

**TEST REPORT
EN 61010-1**

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

EN 61010-2-032

**Safety requirements for electrical equipment for measurement, control and laboratory use
Part 2- 032: Particular requirements for hand-held and hand-manipulated current sensors for
electrical test and measurement**

EN 61010-2-033

**Safety requirements for electrical equipment for measurement, control, and laboratory use
Part 2-033: Particular requirements for HAND-HELD MULTIMETERS and other METERS, for
domestic and professional use, capable of measuring MAINS voltage**

Report Number.....: 191220145GZU-002

Date of issue.....: 08 Apr 2020

Total number of pages 42

Applicant's name: Uni-Trend Technology (China) Co., Ltd

Address.....: No 6, Gong Ye Bei 1st Road Songshan Lake National High-Tech
Industrial Development Zone, Dongguan City Guangdong
Province 523808, CHINA

Test specification:

Standard.....: EN 61010-1:2010+A1:2019, EN 61010-2-032:2012, EN 61010-2-033:2012

Test procedure: LVD

Non-standard test method.....: N/A

Test Report Form No.: TTRF_EN61010_2_032&033B

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Master TRF.....: 2019-07

Test item description : 200A AC Fork Meter

Trade Mark: UNI-T

Manufacturer: Uni-Trend Technology (China) Co., Ltd

No 6, Gong Ye Bei 1st Road Songshan Lake National High-Tech
Industrial Development Zone, Dongguan City Guangdong
Province 523808, CHINA

Model/Type reference: UT256A

Ratings: Measurement: CAT II 1000V, CAT III 600V

Powered: 2 x 1.5VAA battery

Testing procedure and testing location:		
<input checked="" type="checkbox"/>	Testing Laboratory:	Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Testing location/ address..... :		Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China
<input type="checkbox"/>	Associated Laboratory:	
Testing location/ address..... :		
	Tested by (name + signature)	Aaron Lu /Assistant Engineer 
	Approved by (name + signature) .. :	Justin He /Manager 
<input type="checkbox"/>	Testing procedure: TMP	
Testing location/ address..... :		N/A
	Tested by (name + signature)	N/A
	Approved by (name + signature) .. :	N/A
<input type="checkbox"/>	Testing procedure: WMT	
Testing location/ address..... :		N/A
	Tested by (name + signature)	N/A
	Witnessed by (name + signature) .. :	N/A
	Approved by (name + signature) .. :	N/A

List of Attachments (including a total number of pages in each attachment - Table 1):		
Document No.	Documents included / attached to this report (description)	Page Numbers
Appendix 1	Product photos	4
Summary of testing: This product under test complied with EN 61010-1:2010+A1:2019, EN 61010-2-032:2012, EN 61010-2-033:2012		
Test Report History: This report may consist of more than one report and is valid only with additional or previous issued reports:		
Ref. No.	Item	
None		
Tests performed (name of test and test clause): Follow test was performed: Clause 4.4.4 Fault condition Clause 5.3 Durability of markings Clause 6.3 Limit values for ACCESSIBLE parts Clause 6.7 Creepage distance and clearance Clause 6.8 Procedure for voltage tests Clause 8.2.1 Static test Clause 8.3 Drop test Clause 10.1 Equipment temperature limits Clause 10.5.2 Non-metallic ENCLOSURES Clause 8.2.101 JAW impact test Clause 10.5.101 Resistance to heat of current sensors Clause 101.4 Protection against MAINS overvoltages Clause 101.2 Protection against short-circuits during clamping Clause 4.4.2.101 Input voltages Clause 101.3.3 Protection by uncertified current limitation devices or by impedances		Testing location: Intertek Testing Services Shenzhen Ltd. Guangzhou Branch Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD, Guangzhou, China

Copy of marking plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBS that own these marks.

1. Marking on front panel of TU256A



2. Marking on rear panel



Test item particulars:

Type of item : Measurement
 Description of equipment function : See general product information
 Connection to MAINS supply : None
 Overvoltage category : CAT II and CAT III
 POLLUTION DEGREE : 2
 Means of protection : Class II
 Environmental conditions : 0-50°C
 For use in wet locations : No
 Equipment mobility : Hand-held
 Operating conditions : Continuous
 Overall size of equipment (W x D x H) : 220 x 58.5 x 38mm
 Mass of equipment (kg) : 0.260
 Marked degree of protection to IEC 60529 : N/A

Possible 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 : 20 Dec 2019
 Date (s) of performance of tests : 20 Dec 2019 -05 Jan 2020

General remarks:

The test results presented in this report relate only to the object tested.
 This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(see ENCLOSURE #)" refers to additional information appended to the report.

"(see Form A.xx)" refers to a table appended to the report.

Bottom lines for measurement tables Form A.xx are optional if used as record.

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

Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

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The test report only allows to be revised only within the report defined retention period unless standard or regulation was withdrawn or invalid

General product information:

The UT256A is a stable, safe and reliable 6000-count AC fork meter. It measures AC current via the fork, AC/DC voltage (up to 1000V), resistance, and continuity via test leads, and can detect the presence of AC voltage via the non-contact voltage (NCV) sensor. It has data hold, auto/manual range, LCD backlight, audio/visual alarm, and flashlight functions. The full-scale overload protection and unique appearance design make it a special electrical meter with superior performance.

Model similarly:

None

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
4.4	Testing in SINGLE FAULT CONDITIONS		P
4.4.1	Fault tests		P
4.4.2	Application of SINGLE FAULT CONDITIONS		P
4.4.2.1	<i>SINGLE FAULT CONDITIONS not covered by 4.4.2.2 to 4.4.2.14 and in 4.4.2.101</i>		—
4.4.2.101	INPUT VOLTAGES		P
	<i>a) up to 600 V a.c. r.m.s., the voltage applied to the TERMINALS is the RATED voltage multiplied by 1,90 but not to exceed 920 V a.c. r.m.s.;</i>	CAT II 1000V CAT III 600V	N/A
	<i>b) above 600 V a.c. r.m.s. and up to 1 000 V a.c. r.m.s., the voltage applied to the TERMINALS is 1 100 V a.c. r.m.s.;</i>		P
	<i>c) above 1 000 V a.c. r.m.s., the voltage applied to the TERMINALS is the RATED voltage multiplied by 1,1;</i>		N/A
	<i>d) of d.c. voltage, the d.c. voltage applied to the TERMINALS is the RATED voltage multiplied by 1,1.</i>		P
4.4.2.2	PROTECTIVE IMPEDANCE	No such PROTECTIVE	N/A
4.4.2.3	PROTECTIVE CONDUCTOR	No such PROTECTIVE	N/A
4.4.2.4	Equipment or parts for short-term or intermittent operation	Continue work	N/A
4.4.2.5	Motors	No motors	N/A
	– stopped while fully energized		N/A
	– prevented from starting		N/A
	– one phase interrupted (multi-phase)		N/A
4.4.2.6	Capacitors	No such capacitors	N/A
4.4.2.7	MAINS transformers	No MAIN transformers	N/A
4.4.2.7.2	Short circuit		N/A
4.4.2.7.3	Overload		N/A
4.4.2.8	Outputs		N/A
4.4.2.9	Equipment for more than one supply	Only one supply	N/A
4.4.2.10	Cooling	No such devices	N/A
	– air holes closed		N/A
	– fans stopped		N/A
	– coolant stopped		N/A
	– loss of cooling liquid		N/A
4.4.2.11	Heating devices	No such devices	N/A
	– timer overridden		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	– temperature controller overridden		N/A
4.4.2.12	Insulation between circuits and parts		P
4.4.2.13	Interlocks	No interlock system	N/A
4.4.2.14	Voltage selectors	No such part	N/A
4.4.3	Duration of tests		—
4.4.4	Conformity after application of fault conditions		P

5	MARKING AND DOCUMENTATION		P
5.1.1	Required equipment markings		P
	- Visible from the exterior; or		P
	- Visible after removing cover or opening door	No such parts	N/A
	- Visible after removal from a rack or panel	No such parts	N/A
	Not put on parts which can be removed by an operator		P
	Letter symbols (IEC 60027) used		P
	Graphic symbols (IEC 61010-1: Table 1) used		P
5.1.2	Identification		P
	Equipment is identified by:		P
	a) Manufacturer's or supplier's name or trademark	Trademark: UNI-T	P
	b) Model number, name or other means	UT256A	P
	Manufacturing location identified	Only one location	N/A
	<i>aa) for current sensors designed for use only with a specific model of equipment, a clear identification of the equipment, or with symbol 14 of Table 1 if this information is available only in the documentation;</i>		N/A
	<i>bb) for Type A current sensors, with symbol 102 of Table 1;</i>	Symbol 102 marked on JAW surface	P
	<i>cc) for Type B and Type C current sensors, with symbol 101 of Table 1;</i>	Type A current sensor	N/A
	<i>dd) for Type D current sensors, symbol 101 of Table 1 is permitted with an additional marking (see 5.1.5.102).</i>		N/A
	<i>The relevant symbol (14, 101 or 102) shall be marked adjacent to the JAWS or</i>	Symbol 102 marked on JAW surface	P
	<i>the marking of the MEASUREMENT CATEGORY for the JAWS, if present (see 5.1.5.101 and 5.1.5.102)</i>	CAT II and CAT III marked on JAW surface	P
5.1.3	MAINS supply	No MAINS supply Powered by AA 1.5V x 2 battery	N/A
	Equipment is marked as follows:		N/A
	a) Nature of supply:		—

