TEST REPORT

UL 61010-1, Edition 3: 2012

Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

FOR

Zhuzhou Chenxin Induction Equipment Co.,LTD

4-2# Huijia Huanbao Industrial Park, Aviation Street, Lusong, Zhuzhou, Hunan

Model: HG<HG10-1Z1-W-450-Q>

2023-11-21

This Report Concerns:	**Equipment Type:**
☒ Original Report	IGBT power supply

Test Engineer:	Engine Chen / Engine Chen
Report Number:	TH2310260-C03-R01
Test Date:	2023-11-06 to 2023-11-21
Reviewed By:	Prince Huang / Prince Huang
Approved By:	Prince Huang / Prince Huang
Prepared By:	**Shenzhen Tian Hai Test Technology Co.,Ltd.** 4F, A3 BLDG, The Silicon Valley Power intelligent terminal industrial park, Guanlan street, Longhua district, Shenzhen Tel: +86-755-86615100 Fax:+86-755-86615105

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen Tian Hai Test Technology Co.,Ltd.

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Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements

Report Reference No.	TH2310260-C03-R01
Tested by (signature)	Engine Chen/
Reviewed by (signature)	Prince Huang/
Approved by (signature)	Prince Huang/
Date of issue	2023-11-21
Testing Laboratory Name	**Shenzhen Tian Hai Test Technology Co., Ltd.**
Address	4F, A3 BLDG, The Silicon Valley Power intelligent terminal industrial park, Guanlan street, Longhua district, Shenzhen
Testing location	Same as above
Applicant's Name	**Zhuzhou Chenxin Induction Equipment Co.,LTD**
Address	4-2# Huijia Huanbao Industrial Park, Aviation Street, Lusong, Zhuzhou, Hunan
Manufacturer's Name	**Shanghai Guolong Instrument Co., Ltd**
Address	4F, Building 36, No. 258 Xinzhuan Road, Songjiang High tech Park, Shanghai
Test specification	
Standard	UL 61010-1, Edition 3: 2012
Test procedure	N/A
Non-standard test method	N/A
Test item description	**IGBT power supply**
Trade Mark	--
Model and/or type reference	HG<HG10-1Z1-W-450-Q>
Rating(s)	Power :24VDC <0.5W; Input:50-300VAC Ph/N 87-520VAC Ph/Ph
Note	This test report is limited to the above client company and the product model (high temperature furnace CX-GF20/30VT) only.

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Test case verdicts

Test case does not apply to the test object ……: N/A(Not Applicable)

Test item does meet the requirement ……..: P(ass)

Test item does not meet the requirement……: F(ail)

Testing:

Date of receipt of test item……..: 2023-11-06

Date(s) of performance of test……..: 2023-11-06 to 2023-11-21

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(s) tested.

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

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

General product information:

/

Test conclusion:

The products are tested according to UL 61010-1, Edition 3: 2012.

Test result:

Pass

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UL 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
4	**Testing in SINGLE FAULT CONDITION (SFC)**		**P**
	Fault tests	Complied	P
	Application of SINGLE FAULT CONDITIONS	Complied	P
	SINGLE FAULT CONDITIONS not covered by 4.4.2.2 to 4.4.2.14		N/A
4.4.2.2	PROTECTIVE IMPEDANCE	Complied	P
4.4.2.3	PROTECTIVE CONDUCTOR	Complied	P
4.4.2.4	Equipment or parts for short-term or intermittent operations	No such device	N/A
4.4.2.5	Motors		N/A
4.4.2.6	Capacitors	Complied	P
4.4.2.7	Mains transformers	Complied	P
4.4.2.8	Outputs	Complied	P
4.4.2.9	Equipment for more than one supply		N/A
4.4.2.10	Cooling		N/A
4.4.2.11	Heating devices		N/A
4.4.2.12	Insulation between circuits and parts		N/A
4.4.2.13	Interlocks	Complied	P
4.4.2.14	Voltage selectors	Complied	P

