LOW VOLTAGE DIRECTIVE, ELECTROMAGNETIC COMPATIBILITY DIRECTIVE ATTESTATION OF CONFORMITY

Technical file of the company mentioned below has been inspected and audit has been completed successfully.
2014/30/EU Electromagnetic Compatibility Directive and 2014/ 35/EU Low Voltage Directive has been taken as referances for these processes.

Company Name	: Sanyou Tongji (Jiangsu) Heavy Industry Co., Ltd
Company Address	: No. 7 Steada Road, Machinery Manufacturing Industrial Park, Economic Development Zone, Sihong County, Suqian City, China
Related Directives and Annex	: 2014/35/EU Low Voltage Directive /Annex III 2014/30/EU Electromagnetic Compatibility Directive /Annex II
Related Standards	: EN IEC 61000-6-2:2019, EN IEC 61000-6-4:2019 EN 60335-1:2012/A15:2021
Product Name	: REDUCER
Report No and Date	: UNICO20250709L02
Product Brand/Model/Type	: Sanyou Heavy Industry/ K, R, F, S

Certificate Number	: M.2025.206.C122487
Initial Assessment Date	: 14.07.2025
Registration Date	: 15.07.2025
Reissue Date/No	: -
Expiry Date	: 14.07.2030

UDEM Uluslararasl Belgelendirme
Denetim Egitim Merkezi
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EC DECLARE OF THE CONFORMITY No.: CE-DOC20250709G02	CE

1. *The name and address of factory/applicant:*

Applicant Company Title	Sanyou Tongji (Jiangsu) Heavy Industry Co., Ltd
Applicant's company address	No. 7 Steada Road, Machinery Manufacturing Industrial Park, Economic Development Zone, Sihong County, Suqian City
Manufacturer's name	Sanyou Tongji (Jiangsu) Heavy Industry Co., Ltd
Manufacturer's address	No. 7 Steada Road, Machinery Manufacturing Industrial Park, Economic Development Zone, Sihong County, Suqian City

2. Description of the machine

Product Name: REDUCER
Model/type：K, R, F, S
*Dimension：723cm*354cm*340cm*
motor power：2.2KW
Rate voltage: 380V
Produce Year: May 22, 2025

3. *DECLARE of the factory:*

The above-mentioned manufacture declares that machine is conform to the requirements as the following directives:

EC Directive applied:
Low Voltage Directive 2014/35/EU *Electromagnetic Compatibility Directive:2014/30/EU*

4. *Harmonized standard applied*

Harmonized standard applied:
EN IEC 61000-6-2:2019, EN IEC 61000-6-4:2019, EN 60335-1:2012/A15:2021

5. Identification of subscriber:

surname and family name:..... Jian Xiang

Position.....General Manager

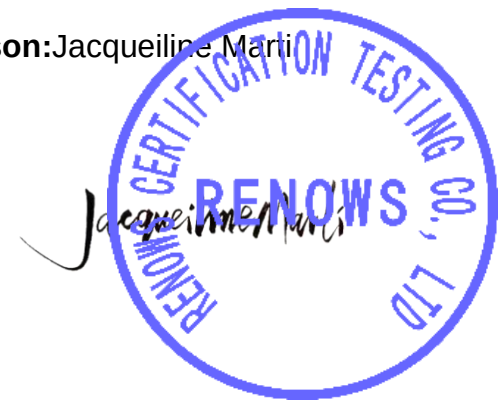
location and date:.....Suqian City, July 09, 2025

signature: _____

Technical Construction File
TEST REPORT

Tcf No:	UNICO20250709L02
Applicant:	Sanyou Tongji (Jiangsu) Heavy Industry Co., Ltd
Address:	No. 7 Steada Road, Machinery Manufacturing Industrial Park, Economic Development Zone, Sihong County, Suqian City
Manufacturer:	Sanyou Tongji (Jiangsu) Heavy Industry Co., Ltd
Address:	No. 7 Steada Road, Machinery Manufacturing Industrial Park, Economic Development Zone, Sihong County, Suqian City
Product:	REDUCER
Model:	K, R, F, S
Test standard:	EN IEC 61000-6-2:2019, EN IEC 61000-6-4:2019, EN 60335-1:2012/A15:2021
Conclusion:	The products meet the above standards.
Directive	2014/35/EU LVD, 2014/30/EU EMC
Edit Date:	2025-07-10
Issue date:	2025-07-10
Testing Laboratory	Name: RENOWS CERTIFICATION TESTING CO., LTD Address: CHASE BUSINESS CENTRE 39-41 CHASE SIDE LONDON UNITED KINGDOM N14 5BP E-Mail: info@renows.net

Signature of Authorized Person: Jacqueiline Marti



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ASSESSMENT REPORT
TCF Reference No. .....: UNICO20250709L02 Tested by(+ signature).....: Project Engineer, Melody Melody Reviewed by(+ signature).....: Manager, Tracy Tracy Date of issue .....: 2025-07-10
Client Name .....: Sanyou Tongji (Jiangsu) Heavy Industry Co., Ltd Address .....: No. 7 Steada Road, Machinery Manufacturing Industrial Park, Economic Development Zone, Sihong County, Suqian City
Test specification Standard .....: EN IEC 61000-6-2:2019, EN IEC 61000-6-4:2019, EN 60335-1:2012/A15:2021 Test procedure .....: CE-LVD+EMC Non-standard test method .....: N.A.
Test item description: Manufacturer.....: Sanyou Tongji (Jiangsu) Heavy Industry Co., Ltd Factory.....: Sanyou Tongji (Jiangsu) Heavy Industry Co., Ltd Trademark .....: Refer to the nameplate Model, Type reference .....: Refer to page 1 Rating(s) .....: refer to the nameplate.
General product information: The product is Silicone Heater.
Test Result: PASS. The product meets the all the test requirements. The details are listed in the following documents.

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EN IEC 61000-6-2:2019, EN IEC 61000-6-4:2019, EN 60335-1:2012/A15:2021			
Clause	Requirement + Test	Result - Remark	Verdict
1	**Scope**		-
	This International Standard deals with the safety of electrical appliances for household and similar purposes,their rated voltage being not more than 250 V for single-phase appliances and 480 V for other appliances including direct current(DC)supplied appliances and battery- operated appliances.		P
	Appliances not intended for normal household use but which nevertheless may be a source of danger to the public,such as appliances intended to be used by laymen in shops,in light industry and on farms,are within the scope of this standard.		P
	This standard deals with the reasonably foreseeable hazards presented by appliances that are encountered by all persons.However,in general,it does not take into account:		P
	- persons (including children)whose		P
	· physical,sensory or mental capabilities;or · lack of experience and knowledge prevents them from using the appliance safely without supervision or instruction;		P
	- children playing with the appliance.		P
	Additional requirements may be necessary for appliances intended to be used in vehicles or on board ships or aircraft.In many countries,additional requirements are specified by the national health authorities,the national authorities responsible for the protection of labour,the national water supply authorities and similar authorities.		P
	This standard does not apply to:		P

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	- appliances intended exclusively for industrial purposes;		P
	- appliances intended to be used in locations where special conditions prevail,such as the presence of a corrosive or explosive atmosphere (dust,vapour or gas);		P
	- audio,video and similar electronic apparatus(IEC 60065);		P
	- medical electrical equipment (IEC 60601 series);		N
	- hand-held motor-operated electric tools (IEC 60745 series);		P
	- information technology equipment (IEC60950-1);		P
	- transportable motor-operated electric tools (IEC61029 series);		P
	- audio/video,information and communication technology equipment(IEC62368-1);		N
	-electric motor-operated hand-held tools,transportable tools and lawn and garden machinery (IEC 62841 series).		N
2	**Normative references**		-
	The following documents,in whole or in part,are normatively referenced in this document and are indispensable for its application.For dated references,only the edition cited applies.For undated references, the latest edition of the referenced document (including any amendments)applies.		P
	EN 62479:2010,Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)		P
	EN 50160:2022,Voltage characteristics of electricity supplied by public electricity networks An		P
	IEC 60034-1,Rotating electrical machines-Part 1:Rating and performance		P

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	IEC 60695-10-2,Fire hazard testing-Part 10-2:Abnormal heat-Ball pressure test		P
3	**Terms and definitions**		-
	For the purposes of this document,the following terms and definitions apply.		P
3.1	Definitions relating to physical characteristics		-
3.1.1	rated voltage		P
	voltage assigned to the appliance by the manufacturer		P
3.1.2	rated voltage range		P
	voltage range assigned to the appliance by the manufacturer,expressed by its lower and upper limits		P
3.1.3	working voltage		P
	maximum voltage to which the part under consideration is subjected when the appliance is supplied at its rated voltage and operating under normal operation, with controls and switching devices positioned so as to maximize the value		P
3.1.4	rated power input		P
	power input assigned to the appliance by the manufacturer		P
3.1.5	rated power input range		P
	power input range assigned to the appliance by the manufacturer,expressed by its lower and upper limits		P
3.1.6	rated current		P
	current assigned to the appliance by the manufacturer		P
3.1.7	rated frequency		P
	frequency assigned to the appliance by the manufacturer		P
3.1.9	normal operation		P
	conditions under which the appliance is operated in normal use when it is connected to the supply mains		-

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	Appliances operated with integral batteries or separable batteries not disconnected from the appliance for charging purposes:		P
	- the battery that is fully discharged is charged with the battery-operated appliance performing its intended function,if allowed by the construction of the appliance;		P
	-the battery that is fully discharged ischarged without the battery-operated appliance performing its intended function		P
3.1.10	rated impulse voltage		P
	voltage derived from the rated voltage and the overvoltage category of the appliance, characterizing the specified withstand capability of its insulation against transient overvoltages		P
3.1.11	dangerous malfunction		P
	unintended operation of the appliance that may impair safety		P
3.1.12	outlet load		P
	load that can be connected to appliance outlets accessible to the user and socket-outlets accessible to the user		P
3.2	Definitions relating to means of connection		P
3.2.2	interconnection cord		N
	external flexible cord between two parts of an appliance,provided as part of a complete appliance for purposes other than connection to the supply mains		P
3.2.3	supply cord		P
	flexible cord,for supply purposes,that is fixed to the appliance		P
3.2.4	type X attachment		P
	method of attachment of the supply cord such that it can easily be replaced		P
3.2.5	type Y attachment		P
	method of attachment of the supply cord such that any replacement is intended to be made by the manufacturer,its service agent or similar qualified person		P

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3.2.6	type Z attachment		P
	method of attachment of the supply cord such that it cannot be replaced without breaking or destroying the appliance		P
3.3	Definitions relating to protection against electric shock		P
3.3.1	basic insulation		P
	insulation applied to live parts to provide basic protection against electric shock		P
3.3.2	supplementary insulation		P
	independent insulation applied in addition to basic insulation, in order to provide protection against electric shock in the event of a failure of basic insulation		P
3.3.3	double insulation		P
	insulation system comprising both basic insulation and supplementary insulation		P
3.3.4	reinforced insulation		N
	single insulation applied to live parts, that provides a degree of protection against electric shock equivalent to double insulation under the conditions specified in this standard		N
3.3.5	functional insulation		P
	insulation between conductive parts of different potential which is necessary only for the proper functioning of the appliance		P
3.3.6	protective impedance		P
	impedance connected between live parts and accessible conductive parts of class Il constructions so that the current,in normal use and under likely fault conditions in the appliance,is limited to a safe value		P
3.3.9	class I appliance		P

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	appliance in which protection against electric shock does not rely on basic insulation only but which includes an additional safety precaution,in that conductive accessible parts are connected to the protective earthing conductor in the fixed wiring of the installation in such a way that conductive accessible parts cannot become live in the event of a failure of the basic insulation		N
3.3.10	class Il appliance		N
	appliance in which protection against electric shock does not rely on basic insulation only but in which additional safety precautions are provided,such as double insulation or reinforced insulation, there being no provision for protective earthing or reliance upon installation conditions		N
3.3.11	class ll construction		N
	part of an appliance for which protection against electric shock relies upon double insulation or reinforced insulation		P
3.3.12	class Ill appliance		P
	appliance in which protection against electric shock relies on supply at safety extra-low voltage and in which voltages higher than those of safety extra-low voltage are not generated		P
3.3.13	class IIl construction		P
	part of an appliance for which protection against electric shock relies upon safety extra-low voltage and in which voltages higher than those of safety extra-low voltage are not generated		P
3.3.14	clearance		P
	shortest distance in air between two conductive parts or between a conductive part and the accessible surface		P
3.3.15	creepage distance		P
	shortest distance along the surface of insulation between two conductive parts or between a conductive part and the accessible surface		P

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3.4	Definitions relating to extra-low voltage		P
3.4.2	safety extra-low voltage		N
	voltage not exceeding 42V between conductors and between conductors and earth or functional earth,the no-load voltage not exceeding 50 V		P
3.4.3	safety isolating transformer		P
	transformer,the input winding of which is electrically separated from the output winding by an insulation at least equivalent to double insulation or reinforced insulation,that is intended to supply an appliance or circuit at safety extra-low voltage		P
3.4.4	protective extra-low voltage circuit		P
	earthed circuit operating at extra-low voltage that is separated from other circuits,except circuits operating at safety extra-low voltage, by basic insulation and protective screening, double insulation or reinforced insulation		N
3.5	double insulation or reinforced insulation		N
3.6	Definitions relating to parts of an appliance		P
3.7	Definitions relating to safety components		P
3.8	Definitions relating to miscellaneous matters		P
3.9	Definitions relating to electronic circuits		P
3.10	Definitions relating to battery charging and discharging		N
3.11	Definitions relating to remote functionality		P
4	**General requirement**		-
	Appliances shall be constructed so that in normal use,they function safely so as to cause no danger to persons or surroundings,even in the event of carelessness that may occur in normal use.		P
	In general,this principle is achieved by fulfilling the relevant requirements specified in this standard and compliance is checked by carrying out all the relevant tests.		P

