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CNAS L3620

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TEST REPORT

Report No.: YZ200717-ACRE-0001

Sample Name: Base station DC energy meter

Model: AMC16-DETT

Applicant: Acrel Co.,Ltd.

The Energy-Efficiency Testing Centre of
Jiangsu Entry-Exit Inspection & Quarantine Bureau

The Energy-Efficiency Testing Centre of
Nanjing Entry-Exit Inspection & Quarantine Bureau

TEST REPORT

Report No.:	YZ200717-ACRE-0001	Applicant:	Acrel Co.,Ltd.
Sample Name:	Base station DC energy meter	Adds of Applicant:	No.253,Yulv Road, Jiading District, Shanghai, China
Models:	AMC16-DETT		
Trade Mark:	Acrel®	Manufacturer:	Jiangsu Acrel Electrical Manufacturing.Co.,Ltd.
Quantity:	1	Adds of Manufacturer:	No.5,Dongmeng Road, Nanzha Street,Jiangyin City ,Jiangsu Province, China
Serial Number:	/		
Sample Receiving Date:	2020-07-17	Factory:	/
Sample State:	Pass	Adds of Factory:	/
Testing Date:	2020-07-18		

Test Standard:

IEC 61010-1:2017 Safety requirements for electrical equipment for measurement, control, and laboratory use—Part 1:General requirements

Test Conclusions: The test items compliance with above requirements.

Tested by: Zhang Ping

Signature: Zhang Ping Date: 2020-07-20

Reviewed by: An Wei

Signature: An Wei Date: 2020-07-20

Approved by: Chen Jiansong

Signature: Chen Jiansong Date: 2020-07-20

(Inspection institution name, stamp)

2020-07-20

Remark:	The client only entrusts the test items: 5,6,7 and 8 chapters.

Statement:	1. It is invalid if the report has no Inspection Seal; 2. It is invalid if the report has no signature or seal of tester, auditor, or approver; 3. It is invalid if the report is altered; 4. It is invalid if the report is duplicated without Inspection Seal; 5. The test report is valid for the samples received; 6. Objections to this report should be submitted to the inspection organization in 15 days of receipting the report. It is not accepted if overdue.
Remarks:	Description of the judgment: 1. P: The test sample meets the standard requirements; 2. F: The test sample does not meet the standard requirements; 3. —: The test item is not applicable to the sample or has not been tested.

Contact information:

Laboratory:	The Energy-Efficiency Testing Centre of Jiangsu Entry-Exit Inspection & Quarantine Bureau The Energy-Efficiency Testing Centre of Nanjing Entry-Exit Inspection & Quarantine Bureau
Address:	No.70, Phoenix Road, Shuanglong Avenue, Jiangning Development Zone, Nanjing(Jiangning Lab) Building A, No.6-3, Xingzhi Road, Economic &Technological Development Zone, Nanjing, Jiangsu, China (Xingang Lab)
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Sample description

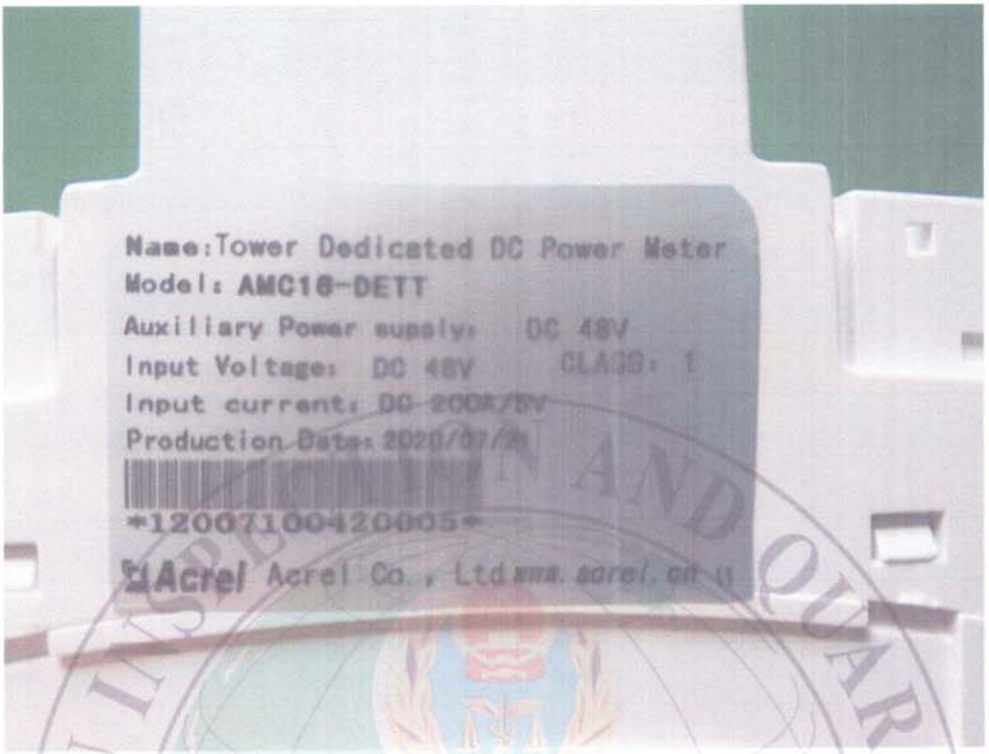
1. Rated values:
   Rated voltage: DC48V Rated current: —
   Rated power: — Rated frequency: —

