

C E R T I F I C A T E



of Conformity
Low Voltage Directive 73/23/EEC
as last amended by EEC Directive 93/68/EEC

Registration No.: AN 50028782 0001

Report No.: 14001600 001

Holder: Precision Mastech Enterprises Co.
Room 1709, Hewlett Centre
52 Hoi Yuen Road
Kwun Tong, Kowloon
Hong Kong

Product: Widerstandsmessgerät
(Digital Insulation Tester)

Identification: MS5201
(refer to Report 14001600 001 for detailed list)

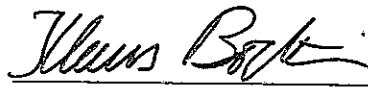
Serial no. : n.a.
Tested acc. to : EN 61010-1:2001
EN 61010-2-31:2002

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all revision of Annex I of Council Directive 73/23/EEC, in its latest amended version, referred to as the Low Voltage Directive. This certificate does not imply assessment of the series-production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex III of the Directive.



Cologne, 08.07.2003

Certification Body


Dipl.-Ing. K. Bodenstein

TÜV Rheinland Product Safety GmbH - Am Grauen Stein - D-51105 Köln

CE The CE marking may be used if all relevant and effective EC Directives are complied with. CE



TEST REPORT

**EN 61010-1 / EN 61010-2-31
Safety requirements for electrical equipment for measurement,
control, and laboratory use
Part 1: General requirements**

**Part 2-31: Safety requirement for hand-help probe assemblies for electrical
measurement and test (page 63-68)**

Report Reference No. : 14001600 001

Tested by (name and signature)..... : See page 1

Approved by (name and signature) ... : See page 1

Date of issue : See page 1

Testing Laboratory : TÜV Rheinland Hong Kong Ltd.

Address..... : Room 405, 4/F., Tech Centre, 72 Tat Chee Avenue, Kowloon, Hong Kong.

Testing location/procedure : CBTL SMT TMP

Address..... : Same as above

Applicant's name : See page 1

Address..... : See page 1

Test specification:

Standard : EN 61010-1: 2001 & EN 61010-2-31: 2002

Test procedure..... : LVD Approval

Non-standard test method : N.A.

Test Report Form No : EN61010_C

TRF Originator : VDE

Master TRF : Dated 01-07-27

Copyright © 2001 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test item description..... : Digital Insulation Tester

Trademark : MASTECH

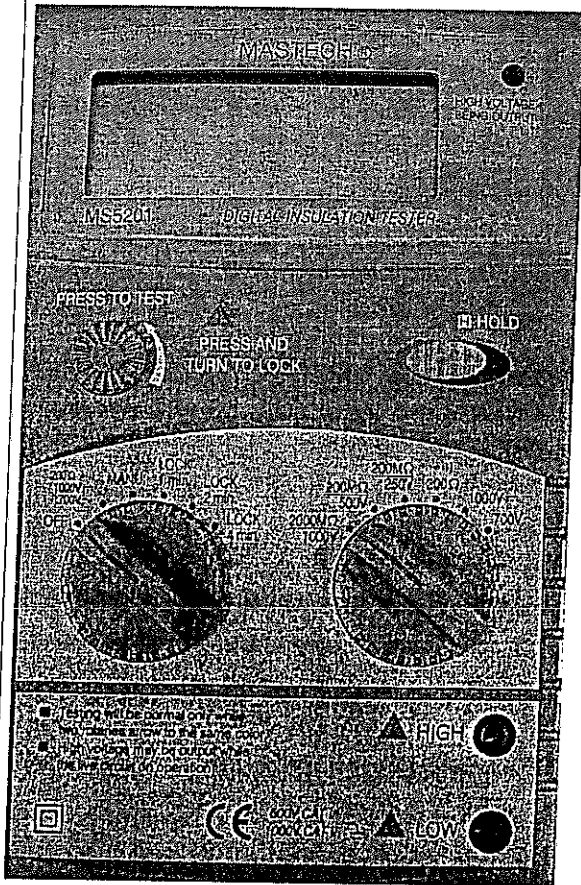
Model and/or type reference : MS5201

Manufacturer : Shenzhen Huayi Mastech Co., Ltd.
Address: East Wing 8/F, Block 4, Saige Science and Technology
Industrial Garden Hua Qiang Bei Road, Shenzhen.

