

**TEST REPORT**  
**EN 50291: 2001**

**Electrical apparatus for the detection of carbon monoxide in domestic premises**  
**Test methods and performance requirements**

Report reference No . : STR10088038S

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Testing location : As above

**Applicant's name** : Ningbo Wanke Electron Technology Co., Ltd.

Address : WanTai Industry City, Shipu, Xiangshan, Zhejiang Province, China.

**Manufacturer's name** : Ningbo Wanke Electron Technology Co., Ltd.

Address : WanTai Industry City, Shipu, Xiangshan, Zhejiang Province, China.

**Test specification** :

Standard : EN 50291: 2001

Test procedure : Type Approval

Procedure deviation : N/A

Non-standard test method : N/A

**This test report is specially limited to the above client company and product model only. It may not be duplicated without prior written consent of SEM.Test.**

**Test item description** : CARBON MONOXIDE DETECTOR



Trademark : N/A.

**Model/type reference** : XC-05, XC-06

Ratings : DC 9V, 50mA

<b>Particulars: test item vs. test requirements</b>	
Class of protection against electrical shock .....	N/A.
Nature of supply .....	DC
Degree of protection against moisture.....	IPX2D
Mass of equipment .....	113g
<b>Possible test case verdicts:</b>	
-test case does not apply to the test object.....	N (N/A)
-test object does meet the requirement.....	P(Pass)
-test object does not meet the requirement .....	F(Fail)
<b>Testing:</b>	
Date of receipt of test item .....	August 09, 2010
Date(s) of performance of test .....	August 09 – 21, 2010
<b>General remarks:</b>	
<p>”(see remark #)” refers to a remark appended to the report.</p> <p>(see appended table)” refers to a table appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p> <p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced except in full without the written approval of the testing laboratory.</p> <p>Clause numbers between brackets refer to clauses in EN 50 291 (Optional remark).</p>	
<b>General Information:</b>	
<ul style="list-style-type: none"> <li>a) The models of XC-05 and XC-06 Carbon Monoxide Detector have same internal construction and they have different appearance.</li> <li>b) All the tests of this report are carried on model XC-05.</li> <li>c) The test result complies with the requirements of the relevant standard.</li> </ul>	
<b>Test Conclusion:</b>	
<p>The carbon monoxide detector submitted by Ningbo Wanke Electron Technology Co., Ltd. are tested according to EN 50291: 2001 Electrical apparatus for the detection of carbon monoxide in domestic premises Test methods and performance requirements</p> <p>Test Result: Pass.</p>	

**Copy of marking plate:**

<b>Carbon Monoxide Detector</b>	
<b>Model: XC-05</b>	
<b>Rated voltage: DC 9V</b> (Alkaline battery)	
<b>Rated Current: 50mA</b>	
<b>Type of Gas: CO Gas alarm</b>	
<b>IPX2D</b>	
	 
<b>Lifetime: 5 years</b>	
<b>Type B apparatus.</b>	
<b>EN 50291:2001</b>	
<b>Ningbo WanKe Electron Technology Co., Ltd.</b>	
<b>Manufactured date: 08, 2010</b>	
<b>CAUTION: READ THESE INSTRUCTIONS CAREFULLY BEFORE OPERATING OR SERVICING.</b>	
<b>Made in China</b>	

On the product

EN 50291: 2001			
Clause	Requirement – Test	Result	Verdict
<b>4.</b>	<b>GENERAL REQUIREMENT</b>		<b>P</b>
4.1	General	According to the standard.	P
4.2	Construction		P
	The apparatus shall comply with the appropriate requirements of EN 60335-1,	See below.	P
(8)	PROTECTION AGAINST ACCESS TO LIVE PARTS (EN 60335-1)		P
(8.1)	Appliance shall have adequate protection against accidental contact with live parts	See clauses 8.1.1- 8.1.3	-
(8.1.1)	Removal of lamps: protection against contact with live parts.		N
	Inaccessibility of live parts in every possible position		P
(8.1.2)	Inaccessibility of live parts through openings in class 0 appliances, class II appliances and constructions		N
	Inaccessibility of live parts through openings in earthed metal enclosures having a non-conductive coating		N
(8.1.3)	Use of test probe: no contact with live parts of visible glowing heating elements.		N
(8.1.4)	Accessible part is no considered to be live if:		P
	The parts is supplied at safety extra-low voltage:		P
	- for a.c., peak value of voltage $\leq 42.4V$		N
	- for d.c., voltage $\leq 42.4V$ ,		P
	The part is separated from live parts by protective impedance:		N
	- for d.c., current $\leq 2mA$		N
	- for a.c., peak value of current $\leq 0.7mA$		N
	- capacitance $\leq 0.1\mu F$ ( $42.4V < V \leq 450V$ )		N
	- discharge $\leq 45\mu C$ ( $450V < V \leq 15kV$ )		N
(8.1.5)	Insulation for live parts of built-in appliance, fixed appliances and appliances delivered in separate units.		N
(8.2)	Inaccessibility of basic insulation and metal parts separated by basic insulation only		N
(11)	HEATING (EN 60335-1)		P
(11.1)	No excessive temperatures in normal use	See clauses (11.2)-(11.7)	P
(11.2)	Placed on a floor or table are placed on the floor of the test corner with their back as near as possible to one of the walls and away from the other wall.	Placed to give the most unfavourable results	P

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Clause	Requirement – Test	Result	Verdict
(11.3)	Type of thermocouple used for determining the temperature rise	Type J	P
(11.4)	Heating appliances operated under normal operation and at 1.15 times rated power input		N
(11.5)	Motor-operated appliances operated under normal operation and supplied with the most unfavourable voltage between 0.94 times and 1.06 times the rated voltage		N
(11.6)	Combined appliances operated under normal operation and supplied with the most unfavourable voltage between 0.94 times and 1.06 times the rated voltage		N
(11.7)	Test duration of appliances	The appliance is operated until steady conditions are established.	P
(11.8)	Temperature rises of various parts shall not exceed the prescribed values	See appended table	P

(13)	LEAKAGE CURRENT AND ELECTRIC STRENGTH AT OPERATING TEMPERATURE (EN 60335-1)		P
(13.1)	leakage current shall not be excessive and electric strength shall be adequate	DC power equipment. Leakage current test no apply.	P
	Operation conditions:		N
	- 1.15 times the rated power input for heating appliances		N
	- 1.06 times rated voltage for motor-operated appliances and combined appliances		N
(13.2)	Leakage current :		N
	- for class II appliances $\leq 0.25\text{mA}$		N
	- for class 0, 0I and III appliances $\leq 0.5\text{mA}$		N
	- for portable class I appliances $\leq 0.75\text{mA}$		N
	- for stationary class I motor-operated appliances $\leq 3.5\text{Ma}$		N
	- for stationary class I heating appliances: $0.75\text{Ma}$ ; $0.75\text{Ma/Kw}$ ; $5\text{Ma}$		N
(13.3)	Electric strength test	See appended table 13.3 for details.	P

