ACCESS CERTIFICATION CENTER

Verification of Conformity

Certificate No.: **acc-c09-fcc-0308** Issue date: **Nov. 06, 2009**

Applicant:	**EASTERN TECHNOLOGY (ZHANGZHOU) CO., LTD**
Address:	**Jinfeng Industrial District, Zhangzhou, Fujian 363000, China**
Trade name:	**E-SUN**
Manufacturer:	**EASTERN TECHNOLOGY (ZHANGZHOU) CO., LTD**
Address:	**Jinfeng Industrial District, Zhangzhou, Fujian 363000, China**
Product name:	**MULTIMETER**
Model number:	**EM420B**
Test lab:	**ACC China Branch**
TCF number:	**C0905096**
Applicable standards:	**FCC: Part15 Class B**

Conclusion:

The above equipment was tested by ACC China Branch, reviewed by ACC, Inc., for compliance with the requirements set forth in the FCC Rules and Regulations Part 15 and the measurement procedure according to ANSI C63.4. The maximum emission levels emanating from the equipment and the level of the immunity endurance of the equipment are within the compliance requirements. The test results of this report relate only to the tested sample identified in this report.

Responsible Party

Authorized Signatory

Test Labs Authorized signatory:

Alex P. Gary

Certification Manager, ACC

ACC TESTED

Ref No. XMT0201312301S/LVD

TEST REPORT

Report Reference No.	XMT0201312301S/LVD
Applicant:	EASTERN TECHNOLOGY GROUP（ZHANGZHOU）CO.，LTD
Address:	Jinfeng Industrial District,Zhang Zhou ,Fujian P.C,:363000
Manufacturer:	ZHANG ZHOU EASTERN INTELLIGENT METER CO., LTD
Address:	Eastern Industrial Park, Jintang Road, Jinfeng Economic Development Zone, Xiangcheng District, Zhangzhou, Fujian, China
Sample Name:	AUTO RANGE DIGITAL MULTIMETER
Model:	EM420A，EM420B，EM420C
Test Type:	EM420A
Standard:	EN 61010-1:2010 EN 61010-2-030:2010 EN 61010-031:2002+A1:2008
Test Period:	Dec .30, 2013 to Jan .08, 2014
Test Result:	Please refer to next pages
Conclusion:	Based on the performed tests on submitted samples, the results comply with the Low Voltage Directive 2006/95/EC and its subsequent amendments

Tested By: **Reviewed By:**

John Chen - Engineer **Amy Zhang - Lab Manager**

SHANGHAI XIMO TESTING TECHNOLOGY CO., LTD
NO.5131, CHUANNANFENG ROAD, PUDONG NEW AREA, SHANGHAI, CHINA

Test item

Description ……...: AUTO RANGE DIGITAL MULTIMETER
Trademark……: /
Model and/or type reference……...: EM420A,EM420B,EM420C
Manufacturer……..…: ZHANG ZHOU EASTERN INTELLIGENT METER CO., LTD
Rating(s)……..: CAT II, 250V
Operation temperature …..…….. : 23±5°C, < 75% RH
Pollution degree …… : /

test case verdicts

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

General remarks

This test report shall not be reproduced except in full without the written approval of the testing laboratory.
The test results presented in this report relate only to the object tested.
"(see remark #)" refers to a remark appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a comma is used as the decimal separator.

Remarks:

Brief description of the tested sample(s):
Ambient temperature: 25°C humidity: 51%
Complete test was conducted on **EM420A;**

Clause	Requirement Test	Result - Remark	Verdict
EN 61010-1 & EN 61010-2-030 & EN 61010-031			
5.	Marking and documentation		-
5.1	Marking		-
5.1.1	General		-
	Markings shall be visible from the exterior, or be visible after removing a cover or opening a door without the aid of a tool	Markings are in the rear of the meter and visible from the exterior	P
	For rack- or panel-mounted equipment	Not rack or panel-mounted equipment	P
	Markings applying to a probe assembly as a whole shall not be put on parts which can be removed by an operator without the use of a tool. (EN61010-031)		P
	Letter symbols for quantities and units shall be in accordance with IEC 60027	The symbols are in accordance with IEC 60027.	P
5.1.2	Identification		P
	The name or registered trade mark of the manufacturer or supplier	See artwork of marking label	P
	A model number, name or other means to identify the equipment.	See artwork of marking label	P
5.1.3	Mains supply	See artwork of marking label	P
	a) nature of supply:		P
	b) the rated value(s) of the supply voltage(s) or the rated range of the supply voltages		P
	c) the maximum rated power in watts (active power) or volt-amperes (apparent power), or the maximum rated input current		P
	d) for different rated supply voltages		N/A
	e) accessory mains socket-outlets		N/A
5.1.4	Fuse		-
5.1.5	Terminals, connections and operating devices		P
5.1.5.1	General		-
5.1.5.2	Terminals		P
	a) functional earth terminals		N/A
	b) protective conductor terminals		N/A
	c) terminals of control circuits		P
	d) terminals supplied form the interior of the equipment and which are hazardous live		N/A
5.1.5.101	Measuring circuit terminals (EN 61010-2-030)		P
5.1.5.101.1	Genera (EN 61010-2-030)		P

Clause	Requirement Test	Result - Remark	Verdict
5.1.5.101.2	Measuring circuit terminals rated for measurement categories II, III or IV (EN 61010-2-030)	CAT II	P
5.1.5.101.3	Measuring circuit terminals rated for connection to voltages above the level of 6.3.1 (EN 1010-2-030)		P
5.1.5.101.4	Low voltage, permanently connected, or dedicated measuring circuit terminals (EN 61010-2-030)		P
5.1.6	Switches and circuit-breakers	Switches	P
	The power supply switch or circuit-breaker is used as the disconnecting device		N/A
	A push-button switch is used as the power supply switch		N/A
	Rating (EN61010-031)		P
5.1.6	a) PROBE ASSEMBLIES for measurements within measurement category I (EN61010-031)		N/A
	b) PROBE ASSEMBLIES for measurements within measurement categories II, III and IV (EN61010-031)	CAT II	P
5.1.7	Equipment protected by double insulation or reinforced insulation	Symbol ⧈ used	P
5.1.8	Field-wiring terminal boxes	No filed-wiring terminal boxes	N/A
5.2	Warning markings shall be visible when the equipment is ready for normal use	On the surface of the appliance	P
	For the responsible body or operator to refer to the instruction manual to preserve the protection afforded by the equipment		P
	An operator is permitted to gain access, using a tool, to a part which in normal use may be Hazards live	Operator can not touch hazards live.	N/A
5.3	Markings shall remain clear and legible under conditions of normal use and resist the effects of cleaning agents specified by the manufacturer.	See appendix table 5.3	P
5.4	Documentation	See the user manual	P
5.4.1	General		P
5.4.2	Equipment ratings		P
5.4.3	Equipment installation		P
5.4.4	Equipment operation		P
5.4.5	Equipment maintenance and service		P
5.4.6	Integration into systems or effects resulting from special conditions		P

