TEST REPORT

IEC 61010-1/ EN 61010-1

Safety requirements for electrical equipment for measurement, control, and laboratory use
Part 1: General requirements

Report Reference No.....:	YCT2023SZ1106592S
Tested by (name and signature).....:	Peter He
Approved by (name and signature)..:	Jim he
Date of issue.....:	November 6, 2023
Contents.....:	57 Pages

Testing Laboratory.....:	Shenzhen Yacetong Testing Technology Services Co., Ltd.
Address.....:	Room 310, No.12, Tongfu Industrial Zone, Xinhe Community, Fuhai Street, Bao 'an District, Shenzhen, Guangdong, China
Testing location/procedure.....:	CE-LVD
Address.....:	As above
Applicant's name.....:	Finetooling Technology（Guangzhou）Co.,Ltd
Address.....:	Building 3, No. 88, Chunfen Road, Huangpu District, Guangzhou City, Guangdong Province
Test specification:	--
Standard.....:	EN 61010-1:2010/A1:2019
Test procedure.....:	LVD
Non-standard test method.....:	—
Test Report Form No.....:	IECEN61010_1P
TRF Originator.....:	VDE
Master TRF.....:	Dated 23-07-27

Test item description.....:	5½ Digital Multimeter
Trademark.....:	Fine Tooling
Model/Type reference.....:	FT3550
Rating(s).....:	CAT I 300 V (Supplied by SEVL 12Vdc/200mA or 24vdc/100mA)

Test item particulars..... :	
Type of item tested.....:	Measurement
Description of equipment function.....:	Insulation resistance and voltage measured
Installation/overvoltage category.....:	I
Pollution degree..... :	2
Environmental rating.....:	standard
Equipment mobility.....:	Portable
Connection to mains supply.....:	none
Operating conditions.....:	continuous
Overall size of the equipment (L x W x H).....:	Approximate: 155 mmx100 mmx 55mm
Mass of the equipment (kg)..... :	0.500 kg
Marked degree of protection to IEC 60529..... :	IP20
Accessories and detachable parts included in the evaluation..... :	Test probe, lead and crocodile clamp comply with EN 61010-031: 2002 shall be used. These accessories were not valuated
Options.....:	N/A
Test case verdicts:	
Test case does not apply to the test object..... :	N/A
Test object does meet the requirement..... :	P(Pass)
Test object does not meet the requirement.....:	F(Fail)
Testing..... :	
Date of receipt of test item.....:	November 3, 2023
Date (s) of performance of tests..... :	November 3, 2023-November 6, 2023

General remarks:

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

The test results presented in this report relate only to the item(s) tested.

"(see remark #)" refers to a remark appended to the report.
"(see Annex #)" refers to an annex appended to the report.
"(see Form A.#)" refers to a table appended to the report.

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

Note:

The enclosure and panel cover comply with cemented joints requirement. No clearance and creepage distance exist in the cemented joints.

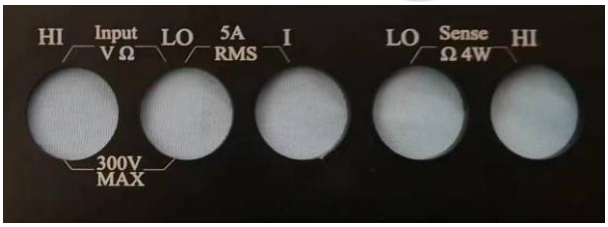
Copy of marking plate:

Below information(measure category, trade mark, model number) were printed outer surface of top case

Marking on Terminal:

Fine Tooling
广州市方通科技有限责任公司 FT3550 12Vdc/200mA or 24vdc/100mA

CAT I 300V ⎓ HI LO



Finetooling Technology（Guangzhou）Co.,Ltd

Made in China

Summary of test results (information/comments):

The equipment compliance with EN 61010-1:2010/A1:2019

	TABLE: 1 - Documents attached to this report	None
Document No.	Document description	Page Numbers
None		

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

	TABLE: 3 - List of components and circuits relied on for safety				
Unique component reference or location (including drawing reference if required)	Application/Function	Manufacturer (NOTE 1)	Part number	RATING (NOTE 2)	Evidence of acceptance (NOTE 3)
Plastic cover		Chi Mei Corporation	CM-211	HB, 50 ºC, CTI (400-600), PMMA	UL E56070
Panel mount (Terminal)		CHANGZHOU TESTER ELECTRONIC TECHNOLOGY CO.,LTD	24.1**	Cr. 12mm, Cl. 12mm. Not intended to connect AC Main	EU certificate
Optical Isolators		ANALOG DEVICES INC	Models ADM*	IsolationVoltage: 2500/3000V	UL E214100
PCB		SHENZHEN BEN QIANG CIRCUIT CO LTD	BQ-2	V-0, 130 ºC, thickness: 1,5 mm	UL E360485
PCB (Alternative)		Various	Various	V-0, Min. 120 ºC,	UL

NOTE 1 - List all manufacturers concerned.
NOTE 2 - Electrical, mechanical, flammability, etc.
NOTE 3 - Licence number, file number or other documentary evidence of acceptance

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
5	MARKING AND DOCUMENTATION		—
5.1.1	General		—
	Required equipment markings are:		P
	visible:		P
	From the exterior; or		P
	After removing a cover; or	No such cover	N/A
	Opening a door		N/A
	After removal from a rack or panel		N/A
	Not put on parts which can be removed by an OPERATOR		P
	Letter symbols (IEC 60027) used		P
	Graphic symbols (IEC 61010-1: Table 1) used		P
5.1.2	Identification		—
	Equipment is identified by:		—
5.1.2a)	Manufacturer's or supplier's name or trademark	Fine Tooling 广州市方途科技有限责任公司	P
5.1.2b)	Model number, name or other means		P
	Manufacturing location identified	In user manual	P
5.1.3	Mains supply		—
	Equipment is marked as follows:		—
5.1.3a)	Nature of supply:	DC supply only	—
	1) a.c. RATED mains frequency or range of frequencies.....:		N/A
	2) d.c. with symbol 1		P
5.1.3b)	RATED supply voltage(s) or range.....:	12V ⎓/200mA or 24v ⎓/100mA	P
5.1.3c)	Max. RATED power (W or VA)or input current.....:		P
	The measured value not more than 110 %		P
	If more than one voltage range:		—
	Separate values marked; or		N/A
	Values differ by less than 20 %		N/A
5.1.3d)	OPERATOR-set for different RATED supply voltages:		—
	Indicates the equipment set voltage		N/A
	PORTABLE EQUIPMENT indication is visible from the exterior		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Changing the setting changes the indication		N/A
5.1.3e)	Accessory mains socket-outlets accepting standard mains plugs are marked:		—
	With the voltage if it is different from the mains supply voltage..... :		N/A
	For use only with specific equipment		N/A
	If not marked for specific equipment it is marked with:		—
	The maximum RATED current or power; or		N/A
	Symbol 14 with full details in the documentation		N/A
5.1.4	Fuses	No fuse	—
	OPERATOR replaceable fuse marking (see also 5.4.5)..... :		N/A
5.1.5	TERMINALS, connections and operating devices		—
	Where necessary for safety, indication of purpose of TERMINALS, connectors, controls and indicators marked		P
	If insufficient space, symbol 14 used		N/A
5.1.5.1	TERMINALS		P
	Mains supply TERMINALS identified		N/A
	Other TERMINAL marking..... :		P
5.1.5.1a)	FUNCTIONAL EARTH TERMINALS (symbol 5 used)		N/A
5.1.5.1b)	PROTECTIVE CONDUCTOR TERMINALS:		—
	Symbol 6 is placed close to or on the TERMINAL; OR		N/A
	Part of appliance inlet		N/A
5.1.5.1c)	TERMINALS of measuring and control circuits (symbol 7 used)		P
5.1.5.1d)	HAZARDOUS LIVE TERMINALS supplied from the interior		—
	Standard MAINS socket outlet; or		N/A
	RATINGS marked; or		N/A
	Symbol 14 used		P
5.1.5.1e)	ACCESSIBLE FUNCTIONAL EARTH TERMINALS:	No such terminals	—
	Self-evident; or		N/A
	Indication (symbol 8 acceptable)		N/A
5.1.5.2	Measuring circuit TERMINALS		—