(15)	MOISTURE RESISTANCE (EN 60335-1)		P
(15.1)	Protection against moisture	See clauses (15.1.1), (15.1.2)	P
(15.1.1)	IPX0 appliances	Not subjected to any tests	N

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Clause	Requirement – Test	Result	Verdict
	IPX1 appliances	According to clause 14.2.1 of IEC 60529	N
	IPX2 appliances	According to subclause 14.2.2 of IEC 60529	P
	IPX3 appliances	According to subclause 14.2.3a of IEC 60529	N
	IPX4 appliances	According to subclause 14.2.4a of IEC 60529	N
	IPX5 appliances	According to subclause 14.2.5 of IEC 60529	N
	IPX6 appliances	According to subclause 14.2.6 of IEC 60529	N
	IPX7 appliances	According to subclause 14.2.7 of IEC 60529	N
(15.1.2)	Installation and placement		P
(15.2)	Liquid spillage test for appliances with container:		N
	- Electric strength		N
	- Trace of water		N
	- Creepage distance and clearances		N
(15.3)	Proof against humid conditions:		P
	- Temperature of the air	25°C	P
	- Relative humidity	93%	P
	- Conditioning duration	48h	P
	Electric strength and leakage current	See clause 16 for details.	P

(16)	LEAKAGE CURRENT AND ELECTRIC STRENGTH (EN 60335-1)		P
(16.1)	No excessive leakage current and adequate insulation and electric strength	DC power equipment. Leakage current test no apply.	<b>P</b>
(16.2)	Leakage current measurements		N
(16.3)	Electric strength tests (values in table 5)	(see appended table 16.3 for details.)	P

(17)	OVERLOAD PROTECTION OF TRANSFORMERS AND ASSOCIATED CIRCUITS (EN 60335-1)		N
	No excessive temperatures in transformer or associated circuits in event of short-circuits likely to occur in normal use		<b>N</b>

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Clause	Requirement – Test	Result	Verdict
	Appliance supplied with 1,06 or 0,94 times rated voltage and the most unfavorable short-circuit or overload likely to occur in normal use applied		N
	Temperature rise of insulation of the conductors of safety extra-low voltage circuits not exceeding the relevant value specified in table 3 by more than 15 K.		N
	Temperature of the winding not exceeding the value specified in table 6		N

(19)	ABNORMAL OPERATION (EN 60335-1)		P
(19.1)	The risk of fire or mechanical damage under abnormal or careless operation obviated		P
	Electronic circuits so designed and applied that a fault will not render the appliance unsafe	See clause 19.11, 19.12	P
(19.2)	Test of appliance with heating elements with restricted heat dissipation; test voltage (V): power input of 0,85 times rated power input .....	No heating element	N
(19.3)	Test of 19.2 repeated; test voltage (V): power input of 1,24 times rated power input .....	No heating element	N
(19.4)	Test with controls short-circuited, under the conditions specified in clause 11		N
(19.5)	Test of clause (19.4) repeated with temperature controller not shorting circuit		N
	- One end of the control element is connected to the sheath of the heating element		N
	- Reversed the polarity of the supply and repeat operated		N
(19.6)	Test with PTC heating elements		N
(19.7)	Appliances tested under stalled conditions:		N
	- test duration		N
	- temperature of windings not exceeding the relevant specified value		N
(19.8)	Test with one phase disconnected at rated voltage for the period specified in clause 9.7		N
(19.9)	Running overload test		N
(19.10)	Test on appliances incorporating series motors		N
(19.11)	Electronic circuits, compliance checked by evaluation of the fault conditions specified in 19.11.2 for all circuits or parts of circuits, unless they comply with the conditions specified in 19.11.1		P

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Clause	Requirement – Test	Result	Verdict
(19.11.1)	Before applying the fault conditions a) to f) in 19.11.2, it is checked if circuits or parts of circuit meet both of the following conditions:		N
	- the electronic circuit is a low-power circuit, that is, the maximum power at low-power points does not exceed 15 W according to the tests specified		N
	- the protection against electric shock, fire hazard, mechanical hazard or dangerous malfunction in other parts of the appliance does not rely on the correct functioning of the electronic circuit		N
(19.11.2)	Fault conditions applied one at a time, the appliance operated under conditions specified in cl. 11, but supplied at rated voltage, the duration of the tests as specified:		P
	a) short circuit of functional insulation if clearances or creepage distances are less than the values specified in 29		N
	b) open circuit at the terminals of any component		P
	c) short circuit of capacitors, unless they comply with IEC 60384-14		N
	d) short circuit of any two terminals of an electronic component, other than integrated circuits. This fault condition is not applied between the two circuits of an optocoupler		P
	e) failure of triacs in the diode mode		N
	f) failure of an integrated circuit. The possible hazardous situations of the appliance are assessed to ensure that safety does not rely on the correct functioning of such a component		P
(19.11.3)	If the appliance incorporates a protective electronic circuit which operates to ensure compliance with clause 19, the relevant test is repeated with a single fault simulated, as indicated in a) to f) of 19.11.2		N
	During and after each test the following is checked:		N
	- the temperature rise of the windings do not exceed the values specified in table 8		N
	- the appliance complies with the conditions specified in 19.13		N
	- any current flowing through protective impedance not exceeding the limits specified in 8.1.4		N
	If a conductor of a printed board becomes open-circuited, the appliance is considered to have withstood the particular test, provided all three of the following conditions are met:		N
	- the material of the printed circuit board withstands the burning test of annex E		N



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Clause	Requirement – Test	Result	Verdict
	- any loosened conductor does not reduce the clearances or creepage distances between live parts and accessible metal parts below the values specified in cl. 29		N
	- the appliance withstands the tests of 19.11.2 with open-circuited conductor bridged		N
(19.11.4)	Appliances having a switch with an off position obtained by electronic disconnection, or a switch that can be placed in the stand-by mode, are subjected to the tests of 19.11.4.1 to 19.11.4.7. The tests are carried out with surge arresters disconnected, unless they incorporate spark gaps		N
(19.11.4.1)	The appliance is subjected to electrostatic discharges in accordance with IEC 61000-4-2, test level 4 being applicable		N
(19.11.4.2)	The appliance is subjected to radiated fields in accordance with IEC 61000-4-3, test level 3 being applicable.		N
(19.11.4.3)	The appliance is subjected to fast transient bursts in accordance with IEC 61000-4-4. Test level 3 is applicable for signal and control lines. Test level 4 is applicable for the power supply lines. The bursts are applied for 2 min with a positive polarity and for 2 min with a negative polarity.		N
(19.11.4.4)	The power supply terminals of the appliance are subjected to voltage surges in accordance with IEC 61000-4-5, five positive impulses and five negative impulses being applied at the selected points.		N
(19.11.4.5)	The appliance is subjected to injected currents in accordance with IEC 61000-4-6, test level 3 being applicable.		N
(19.11.4.6)	The appliance is subjected to voltage dips and interruptions in accordance with IEC 61000-4-11.		N
(19.11.4.7)	The appliance is subjected to mains signals in accordance with IEC 61000-4-13, test level class 2 being applicable.		N
(19.12)	If the safety of the appliance for any of the fault conditions specified in 19.11.2 depends on the operation of a miniature fuse-link complying with IEC 60127, the test is repeated, measuring the current flowing through the fuse-link; measured current (A); rated current of the fuse-link (A)..... : .....		N
(19.13)	During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts		P
	Temperature rises not exceeding the values shown in table 9		P
	Enclosures not deformed to such an extent that compliance with cl. 8 is impaired		P
	If the appliance can still be operated it complies with 20.2		P

