



Test Report issued under the responsibility of:



TEST REPORT
IEC 60730-1
Automatic electrical controls for household and similar use

Report Number .....: CVC2016-0040
Date of issue .....: Feb. 19, 2016
Total number of pages .....: 34



Applicant's name.....: Guangzhou Safty Electronic Technology Co., Ltd.
Address .....: Room 202, No. 3, Commercial Building, Panyu, Guangzhou, 511442, China

Test specification:
Standard .....: IEC 60730-1 (Fourth Edition): 2010
Test procedure.....: CB Scheme
Non-standard test method.....: N/A

Test Report Form No.....: IEC60730\_1G
Test Report Form(s) Originator.....: Electrosulse
Master TRF .....: Dated 2011-04

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This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description .....: Thermal motor protector
Trade Mark .....: SAFTTY
Manufacturer.....: Guangzhou Safty Electronic Technology Co., Ltd. Panyu Branch
Model/Type reference .....: BW-BCP Series
Ratings .....: 250VAC 6A 50°C-155°C Type 3.C

|  |                                  |  |
|--|----------------------------------|--|
| <b>Testing procedure and testing location:</b>     |                                  |  |
| <input checked="" type="checkbox"/>                | <b>CB Testing Laboratory:</b>    | Vkan Certification & Testing Co., Ltd.   |
| <b>Testing location/ address .....</b>             |                                  | No. 3 Bantai Road, Kaitai Avenue, Science City, Guangzhou 510663 P. R. China                               |
| <input type="checkbox"/>                           | <b>Associated CB Laboratory:</b> |  |
| <b>Testing location/ address .....</b>             |                                  |  |
| <b>Tested by (name, function, signature) .....</b> |                                  | Lin Yongming, Engineer  |
| <b>Approved by (name, function, signature) ..</b>  |                                  | Kong Ruixun, Manager    |
| <input type="checkbox"/>                           | <b>Testing procedure: TMP</b>    |  |
| <b>Testing location/ address .....</b>             |                                  |  |
| <b>Tested by (name + signature) .....</b>          |                                  |  |
| <b>Approved by (name + signature) .....</b>        |                                  |  |
| <input type="checkbox"/>                           | <b>Testing procedure: WMT</b>    |  |
| <b>Testing location/ address .....</b>             |                                  |  |
| <b>Tested by (name + signature) .....</b>          |                                  |  |
| <b>Witnessed by (name + signature) .....</b>       |                                  |  |
| <b>Approved by (name + signature) .....</b>        |                                  |  |
| <input type="checkbox"/>                           | <b>Testing procedure: SMT</b>    |  |
| <b>Testing location/ address .....</b>             |                                  |  |
| <b>Tested by (name + signature) .....</b>          |                                  |  |
| <b>Approved by (name + signature) .....</b>        |                                  |  |
| <b>Supervised by (name + signature) .....</b>      |                                  |  |
| <input type="checkbox"/>                           | <b>Testing procedure: RMT</b>    |  |
| <b>Testing location/ address .....</b>             |                                  |  |
| <b>Tested by (name + signature) .....</b>          |                                  |  |
| <b>Approved by (name + signature) .....</b>        |                                  |  |
| <b>Supervised by (name + signature) .....</b>      |                                  |  |

**List of Attachments (Including a total number of pages in each attachment):**

Annex 1: Pictures (P23-P24)

Annex 2: Bill of Material (P25)

**Summary of testing:**

Samples submitted:

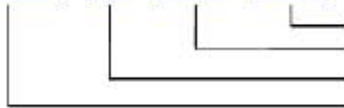
BW-BCP 155°C 10pcs;

BW-BCP 50°C 10pcs;

The method of mounting affects the creepage distances and clearances.

Type reference:

SAFTTY BW - BCP 155°C



Operating temperature: 50~155°C

Plastic case

The name of the series

Manufacturer's name

Apart from the above-mentioned differences, structures, ratings, etc. of samples are all the same.

The motor was not submitted, so the endurance test was carried out at the ratings of 250VAC 6A. See Table A for details.

**Tests performed (name of test and test clause):**

Full test.

**Testing location:**

No. 3, Tiantalyi Road, Kaitai Avenue, Science City, Guangzhou, 510663, P. R. China

**Summary of compliance with National Differences: N/A****List of countries addressed: N/A**

The product fulfills the requirements of \_\_\_\_\_ (Insert standard number and edition and delete the text in parenthesis or delete the whole sentence if not applicable)

**Cope of marking plate**

|   |  |
|---|--|
| <b>Test item particulars</b> .....  |  |
| <b>Classification of installation and use</b> .....   | N/A  |
| <b>Supply Connection</b> .....  | N/A  |
| .....   |  |
| <b>Possible test case verdicts:</b>   |  |
| - test case does not apply to the test object .....   | N/A  |
| - test object does meet the requirement .....   | P (Pass)   |
| - test object does not meet the requirement .....   | F (Fail)   |
| <b>Testing</b> .....  |  |
| <b>Date of receipt of test item</b> .....   | Jan. 16, 2016  |
| <b>Date (s) of performance of tests</b> .....   | Jan. 16, 2016 – Feb. 19, 2016  |
| <b>General remarks:</b>   |  |
| <p>The test results presented in this report relate only to the object tested.<br/> This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.<br/> "(see Enclosure #)" refers to additional information appended to the report.<br/> "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p> |  |
| <b>Manufacturer's Declaration per sub-clause 6.2.5 of IEC60335-1:</b>   |  |
| The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....   | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> Not applicable   |
| <b>When differences exist; they shall be identified in the General product information section.</b>   |  |
| <b>Name and address of factory (ies)</b> .....  | Manufacturer's address: Room 202, No.4, Shijiazui Street, Panyu, Guangzhou, 511442, China<br>Factory: same as manufacturer's name<br>Factory's address: same as manufacturer's address |
| <b>General product information:</b>   |  |
| These series thermal motor protectors are widely used in or on industrial and household appliance to prevent the motors from overcurrent and overheat.  |  |

| IEC 60730-1 |   |                         |         |
|-------------|---|-------------------------|---------|
| Clause      | Requirement + Test  | Result - Remark         | Verdict |
| <b>3</b>    | <b>GENERAL REQUIREMENTS</b>   |                         | P       |
|             | Control designed and constructed in such a fashion not to cause injury to persons or damage to property   |                         | P       |
| <b>5</b>    | <b>RATINGS</b>  |                         | N/A     |
| 5.1         | Maximum rated voltage (V) .....   |                         | N/A     |
| 5.2         | Maximum rated current (A).....  |                         | N/A     |
| <b>6</b>    | <b>CLASSIFICATION</b>   |                         | P       |
| 6.1         | Nature of supply .....  | a.c.                    | —       |
| 6.2         | Type of load and power factor .....   | Resistive; 0.65         | —       |
| 6.3         | Purpose .....   | Thermal motor protector | —       |
| 6.4         | Features of automatic action, Type 1 or Type 2 .....  | Type 3                  | —       |
| 6.5         | Degree of protection provided by enclosure per IEC 60529 and control pollution situation.....   | IP 00/normal            | —       |
| 6.6         | Method of connection .....  |                         | —       |
| 6.7         | Ambient temperature limits of the switch ahead:<br>Tmin(°C); Tmax (°C) .....  |                         | —       |
| 6.8         | Protection against electric shock.....  |                         | —       |
| 6.9         | Circuit disconnection or interruption .....   | Micro- interruption     | —       |
| 6.10        | Number of cycles of actuation (M) of each manual action .....   |                         | —       |
| 6.11        | Number of cycles of actuation (A) of each automatic action .....  |                         | —       |
| 6.12        | Temperature limits of the mounting surface of the control (°C or K) .....   |                         | —       |
| 6.13        | Value of proof tracking index (PTI) for the insulation material used.....   | PTI175                  | —       |
| 6.14        | Period of the electrical stress across insulating parts supporting live parts, and between live parts and earthed metal (short or long period)..... | Long period             | —       |
| 6.15        | Construction .....  | Incorporated control    | —       |
| 6.16        | Ageing requirements (type Y) of end-product equipment.....  |                         | —       |
| 6.17        | Use of thermistor (Annex J).....  |                         | —       |
| 6.18        | Use of software class (Annex H).....  |                         | —       |
| <b>7</b>    | <b>INFORMATION</b>  |                         | P       |
| 7.2.1       | Information provided by one or more of the methods specified in Table 1   | See part 2              | P       |
| 7.2.3       | For integral/separate controls Documentation (D) replaced with Declaration (X)  |                         | N/A     |