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict
	For TERMINALS other than those permanently connected and not ACCESSIBLE:		—
	RATED voltage or current marked	CAT I 300 V ⎓ , 5A ⎓	P
	Unless clear indication that below limits:		—
	Maximum RATED voltage to earth is marked; or	300 V ⎓	P
	For specific connection to other equipment TERMINALS only, and means for identifying provided		P
	Appropriate measurement category marked (CAT II, CAT III or CAT IV); or		N/A
	No measurement category marked (CAT I)	CAT I	P
	Required markings are adjacent to TERMINALS; OR		P
	If insufficient space:		—
	On the RATING plate or scale plate; or		N/A
	TERMINAL is marked with symbol 14		N/A
5.1.6	Switches and circuit breakers	No such device	—
	If disconnecting device, on or off position marked		N/A
5.1.7	Equipment protected by DOUBLE INSULATION or REINFORCED INSULATION	回	—
	Protected throughout (symbol 11 used)	回	P
	Only partially protected (symbol 11 not used)		N/A
5.1.8	Field-wiring TERMINAL boxes	No such terminal boxes	—
	If TERMINAL or ENCLOSURE exceeds 60 °C:		—
	Cable temperature RATING marked		N/A
	Marking visible or beside TERMINAL		N/A
5.2	Warning markings		—
	Visible when ready for NORMAL USE		N/A
	Are near or on applicable parts		N/A
	Symbols and text correct dimensions and colour		N/A
	If necessary marked with symbol 14		N/A
	Statement to isolate or disconnect		N/A
5.3	Durability of markings		—
	The required markings remain clear and legible in NORMAL USE	(see Form A.4)	P
5.4	Documentation		—
5.4.1	General		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Equipment is accompanied by documentation which includes:		—
5.4.1a)	Intended use		P
5.4.1b)	Technical specification		P
5.4.1c)	Instructions for use		P
5.4.1d)	Name and address of manufacturer or supplier		P
5.4.1e)	Information specified in 5.4.2 to 5.4.5		—
5.4.1f)	If marking of TERMINALS required, definition of measurement category		P
5.4.1g)	If CAT 1:	CAT I 300 V	—
	Warning		N/A
	RATINGS		N/A
	Warning statements and a clear explanation of warning symbols:		—
	Provided in the documentation; or		N/A
	Information is marked on the equipment		N/A
5.4.2	Equipment RATINGS		—
	Documentation includes:		—
5.4.2a)	Supply voltage or voltage range		N/A
	Frequency or frequency range		N/A
	Power or current RATING		N/A
5.4.2b)	Description of all input and output connections		P
5.4.2c)	RATING of insulation of external circuits, when such circuits are nowhere ACCESSIBLE		N/A
5.4.2d)	Statement of the range of environmental conditions		P
5.4.2e)	Degree of protection (IEC 60529)	IP20	P
5.4.3	Equipment installation		—
	Documentation includes instructions for:		—
5.4.3a)	Assembly, location and mounting	Portable	N/A
5.4.3b)	Protective earthing		N/A
5.4.3c)	Connections to supply		N/A
5.4.3d)	PERMANENTLY CONNECTED EQUIPMENT:		—
	1) Supply wiring requirements		N/A
	2) If external switch or circuit-breaker, requirements and location recommendation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.3e)	Ventilation requirements		N/A
5.4.3f)	Special services (e. g. air, cooling liquid)		N/A
5.4.3g)	Maximum sound power level		N/A
5.4.3h)	Instructions about sound pressure		N/A
5.4.3i)	Permanently connected measuring TERMINALS:		—
	Measurement category		N/A
	RATED maximum WORKING VOLTAGE or current		N/A
5.4.4	Equipment operation		—
	Instructions for use include:		—
5.4.4a)	Identification of operating controls		P
5.4.4b)	Positioning for disconnection		N/A
5.4.4c)	Interconnection		N/A
5.4.4d)	Specification of intermittent operation limits		N/A
5.4.4e)	Explanation of symbols used		P
5.4.4f)	Replacement of consumable materials		N/A
5.4.4g)	Cleaning and decontamination (see 11.2)		P
5.4.4h)	Listing of any poisonous or injurious gases and quantities		N/A
5.4.4i)	Risk-reduction procedures relating to flammable liquids		N/A
	A statement about protection impairment if used in a manner not specified by the manufacturer		P
5.4.5	Equipment maintenance		—
	Instructions include:		—
	Sufficient preventive maintenance and inspection information		P
	Replacement of hoses, etc.		N/A
	Specific battery type		P
	Any manufacturer specified parts		P
	RATING and characteristics of fuses		N/A
6	PROTECTION AGAINST ELECTRIC SHOCK	(see Form A.5)	—
6.1	General		—
6.1.1	Requirements		—
	ACCESSIBLE parts not HAZADOUS LIVE in NORMAL CONDITION and SINGLE FAULT CONDITION		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Conformity is checked by the determination of 6.2 and 6.3 followed by the tests of 6.4 to 6.11		—
6.1.2	Exceptions		—
	Capacitance test		N/A
	Parts not HAZARDOUS LIVE 10 s after interruption of supply		N/A
6.2	Determination of ACCESSIBLE parts		—
6.2.1	General examination	(see Form A.6)	P
6.2.2	Openings above parts that are HAZARDOUS LIVE	No such openings	N/A
6.2.3	Openings for pre-set controls		N/A
6.3	Permissible limits for ACCESSIBLE parts		—
6.3.1	Values in NORMAL CONDITION	(see Form A.7)	P
6.3.2	Values in SINGLE FAULT CONDITION	(see Form A.8)	P
6.4	Protection in NORMAL CONDITION (see 6.2, 6.3.1, 6.7, 6.8 and 8.1)		P
6.5	Protection in SINGLE FAULT CONDITION		—
	Additional protection is provided by:		—
	One or more of 6.5.1 to 6.5.3; or		P
	Automatic disconnection of the supply (6.5.4)		N/A
6.5.1	Protective BONDING	Class III, no protective bonding	—
	ACCESSIBLE conductive parts:		—
	Separated by DOUBLE INSULATION or REINFORCED INSULATION; or	DOUBLE INSULATION	P
	Bonded to the PROTECTIVE CONDUCTOR TERMINAL; or	Class III, no protective bonding	N/A
	Separated by screen or BARRIER bonded to PROTECTIVE CONDUCTOR TERMINAL from parts which are HAZARDOUS LIVE	Noted as above	N/A
6.5.1.1	Integrity of PROTECTIVE BONDING	Noted as above	—
6.5.1.1a)	PROTECTIVE BONDING consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses		N/A
6.5.1.1b)	Soldered connections:		—
	Independently secured		N/A
	Not used for other purposes		N/A
	Screw connections are secured		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.5.1.1c)	PROTECTIVE BONDING not interrupted		N/A
6.5.1.1d)	Any moveable connection specifically designed, and meets 6.5.1.3		N/A
6.5.1.1e)	No external metal braid of cables used		N/A
6.5.1.1f)	If MAINS supply passes through:		—
	Means provided for passing protective conductor;		N/A
	Impedance meets 6.5.1.3.		N/A
6.5.1.1g)	Protective conductors bare or insulated, if insulated, green/yellow	No protective conductors	N/A
	Exceptions:		—
	1) earthing braids;		N/A
	2) internal protective conductors etc.;		N/A
	Green/yellow not used for other purposes		N/A
6.5.1.1h)	TERMINAL suitable, and meets 6.5.1.2		N/A
6.5.1.2	PROTECTIVE CONDUCTOR TERMINAL		—
6.5.1.2a)	Contact surfaces are metal		N/A
6.5.1.2b)	Appliance inlet used		N/A
6.5.1.2c)	For rewireable cords and PERMANENTLY CONNECTED EQUIPMENT, PROTECTIVE CONDUCTOR TERMINAL is close to MAINS supply TERMINALS		N/A
6.5.1.2d)	If no MAINS supply is required, any PROTECTIVE CONDUCTOR TERMINAL:		—
	Is near TERMINALS of circuit for which protective earthing is necessary		N/A
	External if other TERMINALS external		N/A
6.5.1.2e)	Equivalent current-carrying capacity to MAINS supply TERMINALS		N/A
6.5.1.2f)	If plug-in, makes first and breaks last		N/A
6.5.1.2g)	If also used for other bonding purposes, protective conductor:		—
	Applied first;		N/A
	Secured independently;		N/A
	Unlikely to be removed by servicing; or		N/A
	Warning marking requires replacement of protective conductor		N/A
6.5.1.2h)	Protective conductor of measuring circuit:		N/A
	1) Current RATING;		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	2) PROTECTIVE BONDING:		—
	Not interrupted; or		N/A
	Indirect bonding used (see 6.5.1.5)		N/A
6.5.1.2i)	FUNCTIONAL EARTH TERMINALS allow independent connection		N/A
6.5.1.2j)	If a binding screw:		—
	Suitable size for bond wire		N/A
	Not smaller than M 4 (No. 6)		N/A
	At least 3 turns of screw engaged		N/A
	Contact pressure not capable of reduction by deformation of materials		N/A
	Passes tightening torque test		N/A
6.5.1.3	Impedance of PROTECTIVE BONDING of plug-connected equipment	DC supply used only	N/A
6.5.1.4	Bonding impedance of PERMANENTLY CONNECTED EQUIPMENT		N/A
6.5.1.5	Indirect bonding for measuring and test equipment		N/A
6.5.2	DOUBLE INSULATION and REINFORCED INSULATION (see 6.7, 6.8 and 6.9.2)		—
6.5.3	PROTECTIVE IMPEDANCE	NO SUCH COMPONENTS	N/A
6.5.3a)	HIGH-INTEGRITY single component used (s. 14.6); or		N/A
6.5.3b)	A combination of components used; or		N/A
6.5.3c)	A combination of BASIC INSULATION and current- or voltage-limiting device used		N/A
	Components, wires and connections are RATED as required		N/A
6.5.4	Automatic disconnection of the supply	No such device	N/A
	If used, it meets :		—
6.5.4a)	Supplied with the equipment; or		N/A
	Specified by installation instruction		N/A
6.5.4b)	RATED disconnecting time within limit specified		N/A
6.5.4c)	RATED for maximum RATED LOAD		N/A
6.6	Connections to external circuits		—
6.6.1	General		—
	Connections do not cause ACCESSIBLE parts of the following to become HAZARDOUS LIVE in NORMAL CONDITION or SINGLE FAULT CONDITION:		—

