APPLICATION FOR LOW VOLTAGE DIRECTIVE

On Behalf of

Zhejiang Jinghong Electric Co., Ltd

terminal block

Model: UK1.5N,UK2.5B,UK3N,UK5N,UK6N,UK10N,UK16N,UK25N, UIK35,UKH50,UKH75,UK95,UK150,UK240,URTK/S,UDK4, UKK2.5,UKK5,UDK5-HESI, UK10-DREHSI,UKK5B, USLKG2.5,USLKG3,USLKG5,USLKG6,USLKG10, USLKG16,USLKG35,USLKG50

Prepared For : Zhejiang Jinghong Electric Co., Ltd
No.221.Wei Shijiu Road,Yueqing Economic&Development Zone,325600,Zhejiang,China

Prepared By : Beide (Shenzhen) Product Service Limited
6F, Bldg E, Hourui 3rd Ind Zone, Xixiang, Bao'an Dist, Shenzhen, China

Date of Test	**:**	**Jun.01-07,2021**
Date of Report	**:**	**Jun.07,2021**
Report Number	**:**	**B-S210636958**

Beide
Compliance Laboratory

Test Report

EN 60947

Low-voltage switchgear and controlgear — Part 1: General rules Part 7-1: Ancillary equipment — Terminal blocks for copper conductors

Testing laboratory ..... :	Beide (Shenzhen) Product Service Limited
Address ..... :	6F, Bldg E, Hourui 3rd Ind Zone, Xixiang, Bao'an Dist, Shenzhen, China
Report body..... ..... :	Beide (Shenzhen) Product Service Limited
Address.....:.....	6F, Bldg E, Hourui 3rd Ind Zone, Xixiang, Bao'an Dist, Shenzhen, China
Applicant ..... :	Zhejiang Jinghong Electric Co., Ltd
Address ..... :	No.221.Wei Shijiu Road,Yueqing Economic&Development Zone,325600,Zhejiang,China
Client No.....:	0577C645
Standard ..... :	EN 60947-7-1:2009
Test Result ..... :	Compliance with EN 60947-7-1:2009
Procedure deviation ..... :	N.A.
Non-standard test method ..... :	N.A.
Type of test object .....:	terminal block
Trademark .....:	N.A.
Model/type reference ..... :	UK2.5B
Rating .....:	690V,32A
Manufacturer .....:	Zhejiang Jinghong Electric Co., Ltd
Address .....:	No.221.Wei Shijiu Road,Yueqing Economic&Development Zone,325600,Zhejiang,China

General remarks

This 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 item(s) tested.

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

“(see remark #)” refers to a remark appended to the report.

“(see Annex #)” refers to an annex appended to the report.

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

Photo view:

(See annex 1)

Copy of marking plate:

(See annex 2)

Possible test case verdicts :		
test case does not apply to the test object ……..	:	N(.A.)
test object does meet the requirement …….……	:	P(ass)
test object does not meet the requirement …….	:	F(ail)

Name and address of the testing laboratory: **Beide (Shenzhen) Product Service Limited 6F, Bldg E, Hourui 3rd Ind Zone, Xixiang, Bao'an Dist, Shenzhen, China**

Reported by : Signature / Austin Zhong/ Engineer — Date: Jun.07,2021

Checked by : Signature / Anna Deng / Engineer — Date: Jun.07,2021

Approved by : Signature / Martin Wang / Manager — Date: Jun.07,2021

BEIDE (SHENZHEN) PRODUCT SERVICE LIMITED Beide Compliance Laboratory CERTIFICATION

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
3	Classification		P
	Distinction is made between various types of terminal blocks as follows:		P
	- method of fixing the terminal block to the support;		P
	- number of poles;		P
	- type of clamping units: screw-type clamping units or screwless-type clamping units;		P
	- ability to receive prepared conductors (see 2.3.27 of IEC 60947-1);		P
	- terminal assemblies with identical or dissimilar clamping units;	Terminal assemblies with identical clamping units	P
	- number of clamping units on each terminal assembly;		P
	- service conditions.		P
4	Characteristics		P
4.1	Summary of characteristics		P
	The characteristics of a terminal block are as follows:		--
	- type of terminal block (see 4.2);	See 4.2	P
	- rated and limiting values (see 4.3).	See 4.3	P
4.2	Type of terminal block		P
	The following shall be stated:		P
	- type of clamping units;		P
	- number of clamping units.		P
4.3	Rated and limiting values		P
4.3.1	Rated voltages		P
4.3.2	Short-time withstand current		P
	A specified r.m.s. value of current which a terminal block shall be able to withstand during a specified short-time under prescribed conditions		P