6.	Protection against electric shock		P
6.1	General		P

Clause	Requirement Test	Result - Remark	Verdict
6.1.1	Requirements	Protection against electric shock shall be maintained in normal condition (see 6.4) and single fault condition Accessible parts of equipment shall not be hazards live (see 6.3). (see 6.5).	P
6.1.2	Exceptions		P
	Parts of lamps and lamp sockets after lamp removal		N/A
	Parts intended to be replaced by the operator	No such parts	N/A
	Probe tips (EN 61010-031)		P
6.2	Determination of accessible parts		P
6.2.1	General		P
6.2.2	Examination		P
6.2.3	Openings above parts that are hazardous live	No opening	N/A
6.2.4	Openings for pre-set controls		N/A
6.3	Limit values for accessible parts		P
6.3.1	Values in normal condition		P
	The voltage levels are 33 V r.m.s. and 46,7 V peak or 70 V d.c.	The voltage between any two accessible parts is less than	P
	The current levels		P
	The charge or energy of capacitance levels		P
6.3.2	Levels in single fault condition		P
	The voltage levels are 55 V r.m.s. and 78 V peak or 140 V d.c.	The voltage between any two accessible parts is less than 55Vac or 140Vdc	P
	The current levels		P
	The charge or energy of capacitance levels		N/A
6.4	Primary means of protection		P
	Insulation requirements for protection against electric shock (EN 61010-031)		P
	ACCESSIBLE parts shall be prevented from becoming HAZARDOUS LIVE by one or more of the following means. (EN 61010-031)		P
	a) BASIC INSULATION	Between unmated terminals on multimeter and accessible edge of unmated terminals.	P
	b) DOUBLE INSULATION or REINFORCED INSULATION	Enclosure with reinforced insulation	P
	c) ENCLOSURES or BARRIERS	Enclosure with reinforced insulation	P

Clause	Requirement Test	Result - Remark	Verdict
	d) PROTECTIVE IMPEDANCE		P
	e) Impedance		P
6.4.1	General		-
	Connectors (EN 61010-031)		P
	Insulation, accessible parts, clearances and creepage distances to connectors used on probe assemblies shall meet the applicable below: (EN 61010-031)		P
	a) connectors in fully mated position	Double insulation or reinforced insulation protection	P
	b) connectors in partially mated position	Partially mated connector insulated from the hazardous live parts by at least basic insulation.	P
	c) connectors in unmated position		P
6.4.2	Enclosures and protective barriers		P
	Hand-held parts other than connectors (EN61010-031)		P
6.4.3	Basic insulation		P
	Cable (EN61010-031)	Cables are rated for maximum voltage and current of normal use.	P
6.4.4	Impedance		P
	Probe tips (EN61010-031)	With a barrier and an indication of limit beyond which it may be hazardous to touch the probe body during	P
6.4.5	Double insulation and reinforced insulation (EN61010-031)		P
6.4.6	Protective impedance (EN61010-031)		P
6.5	Additional means of protection in case of single fault condition		P
6.5.1	General		P
6.5.2	Protective bonding		N/A
6.5.2.1	General		P
6.5.2.2	Integrity of protective bonding		N/A
6.5.2.3	Protective conductor terminals		N/A
6.5.2.4	Impedance of protective bonding of plug-connected equipment		N/A
6.5.2.5	Impedance of protective bonding of permanently connected equipment		N/A
6.5.2.6	Transformer protective bonding screen		N/A
6.5.2.101	Indirect bonding for testing and measuring circuits (EN 61010-2-030)		P

Clause	Requirement Test	Result - Remark	Verdict
6.5.3	Supplementary insulation and reinforced insulation		P
6.5.4	Protective impedance		P
6.5.5	Automatic disconnection of the supply		P
6.5.6	Current- or voltage-limiting device		P
6.6	Connections to external circuits		P
6.6.1	General		P
6.6.2	Terminals for external circuits	See appendix table 6	P
6.6.3	Circuits with terminals which are hazardous live	The circuits can not connected to accessible	P
6.6.4	Accessible terminals for stranded conductors		N/A
6.6.101	Measuring circuit TERMINALS (EN 61010-2-030)		P
6.6.102	Specialized measuring circuit TERMINALS (EN 61010-2-030)		P
6.7	Insulation requirements	See appendix table 6.7	P
6.7.1	The nature of insulation		P
6.7.1.1	General		P
6.7.1.2	Clearances		P
6.7.1.3	Creepage distances		P
6.7.1.4	Solid insulation		P
6.7.1.5	Requirements for insulation according to type of circuit		N/A
6.7.2	Insulation for mains circuits of overvoltage category II with a nominal supply voltage up to 300V		N/A
6.7.2.1	Clearances and creepage distances		P
6.7.2.2	Solid insulation		P
6.7.2.2.1	General		-
6.7.2.2.2	Moulded and potted parts		N/A
6.7.2.2.3	Inner insulating layers of printed wiring boards		N/A
6.7.2.2.4	Thin-film insulation		N/A
6.7.3	Insulation for secondary circuits derived from mains circuits of overvoltage category II up to 300V		N/A
6.7.3.1	General		-
6.7.3.2	Clearances		N/A
6.7.3.3	Creepage distances		P
6.7.3.4	Solid insulation		P
6.7.3.4.1	General		N/A

Clause	Requirement Test	Result - Remark	Verdict
6.7.3.4.2	Moulded and potted parts		N/A
6.7.3.4.3	Inner insulating layers of printed wiring boards		N/A
6.7.3.4.4	Thin-film insulation		N/A
6.8	Procedure for voltage tests	See appendix table 6.8	P
6.8.1	General		P
6.8.2	Humidity preconditioning	Temperature: 25°C Humidity: 68% Time: 48h	P
6.8.3	Test procedures		P
6.8.3.1	The a.c. voltage test		N/A
6.8.3.2	The 1 min d.c. voltage test	No flashover of clearances and breakdown of solid	P
6.8.3.3	The impulse voltage withstand test		P
6.9	Constructional requirements for protection against electric shock		P
6.9.1	General		-
6.9.2	Insulating materials		P
6.9.3	Colour coding		N/A
6.9.101	Over-range indication (EN 61010-2-030)		P
6.10	Connection to mains supply source and connections between parts of equipment	Battery supply	P
6.10.1	Mains supply cords		P
6.10.2	Fitting of non-detachable mains supply cords		N/A
6.10.2.1	Cord entry		-
6.10.2.2	Cord anchorage		N/A
6.10.3	Plugs and connectors		N/A
	a) plugs, connectors and appliance couplers used to connect detachable mains supply cords shall conform to the relevant specifications for plugs, socket-outlets and connectors.		N/A
	b) the equipment is designed to be supplied only at voltages below the level of 6.3.2 a) or from a source used solely to supply that equipment.		N/A
	c) if plug pins of cord-connected equipment receive a charge from an internal capacitor, the pins shall not be hazardous live 5s after disconnection of the supply.		N/A
	d) on equipment with accessory mains socket-outlets		N/A
6.11	Disconnection from supply source	Supplied by DC 12V	P