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Clause	Requirement + Test	Result - Remark	Verdict
6.6.1a)	The external circuits		P
6.6.1b)	The equipment		P
	Separation of circuits provided; or		P
	Short circuit of separation does not cause a Hazard		P
	Instructions or markings include:		—
	1) RATED conditions for TERMINAL		P
	2) Required RATING of external circuit insulation	No such requirement	N/A
6.6.2	TERMINALS for external circuits		—
	TERMINALS which receive a charge from an internal capacitor are not HAZARDOUS LIVE	(see Form A.7)	P
	High voltage TERMINALS energized from the interior are:		—
	Not ACCESSIBLE if connected; or		P
	Unmated HAZARDOUS LIVE TERMINALS not ACCESSIBLE ; or	Test probe, lead and crocodile clamp comply with EN 61010-031 shall be used	P
	marked with symbol 12		P
6.6.3	Circuits with TERMINALS which are HAZARDOUS LIVE		—
	These circuits are:		—
	Not connected to ACCESSIBLE conductive parts; or		P
	Connected to ACCESSIBLE conductive parts, but are not MAINS CIRCUITS and have one TERMINAL contact at earth potential		N/A
	No ACCESSIBLE conductive parts are HAZARDOUS LIVE		P
6.6.4	ACCESSIBLE TERMINALS for stranded conductors		—
6.6.4a)	No risk of accidental contact because:		—
	Located or shielded		N/A
	Self-evident or marked whether connected to ACCESSIBLE conductive parts		N/A
6.6.4b)	ACCESSIBLE TERMINALS will not work loose		N/A
6.7	CLEARANCES and CREEPAGE DISTANCES	(See Form A.5 and A.13)	P
6.8	Procedure for dielectric strength tests	(See Form A.5 and A.14)	P
6.9	Constructional requirements for protection against electric shock		—
6.9.1	General		—

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Clause	Requirement + Test	Result - Remark	Verdict
	If a failure could cause a HAZARD:		—
6.9.1a)	Security of wiring connections	Wirings connections are not subjected to mechanical stresses	N/A
6.9.1b)	Screws securing removable covers	The length of screws does not determine Cl or Cr	P
6.9.1c)	Accidental loosening		P
	Easily damaged materials not used		P
	Non-impregnated hydroscopic materials not used		P
6.9.2	ENCLOSURES of equipment with DOUBLE INSULATION or REINFORCED INSULATION	DOUBLE INSULATION	—
	ENCLOSURE surrounds all metal parts except for small metal parts which are separated		P
	ENCLOSURES or parts made of insulating material	Plastic enclosure and metal case	P
	Protection for metal ENCLOSURES or parts by:		—
6.9.2a)	An insulating coating or BARRIER on the inside; or	Noted as above	N/A
6.9.2b)	CLEARANCES and CREEPAGE DISTANCES cannot be reduced by loosening of parts or wires		P
6.9.3	Over-range indication		—
	Unambiguous		N/A
6.10	Connection to MAINS supply source and connections between parts of equipment	No mains supply cord	—
6.10.1	MAINS supply cords		—
6.10.1a)	RATED for maximum equipment current (see 5.1.3c)		N/A
	Cable complies with IEC 60227 or IEC 60245		N/A
6.10.1b)	Heat-resistant if likely to contact hot parts		N/A
6.10.1c)	Temperature RATING (cord and inlet)		N/A
6.10.1d)	Green/yellow used only for connection to PROTECTIVE CONDUCTOR TERMINALS		N/A
	Detachable cords with IEC 60320 MAINS connectors:		—
	Conform to IEC 60799; or		N/A
	Have the current RATING of the MAINS connector		N/A
6.10.2	Fitting of non-detachable MAINS supply cords	No mains supply cord	—
	Non-detachable cord protection:		—
6.10.2a)	Inlet or bushing smoothly rounded; or		N/A
6.10.2b)	Insulated cord guard protruding ≥5D		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The protective earth conductor is the last to take the strain		N/A
6.10.2	Cord anchorages:		—
6.10.2a)	Cord is not clamped by direct pressure from a screw		N/A
6.10.2b)	Knots are not used		N/A
6.10.2c)	Cannot push the cord into the equipment to cause a hazard		N/A
6.10.2d)	No failure of cord insulation in anchorage with metal parts		N/A
6.10.2e)	compression bushing:		—
	1) Clamps all types and sizes of MAINS cords; and		N/A
	2) Is suitable:		—
	For connection to TERMINALS provided; or		N/A
	It is designed for screened MAINS cord		N/A
6.10.2f)	Cord replacement does not cause a HAZARD and method of strain relief is clear		N/A
	Push-pull test		N/A
6.10.3	Plugs and connectors	No plugs or connectors	—
6.10.3a)	MAINS supply plugs, connectors etc., conform with relevant specifications		N/A
6.10.3b)	If equipment supplied at voltages below 6.3.2.a) or from a sole source:		—
	Plugs of supply cords do not fit MAINS sockets above RATED supply voltage		N/A
	MAINS-type plugs used only for connection to MAINS supply		N/A
610.3c)	Plug pins which receive a charge from an internal capacitor		N/A
6.10.3d)	Accessory MAINS socket outlets:		—
	1) Marking if accepts a standard MAINS plug (see 5.1.3e)		N/A
	2) Input has a protective earth conductor if outlet has earth TERMINAL contact		N/A
6.11	Disconnection from supply source		—
6.11.1	General		—
	Disconnects all current carrying conductors		N/A
6.11.1.1	Exceptions		—

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Clause	Requirement + Test	Result - Remark	Verdict
6.11.1.1a)	Equipment supplied by low energy source; or		N/A
6.11.1.1b)	Equipment connected to impedance protected supply; or		N/A
6.11.1.1c)	Equipment constitues an impedance protected load		N/A
6.11.2	Requirements according to type of equipment		—
6.11.2.1	PERMANENTLY CONNECTED EQUIPMENT and multi-phase equipment		—
	Employs switch or circuit-breaker		N/A
	If switch or circuit-breaker is not part of the equipment, documentation specifies:		—
6.11.2.1a)	Switch or circuit-breaker to be included in building installation		N/A
6.11.2.1b)	Location		N/A
6.11.2.1c)	Marking		N/A
6.11.2.2	Single-phase cord-connected equipment		—
	Equipment is provided with:		—
6.11.2.2a)	Switch or circuit-breaker; or		N/A
6.11.2.2b)	Appliance coupler (disconnectable without TOOL); or		N/A
6.11.2.2c)	Separable plug (without locking device)		N/A
6.11.2.3	HAZARDS arising from function		—
	Emergency switch		N/A
	Emergency switch ≤ 1 m from the moving part		N/A
6.11.3	Disconnecting devices		—
	Electrically close to the supply		N/A
6.11.3.1	Switches and circuit-breakers	No switches or circuit - breakers	—
	When used as disconnection device:		—
	Meets IEC 60947-1 and IEC 60947-3		N/A
	Marked to indicate function		N/A
	Not incorporated in MAINS cord		N/A
	Does not interrupt protective earth conductor		N/A
	If has other contacts meets separation requirements of 6.6 and 6.7		N/A
6.11.3.2	Appliance couplers and plugs		—
	Where an appliance coupler or seperable plug is used as the disconnecting device (see 6.11.2.2):		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Readily identifiable and easily reached by the OPERATOR		N/A
	Single-phase PORTABLE EQUIPMENT cord length ≤ 3 m		N/A
	Protective earth conductor connected first and disconnected last		N/A
7	PROTECTION AGAINST MECHANICAL HAZARDS		—
7.1	General	No mechanical hazards present	—
	Conformity is checked by 7.2 to 7.6		P
7.2	Moving parts	No moving parts	—
	Moving parts not able to crush, etc. (see also 6.11.2.3)		N/A
	If OPERATOR access permitted:		—
7.2a)	Access requires TOOL		N/A
7.2b)	Statement about training		N/A
7.2c)	Warning markings or symbol 14		N/A
7.3	Stability		—
	Marking of non-automatic means		N/A
	Conformity tests:		—
7.3a)	10° tilt test		P
7.3b)	multi-directional force test		N/A
7.3c)	downward force test		N/A
7.4	Provisions for lifting and carrying	No carrying handles or grips	—
	Handles or grips withstand four times weight		N/A
	Equipment >18 kg :		—
	Has means for lifting or carrying; or		N/A
	Directions in documentation		N/A
7.5	Wall mounting	Portable	—
	Mounting brackets withstand four times weight		N/A
7.6	Expelled parts	No expelled parts	—
	Equipment contains or limits the energy		N/A
	Protection not removable without the aid of a TOOL		N/A
8	MECHANICAL RESISTANCE TO SHOCK AND IMPACT		—
	After the tests of 8.1 to 8.2:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Voltage tests	(see Form A.14)	P
	Inspections:		—
8a)	HAZARDOUS LIVE parts not accessible		P
8b)	ENCLOSURE shows no cracks (hazard)		P
8c)	CLEARANCES not less than their permitted values	(see Form A.13)	P
8d)	BARRIERS not damaged or loosened	No barriers	N/A
8e)	No moving parts exposed, except permitted by 7.2	No moving parts	N/A
8f)	No damage which could cause spread of fire		P
9	PROTECTION AGAINST THE SPREAD OF FIRE		—
	Conformity for each source of HAZARD or area of the equipment is checked by one of the following:	(See Form A.16)	—
9a)	Fault test of 4.4; or		N/A
9b)	Application of 9.1 (eliminating or reducing the sources of ignition); or		N/A
9c)	Application of 9.2 (containment of fire within the equipment)	V-0 plastic enclosure used/Metal case	P
9.1	Eliminating or reducing the sources of ignition within the equipment		—
9.1a)	1) Limited-energy circuit (see 9.3); or		N/A
	2) Insulation meets the requirements for BASIC INSULATION; OR		N/A
	Bridging the insulation does not cause ignition		N/A
9.1b)	Surface temperature of liquids and parts (see 9.4.a)		N/A
9.1c)	No ignition in circuits designed to produce heat		N/A
9.2	Containment of the fire within the equipment, should it occur		—
9.2a)	Energizing of the equipment is controlled by an OPERATOR held switch		N/A
9.2b)	Enclosure is conform with constructional requirements of 9.2.1; and		P
	Requirements of 9.4b) or c) are met		N/A
9.2.1	Constructional requirements		—
9.2.1a)	Insulated wires have flammability classification FV1 or better		N/A
	Connectors and insulating material have flammability classification FV2 or better		N/A
9.2.1b)	The enclosure is constructed as follows :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	1) Bottom constructed with:		—
	No openings; or		P
	Extent as specified in figure 7; or		N/A
	Baffles as specified in figure 6; or		N/A
	Perforated as specified in Table 12; or		N/A
	Metal screen with a mesh		N/A
	2) Sides have no openings as specified in figure 7		P
	3) Material of ENCLOSURE and any baffle or flame barrier is made of:		—
	Metal (except magnesium); or		N/A
	Non metallic materials have flammability classification FV1 or better	(see Table 3 or Form A.17)	P
	4) ENCLOSURE and any baffle or flame barrier have adequate rigidity		P
9.3	Limited-energy circuit		—
9.3a)	Potential not more than 30 r.m.s. and 42.4 V peak, or 60 V dc		N/A
9.3b)	Current limited by one of following means:		—
	1) Inherently or by impedance; or		N/A
	2) Overcurrent protective device; or		N/A
	3) A regulating network limits also in SINGLE FAULT CONDITION		N/A
9.3c)	Is separated by at least BASIC INSULATION		N/A
	If overcurrent protective device used:		—
	Fuse or a non adjustable electromechanical device		N/A
9.4	Requirements for equipment containing or using flammable liquids		N/A
	Flammable liquids contained in or specified for use with equipment do not cause spread of fire		N/A
	Risk is reduced to a tolerable level :	(see Form A.19)	—
9.4a)	The temperature of surface or parts in contact with flammable liquids is 25 °C below fire point		N/A
9.4b)	The quantity of liquid is limited		N/A
9.4c)	Flames are contained within the equipment		N/A
	Detailed instructions for risk-reduction provided		N/A
9.5	Overcurrent protection		N/A
	Devices not in the protective conductor		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Fuses or single-pole circuit-breakers not fitted in neutral (multi-phase)		N/A
9.5.1	PERMANENTLY CONNECTED EQUIPMENT		N/A
	Overcurrent device:		—
	Fitted within the equipment; or		N/A
	Specified in manufacturer's instructions		N/A
9.5.2	Other equipment		N/A
	Protection within the equipment		N/A
10	EQUIPMENT TEMPERATURE LIMITS AND RESISTANCE TO HEAT		—
10.1	Surface temperature limits for protection against burns		—
	Easily touched surfaces within the limits	(see Form A.20A)	P
	Heated surfaces necessary for functional reasons exceeding specified values:		—
	Are recognizable as such by appearance or function; or		N/A
	Are marked with symbol 13		N/A
	Guards are not removable without TOOL		N/A
10.2	Temperatures of windings	(see Form A.20B)	P
	Limits not exceeded in:		—
	NORMAL CONDITION		P
	SINGLE FAULT CONDITION		P
10.3	Other temperature measurements	(see Form A.20A)	P
	Following measurements conducted if applicable:		—
10.3a)	Value of 60 °C of field-wiring TERMINAL box not exceeded	No field-wiring TERMINAL box	N/A
10.3b)	Surface of flammable liquids and parts in contact with this liquids	No flammable liquids	N/A
10.3c)	Surface of non-metallic ENCLOSURES		P
10.3d)	Parts made of insulating material supporting parts connected to MAINS supply		N/A
10.3e)	TERMINALS carrying a current more than 0.5 A		N/A
10.4	Conduct of temperature test	(see Form A20)	P
10.5	Resistance to heat		P
10.5.1	Integrity of CLEARANCE and CREEPAGE DISTANCES	(See Form A.13)	P