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5	**General conditions for the tests**		-
	Unless otherwise specified,the tests are carried out in accordance with this clause.		P
5.1	Tests according to this standard are type tests.		P
5.2	The tests are carried out on a single appliance that shall withstand all the relevant tests. However,the tests of Clauses 12,20,22(except 22.10,22.11 and 22.18)to 26,28,30 and 31 may be carried out on separate appliances. The test of 22.3 is carried out on a new appliance. If an intentionally weak part becomes open circuit during the tests of Clause 19,an additional appliance may be needed.		P
	The testing of components may require the submission of additional samples of these components.		P
	If the test of normative Annex C has to be carried out,six samples of the motor are needed. If the test of normative Annex D has to be carried out,an additional appliance may be used. If the tests of normative Annex G are carried out,four additional transformers are needed. If the tests of normative Annex H are carried out,three switches or three additional appliances are needed.		P
	The cumulative stress resulting from successive tests on electronic circuits shall be avoided. It may be necessary to replace components or to use additional samples. The number of additional samples shall be kept to a minimum by an evaluation of the relevant electronic circuits.		P
	If an appliance has to be dismantled in order to carry out a test,care shallbe taken to ensure that it is reassembled as originally supplied.In case of doubt,subsequent tests may be carried out on a separate sample.		P

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5.3	The tests are carried out in the order of the clauses.However,the test of 22.11 on the appliance at room temperature is carried out before the tests of Clause 8. The tests of Clause 14,21.2 and 22.24 are carried out after the tests of Clause 29. The test of 19.14 is carried out before the tests of 19.11.		P
	If it is evident from the construction of the appliance that a particular testis not applicable,the testis not carried out.		P
5.4	When testing appliances that are also supplied by other energies such as gas,the influence of their consumption has to be taken into account.		P
5.5	The tests are carried out with the appliance or any movable part of it placed in the most unfavourable position that may occur in normal use.		P
5.6	The tests are carried out with the appliance or any movable part of it placed in the most unfavourable position that may occur in normal use.		P
	If the adjusting means of the control is accessible without the aid of a tool, this subclause applies whether the setting can be altered by hand or with the aid of a tool. If the adjusting means is not accessible without the aid of a tool and if the setting is not intended to be altered by the user,this subclause does not apply.		P
	For appliances fitted with a voltage selector switch,the tests are carried out with the switch in the position corresponding to the rated voltage value used for the tests.		P
5.7	The tests are carried out in a draught-free location at an ambient temperature of 20°C±5°C .		P
	If the temperature attained by any part is limited by a temperature sensitive device or is influenced by the temperature at which a change of state occurs,for example when water boils, the ambient temperature is maintained at 23°C±2°C in case of doubt.		P

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5.8	If the temperature attained by any part is limited by a temperature sensitive device or is influenced by the temperature at which a change of state occurs,for example when water boils, the ambient temperature is maintained at 23℃±2℃ in case of doubt.		P
5.8.1	Appliances for alternating current (AC)only are tested with AC at rated frequency, and those for AC and DC are tested at the more unfavourable supply.		P
	Appliances for AC that are not marked with rated frequency or are marked with a rated frequency range of 50 Hz to 60 Hz are tested with either 50 Hz or 60 Hz,whichever is the more unfavourable.		P
5.8.2	Appliances having more than one rated voltage are tested on the basis of the most unfavourable voltage.		P
	For motor-operated appliances,and combined appliances,marked with a rated voltage range, when it is specified that the supply voltage is equal to the rated voltage multiplied by a factor,the appliance is supplied at		P
	- the upper limit of the rated voltage range multiplied by this factor,if greater than 1;		P
	- the lower limit of the rated voltage range multiplied by this factor,if smaller than 1.		P
	When a factor is not specified,the supply voltage is the most unfavourable within the rated voltage range.		P
	If a heating appliance has a rated voltage range,the upper limit of the voltage range will usually be the most unfavourable voltage within the range.For motor-operated appliances, combined appliances and appliances having more than one rated voltage or rated voltage range, it may be necessary to make some of the tests at the minimum,the mean and the maximum values of the rated voltage or the rated voltage range in order to establish the most unfavourable voltage.		P

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5.8.3	For heating appliances,and combined appliances,marked with a rated power input range, when it is specified that the power input is equal to the rated power input multiplied by a factor,the appliance is operated at		P
	- the upper limit of the rated power input range multiplied by this factor,if greater than 1;		P
	- the lower limit of the rated power input range multiplied by this factor,if smaller than 1.		P
	When a factor is not specified,the power input is the most unfavourable within the rated power input range.		P
5.8.4	For appliances marked with a rated voltage range and rated power input corresponding to the mean of the rated voltage range, when it is specified that the power input is equal to rated power input multiplied by a factor,the appliance is operated at:		P
	- the calculated power input corresponding to the upper limit of the rated voltage range multiplied by this factor,if greater than 1;		P
	- the calculated power input corresponding to the lower limit of the rated voltage range multiplied by this factor,if smaller than 1.		P
	When a factor is not specified,the power input corresponds to the power input at the most unfavourable voltage within the rated voltage range.		N
5.9	When a factor is not specified,the power input corresponds to the power input at the most unfavourable voltage within the rated voltage range.		P
5.10	The tests are carried out on the appliance as supplied. However, an appliance constructed as a single appliance but supplied in a number of units is tested after assembly in accordance with the instructions provided with the appliance.		P

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5.11	Appliances intended to be connected to fixed wiring by means of a flexible cord are tested with the appropriate flexible cord connected to the appliance.		P
5.12	For heating appliances and combined appliances, when it is specified that the appliance has to operate at a power input multiplied by a factor,this applies only to heating elements without appreciable positive temperature coefficient of resistance.		P
	For heating elements with appreciable positive temperature coefficient of resistance,other than PTC heating elements, the supply voltage is determined by supplying the appliance at rated voltage until the heating element reaches its operating temperature. The supply voltage is then rapidly increased to the value necessary to give the power input required for the relevant test, this value of the supply voltage being maintained throughout the test.		P
5.13	The tests for appliances with PTC heating elements and for heating appliances and combined appliances where the heating elements are supplied via a switch mode power supply are carried out at a voltage corresponding to the specified power input.		P
	When a power input greater than the rated power input is specified,the factor for multiplying the voltage is equal to the square root of the factor for multiplying the power input.		N
5.14	An If class I appliances AHl have accessible metal parts that are not earthed and are not separated from live parts by an intermediate metal part that is earthed,such parts are checked for compliance with the appropriate requirements specified for class I construction.		N

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	An If class I appliances Aml have accessible non-metallic parts,such parts are checked for compliance with the appropriate requirements specified for class l construction unless these parts are separated from live parts by an intermediate metal part that is earthed.		P
5.15	If appliances have parts operating at safety extra-Iow voltage,such parts are checked for compliance with the appropriate requirements specified for class Ill construction.		P
5.16	When testing electronic circuits, the supply is to be free from perturbations from external sources that can influence the results of the tests.		P
5.17	Battery-operated appliances and remote controls containing batteries are tested in accordance with normative Annex B.		P
	Battery-operated appliances having a functional earth connection or a supply connection are tested in accordance with the relevant clauses of the main part of this standard and normative Annex B.		P
	Battery-operated appliances having a supply connection are considered dual supply appliances.Dual supply appliances are regarded as battery-operated appliances when deriving their energy from batteries.		P
	Separable batteries and detachable batteries for battery-operated appliances are tested in accordance with normative Annex B.		P
	To condition batteries that are rechargeable,the batteries shall be fully discharged and then fully charged in accordance with the appliance manufacturer's instructions. The sequence shall be repeated at least 2h after the battery was charged.		P

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	For batteries where there is a series arrangement of parallel clusters of cells, the clustershall be treated as a single cell for those tests that require altering the amount of charge on a single cell prior to conducting the test.		P
5.19	Measurements of cell voltages or battery voltages shall be made using a single pole resistive-capacitive low pass filter with a -3dB roll off frequency of 5kHz±0,5 kHz. To determine if the upper limit charging voltage has been exceeded,the peak value of the filtered voltage shall be measured with a tolerance of±1%.		P
	When measuring cell voltages or battery voltages,the peak value of any superimposed ripple exceeding 10%of the average value shall be included. Transient voltages are ignored,such as a temporary increase of voltage,for example,after the battery is removed from the charging system.		P
5.20	If linear and angular dimensions are specified without a tolerance,ISO 2768-1 is applicable.		N
5.21	Probes are applied with a force not exceeding 1N.		N
5.22	If a component or part of the appliance has both a self-resetting feature and a non- self-resetting feature and if the non-self-resetting feature is not required in order to comply with this standard,then appliances incorporating such a component or partshall be tested with the non-self-resetting feature rendered inoperative.		P
	An 5.Z1 In radio appliances,the radio functions shall be operated under their most unfavourable conditions of normal use during the tests of Clause 11,19 and 32.Special settings may be needed to operate the equipment in the most unfavourable conditions.A]		P
6	**Classification**		-

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6.1	Appliances shall be of one of the following classes with respect to protection against electric shock:		P
	A)class I,class II,class IIIII.Al		P
	If an appliance consists of a part of class Il construction and a detachable power supply part,the complete appliance is classified as a class I appliance or class ll appliance in accordance with the classification applicable to its detachable power supply part.		P
6.2	Appliances shall have the appropriate degree of protection against harmful ingress of water.		P
	Compliance is checked by inspection and by the relevant tests.		P
7	Marking and instructions		P
7.1	Appliances shall be marked with the:		P
	- rated voltage or rated voltage range in volts;		P
	- symbol for nature of supply,unless the rated frequency is marked;		P
	- rated power input in watts or rated current in amperes;		P
	- name,trade mark or identification mark of the manufacturer or responsible vendor;		P
	- model or type reference;		P
	- symbol IEC 60417-5172(2003-02)for class ll appliances only;		P
	- IP number according to degree of protection against ingress of water,other than IPX0;		P
	- symbol IEC 60417-5180(2003-02),for class Ill appliances. This marking is not necessary for appliances operated only by batteries (primary batteries or secondary batteries recharged outside of the appliance)or appliances powered by rechargeable batteries recharged in the appliance.		P
	Appliance outlets accessible to the user and socket-outlets accessible to the user:		P

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	- that are incorporated in appliances connected to the supply mains;and		P
	- that operate at rated voltage		P
	shall be marked with their outlet load in watts or amperes.		P
	Appliances intended to be supplied from a detachable power supply part for the purposes of recharging the battery shall be marked with symbol ISO 7000-0790(2004-01).They shall also be marked with symbol IEC 60417-6181(2016-01)and the model or type reference of the detachable power supply part or with the substance of the following:		P
	Use only with<model or type reference>supply unit		P
	Class ll appliances and class Ill appliances incorporating a functional earth shall be marked with the symbol IEC 60417-5018(2011-07).		P
	The enclosure of electrically-operated water valves incorporated in external hose-sets for connection of an appliance to the water mains shall be marked with symbol IEC60417-5036(2002-10)if their working voltage exceeds extra-low voltage.		P
7.2	Stationary appliances for multiple supply shall be marked with the substance of the following:		P
	Warning:Before obtaining access to terminals,all supply circuits must be disconnected This warningshall be placed in the vicinity of the terminal cover.		P
7.3	Appliances having a range of rated values and which can be operated without adjustment throughout the range shall be marked with the lower and upper limits of the range separated by a hyphen.		P

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	Appliances having different rated values and which have to be adjusted for use at a particular value by the user or installershall be marked with the different values separated by an oblique stroke.This requirement is also applicable to appliances with provision for connection to both single-phase and multi-phase supplies.		P
7.4	If the appliance can be adjusted for different rated voltages or rated frequencies, the voltage or the frequency to which the appliance is adjusted shall be clearly discernible.If frequent changes in voltage setting or frequency setting are not required,this requirement is considered to be met if the rated voltage or rated frequency to which the appliance is to be adjusted can be determined from a wiring diagram fixed to the appliance.		N
	The wiring diagram may be on the inside of a cover that has to be removed to connect the supply conductors.It shall not be on a label loosely attached to the appliance.		P
7.5	For appliances marked with more than one rated voltage or with one or more rated voltage ranges,the rated power input or rated current for each of these voltages or ranges shall be marked.However,if the difference between the limits of a rated voltage range does not exceed 10%of the arithmetic mean value of the range,the marking for rated power input or rated current may be related to the arithmetic mean value of the range.		P
	The upper and lower limits of the rated power input or rated current shall be marked on the appliance so that the relation between input and voltage is clear.		P
7.6	When symbols are used,they shall be as follows:		P