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Clause	Requirement – Test	Result	Verdict
	Electric strength of insulation		N
	- basic insulation: 1250 V		N
	- supplementary insulation: 1750 V		N
	- reinforced insulation: 3000 V		N

(22)	CONSTRUCTION (EN 60335-1)		P
(22.1)	Appliances marked with the first numeral of IP system	IPX2D	P
(22.2)	All-pole disconnection means for stationary appliances		N
	Polarity of connection of switches or protective devices		N
(22.3)	Appliance with pins shall not impose undue strain on socket-outlets		N
	Means for retaining pins shall withstand expected forces in normal use:		N
	Equilibrium torque test ( ≤ 0.25Nm )		N
	Pull test on pins (50N; 1min.)		N
	Torque test on pins (0.4Nm; 1min.)		N
(22.4)	Appliances for heating liquids and causing undue vibration		N
(22.5)	Risk of electric shock from charged capacitors		N
	Remainder voltage measurement ( ≤ 34V)		N
(22.6)	Construction protected against possible condensed water or leaked liquid		N
	Syringing test	Complying with clause 29.2	N
(22.7)	Protection against the risk of excessive pressure		N
(22.8)	Appliances having accessible compartments		N
(22.9)	Insulation, internal wiring, windings, commutators, slip rings not subject to oil, grease or similar substances	No such harmful substances existing in the surrounding of these parts	P
(22.10)	Location and protection for reset buttons of non-self resetting controls	No such parts	N
(22.11)	Reliability and mechanical strength of non-detachable parts protecting against access to live parts, moisture or contact with moving parts		N
(22.12)	Handles, knobs, grips, levers and similar parts reliably fixed to avoid working loose		N
	Pull test in the axial force of parts (N)		N
(22.13)	Operator's hand gripping handles not contact with high temperature parts		N
(22.14)	No ragged or sharp edges	Rounded edges	P

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Clause	Requirement – Test	Result	Verdict
	Unaccessibility of pointed ends of self-tapping screws or other fasteners		N
(22.15)	Storage hooks and similar devices for flexible cords		N
(22.16)	Automatic cord reels shall be constructed so that they do not cause:		-
	- undue abrasion or damage to the cord		N
	- breakage of conductor strands		N
	- undue wear of contacts		N
	Cord reel test:		-
	- total length / unreel length		-
	- angle of extraction		-
	- operating cycle		-
	- rate of cycle		-
	- after test, electric strength test conducted between conductors of cord connected together and metal foil wrapped around the cord		N
(22.17)	Spacers intended to prevent the appliance from overheating walls		N
(22.18)	Resistance to corrosion of current-carrying parts and other metal parts		N
(22.19)	Driving belts	No such part	N
(22.20)	Prevention of direct contact between live parts and thermal insulation	Non-corrosive, non-hygroscopic and non-combustible material used	P
(22.21)	Wood, cotton, silk, ordinary paper and similar fibrous or hygroscopic material not used as insulation		P
(22.22)	Asbestos not allowable to use		P
(22.23)	Oils containing PCB not allowable to use		P
(22.24)	Bare heating elements adequately supported		N
	In case of rupture, the heating conductor is unlikely to come in contact with earthed metal parts or accessible metal parts		N
(22.25)	Sagging heating conductors cannot come into contact with accessible metal parts		N
(22.26)	Class II appliance having parts of class III construction		N
(22.27)	Separation of parts connected by protective impedance		N
(22.28)	Insulation of metal parts of class II appliances used to the gas mains or to the water mains		N
(22.29)	Accessibility of live parts of permanently connected class II appliance after installation		N

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Clause	Requirement – Test	Result	Verdict
(22.30)	Fixation and construction of supplementary or reinforced insulation of class II construction		N
(22.31)	Reduction of creepage distances and clearances over supplementary insulation and reinforced insulation due to wear		N
(22.32)	Reduction of creepage distances and clearances over supplementary insulation and reinforced insulation due to deposition of pollution		N
	Reduction of creepage distances over supplementary insulation of rubber parts		N
	Ceramic or similar materials shall not used as supplementary insulation or reinforced insulation		N
	Rubber ageing test:		N
	- volume of oxygen bomb (m <sup>3</sup> )		-
	- purity of oxygen ≥ 97%		-
	- pressure of oxygen bomb (Mpa)		-
	- Temperature of oxygen bomb (°C)		-
	- test duration ( in bomb / out of bomb) (h)		-
	- after conditioning, no crack visible to naked eye		N
	Test to determine if ceramic material is tightly sintered:		N
	- pressure of solution (Mpa)		-
	- test duration (h)		-
	- after test, no trace of dye visible to naked eye		N
(22.33)	Accessible conductive liquids not in direct contact with live parts		N
	Accessible conductive liquids not in direct contact with basic insulation or reinforced insulation for class II construction		N
	Conductive liquids in contact with live parts shall not in direct contact with reinforced insulation		N
	For class II construction: Not direct contact with basic or reinforced insulation		N
(22.34)	Shafts of operation knobs, handles, levers and similar parts shall not become live		N
(22.35)	Handles, levers, knobs and similar parts:		-
	- for constructions other than those of class III		N
	- for stationary appliances		N
(22.36)	Construction of handles of other than class III construction		N
(22.37)	Arrangement of capacitors on class II appliances		N

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Clause	Requirement – Test	Result	Verdict
(22.38)	Capacitors shall not be connected between contact of a thermal cut-out		N
(22.39)	Lampholders used for connection of lamps only		N
(22.40)	Switch for motor-operated appliances and combined appliances		N
(22.41)	Components containing mercury not to be used		P
(22.42)	Protective impedance		N
(22.43)	Device for voltage setting		N
(22.44)	Child-appealing enclosure not to be used		P
(22.45)	Construction of reinforce insulation of air		N
(22.46)	Software used in protective electronic circuits shall be software class B or software class C		N
(22.47)	Appliances intended to be connected to the water mains shall withstand the water pressure expected in normal use.		N
(22.48)	Prevent backsiphonage of non-potable water into the water mains.		N