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	of use and behaviour (see 7.2.3 and 8.4.6).		
4.3.3	Standard cross-sections		P
	The standard values of cross-sections of round copper conductors to be used are contained in Table 1.		P
4.3.4	Rated cross-section		P
	The rated cross-section shall be selected from the standard cross-sections given in Table 1.		P
4.3.5	Rated connecting capacity		P
	For terminal blocks with a rated cross-section between 0,2 mm^2 and 35 mm^2 inclusive, the minimum range contained in Table 2 applies.		P
	The conductors may be rigid (solid or stranded) or flexible.		P
	The manufacturer shall state the types and the maximum and minimum crosssections of conductors that can be connected.		P
5	Product information		P
5.1	Marking		P
	A terminal block shall be marked in a durable and legible manner with the following:		P
	a) the name of the manufacturer or a trade mark by which the manufacturer can be readily identified;		P
	b) a type reference permitting its identification in order to obtain relevant information from the manufacturer or his catalogue.		P
5.2	Additional information		P
	The following information shall be stated by the manufacturer, if applicable, e.g. in the manufacturer's data sheet or his catalogue or on the packing unit:		P
	a) IEC 60947-7-1, if the manufacturer claims compliance with this standard;		P
	b) the rated cross-section;		P

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	c) the rated connecting capacity, if different from Table 2, including the number of conductors simultaneously connectable;		P
	d) the rated insulation voltage (*U*i);		P
	e) the rated impulse withstand voltage (*U*imp), when determined;		N
	f) service conditions, if different from those of Clause 6;		N
	g) conventional free air thermal current (*I*th).		N
6	Normal service, mounting and transport conditions (Clause 6 of EN 60947-1 applies)		P
6.1	Normal service conditions		P
6.1.1	Ambient air temperature		P
6.1.2	Altitude	<2000m	P
6.1.3	Atmospheric conditions		P
6.1.3.1	Humidity	<50%	P
6.1.3.2	Pollution degree	Pollution degree 3	P
6.1.4	Shock and vibration		N
6.2	Conditions during transport and storage	See instrutions	P
6.3	Mounting	See instrutions	P
7	Constructional and performance requirements		P
7.1	Constructional requirements		P
7.1.1	Clamping units		P
	Subclause 7.1.8.1 of IEC 60947-1 applies with the following additions.		P
	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength.		P
	The clamping units shall allow the conductors to be connected by means ensuring that a reliable mechanical linkage and electrical contact is properly maintained.		P

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	The clamping units shall be able to withstand the forces that can be applied through the connected conductors.		P
	No contact pressure shall be transmitted through insulating materials other than ceramic, or other material with characteristics not less suitable, unless there is sufficient resiliency in the metallic parts to compensate for any possible shrinkage of the insulating material.		P
7.1.2	Mounting		P
	Terminal blocks shall be provided with means that allow them to be securely attached to a rail or a mounting surface.	See 8.3.2	P
7.1.3	Clearances and creepage distances		P
	For terminal blocks for which the manufacturer has stated values of rated impulse withstand voltage (*U*imp) and rated insulation voltage (*U*i), minimum values of clearances and creepage distances are given in Tables 13 and 15 of IEC 60947-1.		P
	For terminal blocks for which the manufacturer has not declared a value of rated impulse withstand voltage (*U*imp), guidance for minimum values is given in Annex H of IEC 60947-1.		P
7.1.4	Terminal identification and marking		P
	Subclause 7.1.8.4 of IEC 60947-1 applies with the following addition.		P
	A terminal block shall have provision, or at least space, for identification marks or numbers for each clamping unit or terminal assembly related to the circuit of which it forms a part.		P
	For the identification of the terminal blocks the colour combination green-yellow is not allowed.		P
7.1.5	Resistance to abnormal heat and fire		P
	The insulation materials of terminal blocks shall not be adversely affected by abnormal heat and fire.	Needle flame test	P
7.1.6	Rated cross-section and rated connecting capacity		P
	Terminal blocks shall be so designed that conductors of the rated cross-section and the	See 8.3.3.4	P

