not apply	Carried out	Comments		
4.4.2.1	PROTECTIVE IMPEDANCE		X			
4.4.2.2	Protective conductor		X			
4.4.2.3	Equipment or parts for short-term or intermittent operation	X				
4.4.2.4	Motors	X		DC Fan is safety certified component; Stepper motor		
4.4.2.5	Capacitors	X				
4.4.2.6	Mains transformers	X		Part of certified internal AC-DC Power Supply		
4.4.2.7	Outputs	X				
4.4.2.8	Equipment for more than one supply	X		Single input		
4.4.2.9	Cooling		X	Temperature of surfaces and components is within required limits Fan is safety certified component		
	– air holes closed		X			
	– fans stopped	X				
	– coolant stopped	X				
4.4.2.10	Heating devices	X		None present		
	– timer overridden	X		None present		
	– temperature controller overridden	X				
	– loss of cooling liquid	X				
	– overfilled or empty or both	X				
4.4.2.11	Insulation between circuits and parts	X				
4.4.2.12	Interlocks	X		None provided		
List below all SINGLE FAULT CONDITIONS not covered by 4.4.2.1 to 4.4.2.12:						
Supplementary information: (see Form A.2 for details of tests)						

4.4	TABLE: Testing in single FAULT CONDITION – Results			Form A.2	P
Test subclause	Fault No.	Fault description	Td 4.4.3 (NOTE)	How was test terminated Comments	Meets 4.4.4
4.4.2.9	1	Ventilations blocked	1:50:00	Temperatures stable	Yes
-	-	-	-	-	-

NOTE Td = Test duration in h:min:s
 Record dielectric strength test on Form A.14 and temperature tests on Form A.20.
 Record in the comments column for each test whether carried out during or after SINGLE FAULT CONDITION.

5.1.3c)	TABLE: Mains supply		Form A.3.a	P
	Marked rating	100-240 V		—
	Phase.....	1		—
	Frequency	50 / 60		—
	Current	-		—
	Power	-		—
	Power	0.75K VA		—

Test No.	Voltage V	Frequency Hz	Current A	Power in W	Power in VA	Comments
1.	90	60	4.06	364	365.4	MNL
2.	100	60	3.62	361	362	MNL
3.	120	60	3.0	358	360	MNL
4.	230	50	1.65	352	379.5	MNL
5.	240	50	1.60	351	384	MNL
6.	264	50	1.61	349	425	MNL

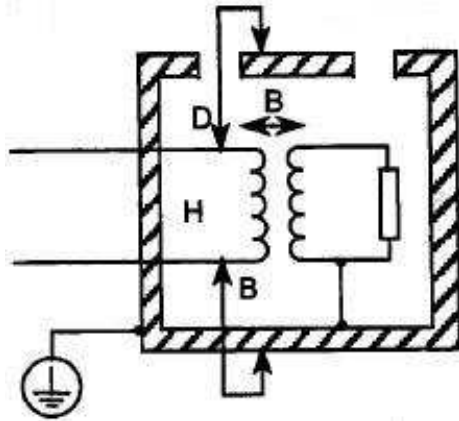
Note: 1. Measurements are only required for marked ratings.

Supplementary information: MNL = Maximum Normal Load (see page 8).

5.3		TABLE: Durability of markings			Form A.4	P
Marking method (see NOTE)				Agent		
1) Adhesive label				A Water		
2) silk screen				B Isopropyl alcohol		
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)				1)		
Mains supply (5.1.3)				1), 2)		
Fuses (5.1.4)				2)		
TERMINALS and operating devices (5.1.5.1)				1), 2)		
Measuring circuit TERMINALS (5.1.5.2)				-		
Switches and circuit breakers (5.1.6)				-		
DOUBLE/REINFORCED equipment (5.1.7)				-		
Field wiring TERMINAL boxes (5.1.8)				-		
Warning marking (5.2)				1)		
Battery charging (13.2.2)				-		
Method	Test agent	Remains legible Verdict	Label loose Verdict	Curled edges Verdict	Comments	
1.	Water and Isopropyl alcohol	Yes, P	No, P	No, P	-	
-	-	-	-	-	-	

6	TABLE: Protection against electric shock - Block diagram of system Form A.5	N
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Applied requirements followed below given principle:



Pollution degree : -	Installation category (overvoltage category) : -
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Location or description	Insulation type (NOTE 1)	Maximum working voltage (NOTE 2)	CREEPAGE DISTANCE (NOTE 3)				CLEARANCE (NOTE 3) mm	Test voltage (NOTE 2) V	Comments
			PWB mm	CTI	Other mm	CTI			
-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	

NOTE 1 – Type of insulation: BI = BASIC INSULATION DI = DOUBLE INSULATION PI = PROTECTIVE IMPEDANCE RI = Reinforced INSULATION SI = Supplementary INSULATION	NOTE 2 - Types of voltage Peak impulse test voltage (pulse) r.m.s. d.c. peak	NOTE 3 - INSTALLATION CATEGORIES (OVERVOLTAGE CATEGORIES) or POLLUTION DEGREES which differ from these should be shown under "Comments".
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Supplementary Information: It is provided inside the AC-DC Power Adapter only, not provided in product.

6.2	TABLE: List of ACCESSIBLE parts		Form A.6	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	RIFL III Hub on test Head	Visual; jointed test finger - Test probe B of IEC 61032 (Figure B.2).	-	
-	-	-	-	
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 Form A.7). NOTE 5 – The determination methods are: visual; rigid test finger; jointed test finger; pin 3 mm diameter; pin 4 mm diameter.				
Supplementary information				

6	TABLE: Values in NORMAL CONDITION							Form A.7					P
6.1.1	Exceptions							11.2 Cleaning and decontamination					—
6.3.1	Values in NORMAL CONDITION (see NOTE 1)							11.3 Spillage					—
6.6.2	Terminals for external circuit							11.4 Overflow					—
6.10.3	Plugs and connections												—
Item	Voltage			Current				Capacitance		5 s test (NOTE 2)			Comments
(see Form A.6)	V r.m.s.	V peak	V d.c.	Test circuit A1/ A2/ A3	mA r.m.s.	mA peak	mA d.c.	µC	mJ	V	µC	mJ	
1	-	-	3.25	Current meter	-	-	Less than 0.3 mA	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
NOTE 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. NOTE 2 – A 5 s test is specified in 6.10.3c).													