| <b>IEC 60730-1</b> |   |                 |         |
|--------------------|---|-----------------|---------|
| Clause             | Requirement + Test  | Result - Remark | Verdict |
| 7.2.4              | Marking for the integral control within the complex control included in the marking of the complex control  |                 | N/A     |
| 7.2.5              | Documentation (D) satisfied by similar information in Marking (C).  |                 | P       |
| 7.2.5.1            | Declaration (X) satisfied by similar information in Documentation (D) or Marking (C)  |                 | P       |
| 7.2.6              | Information for Integrated control provided by Declaration (X).   |                 | N/A     |
|                    | Incorporated control provided with manufacturers name or trademark and unique type reference when other required marking provided by Documentation (D)            |                 | P       |
|                    | Information for incorporated control intended for exclusive delivery to the equipment.  |                 | N/A     |
| 7.2.7              | Controls with limited space marked with manufacturer's name or trademark and the unique type reference while other required marking included in Documentation (D) |                 | N/A     |
| 7.2.8              | Additional pertinent information permitted if does not rise misunderstanding..... :   |                 | N/A     |
| 7.2.9              | Appropriate IEC symbols used per 7.2.9 ..... :  |                 | N/A     |
| 7.3                | Class II symbol   |                 | N/A     |
| 7.3.1              | Used only for in-line cord, free-standing, and independently mounted controls   |                 | N/A     |
| 7.3.2              | Outer square is approximately twice the size of the inner square  |                 | N/A     |
| 7.3.2.1            | Largest dimension of the control (mm)..... :  |                 | —       |
|                    | Side dimension of outer square (mm)..... :  |                 | N/A     |
| 7.3.2.2            | Controls which include terminals for earthing continuity for functional purposes are not marked with the symbol for class II                                      |                 | N/A     |
| 7.4.1              | Marking placed on the main body, on non-detachable parts  |                 | P       |
|                    | Required marking legible and durable  | See Annex A     | P       |
| 7.4.2              | An arrow pointing towards the terminal identifies terminals of control intended for connection of supply conductors   |                 | N/A     |
|                    | Additional markings required by the National Wiring Codes provided ..... :  |                 | N/A     |
| 7.4.3              | Terminals for neutral external conductor identified by letter "N"   |                 | N/A     |
| 7.4.3.1            | External earthing and continuity terminals of Class II and III controls and terminals for earthing for functional purposes identified by earth symbol             |                 | N/A     |
|                    | – for protective earth by the earth symbol for protective earth, IEC 60417-5019 (2002-10)   |                 | N/A     |
|                    | – for functional earth by the earth symbol for functional earth, IEC 60417-5017 (2002-10).  |                 | N/A     |

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|--------------------|--|----------------------------|----------|
| Clause             | Requirement + Test   | Result - Remark            | Verdict  |
| 7.4.3.2            | All other terminals appropriately identified   | Self-evident               | P        |
|                    | For use in Canada and the U.S.A, terminal intended for grounded supply conductor provided in white/grey colour.  |                            | N/A      |
|                    | For use in Canada and the U.S.A, the wire binding screw intended for equipment earthing conductor is slotted/ hexagonal green-coloured head. Location is such that it is unlikely to be removed during servicing.  |                            | N/A      |
|                    | For use in Canada and the U.S.A, the pressure wire connector intended for equipment earthing conductor is marked GROUND, GROUNDING, EARTH, or by a marking on the wiring diagram shipped with the control. Location is such that it is unlikely to be removed during servicing of control. |                            | N/A      |
|                    | Additional markings required by National Wiring Codes of Canada and U.S.A provided..... :  |                            | N/A      |
| 7.4.4              | Symbols "+" and "-" provided to indicate the direction to increase or decrease response value for the controls to be set by the user or the equipment manufacturer.  |                            | N/A      |
|                    | Controls intended to be set by the equipment manufacturer or the installer accompanied by documentation (D) indicating proper method for securing the setting.   |                            | N/A      |
| 7.4.5              | Replaceable parts destroyed during the normal operation marked to enable their identification from a Catalogue or similar document, even after they operated.  |                            | N/A      |
| 7.4.6              | Controls intended to be connected only to SELV systems are marked with the class III symbol  |                            | N/A      |
|                    | This requirement does not apply where the means of connection to the supply is so shaped that it can only mate with a particularly designed SELV or PELV arrangement.  |                            | N/A      |
|                    | Controls designed as for class III but have terminals for earthing continuity for functional purposes are not marked with the symbol for class III construction  |                            | N/A      |
| <b>8</b>           | <b>PROTECTION AGAINST ELECTRIC SHOCK</b>   |                            | <b>P</b> |
| 8.1.1              | Adequate protection provided against accidental contact with live parts in all unfavourable positions of normal use, and after all accessible detachable parts (other than lamps behind the detachable cover) were removed.  | Check in the end equipment | P        |
|                    | Protection against accidental contact with live parts of the lamp provided to allow safe insertion and removal of the lamps.   |                            | N/A      |
|                    | Live parts connected to a SELV supply not exceeding 24 V considered being non-hazardous.   |                            | N/A      |

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|--------------------|---|----------------------------|---------|
| Clause             | Requirement + Test  | Result - Remark            | Verdict |
|                    | If SELV- or PELV-circuits supplied at higher than 24 volts are accessible, the current between the accessible part(s) and either pole of the supply source of the SELV/PELV circuits comply with H.8.1.10.1.      |                            | N/A     |
|                    | Live parts connected to a SELV supply not exceeding 30 V considered to be non-hazardous in the countries specified in the remarks column..... :   |                            | N/A     |
| 8.1.2              | Class II controls and controls for Class II equipment provided with protection against accidental contact with metal parts separated from hazardous live parts by only basic insulation.                          |                            | N/A     |
| 8.1.3              | Lacquer, enamel, paper, cotton, oxide film on metal parts, and beads and sealing compounds not relied upon for protection against accidental contact with hazardous live parts.                                   |                            | P       |
|                    | Self-hardening sealing compounds exempted from the above requirements.  |                            | N/A     |
| 8.1.4              | For controls connected to gas or water supply mains any metal part electrically connected to pipes is separated from hazardous live parts by double insulation or reinforced insulation.                          |                            | N/A     |
| 8.1.5              | Class II controls and controls for Class II equipment for fixed installation: protection not impaired by the installation of control / equipment  |                            | N/A     |
| 8.1.6              | Integrated and Incorporated controls: tests made to accessible parts when control is mounted as intended with detachable parts removed.   | Check in the end equipment | P       |
| 8.1.7              | In-line and free-standing controls: tests are made when control fitted with cord; cross-sectional area of cord (mm <sup>2</sup> ) .....   |                            | —       |
| 8.1.8              | Independently mounted controls: tests are made when control mounted as in normal use, fitted with cable or with a conduit; cross-sectional area of cable (mm <sup>2</sup> ) :                                     |                            | —       |
| 8.1.9              | Tests using the standard test finger and test pin:  |                            | N/A     |
|                    | - not permissible to touch bare live parts.   |                            | N/A     |
|                    | - controls with double insulation: not permissible to touch metal parts with test finger which are separated from live parts by basic insulation.   |                            | N/A     |
| 8.1.11             | Between Class III and main/earth circuits, insulation external to the safety isolating transformer complies with Class II insulation  |                            | N/A     |
| 8.1.12             | Live parts are hazardous if they exceed the values specified in 8.1.1 and it are not separated from the source by protective impedance and are not a PEN conductor or a part of the equipotential bonding system. |                            | N/A     |
| 8.2                | Actuating members and means   |                            | N/A     |
| 8.3                | Capacitors  |                            | N/A     |
| 8.4                | Covers and uninsulated live or hazardous parts; cover fixing screws:  |                            | N/A     |