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	rated connecting capacity, if applicable, can be accepted.		
	The verification of the rated cross-section may be performed by the special test according to 8.3.3.5.		P
7.2	Performance requirements		P
7.2.1	Temperature rise		P
	Terminal blocks shall be tested in accordance with 8.4.5. The temperature-rise of the terminals shall not exceed 45 K.	See 8.4.5	P
7.2.2	Dielectric properties		P
	If the manufacturer has declared a value of the rated impulse withstand voltage (*U*imp) (see 4.3.1.3 of IEC 60947-1), the requirements of 7.2.3 and 7.2.3.1 of IEC 60947-1 apply. If applicable, the impulse withstand voltage test shall be carried out in accordance with 8.4.3 a).	Not declared	N
	For the verification of solid insulation, the requirements of 7.2.3, 7.2.3.2 and 7.2.3.5 of IEC 60947-1 apply. The power-frequency withstand voltage test shall be carried out in accordance with 8.4.3 b).		N
	The verification of sufficient clearances and creepage distances shall be made in accordance with 8.4.2.		N
	For terminal blocks for which the manufacturer has not declared a value of rated impulse withstand voltage (*U*imp), guidance for minimum values is given in Annex H of IEC 60947-1.		P
7.2.3	Short-time withstand current		P
	A terminal block shall be capable of withstanding for 1 s the short-time withstand current which corresponds to 120 A/mm^2 of its rated cross-section, in accordance with 8.4.6.	See 8.4.6	P
7.2.4	Voltage drop		P
	The voltage drop on a terminal block caused by the conductor connection, measured according to 8.4.4, shall not exceed the values specified in 8.4.4 and, where applicable, in 8.4.7.	See 8.4.4	P
7.2.5	Electrical performance after ageing		N
	Terminal blocks shall be capable of withstanding	See 8.4.7	N

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	the ageing test comprising 192 temperature cycles in accordance with 8.4.7.		
7.3	Electromagnetic compatibility (EMC)	Not required	N
	Subclause 7.3 of IEC 60947-1 applies.		N
8	Tests		P
8.1	Kinds of test		P
	Subclause 8.1.1 of IEC 60947-1 applies with the following addition.		P
	No routine tests are specified. The verification of the rated cross-section according to 8.3.3.5 is a special test. All other tests are type tests.		P
8.2	General		P
	Unless otherwise specified, terminal blocks are tested in new and in clean condition, and installed as for normal use (see 6.3 of IEC 60947-1) at an ambient temperature of (20 5) °C.		P
	The tests are carried out in the same order in which the subclauses describe them.		P
	Each test is made on new separate specimens.		P
	The surface of the conductors shall be free of contamination and corrosion which degrades performance.		P
	Care shall be taken when stripping conductors to avoid cutting, nicking, scraping or otherwise damaging the conductors.		P
	In cases where the manufacturer has stated that special preparation of the end of the conductor is necessary, the test report shall indicate the method of preparation used.		P
	The tests are carried out with the type of conductor (rigid or flexible) as stated by the manufacturer.		P
8.3	Verification of mechanical characteristics		P
8.3.1	General		P
	The verification of mechanical characteristics includes the following tests:		P

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	attachment of the terminal block on its support (see 8.3.2);		P
	mechanical strength of clamping units (see 8.3.3.1);		P
	attachment of the conductors to the clamping units (see 8.3.3.2 and 8.3.3.3);		P
	rated cross-section and rated connecting capacity (see 8.3.3.4 and 8.3.3.5).		P
8.3.2	Attachment of the terminal block on its support		P
	The test shall be made on two clamping units at the centre terminal block out of five terminal blocks mounted as in normal use on the appropriate support according to the manufacturer´s instructions.		P
	A steel pin of 150 mm length and of a diameter as specified in Table 3 is clamped successively in each clamping unit.		P
	The tightening torque shall be in accordance with Table 4 of IEC 60947-1 or, alternatively, in accordance with the higher torque value stated by the manufacturer.		P
	During the test, no terminal block shall work free from its rail or support, nor suffer any other damage.		P
8.3.3	Mechanical properties of clamping units		P
8.3.3.1	Test of mechanical strength of clamping units		P
	Subclauses 8.2.4.1 and 8.2.4.2 of IEC 60947-1 apply with the following addition.		P
	The test shall be made on two clamping units at the centre terminal block out of five terminal blocks mounted as in normal use on the appropriate support according to the manufacturer's instructions.		P
	After verification of the voltage drop according to 8.4.4 with a connected rigid conductor of the rated cross-section stated by the manufacturer and subsequently, if applicable, with a connected flexible conductor of the minimum cross-section stated by the manufacturer, rigid conductors of the rated cross-section shall be connected and disconnected five times each.		P