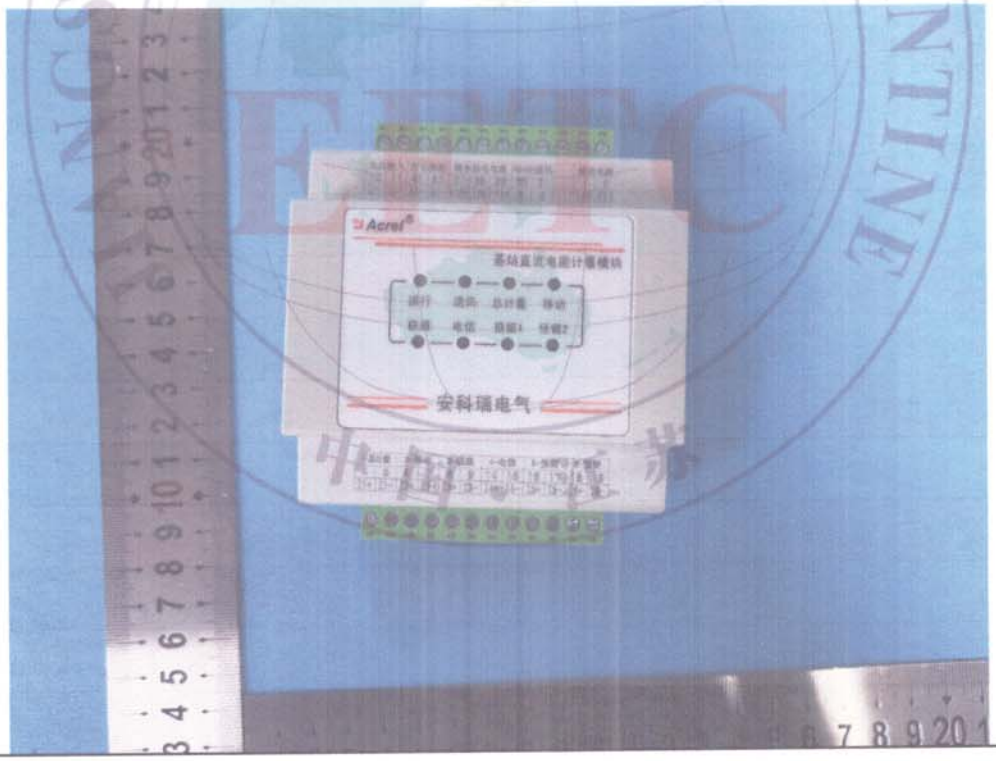
2. Power supply:
   ☐Single phase AC ☐Three phase AC ☑DC ☐AC/DC

3. Plug type of supply cord:
   ☐Single phase two electrodes ☐Single phase three electrodes
   ☐Three phase four electrodes

4. Product nameplate:
   ☐Paste ☑Non-paste

Sample Photos





Main Instrumentation List

No.	Name	Model	Number	Calibration Due Date	use（√）
1	Electronic Display Slidecalipers	150mm	YZTCIC-SB-0242	2020/11/06	
2	Dial gauge	CK-2	YZTCIC-SB-0325	2021/04/22	√
3	Touch current tester	7630	YZTCIC-SB-0303	2021/04/08	
4	Power meter	3332	YZTCIC-SB-0353	2020/11/06	
5	Test probe B	YB9101A	YZTCIC-SB-0310	2021/04/19	
6	Test probe 41	YB9101C	YZTCIC-SB-0312	2022/03/14	
7	Withstanding voltage/insulation resistance tester	TOS9201	YZTCIC-SB-0352	2021/04/08	√
8	Circulating air oven	FD115	YZTCIC-SB-0299	2021/04/08	
9	AC earth resistance tester	7314	YZTCIC-SB-0302	2021/04/08	
10	Ball press tester	QY-1	YZTCIC-SB-0327	2021/04/10	
11	Glow-wire test device	T03.35	YZTCIC-SB-0300	2021/04/08	
12	Spring hammer	F22.50	YZTCIC-SB-0326	2020/11/28	√
13	Digital Push & Pull Tester	Z2-50N	YZTCIC-SB-0380	2020/11/06	√
14	Temperature recorder	34970A	YZTCIC-SB-0432	2021/06/09	
15	Torque screwdriver	RTD260CN	YZTCIC-SB-0334	2021/11/07	
16	Programmable constant temperature and humidity box	ESL-10KA	YZTCIC-SB-0464	2021/04/08	
17	Steel ball	Φ50	YZTCIC-SB-0400	2022/04/26	√
18	Stability test apparatus	/	YZTCIC-SB-0407	2021/04/08	√