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	[symbol IEC 60417-5031 (2002-10)] direct current [symbol IEC 60417-5032 (2002-10)] alternating current 3 ~ [symbol IEC 60417-5032-1 (2002-10)] three-phase alternating current 3N ~ [symbol IEC 60417-5032-2 (2002-10)] three-phase alternating current with neutral [symbol IEC 60417-5016 (2002-10)] fuse-link		N
	time-lag miniature fuse-link where X is the symbol for the time/current characteristic as given in IEC 60127 [symbol IEC 60417-5019 (2006-08)] protective earth [symbol IEC 60417-5018 (2011-07)] functional earthing [symbol IEC 60417-5172 (2003-02)] **class II equipment** [symbol IEC 60417-5012 (2002-10)] Lamp		P
	[symbol ISO 7000-0434A (2004-01)] Caution [symbol ISO 7000-0790 (2004-01)] read operator's manual [symbol IEC 60417-5021 (2002-10)] Equipotentiality [symbol IEC 60417-5036 (2002-10)] dangerous voltage [symbol IEC 60417-5180 (2003-02)] **Class III appliance** [symbol IEC 60417-6181 (2016-01)] **detachable power supply part**		P
	The symbol for nature of supply shall be placed next to the marking for rated voltage.		P
	The symbol for class ll appliances shall be placed so that it will be obvious that it is a part of the technical information and is unlikely to be confused with any other marking.		P
	Units of physical quantities and their symbols shall be those of the international standardized system.		P
	Additional symbols are allowed provided that they do not give rise to misunderstanding.		P
	Symbols specified in IEC60417 and ISO 7000 may be used.		P
7.7	Appliances to be connected to more than two supply conductors and appliances for multiple supply shall have a connection diagram fixed to them,unless the correct mode of connection is obvious.		P

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	The correct mode of connection for multi-phase appliances is considered to be obvious if the terminals for the supply conductors are		P
	- indicated by arrows pointing towards the terminals;or		P
	- marked in words.		P
	The connection diagram may be the wiring diagram referred to in 7.4.		P
7.8	Except for type Z attachment, terminals used for connection to the supply mains shall be indicated as follows:		N
	-terminals intended exclusively for the neutral conductor shall be indicated by the letter N;		P
	- protective earthing terminals shall be indicated by symbol IEC 60417-5019(2006-08);		P
	- functional earthing terminals shall be indicated by symbol IEC 60417-5018(2011-07).		P
	These indications shall not be placed on screws,removable washers or other parts which can be removed when conductors are being connected.		P
7.9	Unless it is obviously unnecessary,switches which may give rise to a hazard when operated shall be marked or placed so as to indicate clearly which part of the appliance they control.Indications used for this purpose shall,wherever practicable,be comprehensible without a knowledge of languages or national standards.		N
7.10	The different positions of switches on stationary appliances and the different positions of controls on all appliances shall be indicated by figures,letters or other visual means.This requirement also applies to switches which are part of a control.		N

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	If figures are used for indicating the different positions,the off position shall be indicated by the figure 0 and the position for a higher value,such as output,input,speed or cooling effect, shall be indicated by a higher figure.		N
	The figure 0 shall not be used for any other indication unless it is positioned and associated with other numbers so that it does not give rise to confusion with the indication of the off position. The figure 0 may be used on a digital programming keyboard.		P
	The figure 0 shall not be used for any other indication unless it is positioned and associated with other numbers so that it does not give rise to confusion with the indication of the off position. The figure 0 may be used on a digital programming keyboard.		P
7.11	Controls intended to be adjusted during installation or in normal use shall be provided with an indication for the direction of adjustment.		P
7.12	Instructions shall be provided in hard copy form with the appliance so that the appliance can be used safely.		P
	Instructions may be marked on the appliance as long as they are visible in normal use.		P
	The instructions shall state the substance of the following:		P
	This appliance is not intended for use by persons (including children)with reduced physical, sensory or mental capabilities,or lack of experience and knowledge,unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety		P
	Children should be supervised to ensure that they do not play with the appliance.		P

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	The instructions for appliances having a part of class II construction supplied from a detachable power supply part shall state that the appliance is only to be used with the power supply unit provided with the appliance.		N
	The instructions for class Ill appliances shall state that it must only be supplied at safety extra- low voltage corresponding to the marking on the appliance.This instruction is not necessary for battery-operated appliances if the battery is a primary battery or secondary battery charged outside of the appliance.		P
	For appliances intended for use at altitudes exceeding 2000 m,the maximum altitude of use shall be stated.		P
	The instructions for appliances incorporating a functional earth shall state the substance of the following:		P
	This appliance incorporates an earth connection for functional purposes.		P
	For appliances intended to be connected to a supply for the purposes of recharging the battery, the instructions shall state the substance of the following:		P
	WARNING:Use only an external supply with the following specifications:<voltage and nature of supply><power /current of supply>		N
	For appliances intended to be supplied from a detachable power supply part for the purposes of recharging the battery ,the type reference of the detachable power supply part shall be stated along with the substance of the following:		P
	For appliances intended for use with batteries that use metal-ion chemistries,the instructions shall state the normal temperature range for charging the battery.		P

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	If the symbol for detachable power supply part is used,its meaning shall be explained.		P
7.12.1	If it is necessary to take precautions during installation of the appliance,appropriate details shall be given.		P
	If an appliance is intended to be permanently connected to the water mains and not connected by a hose-set,this shall be stated.		P
	For appliances marked with different rated voltages or different rated frequencies (separated by a /),instructions shall be included to indicate to the user or installer what action must be taken to adjust the appliance for operation at the required rated voltage or rated frequency.		P
7.12.2	If a stationary appliance is not fitted with a supply cord and a plug,or with other means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category Illconditions,the instructions shall state that means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.		N
7.12.3	If the insulation of the fixed wiring supplying an appliance for permanent connection to the supply mains can come into contact with parts having temperature rise exceeding 50 K during the test of Clause 11,the instructions shall state that the fixed wiring insulation must be protected,for example,by insulating sleeving having an appropriate temperature rating.		P
7.12.4	The instructions for built-in appliances shall include information with regard to the following:		P
	- dimensions of the space to be provided for the appliance;		N

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	- dimensions and position of the means for supporting and fixing the appliance within this space;		P
	- minimum distances between the various parts of the appliance and the surrounding structure;		P
	- minimum dimensions of ventilating openings and their correct arrangement;		P
	- connection of the appliance to the supply mains and the interconnection of any separate components;		N
	- necessity to allow disconnection of the appliance from the supply after installation,unless the appliance incorporates a switch complying with 24.3.The disconnection may be achieved by having the plug accessible or by incorporating a switch in the fixed wiring in accordance with the wiring rules.		N
7.12.5	For appliances with type X attachment having a specially prepared cord,the instructions shall contain the substance of the following:		P
	If the supply cord is damaged,it must be replaced by a special cord or assembly available from the manufacturer or its service agent.		P
	For appliances with type Y attachment,the instructions shall contain the substance of the following:		P
	If the supply cord is damaged,it must be replaced by the manufacturer,its service agent or similarly qualified persons in order to avoid a hazard.		P
	For appliances with type Z attachment, the instructions shall contain the substance of the following:		P
	The supply cord cannot be replaced.If the cord is damaged,the appliance should be scrapped.		P
	If a cord set is required to be provided with the appliance according to Subclause 22.58,the instructions shall contain the substance of the following:		P

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	If the cord set is damaged,it must be replaced by a special cord set available from the manufacturer or its service agent.		P
7.12.6	If a non-self-resetting thermal cut-out is required in order to comply with this standard,then the instructions for appliances incorporating a non-self-resetting thermal cut- out that is reset by disconnection of the supply mains shall contain the substance of the following:		P
	CAUTION:In order to avoid a hazard due to inadvertent resetting of the thermal cut-out, this appliance must not be supplied through an external switching device,such as a timer,or connected to a circuit that is regularly switched on and off by the utility.		P
7.12.7	If a non-self-resetting thermal cut-out is required in order to comply with this standard,then the instructions for appliances incorporating a non-self-resetting thermal cut- out that is reset by disconnection of the supply mains shall contain the substance of the following:		P
7.12.8	The instructions for appliances connected to the water mains shall state:		P
	- the maximum inlet water pressure,in pascals;		P
	- the minimum inlet water pressure,in pascals,if this is necessary for the correct operation of the appliance.		P
	The instructions for appliances connected to the water mains by detachable hose-sets shall state that the new hose-sets supplied with the appliance are to be used and that old hose-sets should not be reused.		P

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7.12.9	For each language,the instructions specified in 7.12 and from 7.12.1 to 7.12.8 shall be in hard copy form and shall appear together before any other instructions supplied with the appliance.Alternatively,these instructions may be supplied with the appliance separately from any functional use booklet.They may follow the description of the appliance that identifies parts, or follow the drawings/sketches common to the languages of the instructions.		P
	In addition,instructions shall also be available in an alternative format such as on a website or on request from the user in a format such as a DVD.		P
7.13	Instructions and other text required by this standard shall be written in an official language of the country in which the appliance is to be sold.		P
7.14	The markings required by this standardshall be clearly legible.		P
	The signal words WARNING,CAUTION,DANGER if in the Latin alphabet shall be in uppercase having a height not less than:		P
	- 3,5 mm for appliances normally used on the floor;		P
	-2,0 mm for portable appliances with a printable surface of less than 10cm²;and		P
	- 3,0 mm for other appliances.		P
	Uppercase letter of the text explaining the signal word shall be no smaller than 1,6 mm,with other letters according to the font size of the uppercase letter.		P
	Countries that do not use the Latin alphabet need to specify the minimum size of the script to be used taking into account what is specified for the Latin alphabet.		P
	Unless contrasting colours are used,moulded in,engraved,or stamped markings shall be either raised above or have a depth below the surface of at least 0,25 mm.		P

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	The markings required by this standard shall be durable.On containers that are likely to be cleaned frequently,the markings shall not be by means of paint or enamel,other than vitreous enamel.		P
	Compliance is checked by inspection,by measurement and by rubbing the marking by hand for 15s with a piece of cloth soaked with water and again for 15s with a piece of cloth soaked with petroleum spirit. The petroleum spirit to be used for the testis aliphatic solvent hexane.		N
	After all the tests of this standard,the marking shall be clearly legible.It shall not be easily possible to remove marking plates nor shall they show curling.		P
7.15	The markings specified in 7.1 to 7.5 shall be on a main part of the appliance.		P
	Markings on the appliance shall be clearly discernible from the outside of the appliance but if necessary after removal of a cover.For portable appliances, it shall be possible to remove or open this cover without the aid of a tool		P
	For stationary appliances, at least the name or trademark or identification mark of the manufacturer or responsible vendor and the model or type referenceshall be visible when the appliance is installed as in normal use.These markings may be beneath a detachable cover. Other markings may be beneath a cover only if they are near to the terminals.For fixed appliances,this requirement applies after the appliance has been installed according to the instructions provided with the appliance.		P
	Indications for switches and controls shall be placed on or near these components.They shall not be placed on parts which can be positioned or repositioned in such a way that the marking is misleading.		P

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	The symbol IEC 60417-5018(2011-07)shall be placed next to the symbol IEC 60417-5172 (2003-02)or the symbol IEC60417-5180 (2003-02)as appropriate.		P
	The type reference of the detachable power supply part shall be placed next to symbol IEC60417-6181(2016-01).		N
	The marking of the outlet load shall be on the appliance close to the appliance outlet or socket- outlet.		P
7.16	If compliance with this standard depends upon the operation of a replaceable thermal link or fuse link,the reference number or other means for identifying the link shall be marked at such a place that it is clearly visible when the appliance has been dismantled to the extent necessary for replacing the link.		P
	This requirement does not apply to links which can only be replaced together with a part of the appliance.		P
8	**Protection against access to live parts**		-
8.1	Protection against access to live parts		N
	Compliance is checked by inspection and by the tests of 8.1.1 to 8.1.3,as applicable,taking into account 8.1.4 and 8.1.5.		N
8.1.1	The requirement of 8.1 applies for all positions of the appliance when it is operated as in normal use,and after the removal of detachable parts,unless otherwise specified.		N

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	Test probe B and test probe 18 of IEC61032 are applied with a force not exceeding 1N,the appliance being in every possible position,except that appliances normally used on the floor and having a mass exceeding 40 kg are not tilted.Through openings,the test probe is applied to any depth that the probe will permit and is rotated or angled before,during and after insertion to any position.If the opening does not allow the entry of the probe,the force on the probe in the straight position is increased to 20 N when probe B is used or 10 N when probe 18 is used. If the probe then enters the opening,the testis repeated with the probe in the angled position.		P
	During the tests with test probe B,all detachable parts are removed except lamps located behind a detachable cover are not removed,provided that the appliance can be isolated from the supply mains by means of a plug or an all-pole switch.However,during insertion or removal of lamps which are located behind a detachable cover,protection against contact with live parts of the lamp cap shall be ensured.		P
	Test probe 18 is not applied to appliances for commercial use unless they are intended to be installed in an area open to the public.		P
	It shall not be possible to touch live parts or live parts protected only by lacquer,enamel, ordinary paper,cotton,oxide film,beads,or sealing compound except self-hardening resins, with the probe.		P
8.1.2	Test probe 13 of IEC61032 is applied with a force not exceeding 1N through openings in A class Il appliances and class ll constructions An,except for those giving access to lamp caps and live parts in socket-outlets.		N

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	The test probe is also applied through openings in earthed metal enclosures having a non- conductive coating such as enamel or lacquer.		P
8.1.3	Instead of test probe B,test probe 18 and test probe 13,for appliances other than those of class Il,test probe 41 of IEC61032 is applied with a force not exceeding 1N to live parts of visibly glowing heating elements,all poles of which can be disconnected by a single switching action.It is also applied to parts supporting such elements,provided that it is obvious from the outside of the appliance,without removing covers and similar parts,that these supporting parts are in contact with the element.		P
	It shall not be possible to touch these live parts.		P
	If a single switching action is obtained by a switching device,the switching deviceshall provide full disconnection and the clearances for full disconnection specified in 20.3.3 of IEC 61058-1:2016 shall be obtained from [AC1 Table 12 of IEC 61058-1:2016 AG using the next higher step for rated impulse withstand voltage.		P
8.2	Class ll appliances and class ll constructions shall be constructed and enclosed so that there is adequate protection against accidental contact with basic insulation and metal parts separated from live parts by basic insulation only.		P
	It shall only be possible to touch parts which are separated from live parts by double insulation or reinforced insulation.		P
	Compliance is checked by inspection and by applying the test probes specified in 8.1.1 in accordance with the conditions specified in 8.1.1.		P