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Clause	Requirement + Test	Result - Remark	Verdict
10.5.2	Non-metallic ENCLOSURES	(See Forms A.21	P
	After treatment:		P
	No HAZARDOUS LIVE parts ACCESSIBLE;		P
	Tests of 8.1 and 8.2	(See Form A.13)	P
	In case of doubt, tests of 6.8 (without humidity preconditioning)	(See Form A.14)	P
10.5.3	Insulating material	No such parts	N/A
10.5.3a)	Parts supporting parts connected to MAINS supply		N/A
10.5.3b)	TERMINALS carrying a current more than 0.5 A		N/A
	Examination of material data; or		N/A
	in case of doubt::		—
	1) Ball pressure test; or		N/A
	2) Vicat softening testof ISO 306		N/A
11	PROTECTION AGAINST HAZARDS FROM FLUIDS		—
11.1	General		N/A
11.2	Cleaning		N/A
11.3	Spillage		N/A
11.4	Overflow		N/A
11.5	Battery electrolyte		—
	Battery electrolyte leakage presents no hazard		N/A
11.6	Specially protected equipment		N/A
11.7	Fluid pressure and leakage		—
11.7.1	Maximum pressure		—
	Maximum pressure of any part does not exceed P_{RATED}		N/A
11.7.2	Leakage and rupture at high pressure		N/A
	Test to IEC 60335 (refrigeration only)		N/A
11.7.3	Leakage from low-pressure parts		N/A
11.7.4	Overpressure safety device		—
	Does not operate in NORMAL USE		N/A
	Meets ISO 4126-1; and		N/A
	It is conform with:		—
11.7.4a)	Connected as close as possible to parts intended to be protected		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
11.7.4b)	Easy access for inspection, maintenance and repair		N/A
11.7.4c)	Adjustment only with TOOL		N/A
11.7.4d)	No discharge towards person		N/A
11.7.4e)	No HAZARD from deposit of discharged material		N/A
11.7.4f)	Adequate discharge capacity		N/A
11.7.4g)	No shut-off valve between overpressure safety device and protected parts		N/A
12	PROTECTION AGAINST RADIATION, INCLUDING LASER SOURCES, AND AGAINST SONIC AND ULTRASONIC PRESSURE		—
12.1	General		—
	Equipment provides protection		N/A
12.2	Equipment producing ionizing radiation		N/A
12.2.1	Ionizing radiation		N/A
12.2.2	Accelerated electrons		N/A
12.3	Ultra-violet (UV) radiation	(Conformity test under consideration)	—
	No unintentional and HAZARDOUS escape of UV radiation		N/A
12.4	Micro-wave radiation		—
	Power density does not exceed 10 W/m^2..... :		N/A
12.5	Sonic and ultrasonic pressure		—
12.5.1	Sound level		N/A
12.5.2	Ultrasonic pressure		N/A
12.6	Laser sources (IEC 60825-1)		N/A
13	PROTECTION AGAINST LIBERATED GASES, EXPLOSION AND IMPLOSION		—
13.1	Poisonous and injurious gases		N/A
	Attached data/test reports demonstrate conformity		N/A
13.2	Explosion and implosion		—
13.2.1	Components		—
	Components liable to explode:		—
	Pressure release device provided; or		N/A
	Apparatus incorporates OPERATOR protection (see also 7.6)		N/A
	Pressure release device:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Discharge without danger		N/A
	Cannot be obstructed		N/A
13.2.2	Batteries and battery charging		—
	If explosion or fire hazard could occur:		—
	Protection incorporated in the equipment; or		N/A
	Instructions specify batteries with built-in protection		N/A
	In case of wrong type of battery used:		—
	No HAZARD; or		N/A
	Warning by marking and within instructions		N/A
	Equipment with means to charge rechargeable batteries:		
	Warning against the charging of non-rechargeable batteries; and		N/A
	Type of rechargeable battery indicated; or		N/A
	Symbol 14 used		N/A
	Battery compartment design		N/A
	Single component failure		N/A
	Polarity reversal test		N/A
13.2.3	Implosion of cathode ray tubes		—
	If maximum face dimensions > 160 mm.....:		—
	Intrinsically protected and correctly mounted; or		N/A
	ENCLOSURE provides protection:		N/A
	If non-intrinsically protected:		—
	Screen not removable without TOOL		N/A
	If glass screen, not in contact with surface of tube		N/A
13.2.4	Equipment RATED for high pressure (See 11.7)		N/A
14	COMPONENTS		P
14.1	General		P
	Where safety is involved, components meet relevant requirements	(see Table 3)	P
14.2	Motors		—
14.2.1	Motor temperatures		—
	Does not present a HAZARD when stopped or prevented form starting; or	(See Form A.20)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Protected by overtemperature or thermal protection device conform with 14.3		N/A
14.2.2	Series excitation motors		—
	Connected direct to device, if overspeeding causes a HAZARD		N/A
14.3	Overtemperature protection devices		N/A
	Devices operating in a SINGLE FAULT CONDITION		N/A
14.3a)	Reliable function is ensured		N/A
14.3b)	RATED to interrupt maximum current and voltage		N/A
14.3c)	Does not operate in NORMAL USE		N/A
14.4	Fuse holders	No fuse holders	N/A
	No access to HAZARDOUS LIVE parts		N/A
14.5	Mains voltage selecting devices		N/A
	Accidental change not possible		N/A
14.6	HIGH INTEGRITY components		N/A
	Used in applicable positions (see Table 3)		N/A
	Conforms with IEC publications		N/A
	Single electronic device not used		N/A
14.7	Mains transformers tested outside equipment	See Forms A.29 and A.30	N/A
14.8	Printed circuit boards	Flammability of V-0	P
	Data shows conformity with FV-1 of IEC 60707 or better; or	UL approved PCB	P
	Test shows conformity with FV-1 of IEC 60707 or better; or		N/A
	Thin film flexible PCB with limited-energy circuit used		N/A
14.9	Circuits or components used as transient overvoltage limiting devices		—
	After test, no sign of overload or degradation		N/A
15	PROTECTION BY INTERLOCKS		—
15.1	General		—
	Interlocks are designed to remove a hazard before OPERATOR exposed		N/A
15.2	Prevention of reactivation		N/A
15.3	Reliability		—
	Single fault unlikely to occur; or		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Cannot cause a HAZARD		N/A
16	TEST AND MEASUREMENT EQUIPMENT		P
16.1	Current measuring circuits	(see Form A.31)	N/A
16.2	Multifunction meters and similar equipment	(see Form A.32)	P
	No HAZARD from:		—
	RATED input voltage combinations		P
	Settings of functions		P
	Settings of range controls		P
ANNEX F	ROUTINE TESTS		N/A
	Manufacturer’s declaration		N/A