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
5	Marking and documentation		
5.1.1	Required equipment markings		P
	–visible from the exterior; or		P
	–visible after removing cover or opening door		—
	–visible after removal from a rack or panel		—
	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		—
5.1.2	Identification		P
	Equipment is identified by:		P
	Manufacturer's or supplier's name or trademark	Acrel®	P
	Model number, name or other means	AMC16-DETT	P
	Manufacturing location identified		—
5.1.3	Mains supply		P
	Equipment is marked as follows:		P
	Nature of supply:	DC	—
	a.c. rated mains frequency or range of frequencies	DC	P
	d.c. with symbol 1		—
	Rated supply voltage(s) or range`	DC48V	P
	Max. rated power (W or VA) or input current		—
	The marked value not less than 90 % of the maximum value		—
	If more than one voltage range:		—
	Separate values marked; or		—
	Values differ by less than 20%		—
	operator-set for different rated supply voltages:		—
	Indicates the equipment set voltage		—
	Portable equipment indication is visible from the exterior		—
	Changing the setting changes the indication		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Accessory mains socket-outlets accepting standard mains plugs are marked:		—
	With the voltage if it is different from the mains supply voltage:		—
	For use only with specific equipment		—
	If not marked for specific equipment it is marked with:		—
	The maximum rated current or power; or		—
	Symbol 14 with full details in the documentation		—
5.1.4	Fuses		—
	Operator replaceable fuse marking (see also 5.4.5)		—
5.1.5	Terminals, connections and operating devices		P
5.1.5.1	General		—
	Where necessary for safety, indication of purpose of terminals, connectors, controls and indicators marked		P
	If insufficient space, symbol 14 used		—
	Push-buttons and actuators of emergency stop devices and indicators:		—
	–used only to indicate a warning of danger; or		—
	–the need for urgent action		—
	–coloured red		—
	–coded as specified in IEC 60073		—
	Supplementary means of coding provided, if meaning of colour relates (see IEC 60073):		—
	–to safety of persons; or		—
	–safety of the environment		—
5.1.5.2	Terminals		P
	Mains supply terminal identified		P
	Other terminal marking:		
	Functional earth terminals (symbol 5 used)		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Protective conductor terminals: Symbol 6 is placed close to or on the terminal; or Part of appliance inlet	DC power supply	—
	terminals of control circuits (symbol 7 used)		—
	Hazardous live terminals supplied from the interior Standard mains socket outlet; or Ratings marked; or Symbol 14 used		—
5.1.6	Switches and circuit breakers		—
	If disconnecting device, off position clearly marked		—
	If push-button used as power supply switch:		—
	–symbol 9 and 15 used for on-position		—
	–symbol 10 and 16 used for off-position		—
	–pair of symbols 9, 15 and 10, 16 close together		—
5.1.7	Equipment protected by double insulation or reinforced insulation		—
	Protected throughout (symbol 11 used)		—
	Only partially protected (symbol 11 not used)		—
5.1.8	Field-wiring terminal boxes	No such parts	—
	If Terminal or enclosure exceeds 60 °C:		—
	Cable temperature rating marked		—
	Marking visible before and during connection or beside terminal		—
5.2	Warning markings		—
	Visible when ready for normal use		—
	Are near or on applicable parts		—
	Symbols and text correct dimensions and colour:		—
	symbols min 2,75 mm and text 1,5 mm high and contrasting in colour with background		—
	symbols and text moulded, stamped or engraved in material min. 2,0 mm high and 0,5 mm depth or raised if not contrasting in colour		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	If necessary marked with symbol 14, Statement to isolate or disconnect if access by using a tool to hazardous live parts is permitted		—
5.3	Durability of markings		—
	The required markings remain clear and legible in normal use		—
5.4	Documentation		P
5.4.1	General		P
	Equipment is accompanied by documentation for safety purposes for operator or responsible body		P
	Safety documentation for service personnel authorized by the manufacturer	Not intended for special servicing	—
	Documentation necessary for safe operation is provided in printed media or in electronic media if available at any time		—
	Documentation includes:		—
	intended use		P
	technical specification		P
	name and address of manufacturer or supplier		P
	information specified in 5.4.2 to 5.4.6		P
	information to mitigate residual risk (see also subclause 17)		—
	accessories for safe operation of the equipment specified		P
	guidance provided to check correct function of the equipment, if incorrect reading may cause a hazard from harmful or corrosive substances of hazardous live parts		—
	instructions for lifting and carrying		—
	Warning statements and a clear explanation of warning symbols:		P
	–provided in the documentation; or		—
	–information is marked on the equipment		P
5.4.2	Equipment ratings		
	Documentation includes:		