6.3.2 TABLE: Values in SINGLE FAULT CONDITION Form A.8												P
Item	Subclause and	Voltage			Transient (see NOTE)		Current			Capacitance		
(See Form A.6)	fault No. (see FormA.2)	V r.m.s.	V peak	V d.c.	V	s	Test circuit A1/ A2/ A3	mA r.m.s	mA peak	mA d.c.	μF (NOTE)	Comments
1	All vents were closed	-	-	3.25	-	-	Current meter	-	-	Less than 0.3 mA	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-

NOTE – Transient voltages must be below the limits given from Figure 1 and the capacitance below the limits from figure 2 of IEC 61010-1.

6.5.1.1 TABLE: Cross-sectional area of bonding conductors Form A.9			N
Conductor location		Cross-sectional area mm ²	Verdict
-		-	-
-		-	-

6.5.1.2 TABLE: Tighting torque test			N
Conductor location	Size of Screw	Tighting torque Nm	Verdict
-	-	-	-
-	-	-	-

6.5.1.3 TABLE: Bonding impedance of plug connected equipment Form A.10				P
ACCESSIBLE part under test	Test current A	Voltage attained after 1 min V	Calculated resistance (maximum allowed 0,1 Ω) Ω	Verdict
From PE pin of AC Cord to Bonding Post on the enclosure of the product	25	0.83	0.0332	P
-	-	-	-	-
Supplementary information: PE = Protective Earthing (grounding).				
6.5.1.4 TABLE: Bonding impedance of PERMANENTLY CONNECTED EQUIPMENT				N
ACCESSIBLE part under test	Test current A	Voltage attained after 1 min (maximum 10 V) V	Verdict	
-	-	-	-	
-	-	-	-	
Supplementary information:-				

6.5.1.5 TABLE: Indirect bonding for measuring and test equipment Form A.11				N
ACCESSIBLE part under test	Voltage attained s	Time for voltage to drop to allowable levels s	Verdict	
a) Voltage limiting device	—	—	—	
-	-	-	-	
-	-	-	-	
Supplementary Information:				
ACCESSIBLE part under test	Voltage applied V	Time for device to trip s	Verdict	
b) Voltage-sensitive tripping device	—	—	—	
-	-	-	-	
-	-	-	-	
Supplementary Information: -				

6.5.3	TABLE: PROTECTIVE IMPEDANCE		Form A.12	N
A high INTEGRITY single component				
Component		Location		Comments
-		-		-
-				
A combination of components				
Component		Location		Comments
-		-		-
-				
A combination of BASIC INSULATION and a current or voltage limiting device				
Component		Location		Comments
-		-		-
Supplementary information: -				

6.7	TABLE: CLEARANCES and CREEPAGE DISTANCES								Form A.13	P		
8	Mechanical resistance to shock and impact								N			
10.5.1	Integrity of CLEARANCES and CREEPAGE DISTANCES								N			
Location (see Form A.5)	Measured (initial – 6.7)		Verdict	Mechanical tests (note)				Test at max. RATED ambient (10.5.1)	Measured after test (if required)		Verdict	Comments
	CREEP. DISTANCE	CLEARANCE		Applied force (6.7) N	Rigidity (8.1)		Drop (8.2)		CREEPAGE DISTANCE	CLEARANCE		
	Mm	mm			Static	Dynamic						
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
Supplementary information: All components related to the requirements are investigated in the separate certification.												
NOTE 1 – Refer to Form A.12 for dielectric strength tests following the above tests.												
Note 2: SELV is referenced to PE												

6.8	TABLE: Dielectric strength tests				Form A.14	P
4.4.4.1 b)	Conformity after application of fault conditions ¹					P
6.4	Protection in NORMAL CONDITION					P
6.5.2	DOUBLE INSULATION and REINFORCED INSULATION					N
6.6.1	Connections to external circuits					N
6.7.3.1 c)	CLEARANCE values – General: reduced CLEARANCES for homogeneous construction					N
6.10.2.5)	Fitting of non-detachable MAINS SUPPLY cords ¹					N
8	Mechanical resistance to shock and impact					N
9.1 a) 2)	Eliminating or reducing the sources of ignition within the equipment					N
9.3 c)	Limited-energy circuit					N
11.2	Cleaning ¹					N
11.3	Spillage ¹					N
11.4	Overflow ¹					N
11.6	Specially protected equipment ¹					N
¹ Record the fault, test or treatment applied before the dielectric strength test						
Test site altitude				<2000 m		—
Test voltage correction factor (see Table 10).....:				Not applied (inhomogeneous construction)		—
Location or references from Forms A.2 and A.5	Clause or sub-clause	Humidity Yes/No	Working voltage V	Test voltage r.m.s./peak/d.c V	Comments	Verdict
Between AC Lines input and Chassis Ground	6.3.2	No	240	2400 V dc for 5s	Basic Insulation	P
Between AC Lines and Secondary Outputs	6.3.2	No	240	3840 V dc for 5s	Reinforced Insulation	P
Supplementary information: -						

6.10.2	TABLE: Cord anchorage					Form A.15	N
Location	Mass kg	Pull N	Verdict	Torque Nm	Verdict	Comment	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
Supplementary information:							

8	TABLE: mechanical resistance to shock and impact							P
Measurements; 1 - location; 2 - rigidity; 3 - impact hammer; 4 - drop test, normal; 5 - drop test, hand-held; 6 - working voltage (V); 7 - test voltage (V); 8 - result; 9 - comments								
1	2	3	4	5	6	7	8	9
Enclosure	Pass	Pass	-	-	240	2400 V dc	Pass	No cracks

9	TABLE: Protection against the spread of fire			Form A.16	P
Item	Source of HAZARD or area of the equipment considered (circuit, component, liquid etc.)	Protection Method (9a, 9b or 9c)	Protection details	Verdict	
1	AC Lines wirings; AC-DC power supply	9c	9c: PCB, enclosure are rated FV-1 or better; AC Lines wirings are all insulated.	P	
Supplementary information: -					

9.2.1	TABLE: Constructional requirements			Form A.17	P
14.8	Printed circuit boards	Flammability is rated FV-0			P
Material tested..... : -					
Generic name..... : -					
Material manufacturer : -					
Type : -					
Colour..... : -					
Conditioning details..... : -					
		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: -					

9.3		TABLE: Limited-energy circuit				Form A.18	P
Item	9.3 a)	9.3 b) Current and power limitation			9.3 c)	Decision	
or Location (see Form A.16)	Maximum potential in circuit voltage r.m.s./ d.c. V	Maximum available current A	Maximum available power VA	Overload protection after 120 s A	Circuit separation	Yes/No	Comments
RIFL III Hub on test Head	3.25 Vdc	0.3 mA	0.975 mVA	0.975 mVA	Yes	Yes	-
Supplementary information:							
1. There are some user accessible circuits/parts of PC, such as Ethernet/ PS2/ VGA/ USB connectors on the motherboard, but it is UL certified.							
2. No other user accessible circuits/parts except the above parts.							