5	**MARKING AND DOCUMENTATION**		**P**
5.1.1	Required markings are visible from the exterior, or		P
	Visible after removing a cover or opening a door, or		P
	Visible after removal from a rack or panel		N/A
	Required markings are not put on parts which can be removed by an OPERATOR		P
	Letter symbols (IEC 60027) used		P
	Graphic symbols (table 1) used		N/A
5.1.2	Identification; equipment is identified by:		P
	- manufacturer's name or registered trademark	Shanghai Guolong Instrument Co., Ltd	P

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UL 61010-1			
Clause	Requirement – Test	Result – Remark	Verdict
	- model number, name or other means	IGBT power supply	P
5.1.3	Mains supply		P
5.1.3 a)	Nature of supply:		P
	- a.c. RATED mains frequency or range of	~	P
	- d.c. with symbol 1		N/A
5.1.3 b)	RATED supply voltage(s) or range	Complied	P
5.1.3 c)	Maximum RATED power in W or VA, or		P
	- maximum RATED input current	Complied	P
	The measured value is not more than 110%	Complied	P
	More than one voltage range: separate values marked, or		N/A
	- values differ by less than 20%		N/A
5.1.4	Fuses		N/A
	Operator replaceable fuse marking		N/A
	Documentation gives details for fuses not replaceable by the OPERATOR		N/A
5.1.5	TERMINALS, connections and operating devices		P
5.1.5.1	Necessary identification for TERMINALS, connectors, controls and indicators		P
	Push-buttons and actuators of emergency stop devices, and indicators used only to indicate a warning of danger or the need for urgent action, shall be coloured red and coded as specified in IEC 60073.	Complied	P
	- the TERMINAL is marked with symbol 14	Complied	P
5.1.5.2	TERMINALS		P
	Necessary identification for TERMINALS, connectors, controls and indicators	Complied	P
	Power supply switch ON or OFF position marked	Complied	P
	Mains supply TERMINAL identified	Complied	P
5.1.5.2 a)	FUNCTIONAL EARTH TERMINALS		N/A
5.1.5.2 b)	PROTECTIVE CONDUCTOR TERMINALS		N/A
	Symbol is placed adjacent to or on the TERMINAL		N/A
5.1.5.2 c)	TERMINALS of measuring and control circuits	Complied	P
5.1.5.2 d)	TERMINALS supplied from the interior	Complied	P

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Clause	Requirement – Test	Result – Remark	Verdict
5.1.6	Switches and circuit-breakers		P
	If the power supply switch or circuit-breaker is used as the disconnecting device, the off-position shall be clearly marked	Complied	P
	If a push-button switch is used as the power supply switch, symbols 9 and 15 of Table 1 may be used to indicate the on-position, or symbols 10 and 16 to indicate the off-position, with the pair of symbols (9 and 15, or 10 and 16) close together.	Complied	P
	For ovens and similar equipment, there shall be an indication of the“ON”condition on each side of the equipment which has a door in it or has any other opening intended for loading.		N/A
5.1.7	Equipment protected by DOUBLE INSULATION or REINFORCED INSULATION		P
	Protected throughout (symbol 11)		P
	Only partially protected (symbol 11 not used)		P
5.1.8	Field-wiring TERMINAL boxes		N/A
	If the temperature of the TERMINALS or the ENCLOSURE of a field-wiring TERMINAL box or compartment exceeds 60 °C in NORMAL CONDITION at an ambient temperature of 40 °C		N/A
	The marking shall be visible before and during connection, or be beside the TERMINALS.		N/A
5.2	Warning markings:		P
	- visible when ready for NORMAL USE	Complied	P
	- if necessary marked with symbol 14	Complied	P
	- are near or on applicable parts	Complied	P
	- The size of warning markings	Complied	P
5.3	Durability of markings; the required markings remain clear and legible (NORMAL USE)	Complied	P
5.4	Documentation		P
5.4.1	Documentation		P
	-intended use of the equipment;	Complied	P
	- technical specification	Complied	P
	- name and address of manufacturer or supplier	Shanghai Guolong Instrument Co., Ltd	P
	- the information supplied in 5.4.2 to 5.4.5	Complied	P
	for equipment which for safety reasons requires		P