Rating(s) : 9 V d.c. (6 pieces of 1,5V AA sizes batteries)



Copy of marking plate:



Summary of test results (information/comments):

Refer to test report

TABLE: 1 - Documents attached to this report		
Document No.	Document description	Page Numbers
Yes (6 pages of equipment list in the end of test report)		

See TÜV Rheinland Hong Kong Ltd Equipment List

TABLE: 2 - Test equipment list					
Item	Type	Equipment No.	Calibration date		Comments
			Last ¹⁾	Due	
Attached with 6 pages of equipment list on last of test report.					
1) or interval between calibrations.					



EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
5	MARKING AND DOCUMENTATION		P
5.1.1	General		P
	Required equipment markings are:		P
	visible:	Marking for Double insulation, caution, CE, earth terminal, HIGH and LOW are mark on apparatus surface.	P
	From the exterior; or		P
	After removing a cover; or	After removing the battery compartment cover: battery type; voltage; polarity indication can be seen.	P
	Opening a door		N
	After removal from a rack or panel		N
	Not put on parts which can be removed by an OPERATOR		P
	Letter symbols (IEC 60027) used	Symbol 1, 2, 5, 11 and 14 used.	N
	Graphic symbols (IEC 61010-1: Table 1) used	Alternating current, Direct current, earth terminal and caution (risk of danger) symbol is used. Refer to rating label	P
5.1.2	Identification		P
	Equipment is identified by:		P
5.1.2a)	Manufacturer's or supplier's name or trademark	Trademark: MASTECH	P
5.1.2b)	Model number, name or other means	MS5201 marked on surface of apparatus.	P
	Manufacturing location identified	Single manufacturing location, see user manual last page.	N
5.1.3	Mains supply	Not operated by AC mains	N
	Equipment is marked as follows:	Ditto	N
5.1.3a)	Nature of supply:	DC	N
	1) a.c. RATED mains frequency or rangeof frequencies		N





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
5.1.5.1b)	PROTECTIVE CONDUCTOR TERMINALS:		N
	Symbol 6 is placed close to or on the TERMINAL; OR		N
	Part of appliance inlet		N
5.1.5.1c)	TERMINALS of measuring and control circuits (symbol 7 used)		N
5.1.5.1d)	HAZARDOUS LIVE TERMINALS supplied from the interior		N
	Standard MAINS socket outlet; or		N
	RATINGS marked; or		N
	Symbol 14 used	Marked on panel below the terminals	P
5.1.5.1e)	ACCESSIBLE FUNCTIONAL EARTH TERMINALS:		N
	Self-evident; or		N
	Indication (symbol 8 acceptable)		N
5.1.5.2	Measuring circuit TERMINALS		P
	For TERMINALS other than those permanently connected and not ACCESSIBLE:		N
	RATED voltage or current marked	Rated voltage (1000V d.c. and 600V a.c.) marked near measuring terminals	P
	Unless clear indication that below limits:		N
	Maximum RATED voltage to earth is marked; or		N
	For specific connection to other equipment TERMINALS only, and means for identifying provided		N
	Appropriate measurement category marked (CAT II, CAT III or CAT IV); or	CAT II, CAT III and symbol 14 marked near measuring terminals	P
	No measurement category marked (CAT I)		N
	Required markings are adjacent to TERMINALS; OR	Adjacent to TERMINALS	P
	If insufficient space:		N
	On the RATING plate or scale plate; or		N





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
5.4.1a)	Intended use		P
5.4.1b)	Technical specification		P
5.4.1c)	Instructions for use		P
5.4.1d)	Name and address of manufacturer or supplier	Manufacturer name and address are marked on last page inside user manual	P
5.4.1e)	Information specified in 5.4.2 to 5.4.5		P
5.4.1f)	If marking of TERMINALS required, definition of measurement category		N
5.4.1g)	If CAT 1:		N
	Warning		N
	RATINGS		N
	Warning statements and a clear explanation of warning symbols:		N
	Provided in the documentation; or		N
	Information is marked on the equipment		N
5.4.2	Equipment RATINGS		P
	Documentation includes:		P
5.4.2a)	Supply voltage or voltage range		P
	Frequency or frequency range	d.c.	N
	Power or current RATING		N
5.4.2b)	Description of all input and output connections	Measuring probe terminal has colour and letter indication (HIGH, LOW) and explain in user manual	P
5.4.2c)	RATING of insulation of external circuits, when such circuits are nowhere ACCESSIBLE		N
5.4.2d)	Statement of the range of environmental conditions		P
5.4.2e)	Degree of protection (IEC 60529)		N
5.4.3	Equipment installation		P
	Documentation includes instructions for:		P
5.4.3a)	Assembly, location and mounting		P
5.4.3b)	Protective earthing		N
5.4.3c)	Connections to supply		N