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.4.2	**TABLE: Summary of SINGLE FAULT CONDITIONS**	**Form A.1**	—

Subclause	Title	Does not apply	Carried out	Comments
4.4.2.1	PROTECTIVE IMPEDANCE	√		
4.4.2.2	Protective conductor	√		
4.4.2.3	Equipment or parts for short-term or intermittent operation	√		
4.4.2.4	Motors	√		
4.4.2.5	Capacitors	√		
4.4.2.6	Mains transformers Attach drawing of MAINS Txs showing all protective devices (see Forms A.29 and A.30)	√		
4.4.2.7	Outputs	√		
4.4.2.8	Equipment for more than one supply	√		
4.4.2.9	Cooling – air holes closed – fans stopped – coolant stopped	√ √ √ √		
4.4.2.10	Heating devices – timer overridden – temperature controller overridden – loss of cooling liquid – overfilled or empty or both	√ √ √ √ √		
4.4.2.11	Insulation between circuits and parts		√	
4.4.2.12	Interlocks	√		
List below all SINGLE FAULT CONDITIONS not covered by 4.4.2.1 to 4.4.2.12:				
4.4	Components abnormal in single fault condition		√	
13.2.2	Battery short circuit		√	
13.2.2	Battery reverse		√	
16.2	Multifunction meters and similar equipment		√	Refer to form A.32
Supplementary information: (see Form A.2 for details of tests)				

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

4.4	**TABLE: Testing in single FAULT CONDITION – Results**			**Form A.2**	**P**
Test subclause	Fault No.	Fault description	Td 4.4.3 (NOTE)	How was test terminated Comments	Meets 4.4.4
4.4.1	1	Short transformer U32 output winding (3 & 4)	2 h, 39 min	Normal measured. The EUT was damaged, no hazard.	Yes
4.4.1	2	Short transformer T1 output winding (3 & 4)	3 h, 11 min	Normal measured. The EUT was damaged, no hazard.	Yes
4.4.1	3	Short resistor R63 (resistance 2,5M ohm)	60 s	Normal CAT II 300 Vdc measured, No hazard	Yes
4.4.1	4	Short semiconductor Q1 (D-S)	1 h, 30 min	Normal measured. No hazard	Yes
NOTE Td = Test duration in h:min:s Record dielectric strength test on Form A.14 and temperature tests on Form A.20. Record in the comments column for each test whether carried out during or after SINGLE FAULT CONDITION.					

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.1.3c)	**TABLE: Mains supply**	**Form A.3**	**N/A**
	Marked rating..... :	V	—
	Phase..... :		—
	Frequency .....:	Hz	—
	Current ..... :	A	—
	Power ..... :	W	—
	Power ..... :	VA	—

Test No.	Voltage V	Frequency Hz	Current A	Power in W	Power in VA	Comments

Note: Measurements are only required for marked ratings.

Supplementary information:

Supplied from DC suply.

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.3	TABLE: Durability of markings	Form A.4	P

Marking method (see NOTE)	Agent
1) Printed	A Water
2) moulded	B Isopropyl alcohol
3)	C (specify agent)
4)	D (specify agent)
5)	E (specify agent)

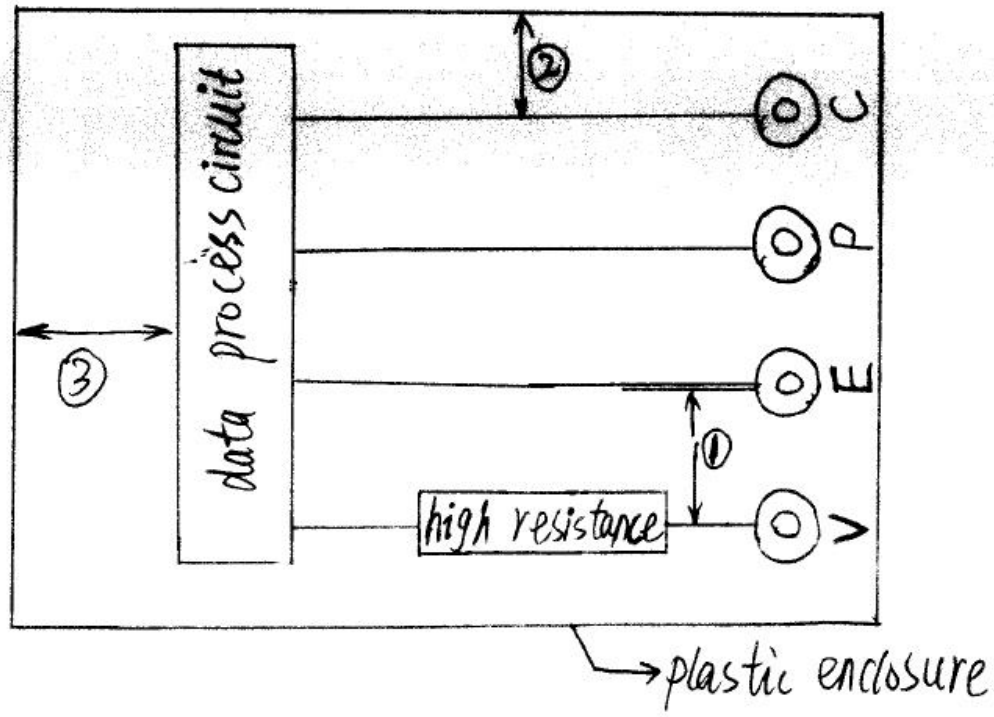
NOTE – Where applicable include print method, label material, ink or paint type, fixing method, adhesive and surface to which marking is fixed.

Marking location	Marking method (see above)
Identification (5.1.2)	1), 2)
Mains supply (5.1.3)	--
Fuses (5.1.4)	--
TERMINALS and operating devices (5.1.5.1)	1)
Measuring circuit TERMINALS (5.1.5.2)	1)
Switches and cricuit breakers (5.1.6)	--
DOUBLE/REINFORCED equipment (5.1.7)	2)
Field wiring TERMINAL boxes (5.1.8)	--
Warning marking (5.2)	2)
Battery charging (13.2.2)	--

Method	Test agent	Remains legible Verdict	Label loose Verdict	Curled edges Verdict	Comments
1)	B	Yes	No	No	--

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict

6	**TABLE: Protection against electric shock - Block diagram of system Form A.5**	P



① Basic insulation, ② Reinforce insulation, ③Reinforce insulation

Pollution degree..... : 2	Installation category (overvoltage category)..... : I	P

Location or description	Insulation type (NOTE 1)	Maximum working voltage (NOTE 2)	CREEPAGE DISTANCE (NOTE 3) PWB mm	CTI	Other mm	CTI	CLEARANCE (NOTE 3) mm	Test voltage (NOTE 2) V	Comments
Terminal surface to accessible parts	FI	300 Vdc	--	--	6	--	6	1500 Vr.m.s	
V terminal before high resistance (R63) to **G** terminal	BI	300 Vdc	--	--	6	--	6	1500 Vr.m.s	

NOTE 1 – Type of insulation:	NOTE 2 - Types of voltage	NOTE 3 - INSTALLATION CATEGORIES (OVERVOLTAGE CATEGORIES)
BI = BASIC INSULATION DI = DOUBLE INSULATION PI = PROTECTIVE IMPEDANCE RI = Reinforced INSULATION SI = Supplementary INSULATION	Peak impulse test voltage (pulse) r.m.s. d.c. peak	or POLLUTION DEGREES which differ from these should be shown under "Comments".

Supplementary Information:

Limit: CAT I 300V, Cl=5,5 mm(BI), Cl=10,5 mm(RI), (BI, PCB CTI>175)

IEC 61010-1			
Clause	Requirement + Test	Result - Remark	Verdict

6.2	**TABLE: List of ACCESSIBLE parts**	**Form A.6**	**P**
6.1.2	Exceptions		—
6.2	Determination of accessible parts		—

Item	Description	Determination method (NOTE 5)	Exception under 6.1.2 (NOTE 4)
1	Enclosure	jointed test finger	None

NOTE 1 – Test fingers and pins are to be applied without force unless a force is specified (see 6.2.1)
NOTE 2 – Special consideration should be given to inadequate insulation and high voltage parts (see 6.2)
NOTE 3 – Parts are considered to be ACCESSIBLE if they could be touched in the absence of any covering which is not considered to provide suitable insulation (see note to paragraph 1 of 6.4).
NOTE 4 – Capacitor test may be required (see Form A.7).
NOTE 5 – The determination methods are: visual; rigid test finger; jointed test finger; pin 3 mm diameter; pin 4 mm diameter.