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|-------------|---|--------------------|---------|
| Clause      | Requirement + Test  | Result - Remark    | Verdict |
| <b>9</b>    | <b>PROVISION FOR PROTECTIVE EARTHING</b>  |                    | N/A     |
| <b>10</b>   | <b>TERMINALS AND TERMINATIONS</b>   |                    | P       |
| 10.1        | Terminals and terminations for external copper conductors   |                    | N/A     |
| 10.2        | Terminals and terminations for internal conductors  |                    | P       |
| 10.2.1      | Connectable conductors  | Lead wire          | P       |
| 10.2.2      | Terminals suitable for their purpose  |                    | P       |
| 10.2.3      | In soldered terminals: soldering is not the only means to maintain conductor in position                          |                    | N/A     |
|             | In soldered terminals: barriers provided to prevent reduction in creepage and clearance.                          |                    | N/A     |
| 10.2.4      | Flat push-on connectors   |                    | N/A     |
| 10.2.4.1    | Dimension of tabs:  |                    | N/A     |
|             | - measured (mm x mm) .....  |                    | —       |
|             | - compliance with Fig. 14, 15, 16 or IEC/EN 61210   |                    | N/A     |
|             | - other dimensions allowed (mm x mm) .....  |                    | —       |
|             | - polarized acceptance of receptacles allowed.  |                    | N/A     |
| 10.2.4.2    | Tabs forming part of a control consist of material appropriate to the maximum temperatures allowed (table 7)      |                    | N/A     |
| 10.2.4.3    | Mechanical strength of tabs.  | See table 10.2.4.3 | N/A     |
| 10.2.4.4    | Space between tabs; applying appropriate receptacles on each tab:   |                    | N/A     |
|             | - no strain, no distortion to any of the tabs or adjacent parts   |                    | N/A     |
|             | - no reduction of creepage distance or clearances below values of Cl. 20  |                    | N/A     |
| 10.3        | Terminals and terminations for integrated conductors  |                    | N/A     |
| <b>11</b>   | <b>CONSTRUCTION REQUIREMENTS</b>  |                    | P       |
| 11.1.1      | Insulating materials  |                    | P       |
|             | Wood, cotton, silk, ordinary paper etc. not used as insulation unless impregnated, or                             |                    | P       |
| 11.1.2      | Current carrying part other than threaded parts of terminals, if made of brass:                                   |                    | P       |
|             | - contain at least 50% copper if cast or from bar   |                    | N/A     |
|             | - contain at least 58% copper if from rolled sheet  |                    | P       |
| 11.1.3.1    | Non-detachable cords of Class I controls provided with a green/yellow conductor insulation and properly connected |                    | N/A     |
| 11.1.3.2    | Non-detachable cords: green/yellow conductor not connected to other than earthing terminals                       |                    | N/A     |
| 11.2        | Protection against electric shock   |                    | N/A     |
| 11.3        | Actuation and operation   |                    | N/A     |

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|-------------|---|----------------------------|---------|
| Clause      | Requirement + Test  | Result - Remark            | Verdict |
| 11.4        | Actions   |                            | N/A     |
| 11.5        | Openings in enclosures (drain holes)  |                            | N/A     |
|             | - minimum area (mm <sup>2</sup> ): .....  |                            | —       |
|             | - maximum area (mm <sup>2</sup> ): .....  |                            | —       |
|             | - minimum dimension (mm <sup>2</sup> ): .....   |                            | —       |
| 11.6        | Mounting of controls  |                            | P       |
| 11.6.1      | Control mounted according to manufacturer's declaration: does not adversely affect compliance with this standard                  | Check in the end equipment | P       |
| 11.6.2      | Control mounted as declared, if movement or removal could adversely affect compliance with this standard:                         |                            | P       |
|             | - cannot rotate or be displaced   | Check in the end equipment | P       |
|             | - cannot be removed without the aid of a tool   | Check in the end equipment | P       |
|             | - when removal (even partial) is necessary for use, requirements of clauses 8, 13, and 20 are satisfied before and after removal. |                            | N/A     |
|             | Controls, other than with rotary actuation, fixed by a nut and single bushing:  |                            | N/A     |
|             | - tightening of the nut requires a tool   |                            | N/A     |
|             | - parts have adequate mechanical strength   |                            | N/A     |
|             | Screwless fixing of an incorporated control: a tool is required before the control can be removed from the equipment              |                            | N/A     |
| 11.6.3      | Mounting of independently mounted controls  |                            | N/A     |
| 11.7        | Attachment of cords   |                            | N/A     |
| 11.8        | Size of non-detachable cords  |                            | N/A     |
| 11.9        | Inlet openings  |                            | N/A     |
| 11.10       | Equipment inlets and socket-outlets   |                            | N/A     |
| 11.11       | Requirements during mounting, maintenance and servicing   |                            | N/A     |
| 11.12       | Controls using software .....   |                            | N/A     |
| 11.13       | Protective controls and components of protective control system   |                            | N/A     |

|           |  |       |     |
|-----------|--|-------|-----|
| <b>12</b> | <b>MOISTURE AND DUST RESISTANCE</b>  |       | P   |
| 12.1.1    | Protection against ingress of water and dust<br>IP Classification of the product.....                    | IP 00 | —   |
| 12.1.2    | Electric Strength Test, 13.2 after tests according to IEC 60529  |       | N/A |
|           | Entered water does not impair compliance with this standard  |       | N/A |
|           | No reduction of creepage distances and clearances below values of Cl. 20                                 |       | N/A |
| 12.1.6    | Sealing means aged in heating cabinet at temperature (°C): (70 ± 2) °C for duration (h): 10 days (240 h) |       | N/A |

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|--------------------|---|-------------------|---------|
| Clause             | Requirement + Test  | Result - Remark   | Verdict |
|                    | Parts then left at room temperature, duration (h): > 16 h .....   |                   | N/A     |
| 12.2               | Protection against humid conditions   |                   | P       |
| 12.2.6             | Detachable parts: removed and tested with main part, if necessary   |                   | N/A     |
| 12.2.7             | 2 days (48 h) Humidity Test for IPx0 controls   | 48h               | P       |
|                    | 7 days (168 h) Humidity Test for other controls   |                   | N/A     |
| 12.2.8             | Relative humidity (%): 91-95% .....   | 93                | —       |
|                    | Temperature (°C): (20 - 30 ± 1) °C .....  | 28                | —       |
| 12.2.9             | Tests executed immediately after the humidity treatment (after the reassembly of detached parts)              |                   | N/A     |
|                    | - in-line, free-standing and independently mounted controls according to Insulation Resistance (13.1)         |                   | N/A     |
|                    | - Electric Strength (13.2)  |                   | N/A     |
|                    | - integrated and incorporated controls according to Electric Strength (13.2)                                  |                   | P       |
| 12.3               | Leakage current test for in-line cord and free -standing controls   |                   | N/A     |
| <b>13</b>          | <b>ELECTRIC STRENGTH AND INSULATION RESISTANCE</b>  |                   | P       |
| 13.1               | Insulation resistance of in-line cord, free-standing and independently mounted controls                       |                   | N/A     |
| 13.1.2             | Reinforced or supplementary insulation measured to non-metal parts covered with metal foil                    |                   | N/A     |
| 13.1.3             | Test voltage applied (Vdc) .....  |                   | —       |
| 13.1.4             | Insulation resistance measured  |                   | N/A     |
|                    | - basic insulation ≥ 2 MΩ .....   |                   | N/A     |
|                    | - supplementary insulation ≥ 5 MΩ.....  |                   | N/A     |
|                    | - reinforced insulation ≥ 7 MΩ .....  |                   | N/A     |
| 13.2               | Electric Strength Test  |                   | P       |
| 13.2.2             | Insulating surfaces covered with metal foil   |                   | P       |
| 13.2.3             | 50 or 60 Hz test voltage applied for 1 min. ....  | 2500V; 50Hz; 1min | —       |
| 13.3               | Leakage current of in-line cord and free-standing controls after the tests of 13.1 or 13.2                    |                   | N/A     |
|                    | Test voltage (V) .....  |                   | —       |
| 13.3.3             | Leakage current measured.   |                   | N/A     |
| <b>14</b>          | <b>HEATING</b>  |                   | N/A     |
| <b>15</b>          | <b>MANUFACTURING DEVIATION AND DRIFT</b>  |                   | N/A     |
| 15.1               | Adequate consistency of declared operating value etc. required for parts of controls providing Type 2 actions |                   | N/A     |
| 15.2               | Measurement of deviation and drift  |                   | N/A     |

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|--------------------|---|--|---------|
| Clause             | Requirement + Test  | Result - Remark                          | Verdict |
| <b>16</b>          | <b>ENVIRONMENTAL STRESS</b>   |  | P       |
| 16.1               | Control can withstand the level of stress likely to occur in transportation and storage                                 |  | P       |
| 16.2               | Environmental stress of temperature   |  | P       |
|                    | Entire control (not energized) maintained for 24h at a temperature of $(-10 \pm 2) ^\circ\text{C}$ or as declared ..... | $(-10 \pm 2) ^\circ\text{C}; 24\text{h}$ | —       |
|                    | Entire control (not energized) maintained for 4h at a temperature of $(60 \pm 5) ^\circ\text{C}$ or as declared .....   | $(60 \pm 5) ^\circ\text{C}; 4\text{h}$   | —       |
|                    | Control capable of being actuated at room temperature to provide disconnection as declared (without dismantling)        |  | P       |
| <b>17</b>          | <b>ENDURANCE</b>  |  | N/A     |
| <b>18</b>          | <b>MECHANICAL STRENGTH</b>  |  | P       |
| 18.1.1             | Control constructed to withstand mechanical stress  |  | P       |
| 18.1.2             | Actuating members of class I and class II controls or for class I and class II equipment:                               |  | N/A     |
|                    | - adequate mechanical strength, or  |  | N/A     |
|                    | - protection against electric shock is maintained if actuating member is broken   |  | N/A     |
| 18.1.3             | For integrated and incorporated controls impact resistance (18.2) to be tested by the equipment standard                | Check in the end equipment               | P       |
| 18.1.4             | Tests of 18.2 to 18.8 carried out sequentially on one sample:   |  | N/A     |
|                    | - tested sample: type reference .....   |  | —       |
|                    | - tested sample: identification No. ....  |  | —       |
| 18.1.5             | Compliance (after the tests of Cl. 18):   |  | N/A     |
|                    | - no damage to impair compliance with this standard, in particular  |  | N/A     |
|                    | - Cl. 8, protection against electric shock  |  | N/A     |
|                    | - Cl. 13, electric strength and insulation resistance   |  | N/A     |
|                    | - Cl. 20, creepage distance and clearances  |  | N/A     |
|                    | - insulating linings, etc. have not worked loose  |  | N/A     |
|                    | - detachable parts: removal and replacing still possible  |  | N/A     |
|                    | - actuating to provide full- or micro-disconnection still possible  |  | N/A     |
|                    | - supplementary or reinforced insulation tested to clause 13  |  | N/A     |
| 18.1.6             | In USA and Canada, mechanical strength requirements for threaded entries.   |  | N/A     |
| 18.2               | Impact resistance   |  | N/A     |