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
	Any manufacturer specified parts		N
	RATING and characteristics of fuses		N
6	PROTECTION AGAINST ELECTRIC SHOCK	(see Form A.5)	P
6.1	General		P
6.1.1	Requirements		P
	ACCESSIBLE parts not HAZADOUS LIVE in NORMAL CONDITION and SINGLE FAULT CONDITION	All accessible parts are below SELV, no hazard to user.	P
	Conformity is checked by the determination of 6.2 and 6.3 followed by the tests of 6.4 to 6.11	For test leads probe tips, see appended report in page 63-68	P
6.1.2	Exceptions		N
	Capacitance test	(see Forms A.6 and A.7)	N
	Parts not HAZARDOUS LIVE 10 s after interruption of supply	(see Forms A.6 and A.7)	N
6.2	Determination of ACCESSIBLE parts	(see Form A.6) For test leads probe tips, see appended report in page 63-68	P
6.2.1	General examination	(see Form A.6)	P
6.2.2	Openings above parts that are HAZARDOUS LIVE	Not parts are hazardous live, not test with terminal.	P
6.2.3	Openings for pre-set controls	Not present control	N
6.3	Permissible limits for ACCESSIBLE parts		N
6.3.1	Values in NORMAL CONDITION	Enclosure measured 0V, except probe tips.	P
6.3.2	Values in SINGLE FAULT CONDITION	Enclosure measured 0V, except probe tips.	P
6.4	Protection in NORMAL CONDITION (see 6.2, 6.3.1, 6.7, 6.8 and 8.1)	All circuits inside the apparatus are enclosed by the enclosure by reinforced insulation. See clause 6.8 and 8.1	P
6.5	Protection in SINGLE FAULT CONDITION	(see Form A.2)	P
	Additional protection is provided by:		N
	One or more of 6.5.1 to 6.5.3; or		N
	Automatic disconnection of the supply (6.5.4)		N
6.5.1	Protective BONDING		N





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
6.5.1.2c)	For rewirable cords and PERMANENTLY CONNECTED EQUIPMENT, PROTECTIVE CONDUCTOR TERMINAL IS close to MAINS supply TERMINALS		N
6.5.1.2d)	If no MAINS supply is required, any PROTECTIVE CONDUCTOR TERMINAL:		N
	Is near TERMINALS of circuit for which protective earthing is necessary		N
	External if other TERMINALS external		N
6.5.1.2e)	Equivalent current-carrying capacity to MAINS supply TERMINALS		N
6.5.1.2f)	If plug-in, makes first and breaks last		N
6.5.1.2g)	If also used for other bonding purposes, protective conductor:		N
	Applied first;		N
	Secured independently;		N
	Unlikely to be removed by servicing; or		N
	Warning marking requires replacement of protective conductor		N
6.5.1.2h)	Protective conductor of measuring circuit:		N
	1) Current RATING;		N
	2) PROTECTIVE BONDING:		N
	Not interrupted; or		N
	Indirect bonding used (see 6.5.1.5)		N
6.5.1.2i)	FUNCTIONAL EARTH TERMINALS allow independent connection		N
6.5.1.2j)	If a binding screw:	No such screw used.	N
	Suitable size for bond wire		N
	Not smaller than M 4 (No. 6)		N
	At least 3 turns of screw engaged		N
	Contact pressure not capable of reduction by deformation of materials		N
	Passes tightening torque test		N
6.5.1.3	Impedance of PROTECTIVE BONDING of plug-connected equipment		N
6.5.1.4	Bonding impedance of PERMANENTLY CONNECTED EQUIPMENT		N



EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
	Not ACCESSIBLE if connected; or		N
	Unmated HAZARDOUS LIVE TERMINALS not ACCESSIBLE ; or		N
	marked with symbol 12		N
6.6.3	Circuits with TERMINALS which are HAZARDOUS LIVE		N
	These circuits are:		N
	Not connected to ACCESSIBLE conductive parts; or		N
	Connected to ACCESSIBLE conductive parts, but are not MAINS CIRCUITS and have one TERMINAL contact at earth potential		N
	No ACCESSIBLE conductive parts are HAZARDOUS LIVE		N
6.6.4	ACCESSIBLE TERMINALS for stranded conductors		N
6.6.4a)	No risk of accidental contact because:		N
	Located or shielded		N
	Self-evident or marked whether connected to ACCESSIBLE conductive parts		N
6.6.4b)	ACCESSIBLE TERMINALS will not work loose		N
6.7	CLEARANCES and CREEPAGE DISTANCES	(See Form A.5 and A.13)	P
6.8	Procedure for dielectric strength tests	(See Form A.5 and A.14)	P
6.9	Constructional requirements for protection against electric shock		P
6.9.1	General	Not possible	N
	If a failure could cause a HAZARD:	Not possible	N
6.9.1a)	Security of wiring connections	No wiring inside apparatus	N
6.9.1b)	Screws securing removable covers	Not possible	N
6.9.1c)	Accidental loosening	Not possible	N
	Easily damaged materials not used		N
	Non-impregnated hydroscopic materials not used		N
6.9.2	ENCLOSURES of equipment with DOUBLE INSULATION or REINFORCED INSULATION	Enclosure is reinforced insulation.	P
	ENCLOSURE surrounds all metal parts except for small metal parts which are separated	All electronics circuit is surround by enclosure.	P
	ENCLOSURES or parts made of insulating material	Enclosure is insulating material.	P



EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
	1) Clamps all types and sizes of MAINS cords; and		N
	2) Is suitable:		N
	For connection to TERMINALS provided; or		N
	It is designed for screened MAINS cord		N
6.10.2f)	Cord replacement does not cause a HAZARD and method of strain relief is clear		N
	Push-pull test	(see Form A.15)	N
6.10.3	Plugs and connectors	Tester is supply by d.c. (Battery)	N
6.10.3a)	MAINS supply plugs, connectors etc., conform with relevant specifications		N
6.10.3b)	If equipment supplied at voltages below 6.3.2.a) or from a sole source:		N
	Plugs of supply cords do not fit MAINS sockets above RATED supply voltage		N
	MAINS-type plugs used only for connection to MAINS supply		N
6.10.3c)	Plug pins which receive a charge from an internal capacitor		N
6.10.3d)	Accessory MAINS socket outlets:	No such things	N
	1) Marking if accepts a standard MAINS plug (see 5.1.3e)		N
	2) Input has a protective earth conductor if outlet has earth TERMINAL contact		N
6.11	Disconnection from supply source		P
6.11.1	General	See § 6.11.1.1	N
	Disconnects all current carrying conductors		N
6.11.1.1	Exceptions	Low power supplied	P
6.11.1.1a)	Equipment supplied by low energy source; or	Apparatus is supply by 6 pieces 1.5V AA size batteries.	P
6.11.1.1b)	Equipment connected to impedance protected supply; or		N
6.11.1.1c)	Equipment constitutes an impedance protected load		N
6.11.2	Requirements according to type of equipment		N



EN 61010-1

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





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
9.2b)	Enclosure is conform with constructional requirements of 9.2.1; and		N
	Requirements of 9.4b) or c) are met		N
9.2.1	Constructional requirements		N
9.2.1a)	Insulated wires have flammability classification FV1 or better		N
	Connectors and insulating material have flammability classification FV2 or better		N
9.2.1b)	The enclosure is constructed as follows :		N
	1) Bottom constructed with:		N
	No openings; or		N
	Extent as specified in figure 7; or		N
	Baffles as specified in figure 6; or		N
	Perforated as specified in Table 12; or		N
	Metal screen with a mesh		N
	2) Sides have no openings as specified in figure 7		N
	3) Material of ENCLOSURE and any baffle or flame barrier is made of:		N
	Metal (except magnesium); or		N
	Non metallic materials have flammability classification FV1 or better		N
	4) ENCLOSURE and any baffle or flame barrier have adequate rigidity		N
9.3	Limited-energy circuit		N
9.3a)	Potential not more than 30 r.m.s. and 42.4 V peak, or 60 V dc		N
9.3b)	Current limited by one of following means:		N
	1) Inherently or by impedance; or		N
	2) Overcurrent protective device; or		N
	3) A regulating network limits also in SINGLE FAULT CONDITION		N
9.3c)	Is separated by at least BASIC INSULATION		N
	If overcurrent protective device used:		N
	Fuse or a non adjustable electromechanical device		N