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8.3	For a battery-operated appliance where the battery circuit has a functional earth connection or a supply connection,it shall only be possible to touch parts within a battery compartment where:		P
	-in A class I appliances and class ll appliances,they are separated from live parts by double insulation or reinforced insulation;		P
	-the battery compartment is of class Il construction.However,if the limits in 8.1.4 are exceeded,then basic insulation is required in addition to supply at SELV.AT		P
	Compliance is checked by inspection and by applying the test probes specified in 8.1.1 in accordance with the conditions specified in 8.1.1.		P
9	**Starting of motor-operated appliances**		-
	NOTE Requirements and tests are specified in part 2 when necessary.		P
10	**Power input and current**		-
10.1	If an appliance is marked with rated power input,the power input at normal operating temperature shall not deviate from the rated power input by more than the deviation shown in Table 1.		P
	Table 1 – Power input deviation **Type of appliance** / **Rated power input** W / **Deviation** All appliances: ≤25: +20 % **Heating appliances** and **combined appliances**: >25 and ≤200: ±10 %; >200: +5 % or 20 W (whichever is the greater) −10 % **Motor-operated appliances**: >25 and ≤300: +20 %; >300: +15 % or 60 W (whichever is the greater)		P
	The deviation for motor-operated appliances applies for combined appliances if the power input of the motors is more than 50%of the rated power input.The permissible deviations apply for both limits of the range for appliances marked with a rated voltage range having limits differing by more than 10%of the arithmetic mean value of the range.		P

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	In case of doubt,the power input of the motors may be measured separately.		P
	Compliance is checked by measurement when the power input has stabilized with:		P
	- all circuits which can operate simultaneously being in operation;		P
	- the appliance being supplied at rated voltage;		N
	- the appliance being operated under normal operation.		P
	If the power input varies throughout the operating cycle and its maximum value exceeds twice its arithmetic mean value occurring during a representative period,then the power input is the maximum value of the power input that is exceeded for more than 10%of the representative period if this value is greater than the arithmetic mean value.Otherwise the power input is taken as the arithmetic mean value.		P
	The testis carried out at both the upper and lower limits of the ranges for appliances marked with one or more rated voltage ranges, unless the marking of the rated power input is related to the arithmetic mean value of the relevant voltage range,in which case the testis carried out at a voltage equal to the arithmetic mean value of that range.		N
	Appliance outlets accessible to the user and socket-outlets accessible to the user that:		P
	- are incorporated in appliances connected to the supply mains;and		P
	- operate at rated voltage		P
	are not loaded during the test;however,their contribution to the power input is considered to be the marked outlet load per appliance outlet or socket-outlet.		N
10.2	If an appliance is marked with rated current,the current at normal operating temperature shall not deviate from the rated current by more than the deviation shown in Table 2.		P

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	Table 2 – Current deviation <table><tr><th>Type of appliance</th><th>Rated current A</th><th>Deviation</th></tr><tr><td>All appliances</td><td>≤0,2</td><td>+20 %</td></tr><tr><td rowspan="2">**Heating appliances** and **combined appliances**</td><td>>0,2 and ≤1,0</td><td>±10 %</td></tr><tr><td>>1,0</td><td>+5 % or 0,10 A (whichever is the greater) −10 %</td></tr><tr><td rowspan="2">**Motor-operated appliances**</td><td>>0,2 and ≤1,5</td><td>+20 %</td></tr><tr><td>>1,5</td><td>+15 % or 0,30 A (whichever is the greater)</td></tr></table>		P
	The deviation for motor-operated appliances applies for combined appliances if the current of the motors is more than 50%of the rated current. The permissible deviations apply for both limits of the range for appliances marked with a rated voltage range having limits differing by more than 10%of the arithmetic mean value of the range.		P
	In case of doubt,the current of the motors may be measured separately.		P
	Compliance is checked by measurement when the current has stabilized with:		P
	- all circuits which can operate simultaneously being in operation;		P
	- the appliance being supplied at rated voltage;		P
	- the appliance being operated under normal operation.		N
	If the current varies throughout the operating cycle and its maximum value exceeds twice its arithmetic mean value occurring during a representative period,then the current is the maximum value of the current that is exceeded for more than 10%of the representative period if this value is greater than the arithmetic mean value.Otherwise the current is taken as the arithmetic mean value.		P

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	The test is carried out at both the upper and lower limits of the ranges for appliances marked with one or more rated voltage ranges, unless the marking of the rated current is related to the arithmetic mean value of the relevant voltage range,in which case the test is carried out at a voltage equal to the arithmetic mean value of that range.		P
	Appliance outlets accessible to the user and socket-outlets accessible to the user that:		N
	- are incorporated in appliances connected to the supply mains;and		P
	- operate at rated voltage		P
	are not loaded during the test;however,their contribution to the current is considered to be the marked outlet load per appliance outlet or socket-outlet.		P
11	**Heating**		-
11.1	Appliances and their surroundings shall not attain excessive temperatures in normal use. Compliance is checked by determining the temperature rise of the various parts under the conditions specified in 11.2 to 11.7.		P
11.2	Hand-held appliances are held in their normal position of use.		P
	Appliances with pins for insertion into socket-outlets are plugged into an appropriate wall- mounted socket-outlet.		P
	Built-in appliances are installed in accordance with the instructions.		N
	Other heating appliances and other combined appliances are placed in a test corner as follows:		P
	-appliances normally placed on a floor or table in use are placed on the floor as near to the walls as possible;		P
	-appliances normally fixed to a wall are fixed to one of the walls,as near to the other wall and floor or ceiling as is likely to occur,taking into account the instructions;		P

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	- appliances normally fixed to a ceiling are fixed to the ceiling as near to the walls as is likely to occur,taking into account in the instructions.		P
	Other motor-operated appliances are positioned as follows:		P
	-appliances normally placed on a floor or table in use are placed on a horizontal support;		P
	- appliances normally fixed to a wall are fixed to a vertical support;		P
	- appliances normally fixed to a ceiling are fixed underneath a horizontal support.		P
	Dull black-painted plywood approximately 20 mm thick is used for the test corner,the supports and for the installation of built-in appliances.		P
	For appliances provided with an automatic cord reel,one-third of the total length of the cord is unreeled. The temperature rise of the cord sheath is determined as near as possible to the hub of the reel and also between the two outermost layers of the cord on the reel.		P
	For cord storage devices,other than automatic cord reels,which are intended to accommodate the supply cord partially while the appliance is in operation,50 cm of the cord is unwound. The temperature rise of the stored part of the cord is determined at the most unfavourable place. An Appliances having a radio function shall be operated in the most unfavourable configuration of the appliance,which can happen in normal use.		P
	All transmitters and receivers shall be operated in continuous mode.		P
	All transmitters and receivers shall be activated in most unfavourable configuration.		P
	If the antenna is a detachable part,tests shall be carried out in both conditions:Al		P

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11.3	Temperature rises,other than those of windings,are determined by means of thermocouples having a diameter not exceeding 0,3 mm positioned so that they have minimum effect on the temperature of the part under test.		N
	Thermocouples used for determining the temperature rise of the surface of walls,ceiling and floor of the test corner are attached to the back of small blackened disks of copper or brass, 15mm in diameter and 1mm thick. The front of the disk is flush with the surface of the board.		N
	As far as is possible,the appliance is positioned so that the thermocouples detect the highest temperatures.		P
	If it is necessary to dismantle the appliance to position thermocouples,verify that the appliance has been correctly reassembled.In case of doubt,remeasure the power input or input current as appropriate.		P
	The temperature rise of electrical insulation,other than that of windings,is determined on the surface of the insulation at places where failure could cause:		P
	- a short circuit;		P
	- contact between live parts and accessible metal parts;		P
	- bridging of insulation;		P
	- a reduction of clearances or creepage distances below the values specified in Clause 29.		P
	NOTE 1 The point of separation of the cores of a multicore cord and the point where insulated wires enter lampholders are examples of places where thermocouples are positioned.		P

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Test Conditions

Environmental Conditions

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment.
The climatic conditions during the tests were within the following limits:

Temperature	Humidity	Atmospheric pressure
15 °C – 35 °C	30 % - 60 %	860 hPa – 1060 hPa

If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.

Performance Criteria

Clause 5		
Criteria	**During test**	**After test**
A	The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonable expect from the apparatus if used as intended.	
B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however no change of actual operating state or stored data is allowed to persist after test. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonable expect from the apparatus if used as intended.	
C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instruction for use.	

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Test Conditions

Environmental Conditions

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:		
Temperature	**Humidity**	**Atmospheric pressure**
15 °C – 35 °C	30 % - 60 %	860 hPa – 1060 hPa
If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.		

Performance Criteria

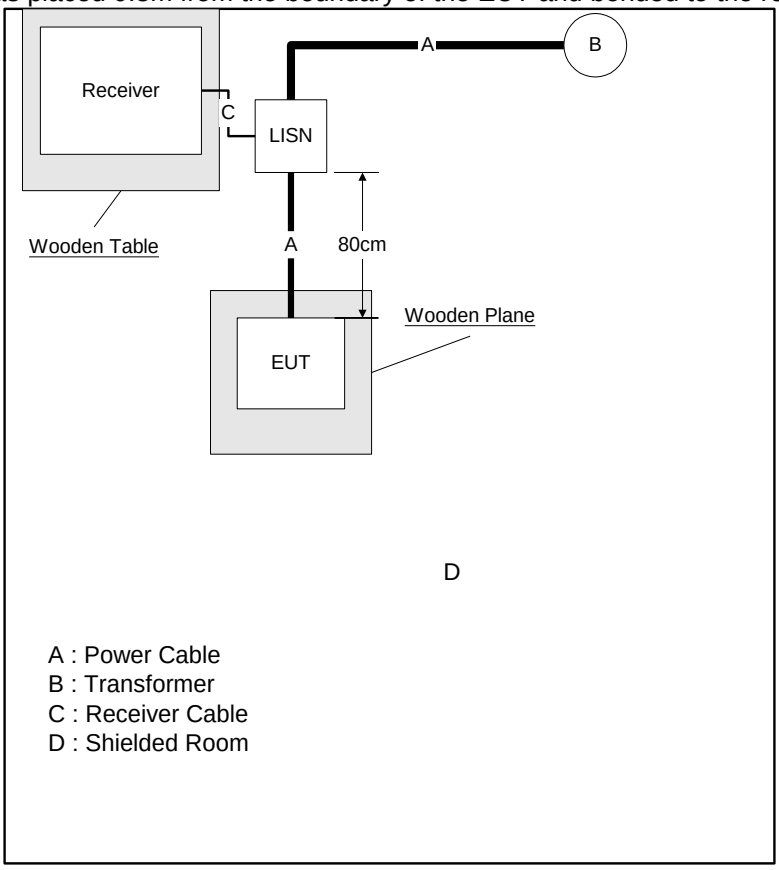
Criteria	During test	After test
A	The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonable expect from the apparatus if used as intended.	
B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however no change of actual operating state or stored data is allowed to persist after test. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonable expect from the apparatus if used as intended.	
C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instruction for use.	

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Conducted Disturbance

Test Method

The EUT was placed on a 0.8 m non-conductive table for table-top equipment and on a 0.12 m insulated support for floor standing equipment above a ground reference plane all within a test laboratory.
All power was connected to the EUT through an Artificial Mains Network (AMN). Conducted disturbance voltage measurements on mains lines were made at the output of the AMN. The AMN was placed 0.8m from the boundary of the EUT and bonded to the reference ground plane.



Specification Limits

Disturbance voltage limits for class B equipment for AC power input port		
Frequency range	AC mains port dB(μV)	
MHz	Quasi-peak	Average
0.15 to 0.5	66 decreasing linearly with logarithm of frequency to 56	56 decreasing linearly with logarithm of frequency to 46
0.5 to 5	56	46
5 to 30	60	50

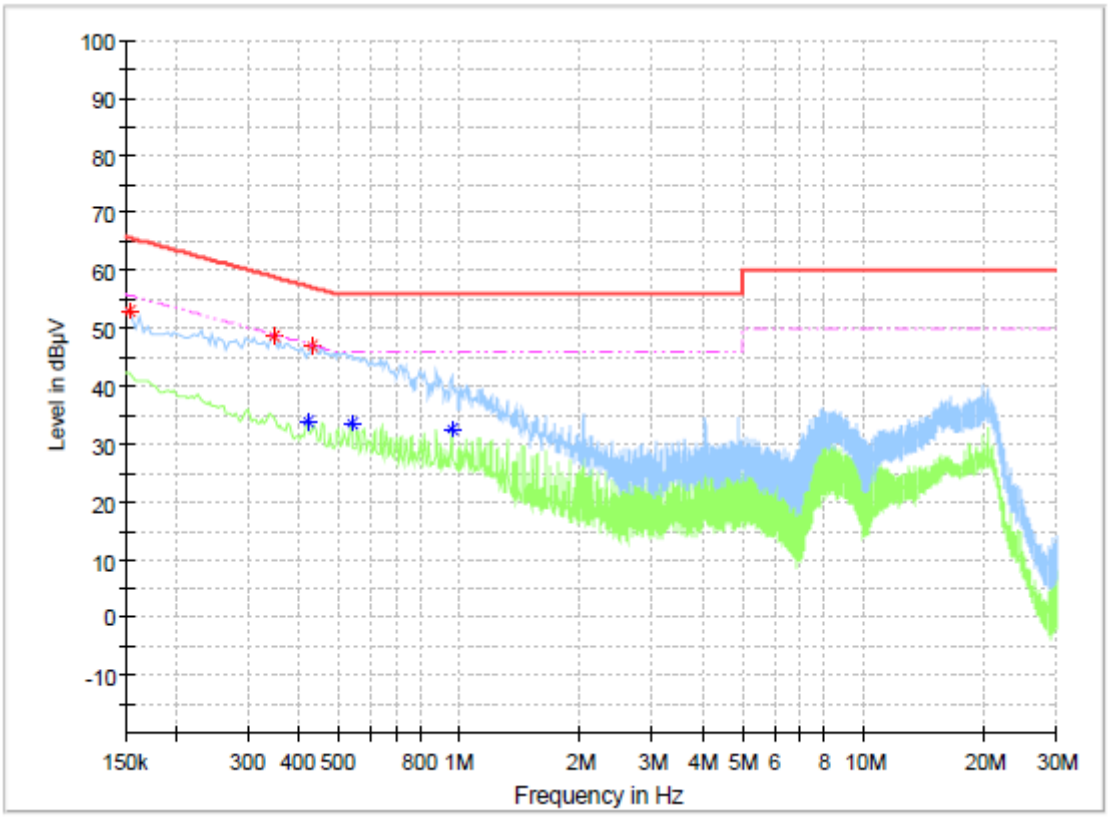
Test Location

This test was carried out in shielded room.