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| Clause          | Requirement + Test   | Result - Remark | Verdict |
| 18.2.1 - 18.2.6 | In-line cord controls, free-standing and independently mounted controls: test by means of impact test apparatus IEC 60068-2-75 |                 | N/A     |
| 18.4            | Alternate compliance - Impact resistance (see tab 18.4.1DV or 18.4.2DV)  |                 | N/A     |
|                 | enclosure material   |                 | N/A     |
|                 | with supporting frame (yes / no)   |                 | N/A     |
|                 | max. with, max length,   |                 | N/A     |
|                 | thickness required; measured:  |                 | N/A     |
| 18.5            | Free standing controls   |                 | N/A     |
| 18.5.1          | Additional tests of 18.5.2 and 18.5.3 required (test apparatus Fig. 4)   |                 | N/A     |
| 18.5.2          | Input terminals: 2 m of flexible, lightest cord (used in 10.1.4); cord; cross-sectional area (mm <sup>2</sup> ) ..... :        |                 | —       |
|                 | Output terminals: 2 m of flexible, lightest cord (if intended); cord; cross-sectional area (mm <sup>2</sup> ) ..... :          |                 | —       |
|                 | Pull and fall test (3 times):  |                 | N/A     |
|                 | - pull (N), increasing value, applied on the cord (Table 9) ..... :  |                 | —       |
|                 | - sample falls onto the base, height 0.500 m (Fig. 4)  |                 | N/A     |
| 18.6            | In-line cord controls  |                 | N/A     |
| 18.7            | Pull-cord actuated controls  |                 | N/A     |
| 18.8            | Foot-actuated controls   |                 | N/A     |
| 18.9            | Actuating member and actuating means   |                 | N/A     |

|           |   |  |          |
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| <b>19</b> | <b>THREADED PARTS AND CONNECTIONS</b>   |  | <b>P</b> |
| 19.1      | Threaded parts to be moved during mounting or servicing   |  | N/A      |
| 19.1.2    | Threaded parts: easily replaceable if completely removed; excluded: constructions restricting complete removal  |  | N/A      |
| 19.1.3    | Thread:   |  | N/A      |
|           | - metric ISO thread or thread of equivalent effectiveness   |  | N/A      |
|           | - for other than ISO, BA, SI or Unified thread: torque values increased by 20%  |  | N/A      |
| 19.1.4    | Screw generating a thread:  |  | N/A      |
|           | - thread forming (swaging) type screws  |  | N/A      |
|           | - thread cutting type screw not used  |  | N/A      |
| 19.1.5    | Space threaded type screws: provided with means to prevent loosening  |  | N/A      |
| 19.1.6    | Threaded parts of non-metallic material are not used if replacement by a dimensionally similar metal screw could impair compliance with Cl. 13 or 20: |  | N/A      |
| 19.1.7    | Threaded parts: not of soft material  |  | N/A      |

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| Clause             | Requirement + Test   | Result - Remark | Verdict |
| 19.1.8             | Screws operating in a non-metallic thread: correct introduction of the screw into its counterpart ensured  |                 | N/A     |
| 19.1.9             | In-line cord controls, threaded parts transmitting contact pressure:   |                 | N/A     |
|                    | - diameter < 3 mm: threaded part of metal  |                 | N/A     |
|                    | - diameter ≥ 3 mm: non-metallic allowed, but not used for electrical connection  |                 | N/A     |
| 19.1.11            | Threaded parts tightened and loosened:   |                 | N/A     |
|                    | - one of threaded parts non-metallic material: 10 times  |                 | N/A     |
|                    | - both parts of metallic material: 5 times   |                 | N/A     |
| 19.1.12            | Screws in thread of non-metallic material: completely removed and reinserted each time   |                 | N/A     |
|                    | Terminal screws and nuts: conductor fitted in the terminal (used in 10.1.4 or 10.2.10); cross-sectional area (mm <sup>2</sup> ) .....                        |                 | —       |
| 19.1.14            | Conductor moved each time the threaded part is loosened  |                 | N/A     |
|                    | - no damage impairing the further use of the threaded part   |                 | N/A     |
|                    | - no breakage of screws  |                 | N/A     |
|                    | - no damage to the slot head or washers  |                 | N/A     |
| 19.1.15            | Torque test  |                 | N/A     |
| 19.2               | Current-carrying connections   |                 | P       |
| 19.2.1             | - not disturbed by mounting or servicing capable of withstanding the stresses in normal use.   |                 | N/A     |
| 19.2.2             | - subjected to torsion in normal use locked against movement   |                 | N/A     |
|                    | - movement is limited  |                 | N/A     |
| 19.2.3             | Contact pressure:  |                 | P       |
|                    | - not transmitted through non-metallic material, or  |                 | P       |
|                    | - sufficient resilience in the metallic part   |                 | N/A     |
|                    | Non-metallic material: suitability considered with respect to stability of dimension within temperatures applicable to the control; max. temperature (°C) .. |                 | —       |
| 19.2.4             | Space threaded screws:   |                 | N/A     |
|                    | - screws clamp current-carrying parts directly in contact with each other  |                 | N/A     |
|                    | - provided with means of locking   |                 | N/A     |
| 19.2.4.1           | - used to provide earthing continuity: at least two screws used for each connection  |                 | N/A     |
| 19.2.5             | Thread cutting screws: screws produce a full-form standard machine screw thread  |                 | N/A     |
| 19.2.5.1           | Thread cutting screws used to provide earthing continuity: at least two screws used for each connection  |                 | N/A     |

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| Clause      | Requirement + Test   | Result - Remark | Verdict  |
| 19.2.6      | Current-carrying connection whose parts rely on pressure for correct function: resistant to corrosion (not inferior to that of brass)                      |                 | N/A      |
|             | If not plated, e.g. bimetallic blades: parts are clamped into contact with parts resistant to corrosion  |                 | N/A      |
| <b>20</b>   | <b>CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION</b>   |                 | <b>P</b> |
|             | PCB: coating conforming requirement of IEC 60664-3:  |                 | N/A      |
|             | PCB: coating meets requirements of 20.3  |                 | N/A      |
|             | PCB: No creepage and clearance applies to conductor under coating (see Annex Q)  |                 | N/A      |
| 20.1        | Clearances   |                 | P        |
| 20.1.1      | Basic Insulation - Case A applies except as permitted in Cl. 20.1.7  |                 | P        |
| 20.1.2      | Operational Insulation - Case A applies except as permitted in Cl. 20.1.7 or   |                 | N/A      |
|             | For electronic controls Cl. H27.1.3 met  |                 | N/A      |
| 20.1.3      | Methods of measurement: Annex B and Fig. 17  |                 | P        |
| 20.1.3.1    | Controls with equipment inlet and/or socket-outlet with connector / plug inserted and without  |                 | N/A      |
| 20.1.3.2    | Controls with terminals for external conductors: without conductors and with conductors of largest cross-sectional area (mm <sup>2</sup> ) (10.1.4) .....  |                 | —        |
| 20.1.3.3    | Controls with terminals for internal conductors: without conductors and with conductors for minimum cross-sectional area (mm <sup>2</sup> ) (10.2.1) ..... | Lead wire       | —        |
| 20.1.4      | Distances through slots or openings of insulating material measured to metal foil in contact with the surface, foil pushed into corners with test finger   |                 | N/A      |
| 20.1.5      | Standard test finger applied to apertures as specified in 8.1: distances between live parts and metal foil not reduced below required values               |                 | N/A      |
| 20.1.6      | Force (standard test finger) to be applied in an endeavour to reduce distances:  |                 | P        |
| 20.1.6.1    | - 2 N force applied by standard test finger to any point on bare live parts accessible before control is mounted .....                                     | 2 N             | —        |
|             | - 30 N force applied by standard test finger to accessible surfaces after control mounted.....   |                 | —        |
| 20.1.7      | For basic and operational insulation, smaller distances permitted but no less than values specified in Case B of table 22, provided that:                  |                 | N/A      |
|             | - control meets the impulse test, Cl 20.1.12   |                 | N/A      |
|             | - all parts are rigid and secure   |                 | N/A      |
|             | - no likelihood of the distance being reduced  |                 | N/A      |
|             | Impulse voltage applied across clearance of operational insulation   |                 | N/A      |