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	1) a.c. RATED MAINS frequency or range of frequencies		N/A
	2) d.c. with symbol 1		N/A
	b) RATED supply voltage(s) or range		N/A
	c) Max. RATED power (W or VA) or input current ... :		N/A
	The marked value not less than 90 % of the maximum value		N/A
	If more than one voltage range:		—
	Separate values marked; or		N/A
	Values differ by less than 20 %		N/A
	d) OPERATOR-set for different RATED supply voltages:		—
	Indicates the equipment set voltage		N/A
	Portable equipment indication is visible from the exterior		N/A
	Changing the setting changes the indication		N/A
	e) Accessory MAINS socket-outlets accepting standard MAINS plugs are marked:		N/A
	With the voltage if it is different from the MAINS supply voltage		N/A
	For use only with specific equipment		N/A
	If not marked for specific equipment it is marked with:		N/A
	The maximum rated current or power; or		N/A
	Symbol 14 with full details in the documentation		N/A
5.1.4	Fuses	No such devices	N/A
	Operator replaceable fuse marking (see also 5.4.5)		N/A
5.1.5	TERMINALS, connections and operating devices		P
5.1.5.1	General		P
	Where necessary for safety, indication of purpose of TERMINALS, connectors, controls and indicators marked		P
	If insufficient space, symbol 14 used		P
	Push-buttons and actuators of emergency stop devices and indicators:	No such devices	—
	used only to indicate a warning of danger or		N/A
	the need for urgent action		N/A
	coloured red		N/A
	coded as specified in IEC 60073		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	Supplementary means of coding provided, if meaning of colour relates (see IEC 60073):		N/A
	to safety of persons; or		N/A
	safety of the environment		N/A
5.1.5.2	TERMINALS		P
	MAINS supply TERMINAL identified	Powered by AA 1.5V x 2 battery	N/A
	Other TERMINAL marking:		P
	a) FUNCTIONAL EARTH TERMINALS (symbol 5 used)	No such terminals	N/A
	b) PROTECTIVE CONDUCTOR TERMINALS:	No such terminals	N/A
	Symbol 6 is placed close to or on the TERMINAL; or		N/A
	Part of appliance inlet		N/A
	c) TERMINALS of control circuits (symbol 7 used)	No such terminals	N/A
	d) HAZARDOUS LIVE TERMINALS supplied from the interior		N/A
	Standard MAINS socket outlet; or		N/A
	RATINGS marked; or		N/A
	Symbol 14 used		N/A
5.1.5.101	<i>Measuring circuit TERMINALS</i>		P
5.1.5.101.1	a) <i>mark the RATED voltage to earth</i>	CAT II 1000V, CAT III 600V	P
	b) <i>mark the RATED voltage or the RATED current, as applicable, of each pair or set</i>		P
	c) <i>the pertinent MEASUREMENT CATEGORY for each pair or set of measuring circuit TERMINALS or symbol 14 of Table 1</i>	CAT II 1000V, CAT III 600V	P
	<i>Markings shall be placed adjacent to the TERMINALS. or on the RATING plate or scale plate</i>		P
	<i>For any set of measuring circuit TERMINALS, symbol 14 of Table 1 does not need to be marked more than once, if it is close to the TERMINALS.</i>		P
	<i>marked "CAT III" or "CAT IV" as applicable</i>	CAT III	P
	<i>Measuring circuit TERMINALS that do not have a RATING for connection to voltages above the levels of 6.3.1, may be marked with alternative markings</i>	CAT III 600V	N/A
	<i>Measuring circuit TERMINALS which are dedicated only for connection to specific TERMINALS of other equipment need not be marked</i>		N/A
	<i>TERMINALS markings shall be visible for NORMAL USE</i>		P

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
5.1.5.101.2	Measuring circuit TERMINALS RATED for MEASUREMENT CATEGORIES II, III or IV		P
5.1.5.101.3	Measuring circuit TERMINALS RATED for connection to voltages above the level of 6.3.1		P
5.1.5.101.4	Low voltage, permanently connected, or dedicated measuring circuit TERMINALS		N/A
5.1.5.102	Voltage and current RATINGS of JAWS		P
	Current sensors that are intended to be used on UNINSULATED conductors shall be marked with the value of the RATED voltage to earth of the JAWS		P
	Current sensors that are intended to be used only on insulated conductors shall be marked to indicate that the current sensor must not be used on UNINSULATED conductors, or with symbol 14.		N/A
	JAWS of Type A, Type B or Type C current sensors shall be marked with the relevant MEASUREMENT CATEGORY II, III or IV		P
	Type D current sensors shall not be marked with any MEASUREMENT CATEGORY.	Type A	N/A
	The value of the RATED current shall be marked.	200 A a c	P
5.1.6	Switches and circuit breakers	No such devices	N/A
	If disconnecting device, off position clearly marked		N/A
	If push-button used as power supply switch:		N/A
	Symbol 9 and 15 used for on-position		N/A
	Symbol 10 and 16 used for off-position		N/A
	Pair of symbols 9, 15 and 10, 16 close together		N/A
5.1.7	Equipment protected by DOUBLE INSULATION or REINFORCED INSULATION		P
	Protected throughout (symbol 11 used)	Symbol 11 marked on rear panel	P
	Only partially protected (symbol 11 not used)		N/A
5.1.8	Field-wiring TERMINAL boxes	No such part	N/A
	If TERMINAL or ENCLOSURE exceeds 60 °C:		N/A
	Cable temperature RATING marked..... :		N/A
	Marking visible before and during connection or beside TERMINAL		N/A
5.2	Warning markings		P
	Visible when ready for NORMAL USE		P
	Are near or on applicable parts		P
	Symbols and text correct dimensions and colour:		—

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	a) symbols min 2,75 mm and text 1,5 mm high and contrasting in colour with background		P
	b) symbols and text moulded, stamped or engraved in material min. 2,0 mm high and		P
	0,5 mm depth or raised if not contrasting in colour		P
	If necessary marked with symbol 14		P
	Additional symbols such as symbol 12, 13 or 17 used to indicate the nature of HAZARD	symbol 12	P
	Statement to place equipment in a safe state bevoor access by using a tool to HAZARDOUS LIVE parts is permitted		N/A
5.3	Durability of markings		P
	The required markings remain clear and legible in NORMAL USE		P
5.4	Documentation		P
5.4.1	General		P
	Equipment is accompanied by documentation for safety purposes for OPERATOR or RESPONSIBLE BODY		P
	<i>in an accepted language of the country where the product is intended to be placed on the market</i>		P
	Safety documentation for service personnel authorized by the manufacturer		P
	Documentation necessary for safe operation is provided in printed media or	Printed media	P
	in electronic media if available at any time		N/A
	Documentation includes:		—
	a) intended use		P
	b) technical specification		P
	c) name and address of manufacturer or supplier		P
	d) Statement of the range of environmental conditions 1) indoor or outdoor use, 2) altitude 3) temperature, 4) relative humidity, 5) MAINS supply voltage fluctuations, 6) OVERVOLTAGE CATEGORY, except for cord/plug-connected equipment, 7) WET LOCATION, if applicable, 8) POLLUTION DEGREE of the intended environment,		P
	e) information to mitigate residual RISK (see also subclause 17)		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	f) Safety characteristics for special external services (e. g. maximum and minimum temperature, pressure, flow of air, cooling liquid)	Test lead assemblies to be used for mains measurement should meet EN 61010-031 standard, the same rating or better.	P
	g) 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	Before each use, verify meter operation by measuring a known voltage.	P
	h) instructions for lifting and carrying	Hand-held equipment	N/A
	<i>aa) probe assemblies to be used for MAINS measurements shall be RATED as appropriate for MEASUREMENT CATEGORY III or IV and</i>	CAT III	P
	<i>shall have a voltage RATING of at least the voltage of the circuit to be measured;</i>		P
	<i>bb) documentation shall clearly identify the MEASUREMENT CATEGORIES where the equipment may be used and where it must not be used</i>		P
5.4.2	Equipment ratings		P
	Documentation includes:		—
	a) Supply voltage or voltage range	2x1.5V AA batteries	P
	Frequency or frequency range		N/A
	Power or current rating.....		N/A
	b) Description of all input and output connections in accordance to 6.6.1 a)		N/A
	c) RATING of insulation of external circuits in accordance to 6.6.1 b)		N/A
	d) Statement of the range of environmental conditions (see 1.4)		P
	e) Degree of protection (IEC 60529)		N/A
	f) if impact rating less than 5 J:	Hand-held equipment No impact test required	N/A
	IK code in accordance to IEC 62262 marked or		N/A
	symbol 14 of table 1 marked, with		N/A
	RATED energy level and test method stated		N/A
	<i>aa) information about each relevant MEASUREMENT CATEGORY</i>		P
	<i>bb) a warning not to use the equipment for measurements on MAINS CIRCUITS if not intend for any measurement category</i>		N/A
	<i>Warning statements and a clear explanation of warning symbols:</i>		—
	<i>Provided in the documentation; or</i>		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	<i>Information is marked on the equipment</i>		N/A
5.4.3	Equipment installation	Hand-held equipment No installation required	N/A
	Documentation includes instructions for:		N/A
	a) assembly, location and mounting requirements		N/A
	b) protective earthing		N/A
	c) connections to supply		N/A
	d) PERMANENTLY CONNECTED EQUIPMENT:		N/A
	1) Supply wiring requirements		N/A
	2) If external switch or circuit-breaker, requirements and location recommendation		N/A
	e) ventilation requirements		N/A
	f) special services (e. g. air, cooling liquid)		N/A
	g) instructions relating to sound level		N/A
	aa) for permanently connected measuring circuit TERMINALS RATED for MEASUREMENT CATEGORIES II, III or IV		N/A
	bb) for permanently connected measuring circuit TERMINALS that are not RATED for MEASUREMENT CATEGORIES II, III or IV		N/A
5.4.4	Equipment operation		P
	Instructions for use include:		P
	a) identification and description of operating controls		P
	b) a clear identification of the equipment;	Not such current sensor	N/A
	c) specifications of limits for intermittent operation		N/A
	d) specifications of limits of the current versus the frequency		N/A
	e) explanation of symbols used		P
	f) instructions for interconnection		P
	g) replacement of consumable materials	Battery	P
	h) instructions for cleaning and decontamination		P
	i) instructions for the application and removal of the current sensor;		N/A
	j) instructions to de-energise the installation or to adopt safe operating procedures	Type A	N/A
	k) instructions to de-energise the installation during application and removal of Type C current sensors		N/A
	l) instructions about the function of the tactile indicator or PROTECTIVE BARRIER,		P