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Test Results

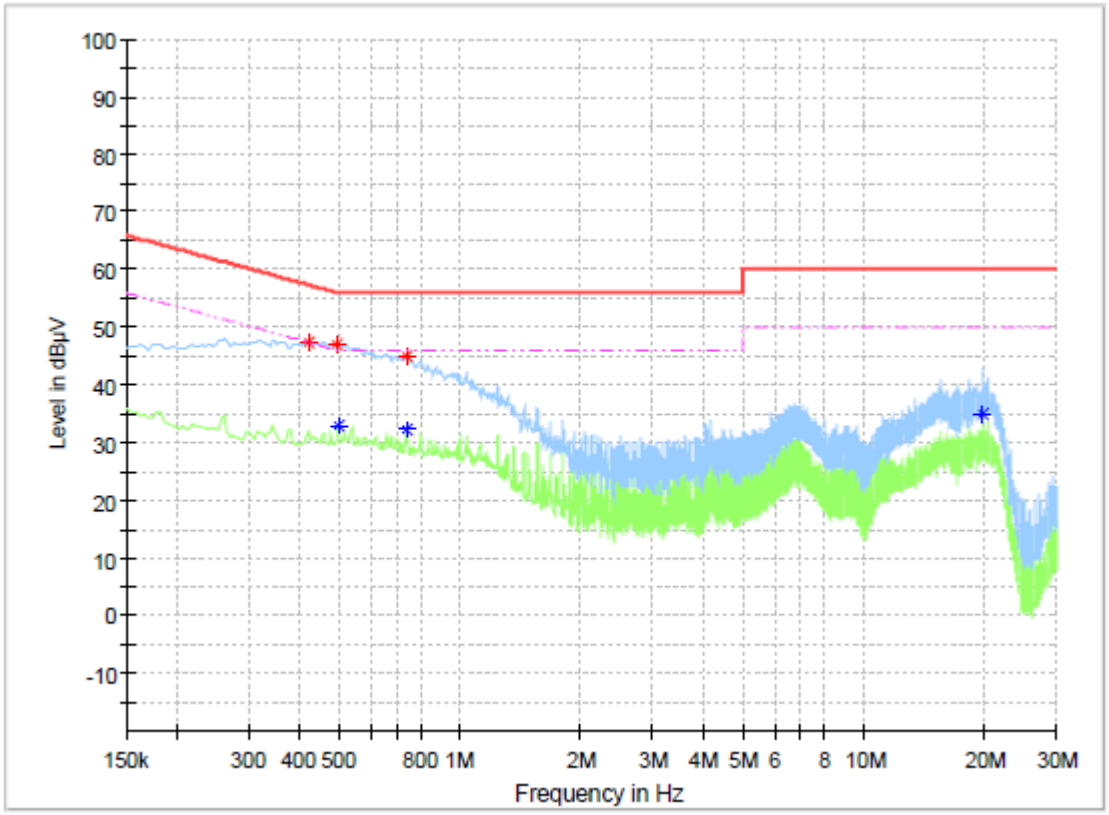
Remark : L1



No significant emission was detected within 6 dB to limit.

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Remark : N



No significant emission was detected within 6 dB to limit.

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Radiated Disturbance

Test Method

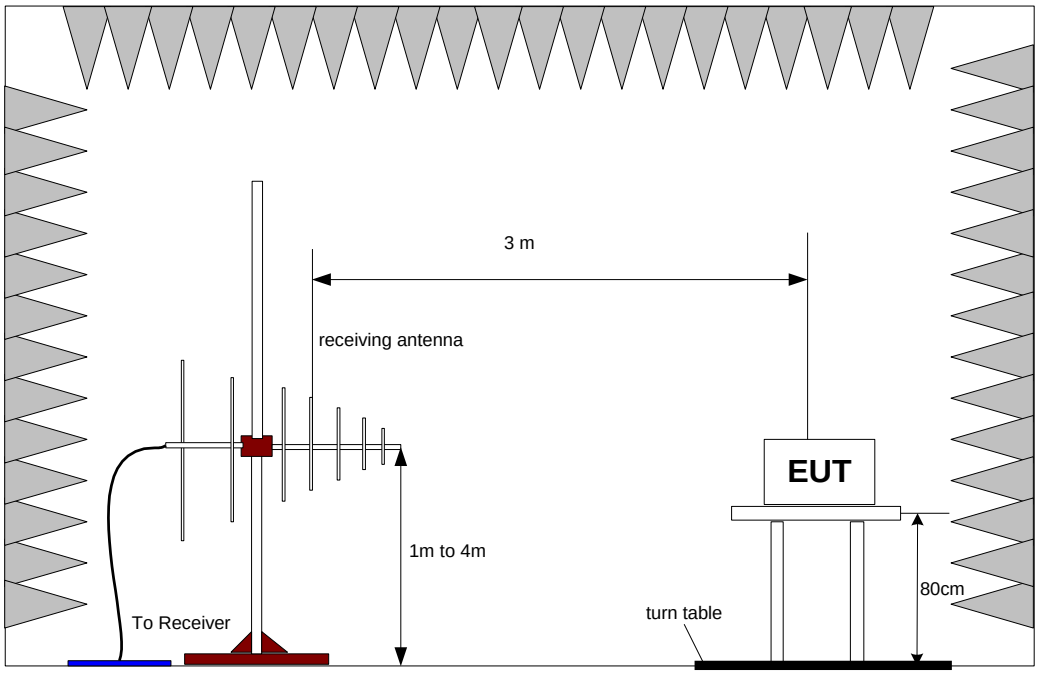
The EUT was set up in a semi-anechoic chamber on a remotely controlled turntable and placed on a non-conductive. Guidance on how to arrange the EUT during the measurements can be found in 5.3.4.3.

Table-top EUT shall be placed at (0,8 ± 0,05) m above the reference plane of the test site
selected for measurement.

Floor standing EUT shall be placed at (0,12 ± 0,04) m above the reference plane of the test
site selected for measurement.

Where the EUT comprises multiple parts, these shall be arranged to minimise, as far as it is
reasonably practical, the test volume. A minimum distance of 0,1 m shall be maintained
between these parts.

A prescan of the EUT emissions profile was made while varying the antenna-to-EUT azimuth and antenna-to-EUT polarization using a peak detector; measurements were taken at a 3m or 10m distance. Using the prescan list of the highest emissions detected, their bearing and associated antenna polarization, the EUT was then formally measured using a Quasi-Peak detector. The readings were maximized by adjusting the antenna height, polarization and turntable azimuth, in accordance with the specification.



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Specification Limits

Radiated disturbance limits in the frequency range 30MHz to 1000MHz at a measuring distance of 3 m	
Frequency range MHz	Quasi-peak limits dB(μV, m)
30 to 230	40
230 to 1000	47

Radiated disturbance limits in the frequency range 30MHz to 1000MHz at a measuring distance of 10 m	
Frequency range MHz	Quasi-peak limits dB(μV, m)
30 to 230	30
230 to 1000	37

Radiated disturbance limits in the frequency range 1000MHz to 6000MHz at a measuring distance of 3 m		
Frequency range MHz	Quasi-peak limits dB(μV, m)	Average
1000 to 3000	70	50
3000 to 6000	74	54

Remark：
Level=Reading Level + Correction Factor
Correction Factor=Antenna Factor + Cable Loss
(The Reading Level is recorded by software which is not shown in the sheet)

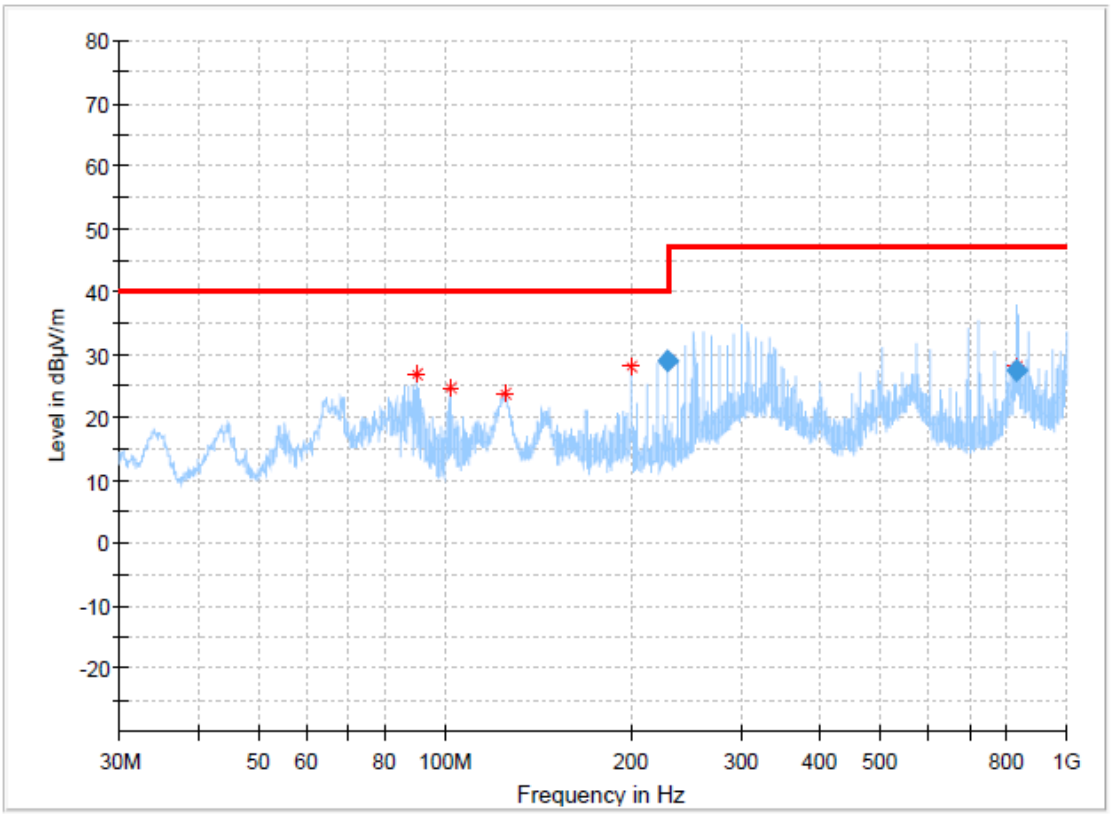
Test Location

This test was carried out in 3m SAC Test Location.

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Test Results

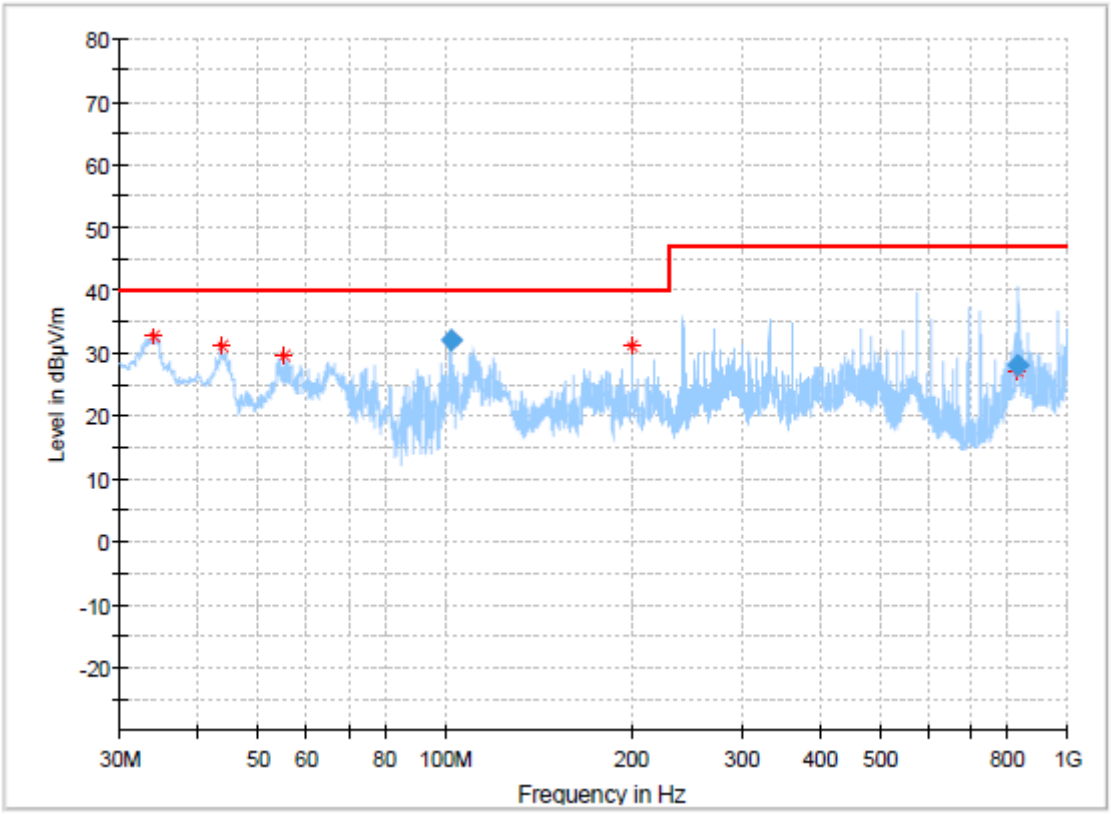
Polarity : Horizontal



No significant emission was detected within 6 dB to limit.