9.4		TABLE: Requirements for equipment containing or using flammable liquids			N
Type of liquid	9.4 Flammable liquids		Verdict		
	b) quantity	c) Containment			
-	-	-	-		
-	-	-	-		
Supplementary information: -					

10.	TABLE : Temperature Measurements					Form A.20A	P
10.1	Surface temperature limits - NORMAL CONDITION						P
Operating conditions:	MNL (See page 8)						
Frequency	60 / 50	Hz	Test room ambient temperature (t_a).....:			24.3 / 24.2 °C	
Voltage	90 / 264	V	Test duration			1 / 1 h 0 / 30 Min	
Part / Location	t_m °C	t_c °C	t_{max} °C	Verdict	Comments		
1. Body of AC Input Plug	25.4 / 25.2	41.1 / 41.0	70	Pass	-		
2. Body of Mains Circuit Breaker	26.3 / 25.8	42.0 / 41.6	85	Pass	-		
3. Body of AC Input Wirings (Black, inside Power Control Unit)	27.9 / 27.5	43.6 / 43.3	105	Pass	-		
4. Body of terminal block of 48V dc (inside Power Control Unit)	31.3 / 30.2	47.0 / 46.0	105	Pass	-		
5. Top of Enclosure (for Power Supply, inside Power Control Unit)	31.4 / 30.4	47.1 / 46.2	70	Pass	-		
6. Body of Circuit Breaker (48V dc, inside Power Control Unit)	26.3 / 26.3	42.0 / 42.1	85	Pass	-		
7. Body of Stepper Motor (inside Power Control Unit)	27.1 / 27.7	42.8 / 43.5	85	Pass	-		
8. On PCB, near CPU (inside PC)	40.7 / 40.4	56.4 / 56.2	105	Pass	-		
9. On enclosure of PC (Hot spot)	34.0 / 34.0	49.7 / 49.8	70	Pass	-		
10. On enclosure of EUT (Hot spot)	27.4 / 27.4	43.1 / 43.2	70	Pass	-		
11. Body of Wirings (Red, 48V dc, inside Power Control Unit)	29.7 / 29.1	45.5 / 44.9	80	Pass	-		
12. Enclosure, near two indicators (outside Testhead)	26.3 / 26.2	42.0 / 42.0	70	Pass	-		
NOTE 1 - t_m = measured temperature t_c = t_m corrected ($t_m - t_a + 40$ °C max. RATED ambient) t_{max} = maximum permitted temperature							
Supplementary information: -							

10.	TABLE : Temperature Measurements				Form A.20B	P
10.2	Surface temperature limits - NORMAL CONDITION and one FAULT CONDITION (ALL VENTS OF EUT ARE BLOCKED)					P
Operating conditions:	MNL (See page 8)					
Frequency	50	Hz	Test room ambient temperature (t_a).....:	25.0 °C		
Voltage.....	240	V	Test duration	1	h	50 Min
Part / Location	t_m °C	t_c °C	t_{max} °C	Verdict	Comments	
1. Body of AC Input Plug	25.6	40.6	105	Pass	-	
2. Body of Mains Circuit Breaker	26.1	41.1	105	Pass	-	
3. Body of AC Input Wirings (Black, inside Power Control Unit)	27.9	42.9	105	Pass	-	
4. Body of terminal block of 48V dc (inside Power Control Unit)	31.3	46.3	105	Pass	-	
5. Top of Enclosure (for Power Supply, inside Power Control Unit)	32.0	47.0	105	Pass	-	
6. Body of Circuit Breaker (48V dc, inside Power Control Unit)	26.6	41.6	105	Pass	-	
7. Body of Stepper Motor (inside Power Control Unit)	28.5	43.5	105	Pass	-	
8. On PCB, near CPU (inside PC)	50.4	65.4	105	Pass	-	
9. On enclosure of PC (Hot spot)	39.5	54.5	105	Pass	-	
10. On enclosure of EUT (Hot spot)	29.1	44.1	105	Pass	-	
11. Body of Wirings (Red, 48V dc, inside Power Control Unit)	30.2	45.2	105	Pass	-	
12. Enclosure, near two indicators (outside Testhead)	27.9	42.9	105	Pass	-	
NOTE 1 - t_m = measured temperature t_c = t_m corrected ($t_m - t_a + 40$ °C or max. RATED ambient) t_{max} = maximum permitted temperature						
Supplementary information: -						

10.3	TABLE: Temperature of windings Resistance method Temperature Measurements						Form A.20E	P
4.4.2.6	MAINS Transformer is located inside the internal DEMKO approved AC/DC Power Supply, no test is deemed to require							N
14.2.1	Motor temperatures: DC fan, all are approved by VDE or TUV or RU							N
Operating conditions:		The unit is powered via the specified AC Power Adapter, running software provided by the manufacturer.						
Frequency	- Hz	Test room ambient temperature (t_{a1}/t_{a2})				- / - °C (initial / final)		
Voltage	- V	Test duration				- h - Min		
Part / Designation	R_{cold} Ω	R_{warm} Ω	Current A	t_r K	t_c °C	t_{max} °C	Verdict	Comments
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
NOTE 1- R_{cold} = initial resistance t_r = temperature rise t_{max} = maximum permitted temperature R_{warm} = final resistance $t_c = t_r$ corrected ($t_c = t_r - \{ t_{a2} - t_{a1} \} + [40 \text{ °C or max RATED ambient}]$) NOTE 2 - Indicate insulation class (IEC 85) under comments (optional) NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary								
Supplementary information: -								