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| Clause      | Requirement + Test   | Result - Remark  | Verdict |
| 20.1.7.1    | For micro-disconnection and interruption:  |                  | P       |
|             | - clearance distance not specified   |                  | P       |
|             | - other parts- not less than contact separation  |                  | N/A     |
| 20.1.7.2    | Full disconnection - case A applies to parts separated by switching element incl. contacts   |                  | N/A     |
| 20.1.8      | Clearances of supplementary insulation: not less than basic insulation, case A   |                  | N/A     |
| 20.1.9      | Clearances of reinforced insulation: next higher step for rated impulse voltage used.  |                  | N/A     |
| 20.1.10     | Clearances of operational and basic insulation in controls supplied from a double insulated transformer  |                  | N/A     |
|             | Clearances in controls supplied from a transformer without separate windings   |                  | N/A     |
| 20.1.11     | ELV circuits derived from supply using protective impedance, clearance of operational insulation determined from table 21 and based on max. working voltage in the ELV circuit   |                  | N/A     |
| 20.1.12     | Impulse voltage test, CI 4.1.1.2.1 of IEC 60664-1 applied between live parts and metal (V)..... :  |                  | N/A     |
| 20.1.13     | If the secondary winding of a transformer is earthed, (or an earthed screen between windings) clearances on the sec. side: basic insulation > limits in Table 22 but using the next lower step for rated impulse voltage |                  | N/A     |
|             | For circuits supplied with a voltage lower than rated voltage, clearances of functional insulation are based on the working voltage  |                  | N/A     |
| 20.2        | Creepage distances   |                  | P       |
| 20.2.1      | Creepage distances for basic insulation, per table 23 and based on material group and pollution degree:  |                  | P       |
|             | - measurements   | See Tabel 20.2.1 | P       |
|             | - 2 N force applied by standard test finger to bare conductors .....   | 2 N              | —       |
|             | - 30 N force applied to accessible surfaces applied by standard test finger .....  |                  | —       |
| 20.2.2      | Creepage distance for operational insulation, per table 24 and based on material group and pollution degree  |                  | N/A     |
|             | - measurements   |                  | N/A     |
|             | - 2 N force applied by standard test finger to bare conductors :   |                  | N/A     |
|             | - 30 N force applied to accessible surfaces applied by standard test finger :  |                  | N/A     |
| 20.2.3      | Supplementary insulation: not less than basic  |                  | N/A     |
| 20.2.4      | Reinforced insulation: double the value of basic   |                  | N/A     |
| 20.3        | Solid Insulation   |                  | N/A     |



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| Clause      | Requirement + Test  | Result - Remark | Verdict |
|             | Solid insulation is capable of durably withstanding electrical and mechanical stresses as well as possible thermal and environmental influences   |                 | N/A     |
| 20.3.2      | For working voltages $\leq 300V$ , supplementary and reinforced insulation between metal parts  |                 | N/A     |
|             | - minimum 0.7mm thick; measured (mm) .....  |                 | N/A     |
| 20.3.2.1    | Insulation is applied in thin sheet form, other than mica or similar scaly material   |                 | N/A     |
|             | - the supplementary insulation consists of at least two layers and each layer complies with Cl. 13.2 for supplementary insulation   |                 | N/A     |
|             | - the reinforced insulation consists of at least three layers and any two layers complies with Cl. 13.2 for reinforced insulation   |                 | N/A     |
| 20.3.2.2    | The supplementary insulation or reinforced insulation is inaccessible and meets one of the following:   |                 | N/A     |
|             | - max. temperature measured per Cl. 27 and H.27 does not exceed permissible values in Table 13  |                 | N/A     |
|             | - conditioned insulation complies with Cl. 13.2 at the oven and room temperatures   |                 | N/A     |
|             | For optocouplers, the conditioning procedure has to be carried out at a temperature of 25 K in excess of the maximum temperature measured on the optocoupler during the tests of Clauses 14, 27 and H.27..... |                 | N/A     |
|             | The optocoupler is operated under the most unfavourable conditions which occur during these tests.  |                 | N/A     |

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| <b>21</b> | <b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>  |  | <b>P</b> |
|           | For Canada and USA see annex D  |  | N/A      |
| 21.1      | No requirements exist for small parts as defined in IEC 60695-2-11, Subclause 3.1               |  | N/A      |
| 21.2      | Integrated, incorporated and in-line cord controls  |  | P        |
| 21.2.1    | Accessible parts (control correctly mounted):   |  | N/A      |
|           | - ball-pressure test 1 (G.5.1) conducted at temperature ( $^{\circ}C$ ) .....                   |  | —        |
|           | diameter of the impression $\leq 2.0mm$ (mm) .....  |  | N/A      |
|           | - glow-wire test (G2.) at 550 $^{\circ}C$   |  | N/A      |
| 21.2.2    | Parts retaining current-carrying parts in position (other than electrical connections):         |  | N/A      |
|           | - ball-pressure test 2 (G.5.2) conducted at temperature ( $^{\circ}C$ ) .....                   |  | —        |
|           | diameter of the impression $\leq 2.0mm$ (mm) .....  |  | N/A      |
|           | - glow-wire test (G2.) at 550 $^{\circ}C$   |  | N/A      |
| 21.2.3    | Parts maintaining or retaining electrical connections in position: according to Annexes F and G |  | P        |
|           | Glow-wire temperature levels according to IEC 60695-2-11  |  | P        |

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| Clause             | Requirement + Test  | Result - Remark | Verdict    |
|                    | - ball-pressure test 2 conducted at temperature (°C) :  |                 | —          |
|                    | diameter of the impression ≤ 2.0mm (mm) .....   |                 | N/A        |
|                    | - glow-wire test (G2.) at 650 °C  |                 | N/A        |
|                    | - ball-pressure test 2 conducted at temperature (°C) :  |                 | —          |
|                    | diameter of the impression ≤ 2.0mm (mm) .....   |                 | N/A        |
|                    | - glow-wire test (G2.) at 750 °C  |                 | N/A        |
|                    | - ball-pressure test 2 conducted at temperature (°C) :  | 195             | —          |
|                    | diameter of the impression ≤ 2.0mm (mm) .....   | <2.0            | P          |
|                    | - glow-wire test (G2.) at 850 °C  |                 | P          |
|                    | 21.2.3 is not applicable to parts retaining in position current-carrying parts in low-power circuits as described in H.27.1.1.1 |                 | N/A        |
| 21.2.4             | Other parts (except small parts unlikely to be ignited):  |                 | N/A        |
|                    | - glow-wire test (G2.) at 550 °C  |                 | N/A        |
| 21.2.7             | Resistance to tracking:   |                 | N/A        |
|                    | Test procedure see Annex G, Cl. G4; applied voltage corresponding to the PTI value declared Table 1, item 30.                   | 175V            | P          |
|                    | Controls designed for operation at ELV levels are not subjected to a tracking test.   |                 | N/A        |
| 21.3               | Independently-mounted controls  |                 | N/A        |
| 21.4               | Controls with mercury-tube switch, subjected to short-circuit test:   |                 | N/A        |
| <b>22</b>          | <b>RESISTANCE TO CORROSION</b>  |                 | <b>N/A</b> |
| <b>23</b>          | <b>ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS – EMISSION</b>  |                 | <b>N/A</b> |
| <b>24</b>          | <b>COMPONENTS</b>   |                 | <b>N/A</b> |
| <b>25</b>          | <b>NORMAL OPERATION</b>   |                 | <b>N/A</b> |
|                    | Meets requirements per annex H.....   | See annex H     | N/A        |
| <b>26</b>          | <b>ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS – IMMUNITY</b>  |                 | <b>N/A</b> |
|                    | Meets requirements per Cl. H.26 .....   | See clause H.26 | N/A        |
| <b>27</b>          | <b>ABNORMAL OPERATION</b>   |                 | <b>N/A</b> |
| <b>28</b>          | <b>GUIDANCE ON THE USE OF ELECTRONIC DISCONNECTION</b>  |                 | <b>N/A</b> |
|                    | Meets requirement per annex H.....  |                 |            |