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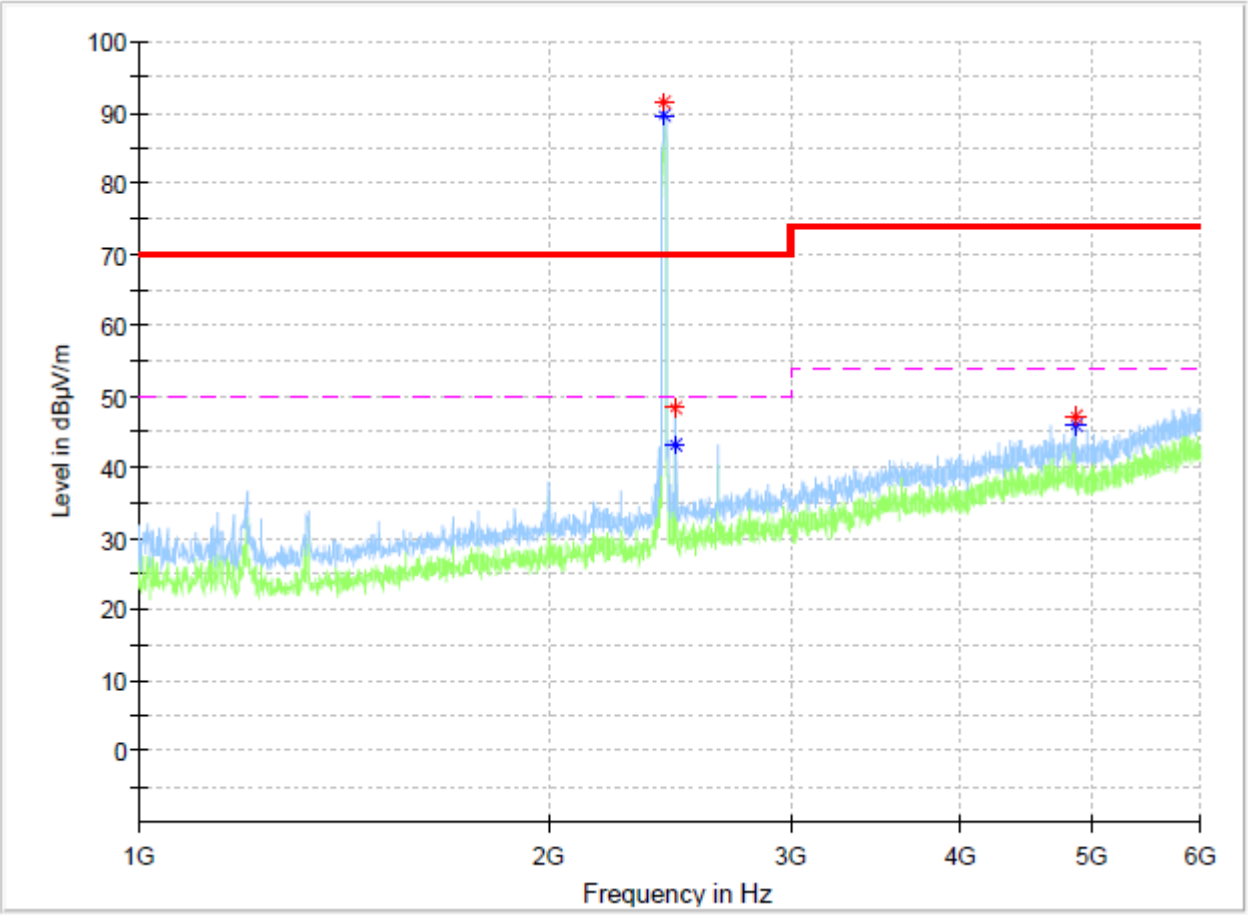
Polarity : Vertical



No significant emission was detected within 6 dB to limit.

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Polarity : Horizontal

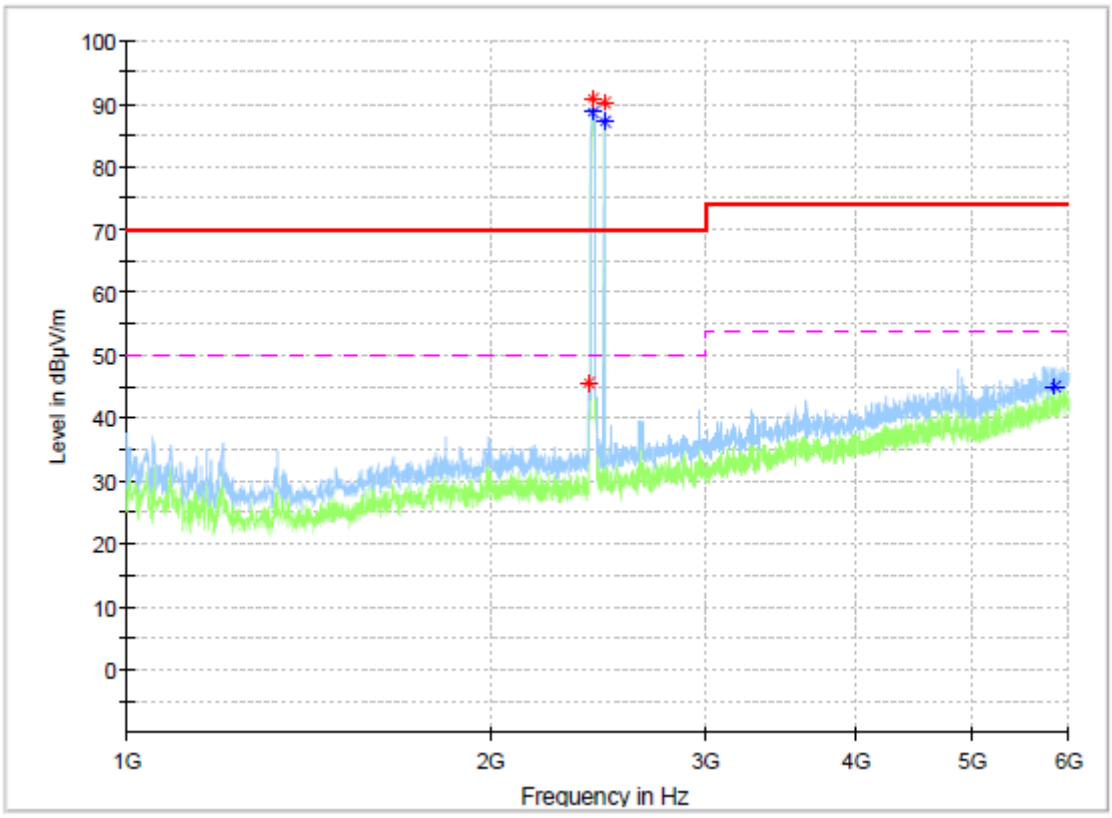


No significant emission was detected within 6 dB to limit

Frequency (MHz)	MaxPeak (dBµV, m)	Average (dBµV, m)	Limit (dBµV, m)	Margin (dB)	Pol
2430.000000	---	89.48	50.00	-39.48	H
2430.000000	91.44	---	70.00	-21.44	H
2477.500000	48.46	---	70.00	21.54	H
2477.500000	---	43.11	50.00	6.89	H

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Polarity : Vertical



No significant emission was detected within 6 dB to limit

Frequency (MHz)	MaxPeak (dBµV, m)	Average (dBµV, m)	Limit (dBµV, m)	Margin (dB)	Pol
2407.500000	45.64	---	70.00	24.36	V
2426.250000	90.65	---	70.00	-20.65	V
2426.250000	---	88.68	50.00	-38.68	V
2480.000000	90.24	---	70.00	-20.24	V
2480.000000	---	87.14	50.00	-37.14	V

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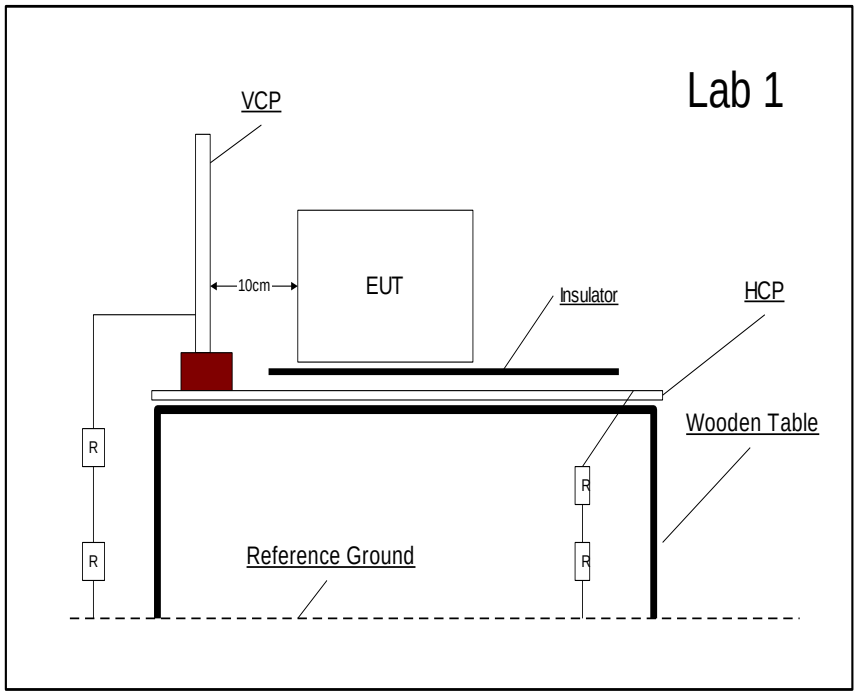
Electrostatic discharge immunity test

Test Method

The equipment under test including associated cabling was configured on but insulated from, using a 0.5mm isolator, a horizontal coupling plane fitted to the top of a 0.8m non-conductive table for table-top equipment; and on a 0.1m insulated support for floor standing equipment; above a ground reference plane all within a test laboratory.

Using the air discharge method for non-metallic parts, contact discharge method for metallic parts with both vertical and horizontal couple plane discharge methods for the sides of the equipment under test, the required electrostatic discharge voltage levels in both voltage polarities were applied at the detailed pulse repartition rate.

During this testing any anomalies in the equipment under tests performance was recorded.



Specification Limits

Required Test Levels				Performance Criteria
Discharge type	Discharge Level (kV)		Number of discharges per location (each polarity)	
	Positive	Negative		
Air – Direct	8	8	10	B
Contact – Direct	4	4	10	B
Contact – Indirect	4	4	10	B

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Test Results

Performance assessment of the EUT made during this test: Pass

Detailed results are shown below.

Test Point	Discharge	Results: Met Performance Criteria									
		2kV		4kV		6kV		8kV		15kV	
		+	-	+	-	+	-	+	-	+	-
HCP	Contact	N, A	N, A	A	A	A	A	N, A	N, A	N, A	N, A
VCP	Contact	N, A	N, A	A	A	A	A	N, A	N, A	N, A	N, A
Each conductive location touchable by hand	Contact	N, A	N, A	A	A	A	A	N, A	N, A	N, A	N, A
Each nonconductive location touchable by hand	Air	N, A	N, A	N, A	N, A	N, A	N, A	A	A	N, A	N, A
N, A	Not Appliance										

Remark: No observable change.

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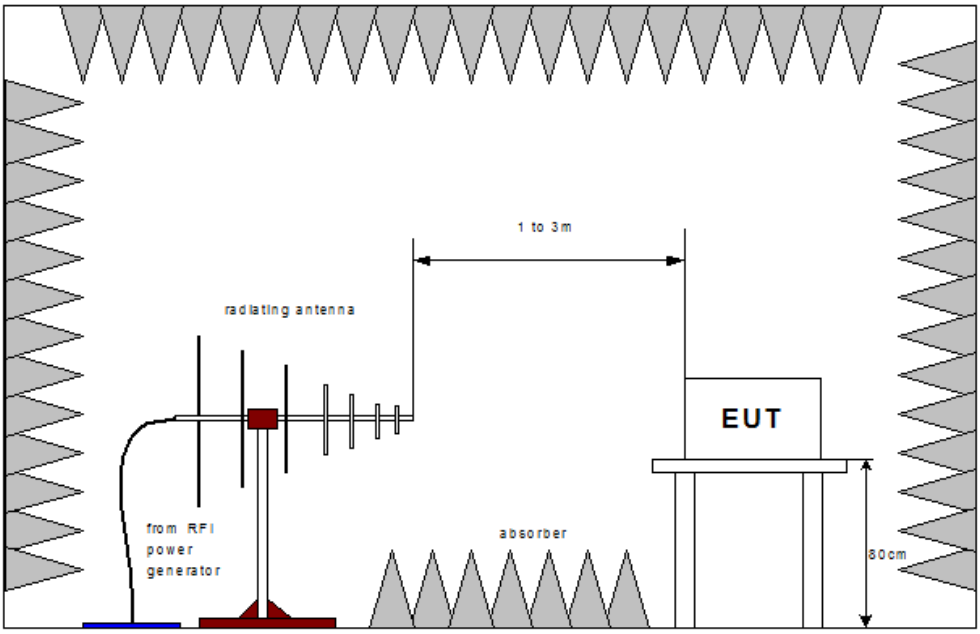
Radiated, radio-frequency, electromagnetic field immunity test

Test Method

The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.12 m insulated support for floor standing equipment; with a pre-calibrated semi anechoic chamber.