10.5.2	TABLE: Resistance to heat of non-metallic enclosures		Form A.21	N
	Test method used:			—
	Non operative treatment.....:	[X]		N
	Empty ENCLOSURE	[]		N
	Operative treatment.....:	[]		N
	Temperature during tests	70 °C		—
	ENCLOSURE samples tested were	Complete system		—
Description	Material	Comments	Verdict	
-	-	-	-	
	Dielectric strength test (6.8).....:	- V	r.m.s./peak/d. c.	N
Supplementary information: -				

10.5.3	TABLE: Insulating Materials		Form A.22	N
10.5.3a)	Ball pressure test			
	Max. allowed impression diameter.....:	2 mm		—
Part	Test temperature °C	Impression Diameter (mm)	Verdict	
-	-	-	-	
Supplementary information: all safety relevant insulating materials are certified or part of certified sub- assemblies (e.g. appliance inlet, power supplies).				
10.5.3b)	Vicat softening test (ISO 306)			N
Part	Vicat softening temperature °C	Thickness of sample (mm)	Verdict	
-	-	-	-	
-	-	-	-	
Supplementary information: -				

8	TABLE: Mechanical resistance to shock and impact								Form A.23	N		
11	Protection against hazards from fluids						-		N			
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 can be used.												
	Clause 8 tests			Clause 11 tests								
Location (see form A.5)	Static	Dynamic	Normal	Handheld Plug-in	Cleaning (11.2)	Spillage (11.3)	Overflow (11.4)	IEC 60529 (11.6)	Working voltage V	Test voltage V	Verdict	Comments
-	-	-	-	-	-	-	-	-	-	-	-	-
NOTE – Use r.m.s., d.c. or peak to indicate the used test voltage.												

11.7.2	TABLE: Leakage and rupture at high pressure						Form A.24	N
Part		Maximum permissible working pressure MPa		Test pressure MPa	Leakage YES / NO	Burst YES / NO	Comments	
-		-		-	-	-	-	
Supplementary information: -								
11.7.3	Leakage from low-pressure parts						N	
Part		Test pressure MPa	Leakage YES / NO	Comments				
-		-	-	-				
Supplementary information: -								

12.2.1	TABLE: Ionizing radiation			Form A 25	N
Locations tested		Measured values $\mu\text{Sv/h}$	Verdict	Comments	
-		-	-	-	
Supplementary information: -					

12.5.1	TABLE: Sound level		Form A.26	P
Locations tested	Measured values dBA		Calculated maximum sound pressure level	
At operator's normal position and at bystanders' positions				
All positions at a distance of 1m around the EUT	<85		-	
Note: EUT does not generate any significant noise. Actual test was waived due to obvious compliance.				
12.5.2	Ultrasonic pressure			N
Locations tested	Measured values		Comments	
	dB	kHz		
At OPERATOR'S normal position	-	-	-	
At 1 m from the ENCLOSURE				
a) -	-	-	-	
b) -	-	-	-	
c) -	-	-	-	
d) -	-	-	-	
e) -	-	-	-	
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.				
Supplementary information: -				

13.2.2	TABLE: Batteries		Form A.27	P
	Coin Battery and charging circuit diagram:	Lithium Ion		
	Battery type.....:	Lithium Ion (BTH1)		
	Battery manufacturer/model/catalogue No.....:	Sony or equivalent / CR2032		—
	Battery ratings.....:	3.2V, 5 mAh		—
	Reverse polarity instalment test	Connector is polarized		P
Single component failures		Verdict		
Component		Open circuit	Short circuit	
-		-	-	
Supplementary information: It is located on UL recognized motherboard, and has been verified to the requirement.				

14.3	TABLE: Overtemperature protection devices		Form A.28	N
Reliability test				
Component	Type (note)	Verdict	Comments	
-	-	-	-	
-	-	-	-	
NOTE: NSR = non-self-resetting (10 times) NR = non-resetting (1 time) SR = self-resetting (200 times)				
Supplementary information: -				

4.4.2.6	TABLE: Mains transformer		Form A.29		N
4.4.2.6.1	Short circuit		-		N
14.7.1	MAINS transformers tested outside equipment		-		N
Type	-				—
Manufacturer	-				—
Test in equipment					N
Test on bench					N
Test repeated inside equipment (see 14.7)					N
Optional – Insulation class (IEC 60085) of the lowest RATED winding					—
Winding identification	-	-	-	-	-
Type of Protector for winding (Note 1)	-	-	-	-	-
Elapsed time	-	-	-	-	-
Current, A	primary	-	-	-	-
	secondary	-	-	-	-
Winding temperature, °C	primary	-	-	-	-
	secondary	-	-	-	-
Tissue paper / cheesecloth OK ? (Pass / Fail)					
Voltage tests (see Note 3)					
primary to secondary	1900	V dc	-	-	-
primary to core	1900	V dc	-	-	-
secondary to secondary	_____	V _____	-	-	-
secondary to core	_____	V _____	-	-	-
Verdict					
Note 1:	Primary fuse	- PF / () A			
	Secondary fuse	- SF / () A			
	Overtemperature protection	- OP / () °C			
	Impedance protection	- Z			
Note 2:	Indicate method of measurement	TC = with thermocouple	R = resistance method		
	If resistance method is used, record resistance in cold and warm condition in FormA.20B!				
Note 3:	Record the voltage applied and the type of voltage (r.m.s. / d.c. / peak) and for results use NB = no breakdown or B = breakdown				
Supplementary information: All isolation transformers are part of certified power supply, no additional tests were deemed required					

4.4.2.6	TABLE: Mains transformer			Form A.30	N
14.7.2	Overload tests (for mains transformers)			-	N
Type	-				—
Manufacturer	-				—
Test in equipment					N
Test on bench					N
Test repeated inside equipment (see 14.7)					N
Optional – Insulation class (IEC 60085) of the lowest RATED winding					—
Winding identification	-	-	-	-	-
Type of Protector for winding (Note 1)	-	-	-	-	-
Elapsed time	-	-	-	-	-
Current, A	primary	-	-	-	-
	secondary	-	-	-	-
Winding temperature, °C	primary	-	-	-	-
	secondary	-	-	-	-
Tissue paper / cheesecloth OK ? (Pass / Fail)					
Voltage tests (see Note 3)					
primary to secondary	_1900 V _dc	-	-	-	-
primary to core	_1900 V __dc _	-	-	-	-
secondary to secondary	_____ V _____ _	-	-	-	-
secondary to core	_____ V _____ _	-	-	-	-
Verdict					
Note 1:	Primary fuse	- PF / () A			
	Secondary fuse	- SF / () A			
	Overtemperature protection	- OP / () °C			
	Impedance protection	- Z			
Note 2:	Indicate method of measurement	TC = with thermocouple		R = resistance	
		method			
	If resistance method is used, record resistance in cold and warm condition in FormA.20B!				
Note 3:	Record the voltage applied and the type of voltage (r.m.s. / d.c. / peak) and for results use NB = no breakdown or B = breakdown				
Supplementary information: All isolation transformers are part of certified power supply, no additional tests were deemed required					