(23)	INTERNAL WIRING (EN 60335-1)		P
(23.1)	Wireways smooth and free from sharp edges		P
	Wires protected against contact with burrs, cooling fins etc.		P
	Wire holes in metal well-rounded or provided with bushings		N
	Wiring prevented from coming into contact with moving parts		P
(23.2)	Beads and similar ceramic insulators on live wires fixed		P
	Beads inside flexible metal conduits provided with insulating sleeves		N
(23.3)	Electrical connections and internal conductors movable relatively to each other not exposed to undue stress		N
	Flexible metallic tubes not causing damage to insulation of conductors		N
	Open-coil springs not used		N
	Adequate insulating lining provided inside a coiled spring, the turns of which touch one another		N
	No damage after 10 000 flexings		N
	Electric strength test, 1000 V between live parts and accessible metal parts		N

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Clause	Requirement – Test	Result	Verdict
(23.4)	Bare internal wiring and heating conductors sufficiently rigid, fixed		N
(23.5)	Insulation for internal wiring: 2000V, 15min between the conductor and metal foil wrapped around the insulation	2000V, 15min	P
(23.6)	Fixing the sleeving used as supplementary insulation		P
(23.7)	Earthing conductors: Green/yellow color		N
(23.8)	Aluminium wire not used for internal wiring		P
(23.9)	Stranded conductors fixing: not use soldering	Not use soldering	N

(24)	COMPONENTS		P
(24.1)	Components comply with relevant IEC standards	Parts of these materials or components complying with relevant EN/IEC standards	P
(24.1.1)	Capacitor subjected to the supply voltage and used for radio interference suppression or for voltage dividing		N
(24.1.2)	Safety isolating transformer		N
(24.1.3)	Switch		N
(24.1.4)	Automatic controls		N
(24.1.5)	Appliance couplers		N
(24.1.6)	Appliance Lampholders		N
(24.2)	Switches and automatic controls operating at safety extra-low voltage may be fitted in interconnection cords in the maintenance area.		N
(24.4)	Plug and socket-outlets for extra-low voltage circuits shall not interchangeable with those listed in IEC60083, IEC60906-1 or IEC60320-1.		N
(24.5)	Capacitors in auxiliary winding of motor		N

(25)	SUPPLY CONNECTION AND EXTERNAL FLEXIBLE CORDS (EN 60335-1)		N
(25.3)	Means for connection to the supply mains for permanently connected appliances:		N
	- a set of terminals allowing connection of cables of fixed wiring		N
	- a set of terminals allowing the connection of a flexible cord		N
	- a set of supply lead		N
	- a set of terminals and cable entries, conduit entries, knock-outs or glands		N

26.	TERMINALS FOR EXTERNAL CONDUCTORS (EN 60335-1)	N
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Clause	Requirement – Test	Result	Verdict
(26.1)	Terminals only be accessible after removal of a non-detachable cover		N
	Compliance standard of relative terminals		N
(26.2)	Soldered connection not acting as the only method to maintain the conductor in position		N
(26.3)	Terminals for type X attachment and for connection to fixed wiring: (when clamping means is tightened or loosened)		N
	- terminal does not become loose		N
	- internal wiring is not subjected to stress		N
	- clearance and creepage distances are not reduced below the specified value		N
(26.4)	Terminals for type X attachment not require special preparation of the conductor		N
(26.5)	Accidental connection to other parts of a strayed wire of a stranded conductor		N
	Manual contact test:		N
	- no contact between live parts and accessible metal parts		N
	- no contact between live parts and metal parts separated from accessible metal parts by supplementary insulation		N
(26.6)	Nominal cross-sectional area of intended conductors		N
	Manual fitting test		N
(26.7)	Accessibility of terminals after removal of a cover or part of the enclosure		N
(26.8)	Terminals located close to each other		N
(26.9)	Visibility and protruded distance of the conductor end introducing into a pillar type terminal		N
(26.10)	Terminals with screw clamping and screwless terminals not used for connection of conductors of flat twin tinsel cords		N
	Pull test (5N)		N
(26.11)	Additional method for maintaining the conductor in position		N

27	Provision for earthing (EN 60335-1)		N
(27.1)	Accessible metal parts connected to earthing terminal or earthing contact		N
	Earthing terminals or earthing contacts not connected to neutral terminal		N
	Class II and III appliances have no provision for earthing		N

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Clause	Requirement – Test	Result	Verdict
	Safety extra-low voltage circuits not earthed		N
(27.2)	Clamping means of earthing terminals shall be adequately secured against accidental loosening		N
	screwless terminals comply with IEC 685-2-1		N
	Terminals used the connection of external equipotential bonding conductors:		N
	- allow the connection of conductors (2.5-6mm <sup>2</sup> )		N
	- not be used it providing earthing continuity between different parts		N
(27.3)	Earth connection “made before” and “separated after” current-carrying connections.		N
	Current-carrying conductors become taut before the earthing conductor		N
(27.4)	No risk of corrosion resulting from contact between parts of earthing terminal and other metal		N
	Resistance to corrosion of parts providing earthing continuity		N
	Steel earthing parts having an electroplated coating of min. 5µm in thickness		N
	Steel parts providing or transmitting contact pressure shall be protected against rusting		N
	In case of aluminium or aluminium alloys precautions taken to avoid risk of corrosion		N
(27.5)	Connection between earthing terminal or earthing contact and earthed metal parts shall have low resistance		N
	Earth resistance test:		N
	- no-load voltage of tester (V)		N
	- test current (A)		N
	- earth resistance: < 0.1 Ω		N
(27.6)	The Printed conductors of PCB not used to provide earthing continuity in hand held appliances.		N
	When used in other appliances if:		N
	- at least two tracks are used with independent soldering points and the appliance complies with requirements of 27.5 for each circuit.		N
	- the material of the printed circuit board complies with IEC 60249-2-4 or IEC 60249-2-5		N

28.	SCREWS AND CONNECTIONS (EN 60335-1)		N
(28.1)	Screwed connections withstand mechanical stresses		N



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Clause	Requirement – Test	Result	Verdict
	Screws likely to be tightened by the user and having a diameter less than 3 mm, and screws transmitting electrical contact pressure, screwed into metal		N
	Screws not of soft metal liable to creep (Zn or Al)		N
	Diameter of screws of insulating material min. 3 mm		N
	Screws of insulating material not used for electrical connection		N
	Screws not of insulating material if their replacement by a metal screw can impair supplementary or reinforced insulation		N
	Screws to be removed for the replacement etc. of the power supply cord not of insulating material if their replacement by a metal screw can impair basic insulation		N
	Screws and nuts withstand torque test		N
	-Number of times		-
	-Torque (Nm)		-
	- no damage impairing the further use of the fixings or connections		N
(28.2)	Contact pressure not transmitted through insulating material liable to shrink or distort, unless shrinkage or distortion compensated		N
	Correct introduction of screw into hole or nut ensured		N
(28.3)	Screws in engagement with thread of insulating material and likely to be tightened by the user, have sufficient length of engagement to ensure reliable connection		N
(28.4)	Clamping and locking means provided if space-threaded (sheet metal) screws used for the connection of current-carrying parts		N
	Thread-cutting (self-tapping) screws used for the connection of current-carrying parts, satisfy with specified requirements		N
	Use of space-threaded or thread-cutting screws for earthing continuity according to specification		N
	Screws for current-carrying mechanical connection secured against loosening		N
	Rivets for current-carrying connections subject to torsion secured against loosening		N
29.	CLEARANCES, CREEPAGE DISTANCES AND SOLID INSULATION (EN 60335-1)		P