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Clause	Requirement – Test	Result – Remark	Verdict
	provide guidance on how to determine that the equipment is functioning correctly;	See the instructions	P
	instructions for lifting and carrying		N/A
	A clear explanation of warning symbols is in the documentation,	Complied	P
5.4.2	Equipment RATINGS; documentation includes:		P
	- supply voltage or voltage range	Complied	P
	- the frequency or frequency range	Complied	P
	- the power or current RATING	Complied	P
	- a description of all input and output connections		N/A
	- the RATING of insulation of external circuits, when such circuits are nowhere ACCESSIBLE		N/A
	- statement of the range of environmental conditions		N/A
	-the degree of ingress protection (IP)	IPX0	P
	-with an impact RATING less than 5 J		N/A
5.4.3	Equipment installation; documentation includes instruction for:		P
	- assembly, location and mounting	Complied	P
	- protective earthing	Complied	P
	- connections to the supply	Complied	P
5.4.4	Equipment operation		P
	- identification of operating controls	See the instructions	P
	- equipment positioning	See the instructions	P
	- specification of intermittent operation limits		N/A
	- explanation of required symbols	Complied	P
	- replacement of consumables		N/A
	- cleaning and decontamination		N/A
	- potentially poisonous or injurious substances		N/A
	- RISK, reduction procedures relating to flammable, liquids		N/A
	- reducing the RISKS of burns from surfaces permitted to exceed the temperature limits of10.1.		N/A
	- a statement against use in a manner not specified by the manufacturer	Complied	P
5.4.5	Equipment maintenance and service		P

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Clause	Requirement – Test	Result – Remark	Verdict
	- sufficient preventive maintenance and inspection information	See the instructions	P
	- specific battery	No such device	N/A
	- any manufacturer specified parts	Complied	P
	- RATING and characteristics of fuses		N/A
	Instructions include following subjects permitting safe servicing and continued safety:		P
	a) product specific RISKS may affect service personnel	Complied	P
	b) protective measures for these RISKS	Complied	P
	c) verification of the safe state after repair	Complied	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	Class I equipment	P
6.1.1	Requirements		P
	Protection against electric shock maintained in NORMAL CONDITION and SINGLE FAULT CONDITION	Complied	P
	ACCESSIBLE parts not HAZARDOUS LIVE	Complied	P
	Voltage, current, charge or energy below the limits in NORMAL CONDITION and in SINGLE FAULT CONDITION between:	Complied	P
	ACCESSIBLE parts and earth	Complied	P
	two ACCESSIBLE parts on same piece of the equipment within a distance of 1,8 m	Complied	P
	Conformity is checked by the determination of 6.2 and 6.3 followed by the tests of 6.4 to 6.11	Complied	P
6.1.2	Exceptions		N/A
	Following HAZARDOUS LIVE parts may be ACCESSIBLE to an OPERATOR		N/A
	a) parts of lamps and lamp sockets after lamp removal		N/A
	b) parts to be replaced by OPERATOR only by the use of tool and warning marking		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	Those parts not HAZARDOUS LIVE 10 s after interruption of supply		N/A
	Capacitance test if charge is received from internal capacitor		N/A
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	Complied	P
6.2.2	Examination		P
	- with jointed test finger (as specified B.2)		N/A
	- with rigid test finger (as specified B.1) and a force of 10 N		N/A
6.2.3	Openings above parts that are HAZARDOUS LIVE		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		N/A
	- test pin with length of 100 mm and 3 mm in diameter applied		N/A
6.3	Permissible limits for ACCESSIBLE parts:	Class I equipment	P
6.3.1	- values in NORMAL CONDITION		P
	a) Voltage limits less than 33 V r.m.s. and 46,7 V peak or 70 V d.c.	Complied	P
	for WET LOCATIONS voltage limits less than 16 V r.m.s. and 22,6 V peak or 35 V d.c.		N/A
	Voltages are not HAZARDOUS LIVE the levels of:		N/A
	b) Current less than 0,5 mA r.m.s. for sinusoidal, 0,7 mA peak non-sinusoidal or mixed frequencies or 2 mA d.c. when measured with measuring circuit A.1 or A.2 if less than 100 Hz		N/A
6.4	Primary means of protection		N/A
6.5	Protection in SINGLE FAULT CONDITION; additional protection is provided as specified in 6.5.1 to 6.5.4, or	Complied	P
	- by automatic disconnection of the supply		N/A
6.5.1	A CCESSIBLE parts are prevented from becoming HAZARDOUS live by the primary means of protection and supplemented by one of:	Complied	P
6.5.2	PROTECTIVE BONDING		N/A
6.5.3	SUPPLEMENTARY INSULATION and REINFORCED INSULATION	See the clause 6.7	P