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| Clause      | Requirement + Test   | Result - Remark | Verdict    |
| <b>A</b>    | <b>ANNEX A – INDELIBILITY OF MARKING</b>   |                 | <b>P</b>   |
| A.1         | Classification of markings   |                 | P          |
| A.1.1       | Markings which are not mandatory   |                 | N/A        |
| A.1.2       | Markings which are mandatory but not accessible to the final user  |                 | P          |
| A.1.3       | Markings which are mandatory and accessible to the final user  |                 | N/A        |
| A.1.4       | Permanence of marking test:  |                 | P          |
|             | - solvents: neutral liquid detergent   |                 | —          |
|             | - solvents: petroleum spirit   |                 | —          |
|             | - solvents: water  |                 | —          |
| A2          | Test of indelibility of markings classified in A1.2  |                 | P          |
| A2.1        | Drops of detergent standing on the marked surface, duration (h): 4 h .....   | 4               | —          |
|             | Drops removed by fine spray of warm water (40 ± 5 °C) or by lightly wiping.....  | 40              | —          |
| A2.2        | Allowed to dry completely at (25 ± 5) °C.....  | 25              | —          |
| A2.3        | Rubbed in the apparatus ( Fig. 8 ) with dry lint, weight 250 g, duration (s): 15 s                                     | 250g; 15s       | P          |
| A2.4        | Rubbed in the apparatus ( Fig. 8 ) with water-soaked lint, weight 250 g, duration (s): 15 s                            | 250g; 15s       | P          |
| A2.6        | Marking after these tests still legible  |                 | P          |
| A3.         | Test of indelibility of markings classified A1.3   |                 | N/A        |
| A3.1        | Rubbed in the apparatus ( Fig. 8 ) with dry lint, weight 750 g, duration (s): 15 s                                     |                 | N/A        |
| A3.2        | Rubbed in the apparatus ( Fig. 8 ) with water-soaked lint, weight 750 g, duration (s): 15 s                            |                 | N/A        |
| A3.3        | Drops of detergent standing on the marked surface: duration (h): 4 h .....   |                 | —          |
|             | Then removed by fine spray of warm water (40 ± 5 °C) or by lightly wiping.....   |                 | —          |
| A3.4        | After sample was dried, marking rubbed (apparatus Fig. 8) with detergent soaked lint, weight 750 g, duration (s): 15 s |                 | N/A        |
| A3.5        | Marking rubbed in apparatus with petroleum spirit soaked lint, weight 750 g, duration (s): 15 s                        |                 | N/A        |
| A3.7        | Marking after these tests still legible  |                 | N/A        |
| <b>D</b>    | <b>ANNEX D – HEAT, FIRE AND TRACKING</b>   |                 | <b>N/A</b> |
|             | Canada and USA national difference   |                 | N/A        |

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| Clause      | Requirement + Test   | Result - Remark | Verdict    |
| <b>G</b>    | <b>ANNEX G – HEAT AND FIRE RESISTANCES TESTS</b>   |                 | <b>P</b>   |
| G.2         | Glow-wire test: Performed in accordance with IEC 60695-2-1 with amendments.  |                 | P          |
| G.4         | Proof tracking test: Performed in accordance with IEC 60112 with amendments.   |                 | P          |
| G.5         | Ball pressure test   |                 | P          |
| G.5.1       | Ball-pressure test 1<br>(tests not to be made on parts of ceramic material and glass)  |                 | N/A        |
|             | Temperature during ball pressure, the higher of:   |                 | N/A        |
|             | - $(20 \pm 2)$ K (or $(15 \pm 2)$ K if control for appliances within IEC 355-1) in excess of the maximum temperature during test Cl. 14 ( $^{\circ}\text{C}$ ), or ..... |                 | —          |
|             | - $75 \pm 2^{\circ}\text{C}$ , or .....  |                 | —          |
|             | - as declared ( $^{\circ}\text{C}$ ).....  |                 | —          |
|             | Ball (steel) diameter: 5 mm, force: 20 N, duration: 1 h  |                 | N/A        |
| G.5.2       | Ball-pressure test 2<br>(tests not to be made on parts of ceramic material and glass)  |                 | P          |
|             | Temperature $T_b$ during ball pressure:  |                 | P          |
|             | - $T_b$ ( $^{\circ}\text{C}$ ): $100^{\circ}\text{C}$ if $T_{\text{max}} = 30\text{-}54^{\circ}\text{C}$ .....   |                 | —          |
|             | - $T_b$ ( $^{\circ}\text{C}$ ): $125^{\circ}\text{C}$ if $T_{\text{max}} = 55\text{-}84^{\circ}\text{C}$ .....   |                 | —          |
|             | - $T_b$ ( $^{\circ}\text{C}$ ): $125^{\circ}\text{C}$ for controls to be incorporated in appliances EN 60 335-1 .....  |                 | —          |
|             | - $T_b$ ( $^{\circ}\text{C}$ ): $(T_{\text{max}} + 40)^{\circ}\text{C}$ if $T_{\text{max}} < 85^{\circ}\text{C}$ .....   | 195             | —          |
|             | - $T_b$ ( $^{\circ}\text{C}$ ): 20 K in excess of the max. temperature during tests of Cl. 14 ( $^{\circ}\text{C}$ ), if higher .....                                    |                 | —          |
|             | - Compliance with Annex H.27.1.1.3   |                 | N/A        |
|             | Ball (steel) diameter: 5 mm, force: 20 N, duration: 1 h  |                 | P          |
| <b>H</b>    | <b>ANNEX H – REQUIREMENTS FOR ELECTRONIC CIRCUITS</b>  |                 | <b>N/A</b> |
| <b>J</b>    | <b>Annex J – requirements for controls using thermistors</b>   |                 | <b>N/A</b> |
| <b>L</b>    | <b>ANNEX L (NORMATIVE) – OVERVOLTAGE CATEGORIES</b>  |                 | <b>P</b>   |
| <b>N</b>    | <b>ANNEX N (NORMATIVE) – POLLUTION DEGREES</b>   |                 | <b>P</b>   |
| <b>P</b>    | <b>ANNEX P (NORMATIVE) – PRINTED CIRCUIT BOARD (PCB) COATING PERFORMANCE TEST</b>  |                 | <b>N/A</b> |
| <b>Q</b>    | <b>ANNEX Q (NORMATIVE) – PRINTED CIRCUIT BOARD COATING PERFORMANCE TEST</b>  |                 | <b>N/A</b> |

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|--------------------|--|------------------------|----------------|
| <b>Clause</b>      | <b>Requirement + Test</b>  | <b>Result - Remark</b> | <b>Verdict</b> |
| <b>T</b>           | <b>ANNEX T (NORMATIVE) - REQUIREMENTS FOR SELV AND PELV</b>                            |                        | <b>N/A</b>     |
| <b>U</b>           | <b>ANNEX U - REQUIREMENTS FOR RELAYS WHEN USED AS CONTROLS IN IEC 60335 APPLIANCES</b> |                        | <b>N/A</b>     |

| IEC 60730-1 |                    |                 |         |
|-------------|--------------------|-----------------|---------|
| Clause      | Requirement + Test | Result - Remark | Verdict |

|                         |                               |              |                     |                  |                         |
|-------------------------|-------------------------------|--------------|---------------------|------------------|-------------------------|
| 13.2                    | TABLE: Electric strength test |              |                     |                  | P                       |
| test location / circuit | type of insulation            | type/model   | working voltage (V) | test voltage (V) | No flashover/ breakdown |
| Live part – Base        | Basic insulation              | BW-BCP 155°C | 250                 | 1450             | No                      |

|  |  |                  |                  |         |                  |         |         |
|--|--|------------------|------------------|---------|------------------|---------|---------|
| 20   | TABLE: Creepage distance and clearance measurements                |                  |                  |         |                  |         | Verdict |
|  | requirements creepage distance and clearance met                   |                  |                  |         |                  | P       |         |
|  | supply working voltage (V) .....                                   |                  | 250V             |         |                  | —       |         |
|  | overvoltage category .....   |                  | II               |         |                  | —       |         |
|  | rated impulse voltage according to table 20.1(V) .....             |                  | 2500V            |         |                  | —       |         |
|  | requirements for case B (20.1.7, 20.1.12) met (cl20.1 Note 2)..... |                  |                  |         |                  | N/A     |         |
| creepage distance Cd and clearance Ci across (type of insulation)  | nominal Volt. (V)  | pollution degree | required Cd (mm) | Cd (mm) | required Ci (mm) | Ci (mm) |         |
| B  | 250  | 2                | 2.5              | >2.5    | 1.5              | >1.5    |         |
| full disconnection   |  |                  |                  |         |                  |         |         |
| micro-disconnection  |  |                  |                  |         |                  |         |         |
| electronic disconnection   |  |                  |                  |         |                  |         |         |
| Abbreviations for types of insulation:<br>OP: operational<br>B: basic<br>S: supplementary<br>R: reinforced |  |                  |                  |         |                  |         |         |

|                                 |   |             |               |              |         |               |         |                 |         |   |
|---------------------------------|---|-------------|---------------|--------------|---------|---------------|---------|-----------------|---------|---|
| 21                              | TABLE: Resistance to heat fire and tracking |             |               |              |         |               | P       |                 |         |   |
| Specimen                        |   |             | Ball pressure |              |         | Glow wire     |         | Tracking test   |         |   |
| Description                     | Material                                    | Colour      | Temp<br>∅[°C] | Impr.<br>∅mm | OK<br>✓ | Temp<br>∅[°C] | OK<br>✓ | Voltage<br>U[V] | OK<br>✓ |   |
| 1                               | Case  | PBT         | White         | 195          | <2.0    | ✓             | 850     | ✓               | 175     | ✓ |
| 2                               | Sealing adhesive                            | Epoxy resin | Black         | 195          | <2.0    | ✓             | 850     | ✓               | 175     | ✓ |
| Supplementary information: None |   |             |               |              |         |               |         |                 |         |   |