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Clause	Requirement – Test	Result	Verdict
	Appliances shall be constructed so that the clearances, creepage distances and solid insulation are adequate to withstand the electrical stress to which it is liable to be subjected		P
(29.1)	Clearances shall not be less than those specified in table 16		P
	Impulse voltage test	See Cl.14	N
	Applicable overvoltage category	II	-
	Rated impulse voltage		-
(29.1.1)	Clearances of basic insulation	See appended table	P
	Clearance at the terminals of tubular sheathed heating elements		N
(29.1.2)	Clearances of supplementary insulation		P
(29.1.3)	Clearances of reinforced insulation	See appended table	P
(29.1.4)	Clearances for functional insulation	See appended table	P
	Clearances between surfaces of PTC heating elements		N
(29.1.5)	Clearances for circuits having higher working voltage than rated voltage		N
	Clearances for earthed or screened secondary circuits of a step-down transformer		N
(29.2)	Creepage distances shall not be less than those appropriate for the working voltage, taking into account ;		-
	- Pollution degree	3	-
	-Material group	II	-
(29.2.1)	Creepage distances of basic insulation		P
(29.2.2)	Creepage distances of supplementary insulation		N
(29.2.3)	Creepage distances of reinforced insulation	See appended table	P
(29.2.4)	Creepage distances of functional insulation	See appended table	P
(29.3)	Distance through solid insulation		N

30.	RESISTANCE TO HEAT AND FIRE (EN 60335-1)		P
(30.1)	External parts of non-metallic material, parts of insulating material support live parts, and parts of thermoplastic material providing supplementary insulation or reinforced insulation shall be sufficiently resistant to heat		P
	Ball-pressure test:		P
	- pressure force (N)	20N	-
	- test duration (h)	1h	-

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Clause	Requirement – Test	Result	Verdict
	- test temperature (°C)	See appended table	-
	- after the test: diameter of the impression $\leq 2.0\text{mm}$		P
(30.2)	Parts of non-metallic material shall be resistant to ignition and spread of fire		P
(30.2.1)	Glow-wire test of IEC 60695-2-11 at 550 °C, unless		P
	the material is classified at least HB40 according to IEC 60695-11-10		N
	Parts for which the glow-wire test cannot be carried out meet the requirements in ISO9772 for category HBF material		N
(30.2.2)	Appliances operated while attended, parts of insulating material supporting current-carrying connections and parts within a distance of 3mm subjected to the glow-wire test of IEC 60695-2-11 at a temperature of :		N
	- 750°C, for connections carrying a current exceeding 0.5A during normal operation		N
	- 650°C, for other connections		N
	Test not applicable to conditions as specified		N
(30.2.3)	Appliances operated while unattended, tested as specified in 30.2.3.1 and 30.2.3.2		N
	Test not applicable to conditions as specified		N
(30.2.3.1)	Parts of insulating material supporting connections carrying a current exceeding 0.2A during normal operation, and		N
	Parts of insulating material within a distance of 3mm		N
	Having a glow-wire flammability index of at least 850°C according to IEC 60695-2-12		N
(30.2.3.2)	Parts of insulating material supporting current-carrying connections, and		N
	Parts of insulating material within a distance of 3mm		N
	Subjected to glow-wire test of IEC 60695-2-11		N
	Test not carried out on material having a glow-wire ignition temperature according to IEC 60695-2-13 as specified		N
	Glow-wire test of IEC 60695-2-11, the temperature being:		N
	-750°C, for connections carrying a current exceeding 0.2A during normal operation		N
	-650°C, for other connections		N
	Parts that during the test produce a flame persisting longer than 2 s, tested as specified		N

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Clause	Requirement – Test	Result	Verdict
	If a flame persists longer than 2 s during the test, parts above the connection, as specified, subjected to the needle-flame test of annex E, unless		N
	The material is classified as V-0 or V-1 according to IEC 60695-11-10		N
(30.2.4)	Base material of printed circuit boards subjected to needle-flame test of annex E		N
	Test not applicable to conditions as specified		N

(31)	RESISTANCE TO RUSTING (EN 60335-1)		N
	Relevant ferrous parts adequately protected against rusting		N

4.3	Indicators and alarms		P
4.3.1	Visual indicator		P
	a) Power supply indicators	Green	P
	b) Alarm indicators	Red	P
	c) Fault alarm indicators	Yellow	P
4.3.2	audible alarm	See clause 5.3.16 for details.	P
4.3.3	Alarm indicators and audible alarms of alarm conditions		P
	CO Concentration & time	See user's manual.	P
4.3.4	Adjustment devices and tools intended for adjustment		N
4.4	Fault signals		P
	The apparatus shall provide a fault signal in the event of loss of continuity or short circuit to the sensor.		P
	The fault signal shall be clearly identified and different from a gas alarm.		P
4.5	Output signal (applicable for type A apparatus only)		N
4.6	Labelling and Instructions		P
4.6.1	General		P
4.6.2	Labelling	See below	P
	A) the manufacturer's or supplier's name, trademark or other means of identification.	Ningbo WanKe Electron Technology Co., Ltd.	P
	b) The name of the apparatus, model number	Carbon monoxide detector, XC-05	P
	The type of gas	CO	P
	c) the number of the European Standard.	EN 50291:2001	P
	d) the type of apparatus, A or B	Type B apparatus.	P

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Clause	Requirement – Test	Result	Verdict
	e) The serial number or manufacturing data code of the equipment.	Manufactured date: 08, 2010	P
	f) For mains powered apparatus, the electricity supply voltage and frequency and maximum power consumption;		N
	g) For battery powered apparatus, the type and size of replacement batteries.	9V Alkalinescence battery,	P
	h) Recommendations on the replacement procedures and lifetime of the apparatus.	Lifetime: 5 years.	P
	The marking shall be legible and shall comply with 7.6 and 7.14 of EN60335-1	See below.	P
(7.6)	Correct symbols used		P
	Symbol for nature of supply placed next to the marking for rated voltage		N
	Symbol for class II appliances obviously placed		N
	Units of physical quantities and their symbols	Complying with international standardized system	P
(7.14)	Marking shall be legible and durable		P
	Marking rubbing test	Still legible after rubbing, no curling	P
4.6.3	Cautions		P
	<b>CAUTION: READ THESE INSTRUCTIONS CAREFULLY BEFORE OPERATING OR SERVICING.</b>		P
4.6.4	Instruction booklet		P
	Instruction shall include at least the following information:		P
	a) For mains powered apparatus, the correct operating voltage, frequency, fuse-rating, if any, and method of connection to premises supply system.		N
	b) the type and size of replacement batteries, normal operating life, battery replacement instructions and information on low battery conditions,		P
	c) Guidance on siting and mounting of the apparatus and the warning		P
	d) Actions to be taken if the apparatus alarms.		N
	e) An explanation of all warning and other indications, including re-setting facilities where relevant.		P
	f) A list of commonly occurring materials, vapours or gases,		P
	g) Warning of the possible hazards of electric shock or malfunction if the apparatus is tampered with.		N
	h) Instruction on the use of any test method supplied		N