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033

Clause	Requirement + Test	Result - Remark	Verdict
	<i>m) a warning to the OPERATOR about Type D current sensors</i>	Type A	N/A
	<i>n) a warning to the OPERATOR that individual protective equipment should be used</i>		P
	<i>o) a warning to the OPERATOR not to use a flexible current sensor if the wear indicator is visible</i>	Not flexible current sensor	N/A
	<i>p) a warning not to use a current sensor if the wear indicator in the JAW END is visible</i>	No wear indicator	N/A
	<i>q) a warning not to use a current sensor above its RATED frequency, if the magnetic circuit can reach a hazardous temperature (see 10.101).</i>		N/A
	<i>A statement about protection impairment if used in a manner not specified by the manufacturer</i>		P
5.4.5	Equipment maintenance and Service		P
	Instructions for RESPONSIBLE BODY include:		—
	Instructions sufficient in detail permitting safe maintenance and inspection and continued safety:		P
	Instruction against the use of detachable MAINS supply cord with inadequate rating	No MAINS supply cord used	N/A
	Specific battery type of user replaceable batteries	Standard AA batteries	P
	Any manufacturer specified parts	No specified parts	N/A
	Rating and characteristics of fuses	No fuse	N/A
	Instructions include following subjects permitting safe servicing and continued safety:		P
	a) product specific RISKS may affect service personnel		N/A
	b) protective measures for these RISKS		N/A
	c) verification of the safe state after repair		P
5.4.6	Integration into systems or effects resulting from special conditions		N/A
	Aspects described in documentation		N/A

6	PROTECTION AGAINST ELECTRIC SHOCK		P
6.1	General		P
6.1.1	Requirements		—
6.1.2	Exceptions		P
	<i>aa) conductive parts of a JAW END, provided that they meet the requirements of 6.9.101.</i>		P
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

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
6.2.2	Examination		P
	- with jointed test finger (as specified B.2)		P
	- with rigid test finger (as specified B.1) and a force of 10 N		P
6.2.3	Openings above parts that are HAZARDOUS LIVE	No openings	N/A
	- test pin with length of 100 mm and 4 mm in diameter applied		N/A
6.2.4	Openings for pre-set controls	No openings	N/A
	- test pin with length of 100 mm and 3 mm in diameter applied		N/A
6.3	Limit values for ACCESSIBLE parts		P
6.3.1	Levels in NORMAL CONDITION	Network: A1 Max leakage current: 0.0207mArms, 0.033 mApk Network: A3 Max leakage current: 0.0604mArms	P
6.3.2	Levels in SINGLE FAULT CONDITION	Short PTC1 Network: A1 Max leakage current: 0.021mArms, 0.035 mApk Network: A3 Max leakage current: 0.0641mArms	P
6.4	Primary means of protection		P
	a) ENCLOSURES OR PROTECTIVE BARRIERS (see 6.4.2)		P
	b) BASIC INSULATION (see 6.4.3)		P
	c) Impedance (see 6.4.4)		N/A
6.5	Additional means of protection in case of SINGLE FAULT CONDITION		P
6.5.1	ACCESSIBLE parts are prevented from becoming HAZARDOUS live by the primary means of protection and supplemented by one of:		P
	a) SUPPLEMENTARY INSULATION (see 6.5.3)		P
	b) Current or voltage limiting device (see 6.5.6)	No such devices	N/A
	c) REINFORCED INSULATION (see 6.5.3).		P
	d) PROTECTIVE IMPEDANCE (see 6.5.4)		N/A
	Alternatively one of the single means of protection is used:		P
	e) REINFORCED INSULATION (see 6.5.3)		P
	f) PROTECTIVE IMPEDANCE (see 6.5.4)		N/A
6.5.2	PROTECTIVE BONDING	No PROTECTIVE BONDING	N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
6.5.2.1	ACCESSIBLE conductive parts, may become HAZARDOUS LIVE in SINGLE FAULT CONDITION:		N/A
	Bonded to the PROTECTIVE CONDUCTOR TERMINAL; or		N/A
	Separated by conductive screen or barrier bonded to PROTECTIVE CONDUCTOR TERMINAL		N/A
6.5.2.2	Integrity of PROTECTIVE BONDING		N/A
	a) PROTECTIVE BONDING consists of directly connected structural parts or discrete conductors or both; and withstands thermal and dynamic stresses		N/A
	b) Soldered connections:		N/A
	Independently secured against loosening		N/A
	Not used for other purposes		N/A
	c) Screw connections are secured		N/A
	d) PROTECTIVE BONDING not interrupted; or		N/A
	exempted as removable part carries MAINS SUPPLY input connection		N/A
	e) Any movable PROTECTIVE BONDING connection specifically designed, and meets 6.5.2.4		N/A
	f) No external metal braid of cables used (not regarded as PROTECTIVE BONDING)		N/A
	g) IF MAINS SUPPLY passes through:		N/A
	Means provided for passing protective conductor;		N/A
	Impedance meets 6.5.2.4		N/A
	h) Protective conductors bare or insulated, if insulated, green/yellow		N/A
	Exceptions:		N/A
	1) earthing braids;		N/A
	2) internal protective conductors etc.;		N/A
	Green/yellow not used for other purposes		N/A
	TERMINAL suitable for connection of a PROTECTIVE CONDUCTOR, and meets 6.5.2.3		N/A
6.5.2.3	PROTECTIVE CONDUCTOR TERMINAL	No PROTECTIVE CONDUCTOR TERMINAL	N/A
	a) Contact surfaces are metal		N/A
	b) Appliance inlet used		N/A
	c) For rewirable cords and PERMANENTLY CONNECTED EQUIPMENT, PROTECTIVE CONDUCTOR TERMINAL is close to MAINS supply TERMINALS		N/A
	d) If no MAINS supply is required, any PROTECTIVE CONDUCTOR TERMINAL:		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	Is near terminals of circuit for which protective earthing is necessary		N/A
	External if other terminals external		N/A
	e) Equivalent current-carrying capacity to MAINS supply TERMINALS		N/A
	f) If plug-in, makes first and breaks last		N/A
	g) If also used for other bonding purposes, PROTECTIVE CONDUCTOR:		N/A
	Applied first;		N/A
	Secured independently;		N/A
	Unlikely to be removed by servicing		N/A
	h) PROTECTIVE CONDUCTOR of measuring circuit:		N/A
	1) Current RATING equivalent to measuring circuit TERMINAL;		N/A
	2) PROTECTIVE BONDING:		N/A
	Not interrupted; or		N/A
	i) FUNCTIONAL EARTH TERMINALS allow independent connection		N/A
	j) If a binding screw used for PROTECTIVE CONDUCTOR TERMINAL:		N/A
	Suitable size for bond wire		N/A
	Not smaller than M 4		N/A
	At least 3 turns of screw engaged		N/A
	Passes tightening torque test		N/A
	k) Contact pressure not capable being reduced by deformation of materials		N/A
6.5.2.4	Impedance of PROTECTIVE BONDING of plug-connected equipment		N/A
	Impedance between PROTECTIVE CONDUCTOR TERMINAL and each ACCESSIBLE part where PROTECTIVE BONDING is specified, is:		—
	less than 0,1 Ohm; or		N/A
	less than 0,2 Ohm if equipment is provided with non detachable cord		N/A
6.5.2.5	Bonding impedance of PERMANENTLY CONNECTED EQUIPMENT		N/A
6.5.2.6	Transformer PROTECTIVE BONDING screen		N/A
	Transformer provided with screen for PROTECTIVE BONDING:		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	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)		N/A
	screen bonding with soldered connection (see 6.5.2.2 b) is:		N/A
	- Independently secured against loosening		N/A
	- Not used for other purposes		N/A
6.5.2.101	<i>Indirect bonding for testing and measuring circuits</i>		N/A
6.5.3	SUPPLEMENTARY and REINFORCED INSULATION		P
	Meet CLEARANCE, CREEPAGE DISTANCE and solid insulation requirements of 6.7		P
6.5.4	PROTECTIVE IMPEDANCE	No protective impedance	N/A
	Limits current or voltage to level of 6.3.1 in NORMAL and to level of 6.3.2 in SINGLE FAULT CONDITION		N/A
	CLEARANCE, CREEPAGE DISTANCE between terminations of the impedance meet requirements of DOUBLE or REINFORCED INSULATION of 6.7		N/A
	The PROTECTIVE IMPEDANCE consists of one or more of the following:		—
	a) appropriate single component suitable for safety and reliability for protection, it is:		N/A
	1) RATED twice the maximum WORKING VOLTAGE		N/A
	2) resistor RATED for twice the power dissipation for maximum WORKING VOLTAGE		N/A
	b) combination of components		N/A
	Single electronic device not used as PROTECTIVE IMPEDANCE		N/A
6.5.5	Automatic disconnection of the supply	No such devices	N/A
6.5.6	Current- or voltage-limiting devices	No such devices	N/A
6.6	Connections to external circuits		P
6.6.1	Connections do not cause ACCESSIBLE parts of the following to become HAZARDOUS LIVE in NORMAL CONDITION or SINGLE FAULT CONDITION:		P
	- the external circuits		P
	- the equipment		N/A
	Protection achieved by separation of circuits; or		N/A
	short circuit of separation does not cause a HAZARD		P
	Instructions or markings for each terminal include:		—
	a) RATED conditions for TERMINAL		P
	b) Required RATING of external circuit insulation		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
6.6.2	TERMINALS for external circuits		P
	TERMINALS which receive a charge from an internal capacitor are not HAZARDOUS LIVE after 10 s of interrupting supply connection		P
6.6.3	Circuits with terminals which are HAZARDOUS LIVE		N/A
	These circuits are:		N/A
	Not connected to ACCESSIBLE conductive parts; or		N/A
	Connected to ACCESSIBLE conductive parts, but are not MAINS CIRCUITS and have one TERMINAL contact at earth potential		N/A
	No ACCESSIBLE conductive parts are HAZARDOUS LIVE		N/A
6.6.4	ACCESSIBLE terminals for stranded conductors	No such terminals	N/A
	No RISK of accidental contact because:		N/A
	Located or shielded		N/A
	Self-evident or marked whether or not connected to ACCESSIBLE conductive parts		N/A
	Complies as applicable:		N/A
	a) Manufacturer's specified maximum length of removed insulation, or		N/A
	b) 8 mm length of insulation removed		N/A
<u>6.6.101</u>	<u>Measuring circuit TERMINALS</u>		P
	<u>Conductive parts of each unmated measuring circuit TERMINAL which could become HAZARDOUS LIVE when the maximum RATED voltage is applied to other measuring circuit TERMINALS on the equipment shall be separated by at least the CLEARANCE and CREEPAGE DISTANCE of Table 101 from the closest approach of the test finger touching the external parts of the TERMINAL in the least favourable position.</u>	clearance and creepage distance:5.50mm	P
<u>6.6.102</u>	<u>Specialized measuring circuit TERMINALS</u>	No such terminals	N/A
6.7	Insulation requirements	See appended table	P
6.8	Procedure for dielectric strength tests	See appended table	P
6.9	Constructional requirements for protection against electric shock		P
6.9.1	If a failure could cause a HAZARD:		P
	a) Security of wiring connections		P
	b) Screws securing removable covers		P
	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