Clause	Requirement Test	Result - Remark	Verdict
6.11.1	General	A power switch control disconnects all current-carrying conductors.	P
6.11.2	Exceptions	When measuring de-energized components (such as resistor), supplied by internal DC 12V battery, no need disconnection	P
6.11.3	Requirements according to type of equipment		N/A
6.11.3.1	Permanently connected equipment and multi-phase equipment	Not permanently connected equipment or multi-phase equipment.	N/A
6.11.3.2	Single-phase cord-connected equipment		N/A
	a) a switch or circuit-breaker		P
	b) an appliance coupler which can be disconnected without the use of a tool		P
	c) a separable plug		N/A
6.11.4	Disconnecting devices		P
6.11.4.1	General		P
6.11.4.2	Switches and circuit-breakers	Switch is approbated by VDE and marked off on enclosure.	P
6.11.4.2	Appliance couplers and plugs		N/A
Clause 6 difference in EN 61010-031			
6.5	CLEARANCES and CREEPAGE DISTANCES (EN61010-031)		P
6.5.1	General requirements		P
6.5.1.1	Clearance	more than limited values	P
6.5.1.2	Creepage distance values	more than limited values	P
6.5.2	Measuring circuits	Measurement category II	P
6.5.2.1	CLEARANCE values		P
6.5.2.2	CLEARANCE values for measurement category		N/A
6.5.3	CREEPAGE DISTANCE values		P
6.6	Voltage tests (EN61010-031)		P
6.6.1	Reference test earth		P
6.6.2	Humidity preconditioning	Temperature: 25°C Humidity: 68% Time: 48h	P
6.6.3	Conduct of tests		P

Clause	Requirement Test	Result - Remark	Verdict
6.6.4	Test voltages		P
6.7	Constructional requirements (EN61010-031)		P
6.7.1	General		P
6.7.2	Enclosures of probe assemblies with double insulation or reinforced insulation	An insulating coating on the inside of the probe assembly's enclosure	P
6.7.3	Corona and partial discharge	The construction of a probe assembly can not discharge corona or partial during operating at maximum rated voltage.	P
	The construction of a PROBE ASSEMBLY shall be such that, while operating at maximum RATED voltage, there is no corona or partial discharge.		P
6.7.4	Cable attachment	Cable attachment can withstand forces likely to be encountered	P
	The attachment of the cable to the probe body and to the equipment shall withstand forces likely to be encountered in NORMAL USE without damage which could cause a HAZARD	After tests, no hazards.	P
6.7.4.1	Pull test	Insulation of the cable have not been cut or torn and moved more than 2mm in the bushing.	P
6.7.4.2	Flexing/pull test	No damage	P
6.7.4.3	Rotational flexing test	No damage	P
6.7.5	Insulation of a probe cable	Double insulation	P

7.	Protection against mechanical hazards		P
7.1	General	Operation can not lead to a mechanical in normal condition or single fault condition	-
7.2	Sharp edge	All easily-touch parts of the equipment are smooth and rounded	P
7.3	Moving parts		N/A
7.3.1	General		-
7.3.2	Exceptions		N/A
7.3.3	Risk assessment for mechanical hazards to body parts		P
7.3.4	Limitation of force and pressure		P

Clause	Requirement Test	Result - Remark	Verdict
7.3.5	Gap limitations between moving parts		P
7.3.5.1	Gap limitations between moving parts – Access normally allowed		N/A
7.3.5.2	Gap limitations between moving parts – Access normally prevented		N/A
7.4	Stability		P
7.5	Provisions for lifting and carrying		N/A
7.5.1	General	Mass less than 18Kg	P
7.5.2	Handles and grips		P
7.5.3	Lifting devices and supporting parts		N/A
7.6	Wall mounting		N**/A**
	Mounting brackets on equipment intended to be mounted on a wall or ceiling shall withstand a force of four times the weight of the equipment.		N/A
7.7	Expelled parts		P
	Equipment shall contain or limit the energy of parts which could cause a HAZARD if expelled in the event of a fault.		N/A
	Handling of a PROBE ASSEMBLY during NORMAL USE shall not lead to a HAZARD (EN61010-031)		P
8.	Mechanical resistance to shock and impact		P
8.1	General	See appendix table 6.7	P
8.2	Enclosure rigidity test	No hazardous live parts become accessible after tests.	P
8.2.1	Static test		P
8.2.2	Impact test		P
8.3	Drop test		P
8.3.1	Equipment other than hand-held equipment and direct plug-in equipment		N/A
8.3.2	Hand-held equipment and direct plug-in equipment		P
	Impact swing test (EN61010-031)	No hazardous live parts become accessible after tests	P
9.	Protection against the spread of fire		P
9.1	General	See appendix table 9	P
9.2	Eliminating or reducing the sources of ignition within the equipment	See appendix table 9.2	P
9.3	Containment of fire within the equipment, should it occur	Energizing of the equipment is controlled by a switch.	P

Clause	Requirement Test	Result - Remark	Verdict
9.3.1	General		P
9.3.2	Constructional requirements		P
9.4	Limited-energy circuit	No limited-energy circuit	N/A
9.5	Requirements for equipment containing or using flammable liquids		N/A
9.6	Overcurrent protection		P
9.6.1	General		P
9.6.1	Permanently connected equipment		N/A
9.6.2	Other equipment		P
10.	Equipment temperature limits and resistance to heat		P
10.1	Surface temperature limits for protection against burns	See appendix table 10	P
10.2	Temperatures of windings	No windings	N/A
10.3	Other temperature measurements	See appendix table 10	P
10.4	Conduct of temperature tests	See appendix table 10	P
10.4.1	General		P
10.4.2	Temperature measurement of heating		N/A
10.4.3	Equipment intended for installation in a cabinet or a wall		N/A
10.5	Resistance to heat		P
10.5.1	Integrity of clearances and creepage distances		P
10.5.2	Non-metallic enclosure	See appendix table 10.5.2	P
10.5.3	Insulating material	Insulating material can have adequate resistance to heat	P
11.	Protection against Hazards from fluids		P
11.1	General		-
11.2	Cleaning	See user manual for cleaning of the appliance	P
11.3	Spillage		N/A
11.4	Overflow		N/A
11.5	Battery electrolyte		P
11.6	Specially protected equipment	Indoor use	N/A
11.7	Fluid pressure and leakage		N/A
11.7.1	Maximum pressure		P
11.7.2	Leakage and rupture at high pressure		N/A
11.7.3	Leakage from low-pressure parts		N/A
11.7.4	Overpressure safety device		N/A