Supplementary information

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

6	**TABLE: Values in NORMAL CONDITION**	**Form A.7**	**P**
6.1.1	Exceptions	11.2 Cleaning and decontamination	—
6.3.1	Values in NORMAL CONDITION (see NOTE 1)	11.3 Spillage	—
6.6.2	Terminals for external circuit	11.4 Overflow	—
6.10.3	Plugs and connections		—

Item (see Form A.6)	Voltage			Current				Capacitance		10 s test (NOTE 2)			Comments
	V r.m.s.	V peak	V d.c.	Test circuit A1/A2/A3	mA r.m.s.	mA peak	mA d.c.	μC	mJ	V	μC	mJ	
Accessible parts to protective earth	99	138	--	A1	0,098	0,11	--	0,82	--	--	--	--	

NOTE 1 – The requirements of 6.3.1 include drying out (if specified). For permanently connected equipment, the current values are 1,5 times the specified values.
NOTE 2 – A 5 s test is specified in 6.10.3c).

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Clause	Requirement + Test	Result – Remark	Verdict

6.3.2	**TABLE: Values in SINGLE FAULT CONDITION**											**Form A.8**	**P**
Item (See Form A.6)	Subclause and fault No. (see FormA.2)	Voltage			Transient (see NOTE)		Current				Capacitance μF (NOTE)	Comments	
		V r.m.s.	V peak	V d.c.	V	s	Test circuit A1/A2/A3	mA r.m.s.	mA peak	mA d.c.			
1	See form A.2	99	138	--	99	>10	A1	0,098	0,11	--	1,2	No hazard	
NOTE – Transient voltages must be below the limits given from Figure 1 and the capacitance below the limits from figure 2 of IEC 61010-1.													

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

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

6.5.1.2	**TABLE: Tighting torque test**			**N/A**
Conductor location		Size of Screw	Tighting torque Nm	Verdict

6.5.1.3	**TABLE: Bonding impedance of plug connected equipment**		**Form A.10**	**N/A**
ACCESSIBLE part under test	Test current A	Voltage attained after 1 min V	Calculated resistance (maximum allowed 0,1 Ω) Ω	Verdict
Supplementary information:				

6.5.1.4	**TABLE: Bonding impedance of PERMANENTLY CONNECTED EQUIPMENT**		**N/A**
ACCESSIBLE part under test	Test current A	Voltage attained after 1 min (maximum 10 V) V	Verdict
Supplementary information:			

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Clause	Requirement + Test	Result – Remark	Verdict

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

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

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

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

6.7	**TABLE: CLEARANCES and CREEPAGE DISTANCES** **Form A.13**	**P**
8	Mechanical resistance to shock and impact	P
10.5.1	Integrity of CLEARANCES and CREEPAGE DISTANCES	P

Location (see Form A.5)	Measured (initial – 6.7)		Verdict	Mechanical tests (note)					Test at max. RATED ambient (10.5.1)	Measured after test (if required)		Verdict	Comments
	CREEPAGE DISTANCE mm	CLEARANCE mm		Applied force (6.7) N	Rigidity (8.1)		Drop (8.2)			CREEPAGE DISTANCE mm	CLEARANCE mm		
					Static	Dynamic	Normal	Hand-held/ Plug-in					
See form A.5	>12,7	12,7	P	10	V	V	--	V	40	>12,7	12,7	P	RI
	37,0	10,4	P	10	V	V	--	V	40	37,0	10,4	P	BI

NOTE – Refer to Form A.12 for dielectric strength tests following the above tests.

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

6.8	**TABLE: Dielectric strength tests**	**Form A.14**	**P**
4.4.4.1 b)	Conformity after application of fault conditions[1]		P
6.4	Protection in NORMAL CONDITION		P
6.5.2	DOUBLE INSULATION and REINFORCED INSULATION		P
6.6.1	Connections to external circuits		P
6.7.3.1 c)	CLEARANCE values – General: reduced CLEARANCES for homogeneous construction		N/A
6.10.2.5	Fitting of non-detachable MAINS SUPPLY cords[1]		N/A
8	Mechanical resistance to shock and impact		P
9.1 a) 2)	Eliminating or reducing the sources of ignition within the equipment		N/A
9.3 c)	Limited-energy circuit		N/A
11.2	Cleaning[1]		N/A
11.3	Spillage[1]		N/A
11.4	Overflow[1]		N/A
11.6	Specially protected equipment[1]		N/A
[1] Record the fault, test or treatment applied before the dielectric strength test			
	Test site altitude.....:	Up to 200 m	—
	Test voltage correction factor (see Table 10).... :	None	—

Location or references from Forms A.2 and A.5	Clause or sub-clause	Humidity Yes/No	Working voltage V	Test voltage r.m.s/peak/d.c V	Comments	Verdict
See form A.2 and A.5	4.4.4.1.b)	No	300 Vdc	3320 Vr.m.s	BI	P
	6.4	Yes	300 Vdc	3320 Vr.m.s	BI	P
	6.5.2	Yes	300 Vdc	5312 Vr.m.s	RI	P
	6.6.1	No	300 Vdc	5312 Vr.m.s	RI	P
	8	No	300 Vdc	3320 Vr.m.s	BI	P
Supplementary information:						

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

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

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

9	**TABLE: Protection against the spread of fire**		**Form A.16**	**P**
Item	Source of HAZARD or area of the equipment considered (circuit, component, liquid etc.)	Protection Method (9a, 9b or 9c)	Protection details	Verdict
1	Short circuit	9a	Insulation between circuits and parts which is below the level specified for BASIC INSULATION was bridged to check against the spread of fire.	P
2	Component	9c	Flammability classification V-0 plastic enclosure and PCB used	P
Supplementary information:				

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

9.2.1	**TABLE: Constructional requirements**	**Form A.17**	**N/A**
14.8	Printed circuit boards		N/A

Material tested..... :		—
Generic name..... :		—
Material manufacturer..... :		—
Type..... :		—
Colour.....:		—
Conditioning details..... :		—

		Sample 1	Sample 2	Sample 3
Thickness of specimen	mm			
Duration of flaming after first Application	s			
Duration of flaming plus glowing After second application	s			
Specimen burns to holding clamp	Yes/No			
Cotton ignited	Yes/No			
Sample result	Pass/Fail			

Supplementary information:

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

9.3	**TABLE: Limited-energy circuit**				**Form A.18**	**N/A**
Item	9.3 a)	9.3 b) Current and power limitation			9.3 c)	Decision
or Location (see Form A.16)	Maximum potential in circuit voltage r.m.s./d.c. V	Maximum available current A	Maximum available power VA	Overload protection after 120 s A	Circuit separation	Yes/No	Comments
Supplementary information:							

9.4	**TABLE: Requirements for equipment containing or using flammable liquids**		**Form A.19**	**N/A**
Type of liquid	9.4 Flammable liquids			Verdict
	b) quantity	c) Containment		
Supplementary information:				

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

10.	**TABLE : Temperature Measurements** **Form A.20A**	**P**
10.1	Surface temperature limits - NORMAL CONDITION	P
10.2	Temperature of windings- NORMAL CONDITION	P
10.3	Other temperature measurements	P

Operating conditions:	Normal earth resistance measured		
Frequency..... :	-- Hz	Test room ambient temperature (t_a).....:	22 °C
Voltage.....:	-- V	Test duration.....:	2 h 5 min

Part / Location	t_m °C	t_c °C	t_{max} °C	Verdict	Comments
PCB surface (under transformer)	25,0	43,0	130	P	
PCB surface	24,2	42,2	130	P	
Internal surface of battery cover	23,5	41,5	85	P	
Outer surface of enclosure	24,6	42,6	80	P	

NOTE 1 - t_m = measured temperature
t_c = t_m corrected (t_m–t_a+ 40 °C or max. RATED ambient)
t_{max} = maximum permitted temperature
NOTE 2 - See also 14.1 with reference to component operating conditions
NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary
NOTE 4 - See Form A.20B for details of winding temperature measurements

Supplementary information:

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

10.	**TABLE : Temperature Measurements** **Form A.20A**	**P**
10.1	Surface temperature limits - SIGNLE FAULT CONDITION	P
10.2	Temperature of windings- SIGNLE FAULT CONDITION	P
10.3	Other temperature measurements	P

Operating conditions:	Short transformer(U32) (3 & 4) when the unit subjected to DC voltagle measured,		
Frequency..... :	-- Hz	Test room ambient temperature (t_a).....:	23 °C
Voltage.....:	-- V	Test duration.....:	3 h 20 min

Part / Location	t_m °C	t_c °C	t_{max} °C	Verdict	Comments
PCB surface (under transformer)	112,8/152,3	129,8/169,3	--	--	No hazard
PCB surface	40,2/64,8	57,2/81,8	--	--	No hazard
Internal surface of cover	48,3/85,5	65,3/102,5	--	--	No hazard
Outer surface of bottom case	40,0/63	57,0/77,0	105	P	--
Outer surface of top case	30,4/ 41,8	47,4/ 58,8	105	P	--