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Supply voltage or voltage range	Provided	P
	Frequency or frequency range		—
	Power or current rating	Provided	P
	Description of all input and output connections in accordance to 6.6.1 a)	Provided	—
	Rating of insulation of external circuits in accordance to 6.6.1 b)		—
	Statement of the range of environmental conditions (see 1.4)		—
	Degree of protection (IEC 60529)	IPX0	—
	If impact rating less than 5 J: IK code in accordance to IEC 62262 marked; or Symbol 14 of table 1 marked, with Rated energy level and test method stated		—
5.4.3	Equipment installation		P
	Documentation includes instructions for:		—
	assembly, location and mounting requirements		P
	protective earthing		—
	connections to supply		P
	permanently connected equipment:		—
	1)Supply wiring requirements		—
	2)If external switch or circuit-breaker, requirements and location recommendation		—
	ventilation requirements		—
	special services (e. g. air, cooling liquid)		—
	instructions relating to sound level		—
5.4.4	Equipment operation		P
	Instructions for use include:		P
	identification and description of operating controls		P
	positioning for disconnection		—
	instructions for interconnection		—
	specification of intermittent operation limits		—
	explanation of symbols used	No symbols	—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	replacement of consumable materials		—
	cleaning and decontamination		—
	listing of any poisonous or injurious gases and quantities		—
	risk reduction procedures relating to flammable liquids (see 9.5)		—
	risk reduction procedures relating burn from surfaces permitted to exceed limits of 10.1		—
	Additional precautions for IEC 60950 conforming equipment in regard to moistures and liquids		—
	A statement about protection impairment if used in a manner not specified by the manufacturer	Provided	P
5.4.5	Equipment maintenance and Service		—
	Instructions for responsible body include:		—
	Instructions sufficient in detail permitting safe maintenance and inspection and continued safety:		—
	Instruction against the use of detachable mains supply cord with inadequate rating		—
	Specific battery type of user replaceable batteries	No battery	—
	Any manufacturer specified parts		—
	Rating and characteristics of fuses		—
	Instructions include following subjects permitting safe servicing and continued safety:	No such risks	—
	product specific risks may affect service personnel		—
	protective measures for these risks		—
	verification of the safe state after repair		—
5.4.6	Integration into systems or effects resulting from special conditions	No such hazards	—
	Aspects described in documentation		—
6	Protection against electric shock		
6.1	General		P

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
6.1.1	Requirements		P
	Protection against electric shock maintained in normal condition and single fault condition accessible parts not hazardous live		P
6.1.2	Exceptions	No exceptions	—
	Following hazardous live parts may be accessible to an operator:	No exceptions	—
	parts of lamps and lamp sockets after lamp removal	No exceptions	—
	parts to be replaced by operator only by the use of tool and warning marking	No exceptions	—
	Those parts not hazardous live 10 s after interruption of supply	No exceptions	—
	Capacitance test if charge is received from internal capacitor		—
6.2	Determination of accessible parts		P
6.2.1	General		P
	Unless obviously determination of accessible parts as specified in 6.2.2 to 6.2.4		P
6.2.2	Examination		—
	–with jointed test finger (as specified B.2)		—
	–with rigid test finger (as specified B.1) and a		—
6.2.3	Openings above parts that are hazardous live	No such openings	—
	–test pin with length of 100 mm and 4 mm in diameter applied		—
6.2.4	Openings for pre-set controls	No such openings	—
	–test pin with length of 100 mm and 3 mm in diameter applied	No such openings	—
6.3	Limit values for accessible parts		P
6.3.1	Levels in normal condition		P
	a)Voltage limits less than 33 V r.m.s. and 46,7 V peak or 70 V d.c.		—
	for wet locations voltage limits less than 16 V r.m.s. and 22,6 V peak or 35 V d.c.		—
	Voltages are not hazardous live the levels of:		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	b)Current less than 0,5 mA r.m.s. for sinusoidal,0,7 mA peak non-sinusoidal or mixed frequencies or 2 mA d.c. when measured with measuring circuit A.1 or A.2 if less than 100 Hz		—
	for wet locations measuring circuit A.4 used		—
	70 mA r.m.s. when measured with circuit A.3 for higher frequencies		—
	or		
	c)Levels of capacitive charge or energy less:		—
	1)45 μC for voltages up to 15 kV peak or d.c.or line A of Figure 3		—
	2) 350 mJ stored energy for voltages above 15kV peak or d.c.		—
6.3.2	Levels in single fault condition		P
	Voltage limits less than 55 V r.m.s. and 78 V peak or 140 V d.c.		—
	for wet locations voltage limits less than 33 V r.m.s. and 46,7 V peak or 70 V d.c.		—
	Voltages are not hazardous live the levels of:		—
	Current less than 0,5 mA r.m.s. for sinusoidal, 0,7 mA peak non sinusoidal or mixed frequencies or 2 mA d.c. when measured with measuring circuit A.1 or A.2 if less than 100 Hz		—
	for wet locations measuring circuit A.4 used		—
	500 mA r.m.s. when measured with circuit A.3 for higher frequencies		—
	or		—
	Levels of capacitive charge or energy less line B of Figure 3		—
6.4	Primary means of protection		P
6.4.1	Accessible parts prevented from being hazardous live by one or more of following means:		P
	enclosures or protective barriers (see 6.4.2)		P
	basic insulation (see 6.4.3)		P