Table A:

| NO.                | 1#           | 2#           | 3#           |
|--------------------|--------------|--------------|--------------|
| Type               | BW-BCP 155°C | BW-BCP 155°C | BW-BCP 155°C |
| Rated Voltage      | 6A           | 6A           | 6A           |
| Rated Current      | 250VAC       | 250VAC       | 250VAC       |
| Power factor       | 0.6          | 0.6          | 0.6          |
| Rates of operation | 6cycles/min  | 6cycles/min  | 6cycles/min  |
| Cycles             | 2000         | 2000         | 2000         |



Test Report issued under the responsibility of:



**TEST REPORT  
IEC 60730-2-2**

**Automatic electrical controls for household and similar use  
Part 2: Particular requirements for thermal motor protectors**

**Report Reference No.** ..... : CVC2016-0040  
**Date of issue** ..... : Feb. 19, 2016  
**Total number of pages** ..... : 34

**CB Testing Laboratory** ..... : Vkan Certification&Testing Co., Ltd.  
**Address** ..... : No. 3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou, 510863, P.R. China

**Applicant's name** ..... : Guangzhou Safty Electronic Technology Co., Ltd.  
**Address** ..... : Room 202, No. 3, Commercial Building, Panyu, Guangzhou, 511442, China

**Test specification:**  
**Standard** ..... : IEC60730-2-2: 2005 (2.1 Edition) used in conjunction with IEC60730-1  
**Test procedure** ..... : CB  
**Non-standard test method**..... : N/A

**Test Report Form No.** ..... : IEC60730\_2\_2B  
**Test Report Form(s) Originator** ..... : CQC  
**Master TRF** ..... : Dated 2008-07

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**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.**

**Test item description** ..... : Thermal motor protector  
**Trade Mark** ..... : SAFTTY  
**Manufacturer** ..... : Guangzhou Safty Electronic Technology Co., Ltd. Panyu Branch  
**Model/Type reference** ..... : BW-BCP Series  
**Ratings** ..... : 250VAC 6A 50°C-155°C Type 3.C

|   |   |            |
|---|---|------------|
| <b>Testing procedure and testing location:</b>                    |   |            |
| <input checked="" type="checkbox"/> <b>CB Testing Laboratory:</b> | Vkan Certification&Testing Co., Ltd.  |            |
| Testing location/ address.....:                                   | No. 3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou, 510663, P.R. China |            |
| <input type="checkbox"/> <b>Associated CB Test Laboratory:</b>    |   |            |
| Testing location/ address.....:                                   |   |            |
| Tested by (name + function +signature).....:                      | Lin Yongming, Engineer  | See page 2 |
| Approved by (name + function + signature).....:                   | Kong Ruixun, Manager  | See page 2 |
| <input type="checkbox"/> <b>Testing procedure: TMP</b>            |   |            |
| Tested by (name + signature).....:                                |   |            |
| Approved by (+ signature) .....                                   |   |            |
| Testing location/ address.....:                                   |   |            |
| <input type="checkbox"/> <b>Testing procedure: WMT</b>            |   |            |
| Tested by (name + signature).....:                                |   |            |
| Witnessed by (+ signature).....:                                  |   |            |
| Approved by (+ signature) .....                                   |   |            |
| Testing location/ address.....:                                   |   |            |
| <input type="checkbox"/> <b>Testing procedure: SMT</b>            |   |            |
| Tested by (name + signature).....:                                |   |            |
| Approved by (+ signature) .....                                   |   |            |
| Supervised by (+ signature).....:                                 |   |            |
| Testing location/ address..... :                                  |   |            |
| <input type="checkbox"/> <b>Testing procedure: RMT</b>            |   |            |
| Tested by (name + signature).....:                                |   |            |
| Approved by (+ signature) .....                                   |   |            |
| Supervised by (+ signature).....:                                 |   |            |
| Testing location/ address.....:                                   |   |            |



**Summary of testing:**

See part 1 IEC60730-1.

**Tests performed (name of test and test clause):**

See part 1 IEC60730-1.

**Testing location:**

See part 1 IEC60730-1.

**Summary of compliance with National Differences:**

See part 1 IEC60730-1.

**Copy of marking plate**

See part 1 IEC60730-1.

|  |                               |
|--|-------------------------------|
| <b>Test item particulars</b> .....   |                               |
| Classification of installation and use.....  | N/A                           |
| Supply Connection .....  | N/A                           |
| .....  |                               |
| .....  |                               |
| <b>Possible test case verdicts:</b>  |                               |
| - test case does not apply to the test object.....   | 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.....  | Jan. 16, 2016                 |
| Date (s) of performance of tests .....   | Jan. 16, 2016 – Feb. 19, 2016 |
| <b>General remarks:</b>  |                               |
| <p>The test results presented in this report relate only to the object tested.<br/> This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.<br/> "(see Enclosure #)" refers to additional information appended to the report.<br/> "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a point is used as the decimal separator.</p> <p>Information for the manufacturer and factory:<br/> Manufacturer's address: same as applicant's address<br/> Factory: same as applicant<br/> Factory's address: same as applicant's address</p> |                               |
| <b>General product information:</b>  |                               |
| See part 1 IEC60730-1  |                               |

| IEC 60730-2-2 |                          |                 |         |
|---------------|--------------------------|-----------------|---------|
| Clause        | Requirement + Test       | Result - Remark | Verdict |
| <b>5</b>      | <b>RATINGS</b>           |                 | —       |
|               | Part 1 is not applicable |                 | —       |

|           |   |  |     |
|-----------|---|--|-----|
| <b>6</b>  | <b>CLASSIFICATION</b>   |  | —   |
|           | Part 1 is applicable, except as follows:  |  | —   |
| 6.4       | According to features of automatic action   |  | —   |
| 6.4.1     | Not applicable  |  | —   |
| 6.4.2     | Replacement: Type 3 action  |  | —   |
| 6.4.3     | Replacement: Type 3 actions are further classified according to one or more constructional or operational features.                         |  | —   |
|           | classifications applicable only if features declared  |  | P   |
| 6.4.3.1   | Void  |  | —   |
| 6.4.3.2   | micro-disconnection on operation (Type 3.B)   |  | N/A |
| 6.4.3.3   | micro-interruption on operation (Type 3.C)  |  | P   |
| 6.4.3.4   | Void  |  | —   |
| 6.4.3.5   | Void  |  | —   |
| 6.4.3.6   | Void  |  | —   |
| 6.4.3.7   | Void  |  | —   |
| 6.4.3.8   | trip-free action type (not possible to prevent contacts from opening), automatically reset if reset means held in reset position (Type 3.H) |  | N/A |
| 6.7       | Not applicable  |  | —   |
| 6.10-6.12 | Not applicable  |  | —   |
| 6.14      | Not applicable  |  | —   |
| 6.16      | Not applicable  |  | —   |

|          |   |                            |     |
|----------|---|----------------------------|-----|
| <b>7</b> | <b>INFORMATION</b>  |                            | —   |
|          | Part 1 is applicable, except as follows:  |                            | —   |
| 7.2.6    | Replacement   |                            | —   |
|          | Information shall be provided as indicated in table 7.2.:   |                            | —   |
|          | 1 - Manufacturer's name or trade mark; method C.:   | SAFTTY ; C                 | P   |
|          | 2 - Unique type reference; method C .....   | BW-BCP ; C                 | P   |
|          | 3 - Rated voltage or rated voltage range in volts (V); method X .....   | 250V; X                    | P   |
|          | 6 - Purpose of control; method D.....   | Thermal motor protector; D | P   |
|          | 22 - Temperature limits of the switch head, if T <sub>min</sub> lower than 0 °C or T <sub>max</sub> other than 55 °C; method X: |                            | N/A |
|          | 30 - PTI of materials used for insulation; method X:  | 175V; X                    | P   |