16.1	TABLE: Current measuring circuits				Form A.31	N
These tests are performed with all types and models of current transformers without internal protection, and which are specified by the manufacturer for use with the equipment						
a) Current transformers						
Type/Model	RATED current A	Test current A	Interrupt Yes / No	Verdict	Comments	
-	-	-	-	-	-	
Supplementary information: -						
b) Range changing switches						
Type / Model	Maximum rated current of switch A	Cycling test Verdict	Comments			
-	-	-	-			
Supplementary information: -						

16.2	TABLE: Multifunctional meters and similar equipment		Form A. 32	N
	Operating conditions	:		—
	Maximum RATED voltage applied (V)	:		—
	Measurement category	:		—
	Test source limit (KVA)	:		—
Function		Range		Verdict
-		-		-
Supplementary information: -				

14.1	TABLE: list of critical components					P
object/part No.	manufacturer/trademark	type/model	technical data	standard	mark(s) of conformity ¹⁾	
1. Enclosure	Various	Various	Aluminum	2 mm thick	-	
2. Power Cord set	Interpower	Cord: H05VV-F; Plug: Schuko CEE 7/7; Connector: IEC 60320 C19	3x1.5mm ² , 2.5m long, 250V 16A	HD 21; IEC 60227, IEC 60320	VDE, SEMKO, OVE, CEBC, KEMA, FIMKO, LCIE, DEMKO, IMQ, GOST, NEMKO	
3. Power Inlet	Interpower	IEC 63020 C20	250V, 16A	IEC 60320	VDE, UR, CSA	
4. Circuit Breaker (for AC Input)	Airpax	LEGH11-1-62F-20.0-91-V	240V, 20A	IEC 60934	VDE	
5. Circuit Breaker (for 48 V DC)	ETA	8340-F	80 V DC, 30A	IEC 60934, EN 60934; UL1077, UL 489A	VDE	
6. AC-DC Power Supply	Unipower	TPCPR1U3A-Z	AC Input: 85-264V, 47-63Hz, DC Output: 48 V, 25A	IEC/EN 60950-1; UL 60950-1.	DEMKO, UL, CSA	
7. Relay (for power supply remote shut-off)	IDEC	RJ2V-C-D5	DPDT; Coil: 5V DC, 8A; Contact: 250V, 8A,	-	VDE, RU, CSA	
8. Step Motor	Schneider	MDriver23	48V DC, 3.5 A	UL508C	RU	
9. Internal Wirings (AC Primary)	Various	1015	14AWG; 600 V, 90°C	-	UL, CSA	
10. PC, it contains the following critical parts	Ross	-	48V DC	-	-	
10-1. Motherboard	Intel	D945GCNL	12V DC, 5V DC, 3.3V DC	UL 60950-1	RU, CRU (E210882)	
10-2. DC Fan	Delta	GFB0412HF	12V DC, 0.21A	-	VDE, RU, CSA	
10-3. DC-DC Converter	TRACO Power	TEP 100-4812	DC Input: 48V; DC Output: 12V, 8.4A	UL 60950-1	RU, CRU (E188913); RoHS	
10-4. DC-DC Converter	XP Power	JTH1548S05	DC Input: 18 - 72V; DC Output: 5V, 3A	UL 60950-1	RU, CRU (E188913); RoHS	
10-5. HDD	WD	WD1200BEVT	-	-	TUV, RU, CRU	
10-6. Chassis	Various	Various	Aluminum	2 mm thick	-	

11. Test Head, it contains the following critical parts:	ROOS	-	-	-	-
11-1. DC-DC Converter	XP Power	JTH1548D05	Input: DC 18-72V; Output: DC 5V, 1.5A	-	-
11-2. DC Fan (2 pieces)	Minebea-Matsushita	2406KL-04W-B30	12Vdc, 0.12A	-	VDE, RU, CSA
11-3. Printed wiring boards	Various	Various	94V-0, 105C	-	UL
11-4. Wirings	Various	Various	300 V, 80°C minimum	-	RU, CSA
11-5. Enclosure	Various	Various	Aluminum	2 mm thick	-
Test Instrument Module (TIM), containing:	-	-	-	-	-
12. RI Digital 80P	ROOS	RI8535B	48V max	-	Tested with the equipment
13. RI 20GHz Rec	ROOS	RI8581A	48V max	-	Tested with the equipment
14. RI 40.5GHz TS	ROOS	RI8563C	48V max	-	Tested with the equipment
15. RI Waveform	ROOS	RI8572A	48V max	-	Tested with the equipment
16. RI Src 1/2	ROOS	RI8577A	48V max	-	Tested with the equipment
17. RI RF Testset	ROOS	RI8545B	48V max	-	Tested with the equipment
18. RI RF Source	ROOS	RI8508A	48V max	-	Tested with the equipment
19. RI RF Device Power	ROOS	RI8546C	48V max	-	Tested with the equipment
1) an asterisk indicates a mark which assures the agreed level of surveillance					

7. PHOTOS

- (1) Front / Right Side Views of Unit
- (2) Rear / Left Side Views of Unit
- (3) Close look of Front View of Controller of Unit
- (4) Internal View of Controller of Unit
- (5) Close look of 48V Circuit Breakers on the side Enclosure of EUT
- (6) Company's Logo
- (7) Close look of Mains Circuit Breaker
- (8) Top / Side Views of PC
- (9) Bottom / Side Views of PC
- (10) Internal Top View of PC
- (11) Close look of Top View of Arm between Controller and Test Head
- (12) Top View of Test Head
- (13) Back View of Test Head
- (14) Internal Top View of Test Head
- (15) AC Input Ratings