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	Material not to be used for safety relevant insulation:		P
	a) Easily damaged materials not used		P
	b) Non-impregnated hygroscopic materials not used		P
6.9.3	Colour coding	No such part	N/A
	Green-and-yellow insulation shall not be used except:		N/A
	a) protective earth conductors;		N/A
	b) PROTECTIVE BONDING conductors;		N/A
	c) potential equalization conductors;		N/A
	d) functional earth conductors		N/A
6.9.101	<i>Insulation requirements for JAWS and JAW ENDS</i>		P
6.9.101.1	<i>Pre-treatment of the JAW ENDS</i>	The JAW is open and fixed	N/A
6.9.101.2	<i>Protection against touching the HAZARDOUS LIVE conductor</i>		P
6.9.101.3	<i>HAND-HELD or hand-manipulated parts</i>		P
	<i>Type A current sensors shall be separated by DOUBLE INSULATION or REINFORCED INSULATION</i>		P
6.9.101.4	<i>Insulation of flexible current sensors</i>	Not flexible current sensor	N/A
	<i>provide at least DOUBLE INSULATION or REINFORCED INSULATION when new, and</i>		N/A
	<i>at least BASIC INSULATION when the wear indicator is visible</i>		N/A
	a contrasting colour of wear indicator		N/A
	a flexible current sensor without a wear indicator shall provide at least DOUBLE INSULATION or REINFORCED INSULATION when new and after typical lifetime wear.		N/A
6.9.101.5	<i>Pull test for endcaps of flexible current sensors</i>		N/A
	<i>the endcaps of a flexible cord shall be securely fixed</i>		N/A
	<i>After the last pull:</i>		N/A
	<i>a) the insulation shall not have moved more than 1 mm more than the displacement from the first pull if it is subjected to 16 pulls;</i>		N/A
	<i>b) CLEARANCES and CREEPAGE DISTANCES shall not have been reduced below the applicable values of K.101 for REINFORCED INSULATION; and</i>		N/A
	<i>c) the current sensor shall pass the tests of K.101.4 for REINFORCED INSULATION.</i>		N/A
6.9.102	<i>Input measuring circuit leads</i>	Clamp meter	N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	<i>meet the requirements of IEC 61010-031</i>		N/A
6.9.103	<i>Output circuit leads</i>	Clamp meter	N/A
	<i>The output circuit leads of current sensors shall have REINFORCED INSULATION between their outer surfaces and their conductors.</i>		N/A
	<i>The mated connectors and TERMINALS located at the current sensor ENCLOSURE body shall have REINFORCED INSULATION between their outer surfaces and their conductors.</i>		N/A
	<i>For Type A, Type B and Type C current sensors, the insulation of the output circuit leads, and of the mated connectors and TERMINALS is based on the requirements of K.101</i>		N/A
	<i>For Type D current sensors, the insulation of the output circuit leads and of the mated connectors and TERMINALS is based on the requirements of K.101 for 300 V in CAT II</i>		N/A
6.9.101	<u>METER RATINGS</u>		P
	<u>RATED for a minimum of 300 V a.c. r.m.s. to earth, and a minimum CAT III</u>		P
	<u>The RATED voltage of measuring circuit TERMINALS shall be equal to or higher than the RATED voltage to earth of the TERMINALS</u>		P
6.10	Connection to MAINS supply source and connections between parts of equipment	Powered by battery	N/A
6.10.1	MAINS supply cords		N/A
	RATED for maximum equipment current (see 5.1.3 c)		N/A
	Cable complies with IEC 60227 or IEC 60245		N/A
	Heat-resistant if likely to contact hot parts		N/A
	Temperature RATING (cord and inlet) :		N/A
	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		N/A
6.10.2.1	Cord entry		N/A
	a) Inlet or bushing with a smoothly rounded opening; or		N/A
	b) Insulated cord guard protruding >5 D		N/A
6.10.2.2	Cord anchorage		N/A
	Protective earth conductor is the last to take the strain		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	a) Cord is not clamped by direct pressure from a screw		N/A
	b) Knots are not used		N/A
	c) Cannot push the cord into the equipment to cause a HAZARD		N/A
	d) No failure of cord insulation in anchorage with metal parts		N/A
	e) Not to be loosened without a tool		N/A
	f) Cord replacement does not cause a HAZARD and method of strain relief is clear		N/A
	Push-pull and or torque test		N/A
6.10.3	Plugs and connectors		N/A
	MAINS supply plugs, connectors etc., conform with relevant specifications		N/A
	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
	Plug pins which receive a charge from an internal capacitor		N/A
	Accessory MAINS socket outlets:		—
	a) Marking if accepts a standard MAINS supply plug (see 5.1.3e)		N/A
	b) Input has a protective earth conductor if outlet has EARTH TERMINAL CONTACT		N/A
6.11	Disconnection from supply source		P
6.11.1	Disconnects all current-carrying conductors		N/A
6.11.2	Exceptions	Powered by 2x1.5 V AA battery	P
6.11.3	Requirements according to type of equipment		N/A
6.11.3.1	PERMANENTLY CONNECTED EQUIPMENT and multi-phase equipment		N/A
	Employs switch or circuit-breaker		N/A
	If switch or circuit-breaker is not part of the equipment, documentation requires:		—
	a) Switch or circuit-breaker to be included in building installation		N/A
	b) Suitable location easily reached		N/A
	c) Marking as disconnecting for the equipment		N/A
6.11.3.2	Single-phase cord-connected equipment		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	Equipment is provided with one of the following:		N/A
	a) Switch or circuit-breaker		N/A
	b) Appliance coupler (disconnectable without tool)		N/A
	c) Separable plug (without locking device)		N/A
6.11.4	Disconnecting devices	No such devices	N/A
6.11.4.1	Disconnecting device part of equipment		N/A
	Electrically close to the SUPPLY		N/A
	Power-consuming components not electrically located between the supply source and the disconnecting device		N/A
	Except electromagnetic interference suppression circuits permitted to be located on the supply side of the disconnecting device		N/A
6.11.4.2	Switches and circuit-breakers	No such devices	N/A
	When used as disconnection device:		—
	Circuit breaker meets the relevant requirements IEC 60947-2 and is suitable for the application		N/A
	Switch meets the relevant requirements IEC 60947-3 and is suitable for the application		N/A
	Marked to indicate function		N/A
	Not incorporated in MAINS cord		N/A
	Does not interrupt PROTECTIVE EARTH CONDUCTOR		N/A
6.11.4.3	Appliance couplers and plugs	No such part	N/A
	Where an appliance coupler or separable plug is used as the disconnecting device (see 6.11.3.2):		N/A
	Readily identifiable and easily reached by the operator		N/A
	Single-phase portable equipment cord length not more than 3 m		N/A
	PROTECTIVE EARTH CONDUCTOR connected first and disconnected last		N/A
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
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