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Impedance (see 6.4.4)		—
6.4.2	enclosures or protective barriers		—
	–meet rigidity requirements of 8.1		—
	–meet requirements for basic insulation, if protection is provided by insulation		—
	–meet requirements of 6.7 for creepage and –clearances between accessible parts and –hazardous live parts, if protection is provided –limited access		—
6.4.3	Basic insulation	Provided between mains and metal safety earthed enclosure	P
	–meet clearance, creepage distance and solid –insulation requirements of 6.7		P
6.4.4	Impedance	Not employed	—
	Impedance used as primary means of protection meets all of following requirements:		—
	limits current or voltage to level of 6.3.2		—
	rated for maximum working voltage and the amount of power it will dissipate		—
	clearance, creepage distance between terminations of the impedance meet requirements of basic insulation of 6.7		—
6.5	Additional means of protection in case of single fault condition		—
6.5.1	Accessible parts are prevented from becoming hazardous live by the primary means of protection and supplemented by one of:		—
	a)Protective bonding (see 6.5.2)		—
	b)Upplementary insulation (see 6.5.3)		—
	c)Automatic disconnection of the supply (see 6.5.5)		—
	d)Current- or voltage-limiting device (see 6.5.6)		—
	Alternatively one of the single means of protection is used:		—
	e)Reinforced insulation (see 6.5.3)		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	f)Protective impedance (see 6.5.4)		—
6.5.2	Protective bonding		—
6.5.2.1	Accessible conductive parts, may become hazardous live in single fault condition:		—
	Bonded to the protective conductor terminal; or		—
	Separated by conductive screen or barrier bonded to protective conductor terminal		—
6.5.2.2	Integrity of protective bonding		—
	protective bonding consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses		—
	Soldered connections:		—
	Independently secured against loosening		—
	Not used for other purposes		—
	Screw connections are secured		—
	protective bonding not interrupted; or		—
	exempted as removable part carries mains supply input connection		—
	Any movable protective bonding connection specifically designed, and meets 6.5.2.4		—
	No external metal braid of cables used (not regarded as protective bonding)		—
	If mains supply passes through:		—
	Means provided for passing protective conductor;		—
	Impedance meets 6.5.2.4		—
	Protective conductors bare or insulated, if insulated, green/yellow		—
	Exceptions:	Not applied	—
	1)earthing braids;		—
	2)internal protective conductors etc.;		—
	Green/yellow not used for other purposes		—
	terminal suitable for connection of a protective conductor, and meets 6.5.2.3		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
6.5.2.3	Protective conductor terminal		—
	a)Contact surfaces are metal		—
	b)Appliance inlet used		—
	c)For rewirable cords and permanently connected equipment, protective conductor terminal is close to mains supply terminals		—
	d)If no mains supply is required, any protective conductor terminal:		—
	Is near terminals of circuit for which protective earthing is necessary		—
	External if other terminals external		—
	e)Equivalent current-carrying capacity to mains supply terminals		—
	f)If plug-in, makes first and breaks last		—
	g)If also used for other bonding purposes, protective conductor:	Not used for other bonding purposes	—
	Applied first;		—
	Secured independently;		—
	Unlikely to be removed by servicing		—
	h)Protective conductor of measuring circuit:		—
	1)Current rating equivalent to measuring circuit terminal;		—
	2)protective bonding: not interrupted by any switch or interrupting device		—
	i)functional earth terminals allow independent connection	No functional earth terminals	—
	j)If a binding screw used for Protective conductor terminal:	Not used	—
	Suitable size for bond wire		—
	Not smaller than M 4		—
	At least 3 turns of screw engaged		—
	Passes tightening torque test		—
	k)Contact pressure not capable being reduced by deformation of materials		—
6.5.2.4	Impedance of protective bonding of plug-connected equipment		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Impedance between protective conductor terminal and each accessible part where protective bonding is specified, is:		—
	–less than 0,1 Ohm; or		—
	–less than 0,2 Ohm if equipment is provided with non-detachable cord		—
6.5.2.5	Bonding impedance of permanently connected equipment		—
6.5.2.6	Transformer protective bonding screen		—
	Transformer provided with screen for protective bonding:		—
	screen bonding consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses (see 6.5.2.2 a)		—
	screen bonding with soldered connection (see 6.5.2.2 b) is:		—
	–Independently secured against loosening		—
	–Not used for other purposes		—
6.5.3	Supplementary and reinforced insulation		—
	Meet clearance, creepage distance and solid insulation requirements of 6.7		—
6.5.4	Protective impedance		—
6.5.5	Automatic disconnection of the supply	Not used	—
	rated to disconnect the load within time specified in Figure 2		—
	rated for the maximum load conditions of the equipment		—
6.5.6	Current- or voltage-limiting devices	Not used	—
	Device complies with all of:		—
	rated to limit the current or voltage to the level of 6.3.2		—
	rated for the maximum working voltage; and		—
	rated for the maximum operational current if a		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	clearance, creepage distance between terminations of the impedance meet requirements of supplementary insulation of 6.7		—
6.6	Connections to external circuits		—
6.6.1	Connections do not cause accessible parts of the following to become hazardous live in normal condition or single fault condition:		—
	–the external circuits		—
	–the equipment		—
	Protection achieved by separation of circuits; or		—
	short circuit of separation does not cause a hazard		—
	Instructions or markings for each terminal include:		—
	rated conditions for terminal		—
	Required rating of external circuit insulation		—
6.6.2	Terminals for external circuits	No such terminals	—
	Terminals which receive a charge from an internal capacitor are not hazardous live after 10 s of interrupting supply connection	No such external circuits	—
6.6.3	Circuits with terminals which are hazardous live	No such terminals	—
	These circuits are:		—
	Not connected to accessible conductive parts; or		—
	Connected to accessible conductive parts, but are not mains circuits and have one terminal contact at earth potential		—
	No accessible conductive parts are hazardous live		—
6.6.4	Accessible terminals for stranded conductors	No such terminals	—
	No risk of accidental contact because:		—
	–Located or shielded		—
	–Self-evident or marked whether or not connected to accessible conductive parts		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Accessible terminals will not work loose		—
6.7	Insulation requirements		—
6.7.1	The nature of insulation		—
6.7.1.1	Insulation between accessible parts or between separate circuits consist of clearances, creepage distances and solid insulation if provided as protection against a hazard		—
6.7.1.2	Clearances		—
	Required clearances reflecting factors of 6.7.1.1		—
	Equipment rated for operating altitude greater than 2000 m correction factor of Table 3 of 61010-1 applied		—
6.7.1.3	Creepage distances		—
	Required creepage distances reflecting factors of 6.7.1.1 a) to d)		—
	CTI material group reflected by requirements		—
	CTI test performed		—
6.7.1.4	Solid insulation		—
	Required solid insulation reflecting factors of 6.7.1.1 a) to d)		—
6.7.1.5	Requirements for insulation according to type of circuit		—
	a)6.7.2 mains circuits of overvoltage category II up to nominal supply voltage of 300 V		—
	b)6.7.3 secondary circuits separated from circuits defined in a) by transformer		—
	c)K.1 mains circuits of overvoltage category III and IV or overvoltage category II over 300 V		—
	d)K.2 secondary circuits separated from circuits defined in c) by transformer		—
	e)K.3 circuits having one or more of:		—
	1)maximum transient overvoltage is Limited to known level below the level of mains circuit		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	2)maximum transient overvoltage above the level of mains circuit		—
	3)Working voltage is the sum of more than one circuit or a mixed voltage		—
	4)Working voltage includes recurring peak voltage, may include non-sinusoidal or non-periodic waveform		—
	5)Working voltage with a frequency above 30 kHz		—
6.7.2	Insulation for mains circuits of overvoltage category II with a nominal supply voltage up to 300 V		—
6.7.2.1	Clearances and creepage distances		—
	Values for mains circuits of Table 4 are met		—
	Coatings to achieve reduction to pollution degree 1 comply with requirements of Annex H		—
6.7.2.2	Solid insulation		—
6.7.2.2.1	Withstands electrical and mechanical stresses in normal use and all rated environmental conditions of 1.4		—
	Equipment passed voltage tests of 6.8.3 with values of Table 5		—
	Complies as applicable:		—
	a)Enclosure or protective barrier of Clause 8		—
	b)Moulded and potted parts requirements of 6.7.2.2.2		—
	c)Inner layers of printed wiring boards requirements of 6.7.2.2.3		—
	d)Thin-film insulation requirements of 6.7.2.2.4		—
6.7.2.2.2	Moulded and potted parts		—
	Conductors between same two layers are separated by at least 0,4 mm after moulding is completed		—
6.7.2.2.3	Inner insulating layers of printed wiring boards		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Separated by at least 0,4 mm between same two layers		—
	Reinforced insulation have adequate electric strength; one of following methods used:		—
	a)thickness of insulation is at least 0,4 mm		—
	b)insulation is assembled of minimum two separate layers, each rated for test voltage of Table 5 for basic insulation		—
	c)insulation is assembled of minimum two separate layers, where the combination is rated for test voltage of Table 5 for reinforced insulation		—
6.7.2.2.4	Thin-film insulation		—
	Conductors between same two layers are separated by applicable clearances and creepage distance of 6.7.2.1		—
	Reinforced insulation have adequate electric strength; one of following methods used:		—
	a)thickness through the insulation at least 0,4 mm		—
	b)insulation is assembled of min two separate layers, each rated for test voltage of Table 5 for basic insulation		—
	c)insulation is assembled of min three separate layers, where the combination of two layers passed voltage tests of 6.8.3 with values of Table 5 for reinforced insulation		—
6.7.3	Insulation for secondary circuits derived from mains circuits of overvoltage category II up to 300 V	No such insulation relied upon	—
6.7.3.1	Secondary circuits where separation from mains circuits is achieved by a transformer providing:		—
	–reinforced insulation		—
	–double insulation		—
	–screen connected to the protective conductor terminal		—
6.7.3.2	Clearances		—