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Clause	Requirement – Test	Result – Remark	Verdict
6.6	Connections to external circuits		P
6.6.1	In NORMAL CONDITION and in SINGLE FAULT CONDITION of the equipment, no ACCESSIBLE parts of the equipment and no ACCESSIBLE parts of an external circuit shall become HAZARDOUS LIVE as a result of connecting the external circuit to the equipment.		P
	- Protection shall be achieved by separation of circuits	Complied	P
	- RATED conditions while maintaining safety	Complied	P
6.6.2	TERMINALS for external circuits		P
	ACCESSIBLE conductive parts of TERMINALS that receive a charge from an internal capacitor shall not be HAZARDOUS LIVE 10s after interruption of the supply.	Complied	P
6.6.3	Circuits with TERMINALS which are HAZARDOUS LIVE		N/A
6.6.4	TERMINALS for stranded conductors		N/A
6.7	CLEARANCES and CREEPAGE DISTANCES between circuits and parts (see Annex B)		P
6.7.1	The nature of insulation	Complied	P
6.7.2	Insulation for MAINS CIRCUITS of OVERVOLTAGE CATEGORY II with a nominal supply voltage up to 300 V	Complied	P
6.7.3	Insulation for secondary circuits derived from MAINS CIRCUITS of OVERVOLTAGE CATEGORY II up to 300 V		N/A
6.8	Procedure for voltage tests		P
6.8.1	ACEESSIBLE insulating parts of the ENCLOSURE are covered with metal foil everywhere except around TERMNALS.	Complied	P
6.8.2	Humidity preconditioning	Complied	P
6.8.3	Test procedures		P
6.8.3.1	The generator shall be able to supply a power of at least 500VA. The waveform of the power frequency test voltage shall be substantially sinusoidal. This requirement is fulfilled if the ratio between the peak value and the r.m.s. value is $\sqrt{2} \pm 3$ %.	Complied	P
	The test voltage is raised uniformly from 0 V to the specified value within 5 s and held at that value for at least the specified time.	Complied	P
	No flashover of CLEARANCES or breakdown of solid insulation shall occur during the test.	No breakdown	P