NOTE 1 - t_m = measured temperature
t_c = t_m corrected (t_m–t_a+ 40 °C or max. RATED ambient)
t_{max} = maximum permitted temperature
NOTE 2 - See also 14.1 with reference to component operating conditions
NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary
NOTE 4 - See Form A.20B for details of winding temperature measurements

Supplementary information:

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

10.2	**TABLE: Temperature of windings** **Form A.20B** **Resistance method Temperature Measurements**	**N/A**
4.4.2.6	MAINS Transformers	N/A
14.2.1	Motor temperatures	N/A

Operating conditions:								
Frequency..... :	Hz	Test room ambient temperature (t_{a1}/t_{a2})....:				/	°C (initial / final)	
Voltage.....:	V	Test duration..... :				h	min	
Part / Designation	R_{cold} Ω	R_{warm} Ω	Current A	t_r K	t_c °C	t_{max} °C	Verdict	Comments

NOTE 1- R_{cold} = initial resistance; R_{warm} = final resistance
t_r = temperature rise; t_c = t_r corrected ($t_c = t_r - \{ t_{a2} - t_{a1} \} + [40\ °C$ or max RATED ambient$]$)
t_{max} = maximum permitted temperature
NOTE 2 - Indicate insulation class (IEC 85) under comments (optional)
NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary

Supplementary information:

10.5.2	**TABLE: Resistance to heat of non-metallic enclosures** **Form A.21**		**P**
	Test method used:		—
	Non operative treatment.....:	[V]	
	Empty ENCLOSURE.....:	[V]	
	Operative treatment.....:	[ ]	
	Temperature during tests.....:	70 °C	—
	ENCLOSURE samples tested were.....:		—

Description	Material	Comments	Verdict
Plastic enclosure	V-0, 130 °C	After the treatment, no hazardous parts was accessible and can pass the test of Clause 8.1 and Clause 8.2	No hazard

	Dielectric strength test (6.8).....:	5312	V	r.m.s.	Pass

Supplementary information:

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

10.5.3	**TABLE: Insulating Materials**	**Form A.22**	**N/A**
10.5.3a)	Ballpressure test		N/A
	Max. allowed impression diameter.....:	2 mm	—

Part	Test temperature °C	Impression Diameter (mm)	Verdict

Supplementary information:

10.5.3b)	Vicat softening test (ISO 306)		N/A

Part	Vicat softening temperature °C	Thickness of sample (mm)	Verdict

Supplementary information:

IEC 61010-1			
Clause	Requirement + Test	Result – Remark	Verdict

8	**TABLE: Mechanical resistance to shock and impact**	**Form A.23**	**P**
11	**Protection against hazards from fluids**		**N/A**

Voltage tests can be carried out once after performing the tests of clause **8** and clause **11**. However, if voltage tests are carried out separately after each set of tests, two forms can be used.

	Clause 8 tests				Clause 11 tests							
Location (see form A.5)	Static	Dynamic	Normal	Handheld Plug-in	Cleaning (11.2)	Spillage (11.3)	Overflow (11.4)	IEC 60529 (11.6)	Working voltage V	Test voltage V	Verdict	Comments
See form A.5	V	V	--	V	--	--	--	--	1000 Vac	5312 Vr.m.s	P	RI

NOTE – Use r.m.s., d.c. or peak to indicate the used test voltage.

11.7.2	TABLE: Leakage and rupture at high pressure	Form A.24	N/A

Part	Maximum permissible working pressure MPa	Test pressure MPa	Leakage YES / NO	Burst YES / NO	Comments

Supplementary information:

11.7.3	Leakage from low-pressure parts	

Part	Test pressure MPa	Leakage YES / NO	Comments

Supplementary information:

12.2.1	TABLE: Ionizing radiation	Form A 25	N/A

Locations tested	Measured values µSv/h	Verdict	Comments

Supplementary information:

12.5.1	TABLE: Sound level	Form A.26	N/A

Locations tested	Measured values dBA	Calculated maximum sound pressure level
At operator's normal position and at bystanders' positions		
a)		

Supplementary information:

12.5.2	Ultrasonic pressure	N/A

Locations tested	Measured values		Comments
	dB	kHz	
At OPERATOR'S normal position			
At 1 m from the ENCLOSURE			
a)			

NOTE – No limit is specified at present, but a limit of 110 dB above the reference pressure value of 20 µPa is under consideration for applicable frequencies between 20 kHz and 100 kHz.

Supplementary information:

13.2.2	TABLE: Batteries		Form A.27	N/A
	Battery load and charging circuit diagram:	No such circuit		
	Battery type..... :			—
	Battery manufacturer/model/catalogue No..... :	--		—
	Battery ratings.....:			—
	Reverse polarity instalment test			N/A

Single component failures	Verdict	
Component	Open circuit	Short circuit
--	--	--

Supplementary information:

14.3	TABLE: Overtemperature protection devices		Form A.28	N/A

Reliability test			
Component	Type (note)	Verdict	Comments

NOTE:
NSR = non-self-resetting (10 times)
NR = non-resetting (1 time)
SR = self-resetting (200 times)

Supplementary information:

4.4.2.6	**TABLE: Mains transformer**	**Form A.29**	**N/A**
4.4.2.6.1	Short circuit		N/A
14.7.1	MAINS transformers tested outside equipment		N/A
Type..... :			—
Manufacturer.....:			—
Test in equipment			
Test on bench			
Test repeated inside equipment (see 14.7)			
Optional – Insulation class (IEC 60085) of the lowest RATED winding .....:			—

Winding identification				
Type of Protector for winding (Note 1)				
Elapsed time				
Current, A primary				
secondary				
Winding temperature, °C primary				
(see Note 2) secondary				
Tissue paper / cheesecloth OK ? (Pass / Fail)				
Voltage tests (see Note 3)				
primary to secondary _____ V ____				
primary to core _____ V ____				
secondary to secondary _____ V ____				
secondary to core _____ V ____				
Verdict				

Note 1: Primary fuse - PF / ( ) A
Secondary fuse - SF / ( ) A
Overtemperature protection - OP / ( ) °C
Impedance protection - Z

Note 2: Indicate method of measurement TC = with thermocouple
R = resistance method
If resistance method is used,record resistance in cold and warm condition in FormA.20B!

Note 3: Record the voltage applied and the type of voltage (r.m.s. / d.c. / peak) and for results use NB = no breakdown or B = breakdown

Supplementary information:

4.4.2.6	**TABLE: Mains transformer**	**Form A.30**	**N/A**
14.7.2	Overload tests (for mains transformers)		N/A
Type..... :			—
Manufacturer.....:			—
Test in equipment			
Test on bench			
Test repeated inside equipment (see 14.7)			
Optional – Insulation class (IEC 60085) of the lowest RATED winding .....:			—

Winding identification				
Type of Protector for winding (Note 1)				
Elapsed time				
Current, A primary				
secondary				
Winding temperature, °C primary				
(see Note 2) secondary				
Tissue paper / cheesecloth OK ? (Pass / Fail)				
Voltage tests (see Note 3)				
primary to secondary _____ V ____				
primary to core _____ V ____				
secondary to secondary _____ V ____				
secondary to core _____ V ____				
Verdict				

Note 1: Primary fuse - PF / ( ) A
Secondary fuse - SF / ( ) A
Overtemperature protection - OP / ( ) °C
Impedance protection - Z

Note 2: Indicate method of measurement TC = with thermocouple
R = resistance method
If resistance method is used,record resistance in cold and warm condition in FormA.20B!

Note 3: Record the voltage applied and the type of voltage (r.m.s. / d.c. / peak) and for results use NB = no breakdown or B = breakdown

Supplementary information:

16.1	TABLE: Current measuring circuits	Form A.31	N/A

These tests are performed with all types and models of current transformers without internal protection, and which are specified by the manufacturer for use with the equipment

a) Current transformers

Type/Model	RATED current A	Test current A	Interrupt Yes / No	Verdict	Comments

Supplementary information:

b) Range changing switches

Type / Model	Maximum rated current of switch A	Cycling test Verdict	Comments

Supplementary information:

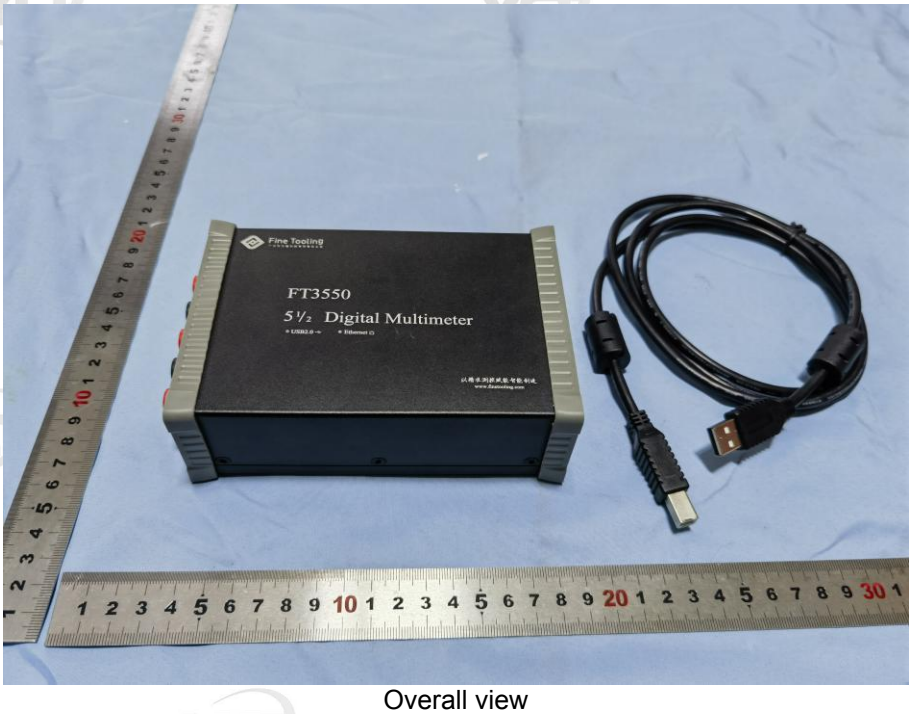
16.2	TABLE: Multifunctional meters and similar equipment	Form A. 32	P
	Operating conditions.....:	Mismatch test	—
	Maximum RATED voltage applied (V).....:	300 Vdc	—
	Measurement category.....:	CAT I	—
	Test source limit (KVA).....:	3 KVdc	—