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Clause	Requirement + Test	Result - Remark	Verdict
	a)meet the values of Table 6 for basic insulation and supplementary insulation; or		—
	twice the values of Table 6 for reinforced insulation		—
	or		
	b)pass the voltage tests of 6.8 with values of Table 6;		—
	with following adjustments:		—
	1) values for reinforced insulation are 1,6 times the values for basic insulation		—
	2) if operating altitude is greater than 2000 m values of clearances multiplied with factor of Table 3		—
	3) minimum clearance is 0,2 mm for pollution degree 2 and 0,8 mm for pollution degree 3		—
6.7.3.3	Creepage distances		—
	Based on working voltage meets the values of Table 7 for basic and supplementary insulation		—
	Values for reinforced insulation are twice the values of basic insulation		—
	Coatings to achieve reduction to pollution degree 1 comply with requirements of Annex H		—
6.7.3.4	Solid insulation		—
6.7.3.4.1	Withstands electrical and mechanical stresses in normal use and all rated environmental conditions of 1.4		—
	a)Equipment passed voltage test of 6.8.3.1 for 5 s with values of Table 6 for basic and supplementary insulation		—
	values for reinforced insulation are 1,6 times the values of basic insulation		—
	b)if working voltage exceeds 300 V, equipment passed voltage test of 6.8.3.1 for 1 min with a test voltage of 1,5 times working voltage for basic or supplementary insulation		—