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
	Limits not exceeded in:		P
	NORMAL CONDITION		P
	SINGLE FAULT CONDITION		P
10.3	Other temperature measurements	(see Form A.20A)	P
	Following measurements conducted if applicable:		P
10.3a)	Value of 60 °C of field-wiring TERMINAL box not exceeded		N
10.3b)	Surface of flammable liquids and parts in contact with this liquids		N
10.3c)	Surface of non-metallic ENCLOSURES		P
10.3d)	Parts made of insulating material supporting parts connected to MAINS supply		N
10.3e)	TERMINALS carrying a current more than 0.5 A		N
10.4	Conduct of temperature test	Equipment not intended to produce heat for voltage / resistance / continuity measurement. (See Form A20)	N
10.5	Resistance to heat		P
10.5.1	Integrity of CLEARANCE and CREEPAGE DISTANCES	(See Form A.13)	N
10.5.2	Non-metallic ENCLOSURES	Checked by non-operative treatment: 7hours at temperature of 70°C. (See Forms A.21)	P
	After treatment:	The equipment is no hazard and pass the test of 8.1.1 and 8.1.2	P
	No HAZARDOUS LIVE parts ACCESSIBLE;	No hazardous live part accessible, except test probe/clip (refer to clause 6.1.2)	P
	Tests of 8.1 and 8.2	(See Form A.13)	P
	In case of doubt, tests of 6.8 (without humidity preconditioning)		N





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
11.7.2	Leakage and rupture at high pressure	No fluids inside the appliance. (See Form A.24)	N
	Test to IEC 60335 (refrigeration only)		N
11.7.3	Leakage from low-pressure parts		N
11.7.4	Overpressure safety device		N
	Does not operate in NORMAL USE		N
	Meets ISO 4126-1; and		N
	It is conform with:		N
11.7.4a)	Connected as close as possible to parts intended to be protected		N
11.7.4b)	Easy access for inspection, maintenance and repair		N
11.7.4c)	Adjustment only with TOOL		N
11.7.4d)	No discharge towards person		N
11.7.4e)	No HAZARD from deposit of discharged material		N
11.7.4f)	Adequate discharge capacity		N
11.7.4g)	No shut-off valve between overpressure safety device and protected parts		N
12	PROTECTION AGAINST RADIATION, INCLUDING LASER SOURCES, AND AGAINST SONIC AND ULTRASONIC PRESSURE	No any radiation will emit from appliance.	N
12.1	General		N
	Equipment provides protection		N
12.2	Equipment producing ionizing radiation		N
12.2.1	Ionizing radiation		N
12.2.2	Accelerated electrons		N
12.3	Ultra-violet (UV) radiation		N
	No unintentional and HAZARDOUS escape of UV radiation		N
12.4	Micro-wave radiation		N
	Power density does not exceed 10 W/m ²		N
12.5	Sonic and ultrasonic pressure		N
12.5.1	Sound level		N
12.5.2	Ultrasonic pressure		N
12.6	Laser sources (IEC 60825-1)		N





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
	Single component failure		N
	Polarity reversal test	(See Form A.27)	P
13.2.3	Implosion of cathode ray tubes	No such item in appliance	N
	If maximum face dimensions > 160 mm		N
	Intrinsically protected and correctly mounted; or		N
	ENCLOSURE provides protection:		N
	If non-intrinsically protected:		N
	Screen not removable without TOOL		N
	If glass screen, not in contact with surface of tube		N
13.2.4	Equipment RATED for high pressure (See 11.7)		N
14	COMPONENTS	No danger is render because 9V d.c. batteries supply all the components inside the PCB. Also, the PCB and housing of tester are UL approved with flammability class V-0 and V-1 respectively.	P
14.1	General		N
	Where safety is involved, components meet relevant requirements		N
14.2	Motors	No motor	N
14.2.1	Motor temperatures		N
	Does not present a HAZARD when stopped or prevented from starting; or		N
	Protected by overtemperature or thermal protection device conform with 14.3		N
14.2.2	Series excitation motors		N
	Connected direct to device, if overspeeding causes a HAZARD		N
14.3	Overtemperature protection devices	No such device in appliance	N
	Devices operating in a SINGLE FAULT CONDITION		N
14.3a)	Reliable function is ensured		N
14.3b)	RATED to interrupt maximum current and voltage		N
14.3c)	Does not operate in NORMAL USE		N
14.4	Fuse holders		N





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

ANNEX F	ROUTINE TESTS	Not connected to main supply	N
	Manufacturer's declaration		N