Clause	Requirement Test	Result - Remark	Verdict
	Specially protected PROBE ASSEMBLIES (EN 61010-031)		P
12.	Protection against radiation, including laser sources, and against sonic and ultrasonic pressure		P
12.1	General		P
12.2	Equipment producing ionizing radiation		N/A
12.2.1	Ionizing radiation		N/A
12.2.2	Accelerated electrons		N/A
12.3	Ultraviolet (UV) radiation		N/A
12.4	Microwave radiation		N/A
12.5	Sonic and ultrasonic pressure		N/A
12.5.1	Sound level		N/A
12.5.2	Ultrasonic pressure		N/A
12.6	Laser sources		N/A
13.	Protection against liberated gases, explosion and implosion		N/A
13.1	Poisonous and injurious gases		N/A
13.2	Explosion and implosion	Explosion and implosion of components is impossible in the equipment.	N/A
13.2.1	Components		N/A
13.2.2	Batteries and battery charging		P
13.2.3	Implosion of cathode ray tubes		N/A
Clause 13 difference in EN 61010-031			
13	Prevention of HAZARD from arc flash and short-circuits		P
13.1	General	No hazards for short-circuit the probe tips	P
13.2	Exposed conductive parts	The exposed conductive part of a probe tip is less than 19mm	P
14.	Components and subassemblies		P
14.1	General		P
14.2	Motors	No motor	N/A
14.2.1	Motors temperature		N/A
14.2.2	Series excitation motors		N/A
	Series excitation motors shall be connected direct to the devices driven by them if an overspeeding motor could cause a hazard.		N/A
14.3	Overtemperature protection devices are devices		N/A

Clause	Requirement Test	Result - Remark	Verdict
	operating in single fault condition and shall meet all of the following requirements: a) be constructed so that reliable function is ensured; b) be rated to interrupt the maximum voltage and current of the circuit in which they are employed; c) not operate in normal use.		
14.4	Fuse holders with fuses intended to be replaceable by an operator shall not permit access to parts which are hazardous live during fuse replacement.		N/A
	Fuse (EN 61010-031)		N/A
14.5	Devices shall be constructed so that a change from one voltage or one type of supply to another cannot occur accidentally. The marking of voltage selecting devices is specified in 5.1.3 d).	No mains voltage selecting devices	N/A
14.6	Mains transformers tested outside equipment		N/A
	Mains transformers tested outside the equipment (see 4.4.2.6) shall be tested in the same conditions as exist inside the equipment if these could affect the test results.		N/A
14.7	Printed circuit boards shall be made of material with a flammability classification of V-1 or better.	Printed circuit boards are made of material with flammability classification of V-0	P
14.8	Circuits or components used as transient overvoltage limiting devices		N/A
	High-integrity components (EN 61010-031)	No high-integrity components	N/A
	Resistors used in PROTECTIVE IMPEDANCE		N/A
14.101	Circuits or components used as TRANSIENT OVERVOLTAGE limiting devices in measuring circuits used to measure MAINS (EN 61010-2-030)		N/A
15.	Protection by interlocks		N/A
15.1	General		N/A
	Interlocks used to protect operators from hazards shall prevent the operator from being exposed to the hazard before the hazard is removed and shall meet the requirements of 15.2 and 15.3.		N/A
15.2	Prevention of reactivating		N/A
	An interlock for the protection of an operator shall prevent the hazard being re-established by reactivating by hand until the action which caused the interlock to operate has been reversed or cancelled.		N/A

Clause	Requirement Test	Result - Remark	Verdict
15.3	Reliability		N/A
	An interlock system for the protection of operators shall ensure that a single fault is either unlikely to occur during the expected life of the equipment, or cannot cause a hazard.		N/A
16.	HAZARDS resulting from application		P
16.1	REASONABLY FORESEEABLE MISUSE	No hazards	P
	No HAZARDS shall arise if adjustments, knobs, or other software-based or hardware-based controls are set in a way not intended, and not described in the instructions.		P
16.2	Ergonomic aspects		P
	If the following factors could give rise to a HAZARD, a RISK assessment shall be documented, taking into account at least the following aspects:	No hazards	N/A
	a) limitation of body dimensions		N/A
	b) displays and indicators		N/A
	c) accessibility and conventions of controls		N/A
	d) arrangements of TERMINALS		N/A
17.	RISK assessment		N/A
	If examination of the equipment shows that HAZARDS not fully addressed might arise, then RISK assessment is required.	No such hazards	N/A
101	Measuring circuits (EN 61010-2-030)		P
101.1	General		P
101.2	Current measuring circuits		P
101.3	Protection against mismatches of inputs and ranges		P
101.3.1	General		P
101.3.2	Protection by a certified overcurrent protection device		P
101.3.3	Protection by uncertified current limitation devices or by impedances		P
101.3.4	Test leads for the tests of 101.3.2 and 101.3.3	Test leads=1m; cross section of the conductor = 1,5 mm², stranded copper wire; equipment connector compatible with the measuring circuit TERMINALS; arranged as straight to connection to the	P

Clause	Requirement Test	Result - Remark	Verdict
		test voltage source. to switch the maximum RATED current 6 000 times. After the test no interruption ,no hazard	
Annex A	Measuring circuits for touch current		P
A.1	Measuring circuits for a.c. with frequencies up to 1 MHz and for d.c.		N/A
A.2	Measuring circuits for a.c. with sinusoidal frequencies up to 100 Hz for d.c.		P
A.3	Current measuring circuit for electrical burns at high frequencies		N/A
A.4	Current measuring circuit for wet contact		N/A
Annex B	Standard test finger		P
Annex C	Measurement of clearances and creepage distances		P
Annex D	Parts between which insulation requirements are specified		P
Annex E	Reduction of pollution degrees		N/A
Annex F	ROUTINE TESTS		P
F.1	Protective earth		P
F.2	Mains circuits		P
F.3	Other circuits		P
Annex G	Leakage and rupture from fluids under pressure		N/A
G.1	General		N/A
G.2	Pressures above 2 MPa and a product pressure and volume greater than 200 kPa_l		N/A
G2.1	General		N/A
G2.2	Conduct of hydrostatic tests for G.2.1		N/A
G2.3	Initial tests		N/A
G2.4	Modifications to minimize leakage		N/A
G2.5	Additional tests if modification succeeded in minimizing leakage		N/A
G2.6	Additional test if modifications failed to reduce leakage		N/A
G.3	Pressures between 50 kPa and 2 MPa, and pressure times volume above 200 kPa_l		N/A