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	At the end of the test, the terminal blocks shall pass the voltage drop test according to 8.4.4 with a connected rigid conductor of the rated cross-section and subsequently, if applicable, with a connected flexible conductor of the minimum cross-section.		P
8.3.3.2	Testing for damage to and accidental loosening of conductors of a terminal block (flexion test)		P
	Subclauses 8.2.4.1 and 8.2.4.3 of IEC 60947-1 apply with the following modification.		P
	Each test shall be carried out on two clamping units of one terminal block.		P
	The tightening torque shall be in accordance with Table 4 of IEC 60947-1 or alternatively in accordance with the higher torque value stated by the manufacturer.		P
	The tests shall be made with the type (rigid and/or flexible) and the number of conductors stated by the manufacturer as follows:		P
	with the different types of conductor of the specified smallest cross-section (only one conductor connected);		P
	with the different types of conductor of the specified rated cross-section (only one conductor connected);		P
8.3.3.3	Pull-out test		N
	Subclause 8.2.4.4 of IEC 60947-1.		N
8.3.3.4	Verification of rated cross-section and rated connecting capacity		P
	The test shall be carried out on each clamping unit of one terminal block.		P
	For conductors of the rated cross-section and for terminal blocks with a rated connecting capacity up to 35 mm^2, one conductor of the two next smaller cross-sections shall be inserted unhindered in the opened clamping unit and be connected.		P
	Theoretical diameter of the largest conductor is given in Table 7a of IEC 60947-1.		P
8.3.3.5	Verification of rated cross-section (special test with gauges)		P

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	Subclause 8.2.4.5 of IEC 60947-1 applies with the following addition.		P
	The test shall be carried out on each clamping unit of one terminal block.		P
8.4	Verification of electrical characteristics		P
8.4.1	General		P
	The verification of electrical characteristics includes the following:		P
	verification of clearances and creepage distances (see 8.4.2);		P
	dielectric test (see 8.4.3);		P
	verification of the voltage drop (see 8.4.4);		P
	temperature-rise test (see 8.4.5);		P
	short-time withstand current test (see 8.4.6);		P
	ageing test for screwless-type terminal blocks only (see 8.4.7).		P
8.4.2	Verification of clearances and creepage distances		P
8.4.2.1	General		P
	The verification is made between two adjacent terminal blocks and between a terminal block and the metal support to which the terminal blocks are attached.		P
	The measurement of clearances and creepage distances shall be made under the following conditions:		P
	a) the terminal blocks shall be wired with the most unfavourable conductor type(s) and conductor cross-section(s) among those declared by the manufacturer;		P
	b) the conductor ends shall be stripped to a length specified by the manufacturer;		P
	c) in case the manufacturer has stated the possibility of using different metal supports, the most unfavourable support shall be used.		P
	The method of measuring clearances and creepage distances is given in Annex G of IEC		P

EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	60947-1.		
8.4.2.2	Clearances		P
	The measured values of clearances shall be higher than the values given in Table 13 of IEC 60947-1 for case B homogeneous field (see 7.2.3.3 of IEC 60947-1) depending on the value of the rated impulse withstand voltage (*U*imp) and the pollution degree stated by the manufacturer.		P
	The impulse withstand voltage test shall be carried out in accordance with 8.4.3 a) unless the measured clearances are equal to or larger than the values given in Table 13 of IEC 60947-1 for case A inhomogeneous field (see 8.3.3.4.1, item 2), of IEC 60947-1).		P
8.4.2.3	Creepage distances		P
	The measured creepage distances shall be not less than the values given in table 15 of IEC 60947-1 in connection with 7.2.3.4 a) and b) of IEC 60947-1 depending on the rated insulation voltage (*U*i), the material group and the pollution degree as specified by the manufacturer.		P
8.4.3	Dielectric tests		P
	a) If the manufacturer has declared a value for the rated impulse withstand voltage *U*imp, the impulse withstand voltage test shall be made in accordance with 8.3.3.4.1, item 2), of IEC 60947-1, except item 2) c) which does not apply.		P
	b) The power-frequency withstand verification of solid insulation shall be made in accordance with 8.3.3.4.1, item 3), of IEC 60947-1. The value of the test voltage shall be as stated in Table 12A of IEC 60947-1 (see 8.3.3.4.1, item 3) b) i), of IEC 60947-1).		P
	Each test shall be carried out on five adjacent terminal blocks wired and installed on a metal support under conditions a), b) and c) indicated in 8.4.2.1.		P
	The test voltage shall be applied first between the adjacent terminal blocks and then between all terminal blocks connected together and the support to which the terminal blocks are attached.		P
8.4.4	Verification of the voltage drop		P

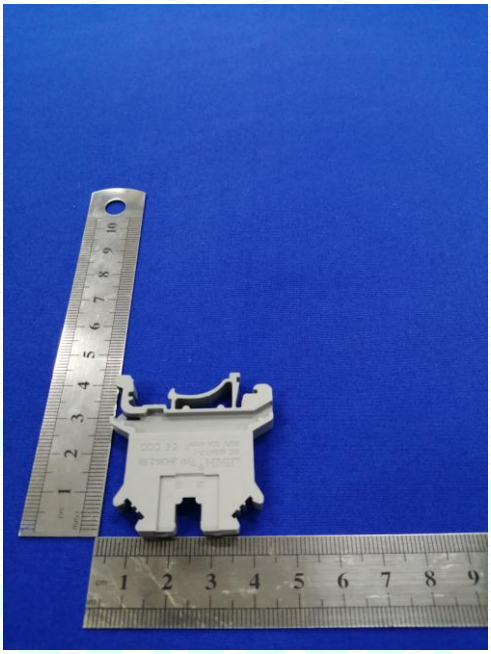
EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	The voltage drop shall be verified		P
	a) before and after the test of mechanical strength of clamping units (see 8.3.3.1);		P
	b) before and after the temperature-rise test (see 8.4.5);		P
	c) before and after the short-time withstand current test (see 8.4.6);		P
	d) before, during and after the ageing test (see 8.4.7).		P
	The voltage drop is measured on each terminal block as Indicated in Figure 2. The measurement is made with a direct current of 0,1 times the value given in Table 4 or Table 5.		P
	Before the tests according to a), b), c) and d) above, the voltage drop shall not exceed		P
	– 3,2 mV, or		P
	1,6 mV on each individual clamping unit when measured separately, only if the overall measured value in Figure 2 exceeds 3,2 mV.		P
	If the measured value exceeds 3,2 mV, the voltage drop is determined on each individual clamping unit separately, which shall not exceed 1,6 mV.		P
	After the tests according to a), b) and c), the voltage drop shall not exceed 150 % of the values measured before the test.		P
	During and after the test according to d), the voltage drop measured shall not exceed the values specified in 8.4.7.		P
8.4.5	Temperature-rise test		P
	During the test, screws of clamping units shall not be retightened.		P
	At the end of the test, after cooling down to ambient air temperature and without any change in the arrangement, the terminal blocks shall pass the voltage drop test according to 8.4.4.		P
8.4.6	Short-time withstand current test		P
	The purpose of this test is to verify the ability to		P