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Clause	Requirement – Test	Result	Verdict
	with the apparatus and a warning on false conclusions that may be drawn from the application of other methods, such as gas lighters, flammable vapours,		
	l) The expected lifetime of the apparatus	Five years.	P
	J) For type A apparatus, the use and characteristics of the output signal.		N
	k) A note stating the working ranges of both temperature and humidity		P
	l) The alarm conditions		P
	m) a description of the effects of carbon monoxide on the human body.		P
	N) Warning that installation	See instruction for details.	P
4.6.5	Packaging		P
	- carry a warning that the apparatus should be installed by a competent person,		P
	- Carry relevant information regarding storage and transport.		P
	The package shall clearly display the following message:		P
	This apparatus is designed to protect individuals from the acute effects of carbon monoxide exposure, it will not fully safeguard individuals with specific medical conditions. If in doubt consult a medical practitioner.		P

<b>5</b>	<b>Test and performance requirements</b>			<b>P</b>
5.1	General requirements for tests			P
5.1.1	Test samples			P
5.1.2	Preparation of samples.	Mounting of accordance with the manufacturer's instructions.		P
5.1.3	Use of mask for testing			P
5.1.4	Test chamber			P
5.2	Normal conditions for tests			P
5.2.1	General			P
5.2.2	Test gases for alarm testing		See below.	P
	<b>CO volume ratio</b>	<b>Test gas volume ratio</b>	<b>No alarm before</b>	<b>Alarm before</b>
	30ppm	32ppm	120 minutes	-
	50ppm	55ppm	60 minutes	90 minutes
	100ppm	110ppm	10 minutes	40 minutes
	300ppm	330ppm	-	3 minutes

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Clause	Requirement – Test		Result	Verdict
5.2.3	Test gases for specified tests			P
	- for the long term stability test		See clause 5.3.14	P
	- for the high volume ratio test		See clause 5.3.6	p
5.2.4	Speed of test gases (between 0.1 m/s and 0.5 m/s)		0.2m/s	P
5.2.5	Power supply		9V	P
5.2.6	Temperature		25°C	P
5.2.7	Humidity		45%	P
5.2.8	Pressure		91kPa	P
5.2.9	Removable parts			N
5.3	Test methods and performance requirements.			P
5.3.1	General			P
	Test gases for alarm testing			P
Test gas	CO volume ratio	Test gas volume ratio	No alarm before	Alarm before
-to clean air for 15 minutes, No alarm.				
A	30ppm	32ppm	120 minutes	-
-to clean air for 15 minutes, No alarm.				
B	50ppm	55ppm	60 minutes	90 minutes
-to clean air for 15 minutes, No alarm.				
C	100ppm	110ppm	10 minutes	40 minutes
-to clean air for 15 minutes, No alarm.				
D	300ppm	330ppm	-	3 minutes
5.3.2	Unpowered storage			P
	Expose the apparatus sequentially to the following conditions:			P
	a) a temperature of -20°C for 24h			P
	b) ambient temperature for 24h			P
	c) a temperature of 50°C for 24h			P
	d) ambient temperature for 24 h.			P
5.3.3	Output signal			P
5.3.3.1	Test			P
5.3.3.2	Performance requirement			P
5.3.4	Alarm conditions			P
5.3.5	Alarm test during warm-up time			P
5.3.6	Response and recovery to a high test gas volume ratio			P
5.3.6.1	Test			P

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<b>Clause</b>	<b>Requirement – Test</b>		<b>Result</b>	<b>Verdict</b>
	- to clean air for 15 minutes		No alarm.	P
	- to 5 000 ppm CO as specified in 5.2.3 for 15 minutes;		5000 ppm	P
	- to clean air for 1 hour		No alarm.	P
	- to test gas B for 90 minutes or until the alarm activates if less than 90 minutes		CO volume ratio:50 ppm	P
	- to clean air for 15 minutes		No alarm.	P
5.3.6.2	Performance requirement			P
	The apparatus shall not alarm during the initial exposure to clean air.			P
	The apparatus shall alarm within 3 minutes when exposed to the high CO volume ratio.		CO volume ratio:50 ppm Test gas volume ratio:55ppm No alarm before: 60 minutes Alarm before: 90 minutes	P
5.3.7	Temperature effects			P
5.3.8	Humidity effects			P
5.3.8.1	Test			P
	Expose the apparatus and the test gas to a humidity of (30±5)% r.h. at (15±2)°C for a period of 6 h followed by an exposure to (90±5)% r.h. at (40±2)°C for a period of 6h			P
	At the end of each exposure interval and before the test conditions are changed.			P
5.3.8.2	Performance requirement			P
	Test gases for alarm testing		See below	P
<b>Test gas</b>	<b>CO volume ratio</b>	<b>Test gas volume ratio</b>	<b>No alarm before</b>	<b>Alarm before</b>
-to clean air for 15 minutes, No alarm.				
A	30ppm	32ppm	120 minutes	-
-to clean air for 15 minutes, No alarm.				
B	50ppm	55ppm	60 minutes	90 minutes
-to clean air for 15 minutes, No alarm.				
C	100ppm	110ppm	10 minutes	40 minutes
-to clean air for 15 minutes, No alarm.				
D	300ppm	330ppm	-	3 minutes
5.3.9	Speed of test gas		The alarm does not operate.	P
5.3.10	Supply voltage variations (mains powered apparatus only)			P
5.3.11	Electromagnetic compatibility			P
5.3.11.1	Test		Accordance with EN 50270.	P