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict

7.3	Moving parts	No moving part	N/A
7.4	Stability	Hand-held equipment	N/A
7.5	Provisions for lifting and carrying	Hand-held equipment	N/A
7.6	Wall mounting	Hand-held equipment	N/A
7.7	Expelled parts		N/A

8	RESISTANCE TO MECHANICAL STRESSES		P
8.1	Equipment does not cause a HAZARD when subjected to mechanical stresses in NORMAL USE		P
8.2	ENCLOSURE rigidity test		P
8.2.1	Static test		P
8.2.101	JAW impact test		P
8.2.2	Impact test	Hand-held equipment	N/A
8.3	Drop test		P

9	PROTECTION AGAINST THE SPREAD OF FIRE		P
9.1	No spread of fire in NORMAL and SINGLE FAULT CONDITION		P
	MAINS supplied equipment meets requirements of 9.6 additionally	Powered by battery	N/A
	Conformity is checked by minimum one or a combination of the following (see Figure 11):		—
	a) SINGLE FAULT test of 4.4; or		P
	b) Application of 9.2 (eliminating or reducing the sources of ignition); or		N/A
	c) Application of 9.3 (containment of fire within the equipment)		P
9.2	Eliminating or reducing the sources of ignition within the equipment		N/A
9.3	Containment of the fire within the equipment, should it occur	Plastic Enclosure flammability classification: V-0	P
9.4	Limited-energy circuit		N/A
9.5	Requirements for equipment containing or using flammable liquids		N/A
9.6	Overcurrent protection		N/A
9.6.1	MAINS supplied equipment protected		N/A
	BASIC INSULATION between MAINS parts of opposite polarity provided		N/A
	Devices not in the protective conductor		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	Fuses or single-pole circuit-breakers not fitted in neutral (multi-phase)		N/A
9.6.2	PERMANENTLY CONNECTED EQUIPMENT		N/A
	Overcurrent protection device:		N/A
	Fitted within the equipment; or		N/A
	Specified in manufacturer's instructions		N/A
9.6.3	Other equipment		N/A
	Protection within the equipment		N/A

10	EQUIPMENT TEMPERATURE LIMITS AND RESISTANCE TO HEAT		P
10.1	Surface temperature limits for protection against burns		P
10.2	Temperatures of windings	No winding	N/A
10.3	Other temperature measurements		P
10.4	Conduct of temperature tests		P
10.5	Resistance to heat	70°C and for 7 hours, no damage occur	P
10.5.101	<i>Resistance to heat of current sensors</i>		P
10.101	<i>Other temperatures of current sensors</i>		P

11	PROTECTION AGAINST HAZARDS FROM FLUIDS AND SOLID FOREIGN OBJECTS		P
11.1	Protection to OPERATORS and surrounding area provided by EQUIPMENT		P
	All fluids specified by manufacturer considered		P
11.2	Cleaning		P
11.3	Spillage		N/A
11.4	Overflow		N/A
11.5	Battery electrolyte		P
	Battery electrolyte leakage presents no HAZARD		P
11.6	Specially protected equipment		N/A
11.6	Equipment RATED with a degree of ingress protection (IP code)		N/A
11.6.1	General		N/A
	Equipment marked with IP code :		N/A
	Conditions specified in the documentation		N/A
11.6.2	Conditions for testing		N/A
	Equipment in clean and new condition, all parts in place and mounted as specified by manufacturer		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	Complete equipment tested, or		N/A
	representative parts tested		N/A
	HAND-HELD EQUIPMENT and PORTABLE EQUIPMENT placed in least favourable position of NORMAL use		N/A
	Other equipment positioned or installed as specified		N/A
	TERMINALS provided with protective cap or cover, are installed as specified by manufacturer		N/A
	The equipment is operating (energized) during the treatment except:		N/A
	a) If manufacturer specifies degrees of protection for non-operating (de-energized) equipment, or		N/A
	b) Equipment is operating or non-operating during the treatment with does not affect the test results		N/A
11.6.3	Protection against solid foreign objects (including dust)		N/A
	Applicable test of IEC 60529 for protection against solid foreign objects conducted		N/A
	Additionally inspection of equipment resulted:		N/A
	a) No deposit on insulation parts that could lead to a HAZARD		N/A
	b) No created accumulations that have the potential to cause spread of fire		N/A
11.6.4	Protection against water		N/A
	Applicable test of IEC 60529 for protection against water conducted		N/A
	If any water has entered, safety is not impaired, inspection of equipment resulted:		N/A
	a) No deposit on insulation parts that could lead to a HAZARD		N/A
	b) Water has not reached hazardous live parts or windings which are not designed to operate when wet		N/A
	c) No accumulations near the end of cable nor enter the cable where it could cause a HAZARD		N/A
	d) No accumulations where it could lead to a HAZARD taking in consideration movement of the equipment		N/A
11.7	Fluid pressure and leakage		N/A
12	PROTECTION AGAINST RADIATION, INCLUDING LASER SOURCES, AND AGAINST SONIC AND ULTRASONIC PRESSURE		P
12.1	Equipment provides protection		P

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
12.2	Equipment producing ionizing radiation		N/A
12.3	Optical radiation		P
	No unintentional HAZARDOUS escape of optical radiation as ultraviolet, visible or infrared radiation:		P
	– Checked by inspection; and		P
	– Radiation sources assessed in acc. to the requirements of IEC 62471, except for sources considered to be safe (Table 22) or conditionally safe (Table 23).	LCD screen and Task lighting with LED lamps considered to be safe (Table 22)	P
	– Lamp and lamp systems assessed to Risk Groups 1, 2, or 3 of IEC 62471 are labelled in acc. to IEC 62471-2		N/A
	– If labelling impractical, lamp or lamp systems marked with symbol 14		N/A
	– Protective measures, restrictions on use, and operating instructions that may be necessary are provided, including the applicable conditions of use of Table 23.		N/A
12.4	Microwave radiation		N/A
12.5	Sonic and ultrasonic pressure		N/A
12.6	Laser sources		N/A

13	PROTECTION AGAINST LIBERATED GASES AND SUBSTANCES, EXPLOSION AND IMPLOSION		P
13.1	Poisonous and injurious gases and substances	No such gases and substances	N/A
	No hazardous substances liberated in NORMAL CONDITION and in SINGLE FAULT CONDITION		N/A
	If potentially-hazardous substances are liberated:		N/A
	Operator is not directly exposed to a quantity of the substance that could cause harm		N/A
	Requirements to discharge of hazardous substances during NORMAL operation in accordance to manufacturer's instructions not considered as liberation		N/A
13.2	Explosion and implosion		P
13.2.1	Components	No such Components	N/A
13.2.2	Batteries and battery charging		P
13.2.3	Implosion of cathode ray tubes		N/A

14	COMPONENTS AND SUBASSEMBLIES		P
14.1	Where safety is involved, components and subassemblies meet relevant requirements		P

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
14.2	Motors	No motor	N/A
14.2.1	Motor temperatures		N/A
	Does not present a HAZARD when stopped or prevented from starting; or		N/A
	Protected by over-temperature or thermal protection device conform with 14.3		N/A
14.2.2	Series excitation motors		N/A
	Connected direct to device, if overspeeding causes a HAZARD		N/A
14.3	Overtemperature protection devices	No such devices	N/A
	Devices operating in a SINGLE FAULT CONDITION		N/A
	a) Reliable function is ensured		N/A
	b) RATED to interrupt maximum current and voltage		N/A
	c) Does not operate in NORMAL USE		N/A
	If self-resetting device used to prevent a HAZARD, protected part requires intervention before restarting		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	No such devices	N/A
	Accidental change not possible		N/A
14.6	MAINS transformers tested outside equipment	No transformer	N/A
14.7	Printed circuit boards		P
	Data shows conformity with V-1 of IEC 60695-11-10 or better; or	PCB have flammability classification: V-0	P
	Test shows conformity with V-1 of IEC 60695-11-10 or better		N/A
	Not applicable for printed wiring boards with limited-energy circuits (9.4)		N/A
14.8	Circuits used to limit TRANSIENT OVERVOLTAGES		N/A
	Test conducted between each pair of MAINS SUPPLY TERMINALS		N/A
	No ignition or overheating of other materials :		N/A
	– no ignition		N/A
	– no heat to other parts above the self-ignition points		N/A
14.101	<i>Circuits or components used as TRANSIENT OVERVOLTAGE limiting devices in measuring circuits used to measure MAINS</i>		N/A
14.102	<i>Probe assemblies and accessories</i>		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033

Clause	Requirement + Test	Result - Remark	Verdict
15	PROTECTION BY INTERLOCKS		N/A
15.1	Interlocks are designed to remove a HAZARD before OPERATOR exposed	No interlock	N/A
15.2	Prevention of reactivation		N/A
15.3	Reliability		N/A

16	HAZARDS RESULTING FROM APPLICATION		P
16.1	REASONABLY FORESEEABLE MISUSE		P
	No HAZARDS arising from settings not intended and not described in the instructions		P
	Other cases of REASONABLY FORESEEABLE MISUSE addressed by RISK assessment		N/A
16.2	Ergonomic aspects		N/A
16.101	<i>Reliance on the displayed value</i>		P
16.101.1	<i>Over-range indication</i>		P
16.101.2	<i>Low battery indication</i>		P