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Clause	Requirement – Test	Result – Remark	Verdict
6.8.3.2	The 1 min d.c. voltage test		N/A
6.8.3.3	The impulse voltage withstand test		P
	The impulse voltage test is carried out with a 1,2/50 µs waveform	Complied	P
	No flashover of CLEARANCES or breakdown of solid insulation shall occur during the test	No breakdown	P
6.9	Constructional requirements for protection against electric shock		P
6.9.1	General; in circuits exceeding the values of 6.3.2:		P
	- security of wiring connections	Complied	P
	- screws securing removable covers	Complied	P
	- accidental loosening	Complied	P
6.9.2	Insulating materials		P
	materials which can easily be damaged (for example, lacquer, enamel, oxides, anodic films);	Not used these material	N/A
	non-impregnated hygroscopic materials (for example, paper, fibres, fibrous materials).	Not used these material	N/A
6.9.3	Colour coding		N/A
	Green-and-yellow insulation shall not be used except for:		N/A
	a) protective earth conductors;		N/A
	b) PROTECTIVE BONDING conductors;		N/A
	c) potential equalization conductors for safety purposes;		N/A
	d) functional earth conductors.		N/A
6.10	Mains supply cords are RATED for maximum equipment current (see 5.1.3 c)		N/A
6.11	Disconnection from supply source		P
6.11.1	equipment shall be provided with a means for disconnecting it from each electrical supply source, whether external or internal to the equipment.	Complied	P
	The disconnecting means shall disconnect all current-carrying conductors.		N/A
6.11.2	Exceptions		N/A
	A disconnecting device is not required if a short circuit or overload cannot cause a HAZARD.		N/A
6.11.3	Requirements according to type of equipment		P
6.11.3.1	PERMANENTLY CONNECTED EQUIPMENT and multi-phase equipment	Complied	P
6.11.3.2	Single-phase cord-connected equipment		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	Single-phase cord-connected equipment shall have one of the following as a disconnecting device:		N/A
	a) a switch or circuit-breaker;		N/A
	b) an appliance coupler which can be disconnected without the use of a TOOL;		N/A
	c) a separable plug, without a locking device, to mate with a socket-outlet in the building.		N/A
6.11.4	Disconnecting devices		N/A
7	**Protection against mechanical HAZARDS**		**P**
7.1	The equipment shall not cause a mechanical HAZARD in NORMAL USE, or cause a HAZARD in a SINGLE-FAULT CONDITION that might not be easily noticed.		P
	a) sharp edges which could cause cuts	No sharp edges	P
	b) moving parts that could crush body parts or penetrate the skin	Complied	P
	c) unstable equipment that could fall on a person while in use or while being moved	No this hazard	P
	d) falling equipment, resulting from breakage of the carrying device, wall mounting bracket other support part ; and	No this hazard	P
	e) expelled parts from the equipment	No this hazard	P
7.2	Sharp edges		P
	All easily-touched parts of the equipment shall be smooth and rounded so as not to cause injury during NORMAL USE of the equipment.	smooth and rounded	P
	Unless the fault presents an obvious HAZARD, easily-touched parts of the equipment shall not cause an injury in SINGLE FAULT CONDITION.	not cause an injury	P
7.3	Moving parts not able to crush, etc. (see also 6.12.32.3)		N/A
7.4	Stability, compliance tests:		P
	10°tilt test	Complied	P
	- multi-directional force test	250N, on enclosure	P
	- downward force test	Complied	P
8	**Resistance to mechanical stresses**		**P**
8.1	The normal energy protection level required is 5 J		P

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Clause	Requirement – Test	Result – Remark	Verdict
8.2	ENCLOSURE rigidity tests		P
8.2.1	Static test		P
	The equipment is held firmly against a rigid support and subjected to a force of 30 N applied by the hemispherical end of a hard rod of 12 mm diameter.	Subjected to a force of 30 N	P
8.2.2	Impact test		P
	equipment is held firmly against a rigid support and each test point is subjected to one impact by a smooth steel sphere with a mass 500 g ± 25 g and with a diameter of approximately 50 mm.	Complied	P
	The impact test can be performed with the equipment mounted at 90° to its normal position to horizontal surface and a vertical surface.	Complied	P
8.3	Drop test		P
8.3.1	Equipment other than HAND-HELD EQUIPMENT and DIRECT PLUG-IN EQUIPMENT		P
	The equipment is placed in its position of NORMAL USE on a smooth, hard rigid surface of concrete or steel. It is then tilted about each bottom edge in turn so that the distance between the opposite edge and the test surface is 100 mm for equipment up to 20 kg, 25 mm for equipment between 20 kg and 100 kg, or so that the angle made by the bottom and test surface is 30°, whichever is less severe. It is then allowed to fall freely onto the test surface.	Complied	P
8.3.2	HAND-HELD EQUIPMENT and DIRECT PLUG-IN EQUIPMENT		N/A
	The equipment is dropped once through a distance of 1m onto a 50 mm thick hardwood 3 board having a density of more than 700kg/m lying flat on a rigid base such as concrete.		N/A
9	**Protection against the spread of fire**		**P**
9.1	General		P
	There shall be no spread of fire outside the equipment in NORMAL CONDITION or in SINGLE FAULTCONDITION.		P
	Equipment energized from a MAINS supply shall also meet the requirements of 9.6.		P
	a) Testing in the SINGLE FAULT CONDITIONS that could cause the spread of fire outside the equipment.	Complied	P