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Clause	Requirement – Test	Result	Verdict
5.3.11.2	Performance requirements	Accordance with EN 50270.	P
5.3.12	Response to mixtures of carbon monoxide and other gases		P
5.3.13	Effects of other gases		P
5.3.13.1	Test		P
	Subject the apparatus consecutively to the following gas mixtures under the conditions given below:		P
	- NO at a volume ratio of 5 ppm +2/-0 ppm for 1h;		P
	- SO2 at a volume ratio of 2 ppm +1/-0 ppm for 1h;		P
	- ethanol at a volume ratio of (500 ± 50) ppm for 30 min for LPG apparatus,		P
	- ethanol at a volume ratio of (2 000 ± 200) ppm for 30 min for apparatus suitable for town gas or natural gas.		P
	- hexamethyldisiloxane at a volume ratio of (10 ± 3) ppm for 40 min.		P
5.3.13.2	Performance requirement		P
	The lower volume ratio of test gas shall cause no alarm, the higher volume ratio of test gas shall induce an alarm.		P
	No other alarms shall be generated during the test.		P
	Remote sensors shall conform to the requirements of EN 50194, Subclause 5.3.13.		N
5.3.14	Long term stability		P
5.3.15	Drop test (applicable to apparatus not intended for fixed installation)		N
5.3.16	Alarm sound level(Limited: at least 85dB at 1m)	>85dB	P
5.3.17	Degree of protection	IPX2D	P
5.3.17.1	Test		P
	The enclosure of the apparatus shall provide a degree of protection of at least IPX2D.	According to EN 60529:1991 clauses 12, 13 and 14	P
5.3.17.2	Performance requirement	According to EN 60529:1991 clauses 12, 13 and 14	P
	- Remote sensors shall provide protection of at least IP44.		N
	- The control unit shall provide protection of at least IP42.		N
5.3.18	Mechanical strength		P
	The apparatus shall be tested in accordance with the test specified in clause 21 of EN 60335-1,	See below.	P
21.	MECHANICAL STRENGTH (EN 60335-1)		P

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Clause	Requirement – Test	Result	Verdict
(21.1)	Appliances shall have adequate mechanical strength and appropriate construction		P
	Impact test:	By spring hammer	P
	- impact energy (1.0 ±0.2)J	Enclosure, 1.0J	P
	- observation		P
	- complying with clause 8.1		P
	- complying with clause 15.1	IPX2D	P
	- complying with clause 29		P
	- complying with clause 16.3		P
(21.2)	Accessible parts of solid insulation shall have sufficient strength to prevent penetration by sharp implements		P
	Scratch test		P
	- by hardened steel pin	10 N ±0.5 N for axis force; 30 N ±0.5 N perpendicularly force.	P
	- by test fingernail of Figure 7	10 N	P
	- complying with clause 16.3		P
	The apparatus is rigidly supported and three blows are applied to every point of the enclosure that is likely to be weak with an impact energy of (1 ±0.2)J.		P

<b>6</b>	<b>Self-contained battery powered apparatus</b>		<b>P</b>
6.1	Battery fault warning		P
6.1.1	Visual or audible fault warning		P
6.1.2	Test		P
6.1.3	Performance requirements		P
	When exposed to CO-air mixtures, the alarm shall operate according to the conditions in Table 3. Recovery from the alarm state shall take place, after manual resetting if necessary within 6 minutes when exposed to clean air.		P
6.2	Battery capacity		P
6.2.1	General		P
6.2.2	Assessment		P
6.2.3	Performance requirements		P
	The low battery voltage warning shall be indicated by either:		P
	- a suitable permanent optical indication for example a separate LED or a flashing of the fault indicator,		P

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Clause	Requirement – Test	Result	Verdict
	- an acoustic indicator which may be intermittent having a minimum of 1 minute energized per hour.		P
6.3	Battery reversal		N
6.3.1	General		N
6.3.2	Test		N
6.3.3	Performance requirements		N
	The lower volume ratio of test gas shall cause no alarm.		N
	The higher volume ratio of test gas shall induce an alarm.		N
	For type A apparatus, the output signal shall be activated.		N
6.4	Battery connections		P
6.4.1	General		P
6.4.2	Test		P
	Pull test (20N, 1 min)		P
6.4.3	Performance requirements		P
	The strain relieving devices shall be effective in ensuring that strain is not imparted to the battery terminals or circuit board during the test.		P

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Clause	Requirement – Test	Result	Verdict
<b>A</b>	<b>ANNEX A, Health effects</b>		<b>P</b>
A.1	Toxic effects		P
A.2	Chronic effects on high risk groups		P
A.3	Normal COHb levels		P
A.4	Tobacco smoking		P
<b>B</b>	<b>ANNEX C, A-deviations</b>		<b>N</b>

11.8	TABLE: Heating Test, thermocouples				P
	Test voltage (V).....:	9.0V		-	
	Ambient (°C) .....	25.1		-	
Measured locations	dT(K)		Max. dT (K)		
External Enclosure	4.5		60		
Surface of Battery	4.8		15		
Inside wire	3.0		75		
Winding of Inductor L	8.6		75		
PCB under U3	10.4		105		
Heating test, resistance method					
Temperature rise of winding	R1(Ω)	R2(Ω)	dT(K)	Max. dT(K)	Insulation Class
---	---	---	---	---	---
---	---	---	---	---	---
Note: N.A.					

13.2	TABLE: leakage current measurements				N
	Heating appliances: 1.15 x rated input.....:			---	
	Motor-operated and combined appliances: 1.06 x rated voltage. ....:			---	
Leakage current between			I (mA)	Max. allowed I (mA)	
---			---	---	
---			---	---	
Note: N/A					

13.3	TABLE: electric strength measurements			P
test voltage applied between:			test voltage (V)	Breakdown (Yes/No)
DC Input to enclosure			500	No
Note: N/A				

14	TABLE: Transient overvoltages					N
Clearance between:	CI (mm)	Required CI (mm)	Rated impulse voltage (V)	Impulse test voltage (V)	Flashover (Yes/No)	
-	-	-	-	-	-	

16.2	TABLE: leakage current measurements		N
	Single phase appliances: 1.06 x rated voltage.:		---
	Three phase appliances 1.06 x rated voltage divided by $\sqrt{3}$ .....:		---
Leakage current between		I (mA)	Max. allowed I (mA)
---		---	---
---		---	---
Note: N/A			

16.3	TABLE: electric strength measurements		P
test voltage applied between:		test voltage (V)	Breakdown (Yes/No)
DC Input to enclosure		500	No
Note: N/A			

17	TABLE: overload protection of transformers and associated circuits		N
	t1 (°C)	---	
	Test condition	---	
	Test voltage (V)	---	
part measured or position of measurement		dT (K)	required dT (K)
---		---	---
Note: N/A.			

19.11.2	TABLE: abnormal operation				P
No	Component	Fault	Test Voltage (V)	Test Time	Result
1	Diode D1	s-c	9	<3min	No hazard, No high temperature. The appliance can't work normally.
2	U3 (Pin 1- Pin2)	s-c	9	60min	No hazard, No high temperature.
3	Inductor L	o-c	9	<3min	No hazard, No high temperature. The appliance can't work normally.

19.11.2	TABLE: abnormal operation					P
No	Component	Fault	Test Voltage (V)	Test Time	Result	
4	sensor	s-c	9	60min	The equipment can clearly identified and different from a gas alarm.	
Note: s-c =Short Circuit, o-c = Open Circuit						

24.1	TABLE: Component list			P
Name	Manufacturer / Trademark	Type / Specification		Certification
PCB	Wing Shing Electronic & PCB Ltd.	YS-1B,94V-0 130°C		UL (E190407)
Appliance wiring material	Evernew Wire & Cable Co., Ltd.	1672, 22AWG, VW-1, 105°C, 300V		UL (E138922)
Enclosure	Guangzhou Arco Science & Technology Ltd.	---		Test with equipment
Note: N/A.				