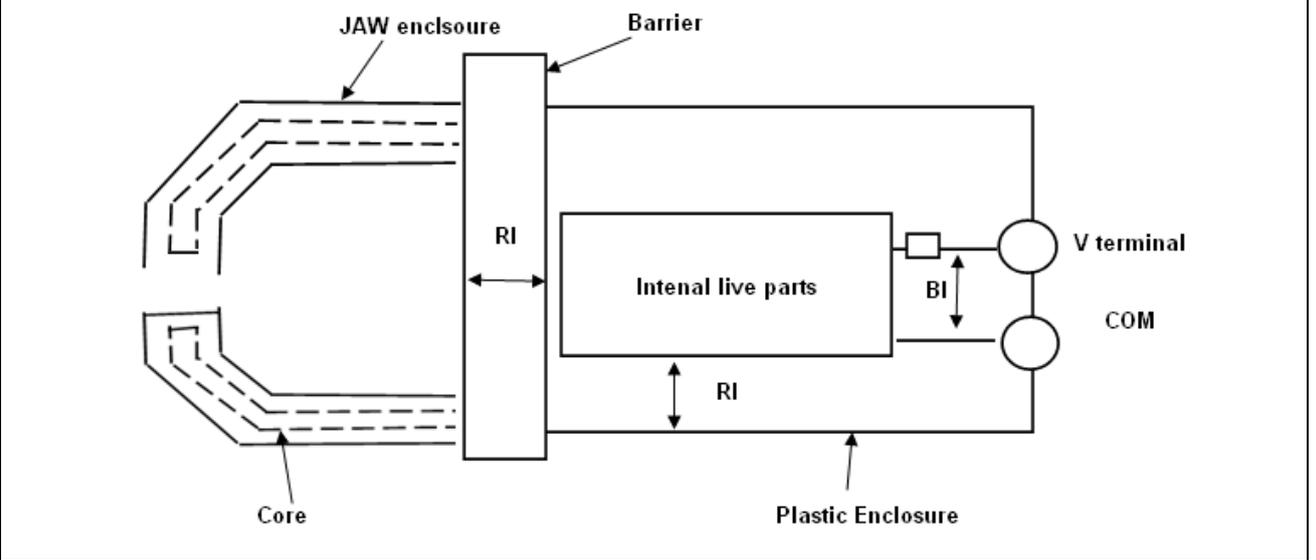
17	RISK ASSESSMENT		N/A
	RISK assessment conducted, if HAZARD might arise and not covered by Clauses 6 to 16	All risk covered by clause 6 to 16	N/A
101	<i>Measuring circuits</i>		P
101.1	<i>The equipment shall provide protection against HAZARDS resulting from NORMAL USE and REASONABLY FORESEEABLE MISUSE of measuring circuits,</i>		P
	<i>a) a current measuring circuit shall not interrupt the circuit being measured during range changing, or during the use of current sensors with an internal current transformer</i>		P
	<i>b) An electrical quantity that is within specification for any TERMINAL shall not cause a HAZARD when it is applied to that TERMINAL or any other compatible TERMINAL, with the range and function settings set in any possible manner</i>	No such terminal	N/A
	<i>c) Any interconnection between the equipment and other devices or accessories shall not cause a HAZARD even if the documentation or markings prohibit the interconnection while the equipment is used for measurement purposes</i>		N/A
	<i>d) A TEMPORARY OVERVOLTAGE or a TRANSIENT OVERVOLTAGE applied on the measuring circuits TERMINALS in voltage measurement function shall not cause a HAZARD</i>		P

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement + Test	Result - Remark	Verdict
	<i>e) Other HAZARDS that could result from REASONABLY FORESEEABLE MISUSE shall be addressed by RISK assessment</i>		N/A
101.2	<i>Current measuring circuits</i>		N/A
	<i>If a high voltage could be generated by an open-circuit condition of the output circuit, any voltage above the levels of 6.3.2 shall not be ACCESSIBLE</i>		N/A
101.3	<i>Protection against mismatches of inputs and ranges</i>		P
101.3.1	<i>In NORMAL CONDITION and in cases of REASONABLY FORESEEABLE MISUSE, no HAZARD shall arise when the maximum RATED voltage or current of a measuring TERMINAL is applied to any other compatible TERMINAL, with any combination of function and range settings</i>		P
101.3.2	<i>Protection by a certified overcurrent protection device</i>	No such devices	N/A
101.3.3	<i>Protection by uncertified current limitation devices or by impedances</i>		P
101.3.4	<i>Test leads for the tests of 101.3.2 and 101.3.3</i>		P
101.4	<i>Functional integrity</i>		P
101.4	<i>Protection against MAINS overvoltages.....</i>		P
102	<i>Prevention of HAZARD from arc flash and short-circuits</i>		P
102.1	<i>The current sensor shall be constructed to mitigate the RISK of arc flash and short-circuits</i>		P
102.2	<i>Protection against short-circuits during clamping</i>		P
102.3	<i>Protection against short-circuits in closed position</i>		P
ANNEX F	ROUTINE TESTS		N/A
	Manufacturer 's declaration		N/A

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
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Clause	Requirement — Test	Result — Remark	Verdict
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6.7	TABLE: Insulation requirements- Block diagram of system	Form A.14	P
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Pollution degree : 2	Overvoltage category: CAT II 1000V CAT III 600V
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Area	Location	Insulation type (NOTE 1)	WORKING VOLTAGE			Test voltage (NOTE 2) V	Comments (NOTE 3)
			RMS V	Peak V	Frequency kHz		
A	Between live part an accessible part near battery	RI	1000V	-	-	6293V	Duration 1min
B	Between live pat inside meter and accessible part	RI	1000V	-	-	6293V	Duration 1min
C	Between live part and accessible part near button	RI	1000V	-	-	6293V	Duration 1min
D	Between live part and accessible part near LCD	RI	1000V	-	-	6293V	Duration 1min
E	Between JAW enclosure and hand-held part across barrier	RI	1000V	-	-	6293V	Duration 1min
F	Between terminal V and COM	BI	1000V	-	-	4039V	Duration 1min
G	Between core and JAW surface	BI	1000V	-	-	4039V	Duration 1min

NOTE 1 – Type of insulation:
 BI = BASIC INSULATION
 DI = DOUBLE INSULATION
 PI = PROTECTIVE IMPEDANCE
 RI = Reinforced INSULATION
 SI = Supplementary INSULATION
 see also Form A.15 for further details

NOTE 2 - Types of voltage
 Peak impulse test voltage (pulse)
 r.m.s.
 d.c.
 peak

NOTE 3 - OVERVOLTAGE CATEGORIES or POLLUTION DEGREES which differ should be shown under "Comments"

Supplementary Information:

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement — Test	Result — Remark	Verdict

6.7	TABLE: Insulation requirements- Clearances and Creepages	Form A.15	P	
6.2.2	Examination	6.5.4	Protective impedance	—
6.4.2	ENCLOSURES and protective barriers	6.5.6	Current- or voltage-limiting device	—
6.4.4	Impedance			—

Area	Location	Insulation type (NOTE 1)	WORKING VOLTAGE (NOTE 2)			Clearance		Creepage		CTI	Verdict	Comments
			RMS V	Peak V	Frequency kHz	Required mm	Measured mm	Required mm	Measured mm			
	(See Form A.14)	(NOTE 1)										
A	Between live part an accessible part near battery	RI	1000V	-	-	10.5	17.56	14.2	17.56	Group II	P	
B	Between live pat inside meter and accessible part	RI	1000V	-	-	10.5	15.75	14.2	15.75	Group II	P	
C	Between live part and accessible part near button	RI	1000V	-	-	10.5	16.58	14.2	16.58	Group II	P	
D	Between live part and accessible part near LCD	RI	1000V	-	-	10.5	13.94	10.5	16.25	Group I	P	
E	Between JAW enclosure and hand-held part across barrier	RI	1000V	-	-	10.5	14.70	14.2	14.70	Group II	P	
F	Between terminal V and COM	BI	1000V	-	-	5.5	13.21	5.5	13.21	On PCB	P	
G	Between core and JAW surface	BI	1000V	-	-	5.5	14.65	7.1	14.65	Group II	P	

NOTE 1 – refer to Form A.14 for type of insulation shown in the insulation diagram

NOTE 2 - to be used for definition of required insulation (see Form A.14)

Input supply voltage.....: - V - Hz

Supplementary information:

For CAT II 1000V, CAT III 600

CL(BI)=5.5mm: CL(RI)=10.5mm. CR(RI) material group I and PCB is 10.0 mm, group II is 14.2mm, group III is 20 mm.