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Clause	Requirement – Test	Result – Remark	Verdict
	b) elimination or reduction of the sources of ignition within the equipment	Complied	P
	c) if a fire occurs it will be contained within the equipment.		N/A
9.2	Eliminating or reducing the sources of ignition within the equipment		N/A
9.3	Containment of fire within the equipment, should it occur		P
9.3.1	a) energizing of the equipment is controlled by a switch	Complied	P
9.3.2	Constructional requirements		P
	a) Connectors and insulating material on which components are mounted shall have a flammability classification V-2, or better, of IEC 60695-11-10. See also 14.7 for requirements for printed wiring boards.	Complied	P
	b) Insulated wires and cables shall retard flame propagation.	Complied	P
	c) The ENCLOSURE shall meet the following requirements:		N/A
9.4	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	Mains operated equipment protected	Complied	P
9.6.2	PERMANENTLY CONNECTED EQUIPMENT		N/A
10	**Equipment temperature limits and resistance to heat**		**P**
10.1	Surface temperature limits for protection against burns	Complied	P
10.2	Temperatures of windings		N/A
10.3	Other temperature measurements		N/A
10.4	Conduct of temperature tests		N/A
10.5	Resistance to heat		P
10.5.1	Integrity of CLEARANCES and CREEPAGE DISTANCES	Complied	P
10.5.2	Non-metallic ENCLOSURES		N/A
10.5.3	Insulating material	Complied	P
11	**Protection against HAZARDS from fluids**		**P**
11.1	Equipment shall be designed to give protection to	Complied	P

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Clause	Requirement – Test	Result – Remark	Verdict
	OPERATORS and the surrounding area against HAZARDS from fluids encountered in NORMAL USE.		
11.2	Cleaning		N/A
11.3	Spillage		N/A
12	**Protection against radiation, including laser sources, and against sonic and ultrasonic pressure**		**N/A**
12.1	The equipment shall provide protection against the effects of internally generated ultraviolet, ionizing and microwave radiation; laser sources, and sonic and ultrasonic pressure.		N/A
12.2	Equipment producing ionizing radiation		N/A
13	**Protection against liberated gases and substances, explosion and implosion**		**P**
13.1	Poisonous and injurious gases and substances		N/A
13.2	Explosion and implosion		N/A
13.2.1	Components, and materials being heated		P
	Pressure release device provided	Complied	P
13.2.2	Batteries and battery charging		N/A
13.3	Implosion of high-vacuum devices		N/A
14	**Components and subassemblies**		**P**
14.1	Safety components comply with applicable safety requirements in relevant IEC standards	Complied	P
14.2	Motors		N/A
14.2.1	Motor temperatures		N/A
14.2.2	Series excitation motors		N/A
14.3	Overtemperature protection devices; devices operating in a SINGLE FAULT CONDITION:		N/A
	- are constructed and tested		N/A
	- are RATED for voltage and current interrupt		N/A
	- are RATED for the maximum surface temperature		N/A
	If practicable, means shall be provided for the OPERATOR to check that a device or system will function in the case of SINGLE FAULT CONDITION. The instructions for use shall specify the method and how often the check is required		N/A
	Liquid-level devices used to protect against overtemperature shall meet the same requirements as overtemperature protection devices and systems.		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
	1) non-resetting devices are caused to operate once;		N/A
	2) non-self-resetting devices and systems, except thermal fuses, are reset after each operation and thus caused to operate 10 times;		N/A
	3) self-resetting liquid level devices are caused to operate 200 times.		N/A
	During the test, resetting devices shall operate each time the SINGLE FAULT CONDITION is applied, and non-resetting devices shall operate once. After the test, resetting devices shall show no sign of damage which could prevent their operation in a further SINGLE FAULT CONDITION		N/A
14.4	Fuse holders		N/A
14.5	Mains voltage selecting devices		N/A
14.6	MAINS transformers tested outside equipment		N/A
	If environmental conditions could affect the test results, MAINS transformers tested outside the equipment shall be tested in the same conditions as exist inside the equipment.		N/A
14.7	Printed wiring boards		P
	Printed wiring boards shall be made of material with a flammability classification of V-1 or better	Complied	P
14.8	Circuits or components used as TRANSIENT OVERVOLTAGE limiting devices		N/A
15	**PROTECTION BY INTERLOCKS**		**N/A**
15.1	General; interlocks are designed to remove a hazard before OPERATOR exposed	No such parts	N/A
15.2	Prevention of reactivation		N/A
15.3	Reliability		N/A
16	**HAZARDS resulting from application**		**N/A**
17	**RISK ASSESSMENT**		**N/A**
ANNEX F	**ROUTINE TESTS**		**N/A**
ANNEX H	**QUALIFICATION OF CONFORMAL COATINGS FOR PROTECTION AGAINST POLLUTION**		**N/A**
H.1	General		N/A
	Conformal coatings meet the requirements of Clause H.2 and H.3.		N/A
H.2	Technical properties		N/A
H.3	Qualification of coatings		N/A
ANNEX K	**INSULATION REQUIREMENTS NOT COVERED BY CLAUSE 6.7**		**N/A**