Clause	Requirement Test	Result - Remark	Verdict
G.4	Pressures below 50 kPa, or pressure times volume below 200 kPa l		N/A
G.5	Overpressure safety devices		N/A
Annex K	Insulation requirements not covered by 6.7 (EN 61010-2-030)		P
K.3	Insulation in circuits not addressed in 6.7, Insulation in circuits not addressed in 6.7, K.1 or K.2, and in measuring circuits where MEASUREMENT CATEGORIES do not apply		P
K.101	Insulation requirements for measuring circuits of MEASUREMENT CATEGORIES II, III and IV	CATEGORIES II	P
K.101.1	General		P
K.101.2	CLEARANCES		P
K.101.3	CREEPAGE DISTANCES		P
K.101.4	Solid insulation (EN 61010-2-030)	BASIC INSULATION or SUPPLEMENTARY INSULATION	P
K.101.4.1	General		P
K.101.4.2	Moulded and potted parts		P
K.101.4.3	Inner insulating layers of printed wiring boards		P
K.101.4.4	Thin-film insulation		P
K.102	Reduction of MEASUREMENT CATEGORIES by the use of overvoltage limiting devices		P
ANNEX AA	Measurement categories (EN 61010-2-030)		P
AA.1	General		P
AA.2	MEASUREMENT CATEGORIES		P
AA.2.1	MEASUREMENT CATEGORY II		P
AA.2.2	MEASUREMENT CATEGORY III		N/A
AA.2.3	MEASUREMENT CATEGORY IV		N/A
AA.2.4	Equipment without a RATED MEASUREMENT CATEGORY		N/A

Clause	Requirement Test	Result - Remark	Verdict
Annex BB	Hazards pertaining to measurements performed in certain environments (EN 61010-2-030)		P
BB.1	General		P
BB.2	MAINS CIRCUITS		P
BB.3	Electric shock		P
BB.4	Arc flash		P
BB.5	Thermal burns		P
BB.6	Telecommunications networks		N/A
BB.7	Current measurements in inductive circuits		P
BB.8	Battery-driven circuits		P
BB.9	Measurements at higher frequencies		P
BB.10	Measurements using measuring circuits with a FUNCTIONAL EARTH TERMINAL		P

4.4.2.	TABLE: summary of single fault conditions			P
Sub clause	Title	Does not apply	Carried out	Comments
4.4.2.2	Protective impedance	X		
4.4.2.3	Protective conductor		X	PTC in series
4.4.2.4	Equipment or parts for short-term or intermittent operation	X		Continuously operation
4.4.2.5	Motors	X		No motors
4.4.2.6	Capacitors	X		No motors capacitors
4.4.2.7	Mains transformers attach drawing of mans Txs showing all protective devices	X		No mains transformers
4.4.2.8	Outputs	X		No outputs
4.4.2.9	Equipment for more than one supply	X		Supply by DC 12V battery
4.4.2.10	Cooling - air holes closed - fans stopped - coolant stopped	X		No cooling provisions
4.4.2.11	Heating devices - timer overridden - temperature controller overridden - loss of cooling liquid - overfilled or empty or both	X		No heating devices
4.4.2.12	Insulation between circuits and parts		X	See appendix table 4.4
4.4.2.13	Interlocks	X		No interlocks
4.4.2.14	Voltage selectors	X		No voltage selectors
Note: see appendix table 4.4 for details of tests				

4.4.	TABLE: Testing in single fault conditions- Results				P
Test subclause	Fault No.	Fault description	Td 4.4.3	Comments	Meets 4.4.4
4.4.2	1	D1 S-C	10 minutes	Error information warning, no hazards	P
	2	R19 S-C	10 minutes	Error information warning, no hazards	P
	3	D3 S-C	10 minutes	Error information warning, no hazards	P
	4	Battery polarity “+”, “-“ S-C	10 minutes	No fire, explosion or leakage observed after the test.	P
	5	Q2pin1-3 S-C	10 minutes	Down to 8.3 A, can return, no hazards	P
Supplementary information: S-C= short-circuit					

5.3.	TABLE: Durability of markings	P
Marking method(see Note)		Agent
1) Label material		A Water
2) Fixing (molded)		B Isopropyl alcohol
3) Print		C (Specify agent)
Note: Where applicable include print method, label material, link or paint type, fixing method, adhesive and surface to which marking is fixed.		
Marking location		Marking method (see above)

Identification (5.1.2)	1), 3)
Mains supply (5.1.3)	N/A
Fuses (5.1.4)	N/A
Terminals and operating devices (5.1.5.1)	2)
Measuring circuit terminals (5.1.5.2)	2), 3)
Switches and circuit breakers (5.1.6)	N/A
Double/Reinforced equipment (5.1.7)	2)
Field wiring terminal boxes (5.1.8)	N/A
Warning marking (5.2)	1), 2)
Battery charging (13.2.2)	Non-chargeable battery used

Method	Test agent	Remains legible	Label loose	Curled edges	Comments
		Verdict	Verdict	Verdict	--
1/2/3	A/B	P	P	P	Clearly legible

Supplementary information:

6.	TABLE: Protection against electric shock- Block diagram of system form								P
Pollution degree: 2			Measurement category(overvoltage category): CATII, 250V						
Location or	Insulation type	Maximum working	Creepage distance (Note 3)				Clearance (Note 3)	Test voltage	Comments
Description	(Note 1)	Voltage (Note 2)	PWB mm	CTI	Other mm	CTI	mm	(Note 2) V	Required Cl. & Cr.
Between live parts in V, COM or A to accessible edge	BI	250Vac	--	--	12.0	<400	11.2	1500Vrms	Cl.=1.01mm Cr.=5.0mm
Between live parts in V and parts of COM under rotary switch	BI	250Vac	--	--	6.2	<400	5.5	1500Vrms	Cl.=1.01mm Cr.=5.0mm
Between live parts and enclosure edge	RI	250Vac	--	--	13.1	<400	12.1	2400Vrms	Cl.=2.5mm Cr.=10.0mm
Between live parts to fixing Screw for enclosure	RI	250Vac	--	--	12.2	<400	11.1	2400Vrms	Cl.= 2.5mm Cr.=10.0mm
Between probe tip and handheld part	RI	250Vac	--	--	27.8	<400	27.0	2400Vrms	Cl.= 2.5mm Cr.=10.0mm

Between live part inside probe and handheld part	RI	250Vac	--	--	17.5	<400	16.4	2400Vrms	Cl.= 2.5mm Cr.=10.0mm

NOTE 1-Type of insulation:
BI=BASIC INSULATION
DI=DOUBLE INSULATION
FROM PI=PROTECTIVE IMPEDANCE
"COMMENTS" RI=REINFORCED INSULATION
SI=SUPPLEMENTARY INSULATION

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

NOTE 3-INSTALLATICN CATEGCRIES
(OVERVCL TAGE CATEGORIES)
or POLLUTION DEGREES WHICH DIFFER
THESE SHOULD BE SHOWN UNDER

Supply mentary information:
The internal working voltage will not more than 250V under normal operation.