All four side of the equipment under test were subjected to the required RF field strength, modulated as described, swept over the frequency range of test with the antenna positioned in both horizontal and vertical polarizations.

During this testing any anomalies in the equipment under tests performance was recorded.



Specification Limits

Required Test Levels					Performance Criteria
Frequency Range (MHz)	Level (V, m)	Modulation	Step Size (%)	Dwell (s)	
80 to 6000	3	AM (80 %,1 kHz, sine wave)	1	1	A
Note 1. EUT powered at one of the Nominal input voltages and frequencies					

Test Results

Performance assessment of the EUT made during this test: Pass

Detailed results are shown below.

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Tabulated Results for RF Electromagnetic Field 80 - 2700 MHz					
Side of the equipment under test	Antenna polarization	Test Level	Dwell Time	Measuring distance	Results
Front, Left, Right, Back sides	Horizontal	3 V, m 80 to 6000MHz	1 s	3 m	A
Front, Left, Right, Back sides	Vertical	3 V, m 80 to 6000MHz	1 s	3 m	A

Remark: No observable change

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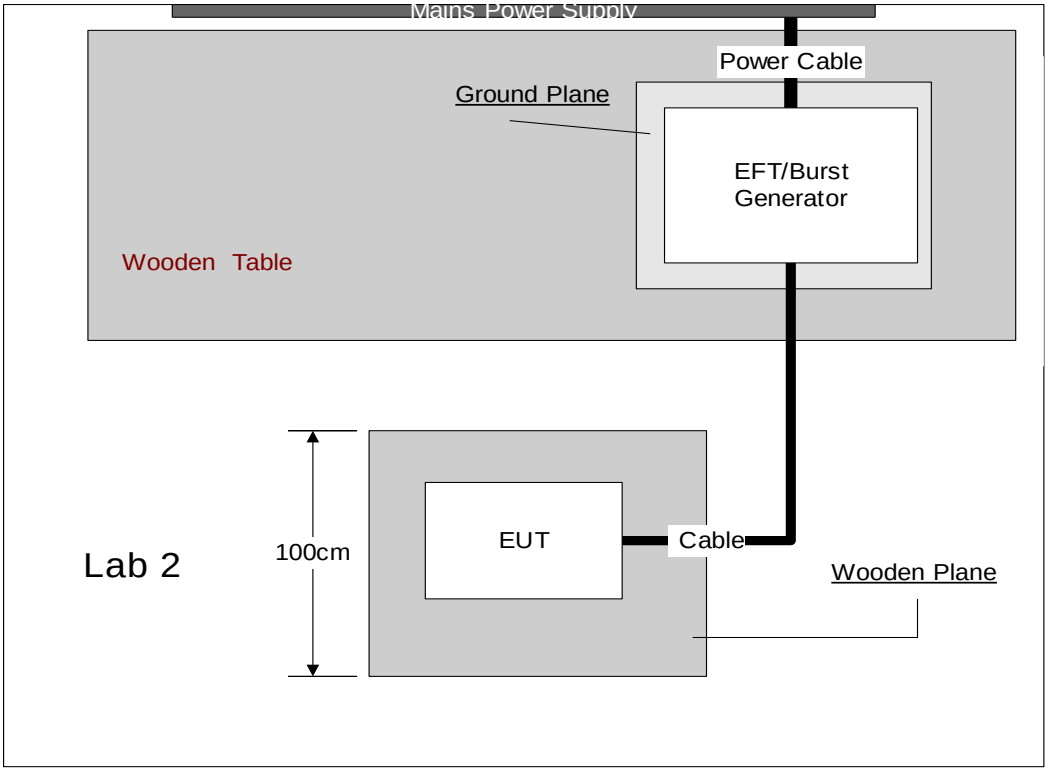
Electrical fast transient , burst immunity test

Test Method

The equipment under test including associated cabling was configured on but insulated from, using a 0.1 m isolator, a horizontal coupling plane fitted to the top of a 0.8 m non-conductive table for table-top equipment; and on a 0.1 m insulated support for floor standing equipment; above a ground reference plane all within a test laboratory.

Using a CDN for power ports, capacitive coupling clamp for signal and control ports and a 33nF coupling capacitor for earth ports, the required fast transient burst voltage levels in both voltage polarities were applied at the detailed pulse repartition rate and duration of test.

During this testing any anomalies in the equipment under tests performance was recorded.



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Specification Limits

Required Test Levels Input and output a.c. power ports					
Line Under Test	Level (kV)	Repetition Rate (kHz)	Test Duration	Coupling Method	Performance Criteria
Input and output a.c. power ports	± 2.0	5 kHz	2 min per polarity	Direct	B
For extra low voltage a.c. ports and output a.c. ports, this testing is only applicable to ports interfacing with cables whose total length may exceed 3 m according to the manufacturer's functional specification.					

Required Test Levels ports for network and signal, control lines					
Line Under Test	Level (kV)	Repetition Rate (kHz)	Test Duration	Coupling Method	Performance Criteria
Signal and control lines	± 1.0	5 kHz	2 min per polarity	Clamp	B
Applicable only to ports interfacing with cables whose total length can exceed 3m according to the manufacturer’s function specification.					

Test Results

Performance assessment of the EUT made during this test: Pass

Detailed results are shown below.

Tabulated Results for Fast Transient Burst Immunity					
Line under test	Test Level (kV)	Repetition Rate	Test Duration	Coupling Method	Result
Input a.c. power ports	± 2.0 kV	5 kHz	2 min	Direct	A

Remark: During the test of the network port, the signal interrupts. After the test, it can automatically return to normal status.

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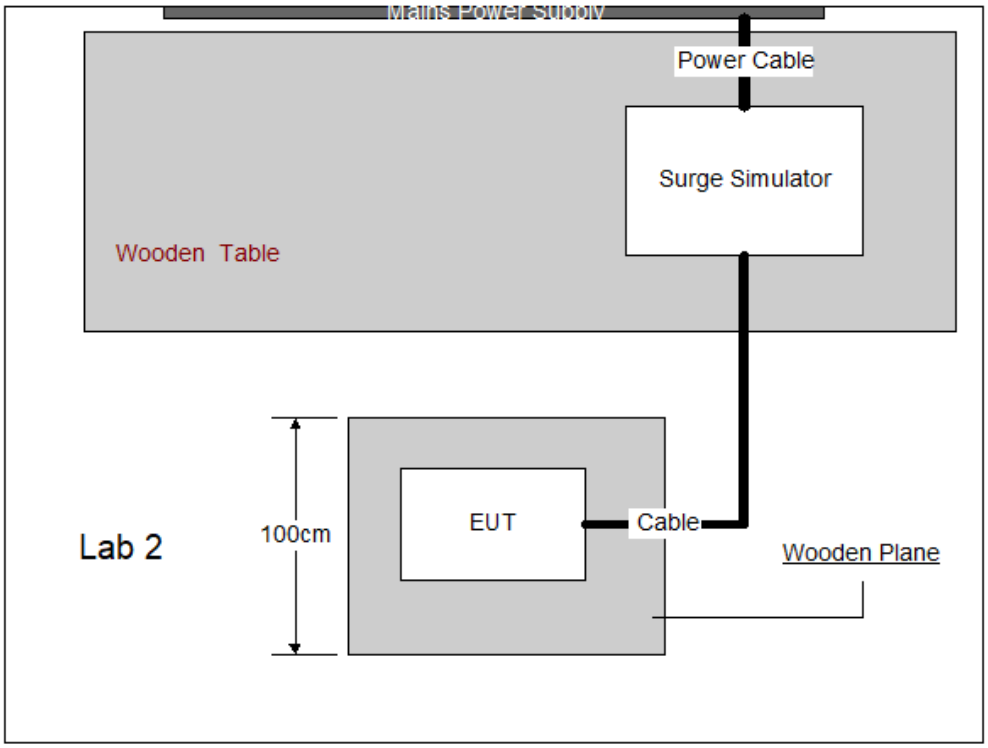
Surge immunity test

Test Method

The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.1 m insulated support for floor standing equipment above a ground reference plane all within a test laboratory.

Using CDNs for power ports and appropriate coupling methods for applicable signal and control ports, the required number of surges was applied for each surge voltage level using both positive and negative surge voltage polarities. Surges were applied at the power line frequency phase angles and repartition rates detailed.

During this testing any anomalies in the equipment under tests performance was recorded.



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Specification Limits

Required Test Levels a.c.Input and CPT ports			Performance Criteria
Line Under Test	Characteristics	Test Levels	
line to line with line to earth with	Wave-shape data 2Ω impedance 12Ω impedance	1.2, 50 μs ± 1.0 kV ±2.0 kV	B
Note in addition to the specified test level, all lower levels as detailed in IEC 61000-4-5 should also be satisfied. For CPT ports: Applicable only to ports interfacing with cables whose total length according to the manufacturer's functional specification is greater than 30 m.			

Required Test Levels Ports for network and signal, control lines			Performance Criteria
Line Under Test	Characteristics	Test Levels	
line to earth with	Wave-shape data 42Ω impedance	1.2, 50 μs ± 1.0 kV	B
Applicable only to ports interfacing with long distance lines(>30m). Where the normal functioning cannot be achieved because of the impact of the coupling, decoupling network (CDN) on the EUT, the test shall be done with the reduced functionality. A rationale shall be given in the test report for doing so. After the test and the removal of the CDN, the normal function shall not be affected.			

Test Location

This test was carried out in EMS Test Location.

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Test Results

Performance assessment of the EUT made during this test: Pass

Detailed results are shown below.

Tabulated Results for Surge Immunity (a.c.Power Ports)							
Line Name	Coupling	Level	Polarity	Phase Angle	No of Pulses	Repetition Rate	Result
Power line	Live to Neutral	1.0, 2.0kV	NEGATIVE	0, 90, 180,270	5	60 sec	A
Power line	Live to Neutral	1.0, 2.0kV	POSITIVE	0, 90, 180,270	5	60 sec	A
Power line	Live to Earth	2.0, 4.0kV	NEGATIVE	0, 90, 180,270	5	60 sec	A
Power line	Live to Earth	2.0, 4.0kV	POSITIVE	0, 90, 180,270	5	60 sec	A
Power line	Neutral to Earth	2.0, 4.0kV	NEGATIVE	0, 90, 180,270	5	60 sec	A
Power line	Neutral to Earth	2.0, 4.0kV	POSITIVE	0, 90, 180,270	5	60 sec	A

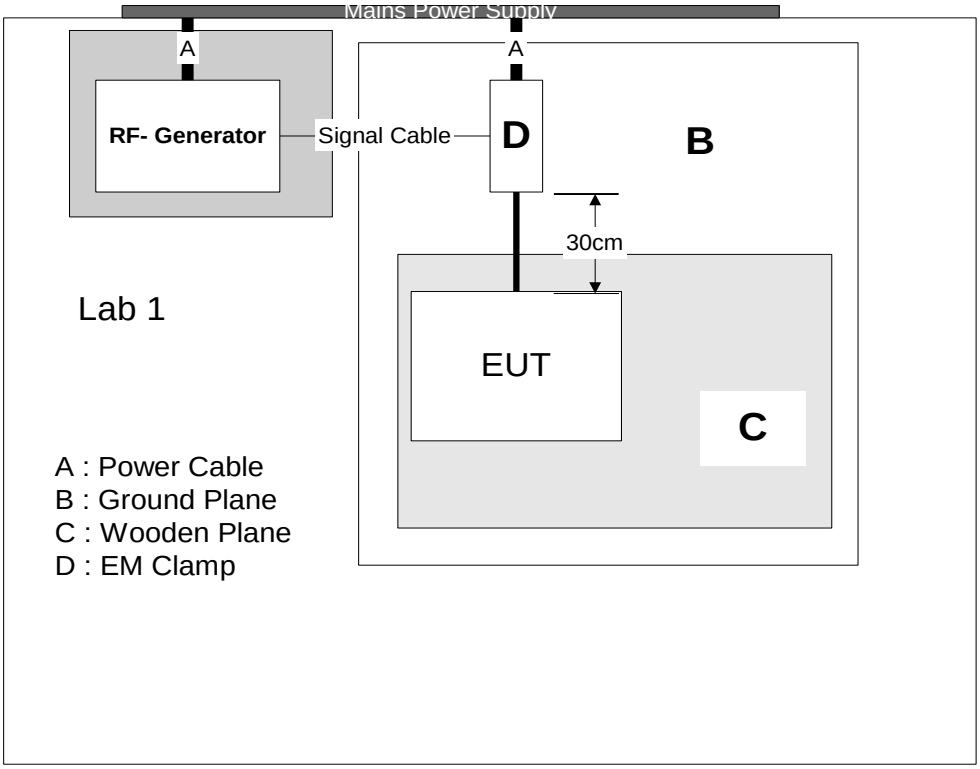
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Immunity to conducted disturbances, induced by radio-frequency fields
Test Method

The equipment under test was configured, on but insulated from, using a 0.1 m isolator, a horizontal coupling plane fitted to the top of a 0.1 m non-conductive table for table-top equipment, above a ground reference plane all within a test laboratory.