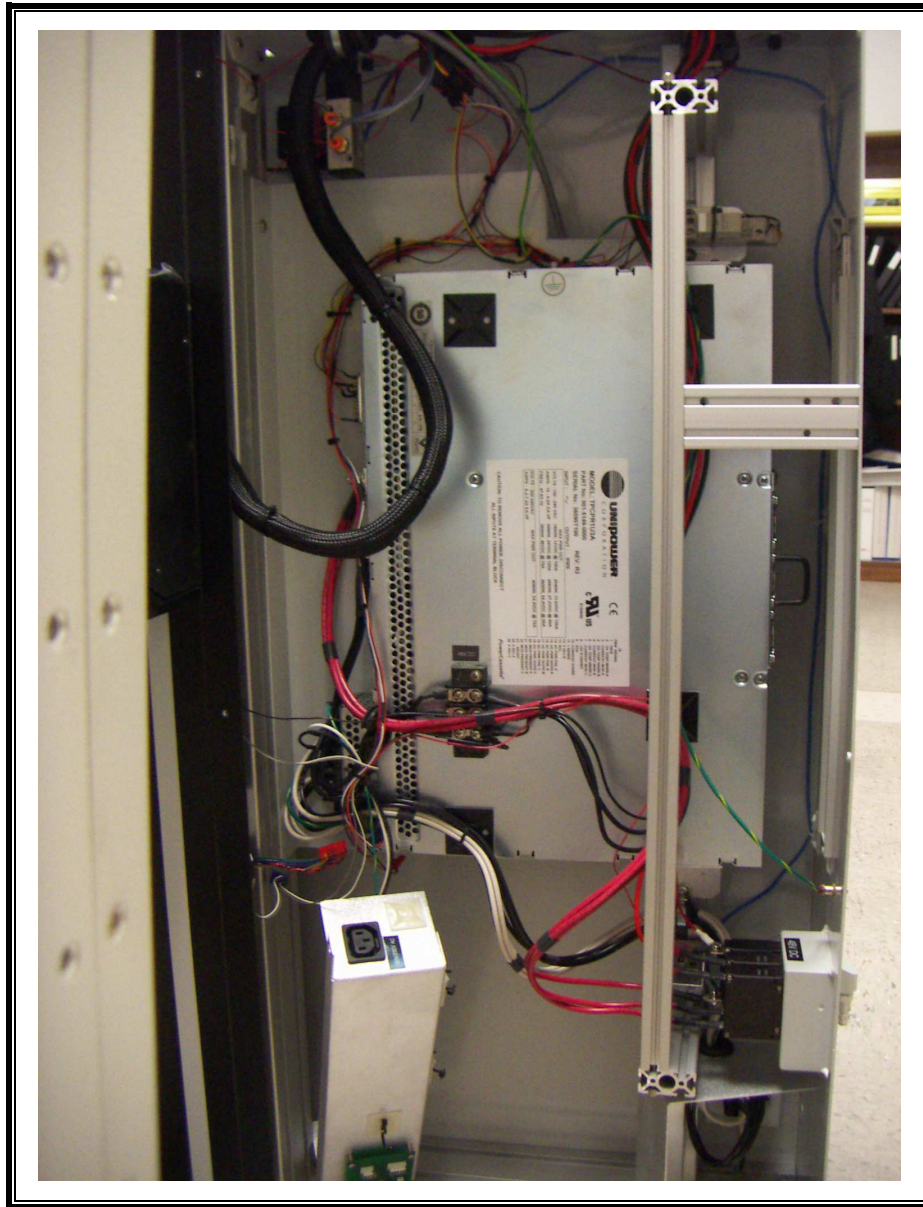
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(2)



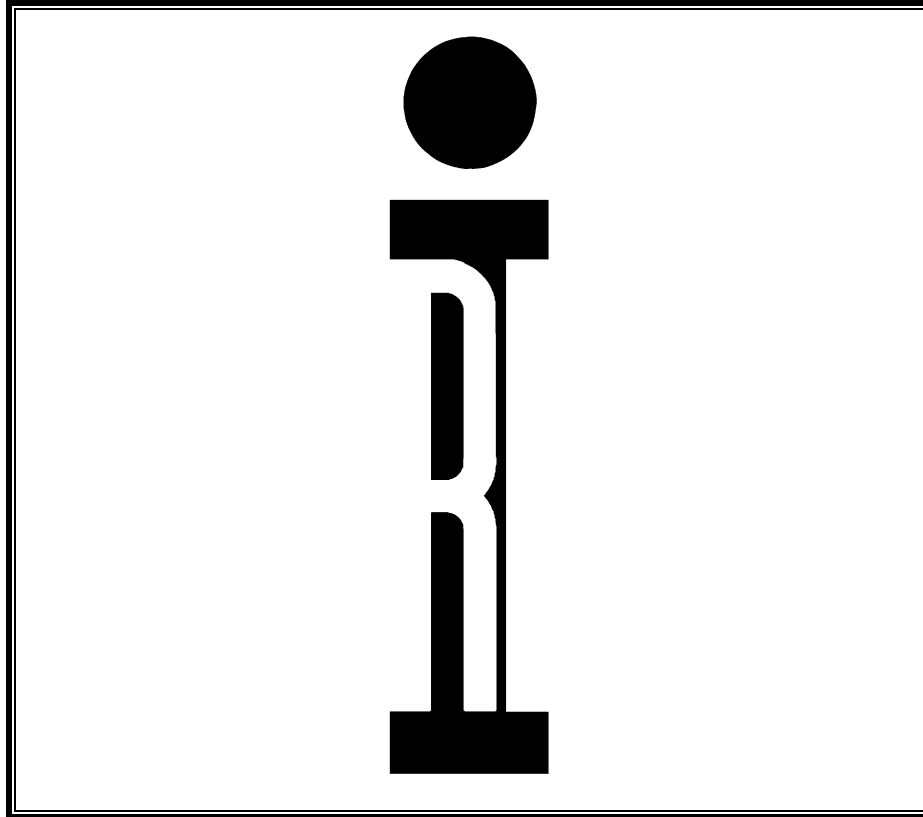
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(4)



(5)