6.2	TABLE: List of ACCESSIBLE parts		P
6.1.2	Exceptions	Battery,Probe tip	--
6.2	Determinnation of accessible parts		--
Item	Description	Determination method(NOTE 5)	Exception under 6.1.2(NOTE 4)
1	Enclosure	V,R,J	N/A
2	Scale panel	V,R,J	N/A
3	Function selection switch	V,R,J	N/A
4	Insulation part of measuring terminal		N/A
5	Probe cable	V,R	N/A
6	Probe handheld part	V,R,J	N/A
7	Battery(accessible part after open of the compartment with a screw driver)	-	Exception in 6.1.2 b of EN 61010-1
8	Probe tip	-	Exception in 6.1.1 b of EN 61010-031

NOTE 1 – Test fingers and pins are to be applied without force unless a force is specified(see 6.32.1) 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 Form A.7)
NOTE 4 – Capacitor test may be required(see Form A 7). NOTE
5 – The determination methods are:
V=visual; R=rigid test finger; J=jointed test finger;P3=pin 3 mm diameter; P4=pin 4mm diameter.

Supplementary information:
* see sub-clause 6.1.2 b)

6.7	TABLE:CLEARANCES and CREEPAGE DISTANCES	P
8	Mechanical resistance to shock and impact	P
10.5.1	Integrity of CLEARANCES and CREEPAGE DISTANCES	P

Location	Measured (initial-6.7)		Verdict	Mechanical tests(note)					Test at max	Measured after test (if required)		Verdict	
	Creepage distance	clearance		Applied force	Rigidity (8.1)		Drop (8.2)		Rated ambient	Creepage distance	clearance		Comments
	mm	mm		(6.7)N	Static	Dynamic	Normal	Hand-held/plug-in	(10.5.1)	mm	mm		

Between live parts in V, COM or A to accessible edge	12.0	11.2	P	10N	30N	-	-	1m	40℃	12.0	11.2	P
Between parts of V and parts of COM under rotary switch	6.2	5.5	P	10N	30N	-	-	1m	40℃	6.2	5.5	P
Between live parts and enclosure edge	13.1	12.1	P	10N	30N	-	-	1m	40℃	13.1	12.1	P
Between live parts to fixing Screw for enclosure	12.2	11.1	P	10N	30N	-	-	1m	40℃	12.2	11.1	P
Between probe tip and handheld part	27.8	27.0	P	10N	30N	-	-	1m	40℃	27.8	27.0	P
Between live part inside probe and handheld part	17.5	16.4	P	10N	30N	-	-	1m	40℃	17.5	16.4	P
NOTE – Refer to table 6.8 for dielectric strength tests following the above tests.												
Supplementary information :												

6.8	TABLE: Dielectric strength tests		P
4.4.4.1 b)	Conformity after application of fault conditions		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		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		P
11.3	Spillage		N/A
11.4	Overflow		N/A
11.6	Specially protected equipment		P
Record the fault, tests or treatment applied before the dielectric strength test			
	Test site altitude……..:	Up to 2000m	--
	Test voltage correction factor(see Table	1	--

	10)..					
Location or references	Clause or sub-clause	Humidity Yes/No	Working Vlotage V	Test voltage r.m.s/peak/d.c V	Comments	Verdict
Measuring Circuit -Enclosure	6.5.2	Yes	250Vac	1500x1.6 =2400Vrms	Enclosure rated Reinforced Insulation	P
Measuring Circuit -Cable of probe Assembly	8	No	250Vac	1500x1.6 =2400Vrms	Cable with Reinforced Insulation	P
Measuring circuit -Handheld part of probe Assembly	6.6.1	No	250Vac	1500x1.6 =2400Vrms	Enclosure of the Probe with reinforced insulation	P
Live parts inside unmated terminal -Accessible parts	6.5.2	No	250Vac	1500Vrms	Basic insulation through air	P
Measuring circuit -Battery Compartment Edge	6.5.2	Yes	250Vac	1500x1.6 =2400Vrms	Enclosure of Battery Compartment with reinforced Insulation	P
V and COM	6.6.1	No	250Vac	1500Vrms	Rotery switch set At 'V' position	P

6.8	TABLE: Dielectric strength tests					P
The soldering point between R25 to COM	6.6.1	No	250Vac	1500Vrms	Rotary switch Set at 'V' position	P
Supplementary information :						

9	TABLE: Protection against the spread of fire			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	Measuring circuit	9c	Insulated wire of VW-1,PCB of V-0, Enclosure of V-0,insulation of probe assembly:V-0,Terminal insulation of V-0	P
2	Battery	9c	Battery compartment material of V-0	P
3	Other circuit on PCB	9c	PCB of V-0,enclosure of V-0	P
Supplementary information:				

9.2.1	TABLE: Construction requirements		P
14.8	Printed circuit boards	See supplementary insulation	P
Material tested			--
Generic name			--
Material manufacturer			--

Type				--
Colour				--
Conditioning details				--
		Sample 1	Sample 2	Sample 3
Thickness of specimen	mm			
Duration of flaming after first Application	s			
Duration of flaming plus glowing After Second application	s			
Specimen burns to holding clamp	Yes/No			
Cotton ignited	Yes/No			
Sample result	Pass/Fail			
Supplementary information: PCB rated V-0				

10.	TABLE: Temperature Measurements	P
10.1	Surface temperature limits – NORMAL CONDITION and/or SIGNLE FAULT CONDITION	P
10.2	Temperature of winding –NORMAL CONDITION and /or SIGNLE FAULT CONDITION	N/A
10.3	Other temperature measurements	P

Operating conditions	Load: t the multimeter measuring the current 10A for 10s every each 15minutes According to the instruction specified by the manufacturer.				
Frequency	-- Hz	Test room ambient temperature(t)		23.9°C	
Voltage	-- V	Test duration……		1 h 45min.	
Part/Location	tm °C	tc °C	T max °C	Verdict	Comments
Enclosure(inside)	29.9	44.4	80	P	Rated 80°C
Enclosure(outside)	29.5	44	80	P	Limit of non-metallic Enclosure:80°C
Switch wheel	29.5	44	70	P	Limit of non-metallic Handle:70°C
Battery body	29.6	44.1	--	P	For reference
display panel	29.3	43.8	80	P	Limit of non-metallic Enclosure:80°C
PCB near PTC	30.1	44.6	130	P	Rated 130°C
Connector of probe assembly	29.3	43.8	70	P	Limit of non-metallic material:70°C
Cable of probe	29.7	44.2	80	P	Rated 80°C
Handheld part of probe	29.2	43.7	70	P	Limit of non-metallic Material:70°C
Ambient	25.5	40.0	--	P	--