All associated cabling was configured, on but insulated from, using a 50 mm isolator, the same horizontal coupling plane as the equipment under test.

Using CDNs, EM Clamps or current clamps as appropriate, the power ports and applicable signal and control ports were subjected to the required, pre calibrated RF injected signal strength, modulated as described, swept over the frequency range of test.
During this testing any anomalies in the equipment under tests performance was recorded.



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Specification Limits

Required Test Levels Input and output a.c. power ports						
Line Under Test	Frequency Range (MHz)	Level (V)	Modulation	Step Size (%)	Dwell (s)	Performance Criteria
Input and output a.c. power ports	0.15 to 80	3	AM (80 %,1 kHz, sine wave)	1	1	A
For extra low voltage a.c ports and output a.c. ports, this testing is only applicable to ports interfacing with cables whose total length may exceed 3 m according to the manufacturer's functional specification.						

Required Test Levels Ports for network and signal, control lines						
Line Under Test	Frequency Range (MHz)	Level (V)	Modulation	Step Size (%)	Dwell (s)	Performance Criteria
Signal and control port	0.15 to 80	3	AM (80 %,1 kHz, sine wave)	1	1	A
Applicable only to ports interfacing with cables whose total length may exceed 3m according to the manufacturer’s function specification.						

Test Results

Performance assessment of the EUT made during this test: Pass

Detailed results are shown below.

Tabulated Results for Injected current, a.c. power ports						
Line and sensitive frequency under test	Test Level	Step	Dwell Time	Coupling Method	Modulation	Result
Power line	3V	1%	1s	CDN	1kHz, 80%	A

Remark: No observable change.

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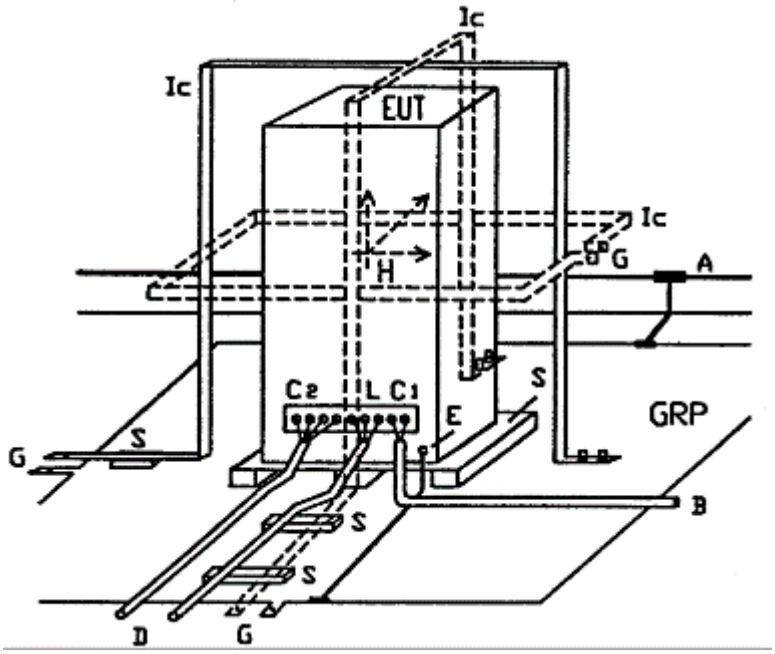
Power-frequency magnetic field immunity test

Test Method

The equipment under test including associated cabling was configured on a non-conductive support at the volumetric center of the immunity coils. A pre calibrated input level was then applied to magnetic immunity coils at the detailed frequency and level for the required test period.

The EUT was retested with the magnetic field applied in all 3 orthogonal planes of the EUT.

During this testing any anomalies in the equipment under tests performance was recorded.



Specification Limits

Required Test Levels			Performance Criteria
Application	Level (A, m)	Duration	
Continuous Field	30(for systems ≤32A)	dependent on EUT operating cycle	A
Supplementary information: Note 1. EUT powered at one of the Nominal input voltages and frequencies			

Test Results

Performance assessment of the EUT made during this test: Pass

Detailed results are shown below.

Tabulated Results for Power Frequency Magnetic Immunity					
Orientation	Operating	Test	Test Level	Duration	Result

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Tabulated Results for Power Frequency Magnetic Immunity					
	Frequency	Frequency			
X axis	50 Hz	50 Hz	30A, m	3 min	A
Y axis	50 Hz	50 Hz	30A, m	3 min	A
Z axis	50 Hz	50 Hz	30A, m	3 min	A
X axis	60 Hz	60 Hz	30A, m	3 min	A
Y axis	50 Hz	50 Hz	30A, m	3 min	A
Z axis	60 Hz	60 Hz	30A, m	3 min	A

Remark: No observable change.

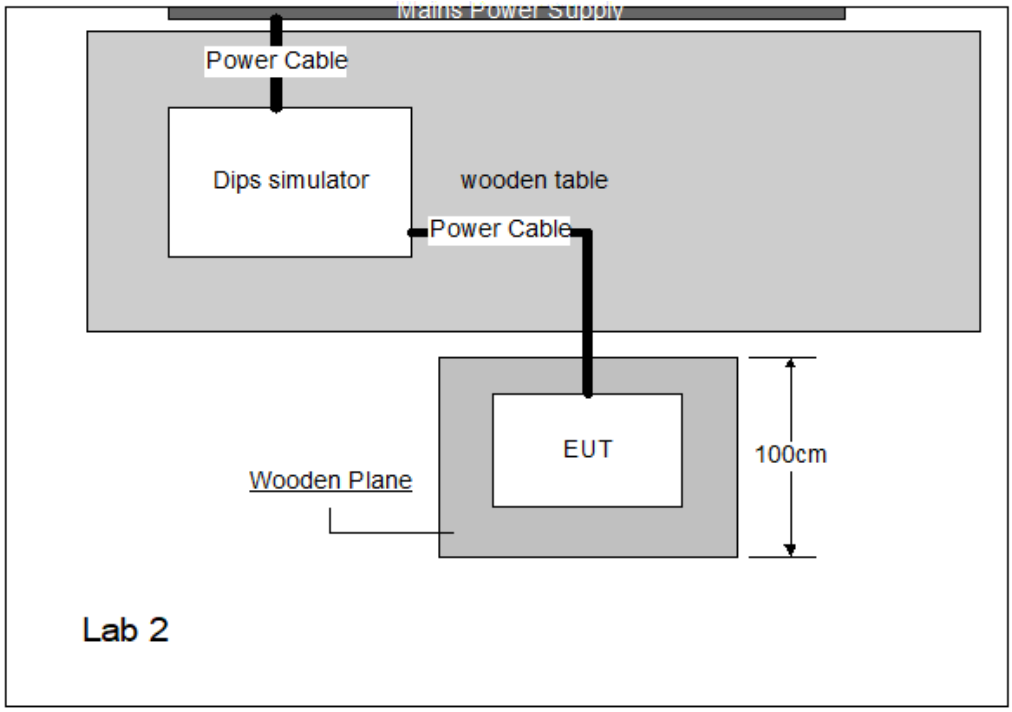
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Voltage dips, short interruptions and voltage variations immunity tests

Test Method

The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.1 m insulated support for floor standing equipment above a ground reference plane all within a test laboratory.

Using a programmable power supply the equipment under test was subjected to the detailed supply voltage dips and interruptions. The required supply phase synchronization and test repetition rate, detailed, was controlled by the programmable power supply.
During this testing any anomalies in the equipment under tests performance was recorded.



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Specification Limits

Voltage Dips and short interruptions				
Voltage Dips in % UT	Test level in % UT	Duration		Performance Criteria
		50Hz	60Hz	
100	0	1 cycle	1 cycle	B
60	40	10 cycles	12 cycles	B
30	70	25 cycles	30 cycles	B
100	0	250 cycles	300 cycles	C
UT is the rated voltage of the Equipment Under Test				

Test Results

Performance assessment of the EUT made during this test: Pass

Detailed results are shown below.

Tabulated Results for Voltage Dip and Short Interruption					
Line under test	Vnom	Operating Frequency	Test Level	Duration	Result
Power line	230 V~	50 Hz	0% of Vnom	1 cycle	A
Power line	230 V~	50 Hz	40% of Vnom	10 cycles	A
Power line	230 V~	50 Hz	70% of Vnom	25 cycles	A
Power line	230 V~	50 Hz	0% of Vnom	250 cycles	B

Remark: During 25, 30 cycles interruption test, the EUT stopped working. After the test, it can automatically return to normal status.

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Test Equipment Information

General Test Equipment Used

Conducted Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
Receiver (9K-3GHz)	Rohde & Schwarz	ESCI	100727
LISN	Rohde & Schwarz	ENV216	3506.6550.05
LISN	SCHWARZBECK	NSLK8163	05018
LISN	SCHWARZBECK	NNLK-8140	00136
LISN	SCHWARZBECK	NNLK-8140	00137
LISN	SCHWARZBECK	NNLK-8140	00138
LISN	SCHWARZBECK	NNLK-8140	00139
ISN	Rohde & Schwarz	ENY81	100389
ISN	Rohde & Schwarz	ENY81-CA6	101887
RF Switch Box	Compliance Direction Systems Inc.	RSU-M314-N	08042801

Radiated Emission Test（SAC-3 area）

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
EMI Test Receiver	Rohde & Schwarz	ESR 26	101702
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9162	00341
Horn Antenna	Schwarzbeck	BBHA 9120D	02152
Loop Antenna	Schwarzbeck	FMZB 1519	1519-013
Pre-amplifier	Rohde & Schwarz	SCU08F1	101016
Pre-amplifier	Rohde & Schwarz	SCU 18	100759
3m Semi-anechoic chamber	TDK	SAC-3	----

Harmonic Test , Flicker Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
3-phase analyzer for Harmonics and Flicker	EMTEST	DPA 503N	P2003237205
Multifunctional threephase voltage source	EMTEST	NetWave 67.3-400	P2009239095
3-phase Flicker impedance	EMTEST	AIF 503N63.1	P2009239213

Electrostatic Discharge Test(ESD area)

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
ESD Generator	EMTEST	ESD NX30	23124

Radiated Immunity Test (SAC-3 area)

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
Signal Generator	Rohde & Schwarz	SMB100B	101903
Power Amplifier	Rohde & Schwarz	BBA150-BC 500	104061
Power Amplifier	Rohde & Schwarz	BBA150-D1 10E100	104048
Microwave Log-Periodic Antenna	Schwarzbeck	STLP9129 SET	3074
Average Power Sensor	Rohde & Schwarz	NRP6AN	101424
Average Power Sensor	Rohde & Schwarz	NRP6AN	101425
3m FAC Chamber	TDK	CAC-3	--

Electrical Fast Transients Test(EMS area)

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DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
Compact Simulator	EMTEST	UCS 500N7.7	P1949235471
3-phase coupling, decoupling network	EMTEST	CNI 503B9.4	P1740204286
Capacitive Coupling Clamp	EMTEST	CCI	P2009239178

Surges Test(EMS area)

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
Compact Simulator	EMTEST	UCS 500N7.7	P1949235471
3-phase coupling, decoupling network	EMTEST	CNI 503B9.4	P1740204286
Telecom Surge Module	EMTEST	Tsurge 7	P1908227146
Coupling, decoupling network for signal, datalinescoupling, decoupling network	EMTEST	CNV 504 N1	P1949235473
coupling, decoupling network for unshielded symmetrical lines	EMTEST	CNV 508T5	P2004237741
Railway coupler	EMTEST	PCN 7-R s-1	P2012240055

Conducted Immunity Test(EMS area)

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
Compact immunity test systemr	TESEQ	NSG 4070C-110	56172
6dB Attenuator	TESEQ	ATN 6150	20011501
Coupling, Decoupling Network	EM TEST	CDN M016S	56466
Coupling, Decoupling Network	EMTEST	CDN M5-100-750 VS	54984
Current injection probe	EMTEST	CIP 9136A	56220
EM Clamp	TESE Q	KEMA 801A	56676

Variation of power frequency Test (EMS area)

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
Multifunctional threephase voltage source	EMTEST	NetWave 67.3-400	P2009239095
3-phase Flicker impedance	EMTEST	AIF 503N63.1	P2009239213

Power-frequency magnetic field Test(EMS area)

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
Multifunctional threephase voltage source	EMTEST	NetWave 67.3-400	P2009239095
Helmholtz Coils	Schwarzbeck	HHS 5215-100	HHS 5215-100 #111

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Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Conducted Emission in shielding room 150kHz-30MHz (for test using AMN ENV216 or ENV4200 or NSLK8163)	±3.22dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: ±5.13dB; Vertical: ±5.20dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-18000MHz	Horizontal: ±5.02dB; Vertical: ±5.02dB;
Uncertainty for Harmonic test	3.16%
Uncertainty for Flicker test	4.69%
Uncertainty for RS test	49%, K=2
Uncertainty for CS test	28%(CDN); 45%(EM Clamp) K=2
Uncertainty for ESD test	The immunity measurement system uncertainty is within standard requirement and is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.
Uncertainty for EFT test	
Uncertainty for Surges test	
Uncertainty for PMF test	
Uncertainty for Voltage Dips, Voltage Variations and Short Interruptions Test	

Remark:
Measurement Uncertainty Decision Rule
Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2007, clause 4.4.3 and 4.5.1.

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