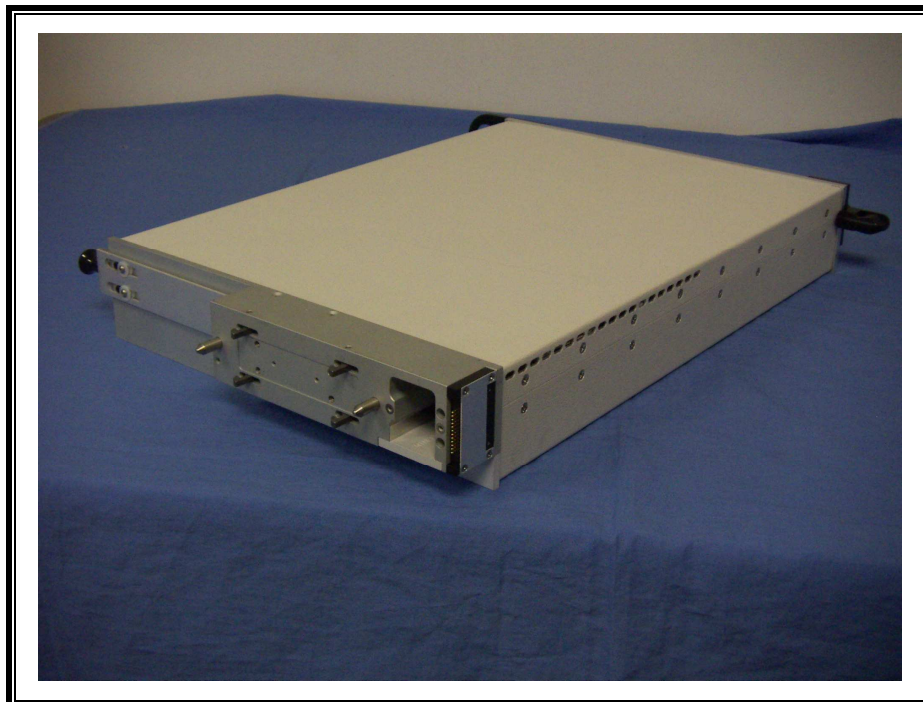
(6)



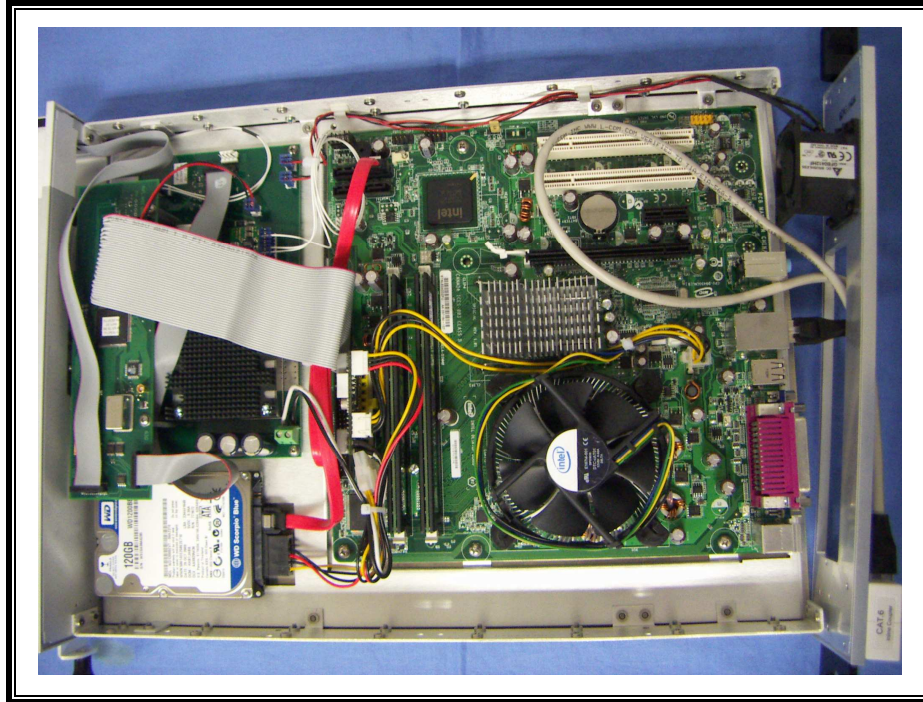
(7)



(8)