Function	Range	Verdict

Supplementary information:

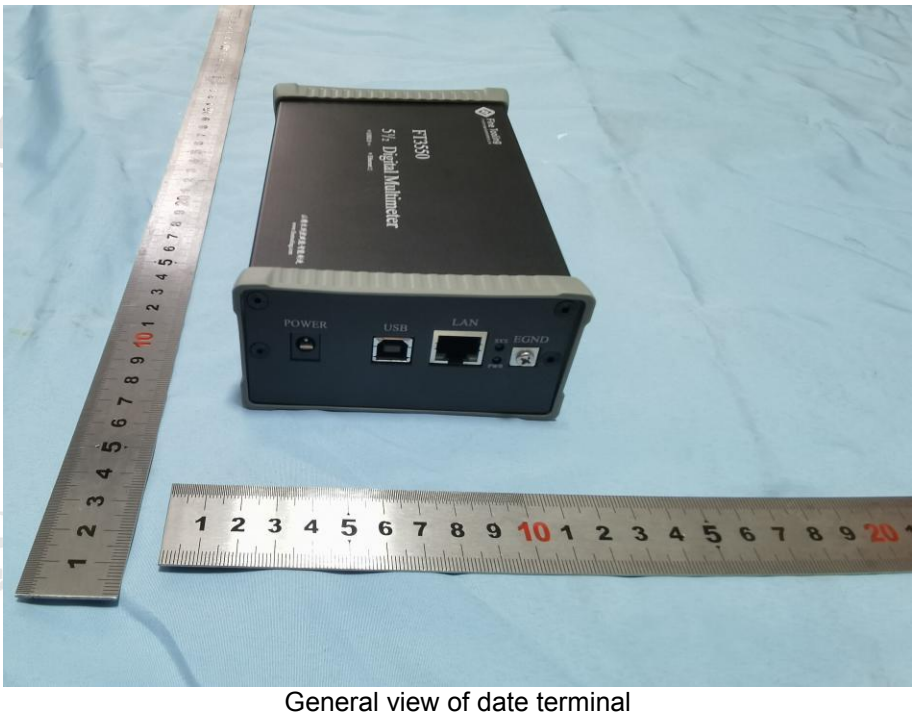
For detail, see next page

Product Photos:



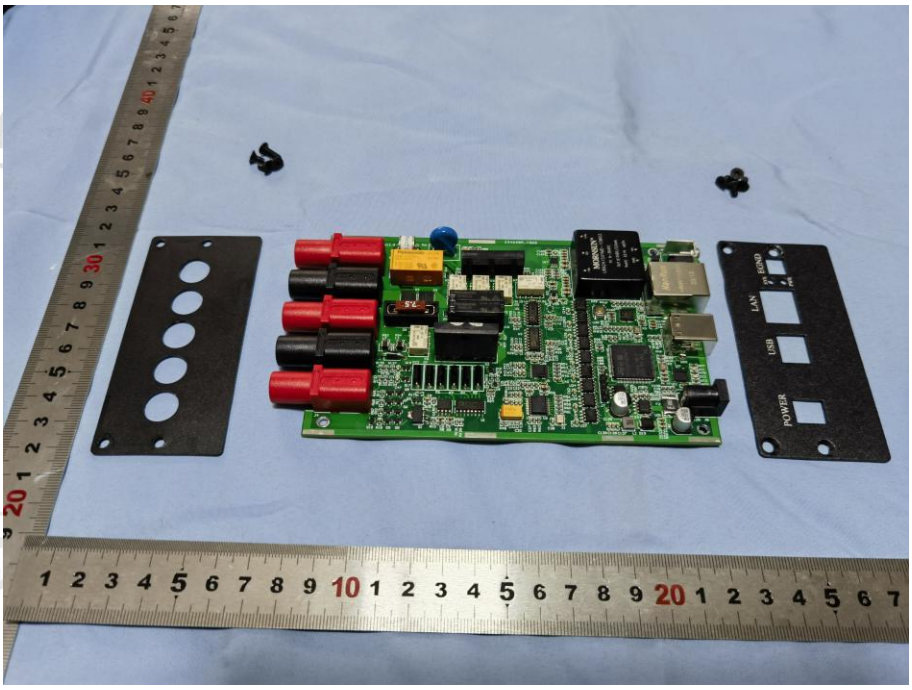
Overall view

General view of Measurement terminal

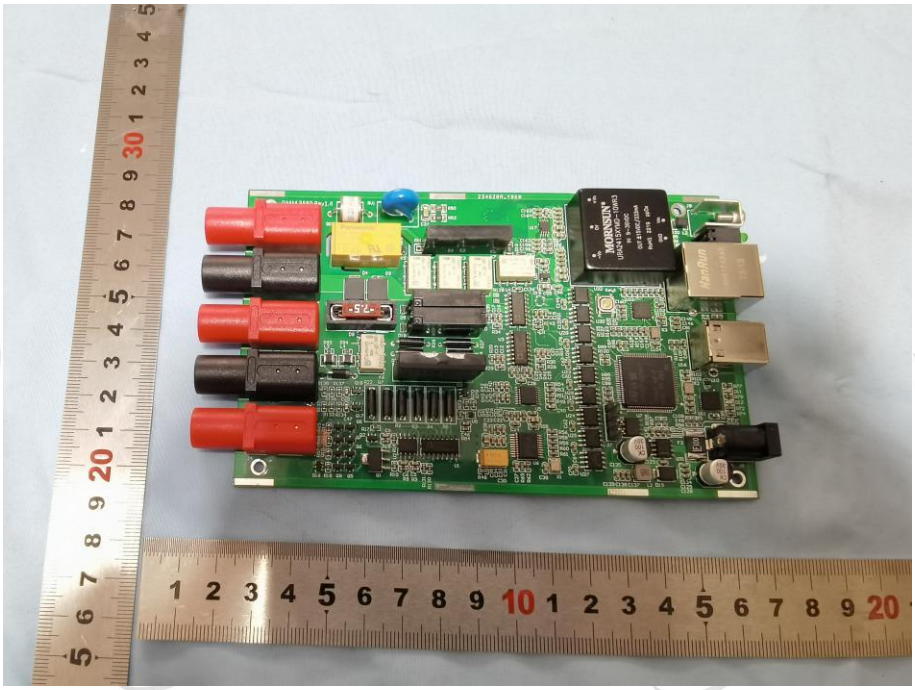


General view of date terminal

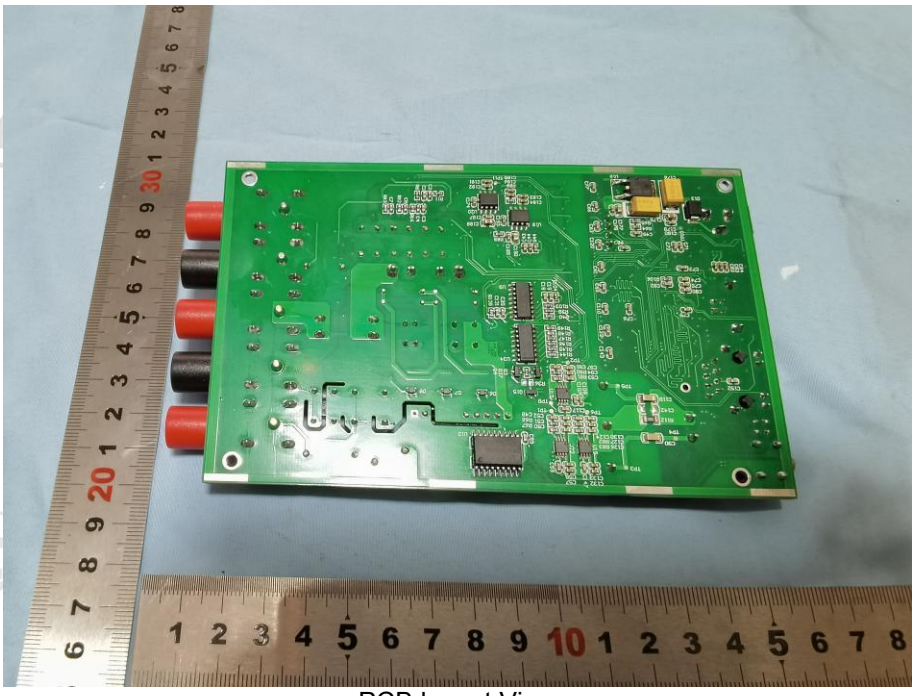
External Side view



Internal View



Main Board View



PCB layout View