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Clause	Requirement + Test	Result - Remark	Verdict
	value for reinforced insulation are twice the working voltage		—
	Complies as applicable:		
	1)enclosure or protective barrier of Clause 8		—
	2)moulded and potted parts requirements of 6.7.3.4.2		—
	3)inner layers of printed wiring boards requirements of 6.7.3.4.3		—
	4)thin-film insulation requirements of 6.7.3.4.4		—
6.7.3.4.2	Moulded and potted parts		—
	Conductors between same two layers are separated by applicable distances of Table 8		—
6.7.3.4.3	Inner insulation layers of printed wiring boards		—
	Separated by at least by applicable distances of Table 8 between same two layers		—
	Reinforced insulation have adequate electric strength; one of following methods used:		—
	a)thickness at least applicable distance of Table 8		—
	b)insulation is assembled of minimum two separate layers, each rated for test voltage of Table 6 for basic insulation		—
	c)insulation is assembled of min two separate layers, where the combination is rated for 1,6 times the test voltage of Table 6		—
6.7.3.4.4	Thin-film insulation		—
	Conductors between same two layers are separated by applicable clearances and creepage distance of 6.7.3.2 and 6.7.3.3		—
	Reinforced insulation have adequate electric strength; one of following methods used:		—
	a)thickness at least applicable distance of Table 8		—
	b)insulation is assembled of min. two separate layers, each rated for test voltage of Table 6 for basic insulation		—