| IEC 60730-2-2 |  |                     |         |
|---------------|--|---------------------|---------|
| Clause        | Requirement + Test   | Result - Remark     | Verdict |
|               | 31 - Method of mounting control; method D.....:  | By Documentation; D | P       |
|               | 43 - Reset characteristics for cut-out action; method D .....  | Auto reset; D       | P       |
|               | 49 - Control pollution situation; method D .....   | Normal; D           | P       |
|               | 51 - Heat and fire resistance category; method X ..:   | Category D; X       | P       |
|               | 101 - Features of automatic action; method X.....:   | Type 3.C; X         | P       |
|               | 102 - Limited short circuit capability in terms of prospective current, voltage and rated current and characteristic of fuse; method X ..... |                     | N/A     |
| <b>8</b>      | <b>PROTECTION AGAINST ELECTRIC SHOCK</b>   |                     | —       |
|               | Part 1 is applicable, result:  |                     | P       |
| <b>9</b>      | <b>PROVISION FOR PROTECTIVE EARTHING</b>   |                     | —       |
|               | Part 1 is applicable, result:  |                     | N/A     |
| <b>10</b>     | <b>TERMINALS AND TERMINATIONS</b>  |                     | —       |
|               | Part 1 is applicable, except as follows:   |                     | —       |
| 10.1          | Not applicable   |                     | —       |
| 10.2          | Addition: internal wiring conductors are considered as integrated conductors.  |                     | N/A     |
| <b>11</b>     | <b>CONSTRUCTIONAL REQUIREMENTS</b>   |                     | —       |
|               | Part 1 is applicable, except as follows:   |                     | —       |
| 11.3.4        | Setting by the manufacturer  |                     | —       |
|               | Addition: Sealing compound, lock nuts and the like are deemed adequate for this purpose.   |                     | N/A     |
| 11.4          | Actions  |                     | —       |
|               | Additional subclauses:   |                     | —       |
| 11.4.101      | Type 3.B.H action shall operate to provide the electric strength requirements specified for micro-disconnection. (tests in clause 13 and 20) |                     | N/A     |
| 11.4.102      | Type 3.B.H action shall be so designed that the contacts cannot be prevented from opening  |                     | N/A     |
|               | and that they may automatically reset to the closed position if the reset means is held in the reset position.                               |                     | N/A     |
|               | If actuator in its normally free position, the control shall not reset automatically at any test ambient temperature above -5 °C.            |                     | N/A     |
| 11.4.103      | Type 3.C action shall operate to provide circuit interruption by micro-interruption. (tests in clause 20)                                    |                     | P       |

| IEC 60730-2-2 |  |                 |         |
|---------------|--|-----------------|---------|
| Clause        | Requirement + Test   | Result - Remark | Verdict |
| <b>12</b>     | <b>MOISTURE AND DUST RESISTANCE</b>  |                 | —       |
|               | Part 1 is applicable, result:  |                 | P       |
| <b>13</b>     | <b>ELECTRIC STRENGTH AND INSULATION RESISTANCE</b>   |                 | —       |
|               | Part 1 is applicable, except as follows:   |                 | —       |
|               | Addition: suitability of clause 13 may depend on mounting of equipment. if test on control as received are not representative, tests will be carried out with thermal protector mounted in the equipment |                 | P       |
| <b>14</b>     | <b>HEATING</b>   |                 | —       |
|               | Part 1 is not applicable   |                 | —       |
| <b>15</b>     | <b>MANUFACTURING DEVIATION AND DRIFT</b>   |                 | —       |
|               | Part 1 is not applicable   |                 | —       |
| <b>16</b>     | <b>ENVIRONMENTAL STRESS</b>  |                 | —       |
|               | Part 1 is applicable, except as follows:   |                 | —       |
| 16.2.4        | Not applicable   |                 | —       |
| <b>17</b>     | <b>ENDURANCE</b>   |                 | —       |
|               | Part 1 is applicable, except as follows:   |                 | —       |
|               | Endurance tests of the combination of thermal motor protectors and motors are given in annex AA for information and in the appropriate IEC publications.   |                 | N/A     |
|               | Additional subclauses:   |                 | —       |
| 17.101        | Limited short circuit  |                 | —       |
|               | Protector shall not cause risk of fire when subjected to the limited short-circuit test.   |                 | N/A     |
|               | 3 samples subjected to tests   |                 | N/A     |
| 17.101.1      | Test values applied: Fuse rating; current; voltage ..:   |                 | N/A     |
|               | cotton wrapped around protector  |                 | N/A     |
|               | manual reset protector subject to one test   |                 | N/A     |
|               | if protector cycles, test continued until protector or fuse opens permanently  |                 | N/A     |
| 17.101.2      | there is no ignition of the cotton   |                 | N/A     |
|               | accessible metal parts shall not be live   |                 | N/A     |
| <b>18</b>     | <b>MECHANICAL STRENGHT</b>   |                 | —       |
|               | Part 1 is applicable, except as follows:   |                 | —       |

| IEC 60730-2-2  |   |                 |         |
|----------------|---|-----------------|---------|
| Clause         | Requirement + Test  | Result - Remark | Verdict |
| 18.1.4 to 18.9 | Not applicable  |                 | P       |
| <b>19</b>      | <b>THREADED PARTS AND CONNECTIONS</b>   |                 | —       |
|                | Part 1 is applicable, result:   |                 | P       |
| <b>20</b>      | <b>CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH INSULATION</b>  |                 | —       |
|                | Part 1 is applicable, except as follows:  |                 | —       |
|                | Additional subclauses:  |                 | —       |
| 20.101         | Requirements for creepage distances and clearances do not apply   |                 | —       |
|                | - between same polarity live parts (including its heater(s), if used);  |                 | N/A     |
|                | - across the contact gap;   |                 | N/A     |
|                | - between terminals and terminations of the same polarity. This exception includes terminals and terminations.                |                 | N/A     |
| 20.102         | In Canada and the U.S.A, the creepage distances and clearances shall not be less than the appropriate values in table 20.102. |                 | N/A     |
| <b>21</b>      | <b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>  |                 | —       |
|                | Part 1 is applicable, result:   |                 | P       |
| <b>22</b>      | <b>RESISTANCE TO CORROSION</b>  |                 | —       |
|                | Part 1 is applicable, result:   |                 | N/A     |
| <b>23</b>      | <b>ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS - EMISSION</b>  |                 | —       |
|                | Part 1 is applicable, result:   |                 | N/A     |
| <b>24</b>      | <b>COMPONENTS</b>   |                 | —       |
|                | Part 1 is applicable, result:   |                 | N/A     |
| <b>25</b>      | <b>NORMAL OPERATION</b>   |                 | —       |
|                | Part 1 is not applicable  |                 | —       |
| <b>26</b>      | <b>ELECTROMAGNETIC COMPATIBILITY (EMC) REQUIREMENTS - IMMUNITY</b>  |                 | —       |
|                | Part 1 is not applicable  |                 | —       |

| IEC 60730-2-2 |  |                 |         |
|---------------|--|-----------------|---------|
| Clause        | Requirement + Test   | Result - Remark | Verdict |
| <b>27</b>     | <b>ABNORMAL OPERATION</b>  |                 | —       |
|               | Part 1 is applicable, except as follows:   |                 | —       |
| 27.1          | Not applicable   |                 | N/A     |
| 27.4          | Not applicable   |                 | N/A     |
| <b>28</b>     | <b>GUIDANCE ON THE USE OF ELECTRONIC DISCONNECTION</b>                             |                 | —       |
|               | This clause is not applicable  |                 | —       |
|               | <b>ANNEXES</b>   |                 | —       |
|               | The annexes of part 1 are applicable, except as follows:                           |                 | —       |
|               | <b>ANNEX C - COTTON USED FOR MERCURY SWITCH TEST</b>                               |                 | —       |
|               | Part 1 is applicable, result:  |                 | P       |
|               | <b>ANNEX D - HEAT, FIRE AND TRACKING</b>   |                 | —       |
|               | Part 1 is applicable in Canada and the USA   |                 | N/A     |
|               | <b>ANNEX E - CIRCUIT FOR MEASURING LEAKAGE CURRENT</b>                             |                 | —       |
|               | Part 1 is applicable, result:  |                 | N/A     |
|               | <b>ANNEX H - REQUIREMENTS FOR ELECTRONIC CONTROLS</b>                              |                 | —       |
|               | Part 1 is applicable, result:  |                 | N/A     |
|               | <b>ANNEX AA - TESTING OF THE COMBINATION OF MOTOR AND THERMAL MOTOR PROTECTORS</b> |                 | —       |