29.2(1)	TABLE: Creepage distances, basic, supplementary and reinforced insulation										P
Working voltage (V)	Creepage distance (mm)							Type of insulation			Verdict
	Pollution degree										
	1	2			3						
		Material group			Material group						
		I	II	IIIa/IIIb	I	II	IIIa/IIIb	B*)	S*)	R*)	
≤50	0,2	0,6	0,9	1,2	1,5	1,7	>1,9	√	—	—	P
≤50	0,2	0,6	0,9	1,2	1,5	1,7	>1,9	—	√	—	P
≤50	0,4	1,2	1,8	2,4	3,0	3,4	>3,8	—	—	√	P
>50 and ≤125	0,3	0,8	1,1	1,5	1,9	2,1	2,4	—	—	—	N
>50 and ≤125	0,3	0,8	1,1	1,5	1,9	2,1	2,4	—	—	—	N
>50 and ≤125	0,6	1,6	2,2	3,0	3,8	4,2	4,8	—	—	—	N
>125 and ≤250	0,6	1,3	1,8	2,5	3,2	3,6	4,0	—	—	—	N
>125 and ≤250	0,6	1,3	1,8	2,5	3,2	3,6	4,0	—	—	—	N
>125 and ≤250	1,2	2,6	3,6	5,0	6,4	7,2	8,0	—	—	—	N
>250 and ≤400	1,0	2,0	2,8	4,0	5,0	5,6	6,3	—	—	—	N
>250 and ≤400	1,0	2,0	2,8	4,0	5,0	5,6	6,3	—	—	—	N
>250 and ≤400	2,0	4,0	5,6	8,0	10,0	11,2	12,6	—	—	—	N
>400 and ≤500	1,3	2,5	3,6	5,0	6,3	7,1	8,0	—	—	—	N

>400 and ≤500	1,3	2,5	3,6	5,0	6,3	7,1	8,0	—	—	—	<b>N</b>
>400 and ≤500	2,6	5,0	7,2	10,0	12,6	14,2	16,0	—	—	—	<b>N</b>
>500 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	—	—	—	<b>N</b>
>500 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	—	—	—	<b>N</b>
>500 and ≤800	3,6	6,4	9,0	12,6	16,0	18,0	20,0	—	—	—	<b>N</b>
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	—	—	—	<b>N</b>
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	—	—	—	<b>N</b>
>800 and ≤1000	4,8	8,0	11,2	16,0	20,0	22,0	25,0	—	—	—	<b>N</b>
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	—	—	—	<b>N</b>
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	—	—	—	<b>N</b>
>1000 and ≤1250	6,4	10,0	14,2	20,0	25,0	28,0	32,0	—	—	—	<b>N</b>
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0	—	—	—	<b>N</b>
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0	—	—	—	<b>N</b>
>1250 and ≤1600	8,4	12,6	18,0	25,0	32,0	36,0	40,0	—	—	—	<b>N</b>
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0	—	—	—	<b>N</b>
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0	—	—	—	<b>N</b>
>1600 and ≤2000	11,2	16,0	22,0	32,0	40,0	44,0	50,0	—	—	—	<b>N</b>
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0	—	—	—	<b>N</b>
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0	—	—	—	<b>N</b>
>2000 and ≤2500	15,0	20,0	28,0	40,0	50,0	56,0	64,0	—	—	—	<b>N</b>
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0	—	—	—	<b>N</b>
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0	—	—	—	<b>N</b>
>2500 and ≤3200	20,0	25,0	36,0	50,0	64,0	72,0	80,0	—	—	—	<b>N</b>
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0	—	—	—	<b>N</b>
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0	—	—	—	<b>N</b>
>3200 and ≤4000	25,0	32,0	44,0	64,0	80,0	90,0	100,0	—	—	—	<b>N</b>
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0	—	—	—	<b>N</b>
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0	—	—	—	<b>N</b>
>4000 and ≤5000	32,0	40,0	56,0	80,0	100,0	112,0	126,0	—	—	—	<b>N</b>
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0	—	—	—	<b>N</b>
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0	—	—	—	<b>N</b>
>5000 and ≤6300	40,0	50,0	72,0	100,0	126,0	142,0	160,0	—	—	—	<b>N</b>
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0	—	—	—	<b>N</b>
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0	—	—	—	<b>N</b>
>6300 and ≤8000	50,0	64,0	90,0	126,0	160,0	180,0	200,0	—	—	—	<b>N</b>
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	—	—	—	<b>N</b>



>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	—	—	—	<b>N</b>
>8000 and ≤10000	64,0	80,0	112,0	160,0	200,0	220,0	250,0	—	—	—	<b>N</b>
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	—	—	—	<b>N</b>
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	—	—	—	<b>N</b>
>10000 and ≤12500	80,0	100,0	142,0	200,0	250,0	280,0	320,0	—	—	—	<b>N</b>
*) , B=Basic, S=Supplementary and R=Reinforced											

<b>29.2(2)</b>	<b>TABLE: Creepage distances, functional insulation</b>								<b>P</b>
Working voltage (V)	Creepage distance (mm) Pollution degree							Verdict / Remark	
	1	2			3				
	Material group			Material group					
	I	II	IIIa/IIIb	I	II	IIIa/IIIb			
≤50	0,2	0,6	0,8	1,1	1,4	1,6	>1,8	<b>P</b>	
>50 and ≤125	0,3	0,7	1,0	1,4	1,8	2,0	2,2	<b>N</b>	
>125 and ≤250	0,4	1,0	1,4	2,0	2,5	2,8	3,2	<b>N</b>	
>250 and ≤400	0,8	1,6	2,2	3,2	4,0	4,5	5,0	<b>N</b>	
>400 and ≤500	1,0	2,0	2,8	4,0	5,0	5,6	6,3	<b>N</b>	
>500 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	<b>N</b>	
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	<b>N</b>	
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	<b>N</b>	
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0	<b>N</b>	
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0	<b>N</b>	
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0	<b>N</b>	
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0	<b>N</b>	
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0	<b>N</b>	
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0	<b>N</b>	
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0	<b>N</b>	
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0	<b>N</b>	
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	<b>N</b>	
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	<b>N</b>	

<b>30.1</b>	<b>TABLE: ball-pressure tests</b>			<b>P</b>
	part	test temperature (°C)	Impression diameter (mm)	Allowed impression diameter(mm)
	Plastic material of enclosure	75	1.0	≤2.0
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Note: N/A.				

<b>30.2</b>	<b>TABLE: resistance to heat, fire and tracking, tracking and glow-wire test</b>						<b>P</b>	
	Part	Tracking test (V)		glow-wire test (°C)			Flames	Result
		175	250	550	650	750	850	
	Insulation material of enclosure	---	---	√	---	---	---	No burning Pass
Note: N/A.								

## PHOTOS

Model: XC-05



\*\*\*\*\* End of Test Report \*\*\*\*\*