NOTE 1 - tm = measured temperature
tc = tm corrected (tm–ta+ 40 °C or max. RATED ambient)
tmax = 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

Supplementary information:

10.5.2	TABLE: Resistance to heat of non-metallic enclosure		P
	Test method used:		--
	Non operative treatment	[ ]	P
	Empty ENCLOSURE	[ ]	P
	Operative treatment	[ ]	N/A
	Temperature during tests	70°C	--
	ENCLOSURE samples tested were		--

Description	Material	Comments	Verdict
Enclosure	Type: PA765A(+)	After treatment at	P

		70℃For 7h,passed cl.8.1.1,8.2&6.8			
	Dielectric strength test(6.8)	2400	V	r.m.s/peak/d.c	P
Supplementary information:					

8	TABLE: Mechanical resistance to shock and impact		P
11	Protection against hazards from fluids		P

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	Static	Dynamic	Normal	Hand held Plug-in	Cleaning (11.2)	Spillage (11.3)	Overflow (11.4)	IEC 60529 (11.6)	Working Voltage V	Test Voltage V	Verdict	comments
Enclosure	30N Φ12 mm	--	--	1m	--	--	--	--	250Vac	2400 V r.m.s	P	Handheld equipment
Probe assembly	20N Φ12 mm	--	--	1m	--	--	--	--	250Vac	2400 V r.m.s	P	Tested according to EN61010-031 c l,8.1,8.2 and 8.3

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

Supplementary information:

Table: Equipment list

Test procedure	Test equipment	Model
Marking test	Petroleum spirit, Water, Piece of cloth	
	MT-E055 Stop Watch	PC396
Normal Operation	MT-E001 Digital Power Meter;	2102C
	MT-E073 Frequency conversion Power Supply;	WEW-1010
Temperature rise measurements	MT-E001 Digital Power Meter;	2102C
	MT-E004 Hybrid Recorder(20CH);	DR130
	MT-E073 Frequency conversion Power Supply;	WEW-1010
Hygroscopic materials	MT-E080 Programmable temp. /Humi. Chamber;	GDS-408
	MT-E006 Withstanding Voltage tester	CS2672C
Dielectric Strength Test for insulation material	MT-E076 Digital Caliper;	G07001155
External forces, windows etc.	MT-E089 Push-Pull Scale;	SKN-1
	MT-E055 Stop Watch	PC396
External forces, covers	MT-E089 Push-Pull Scale;	SKN-1
	MT-E055 Stop Watch	PC396
Internal forced	MT-E089 Push-Pull Scale;	SKN-1
	MT-E055 Stop Watch	PC396
Endurance test for wound components	MT-E012 Oven Chamber	CS101-2A
	MT-E080 Programmable temp. /Humi. Chamber;	GDS-408
	MT-E067 Vibration generator;	LD-F
	MT-E073 Frequency conversion Power Supply;	WEW-1010
Shock Hazard Under Normal Operating Conditions	MT-E066 touch current tester	410B
Accessibility	MT-E026 Test Finger;	--
	MT-E094 UL test finger;	ULZ-1
	MT-E083 Child test finger;	WZ-2
	MT-E084 Child test finger;	WZ-1
Openings in the enclosure	MT-E050 Test Probe	Probe 3-1

Terminals	MT-E049 Test Probe	Probe 3-3
Pre-set controls	MT-E048 Test Probe	Probe 3-2
External Force Test to Enclosure	MT-E025 Test Finger;	--
	MT-E086 Test hook;	SG-1

Table: Equipment list

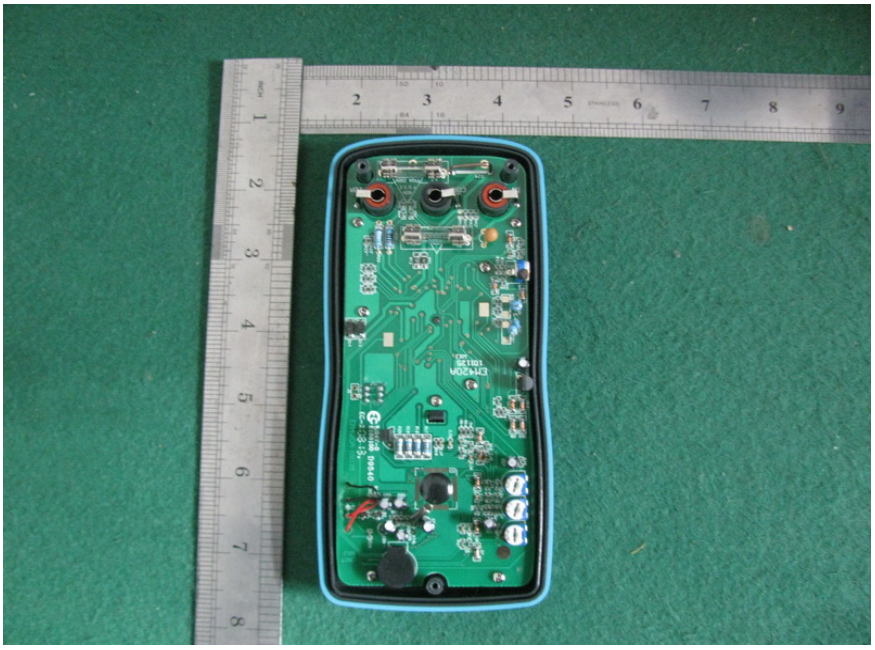
Test procedure	Test equipment	Model
Surge Test	MT-E054 Surge Tester	1065A
Humidity Test	MT-E080 Programmable temp. /Humi. Chamber;	GDS-408
Insulation Resistance and Dielectric Strength	MT-E011 Insulation Resistance meter;	YD2681A
	MT-E006 Withstanding Voltage tester	CS2672C
Heating Under Fault Conditions	MT-E001 Digital Power Meter;	2102C
	MT-E073 Frequency conversion Power Supply;	WEW-1010
Vibration Test	MT-E067 Vibration generator	LD-F
Impact Test	MT-E019 Impact hammer;	CJ-2
	MT-E021 Steel ball;	--
	MT-E032 Measure tape	J19-50
Drop Test	Hard wood 13mm on 19mm to 20mm plywood, two layers	--
	MT-E032 Measure tape	J19-50
Clearances and Creepage distances	MT-E076 Digital Caliper;	G07001155
Operating voltage measurement	MT-E131 Digital Oscilloscope;	TDS1012B
	MT-E144 Oscilloscope Probes	HP-9258
Jointed Insulation	MT-E012 Oven Chamber;	CS101-2A
	MT-E080 Programmable temp. /Humi. Chamber;	GDS-408
Protective devices	MT-E012 Oven Chamber;	CS101-2A
	MT-E011 Insulation Resistance meter;	YD2681A
	MT-E006 Withstanding Voltage tester	CS2672C
Grounding Path Test	MT-E010 Ground Continuity Tester	9611C
Tests for Devices Forming a Part of Mains Plug	MT-E097 Power supply plug set test platform;	940A
	MT-E033 Torque Driver;	RTD120CN
	MT-E089 Push-Pull Scale;	SKN-1
Flexible Cord Strain Test	MT-E089 Push-Pull Scale;	AP-30
Screw Securement Test	MT-E033 Torque Driver;	RTD120CN
Stability Test on the 10° plane	MT-E035 Inclined plane	--
Tip Stability Test with Horizontal Force	MT-E035 Inclined plane	--
Pre-conditioning of printed circuit boards	MT-E012 Oven Chamber;	CS101-2A
	MT-E125 Needle Flame Test Set	ZY-2