4.4.2	TABLE: Summary of SINGLE FAULT CONDITIONS	Form A.1	P
-------	---	----------	---

Subclause	Title	Does not apply	Carried out	Comments
4.4.2.1	PROTECTIVE IMPEDANCE	X		
4.4.2.2	Protective conductor	X		
4.4.2.3	Equipment or parts for short-term or intermittent operation	X		
4.4.2.4	Motors	X		
4.4.2.5	Capacitors		X	See Form A.2
4.4.2.6	Mains transformers Attach drawing of MAINS TxS showing all protective devices (see Forms A.29 and A.30)	X		Transformer inside the tester is not directly connected to mains.
4.4.2.7	Outputs		X	Refer to clause 10.1 temperature measurement result, no hazard.
4.4.2.8	Equipment for more than one supply	X		
4.4.2.9	Cooling - air holes closed - fans stopped - coolant stopped	X X X X		
4.4.2.10	Heating devices - timer overridden - temperature controller overridden - loss of cooling liquid - overfilled or empty or both	X X X X X		
4.4.2.11	Insulation between circuits and parts		X	Reinforced insulation between circuits to parts (enclosure).
4.4.2.12	Interlocks	X		

List below all SINGLE FAULT CONDITIONS not covered by 4.4.2.1 to 4.4.2.12:

Clause 4.4.4.3, after 4.4.2.7 (Same as clause 10.1 "temperature measurement", Form A.20A, refer to it), criteria required by standard meet. Pass

Supplementary information:
(See Form A.2 for details of tests)





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

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

Pollution degree: 2 Installation category (overvoltage category).....: N

Location or Description	Insulation type (NOTE 1)	Maximum working Voltage (NOTE 2)	CREEPAGE DISTANCE (NOTE 3)				CLEARANCE (NOTE 3) mm	Test voltage (NOTE 2) V	Comments
			PWB mm	CTI	Other mm	CTI			
From test terminal (HIGH, LOW) to external accessible part	RI	1000Vd.c. ± 10% max. at output of test terminal (in insulation test mode)	See form A.13	175 (IIIb)	See form A.13	175 (IIIb)	See form A.13	7504V (1,6x4690V) peak a.c. and d.c. tested	Measurement category II and III
Between test terminal HIGH and LOW	BI	1000Vd.c. ± 10% max. at output of test terminal (in insulation test mode)	See form A.13	175 (IIIb)	See form A.13	175 (IIIb)	See form A.13	4690V peak a.c. and d.c. Tested	Test performed with capacitor CJ17, CJ18 disconnected Measurement category II and III
Live to probe body	RI	1000V d.c. or 700V a.c	---	---	---	---	---	7504V (1,6x4690V) peak a.c. and d.c. tested	Measurement category II and III

NOTE 1 – Type of insulation:
 BI = BASIC INSULATION
 DI = DOUBLE INSULATION
 PI = PROTECTIVE IMPEDANCE
 RI = Reinforced INSULATION
 SI = Supplementary INSULATION

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

NOTE 3 - INSTALLATION CATEGORIES (OVERVOLTAGE CATEGORIES) or POLLUTION DEGREES which differ from these should be shown under "Comments".

Supplementary Information:

Hand-help probe: -

- Test lead require RI
- Plug of test lead require BI



<14001600 001>

Page 36

EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

6	TABLE: Values in NORMAL CONDITION										Form A.7	P	
	6.1.1	Exceptions											
6.3.1	Values in NORMAL CONDITION (see NOTE 1)												
6.6.2	Terminals for external circuit												
6.10.3	Plugs and connections												
Item (see Form A.6)	Voltage			Current			Capacitance			10 s test (NOTE 2)		Comments	
	V r.m.s.	V peak	V d.c.	mA r.m.s.	mA peak	mA d.c.	µC	mJ	V	µC	mJ		
Housing of tester	0V	-	-	-	-	-	-	-	-	-	-	-	Pass
Measuring terminals (HIGH, LOW)	0V	-	-	-	-	-	-	-	-	-	-	-	Pass
Test leads	0V	-	-	-	-	-	-	-	-	-	-	-	Pass

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



EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

6.5.1.5	TABLE: Indirect bonding for measuring and test equipment		Form A.11	N
ACCESSIBLE part under test	Voltage attained s	Time for voltage to drop to allowable levels s	Verdict	
a) Voltage limiting device	—	—	—	

Supplementary Information:

ACCESSIBLE part under test	Voltage applied V	Time for device to trip s	Verdict	
b) Voltage-sensitive tripping device				

Supplementary Information:



Requirement - Test

Result - Remark

Verdict

Form A.13 P

TABLE: CLEARANCES and CREEPAGE DISTANCES

Mechanical resistance to shock and impact

Integrity of CLEARANCES AND CREEPAGE DISTANCES

Location (see Form A.5)	Measured CLEARANCE (Initial - 6.7)		Verdict	Mechanical tests (note)			Test at max. RATED ambient (10.5.1)	Measured after test (if required)		Verdict	Comments
	CREEPAGE DISTANCE mm	CLEARANCE mm		Applied force (6.7) N	Rigidity (8.1)	Drop (8.2)		CREEPAGE DISTANCE mm	CLEARANCE mm		
From test terminal (HIGH, LOW) live part to accessible part [Reinforced insulation]	18,2mm	18,2mm	Pass	Static	Dynamic	Normal	40°C	18,2mm	18,2mm	Pass	Measurement from measuring terminal to accessible part of enclosure: cr=d=18,2mm For working voltage 1000 Vd.c. max. under insulation test mode. - Clearance required: ≥ 10,5 mm (table 8, measurement category II or III) - Creepage required: ≥ 10,0 mm (table 7, on other circuits, pollution degree 2, material group IIIa-b) Internal to external enclosure in moulding: 9,5mm (creepage) Enclosure thickness: 4,2mm

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



EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

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





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

10.2	TABLE: Temperature of windings Resistance method Temperature Measurements	Form A.20B	N
4.4.2.6	MAINS Transformers (transformer not directly connected to mains)		N
14.2.1	Motor temperatures		N

Operating conditions:		
Frequency.....:	--- Hz	Test room ambient temperature (t_{a1}/t_{a2}) .. : / °C (initial / final)
Voltage	V	Test duration.....:

Part / Designation	R_{cold} Ω	R_{warm} Ω	Current A	t_r K	t_c °C	t_{max} °C	Verdict	Comments

NOTE 1- R_{cold} = initial resistance
 t_r = temperature rise
 t_{max} = maximum permitted temperature
 R_{warm} = final resistance
 $t_c = t_r$ corrected ($t_c = t_r - \{ t_{a2} - t_{a1} \} + [40 \text{ °C or max RATED ambient}]$)

NOTE 2 - Indicate insulation class (IEC 85) under comments (optional)

NOTE 3 - Record values for NORMAL CONDITION and / or SINGLE FAULT CONDITION in this Form use additional form if necessary

Supplementary information:



EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

10.5.3	TABLE: Insulating Materials	Form A.22	N
--------	------------------------------------	-----------	---

10.5.3a)	Ballpressure test		
----------	-------------------	--	--

	Max. allowed impression diameter	2 mm	—
--	--	------	---

Part	Test temperature °C	Impression Diameter (mm)	Verdict

Supplementary information:

10.5.3b)	Vicat softening test (ISO 306)		N
----------	--------------------------------	--	---

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

Supplementary information:



EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

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

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

Supplementary information:

11.7.3 Leakage from low-pressure parts N

Part	Test pressure MPa	Leakage YES / NO	Comments

Supplementary information:



EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

12.5.1 TABLE: Sound level Form A.26 N

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

Supplementary information:

12.5.2 Ultrasonic pressure N

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

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

Supplementary information:





EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

14.3	TABLE: Over temperature protection devices	Form A.28	N
------	--	-----------	---

Reliability test			
Component	Type (note)	Verdict	Comments

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

Supplementary information:



EN 61010-1

Clause	Requirement - Test	Result - Remark	Verdict
--------	--------------------	-----------------	---------

4.4.2.6	TABLE: Mains transformer		Form A.30	N
14.7.2	Overload tests (for mains transformers)			
Type..... :				—
Manufacturer				—
Test in equipment				
Test on bench				
Test repeated inside equipment (see 14.7)				
Optional – Insulation class (IEC 60085) of the lowest RATED winding				—
Winding identification				
Type of Protector for winding (Note 1)				
Elapsed time				
Current, A	primary			
	secondary			
Winding temperature, °C	primary			
	secondary			
Tissue paper / cheesecloth OK ? (Pass / Fail)				
Voltage tests (see Note 3)				
primary to secondary	_____ V _____			
primary to core	_____ V _____			
secondary to secondary	_____ V _____			
secondary to core	_____ V _____			
Verdict				
Note 1:	Primary fuse	- PF / () A		
	Secondary fuse	- SF / () A		
	Overtemperature protection	- OP / () °C		
	Impedance protection	- Z		
Note 2:	Indicate method of measurement	TC = with thermocouple R = resistance method		
	If resistance method is used, record resistance in cold and warm condition in Form A.20B!			
Note 3:	Record the voltage applied and the type of voltage (r.m.s. / d.c. / peak) and for results use NB = no breakdown or B = breakdown			
Supplementary information:				