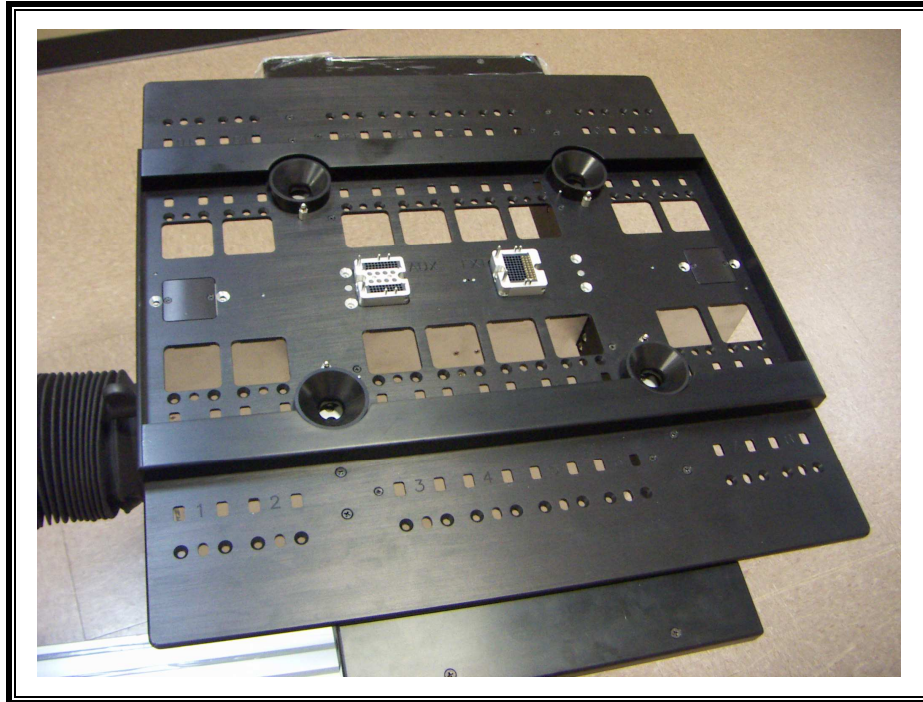
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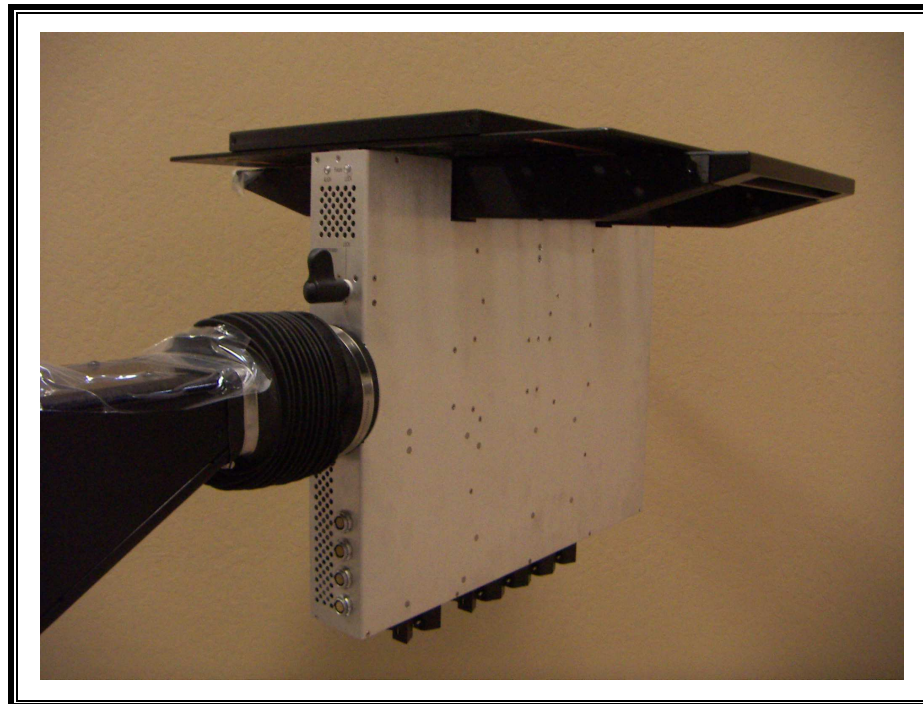
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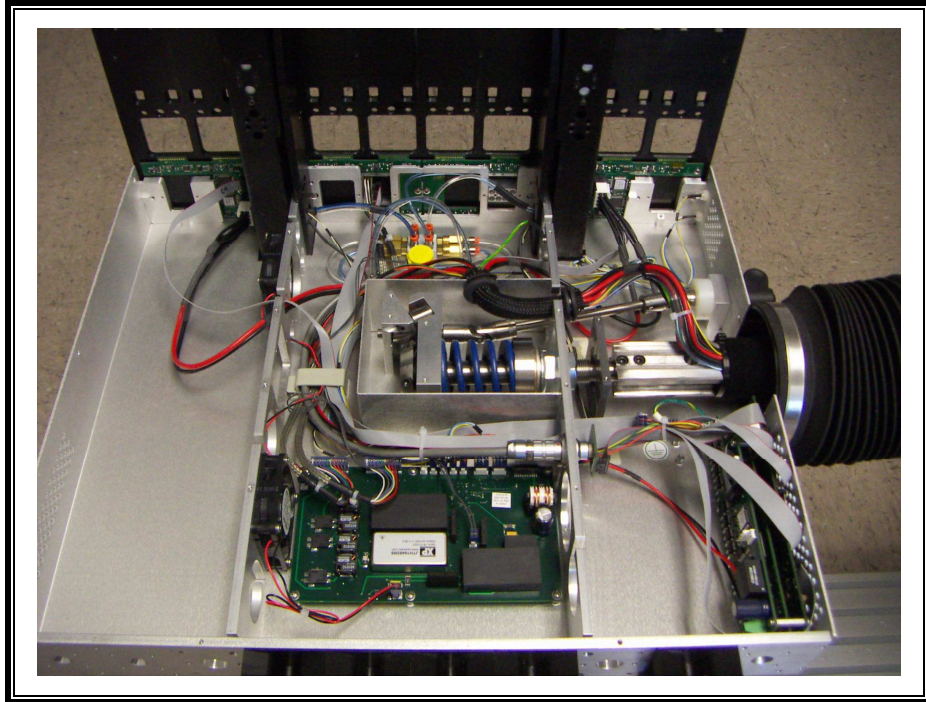
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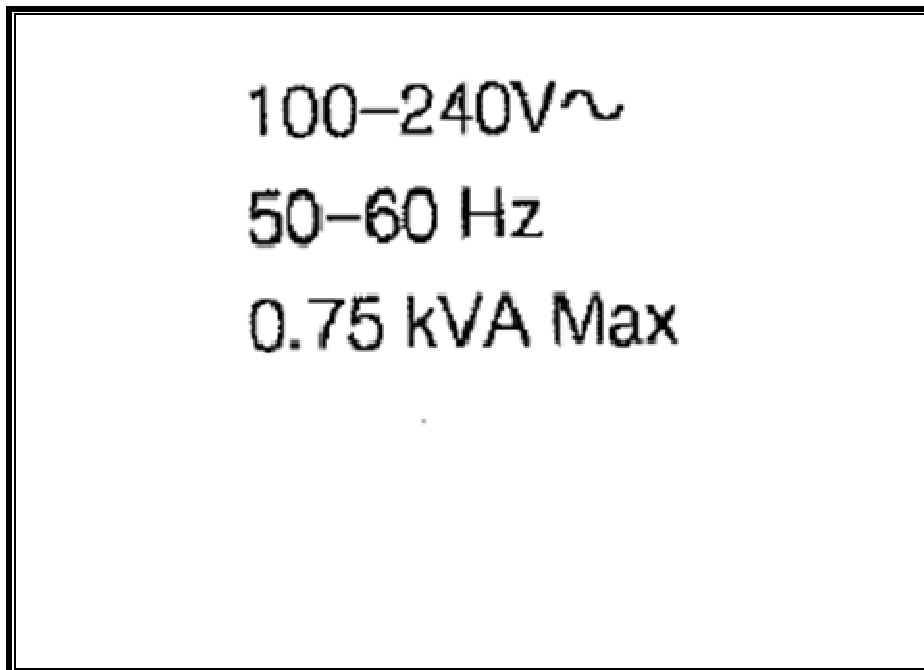
(12)



(13)



(14)



(15)

END OF REPORT