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ANNEX A- EUT PHOTOGRAPHS

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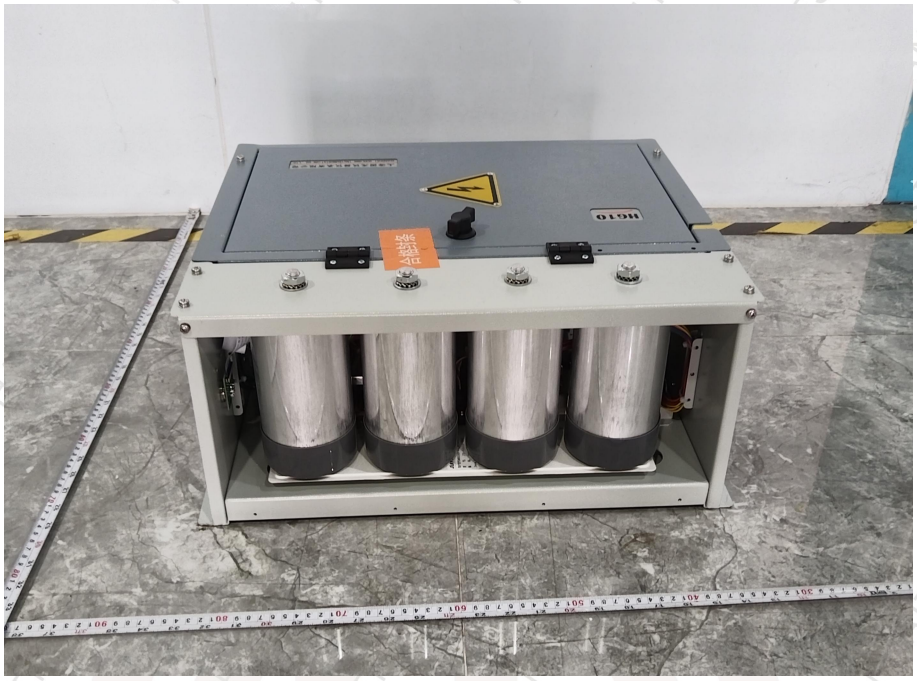

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************END OF THE REPORT************

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China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(Registration No. CNAS L5885)

Shenzhen Tianhai Test Technology Co., Ltd.

(Legal Entity: Shenzhen Tianhai Test Technology Co., Ltd.)

4B/F., Building A3, The Silicon Valley Power Intelligent Terminal Industrial Park, Guanlan Street, Longhua District, Shenzhen, Guangdong, China

is accredited in accordance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence to undertake the service described in the schedule attached to this certificate.

The scope of accreditation is detailed in the attached schedule bearing the same registration number as above. The schedule forms an integral part of this certificate.

Effective Date：2019-01-22

Expiry Date：2025-01-21

Signed on behalf of China National Accreditation Service for Conformity Assessment

China National Accreditation Service for Conformity Assessment(CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation schemes for conformity assessment. CNAS is a signatory of the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement (ILAC MRA) and the Asia Pacific Laboratory Accreditation Cooperation Mutual Recognition Arrangement (APLAC MRA).

The validity of the certificate can be checked on CNAS website at http://www.cnas.org.cn/english/findanaccreditedbody/index.shtml