EN 61010-1 / EN 61010-2-31

Clause	Requirement - Test	Result - Remark	Verdict
5.4	Documentation		P
5.4.1	a) technical specification		P
	b) Instruction for use		P
	c) Name or address of manufacturer for technical assistance	See EN 61010-1 report.	P
	d) Information specified in 5.4.2 to 5.4.4		P
5.4.2	Ratings	1000V, CAT III	P
5.4.3	Operation		P
	a) Identification of operating controls		P
	b) Instruction for interconnections		P
	c) Limits for intermittent operations		N
	d) Explanation of symbols used	Symbol 11, 14 used, See report EN 61010-1	P
	e) Instructions for replacement of consumables		N
	f) Measurement category		N
	g) For CAT I a warning shall be given not to use the equipment within the other measurement categories		N
	h) Instruction for cleaning if required	No cleaning required.	N
5.4.4	Maintenance	No maintenance required.	N
	Rating for fuses in the documents	No fuses	N

6	PROTECTION AGAINST ELECTRIC SHOCK		P
6.1.1	Exceptions: a) Parts intended to be replaced by the operator which may be hazardous live only with warning marking in accordance with 5.2 b) Probe tips which comply with 6.4.4	Probe tip meets 6.4.4	P
6.2	Determination of accessible parts		P
6.2.1	General examination	See report EN 61010-1	P
6.2.2	Openings for pre-set controls	No such parts	N





EN 61010-1 / EN 61010-2-31

Clause	Requirement - Test	Result - Remark	Verdict
	c) does not apply for screw type connectors were the current is limited by an protective impedance consisting of high integrity components		N
6.4.2	Hand-held parts other then connectors		P
	hand-held parts of probe assembly shall meet the requirements of DOUBLE or REINFORCED INSULATION	All hand-held parts are reinforced insulated	P
	-test voltage based on the RATED voltage	1000Vd.c. and 700Va.c.	P
	-type B assemblies' test voltage based on the RATED voltage but is not less than 500V	Type A assembly	N
	-type B assemblies' test voltage of the reference connector based on the Rated voltage of the assembly divided by the divider ratio, but is not less 500V		N
	-type C' test voltage for the reference connector based on the RATED voltage of its if the voltage level exceeds the levels of 6.3.1.1		N
6.4.3	Cables shall meet the requirements for DOUBLE or REINFORCED INSULATION based on ...		P
	...125V or the maximum Rated voltage of the assembly for type A	Type A, 1000Vd.c. and 700Va.c.	P
	... 500V or the Rated voltage of the assembly divided by the divider ratio for type B		N
	... 125V or the Rated voltage of the assembly divided by the divider ratio for type C		N
6.4.4	PROBE TIP		P
	barrier shall be fitted to provide a protective distance to the probe tip	Barrier provided to provide a protective distance to the probe tip (> 20mm)	P
	CLEARANCE and CREEPAGE between probe tip and the hand-held side	> 20mm	P
	except spring-loaded squeeze probes provided that:	No spring loaded probe assembly	N
	a) the spring loaded mechanism prevent the operator touching hazardous life parts		N
	b) CLEARANCE and CREEPAGE distance shall be 45mm longer than the required barrier		N



EN 61010-1 / EN 61010-2-31

Clause	Requirement - Test	Result - Remark	Verdict
7	PROTECTION AGAINST MECHANICAL HAZARDS		P
	Handling of PROBE ASSEMBLIES during normal use shall not lead to hazard (except PROBE TIPS)	No sharp edges or the like	P
8	MECHANICAL RESISTANCE TO SHOCK AND IMPACT		P
	After the tests of 8.1 to 8.3:	See report EN 61010-1	P
9	EQUIPMENT TEMPERATURE LIMITS AND PROTECTION AGAINST THE SPREAD OF FIRE		P
10	RESISTANCE TO HEAT		P
10.1	Integrity of clearance and creepage distances		P
10.2	Resistance to heat of PROBE ASSEMBLIES		P
	after the treatment, the PROBE ASSEMBLY shall cause no hazard and shall pass 6.6, 8.1, 8.2 and 8.3	All tests passed	P
11	PROTECTION AGAINST HAZARDS FROM FLUIDS		N
11.1	General		N
11.2	Cleaning	No cleaning with fluids	N
11.3	Specially protected probe assemblies		N
12	COMPONENTS		P
12.1	General		P
12.2	Fuses		N
12.3	High-integrity components		N
12.3.1	Resistors used in protective impedance		N