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033						
Clause	Requirement — Test			Result — Remark		Verdict
6.8	TABLE: Dielectric strength tests				Form A.19	P
4.4.4.1 b)	Conformity after application of SINGLE FAULT CONDITIONS ¹					P
6.4	Primary means of protection ²					P
6.6	Connections to external circuits					P
6.7.	Insulation requirements ² (see Annex K)					P
6.10.2	Fitting of non-detachable MAINS supply cords ¹					N/A
9.2 a) 2)	Eliminating or reducing the sources of ignition within the equipment					N/A
9.4 c)	Limited-energy circuit					N/A
9.6.1	Overcurrent protection basic insulation between MAINS - parts					N/A
	Test site altitude			0 m		—
	Test voltage correction factor (see Table 10)			1.22		—
Location or references from Forms A.1 and A.14	Clause or sub-clause	Humidity Yes/No	Working voltage V	Test voltage r.m.s./peak/ d.c.	Comments (NOTE)	Verdict
Between live part and accessible part	4.4.4.1 b)	No	1000	6293V	Duration 1min	P
	6.4	Yes	1000	6293V	Duration 1min	P
	6.6					
	6.7					
Between terminal V and COM	4.4.4.1 b)	No	1000	4039V	Duration 1min	P
	6.4	Yes	1000	4039V	Duration 1min	P
	6.6					
	6.7					
Between core and JAW surface	4.4.4.1 b)	No	1000	4039V	Duration 1min	P
	6.4	Yes	1000	4039V	Duration 1min	P
	6.6					
	6.7					
¹ Record the fault, test or treatment applied before the dielectric strength test. ² Humidity preconditioning required. NOTE: Test duration may be recorded.						
Supplementary information:						

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033						
Clause	Requirement — Test			Result — Remark		Verdict
10.	TABLE : Temperature Measurements				Form A.27A	P
10.1	Surface temperature limits - NORMAL CONDITION and / or SINGLE FAULT CONDITION					P
10.2	Temperature of windings- NORMAL CONDITION and / or SINGLE FAULT CONDITION					N/A
10.3	Other temperature measurements					P
Operating conditions:		Input: 1000V and LED light working				
Frequency	- Hz	Test room ambient temperature (ta) .. :		23.4 °C		
Voltage	- V	Test duration		1 h 33 min		
Part / Location		t_m °C	t_c °C	t_{max} °C	Verdict	Comments
JAW surface		23.4	50.0	70	P	
LCD surface		24.1	50.7	70	P	
Rotary switch		23.7	50.3	70	P	
Battery cover		24.5	51.1	70	P	
PCB near V terminal		26.3	53.0	130	P	
Top LED surface		25.4	52.0	70	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.21B for details of winding temperature measurements						
Supplementary information:						
Corrected to 50°C						

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033						
Clause	Requirement — Test	Result — Remark				Verdict
TABLE: 1 - List of components and circuits relied on for safety						P
Unique component reference or location	Application/function	Manufacturer / trademark (NOTE 1)	Type / model	Technical data (NOTE 2)	Standard	Mark(s) of conformity evidence of acceptance (NOTE 3 and 4)
Enclosure	-	SHANGHAI CHANGWEI JINCI ENGINEERING PLASTICS CO LTD	5288F	V-0, 60°C, Min. thickness 1.0 mm, Material Group I	UL94	E313427
Alternative	-	SILVER AGE ENGINEERING PLASTICS (DONGGUAN) CO LTD	2540(f1)	V-0, 60°C, Min. thickness 1.5 mm, Material Group II	UL94	E225348
Transparency Cover for LCD windows	-	CHI MEI CORPORATION	PA-758(+)	HB 60°C, Min. thickness: 1.5 mm, Material Group I	UL94	E56070
Battery cover and Rotary switch	-	LG CHEM LTD	AF312	V-0,85°C,Min. thickness: 1.5 mm, Material Group I	UL94	E67171
Alternative	-	CHI MEI CORPORATION	PA-765A(+)	V-0, 85°C, Min. thickness 2.1 mm, Material Group II	UL94	E56070
PCB	-	interchangeable	interchangeable	V-0,130°C	UL94	UL or ETL or VDE
PTC	-	SHENZHEN WEILIN HI-TECH CO LT	WMZ12A-152M003	1.5KΩ±20%, Withstand 900V	UL 1434	E232204
Alternative	-	ShenZhen Ampron Sensitive Components Co., Ltd.	MZ11-07M112M550	1.1KΩ±20% Withstand 1000V	UL 1434	R50187698

EN 61010-1 / EN 61010-2-032 / EN 61010-2-033			
Clause	Requirement — Test	Result — Remark	Verdict

TABLE: 1 - List of components and circuits relied on for safety							P
Unique component reference or location	Application/function	Manufacturer / trademark (NOTE 1)	Type / model	Technical data (NOTE 2)	Standard	Mark(s) of conformity evidence of acceptance (NOTE 3 and 4)	
Varistor	-	LIEN SHUN ELECTRONICS CO LTD	07D821K	Varistor Voltage 675~825 Withstand surge Current 1200A	UL 1449	E315524	
Alternative	-	CENTRA SCIENCE CORP	CNR-07D821K	Varistor Voltage 675~825 Withstand surge Current 1200A	UL 1449	E316325	
Alternative	-	GUIZHOU KAILI ECONOMIC ZONE ZHONGHAO ELECTRONICS CO.,LTD.	WLR-07D821KH#	Varistor Voltage 730~880 Withstand surge Current 1200A	UL 1449	E488935	
Alternative	-	SHENZHEN YUHE ELECTRONIC CO LTD	07D821K	Varistor Voltage 730~902 Withstand surge Current 1200A	UL 1449	E483148	
Alternative	-	HONGZHI ENTERPRISES LTD	HEL7D821K	Varistor Voltage 730~902 Withstand surge Current 1200A	UL 1449	E324904	
Button	-	SHIN-ETSU CHEMICAL CO LTD	KE-5606@	V-1, 150°C, Min. thickness 0.38 mm, Material Group II	UL94	E48923	

NOTE → 1 List all different manufacturers of the above components → 2 May include electrical, mechanical values → 3 List licence no or method of acceptance → 4 asterisk indicates mark assuring agreed level of surveillance