Photos of Sample

Front and Rear views

Photos of Sample

Main Board and Warning views



Photos of Sample

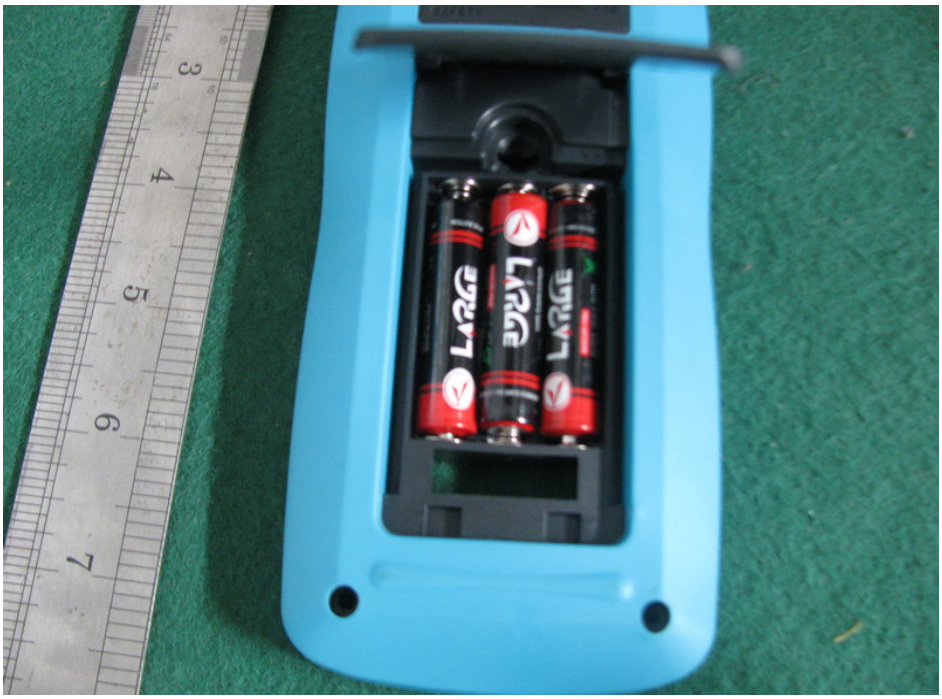
Detail views

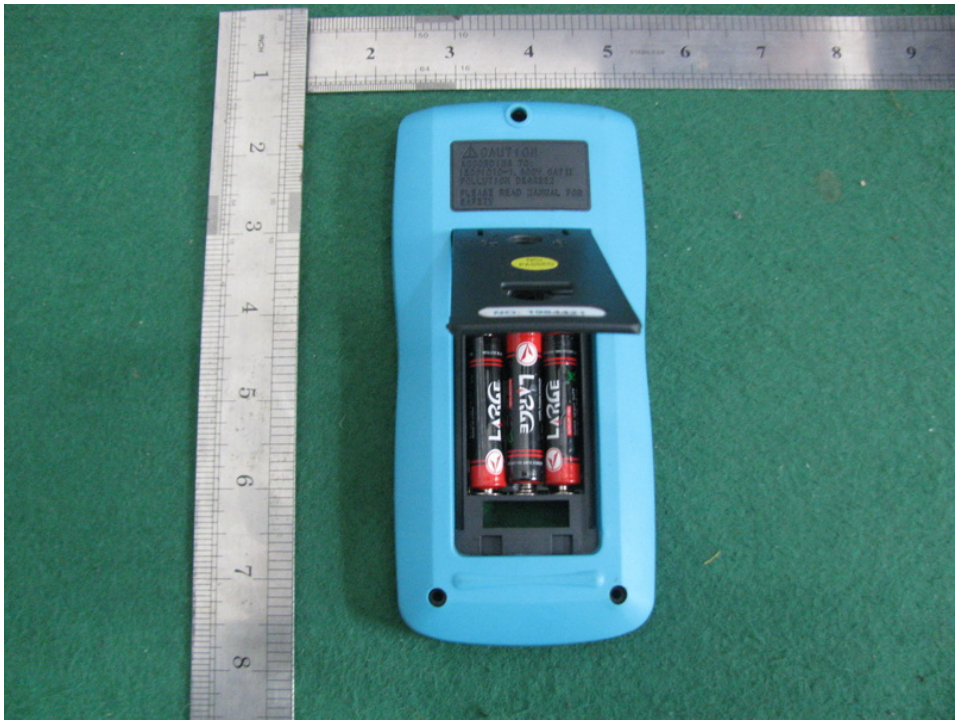

CAUTION


EM420A
CE
FUSED 10A MAX
15sec MAX
EACH 15min
FUSED
MAX 250V
MAX 200mA
10A
COM
INPUT
CAT II
250V

Photos of Sample

Battery views





****END OF REPORT****

EC Declaration of conformity

Council Directive 2006/95/EC on Low Voltage Directive

Applicant: EASTERN TECHNOLOGY GROUP (ZHANGZHOU) CO.，LTD
Jinfeng Industrial District,Zhang Zhou ,Fujian P.C,:363000

Manufacturer: ZHANG ZHOU EASTERN INTELLIGENT METER CO., LTD
Eastern Industrial Park, Jintang Road, Jinfeng Economic Development Zone, Xiangcheng District, Zhangzhou, Fujian, China

Certify that the product described is in conformity with the Directive 2006/95/EC as amended

Product Name: AUTO RANGE DIGITAL MULTIMETER
Item No: EM420A ,EM420B,EM420C

The product has been assessed by the application of the following standards:

EN 61010-1: 2010;
EN 61010-2-030:2010;
EN 61010-031:2002+A1:2008

Issue place and date

Company stamp and Signature of authorized personnel

Notice

1. This test report shall be invalidation without the cachet of the testing laboratory.
2. This copied report shall be invalidation without sealed the cachet of the testing laboratory.
3. This report shall be invalidation without tester signature, reviewer signature and approver signature.
4. This altered report shall be invalidation.
5. Client shall put forward demurrer within 15days after received report. The testing laboratory shall refuse disposal if exceeded the time limit.
6. The test results presented in this report relate only to the object tested.