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Clause	Requirement + Test	Result - Remark	Verdict
	c)insulation is assembled of min. three separate layers, where the combination of two layers passed voltage tests with 1,6 time values of Table 6:		—
	a.c. test of 6.8.3.1; or		—
	d.c. test of 6.8.3.2 for circuits stressed only by d.c. voltages		—
6.8	Procedure for dielectric strength tests		P
6.9	Constructional requirements for protection against electric shock		P
6.9.1	If a failure could cause a hazard:		
	a)Security of wiring connections		P
	b)Screws securing removable covers		—
	c)Accidental loosening		P
	d)Clearances and creepage distances not reduced below the values of basic insulation by loosening of parts or wires		P
6.9.2	Insulating materials		P
	Material not to be used for safety relevant insulation:		
	a)easily damaged materials not used		P
	b)non-impregnated hygroscopic materials not used	Non-impregnated hydroscopic materials not used	P
6.9.3	Colour coding		—
	Green-and-yellow insulation shall not be used except:		—
	a)protective earth conductors;		—
	b)protective bonding conductors;	No such conductors	—
	c)potential equalization conductors;	No such conductors	—
	d)functional earth conductors	No such conductors	—
6.10	Connection to mains supply source and connections between parts of equipment		—
6.10.1	Mains supply cords		—
	rated for maximum equipment current (see 5.1.3 c)		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Cable complies with IEC 60227 or IEC 60245		—
	Heat-resistant if likely to contact hot parts		—
	Temperature rating (cord and inlet)		—
	Green/yellow used only for connection to protective conductor terminals		—
	Detachable cords with IEC 60320 mains connectors:		—
	Conform to IEC 60799; or		—
	Have the current rating of the mains connector		—
6.10.2	Fitting of non-detachable mains supply cords	No non-detachable cords	—
6.10.2.1	Cord entry		—
	inlet or bushing with a smoothly rounded opening; or		—
	insulated cord guard protruding >5 D (diameter)		—
6.10.2.2	Cord anchorage		—
	Protective earth conductor is the last to take the strain		—
	a)cord is not clamped by direct pressure from a screw		—
	b)knots are not used		—
	c)cannot push the cord into the equipment to cause a hazard		—
	d)no failure of cord insulation in anchorage with metal parts		—
	e)not to be loosened without a tool		—
	f)cord replacement does not cause a hazard and method of strain relief is clear		—
	Push-pull and or torque test		—
6.10.3	Plugs and connectors		—
	Mains supply plugs, connectors etc., conform with relevant specifications		—
	If equipment supplied at voltages below 6.3.2.a) or from a sole source:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Plugs of supply cords do not fit mains sockets above rated supply voltage		—
	Mains type plugs used only for connection to mains supply		—
	Plug pins which receive a charge from an internal capacitor		—
	Accessory mains socket outlets:		—
	a)marking if accepts a standard mains supply plug (see 5.1.3e)		—
	b)input has a protective earth conductor if outlet has earth terminal contact		—
6.11	Disconnection from supply source		—
6.11.1	Disconnects all current-carrying conductors		—
6.11.2	Exceptions	No exceptions	—
6.11.3	Requirements according to type of equipment		—
6.11.3.1	Permanently connected equipment and multi-phase equipment	No such equipment	—
	Employs switch or circuit-breaker		—
	If switch or circuit-breaker is not part of the equipment, documentation requires:		
	a)switch or circuit-breaker to be included in building installation		—
	b)suitable location easily reached		—
	c)marking as disconnecting for the equipment		—
6.11.3.2	Single-phase cord-connected equipment		—
	Equipment is provided with one of the following:		
	a)switch or circuit-breaker		—
	b)appliance coupler (disconnectable without tool)		—
	c)separable plug (without locking device)		—
6.11.4	Disconnecting devices		P
7	Protection against mechanical hazards		P
7.1	Equipment does not cause a mechanical hazard in normal nor in single fault condition		P
	Conformity is checked by 7.2 to 7.7		P

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Clause	Requirement + Test	Result - Remark	Verdict
7.2	Sharp edges		P
	Easily touched parts are smooth and rounded		P
	Do not cause injury during normal use and		P
	Do not cause injury during single fault condition		P
7.3	Moving parts		—
7.3.1	Hazards from moving parts limited to a tolerable level with the conditions specified in 7.3.2 and 7.3.5		—
	Risk assessment in accordance with 7.3.3 carried out		—
7.3.2	Exceptions		—
	Access to hazardous moving parts permitted under following circumstances:		—
	a)Obviously intended to operate on parts or materials external of the equipment		—
	inadvertent touching of moving parts minimized by equipment design (e .g. guards or handles)		—
	b)If operator access is unavoidable outside normal use following precautions have been taken:		—
	1)access requires tool		—
	2)statement about training in the instructions		—
	3) warning markings on covers prohibiting access by untrained operators		—
	or symbol 14 with full details in documentation		—
7.3.3	Risk assessment for mechanical hazards to body parts		P
	Risk is reduced to a tolerable level by protective measures as specified in table 12		P
	Minimum protective measures:		
	a)Low level measures		P
	b)Moderate measures		—
	c)Stringent measures		—
7.3.4	Limitation of force and pressure		—