Appendix 1 Product Photos



Photo 1 - Front view



Photo 2 - Rear view

Appendix 1 Product Photos



Photo 3 – Battery box view

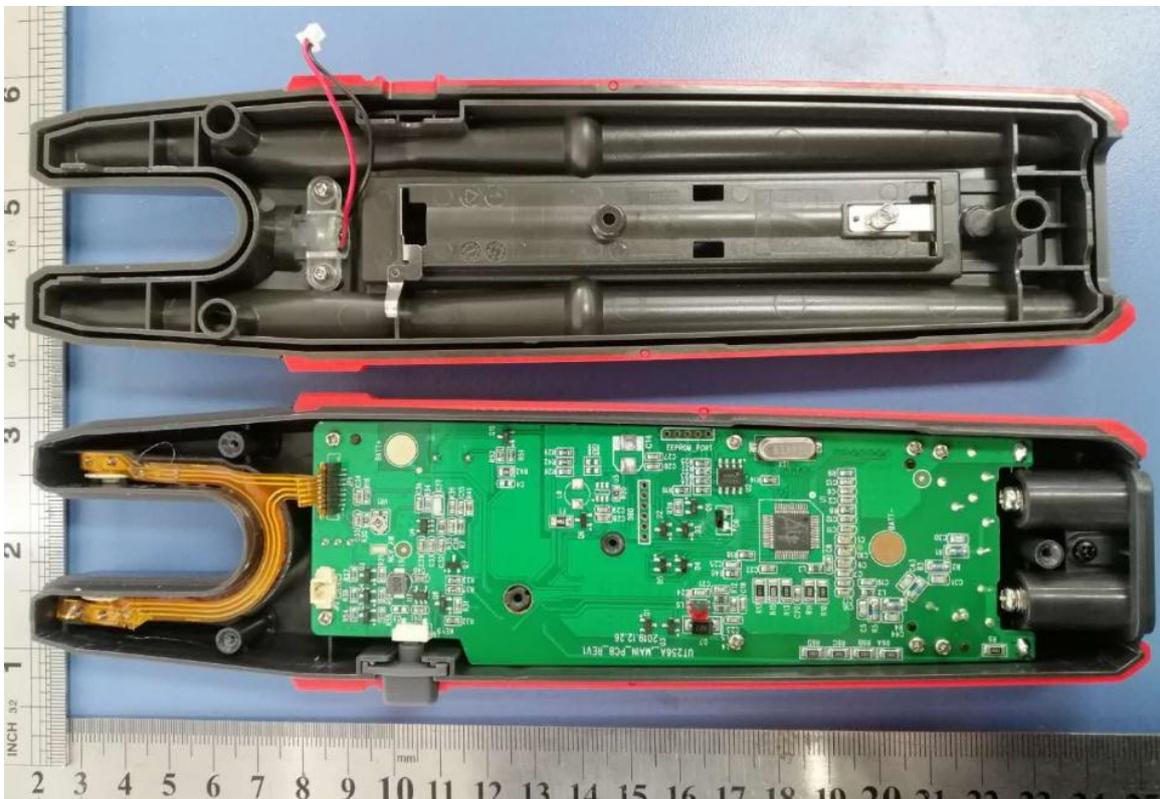


Photo 4 - Internal view

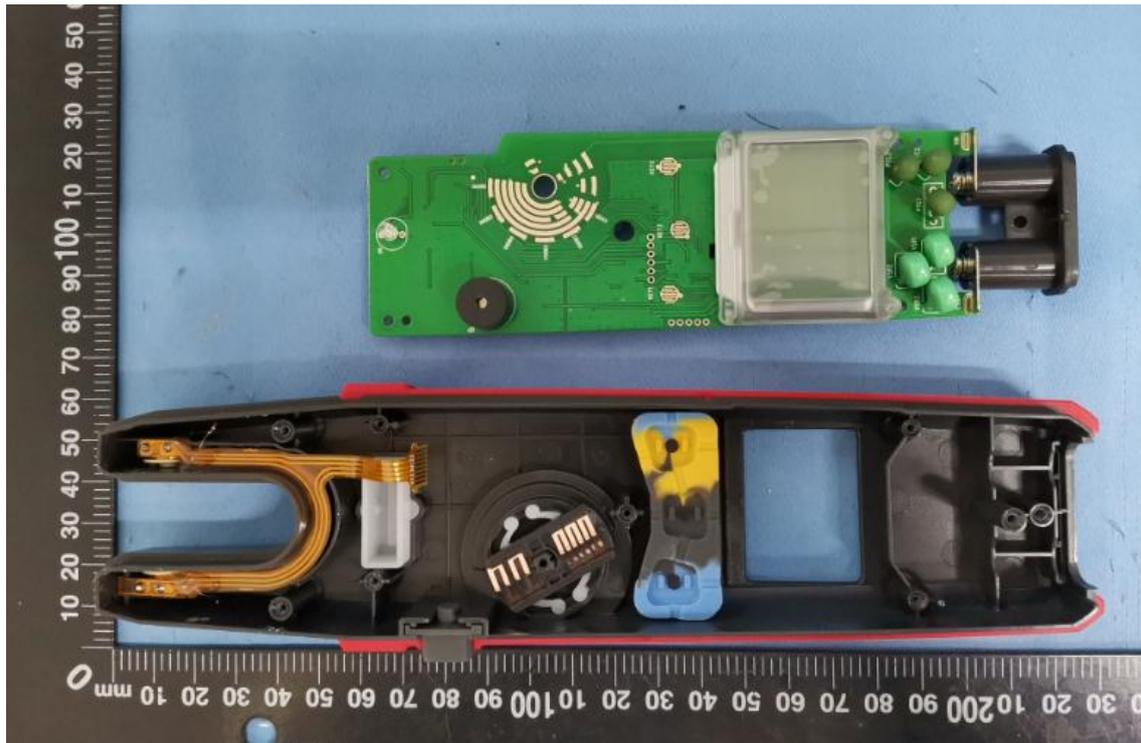


Photo 5 - Internal view

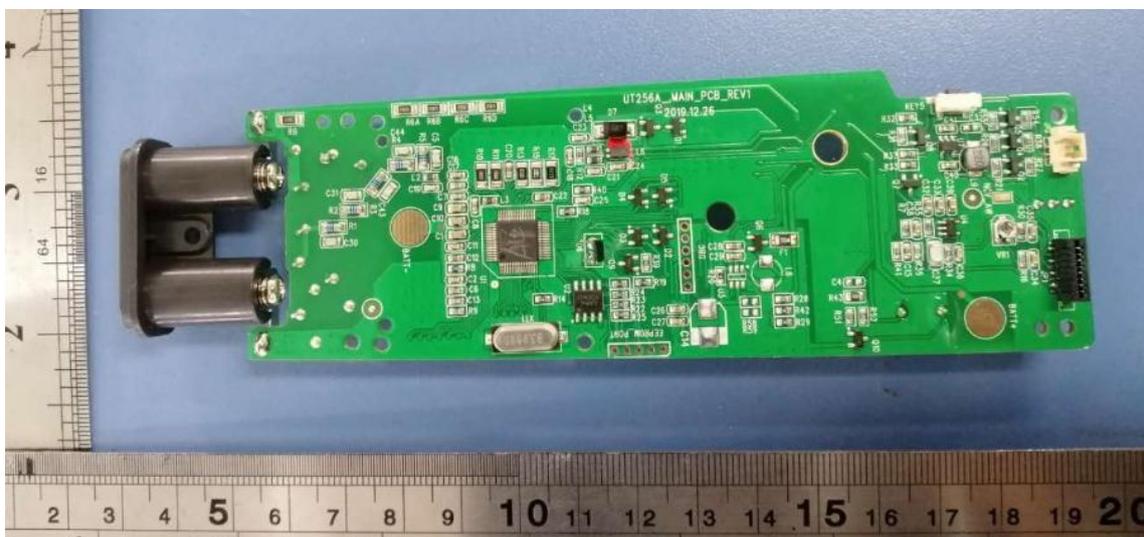


Photo 6 - PCB top layout

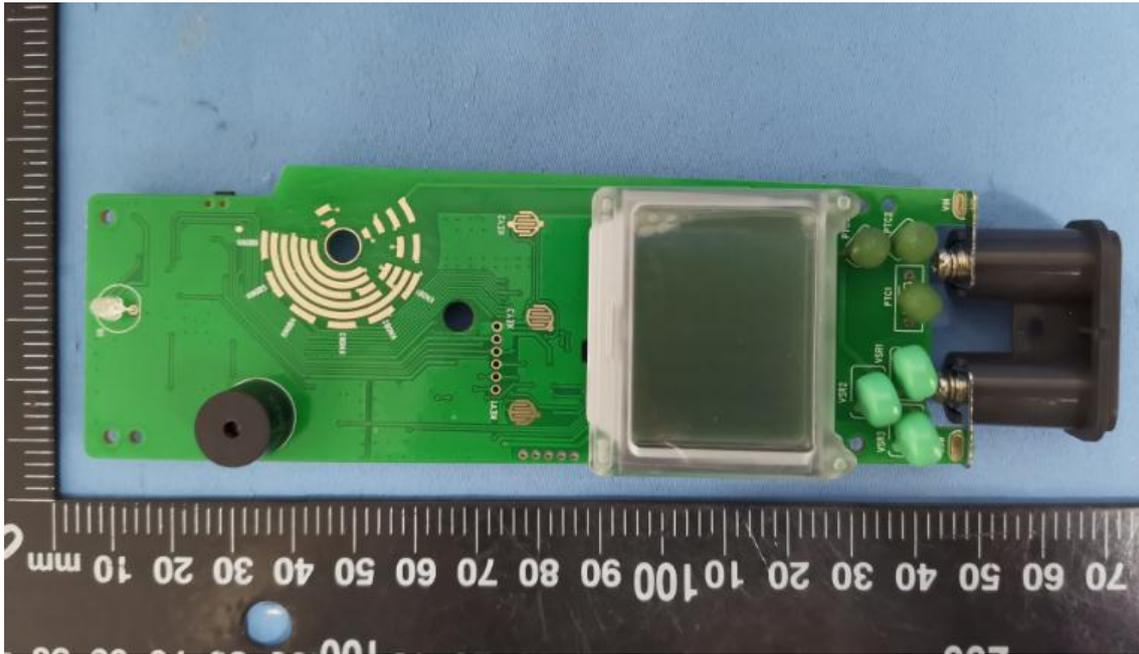


Photo 7 -PCB bottom layout

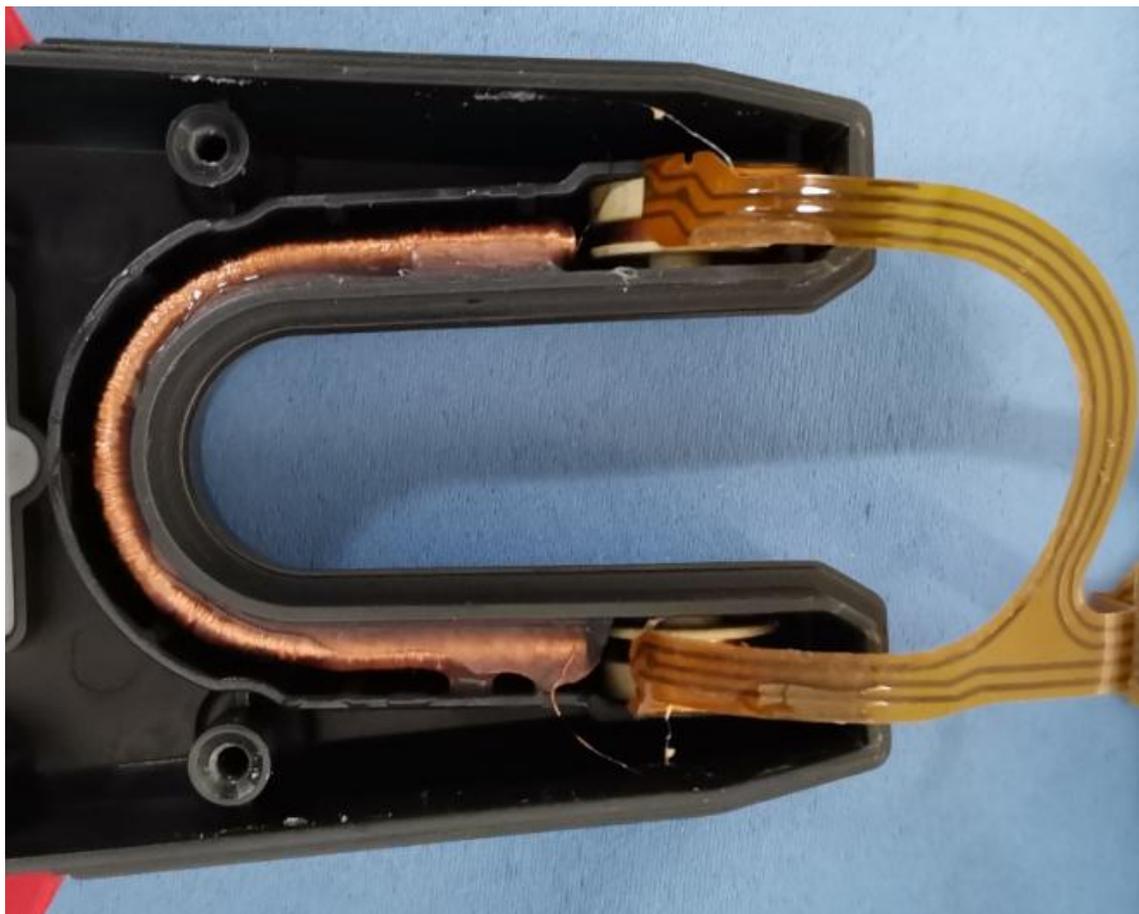


Photo 8 - JAW internal view

****END OF REPORT****