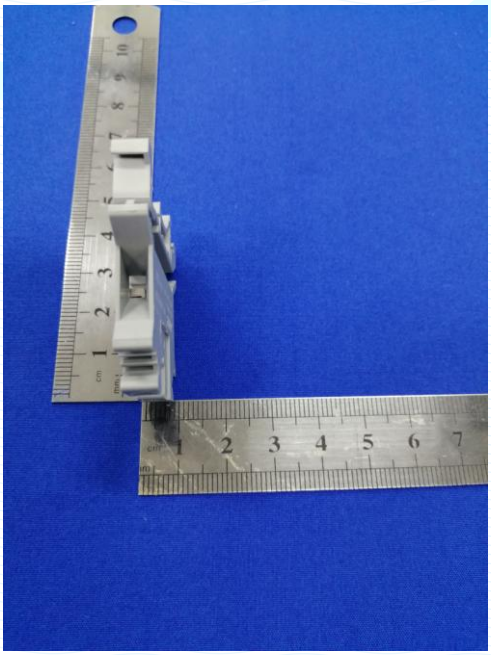
EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	withstand a thermal shock.		
	After verification of the voltage drop according to 8.4.4, the value and the duration of the test current shall be in accordance with 7.2.3.		P
	At the end of the test, continuity shall exist on the test sample assembly and the terminal blocks shall not show any cracking, breakage or other critical damage. After cooling down to ambient temperature and without any change in the arrangement, the terminal block shall pass the voltage drop test according to 8.4.4.		P
8.4.7	Ageing test		N
8.5	Verification of thermal characteristics		P
	The thermal characteristics are checked by the needle flame test.		P
	The test is carried out according to IEC 60695-11-5 successively in the area of one clamping unit of three terminal blocks.		P
	The test room shall be substantially draught-free with dimensions sufficient to ensure an adequate supply of air.		P
	Before the test, the terminal blocks are stored for 24 h in an atmosphere having a temperature between 15 °C and 35 °C and a relative humidity between 45 % and 75 %.		P
	After this preconditioning, the terminal block is mounted on its appropriate support and fixed with suitable means so that one lateral insulation wall lies parallel to the layer placed below it.		P
	The layer placed below, which consists of an approximately 10 mm thick pinewood board covered with a single layer of tissue paper (grammage between 12 g/m^2 to 30 g/m^2 according to 4.215 of ISO 4046-4:2002, is positioned at a distance of (200 5) mm below the terminal block.		P
	The test flame, adjusted in accordance with Figure 1a) of IEC 60695-11-5, is guided under an angle of 45° to the lateral insulation wall.		P
	The tip of the flame shall make contact with the insulation wall in the area of the clamping unit (see Figure 4).		P

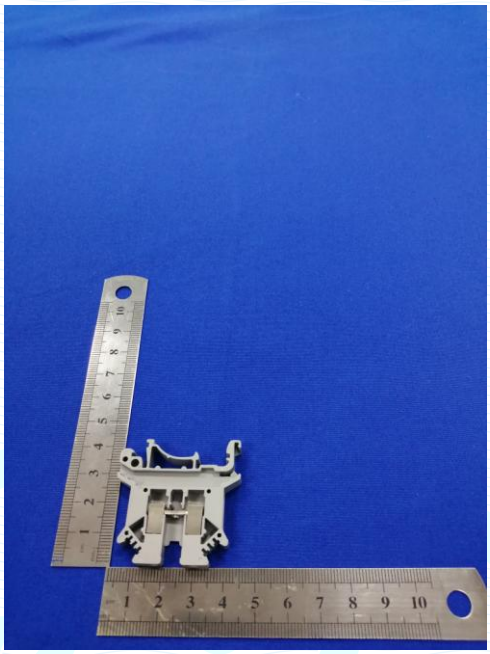
EN 60947-7-1			
Clause	Requirement – Test	Result - Remark	Verdict
	The flame is applied for 10 s. For insulation walls 1 mm and/or an area 100 mm^2, the flame is applied for 5 s.		P
	After the flame is removed, the duration of burning in the case of ignition is measured.		P
	Duration of burning denotes the time interval from the moment the flame is removed until flames or glowing of the terminal block have extinguished.		P
	The terminal blocks are considered to have passed the test if the duration of burning is 30 s in case of ignition.		P
	Moreover, the tissue paper on the pinewood board shall not ignite if burning or glowing particles fall from the terminal block.		P
8.6	Verification of EMC characteristics		N
8.6.1	Immunity		N
	Terminal blocks within the scope of this standard are not sensitive to electromagnetic disturbances and therefore no immunity tests are necessary.		N
8.6.2	Emission		N
	Terminal blocks within the scope of this standard do not generate electromagnetic disturbances and therefore no emission tests are necessary.		N

Annex 1

Photo views of EUT







Annex 2

Product marking of EUT

terminal block

Model No.: UK2.5B
Rating: 690V,32A

Zhejiang Jinghong Electric Co., Ltd
MADE IN CHINA